

GBIF Work Programme 2012-2013

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OVERVIEW

The new **Strategic Plan** for the period 2012-2016 (SP 12-16) sets out the framework for GBIF's third five-year phase, aimed at realizing the *vision of a world in which biodiversity information is freely and universally available for science, society and a sustainable future*; and the *mission to be the foremost global resource for biodiversity information, and engender smart solutions for environmental and human well-being*.

The Work Programme (WP12-13) presented here sets out the activities proposed for, and agreed by, the whole GBIF community, in pursuit of the three *interlinked Strategic Imperatives* to focus action from 2012 to 2016, namely to:

- **Advance the Digital Content** – through filling data gaps, enhancing fitness for use, ensuring compatibility and integration with future data types, and measuring data impact;
- **Advance the Informatics Infrastructure** – through expanding the distributed infrastructure, improving standards and interoperability and fostering community-developed standards, tools and services; and
- **Advance the Engagement** – through engaging a global GBIF community, strengthening Participant engagement and capacity, recruiting new Participant countries and strategic partners, and assessing stakeholder needs.

The Work Programme aims to guide the work and priorities of all those seeking to achieve and benefit from the GBIF vision and mission: the Participants, both national and institutional, the Secretariat and the wider biodiversity information community. The detailed activities and products envisaged for 2012-13, how they relate to the Strategic Plan and how they will be financed under existing budget projections, are set out in Sections 1 and 2 below.

To help focus priorities, key activities proposed for both the Secretariat and Participants, with timelines where appropriate, can be summarized as follows:

To advance the digital content

For Secretariat:

- **By mid-2012:**
 - a **reporting service** will be attached to the enhanced GBIF data portal, to analyse data gaps.
- **By early 2013:**
 - a **roadmap** will be developed for **accommodating new types of data**, especially genomic and ecological biodiversity data, so that GBIF complements but does not duplicate initiatives in these fields.
- **By mid-2013:**
 - **new options for cost-effective, mass-digitization of biodiversity data**, using latest technology and best practices, will be set out in a position paper.
- **By end 2013:**
 - **external data quality services** will be integrated into the GBIF network to enhance fitness for use, their impact will be evaluated and further improvements proposed;

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- **data publishers will receive feedback** from monitoring of the quality of data mobilized by the network
- **error detection and flagging, and an annotations service**, through enhancements to the data portal, will help guide users as to the quality of data accessible via the GBIF network.
- **best practice guidelines for citing biodiversity data** will be issued, and a **data citation service** will be integrated into the GBIF informatics infrastructure, enhancing incentives to publish biodiversity data.
- **an assessment of the impact of GBIF-mobilized data on the wider biodiversity informatics landscape** will be completed.

For Participants:

- **Strategies and action plans for data publishing** will be developed, including specific efforts to mobilize remaining unpublished data held in major natural history collections.
- **Content gaps** will be reported to the wider community through the participant reporting system.
- **Incentives for metadata publishing** will be enhanced by promoting initiatives such as **Data Papers** among networks of biodiversity data custodians within countries and thematic communities.
- **Best practices on monitoring and improving data quality** will be shared with the wider GBIF community.

To advance the informatics infrastructure

For Secretariat:

- **By end 2012:**
 - **major enhancements to the GBIF data portal** will be deployed, and improved through 2013, including richer content, faster processing and better flagging of errors and issues of quality.
- **By mid-2013:**
 - **comprehensive documentation of the GBIF systems architecture, data exchange standards, protocols, vocabularies etc.** will be completed, as an aid to integration and expansion of the network.
- **By end 2013:**
 - **the next generation of the Integrated Publishing Toolkit** will be launched and deployed, further enhancing the ability of Participants to publish biodiversity data and metadata through the GBIF network.

For Participants:

- **Identification of software gaps**, through the Nodes Committee, will aid the updating and completing of an **inventory of tools and services** by end 2012.
- Participants will **provide input for documentation of tools, standards and protocols, and improve interoperability through strategic partnerships** to position and integrate the informatics infrastructure.
- **By late-2012**, in collaboration with the Secretariat, a **Nodes Portal Toolkit** will be launched, aimed at helping Participants to set up national, regional or thematic data portals.

To advance the engagement

For Secretariat:

- *By late 2012,*
 - a significant overhaul of the website www.gbif.org will be completed, in order to substantially improve navigation and showcase news of data publishing, scientific/policy uses and community activities across the GBIF network; together with significantly enhanced communication and outreach resources and practices.
 - a 'BIF Start-up Kit' will be developed and delivered, to aid Participants in the setting up of national biodiversity information facilities.
 - a **Global Biodiversity Information Outlook** will be published, in collaboration with the wider biodiversity informatics community, and informed by the outcomes of a conference in mid-2012.

For Participants:

- Participants will establish and strengthen **regional priorities and collaboration networks**, and will help recruit new country Participants.
- Partnerships will be developed between Participants to **exchange skills, capacity and technologies**, for example through the Mentoring Programme and Capacity Enhancement Programme for Developing Countries (CEPDEC).
- Participants will actively contribute to the **BIF Start-up Kit**.
- Full use will be made of **communication channels and platforms throughout the GBIF network** in order to showcase stories on data publishing, scientific/policy uses and capacity enhancement.
- Participant countries and organizations will ensure that their representatives on the **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** are fully aware of the need for GBIF to complement the work of the new body, given the requirement for sound data, discoverable and accessible via globally-agreed standards, on which to base assessments for decision-makers.¹

Organization of the Work Programme

The WP12-13 includes a combination of ongoing activities from the 2011 Work Programme and its predecessors, to be continued, expanded and/or improved in various ways; and activities to address new areas included in the Strategic Plan. Both continuing and new activities will be **aligned to the three Strategic Imperatives and grouped into the products** and services designed to respond to them.

Thus, the WP12-13 adopts a different format from previous Work Programmes. **Section 1** summarizes how the first two years of the SP12-16 will be put into operation through investments relevant to the three Strategic Imperatives and their respective objectives. Because of the cross-cutting nature of these investments, **Section 2** describes five **Headline Products** which will support achievement of the aspirations of the Strategic Plan over its full five years; and

¹ A briefing on the potential relationship between IPBES and GBIF has been prepared by the Secretariat, and is available on request by contacting info@gbif.org.

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lists the **Component Products** (and services²) together with costed, time-specific **actions** proposed for 2012-13, to make them available to the GBIF community for uptake and use.

The five **Headline Products** (described in detail in Section 2) are:

1. **A simplified and extensible biodiversity data publishing framework** -- providing the incentives and facilities needed to encourage and enable publication of more, better quality and new types of data, accessible via the Internet;
2. **A Biodiversity Information Facility (BIF)-building package** -- offering Parties and organizations tools and best practice guidance for efficient publication, geographically and among thematic capabilities, in data publishing and sharing through the GBIF. Ensuring that data published through the GBIF.
3. **A Biodiversity Information Facility (BIF)-building package** -- offering Parties and organizations tools and best practice guidance for efficient publication, geographically and among thematic capabilities, in data publishing and sharing through the GBIF. Ensuring that data published through the GBIF.
4. **A Biodiversity Information Facility (BIF)-building package** -- offering Parties and organizations tools and best practice guidance for efficient publication, geographically and among thematic capabilities, in data publishing and sharing through the GBIF. Ensuring that data published through the GBIF.
5. **An ongoing assessment of the status of global biodiversity information** setting baselines, benchmarks and targets to measure progress in the wider lands-use in the field of biodiversity information.

It should be noted that many activities in the **Work Areas** will be provided by the GBIF.

The use of biodiversity information for individual Parties and dedicated metrics of metrics for three Strategic

areas needing adjustment, re-prioritization and appropriate investment, both for the current Work Programme and for developing subsequent Work Programmes.

HOW TO USE THIS DOCUMENT

SECTION 1 provides an overview of how the aspirations (Strategic Imperatives) of the Strategic Plan will be met and financed during 2012-13.

SECTION 2 provides a more detailed explanation of the products, processes and activities proposed for 2012-13. It shows how they combine into coherent products (the Headline Products) to be built over the full five years of GBIF's next phase in order to achieve our vision and mission.

SECTION 1 IMPLEMENTING THE STRATEGIC PLAN 2012-16: THE FIRST TWO YEARS

KEY to this section:

Headings relate to the Strategic Imperatives and objectives of the GBIF Strategic Plan 2012-16.

Numbers in red-bold (x.x.x) relate to a Work Programme activity whose cost is included in the total budget for the Strategic Plan objective where it is listed.

Numbers in green-italics (x.x.x) relate to a Work Programme activity also relevant to achieving that Strategic Plan objective, but whose cost is allocated elsewhere in the budget.

Please note that given their cross-cutting nature, many of the activities contribute to more than one objective of the Strategic Plan, and may therefore appear several times in this section. To avoid double counting in the budget table, the cost of an activity is allocated to the objective to which it contributes most significantly. The colour-coding is not meant to imply higher or lower priority.

1 ADVANCE THE DIGITAL CONTENT

Continuing to advance the digital content by mobilizing biodiversity data for free and universal use *is a primary responsibility of the GBIF Participants* and core to the GBIF mission. By 3rd Quarter 2011, the GBIF community had mobilized more than 300 million primary biodiversity records. Continuous efforts to improve the quality, quantity and scope of data must and will have equal priority, as ever-increasing data volumes are made accessible through the GBIF network. The types of data included in or integrated with GBIF's platforms will be expanded through collaboration with relevant standards bodies and communities. Advances in this area critically depend on a dynamic partnership between the Secretariat, GBIF Participants and their networks of existing and potential data publishers.

1.1 Quantity: Fill the data gaps

Summary of proposed actions towards this objective during 2012-13

Priority will be given to identifying and, wherever possible, filling current gaps - geospatial, taxonomic and temporal - in the biodiversity data accessible via the GBIF network. Actions include improving incentives for data holders to digitize and publish; identification of content gaps through feedback from the GBIF community and data users worldwide, in order to prioritize data mobilization efforts; and establishing a set of metrics to monitor progress towards achieving more representative coverage.

Specific activities associated with this objective include:

- a) Engagement with country Participants and thematic communities to develop strategies and action plans for data publishing, including specific efforts to mobilize the remaining unpublished data held in major natural history collections (1.1.1).
- b) Through an advisory task group, developing a GBIF position paper on new options for cost-effective, mass-digitization of biodiversity data, using latest technology and best practices, including lessons learned from past and existing initiatives, to help inform new Participants (1.2.4).
- c) Improving incentives to publish data through the GBIF network, including through strategic partnerships with scientific journal publishers on Data Papers (1.3.1), a best practice guide for citation of primary biodiversity data and development of a data citation service integrated into GBIF informatics infrastructure (1.3.2, 4.3.3).
- d) Identification of data gaps (taxonomic, geospatial, temporal) through interaction with the GBIF community and via a reporting service linked to the expanded Data Portal, in order to prioritize resources for mobilization of data (2.1.2, 3.2.1, 4.3.2).
- e) Expanding the Participants' capacity to fill data gaps through training, capacity building and helpdesk (2.1.2, 3.1.1, 3.2.3, 3.3.4).
- f) Liaising with target communities through strategic partnerships to fill data gaps (3.3.2).
- g) Improvements to the GBIF global registry, including enhanced deployment and uptake and registration of community developed services (4.2.3).
- h) Analysis of data gaps (taxonomic, geospatial, temporal) via a reporting service linked to the expanded Data Portal, informed also by scientific study by Secretariat staff and through external collaborators, to reveal such gaps, in order to prioritize resources for mobilization of data (4.3.2).
- i) Establishment of a set of baselines, 2016 targets and monitoring mechanisms relating to data gaps (5.1.1, 5.1.2)

1.2 Quality: Enhance fitness for use

Summary of proposed actions towards this objective during 2012-13

Additional mechanisms will be introduced to the GBIF data publishing system to improve error flagging, data annotation and enhanced attribution, all of which should improve fitness for use of data accessed through the Data Portal. In addition, data quality will be assessed and feedback provided to publishers. A set of metrics will be developed to monitor progress towards improving the quality of GBIF-enabled data.

Specific activities associated with this objective include:

- a) Integration of external **data quality services** to enhance fitness for use of GBIF-mobilized data, with particular emphasis on georeferencing, **monitoring of data quality** and provision of feedback to **data publishers**, including sharing of experience and best-practices developed by **Participants and data publishers for enhancing fitness for use (1.2.3)**.
- b) Maintain an **inventory of tools and services** that will help Participants to address issues related to fitness for use (2.1.1)
- c) Expanding the Participants' capacity to assess and improve data quality through training, capacity building and helpdesk (2.1.2, 3.1.1, 3.2.3, 3.3.4).
- d) Documentation of and development of guidelines on **data exchange standards, Persistent Identifier technologies, Knowledge Organization Systems (including vocabularies/thesauri/ontologies** and associated tools and services) in use by the GBIF network (4.1.2).
- e) **Enhancements to the GBIF Data Portal** to integrate richer information relating to **taxonomic content, attribution of data owners, error detection and flagging**, among other features (4.2.1).
- f) Improvements to the **GBIF global registry**, including **identifier resolution services and enhanced attribution** (4.2.3).
- g) Integration of an **annotations service** (both machine-generated and user-generated) into the Data Portal (4.3.1).
- h) Develop or adopt a **persistent identifier resolution service** (4.3.5).
- i) Establishment of a set of **baselines, 2016 targets and monitoring mechanisms** relating to fitness for use (5.1.1, 5.2.2)

1.3 Scope: Accommodate data futures

Summary of proposed actions towards this objective during 2012-13
Engagement will continue with relevant communities to ensure that standards for new data types are to the greatest possible extent interoperable with those used in the GBIF publishing system. A roadmap for accommodating new data types will be developed, and templates and tools refined to meet this objective.

Specific activities associated with this objective include:

- a) Reviewing and investigating mechanisms to **accommodate new data types**, for example **ecological biodiversity data, multilingual biodiversity data and genomic data**, engaging with new data publishing communities and developing a roadmap for accommodating these data (1.1.2, 3.2.1, 4.1.1, 4.1.2)
- b) With partners, refining data and metadata **templates and tools to accommodate new data types and publishers** (1.2.2)
- c) Collaborating with target communities through strategic partnerships to allow maximum data interoperability (3.3.2).
- d) Reviewing and reporting on **progress in the broader biodiversity information community**, including publication of a **Global Biodiversity Information Outlook** (5.2.1, 5.2.2).

1.4 Use: Measure data impact

Summary of proposed actions towards this objective during 2012-13
Measures will be developed to encourage and facilitate better citation of primary data in scientific research, making it much easier to monitor how data accessed through GBIF are being used. Pro-active communication of practical uses of GBIF-enabled data in a range of research and policy areas (e.g. predicting spread of invasive alien species, climate change impacts, protected area priorities) will help to inform key stakeholders of the utility of GBIF services, and provide additional incentives for individuals and institutions to publish biodiversity data.

Specific activities associated with this objective include:

- a) Developing **Data Papers** and a **Data Citation Service** to improve visibility of data use and thereby enable better measurement of its impact (1.3.1, 1.3.2, 4.3.3).
- b) Using the **GBIF communication platforms** to continuously inform the GBIF community about data impact, including regular news of scientific journal articles using GBIF-enabled data, use of such research in policy, and information resources enabling Participants to discover quickly how GBIF is being used in research involving their own countries' biodiversity and institutions (3.2.2).
- c) Providing a **reporting service on trends in data publishing and usage** (4.3.2)
- d) An **assessment of the impacts of data mobilized through GBIF** on the broader biodiversity information landscape. (5.1.3, 5.2.1)

2 ADVANCE THE INFORMATICS INFRASTRUCTURE

Major elements of the WP2012-13 concentrate on further improving the informatics infrastructure through which biodiversity data are published, discovered and accessed. In particular, the two years of the Work Programme envisage concentrated efforts to enhance the ability of country participants to develop their own Biodiversity Information Facilities (BIFs); a range of enhancements of the GBIF Data Portal in support of an improved global data discovery and access infrastructure; and further development of the Integrated Publishing Toolkit (IPT) to help facilitate a simplified and extensible biodiversity data publishing framework.

2.1 Expand the GBIF distributed infrastructure

Summary of proposed actions towards this objective during 2012-13
The two years of this Work Programme will see significant improvements in the entire informatics infrastructure developed by GBIF. An enhanced Data Portal, with richer content, faster processing of data and better error detection will be released in 2012. In addition, new tools are being developed to enable countries, regions or thematic groups to set up their own biodiversity data portals. Tools for data publishing will continue to be enhanced and upgraded.

Specific activities associated with this objective include:

- a) Following publisher feedback and prioritization, developing and launching the “next generation” of the **Integrated Publishing Toolkit**, further enhancing the ability of Participants to publish and document the data published through GBIF (1.2.1)
- b) Developing additional tools and support services, including **validation and visualization of the Darwin Core Archive (DwC-A)** and refining **templates and tools to accommodate new data types and publishers** (1.2.2)
- c) Maintaining an updated **inventory of tools and services** that will allow Participants to take the most appropriate decisions when building their own customized infrastructures (2.1.1)
- d) Expanding the Participants' capacity to build their own infrastructures through **training and capacity building** (2.1.2, 3.1.1, 3.3.4).
- e) Developing, testing, launching (by GB19) and rolling out a **Nodes Portal Toolkit** aimed at improving the technical ability of Participants to construct national, thematic or regional portals to enable the discovery of and access to biodiversity data (2.2.1, 2.2.2, 2.2.3)
- f) Providing a **BIF start-up kit** to Participants, which includes components to help them to build their national and thematic infrastructures (2.3.2).
- g) Improving the **distributed helpdesk system** to ensure that users of GBIF informatics tools are given adequate, timely support (3.2.3).
- h) Further enhancing the functionality and performance of the **GBIF Data Portal**, including richness of data content, error detection and flagging, speed of data harvesting and evaluation of user requirements; with launch of the expanded portal envisaged at GB19 in 2012 (4.2.1, 4.2.2, 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5).
- i) Enhancing the deployment and uptake of the **GBIF global registry** (4.2.3)
- j) Through new **baselines and targets**, monitoring the performance of the GBIF infrastructure for data publishing and discovery (5.1.1, 5.1.2, 5.1.3)

2.2 Improve standards and interoperability

Summary of proposed actions towards this objective during 2012-13

The Work Programme period will see full documentation of the standards, protocols and systems of organizing knowledge currently in use by GBIF. New systems will be evaluated and deployed to manage and organize the data published through GBIF. Collaboration and partnerships with a range of communities involved in biodiversity informatics will prioritize interoperability across systems and platforms.

Specific activities associated with this objective include:

- a) Investing in mechanisms for **accommodating new data types and data publishing communities**, thus contributing towards improving data standards and enhancing interoperability of the network (1.1.2)
- b) Collaborating with target communities through **strategic partnerships** to ensure maximum interoperability when developing/refining standards and services, including data exchange standards (3.3.2).
- c) Documenting the **GBIF systems architecture** as an aid to integration and expansion (4.1.1)

- d) Documenting data exchange standards, protocols, persistent identifier technologies, Knowledge Organization Systems (vocabularies, ontologies and thesauri) in use on the GBIF network (4.1.2)
- e) Evaluating and deploying a vocabulary and ontology management system (4.3.4) and a persistent identifier resolution service (4.3.5).
- f) Assessment of current biodiversity information landscape and uses, helping to inform future standards and interoperability (5.1, 5.2).

2.3 Foster community-developed standards and services

Summary of proposed actions towards this objective during 2012-13

Drawing on the wide reach of the GBIF worldwide community, collaboration and feedback will be solicited and acted upon, in the enhancement of publishing tools and services. This will include identification of software gaps through the Nodes Committee, enabling community contributions to the Integrated Publishing Toolkit, and assessing needs and opportunities through the Participants Reporting System.

Specific activities associated with this objective include:

- a) Enabling community contributions to enhancement of the Integrated Publishing Toolkit and development of other data and metadata publishing tools (1.2.1, 1.2.2)
- b) Identifying software gaps through the Nodes Committee and GBIF Community, updating and completing an inventory of tools and services (2.1.1)
- c) Assessing needs and opportunities arising from the community through assessment and feedback mechanisms (3.2.1)
- d) Ensuring continuous communication and collaboration within the GBIF community through the GBIF communication platforms to avoid duplication of efforts (3.2.2)
- e) Registration of community developed standards within the global registry (4.2.3)
- f) Collaborating with TDWG to provide services supporting, amongst other things, community development of vocabularies and ontologies for biodiversity informatics (4.3.4).

3 ADVANCE THE ENGAGEMENT

As the Strategic Plan makes clear, effective communication and deeper engagement with GBIF's global network and the wider community are essential for the fulfilment of the vision and mission. Significant expansion and enhancement of this side of GBIF's activities are included in the Work Programme products.

3.1 Engage a Global GBIF community

Summary of proposed actions towards this objective during 2012-13
This Work Programme period will see a concentrated effort to improve the communication of GBIF's activities to relevant audiences. Much clearer organization of the GBIF website, in parallel with enhancements to the Data Portal, will make it easier for data publishers, users, decision makers and the general public to get the information they need. Activities across the GBIF network will be better integrated into overall communications, and priority will be given to raising visibility of datasets entering the Portal, and the use of GBIF-enabled data in scientific research, policy and decisions.

Specific activities associated with this objective include:

- a) Engaging a global community through development of mechanisms and services providing incentives for publishing data (1.3.1, 1.3.2).
- b) Maintaining and enhance GBIF's communication platforms, including a significant overhaul and improvement of the public website www.gbif.org (3.2.2)
- c) Implementing a communications and outreach strategy, including media relations, promotion and international positioning, including targeted information to governments and intergovernmental processes to encourage greater recognition of GBIF's role (3.3.1).
- d) Organizing and promoting, in 2012, a Global Biodiversity Information Conference and Global Biodiversity Information Outlook, in order to brand GBIF as the global infrastructure for science-based primary biodiversity data, identify the major biodiversity informatics challenges and identify solutions (5.2.2).

3.2

- d) Development of **training manuals and texts**, and broad digital content for a biodiversity informatics **Virtual Classroom** (3.1.1).
- e) Enhancing capacity to mobilize, share, access and use biodiversity data by enabling the sharing of skills and resources between GBIF Participants, through continuation of the **Mentoring Programme** and the **Capacity Enhancement Programme for Developing Countries (CEPDEC)** (3.1.2, 3.1.3).
- f) Providing direct support to Participants in early stage of development (3.3.1).
- g) Supporting better communication and collaboration among Participant Nodes by setting up **regional sub-committee meetings**, as well as supporting regular meetings of the **Global Nodes Committee** and mid-term meetings of the **Nodes Strategy Group** (3.3.3).
- h) Setting up a **network of experts** to support the **internationalization of GBIF**, through **translation of key resources**, as well as to meet other capacity building and training needs. (3.3.4).
- i) Developing a well-documented **reference model of the GBIF informatics architecture**, thus helping Participants to plan and coordinate their in-country efforts to integrate with the global network, strengthening engagement and capacity (4.1.1, 4.1.2).

3.3 Recruit new Participant countries

Summary of proposed actions towards this objective during 2012-13

The objective set out in the Strategic Plan to recruit new GBIF Participants, especially from countries containing significant biodiversity resources and/or collections, will be a priority underlying many activities in the Work Programme. Communications will be specifically focussed and organized with this objective in mind. Clearer demonstration will be made of the benefits of GBIF participation and the advantages to the global community of wider and more representative data coverage.

Specific activities associated with this objective include:

- a) **Targeted outreach** to key potential Participants, under the communications strategy, clearly outlining the benefits of participation (3.3.1)
- b) Packages to enable the efficient building and enhancement of national biodiversity information facilities, thus increasing the benefits of GBIF participation (2.3.1, 2.3.2).
- c) Improvement of **communication platforms**, in particular the website www.gbif.org, more clearly setting out the work of GBIF and engage the interest of potential new Participants (3.2.2).

3.4 Recruit strategic Partners

Summary of proposed actions towards this objective during 2012-13

The period of the Work Programme will prioritize the development of Strategic partnerships covering a range of scientific and technical issues. They will be aimed at helping GBIF to fulfil our vision and mission in the fast-moving world of biodiversity information, ensuring that new types of data, policy needs and scientific applications are adequately served.

Specific activities associated with this objective include:

- a) Engage potential strategic partners by working with them to develop mechanisms to accommodate new data types. (1.1.2, 1.2.2).
- b) Prioritization of potential partnerships, a strategic partnerships framework and strategic applications for GBIF data and informatics resources (3.3.2).

3.5 Assess stakeholder needs

Summary of proposed actions towards this objective during 2012-13

GBIF will develop and improve a number of mechanisms for ensuring that its work in facilitating free and open access to biodiversity data remains an essentially demand-driven process. Stakeholders' needs will be tailored to their major roles as i) data publishers; ii) data users; and iii) official GBIF Participants, with the results guiding GBIF activities (as described by the Forward Look Committee report). There will be constant evaluation of and feedback on the various tools and services, including an improved Participant Reporting System. A significant development will be the organization of a Global Biodiversity Information Outlook, to help assess needs and establish priorities for investment in coming years.

Specific activities associated with this objective include:

- a) Inventory of GBIF tools, services, manuals and guides, based on identification of gaps by the Nodes Committee and GBIF community (2.1.1, 2.1.2).
- b) Evaluation of training, mentoring and CEPDEC capacity building programmes (3.1.1, 3.1.2, 3.1.3)
- c) Improvement of assessment and feedback mechanisms within the GBIF network, including improvements to the Participant Reporting System, the publication of Participant fact sheets and assessing thematic needs (3.2.1).
- d) Feedback from various committees and sub-committee meetings of GBIF Nodes (3.3.3).
- e) Establishment of advisory and analytical mechanisms to guide future enhancements to the Data Portal (4.2.3)
- f) The setting of comprehensive baselines and targets for the mobilization, publishing and use of data through GBIF. (5.1.1)
- g) A comprehensive evaluation report of WP12-13, with a view to guiding major priorities for the next Work Programme. (5.1.4)
- h) A review of progress in biodiversity information, and the Global Biodiversity Information Outlook, including assessment of needs from scientists, policy makers and wider society (5.2.1, 5.2.2).

WORK PROGRAMME 2012-13: BUDGET PROPOSAL

The table below provides the draft budget for implementing the Work Programme according to the three Strategic Imperatives in the Strategic Plan 2012-16. The figures are the combined operational costs (eg meetings, consultancies, travel for Participants) of all the activities mainly associated with each imperative, highlighted in red in the lists above. Also included are the salary costs of employment for those staff directly involved in implementing the Work Programme, broken down according to Strategic Imperatives in Annex 1.

	'000 €	
	2012	2013
Advance the digital content	205	240
Advance the Informatics Infrastructure	515	440
Advance the Engagement	280	240
Total external operational costs	1,000	920
WP Staff Implementation costs	2,000	2,080
Total GBIFS Expenditure Work Programme 2012-2013	3,000	3,000
<p>Note: The figures in this table do not include general running costs of the Secretariat, such as administrative staff and management facilities, costs of Standing Committees etc. These can be found in the full draft GBIF Budget Proposal circulated separately to all Participants.</p>		

SECTION 2: HEADLINE AND COMPONENT PRODUCTS FOR WP12-13, AND THEIR ASSOCIATED ACTIVITIES

None of these **headline products** are being started anew, but continue to expand and improve on the existing suite of products and activities which have been and are being invested in, and which encompass GBIF as an global network. WP12-13 thus builds on and from the Work Programme 2011, whilst comprehensively mapping across the new Strategic Imperatives (see Section).

It is important to note that all five **headline products** are intended to be invested in over the full five year period of the SP12-16, with individual **component products** and **activities** being variously started and completed within this period, and potentially adjusted in scope or priority according to the ongoing assessments.

For this reason, an introduction to each headline product here refers to the proposed outcome by 2016, followed by details of the budget and timeline for work on each component product and activity within the two-year timescale of this Work Programme.

Figure 1 (at end of this section) provides a visual summary of how each of the component products of the Work Programme contributes to the objectives of the Strategic Plan 2012-16.

1 HEADLINE PRODUCT: A SIMPLIFIED AND EXTENSIBLE BIODIVERSITY DATA PUBLISHING FRAMEWORK

By 2016, the GBIF network will be served by a comprehensive, simplified and extensible **biodiversity data publishing framework** that facilitates discovery and publishing of primary biodiversity data. It will enable discovery and access to fit-for-use primary biodiversity data. The impact will be determined by the efforts and investment in implementing local-to-global scale data publishing strategy and action plans by GBIF Participants and, potentially, the wider community. The framework will offer a set of incentives for all players engaged in data publishing activities, which aim to catalyse the necessary socio-cultural changes, in part by increasing the recognition of data publishing to give it the status of scholarly publishing.

Contribution to Strategic Imperatives:

- a) **Advance the Digital Content:** The biodiversity data publishing framework will result in increased discovery and accessibility of fit-for-use primary biodiversity data. It will contribute towards filling the data gaps (objective 1.1), enhancing fitness for use (objective

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- 1.2), exploring inclusion of new data types and engaging with different data publishing communities (objective 1.3), and providing incentives for data publishing and assessing data publishing potential of Participants (objective 1.4).
- b) **Advance the Informatics Infrastructure:** Through establishment of data hosting centres, the framework will contribute towards expanding distributed infrastructure (objective 2.1). By investing in mechanisms for accommodating new data types and data publishing communities, it will contribute towards improving data standards and enhancing interoperability of the network (objective 2.2). By enabling community contributions towards improving the Integrated Publishing Toolkit (IPT), and towards developing other data and metadata publishing tools, this headline product will contribute towards fostering community-developed standards, tools and services (objective 2.3).
 - c) **Advance the Engagement:** The framework will engage a global community (objective 3.1) through development of mechanisms and services providing incentives for publishing data. It will strengthen the capacity of Participants and potential data publishers (objective 3.2) by encouraging them to develop strategy and action plans for data mobilization and publishing. It will attract increased support and funding for expedited mobilization and publishing of primary biodiversity data, and help to engage potential strategic partners through mechanisms to accommodate new data types (objective 3.4).

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1.1 Component Product: Strategies and Action Plans for expediting and expanding mobilization and publishing of data

Activities 2012-13: Review the current state of the data publishing framework across the GBIF network. Encourage GBIF Participants and untapped thematic communities to develop demand-driven strategies and action plans for mobilization of data. Recommend innovative mechanisms to expand GBIF data coverage to accommodate new data types and data publishing communities. On the basis of these inputs and recommendations, develop a network-wide data publishing framework. Develop a strategic plan for expansion of data hosting infrastructure across the GBIF network, to facilitate mobilization and publishing of non-hosted data resources, and to support data publishers lacking infrastructure and technical capacity.

		€2012	€2013	2012				2013			
1.1.1 Data publishing strategy & action plans		10	10								
Engage country Participants to develop strategy & action plans	S/P			X	X	X	X	X	X	X	X
Engage thematic communities to develop strategy & action plans - including major natural history collections	S/P			X	X	X	X	X	X	X	X
Develop network-wide roadmap for biodiversity data publishing framework	S/P							X	X	X	X
Develop strategic plan for expansion of data hosting infrastructure across GBIF network	S/P							X	X	X	X
1.1.2 Mechanisms to connect with and integrate new data types		40	35								
Review and investigate mechanisms to ensure GBIF resources are compatible and interoperable with emerging standards for new data types (e.g. polygon based primary biodiversity data, ecological data, multilingual data, genomic data etc.)	S/P				X	X					
Develop roadmap for connecting with and integrating new data types	S/P						X	X			
Engage with new data publishing communities	S/P								X	X	X
TOTAL		50	45								

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1.2 Component Product: A suite of data publishing tools, infrastructure and documentation that support a range of data publisher requirements

Activities 2012-13: Develop, refine, and deploy a suite of data publishing, quality assessment and enhancement tools and supporting documentation encompassing the biodiversity data publishing community. The suite will ensure that data publishers have multiple options (depending on their level of skills, capacity and infrastructure) for easy mobilization and publishing of primary biodiversity data. Recommend innovative practices and foster technical developments to expedite collection, digitization, collation and publishing of primary biodiversity data across the GBIF network, drawing lessons from past and existing efforts for the benefit of new Participants.

		€2012	€2013	2012				2013			
		35	35	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.2.1 Next generation Integrated Publishing Toolkit											
Minor upgrade releases following 2011 release and deployment of IPT 2.0	S			X							
Publisher feedback, needs capture and prioritization for next generation IPT	S/P				X						
Roadmap for next generation IPT (including quality assessment & enhancement)	S/P					X					
Development of next generation IPT	S/P						X	X			
Testing, Refinement and Documentation for next generation IPT	S/P								X		
Launch (deployment and uptake by publishers) of next generation IPT	S/P									X	X
1.2.2 Data and Metadata Publishing Tools other than IPT		20	25								
Development and update of tools for validation & visualization of Darwin Core Archive (DwC-A)	S			X							
Refine templates & tools to accommodate new data types & publishers	S					X	X				
Consolidate publisher feedback, assess impact, and develop roadmap	S/P								X	X	
1.2.3 Data 'fitness for use' assessment & cleaning tools		30	30	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Integrate external data quality services to enhance fitness for use	S				X	X	X				

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of GBIF mobilized data (e.g. BioGeoBIF)											
Launch integrated external services	S							X	X		
Assess impact and develop roadmap for enhancing fitness for use of GBIF mobilized data										X	X
Monitor quality of data mobilized by GBIF network and provide feedback to data publishers										X	X
1.2.4 Expediting data digitization and mobilization		15	10								
Through advisory task group, develop GBIF Position Paper on 'Expediting primary biodiversity data digitization and mobilization through the GBIF network'	S					X	X	X	X		
TOTAL		100	100								

GBIF Work Programme 2012-2013

1.3 Component Product: Data publishing incentive mechanisms

Activities 2012-13: On the basis of the recommendations of the **Data Publishing Framework Task Group**, develop, deploy and ensure uptake of incentive mechanisms and services by Participants and publishing communities. Ensure mainstreaming the **Data Paper** as a mechanism to incentivize authoring and publishing of enriched metadata documents, including strong involvement of Participants to maximize buy-in from publishers. Develop **data citation mechanism & services** to ensure attribution to all players involved in the data publishing life cycle, informed by continuing active engagement with other relevant initiatives such as CODATA Data Citation Task Group and DataCite.

		€2012	€2013	2012				2013			
1.3.1 Data Papers to incentivize data discovery		20	15	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Develop roadmap for mainstreaming the Data Paper mechanism	S/P			X	X						
Strategic Partnerships with journals for introducing the Data Paper mechanism	S/P					X	X	X	X	X	X
Develop roadmap for 'Biodiversity Data Journals'	S/P									X	X
1.3.2 Data citation mechanism & services		20	0								
Best practice guide for citation of primary biodiversity data	S/P			X							
Develop prototype of 'Data Citation Service' ver.1.0	S				X	X					
Consolidate community feedback, develop implementation plan	S/P						X	X			
Integrate 'Data Citation Service' ver. 1.0 into GBIF informatics infrastructure	S								X	X	X
TOTAL		40	15								

TOTAL, HEADLINE PRODUCT 1	2012	2013
	190	160

2 HEADLINE PRODUCT: A BIODIVERSITY INFORMATION FACILITY (BIF)-BUILDING PACKAGE

By 2016, the BIF-Building Package will be a comprehensive set of tools, services and documentation to support Participants in the complex task of building national or supra-national facilities to manage and make use of biodiversity information. This set of resources will apply to all GBIF Participants for the consolidation of their BIFs. It will in particular benefit new Participants, giving them access not only to current resources but also to the experience and best practices built by the GBIF network worldwide over the past 10 years. GBIF Participants will be involved in the testing and uptake of the BIF-building package as well as contributing content for its ongoing improvement.

The BIF-Building Package will be organized and delivered to GBIF Participants in **three different modules**: the **GBIF Welcome Box** (launched in 2011 for new Participants), the **BIF Start-up Kit** (2012-13), and the **BIF Advanced Kit** (planned start in 2014). The BIF Start-up Kit provides the core documentation and access to tools to guide the early stages of development of a BIF, including technical, socio-political, operational, and scientific aspects and considerations. The **BIF Advanced Kit** is aimed at those biodiversity information networks or facilities that are already established and are in the process of consolidation or expansion. This kit will provide access to more specialized tools, as well as guidelines and documentation on the tools, techniques, and processes concerning the mobilization, publication and use of biodiversity data. The full contents of the BIF-Building Package will be made available via the Online Resource Centre (www.gbif.org/orc). Guidelines and recommendations for establishing a BIF will be provided, covering topics such as policies on open access to biodiversity data, developing strategies for data digitization and publishing, improving the fitness for use of biodiversity data, and staffing and governance structures for BIFs. In addition, the BIF-Building Package will include tools and technical documentation for setting up a customized BIF informatics infrastructure to support the publication, harvesting, indexing, access and use of biodiversity data on the national, regional or thematic level. This will include the ongoing community-led development of a Nodes Portal Toolkit (NPT), a suite of informatics tools designed to help GBIF Participants to deploy, maintain and extend biodiversity data portals.

Contribution to strategic imperatives:

- a) **Advance the Digital Content:** The BIF-Building Package includes all the elements to support the implementation of a customized biodiversity data publishing framework, enabling Participants to be more effective in their data discovery and publishing (objective 1.1). By encouraging Participants to take up recommendations from expert groups across the network, the BIF-Building Package will also promote measures to improve the fitness for use at the Participant BIF level (objective 1.2).

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- b) **Advance the Informatics Infrastructure:** Those GBIF Participants setting up their own informatics infrastructure will have access to a diversity of options as part of the BIF-Building Package, including the tools, the documentation and the best practice guides that they need for successful implementation (objective 2.1). The community-led development of tools for the BIF-Building Package, such as the NPT, will leverage capacity from the global GBIF informatics community to advance biodiversity informatics (objective 2.3).
- c) **Advance the Engagement:** The facilities built by Participants using the BIF-Building Package allow them to meet their own information management needs, and actively participate in international initiatives such as GBIF. This headline product will thus build capacity among new Participants (objective 3.2) and enable fast, effective improvement of their biodiversity data management activities that may encourage non-members to join the GBIF initiative (objective 3.3). The BIF-Building Package will use the GBIF collaboration platform to assess its effectiveness and continuously adapt its contents to users' needs (objective 3.5).

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2.1 Component Product: A comprehensive set of software tools, services and documentation for building BIFs

Activities 2012-13: Complete, update and improve the inventory of GBIF-compatible biodiversity informatics software and services, begun in 2011. Extend inventory from initial focus on GBIF-developed tools, to include mechanisms for involving the community in the identification of gaps and in the contribution of additional tools that can be integrated in the GBIF infrastructure. Include inventory in the Online Resource Centre, and customize for easy uptake and use by GBIF Participants. Continue to develop a comprehensive, step-by-step set of documents to guide GBIF Participants in the process of building, consolidating, or expanding BIFs at the national, regional, or thematic level.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.1.1 Updated tools and services inventory		10	10								
Identification of software gaps by the Nodes Committee	P			X							
Completion of the inventory	S/P			X	X	X	X				
Iteration for enhancements	S						X	X	X	X	X
2.1.2 Updated set of manuals and best practice guides		20	20								
Identification of content gaps and priorities by the GBIF Community	P			X				X			
Advertise the process for contributing contents	S			X				X			
Annual authoring of documents	S/P				X	X	X	X	X	X	X
TOTAL		30	30								

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2.3 Component Product: BIF-Building Package access and distribution

Activities 2012-13: Assemble and distribute **GBIF Welcome Box** for new Participants. Develop, assemble and distribute the **BIF Start-up Kit**, mainly targeted at the teams responsible for the design and initial implementation of a national, regional or thematic BIF.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.3.1 The GBIF Welcome Box		5	5								
WBox (2012 Edition) assembling and distribution	S				X	X					
WBox (2013 Edition) assembling and distribution	S								X	X	
2.3.2 The BIF Start-up Kit		10	10								
Feedback on 2011 Edition received and processed	P			X	X						
BIF Start-up Kit (2012 Edition) assembling and distribution	S				X	X					
BIF Start-up Kit (2013 Edition) assembling and distribution	S								X	X	
TOTAL		15	15								

TOTAL, HEADLINE PRODUCT 2	2012	2013
	190	130

3 HEADLINE PRODUCT: A GLOBAL COLLABORATION PLATFORM

By 2016, the GBIF community will be fully and actively engaged by means of a comprehensive yet flexible collaboration platform. In its current form, it provides GBIF stakeholders at all levels with access to improved opportunities and mechanisms for engagement, a consolidated capacity building programme, and a variety of network-wide communication and support services. This collaboration platform will continue to evolve based on a deep understanding of the diversity of GBIF's international network, its strengths and its needs. The main objective is to support and facilitate interaction between Participants, enabling them to achieve common goals that would be unattainable when working in isolation. It will also seek to engage wider understanding of and support for GBIF's activities through enhanced communication and outreach among diverse constituencies including policymakers, scientists, educators, non-governmental organizations, media and the general public.

Contribution to strategic imperatives:

- a) **Advance the Digital Content:** The public sharing of best practices and the exchange of expertise across the network will ensure a faster uptake of the optimal methodologies and tools for a more targeted mobilization of biodiversity data (objective 1.1). It will help to increase the overall level of quality of the information flowing through the GBIF network (objective 1.2). Assessing thematic needs across the network will facilitate engagement with new data publishing communities (objective 1.3). The collaboration platform also enables better assessment of how data accessed through GBIF are being incorporated into scientific research, policies and decisions (objective 1.4).
- b) **Advance the Informatics Infrastructure:** The collaboration platform enables the involvement of all the relevant stakeholders in the definition of the **needs and requirements** for the GBIF informatics infrastructure, an essential process to ensure that resources are invested in an optimal way (objective 2.3). It will also facilitate the uptake of new and established technologies as a permanent common effort towards international standardization (objective 2.1). Collaborating with target communities through strategic partnerships will help ensure full inter-operability when developing/refining standards and services, including data exchange standards (objective 2.2).
- c) **Advance the Engagement:** GBIF will not be able to achieve its objectives without close collaboration between its growing community of Participants and partners. The collaboration platform will support the expansion of the network (objectives 3.3 and 3.4), and the communication, collaboration and coordination processes that support joint endeavours and engage a broad range of stakeholders (objectives 3.1, 3.2 and 3.5).

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3.1 Component Product: A capacity-building programme

Activities 2012-13: Continue to support the GBIF community in gaining the knowledge required to fully participate in and benefit from GBIF. Build on existing experience in the network and provide the mechanisms for the easy sharing of that experience. Focus on providing the means for successful knowledge transfer and exchange. Maintain the annual training and mentoring programmes, and the GBIF CEPDEC³ programme, the permanent capacity-building framework for developing countries.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.1.1 Training programme		40	40								
Publication annual Training Plan	S			X				X			
Development of training manuals and texts	S/P			X	X			X	X		
Development of additional contents for the Virtual Classroom	S/P			X	X	X		X	X	X	
3.1.2 Mentoring programme		20	20								
Annual calls: issue, response and evaluation	SP			X				X			
Delivery of the grants	S				X				X		
Execution of the mentoring projects' activities	P				X	X	X		X	X	X
Submission of final reports	P							X			
General evaluation of the mentoring programme	S							X			
3.1.3 CEPDEC programme		5									
Contribution to the SEP-CEPDEC2 pre-proposal and proposal	S			X							
Best practices captured from SEP-CEPDEC	S			X							
Promote and explore further collaboration for other CEPDEC projects	S				X	X			X	X	
TOTAL		65	60								

³ Capacity Enhancement Programme for Developing Countries

GBIF Work Programme 2012-2013

3.3 Component Product: Network engagement and broader outreach mechanisms

Activities 2012-13: Facilitate a targeted expansion of GBIF and permanent engagement of existing Participants. Develop new strategic, scientific and technological partnerships across the biodiversity, conservation, genetic/genomic and ecosystem realms. Prioritize the expansion of country participation, particularly those that contain critical biodiversity resources and/or hold important biodiversity data in their institutions. Seek closer and more synergistic relationships with relevant intergovernmental processes such as MEAs (especially CBD), UN Secretariats and Agencies, GEOS and IPBES, among others. Ensure close collaboration and integration with other biodiversity data initiatives such as OBIS, CoL, ALA, BioCASE etc. Enhance understanding of and support for GBIF by improved outreach to diverse constituencies.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.3.1 A PR and Outreach Strategy		10	0								
Targeted outreach to key potential Participants	S			X		X		X		X	
Support to GBIF Participants in early stages of development	S/P				X	X			X	X	
Promotion, media relations and international positioning	S/P			X	X	X	X	X	X	X	X
Annual reports	S/P			X			X	X			X
3.3.2 Strategic Partnerships		30	30								
Prioritization of potential partnerships	S						X				X
Strategic partnerships framework	S			X		X		X		X	
Strategic applications	S			X	X	X	X	X	X	X	X
3.3.3 Nodes Committee activities		60	60								
Nodes Strategy Group mid-term meetings	P				X				X		
Global Nodes Committee Meeting 2013	P								X	X	
Regional Sub-Committee Meetings 2012	P			X	X	X	X				
3.3.4 A network to support the internationalization of GBIF		10	10								
Establishment and activation of the expert networks	P				X				X		
Translation of key resources by language networks	S/P					X	X			X	X
TOTAL		110	100								

TOTAL, HEADLINE PRODUCT 3	2012	2013
	240	200

4 A GLOBAL DATA DISCOVERY AND ACCESS INFRASTRUCTURE

By 2016, GBIF will support distributed discovery of, and access to, the content (both data and metadata) published through the next generation Integrated Publishing Toolkit and other means, through an infrastructure that is scalable, reliable, powerful, user-friendly and efficient. During this two-year Work Programme, current services will be enhanced to enable richer discovery and access, mechanisms will be integrated to improve and flag the quality of shared content, and enhancements will be made in the robustness and responsiveness of the underlying systems. Dedicated resources will be allocated to the thorough documentation of the informatics architecture to enable greater participation and engagement within the GBIF network, and to enable interoperability with other initiatives. Community developed standards, tools and services will be fostered. This headline product will help to ensure that GBIF's informatics infrastructure is adequate to meet the requirements of processes such as the CBD Clearing House Mechanism, GEOBON and IPBES.

Contribution to strategic imperatives:

- a) **Advance the Digital Content:** The discovery and access infrastructure includes services and means to establish and automate data trending to identify major taxonomic, temporal and geospatial gaps (objective 1.1). Richer metadata and flagging of data quality will enhance fitness for use (objective 1.2) and accommodation of new data types such as genomic and ecological level observations will allow Participants to address the rapidly-changing landscape of biodiversity data types and serve the future needs of data users (objective 1.3). A data citation service and a reporting service on trends in data publishing and use will enhance measurement of data impact (objective 1.4).
- b) **Advance the Informatics Infrastructure:** This work programme will provide increased discovery and access to data (objective 2.1) by improving the functionality and performance of the GBIF Data Portal. Thorough documentation of the GBIF system architecture and of the exchange standards and protocols will facilitate interoperability and expansion of the network while tools and services to support Knowledge Organization systems will contribute to improvements in standards and interoperability (objective 2.2). Registration of community developed services and standards in the GBIF registry will facilitate uptake by the global biodiversity community, and collaboration with TDWG will strengthen the availability of robust services for management of vocabularies and ontologies for biodiversity informatics. A stronger focus on collaborative development through open source projects will promote wider community participation (objective 2.3).

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- c) **Advance the Engagement:** A dedicated focus on documenting the informatics architecture will ensure the widest possible participation at all levels of the global infrastructure. A well documented reference model of the GBIF informatics architecture will help Participants to plan and coordinate their in-country efforts to integrate with the global network, strengthening their engagement and capacity (objective 3.2).
An advisory mechanism will be established to help direct the infrastructure developments, thus engaging the global GBIF community and assessing stakeholder needs (objective 3.5)

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4.1 Component Product: A reference model for the biodiversity informatics architecture

Activities 2012-13. Develop a reference model for the biodiversity informatics architecture, enabling all GBIF Participants to understand how the various components in the network fit together to create a global platform supporting interoperability across disparate, distributed resources. Fully describe the systems architecture, as well as data exchange standards, network protocols, Persistent Identifier technologies and Knowledge Organization Systems (i.e. vocabularies, thesauri, ontologies), thus supporting unified discovery, access and integration.

	S/P	€2012	€2013	2012				2013			
		20	20	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.1.1 GBIF systems architecture overview											
Document the GBIF systems architecture including the core data model and all major components of the network such as the registry, harvesting and indexing sub-systems (of data, checklists, metadata), and web services.	S/P			X	X	X	X	X	X		
Develop white paper on role of emerging general semantic models for biodiversity observations (e.g., OBOE ⁵) in GBIF architecture	S/P									X	
Develop a future directions overview						X	X				
4.1.2 Exchange standards and protocol guidelines		20	20								
Document the data exchange standards and protocols deployed on the GBIF network for data and metadata	S/P				X	X	X				
Document the Persistent Identifier technologies, tools and services in use on the GBIF network	S/P							X			
Document the KOS technologies, tools and services, and the main vocabularies/thesauri/ontologies in use on the GBIF network	S/P							X			
TOTAL		40	40								

⁵ <http://marinemetadata.org/references/oboeontology>

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4.2 Component Product: A gateway to the content within the GBIF network

Activities 2012-13: Further develop the GBIF Data Portal, enhancing its role as a unified gateway to discover and access the content shared through the GBIF network. Grow the range of its services to aid in discovery, access, visualization, derivation of metrics and improvement of quality throughout the network. Enhance deployment and uptake of the GBIF registry, serving as the primary coordination mechanism for the GBIF network and the external networks it connects to, for example by supporting the capture and resolution of the various identifiers used for the same entity, the modelling of relationships between Participants to provide correct attribution, registration of an expanded range of content types such as Participant Portals and external services, and integration with other dataset registry systems. Progressively integrate the Portal and registry with the other GBIF communication systems.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.2.1 Increased discovery and access to data*		100	100								
Improve integration of content during index building	S			X	X	X	X	X	X	X	X
Improvements in the richness of taxonomic and name based content	S			X	X	X	X				
Improve attribution of data owners	S			X				X	X	X	X
Improve error detection and flagging	S			X	X	X	X	X	X	X	X
Improve visualizations	S			X	X	X	X	X	X	X	X
Expand and simplify output format options	S			X	X	X					
Enhance metrics on access and content	S					X	X	X	X	X	X
4.2.2 Improved performance		100	80								
Incremental processing of indexes	S			X	X	X	X	X	X	X	X
Improved speed and frequency of harvesting	S/P			X	X						
Evaluate requirements to ensure robust and efficient services	S/P			X		X		X		X	
Monitor service performance levels	S			X	X	X	X	X	X	X	X
Update deployment of services	S/P				X		X		X		X
4.2.3 A global registry		50	50								
Enhanced deployment and uptake	S			X	X	X	X				
Identifier resolution services	S/P			X	X	X	X				
Enhanced attribution	S			X	X						
Improved services and interfaces	S			X	X	X	X	X	X	X	X

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Improved content	S/P			X	X	X	X				
Registration of community developed services	S/P					X	X				
Integrate with external registry initiatives	S/P			X	X	X	X	X	X	X	X
TOTAL		250	230								

* Metadata, name and primary biodiversity data

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4.3 Component product: Network services

Activities 2012-13: Develop and enhance the range of services within the Data Portal, including search, access, annotation, analytics, and citation. Collaborate with TDWG and other appropriate initiatives, to provide services supporting the governance, community development and maintenance of vocabularies and ontologies for biodiversity informatics.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.3.1 An annotations service			20								
Support machine generated annotations (applied at indexing)	S							X	X	X	X
Support user generated annotations (post indexing)	S/P			X	X	X	X	X	X	X	X
Evaluate existing initiatives on annotations, identifying opportunities to collaborate on common goals	S/P			X	X	X	X	X	X	X	X
4.3.2 An analytics service			20								
Provide reporting service on gaps in GBIF data coverage (taxonomic, geospatial, temporal)	S			X	X						
Provide reporting service on usage of GBIF data portal and services (access, downloads, etc)	S				X	X					
Provide reporting service on quality of data	S					X	X				
Provide reporting service on trends in data publishing and usage	S							X	X		
4.3.3 A citation service			20								
Provide a service for generating appropriate citation text for a dataset or combination of datasets accessed via the GBIF network.	S								X	X	X
4.3.4 Vocabulary and Ontology services											
Evaluate and deploy a vocabulary and ontology management system ⁶	S			X	X	X	X				
Offer versioned, published vocabularies	S/P						X	X	X	X	X
4.3.5 Persistent Identifier service **			10								
Develop or adopt a persistent Identifier resolution service	S			X	X	X	X	X	X	X	X
TOTAL			70								

⁶ Supported through external funding (EU ViBRANT project)

TOTAL, HEADLINE PRODUCT 4	2012	2013
	290	340

5 ASSESSMENT OF THE STATUS OF GLOBAL BIODIVERSITY INFORMATION.

By 2016, GBIF will have a comprehensive set of assessment and monitoring mechanisms in place. Understanding the 2012 baselines, the expected and realized targets of GBIF's work programmes over the 2012-2016 period will be critical. This product, complementing the Participants' Report, is envisaged as a tool to enable realignment of investments in the various areas of the Work Programme. It also aims to document progress in biodiversity information through the publication of a Global Biodiversity Information Outlook (GBIO) and organization of an accompanying conference. The GBIO is a critical cornerstone of the GBIF initiative since it will provide an up to date overview of the broad landscape of biodiversity information, and of the external environment within which GBIF must position its activities.

Contribution to Strategic Imperatives:

a) Advance the Digital Content:

The first component of this product will directly contribute to filling data gaps, improving fitness for use and accommodating new data types, by assessing baselines and then implementing a mechanism to measure progress towards agreed 2016 targets (eg for representativeness or quality of data) (objectives 1.1, 1.2, 1.3). It will also include an assessment of the use of GBIF-enabled data (objective 1.4).

b) Advance the Informatics Infrastructure:

The first component of this product will assess the GBIF informatics infrastructure, with a focus on the publishing and discovery mechanism. Starting from an assessment of the baselines in the beginning of 2012, the proposed activities will focus on implementing a mechanism to measure progress towards agreed 2016 targets (e.g. performance of the data publishing tools in place, indexing lag time from registration of resources up to discovery through the Portal, and other services). Particular attention will be given to monitoring the full pathway from data publisher up to the discovery of the content mobilized (objectives 2.1, 2.2).

c) Advance the Engagement:

The first component of this product will assess GBIF's engagement, with a focus on the use of the content mobilized, for example in scientific literature (objectives 3.1, 3.2, 3.3, 3.4, 3.5). An assessment of the full network is proposed for inclusion in the 2014-15 Work Programme.

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5.1 Component Product: Assessment of the Work Programme progress towards the 2016 targets

Activities 2012-13. Following good practice in organizations, establish regular assessment of progress towards targets, seeking to establish if investments, processes and outputs are proceeding according to the Work Programme. Regularly collect and analyse data to assist in timely decision-making and ensure accountability, providing the basis for evaluation and learning. Use evaluation report to determine as systematically and objectively as possible the relevance, effectiveness, sustainability and impacts of the activities in the WP 2012-13; provide valuable management information; and draw lessons for future actions and decisions, especially with regard to the 2014-15 Work Programme.

	S/P	€2012	€2013	2012				2013			
		20	20	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5.1.1 A set of comprehensive baselines and 2016 targets											
A set of comprehensive baselines and targets for the content mobilized (e.g. gaps and fitness for use)	S/P			X				X			
A set of comprehensive baselines and targets for the GBIF publishing and discovery frameworks	S/P			X				X			
A set of comprehensive baselines and targets for the use of GBIF mobilized data	S/P			X				X			
5.1.2 A monitoring mechanism toward 2016 targets		10	10								
Development of a collection of scripts to automatically assess baselines and progress towards 2016 targets.	S			X	X			X			
A yearly review on progress towards meeting the 2016 targets	S/P					X	X			X	X
5.1.3 An assessment of the impacts of GBIF		20	20								
An assessment of the content mobilized and the impacts on the broader biodiversity information landscape	S/P					X	X		X	X	X
An assessment of the data publishing and discovery frameworks and the impacts on the broader biodiversity Information landscape	S/P					X	X		X	X	X
An assessment of the use of GBIF mobilized data and the impacts on the broader biodiversity information landscape	S/P					X	X		X	X	X
5.1.4 A comprehensive evaluation report of the Work											

GBIF Work Programme 2012-2013

Programme 2012-13												
A summary report of the WP 2012-2013 achievements	S/P									X	X	X
A road map toward 2014-15 work programme highlighting major priorities.	S/P									X	X	X
TOTAL			50	50								

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5.2 Component Product: A Global Biodiversity Information Outlook (GBIO)

Activities 2012-13: Develop, with partners, a Global Biodiversity Information Conference and Outlook (GBIO) to identify and define (a) the current landscape and state of the art of biodiversity information; (b) the major challenges facing the biodiversity information community in the next decade; (c) develop plans on how to overcome these challenges, across the spectrum of scientific discovery from macro- to genomic biodiversity; and, (d) define the required knowledge base. Conduct a review of progress in publishing and discovery, content and data impacts in the broader biodiversity information community.

	S/P	€2012	€2013	2012				2013			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5.2.1 A review of the progress in biodiversity information		20	20								
A report of publishing and discovery mechanisms in the broader biodiversity information community	S/P			X			X	X			X
A report of data availability, quality and fitness for use in the broader biodiversity information community	S/P			X			X	X			
A report of the data impacts in the broader biodiversity information community	S/P			X			X	X			X
5.2.2 A Global Biodiversity Information Conference and Outlook.		20	20								
A biodiversity information landscape	S/P			X	X	X	X	X	X	X	X
A Global Biodiversity Information Conference and Outlook	S/P							X	X	X	X
TOTAL		40	40								

TOTAL, HEADLINE PRODUCT 5	2012	2013
	90	90

GRAND TOTAL (HEADLINE PRODUCTS 1-5)	2012	2013
	1000	920

GBIF Work Programme 2012-2013

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Component Product		1.1 Data mobilization strategies	1.2 Data publishing tools	1.3 Incentive mechanisms	2.1 BIF tools	2.2 Nodes Portal Toolkit	2.3 Package distribution	3.1 Capacity building	3.2 Comms and support	3.3 Engagement and outreach	4.1 Reference model	4.2 Data portal	4.3 Network services	5.1 Assessment mechanisms	5.2 Global Biodiversity Information Outlook
Advance the Content	1.1. Data gaps	X	X	X	X			X	X	X		X	X	X	X
	1.2 Data quality		X		X			X	X	X	X	X	X	X	X
	1.3 Data futures	X	X						X	X	X	X	X		X
	1.4 Data impact			X					X				X	X	
Advance the Informatics	2.1 Distributed infrastructure		X		X	X	X	X	X	X		X	X	X	
	2.2 Standards/interoperability	X								X	X		X	X	X
	2.3 Community developed standards		X		X				X			X	X		
Advance the Engagement	3.1 Engage global community			X					X	X					X
	3.2 Strengthen participant engagement and	X					X	X		X	X		X		

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	capacity														
	3.3 Recruit new countries								X	X				X	
	3.4 Recruit strategic partners	X	X							X				X	
	3.5 Assess stakeholder needs				X			X	X	X		X		X	X

Figure 1: Overview of WP12-13 contribution to the objectives of the Strategic Plan 2012-16
KEY: X indicates component product contributing most significantly to corresponding objective
 x indicates component product contributing partially to corresponding objective
 (HP = Headline Product)

Annex 1

Staff paid out of the GBIF core funds with key workloads in WP implementation and the maintenance of informatics services 2012

Content:

Electronic catalogue of names, checklists and Darwin Core publishing:
2 staff members

Digitization and data publishing:
1 staff member

Interoperability and standards:
1 staff member

Content assessment and science liaison:
1 staff member

Content total: 5 staff members

Informatics

Information systems architect
1 staff member

Development team (*Data Portal, IPT, Helpdesk etc.*):
3 staff members

Data portal management and systems analysis:
2 staff members

GBIF Internal systems - hardware - software:
Web-master - system administrators
2 staff members

Informatics total: 9 staff members

Engagement:

Communication and Engagement/outreach:
2 staff members

Participation, Nodes and Capacity building:

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3 staff members (one temporary and one on maternity leave)

Training:

1 staff member

Administrative to PO's:

1 WP support assistant

Engagement total: 7 staff members

WP total staff: 21 staff members (going back to 20 staff members during 2012)