Notification 2013-005: "Identification of scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets"

1. INTRODUCTION

The EU and its Member States are committed to providing robust information related to the scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 as requested in Notification 2013-005. We believe this is important information for all Parties to provide, to ensure an effective implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets.
This submission addresses both contributions from the EU and from its Member States. Given the substantial nature of this request, the EU and its Member States have decided to engage the broader scientific community in responding to the relevant questions of this request.

The EU reaches out to its scientific community through a web-based discussion forum (http://www.biodiversityknowledge.eu/). This process is intended to gather, discuss and synthesise information on a) scientific and technical needs related to the implementation of each of the Aichi Targets, b) adequacy of observations, and of data systems, for monitoring the biodiversity attributes addressed in the Aichi Targets, and c) relevant policy support tools and methodologies.

Another, more European-focused but nevertheless relevant input to this request's theme is to be expected from the upcoming meeting of the European Platform for Biodiversity Research Strategy (EPBRS), which will address the research needs to support the implementation of the EU Biodiversity Strategy in view of setting priorities for the next seven-year research framework programme, "Horizon 2020".

However, only some of these processes have concluded in time to provide this information to the CBD Secretariat before the extended deadline we requested. For example, both the web-based discussion initiated at the EU level and the EPBRS meeting will not render results before mid May. A number of Member States are also consulting with their scientific communities and they will submit the results of these activities to the CBD Secretariat as soon as they become available. Understanding that this request is just a first step in a longer process providing more elaborate and robust information for discussions at the next SBSTTA meetings and at COP12, we are confident that the CBD Secretariat will find appropriate opportunities to take into account all the relevant contributions that are not yet part of this submission at a later stage.

Scientific and technical expertise will be required in the further development of indicators for measuring biodiversity and ecosystem services and for tracking

resources needed for the implementation of the Strategic plan. Additionally, the impacts of climate change on biodiversity have not been sufficiently estimated. To understand the complex interactions between ecosystems and climate change new predictive models need to be developed.

Existing science-policy platforms and networks need to be utilized in engaging the scientific community to strengthen the scientific basis in measuring progress in implementing the Strategic Plan. In particular, the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) should have a central role to play in this. Furthermore, the link between enhancing sustainable consumption and production patterns and halting biodiversity loss and ecosystem degradation needs more focus and could be strengthened through cooperation with UNEP´s International Resources Panel.

The scientific basis of tipping points or planetary boundaries of biodiversity loss and ecosystem degradation needs to be better understood to support the implementation of the Strategic Plan.

Attached are contributions of Bulgaria, Czech Republic, European Union, Finland, Ireland, and the United Kingdom. Annexed to this submission are also the recommendations of the meeting of the EPBRS held under the Hungarian Presidency of the Council of the EU in Budapest, Hungary, in April 2011 concerning scientific and technical needs relating to ecosystem services.

EUROPEAN UNION

A. Policy support tools and methodologies

Implementation of the NBSAP:

In May 2011, the European Union adopted a new strategy 'Our life insurance, our natural capital: an EU biodiversity strategy to 2020' (COM 2011/244 final).[1] The Strategy lays down the framework for EU action over this decade in order to meet the commitments made by EU leaders in March 2010, in particular the 2020 headline target: "*Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss*"; and the 2050 vision: "*By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided*".

The EU Biodiversity Strategy to 2020 follows up on the 2006 EU Biodiversity Action Plan and is the European Union's equivalent to a National Biodiversity Strategy and Action Plan (NBSAP) – and among the first ones to be fully aligned with the global Strategic Plan for Biodiversity 2011-2020. Apart from this EU Biodiversity Strategy, nearly all EU Member States have revised their own NBSAPs. As presented in their respective country profiles, EU Member States' NBSAPs further add to the implementation of the CBD and related multilateral agreements in individual countries through a wide range of national and sub-national policies and measures.

Actions taken to achieve the 2020 Aichi Biodiversity Targets:

The EU Biodiversity Strategy to 2020 is built around six mutually supportive targets which address the main drivers of biodiversity loss and aim to reduce the key pressures on nature and ecosystem services in the EU. Each target is further translated into a set of time-bound actions and other accompanying measures. The Strategy's targets and actions fully cover the EU's commitment to the 2020 Aichi Biodiversity Targets.[2]

Target 1: To fully implement the Birds and Habitats Directives (the EU nature legislation): Over the last 25 years, on the legal basis of the Birds and Habitats Directives,[3] the EU has built up a vast network of 26,000 protected areas throughout its Member States. Known as Natura 2000, the network covers an area of more than 750,000 km^2, which is 18% of the EU's land area, as well as an increase share of EU marine areas. Thanks to the EU nature legislation and Natura 2000, the area protected for nature conservation has more than tripled in the EU. The implementation of EU and national nature legislation and conservation efforts often supported by EU funding instruments such as the LIFE fund have already led to an impressive recovery of many species and habitats which were on the brink of extinction and the large-scale destruction of valuable wildlife-rich habitats has been halted. Cooperation

[1] http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7%5b1%5d.pdf

[2] See correspondence table at http://biodiversity.europa.eu/policy/eu-biodiversity-strategy/target-1-and-related-aichi-targets

[3] http://ec.europa.eu/environment/nature/legislation/index_en.htm

between the different public and private actors has greatly increased at local, national and EU level and the soon 28 EU Member States are coordinating their efforts to conserve Europe's natural heritage. However, despite these measures and successes, only 17% of habitats and species under protection are in favourable condition. Target 1 aims at a significant and measurable improvement in the status of all species and habitats covered by EU nature legislation so that, by 2020, compared to current assessments: (i) 100 % more habitat assessments and 50 % more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50 % more species assessments under the Birds Directive show a secure or improved status. This is to be achieved by the completion of the Natura 2000 Network, by ensuring good management and adequate financing of Natura 2000 sites, through increased stakeholder awareness and involvement and improved enforcement, monitoring and reporting.

Target 2: To maintain and enhance ecosystems and their services: Target 2 addresses the fragmentation and degradation of ecosystems and their services within and beyond protected areas with the aim that, by 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems. A strategic framework will be developed by Member States, assisted by the Commission, to set priorities for ecosystem restoration at EU, national and subnational level by 2014. Furthermore, a Green Infrastructure Strategy is being developed to promote the deployment of green infrastructure in the EU in urban and rural areas. Action under this target will also seek to achieve "no net loss" of biodiversity and ecosystem services for example through compensation or offsetting schemes and by "biodiversity-proofing" EU-funded projects, plans and programmes.

Target 3: To increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity: Biodiversity concerns have been part of European agricultural policy for some time already, notably through the EU Common Agriculture Policy (CAP). However, despite some improvements e.g. in the reduction of nitrogen pollution, many farms intensified their activities and became highly mechanised, whilst those who could not do so became increasingly marginalised and were sometimes forced to abandon their land, with equally devastating consequences for biodiversity. Hence, by 2020, this Target aims at having maximised the share of agricultural and forested areas which is covered by biodiversity-related measures, to bring about a measurable improvement in the provision of ecosystem services and in the conservation status of species and habitats that depend on or are affected by agriculture and forestry. This is to be achieved, inter alia, by enhancing direct payments for environmental public goods in the CAP, better targeting of rural-development measures to biodiversity conservation, and encouraging the adoption of forest management plans that include biodiversity-specific measures.

Target 4: To ensure the sustainable use of fisheries resources: Despite important progress to the EU's Common Fisheries Policy (CFP) since 2002 (long-term management plans) and adoption of the Marine Strategy Framework Directive (MSFD) in 2008, nearly half of Europe's commercial fish stocks remain over-exploited. The EU Biodiversity Strategy aims to restore and maintain stocks to levels that can produce maximum sustainable yield (MSY) by 2015, and to achieve good environmental status of Europe's seas by 2020, as required by the MSFD. This is to be achieved by improving the management of fish stocks, in particular through long-term management plans, and by significantly reducing adverse impacts of fishing on non-targeted species and marine ecosystems (avoiding by-catch and eliminating discards). The new CFP will play a crucial role in this regard.

Target 5: To control invasive alien species (IAS): Invasive alien species have become one of the fastest growing threats to biodiversity in Europe, threatening 22% of European species and causing at least €12 billion damage/year in the EU. By 2020, this Target aims to have IAS and their pathways identified and prioritised, priority species controlled or eradicated, and pathways managed to prevent the introduction and establishment of new IAS. To achieve this, the EU is preparing a dedicated legislative instrument to address common challenges associated with IAS in the EU. The EU will also further integrate additional biodiversity concerns into its plant and animal health regimes and other relevant legislation.

Target 6: To help avert global biodiversity loss: The EU is fully committed to helping combat biodiversity loss across the globe and to fulfilling its global commitments under the Convention. This Target is about further stepping up the EU's contribution to averting global biodiversity loss by 2020. Actions to achieve this include the implementation of the Nagoya Protocol on Access and Benefit Sharing by 2015 and the contribution of a fair share to international efforts to significantly increase resources for global biodiversity. The EU is already the largest contributor to biodiversity finance with an average annual EU external assistance for biodiversity of about 1.7 billion € during the last decade. At COP 11 the EU further committed to double its contribution, based on an average from 2006 – 2010, by 2015 and maintain it until 2020. Further, as the world's biggest trader, Europe must also address the impact that its consumption patterns are having on the rest of the planet. Actions aim to reduce the EU's biodiversity footprint on the rest of the world by enhancing the contribution of EU trade policy to conserving biodiversity, whilst eliminating as far as possible any negative biodiversity impacts of EU trade agreements; and assist developing countries in their efforts to conserve biodiversity and ensure its sustainable use. This is to be achieved, inter alia, by providing the right market signals for biodiversity conservation, including work to reform, phase out and eliminate harmful subsidies at both EU and Member State level, and 'biodiversity-proofing' EU development cooperation. In addition, the EU's BEST Initiative[4] aims to promote conservation and sustainable use of biodiversity and ecosystem services in EU Outermost Regions and Overseas Countries and Territories.

As part of the mid-term review of the Strategy in early 2015, further actions may be recommended, in justified cases, contributing to enhance the effectiveness of the second stage

[4] http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm#best

of the Strategy's implementation, and in order to ensure that the headline target of the Strategy is achieved by 2020.

Support mechanisms for implementation (legislation, funding, capacity-building, coordination, mainstreaming, etc.):

The EU Biodiversity Strategy to 2020 underlines the need for close coordination between authorities at all levels – EU, national, sub-national – which are responsible for ensuring implementation of the Strategy, as well as the importance of stakeholders' involvement in implementation (including business and society at large). To this end, the Strategy is accompanied by a common implementation framework (CIF), which also serves the purposes of monitoring, assessing and reporting on progress in implementing the Strategy. The CIF involves the European Commission and Member States in partnership with key stakeholders and civil society. Specifically, its purpose is to (i) facilitate implementation of the EU Biodiversity Strategy to 2020 by putting in place a clear and logical EU level governance framework that is as efficient and effective as possible; (ii) create ownership for the implementation of the Biodiversity Strategy across all relevant policy areas by involving representatives from a wide range of services, ministries and institutions in implementation of the Strategy; (iii) ensure the involvement of all relevant stakeholders at the appropriate level of policy making, beyond the traditional "biodiversity community"; and (iv) to minimise duplication of work and maximise synergies between efforts undertaken at different levels and by different actors and stakeholders; share information and best practice and address common challenges.

Other *Relevant Tools*

Policy support tools and methodologies		**Most relevant**	**Other relevant Aichi Target(s)**
Biodiversity Information System for Europe		all	
SEBI indicators		all	
Natura 2000 viewer		11	7, 12, 14
Natura 2000 data		11	7, 12, 14
Streamlining European Biodiversity Indicators 2020. EEA Technical Report 11/2012		all	
EU 2010 Biodiversity Baseline. EEA Technical Report 12/2010		all	
Biodiversity - 10 messages for 2010			
Protected areas in Europe - an overview. EEA Report 5/2012		11	7, 12, 14
Invasive Alien Species Indicators in Europe. EEA Technical Report 15/12		9	
The Impacts of Invasive Alien Species in Europe. EEA Technical Report 16/2012		9	
Landscape Fragmentation in Europe. EEA Report 2/2011		5	
Environmental pressures from European production		4	

and consumption. EEA Technical Report 2/2013			
European waters - current status and future challenges. EEA Report 9/2012		8	

B. Adequacy of observations, and of data systems, for monitoring the biodiversity attributes addressed in the Aichi Biodiversity Targets

Mechanisms for monitoring and reviewing implementation:

The EU 2020 Biodiversity Strategy and related targets are underpinned by the EU 2010 Biodiversity Baseline which provides facts and figures on the state and trends of the different biodiversity and ecosystem components and thereby factual information for measuring and monitoring progress in the EU from 2011 to 2020.

A coherent framework for monitoring, assessing and reporting on progress in implementing the EU Biodiversity Strategy to 2020 is currently being developed. This framework will eventually link existing biodiversity data and knowledge systems with the Strategy and streamline EU and global monitoring, reporting and review obligations under environmental and other relevant legislation, while trying to avoid any duplication or increase of administrative burden.

Also EU biodiversity indicators, in the context of an exercise in Streamlining European Biodiversity Indicators (SEBI),[5] are currently being updated, upgraded and further developed to be used at EU level, in correspondence with the Aichi Targets and providing for a flexible framework. The EU is planning to make its indicator-based assessment available to be included in the preparation and consultation on the 5th National Report to the CBD Secretariat, due by March 2014. EU indicators will also be made available as advance information/case-studies for inclusion in the fourth Global Biodiversity Outlook (GBO4) prior to COP12 as requested by decision UNEP/CBD/COP/XI/3[6].

C. Scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets

Scientific and technical expertise will be required in the development of indicators for measuring biodiversity and ecosystem services and for tracking resources needed for the implementation of the Strategic plan. Additionally, the impacts of climate change on biodiversity have not been sufficiently estimated. To understand the complex interactions between ecosystems and climate change new predictive models need to be developed.

Existing science-policy platforms and networks need to be utilized in engaging the scientific community to strengthen the scientific basis in measuring progress in implementing the Strategic Plan. In particular, the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) should have a central role to play in this. Furthermore, the link between enhancing sustainable consumption and production patterns and halting biodiversity loss and ecosystem degradation needs more focus and could be strengthened through cooperation with UNEP´s International Resources Panel.

[5] http://biodiversity.europa.eu/topics/sebi-indicators
[6] http://www.cbd.int/doc/decisions/cop-11/cop-11-dec-03-en.pdf

The scientific basis of tipping points or planetary boundaries of biodiversity loss and ecosystem degradation needs to be better understood to support the implementation of the Strategic Plan.

Further to these initial and more ad hoc listed scientific and technical needs the EU will be able to further contribute relevant input to this request's theme through upcoming meetings and conferences such as the meeting of the European Platform for Biodiversity Research Strategy (EPBRS) (http://www.epbrs.org/event/show/35), which will address the research needs to support the implementation of the EU Biodiversity Strategy in view of setting priorities for the next seven-year research framework programme, "Horizon 2020"; or the ALTER-Net Conference 2013: "Science underpinning the EU 2020 Biodiversity Strategy" that will take place 15-18 April 2013 (http://www.alter-net.info/outputs/conf-2013).

Moreover, the EU is planning to reach out to its scientific community through a web-based discussion forum (http://www.biodiversityknowledge.eu/). This process is intended to gather, discuss and synthesise information on a) scientific and technical needs related to the implementation of each of the Aichi Targets, b) adequacy of observations, and of data systems, for monitoring the biodiversity attributes addressed in the Aichi Targets, and c) relevant policy support tools and methodologies.

D. Options for assessing the effects of the types of measures taken in accordance with the provisions of the Convention

With regard to what happens inside the EU, a necessary condition for implementing the Biodiversity Strategy (based on the principle that you can't manage what you can't or don't measure) is comprehensive and robust information concerning the status of biodiversity, ecosystems and ecosystem services across the EU and the capacity to monitor changes. If we do not know what the status is now and what it will be in 2020 it will be impossible to assess whether or not we have achieved our target(s). Similarly, in 2010, it was not possible to quantify by how much the target of halting biodiversity loss in the EU by that date had been missed.

The information and knowledge base upon which the Biodiversity Strategy is developed will integrate and streamline the latest outcomes from the reporting under the Birds and Habitats Directives, the Water Framework Directive, the Marine Strategy Framework Directive, and other relevant data flows reported under environmental legislation, including spatial data such as the Natura 2000 network, river basins, marine regions, etc. Reliable data on the status of species and habitats such as EU Red-Lists or independent scientific reports on the status of different taxonomic groups such as birds and butterflies will also be taken into account. Through the mapping and assessment of ecosystems and their services (Action 5 of the EU Biodiversity Strategy) the role of the implementation by Member States of EU environmental legislation and policy in the delivery of ecosystem services should be evaluated (e.g. contribution of Natura 2000 network to the delivery of services, integration of ecosystem services in future design of river basin management plans under the Water Framework Directive and in the marine strategies under the Marine Strategy Framework Directive).

EU Member States together with the European Commission and the EEA are currently working towards the mapping and assessment of ecosystems and their associated services in the context of the EU Biodiversity Strategy (MAES) [7].

Outputs will also inform policy development and implementation in other domains, such as transport and energy.

See MAES Analytical Framework http://biodiversity.europa.eu/ecosystem-assessments/about-1/an-analytical-framework-for-ecosystem-assessments-under-action-5-of-the-eu/download

To improve the evidence base for environment policy

Evidence for EU environment policy is based on environmental monitoring, data, indicators and assessments linked to the implementation of EU legislation, as well as formal scientific research and 'citizen science' initiatives. There has been considerable progress on strengthening this evidence base, raising awareness and improving the confidence of policy-makers and the public in the evidence-based approach to policy, facilitating their understanding of complex environmental and societal challenges.

Steps should be taken at EU and international level to further strengthen and improve the science-policy interface for environment, such as through the appointment of Chief Scientific Advisors, as already done by the Commission and some Member States.

However, the pace of current developments and uncertainties surrounding likely future trends requires further steps to maintain and strengthen this evidence base to ensure policy in the EU continues to draw on a sound understanding of the state of the environment, possible response options and their consequences.

Over past decades, there have been improvements in the way environmental information and statistics are collected and used, at EU and at Member State level, as well as globally. However, data collection and quality remain variable and the plethora of sources can make access difficult. Continuous investment is therefore needed to ensure that credible, comparable and quality-assured data and indicators are available and accessible to those involved in defining and implementing policy. Environmental information systems need to be designed to enable new information on emerging themes to be easily incorporated.

Further implementation of the Shared Environmental Information System principle of 'produce once, use often' and the common approaches and standards on acquisition and collation of spatial information under the INSPIRE and GMES systems will help avoid duplication of effort and eliminate unnecessary administrative burdens on public authorities, as will efforts to streamline reporting obligations under different pieces of legislation. Member States should make information gathered to assess environmental impacts of plans,

7 http://biodiversity.europa.eu/ecosystem-assessments

programmes and projects (e.g. through Environmental or Strategic Impact Assessments) more accessible to the public.

There are still significant gaps in knowledge, some of them relevant to this programme's priority objectives. Investing in further research to fill these gaps is therefore essential to ensure that public authorities and businesses have a sound basis for taking decisions which fully reflect true social, economic and environmental benefits and costs. Four gaps stand out:

- Advanced research to fill data and knowledge gaps and adequate modelling tools are needed to better understand complex issues related to environmental change, such as climate change and disaster impacts, the implications of species loss for ecosystem services, environmental thresholds and ecological tipping points. While available evidence fully warrants precautionary action in these areas, further research into planetary boundaries, systemic risks and our society's ability to cope with them will support the development of the most appropriate responses. This should include investment in closing data and knowledge gaps, mapping and assessing ecosystem services, understanding the role of biodiversity in underpinning them and how they adapt to climate change.
- The transition to an inclusive green economy requires proper consideration of the interplay between socio-economic and environmental factors. Improving our understanding of sustainable consumption and production patterns, how costs of action or inaction can be considered more accurately, how changes in individual and societal behaviour contribute to environmental outcomes and how Europe's environment is affected by global megatrends can help better target policy initiatives towards improving resource efficiency and relieving pressures on the environment.
- There are still uncertainties surrounding the human health and environmental implications of endocrine disruptors, mixtures, chemicals in products and nanomaterials. Filling these gaps can accelerate decision-making and enable the further development of the chemicals *acquis* to better target areas of concern, while stimulating more sustainable use of chemicals. An improved understanding of the environmental factors affecting human health would allow preventive policy actions to be taken.
- Ensuring all sectors contribute to efforts to combat climate change requires a clear overview of GHG measurement, monitoring and data collection, which is currently incomplete for key sectors, such as agriculture.

Horizon 2020 will provide the opportunity to focus research efforts and to deploy Europe's innovation potential by bringing together resources and knowledge across different fields and disciplines within the EU and internationally.

New and emerging issues arising from rapid technological developments that outpace policy, such as nanomaterials, unconventional energy sources, carbon capture and storage and electromagnetic waves, pose risk management challenges and can give rise to conflicting interests, needs and expectations. This in turn can lead to increasing public concern and potential hostility towards new technologies.

There is therefore a need to ensure a broader, explicit societal debate about the environmental risks and possible trade-offs that we are willing to accept in the light of sometimes incomplete or uncertain information about emerging risks and how they should be handled. A systematic approach to environmental risk management will improve the EU's capacity to

identify and act upon technological developments in a timely manner, while providing reassurance to the public.

In order to improve the evidence base for environment policy, the programme shall ensure that by 2020:

a) Policy-makers and businesses have a better basis for developing and implementing environment and climate policies, including measuring costs and benefits.
b) Our understanding of and ability to evaluate and manage emerging environmental and climate risk is greatly improved.
c) The environment policy-science interface is strengthened.

This requires, in particular:

a) Coordinating and focusing research efforts at EU and Member State levels on addressing key environmental knowledge gaps, including the risks of environmental tipping-points.
b) Adopting a systematic approach to risk management.
c) Simplifying, streamlining and modernising environmental and climate change data and information collection, management and sharing.

BULGARIA

Information and comments for the Annex of the CBD Notification 2013-005

A. Regarding the technical (methodological) tools developed as part of CBD:

Applicability:

- Technical documents and tools- manuals, guidelines and methodologies are very necessary and useful to apply and unified approach in executing the policies in the area of biological diversity and achieving the Aichi targets
- The technical documents and tools available have been developed at high professional level and include broad information, analysis, practices and ideas in specific area, which allow them to be applied both for strategic planning and for determining the approaches and actions need to solve specific problems.

Proposals:

- When methodological tools are developed regional specificities should be taken into account in order to increase their utility and effectiveness at national level.
- When manuals and guidelines are developed more attention should be given to the role, responsibilities, contributions and specific participation of the interested parties for solving the problems and achieving a given biodiversity preservation goal, in particular those of the local communities and authorities and the business.

B. Adequacy of observation, and of data systems, for monitoring the BD attributes

Applicability:

When information about the components of the biodiversity in the official annual national reports on the state of environment is presented, a system of indicators developed by EEA and adopted by EU (SEBI) is applied. That approach allows application of unified methodologies, formalization of the data, getting objective picture of the state of biodiversity and comparability within EU.

Part of the indicators are still in the process of being developed, established and adapted to the national targets and specificities, which does not allow them to be fully useful.

Proposals:

- Development of methodological basis and exchange of information would be useful at present and in the near future.

C. Scientific and technical needs related to the implementation of the SP 2011-2020

Within the common EU policy for Conservation of Biodiversity Bulgaria participates in the establishment of the Natura 2000 European ecological network, which includes 34% of the country territory and protects species and habitats of European importance. Policies and funding mechanisms for the development of ecologically considered agriculture.

Being implemented a number of projects to protect and restore species and habitats and improve their condition. There is a cooperation with neighboring countries and a number of other European countries in terms of wetlands, preventing and combating invasive species, conservation of large mammals, birds of prey, exchange of information etc..

Activities planned to 2020, with national and European funding under the European strategy for biodiversity conservation by 2020. Bulgarian research institutions and NGOs representatives are involved in European research and conservation programs - the 7th EU Framework Programme, LIFE + , and implement projects under bilateral and multilateral financial mechanisms.

Common comments for & A.6. и § 12

Current status:

- Bulgaria considers CBD guidelines and tools from Annex 1 like very informative and useful.

- A number of guidelines and manuals which have been produced as part of different projects and utilise data from governmental, NGO and scientific databases are currently available, for example:

  - ✓ Conspectus of the Bulgarian vascular Flora –description maps and floristic elements, IV revised and updated edition, BBF, Sofia, 2012
  - ✓ Important Plant Areas in Bulgaria – Pensoft, Sofia-Moscow, 2012
  - ✓ Guidelines for assessing favourable conservation status of NATURA 2000 species and habitats types in Bulgaria. (in Bulgarian), Final report from BBI/MATRAS project, 2009
  - ✓ Red book of Republic of Bulgaria (Animals, Plants and Habitats), vol. 1, 2 and 3 (in print)

- three formal Interdepartmental expert groups have been created at a national level which are responsible for the Aichi targets , too, and other environmental issues, such as:

  - ✓ Implementation of CBD;
  - ✓ The Nagoya Protocol on Access and Benefit-sharing
  - ✓ Biodiversity and Climate changes
  - ✓ The Cartagena Protocol on Biosafety

- Bulgaria plans to include the scientific information available on Fungi (some species have protected status under the Biodiversity Act) in the updated Strategy and III-th Action Plan for conservation of the biological diversity.

- Endangered species protected under Bulgarian Act are subject to regular monitoring.

- Information campaigns are conducted and booklets are published on some CBD topics- mainly as part of projects financed by EU funds and to smaller extend by the national budget.

- Farmers that apply measures to protect NATURA 2000 sites receive financial support from EU funds.

Gaps:

- Methodologies and national standards in the area of assessment of natural resources and ecosystem services are still incomplete or missing.

- In order to coordinate better the interaction between science and policy decision making signing an Agreement between Ministry of Environment and water and Bulgarian Academy of Sciences is planned.

- No financial funding is currently available for translation and publishing guidelines and manuals for conservation of biological diversity in different topical issues of CBD.

- Current financial situation in Bulgaria limits the capacity building (human factors, technical and technological). - in this way there are limits for specialists and experts activities.

- Estimation and scientific database of the effects of technology (for example Wind power generators, maritime transport, electric power lines, etc.) in Bulgaria on biological diversity is still missing.

SUBMISSION BY THE CZECH REPUBLIC TO THE CBD NOTIFICATION 2013-05 –

Identification of scientific and technical needs related to the implementation of the Strategic plan for Biodiversity 2011-20020 and its Aichi targets

A. Policy support tools and methodologies developed or used under the Convention and their adequacy, impact and obstacles to their uptake, as well as gaps and needs for further development of such tools and methodologies

1. **How adequate are the policy support tools or methodologies developed or used by the Convention?**

   Some policy support tools or methodologies developed or used by the Convention are quite adequate for implementing the CBD in the Czech Republic, depending on specific conservation status of biological diversity components in the country. Particularly, documents on invasive alien species (IAS) and on ecosystem approach should be mentioned in this respect. For more details, see For more details, see the *State Environmental Policy of the Czech Republic 2012 – 2020* (http://www.mzp.cz/C1257458002F0DC7/cz/news_130108_Statni_politika_zivotniho_prostredi/$FILE/SP%C5%BDP_2012-20.pdf, in Czech only), the *National Biodiversity Strategy of the Czech Republic* (http://chm.nature.cz/cooperation/fol194082/fol052091/fol362718/) and the updated State Nature Conservation and Landscape Protection Programme of the Czech Republic (http://www.mzp.cz/cz/statni_program_ochrany_prirody_a_krajiny, in Czech only), the Czech Republic Strategy for Sustainable Development (http://www.mzp.cz/C125750E003B698B/en/czech_republic_strategy_sd/$FILE/KM-CR_SDS_eng-20041208.pdf) and National Forest Programme of the Czech Republic for the period until 2013 (http://eagri.cz/public/web/file/10621/NLP_II_ENG.pdf).

2. **What has been their applicability and impact at the national level?**

   Some of the above policy support tools/methodologies developed or used by the CBD (*e.g.*, forest biological diversity) can be easily applied at the national level due their general character: - see also A4.

3. **What have been challenges or obstacles to their use or uptake at the national level?**

   Although most policy support tools or methodologies developed or used by the Convention for its implementation are quite adequate to be applied in

the Czech Republic, the main obstacles to their use or uptake at the national level include

i. Lack of funding – although the Czech Republic has been a EU Member State and OECD member Country, there has been lack of funds for biodiversity conservation, particularly due to current economic difficulties;
ii. Lack of capacities – despite quite developed research, science and governmental and non-governmental institutions to conserve biological diversity and to use its components in sustainable way, there has been still lack of capacities to implement the support tools or methodologies developed or used by the Convention are quite adequate for implementing the CBD in the Czech Republic;
iii. Lack of time – apparently, when implementing some support tools or methodologies developed or used by the Convention in the Czech Republic, priority issues should be identified, as a matter of urgency. Therefore, the importance of conservation planning has been increasing.

4. Bearing in mind that not all policy support tools and methodologies necessarily used to be developed by the Convention, what other tools developed nationally or by other organisations are relevant?

Some policy support tools or methodologies developed or used by the Convention have been elaborated in more details at the pan-European level (*e.g.*, by the Convention on the Conservation of European Wildlife and Natural Habitats, also known as the Bern Convention, http://www.coe.int/t/dg4/cultureheritage/nature/bern/default_en.aspor, by the European Environment Agency, http://www.eea.europa.eu or by its European Topic Centre for Biological Diversity, http://bd.eionet.europa.eu/), within the European Union by the *Our life, our capital: An EU biodiversity strategy to 2020* (http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7%5B1%5D.pdf).

In addition to the policy support tools or methodologies developed by the CBD, the tools and methodologies applied by other international intergovernmental organisations have been proved to be instrumental in implementing the Convention in the country. The tools produced by the European Commission and their technical bodies (EEA, ETC/BD respectively – see above) are crucial for fulfilling requirements raised from the CBD to Parties. The documents produced by, *inter alia,* the FAO (forest ecosystems, crop and livestock diversity, inland water fishery, *etc.*), OECD (sustainable development indicators, ecosystem and natural capital accounting), Council of Europe/Bern Convention (European Strategy for Invasive Alien Species, Pan-European Ecological Network, climate change and biological diversity) and the International Union for Conservation of Nature (IUCN, guidelines for the application of IUCN Red List criteria at national and regional levels, guidelines

for applying protected area management categories, guidelines for re-introductions), should be mentioned in this respect.

The main strategic documents dealing with biological diversity conservation and sustainable use of its components are mentioned above.

B. Adequacy of observations, and of data systems, for monitoring the biodiversity attributes addressed in the Aichi Biodiversity Targets

1. **How adequate are the observations and data systems in your country for reporting on the issues addressed in each of the Aichi Biodiversity Targets?**

Target 1:

By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

- Similarly to other DEU Member States, the awareness of values of biodiversity is quantified by EUROSTAT.

Target 2:

By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

- See above

Target 3:

By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

- There is a quite developed system of National Subvention Programmes/Subsidiary Schemes of the Ministry of the Environment of the Czech Republic in nature conservation and landscape protection. In relation to floods which has recently repeatedly affected some of the country´s region, within the River System Restoration Programme, the new sub-programme entitled Support of the Ministry of the Environment of the Czech Republic in Restoration of the Areas Suffering from Floods was launched in 2010. The Ministry of the Environment of the Czech Republic also launched a new subsidiary scheme, the Landscape Natural Function Restoration Programme. The sub-programme State Property Management in the Czech Republics Specially Protected Areas has been continuing as well as the Landscape Management Programme.

  Several policy instruments supporting the CBD implementation can be found in the Common Agriculture Policy (CAP) second pillar. These include agri-environment schemes, support available to farmers in areas with natural handicaps and Natura 2000 areas, some of the investment measures as well as support for training and extension services.

Target 4:

By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

- Production and consumption and their patterns are monitored by the Ministry of Industry and Trade, Ministry of Agriculture and the Ministry of the Environment as well as by the appropriate professional chambers.

Target 5:

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

- Observation and information systems on extent and loss of natural habitats include, *inter alia,* remote sensing activities (see below), natural habitat types mapping, National Forest Inventory, forest type mapping

Target 6:

By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

- Not applicable for the Czech Republic, applicable only for inland water fishery respectively

Target 7:

By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

- The data on areas under agriculture, aquaculture and forestry are regularly collected by the Ministry of Agriculture and its research/technical institutions as well as by NGOs, the latter dealing particularly with organic/ecological farming and sustainable forest management.

Target 8:

By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

- Monitoring pollution including excess nutrients is traditionally carried out at the national level: the range of contaminants monitored and analysed is quite broad.

Target 9:

By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

- Black Lists both of Wild Plant and Wild Animal Invasive Alien Species have been published in the Czech Republic. Controlling or eradicating IAS is funded by the Czech Republic´s public budget as well as by the EU funds: data on these activities are available particularly those gathered by the State Phytosanitary Service and State Veterinary Service,

Target 10:

By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

- Not applicable for the Czech Republic

Target 11:

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

- The data on Specially Protected Areas as well as on the Territorial system of Ecological Stability of the landscape, a multi-level ecological network, are gathered and managed by the Nature Conservation Agency of the Czech Republic.

Target 12:

By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

- Red Lists of Threatened Species have been published for main taxa/ecological groups (vertebrates, invertebrates, vascular plants, lichens, mosses and fungi) in the Czech Republic. Implementation of Action Plan/Recovery Programmes is monitored by the Nature Conservation Agency of the Czech Republic.

Target 13:

By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

- In the Czech Republic, the comprehensive National Programme of Conservation and Using of Plant, Animal and xxxxx Genetic Resources xxx the Food, Agriculture and Forestry has been implemented. Within the Programme, data are available, some time as time series.

Target 14:

By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

- In the Czech Republic, studies mapping and quantifying ecosystem services provided by grassland, forest and floodplain ecosystem have been published. At the same time, the concept of ecosystem/natural capital accounting is being under development in the country.

Target 15:

By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

- The data related to the above target are being collected by the Academy of Sciences of the Czech Republic, universities, by research institutes within some ministries, private sector and NGOs. The Ministry of the Environment of the Czech Republic has been preparing the Strategy of Adaptation to Climate Changes in the Czech Republic. The draft proposes, *inter alia,* a range of the specific measures on how to deal with the consequences of changing climate for nature and the landscape in a reasonable manner in the Czech Republic, aiming at four main ecosystem/land-cover types: forest, aquatic, agricultural and urban ones. It also analyses financial sources, both domestic and the European Union´s funds, with proposals for their changes to enabling implementation of adaptation measures in the landscape by various stakeholders. The Strategy also includes a gap analysis of the current legislation according to various sectors.

Target 16:

By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

- The Czech Republic signed the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization on June 23, 2011. Similarly to other EU Member States, the process of ratifying the Nagoya Protocol has started.

Target 17:

By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

- The National Biodiversity Strategy of the Czech Republic was approved by the Government of the Czech Republic on May 25, 2005, as the key document for implementing the CBD at the national level. The Action Plan to Strategy was further elaborated within the updated State Nature Conservation and Landscape Protection Programme of the Czech Republic, approved by the Government of the Czech Republic on November 30, 2009.

Target 18:

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

- Not applicable for the Czech Republic

Target 19:

By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

- The data on the development of knowledge, the science base and technologies relating to biodiversity are available at the Ministry of Education of the Czech Republic (R & D), Grant Agency of the Czech Republic, Technological Agency of the Czech Republic, Academy of Sciences of the Czech Republic and the Council of the Government of the Czech Republic for Research, Development and Innovations.
-

Target 20:

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

- The total funds spent for environmental protection in the Czech Republic are monitored by the Czech Statistical Office, while the Ministry of Finances monitors public fund spent for environment protection in the country as well as abroad (ODA). The data are reported to the OECD.

2. What would be needed to improve their adequacy?

For improving the adequacy of observations and systems in the Czech Republic, it is necessary to overcame the obstacles mentioned in the A3, i.-iii.

3. What are the opportunities to make enhancements in the following areas:

(i) *in situ* observations – the nation-wide monitoring scheme aiming at model biological diversity components, supported by its long-term financing, should be launched as soon as possible in the Czech Republic, similarly to exiting monitoring schemes on other environment components, *e.g.* air or water quality.

(ii) remote sensing information – the remote sensing information can be improved combining in a reasonable way satellite imaginary, *i.e.* CORINE Land Cover and aerial photographing with mapping habitats and landscapes.

(iii) data management and analysis – within the data analysis, some tools which help break "splendid isolation" of various activities, *e.g.* through meta-analyses or scenario-analyses.

(iv) preparation of decision support tools (*e.g.*, indicators): The comprehensive *Report on Implementing the 2010 Biodiversity Conservation Target in the Czech Republic* was published in Czech by the Ministry of the Environment of the Czech Republic in late 2010 (ZEDEK *et al.* 2010). Within the report, 21 indicators developed by the EEA´s programme *Streamlining European 2010 Biodiversity Indicators* (*SEBI* 2010) were applied. In total, the report was prepared by 27 experts from the Academy of Sciences of the Czech Republic, universities, research institutes, NGOs and the Nature Conservation Agency of the Czech Republic (http://www.mzp.cz/osv/edice.nsf/DCDC245D147DC3ACC125780E0049429C/$file/OVV-Zprava_naplnovani_cile-20101220.pdf).

C. Scientific and technical needs related to the implementation of the Strategic plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets

1. **What tools and guidance have been adopted under the Convention that can support Parties implementing the Strategic Plan? What are the gaps?**

   Almost most of the thematic programmes of work as well as the cross-cutting issues adopted by the Convention can support the Czech Republic in implementing the Strategic Plan. Nevertheless, the gaps include biodiversity on agricultural lands (croplands, pasturelands, other farmland), since the agricultural land covers in 55.6 % of the country´s territory by land cover and 50.0 by land use in the Czech Republic.

2. **What information and tools are available specifically to aid Parties in establishing national targets and monitoring or assessing progress towards them? What are the gaps?**

   See B1

3. **What global initiatives and partnerships are available to support implementation of the Strategic Plan: What are the gaps?**

   In addition to support tools or methodologies developed or used by the Convention are quite adequate for implementing the CBD in the Czech Republic, the global initiatives and partnerships available to support implementation of the Strategic Plan include the Biodiversity Indicator Partnership (BIP), the IUCN methodologies (guidelines for the application of IUCN Red List criteria at national and regional levels, guidelines for applying protected area management categories, guidelines for re-introductions), World Database on Protected Areas (WDPA) maintained by the UNEP-WCMC (www.protectedplanet.net), *etc.*

4. **What capacity building support is provided by the CBD Secretariat and partners for implementing the Strategic plan? What are the gaps?**

   The gaps in capacity building support provided by the CBD Secretariat and partners for implementing the Strategic Plan include issues related to biological diversity identification, monitoring and assessments)see above). Despite the fact that key emerging issues have been – at least from a scientific, technical and technological point of view – covered by the CBD, there are new ones to be dealt with, *e.g.* second generation biofuels, influence of nanomaterials on biological diversity and affects of new chemical substances, *e.g.* micropollutants, on biological diversity.

FINLAND

Notification: 2013-005: Identification of scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets

A. Policy support tools

On 20 December 2012, the Government adopted a resolution on the 2012–2020 strategy for the conservation and sustainable use of biodiversity in Finland. Entitled 'Saving Nature for People', this strategy has the key target of halting biodiversity loss in Finland by 2020.
http://www.ymparisto.fi/default.asp?contentid=426956&lan=en&clan=en

Finland is committed to the objectives of the CBD, including the conservation and sustainable use of biodiversity, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Finland is also committed to intensify efforts to realise these main objectives in order to halt the loss of biodiversity globally, regionally and at national level by 2020. The tenth Conference of Parties to the CBD (COP 10) approved the Strategic Plan for biodiversity, the resource mobilization strategy, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity.

Bringing biodiversity into the mainstream

Biodiversity cannot be safeguarded by traditional nature conservation measures alone. The input of society as a whole is required. The strategy places economic and cultural values related to biodiversity at the heart of decision-making on the use of natural resources.

The strategy's five objectives focus on the mainstreaming of biodiversity issues across society, the introduction of new participants in the work to advance biodiversity causes, a decision-making process based on robust research data, and Finland's responsibility, as a member of the international community, for global biodiversity. The strategy also outlines policies linking the Sámi community's traditional knowledge to the protection of biodiversity.

Particular attention is paid to sustainable use of natural resources. Renewable resources should be used in a manner that ensures their genuine renewal and does not deplete them, while non-renewable resources should be used as eco-efficiently as possible.

The national biodiversity indicator collection at www.biodiversity.fi has been an important tool for measuring the status and trends of biodiversity work in Finland. The evaluation of the first NBSAP for 1997-2005 represented the first time that the state and development of Finland's biodiversity was assessed by using indicators. The set of national biodiversity indicators has subsequently

been expanded and improved through on-going cooperation involving governmental research institutes and organizations and environmental NGOs.

The European Commission Communication of 3.5.2011, *Our life insurance, our natural capital: an EU biodiversity strategy to 2020* (COM(2011) 244 final) formed the basis for the Council conclusions made by the European Council in June 2011 and December 2011. According to the vision defined in the Communication, "By 2050, European Union biodiversity and the ecosystem services it provides — its natural capital — are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided. The Communication also sets a headline target for 2020, regarding: "Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss."

Finland supports the use of and development of the indicative list of indicators for the Strategic Plan for Biodiversity in line with decision XI/3, Annex). Many of the resolutions made at COP 10 in Nagoya emphasised the need to safeguard the functioning of ecosystems and ecosystem services as well as biodiversity. Ecosystem services are the benefits obtained by people from nature. They can be divided into four categories: provisioning services, cultural services, supporting services and regulating services. Biodiversity forms the basis for ecosystem services, but there are also many important ecosystem services whose relationship to biodiversity has not yet been sufficiently studied. Attitudes to and awareness of ecosystem services and the relationship to biodiversity and human well-being needs emphasizes on different levels, Target differs from the majority of the other targets in its reliance on social data. For assessing awareness of biodiversity in a representative way requires efforts and new knowledge.

Finland strongly supports the collaboration and continued work through the Biodiversity Indicators Partnership, GEO-BON, FAO, IUCN and other partners in developing and identifying both practical information and the rationale behind the indicators (XI/3 para 12). Here, especially (iv) we would like to see more progress in promoting the further harmonization of global indicators and their use between the CBD and other conventions, regional agreements and processes and promote further collaboration, through effective means. Enhancing government ownership is crucial in order identify and agree on indicators that are applicable to a variety of conventions in a synergistic manner. A party-driven process among the biodiversity-related MEAs would allow Parties to come together to identify and agree on recommendations for an initial set of joint indicators.

The assessment and valuation of the services provided by ecosystems will play a vital role in the future monitoring of progress towards the objectives defined

at Nagoya. Research findings and the development of assessment methods will be needed for this purpose. There is also a need to develop suitable indicators to describe ecosystem services and related trends.

Recognizing, valuing and conserving biodiversity and awareness of ecosystem services are important. Decision-making related to biodiversity is greatly dependent on scientific research, data storage and management, and monitoring, since many issues involve complex cause and effect relationships. Finland's active involvement in the work of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is an important way to ensure that a suitable knowledge base is available to support policy decisions on biodiversity at the national and international levels. Finland stresses the importance of the upcoming work, in contributing to assessments of the achievement of the Aichi Biodiversity Targets.

The notification 2013-005 in Appendix (I-II) lists CBD tools and guidelines. A national compilation of the use of these has not been made, but there is a quite good overview of the situation due to the comprehensive work done in revising our national NBSAP 2012-2020 and the new Action plan. Finland has e.g. been active in the using policy supports tools, such as; the WPs, the Akwé Kon Volontary guidelines, Bon Guidelines on Access and Benefit Sharing, The Ecosystem Approach, CBD Technical Series on the interlinkages between biological diversity and climate change, Technical series on protected areas and marine and coastal areas among others. That said many good products/tools/guidelines have not actively been launched/informed by the Secretariat to the parties and the timing and amount of products could be looked into.

B. Adequacy of observations, and data systems, for monitoring biodiversity

The *2010 Red List of Finnish species* (2010): 'In order to be able to slow done and ultimately to halt biodiversity loss, better and greater consideration must be given to species in decline and their habitats in all activities'. Achieving and maintaining a good reporting ability requires continuous inventory, monitoring, and data management activities inside and outside of protected areas. In changing habitats facing various land-use pressures outside the conservation area network, additional resources are needed for both systematic management of localities and their protection in the context of various types of land-use plans and projects.

Various observation databases have been created as technical conditions have improved. The challenge is that the information is scattered in many existing databases. UNEP/CBD/SBSTTA/15/INF/8 reviewed the availability of observation systems for the Aichi targets. The work done by IUCN on Red lists (SSC), protected areas (WCPA) and genetic resources (ABS) are highly appreciated. For reporting and monitoring a lot of work is required for managing and improving the adequacy

especially on the international and regional level. The information needs for TK, ecosystem services and awareness building among other things needs a systematic way and approach to be successful.

Our data and observation systems are relevant for reporting on the issues addressed in the Aichi target, including the use of the set of indicators approved and used on national level (see: www.biodiversity.fi). The data management and data analysis needs to be built on national work and experiences. Finland will report on the progress and used monitoring systems in its upcoming 5th National report in 2014.

Ref.: SCBD/STTM/DC/ac/81207

Identification of scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets

Submission by Ireland

A. Policy support tools and methodologies developed or used under the Convention and their adequacy, impact and obstacles to their uptake, as well as gaps and needs for further development of such tools and methodologies

How adequate are the policy support tools or methodologies developed or used by the Convention?

Policy support tools	Detail	Reference
Strategic Plan for Biodiversity 2011-2020	The CBD Strategic Plan 2011-2020 is referenced in the EU 2020 Biodiversity Strategy, which is in turn used to guide EU Member State national conservation policy. Ireland's second Biodiversity Plan (NBSAP) specifically refers to the CBD Strategic Pan 2011-2020.	EU 2020 Biodiversity Strategy: http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm Ireland's second Biodiversity Plan: http://www.cbd.int/countries/default.shtml?country=ie
Global Strategy for Plant Conservation 2011-2020	Good, although Ireland's National Plant Conservation Strategy (NSPC 2005) requires updating in relation to some of the targets under GSPC (2011-2020) especially under objectives I and II .	http://www.botanicgardens.ie/herb/census/newcensus.htm http://www.botanicgardens.ie/gspc/targets/inspc1.htm http://www.botanicgardens.ie/gspc/targets/inspc2.htm http://www.botanicgardens.ie/gspc/targets/inspc3.htm *http://www.npws.ie/publications/redlists/RL8.pdf* Ireland's second Biodiversity Plan: http://www.cbd.int/countries/default.shtml?country=ie
Programmes of Work	The support tools derived through the CBD Programmes of Work have not been followed directly. Instead the EU Birds and Habitats Directives, the EU 2020 Biodiversity Strategy, and national legislation, particularly the Wildlife Acts and the European Communities (Birds and Natural Habitats) Regulations	EU Birds Directive: http://ec.europa.eu/environment/nature/legislation/birdsdirective/ EU Habitats Directive: http://ec.europa.eu/environment/

Policy support tools	Detail	Reference
	2011, guide the implementation of the various areas of conservation action. These include: • Agricultural Biodiversity • Forest Biodiversity • Marine & Coastal Biodiversity • Protected Areas • Global Taxonomy Initiative	nature/legislation/habitatsdirective/ Wildlife Act and Birds and Natural Habitats Regulations: http://www.irishstatutebook.ie/2000/en/act/pub/0038/ http://www.irishstatutebook.ie/2011/en/si/0477.html
Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species	Invasive Species Ireland, an all-island initiative, refers to CBD including its definition of IAS. There is no mention of using the Guiding Principles	Invasive Species Ireland: http://invasivespeciesireland.com/
The Ecosystem Approach	The Ecosystem Approach has been referenced in a number of Irish and EU policy documents. Most recent is the Ireland's second Biodiversity Plan, while other policy documents that refer to the concept include: • EU Marine Framework Directive • EU Common Fisheries Policy – European Council guidance (2008) was produced on the link between the CFP and the Ecosystem Approach In addition, the Ecosystem Approach has been considered as part of a number of agri-environmental programmes.	Ireland's second Biodiversity Plan: http://www.cbd.int/countries/default.shtml?country=ie Marine Framework Directive: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0056:EN:HTML Common Fisheries Policy & Ecosystem Approach: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0187:FIN:EN:PDF
Guidelines on Biodiversity and Tourism Development	Failte Ireland and the National Parks & Wildlife Service (through the initiative 'Notice Nature') have produced guidelines on biodiversity and tourism, which refer to the CBD, but do not	http://www.noticenature.ie/files/tourism_guidelines.pdf

Policy support tools	Detail	Reference
	mention the CBD guidelines specifically.	
Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity	The Department of Environment sustainable development plan, published in 2002, refers to the CBD and to the concept of sustainable use, but does not refer to the Addis Ababa principles. A new Framework for Sustainable development went to public consultation in 2011.	Department of Environment sustainable development plan (2002): http://www.environ.ie/en/Environment/SustainableDevelopment/PublicationsDocuments/FileDownLoad,1839,en.pdf Draft Framework for Sustainable Development for Ireland (2011): http://www.environ.ie/en/Publications/Environment/Miscellaneous/FileDownLoad,29081,en.pdf

What has been their applicability and impact at the national level?
Given the very substantial legal requirements of EU Directives relating to biodiversity conservation, and the associated support provided, Ireland has not used the guidance provided to a very great extent in formulating its national policies.. However there is very substantial overlap. A couple of further exceptions include the Ecosystem Approach which has been central to Ireland's second Biodiversity Plan (NBSAP) and the Global Strategy for Plant Conservation (c.f., Ireland's National Strategy for Plant Conservation, http://www.botanicgardens.ie/gspc/inspc.htm).

What have been the challenges or obstacles to their use or uptake at the national level?
As indicated above , many are invoked through the application of EU law. For the remainder, the greatest challenge has been resource availability, in particular the availability of personnel to either become sufficiently familiar with the tools or to attend capacity building workshops provided by the CBD Secretariat. This lack of resources also limits outreach to relevant sectors to publicise CBD guidance.

Bearing in mind that not all policy support tools and methodologies necessarily need to be developed by the Convention, what other tools developed nationally or by other organizations are relevant?
A range of tools and methodologies have been developed at the national level in Ireland that directly or indirectly support the implementation of aspects of the CBD Strategic Plan 2011-2020. In addition to those listed in the tables above and below, others include:

- Bord Iascaigh Mhara (Irish Seas Fisheries Board) has tools to monitor the impact of Irish fisheries on protected species, derived from EU legislation (http://www.bim.ie/our-work/projects/monitoringinteractionsbetweenirishfisheriesandprotectedspecies/)
- The Forest Service of the Department of the Marine and Natural Resources produced guidelines on appropriate practices to maintain biodiversity in forestry landscapes in Ireland (http://www.agriculture.gov.ie/media/migration/forestry/publications/biodiversity.pdf)
- Teagasc (Agriculture and Food Development Authority) facilitates a Rural Environment Protection Scheme which provides incentives for environmentally-sensitive agricultural practices (http://www.teagasc.ie/environment/heritage/farmland_biodiversity.asp)
- The Environmental Protection Agency provides guidance on Strategic Environmental Assessments (http://www.epa.ie/whatwedo/advice/sea/) in the case of broad-scale planning and development, and Environmental Impact Assessments (http://www.epa.ie/whatwedo/advice/eia/) for construction and other physical developments.

B. Adequacy of observations, and of data systems, for monitoring the biodiversity attributes addressed in the Aichi Biodiversity Targets

How adequate are the observations and data systems in your country for reporting on the issues addressed in each of the Aichi Biodiversity Targets?

Target		Note	Reference
1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	Good. The Heritage Council of Ireland has conducted surveys on biodiversity, including one entitled *'Biodiversity Awareness, Understanding & Impact of its Loss'* (2010). However these surveys need to be continually updated and undertaken.	http://www.heritagecouncil.ie/publications/market-research/
2	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	Inadequate at present. A good start was made by the publication in 2008 of a report on The Social and Economic Benefits of Biodiversity. However this work has not yet been further advanced. The mainstreaming of biodiversity values is a central pillar of Ireland's second Biodiversity Plan (NBSAP). There are a number of associated indicators in the plan, including 'Extent to which the economic value of biodiversity is integrated in national accounts, national	http://www.npws.ie/publications/archive/Bullock_et_al_2008_Economic_&_Social_Benefits_of_Biodiversity.pdf Ireland's second Biodiversity Plan: http://www.cbd.int/countries/default.shtml?country=ie

Target		Note	Reference
		and local development strategies and planning processes' The process by which this will be undertaken requires the mobilisation of the research community to take on board TEEB studies.	
3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	To be completed	
4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the	To be completed	http://www.environ.ie/en/Environment/SustainableDevelopment/PublicationsDocuments/FileDownLoad,30452,en.pdf

	Target	Note	Reference
	impacts of use of natural resources well within safe ecological limits.		
5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	Good. Programmes to monitor the conservation status (which includes extent and condition) of habitat types listed on the EU Habitats Directive have being initiated or are ongoing. These status assessments are submitted to the EU every 6 years. These habitats are representative of most semi-natural habitat types in Ireland. Land-use data is regularly updated using satellite imagery, forestry extent and agricultural data.	EU Article 17 reporting: http://bd.eionet.europa.eu/article17 Smith, G.F., O'Donoghue, P, O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. Heritage Council, Ireland. http://www.heritagecouncil.ie/fileadmin/user_upload/Publications/Wildlife/Habitat_Survey_Guidance/Habitat_Survey_Guidance_Hyperlinked_2.pdf Environmental Protection Agency: http://www.epa.ie/whatwedo/assessment/land/corine/ Department of Agriculture, Food and the Marine: http://www.agriculture.gov.ie/forestservice/forestservicegeneralinformation/abouttheforestservice/forestcoverdatasets/
6	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species,	Good. Data on fish takes and assessments of the impact of Irish fisheries on protected species are conducted by the Marine Institute and Bord Iascaigh Mhara (Irish Seas Fisheries Board).	Marine Institute: http://www.marine.ie/home/publicationsdata/ Bord Iascaigh Mhara: http://www.bim.ie/our-work/projects/monitoringinteractionsbetweenirishfisheriesandprotectedspecies/

	Target	Note	Reference
	fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.		
7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	Good. There is significant data collection for birds and butterflies in particular within agricultural landscapes. The State is currently engaged in a major exercise in collecting baseline data towards management of aquaculture and fisheries in the marine environment, and specifically within areas protected under the EU Habitats and Birds Directives. The State's Forest Service carries out substantial work to maintain and protect biodiversity in and adjoining plantation areas	http://www.birdwatchireland.ie/Ourwork/Researchmonitoring/CountrysideBirdSurvey/tabid/114/Default.aspx http://butterflies.biodiversityireland.ie/ http://www.agriculture.gov.ie/forestservice/forestservicegeneralinformation/
8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	Good. Lakes and rivers monitoring programmes are carried out by the Environmental Protection Agency. Programmes relating to the monitoring of groundwater need to be	http://gis.epa.ie/

Target		Note	Reference
		expanded and links to ecosystem function warrant further research. Transitional and coastal waters are also monitored by the EPA for a range of parameters. The Irish Coast Guard routinely monitors for oil spills and Inland Fisheries Ireland and the Local Authorities are also actively engaged in pollution monitoring.	
9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	Good. Invasive Species Ireland provides links to a number of monitoring programmes of invasive alien species in Ireland. The National Biodiversity Data Centre has a search function specifically for invasive alien species.	Invasive Species Ireland: http://invasivespeciesireland.com/projects/ National Biodiversity Data Centre: http://www.biodiversityireland.ie/biodiversity-data/access-biodiversity-data/
10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	Moderate. Ireland has deepwater cold water coral reefs. At this time, climate/acidification are not known to be significant pressures, when compared with risks from certain fishing activities.	
11	By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine	Good. The National Parks and Wildlife Service provides maps and data of existing protected	http://www.npws.ie/mapsanddata/

Target		Note	Reference
	areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	areas in Ireland. Monitoring the effectiveness of management requires more development.	
12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	Adequate. Through EU Article 17 reporting and the existence of a National Red List Committee (comprising the National Parks and Wildlife Service, academia, North Ireland Environment Agency), national Red Lists have been produced	EU Article 17 reporting: http://bd.eionet.europa.eu/article17 Ireland National Red Lists: http://www.npws.ie/publications/redlists/
13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and	Adequate. The Advisory Committee on Genetic Resources for Food & Agriculture of the Department of Agriculture, Food and the Marine compiles lists of unique genetic resources whose survival is being threatened or endangered. The National Biodiversity Data	Advisory Committee on Genetic Resources for Food & Agriculture: http://www.agriculture.gov.ie/farmerschemespayments/otherfarmersschemes/conservationofgeneticresourcesforfoodandagriculture/advisorycommitteeongeneticresources/ National Biodiversity Data Centre genetic resources portal: http://geneticresources.biodiversityireland.ie/

Target		Note	Reference
	safeguarding their genetic diversity.	Centre also maintains a web portal on genetic resources drawing on information from a number of bodies.	
14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	Inadequate. Mapping of ecosystems and the identification of ecosystem services is currently under development. Certain elements will be covered by Target 5.	
15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	See Target 14.	
16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with	Good. Data are available on whether Ireland is a Party to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	http://www.cbd.int/countries/default.shtml?country=ie

Target		Note	Reference
	national legislation.		
17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	Good. Ireland's second Biodiversity Plan (NBSAP) was produced in 2010, involving a broad consultation process led by the National Parks and Wildlife Service. An associated Action Grid was produced in 2012 which delegates responsibility to a range of appropriate authorities.	Ireland's second Biodiversity Plan: http://www.cbd.int/countries/default.shtml?country=ie
18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	Inadequate. While traditional farming and fishing practices are encouraged in Ireland, data are not available as to the extent of their use.	
19	By 2020, knowledge, the science	Adequate. Data are available	National Parks and Wildlife Service:

Target		Note	Reference
	base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	through the National Parks and Wildlife Service, National Biodiversity Data Centre, the Environmental Protection Agency and GBIF. However more are needed, as well as improved linkages across the existing systems. Further work is needed in the marine to fully understand the impacts of pressures. The implementation of the EU Marine Framework Strategy Directive is expected to bring progress in this area.	http://www.npws.ie/mapsanddata/ National Biodiversity Data Centre: http://www.biodiversityireland.ie/biodiversity-data/access-biodiversity-data/ Environmental Protection Agency: http://gis.epa.ie/
20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by	Adequate. The Department of Foreign Affairs and Trade, through Irish Aid, and the Department of Finance maintain records of financial resources provided overseas. While not addressing biodiversity conservation, sustainable environmental management is a key pillar in seeking to achieve the primary objective of poverty reduction. Ireland does not currently have a Resource Mobilisation strategy	http://www.irishaid.gov.ie/what-we-do/our-priority-areas/environment-and-climate-change/

Target		Note	Reference
	Parties.		

What would be needed to improve their adequacy?
Resources of funds and staff in appropriate institutions are the main requirement.

Further capacity is needed at the national level to develop detailed data systems to capture all biodiversity-related data and metadata. Data that is transferred to regional and global platforms is often limited in content, misused and misinterpreted. There is a vast amount of grey data held within governments. In the case of habitat mapping (Target 5), guidelines (Smith *et al*., 2011) have been developed and should improve the standard of maps produced and associated metadata.

Baseline mapping and further monitoring are limited by resources, and the effect of the pressures impacting the condition of many habitats is poorly understood and further research is warranted. A central repository for habitat maps in Ireland in the Ordnance Survey of Ireland is proposed but progress is slow. This will be populated with data from national surveys, as well as a*d hoc* maps produced as part of county surveys or research projects. Digitised maps often become separated from information on condition. A habitat portal to collate all relevant data would improve the ability to effectively report on this target.

What are the opportunities to make enhancements in the following areas: (i) *in situ* observations, (ii) remote sensing information, (iii) data management, (iv) data analysis and (v) preparation of decision support tools (e.g. indicators)?

(i) The involvement of citizen science to collect Biodiversity data is being encouraged by the National Biodiversity Data Centre, and several non-governmental organisations such as Birdwatch Ireland (the national BirdLife partner) run monitoring programmes of species of interest. Such surveys are supported by the State

(ii) Ireland does not have a complete habitat map. Landcover imagery derived from remote sensing, e.g. CORINE, is too coarse to satisfactorily represent the habitat types. Progress is being made by an expert landcover group which includes relevant stakeholders from a variety of sectors.

(v)A national set of Biodiversity Indicators will be developed in 2013.

C. Scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets

What tools and guidance have been adopted under the Convention that can support Parties implementing the Strategic Plan? What are the gaps?
For the purposes of supporting Ireland in implementing the CBD Strategic Plan 2011-2020, sufficient guidance exists between what has been produced by the CBD (see Appendix I to this notification) and the European Commission. No gaps have currently been identified, and the limitations in full and effective implementation remain with the insufficiency of resources at the national level.

What information and tools are available specifically to aid Parties in establishing national targets and monitoring or assessing progress towards them? What are the gaps?
Guidance has been provided by the CBD Secretariat, the Biodiversity Indicators Partnership and other related initiatives such as the NBSAP Forum. Ireland produced its second Biodiversity Plan (NBSAP) in 2010 and therefore is unaware of any gaps.

What technical and scientific cooperation already exists between Parties for implementing the Strategic Plan? What are the gaps?
The European Commission supports activities at the regional level across the EU Member States. A number of biodiversity data portals exist, including:

- EC Shared Environmental Information System (http://ec.europa.eu/environment/seis/)
- EC and EEA Biodiversity Information System for Europe (http://biodiversity.europa.eu/)
- EEA Biodiversity Data Centre (http://www.eea.europa.eu//themes/biodiversity/dc)
- EU Article 17 reporting (http://bd.eionet.europa.eu/article17)
- Background information on Structured Implementation and Information Frameworks (SIIFs) across the EU (https://circabc.europa.eu/sd/d/f3e3726e-e217-4f3a-a2aa-aa2c5d37f25a/Point%204%20-%20SIIF%20nature%20overview.docx)

In addition, regional fora such as the European Platform for Biodiversity Research Strategy (EPBRS; http://www.epbrs.org/) and the EU-funded Network of Knowledge BiodiversityKnowledge initiative (http://www.biodiversityknowledge.eu/) encourage dialogue between technical experts and policy makers.

The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) is expected to fill a major gap in this regard once fully operational.

What global initiatives and partnerships are available to support implementation of the Strategic Plan? What are the gaps?

Other than data providers such as GEO-BON (and the regional EU-BON) and GBIF, Ireland is unaware of any global initiatives and partnerships that support national implementation of the CBD Strategic Plan 2011-2020. While GEF funding is available for certain countries, and regional workshops that support NBSAP development, there are no known global initiatives underway.

The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) is expected to fill a major gap in this regard once fully operational.

What capacity building support is provided by the CBD Secretariat and partners for implementing the Strategic Plan? What are the gaps?
While regional NBSAP workshops have been conducted, Ireland was unable to participate owing to a lack of available personnel.

D. Options for assessing the effects of the types of measures taken in accordance with the provisions of the Convention

What options to assess progress or effects of the measures taken in accordance with the provisions of the Convention are being used at the national level?
Ireland will be submitting National Reports in accordance with the requirements of the CBD. Reporting of progress against the national targets, as listed in Ireland's National Biodiversity Plan, will be contained therein.

Response to Notification (SCBD/STTM/DC/ac/81207)

Please find attached a number of reports submitted by the UK as a response to the above notification for the information of Parties. The reports have been compiled within the limited time available and are not comprehensive or complete in terms of coverage of relevant issues. The reports are submitted as provided and do not necessarily represent a position adopted by the UK Government.

List of attachments:

Annex 1. Report of workshop on identification of scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets, JNCC, Peterborough, 18th March 2013.

Annex 2. Summary of research projects commissioned by Defra to develop new policy support tools relevant to the implementation of the Strategic Plan.

a. Incentive measure
b. Global impacts

(Note: We have a number of further examples which we will submit at a later date).

Annex 3. Priority research needs included in Defra's Biodiversity and Ecosystems Evidence Plan.

ANNEX 1

Report of a workshop on identification of scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets, JNCC, Peterborough, 18th March 2013

Introduction

This is the report of a workshop convened by the UK Department for Environment Food and Rural Affairs (Defra) and the Joint Nature Conservation Committee (JNCC) in response to Decision XI/13 in section B, paragraph 1 (a) (i) and subsequent request for information to the Parties. The aim of this workshop was to identify scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets.

An invitation for the workshop was distributed to members of the UK IPBES Stakeholder network; the UK Biodiversity Indicators Forum; authors of the United Kingdom National Ecosystem Assessment; United Kingdom Biodiversity Research Advisory Group; and Government Departments and Devolved Administrations. Participant selection considered relevant experience and ensured a multi-disciplinary representation. A list of participants can be found at the end of Annex 1.

The workshop was broken down into groups to consider each of the goals of the Strategic Plan. Participants were asked to indicate their preferred group before attending the meeting, based upon their expertise. A total of 42 experts attended and groups consisted of up to 14 participants, including 1 facilitator and 1 rapporteur. Each participant attended two 90 minutes group sessions in the morning and afternoon. The aim for each group was to develop a short list of prioritised scientific and technical needs for the targets associated with each of the goals in the Strategic Plan.

Each group was asked to help fill in a table for each target and these have been used to construct the report. Experts were requested to consider the full range of scientific and technical needs, and also any relevant new and emerging issues that should be a high priority for the CBD. At the end of the group sessions experts were given time to review the work of each group and identify priorities.

In addition, each group was also to identify any CBD scientific and technical needs that may require the attention of IPBES. A separate breakout group reviewed the issues that may be considered in submitting a request on such needs to IPBES. The report from this breakout group is not included here.

As requested within the notification document, additional relevant information that was provided by experts during the meeting with respect to specific targets has been provided below the prioritisation tables. Additional overarching information relevant to the implementation of the Strategic Plan has been summarised at the end of this report.

To note the report of the workshop contained in this Annex does not represent an official UK Government view but is rather a collection of stakeholder views convened by JNCC on behalf of the UK Government.

Strategic Goal A – Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 1 - By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Scientific and technical need	Type	Scale	Uses	Methods
More information that will assist in raising awareness of the benefits society obtains from biodiversity.	Data Observations Research	Global, Regional, Sub-regional, national, local.	Raises awareness and promotes behaviour change.	Develop indicators and effective channels of communication. **Potentially delivered by IPBES**
Research need to ascertain how society values biodiversity and ecosystem services, ensuring that non-monetary values are considered. Take into account how the links between the natural environment and human well-being will vary between different segments of society, from place to place and between generations.	Research Policy support tools	Global, Regional, Sub-regional, national, local.	Provides tools for use in decision making and environmental accounting.	Define stakeholder groups and identify similarities, differences, synergies between the perceptions of various groups. Ongoing, iterative valuation exercise over time that

				captures fluctuations in valuation. Potential for an ecosystem stock market to take into account the different values at various times, spatial scales, and the varying needs of society. Ensure that well-being valuation is an integral part of the valuation process. UK National Ecosystems Assessment Follow-up will explore these issues. **Potentially delivered by IPBES**
Need to identify links between valuation of biodiversity and action (i.e. using valuation finding to drive behavioural changes)	Policy support tools Data Observations	Global, Regional, Sub-regional,	Developing techniques and policies ot driving change toward sustainable behaviour.	Identify language to engage stakeholder groups.

		national, local.		Develop effective channels of communication. Modify language and move away from using economic and scientific jargon to increase stakeholder buy-in. **Potentially delivered by IPBES**
Need to identify stakeholder demographic.	Data Observations	Global, Regional, Sub-regional, national, local.	Identify audiences to direct effective communication tools that drive behaviour change.	Segmentation of stakeholder groups. **Potentially delivered by IPBES**
Ascertain what behaviour needs to be altered in order to achieve target.	Policy support tools Data Observations	Global, Regional, Sub-regional, national, local.	Target societal behaviour / culture driving biodiversity loss.	Development of toolkits and guidance to support policies that aim to achieve behavioural change. Ensuring that people, businesses and governments recognise the value

				of biodiversity, recognise the impacts they have on biodiversity, and comprehend what can be done to mitigate these impacts. **Potentially delivered by IPBES**

Target 2 - By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Need to address technical issues regarding accounting methods.	Research and development Policy support tools	Sub-regional, National	Better integration of biodiversity into national accounting.	Development of conceptual framework, definitions and standards, including through the UN SEEA process on ecosystem

				accounting. Assess and further develop methods and share national experiences of ecosystem accounting. (e.g. from the implementation of UK roadmap for ecosystem accounting) Assess the suitability of accounting/valuation tools at different scales.
Develop effective communication regarding the integration of biodiversity into development strategies and planning processes.	Policy support tools	Global, Regional, Sub-regional, National	Better integration of biodiversity into national and local development and poverty reduction strategies and planning processes.	Expert review and assessments. Develop effective channels of communication.
Developing capacity for utilising tools to integrate biodiversity, as well as simplifying existing tools	Policy support tools	Global, Regional, Sub-	Better integration of biodiversity into national and local development and poverty	Review existing and develop novel tools.

to facilitate wider use.		regional, National	reduction strategies and planning processes.	Provide open access to data, increase data availability and promote the value if open source software and tools. **Potentially delivered by IPBES via capacity building activities.**

Target 3 - By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Need to identify how it will be possible to counteract impacts of harmful subsidies; by removing, phasing out or reforming harmful subsidies	Policy support tools	Global, Regional, Sub-regional, National	Minimise negative impacts on biodiversity from existing policies and identifying potential for reform.	Policy evaluation and review of existing subsidies.

Develop methods to identify and assess impacts of harmful subsidies and monitor outcomes of if interventions are put in place.	Observations Data Policy support tools	Global, Regional, Sub-regional, National	Will make it possible to identify potential opportunities for reform in order to phase out or incentive change to minimise negative impacts on ecosystems and biodiversity.	Assessments and modelling. Defra funded work to explore this target please see Annex 2
Evaluation of existing policies and subsidies and their impacts on biodiversity and capturing positive incentives.	Observations Data Policy support tools	Global, Regional, Sub-regional, National	Will make it possible to identify potential opportunities for reform in order to phase out or incentive change to minimise negative impacts on ecosystems and biodiversity.	Assessments, modelling and surveying.
Identifying future positive incentives and develop suitable tools for implementing effective subsidies (i.e. reconciling positive subsidies with free trade rules).	Observations Data	Global, Regional, Sub-regional, National	Identify positive incentives that minimise environmental impacts and improve conservation and promote sustainable use of biodiversity.	Assessment, modelling, pilots (to identify implementation issue)

Target 4 - By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**

Need for a trans-boundary supply chain analysis.	Research and development. Observations Data	Global	Identify areas for improvement or examples of best practice to help achieve sustainable production and consumption.	Statistical analysis and modelling. Defra funded work to explore this target please see Annex 2
Sustainability labelling for products.	Research and development. Data Policy support tools	Global, Regional, Sub-regional, National	Incentivise sustainable production and inform consumer choice.	Assessment, survey and monitoring supply chains and consumer behaviour. Develop simple labelling that enables consumers to make informed choice.
Ascertain methods for measuring and monitoring awareness and impacts of business decisions.	Research and development. Observations Data Policy support tools	Global, Regional, Sub-regional, National	Identify opportunities for subsidies. Ascertain if particular instruments could be utilised to alter business decisions and incentivise sustainable production	Assessment and survey markets and business strategy and decision making.
Need to learn how to effectively engage with business and influence business decisions and strategy to ensure that biodiversity and ecosystem services are incorporated into the decision making process.	Observations Policy support tools	Global, Regional, Sub-regional, National	It will be essential to understanding business strategy and to identify what drives particular choices that favour unsustainable practices. This will enable development of effective tools to achieve sustainable production and consumption.	Assessment and survey markets and business strategy and decision making. Demonstrating value of biodiversity to the business community may require an

				economic approach, which may make it difficult to include features that are valued in non-economic terms. Therefore there will be a need that enables businesses to appreciate non-economic values.
Define 'safe ecological limit' at the correct scale. See also Target 5 and 7.	Research and development Observations Data	Global, Regional, Sub-regional, National	This will ensure that stakeholders are able to recognise safe ecological limits and take step necessary to ensure activities operate within these limits.	Assessments, surveys, modelling. Need to assess structure and function plus the resilience and recovery of particular habitats / biomes. Development of monitoring systems and indicators. **This could potentially be delivered via an**

				IPBES assessment.

Strategic Goal B – Reduce the direct pressures on biodiversity and promote sustainable use.

Target 5 - By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Scientific and technical need	Type	Scale	Uses	Methods
Need for widely available tools that map and measure short term change in habitats and ecosystems and demonstrate rates of change.	Research and development	National, Local	This will improve monitoring as change will be detected quicker.	Remote sensing and GIS
Development of tools that enables imperfect or insufficient data to be used as effectively as possible.	Research and development	Global, Regional, Sub-regional, National, Local.	Improve efforts to arrest the lost of natural habitats by informing conservation efforts.	Modelling and statistical analysis. Survey design.
Need for reliable habitat/ecosystem maps.	Research and development Data	Regional, Local	Finer scale (local/regional) maps contain more information and are therefore more useful than global or larger scale maps, which are better at providing an overview or summary of habitats/ecosystems across a large area. Need to focus	Remote sensing. Data integration, GIS.

			on user requirements – maps as management and decision-making tools.	
Need to understand the capacity limits of, or point at which, ecosystem processes change or become degraded. See also Targets 4 and 7,	Research and development Data	Regional, Sub-regional, National, Local.	Identify where to focus and deploy conservation /restoration efforts.	Assessment, surveys, modelling
				All above are necessary for assessments at all scales, including those undertaken by IPBES.

Target 6 - By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Developing scientifically robust means of "policing" stocks.	Policy support tools	Regional, Sub-regional	By helping to ensure that quotas, limits, etc. are not exceeded.	Assessment. Guidelines on effective policing /

				monitoring of stocks.
Rapid genetic assessment of stocks and species.	Observations Data	Global, Regional, Sub-regional, National, Local.	By increasing knowledge of what constitutes a 'safe ecological limit' for certain stocks.	Surveys.

Additional information relevant to Target 6:

- There is potentially a need to systematically, and regularly, survey the community structure of all exploited aquatic ecosystems, in particular marine ecosystems. This should be on a sub-regional, but likely to require support from global community (e.g. by providing research vessels). This could be used to identify status of, and trends in, exploited aquatic ecosystems in order to inform management.

- Need to develop simple, globally applicable management schemes that ensure meeting Target 6 without negatively impacting food supply from marine ecosystems. The goal of attaining Maximum Sustainable Yield (MSY) alone is insufficient for this; determining ecosystem MSY is extremely data and management intensive and MSY under the constraint of avoiding any extirpations is very low. This activity would need a global focus, because development of such schemes are difficult, expensive, and the basic principles (ecological and fleet interactions, complexity of food-web dynamics) and issues (poor data, easy extirpation of the most vulnerable socks, tragedy of commons) are the same everywhere. Governments and management bodies would need to apply these schemes in order to meet Target 6.

- Need to develop institutions to expand the Ecosystem Approach to fisheries management to the high seas.

- Need to continue developing recovery plans and measures for depleted species.

- Improved engagement amongst regional, international and global bodies to improve regulations and minimise impacts.
- Need to consider the differential impact and needs of small-scale versus industrial fisheries.

Target 7 - By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Improved environmental indicators to help managers identify when limits are exceeded. See also Target 4 and 5.	Research and development Policy support tools	Sub-regional, Local	Improved engagement and management of land users, especially within industry.	Surveys and pilot studies
Development of production methods and guidance on sustainable aquaculture development.	Research and development	Local	Cheaper food, lessened environmental impacts from aquaculture.	Assessment of best practices, pilot studies.
Improved understanding of how better to use fertilisers.	Research and development	Local	Reduced pollution and eutrophication.	Assessment of current best practices.

Additional information relevant to Target 7:

- There is a need to improve method for food distribution and storage; as well as investigate the reasons for excessive food waste and begin developing effective tools to instigate a change in policy and societal behaviour.

- More work needs to be undertaken to understanding the ecological importance and limitations of soils. Potentially create policy guidelines, based on current knowledge of soil dynamics, to run concurrently with research efforts.

Target 8 - By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Scientific and technical need	Type	Scale	Uses	Methods
Need to better understand the functions of wetlands in terms of how they control pollution and how pollution affects wetland ecosystem functions and processes.	Research and development	Catchment	Pollution amelioration.	Assessments, survey.
Develop tools to assess ecosystem health, particularly soils.	Research and development Policy support tools	Global, Regional, Sub-regional, National.	Monitoring the impacts of pollution on ecosystem function and biodiversity.	Assessments, survey.

Need to investigate links between pollution and human health in cities and urban areas.	Research and development	Megapolis, Megaregion, Metropolitan areas.	Stimulate action to effectively mitigate against pollution in urban areas.	Expert review, reanalyse existing data.
				All above could be included in assessments at all scales, including those undertaken by IPBES.

Target 9 - By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
There is a need to consider the impacts on biodiversity, not in terms of single entities (e.g. invasive alien species) but as a complex interaction of threats that have a combined impact, which together present a much greater risk to biodiversity than can be measured by assessing threats individually.	Research and development Observations Data	Global	Developing responses that reflect the complexity of threats that are impacting upon species and ecosystems.	Assessment, modelling.

Need to effectively communicate with governments to enhance understanding that biodiversity recovery, in response to conservation actions, takes decades and not the period of a political term.	Policy support tools	Global	Ensures long-term conservation planning decisions are put in place.	Regional negotiation and trans-disciplinary communication. Establishing a set of long-term research projects focusing on environmental change in some key environments in response to the most likely stress impacts.
Need to establish what ecological traits cause some species to become invasive aliens.	Research and development	Global	Enable better targeting of efforts to deal with invasive alien species.	Assessment, surveys, modelling.

Additional information relevant to Target 9:

- There is a need to recognize that individuals and communities (both in developing and developed countries) are already responding, and adapting, to invasive species (and other cases of biodiversity change), autonomously from government or science led intervention, to secure their well being; these adaptations (based on local knowledge, values and livelihoods) are in turn affecting ecosystem functions and services. Management interventions need to understand the adaptation pathways already taken, for they may supply local knowledge of the situation and innovative solutions.

Target 10 - By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Improved use of environmental economics to address environmental pressures.	Policy support tools	Global	Link society, industry and non-environmental sectors with conservation measures to address anthropogenic pressures.	Expert review, assessments.
Use data from United Nations Framework Convention on Climate Change (UNFCCC) to understand marine impacts.	Policy support tools	Global	Linking IPBES/CBD/UNFCCC/ World Ocean Assessment (WOA)	Assessments, modelling scenarios
Conservation thinking is often about stasis (i.e. protected areas are fixed in space). However, biodiversity changes in response to environmental variables (i.e. climate). There is therefore a need to introduce the idea of dealing with these changes in conservation thinking.	Observations Research,	Global	Better assessment of impacts of future change will inform management and enable managers to deal with future impacts on biodiversity and maintain ecosystem integrity and functioning.	Assessment, altered perspectives and ways of thinking.
				All above could be included in assessments at all scales, including

				those undertaken by IPBES.

Strategic Goal C – Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

Target 11 - By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Scientific and technical need	Type	Scale	Uses	Methods
Collation of examples where the Ecosystem Approach has been applied to Protected Area management. Evaluation of different types of policyinterventions including community-led and local partnership approaches.	Observations	Global, Regional, Sub-regional, national, local	Ensures a holistic approach to protected area management is adopted, which will integrate protected areas into the wider landscapes/seascapes.	Assessment. Possibly measure effectiveness through a suite of indicators. Indicators would require suitable definitions to ensure the relationship between ecosystem health and ecosystem services and the ecosystem approach and policy interventions are

				clearly defined.
Understanding what ecosystem services are provided by Protected Areas and how service provision relates to conservation objectives. Understanding trade-offs between conservation and ecosystem services.	Observations Research Policy support tools	Global, Regional, Sub-regional, national, local	To develop integrated approaches to protected areas management	Development of methods for measuring ecosystem services, including indicators.
Need to assess whether protected areas have effective management, and identify how effectiveness can be measured.	Research and development Policy support tools	Global, Regional, Sub-regional, national, local	Ensure protected area management is fit for purpose and ecosystems are being conserved effectively.	This may require different methods in different places and at different scales. Assess or collate existing work on measuring effective conservation management, with expert evaluation of what works under various circumstances. May be possible to establish 'Green Listing'. Potentially to

				identify and develop performance indicators
Ascertain whether protected areas have equitable management and how should / could this be measured.	Research and development Observation	Global, Regional, Sub-regional, national, local	Links with join-up existing guidance and information	Assessment, pilots. Capacity building in co-management may be necessary. Identify trade-offs in achieving equitable management via stakeholder analyses. Sustainable use indicators developed with input from indigenous peoples and the use of traditional knowledge
The integration of protected areas at a landscape scale is needed to avoid islands of biodiversity and ensure the totality of the target is addressed.	Research and development Observation	Global, Regional, Sub-regional, national, local.	Ensures systems of protected areas are ecologically representative and well connected.	Mapping /GIS support tools. World Database on Protected Areas (WDPA) cleansing to ensure it remains useful and accurate.

				Connectivity and coherence measures need to be identified and created so that the scale of integration can be measured
Need to assess what ecosystem services are provided by Protected Areas.	Assessment	Regional, sub-regional, national or local scale	Would help ensure protected areas are integrated, fit for purpose, and enable effective delivery of ecosystem services at a landscape scale.	Assessment of existing data to ascertain whether this type of evaluation is possible. (*NB. two studies currently underway in the UK are investigating this question*).

Additional information relevant to Target 11:

- Need to
- Need to assess the potential role that Indigenous and Community Conserved Areas (ICCAs) can play in improve inter-connectivity between Protected Areas.

- Need to assess buffer zone areas surrounding Protected Areas for potential sources of support from communities as well as developing threats from economic development (e.g. ecotourism and plantations).

Target 12 - By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Identify ecosystem services provided by threatened species.	Research and development Observation Data	Global, Regional, Sub-regional, National, Local.	Potential to highlight value of threatened species to increase stakeholder buy-in with conservation management.	Prioritisation of actions and linkage with key biodiversity areas (hotspots) and species-oriented conservation measures. UK funded research on Methodology for Assessment of Priorities for International Species Conservation (MAPISCO)
Need to develop a way of dealing with taxa that do not have red-lists (e.g. fungi, invertebrates).	Research and development Observation	Global, Regional, Sub-regional, National, Local	Improved management of threatened species.	Package of clearly defined ecosystem health indicators. Identify links with key biodiversity variables. Ascertain focus areas. Determine whether differing regional

				approaches exist.
Collation of existing governance, political and management processes.	Research and development Observation	Global, Regional, Sub-regional, National, Local.	Improved management of threatened species.	Publication of a document outlining how existing mechanisms impact on threatened species in different contexts, taking into account success and failure.

Additional information relevant to Target 12:

- Need for assessment of methodologies that can be used to determine changes in species conservation status. This would improve early detection of changes in a species conservation status. Rapid assessment techniques could be considered as one of the tools for trialling in a broader assessment of methodologies to measure both stock and changes. This would enable conservationists to ascertain what assessment methods are appropriate for particular species and scenarios.

- Need to identify what capacity building activities are required to encourage ownership of threatened species. This could lead to improved engagement with local and indigenous communities when managing threatened species. This could be achieved by delivering community awareness campaigns, knowledge sharing and promoting interconnected communications between local groups.

Target 13 - By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is

maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Ascertain the genetic diversity in species which are not domesticated.	Research and development Observation Data	Global, Regional, Sub-regional, National, Local.	Better understanding of how to minimise genetic erosion and safeguard genetic diversity.	Assessment, Surveys.
Need to investigate the genetic diversity of soil organisms, how does this vary, what determines variations, and how do soil organisms underpin ecosystem services?	Research and development Observation Data	Regional, Sub-regional, National, Local.	Better understanding of how to minimise genetic erosion and safeguard genetic diversity.	Assessment, Surveys, Modelling.
Investigate the possibility of determining indicator species for genetic diversity.	Research and development Observation Data	Global, Regional, Sub-regional, National, Local.	Establish a rapid assessment of genetic diversity within a given ecosystems and help prioritize actions for conservation.	Ascertain what markers exist and how these could be utilized across different ecosystems. Perform an extensive literature review of existing publications and collate

				information regarding the genetic diversity.

Additional information relevant to Target 13:

- Need to better understand how genetic diversity underpins animal and plant health issues as this will help guide strategies to minimizes the impact of animal and plant health issues in both domesticated and wild organisms.
- Need to assess whether genetic diversity underpins the provision of ecosystem services.
- Need to identify genetic impacts of marine pressures (i.e. ocean acidification, genetic pollution from aquaculture, and overexploitation). Better understanding of how to minimise genetic erosion and will make it easier to safeguard genetic diversity in the oceans.
- Need for better methods for detecting DNA in the environment that are cheap, fast, accessible and relevant.

Strategic Goal D – Enhance the benefits to all from biodiversity and ecosystem services.

Target 14 - By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Scientific and technical need	**Type**	**Scale**	**Uses**	**Methods**
Need to better understand baselines, using a range of information to address this need (e.g. Which ecosystems are most important in providing essential services; What is their current state and distribution; and what are the threats to these ecosystems) (including population, and the distribution and impact of different populations)	Research and development Policy support tools (including 'Quick and dirty' tools)	Global, Regional, Sub-regional, National, Local.	Improved information regarding ecosystem service delivery and negative impacts to services, will inform activities aimed at restoring and safeguard essential services.	UK National Ecosystem Assessment (UK NEA). The Economics of Ecosystems and Biodiversity (TEEB). IUCN Red List of Ecosystems. See additional notes * **This need could be taken forward at different spatial scales by IPBES.**

Need a better understanding of: the link between ecosystems and services and the factors that alter these linkages, the importance of biodiversity in providing ecosystem services, and of the link between ecosystem restoration and change in the level of essential services. As part of this, need for evidence that helps determine optimal balance between ecosystems and services.	Research and development Policy support tools (including 'Quick and dirty' tools)	Global, Regional, Sub-regional, National, Local.	Improved understanding will ensure biodiversity is taken into account when restoring and delivering essential services.	Assessment and analysis to be undertaken at different spatial and temporal scales. UK National Ecosystem Assessment (UK NEA). The Economics of Ecosystems and Biodiversity (TEEB). IUCN Red List of Ecosystems. See additional notes **
Need for improved and more systematic evaluation of ecosystem services which is incorporated into project planning from inception.	Research and development	Dependent on project scale.	Ensure that ecosystem services are accounted in all project decision making.	Develop and employ ecosystem health indicators. Employ ecosystem service mapping tools to assess ecosystem service provision and ensure optimisation of service delivery and

				realise multiple benefits.

Additional information relevant to Target 14:

- Potential need for improved evidence on the relationship between ecosystems and human rights, at different spatial scales. Understanding this linkage would enable decision makers to better take into account the needs of women, indigenous and local communities.

- Need for improved evidence of economic benefits, including costs and benefits of restoration and safeguarding ecosystem services. This would help focus resource mobilisation to activities with the greatest potential benefits.

- Require assessment tools which enable the needs of disadvantaged groups to be taken into account more effectively. These tools could potentially help the needs of women, indigenous and local communities, and the poor and vulnerable be taken into account by international developers, and assess any trade-offs.

- Need broader, more integrated evidence across different ecosystem services.
- Need for improved evidence of human contributions to and maintenance of ecosystems services; recognising that human economic and cultural needs drive the manipulation of ecosystem functions in order to create certain ecosystems services.
- Conduct gap analysis of existing knowledge. Utilise methods that allow assessment within countries (e.g. at catchment or regional level), and ensure scale remains relevant to the needs of women, indigenous and local communities, and the poor and vulnerable (also relevant to Need 2). Employ ecosystem service mapping tools: Natural Capital Project Integrated Valuation of Environmental Services and Tradeoffs (InVEST) and POLYSCAPE: Multiple criteria GIS toolbox to assess multiple ecosystem service provision (also relevant to Need 3.)*.
- Utilise methods that allow assessment within countries and ensure scale remains relevant to the needs of women, indigenous and local communities, and the poor and vulnerable. Employ ecosystem service mapping tools to assess ecosystem service provision and ensure optimisation of service delivery and realise multiple benefits.**
-

Target 15 - By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Scientific and technical need	Type	Scale	Uses	Methods
Need for a range of ecosystem health indicators, one of which would be carbon storage.	Research and development	Global, Regional, Sub-regional, National, Local.	Assist in identifying priority ecosystems in need of restoration.	Assessment, survey, modelling.
Prioritisation methodology to enable the selection of 15 per cent of degraded ecosystems in need of restoration.	Research and development Data	Global, Regional, Sub-regional, National, Local.	Targeted resource mobilization to ecosystems where restoration would have greatest contribution to climate change mitigation and adaptation and to combating desertification.	Assessment, survey, pilots, adaptive management and monitoring.
Information on how to enhance ecosystem resilience and how to identify when a system is resilient.	Research and development	Global, Regional, Sub-regional, National, Local.	Better understanding of factors determining ecosystem resilience will be incorporated into management strategies aimed at achieving this target.	Review of existing guidance. Assessment and collation of exiting evidence.

Additional information relevant to Target 15:

- Need methods to identify tipping points and indicators to ensure tipping points are not exceeded, recognising that identification of tipping points will be challenging. This could potentially have a great deal of value in assessing marine ecosystems (particularly those vulnerable to over exploitation). Evidence would inform political decisions on what level of resilience is acceptable /needed to ensure ecosystems are not vulnerable to global change. This could be achieved through collation and assessment of work currently being undertaken to address this question at European level.

- Need to understand how biodiversity contributes to ecosystem resilience. This will provide evidence on the role biodiversity plays in maintaining ecosystem resilience under future global change.

- Need to identify which ecosystems lose resilience with minimal human impact so that remaining ones can be protected from human impact.

Target 16 - By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Scientific and technical need	Type	Scale	Uses	Methods
Safeguards put in place to protect ecosystems where genetic resources have not yet been assessed	Research and development Policy support tools	Global, Regional, Sub-regional, National, Local.	Ensure that benefits rising from utilization of genetic resources are not eroded before benefits can be realised [Links to target 4]	Political and stakeholder negotiations to establish suitable safeguards.

Need for evidence which indicates whether existing legislation is sufficient.	Research and development Policy support tools	Global, Regional, Sub-regional, National, Local.	Assess the effectiveness of current enforcement measures.	Assessment of effectiveness of existing legislation, levels of compliance, and evaluation

Strategic Goal E – Enhance implementation through participatory planning, knowledge management and capacity-building.

Target 17 By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan (NBSAP).

Scientific and technical need	Type	Scale	Uses	Methods
Four linked needs exist with regards to the effectiveness of NBSAPs: 1. Assess effectiveness of NBSAPs. 2. Assess lessons learned. 3. Identify barriers. 4. Identify successful components.	Research Policy support tools.	Global	Assist with the development of effective NBSAPs.	Assessment, expert review, pilots, monitoring.
Need for a tool that collates information on actions undertaken as part of NBSAPs from around the world.	Info tool.	Global	Assist with the development of effective NBSAPs.	Potential to develop a global Biodiversity Action Reporting System. See UK: http://ukbars.defra.gov.uk/

Target 18 - By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Scientific and technical need	Type	Scale	Uses	Methods
Build capacity in utilising traditional and local knowledge (e.g. citizen science; sectoral knowledge such as fishermen's).	Research and development Policy support tools	Global	Enable policy makers to consider communities traditional knowledge is incorporated into decision making.	Assessments, surveys, pilots.
Establishing ways in which to engage the right people with a balanced mix of skills, values, beliefs and views in the debates driving the research agenda and policy implementation.	Research and development Policy support tools	Global, Regional, Sub-regional, National, Local.	Enables the integration of wide range of belief systems into the implementation of the CBD and stimulates stakeholder participation.	Assessments, surveys, pilots. IPBES expert workshop on knowledge systems.
Develop tools that enable citizens and local communities to conduct effective and accurate biodiversity monitoring.	Research and development	Global, Regional, Sub-regional, National, Local.	Empowers citizens and stimulates societal engagement with CBD.	Assessments, surveys, pilots.
Need to develop a method for achieving a balanced assessment of the value of 'scientific rigour' and 'traditional and indigenous knowledge'	Research and development Policy support tools Observation Data	Global	Ensures traditional knowledge, innovations and practices of indigenous and local communities are effectively utilised in delivering CBD goals.	Assessments, surveys, pilots.

Additional information relevant to Target 18:

- There is potentially a need to understand the impacts of traditional practices, both positive and negative, on ecosystems. This could help determine where action may be required to instigate behaviour and/or policy change in order to deliver goals.
- There was discussion regarding the extent to which this target should or should not apply to developed countries. There could be positive benefits if it meant that society had a greater comprehension of the role biodiversity plays in societal well-being.
- Management interventions need to understand the adaptation pathways already taken by individuals and communities, for they may supply local knowledge of the situation and identify innovative solutions to be incorporated into interventions.

Target 19 By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Scientific and technical need	Type	Scale	Uses	Methods
Need to effectively implement a trans-disciplinary approach (i.e. moving beyond sciences) to overcoming challenges and building capacity.	Adapting scientific approach.	Global	Improved science base, bringing all knowledge to bear, ensuring knowledge is shared and transferred.	Improved communication mediums across all disciplines. Development of easy to access electronic forums that facilitate knowledge sharing.

Need for syntheses of information and evidence including: meta-analyses, systematic reviews, and evaluations and recommendations of modelling approaches.	Research and development Policy support tools Funding mechanisms	Global	Collation of existing information would improve knowledge sharing.	Assessment and evaluation of existing modelling methods identified as important/effective by relevant experts.
Technical need for better linking of disparate data: • Linking datasets across sectors, geographic boundaries and scales. • Scaling data for use at a range of spatial units. • Improving citizen science/crowd sourcing (i.e. tools to collect data, validate knowledge and ground-truth remote sensing).	Research and development	Global	Enable more effective knowledge sharing.	Develop technical improvements to tools for storing, sharing, evaluating data. Pilot studies. Encourage wider sharing of data and knowledge.
Tools to measure/value ecosystems including: • Measuring ecosystem function and health. • Valuing biodiversity and how to deal with biodiversity which is difficult to value or appears to have seems to have little or no demonstrable economic value.	Research and development	Global	Better application of biodiversity valuation.	Assess existing valuation tools

Improved access to, and evaluation of, information: • Open access publishing, including ways to help users assess quality of information. • Identify flow of information and barriers to participation and knowledge exchange.	Research and development	Global	Facilitate more effective knowledge sharing.	Open access source to include case studies, information materials aimed at a variety of audiences. Development of systems giving improved/fairer access to information. Need to address concerns about the cost of open access publishing to authors.
Global and regional assessment of status and trends in biodiversity and ecosystem services	Observations Research Policy support tools	Global, regional	Assessment of achievement of Aichi targets and evidence base to inform policy objectives and targets beyond 2020. Tracking progress on Sustainable Development Goals.	Integrated assessments to be undertaken by IPBES – including above elements.

Target 20 - By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Scientific and technical need	Type	Scale	Uses	Methods
A need to understand which types of funding delivery mechanisms work best in the long-term for biodiversity, and what the link is between spending and benefits under different scenarios.	Research and development	Global, Regional, Sub-regional, National, Local.	Better inform mobilization of financial resources via effective and efficient mechanisms.	Assessment, expert review

Additional observations relevant to the implementation of the Strategic Plan

- There is a need for conservationists to recognise the diversity of skill sets and expertise available that can be adapted and used to address conservation problems. Adapting existing methods to suit conservation purposes will save a great deal of time, as opposed to having to develop new tools. In order to achieve this there is a need introduce non-conservationist experts into conservation problem solving exercises.

- How can we make effective use of Earth observation data (noting issues relating to standards and nomenclature)? In order to facilitate this, the science on how to utilise earth observation effectively needs to be better understood.

- Identify knowledge gaps and their relevance to addressing the issues in the targets and assess whether knowledge gaps vary according to the scale of data.

- The existing guidance should be reviewed against targets to identify what gaps exist, and to allow links between the targets to be identified.

- There is a need for greater understanding of variability within systems and how this will inform management.

- Need to determine the status of biodiversity in areas beyond national jurisdiction. Rapid stock take methods could be used to determine status and assessment could identify links with governance issues and ascertain how to implement action effectively.
- Requirement for basic research to be undertaken to evaluate policies (i.e. did policy achieve what it set out to do?).

- Need for greater sharing of expertise across disciplines. This could be achieved by setting up an electronic forum or IPBES could instigate this via trans-disciplinary Working Groups.

- Need for information from CBD on what should be considered as research priorities to enable research institutions to make research questions more policy relevant.

- Clearer definitions behind top levels goals that can be used to guide research spending.

List of Participants

Name		Organisation
Alan	Simcock	United Nations
Allan	Watt	Centre for Ecology and Hydrology
Ana	Delgado	Department for Environment, Food and Rural Affairs
Andrew	Stott	Department for Environment, Food and Rural Affairs
Ant	Maddock	Joint Nature Conservation Committee
Axel	Rossberg	Centre for Environment, Fisheries and Aquaculture Science
Caroline	Howe	University College London / Ecosystem Services for Poverty Alleviation Programme
Christel	Fiorina	French Ministry of the Environment
Christine	Maggs	Queens University Belfast
Davy	McCracken	Scotland's Rural College
Diana	Mortimer	Joint Nature Conservation Committee
Gillian	Petrokofsky	Oxford University
Helen	Baker	Joint Nature Conservation Committee
James	Munford	National Biodiversity Network
James	Williams	Joint Nature Conservation Committee
James	Vause	Department for Environment, Food and Rural Affairs
Janet	Khan-Marnie	Scottish Environment Protection Agency
Jonathan	Sadler	University of Birmingham
Jonathan	Hughes	Scottish Wildlife Trust
Joseph	Bull	Imperial College London
Katie	Medcalf	Environment Systems
Kirsty	Lindenbaum	Countryside Council for Wales
Marcus	Bates	Department for Environment, Food and Rural Affairs

Matt	Smith	Joint Nature Conservation Committee
Mercy	Morris	Plant Heritage - National Plant Collections
Michael	Bruford	Cardiff University
Mike	Fay	Royal Botanic Gardens, Kew
Andrew	Cherrill	Harper Adams University
Noëlle	Kümpel	Zoological Society London
Pete	Iannetta	James Hutton Institute
Pete	Hollingsworth	Royal Botanic Gardens Edinburgh
Peter	Brotherton	Natural England
Rajindra	Puri	University of Kent at Canterbury
Richard	Gregory	Royal Society for the Protection of Birds
Richard	Preziosi	University of Manchester
Rob	Brooker	James Hutton Institute
Ruth	Waters	Natural England
Samia	Sarkis	Joint Nature Conservation Committee
Simon	Maxwell	Department for Environment, Food and Rural Affairs
Tom	Oliver	Centre for Ecology and Hydrology
Vicky	Morgan	Joint Nature Conservation Committee
Vin	Fleming	Joint Nature Conservation Committee

Matt Smith, Joint Nature Conservation Committee, 21st March 2013

ANNEX 2

1. Subsidy Reform Measures Tool

Full report of the tool can be found here:
http://randd.defra.gov.uk/Document.aspx?Document=10019_Volume3-BHIguidanceandreformtool_revised230412.pdf

Description of Tool

The tool is a practical guideline to assess which subsidies are harmful to biodiversity with a view to reforming or phasing them out in support of Aichi Target 3. The methodology is a four-phase approach, which builds on the OECD checklist (OECD, 2005) and the integrated assessment framework (OECD, 2007), an integrated Environmental Harmful Subsidy tool developed by IEEP (Valsecchi et al, 2009) and the work on subsidies by the CBD Secretariat, IEEP and others within The Economics of Ecosystems and Biodiversity (TEEB, 2011). A flow chart of the tool can be seen in figure 1. A traffic light system for the different outputs of the different phases of the tool is applied to visualise the outcomes (See figure 2).

Actual and Potential Impacts

The model was applied to three UK case studies: 1. Water abstraction 2. Eligibility criteria for CAP direct payments; and, 3. Wind energy developments. For each of the case studies the model came to conclusions with regards to the need to reform, the ease of reform, and means of reform.

The methodology is flexible and therefore can be applied by other countries and across different policy areas.

Obstacles for uptake

Incentives that may be harmful to biodiversity can occur in a range of sectors such as energy, transport, manufacturing and services, as well as those more obviously linked to biodiversity such as agriculture, forestry, fisheries and construction.

It follows that the potential application of the tool is widespread, but that the priority for reform is likely to vary widely according to the extent of the pressure on biodiversity and the degree to which it is driven by harmful incentives. However, this tool does not determine which sectors may have greatest impact. Such information may be better attained by looking at National Ecosystem Assessments.

In the UK a number of opportunities for subsidy reform have already taken place and therefore clear cut opportunities for new reform are more difficult to find. The scope for incentive reform in the UK is also limited by what is achievable at national level, rather than requiring EU wide action. The Common Fisheries Policy and Common Agricultural Policy remain among the greatest priorities for incentive reform in the UK, but can only be achieved through EU wide negotiations, in which the UK

continues to play an active role. The relevance of these policies for biodiversity is widely understood, and the tool provides limited added value.

Another important factor in addressing incentives is the degree to which reform should be a priority, or whether attention should focus on safeguards to their application. Biodiversity is potentially affected by a wide range of incentives, but is also protected by a range of different mechanisms. The tool provides structure to factor this in. .

Adequacy and Needs for further Development

Most of the incentives potentially harmful to biodiversity also have other environmental impacts; many affect biodiversity only indirectly through their effects on climate change, air quality or the water environment. Examples include taxation of aviation fuel and domestic energy, and pricing of water. This suggests that reform of incentives that are harmful to biodiversity should be seen in the context of the wider environmental objectives. However, the guidance tool also highlights the need to consider specific evidence of biodiversity pressures (such as through the National Ecosystem Assessment) when determining priorities.

As a result of these different considerations, a general conclusion from the development and testing of the tool is that there might be some priorities for reform of biodiversity harmful incentives. However many such perverse incentives have already been identified in the UK context and measures are already being taken to address them. Nonetheless, the tool can be used to identify these priorities in a structured way, and to guide action for reform.

The tool provides a mechanism for reviewing and understanding financial flows across different sectors and economic activities, in order to identify biodiversity harmful subsidies which may otherwise be difficult to identify. Therefore, the tool may be of use when exploring an indicator to monitor progress on implementation of the Resource Mobilization Strategy (indicator 13) and also Aichi Target 3, however further development on what data to capture and how to interpret this data would be required. The tool developed by UK may be useful to other countries and is designed flexibly for this wider application.

Figure 1: Flow chart of the subsidy reform tool

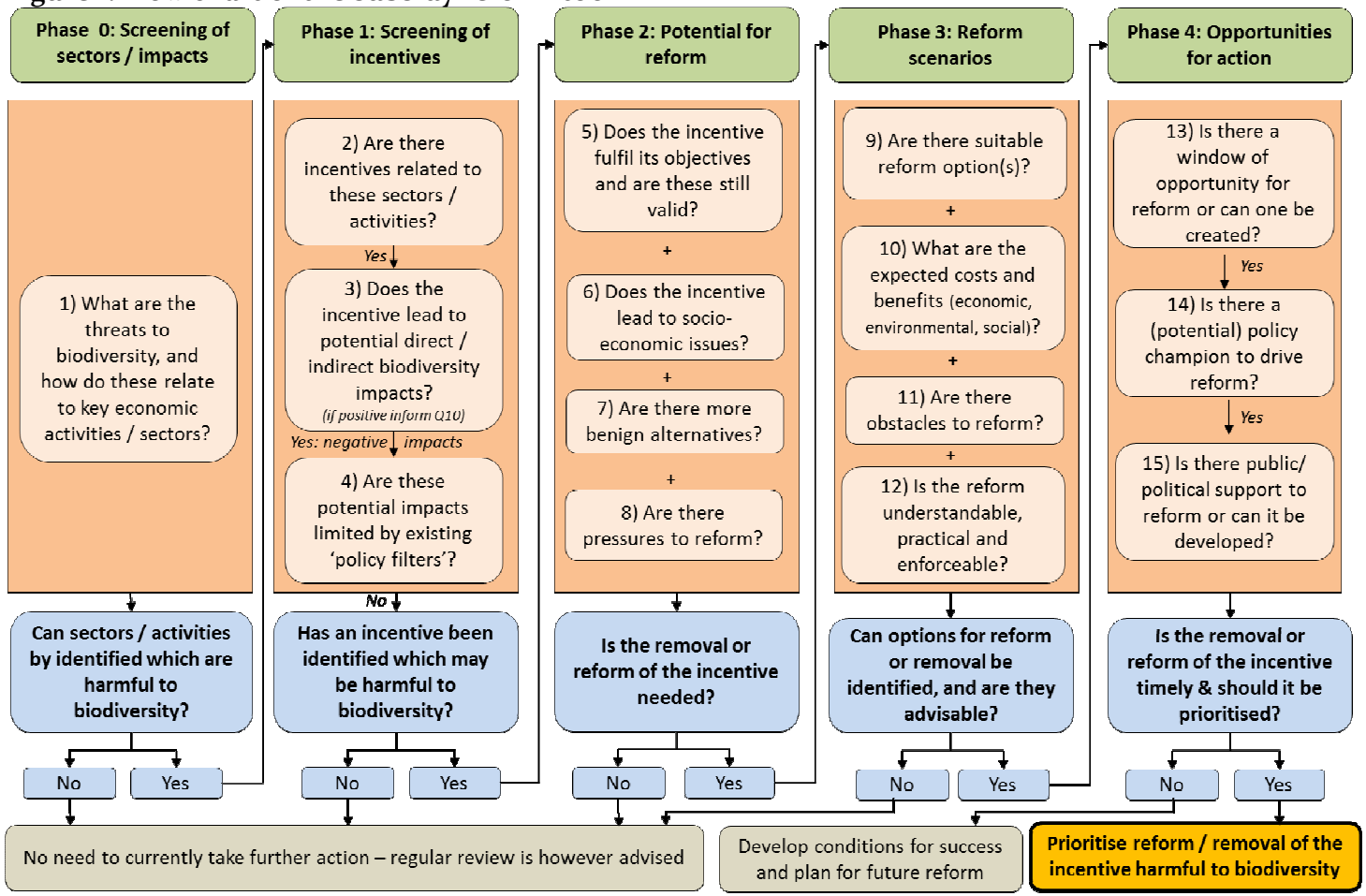

Figure 2 – Traffic light system for visualisation

See the table below for summary to help clarify how the traffic lights are operationalised within the tool, reflecting the difference in the use of traffic lights in the phases 0-2 and 3-4.

Phases 0,1,2 **Deciding whether there is a problem**		No major cause for concern; no need to further assess the incentives at this point in time
		There are some issues, worth double checking
		Is it necessary to "stop and think"and assess the incentive's impacts on biodiversity and whether the incentive potentially merits reform or removal.
Phases 3,4 **Deciding whether to progress with reform**		Real potential for action: prioritise and go ahead with reform initiative
		Check the best options, their merits and practical possibilities for reform; see whether existing obstacles can be overcome
		'Wait' – e.g. where obstacles are too large for immediate action and support currently not big enough to overcome obstacles. Here, better to actively plan and develop due opportunities for action than either do nothing or attempt a reform that is likely to fail and use up political capital for reform.

References

OECD (2005), Environmentally Harmful Subsidies: Challenges for Reform, OECD, Paris.

OECD (2007) Subsidy Reform and Sustainable Development: Political Economy Aspects, OECD, Paris

TEEB (2011), The Economics of Ecosystems and Biodiversity in National and International Policy Making. Edited by Patrick ten Brink. Earthscan, London.

Valsecchi C., ten Brink P., Bassi S., Withana S., Lewis M., Best A., Oosterhuis F., Dias Soares C., Rogers-Ganter H., Kaphengst T. (2009), *Environmentally Harmful Subsidies: Identification and Assessment*, Final report by IEEP, Ecologic, IVM and partners for the European Commission's DG Environment, November 2009.

2. **Measuring the global biodiversity impact of imported goods and services**
(*Please note: Research not yet completed – no web links to reports provided*)

Description of tool
Imported goods and services from a wide range of sources have the potential to bring about large-scale impacts on global biodiversity through mechanisms such as over-exploitation, land-use and habitat change, and pollution. The outcomes of this research project allow an improved insight into the links between trade, consumption and drivers of biodiversity loss.

The method developed uses a top-down approach, which can simultaneously assess the global production requirements of over 200 commodities for UK consumption of all goods and services. It provides information on the location of production of these commodities, along with associated environmental impact and biodiversity data. These data are then combined with in-depth case studies to explore the localised impacts of key commodities in more detail. This work provides a platform for the development of a 'Global Impacts' Indicator aligned with Aichi Target 4 of the Convention on Biological Diversity and future scenario work.

The method is applicable to all countries and therefore could be applied by different countries and comparisons would be possible.

Potential impacts of tool
Of the products analysed in the modelr, we can gain an impression of where in the world consumption form the UK may place the greatest pressure on resources, land use, water and biodiversity. High-level comparisons between the impact of UK demand and the availability of goods produced or land area on an international per capita basis demonstrate that the UK places a larger pressure compared to that available per person globally for some products and lower for others. This information may be useful for communication of the issue and understanding issues relating to particular products. Relating the UK demand to land area requirements and other environmental data, including water use, water scarcity, IUCN red lists, highlights those areas where key criteria of potential biodiversity loss may overlap. This overview can be supplemented by in depth case studies for more detailed conclusions and recommendations.

The tool could be used to give a time series, enabling an indicator to be developed to monitor progress on Aichi Target 4. There may also be potential to apply the methods to different possible scenarios (Futures Analysis) depending on different policy levers applied.

Adequacy and needs for further development

Currently there are few tools available to effectively measure progress or provide evidence on where and how to act in terms of policy to progress Aichi Target 4. The ecological footprint work goes some way in doing this but does not define the geographical area of impact. This method is one step towards assisting with this; in that it identifies where consumption may be having the greatest impact. However, the methodology could benefit from more work to explore how to model the biodiversity impacts, especially if a time series is to be developed from this work. The UK is currently exploring how this could be done and how the model could be applied to explore different policy scenarios. Further work may be needed to transfer the methods to other countries.

ANNEX 3

Scientific and technical needs identified in Defra's Biodiversity and Ecosystems Evidence Plan (the full plan can be found here: http://www.defra.gov.uk/publications/2013/03/26/evidence-plans/)

Policy outcomes (*Biodiversity 2020: A strategy for England's wildlife and ecosystem services*)	**Evidence objectives 2013 - 2018**	**Corresponding Aichi Targets**
1. Habitats and sites: more, bigger, and less fragmented areas for wildlife.	Collaborate with partners to test, monitor and evaluate new policy instruments including **Nature Improvement Areas and Biodiversity Offsets** and improve understanding of policy, institutional, social and economic barriers to more integrated approaches, including access to data.	1, 2, 5, 14, 19, 20
	Develop cost-effective methods to measure and map, and project future changes in, **habitat extent and condition**, ecosystem services, ecosystem resilience and ecological connectivity, and to understand the role of protected sites in those processes.	5, 7, 14, 15, 19
	Assess options for, or alternatives to **Countryside Survey,** and develop a collaborative approach for the next Countryside Survey with a focus on essential needs for biodiversity and ecosystems policy development.	5, 7, 8, 14, 15, 19
	Establish priorities and programme for assessment of trends in condition of **protected sites**, extent and condition of habitats, and provision of ecosystem services.	5, 7, 8, 11, 14, 15, 19
	Quality assurance of scientific evidence underpinning policy development and decisions on statutory designations and wildlife licensing	12, 19

2. Species: overall improvement in the status of our wildlife	Establish priorities and strategy for monitoring trends in **species populations** and improve the coverage, quality and accessibility and use of data on species for biodiversity and ecosystem assessment, targeting conservation action and better national and local decision making. Improve understanding of the reasons for declines in wildlife and impacts on ecosystem services (e.g pollination) so that actions to halt loss can be more effective. Identify critical gaps in monitoring species and develop cost-effective survey methods.	12, 19 8, 9, 12 12
3. People: significantly more people engaged in biodiversity, aware of its value and taking positive action	Collaborate with partners to monitor and evaluate **people's engagement** with the natural environment and understand what motivates different social groups, institutions, businesses and volunteers, and their attitudes, values and behaviours and develop tools to ensure any interventions are carefully targeted and cost effective. Determine what measures, tools, delivery mechanisms and information products/systems are effective at increasing motivation, **encouraging engagement and changing behaviour** and evaluate pilot studies. Develop and improve cost-effective techniques for measuring public engagement, social and economic benefits and valuation.	1, 2, 4
4. Reducing environmental pressures: protection	**4.1 Wildlife management:** Develop methods to resolve conflicts between wildlife and human interests where this is clearly in the public interest and with appropriate co-funding	12

and management of biodiversity is integrated in wider policy and decision making	Improve understanding of **public attitudes to wildlife management** and develop approaches to conflict management. Develop a strategic risk-based framework for identifying emerging wildlife management problems.	
	4.2 Non-native species: Improve understanding of the risks, costs, impacts (on biodiversity, ecosystems and our economy and well-being) and effectiveness of policies and regulation to control invasive non-native species (NNS) and provide analytical support in relation to EU Directive on Invasive Species. Develop cost-effective methods and strategies for control of NNS, including surveillance and rapid response. Understand interactions between invasive non native species and other non native species and our native biodiversity.	9 9
	4.3 Plant and animal disease, climate change and other pressures Improve understanding of climate change impacts on biodiversity and ecosystem services and develop approaches to adaptation Improve understanding impacts of ongoing and emerging pressures on biodiversity and ecosystem services including: plant and animal disease (e.g *Chalara fraxinae, Phytophthera spp*), air pollution, new technologies and identify mitigation options Improve understanding of the scale of current and future, and cumulative, impacts on biodiversity and ecosystem services of other policy objectives and **develop methods for integrated approaches** to the management of natural resources, including policies on sustainable food, flood management, greenhouse gas emissions, low carbon energy, water quality and economic growth.	5, 7, 14, 15 9, 12, 14, 15, 19

5. Improved implementation of the Habitats and Birds Directives for the benefit of economic growth and the environment	Determine what evidence on biodiversity and ecosystem services is needed to facilitate and direct nationally significant **infrastructure projects**, including through appropriate mitigation compensation and offsets Improve understanding of how different human pressures impact on favourable condition of **European Protected Species** and the methods, effectiveness and costs of mitigating these impacts	1, 2, 4, 5, 7, 12, 14, 15, 19 12
6. Supporting sustainable economic growth through the creation of new markets for green goods and services and greening existing markets, expanding the opportunities for UK business.	Evidence and analysis to support advice to Govt on opportunities for UK business to develop green markets, goods and services Evidence and analysis to enable and facilitate the development of **biodiversity offsets and payments for ecosystem services** that deliver investments in the natural environment. Understanding the links between housing development pressures, biodiversity and ecosystem goods and services (e.g. green space) in terms of evidence to support **Biodiversity Offsets.** Improve understanding of how to optimise biodiversity and **economic growth objectives**, identify ways to reduce barriers to growth and promote sustainable growth opportunities alongside the conservation and restoration of biodiversity. Evidence to improve understanding of the relationship between key **drivers of growth** (e.g. infrastructure, energy) and the natural environment and to stimulate investment in green infrastructure. Understand opportunities for UK business of implementing the **Nagoya Protocol** on Access and Benefit Sharing arising from the use of genetic resources.	1, 2, 3, 4, 20 1, 2, 3, 4, 20 1, 2, 3, 4, 20 1, 2, 16, 20
7. Developing ways to capture the value of	Evidence work on **ecosystems accounting** including development of two or three priority ecosystem accounts by 2014-15, and contribution to	1, 2, 19, 20

nature in the way we value our wealth as a nation, in order to put natural capital at the heart of economic thinking.	development of international guidance.	
8. Developing and embedding tools, and building the evidence base, to help decision-makers take account of the value of biodiversity and ecosystem services and secure the most benefits for biodiversity, **people and the economy from our ecosystems;**	Building on **the National Ecosystem Assessment** and other key studies break new ground in ecosystems valuation and tools for decision-makers Addressing data deficiencies e.g. for economic and social data to underpin **impact assessments** and decision-making e.g. data for valuing soil quality and undeveloped land Investigating the interactions and linkages between different ecosystems, scale effects, and options for the dissemination of **mapping and other spatial data** on ecosystem services Integrate long-term monitoring data to support an ecosystems approach Enabling knowledge sharing between local scale projects that are applying an ecosystem approach. Refining our understanding of ecosystem structure, function and valuation and developing practical tools to enable decision makers to secure the most benefits for biodiversity, people and the economy from our ecosystems. This will be achieved primarily by engaging with and influencing other evidence providers to join-up the evidence base, facilitating cross-cutting research, working with end-users and ensuring critical evidence gaps are addressed to **enable operational tools for applying an ecosystems approach** to be developed Critical evidence needs for tool development and decision-making include:	1, 2, 19, 20 1, 2, 19, 20 1, 2, 19, 20 1, 2, 19 1, 2, 19, 20

	○ evidence on resilience of ecosystems and ability to recover from disturbance, including thresholds and "tipping points"; ○ evidence on relationships between ecosystem services, biodiversity and function; ○ evidence on mechanisms that underpin supporting services and how these services respond to current and future drivers like climate change, land use and nitrogen deposition – developing sustainable management options for end-users; ○ developing guidance on methods, standards and criteria for measurement, mapping and monitoring of biodiversity and ecosystem services – including data interoperability, management and indicators; ○ addressing gaps on valuation (both monetary and non monetary) by taking forward new primary valuation studies and working with end-users to develop new valuation tools in different policy contexts; ○ developing approaches and techniques that enable a full range of social and cultural meanings and values to be integrated in biodiversity and ecosystems decision-making at a variety of spatial scales; ○ developing accessible tools and methods for end-users to design coherent ecological networks and resilient ecosystems and to guide adaptation to climate change and determine the most cost-effective methods of ecosystem restoration.	

9. UK effectively influences international and intergovernmental processes to conserve and enhance biodiversity around the world.	9.1 Enable **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** to be fully operational leading towards a future global assessment of biodiversity and ecosystem services, and contribute implementation of the EU Monitoring and Assessment of Ecosystem Services (MAES) initiative. Improved understanding of relationships between biodiversity, ecosystem services and human well-being and implications for policies on conservation, poverty alleviation and economic growth – support for **regional and global assessments** of biodiversity and ecosystem services, and capacity building to be undertaken by IPBES. Support UK objectives in the **Convention on Biological Diversity (CBD) and Convention on International Trade in Endangered Species** through the application of an improved and influential evidence base, including understanding economic benefits and costs of meeting the Aichi targets, global impacts of UK consumption, potential impacts of synthetic biology, and capacity building in developing countries (ongoing) (H). Support our commitments to the CBD, promote sustainable development and seek to maintain resilient supply chains by developing policy tools and capacity to support mainstreaming of biodiversity in Developing Countries Develop techniques to support regulation of trade in endangered species, including reliable and cost-effective methods for identification of specimens Improved methods for monitoring and access to global data on biodiversity and ecosystem services, including subscription to the **Global Biodiversity Information Facility**	1, 2, 3, 4, 19, 20 1, 2, 3, 4, 14, 15, 19 12 19

	Identifying where bilateral investments can add most value and have greatest impact and developing methods to evaluate outcomes.	
	9.2 Improve the evidence base in **UK Overseas Territories** to assist in meeting international commitments, in particular the control and management of invasive species	1, 2, 9, 10,
10. Implementing, monitoring & reporting Tracking the effective implementation of the Natural Environment White Paper in partnership with others, including, civil society, businesses and local communities.	Evaluation of **progress against Natural Environment White Paper Commitments** Evaluation **of progress towards *Biodiversity 2020* outcomes**, strategy actions and publication of annual indicator updates Reporting on UK Biodiversity Framework actions and support international reporting commitments including the 5th and 6th National Reports to the CBD and requirements under the EU Biodiversity Strategy Developing and establish long-term evaluation methods to measure the impact of **Local Nature Partnerships** and assess outcomes.	All targets 17 17, 19