POSITION PAPER
13 September 2012

WWF for a living planet®

Conference of the Parties to the Convention on Biological Diversity

Eleventh meeting (COP11)

Hyderabad, India, 8-19 October 2012

Agenda Item 3.3: Further development of tools and guidance for monitoring implementation, including the use of indicators

Summary

A limited number of simple, easily applicable and cost-effective indicators that can be used at national level as well as at global level to monitor implementation of the Strategic Plan are outlined in the Annex to this paper.

WWF urges COP 11 to:

1. consider endorsing this set of indicators for use by Parties and the CBD Secretariat

2. adopt SBSTTA recommendation XV/1 with emphasis on:

- urging Parties to incorporate indicators and milestones into NBSAPs and provide updates on progress towards milestones at each COP

- requesting the CBD Secretariat, GEF, UNDP and UNEP and other relevant organisations to ensure that indicators and milestones are promoted in their activities supporting NBSAP revision

- engaging regional organisations and regional centres of excellence in the implementation of the indicator framework including the development of guidance, toolkits, databases and the building of capacity at national and regional level.

A full set of WWF position papers is available at: wwf.panda.org/cop

Rationale

WWF welcomes the work of the Ad Hoc Technical Expert Group meeting to provide guidance for monitoring implementation of the Strategic Plan for Biodiversity 2011-2020.

WWF believes that an effective monitoring system needs to be in place to measure progress implementing the Strategic Plan in order to inform decision-making and communicate the status and values of biodiversity.

However, WWF is concerned that the large number of indicators proposed in the indicative list of indicators (Annex 1 to SBSTTA recommendation XV/1), will make it difficult for many Parties to implement effective monitoring without further guidance.

SBSTTA 15 recommended that the Executive Secretary be requested to propose "a limited number of simple, easily applicable and cost-effective indicators that can be potentially implemented by all Parties".

In the attached paper WWF proposes such a set of simple, easily applicable and cost-effective indicators based on the DPSIR (Driver-Pressure-State-Implication-Response) Framework. This set of indicators already exists at global level and would be relatively easy to calculate and use at national level.

WWF urges Parties to consider the application of this simple set of indicators at national level and to recommend this set of indicators for national and global use at COP 11.

Given the the limited use of the indicators by Parties to monitor progress towards the 2010 biodiversity target, WWF believes that more effective technical and capacity support should be made available to Parties for monitoring the Strategic Plan. The development of technical guidance and advice from international experts is welcome but additional efforts need to be made to support indicator use by Parties.

WWF recommends that indicators are mainstreamed into the process of revising NBSAPs. Collaboration between the CBD Secretariat and international organisations such as the GEF, UNDP and UNEP which are involved in supporting the revision of NBSAPs in many countries will support the integration of the indicator framework and milestones into NBSAPs.

WWF notes that there are many national and regional centres of expertise as well as regional agreements that have a major role to play in supporting the implementation of the Strategic Plan. **WWF urges COP 11 to ensure that regional organisations, centres of expertise and agreements are engaged in the implementation of the indicator framework** including the development of guidance, toolkits, databases and the building of capacity at national and regional level.

Annex: A Simplified Indicator Set for Measuring Progress against CBD 2020 Targets at National and Global Level

Introduction

The CBD has developed a set of about 100 indicators to track progress against the Aichi Targets of its Strategic Plan (2010-2020), detailed in SBSTTA 15 recommendation XV/1 in document UNEP/CBD/COP/11/2. The SBSTTA recommendation categorises indicators as:

A. global-level ready to use
B. global-level requires further development
C. national-level

In addition, SBSTTA 15 recognised the need to assist Parties: *…especially those with limited resources and capacities and/or not yet using systematically produced indicators …to establish and apply a few simple, cost-effective and easily applicable indicators for priority issues* (paragraph 10. g. (ii))

This paper proposes a simplified set of ten indicators that fall into categories A and C: these indicators are already developed at the global or regional level, but also form a simple, cost-effective and complementary set which can be applied at national level. Seven of these indicators already exist at national and global level, two exist at the global level and can be developed at the national level where sufficient data exist, and one is available for large river basins.

The raw data on which many of these indicators are based are already collected by national governments and reported to international agencies such as the UN Food and Agriculture Organization. The indicators have been developed by international organizations and NGOs based on national level datasets. The fact that these indicators are already in use means that they can be used to monitor progress on the CBD Strategic Plan against a baseline using pre-2010 data

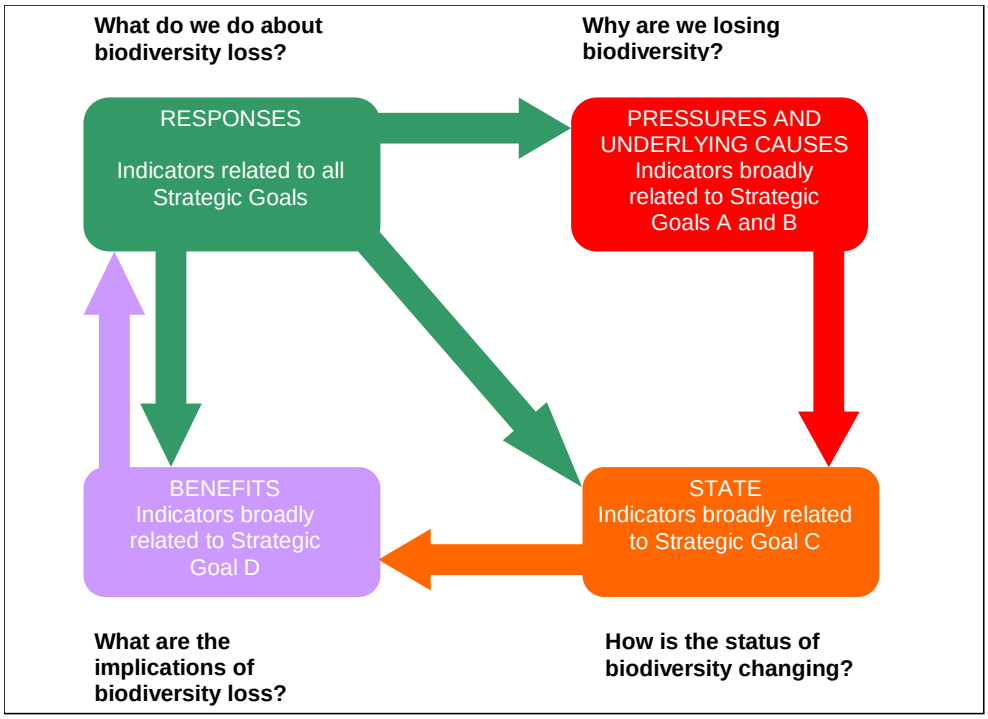
	Indicator	Data availability
1	Agriculture, forest and fishery consumption footprint	Global and national
2	Carbon footprint (can be combined with 1)	Global and national
3	Water footprint	Global and national
4	Agriculture, forest and fishery production footprint	Global and national
5	River fragmentation and flow regulation	Large river basins
6	Habitat cover	Global and national for forests. Other habitat data available for many countries
7	Species populations or abundance	Global, national for many countries with sufficient data
8	Biological productive capacity (biocapacity)	Global and national
9	Protected area coverage and management effectiveness	Global and national for coverage. Effectiveness nationally where sufficient assessments have been completed
10	Area and/or production of forestry and fisheries under sustainable management[1]	Global and national

[1] Agriculture under sustainable management should be added when sufficient data are available to develop an internationally comparable indicator.

The CBD's Conceptual Model

The CBD's Aichi Targets are based around five strategic goals which relate to the CBD's "*Conceptual model" (see Figure 1)*.

Figure 1: *Conceptual model for communicating the different types of indicators for assessing progress towards the strategic plan for biodiversity 2011-2020* (from Annex 2,



SBSTTA 15 recommendation XV/1 in document UNEP/CBD/COP/11/2)

Strategic Goals from the CBD Strategic Plan for Biodiversity 2011-2020.

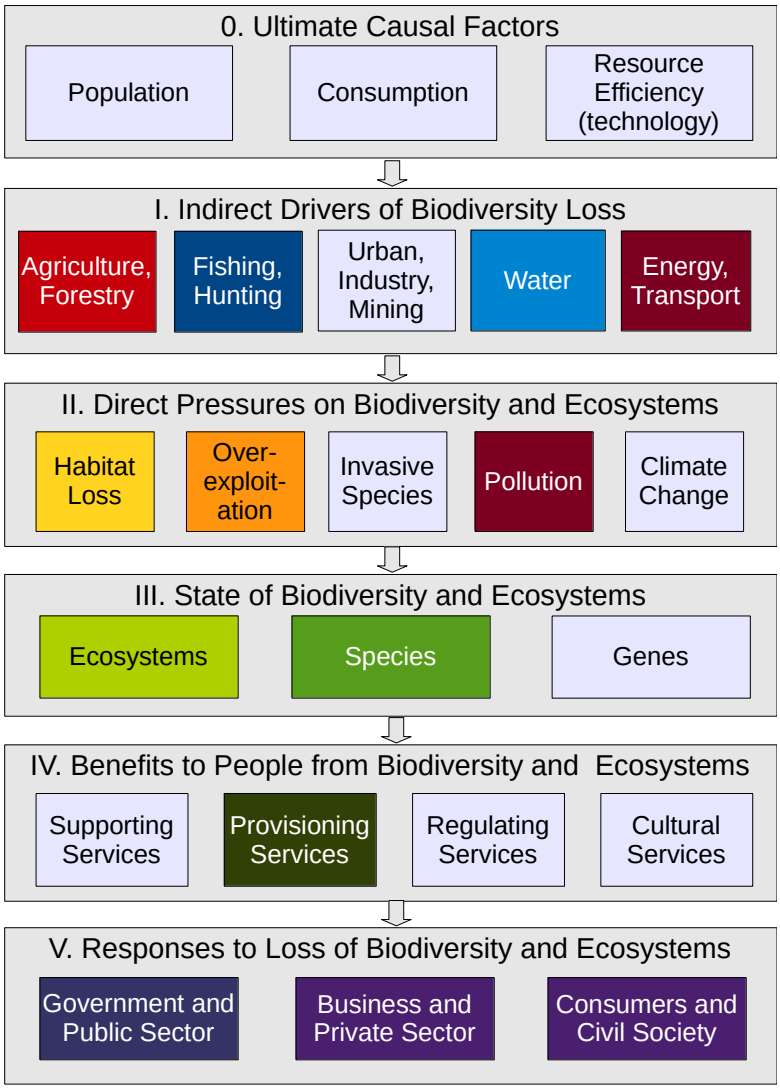
1. *Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society*
2. *Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use*
3. *Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity*
4. *Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services*
5. *Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building*

The indicators proposed in this paper also follow the CBD's conceptual model, with one, two or three indicators for each Strategic Goal (see Figures 2 and 3). Although there are 20 CBD targets and only 10 indicators, it is possible to assess progress against most of the targets using this simplified set of indicators.

The Chain of Causes and Effects of Biodiversity Loss

In order to understand the logic of the simplified indicator set it is helpful to view drivers, pressures, states, benefits and responses as layers in a chain of causes and effects of biodiversity loss.

***Figure 2**: **Six levels of the chain of cause and effect of biodiversity loss.** Individual causes or effects are shown in coloured boxes. Colours correspond to indicators in Figure 3, grey boxes have not been assigned an indicator. (Based on Loh, J. (ed.) 2010 and Beyond: rising to the biodiversity challenge. WWF International, Gland)*



The six rows of the diagram in Figure 2 correspond to levels in the chain of causes and effects of biodiversity loss, from (0) the ultimate causal factors, through (I) indirect drivers of biodiversity loss and (II) direct pressures on biodiversity and ecosystems to (III) the state of biodiversity and ecosystems, down to (IV) the benefits to people of biodiversity and ecosystems and (V) society's responses the loss of biodiversity and ecosystems.

The boxes in the first three levels (0, I, II) of the chain show different causes, from ultimate to proximate. Among the direct pressures on biodiversity (level II) are the five main threats to

biodiversity, including habitat loss and degradation, over-exploitation of species, invasive species, pollution and climate change (see Box 1 for more detail). These threats stem ultimately from human demands on the biosphere – the production and consumption of food, water, energy and materials, and the disposal of associated waste products – or the displacement of natural ecosystems by towns, cities and infrastructure. It is clear that all of these direct threats or pressures are the effect, in turn, of more distant, indirect drivers of biodiversity loss which relate to the consumption of resources and pollution arising from their waste products (level I). These drivers are the human demands for food, water, energy and materials, and can be considered, sector by sector, in terms of the production and consumption of agricultural crops, meat and dairy products, fish and seafood, timber and paper, water, energy, transport, and land for towns, cities and infrastructure.

The ultimate causal factors of biodiversity loss are population, consumption (or affluence) and technology (level 0); as the human population and per capita consumption grow, so does the magnitude of the drivers, although this is ameliorated by technology which improves the efficiency with which natural resources are converted into goods and services.

Box 1: The five major direct threats to biodiversity

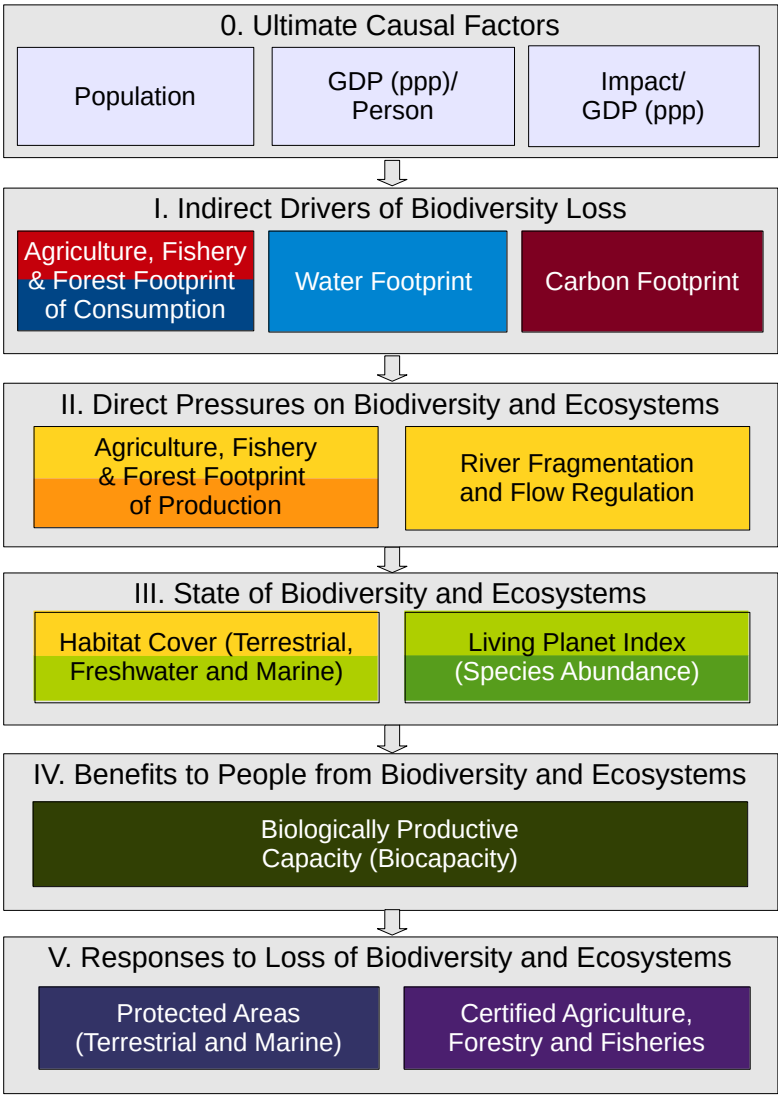
- *Habitat loss and degradation:* especially in terrestrial ecosystems, wildlife habitat is lost, altered or fragmented through conversion for cultivation, grazing, aquaculture, industrial or urban use. River systems are dammed and altered for irrigation, hydro-power or flow regulation, and even marine ecosystems, particularly the sea bed, are physically degraded by trawling, construction and extractive industries.
- *Over-exploitation:* The result of harvesting or killing wild animals or plants for food, materials or medicine, over and above the reproductive capacity of the population to replace itself. It has been the dominant threat to commercial fish stocks, but is also a serious threat to many terrestrial species, particularly tropical forest mammals. Overharvesting of timber and fuel wood has also lead to loss of forests and their associated plant and animal populations.
- *Invasive species:* introduced from one part of the world to another, whether deliberately or inadvertently, are responsible for declines in many native species populations. This is especially important on islands and in freshwater ecosystems, where they are the main cause of extinction among endemic species.
- *Pollution:* particularly important in aquatic ecosystems where excess nutrient loading or toxic chemical pollution arise from farming, aquaculture, industry or mining. Increasing carbon dioxide concentrations in the atmosphere is acidifying the oceans, which is likely to have widespread effect on shell and reef-building organisms.
- *Climate change:* potentially the greatest threat to biodiversity over the course of the next few decades. Already impacts of climate change have been measured in arctic and alpine as well as coastal and marine ecosystems, such as coral reefs.

The impacts of these direct, indirect and ultimate causes of biodiversity loss are reflected in the state of biodiversity and ecosystems (level III). If the state of biodiversity and ecosystems declines, in particular if their productivity declines, this may reduce the benefits which people are able to derive from them (IV). Finally, level V shows society's response to the loss of biodiversity, ecosystems and their associated benefits in terms of actions by governments, the private sector and civil society.

A Simplified Set of Indicators of Drivers, Pressures, States, Benefits and Responses

The simplified set of indicators is subdivided into five groups corresponding to (I) drivers, (II) pressures, (III) states, (IV) impacts and (V) responses, although some of the indicators are dual-purpose (eg. habitat cover can be used as an indicator of either pressures (II) or states (III)). The ultimate causal factors of population, affluence and technology have not been assigned indicators in the simplified set because these data are widely reported elsewhere, although they can easily be added if desired.

***Figure 3**: **Indicators: corresponding to the six levels of the chain of cause and effect of biodiversity loss** (see Figure 2). Indicators in individual boxes are colour-coded to show which causes/effects in Figure 1 they can be used to monitor. Blue-grey coloured boxes have not been assigned an indicator.*



A number of the indicators proposed in Figure 3 are based on the concept of a footprint. A footprint is a measure of the demands that humans make on the biosphere in order to sustain their production and consumption of goods and services in a given year. Specifically, it is a way of accounting for the total quantity resources – land, water or energy – needed to maintain an individual's or a population's level of consumption or production using the technology available to them. These footprint metrics may be measured in hectares, tonnes of carbon, cubic metres of water, or other convenient units.

It is important to distinguish whether a footprint is being be used to measure consumption or production. The footprint of production simply measures the quantity of land, water or energy required to make the goods or services produced by a population. A consumption footprint is the total amount of resources required to make the goods or services consumed by a given population, wherever in the world those goods or services are produced. The consumption footprint of a nation therefore takes international trade into account, so that imports are added to its domestic production and exports are subtracted.

I. Indirect Drivers of Biodiversity Loss

Agriculture, Forest and Fishery Consumption Footprints (total and per capita). There are a number of consumption footprint metrics that are very useful for measuring different drivers of biodiversity loss. All are based on the consumption of renewable natural resources.

- Agricultural footprint: measures the total area of cropland and pasture land required to produce all the food (plant and animal) and natural fibre consumed by an individual, a country or the world.
- Forest footprint: measures the total area of forest required to produce all the timber, fuel-wood, pulp and paper consumed by an individual, a country or the world.
- Fishery footprint: measures the total area of sea required to produce all the fish and seafood consumed by an individual, a country or the world.

These three footprint measures can be combined if each is adjusted to take the differences in productivity between different biomes into account (eg. agricultural land and forest land). The respective areas are the expressed in hectares of global average productivity (global hectares) and aggregated.[2]

Date Source: Global Footprint Network

Carbon and Water Production footprints (total and per capita). These footprint metrics could also be expressed as consumption footprints

- Carbon footprint: measures fossil fuel consumption in terms of carbon emissions, the most important driver of global climate change. The carbon footprint may be measured in tonnes of carbon per year or in terms of the area of the terrestrial biosphere needed to maintain stable CO_2 concentrations in the atmosphere given

[2] The Ecological Footprint is a well-known indicator developed by the Global Footprint Network that combines crop land, grazing land, forest, fishery and carbon footprints with urban land into a single figure. The footprint indicators proposed here break the Ecological Footprint down into some of its components.

that rate of emission.[3] (CO_2 emissions are also a proxy indicator for pollution, which is one of the five main threats to biodiversity (see box 1)).

- Water footprint: measures the total volume of freshwater that is used to produce the goods and services, principally agricultural products but also industrial goods, produced by a country. The water footprint of production is a measure of the stress a country places on its available water resources.

Data sources: International Energy Agency (carbon footprint of production in tonnes/year), Global Footprint Network (carbon footprint of consumption in global hectares), Water Footprint Network.

II. Direct Pressures on Biodiversity and Ecosystems

It is proposed that two indicators are used to measure pressures:

1. Agriculture, forest and fishery footprints of production
2. River fragmentation and flow regulation

Agriculture, Forest and Fishery Production Footprint (total and per capita): The agriculture, forest and fishery consumption footprints listed above are good indicators of the indirect drivers of biodiversity loss, but not of the direct pressures or threats to biodiversity. Because the threats to biodiversity such as habitat loss and degradation are proximate, and their impacts felt locally, it is necessary to measure pressure at the level of the production of natural resources. It is proposed that the same agricultural, forest and fishery footprint metrics used to measure drivers are used to measure pressures, but from the point of view of the producer. Instead of measuring the consumption of food and fibre crops, meat and fish, forest products and so forth, these pressure indicators measure their production. So, for example, the forest production footprint is a measure of the area of forest needed to grow the timber and forest products produced in a given country or region, regardless of whether these products are exported or consumed domestically. Similarly the agricultural (or fishery) production footprint measures the area of land (or sea) required to produce the agricultural (or fish) products. As with the consumption footprint, these three measures can be aggregated.

Data source: Global Footprint Network

River fragmentation and flow regulation: The alteration and damming of river systems for flood control, irrigation and hydro-electric power have fragmented most of the world's large river systems to some extent. The fragmentation of river flows affects the productivity of freshwater ecosystems and causes declines in freshwater species. Data on trends in river fragmentation and flow regulation are available for the world's major river basins.

Data source: The Nature Conservancy and Umea University, Sweden

[3] The carbon footprint is included as an indirect driver of biodiversity loss, but is not so relevant as a direct pressure indicator, because the production of CO2 does not have local impacts. Climate change would be a relevant indicator of proximate threat to biodiversity. At the global level a good indicator would be Arctic sea ice extent.

III. States of Biodiversity and Ecosystems

It is proposed that only two indicators are used to measure states:

1. Habitat cover
2. Species populations or abundance

Habitat Cover: the basic measure of the state of terrestrial ecosystems, as well as some freshwater and marine systems such as coral reefs and sea grass beds; is able to show both status and trends. Comparison of present habitat cover with past years gives a measure of habitat loss (or gain), which is the single most important threat to species. Habitat cover, therefore, can be used as an indicator of both state and pressures on biodiversity. However, species populations can decline even if habitat cover remains constant, so additional measures of the state of ecosystems are necessary. Data on forest cover over time are available globally and for most countries of the world.

Data sources: WWF, UNEP-WCMC, FAO, The Nature Conservancy/Umea University.

Species Populations or Abundance: the most fundamental measure of the state of biodiversity. Trends in wild species populations in terrestrial, freshwater or marine ecosystems provide information not only about the species themselves, but also indicate the state of their habitat. A multi-species population index such as the *Living Planet Index* can be constructed to show trends in the biodiversity of any region (sub-national, national or super-national), taxonomic group, biome, management strategy or combination of these. Data are available globally and regionally, and sufficient national-level data are available for an increasing number of countries.

Data source: WWF and Zoological Society of London.

IV. Benefits to People of Biodiversity and Ecosystems

Biocapacity: a measure of the biological productivity of the biosphere. In terms of ecosystem services, biocapacity measures the capacity of natural and managed ecosystems to produce the biomass which people use, either to consume as food, timber or fibre, or to absorb carbon. Using the standard classification of ecosystem services, biocapacity is a measure of "provisioning services". Biocapacity has the advantage of bundling a group of different types of provisioning services into one indicator. Data are available for all countries and regions of the world as time-series data going back to 1961. Global biocapacity has grown steadily since the 1960s as productivity of agricultural land has increased, but biocapacity per capita has declined because biological productivity has not increased as fast as population growth. Just as the Ecological Footprint is an aggregate measure of the consumption of agricultural, forestry and fishery products, biocapacity can also be broken down in this way.

Data source: Global Footprint Network.

V. Responses to Losses of Biodiversity and Ecosystems

Two indicators are proposed to measure responses:

1. Protected area coverage and management effectiveness
2. Area and production of forestry and fisheries under sustainable management

Protected Area coverage and management effectiveness: the area of land or sea (in total or as a percentage of a national, regional or global territory) that is protected for biodiversity conservation is the best-established indicator of governmental efforts to alleviate pressure on biodiversity and ecosystems. It should be noted that it is not a measure of the state of biodiversity, although it has been used as such. CBD has targets for both terrestrial and marine protected areas. The indicator can be broken down by country, region or biome to show the extent or proportion of different habitat types that are protected.

Protected Area coverage should be combined with data on management effectiveness. The mere existence of a protected area is no guarantee of effective conservation. Several systems have been developed to assess the effectiveness of the management of a protected area as well as the effectiveness of national level PA systems and their corresponding legislation, governance and ability to deal with threats. Many countries have already assessed the management effectiveness of their PA systems which allows a basis for comparison, and the growing amount of data will make more national-level assessments available over time.

Data source: UNEP-WCMC World Database on Protected Areas and University of Queensland, Australia/World Commission on Protected Areas.

Area and production of forest and fisheries under sustainable management: the primary conservation response from the private sector, and one of the principal conservation measures outside of protected areas, is the sustainable management of forests, fisheries and agriculture. Independent certification of both producers and products by internationally recognized bodies has grown rapidly in the last decade or more. The area of certified agricultural land and forests, and the volume of production of certified food, fish or forest products, are indicators of the sustainable production and consumption of crops, meat, fish, fibre and wood. At present, sufficient data are available on the certification of forests and fisheries at both the global and national levels, but further development is needed to make an internationally comparable indicator of sustainable agriculture.

Data source: Forest Stewardship Council, Marine Stewardship Council, Rainforest Alliance/Sustainable Agricultural Network, ISEAL Alliance and others.

Data Sources

The table below shows the sources of raw data and indicator providers for the ten proposed indicators.

	Indicator	Raw data source	International Indicator Developer/Provider
1	Agriculture, forest and fishery consumption footprint	National governments, reported to UN FAO	Global Footprint Network
2	Carbon footprint (can be combined with 1)	National governments, reported to International Energy Agency	Global Footprint Network
3	Water footprint	National governments, reported to UN FAO	Water Footprint Network
4	Agriculture, forest and fishery production footprint	National governments, reported to UN FAO	Global Footprint Network
5	River fragmentation and flow regulation	Various	The Nature Conservancy and Umea University
6	Habitat cover	Various, and national governments, reported to UN FAO, UNEP-WCMC	UN FAO, UNEP-WCMC, WWF and others
7	Trends in species populations	Various	WWF and Zoological Society of London
8	Biological productive capacity (biocapacity)	National governments, reported to UN FAO	Global Footprint Network
9	Protected area coverage and management effectiveness	Various, and national governments, reported to UNEP-WCMC	UNEP-WCMC, University of Queensland
10	Area and/or production of agriculture, forestry and fisheries under sustainable management	Forest Stewardship Council (FSC), Marine Stewardship Council (MSC, UN FAO and others	FSC, MSC, FAO and others

Written by Jonathan Loh on behalf of WWF, August 2012

For further information contact:

Jonathan Loh
Consultant to WWF International
Tel: +44 17 30 89 25 18
Email: jonathan@livingplanet.org.uk

At COP11

Rolf Hogan
Co-leader of WWF Delegation
Coordinator Biodiversity Policy
WWF International
Tel: +41 22 364 9391
Mobile: +41 372 9897
Email: rhogan@wwfint.org

Sejal Worah
Co-leader of WWF Delegation
Programme Director
WWF India
Tel:+91 11 4150 4804
Mobile:+91 98 3707 0839
Email: sworah@wwfindia.net