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, 21st March 201.

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
c. Valuation methods
d. MAPISCO
e. NEA FO

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, 21st March 2013

Introduction

In response to Decision XI/13 in section B, paragraph 1 (a) (i) and subsequent request for information to the Parties, the United Kingdom has prepared this report to present collated and synthesized results from expert meeting that was held on the 18th March 2013. The aim of this meeting 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 expert meeting was distributed to members of the UK IPBES Stakeholder Hub; Biodiversity Indicators Forum; Authors of the United Kingdom National Ecosystem Assessment; United Kingdom Biodiversity Research Advisory Group; and Central and Devolved Government 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 meeting took the form of a workshop, which was broken down into groups that consider each of the Strategic Plan Goals. 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, which have been used to construct the basis of this 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 individual experts were given three votes per target, which have been used to identify priorities.

In addition, each group was also to identify any CBD priorities that may require the attention of IPBES. A separate breakout group reviewed the issues that may be considered in submitting a request to IPBES.

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.

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
There is a need for greater information that will assist in raising awareness of the benefits society obtains from biodiversity.	Data Observations	Global	Raises awareness and promotes the need for sustainable use.	Develop effective channels of communication. **Potentially delivered by IPBES**
Research need to ascertain how society values biodiversity, ensuring that non-monetary values are also included. Take into account how the links between the natural environment and human well-being will vary spatially and temporally.	Data Observations	Global	Provides an indication of how society values biodiversity that can be used to guide sustainable resource management.	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. **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, national, local.	Driving change toward sustainable behaviour.	Identify language to engage stakeholder groups. Develop effective channels of communication. Modify language and move away from using economic jargon to increase stakeholder buy-in. **Potentially delivered by IPBES**
Need to identify stakeholder demographic.	Data Observations	Global, Regional, Sub-regional, national, local.	Identify audience to direct effective communication tools that drive behaviour change.	Segment 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.	Produce guidelines to instigating 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	Global, Regional, Sub-regional, National	Better integration of biodiversity into national accounting.	Development of national accounting methods. Assess and further develop Defra guide to 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 to facilitate wider use.	Policy support tools	Global, Regional, Sub-regional, National	Better integration of biodiversity into national and local development and poverty reduction strategies and planning processes.	Review existing and develop novel tools. 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 operate within existing policies to counteract impacts of harmful subsidies.	Policy support tools	Global, Regional, Sub-regional, National	Minimise negative impacts on biodiversity from existing policies and identifying potential for reform.	Assessment.
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.
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.	Assessment.
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.
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 scientists to develop effective tools to achieve sustainable production and consumption.	Assessment and survey markets and business strategy and decision making. Ensure that information that effectively influences decision makers is available and communicated. 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.	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. **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 tools to measure short term change in habitats.	Research and development	Habitat, Ecosystem	This will improve monitoring as change will be detected quicker.	Remote sensing
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.	Assessment
Need for accurate habitat 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 across a large area.	Remote sensing
Need to understand the capacity limits of, or point at which, ecosystem processes change or become degraded.	Research and development Data	Regional, Sub-regional, National, Local.	Identify where to focus and deploy conservation efforts.	Assessment, surveys, modelling

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
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.

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.	Research and development Policy support tools	Sub-regional, Local	Improved engagement and management of land users, especially within industry.	Surveys and pilot studies
Improved 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.

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.

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	Reflect the complexity of threats that are impacting upon species and ecosystems.	Assessment
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.
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.

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 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, altered perspectives and ways of thinking.	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

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.	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 ecosystem health 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

Additional information relevant to Target 11:

- Need to assess what Ecosystem Services are provided by Protected Areas. This could be conducted at a regional, sub-regional, national or local scale and 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*).

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)
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 ecosystem health indicators. Identify links with key biodiversity variables. Ascertain focus areas. Determine whether differing regional approaches exist.
Collation of existing management processes.	Research and development Observation	Global, Regional, Sub-regional, National, Local.	Improved management of threatened species.	Publication of a document outlining governance mechanisms and how they impact on threatened species in different contexts.

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. This could be achieved by applying rapid assessment techniques to 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 safeguarding 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 safeguarding 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 how genetic diversity relates to the provision of ecosystem services and effectively articulate the benefits of genetic diversity as this may make it possible to assign values to genetic diversity and highlight the importance of genetic diversity in ecosystem service provision.
- 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 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. 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.). **This need could be taken forward at different spatial scales by IPBES.**
Need a better understanding of the link between ecosystems and services, 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.

				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.
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.

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,	Targeted resource mobilization to ecosystems where restoration would have greatest contribution to climate change mitigation and adaptation	Assessment, survey, pilots, adaptive management and monitoring.

		Local.	and to combating desertification.	
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.

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,	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

		Local.		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.

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.

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 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

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: **1.** Linking datasets across sectors, geographic boundaries and scales. **2.** Scaling data for use at a range of spatial units. **3.** 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: **1.** Measuring ecosystem function and health. **2.** Valuing biodiversity and how to deal with biodiversity which is difficult to value or appears to have seems to	Research and development	Global	Better application of biodiversity valuation.	Assess existing valuation tools

have little or no demonstrable economic value.				
Improved access to, and evaluation of, information: **1.** Open access publishing, including ways to help users assess quality of information. **2.** 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.

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 for biodiversity, and what is the link between spend 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 overarching information 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 to 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.

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