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A survey of existing scientific or policy targets

relevant for each SEBI indicator

among global, European and national initiatives

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Background

The following report has been produced in order to fulfil the requirement for delivery of Task 1.3.3.B of the European Topic Centre – Biodiversity Implementation Plan 2009. This piece of work is specified in detail in the text box below:

1.3.3.B Producing SEBI 2010 indicators & other biodiversity related indicators

Phase 1 of SEBI 2010 ended in 2007 with the selection of a set of 26 indicators. The focus of Phase 2 is on using the set, especially through the production of a first indicator based assessment report to be published in May 2009. Phase 3 (to start after the publication of the first indicator based assessment report), apart from continuing assessments, will work on improving data flows and indicator development and prepare the 2010 SEBI assessment (finalise the 2009 report and have a first draft of the 2010 report).

Improving existing biodiversity indicators within different sets of indicators is also of primary importance. Among several tasks described below, some will strongly rely on capacity building facilitating the connection between relevant EEA services, Commission services and other institutions. The goal will be to get a good balance between harmonisation and recognition of specific needs with the concerns to avoid duplication and to promote the EEA activity on indicators.

Short description of activity

Support the EEA to ensure the production of indicators, **to improve the SEBI set** and to improve the harmonisation of biodiversity indicators between the existing sets (CSI, IRENA, SDI,…).

Detailed description of activities

Assist EEA on improvement of existing indicators and development of new indicators:

1) ….
2) **Ideally indicators should include a target to help the assessment; the ETC/BD will prepare a survey of existing scientific or policy targets relevant for each SEBI indicators among global, European and national initiatives**

In 2008, the 26 SEBI indicators were developed and published as a set of factsheets annexed to the EC BAP Mid Term review; these were circulated among the EIONET and SEBI community for comment and are soon to formally published. During the exercise of biodiversity assessment based on these indicators, one of the main difficulties was encountered in relation to the interpretation of each indicator, in particular: which baseline should be used (long term, short term), what is the minimum percentage of change to demonstrate no change, positive or negative change, etc…

Based on these issues, it became clear that baselines and targets should be defined in order to assist the interpretation (and comprehensibility) of the indicators. However, the definition and acceptance of baselines and targets is likely to require a lengthy discussion and debate. As a first step, and to provide a framework within which these discussions could take place, it was necessary that a survey be undertaken among all the existing (and available) biodiversity indicators similar to those defined by SEBI, to establish what baselines and targets have already been defined and adopted by any institution or/and country.

In this context, both scientific and political targets can be distinguished. A scientific target is a recommendation from experts whilst a political target is a commitment at policy level.

Methodology

ECNC-European Centre for Nature Conservation prepared the following report, based on the following key elements:

- a survey of assessment methodology used/proposed by any biodiversity indicator producer in a political context.

- a survey of existing baselines and scientific and/or political targets.

The following list of Reports on indicators mentioning SEBI process or making links between national indicators and SEBI indicators were accessed for the purpose of this review:

Belgium
Dumortier, M.; De Bruyn, L.; Hens M.; Peymen, J.; Schneiders, A.; Van Daele, T. and Van Reeth, W., 2007. *Biodiversity indicators 2007*. State of Nature in Flanders (Belgium). Research Institute for Nature and Forest, Brussels.
http://www.biodiversityindicators.be/

Finland
Developing a biodiversity indicator collection for Finland
http://www.environment.fi/defa.ult.asp?contentid=228447&lan=EN

France
MEEDDAT/DNP/Cellule biodiversité, 2007. *Indicateurs de suivi de la biodiversité proposés pour la métropole dans le cadre de la SNB.*
http://www.naturefrance.fr/spip.php?rubrique36

Germany
BfN, 2008. *Policy-related Indicators Measure the Effectiveness of the German National Strategy on Biological Diversity*. Federal Agency for nature Conservation.
http://www.bfn.de/fileadmin/MDB/documents/themen/monitoring/Indicators_German_Biodiversity_Strategy.pdf
http://www.bfn.de/0315_biodiv-indikatoren.html

Netherlands
PBL & WUR, 2008. *Halting biodiversity loss in the Netherlands: Evaluation of progress.* Netherlands Environmental Assessment Agency.
http://www.mnp.nl/en/publications/2008/Halting-biodiversity-loss-in-the-Netherlands.html

Spain
Jiménez Herrero, L. (ed.), 2007. *Informe de Sostenibilidad en España – 2007*. Observatorio de la Sostenibilidad en España.
http://www.sostenibilidad-es.org/Observatorio+Sostenibilidad/esp/servicios/Indicadores+de+Sostenibilidad

Switzerland
Monitoring de la biodiversité en Suisse, 2006*. Etat de la biodiversité en Suisse*. Etat de l'environnement n° 0604. OFEV. Berne.
http://www.biodiversitymonitoring.ch/pdfs/downloads/Lagebericht_f_lowres.pdf
http://www.biodiversitymonitoring.ch/

United-Kingdom
DEFRA, 2007. *Biodiversity Indicators in Your Pocket 2007.*
http://www.jncc.gov.uk/page-4229

Further reference was made to the following reports/websites containing country level biodiversity indicators:

Austria
Bogner, D.;Fiala, I., 2008. *Österreichisches biodiversitätsmonitoring MOBI. Interpretation ausgewählter indikatoren.* Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft Abteilung II/3.
http://www.umweltnet.at/filemanager/download/30682

Estonia
Environment Indicators of Estonia
http://eelis.ic.envir.ee:88/seireveeb/envirind_avalik/index.php?l=en&t1=AVALEHT

Finland
Natural resource indicators
http://www.mmm.fi/en/index/frontpage/environment/luonnonvaramittarit.html

France
IFEN. Indicateurs de suivi des engagements européens
http://www.ifen.fr/indicateurs/indicateurs-de-suivi-des-engagements-europeens.html

Italy
Mammoliti Mochet, A.; Morra di Cella, U.; Trèves, C., 2003. *Indicatori per il reporting sulla biosfera*. CTN_NEB/CTN_CON.
http://www.sinanet.apat.it/it/strumenti/catalogo/dettagli_metadati?testo=biodiver&document_type=&metadata_lookup=1001&docid=429

Malte
MEPA, 2007*. State of the environment indicators 2006*. Malta Environment & Planning Authority.
http://www.mepa.org.mt/Environment/SOER/indicators2006/pdfs/SOEI2006.pdf

Spain
Elorrieta Pérez, J.I., 2008. *Perfil Ambiental de España 2007, Informe basado en indicadores*. Ministerio de Medio Ambiente.
http://www.mma.es/portal/secciones/calidad_contaminacion/indicadores_ambientales/perfil_ambiental_2007/

Allué, R., 2008. *Medio ambiente en España 2007*. Ministerio de Medio Ambiente.
http://www.mma.es/portal/secciones/info_estadistica_ambiental/estadisticas_info/memorias/2007/index.htm

Sweden
Swedish Environmental Objectives
http://miljomal.nu/Environmental-Objectives-Portal/

Not all the reports were available in English; where possible these were translated (in part) for inclusion in this document. Where resources for translation were not available these reports were not included in this survey. It is recognised that there may be other country level reports that are not available or cannot be accessed in electronic format. It was not feasible to source these within the constraints of the resources available for this study.

A - SURVEY OF GENERAL ASSESSMENT METHODOLOGIES USED/PROPOSED BY ANY BIODIVERSITY INDICATOR PRODUCER IN A POLITICAL CONTEXT

From an extensive review of country level biodiversity and environmental indicators a number of general methodologies to assess trends and achievement of objectives or targets related to indicators were identified. It should be noted that these were only found in the following initiatives:

- United Kingdom biodiversity indicators;
- Sweden's environmental objectives;
- Flemish biodiversity indicators;
- Finnish biodiversity indicators and;
- Sustainability in Spain: Integrated assessment.

A variety of visual symbols such as traffic lights, arrows and smileys are used within these initiatives to provide an easily understandable and quickly assimilated representation of: graphical synthesis of changes over time; trends; the achievability of a target within a time frame; and a rapid comparison between different indicators.

In some cases, background colours are used to relate to the historical impact or development of the indicator. However, indicators only present the distance to the target and do not evaluate policy implementation. In addition, the methodology underlying the classification which allows a particular symbol to be allocated to an indicator is rarely if ever given.

Many indicators have a single measure which changes over time (fish stocks in UK waters, for example) but where data cannot logically be combined, such as for the area of sensitive UK habitats affected by acidity and area affected by nitrogen, the indicator will have more than one measure. Each measure is assessed, using a set of 'traffic lights'. The traffic lights assess 'change over time' (whether or not things are moving in the right or wrong direction). They *do not* assess whether the measure has reached any published or implied targets, or indeed whether the status is 'good' or 'bad', although where targets have been set, these are identified in the indicator text.

✓	=	improving
≈	=	little or no overall change
✗	=	deteriorating
⋯	=	insufficient or no comparable data

The traffic lights are determined by identifying the period over which the change is to be assessed and comparing the value of the measure in the base or start year with the value in the end year.

For the measures within the indicators on trends in populations of selected species, statistical analysis techniques have been developed in collaboration with the data providers and the assessment is based on this analysis. A green or red traffic light is only applied when there is sufficient confidence that the change is 'significant' and not simply a product of random fluctuations.

For other indicators, the assessment has been made by comparing the value of the measure in the base or start year with the value in the end year against a standard threshold. A three year average is used to calculate the base year, to reduce the likelihood of any unusual year(s) unduly influencing the assessment. Where an indicator value has changed by less than the threshold of 3 per cent, the traffic light has been set at amber. The choice of 3 per cent as the threshold is arbitrary but has been used successfully in other Government Indicators.

The traffic lights only reflect the overall change in the measure from the base to latest year and do not reflect fluctuations during the intervening years.

Where data are available, two assessment periods have been used:

1. Long-term – an assessment of change since the earliest date for which data are available, although, if data do not precede 1996 a long term assessment is not made.
2. Short-term - an assessment of change since 2000 (or the closest date for which data are available).

The individual indicators also have a third column showing the direction of change in the last year. This period is too short for a meaningful assessment. However the direction of change is given simply as an acknowledgement of very recent trends and as a possible early warning of emerging trends.

Smileys for environmental quality objectives and interim targets

Additional smileys for interim targets

The assessment is that the objective/target can be achieved within the defined time frame.

The target year has passed. The target was achieved by that date.

The objective/target can be achieved within the defined time frame, provided that further action is taken.

The objective/target will be very difficult or not possible to achieve within the defined time frame, even if further action is taken.

The target year has passed. The target was not achieved by that date.

Trend arrows for the national environmental quality objectives

The trend in the state of the environment is positive.

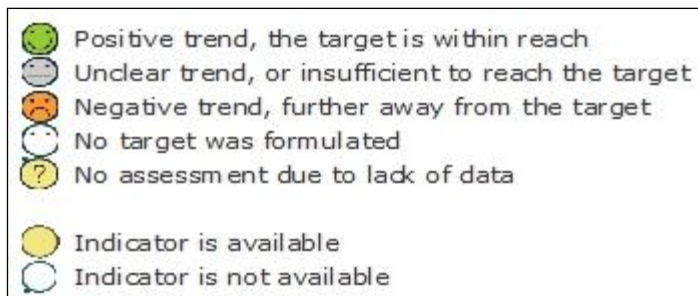No clear trend in the state of the environment can be seen.

The trend in the state of the environment is negative.

When a policy has proposed specific, clear and measurable targets within a certain time frame indicators can help to assess the distance to target or goal achievement. The distance to target is graphically synthesized via smileys. For reasons of consistency Biodiversity Indicators uses the symbols that are also used in the annual Flemish Environmental Report (MIRA).

Positive trend, the target is within reach
Unclear trend, or insufficient to reach the target
Negative trend, further away from the target
No target was formulated
No assessment due to lack of data

Indicator is available
Indicator is not available

It is important to keep in mind that indicators only present the distance to target, they do not evaluate policy implementation. A green smiley means that the policy target has been reached but the indicator does not say whether this is the consequence of implemented policy measures or of fortunate contextual factors. Similarly a red smiley only indicates that the policy target wasn't reached, or will most likely not be reached. This however can be due to the ineffectiveness of policy, or to unexpected contextual factors that adversely affected policy outcomes.

The overall development of each indicator has been illustrated by a symbol consisting of a white arrow on a coloured background. This symbol depicts the development of the indicator on two levels. The symbol's background colour relates to the historical impact or development of the indicator in the 20th century before year 1990. The direction of the arrow indicates trends after 1990.

Pressure and response indicators

The interpretation of the symbol varies slightly depending on the type of indicator. In the case of pressure (P) and response (R) indicators, the background colour of the symbol relates to the historical impact of the human action in question.

Interpretation of the arrow symbols in the case of pressure (P) and response (R) indicators.

Impact in the 20th century before 1990	Trend since 1990
Strong positive impact on biodiversity *Affecting >50% of the species and/or total area of the habitat*	Strong increasing trend *>1.5% annual increase or more than 35% in 20 years*
Moderate positive impact on biodiversity *Affecting 50-20% of the species and/or total area of the habitat*	Moderate increasing trend *>0.5-1.5% annual increase or more 10-35% in 20 years*
Weak positive impact on biodiversity *Affecting <20% of the species and/or total area of the habitat*	Weak increasing trend *<0.5% annual increase or less than 10% in 20 years*
No clear impact on biodiversity, *or the phenomenon has been unknown, or has not existed before 1990*	No discernible trend
Weak negative impact on biodiversity *Affecting <20% of the species and/or total area of the habitat*	Weak decreasing trend *<0.5% annual decrease or less than 10% in 20 years*
Moderate negative impact on biodiversity *Affecting 50-20% of the species and/or total area of the habitat*	Moderate decreasing trend *>0.5-1.5% annual decrease or more 10-35% in 20 years*
Strong negative impact on biodiversity *Affecting >50% of the species and/or total area of the habitat*	Strong decreasing trend *>1.5% annual decrease or more than 35% in 20 years*

State indicators

In the case of state (S) indicators, the coloured background refers to real observed trends in the 20th century before 1990. However, monitoring data often limit the period for which this evaluation can be given. Often data series do not cover the whole 20th century but begin in the 1950s or 1970s, for example. In these cases, the symbols are based on a shorter time span.

Interpretation of the arrow symbols in the case of state (S) indicators.

Development in the 20th century before 1990	Trend since 1990
Strong increase *Equaling >100% increase between 1900 and 1990* *(>0.8% per year)*	Strong increasing trend *>1.5% annual increase or more than 35% in 20 years*
Moderate increase *Equaling 20-100% increase between 1900 and 1990* *(0.8-0.2% per year)*	Moderate increasing trend *>0.5-1.5% annual increase or more 10-35% in 20 years*
Weak increase *Equaling <20% increase between 1900*	Weak increasing trend *<0.5% annual increase or less than 10% in*

and 1990 *(<0.2% per year)*		*20 years*

▇	No change *or the development is unknown*	⟹ No discernible trend
▇	Weak decrease *Equaling <20% decrease between 1900* *and 1990* *(<0.2% per year)*	↘ Weak decreasing trend *<0.5% annual decrease or less than 10% in* *20 years*
▇	Moderate decrease *Equaling 20-50% decrease between 1900* *and 1990* *(0.8-0.2% per year)*	↘ Moderate decreasing trend *>0.5-1.5% annual decrease or more 10-35%* *in 20 years*
▇	Strong decrease *Equaling >50% decrease between 1900* *and 1990* *(>0.8% per year)*	⬇ Strong decreasing trend *>1.5% annual decrease or more than 35% in* *20 years*

All of the criteria listed above are meant as indicative and not definitive. They should give a rough idea of the volume of change that the symbols correspond to. All overall assessments contain an element of expert judgement. The interpretation of impact (I) indicators is based on criteria for state indicators but only very roughly for the want of relevant monitoring data. They include the greatest amount of expert judgement.

Milestone at year 1990

Year 1990 has been chosen as a milestone for biodiversity conservation. The concept biodiversity first broke into the international scientific and political arena in the late 1980s. In 1992 the signing of the Convention on Biological Diversity at the UN Earth Summit in Rio de Janeiro made the conservation of biodiversity a priority issue for each contracting party, Finland included. Therefore we may assume that the impacts of purposeful biodiversity policies should become visible soon after 1990.

The arrow symbols have been developed based on the corresponding symbols used in the Millennium Ecosystem Analysis (2005). The approach of the MEA has been extended and made more precise in terms of time spans, class definitions and trend criteria.

The symbols help in summarizing and comparing indicators. They are based on quantitative data as far as possible, but always also contain an element expert judgment. Although the symbols aim at making very different variable more commensurate, they never quite achieve this.

An assessment has been made to obtain a simplified overview of Spain's actual situation in regard to sustainability issues. The status of each indicator is calculated as the end result of the analysis of the corresponding variables and their interactions. Its status is represented graphically by the following symbols:

🙂	Current status favourable
🙂	Status indefinite or hard to assess
☹	Current status unfavourable
???	Information or data unavailable
!	Hopeful signs
🚩	Critical sustainability situation; a long way from goals
★	Of strategic interest for Spain
⇧	Positive trend
⇩	Negative trend
	European average
	Above European average
	Below European average

B – SPECIFIC METHODOLOGIES

B - SPECIFIC METHODOLOGIES RELATED TO INDIVIDUAL INDICATORS IN THE SEBI2010 SET

A thorough evaluation was made of all available country level and other relevant indicators. These were assessed in relation to their correspondence with the SEBI indicators set. For example Sweden has an extensive list of environmental indicators, many of which are related to biodiversity; however only a small proportion can be seen to correspond with SEBI set. The latter were selected for review in this study; in addition, a number of indicators which were close to but not the same as the SEBI set were also considered.

In the text which follows, specific assessment methodologies are therefore described under each of the indicators, when available, even if the definition of the indicator does not correspond entirely with the one described in the SEBI2010 set.

It became clear that whilst the majority of the indicators identified were provided with information about how they were calculated, they lacked any kind of descriptive text or diagrammatic indication of how to interpret changes over time. In many cases existing information on individual indicators is therefore focused on methodologies to calculate the indicator and not on how to assess or interpret its trends. This may create difficulties when making the transition from monitoring outcomes to the implementation of policy and practical actions.

B – SPECIFIC METHODOLOGIES

1- ABUNDANCE AND DISTRIBUTION OF SELECTED SPECIES

- UK biodiversity indicators:
  - o 1a. Trends in populations of wild birds. The assessment is made by comparing a three year average for the baseline with the latest data point. This accounts for the difference in the since-2000 assessment for farmland and wetland birds despite an apparently similar trend. The assessment criteria are being reviewed with data providers, with the aim of introducing tests of statistical significance in future publications. Within the measures, each species is given equal weighting, and the annual index is the geometric mean of the individual species indices for that year. The individual species indices are largely derived by modelling and estimates are revised when new data or improved methodologies are developed and applied retrospectively to earlier years.
  - o 1b. Trends in populations of butterflies. To identify underlying patterns, the assessment of trends is based on indices smoothed by structural time series modelling with a measure of precision (confidence intervals) estimated by applying the Kalman filter. For each measure a statistical test has been applied to compare the difference between the current year index value and the index value for each year of the preceding years, and to quantify long-term (1976-2007) and short-term (2000-2007) changes.

- Biodiversity monitoring Switzerland:
  - o Z3: Species diversity at national and regional level. Change in the total number of species of selected taxa living in the wild. Animals are basically classified into species that permanently occurred in Switzerland, and species that underwent status changes during the monitoring period. A status change is defined as a species disappearing, a species newly arriving, or a species changing its status several times.
  - o Z6: Population size of endangered species. Change in population size of species endangered worldwide, in Europe or in Switzerland. This indicator allows a comparison to be drawn between the legal mandate – to prevent indigenous species of fauna and flora from becoming extinct – and the facts on the ground. The indicator registers changes in population sizes of endangered or potentially threatened animal and plant species over a period of ten or more years. Species populations develop in a very individual manner, influenced by many factors which are frequently unknown in detail. Moreover, available species data are incomplete in many cases. This makes it impossible to indicate a nationwide trend applicable to all species. For this reason, the Z6 indicator limits itself to presenting examples that speak for themselves. These examples represent three different types of population development:
    - • long-term trend to decline (persisting for more than ten years);
    - • long-term trend to increase (persisting for more than ten years);
    - • fluctuating population size (several short-term, sometimes contradictory trends within a period of between ten and twenty years, or constant fluctuations that do not follow a clear trend).

B – SPECIFIC METHODOLOGIES

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

- UK biodiversity indicators: 3. Status of UK Biodiversity Action Plan Priority Species. Every three years, the status of each priority species has been assessed by a range of experts across the UK. The indicator assessment is based on the change in the status of 339 species for which a status assessment is available in at least in one of the recording years.

   Consolidation of status assessment categories for presentation in the indicator:

Categories used in the indicator	Categories used in the original assessments
Increasing	Fluctuating - probably increasing Recovered Signs of recovery Increasing
Stable	Fluctuating - probably stable No change Stable
Decreasing	Declining (continuing/accelerating) Declining (slowing) Fluctuating - probably declining Lost (pre BAP publication) Lost (since BAP publication) No data entered Lost pre UK BAP Unknown (presumed extinct)
Unknown	Insufficient information Fluctuating / No clear trend No clear trend No data entered Unknown

- Biodiversity monitoring Switzerland. Z5: Change in the endangerment status of species. Number of species now less endangered in Switzerland minus number of species now in greater danger. Free-living species belonging to select taxonomic groups that occur in Switzerland are assigned to one of several threat categories, ranging from "vulnerable" to "extinct worldwide" and complemented by "near threatened", "least concern", and "data deficient". These categories are used to compute the net change in the endangerment status. Red List threat categories correspond to IUCN criteria of 2001 (Version 3.1). Species are classified into threat categories in two steps: First, species are classified according to global criteria, as if the Swiss population were the world population. Next, an evaluation is carried out to determine whether the extinction risk faced by these species in Switzerland is being increased or decreased by outside populations. Accordingly, species are then either assigned to a higher or lower threat category, or left in the category they were in after the first step.
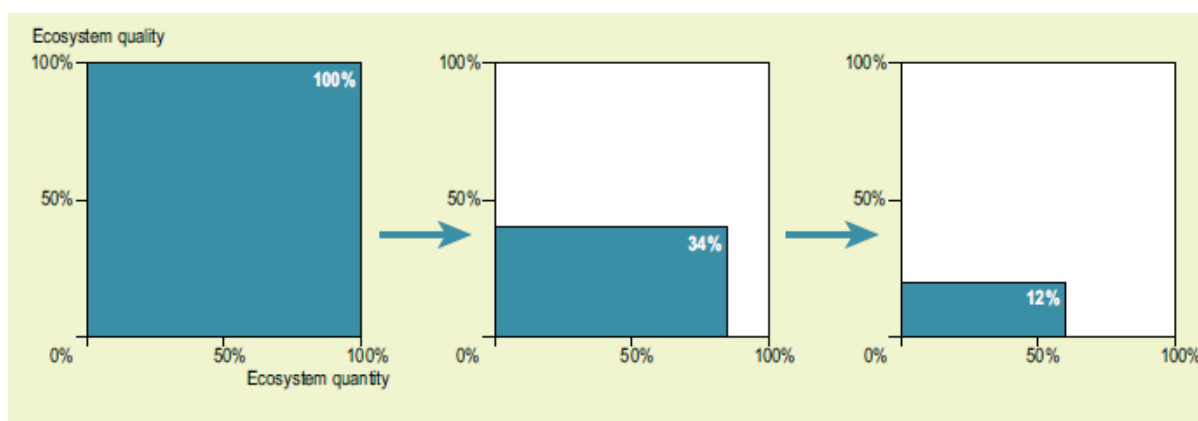
B – SPECIFIC METHODOLOGIES

4- ECOSYSTEM COVERAGE

- Biodiversity indicators for the Netherlands. The Natural Capital Index framework (NCI): developed as a contribution to the implementation of the Convention on Biological Diversity (CBD), the NCI was designed to answer the questions 'How much biodiversity remains?', 'What are the causes of loss?' and 'What can we do about it?' for policy-makers and public. It has two main components: i) *loss of habitats*, or 'ecosystem quantity', resulting from the conversion of natural areas to agricultural or urban use and ii) *loss of ecosystem quality* due to factors such as climate change, pollution, habitat fragmentation and over-exploitation. NCI considers biodiversity as 'natural capital', a 'common resource base' containing all species with their corresponding abundance. It is defined as the product of the size of the remaining area (quantity) and its quality.

NCI = ecosystem quantity (%) x ecosystem quality (%).

Ecosystem quantity is calculated as a percentage of the total area (% area of the country or region). Ecosystem quality is calculated by counting the average abundance of a core set of animal and plant species; however, process and structure variables can also be used as quality variables. Quality is defined as the ratio between the current situation and baseline state (percentage of the baseline). The NCI range is from 0 to 100%. The three diagrams 'ecosystem quantity and ecosystem quality' shown below demonstrate how the process of ecosystem degradation can be visualized using the Natural Capital Index. If we assume for a country, for example, that 60% of the natural area remains, with a quality of 20%, the natural capital is 12%. An NCI of 12% means an average abundance of the characteristic species of roughly 12% of the baseline state.

B – SPECIFIC METHODOLOGIES

- UK biodiversity indicators: 4. Status of UK Biodiversity Action Plan Priority Habitats. Every three years, the status of priority habitat has been assessed by a range of experts across the UK. The indicator assessment is based on the change in the status of the 43 habitats for which a status assessment is available in at least one of the recording years. To make best use of available data and because the change in status is assessed by comparing, for each habitat, the earliest available assessment was compared with the most recent.

  Consolidation of status assessment categories for presentation in the indicator:

Categories used in the indicator	Categories used in the original assessments
Increasing	Fluctuating - probably increasing Signs of recovery Increasing Increasing
Stable	Fluctuating - probably stable No change Stable
Decreasing	Declining (continuing/accelerating) Declining (slowing) Fluctuating - probably declining No data entered
Unknown	Insufficient information Fluctuating / No clear trend No clear trend No data entered Unknown

- Biodiversity monitoring Switzerland. Z11: Quality of valuable habitats. Change in the mean quality of each of the valuable habitat types. Designed to cover changes in the quality of valuable habitats, the Z11 indicator now presents initial results regarding mires. In order to detect changes, the indicator compares initial surveys to second surveys, assessing indicator value changes against targets set by nature conservation policies. An individual mire is considered to have undergone significant change when net changes affect at least 10% of its surface and these changes can be proven with an error probability of less than 10%. As a matter of principle, the following changes are rated to be favorable developments: waterlogging (increasing moisture value), growing poorness (decreasing nutrient value), peat formation (increasing humus value), thinning (decreasing share of woody plants), and intensification of mire nature (increasing mire index, i.e. increasing diversity and dominance of mire species).

B – SPECIFIC METHODOLOGIES

- UK biodiversity indicators: 5. Trends in the effective population size of selected breeds of cattle and sheep at risk of loss of genetic diversity. The indicator presents the change in genetic diversity in native breeds of cattle and sheep in the UK between 2001 and 2007, as measured by their effective population size. This is calculated for each breed by assessing a number of factors, including the number of breeding animals, the frequency of breeding events and the degree to which breeding animals are related. The effective population size represents the size at which the rate of loss of genetic variation is equivalent to the rate of loss if that number of individuals were mating randomly each generation. The greater the effective population size, the lower the risk of in-breeding and the greater the diversity retained over time.

B – SPECIFIC METHODOLOGIES

7- NATIONALLY DESIGNATED PROTECTED AREAS

- UK biodiversity indicators: 6. Extent and condition of UK protected areas. This indicator shows extent and condition of land, freshwater and coastal sea area protected under 3 designations: Sites or Areas of Special Scientific Interest, Special Areas of Conservation and Special Protection Areas. The total protected area is the combined area of nationally designated sites (Sites of Special Scientific Interest SSSI or Areas of Special Scientific Interest (ASSI) in Northern Ireland) and internationally designated sites (Special Protection Areas (SPA) and Special Areas of Conservation (SAC) under the EU Birds and Habitats Directives respectively). There is considerable geographic overlap in these designations, with many sites being designated as A/SSSI, SAC and SPA, although such sites contribute only once to the total extent figures. The SSSI and ASSI designation underpins almost all of the international sites, but the European sites go further, by the inclusion of marine areas - a further million hectares of which has been designated as SAC and/or SPA. As a matter of policy, candidate SACs are given full protection from the time they are submitted to the European Commission.

- Dutch Nature Balance 2008. Trends in the development of nature reserves and landscape in the Netherlands. The following table also shows the probability of timely realization of several goals in nature and landscape policy.

- Sustainability in Spain 2007: Integrated Assessment. Natural protected areas. Number of natural protected areas officially designated under national and autonomic laws and its surface; number of natural protected areas with planning instruments. Compared with the EU average proportion of protected surface related to the total surface.

B – SPECIFIC METHODOLOGIES

- Sustainability in Spain 2007:
    o Integrated Assessment. Adaptation of Natura 2000 Network proposals. Appropriateness of the proposals of Sites of Community Importance (SCI) for the maintenance or reestablishment of a favourable conservation status of natural habitat types and species of vertebrates of community interest, excluding the species linked to the marine environment.
    o Places designated under Habitats and Birds Directives. Surface of SCI, special conservation areas and special protection areas for birds at national and autonomic level.

B – SPECIFIC METHODOLOGIES

9- CRITICAL LOAD EXCEEDANCE FOR NITROGEN

- UK biodiversity indicators: 10. Area of sensitive UK habitats exceeding critical loads for acidification and eutrophication. There are three main steps in the assessment of the area of sensitive habitat exceeding critical loads: the calculation of critical loads for each of the sensitive habitats; the mapping of the habitats and the identification of the area of habitat where deposition exceeds the critical load. Critical loads for acidity and nutrient nitrogen are calculated for 11 broad habitats considered sensitive to deposition. These include woodland, semi-natural grassland, heathland, freshwater and coastal habitats. A variety of methods are used to calculate critical loads, based either on empirical (observational or experimental data) or mass balance (input/output) data.

B – SPECIFIC METHODOLOGIES

<div style="border:1px solid">

10- INVASIVE ALIEN SPECIES IN EUROPE

</div>

- UK biodiversity indicators: 11. Impact of invasive non-native species. Two charts are presented in this indicator. The first shows proportion of non-native species in survey samples for birds, mammals, plants and marine organisms. Given that the majority of these species are not considered to have a high impact on native biodiversity, this chart is shown to provide context and is not assessed. The second chart shows the change in the number of species identified as highly invasive (i.e. of greatest threat to native biodiversity) established across more than 10% of the land area of Great Britain in all ecosystems (freshwater, marine and terrestrial).

  Invasion extent of non-native species:

Definition	Interpretation	Extent
Not present in territory	Absent	0
Present in territory and either not established or with established populations that have not spread more than 10 km from their source	Not or scarcely established	1
Established populations present less than 10% of territory, with some having arrived from further than 10 km from their source; or if more widespread then populations scattered and sparse	Established but still generally absent or at most occasional	2
Established populations present in 10-50% of the territory	Established and frequent in part of the territory	3
Established in more than 50% of the territory	Widespread	4

- Sustainability in Spain 2007: Integrated Assessment. Invasive alien species. The index considers number of invasive alien species (IAS) established in Spain, number of IAS included in the 'black list of IAS', number of IAS for which eradication is urgent and number of IAS for which eradication is advisable in particular situations.

B – SPECIFIC METHODOLOGIES

11- OCCURRENCE OF TEMPERATURE-SENSITIVE SPECIES

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

<div style="border:1px solid black">

12- MARINE TROPHIC INDEX OF EUROPEAN SEAS

</div>

- UK biodiversity indicators: 13. Size of marine fish in the North Sea. The indicator shows changes in the percentage, by weight, of large individuals equal to or over 40 cm in length in fish populations in the northern part of the North Sea, from the Humber Estuary to the Shetland Islands.

B – SPECIFIC METHODOLOGIES

- UK biodiversity indicators: 14. Connectivity for selected UK semi-natural habitats (indicator under development).

- Biodiversity monitoring Switzerland. E15: Landscape fragmentation. Changes in landscape fragmentation in Switzerland and the regions. The Landscape Fragmentation indicator records the degree to which Switzerland's landscape below 2,100 meters above sea level is cut up by artificial barriers such as roads or settlements. It is measured by effective mesh size, i.e. the size of patches remaining free of barriers cutting up the landscape. The greater the number of barriers cutting up a landscape, the smaller the effective mesh size.

B – SPECIFIC METHODOLOGIES

14- FRAGMENTATION OF RIVER SYSTEMS

- UNESCO Indicators of the World Water Development Report (WWDR2). 5- Ecosystems: 1- Fragmentation and flow regulation of rivers. The indicator represents the degree of environmental impact at the river basin level resulting from flow regulation, channel fragmentation and other stresses associated with dams, withdrawals and diversions. The computation of the indicator is as following:

1. Individual river systems are delineated on topographic maps, and VMAD data.
2. All dams within a river system are located and storage capacities identified.
3. Flow regulation is calculated as the sum of reservoir live storage capacities within the system as a percent of the VMAD.
4. Channel fragmentation is ranked into five classes describing the longest main-channel segment without dams (but frequently including reservoir water tables) in relation to the entire main channel (0 = 100%; 1 = 75-99%; 2 = 50-74%; 3 = 25-49%; and 4 = 0-24%). For the tributaries, fragmentation is described by three classes (0 = no dams; 1 = dams only in the catchment of minor tributaries; 2 = dams also in the catchment of the largest tributary).
5. Presented below are the principles for constructing the indicator, comprised of classes of river system impact (not affected, moderately affected, and strongly affected) from the combination of fragmentation and flow regulation assessments.

Fragmentation (Main channel + tributaries)	Flow regulation (%)		
	Not affected	Moderately affected	Strongly affected
0 + 0	0		
0 + 1	≤ 2	> 2	
0 + 2	≤ 1	> 1	
1 + 0		≤ 30	> 30
1 + 1		≤ 25	> 25
1 + 2, 2 + 0		≤ 20	> 20
2 + 1		≤ 15	> 15
2 + 2, 3 + 0		≤ 10	> 10
3 + 1		≤ 5	> 5
3 + 2, 4 + 0, 1, 2			≥ 0

6. Irrigation pressure is VMAD divided by irrigated area in the basin (m3s- 1km-2). The basin's irrigation pressure is applied to both minimum and maximum expected irrigation consumption rates to provide a range of probable additional withdrawals from the system. These values can then be interpreted as additional flow regulation, and assessed to identify systems which most likely belong in a higher impact class.

The degree of river fragmentation and altered flows is rated in three categories: Strongly affected, Moderately affected, and Not affected.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

15- NUTRIENTS IN TRANSITIONAL, COASTAL AND MARINE WATERS

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

16- FRESHWATER QUALITY

- UK biodiversity indicators: 15. Percentage of rivers of good biological quality. The traffic light assessments are based on the biological and chemical quality of river lengths in England and Wales only. In England, Wales and Northern Ireland biological quality classifications are based on surveying macro-invertebrates living in or on the river bed. Species groups recorded at a site are compared with those which would be expected in the absence of pollution. In Scotland, since 1996, an overall classification has been used combining chemical, biological, nutrient and aesthetic quality.

- 10 key environmental indicators for France. Water: Nitrate in rivers. The indicator shows the percentage of measurement points per quality category. Quality categories are in mg/l of NO_3: high (<2), good (between 2 and 10), moderate (between 10 and 25), poor (between 25 and 50), bad (>50).

- French monitoring indicators for European commitments. Nature and Biodiversity: Phosphates in rivers. The indicator measures the percentage of measurement points per quality category. Phosphates are calculated by the analysis of orthophosphates and total phosphor.
    - Quality categories in mg/l of orthophosphates: high (<0,1), good (between 0,1 and 0,5), moderate (between 0,5 and 1), mediocre (between 1 and 2), bad (>2).
    - Quality categories in mg/l of total phosphor: high (<0,05), good (between 0,05 and 0,2), moderate (between 0,2 and 0,5), poor (between 0,5 and 1), bad (>1).

B – SPECIFIC METHODOLOGIES

17- FOREST: GROWING STOCK, INCREMENT AND FELLINGS

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

18- FOREST: DEADWOOD

It was not possible to locate any specific assessment methodology.

B – SPECIFIC METHODOLOGIES

19- AGRICULTURE: NITROGEN BALANCE

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

20- AGRICULTURE: AREA UNDER MANAGEMENT PRACTICES POTENTIALLY SUPPORTING BIODIVERSITY

- UK biodiversity indicators: 8. Area of land under agri-environment scheme management. There are two main types of agri-environment scheme in the UK: Entry-level type, whole farm schemes that have a simple set of prescriptions providing basic environmental protection and enhancement; and 'higher-level' or targeted schemes that protect or restore land of high environmental value. The former are generally selected at the whole farm scale and it is the whole farm area that contributes to the indicator for entry-level type schemes. The latter are targeted to parts of the farm or land-holding that are of high environmental value or potential. It is possible for land to be in both an entry-level type and a higher-level scheme.

B – SPECIFIC METHODOLOGIES

21- FISHERIES: EUROPEAN COMMERCIAL FISH STOCKS

- UK biodiversity indicators: 9. Percentage of fish stocks harvested sustainably and at full reproductive capacity. This indicator shows the percentage of fish stocks in seas around the UK that are both harvested sustainably and are at full reproductive capacity. This is based on a group of 20 indicator stocks for which there are reliable estimates of fishing mortality and spawning biomass and which together represent the fish stocks of major importance to the UK fishing industry.

- French sustainable development indicators: Share of captures related to the state of halieutic stocks. The state of fish stocks is evaluated in terms of two variables, which are compared to the so-called 'precautionary thresholds':
  o The spawning biomass: when the breeding population falls below a certain threshold known as 'precautionary biomass', characteristic of each stock, the risk of reduction of the reproductive capacity of the stock becomes very high;
  o The fishing pressure on halieutic resources: beyond a certain level of fishing mortality, the risk of fall of spawners abundance below the precautionary biomass becomes very high.
  o The state of stocks is qualified as 'good status' if it complies with both thresholds; 'critical status' in the opposite case and 'intermediate situation' if it just respect one of the thresholds.

B – SPECIFIC METHODOLOGIES

It was not possible to locate any specific assessment methodology.

B – SPECIFIC METHODOLOGIES

23- ECOLOGICAL FOOTPRINT OF EUROPEAN COUNTRIES

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

24- PATENT APPLICATIONS BASED ON GENETIC RESOURCES

It was not possible to locate any specific assessment methodology.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

B – SPECIFIC METHODOLOGIES

25- FINANCING BIODIVERSITY MANAGEMENT

- UK biodiversity indicators:
    - o 16. Public sector expenditure on biodiversity in the UK. This indicator is based upon published and unpublished estimates of spending by the public sector combined with a range of estimates and assumptions about the element relating to biodiversity, using expert opinion from within the relevant organizations wherever possible.
    - o 17. UK Government funding for conservation of global biodiversity. The information published by the indicator is drawn from a number of sources. The Royal Botanical Gardens, Kew is increasingly involved in the global conservation of endangered plant species as threats to the world's vegetation escalate. Others such as the Global Environment Facility and Global Opportunities Fund are some institutions that channel funds directly to developing countries in order to protect the environment and biodiversity. In addition, the UK Government provides funding for biodiversity through direct bilateral aid - the Darwin Initiative, the Flagship Species Fund and the Overseas Territories Environment Programme. This indicator is based upon published and unpublished estimates of spending by the UK public sector, combined with estimates and assumptions about the element relating to global biodiversity using expert opinions from the relevant organizations.

- Biodiversity monitoring Switzerland. M7: Financial resources for nature and landscape conservation. The indicator does not cover all public funds allocated to nature and landscape conservation. It considers all public spending reported to be "nature conservation expenditure" by the revenue offices of the Federal government, the cantons and the communities. However, there are other types of expenditure that also impact nature conservation while not being posted as nature conservation expenditure. Green bridges, for example, are partly financed out of road building budgets. Furthermore, nature and landscape conservation are not only funded by the Federal government, the cantons and the communities, but also by organizations, corporations, and private individuals. Since data on these funds are very difficult to collect, they have not been included in the definition of this indicator.

B – SPECIFIC METHODOLOGIES

26- PUBLIC AWARENESS

- UK biodiversity indicators: 18. Volunteer time spent in biodiversity conservation in the UK. The amount of time people spend volunteering to assist in conservation reflects society's commitment to and understanding of biodiversity. This indicator presents an index of the number of hours worked by volunteers in seven major UK conservation charities.

- 10 key environmental indicators for France. Opinion: French people's concerns. The indicator answers to the question: which two environmental issues are you more concerned about? It is based on a monthly household survey.

C – BASELINES AND TARGETS

C - SURVEY OF EXISTING BASELINES AND SCIENTIFIC AND/OR POLITICAL TARGETS

The final aspect of the study was centred on the question of existing baselines (whether or not they have been set) and, with or without baselines, whether political and scientific targets were given as context in the written or visual presentation of the indicators.

Within the sources analyzed for the survey baselines have been found for 23 of the 26 indicators, mostly represented by the year when data started to be collected or the year considered as the reference point. However, 23 is the cumulative figure across all of the countries-initiatives surveyed, which means that individual countries generally have less than 23 indicators with baselines.

In relation to targets, qualitative targets are described for five indicators (01, 02, 03, 05 and 16) and quantitative targets are listed for 16 indicators from the set. Again these are cumulative figures.

The details of the figures referred to in the two paragraphs above, in terms of which countries have baselines and targets, can be found in table attached to this document (see baselines targets SEBI.xls)

Rather than create their own targets, several countries use EC Directives as the reference point for the establishment of their targets: the Water Framework Directive (Directive 2000/60/EC), the National Emission Ceilings Directive (Directive 2001/81/EC), the Habitats Directive (Council Directive 92/43/EEC) and the Birds Directive (Council Directive 79/409/EEC).

C – BASELINES AND TARGETS

- UK biodiversity indicators:
  - o 1a. Trends in populations of wild birds.

	Baseline
Breeding farmland birds	1970
Breeding woodland birds	1970
Breeding water and wetland birds	1975
Breeding seabirds	1970
Wintering waterbirds	1975

The UK Government has adopted a formal commitment to "reverse the long-term decline in the number of farmland birds by 2020".

  - o 1b. Trends in populations of butterflies: measures for butterflies associated strongly with semi-natural habitats (specialists) and for those found in the wider countryside (generalists) from 1976 are used.

- Flemish biodiversity indicators: European Common Bird Index and European butterfly index (grassland) in Flanders. The central objective of the EU Biodiversity strategy, as formulated in April 2002, is to stop the loss of biodiversity by 2010. Based on this objective, all species should be stable or show a positive trend. This is also the aim of the stand-still principle as entered in the Nature Decree (art. 8).

- French biodiversity indicators: 1. Evolution of abundance of common birds. The year 1989 is used as reference year; relative abundance is fixed to 1 related to this year.

- Sustainability in Spain 2007: Integrated Assessment. Farmland bird index. 1998 is considered the reference year for the assessment.

- Biodiversity monitoring Switzerland. Z3: Species diversity at national and regional level. The indicator shows changes in the total number of species of selected taxa living in the wild since 1900.

- Finish Indicators for Renewable Natural Resources. Indicator: Birds. The indicator shows average population change indices of ecological groups of birds nesting in agricultural environments (1981=1).

C – BASELINES AND TARGETS

2- RED LIST INDEX FOR EUROPEAN SPECIES

- German national strategy on biological diversity. By 2020, the threat situation will have improved by one level for most of the species on the Red List.

- Sustainability in Spain 2007: Integrated Assessment. Endangered fauna. It represents the state and trends of threatened animal species. The reference year for the assessment is 1990.

- Biodiversity monitoring Switzerland. Z4: Number of species in Switzerland facing global extinction. The indicator shows the change in the total number of globally endangered species occurring in Switzerland since 1990.

- Flemish biodiversity indicators: Species status. The central objective of the EU Biodiversity strategy, as formulated in April 2002, is to stop the loss of biodiversity by 2010. Based on this objective, all species should be stable or show a positive trend. This is also the aim of the stand-still principle as entered in the Nature Decree (art. 8).

- Italian indicators for reporting on the biosphere: Level of threat of animal species. The indicator describes the degree of threat to animal biodiversity (Vertebrates and Invertebrates) in the national territory according to IUCN criteria. Data availability: since 1997. The target is to reduce the number of endangered species to less than 1% of total species in each class.

C – BASELINES AND TARGETS

3- SPECIES OF EUROPEAN INTEREST

- UK biodiversity indicators: 3. Status of UK Biodiversity Action Plan Priority Species. The indicator shows the change in status of the 371 priority species assessed between 1999 and 2008.

- Sweden's environmental objectives: 16. A Rich Diversity of Plant and Animal Life. By 2015 the conservation status of threatened species in Sweden will have improved to the point where the proportion of evaluated species classified as threatened will have fallen by at least 30% on corresponding figures for 2000, with no increase in the percentage of species that have become regionally extinct.

- Flemish biodiversity indicators: Conservation status of species of European interest. The main goal of the Habitats Directive is to maintain a 'favourable' conservation status of selected species.

- Biodiversity monitoring Switzerland. Z5: Change in the endangerment status of species. The indicator shows whether species endangerment in Switzerland generally tends to intensify or ease compared to 2001.

- Italian indicators for reporting on the biosphere: Status of species present in sites designated under Habitats and Birds Directives. The indicator represents the abundance and conservation status of species listed in Habitats Directive and present in sites designated under Habitats and Birds Directives. Temporal coverage: 30/10/2000.

C – BASELINES AND TARGETS

4- ECOSYSTEM COVERAGE

- Sweden's environmental objectives: 11. Thriving Wetlands.
    - o At least 12,000 hectares of wetlands and ponds will be established or restored on agricultural land by 2010.
    - o By 2015, at least 5,000 hectares of wetlands will be established or restored on agricultural land.

- German national strategy on biological diversity. Land use indicator: Increase in the amount of land used for human settlements and the transport infrastructure. The German Government aims to limit the utilization of new land for the purposes of human settlement and the transport infrastructure to 30 ha per day by the year 2020.

- Biodiversity indicators for the Netherlands. The Natural Capital Index framework (NCI). Because it makes the most sense to show the biodiversity change when human influence was accelerating rapidly, the first CBD Liaison Group on Biodiversity Indicators recommends 'a postulated baseline, set in pre-industrial times' or a 'low-impact baseline' as being the most appropriate. The baseline i) allows aggregation to a high level, ii) makes figures within and between countries comparable, iii) is a fair and common denominator for all countries, being in different stages of economic development, and iv) is relevant for all habitat types. Similarly, agricultural ecosystems are compared with the traditional agricultural state as the baseline, actually before industrialization of agricultural practices started. It has to be stressed that the baseline is not the targeted state. Policy-makers choose their ecological targets somewhere on the axis between 0 and 100%, depending on the political balance between social, economic and ecological interests.

- Sustainability in Spain 2007: Integrated Assessment.

    - o Extension of ecosystems. The ecosystem analyses the distribution of the main types of natural and seminatural ecosystems of Spain, obtained from the aggregation of soil categories and its evolution since 1987.
    - o Increase in artificial areas. The indicator shows the evolution of the surface of artificial areas in Spain since 1987.
    - o Loss of agricultural areas. The indicator shows the change of agriculture areas into other uses in Spain since 1987.
    - o Loss of forest areas. The indicator shows the loss of forest surface in Spain since 1987.
    - o Artificial land cover on the coast. The indicator shows the rate of increase of artificial use of land in costal areas since 1987.

- Biodiversity monitoring Switzerland. E2: Size of areas of defined use. It measures the change in total area accounted for by individual land uses in Switzerland. The land use statistics provide data for the periods 1979 to 1985 and 1992 to 1997.

- Estonian National Strategy on Sustainable Development: Sustainable Estonia 21. Goal 4: Ecological balance. The share of lands excluded from economic use will be at least 5% of the territory by the year 2010.

- Italian indicators for reporting on the biosphere: Land protected by D. LGS. 490/99. The indicator is defined as the regional extension, absolute and percentage, of the various landscape types. Temporal coverage: Since 1996.

C – BASELINES AND TARGETS

- UK biodiversity indicators: 4. Status of UK Biodiversity Action Plan Priority Habitats. The indicator shows the change in the status of 45 priority habitats assessed between 1999 and 2008.

- Flemish biodiversity indicators: Conservation status of habitats of European interest. The main goal of the Habitats Directive is to maintain a 'favourable' conservation status of selected habitats.

- Italian indicators for reporting on the biosphere: Conservation status of sites of communitarian interest. Temporal coverage: first assessments where done in 1990.

C – BASELINES AND TARGETS

6- LIVESTOCK GENETIC DIVERSITY

- UK biodiversity indicators: 5. Trends in the effective population size of selected breeds of cattle and sheep at risk of loss of genetic diversity. The indicator presents the change in genetic diversity in native breeds of cattle and sheep in the UK between 2001 and 2007.

- The United Nations Food and Agriculture Organisation (FAO) recommends a minimum effective population size of at least 50 individuals to reduce the rate of inbreeding to less than 1% and ensure the long-term survival of the breed.

- Biodiversity monitoring Switzerland:
    o Z1: Number of livestock breeds and plant varieties. The indicator measures the change in the number of all domesticated livestock breeds and agricultural plant varieties recognized in Switzerland since 1999, when the new Swiss Ordinance on Livestock Breeding came into force.
    o Z2: Proportion of livestock breeds and plant varieties. The indicator reflects the change in the proportion of livestock breeds and plant varieties within the total population/total production of the breed/variety in Switzerland since 1999.

- Finish Indicators for Renewable Natural Resources. Indicator: Genetic diversity of production animals. The indicator shows the numbers of breeding females of Finnish landrace breeds since 1994.

C – BASELINES AND TARGETS

- UK biodiversity indicators: 6. Extent and condition of UK protected areas. The long term assessment of change in area and condition of UK protected sites is based on data collected since 1996.

- Sweden's environmental objectives:
  - o 8. Flourishing lakes and streams. By 2015, two-thirds of natural and cultural environments of particular national value, in and in the vicinity of lakes and watercourses, will be conserved on a long-term basis.
  - o 10. A Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos.
    - By 2010 long-term protection will be provided for at least 50% of marine environments of high conservation value and at least 70% of coastal and archipelago areas with significant natural and cultural assets. By 2010 14 marine areas will be protected as nature reserves.
    - By 2015, a representative network of marine areas of high conservation value, covering at least 15% of Sweden's total marine area, will be established and conserved.

- Halting the loss of biodiversity in the Netherlands: Nature site designation. The cornerstone of Dutch nature policy is the establishment of the so-called National Ecological Network (EHS) to be finalized in 2018. The land covered by the EHS will be about 725,000 hectares, which represent about 20% of the national territory.

- Biodiversity monitoring Switzerland. M1: Size of protected areas. Change in size of nature conservation areas protected by law. The indicator shows the development of protected areas of national importance since 1991.

- Estonian National Strategy on Sustainable Development: Sustainable Estonia 21. Goal 4: Ecological balance. The coverage of protected areas and Natura 2000 sites will be no less than 10% of the territory of Estonia.

- Environmental Profile of Spain 2007. Indicator: Protected natural sites. The indicator shows the surface covered by protected sites in Spain since 1990.

- Italian indicators for reporting on the biosphere:
  - o Surface of terrestrial protected areas. The indicator shows the cumulative surface and cumulative number of terrestrial protected areas since 1922.
  - o Surface of marine protected areas. The indicator shows the surface of marine protected areas per region. Data are available since 2000.

C – BASELINES AND TARGETS

- Flemish biodiversity indicators: Natura 2000. The indicator shows the coverage of protected areas under Natura 2000 since 1988.

- Estonian National Strategy on Sustainable Development: Sustainable Estonia 21. Goal 4: Ecological balance. The coverage of protected areas and Natura 2000 sites will be no less than 10% of the territory of Estonia.

- French monitoring indicators for European commitments. Nature and Biodiversity: Status of the Natura 2000 network. In 2005 the OECD recommended to France to extend the network of protected sites under Natura 2000 framework to the 15% of the metropolitan surface (OECD, Environmental review of France, 2005).

- Environmental Profile of Spain 2007. Indicator: Protected natural sites. The indicator shows the surface covered by sites designated under the EU Habitats Directive (LIC) and Birds Directive (ZEPA) in Spain since 2003.

- Italian indicators for reporting on the biosphere:
    - Area of especial protection. The indicator represents area and number of protected areas under Birds Directive. Data are available since 2000.
    - Sites of community importance approved and proposed. The indicator representsarea and number of sites under Habitats Directive. Data are available since 2000.

C – BASELINES AND TARGETS

9- CRITICAL LOAD EXCEEDANCE FOR NITROGEN

- UK biodiversity indicators: 10. Area of sensitive UK habitats exceeding critical loads for acidification and eutrophication. The long term assessment of change in area of sensitive habitat exceeding air pollution critical loads is based on data collected since 1996.

- Sweden's environmental objectives:
    - 3. Natural acidification only:
        - By 2010 emissions of nitrogen oxides to air in Sweden will have been reduced to 148,000 tonnes.
        - By 2015, emissions of nitrogen oxides to air in Sweden will have been reduced to 130,000 tonnes.
    - 7. Zero eutrophication:
        - By 2010 Swedish waterborne anthropogenic emissions of nitrogen compounds into sea areas south of the Åland Sea will have been reduced by at least 30% compared with 1995 levels.
        - By 2016, action will have been taken to reduce Swedish waterborne anthropogenic emissions of nitrogen compounds to the Baltic Sea by 20,780 tonnes from the level of 1997–2003, in accordance with HELCOM's preliminary burden-sharing formula.
        - By 2010 emissions of ammonia in Sweden will have been reduced by at least 15% compared with 1995 levels.
        - By 2015, emissions of ammonia in Sweden will have been reduced by 13% compared with 2005 levels.

- Flemish biodiversity indicators:
    - Exceedance of critical load for eutrophication. The Flemish environmental policy plan (MINA-plan 3+) only includes emission targets for nitrogen. Targets for atmospheric deposition are limited to acidifying compounds. The long-term targets (to achieve by 2030) in this context are:
        - A deposition rate allowing for sustainable development of most forest ecosystems. This implies a deposition rate below the critical load for acidification;
        - An environmental quality that matches the ecological requirements of sensitive species and habitats within the Flemish ecological network, NATURA 2000 areas and planological nature, park and forest zones. This requires that deposition rates in areas with sensitive ecosystems such as heathlands and mires need to be reduced below the critical loads of these systems.
    - Exceedance of critical load for acidification. The Flemish environmental policy plan (MINA-plan 3+) includes a long-term deposition target of 1400 acid-equivalents/ha/year by 2030.

- German national strategy on biological diversity. To reduce the surplus nitrogen in the overall balance sheet to 80 kg/ha by 2010.

- Environmental Profile of Spain 2007. Indicator: Emissions of acidifying and eutrophicating gases. The indicator shows the level of total annual emissions of acidifying and eutrophicating gases since 1990. The national emission ceilings for 2010 according to the National Emission Ceilings Directive (2001/81/EC Directive) are (in Kt):
    - SO_2: 746
    - NO_x: 847

C – BASELINES AND TARGETS

- UK biodiversity indicators: 11. Impact of invasive non-native species. The long term assessment of change in the impact of invasive species is based on data collected since 1960.

- Flemish biodiversity indicators: Alien species. The indicator shows the cumulative number of plant and animal alien species since 1900.

C – BASELINES AND TARGETS

11- OCCURRENCE OF TEMPERATURE-SENSITIVE SPECIES

- Italian indicators for reporting on the biosphere: Extension of flora populations sensitive to climate change in high altitude. The indicator evaluates, according to the protocol defined by the project GLORIA (Global Observation Research Initiative in Alpine Environments), the areal variation of selected plant species and the speed and anomalies of those variations as an effect of climate change impacts on high mountain vegetation. Temporal coverage: Data are available since 2001.

- An Indicator of the Impact of Climatic Change on European Bird Populations. Research Article. Slowing the rate of increase of the indicator might be a policy objective, although such a target must recognize inherent time lags in the system.

C – BASELINES AND TARGETS

12- MARINE TROPHIC INDEX OF EUROPEAN SEAS

- UK biodiversity indicators: 13. Size of marine fish in the North Sea. The long term assessment of change in the proportion of large individuals in North Sea fish populations is based on data collected since 1982.

C – BASELINES AND TARGETS

13- FRAGMENTATION OF NATURAL AND SEMI-NATURAL AREAS

- Biodiversity monitoring Switzerland:
    - o E3: Size of wilderness areas. Change in the total number of wilderness areas in Switzerland. By now, only data for the sub-section "forest wilderness" have been gathered since 1983.
    - o E15: Landscape fragmentation. Changes in landscape fragmentation in Switzerland and the regions. The indicator measures changes in effective mesh size in Switzerland since 1935.

- Italian indicators for reporting on the biosphere:
    - o Pressure from transport infrastructure in protected areas. The indicator shows the metres of transport infrastructure per hectare of protected area. Data are available since 1997.
    - o Level of fragmentation of natural and semi-natural areas. This indicator quantifies the loss of biodiversity in terms of degree of isolation of patches. Temporal coverage: Since 1990.

C – BASELINES AND TARGETS

14- FRAGMENTATION OF RIVER SYSTEMS

- Flemish biodiversity indicators: Defragmentation of rivers. This indicator shows the number of fish migration barriers that must be removed on a 3000 km long priority network of rivers. In 1996, Belgium, The Netherlands and Luxemburg agreed to take all measures necessary to allow free fish migration through all hydrographic basins by 2010. A postponement to 2015 (90%) and 2021 (100%) is under preparation, synchronizing the target with the European Water Framework Directive.

C – BASELINES AND TARGETS

- Sweden's environmental objectives: 7. Zero eutrophication.
    - o Nutrient conditions in coastal waters and seas will be essentially the same as in the 1940s.
    - o By 2010 Swedish waterborne anthropogenic emissions of phosphorus compounds into lakes, streams and coastal waters will have decreased by at least 20% from 1995 levels. The largest reductions will be achieved in the most sensitive areas.
    - o By 2016, action will have been taken to reduce Swedish waterborne anthropogenic emissions of phosphorus compounds to the Baltic Sea by 290 tonnes from the level of 1997–2003, in accordance with HELCOM's preliminary burden-sharing formula.
    - o By 2010 Swedish waterborne anthropogenic emissions of nitrogen compounds into sea areas south of the Åland Sea will have been reduced by at least 30% compared with 1995 levels.
    - o By 2016, action will have been taken to reduce Swedish waterborne anthropogenic emissions of nitrogen compounds to the Baltic Sea by 20,780 tonnes from the level of 1997–2003, in accordance with HELCOM's preliminary burden-sharing formula.

- Finish biodiversity indicators. Baltic sea:
    - o BS1 Phosphorus. The indicator shows the phosphorus load carried by rivers since 1970 and the total phosphorus in surface water since 1965.
    - o BS2 Nitrogen. The indicator shows nitrogen load carried by rivers since 1970.

C – BASELINES AND TARGETS

16- FRESHWATER QUALITY

- UK biodiversity indicators: 15. Percentage of rivers of good biological quality. The assessment is based on changes in England and Wales since 1990.

- Water Framework Directive (Directive 2000/60/EC). For lakes in the agricultural landscape, the total phosphorus concentration should not exceed 25 micrograms per litre.

- Sweden's environmental objectives:
    - 3. Natural acidification only:
        - By 2010 not more than 5% of all lakes and 15% of the total length of running waters in the country will be affected by anthropogenic acidification.
        - By 2015, the proportion of fresh waters acidified as a result of human activities will not exceed 25% in south-west Sweden or 5% in central and south-east Sweden. In northern Sweden, no increase in acidification will occur.
    - 7. Zero eutrophication:
        - By 2010 Swedish waterborne anthropogenic emissions of phosphorus compounds into lakes, streams and coastal waters will have decreased by at least 20% from 1995 levels.
        - By 2016, action will have been taken to reduce Swedish waterborne anthropogenic emissions of phosphorus compounds to the Baltic Sea by 290 tonnes from the level of 1997–2003, in accordance with HELCOM's preliminary burden-sharing formula.

- Finish Indicators for Renewable Natural Resources. By 2015 the ecological status of waters should be at least good in all water areas.

- 10 key environmental indicators for France. Water: Nitrate in rivers. The indicator shows the percentage of measurement points per quality category since 1990.

- French monitoring indicators for European commitments. Nature and Biodiversity: Phosphates in rivers. The national strategy of sustainable development, reviewed in October 2006, recommends achieving a good status of freshwater quality in the whole territory by 2015.

- Environmental Profile of Spain 2007. Indicator: Organic pollution in rivers. The indicator shows the percentage of stations according to their average value of BOD_5 (mg/l) since 1990.

- Environment in Spain 2007. Status of water bodies: It shows temporal changes of ammonium, nitrates and phosphates since 1990.

- Flemish biodiversity indicators: Phosphorus concentrations in rivers. The indicator shows the proportion of sampling points with high, good or moderate-bad quality since 1990. According to the WFD the objective of "good ecological status" should be reached in all surface waters by 2015.

C – BASELINES AND TARGETS

17- FOREST: GROWING STOCK, INCREMENT AND FELLINGS

- Sweden's environmental objectives: 12. Sustainable Forests. A further 900,000 hectares of forest land of high conservation value will be excluded from forest production by the year 2010.

- Sustainability in Spain 2007: Integrated Assessment. Forests: timber stocks, increases and extractions. The indicator shows the balance between growing stocks and loss of wood volume analyzed through the variation of barked standing wood volume and the intensity of fellings considering the year 1990.

- Finish Indicators for Renewable Natural Resources. Indicator: Total growing stock volume. The indicator shows the growing stock volume since 1920.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

C – BASELINES AND TARGETS

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18- FOREST: DEADWOOD

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- Sweden's environmental objectives: 12. Sustainable Forests:
    - o By 2010 increase the quantity of hard dead wood by at least 40% throughout the country and considerably more in areas where biological diversity is particularly at risk.
    - o By 2020, in order to enhance and preserve biologically valuable structures, the volume of hard dead wood will increase by at least 30 million cubic metres standing volume nationwide.

- WWF suggests a target of 20-30m3/ha of deadwood by 2030 in boreal and temperate forests (WWF Report – October 2004: Deadwood – living forests).

- Biodiversity monitoring Switzerland. E10: Deadwood. Changes in the amounts of deadwood found in various forest types in Switzerland as a whole and in individual regions. For biodiversity to flourish, forests should ideally hold at least 20 cubic meters of deadwood per hectare.

- Forestry Commission England. English Woodland Grant Scheme. Operations Note 15 (1st June 2008). Deadwood. The general prescription is that dead wood should be removed from sites of high floristic value. On all other sites the minimum standard suggested is that 5-10% of the average stand volume or 20m^3 per hectare should be dead or contain significant decaying wood features.

C – BASELINES AND TARGETS

- Finish Indicators for Renewable Natural Resources. Indicator: Nitrogen balance. The indicator shows the field balance of nitrogen since 1985.

- Flemish biodiversity indicators: Nitrogen residue in agricultural soils. The indicator shows the average annual nitrogen residue in agricultural soils in Flandres since 1990. The 2010 target in the Flemish Environmental Policy Plan (2003-2010) is 70 Kg N/ha.

C – BASELINES AND TARGETS

20- AGRICULTURE: AREA UNDER MANAGEMENT PRACTICES POTENTIALLY SUPPORTING BIODIVERSITY

- UK biodiversity indicators: 8. Area of land under agri-environment scheme management. The long term assessment of change in area of land covered by agri-environment schemes is based on data collected since 1992.

- Sweden's environmental objectives. 13. A Varied Agricultural Landscape:
    - The number and extent of culturally significant landscape features that are managed will increase by about 70% by 2010.
    - By 2020, at least 20% of farmland will be certified for organic production.

- German national strategy on biological diversity. By 2015, the proportion of land used for valuable conservationist agro-biotopes (high-grade grassland, orchard meadows) has increased by at least 10% compared with 2005. In 2010, semi-natural landscape elements (such as hedges, borders, field shrubbery and small bodies of water) account for at least 5% of agricultural areas. The Federal Government's sustainability strategy is based around a 20% target for organic farming by 2010.

- Halting the loss of biodiversity in the Netherlands: Wider countryside. The main policy instruments for the conservation of farmland biodiversity are formed by the biodiversity measures under the Farmland Conservation Scheme. This scheme is co-funded by the EU and facilitates nature and landscape management contracts with farmers on a voluntary basis for a six years period. The Dutch government has designated areas for which agreements can be concluded under this scheme. The target is to bring approximately 120,000 hectares under the scheme in 2018, amounting to about 7% of Dutch farmland.

- Sustainability in Spain 2007: Integrated Assessment. Area dedicated to ecological agriculture. The indicator shows the surface dedicated to ecological agriculture related to the used agriculture surface, at national and autonomic level since 1991.

- Environmental Profile of Spain 2007. Indicator: Organic farming. The indicator shows the surface used for organic farming in Spain since 1994.

- Biodiversity monitoring Switzerland. M5: Areas farmed organically. Change in total area used by organic farms in Switzerland since 1993.

- Finish Indicators for Renewable Natural Resources. Indicator: Land use in agriculture. The indicator shows changes in use of agricultural land (including organic farming) since 1970.

- Finish biodiversity indicators. Farmlands: FA16 Organic farming. The indicator shows the area under organic farming since 1990.

- Malta State of the Environment indicators. L1: % Organic farming. The indicator shows the percentage of Malta's agricultural land under organic cultivation since 2005.

- Flemish biodiversity indicators:
    - Area with agri-environmental measures that support biodiversity. The indicator shows the area with agri-environmental measures that support biodiversity since 2000. The Flemish Environmental Policy Plan (2003-2010) aims to have 16,750 ha of agricultural land under agri-environmental schemes by 2010.
    - Area under organic farming. The indicator shows the proportion of agricultural land under organic farming in Flanders since 1994.

- Italian indicators for reporting on the biosphere: Number and surface of farms dedicated to organic farming. Temporal coverage: Since 1990.

C – BASELINES AND TARGETS

21- FISHERIES: EUROPEAN COMMERCIAL FISH STOCKS

- UK biodiversity indicators: 9. Percentage of fish stocks harvested sustainably and at full reproductive capacity. The long term assessment of change in stocks harvested sustainably and at full reproductive capacity is based on data collected since 1990.

- Sustainability in Spain 2007: Integrated Assessment. Above-quota fish catching. The indicator expresses catching in tones from fishing grounds evaluating if they are above the quotes established by the European Commission

- Scottish Government Technical Notes for the 2007 spending review. Indicator 44: Key commercial fish stocks at full reproductive capacity and harvested sustainably. The baseline is three year moving average over calendar years 2005 to 2007, centred on 2006. National target: Ensure 70% key commercial fish stocks at full reproductive capacity and harvested sustainably by 2015.

C – BASELINES AND TARGETS

22- AQUACULTURE: EFFLUENT WATER QUALITY FROM FINFISH FARMS

- Finish Indicators for Renewable Natural Resources. Indicator: Trends in nutrient loading. The indicator shows changes in phosphorus and nitrogen load on waters from fish farming since 1976.

- Environmental Profile of Spain 2007. Indicator: Aquaculture production. The indicator shows the tones of aquaculture production in Spain since 2000.

C – BASELINES AND TARGETS

23- ECOLOGICAL FOOTPRINT OF EUROPEAN COUNTRIES

- Flemish biodiversity indicators: Ecological footprint of the consumption of renewable natural resources. The indicator shows the ecological footprint of the consumption of renewable natural resources (excluding energy consumption) in universal hectares since 1993.

- Global Footprint Network. The 2008 National Footprint Accounts determines the area required to produce the biological resources a country uses and to absorb its wastes, and to compare this with the area available. This area is reported in global hectares (global acres), hectares (acres) with world-average productivity, for each year from 1961. There were 13.4 billion hectares of biologically productive land and water on this planet in 2005. Dividing by the number of people alive in that year, 6.5 billion, gives 2.1 global hectares per person.

C – BASELINES AND TARGETS

It was not possible to locate any specific baselines or targets.

A survey of existing scientific or policy targets relevant for each SEBI indicator among global, European and national initiatives

C – BASELINES AND TARGETS

- UK biodiversity indicators:
    - o 16. Public sector expenditure on biodiversity in the UK. The assessment has been done from 2000/1 to 2007/8.
    - o 17. UK Government funding for conservation of global biodiversity. The assessment has been done from 2000/1 to 2007/8.

- Flemish biodiversity indicators: Flemish budget for nature conservation. The indicator shows the relative proportion of the Flemish expenditure budget that is allocated to environment, to nature conservation and to the Flemish Fund for Tropical Forests since 1997. The numbers are based on the policy appropriations.

- Biodiversity monitoring Switzerland. M7: Financial resources for nature and landscape conservation. The indicator shows the change in total funds devoted to nature and landscape conservation in the public sector, i.e. by central government, cantons and municipalities since 1990.

- 10 key environmental indicators for France. Expenditure: Environmental protection. The indicator shows the total expenditure for environmental protection since 1990.

- Malta State of the Environment indicators. PR1: Public environmental expenditure. The indicator shows the share of GDP that the government is spending on the environment since 2002.

C – BASELINES AND TARGETS

- UK biodiversity indicators: 18. Volunteer time spent in biodiversity conservation in the UK. The assessment has been done between 2000 and 2008.

- German national strategy on biological diversity. In the year 2015, at least 75% of the population will rate the conservation of biological diversity as one of the top priorities for society.

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