



Working paper N° A/2013

**Working paper**  
**on biodiversity and ecosystem assessment reports**  
**(Annexes)**

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# Working paper on biodiversity and ecosystem assessment reports - Annexes

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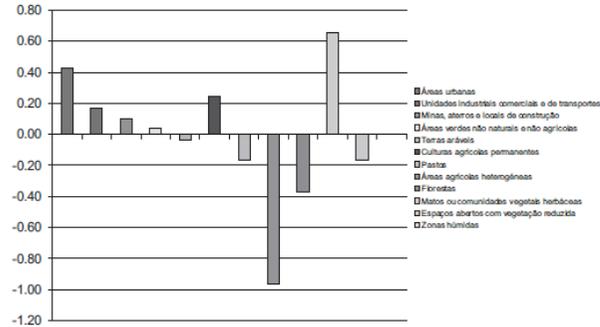
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This document was prepared by a project team from the European Topic Centre on Biological Diversity – Sophie Condé, MNHN, Amor Torre-Marín and Ben Delbaere, ECNC (July 2013)

# Annex 1 – Visual representation of the analysis of ecosystems and ecosystem services across the three NEAs

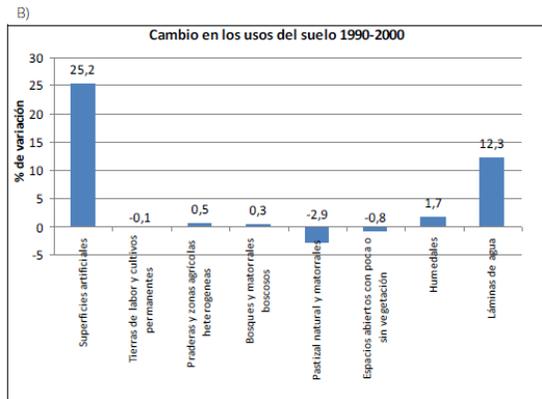
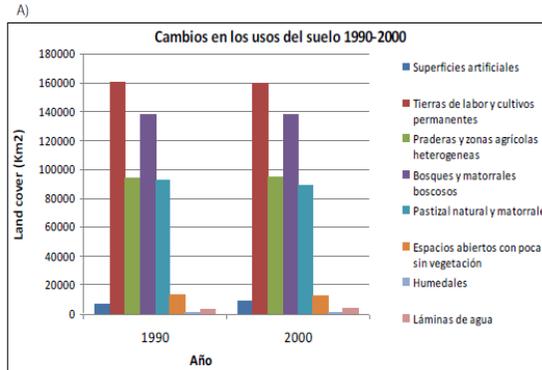
Table 1: Surface and surface change

Evolution of land cover between 1990 and 2000



Source: Corine Land Cover, 2004 in ptMA, 2012

Changes in land use obtained from Corine Land Cover, in surface (A) and in percentage of variation (B)



Source: MARM, OSE, 2006 in EME, 2012

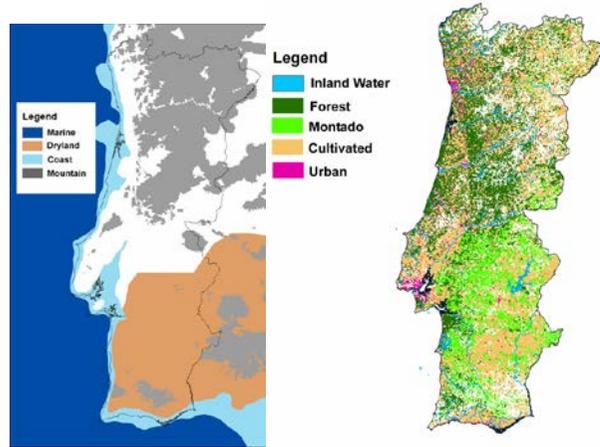
UK NEA Broad Habitats and estimated Net change between 1998 and 2007

| UK NEA Broad Habitats                          | UK NEA component habitats   | Estimate from Northern Ireland Countryside Survey                                 | 1998   |   | 2007                     |                | Net change     |               |             |               |             |
|--|---|---|--|---|--------------------------|----------------|----------------|---------------|-------------|---------------|-------------|
|  |   |   | ha   | % NI  | ha                       | % NI           | ha             | %             |             |               |             |
| Mountains, Moorlands & Heaths                  | Bracken   | BH09 Dense bracken  | 3,084  | 0.22  | 2,645                    | 0.19           | -439           | -14.2         |             |               |             |
|  | Dwarf Shrub Heath   | BH10 Dwarf shrub heath  | 13,909   | 0.98  | 16,751                   | 1.18           | 2,842          | 20.4          |             |               |             |
|  | Upland Fen, Marsh & Swamp   | S16 Poor fen  | 24,784   | 1.75  | 21,005                   | 1.48           | -3,779         | -15.2         |             |               |             |
|  | Bog   | BH12 Bog (Above 150 m <sup>2</sup> )  | 140,814  | 9.94  | 139,796                  | 9.87           | -1,018         | -0.7          |             |               |             |
|  | Montane   | BH15 Montane vegetation   | 735  | 0.05  | 735                      | 0.05           | 0              | 0.0           |             |               |             |
|  | Inland Rock   | BH16 Inland rock  | 7,569  | 0.56  | 5,459                    | 0.39           | -2,110         | -31.6         |             |               |             |
| <b>Mountains, Moorlands &amp; Heaths Total</b> |   |   | <b>191,295</b>                                   | <b>13.45</b>                                | <b>186,382</b>           | <b>13.21</b>   | <b>-4,913</b>  | <b>-2.6</b>   |             |               |             |
| Semi-natural Grasslands                        | Acid Grassland  | BH01 Acid grassland   | 13,324   | 0.94  | 10,369                   | 0.73           | -2,955         | -22.2         |             |               |             |
|  | Neutral Grassland   | BH06 Neutral grassland  | 269,902  | 18.64                                       | 231,116                  | 16.32          | -38,786        | -12.4         |             |               |             |
|  | Calcareous Grassland  | BH07 Calcareous grassland   | 1,765  | 0.13  | 1,802                    | 0.13           | 37             | 2.1           |             |               |             |
|  | Purple Moor-grass & Rush Pasture                                    | S02 Species rich wet grassland  | 13,396   | 0.95  | 13,186                   | 0.93           | -210           | -1.6          |             |               |             |
|  | 565 Fen meadow  | S65 Fen meadow  | 6,533  | 0.46  | 5,200                    | 0.37           | -1,243         | -19.0         |             |               |             |
| <b>Semi-natural Grasslands Total</b>           |   |   | <b>298,920</b>                                   | <b>21.32</b>                                | <b>261,763</b>           | <b>18.48</b>   | <b>-37,157</b> | <b>-12.4</b>  |             |               |             |
| Enclosed Farmland                              | Arable & Horticulture (including orchards & short rotation coppice) | BH04 Arable and horticulture  | 57,213   | 4.04  | 48,917                   | 3.46           | -8,296         | -14.5         |             |               |             |
|  | W12 Orchard   | W12 Orchard   | 1,623  | 0.12  | 1,365                    | 0.08           | -258           | -28.2         |             |               |             |
|  | Improved Grassland  | BH05 Improved grassland   | 554,982  | 39.19                                       | 573,010                  | 40.47          | 18,028         | 3.2           |             |               |             |
|  | Boundary and linear features <sup>1</sup>                           | BH03a Field Boundaries (km)   | 226,296  | n/a   | 225,917                  | n/a            | -379           | -0.2          |             |               |             |
| <b>Enclosed Farmland Total<sup>1</sup></b>     |   |   | <b>619,818</b>                                   | <b>43.35</b>                                | <b>623,092</b>           | <b>44.01</b>   | <b>9,274</b>   | <b>1.5</b>    |             |               |             |
| Woodlands                                      | Broadleaved, Mixed & Yew Woodland                                   | BH01 Broadleaved, mixed and yew woodland (Not including W12 Orchard) <sup>2</sup> | 61,884   | 4.37  | 80,534                   | 5.69           | 18,650         | 30.1          |             |               |             |
|  | Coniferous Woodland   | BH02 Coniferous woodland  | 62,135   | 4.39  | 60,617                   | 4.28           | -1,518         | -2.4          |             |               |             |
|  | <b>Woodlands Total</b>  |   |  | <b>124,019</b>                              | <b>8.76</b>              | <b>141,151</b> | <b>9.97</b>    | <b>17,132</b> | <b>13.8</b> |               |             |
| UK NEA Broad Habitats                          | UK NEA component habitats   | Estimate from Northern Ireland Countryside Survey                                 | 1998   |   | 2007                     |                | Net change     |               |             |               |             |
|  |   |   | ha   | % NI  | ha                       | % NI           | ha             | %             |             |               |             |
|  |   |   | Freshwaters - Openwaters, Wetlands & Floodplains | Standing open water (lakes, ponds & canals) | BH13 Standing open water | 61,785         | 4.36           | 61,322        | 4.33        | -463          | -0.7        |
|  |   |   |  | Rivers and streams                          | BH14 Rivers and streams  | 5,300          | 0.38           | 5,495         | 0.39        | 195           | 3.9         |
|  |   |   |  | Lowland raised bog <sup>3</sup>             | BH12 Bog (Below 150 m)   | 23,402         | 1.65           | 21,106        | 1.49        | -2,296        | -9.8        |
|  |   |   |  | S17 Reedbeds                                | S17 Reedbeds             | 2,958          | 0.21           | 2,563         | 0.18        | -395          | -13.4       |
|  |   |   |  | S18 Fen                                     | S18 Fen                  | 2,723          | 0.19           | 2,499         | 0.18        | -224          | -8.2        |
|  |   |   |  | S66 Swamp                                   | S66 Swamp                | 2,280          | 0.16           | 2,524         | 0.18        | 244           | 10.7        |
|  |   |   | S68 Water inundation vegetation                  | S68 Water inundation vegetation             | 260                      | 0.02           | 187            | 0.01          | -73         | -28.1         |             |
|  |   |   | <b>Freshwater Total</b>                          |   |                          | <b>98,798</b>  | <b>6.98</b>    | <b>95,706</b> | <b>6.76</b> | <b>-3,092</b> | <b>-3.1</b> |
| Urban  | Built-up Areas & Gardens  | BH17 Built up areas   | 56,847   | 4.01  | 74,098                   | 5.23           | 17,251         | 30.3          |             |               |             |
|  | Roads, tracks and hard verges                                       | BH03b Roads, tracks and hard verges   | 29,449   | 2.08  | 30,951                   | 2.19           | 1,502          | 5.1           |             |               |             |
| <b>Urban Total</b>                             |   |   | <b>86,296</b>                                    | <b>6.09</b>                                 | <b>105,049</b>           | <b>7.42</b>    | <b>18,753</b>  | <b>21.7</b>   |             |               |             |
| Coastal Margins                                | Sea Cliffs  |   |  |   |                          |                |                |               |             |               |             |
|  | Shingle   | BH18 Supralittoral rock   | 1,717  | 0.12  | 1,581                    | 0.11           | -136           | -7.9          |             |               |             |
|  | Coastal Lagoons   |   |  |   |                          |                |                |               |             |               |             |
|  | Saltmarsh   | BH19 Supralittoral sediment   | 1,859  | 0.13  | 1,995                    | 0.14           | 136            | 7.3           |             |               |             |
| <b>Coastal Margins Total</b>                   |   |   | <b>3,576</b>                                     | <b>0.25</b>                                 | <b>3,576</b>             | <b>0.25</b>    | <b>0</b>       | <b>0.0</b>    |             |               |             |
| Marine   | Intertidal Rock   | BH20 Littoral rock  | Not recorded                                     | n/a   | 1,212                    | n/a            | n/a            | n/a           |             |               |             |
|  | Intertidal Sediment   | BH21 Littoral sediment  | Not recorded                                     | n/a   | 9,518                    | n/a            | n/a            | n/a           |             |               |             |
|  | Subtidal Rock   |   |  |   |                          |                |                |               |             |               |             |
|  | Subtidal Sediment—shallow & shelf                                   | T2 NM Territorial Waters <sup>4</sup>   | -450,000   | n/a   | -450,000                 | n/a            | 0              | 0             |             |               |             |
| <b>Deep-sea Habitat</b>                        |   |   |  |   |                          |                |                |               |             |               |             |

Source: Cooper & McCann, 2010 in UK NEA, 2011b

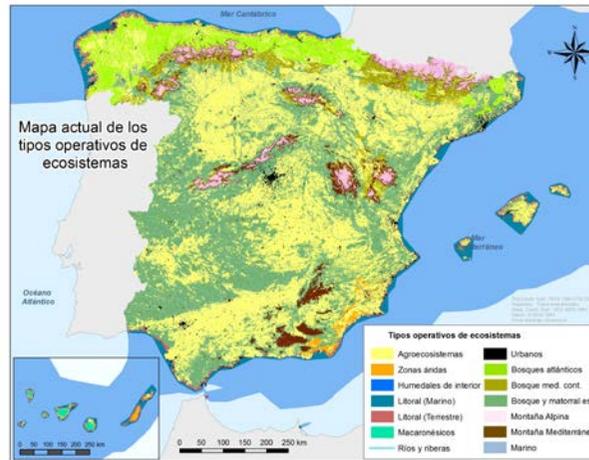
Table 2: Geographical distribution of ecosystem types

Distribution of the mainland systems analysed in the Portugal Assessment



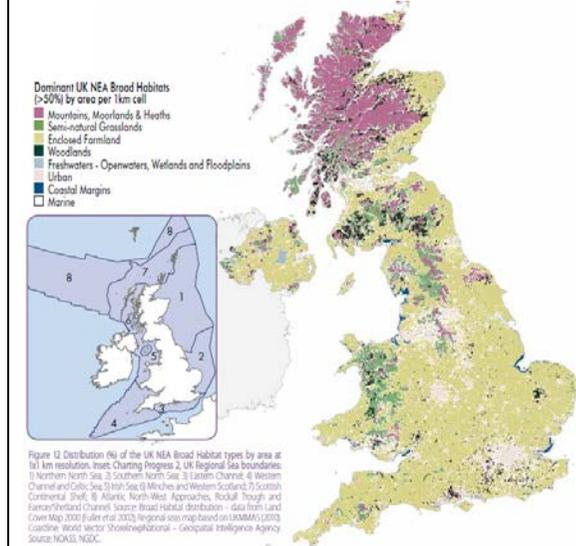
Source: Direcção erald as Florestas 2003, MA 2004 in Pereira et al., 2004

Map of current operational ecosystem types in Spain



Source: EME, 2013

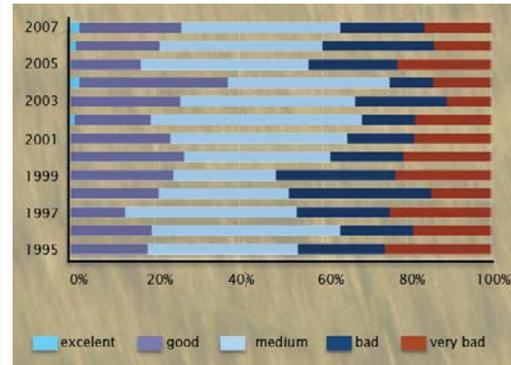
Distribution (%) of the UK NEA Broad Habitat types by area at 1x1 km resolution



Source: Land Cover Map 2000 (Fuller et al. 2002) in UK NEA, 2011a

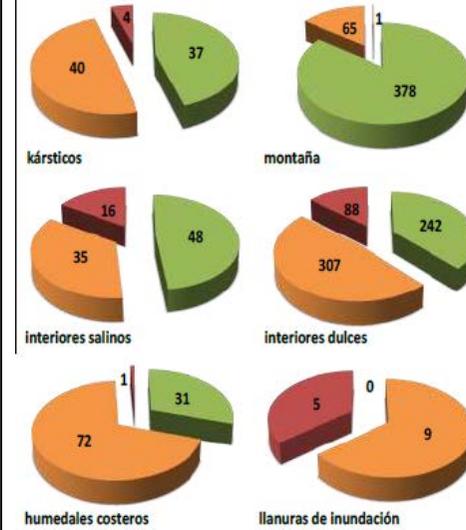
Table 3: Conservation status and trends of ecosystem types

Water quality in rivers between 1995 and 2007, according to a generic indicator based on uses



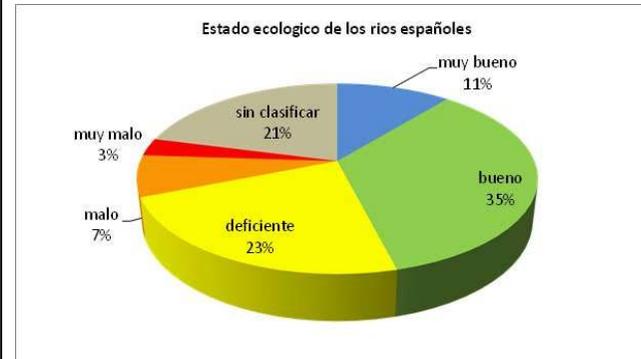
Source: ptMA, 2012

Conservation status of the main types of wetlands, expressed by the number of sites conserved (green), altered (orange) and disappeared (red) from the beginning of the XIX century until 1990



Source: EME, 2012 based on Casado et al., 1992

Ecological status of Spanish rivers according to the criteria of the Water Framework Directive



Source: MIMA, 2007 in EME, 2012

The health and biodiversity of Welsh Marine habitats

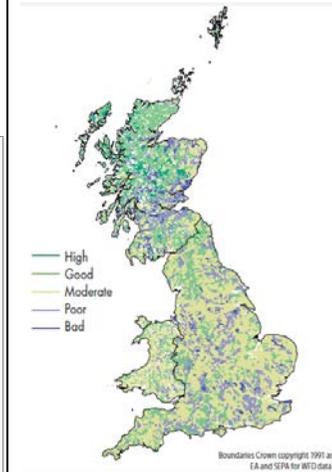
| Habitat                    | Status     |                     |
|----------------------------|------------|---------------------|
|                            | Celtic Sea | Irish Sea           |
| Intertidal rock            | ↓          | ↓                   |
| Intertidal sediments       | ↓          | ↓                   |
| Subtidal rock              | ↔          | ↔                   |
| Shallow subtidal sediments | *          | ↔                   |
| Shelf subtidal sediments   | *          | ↔                   |
| Deep-sea habitats          | ↓          | habitat not present |

|   |                                |                    |
|---|--------------------------------|--------------------|
| ↑ | Improvement                    | Many problems      |
| ↓ | Deterioration                  | Some problems      |
| ↔ | Stable                         | Few or no problems |
| * | No trend information available |                    |

Source: UKMMAS, 2010 in UK NEA, 2011b

Ecological status classes for rivers and river basins in England, Wales and Scotland as determined by the Environment Agency and Scottish Environment Protection Agency (SEPA) in 2008 for the purposes of the Water Framework Directive



Source: Environment Agency and SEPA in UK NEA, 2011b

Note: The classes reflect the most sensitive indicator element in each location relative to the prevailing risks

Table 4: Drivers of change of the different ecosystem types

| Promotor de alteração               | Ex/En | D/I | Escala espacial | Velocidade | Imp. |
|-------------------------------------|-------|-----|-----------------|------------|------|
| Alterações do uso do solo           | En/Ex | D   | N               | Alta       | 1    |
| Alterações climáticas               | Ex    | D   | Eu/Mu           | Baixa      | 3    |
| Fogo                                | En/Ex | D   | N               | Média      | 2    |
| Coesão social e identidade cultural | Ex    | I   | N, Eu/Mu        | Alta       | 3    |
| Políticas agrárias                  | En/Ex | I   | N, Eu           | Média      | 2    |

Source: ptMA, 2012

Note: Abbreviations: Ex – Exogenous; En – Endogenous; D – Direct; I – Indirect; N – national scale; EU – European Union scale; Imp. – Importance, from 1 (highest) to 3 (lowest)

Estimation of the trends and intensity of the direct drivers of change on Mediterranean continental forests and bush land



Source: EME, 2012

A summary of drivers of change in Semi-natural Grassland and their impacts at different periods

Table 6.9 A summary of drivers of change in Semi-natural Grassland and their impacts at different periods. The role of the driver of change is categorised as major (■), moderate (◻) or minor (□).

| Driver of change                                 | Semi-natural Grassland affected | Impact of driver on Semi-natural Grassland  | Role since 1940s | Present role | Future role † |
|--|---------------------------------|---|------------------|--------------|---------------|
| Agricultural grassland improvement               | Priority habitats               | Domination by fast-growing plants; loss of plant and animal diversity; soil processes compromised                         | ■                | □            | □             |
| Conversion to arable                             | Priority habitats               | Cultivation and total loss of habitat   | ■                | □            | □             |
| Conversion to forestry                           | All*                            | Cultivation, planting and total loss of habitat   | ■                | ◻            | ◻ (uplands)   |
| Other conversion: roads, building quarries, etc. | All                             | Habitat destruction   | ◻                | □            | □             |
| Nitrogen deposition and transfer                 | All                             | Increased soil fertility leading to domination by fast-growing plants and loss of plant diversity                         | ■                | ■ (◻)        | ◻             |
| Inadequate management                            | Priority habitats               | Insufficient grazing leading to rank vegetation, scrub and trees  | ◻                | ■            | ■             |
| Overgrazing                                      | Upland acid                     | Overgrazing (sheep) of moorland causing loss of heather and increase in upland grassland                                  | ■                | ◻            | □             |
| Habitat fragmentation                            | Priority habitats               | Remaining Semi-natural Grassland are small and isolated leading to local species losses and invasions                     | ◻                | ◻            | ◻             |
| Invasion by non-native plants                    | All                             | Exclusion of desirable species; change in soil processes  | □                | □            | ◻ (◻)         |
| Agri-environment schemes                         | Priority habitats               | Conservation management of existing Semi-natural Grassland and re-creation of Semi-natural Grassland on agricultural land | □                | ◻            | ◻             |
| Agri-environment schemes                         | Upland acid                     | Conversion back to heather moorland   | □                | ◻            | ◻             |
| Protection                                       | Priority habitats               | Designation for conservation and so protected and managed against destruction and degradation                             | ■                | ■            | ■             |
| Climate change                                   | All                             | Species losses; colonisation by novel species; increased openness   | □                | □            | ■             |

\* 'All' refers to all Semi-natural Grassland habitats; i.e. Priority habitats and Upland acid.  
 † Future roles to 2050 are predicated on the continuation of current environmental and land use policies.

Source: UK NEA, 2011b

Table 5: Status and trends of the ecosystem services provided by the different ecosystem types

Condition and trend for the services of each Portugal ecosystem

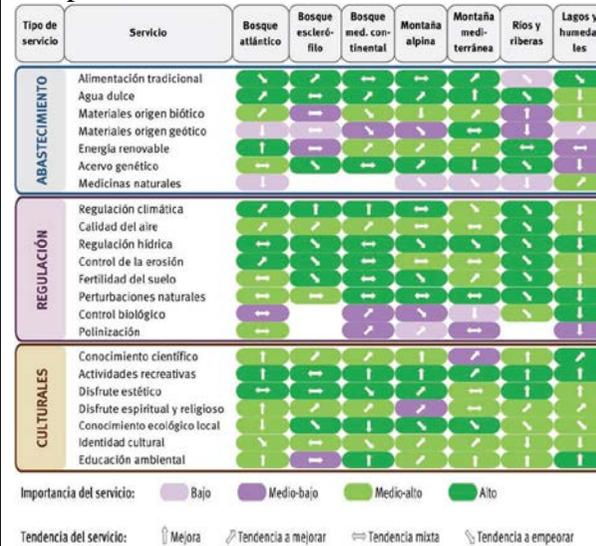
|              | Biodiversity | Food | Water | Fiber | Soil and Flood Protection | Climate Regulation | Recreation |
|--------------|--------------|------|-------|-------|---------------------------|--------------------|------------|
| Marine       | ↘            | ↗    |       |       |                           | ?                  | ↗          |
| Coastal      | ↘            | ↗    |       |       | ↘                         |                    | ↗          |
| Inland Water | ↘            | ↗    | ↘     |       | ↘                         |                    | ↗          |
| Forest       | →            | ↗    | ↘     | ↗     | →                         | ↗                  | ↗          |
| Montado      | →            | ↗    | →     | ↗     | →                         |                    | ↗          |
| Cultivated   | →            | ↗    | ↘     |       | ↗                         | ?                  | ↗          |
| Urban        | ↘            |      |       |       | ↘                         |                    | ↗          |

Not Assessed (white), Bad (red), Poor (orange), Fair (yellow), Good (green), Excellent (blue)

Source: Pereira et al., 2004

Note: The condition of the service is given by a color code. Two types of trend are shown: arrows give the trend of the condition (or “stock”); hands give the trend of the production (or “flow”) for provisioning services and recreation. In some cases services were not assessed because they do not occur or they have a marginal importance. Question marks indicate services that would have been assessed if data were available.

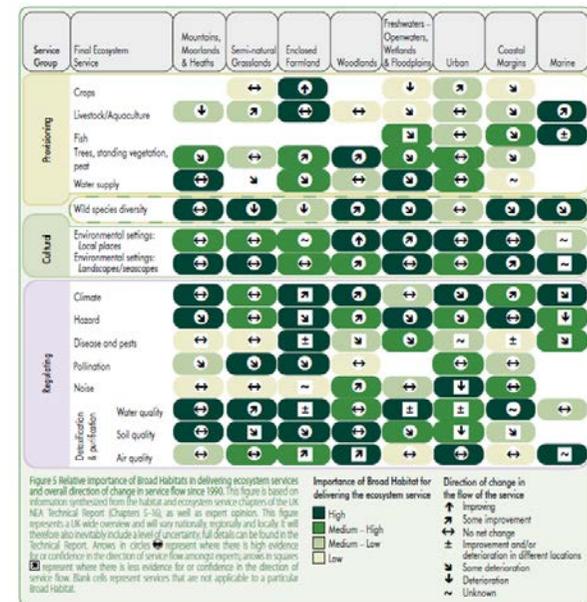
Evaluation of the relative importance and the trends since the 60s of the 22 services provided by the operational ecosystem types of Spain



Source: EME, 2011

Note: White cells mean that the service has not been evaluated or is not applicable to a certain ecosystem type.

Relative importance of Broad Habitats in delivering ecosystem services and overall direction of change in service flow since 1990



Source: UK NEA, 2011a

Table 6: Ecosystem services provided by specific ecosystem types

|                      | Situação actual | Tendência de evolução |
|----------------------|-----------------|-----------------------|
| Produção alimentar   | -               | =                     |
| Sequestro de Carbono | -               | =                     |
| Biodiversidade       | +               | ↓                     |
| Provisão de água     | -               | ↓                     |
| Protecção do solo    | --              | ↓                     |
| Recreio              | 0               | =                     |

Source: ptMA, 2012

Note: Status: (+) Positive; (0) Neutral; (-) Negative; (--) Very negative. Trends: (=) Stationary; (↓) Negative

Estimated situation of the ecosystem services provided by sclerophyllous forest and bush land and associated annual grassland

| Tipo           | Servicio   | Situación                           |   |
|----------------|--|-------------------------------------|---|
| Abastecimiento | Alimentación   | ↗                                   |   |
|                | Agua   | ↔                                   |   |
|                | Tejidos, fibras y otros materiales bióticos                      | ↔                                   |   |
|                | Materiales origen geotico  | ↔                                   |   |
|                | Energía  | ↔                                   |   |
| Regulación     | Reserva genética   | ↘                                   |   |
|                | Regulación climática local y regional. Almacenamiento de carbono | ↑                                   |   |
|                | Regulación del aire  | ↗                                   |   |
|                | Regulación hídrica y depuración del agua                         | ↘                                   |   |
|                | Regulación morfo sedimentaria                                    | ↘                                   |   |
| Culturales     | Regulación del suelo y nutrientes. Fertilidad del suelo          | ↘                                   |   |
|                | Amortiguación de perturbaciones                                  | ↔                                   |   |
|                | Conocimiento científico  | ↗                                   |   |
|                | Actividades recreativas  | Turismo clásico<br>Turismo cultural | ↔ |
|                | Paisaje - Servicio estético                                      |                                     | ↗ |
|                | Disfrute espiritual  | ↗                                   |   |
|                | Conocimiento ecológico local                                     | ↘                                   |   |
|                | Identidad cultural y sentido de pertenencia                      | ↔                                   |   |
|                | Educación ambiental  | ↔                                   |   |



Source: EME, 2102

Overview of final ecosystem services provided by Enclosed Farmland

| Final ecosystem service   | Importance of enclosed farmland for service | Impact of enclosed farmland on service | Evidence base | Comments  |
|---|---|--|---------------|---|
| Crops, plants, livestock, fish, etc. (wild and domesticated)        | High  | ++                                     | ⊕             | Strong positive score: farmland is largely managed for crop and livestock production.   |
| Trees, standing vegetation & peat                                   | Low   | +                                      | ⊖             | Positive score, due to small but increasing areas of biomass crops.   |
| Climate regulation  | High  | --                                     | ⊕             | Strong negative score, due to emissions of Greenhouse gases and depletion of carbon in soils.   |
| Water quantity  | High  | + / -                                  | ⊕             | Important for catching water for ground and surface waters, though flood risk mitigation potential often compromised by management.             |
| Hazard regulation - vegetation & other habitats                     | High  | --                                     | ⊕             | Negative impact on sediment loss to watercourses, increasing flood risk downstream.   |
| Waste breakdown & detoxification                                    | High  | -- / +                                 | ⊕             | Negative score due to diffuse (mainly) pollution leaving farmland; positive score for ability to compost green waste / AD, and sewage disposal. |
| Wild species diversity including microbes                           | High  | --                                     | ⊕             | Negative impacts; status of microbes unknown.   |
| Purification  | Low   | --                                     | ⊕             | Negative impacts on water quality as a result of diffuse pollution.   |
| Environmental settings - meaningful places incl. green & blue space | Low   | Zero                                   | ⊖             | Individual sites have less significance than spaces in cities or mountain tops.   |
| Environmental settings - socially valued landscapes and waterscapes | High  | ++                                     | ⊖             | Farming management is largely responsible for the landscapes that many people cherish.  |

Source: UK NEA, 2011b

Note: the impact values range from ++ to --, depending on the magnitude and direction of influence. ⊕ denotes high agreement with much evidence; ⊖ indicates high agreement with limited evidence. Ecosystem services are categorised as provisioning (P), regulating (R) or cultural (C).

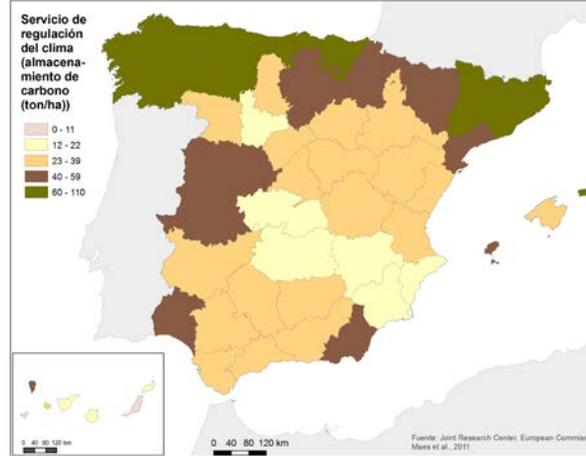
Table 7: Assessment and mapping of specific ecosystem services: regulating services

Inventory of the quantity of carbon sequestered in Quinta da França in 2006, 2007 and 2008

| Item                 | Carbono sequestrado (t) |             |             |             |             |             |
|----------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
|                      | 2006                    |             | 2007        |             | 2008        |             |
| Biomassa florestal   | 980                     |             | 1028        |             | 1656        |             |
| Solo florestal       | 369                     |             | 409         |             | 409         |             |
| Gestão agrícola      | 105                     |             | 708         |             | 99          |             |
| Gestão de pastagens* | 344                     | 432         | 507         | 588         | 578         | 702         |
| <b>Total</b>         | <b>1798</b>             | <b>1886</b> | <b>2652</b> | <b>2733</b> | <b>2742</b> | <b>2866</b> |

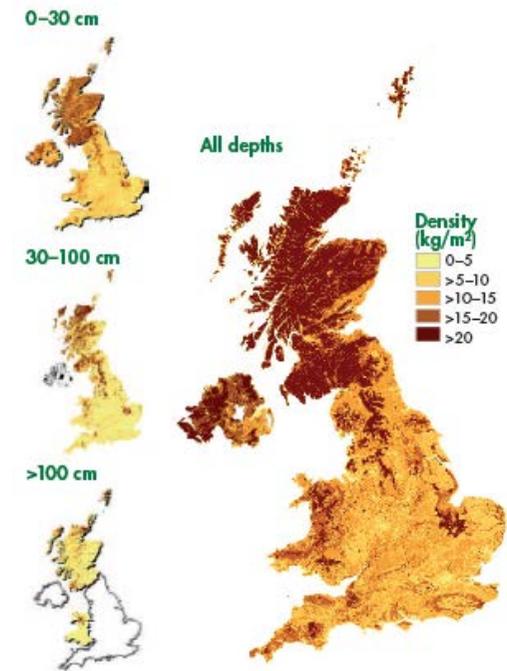
Source: Terraprima in ptMA, 2012

Map of climate regulation service (Carbon storage in ton/ha)



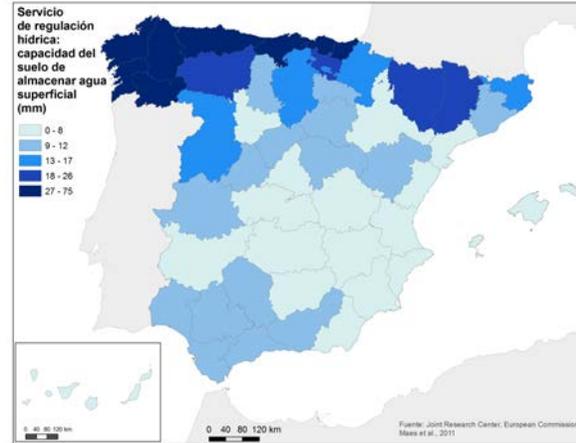
Source: EME, 2013

Density (kg/m<sup>2</sup>) of soil carbon in the UK



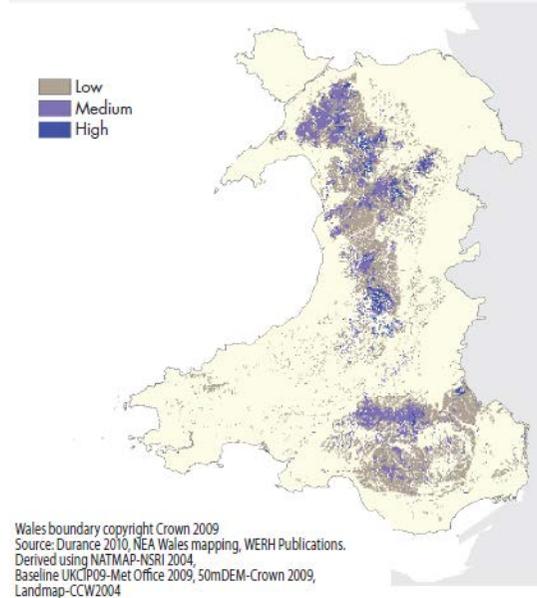
Source: Bradley et al., 2005 in UK NEA, 2011b

Regulation of water flows (soil capacity to store surface water in mm)



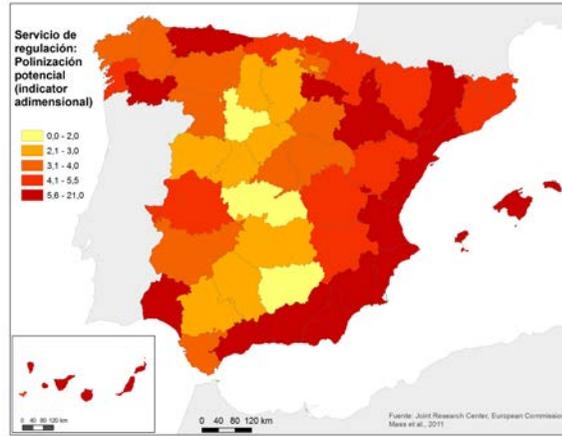
Source: EME, 2013

Potential for regulation of surface runoff by land cover in highly erodible areas of Wales



Source: Wales Environment Research Hub unpublished data in UK NEA, 2011b

Map of potential pollination (dimensionless service)



Source: EME, 2013

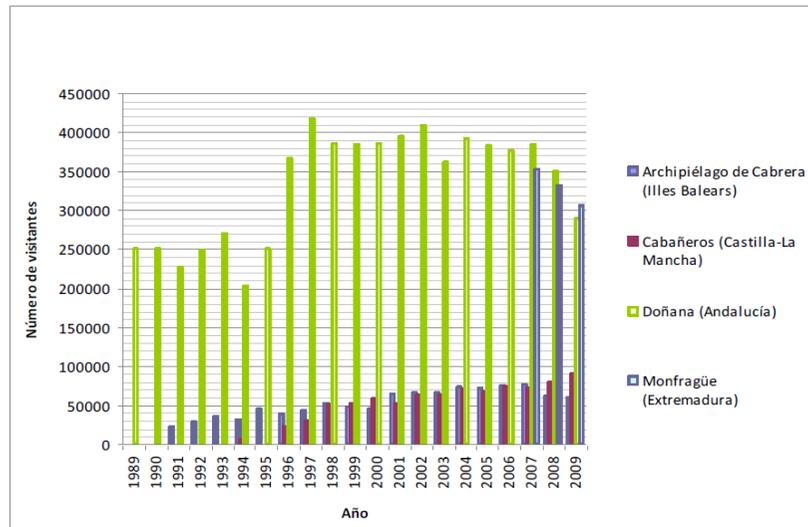
Crop dependencies on pollinators and annual value of pollination in 2007

| Crop            | Dependence on Pollinators (%) | Value per annum (£ millions) |
|-----------------|-------------------------------|------------------------------|
| Oilseed rape    | 25                            | 106                          |
| Strawberries    | 45                            | 72                           |
| Dessert apples  | 85                            | 44                           |
| Culinary apples | 85                            | 43                           |
| Raspberries     | 45                            | 39                           |
| Cucumbers       | 65                            | 22                           |
| Tomatoes        | 25                            | 21                           |
| Runner beans    | 85                            | 16                           |
| Plums           | 65                            | 6                            |
| Pears           | 65                            | 5                            |
| Others          | 5-85                          | 54                           |
| <b>Total</b>    |                               | <b>Approx. £430 million</b>  |

Source: UK NEA, 2011b

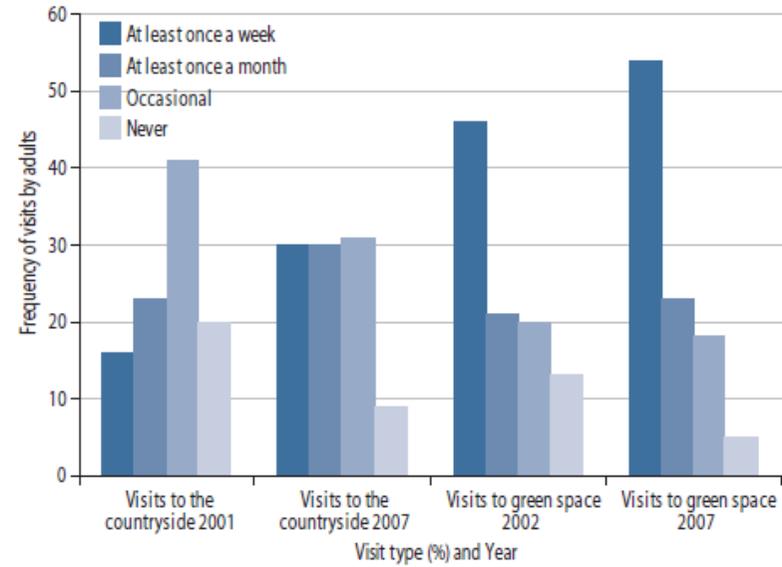
Table 8: Assessment and mapping of specific ecosystem services: cultural services

Evolution of the number of visitors to national parks which represent certain ecosystem types (in this case termophilic Mediterranean forests)



Source: MARM, 2009 in EME, 2012

Frequency of visits to the countryside and greenspaces in England



Source: FLUFP, 2010 in UK NEA, 2011b

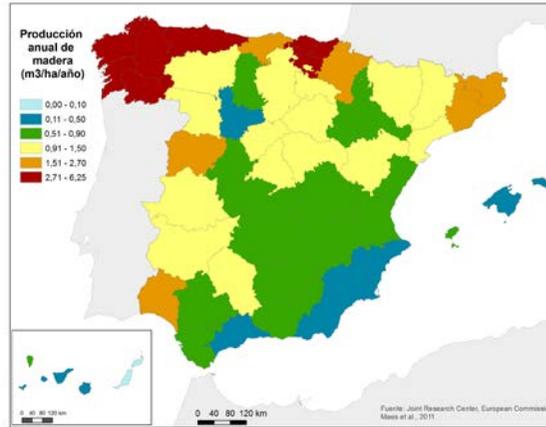
Table 9: Assessment and mapping of specific ecosystem services: provisioning services

Cork production in ton

| Years         | Total   | Virgin cork | Reproduction cork |
|---------------|---------|-------------|-------------------|
| Average 43/51 | 170 666 | 44 222      | 126 444           |
| Average 52/60 | 188 334 | 57 778      | 130 556           |
| Average 61/69 | 221 555 | 78 444      | 143 111           |
| Average 70/78 | 185 966 | 47 033      | 138 933           |
| Average 79/87 | 149 422 | 33 700      | 115 722           |
| Average 88/96 | 170 444 | 30 000      | 140 444           |
| Average 97/00 | 165 500 | 30 000      | 135 500           |

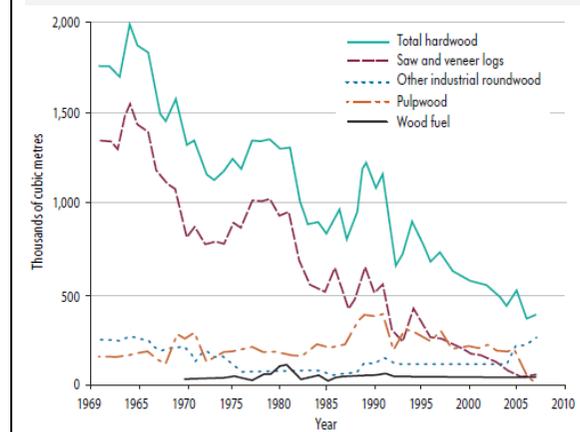
Source: Mendes, 2004 in Pereira et al., 2004

Annual timber production (m<sup>3</sup>/ha/year)



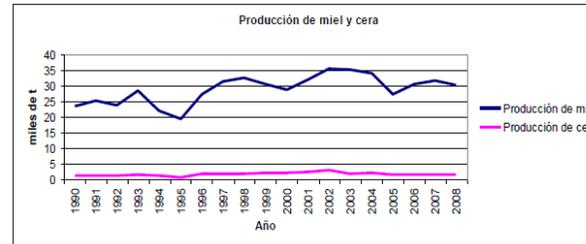
Source: EME, 2013

Production of hardwoods in the UK from 1961 to 2007



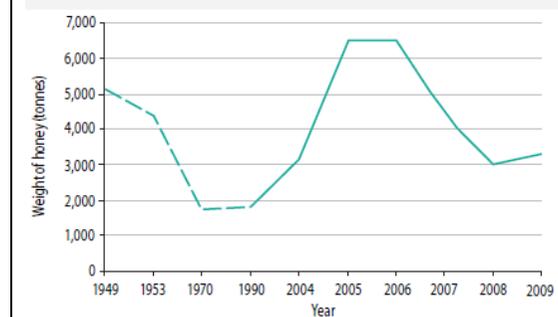
Source: Forestry Commission in UK NEA, 2011b

Evolution of the production of honey and wax



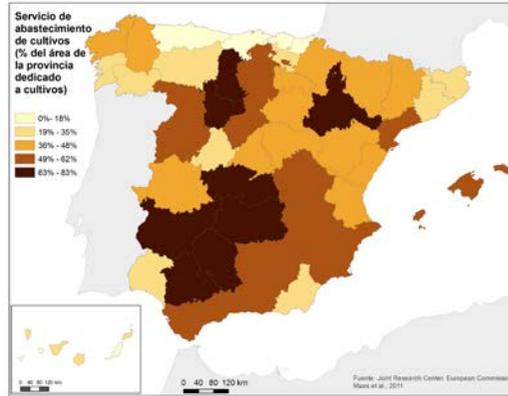
Source: COAG, 2006 in EME, 2012

Honey production in England and Wales



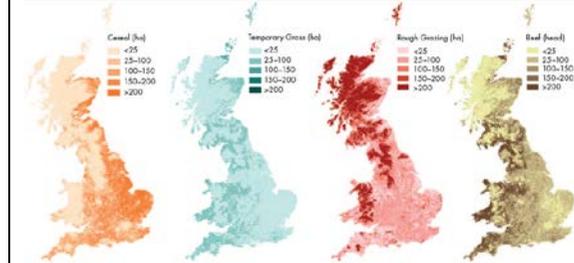
Source: UK NEA, 2011b

Provisioning service: crops (% of the area of the region dedicated to crops)



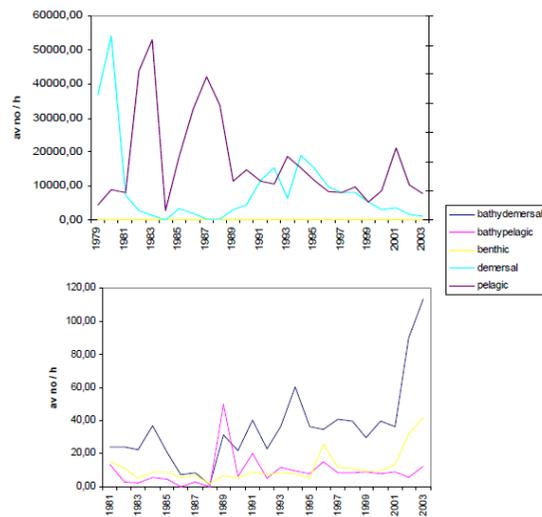
Source: EME, 2013

Cereals, temporary grassland, rough grazing and beef cows at the year 2000 baseline



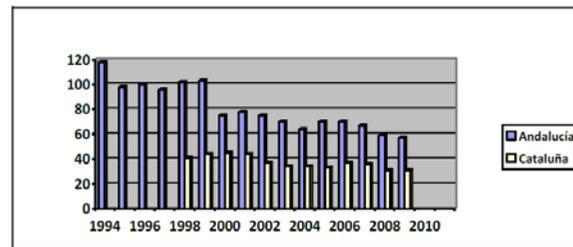
Source: UK NEA, 2011b

Fish abundance (average number per hour of fishing) according to ecological guilds in the Portuguese coast, based on regular sampling surveys performed by IPIMAR from 1981 to 2003



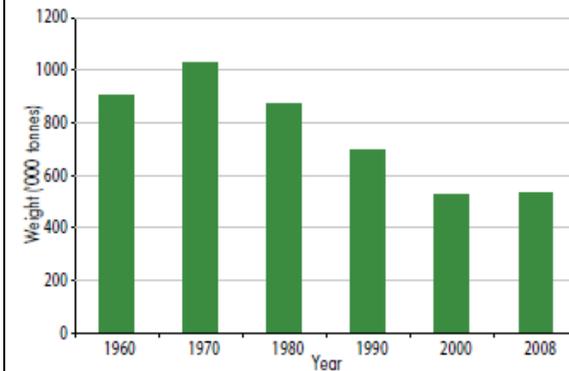
Source: Pereira et al., 2004

Evolution of fresh fish landed



Source: EME, 2012

Landings of fish and shellfish into the UK by UK and foreign vessels between 1960 and 2008



Source: MMO, 2010 in UK NEA, 2011a

Table 10: Trade-offs and synergies

Trade-offs and synergies in Mediterranean sclerophyllous ecosystem types

| DECISIÓN   | OBJETIVO   | GANADOR/ES   | ECOSERVICIO QUE DECECE   | PERDEDORES  |
|--|--|--|--|---|
| Desarrollar zonas residenciales en una provincia .   | Mejora de la calidad de vida de habitantes urbanos mediante el disfrute del campo.   | Empresarios constructores. Residentes. Empresarios de servicios. Comerciantes.   | El paisaje rural silvestre y cultural tradicional. La biodiversidad. El disfrute espiritual colectivo. El turismo cultural.  | Turistas culturales. La cultura rural. Ganaderos y silvicultores.   |
| Mejorar el transporte por carretera.                 | Comunicación terrestre a través de una comarca con monte esclerófilo y dehesa. Rotura del aislamiento. Comunicación socioeconómica y cultural. | Comercio, industria, cultura. Habitantes de los núcleos urbanos de la región.  | Regulación hídrica. Suministro de fertilidad natural a los valles. Conectividad física entre zonas altas y valles y conectividad biológica (mantenimiento de la biodiversidad silvestre y ganadera). | Ganaderos y agricultores de la comarca. Economía agraria. Puede no haber ningún perdedor, si los proyectos de carretera incorporan provisiones de salvaguarda de la conectividad. |
| Promocionar la agricultura extensiva en una comarca. | Aumento del abastecimiento alimentario.  | Sociedad en general. Los agricultores en particular. La cultura agrícola.  | Regulación climática local. Almacenamiento de carbono. Regulación morfosedimentaria.   | Ninguno, si el desarrollo agrícola tiene lugar de forma "sensata".  |
| Desarrollar el turismo clásico.                      | Mejora del nivel de vida de la comarca.  | Determinadas tramas (monetaristas) empresariales y laborales del turismo.  | El paisaje rural silvestre y cultural tradicional. La biodiversidad. La regulación hídrica y depuración natural del agua.  | Turistas culturales. La cultura rural. Ganaderos y silvicultores.   |
| Desarrollar el turismo cultural y de la naturaleza.  | Mejora del nivel de vida de la comarca protegiendo la capacidad de genera servicios de sus ecosistemas.  | Determinadas tramas (socioculturales) empresariales y laborales del turismo. Turistas culturales. La cultura rural. Ganaderos y silvicultores. | Ninguno (si el desarrollo tiene lugar de forma "sensata").   | Ninguno (si el desarrollo tiene lugar de forma "sensata").  |
| Declarar una reserva biológica integral.             | Protección de las diversidad biológica.  | La comunidad científica. La sociedad en general según el conocimiento aportado.  | Ninguno.   | La cultura rural. Ganaderos y silvicultores. Turistas culturales (dependiendo de la idea de protección aplicada).   |

Source: EME, 2012

Trade-offs and synergies for final ecosystem services in Sand Dunes

|   |  | P  | P                                 | R                  | P              | R  | R                                | P   | R            | C   | C  |
|---|--|--|-----------------------------------|--------------------|----------------|--|----------------------------------|---|--------------|---|--|
|   |  | Crops, plants, livestock, fish, etc. (wild and domesticated) | Trees, standing vegetation & peat | Climate regulation | Water quantity | Hazard regulation -vegetation & other habitats | Waste breakdown & detoxification | Wild species diversity including microbes | Purification | Environmental Settings: Meaningful places inc. green & blue space | Environmental Settings: Socially valued landscapes and waterscapes |
|   |  | Livestock related  | Forestry                          |                    |                |  |                                  |   |              |   |  |
| P | Crops, plants, livestock, fish, etc. (wild and domesticated) |  |                                   |                    |                |  |                                  |   |              |   |  |
|   |  |  |                                   |                    |                |  |                                  |   |              |   |  |
| P | Trees, standing vegetation & peat                            |  |                                   |                    |                |  |                                  |   |              |   |  |
| R | Climate regulation   |  |                                   |                    |                |  |                                  |   |              |   |  |
| P | Water quantity   |  |                                   |                    |                |  |                                  |   |              |   |  |
| R | Hazard regulation -vegetation & other habitats               |  |                                   |                    |                |  |                                  |   |              |   |  |
| R | Waste breakdown & detoxification                             |  |                                   |                    |                |  |                                  |   |              |   |  |
| P | Wild species diversity including microbes                    |  |                                   |                    |                |  |                                  |   |              |   |  |
| R | Purification   |  |                                   |                    |                |  |                                  |   |              |   |  |
| C | Environmental Settings: places (inc. green & blue space)     |  |                                   |                    |                |  |                                  |   |              |   |  |
| C | Environmental Settings: landscapes and waterscapes           |  |                                   |                    |                |  |                                  |   |              |   |  |

Source: UK NEA, 2011b

Note: = No effect, - Minor negative or net negative if mixed, -- Strong negative, + Minor positive or net positive if mixed, ++ Strong positive, +/- Balanced positive/negative. Scores should not be summed due to potential double-counting across services. P=Provisioning service, R=Regulating service, C=Cultural service. Waste breakdown not relevant to dunes

Table 11: Response options and management practices

Comparison of the ecosystem service values of different lowland peatland management practices using active non-impacted peatland systems as a baseline

|                     |                                    | Afforestation            | Abandonment      | Peat cutting (fuel) | Peat cutting (horticulture) | Agricultural improvement          | Cultivation      |
|---------------------|------------------------------------|--------------------------|------------------|---------------------|-----------------------------|-----------------------------------|------------------|
|                     | <b>Vegetation produced</b>         | Coniferous forestry      | Scrub/Woodland   | Wet/Dry Heath       | Bare                        | Improved grassland, Grazing marsh | Cropland         |
|                     | <b>Peatland type most affected</b> | Shallow peat, Raised bog | Raised bog, Fens | Raised bog          | Raised bog                  | Shallow peat, Raised bog, Fen     | Raised bog, Fens |
|                     | <b>Peat condition</b>              | Degraded/Archaic         | Degraded         | Degraded            | Bare                        | Archaic                           | Archaic          |
| <b>Provisioning</b> | Crops, livestock & fisheries       | ↓                        | ↓                | ≈                   | ≈                           | ↑                                 | ↑                |
|                     | Fuel or horticultural peat         | ≈                        | ≈                | ↑                   | ↑                           | ≈                                 | ≈                |
|                     | Timber or building material        | ↑                        | ↑                | ≈                   | ≈                           | ≈                                 | ≈                |
|                     | Genetic resources                  | ↓                        | ↑/↓              | ↓                   | ↓                           | ↓                                 | ↓                |
|                     | Drinking water supply              | ↓                        | ≈                | ≈                   | ≈                           | ≈                                 | ≈                |
| <b>Regulating</b>   | Carbon storage                     | ↓/≈                      | ↓                | ↓                   | ↓                           | ↓                                 | ↓                |
|                     | Preventing GHG emissions           | ↑/↓                      | ↓                | ↓/≈                 | ↓                           | ↓                                 | ↓                |
|                     | Flood prevention                   | ↓/↑                      | ↑                | ↓/≈                 | ↓                           | ↓                                 | ↓                |
|                     | Disease prevention                 | ≈                        | ≈                | ≈                   | ↑?                          | ↑                                 | ↑                |
|                     | Detoxification and purification    | ↓                        | ≈                | ≈                   | ↓                           | ↓                                 | ↓                |
|                     | Pollination                        | ↓                        | ↑                | ↓                   | ↓                           | ↓                                 | ↓                |
| <b>Cultural</b>     | Religion and spirituality          | ↑                        | ↑                | ≈                   | ≈                           | ↑?                                | ↑?               |
|                     | Cultural heritage                  | ↑                        | ↓                | ↑                   | ↑                           | ↑                                 | ↑                |
|                     | Aesthetics                         | ↓                        | ↓/↑              | ↑                   | ↓                           | ↓/↑                               | ↓?               |
|                     | Social Cohesion                    | ≈                        | ↓                | ↑                   | ↑?                          | ≈/↑                               | ≈/↓              |
|                     | Tourism and recreation             | ↑                        | ↓                | ↑                   | ↓                           | ≈                                 | ≈                |
|                     | Education                          | ↑                        | ↑                | ↑                   | ↓                           | ↑                                 | ↑                |
| <b>Supporting</b>   | Soil formation                     | ↓                        | ↓                | ↓                   | ↓                           | ↓                                 | ↓                |
|                     | Nutrient cycling                   | ≈                        | ↑                | ↑                   | ↑                           | ↑                                 | ↑                |
|                     | Biodiversity                       | ↓                        | ↑                | ↓                   | ↓                           | ↓                                 | ↓                |

Source: JNCC, 2011 in UK NEA, 2011b

Note: The table indicates how different management practices, when applied to an active lowland peatland, affect delivery of these services\*. ↓ shows a decrease in ecosystem service function; ↑ shows an increase in ecosystem service function; ≈ shows no change in ecosystem function. \* An increase or decrease of any given ecosystem service function does not necessarily equate to an improvement or deterioration of the system overall

Table 12: Links with human well-being

State or degree of vulnerability of ecosystem services in relation to the relative importance of the service for human well-being and their conservation trends in relation to the presence of impacts generated by one or more direct drivers of change

| Servicios de los ecosistemas | Tendencia                                | Importancia | Estado*                             | Indicador  | Impulsores directos    |                  |               |                     |                   |                         |   |
|------------------------------|--|-------------|-------------------------------------|--|------------------------|------------------|---------------|---------------------|-------------------|-------------------------|---|
|                              |  |             |                                     |  | Cambios de uso suelo   | Cambio climático | Contaminación | Ciclo biogeoquímico | Sobre-explotación | Esp. exóticas invasoras |   |
| ABASTECIMIENTO               | Agricultura                              | ↗           | ♦♦                                  | Producción de cereales, frutales y olivos  | ✓                      | ✓                |               | ✓                   | ✓                 | ✓                       |   |
|                              | Ganadería                                | ↗           | ♦♦                                  | Producción de carne  |                        | ✓                |               | ✓                   | ✓                 | ✓                       |   |
|                              | Apicultura                               | ↔           | ♦                                   | Producción de <i>Apis mellifera</i>  |                        | ✓                |               |                     |                   | ✓                       |   |
|                              | Acuicultura                              | ↗           | ♦♦                                  | Producción total acuícola  |                        |                  |               |                     | ✓                 |                         |   |
|                              | Agua dulce                               | ↔           | ♦                                   | Captación de agua para uso humano  | ✓                      | ✓                | ✓             | ✓                   | ✓                 |                         |   |
|                              | Mat. bióticos                            | Madera      | ↗                                   | ♦  | Producción de madera   | ✓                |               |                     | ✓                 | ✓                       | ✓ |
|                              |  | Papel       | ↔                                   | ♦  | Producción pasta papel | ✓                |               |                     | ✓                 | ✓                       | ✓ |
|                              | Material geótico                         | ↔           | ♦                                   | Producción de cemento  | ✓                      |                  |               |                     | ✓                 |                         |   |
|                              | Energía renovable                        | ↔           | ♦                                   | Potencia hidroeléctrica instalada  |                        | ✓                |               |                     | ✓                 |                         |   |
|                              | Acervo genético                          | ↘           | ♦♦                                  | Basado en evaluación de ecosistemas  | ✓                      |                  |               |                     |                   | ✓                       |   |
| Med. naturales               | ↘  | ♦           | Basado en evaluación de ecosistemas |  | ✓                      |                  |               | ✓                   |                   |                         |   |
| REGULACIÓN                   | Climática local y regional               | ↘           | ♦♦                                  | Ratio entre emisiones y secuestro de CO <sub>2</sub>                                       | ✓                      | ✓                | ✓             | ✓                   | ✓                 |                         |   |
|                              | Aire                                     | ↔           | ♦                                   | Emisiones de gases contaminantes   | ✓                      | ✓                | ✓             | ✓                   | ✓                 |                         |   |
|                              | Hídrica                                  | ↘           | ♦♦                                  | Almacenamiento de agua en el suelo, nieve, recarga de acuíferos y capacidad autodepuradora | ✓                      | ✓                | ✓             | ✓                   | ✓                 | ✓                       |   |
|                              | Control de la erosión                    | ↘           | ♦♦                                  | Basado en evaluación de ecosistemas  | ✓                      | ✓                |               |                     |                   |                         |   |
|                              | Fertilidad del suelo                     | ↘           | ♦♦                                  | Necesidad de utilización de fertilizantes nitrogenados                                     | ✓                      |                  | ✓             | ✓                   | ✓                 | ✓                       |   |
|                              | Perturbaciones naturales                 | ↘           | ♦♦                                  | Incendios forestales   | ✓                      | ✓                |               | ✓                   | ✓                 | ✓                       |   |
|                              | Control biológico                        | ↘           | ♦♦                                  | Capacidad de regulación de especies exóticas   | ✓                      | ✓                | ✓             | ✓                   |                   | ✓                       |   |
|                              | Polinización                             | ↔           | ♦                                   | Basado en evaluación de ecosistemas  | ✓                      | ✓                | ✓             |                     |                   | ✓                       |   |
| CULTURALES                   | Conocimiento Científico                  | ↗           | ♦♦                                  | Número de publicaciones españolas sobre ecosistemas  | ✓                      | ✓                | ✓             |                     |                   |                         |   |
|                              | Actividades Recreativas                  | ↗           | ♦♦                                  | Número de alojamientos turísticos, visitantes y pernoctaciones                             | ✓                      | ✓                | ✓             |                     |                   |                         |   |
|                              | Disfrute estético                        | ↔           | ♦                                   | Basado en evaluación de ecosistemas  | ✓                      | ✓                |               |                     |                   |                         |   |
|                              | Educación ambiental                      | ↗           | ♦♦                                  | Equipamientos destinados a educación ambiental   |                        | ✓                | ✓             |                     | ✓                 | ✓                       |   |
|                              | Conocimiento ecológico local             | ↘           | ♦♦                                  | Aprovechamiento tradicional del corcho y ovejas en trashumancia                            | ✓                      |                  |               |                     | ✓                 | ✓                       |   |
|                              | Disfrute espiritual                      | ↗           | ♦♦                                  | Basado en evaluación de ecosistemas  | ✓                      |                  | ✓             |                     |                   |                         |   |
|                              | Identidad cultural y sentido pertenencia | ↘           | ♦                                   | Basado en evaluación de ecosistemas  | ✓                      |                  |               |                     |                   | ✓                       |   |

| SERVICIOS DE LOS ECOSISTEMAS |             |        | IMPULSORES DE CAMBIO |  |
|------------------------------|-------------|--------|----------------------|--|
| Tendencia                    | Importancia | Estado |                      |  |
| ↗                            | Alta        | ♦♦     | No vulnerable        | ✓ Impulsores directos de cambio que afectan al suministro de servicios de los ecosistemas<br>La relación de los impulsores directos de cambio con los servicios de los ecosistemas se ha medido principalmente con correlaciones de Pearson basado en los indicadores establecidos, así como por criterio de expertos. |
|                              | Medio-alta  | ♦      | Poco vulnerable      |  |
| ↔                            | Medio-baja  | ♦      | Vulnerable           |  |
| ↘                            | Baja        | ♦♦     | Muy vulnerable       |  |

\*El estado de los servicios de los ecosistemas es la resultante del análisis de la tendencia y su importancia

Source: EME, 2011

Table 13: Evaluation methods and sources of data

Services, indicators, sources of information and measurement units used to evaluate the services delivered by the different ecosystem types (in this case Alpine mountains)

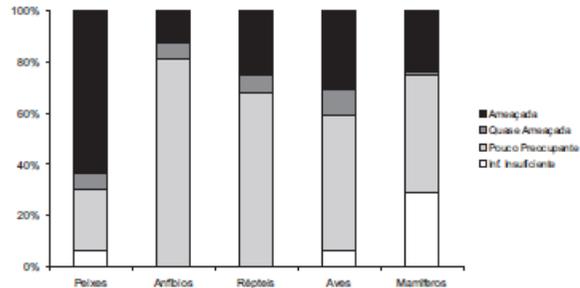
| Tipo                                     | Subtipo                                     | Categoría                                    | Indicador  | Fuente                        | Unid.                    |
|--|---|--|--|-------------------------------|--------------------------|
| Abastecimiento                           | Alimentación                                | Agricultura                                  | Producción agrícola                                | Anuarios CCAA                 | t/ha                     |
|  |   |  | Productividad Agraria                              | Anuarios CCAA                 | t/ha                     |
|  |   |  | Estructura de la producción agrícola               | Anuarios CCAA                 | %                        |
|  |   |  | Huella Ecológica del sector agrícola               | Anuarios CCAA                 | ha/cap                   |
|  |   |  | Producción Agricultura Ecológica                   | Anuarios CCAA                 | t/ha                     |
|  |   |  | Empleo ligado al sector agrícola                   | Anuarios CCAA                 | % total población activa |
|  |   |  | VAB ligado al sector agrícola                      | Anuarios CCAA                 | €/ano                    |
|  | Agua dulce                                  | Anuarios CCAA, Confederaciones Hidrográficas | m <sup>3</sup>                                     |                               |                          |
|  | Materias primas de origen vegetal           |  | Superficie y producción                            | Anuarios CCAA                 | ha y t                   |
|  | Materias primas de origen mineral           |  | Materiales de construcción y energía               | Anuarios CCAA                 | t                        |
| Energías renovables                      |   | Biomasa forestal                             | Anuarios CCAA                                      | %                             |                          |
| Acervo genético                          |   | Diversidad natural y doméstica               | Anuarios CCAA                                      | nº                            |                          |
| Medicinas naturales y principios activos |   | Plantas medicinales                          | Anuarios CCAA                                      | nº                            |                          |
| Regulación                               | Regulación climática                        | Global                                       | Captura de CO <sub>2</sub> en bosques y matorrales | Mapa Forestal de España, CCAA | t                        |
|  |   | Regional y Local                             | Cambios de uso y temperaturas y precipitaciones    | Anuarios CCAA                 | %                        |
|  | Regulación hídrica                          |  | Cambios de usos del suelo                          | Anuarios CCAA                 | %                        |
|  | Regulación morfosedimentaria                |  | Cobertura de vegetación                            | Mapa Forestal de España, CCAA | %                        |
|  | Formación y fertilidad del suelo            |  | Fertilidad y cambios de usos                       | Anuarios CCAA                 | %                        |
|  | Regulación de las perturbaciones naturales  |  | Regulación de perturbaciones climáticas            | Anuarios CCAA                 | nº                       |
|  | Control biológico                           |  | Cambios de uso y gestión del paisaje               | Anuarios CCAA                 | %                        |
| Polinización                             |   | Especies polinizadoras                       | Informes diversos                                  | nº                            |                          |
| Culturales                               | Conocimiento científico                     |  | Universidades e investigación                      | Universidades y OPIs          | %                        |
|  | Conocimiento ecológico local                |  | Iniciativas educativas y de producción             | Diversas fuentes              | nº                       |
|  | Identidad cultural y sentido de pertenencia |  | Lenguas locales, folklore, monumentos históricos   | Diversas fuentes              | nº                       |
|  | Disfrute espiritual y religioso             |  | Rutas culturales                                   | Diversas fuentes              | nº                       |
|  | Paisaje disfrute estético                   |  | Paisaje, geología, flora y fauna                   | Diversas fuentes              | %                        |
|  | Actividades recreativas y Ecoturismo        |  | ENP y turismo Deportes de nieve                    | Anuarios CCAA                 | €                        |
| Educación Ambiental                      |   | Programas de educación ambiental             | Anuarios CCAA                                      | nº                            |                          |

Source: EME, 2012

## Annex 2 – Visual representation of the biodiversity information provided in the three NEAs

Table 1: State and trends of biodiversity

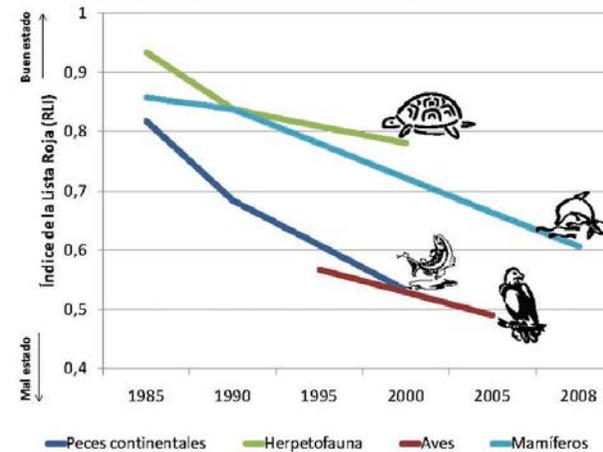
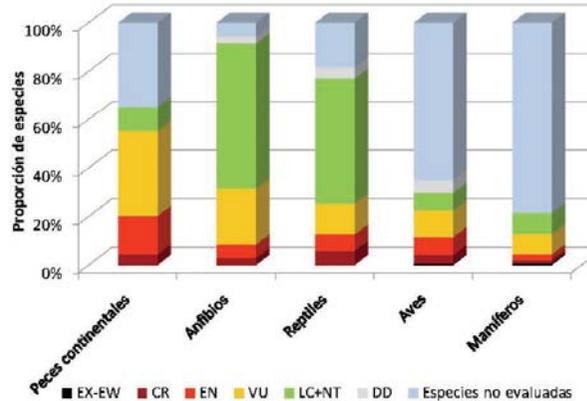
Threat status of species classified in the Red Book of Vertebrates of Portugal



Source: Cabral et al., 2005 in ptMA, 2012

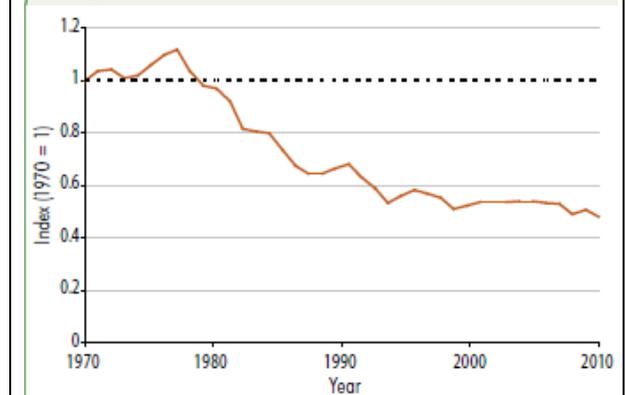
Note: Fish (n=33), reptiles (n=28), birds (n=246) and mammals (n=72)

Proportion of threatened vertebrates according to the Red Book of Vertebrates (top) and evolution of the conservation status of the same species according to the Red List Index (down)



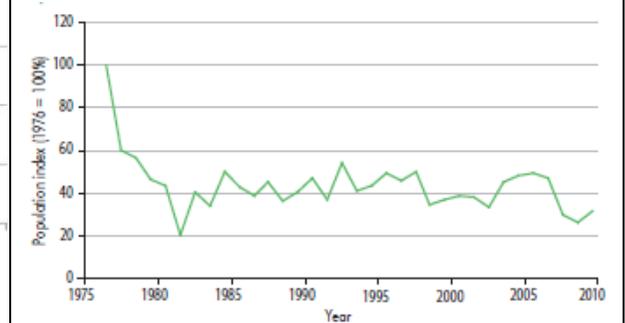
Source: EME, 2011

The UK Farmland Bird Index, 1970 to 2009, calculated on data from 19 individual farmland bird species



Source: RSPB, BTO, JNCC, Defra, 2010 in UK NEA, 2011a

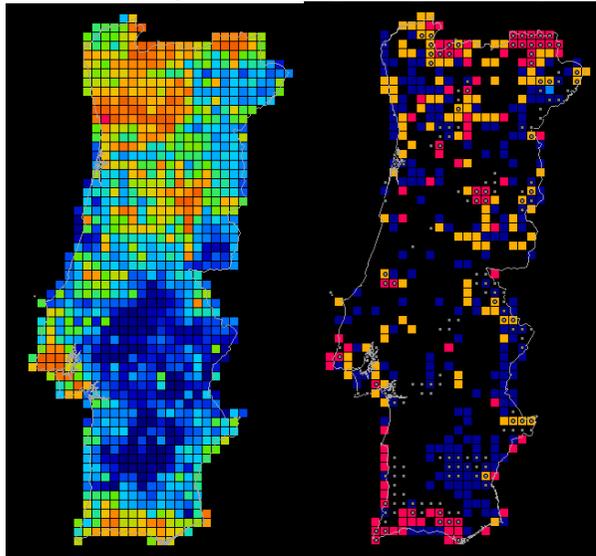
Composite population trend from 1976 to 2009 for 25 species of butterfly which are specialists of semi-natural habitats



Source: Several in UK NEA, 2011b

Table 2: State and trends of biodiversity: species richness

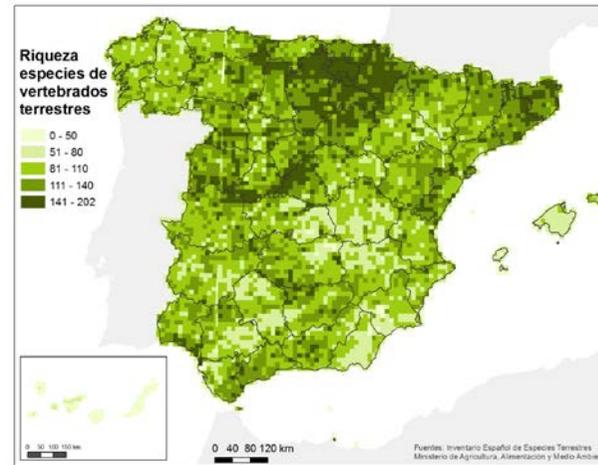
Spatial distribution of biodiversity in Portugal:  
 Species richness of selected groups  
 (gymnosperms, pteridophytes, amphibians,  
 reptiles, mammals and butterflies) (left);  
 irreplaceability of each UTM cell, measured as the  
 number of range restricted species per cell (right)



Source: Pereira et al., 2004

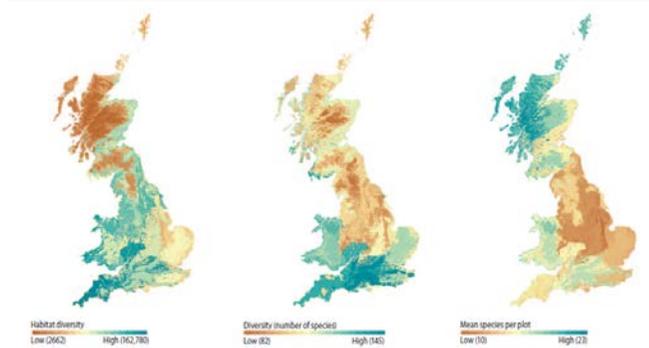
Note: Warm colours correspond to high species richness and cool colours to low species richness. Decreasing levels of irreplaceability: red, yellow, blue, black. Dots denote cells protected in the Natura 2000 network

Map of species richness of terrestrial vertebrates



Source: EME, 2013

Terrestrial habitat complexity/diversity; total species richness per 1 km<sup>2</sup> and mean species richness per plot, for 1 km<sup>2</sup> sample plots from the Countryside Survey

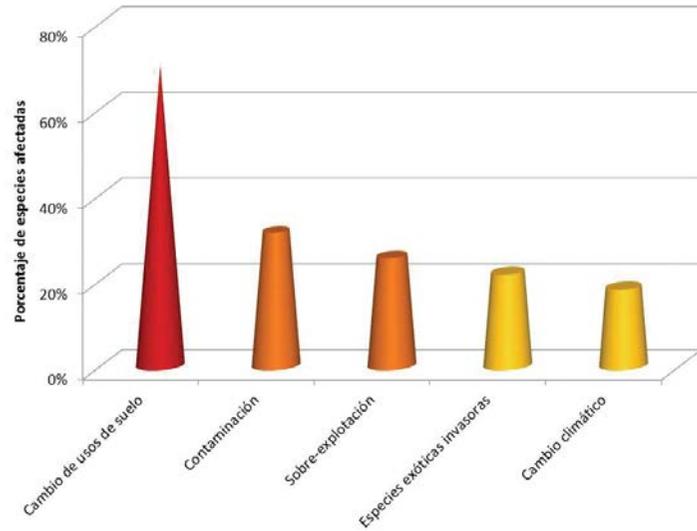


Source: Smart et al., 2010 in UK NEA, 2011b

### Annex 3 – Visual representation of the drivers of change across the three NEAs

Table 1: Drivers of biodiversity change

Effects of direct drivers of biodiversity change: percentage of species affected



Source: EME, 2011

Drivers of biodiversity change in the UK

| Biodiversity Group | Trend information | Drivers of biodiversity change |                |                  |                                    |            |   |
|--------------------|-------------------|--------------------------------|----------------|------------------|------------------------------------|------------|---|
|                    |                   | Land use change                | Climate change | Invasive species | Exploitation (direct and indirect) | Pollutants |   |
| Microorganisms     | Marine            | Patchy                         | ○              | ○                |                                    |            | ○ |
|                    | Terrestrial       | Poor                           | ●              | ○                |                                    |            | ○ |
| Fungi              | Non-lichenised    | Poor                           | ●              | ●                | ●                                  |            | ○ |
|                    | Lichens           | Moderate                       | ●              | ○                | ○                                  |            | ○ |
| Lower plants       | Phytoplankton     | Good                           |                | ●                | ○                                  |            | ○ |
|                    | Macroalgae        | Patchy                         | ○              | ●                | ●                                  |            | ○ |
|                    | Bryophytes        | Moderate                       | ●              | ○                | ○                                  | ○          | ○ |
| Higher plants      | Seagrasses        | Patchy                         | ●              | ●                | ○                                  | ○          | ○ |
|                    | Land plants       | Good                           | ○              | ●                | ○                                  | ○          | ○ |
| Invertebrates      | Marine            | Patchy                         | ○              | ○                | ●                                  | ○          | ○ |
|                    | Terrestrial       | Moderate                       | ●              | ○                |                                    |            | ○ |
| Fish               | Marine            | Moderate                       |                | ○                |                                    | ○          | ○ |
|                    | Freshwater        | Good                           | ●              | ○                | ○                                  | ○          | ○ |
| Amphibians         | Moderate          | ●                              | ○              | ○                |                                    |            |   |
| Reptiles           | Patchy            | ●                              | ○              |                  |                                    |            |   |
| Birds              | Good              | ○                              | ○              |                  | ○                                  | ○          |   |
| Mammals            | Moderate          | ●                              | ○              | ○                | ○                                  |            |   |

|                      |   |                      |   |                      |   |
|----------------------|---|----------------------|---|----------------------|---|
| High importance      | Amount of evidence (theory, observations, models) → | Medium importance    | Amount of evidence (theory, observations, models) → | Low importance       | Amount of evidence (theory, observations, models) → |
| Level of agreement ↑ | ● ● ●   | Level of agreement ↑ | ○ ○ ○   | Level of agreement ↑ | ○ ○ ○   |
|                      | ○ ○ ○   |                      | ○ ○ ○   |                      | ○ ○ ○   |
|                      | ○ ○ ○   |                      | ○ ○ ○   |                      | ○ ○ ○   |

Source: UK NEA, 2011b

Note: Importance is colour-coded: high (maroon), medium (beige), low (green), unimportant on the basis of available evidence (blank). The size of the circle in each cell indicates the level of uncertainty. The impact of exploitation includes both the impact of the exploitation itself, but also the indirect consequences of exploitation through physical or ecological changes to the ecosystem

Table 2: Drivers of ecosystem change

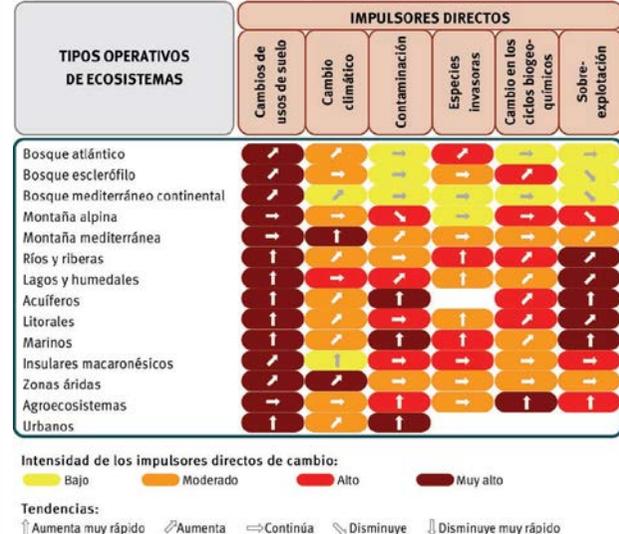
Most important drivers of ecosystem change in Portugal

| Driver   | Ex/En | D/I | Spatial Scale | Speed       | Imp. |
|--|-------|-----|---------------|-------------|------|
| Fire regime                                      | Ex/En | D   | N             | Fast        | 1    |
| Land tenure and farm structure                   | En    | I   | N             | Slow        | 2    |
| Land use changes                                 | En    | D   | N             | Medium      | 1    |
| Tourism  | Ex/En | I   | N             | Medium      | 2    |
| Exotic species                                   | En    | D   | N             | Medium      | 3    |
| Economic growth                                  | Ex/En | I   | N             | Medium      | 1    |
| Population distribution and migration            | Ex/En | I   | N             | Medium      | 2    |
| Environmental legislation and attitudes          | Ex/En | I   | N/EU          | Medium-Slow | 2    |
| EU Common Agricultural Policy and global markets | Ex    | I   | EU            | Medium      | 1    |

Source: Pereira et al., 2004

Note: Abbreviations: Ex – Exogenous; En – Endogenous; D – Direct; I – Indirect; N – national scale; EU – European Union scale; Imp. – Importance, from 1 (highest) to 3 (lowest)

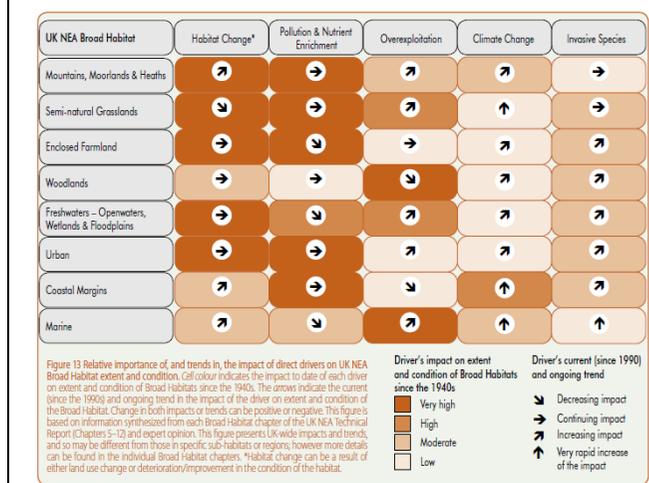
Relative intensity and trends of the impact of the 6 direct drivers of change evaluated in the different operational ecosystem types considered in the EME



Source: EME, 2011

Note: The colour indicates the intensity of the current impact of each driver on the flux of services of each ecosystem and the arrows indicate the trend in the impact of the driver. Blank cells mean that the driver is not applicable to that specific ecosystem type

Relative importance of, and trends in, the impact of direct drivers on UK NEA Broad Habitat extent and condition



Source: UK NEA, 2011a

Table 3: Drivers of ecosystem services change

Relative importance of, and trends in, the impact of direct drivers on UK ecosystem services

