

GBIF Work Programme 2011

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¹ all terms in the text marked by [†] appear in the Glossary

I Overview: GBIF Work Programme 2011

Introduction

The GBIF Plans 2007-2011 - including the strategic and the operational plans - have been implemented to date through two, two-year Work Programmes (WP 2007-08 and 2009-10). The WP 2009-10 introduced some key changes in the implementation of the Work Programme with the following key elements:

- *“An organisational Work Programme, based on the premise that GBIF is an organisation of highly diverse, yet like-minded Participants in that each sees benefits from pooling resources into building a ‘common good’. As such, the Work Programme imputes that, in its simplest form, the GBIF Secretariat is a service-provider to the client (the GBIF network[†] of Participants) who then take up the products and services for their own use.*
- *A summary of the overall strategies and larger-scale goals to be achieved by 2010 from across each Work Area coordinated by a Secretariat Programme Officer, as components of the overall organisational Work Programme.*
- *A clear indication of what is dependent on the Secretariat to implement, and what is dependent on resourcing, uptake and implementation by Participants, which together will enable attainment of the overall GBIF WP goals.”²*

In contrast to these two previous Work Programmes the 2011 Work Programme is developed for only one year as the current MOU expires at the end of 2011. 2011 should thus be seen very much as a **year of consolidation** of what has been carried-out in the WP 2007-08 and initiated and/or completed in the WP 2009-10. In addition, 2011 is also the year for preparing for a post-2011 ‘third phase’ of GBIF taking into consideration developments to date, changes in the external operating environment such as advances in IT, and the requirements and recommendations from the network of Participants which comprise the wider GBIF constituency. Thus it is also a **‘bridging’ year**. In order to facilitate continuity and understanding, the WP 2011 is aligned to the structure in the 2009-10 Work Programme³ and the related Secretariat Work Areas, despite ‘phasing-in’ some interim changes towards the post-2011 phase of GBIF.

Overall the WP 2011 is designed to complete many of the activities initiated during 2007-2010, in order to move GBIF Participants more fully ‘towards full operation’, based on the 2007-11 Plan. The WP 2011 thus again emphasises the need for investment in capacity, data mobilisation, infrastructure and uptake at the Participant level, in particular in building fully functional Biodiversity Informatics Facilities (BIFs) in order to benefit more fully from GBIF activities.

² From the WP 2009-2010 p2

³ For the complete description of roles and responsibilities for the Secretariat and the Participants in the new structure introduced in 2009 please review the GBIF WP2009-2010.

II Summary of the Work Programme 2011

The key deliverables by the end of 2011 (or earlier) are summarised in Table 1 below. The table clearly separates responsibilities for the Secretariat and for the GBIF Participants (please see following sections for full descriptions):

Table 1: Summarised Key Outputs by end 2011

Participation		
Nodes	Secretariat	<ul style="list-style-type: none"> • Nodes Committee activities supported, in particular the consolidation and formalisation of the Nodes Executive Committee (NEC); • An incentive scheme implemented to support regional activities of the Nodes Committee to be fully led by Participant Nodes; • Access to a wider range of documents and applications to support the development of Participant BIFs via the Welcome Box and the Online Resource Centre; • Mechanisms in place to promote and facilitate the participation of the Nodes community in the development and deployment of GBIF informatics tools and infrastructure, especially the Nodes Portal Toolkit; • A call for mentoring projects issued and implemented.
	Participants	<ul style="list-style-type: none"> • Full participation in the Nodes Committee[†] and through this contribute to implementation of the WP; • Regional activities planned, organised, and implemented, promoting regionally-led collaboration and coordination; • Success stories from national, regional or thematic BIFs documented and shared as widely as possible; • Contribute to the contents and further development of the Online Resource Centre[†]; • Invest in the development of fully functional BIFs, actively using the capacity building opportunities and technical assistance provided by GBIF to fast-track this process; • Active participation in the development and testing of the Nodes Portal Toolkit; • Active collaboration and sharing of expertise and technologies with other Nodes, especially via formal mentoring plans and CEPDEC projects.
Training	Secretariat	<ul style="list-style-type: none"> • Provide advice, coordination and generic materials to the GBIF Participants for their training initiatives; • Support and promote the regionalisation approach; • Complete and update information on GBIF training through the Online Resource Centre (ORC) for Training; • A continuously increasing set of training resources and e-training tools.
	Participants	<ul style="list-style-type: none"> • Active support of regionalisation; • Provide input, support and feedback in training initiatives, especially regarding populating the Annual Training Plans, the ORC for Training and the Virtual Classroom, and providing members for the Experts and Language Networks; • Promote the widest participation in GBIF Training and support the Train-the-Trainers approach.

Helpdesk	Secretariat	<ul style="list-style-type: none"> • Maintenance of framework and communication channels for distributed Helpdesk support; • An incentive system for on-site Helpdesk; • A specialised Helpdesk service.
	Participants	<ul style="list-style-type: none"> • Appropriate use of the different levels of Helpdesk; • Advertise their capacities and offer Helpdesk services to others whenever possible.
Outreach & Communications	Secretariat	<ul style="list-style-type: none"> • Significant growth and geographic balance in GBIF participation; • Key Participants identified and mobilised as Outreach Task Group to expand outreach activities; • Agreements signed with relevant MEAs to mobilise data and tools to assist countries to meet their MEA obligations; • Major conservation NGOs use and share data via GBIF ; • Develop and roll-out a comprehensive communication strategy; • Develop digital media products for various audiences - online videos etc.
	Participants	<ul style="list-style-type: none"> • Active participation in the Outreach Task Group to mobilise new Participants (countries, organisations, etc.); • Associate Participants move to Voting Participation; • Provision of relevant information on publications and use of GBIF-network information ; • Contribute to and use promotional materials on GBIF to raise funds for national needs and interaction with national stakeholders; • Use materials to promote GBIF to the widest possible audience.
Internationalisation	Secretariat	<ul style="list-style-type: none"> • An internationalisation strategy with three components: communications, resources and tools.
	Participants	<ul style="list-style-type: none"> • Input and feedback during the elaboration of the Internationalisation Strategy; • Active participation in the Language Networks; • Collaboration in the translation of resources and tool interfaces.
Strategic Applications	Secretariat	<ul style="list-style-type: none"> • Invest in Strategic Applications with partners using GBIF mediated data and/or database interoperability in addressing priority user needs.
	Participants	<ul style="list-style-type: none"> • Participate in projects in strategically relevant areas using GBIF mediated data and/or enhancing interoperability.
Informatics		
IDA	Secretariat	<ul style="list-style-type: none"> • A robust GBIF metadata catalogue system available; • A revised GBIF metadata profile; • Integration of the GBIF infrastructure as a foundation of GEO BON; • GBIF data portal providing a suite of OGC web services.
	Participants	<ul style="list-style-type: none"> • Uptake and deployment of the GBIF metadata catalogue system at the appropriate level, whether country, regional or thematic; • Provision of high quality, complete metadata for all datasets under their ownership and/or custodianship; • Active participation in review of position papers so that these

		correctly reflect GBIF Participant requirements.
DIGIT	Secretariat	<ul style="list-style-type: none"> • Assess the scientific data needs via constant interaction with the wider GBIF community; • Monitor and analyse the use of GBIF data in scientific publications and projects and contribute to a rolling Gap Analysis of GBIF mobilised data; • Analyse and operationalise the recommendations on 'science' from GBIF Task Groups and other relevant reports; • Coordinate the interaction with the different scientific, conservation and policy communities on scientific data needs and broker the development and delivery of key informatics products and services to address multi-stakeholder needs; • Analyse the scientific community/organisation landscape and initiate the development of a strategy for strategic partnerships 'for science'; • Best practice guidelines for demand-driven data discovery & publishing strategy and action plans; • Prototype development of data citation mechanism and data citation service; institutionalisation of 'Data Usage Index (DUI)'; • Institutionalisation of the 'Data Paper' as a mechanism for discovery of resources through enriched metadata; • Best practice guidelines for establishment, endorsement and monitoring of 'Hosting Centres', on data standards, quality assessment and control, data cleaning, etc.
	Participants	<ul style="list-style-type: none"> • Rapidly increase investments in and rate of data discovery, digitisation and publishing; • Uptake of GBRDS, IPT and metadata catalogue, and contributing to discovery of and publishing of 'fit-for-use' primary biodiversity data[†] records; • Uptake of Task Group recommendations; • Develop demand-driven data discovery and publishing strategy and action plans; • Adopt and implement the strategies for industrialising the mobilisation of primary biodiversity data; • Designate "Hosting Centre(s)" and actively engage in rescuing datasets; • Actively engage, promote and coordinate infrastructure and capacity building activities in-country or within thematic areas to ensure "fitness-for-use"[†] for a variety of users.
ECAT	Secretariat	<ul style="list-style-type: none"> • Flexible taxonomic data publishing solution that meets GBIF Participant needs; • Access to world's largest index of taxonomic classifications, catalogues and species checklists ; • Access to primary data in the GBIF portal via multiple classifications and species checklists; • Taxonomic name services that improve the quality of primary data published to GBIF; • Taxonomic tools that streamline data capture, data validation and the building of new species checklists.
	Participants	<ul style="list-style-type: none"> • Adopt and refine the GBIF taxonomic data standard; • Draft and internationalise vocabularies and data extensions using the Vocabulary Server;

		<ul style="list-style-type: none"> • Publish taxonomic catalogues and species checklists to GBIF; • Publish taxonomic identifiers for species that can be referenced by publishers of primary data; • Provide requirements for taxonomic tools and services for national/regional checklist building, data validation, and other uses; • Utilise GBIF taxonomic name services and tools.
Informatics Infrastructure and GBIF Portal	Secretariat	<ul style="list-style-type: none"> • Provide an Informatics suite of tools to meet Participants' needs; • Develop and roll-out a strategy for a distributed[†] GBIF network[†] infrastructure, including the required standards and customisable tools for data sharing; • Improve the GBIF Portal[†] with the inclusion and enhancement of discovery services for Metadata, Names and Primary Biodiversity Data to provide quicker and simpler access to content; • Prototype improved citation, annotation and the indication of fitness-for-use markers in the GBIF Portal.
	Participants	<ul style="list-style-type: none"> • Make use of the GBIF Informatics suite to optimise benefits; • Adopt the decentralisation strategy and mobilise investment in, and uptake thereof; • Index nomenclatures, metadata[†], and primary biodiversity data[†] within the new distributed[†] model; • Customise tools and services to meet own needs and also provide these freely to the network.

III Work Programme 2011 - Thematic Areas

The Work Programme 2011 has been developed in-line with the 2009-10 Programme around the two Thematic Areas: **Participation** and **Informatics**. Within each thematic Area, each Work Area gives a short description of goals, activities and key outputs to be achieved. The majority of activities has significant cross-sectional linkages within the Secretariat and across the network, thus it is important not to view a Work Area[†] in isolation but to see it as a component of the GBIF Work Programme as a whole.

1. Participation

The overall goal of the Participation Thematic Area is to increase participation in GBIF, by raising GBIF's profile, raising public awareness and engagement with external stakeholders, facilitating the meeting of Participants' needs and coordinating across the various Participation Work Areas[†] and with the components of the Informatics Thematic Area, thereby providing the basis for more coherent Secretariat-Participant interactions. The Participation Thematic Area covers the following Work Areas:

- a. **Nodes[†]**: Work directly with Participant Nodes[†] (including through the Nodes Committee[†]) to develop viable models for all Node levels. The focus is on assisting Participant Nodes to establish, manage, consolidate and expand functional biodiversity information facilities (BIFs) at the national, regional, and thematic levels. In addition to leading the development of tools and documents especially designed to support Participant Nodes, the Nodes Work Area offers several mechanisms to promote and facilitate communication, coordination and collaboration across the Nodes community.
- b. **Training[†]**: Work directly with Participants to understand their various capacity constraints and ensure that they receive appropriate guidance, support and training from the Secretariat and other Participants. Drives the development of a suite of e-learning[†] tools and curricula to complement face-to-face training, providing a comprehensive, easily accessible, customisable and user-friendly set of training materials in several languages for the Participants to build from.
- c. **Helpdesk Support**: provide prompt solutions to challenges encountered by GBIF Participants in the implementation of the GBIF Work Programmes.
- d. **Outreach[†] & Communications**: Drive a robust, more visible outreach and recruitment strategy built around the benefits from participating in GBIF. Key objectives are to build a balanced geographic spread of GBIF national Participants, together with a broad spectrum of non-country Participants amongst relevant international organisations. Develop a strategic communications and media portfolio designed to build GBIF's profile, grow the awareness of and participation in GBIF amongst countries, scientific institutions and others and particularly focused on customisable templates to enable Participants to develop in-country responses to needs analyses and provision of services.
- e. **Internationalisation**: develop a strategy that identifies and addresses the challenges that GBIF faces regarding the use of different languages in content, communication, resources and tools.
- f. **Strategic Applications**: Investment in applications with partners to demonstrate how the GBIF network data and/or online database interoperability can be used to provide answers to address some of the key conservation and biodiversity-related socio-economic questions faced by Participants.

1.1. NODES

Introduction

In 2011, the Nodes Work Area will strengthen the services and mechanisms developed by GBIF to support the implementation and management of functional Biodiversity Information Facilities (BIFs) nationally, regionally and thematically. The Nodes Work Area will also seek to promote and facilitate wider networking, through improved communication, collaboration and coordination across the Nodes community, contributing in this way to the further streamlining of the Node Managers Committee.

Vision

By the end of 2011, GBIF Participant Nodes will have access to documents, applications, capacity building opportunities, and expert support from the community to fast-track the implementation and ongoing management of fully functional BIFs. A consolidated Nodes Committee will facilitate improved coordination, communication, and collaboration among Nodes (as well as between Nodes, the Governing Board, the Secretariat, and other GBIF Committees). As a result Nodes will be able to more effectively contribute to and benefit from the overall implementation of the GBIF Work Programme.

Rationale

With the understanding that the establishment of a functional Node is the responsibility of each GBIF Participant, having access to the adequate technical assistance, guidance, documentation and tools for effective and efficient implementation is critical. The GBIF WP, particularly through the Nodes Work Area, seeks to ensure that such a level of assistance is available for any GBIF Participant at any stage of development, and that Participant Nodes[†] can share their capacity and expertise as participants of GBIF as a global network.

Strategy

The Nodes Work Area objectives are based on three inter-linked strategies (see WP09-10) focused on rapidly growing the active participation of Nodes as the key cogs in the decentralised[†] network:

- a) Increase the relevance of GBIF for its Participants*
- b) Make the work of Nodes simpler, easier, and faster*
- c) Promote Node-to-Node collaborations*

Goals and Activities

In 2011 the Nodes Work Area will comprise four key goals and seven primary activities:

Goal 1: Participant Nodes have the necessary visibility and are empowered to effectively participate in GBIF and obtain tangible benefits from such participation

Activity 1: Expand the role of the Nodes Committee, particularly through the formalisation of the Nodes Executive Committee (NEC)

The role of the Nodes Committee as an advisory body to the Nodes Community, the Secretariat and the Governing Board will be strengthened during 2011. Options to streamline the structure, functioning and role of this committee will be explored and implemented.

Activity 2: Support the regional activities of the Nodes Committee as a contribution to the decentralisation of the GBIF network and also as a way to empower Node Managers to participate more actively in GBIF

During 2011 Node Managers will have access to support funds for carrying out regional-level activities that will contribute to the regional uptake of the GBIF WP while helping to improve regional collaboration, communication, and coordination. The Secretariat will endeavour to have at least one representative present at regional meetings to provide support and communicate requirements back to the Secretariat to guide the implementation of the WP. This activity is a continuation of the strategy initiated in 2008, and pursued through 2009 and 2010 following the recommendations on regionalisation made by the Nodes Committee.

Goal 2: Participant Nodes have access to technical assistance, tools, documentation, training, and capacity building opportunities to facilitate their implementation and overcome barriers

Activity 1: Update and improve the contents and functionality of the GBIF Nodes Welcome Box (WBox)

A 2011 Edition of the GBIF WBox is released with improved structure, packaging and contents based on the learning from 2010. This WBox is distributed to all new Participant Node Managers to facilitate the process of establishing a Participant BIF. A web-based version of the WBox will be available through the Online Resource Centre for Nodes.

Goal 3: Promote and facilitate the participation of Nodes in the development, testing, and deployment of the GBIF Informatics Infrastructure

Activity 1: Continue the development of the Nodes Portal Toolkit (NPT) through a community-led approach

By end 2011 a functional version of the NPT will be available for testing. This version will provide the basic modules to enable the deployment and customisation of biodiversity data portals at any level.

Activity 2: Ensure active engagement of the Nodes Community in the planning and deployment of the GBIF Informatics Infrastructure

Continue the implementation of mechanisms to ensure that Participant Nodes are properly informed about and actively involved in the planning, development, testing, and deployment of the GBIF informatics infrastructure.

Goal 4: The expertise of Nodes and the services they provide are openly shared as a strategic component of GBIF as a global network

Activity 1: Grow the implementation of the Capacity Enhancement Programme for Developing Countries as a driver of collaboration across the GBIF network

The development of promotional materials on CEPDEC will assist in attracting and contacting future potential CEPDEC partners. Documentation about previous CEPDEC projects is compiled and made available to new CEPDEC partners to ensure that future projects capitalise on the lessons learnt and materials developed.

Activity 2: Facilitate the sharing of best practices, technologies, expertise and capacity among Nodes via the Mentoring Programme

Node-to-Node collaborations and partnerships are effectively promoted and facilitated by means of a well-established mentoring programme that complements the capacity building support provided by the GBIF Secretariat and the regional partners.

Budget

Goal / Activity		2011
Goal 1	Participant Nodes have the necessary visibility and are empowered to effectively participate in GBIF and obtain tangible benefits from such participation.	€ 80,000
Activity 1	<i>Expand the role of the Nodes Committee, particularly through the formalisation of the Nodes Executive Committee (NEC)</i>	€ 20,000
Activity 2	<i>Support the regional activities of the Nodes Committee as a contribution to the decentralisation of the GBIF network and also as a way to empower Node Managers to participate more actively in GBIF.</i>	€ 60,000
Goal 2	Participant Nodes have access to technical assistance, tools, documentation, training, and capacity building opportunities to facilitate their implementation and overcome barriers.	€ 15,000
Activity 1	<i>Update and improve the contents and functionality of the GBIF Nodes Welcome Box (WBox), including its web-based version available through the Online Resource Centre[†] for Nodes</i>	€ 15,000
Goal 3	Promote and facilitate the participation of Nodes in the development, testing, and deployment of the GBIF Informatics Infrastructure	€ 45,000
Activity 1	<i>Continue the development of the Nodes Portal Toolkit (NPT) through a community-led approach</i>	€ 45,000
Activity 2	<i>Ensure active engagement of the Nodes Community in the planning and deployment of the GBIF Informatics Infrastructure</i>	NA*
Goal 4	The expertise of Nodes and the services they provide are openly shared as a strategic component of GBIF as a global network.	€ 60,000
Activity 1	<i>Grow the implementation of the Capacity Enhancement Programme for Developing Countries as a driver of collaboration across the GBIF network</i>	€ 10,000
Activity 2	<i>Facilitate the sharing of best practices, technologies, expertise and capacity among Nodes via the Mentoring Programme</i>	€ 50,000
	TOTAL	€ 200,000

**NA (Non Applicable): These activities will be limited to coordination, facilitation or technical support from the GBIF Secretariat (using existing resources). Their scope could be expanded if additional funds are available. See also section 2.3 Informatics Infrastructure & Portal (IIP) for support to activities listed.*

Output by end 2011

By end 2011, the GBIF Participants will comprise a decentralised[†] global network facilitated by functional Participant Nodes[†], a critical mass of which actively help mobilise data, develop applications, build capacity, and contribute to the overall implementation of the WP. At least 60% of GBIF Participants will have and maintain functional Nodes[†], while the remaining 40% will be actively involved in the process of setting up and developing their own Nodes and biodiversity information facilities (BIFs).

The streamlined Nodes Committee[†] will effectively communicate Participants' needs, priorities, and expectations. As a result, Nodes will have ready access to the tools, documentation, and guidance to perform their duties and overcome barriers easily and cost-effectively. Such support will be coordinated by the GBIF Secretariat through regional partners and other Nodes, focussing on capacity building and help-desk functions at the regional level.

GBIF Participants will recognise the establishment of functional Nodes[†] as one of the most important tangible benefits from their participation in GBIF. Through a cascade effect, data holders and users will receive effective assistance from their respective Nodes to easily share, publish, and use biodiversity data.

Key GBIF Secretariat Outputs:

- Mechanisms in place to support the consolidation of the Nodes Committee, in particular through the formalisation of the Nodes Executive Committee
- Incentives to support regional activities of the Nodes Committee issued and implemented
- A GBIF Welcome Box distributed to all new and existing Node Managers during 2011. Access to key documents and tools included in the Welcome Box for supporting the implementation of Participant BIFs via the Online Resource Centre for Nodes.
- Activities to promote and facilitate the engagement of the Nodes community in the development and testing of the Nodes Portal Toolkit (NPT) in place
- A call for mentoring projects issued and implemented
- Strategies to build capacity in developing countries according to the CEPDEC framework

Key GBIF Participant / Network Outcomes / Contributions:

GBIF Participants provide the institutional and financial support required to establish and maintain functional Nodes[†]. Nodes therefore are expected to become the hub of BIFs that effectively serve the Participants' broadest biodiversity informatics needs, while contributing to the overall implementation of the GBIF WP. It is therefore expected that Participant Nodes[†] will, in close liaison with the Secretariat:

- Actively use the Nodes Committee[†] to help implement the WP in ways that appropriately reflect their needs, motivations, and expectations
- Lead the regional activities
- Effectively engage in the process of designing, developing, and deploying informatics tools, providing feedback on improvements to existing tools and gaps requiring new developments
- Design and implement strategies to address their end-users' needs via investment in BIFs
- Mobilise the technical capacity to engage and support data holders within their domain, assisting them with the implementation of GBIF informatics solutions and best practices to expedite the publication of relevant biodiversity content
- Actively contribute to improve and increase the contents of the Online Resource Centre[†] for Nodes by publishing success stories and sharing their own experiences, best practices, publications, training materials, etc.; Participant Nodes[†] use this resource centre as a primary source of GBIF-related documentation
- Actively establish Node-to-Node collaborations and mentorships, especially regionally; advanced Nodes readily share their capacity and help others in their implementation process

1.2. Training

Introduction

The concept of training in GBIF is gradually changing, adapting to the evolution that the organisation has experienced during its first 10 years of existence. The increasing number of GBIF Participants, the new data types published through the network, the innovative tools developed, the new avenues in the field of biodiversity informatics led by GBIF and the original ways of using, analysing and interpreting the data are challenges that the Training Work Area has to face. In spite of this, the basic pillar for this Work Area[†] remains the same: to enhance both the effectiveness and benefits of participation in GBIF.

Activities during 2009-2010 set a fresh approach in training based on regional collaboration and empowerment. To support this distributed model, the establishment of the first experts and language networks have been key. The Online Resource Centre for Training was launched in September 2009 and now gives access to scores of resources developed since GBIF's inception. In parallel, the foundations for a new concept for training have been firmly laid, with a strong internet component and based on a balanced combination of digital materials and interaction with skilled instructors and aims to deliver high-quality training to a large international audience. To support this, two new platforms were launched in 2010: a social platform to facilitate interaction among GBIF-related professionals (the GBIF Community Site) and an electronic learning facility in biodiversity informatics (the GBIF Virtual Classroom).

Vision

Training is a formalised component of core GBIF Participant activities and is perceived as one of the most tangible benefits of participating in GBIF.

Rationale

2011 will serve as a consolidation period for the new concept of training in GBIF as well as a preparation for the challenges that the third phase of GBIF and its new 2012-2016 Strategic Plan will bring. The concepts successfully demonstrated with early projects will be confirmed and expanded with the aim to cover the whole spectrum of GBIF-related topics and audiences in the near future. In parallel and aligning with the course for the future set by the Nodes Work Area and Nodes Committee regarding greater empowerment and autonomy of the different regions, 2011 will serve to start a pilot project of GBIF regional training, where a regional hub will lead long-term training programmes within its geographical scope.

These actions are expected to contribute towards the main objectives of the Training Work Area[†] set in late 2008: to increase exponentially the number of people benefiting from GBIF training activities and at the same time increase the awareness and the value associated with the GBIF training efforts.

Strategy

There are two clearly defined work lines in the Training Work Area of GBIF. First, to maintain and grow the current activities and to keep updated the platforms in place. Second is to continue the forward-looking developments described in the 'Rationale' section above.

Activities to continue:

- Develop and publish the Annual Training Plans for 2011, with input from the GBIF Community;
- Ensure that GBIF Participants receive appropriate support for their training initiatives;
- Continuously promote and support the regional approach and the autonomy of GBIF Participants in terms of training;
- Continuously update the Online Resource Centre for Training, especially the calendar of training events and the resources section;
- Ensure that appropriate training accompanies all new tools, infrastructures and initiatives by GBIF;
- Promote interaction and collaboration related to training and capacity building in the GBIF Community Site.
- Expand the languages in which GBIF training materials are available;

New activities/areas to reinforce:

- Expand the number of topics available in the GBIF Virtual Classroom;
- Promote the combination of on-site helpdesk and training activities;
- Expand the number of experts networks in order to cover all the topics included in the GBIF Training Plans;
- Expand the number of language networks;

Goals and Activities

The new Training Work area includes three key goals and nine primary activities.

Goal1: Support GBIF Participants in their training initiatives

Activity 1: Ensure that GBIF Participants receive appropriate support for their training initiatives while promoting the regionalisation of training

Ensure that the necessary support and guidance is provided both by the GBIF Secretariat and from other GBIF Participants and partners. Up to 4 regional initiatives will receive direct assistance by the GBIF Secretariat during 2011. Limited financial support will be made available to support regional participation in training events.

Activity 2: Populate the Online Resource Centre for Training

The contents of this facility will be expanded and kept up to date. No new functionality will be developed in 2011.

Activity 3: Support the use of multiple languages in GBIF training

The in-kind collaboration from the language resources networks will be both the main driver and the workforce for the production of training materials in different languages. This activity will provide limited support for the production of key documents in languages other than English when not covered by the network.

Goal 2: Development and execution of Annual Training Plans

Activity 1: Development and publication of Annual Training Plans

The Annual Training Plans are developed and published in the first quarter of every year. The contents are adapted to the needs expressed by the GBIF Community during the previous year and in the evaluation period set after their publication.

Activity 2: Develop contents for the GBIF Virtual Classroom

This includes all sorts of digital training materials to be published in the GBIF Virtual Classroom and in the ORC for Training. Among those, at least 1 complete eLearning course will be published during 2011. These materials will be used also for on-site training to complement the trainers work, and will include evaluation systems to measure their impact.

Activity 3: Expand the topics covered by the GBIF Training Manuals and booklets

The GBIF Training Manuals have been a valuable training resource that has served as a basis for many other initiatives. The topics available will be expanded with 1-3 new texts in 2011, according to the priorities defined by the other Work areas.

Goal 3: Promote the social component of training

Activity 1: Creation/activation of training experts and language resources networks

Ensuring that these networks are effective with an appropriate number of capacitated experts and that the requests made to them are properly attended are the main objectives of this activity. During 2011, up to 2 new language networks and one new experts network will be created.

Activity 2: Interest rising among training consumer groups

To make the most of the training initiatives led by the GBIF Secretariat and Participants, promotional materials and activities will be developed to ensure adequate participation and uptake by the community.

Budget

	Goal / Activity	2011
Goal 1	Support GBIF Participants in their training initiatives	€ 35,000
Activity 1	<i>Ensure support for Participants training initiatives and promote the regionalisation of training</i>	€ 20,000
Activity 2	<i>Populate the Online Resource Centre for Training</i>	€ 5,000
Activity 3	<i>Support the use of multiple languages in GBIF training</i>	€ 10,000
Goal 2	Development and execution of Annual Training Plans	€ 55,000
Activity 1	<i>Development and online publication of Annual Training Plans</i>	NA
Activity 2	<i>Develop contents for the GBIF Virtual Classroom</i>	€ 40,000
Activity 3	<i>Expand the topics covered by the GBIF Training Manuals and booklets</i>	€ 15,000
Goal 3	Promote the social component of training	€ 10,000
Activity 1	<i>Creation/activation of training experts and language resources networks</i>	€ 5,000
Activity 2	<i>Interest raising among training consumer group</i>	€ 5,000
	Advisory Task Groups	€ 10,000
	TOTAL	€ 110,000

Output by end 2011

By the end of 2011, it is expected that a solid social and technical basis for the execution of the GBIF Annual Training Plans will be in place, facilitating simple collaboration. All actors will have ready access to the relevant information and resources about training in GBIF no matter their location, resources and capabilities.

Digital and web-based materials will have increased relevance in GBIF Training, supported by the appropriate experts, in-site events and helpdesk when needed. New GBIF Participants will benefit from a fast launch of their training activities thanks to training inputs from appropriate experts and partners throughout the GBIF network.

Key GBIF Secretariat Outputs:

- Work with GBIF Participants to support their training initiatives;
- A comprehensive annual training implementation plan available;
- An Online Resource Centre[†] for Training ensuring that the most up-to-date information on GBIF training is always publicly available;
- A suite of training courses and on-line training resources to meet the needs of the GBIF Community;
- A common set of tools and standards, providing the means for the start of e-learning[†] activities and the production and sharing of contents for the GBIF e-learning[†] portals. The GBIF Secretariat maintains one of these e-learning[†] portals, with a global scope;
- Set-up, maintenance and activation of the expert and language networks;
- Metrics on the success of different training modules and approaches.

Key GBIF Participant / Network Outcomes / Contributions:

- Support the regionalisation strategy in training by opening training events for regional participation;

- Participate in the development of training materials adapted to their local, national and regional requirements;
- Participants and regional partners will take responsibility for assessing their training needs and mobilising the resources to meet these needs to fully benefit from GBIF. They will make use of the tools provided and/or promoted to develop their e-learning[†] initiatives and portals;
- Participate in the Online Resource Centre[†] for Training providing relevant information from their experiences and resources (training opportunities and events, resources available, etc.);
- Provide input and feedback in the development of the GBIF Annual Training Plans;
- Support the use and population of the Experts and Language Networks, ensuring that the people participating in those have the expertise, time and resources needed to best contribute to this common endeavour;
- Participants will promote the widest possible participation in GBIF Training activities, and support the *Train-the-Trainers* approach;
- Participants and users provide feedback on materials and their needs for the further development of the training portfolio, courses and materials.

1.3. Helpdesk Support

Introduction

One of the first services offered by the Secretariat was a helpdesk system where Participants could obtain help to solve the technical problems that they encounter when publishing data.

During 2010 the GBIF Helpdesk system was expanded from a limited centralised model to include a distributed system where experts from throughout the network can assist GBIF Participants and additionally help them to build local capacity. In 2010 the Distributed Helpdesk system was formalised as a permanent service of the network, coordinated by the GBIF Secretariat. The first test-case was linked to the deployment of the IPT.

This system will be expanded during 2011, both in scope (more topics will be included such as node management, additional IT tools) and capacity (more resources will be invested in this system). Reinforcing support to users on data retrieval, use and analysis will also be considered for 2011, subject to user demand and the spare capacity of the Secretariat and the experts on the field.

Vision

The GBIF Helpdesk system is an organisation-wide, sustainable mechanism to effectively support GBIF Participants to solve problems they encounter during the implementation of the GBIF Work Programme.

Rationale

The growth of the GBIF Network both technically and socially has been accompanied by a parallel growth in the challenges to solve. The initial Helpdesk system based on the capacity of the Secretariat is insufficient to cover these increasing demands in the growing network. The proposed distributed Helpdesk system builds both on the experience built in the GBIF Network as well as the decentralised ownership by Participants.

Strategy

In keeping with the broader distributed network model, the first remote Helpdesk line and communications (with the appropriate experts) will be channelled through existing platforms such as the training expert networks, the GBIF Community Site groups, the technical mailing lists and the different GBIF Committees. For those cases where remote assistance is not sufficient, limited financial support will be available for on-site help by experts.

The GBIF Secretariat will coordinate and facilitate these efforts, and will continue acting as a backup helpdesk, providing assistance for the more specialised cases. To optimise the impact of the Helpdesk services and expand the availability of expertise available to the network, Participants are expected to ensure that the recipients of the Helpdesk services build related local capacity.

Goals and Activities

The Helpdesk Support area includes one key goal and three primary activities.

Goal 1: A functional distributed Helpdesk system for the GBIF community

Activity 1: Helpdesk for Node Managers on the creation and management of BIFs

Sometimes Node Managers encounter emerging difficulties that have frequently been already encountered (and solved) by others. By formalising the Helpdesk System through the Nodes Committee and regional sub-committees, the more experienced Node Managers will be able to provide help to others to efficiently solve these issues.

Activity 2: Helpdesk for biodiversity data pre-publishing activities

Data custodians and publishers can greatly benefit from the help of others and from existing guidelines to address specific issues related to data capture, digitisation, management in internationally agreed standards, data discovery and publishing strategies and action plans development, integration of metadata and checklists/names resources, pre- and post-indexing support. Solving these problems without delay will expedite progress in the publishing of metadata and data through the GBIF network.

Activity 3: Helpdesk to support publishing software (IPT) and technical frameworks

As per 2009-2010 Work Programme, the Secretariat will continue its support to Participants in the uptake of the IPT in various scenarios (e.g. publishing of various data types). This activity in particular will focus on providing a remote and whenever possible an on-site support to Participants in the form of technical informatics Helpdesk or visits.

Budget

	Goal / Activity	2011
Goal 1	A functional distributed helpdesk system for the GBIF community	€30,000
Activity 1	<i>Helpdesk for Node Managers on the creation and management of BIFs.</i>	NA
Activity 2	<i>Helpdesk for biodiversity data pre-publishing activities</i>	€10,000
Activity 3	<i>Helpdesk to support publishing software (IPT) and technical frameworks</i>	€20,000
	TOTAL	€30,000

Output by end 2011

A simple, functional and stratified distributed Helpdesk system that allows GBIF Participants to receive prompt support to overcome difficulties that they may encounter in the implementation of the GBIF Work Programme.

Key GBIF Secretariat Outputs:

- Maintain the frameworks and communication channels where those requiring and providing Helpdesk support can get together and efficiently solve problems;
- Maintain an incentive system for on-site support related to distributed Helpdesks;
- Maintain a specialised Helpdesk service for the more difficult cases.

Key GBIF Participant / Network Outcomes / Contributions:

- Make appropriate use of the distributed Helpdesk when they encounter difficulties;
- Advertise their capacities and exploits using the Helpdesk framework;
- Actively participate as components of the distributed Helpdesk system and be ready to provide expertise to others experiencing difficulties.

1.4. Outreach and Communication

Introduction

By 2011, GBIF finds itself in a different environment to that in which it started operating ten years ago. Over the past decade, GBIF has evolved from concept to an international organisation with a truly global reach comprising at least 54 countries and 44 international organisations by the start of 2010.

GBIF therefore needs to be engaging pro-actively in beneficial partnerships and collaborative arrangements with conventions, institutions and like-minded groups. It becomes all the more important to reach out to different scientific communities, through science-related events and meetings to increase awareness and participation in GBIF.

Vision

By the end of 2011, GBIF is a widely recognised, respected and inclusive organisation with an effective, efficient and regionally balanced network of Participants and partners working in global partnership towards the advancement of science, conservation and sustainable development underpinned by biodiversity informatics.

Rationale

Communications and outreach form a crucial part of the GBIF growth and decentralisation model. Effective, targeted communications stimulates interest in GBIF which in turn secures high level outputs such as increased participation, discovery and mobilisation of data, geographic representation, increased investment, stronger international positioning and ultimately more effective delivery on the GBIF mandate on behalf of Participants.

The 2010 United Nations International Year of Biodiversity has provided GBIF with an unprecedented opportunity to raise awareness of GBIF and issues relating to biodiversity management, to position the organisation strategically, and to strengthen our network. By the end of 2010, Heads of State would have reviewed progress towards the achievement of the Millennium Development Goals, new biodiversity targets post-2010

under the CBD would have been identified, potentially a new scientific body on biodiversity (IPBES) established and a new climate deal proposed under the UNFCCC.

Although the core work remains the discovery and mobilisation of primary biodiversity data, GBIF's position within the larger multilateral world in 2011 requires of us to have broad relevance, communicate our value-add and partner with like-minded organisations and scientific communities that can assist in fulfilling the GBIF mandate. Effective communications and outreach becomes crucial and is possibly the area of the 2011 WP most focussed on the post-2011 phase.

On order to optimise the benefits provided by 2010, efforts in communications and outreach during 2011 must build on this momentum. At the same time, this includes consolidating efforts from the current programme of work such as the discovery and mobilisation of significantly more data, more and broader participation from countries across the globe, robust internal communication and outreach mechanisms and tools, a stronger position and brand for the organisation within the multilateral context and closer communication and collaboration with the existing network of Participants and stakeholders.

Strategy

1. Communicate the GBIF value proposition through a communications mix that is relevant, innovative and targeted in order to increase visibility and participation;
2. Build relationships with the media in order to communicate this message to broader audiences in an ongoing and institutionalised manner;
3. Support data mobilisation through international outreach efforts to ensure a broader geographic representation of participants and data mobilised.
4. Position GBIF strategically within the larger global community as a leader that supports global, regional and national decision-making on biodiversity management and sustainable development, through the communication of relevant applications and use-cases.

Goal 1: Strengthen communications with key audiences and stakeholders

Activity 1.1: Develop and implement an appropriate GBIF corporate communications mix that supports the GBIF Work Programme 2011 and the principles contained in the draft GBIF 2012 - 2016 Strategic Plan

GBIF, as international organisation, needs to communicate and reach out effectively to a number of different audiences. Selecting the appropriate mix of communications tools is of the utmost importance and must be evaluated in an ongoing manner.

Activity 1.2: Develop and roll-out a comprehensive communications plan

A comprehensive plan covering important events and opportunities, drawing on relevant materials and background documents such as agendas for meetings, audience mapping, and opportunities presented (side events, booth, etc).

Activity 1.3: Develop a diverse suite of multi-media products

Including tools to be used for various audiences, such as corporate videos, online tutorials, etc.

Activity 1.4: Publicise achievements and showcase uses of GBIF data, standards and related infrastructure

Link to key socio-political requirements, e.g. climate change, invasive alien species, gender, MDGs, etc. Produce new promotional materials that highlight the advantages of being a GBIF Participant.

Goal 2: Develop and maintain efficient and effective GBIF media relations

Activity 2.1: Initiate, develop and maintain contacts and relationships with selected media that could support communications and outreach on GBIF

Activity 2.2: Keep media updated on important GBIF developments, activities, achievements and products and services

Activity 2.3: Continually update the information and technologies of the official GBIF website (CMS) and other newsletters, communication tools, and others

Goal 3: Promote the engagement of new members and partners based on meeting their primary biodiversity data needs and other requirements that are in line with GBIF's mandate and work programme

Activity 3.1: A robust, efficient and visible international outreach and recruitment strategy

Build on the momentum gained through the 2010 UN International Year of Biodiversity and the benefits of participating in GBIF, increasing participation, drawing on the support of and giving support to the existing network of Participants to engage effectively in this activity.

Activity 3.2: Identify synergies and pursue collective agreements and working relationships with relevant MEA conventions and other key stakeholders

Build and grow formal relationships with the six environmental MEAs, plus relevant IGOs, major international organisations, NGOs and others to benefit from interaction, collaboration and participation in GBIF.

Activity 3.3: Develop strategic projects and use various international, regional and national events and international science meetings, workshops and conferences to increase awareness and participation in GBIF

Activity 3.4: Collaborate with key international organisations and strategic initiatives that could assist countries in meeting their national obligations with regards to biodiversity-related obligations

Goal 4: Position GBIF as a global leader and preferred partner on biodiversity management, conservation and sustainable development

Activity 4.1: Use the international calendar of events and other opportunities to promote GBIF activities and the broader relevance of our work as the basis for global outreach and positioning

Activity 4.2: Engage in relevant international events and organisations that could potentially increase the positioning of GBIF within the larger sustainable development community

Budget

	Goal / Activity	2011
Goal 1:	Communications: Strengthen communications with key audiences and stakeholders	€ 50,000
Activity 1	<i>Develop and implement an appropriate GBIF corporate communications mix that supports the GBIF Work Programme 2011 and the principles contained in the draft GBIF 2012 - 2016 Strategic Plan.</i>	€ 20,000
Activity 2	<i>Develop and roll-out a comprehensive communications plan.</i>	€ 5,000
Activity 3	<i>Develop a diverse suite of multi-media products.</i>	€ 15,000
Activity 4	<i>Publicise achievements and showcase uses of GBIF data, standards and related infrastructure.</i>	€ 10,000
Goal 2:	Media Relations: Develop and maintain efficient and effective GBIF media relations.	€ 5,000
Activity 1	<i>Initiate, develop and maintain contacts and relationships with selected media that could support communications and outreach on GBIF.</i>	€ 3,000
Activity 2	<i>Keep media updated on important GBIF developments, activities, achievements and products and services.</i>	€ 1,000
Activity 3	<i>Continually update the information and technologies of the official GBIF website (CMS) and other newsletters, communication tools, and others.</i>	€ 1,000
Goal 3:	Outreach, Retention & Recruitment: Promote the engagement of new members and partners based on meeting their primary biodiversity data needs and other requirements that are in line with GBIF's mandate and work programme.	€ 35,000
Activity 1	<i>A robust, efficient and visible international outreach and recruitment strategy.</i>	€ 20,000
Activity 2	<i>Identify synergies and pursue collective agreements and working relationships with relevant MEA conventions and other key stakeholders.</i>	€ 5,000
Activity 3	<i>Develop strategic projects and use various international, regional and national events and international science meetings, workshops and conferences to increase awareness and participation in GBIF.</i>	€ 5,000
Activity 4	<i>Collaborate with key international organisations and strategic initiatives that could assist countries in meeting their national obligations with regards to biodiversity-related obligations.</i>	€ 5,000
Goal 4:	International Positioning: Position GBIF as a global leader and preferred partner on biodiversity management, conservation and sustainable development.	€ 10,000
Activity 1	<i>Use the international calendar of events and other opportunities to promote GBIF activities and the broader relevance of our work as the basis for global outreach and positioning.</i>	€ 5,000
Activity 2	<i>Engage in relevant international events and organisations that could potentially increase the positioning of GBIF within the larger sustainable development community.</i>	€ 5,000
	TOTAL	€ 100,000

Output by end 2011

By the end of 2011, GBIF is recognised, respected and fully engaged within the larger multilateral world through a successful international outreach and communications strategy that delivers credible, high quality and user-oriented products and services developed through the GBIF network.

GBIF network infrastructure, GBIF-mediated data and analytical tools are relevant and used by a broad range of communities (scientific, decision-makers, conservationists, policy-makers, environmental planners and managers, etc.) and assist them to meet their needs. As a result, GBIF has increased significantly geographical presence and participation.

Based on assessed country needs GBIF is able to serve data that supports the national implementation of biodiversity-related conventions. GBIF products and services are relevant to the needs of key policy issues of the international community, as a result of which increasing numbers of countries and organisations seek to engage in GBIF.

Key GBIF Secretariat Outputs:

- A comprehensive and appropriate communications mix geared towards increased participation in GBIF is developed and implemented, continuously reviewed and updated;
- Updated and innovative materials, promotional work, activities and strategies to effectively communicate the benefits of becoming a GBIF member and as a result GBIF attain a significant increase in VP and AP membership;
- Data uses and members' achievements and experiences are widely publicised (web, newsletter, scientific events, congresses, etc) and promote a greater visibility and recognition of GBIF's work;
- A significant database of media contacts compiled and fruitful working relationships with selected agencies and journalists cultivated;
- Agreements are signed and targeted work plans implemented with biodiversity convention Secretariats (CBD[†], CITES[†], Ramsar, etc[†]) to mobilise data and tools that help meet national implementation needs and reporting obligations;
- Robust, professional and comprehensive suite of communications products and tools customised for various target audiences, including amongst Participants.

Key GBIF Participant / Network Outcomes / Contributions:

- Participants actively participate in the Outreach Task Group; Participants share their successful experiences in participating in GBIF which helps attract new Participants;
- Additional countries and relevant international organisations sign the GBIF MoU and assist with implementing the GBIF Work Programme;
- Associate Participants respond positively to a strategy for moving to Voting Participation during 2011 and facilitate visits at the governmental level where required;
- Participants proactively collaborate with the Secretariat in the identification of scientific data needs, priorities, and solutions;

- Participants mobilise and use GBIF-mediated data to address national needs particularly regarding the implementation of biodiversity conventions;
- Conservation NGOs use GBIF to share and use conservation-related data to achieve the goals of conserving and sustainably using the world's biodiversity;
- Provide ongoing, detailed and useful feedback on GBIF products and services to enable upgrades and customisation;
- Promote and support GBIF endeavours, in particular to raise additional funds from new sources;
- Play significant promotional roles in all interactions with key stakeholders, in particular in-country with national funding agencies.

1.5. Internationalisation

Introduction

GBIF is a diverse international organisation with membership spanning the globe. Unlike other international organisations, GBIF's budget does not allow for the professional translation of all its official communications and resources, and most of the efforts in this direction in the past have been led and supported by its Participants.

The contents transferred through the network (data and metadata) are also published in different languages and codifications. This implies challenges that start with data mobilisation planning and also affect data management by the technical platforms.

It is now time for GBIF to analyse the implications and challenges that internationalisation implies and propose viable strategies on how to address them during its third phase (2012-2016).

Vision

GBIF, as a true international initiative, has effective mechanisms in place to deal with multiple natural languages in its contents, communication, resources and tools.

Rationale

Providing access to resources, communications and events in multiple languages has proven to be a fruitful (and necessary) exercise in the past. Some of the surveys, courses and regional meetings had much greater impact when different languages were used or translators were present. Building on these successful experiences will be key when defining the internationalisation strategy proposed here.

Strategies

The first step will be to identify and analyse the challenges that internationalisation imposes on GBIF at various levels. The GBIF Internationalisation Strategy will review these, together with different alternatives on how to address them, based on successful initiatives in the past (when possible).

Goals and Activities

The Internationalisation area includes one key goal and four primary activities.

Goal 1: Define an Internationalisation Strategy for GBIF

Activity 1: Internationalisation in the GBIF Communications Strategy

The Communications Strategy defined in the 'Outreach and Communication' section will include a specific section on language in communications.

Activity 2: Internationalisation of selected GBIF resources

GBIF produces a significant amount of training and capacity building resources, available in the Online Resource Centre. Two Language Networks have already been set up and more are planned for 2011 to help make these resources available in additional languages. This activity will further explore how to expand this model.

Activity 3: Internationalisation of GBIF tools and technical platforms

The wide adoption and use of GBIF tools and technical platforms necessarily imply the translation of the interfaces into multiple languages. This activity focus on identifying means to ensure that a basic set of languages is covered.

Activity 4: Internationalisation in network contents

Data and metadata in multiple natural languages are already flowing through the GBIF network. A specific strategy needs to be developed on how to deal with this complex issue, how to manage these data appropriately and identify the implications in the mobilisation strategies and infrastructure design. During 2011 the basis for the strategy will be set, but it will not be further defined until 2012.

Budget

	Goal / Activity	2011
Goal 1	Define an Internationalisation Strategy for GBIF	€15,000
Activity 1	<i>Internationalisation in the GBIF Communications Strategy</i>	NA
Activity 2	<i>Internationalisation of selected GBIF resources</i>	€15,000
Activity 3	<i>Internationalisation of GBIF tools and technical platforms</i>	NA
Activity 4	<i>Internationalisation in network contents</i>	NA
	TOTAL	€15,000

Output by end 2011

A clear and realistic strategy on how GBIF can deal with internationalisation during its third phase (2012-2016), within its financial scope. The section on network contents will be completed in 2012.

Key GBIF Secretariat Outputs:

- An Internationalisation Strategy with three components: communications, resources and tools.

Key GBIF Participant / Network Outcomes / Contributions:

- Input and feedback during the elaboration of the Internationalisation Strategy;
- Active participation in the Language Networks;
- Collaboration in the translation of resources and tool interfaces.

1.6. Strategic Applications

As GBIF matures and Participants increasingly mobilise data, take up the tools and identify new applications requirements, it is imperative that GBIF be able to respond to expressed user needs for testing or designing new analytical functions and/or online database interoperability and integration. In 2009-2010 the strategic funds were used on high-level, promotional strategic applications using GBIF-mediated data, in particular to demonstrate their usefulness in climate change impacts modelling (See 2009 Annual Report). Funding permitting, in 2011 strategic areas of application that can demonstrate the use of GBIF-mediated data and/or database interoperability may be identified for investment.

Budget

	Goal / Activity	2011
	Strategic applications	€70,000
Activity	GSAP-NHC high-level Steering group; EIA data mobilisation project; CBD reporting application; possible 'science' think-tank; others	
	TOTAL	€70,000

2. Informatics

The overall goal for the Informatics Thematic area is a) to develop the full suite of IT infrastructure, architecture, services and tools to enable a fully-functional, scalable, distributed[†] network of Participants and b) to increase content by mobilising data, provide tools for improving quality data and use as well as including new types of data to ensure multiple user needs.

Prioritisation of developments is designed to accord with expressed priority Participant needs.

- a. **IDA[†]**: Focus at a higher (metadata[†]) level by facilitating the development of inventory tools and web services[†] to substantially improve the ability to discover and access relevant biodiversity datasets worldwide. Provision of improved dataset descriptions will foster user confidence in fitness-for-use[†] while standards-based services e.g. Open Geospatial Consortium[†] (OGC[†]) web services will enable interoperability; this metadata strategy includes the provision of simpler data publishing software for contributors to index, connect and share datasets.
- b. **Content**: Focus on improving the quantity, quality and usability of the data being indexed through the data portal, as well as to accommodate a greatly expanded variety of data types, in ways responsive to expressed Participant needs by:
 - b.1: **DIGIT[†]**: Catalyse the technical and socio-political mechanisms to assist Participants to mobilise the volume, depth and density of primary biodiversity data[†] to allow useful and credible analyses using the portal and web services[†]. Critical is the focus on developing the network's capacity to discover and mobilise a greatly expanded array of primary biodiversity data[†] types beyond specimen and observational records. It is imperative to institutionalise the 'data publishing framework' to raise the profile of data publishing on a par with scholarly publishing.
 - b.2.: **ECAT[†]**: Complete a fully-functional Global Names Architecture[†] (GNA[†]) comprising a comprehensive index of known organism names cross-referenced to a directory of authoritative taxonomic data. The GNA will enable all information (captured to the relevant standards within the GBIF network) relating to taxa to be discovered, accessed, and organised via the same principles by which taxa are organised.
- c. **Informatics Infrastructure and GBIF Portal[†]**: Based on ongoing feedback from Nodes on priority requirements, and incorporating the data types of both Content Work areas[†] (i.e. DIGIT & ECAT) and using IDA technical recommendations, the Informatics team will focus on improving the integrated data publishing tools and web services[†] to allow Participants to better access and use, and assess and improve the quality and fitness-for-use[†] of the data they serve and use.

The GBIF Portal[†] will continue to be developed and improved as the service front-end through the period of this Work Programme. It is through the portal that most users will interact with the GBIF network[†]. The portal is a significant IT infrastructure that manages the metadata[†] and data index for the whole network, and supports data

publishers[†] in getting their data online, and users accessing and downloading from across the network.

In moving more comprehensively 'towards full operation' of a fully distributed[†] network architecture, the key focus in portal improvement will be to enable customisation by Participants to their local needs, through appropriate and user-friendly tools comprising the Nodes Portal Toolkit (NPT). Particular focus will go on continuing to simplify the process of publishing data as well as to improve the indexing frequency of data.

2.1. IDA (Inventory, Discovery, Access)

Introduction

In meeting one of our core informatics challenges, that of designing a scalable, distributed architecture and implementing it according to best practices, GBIF must ensure that we adhere to international standards for data exchange formats and protocols (setting community standards where appropriate) to enable the maximum degree of interoperability across heterogeneous, distributed data holdings and applications. In addition, large distributed networks featuring numerous publishers and users of data require that the key activities of inventory, discovery and access are well coordinated through provision of registries and metadata catalogues. The IDA Work Area will continue in 2011 to drive the design of the GBIF metadata cataloguing system and its integration with the GBIF registry, inform developments across Informatics through recommendations on appropriate standards, in particular relating to vocabularies, and including those for geospatial web services, and ensure the GBIF network realises its potential as an essential component of the Group on Earth Observations Biodiversity Observation Network (GEO BON).

Vision

By the end of 2011, the metadata catalogue system and web services enable discovery of, and access to, primary biodiversity data on the GBIF network.

Rationale

To share biodiversity data effectively and facilitate re-use to meet the needs of a "Data Intensive Science" framework supported by a Global Data Infrastructure (as described, e.g., in the recent ESFRI Report on Data Management⁴) requires that high quality metadata descriptions are provided for datasets. Inclusion of metadata is thus a critical aspect of the data publishing process and requires a supporting informatics infrastructure for publishing and sharing metadata on the GBIF network. Key components of this infrastructure include the IPT (for publishing metadata) and the distributed GBIF metadata catalogue system, first deployed in 2010, to manage metadata resources.

Full participation in GEO BON requires that a distributed metadata catalogue for biodiversity resources and an operational capacity based on Open Geospatial Consortium web service standards are in place on the GBIF network. In addition, the GBIF network must expand to offer many types of web services for delivering data to users, and client

⁴ e-Infrastructure Reflection Group (European Strategy Forum on Research Infrastructures). Report on Data Management, November 2009. http://www.e-irg.eu/images/stories/publ/task_force_reports/dmtfjointreport.pdf

applications that can use the data in novel and specialised ways that supplement the mapping/visualisation and ecological niche modelling applications already available.

Underpinning both metadata and data services is the requirement for standardised terminology for describing biodiversity resources. A key task for the IDA Work Area in 2011 is to drive the community-based development of appropriate vocabularies and schemas.

Strategy

The IDA Work Area in 2011 will focus on consolidating and refining the distributed metadata catalogue system and web services, promoting the underlying standards and, . In particular, additional outreach and capacity building activities will be undertaken to ensure uptake by Participants. In regard to interoperability standards, the focus will be on documenting requirements as identified by IIP, DIGIT and ECAT Work Areas and facilitating development of new standards where required. Core focus areas will be:

1. Consolidation and refinement of the GBIF metadata catalogue system;
2. Facilitating development, adoption and deployment of biodiversity standards;
3. Provision of requirements for enhanced web services;
4. Coordination with other networks.

Goals and Activities

Goal 1: Develop the GBIF Metadata Catalogue System

The GBIF metadata catalogue system and associated services established in 2010 will be consolidated and refined through the following activities:

Activity 1: Develop the GBIF EML metadata profile and IPT metadata editor

Based on Participant feedback, scope enhancements to the GBIF metadata profile, ensuring that it meets their needs for describing datasets, collections and names data. In particular, to address issues around data quality and fitness for use, ensure that the metadata profile can adequately document: i) coordinate positional accuracy, ii) gridded data positional accuracy, iii) sampling effort. Provide requirements document to IIP. Scope requirements for expressing metadata in multiple natural languages and for enhancing the IPT metadata editor in line with an amended metadata profile or new user interface requirements. Provide requirements document to IIP.

Activity 2: Develop best practice guide for writing GBIF EML metadata

Liaise with Training Work Area (supported through Goal 2, Act. 3) on developing best practices guide on preparing metadata based on the enhanced GBIF EML metadata profile.

Activity 3: Implement and deploy GBIF metadata catalogue

Based on review of metadata catalogue deployment in 2010, implement and deploy new, revised catalogue system.

Activity 4: Develop the GBIF metadata catalogue network

Work with at least one GBIF Participant to enable an advanced, established metadata catalogue to connect to the GBIF metadata catalogue network. Provide requirements to IIP.

Goal 2: Facilitate development and deployment of standards

Work closely with the other Informatics Work Areas (ECAT, DIGIT, IIP) to ensure that requirements for new standards are documented, the standards are developed, and then deployed in support of greater interoperability across the GBIF network. In particular, facilitate, in response to community needs, development and deployment of vocabularies and ontologies for biodiversity data.

Activity 1: Scope requirements for a standard for annotating data/metadata records

Document requirements for a standard and associated mechanism for annotating data and metadata records as a means, e.g., of improving data quality. Provide requirements document to IIP.

Activity 2: Scope requirements for a standard for describing species distribution data

Document requirements for a standard to describe the significant attributes associated with a species distribution (i.e., based on a polyline or polygon geospatial feature type with associated properties). Provide requirements document to IIP.

Activity 3: Review geospatial web services in GBIF portal/network

Commission review of existing OGC web services as implemented by GBIF in 2010, highlighting issues and providing recommendations for enhancement, in particular around an observational model expressed in GML.

Activity 4: Commission a task group on primary biodiversity data associated with genomic data

Commission a task group to develop a report on dealing with the primary biodiversity data associated with genomic level observations (usually not tied to particular scientific names) ranging from current straightforward genomic sequences to the over-the-horizon environmental and ecological genomics data, liaising with Genomic Standards Consortium, GenBank, CBOL and other genomic initiatives as appropriate, and providing recommendations on data integration/interoperability.

Activity 5: Training workshop on persistent identifiers

Run train-the-trainers-workshop for data publishers on promoting awareness of identifiers; choosing and implementing persistent identifiers; technical and deployment issues.

Goal 3: Coordinate with other Networks

GBIF is not the only large-scale biodiversity informatics initiative. New projects and networks are continually being created. However, it is essential to encourage the adoption of common standards to ensure interoperability across the biodiversity domain. GBIF, as a relevant megascience initiative with a 10 year track record, is in a strong position to undertake a coordination role for the integration of biodiversity data and can draw on its experience to engage and collaborate with related initiatives.

Activity 1: Liaison with BIS (TDWG) and other standards bodies

Act as GBIF liaison for TDWG, serving on its Executive Committee, coordinating participation in the annual conference and promoting development of standards relevant and necessary for GBIF's work.

Activity 2: Participation in GEOSS / GEO BON

Coordinate GBIF participation in GEOSS, particularly the GEO Biodiversity Observation Network (BON), acting as co-lead of the GEO BON Implementation Plan Working Group on Data Interoperability.

Activity 3: Coordinate participation in relevant EU projects

Coordinate participation in relevant EU projects (e.g., EuroGEOSS, EMODNET), providing inputs as required to delivery of a distributed metadata catalogue system for biodiversity resources and operational capacity for delivering biodiversity data via OGC Web services.

Budget

	Goal / Activity	2011
Goal 1	Develop the GBIF Metadata Catalogue System	€25,000
Activity 1	Develop GBIF metadata profile and IPT metadata editor	€20,000
Activity 2	Develop best practice guide for writing GBIF EML metadata	€5,000
Activity 3	Implement and deploy the GBIF metadata catalogue	€0 ⁵
Activity 4	Develop the GBIF metadata catalogue network	€0 ⁶
Goal 2	Facilitate development and deployment of standards	€70,000
Activity 1	Scope requirements for a standard for annotating data/metadata records	€10,000
Activity 2	Scope requirements for a standard for describing species distribution data related to the vector-based geospatial feature types of polyline and polygon	€10,000
Activity 3	Review geospatial web services in GBIF portal/network	€20,000 ⁷
Activity 4	Task group on primary biodiversity data associated with genomic data	€15,000
Activity 5	Training workshop on persistent identifiers	€15,000
Goal 3	Coordinate with other Networks	€10,000
Activity 1	Liaison with BIS (TDWG) and other standards bodies	N/A
Activity 2	GEO BON implementation planning workshop	€10,000
Activity 3	Participation in EU projects EuroGEOSS, EMODNET	(EU Funded)
	TOTAL	€105,000

Output by end 2011

By the end of 2011, the GBIF Portal will offer a robust metadata catalogue integrated with the GBIF Registry and sharing metadata with other catalogues on the GBIF network.

GBIF will have become a key player as broker/integrator of biodiversity data through actively coordinating relationships with other major biodiversity networks. The standards to improve the sharing of biodiversity data both within the GBIF network and with other networks will be augmented and their uptake promoted.

⁵ Supplementary funding: Funded through the EU project, EuroGEOSS (€10,000)

⁶ Supplementary funding: Funded through the EU project, EuroGEOSS (€50,000)

⁷ Supplementary funding: Additional funding through the EU project, EMODNET (€10,000)

Key GBIF Secretariat Outputs:

- a robust GBIF metadata catalogue system;
- a revised GBIF metadata profile;
- positioning of the GBIF infrastructure as a foundation of GEO BON;
- provision of a suite of OGC web services via the GBIF data portal.

Key GBIF Participant / Network Outcomes / Contributions:

- uptake and deployment of the GBIF metadata catalogue system at the appropriate level, whether country, regional or thematic;
- provision of high quality, complete metadata for all datasets under their ownership and/or custodianship;
- active participation in review of position papers so that they fully reflect GBIF Participant requirements.

2.2. Content

2.2.1. DIGIT (Digitisation and mobilisation of primary biodiversity data[†])

Introduction

To achieve the GBIF second phase objective of moving 'from prototype towards full-operation' significant changes in the approach in the DIGIT (data capture, digitisation, mobilisation and publishing) Work Area[†] activities were introduced in the 2009-2010 Work Programme. The Governing Board at its 15th meeting in 2008, took on the challenge of discovery of datasets up to 5 billion records, and publishing of up to 2 billion data records by the end of 2010, based on the understanding that "full-operation" requires a volume, density, and coverage of data that would allow meaningful and useful analyses for all Participants as well as the fact that these volumes of data are known to be held amongst the Participants. Whilst achieving these targets required an exponential increase in discovery and mobilisation, to date progress across the network remains linear. Therefore, additional funds and resources must be mobilised, and innovative approaches implemented together with commitments at all levels of the data publishing cycle by Participants if the agreed targets are to be achieved in 2011.

Vision

By the end of 2011, as a result of demand-driven discovery, digitisation, and publishing of 'fit-for-use' primary biodiversity data the GBIF network enables Participants to make more effective decisions regarding management and use of their biodiversity.

Rationale

Currently, approximately 200 million primary biodiversity data[†] records are indexed through the GBIF network[†], the majority of which are observation records. With the majority of data publishers[†] and datasets mobilised from developed countries, these data represent an uneven distribution, thus this existing quantity and quality of mobilised data are inadequate for definitive 'local-to-global' scale analysis. Analysis reveals that the majority of the GBIF Participants lack (a) demand-driven data discovery and publishing strategy and action plans, (b) institutionalisation of a data publishing framework to create a socio-politically conducive environment for data publishing, and (c) a hosting

centre infrastructure to facilitate data publishing irrespective of the infrastructure and skill sets of the contributing data publishers.

Therefore, 2011 activities of the DIGIT Work Area[†] are aimed at addressing these issues, resulting in increased discovery and access of various types of primary biodiversity data[†] by orders of magnitude such that these gaps can be filled. In particular, a key focus will be on ensuring “fitness-for-use[†]” of GBIF mobilised data, enhancing the access to reliable data that are fundamental for scientific analysis.

Strategy

Promote uptake of the GBIF informatics suite, standards, best practice guidelines, and recommendations of various Task Groups to improve existing data publishing processes, and to broaden the data types and data publisher coverage of the GBIF network.

Goals and Activities

Goal 1: Development of demand-driven Strategies and Action Plans facilitating expedited discovery, digitisation and publishing of ‘primary biodiversity data’ records

Activity 1: Assess the scientific data needs, monitor use of the GBIF data and assess gap in GBIF mobilised data

Assessment of scientific user needs will be initiated in preparation of the next phase of GBIF (2012-2016). Particular attention will be given to monitor and analyse the use of GBIF data such as in scientific publications and relevant projects. In parallel to these studies, a gap analysis of primary biodiversity data discovered and mobilised through the GBIF network will be conducted. Particular attention will be given to integrate the data requirements identified by the Content Needs Assessment Task Group. This rolling gap analysis will be aimed at understanding taxonomic, geographic, temporal, and qualitative gaps in data with a particular focus on the end-users needs. During this process, DIGIT will explore the feasibility to develop a set of web services to deliver the results generated to the Participants.

Activity 2: Best Practice Guidelines for demand-driven Data Discovery and Publishing Strategies and Actions Plans by the Participants

Develop best practice guidelines, tool kits and templates to capacitate GBIF Participants to develop demand-driven strategies and action plans for increased discovery, digitisation and publishing of ‘primary biodiversity data’ through the GBIF network. Such guidelines will include step-by-step approaches to conduct; (a) ‘content needs analysis’, (b) ‘data gap analysis’, (c) strategies and action plans for demand-driven data capture, discovery, digitisation, management, long term archival, and publishing by the Participants and publishers.

Activity 3: Explore feasibility of development of a ‘Biodiversity Informatics Potential’ Index to strategise engagement of untapped data types

Continue exploratory study to develop and test a ‘Biodiversity Informatics Potential’ Index (BIP Index) to provide a prioritisation mechanism, by integrating a number of parameters that might be related to the state of biodiversity informatics in individual countries and disciplines. This could result in more focused efforts in regions and disciplines with potential to bridge data gaps, and harmonise progress in biodiversity informatics.

Goal 2: Development and implementation of 'Data Discovery and Publishing' mechanisms and tools

Activity 1: Contribute in expansion of GBIF infrastructure to facilitate take up of new data types, and data publisher communities

In order to cater for uptake of new data types, the existing GBIF infrastructure requires expansion. This requires detailed requirements gathering to improve existing data discovery and publishing infrastructure components (such as GBRDS, IPT, Data Portal, templates, and related tools). This will facilitate uptake of data types and publisher communities such as observation, multimedia, ecology, environmental impact assessments, and citizen science data etc.

Activity 2: Prototype Data Publishing Framework mechanisms and tools

On the basis of the recommendations of the 'Data Publishing Framework' Task Group, undertake conceptualisation, specify, and develop prototype implementation of tools, mechanisms and infrastructure such as:

- (i) Data citation service and data citation mechanism,
- (ii) Data Usage Index,
- (iii) Data paper to encourage data discovery through metadata, and
- (iv) Engagement of academic and scholarly societies, publishers, international and national science funding agencies to ensure uptake of data publishing framework.

Activity 3: Institutionalisation of hosting centre infrastructure across the GBIF network

On the basis of the community and expert consultations develop criteria for establishment and endorsement of 'data hosting centres'. Develop best practice guidelines for hosting centres to rescue, archive, host and publish primary biodiversity data and uptake by Participants. Engage science funding agencies and institutions to invest in establishment and strengthening of 'hosting centres'. Improve existing tools (such as the Integrated Publishing Toolkit) as the basis for 'hosting centres'.

Activity 4: Improving "fitness-for-use"[†] of GBIF mobilised data

On the basis of the white paper commissioned during 2010, scientific user needs from the scientific community, develop criteria for assessing 'fitness-for-use' of GBIF mobilised data. Together with other Work Areas and external experts develop a catalogue of data quality assessment, quality control, data cleaning tools, standards, protocols and procedures for various types of primary biodiversity data[†]. Contribute towards development of best-practice guides, and e-learning[†] tools. Develop (new) and /or improve (existing) tools for enhancing fitness-for-use[†] and implement contracts for assessing and improving fitness-for-use[†] of GBIF mobilised data. Contribute towards development of 'annotation standards and tools' and user feedback tools/services development.

Activity 5: Participate in decentralised and distributed Helpdesk infrastructure for pre-publishing activities

Participate in decentralised and distributed Helpdesk infrastructure across the GBIF network through pre- and post indexing support to expedite progress through the GBIF network.

Goal 3: Targeted outreach and enhancement of capacity of existing and un-tapped custodians and publishers

Activity 1: Support development of Training Manuals and e-learning modules

Through the Training Work Area (Goal 2, Act. 3) help develop training manuals and e-learning modules dealing with 'demand-driven data publishing strategies and action plans', 'data discovery', 'data capture and digitisation', 'improving fitness-for-use', 'data citation and annotation practices', and 'publishing' of all types of primary biodiversity data types.

Activity 2: Activate Capacity building and outreach to potential data publishers[†]

Assist with the development and revision of curricula for training for digitisation and mobilisation of all types of primary biodiversity data[†]. Encourage the organisation of regional "train-the-trainer" activities. Implement targeted outreach through meetings with data custodians, data publishers[†], aggregators, scientific societies, funding and donor agencies, as well as scientific publishers.

BUDGET

	Goal / Activity	2011 (100%)
Goal 1	Development of demand-driven Strategies and Action Plans facilitating expedited discovery, digitisation and publishing of 'primary biodiversity data' records	€ 45,000
Activity 1	Gap Analysis of GBIF mobilised data	€ 5,000
Activity 2	<i>Best Practice Guidelines for demand-driven Data Discovery and Publishing Strategies and Actions Plans by the Participants</i>	€20,000
Activity 3	<i>Feasibility study of development of a 'Biodiversity Informatics Potential' Index to engage untapped data types, regimes, and publishers to homogenise data discovery, digitisation and publishing of primary biodiversity data globally</i>	€ 20,000
Goal 2	Development and implementation of 'Data Discovery and Publishing' mechanisms and tools	€ 95,000
Activity 1	<i>Contribute in expansion of GBIF infrastructure to facilitate take up of new data types and data publisher communities</i>	N/A
Activity 2	<i>Prototype Data Publishing Framework mechanisms and tools</i>	€ 55,000
Activity 3	<i>Institutionalisation of hosting centre infrastructure across GBIF network</i>	€ 20,000
Activity 4	<i>Improving "fitness-for-use[†]" of GBIF mobilised data</i>	€ 20,000
Activity 5	<i>Participate in decentralised and distributed HelpDesk infrastructure for pre-publishing activities</i>	€ 0
Goal 3	Targeted outreach and enhancement of capacity of existing and un-tapped custodians and providers	€ 20,000
Activity 1	<i>Support development of Training Manuals and e-learning Modules</i>	€ 0
Activity 2	<i>Activate Capacity Building and Outreach to potential data publishers[†]</i>	€ 20,000
	Advisory Task Groups: DIGIT	€ 10,000
	TOTAL	€ 170,000

Output by end 2011

The DIGIT Work Area[†] will have facilitated a socio-political framework, technical infrastructure and capacity within the GBIF network resulting in expedited discovery, digitisation and publishing of 'fit-for-use' primary biodiversity data. This will increase

dramatically the current linear rate of discovery and mobilisation to ensure that a volume, density, and coverage of data that would allow meaningful and useful analyses for all Participants. This will enable credible analysis on key social, ecological, and economic issues in most geographic regions, thereby enhancing GBIF's relevance. Providing access to primary biodiversity data[†] (through the GBIF network[†]) should be recognised as a valid publishing activity and an integral part of the research data management chain, as a result of activities proposed through this work area[†].

Key GBIF Secretariat Outputs:

- Gap Analysis of GBIF mobilised data;
- Best practice guidelines for demand driven data discovery and publishing strategy and action plans;
- Feasibility study of development of 'Biodiversity Informatics Potential Index (BIP Index);
- Prototype development of data citation mechanism and data citation service, and 'Data Usage Index (DUI)';
- Institutionalisation of the 'Data Paper' as a mechanism for discovery of resources through enriched metadata;
- Best practice guidelines for establishment, endorsement and monitoring of 'Hosting Centres'; best practice papers on data standards, quality assessment and control, data cleaning, etc.;
- Implement targeted outreach to potential publishers of primary biodiversity data[†].

Key GBIF Participant / Network Outcomes / Contributions

- Rapidly increase investments in and rate of data discovery, digitisation and publishing;
- Uptake of GBRDS, IPT and metadata catalogue, and contributing to discovery of and publishing of 'fit-for-use' primary biodiversity data[†] records;
- Uptake of recommendations by Task Groups and approaches to industrialisation of data digitisation and publishing, thereby expediting the process of discovery and publishing of primary biodiversity data records;
- Develop demand-driven data discovery and publishing strategy and action plans.
- Adopt and implement the strategies for industrialising the mobilisation of primary biodiversity data[†];
- Promote use of mechanisms and tools developed to implement the recommendations of the Data Publishing Framework Task Group;
- Designate suitable national, regional, and thematic agency/institution(s) as "Hosting Centre(s)" and actively engage in rescuing orphaned and potentially orphaned datasets;
- Actively engage, promote and coordinate infrastructure and capacity building activities in-country or within thematic areas to ensure that "fitness-for-use[†]" of the primary biodiversity data could be improved for a variety of users.

2.2.2. ECAT (Electronic Catalogue of Names of Known Organisms)

Introduction

A core component of GBIF's mission is providing infrastructure that makes biodiversity databases interoperable among themselves and across all levels of biological organisation. Taxonomy is the essential key to this interoperability. Scientific names link

all information about a species and taxonomy provides the organisational framework for scientific names. The ECAT work area serves to facilitate the publication, integration, discovery and use of taxonomic data to support interoperability and access to biodiversity data.

Taxonomic data are organised into authoritative taxonomic catalogues, species checklists, and nomenclators that assert the correct spelling for species' names, reveal synonymy and organise taxa into hierarchical classifications. This information, collectively, yields an organisational framework that can be applied to information about species. The ECAT work area has focused on developing a taxonomic data exchange standard based on established international standards and integrating it into existing GBIF infrastructure while promoting its uptake more broadly.

In 2011, we will consolidate activities initiated in 2009-10 that establish GBIF as a principal taxonomic data publishing solution that supports initiatives such as the Catalogue of Life Partnership and the Pan European Species directory Infrastructure (PESI) by leveraging the global scope of GBIF toward discovering and mobilising resources relevant to them. We will use the data published through GBIF to improve the taxonomic integrity of the GBIF data portal, provide users of the portal with more accurate, intuitive, and comprehensive access to data. We will refine existing taxonomic name services to provide cross-cutting and consistent access to multiple taxonomic sources and we will use these services to support and develop new and useful data products that impact GBIF participants. This includes services for mapping data to taxonomic authority files, for validating primary data records before they are published, and for embedding service-enabled workflows for creating and maintaining new species checklists among all our regional partners.

Rationale

*"The key to modern biological information is the scientific names of organisms"*⁸

The GBIF infrastructure sits at the interface between taxonomy and the vast and growing index of biodiversity data indexed through the GBIF network. This index contains millions of different scientific names and our goal, and corresponding challenge, is to ensure that all of these are accounted for within a taxonomically-informed framework. The GBIF network is that framework. As it provides access to the largest collective index of primary biodiversity data so it must also enable and provide access to authoritative taxonomic catalogues, species checklists and nomenclatural data. These data must be available to the network and integrated in its data discovery and delivery processes. In so doing, GBIF serves taxonomy by raising its relevance and visibility while also enabling the assessment of gaps and inconsistencies between authoritative taxonomic coverage and the growing index of biodiversity data mobilized through the network.

Vision

By 2011, GBIF will unify access to organism names and information about organism names and provide participants with tools and services that improve all aspects of biodiversity data management and integration.

⁸ GBIF Strategic Plan 2007-2011

Strategy

Consolidate and promote the taxonomic publishing infrastructure developed in 2009-10 to create a global brokerage system of taxonomic authority files and build the tools and services to utilise this system, based on four key components:

1. Consolidation and promotion of the publication framework for authoritative taxonomic catalogues and species checklists;
2. Integration of taxonomic data with primary biodiversity data to improve interoperability and access;
3. Discovery and access to taxonomic data and services via the GBIF data portal through coordination with IIP;
4. Use of taxonomic name services to meet strategic needs.

Each of the activities within these includes a set of tasks that begin within an overall consolidation and documentation component, provide opportunities for GBIF Participants to evaluate and provide additional requirements and input, and develop new and refined products and services.

Goal 1: No barriers to publishing taxonomic data through the GBIF network

Data publishers require incentives, tools, and data standards. We will ensure these requirements are met with strategies that target two distinct groups. First, we will ensure that the Participant Nodes of GBIF are provided with complete documentation and guides regarding the data standards, best practices, and publishing procedures for publishing regional checklist data through the GBIF network. Second, we will focus on Associate Participant Organisations and other partners that produce authoritative taxonomic catalogues and specialised thematic species checklists and promote the GBIF GNA publishing framework as the primary publishing solution to ensure these data are available in a consistent format.

Activity 1: Ensure end-to-end checklist publishing solutions are available for all national and regional Nodes

Provide internationalised best practice documents and tools, capture additional requirements, and develop additional supporting infrastructure. A range of publishing options will ensure appropriate solutions for each case.

Activity 2: Ensure taxonomic data networks among Associate Participants and other partners support the GBIF GNA checklist-publishing format

Provide best practices and promote the GBIF taxonomic publication infrastructure to data providers through requirements capture, refinement of data exchange standards and infrastructure. Ensure citation and attribution are effective components of the GBIF solution.

Goal 2: Integrate taxonomic data published to the GBIF network with other biodiversity data to improve precision and recall

In 2010 we have increased the capacity to access and index a wider range of taxonomic checklist data, common names and other components of annotated species checklists. In 2011 we will actively engage in integrating these data with other data types within the GBIF data portal with a principal focus on improving the overall taxonomic integrity and accessibility of the hundreds of millions of primary biodiversity data records. The most

import integration focus is in the refinement of the composite taxonomic backbone that links all data indexed in the GBIF network.

The overall impact of the activities in this goal will be an increase in the precision and recall of biodiversity data at all taxonomic and regional scales. One metric for evaluation of success will be the measure of proportional coverage at these scales between primary and authoritative taxonomic data sources with a target of 100% concordance between the two.

Activity 1: Ensure access to primary biodiversity data via multiple classifications/species checklists

This internal activity provides data processing methodologies for enabling indexed taxonomic catalogues, regional checklists and thematic species lists to be used as navigational profiles through biodiversity data in the GBIF data portal, or via services, other data stores.

Activity 2: Prototype expert annotation of the GBIF composite taxonomic backbone

Capture requirements from taxonomic reviewers regarding interfaces and practices for commenting and refining the GBIF taxonomic backbone. Requirements will be integrated into the data portal development roadmap. Annotations will improve precision and recall within the data portal and will be accessible to curators of source taxonomic databases.

Activity 3: Integrate indexed checklist data with additional data types

Develop taxonomic name-identification and integration processes that allow scientific names to be indexed and discoverable in full text documents, bibliographic data, and metadata records, increasing the discovery scope of the GBIF network.

Activity 4: Provide clear indicators of taxonomic and nomenclatural coverage for all organism groups

This internal activity integrates taxonomic name processing tools with primary data and authoritative taxonomic data to provide updated metrics for all organism groups indicating relative coverage between primary data and different classes of indexed taxonomic data.

Goal 3: Consolidate strategic applications and uses of GBIF taxonomic name services among Participants

Ensure that the taxonomic data mobilised through the GBIF network is put to direct use in addressing two key objectives: improving the overall 'fitness for use' of all data mobilised through the GBIF network and creating new taxonomic resources such as national and thematic species checklists.

Activity 1: Develop workflows and best practices that assist governments in meeting their national and international obligations with regards to environmental policies and conventions

Define nationally-relevant data workflows that benefit from access to authoritative taxonomic data. For example, very few countries have comprehensive national species checklists or inventorying processes and many that do are inaccurate or require updating.

Apply GBIF name services and tools to streamline and improve these processes and products.

Activity 2: Promote the development and use of taxonomic services to improve the quality and fitness of primary biodiversity data published through the GBIF network
Promote and develop decentralised data quality services for evaluating and annotating primary biodiversity data that improve taxonomic precision prior to publication.

Budget

	Goal / Activity	2011
Goal 1	No barriers to publishing taxonomic data through the GBIF network	€ 30,000
Activity 1	<i>Ensure end to end checklist publishing solutions available for all National Nodes</i>	€ 10,000
Activity 2	<i>Ensure taxonomic data networks among Associate Participants and other partners support the GBIF GNA checklist publishing format.</i>	€ 20,000
Goal 2	Expanded integration of taxonomic data published to the GBIF network with other biodiversity data types	€ 30,000
Activity 1	<i>Ensure access to primary biodiversity data via multiple classifications/species checklists</i>	n/a
Activity 2	<i>Expert annotation of the GBIF composite taxonomic backbone.</i>	€ 10,000
Activity 3	<i>Integrate indexed checklist data with additional data types</i>	€ 20,000
Activity 4	<i>Provide clear indicators of taxonomic and nomenclatural coverage for all organism groups.</i>	€ 0
Goal 3	Consolidate strategic applications and uses of GBIF taxonomic name services among Participants	€ 50,000
Activity 1	<i>Develop best practices and workflows that assist governments in meeting their national and international obligations with regards to environmental policies and conventions (e.g. national checklists)</i>	€ 20,000
Activity 2	<i>Promote the development and use of taxonomic services to improve the quality and fitness of primary biodiversity data published through the GBIF network.</i>	€ 30,000
	Task Groups ECAT	€ 10,000
	TOTAL	€ 120,000

Output by end 2011

By the end of 2011 the GBIF infrastructure will support the publication and discovery of taxonomic data to a degree that is on par with the publication and discovery of primary biodiversity data. The taxonomic data standard developed by GBIF for supporting a common Global Names Architecture will be supported by many taxonomic databases that will utilise components of the GBIF Informatics suite of publishing and indexing tools within their own infrastructure organisations. The GBIF network will provide access to the world's largest list of organism names and taxon concepts, supporting the development of a complete single and authoritative dictionary of organism names. Like the primary biodiversity data index in the GBIF data portal, this will be a super-index of existing data resources, not a new compilation in itself. The network will also provide access to the largest index of multi-lingual common names.

The GBIF data portal will support access to biodiversity data via multiple taxonomic, regional, and thematic views. GBIF will demonstrate the value of taxonomic databases in the accelerated development of accurate, nationally relevant species checklists.

Taxonomic name services will dramatically improve the taxonomic precision and fitness of biodiversity data published through the network with benefits extending to all uses of the GBIF network.

Key GBIF Secretariat Outputs:

- Flexible taxonomic data publishing solution that meets GBIF Participant needs;
- Access to world's largest index of taxonomic classifications, catalogues and species checklists via standard formats and services;
- Access to primary biodiversity data in the GBIF portal via multiple classifications and species checklists;
- Taxonomic name services that improve the quality of primary data published to GBIF;
- Taxonomic tools that streamline data capture, data validation and the building of new species checklists.

Key GBIF Participant / Network Outcomes / Contributions:

- Adopt and refine the GBIF taxonomic data standard;
- Draft and internationalise vocabularies and taxonomic data extensions using the Vocabulary Server;
- Publish taxonomic catalogues and species checklists via the GBIF network;
- Publish taxonomic identifiers for taxa that can be referenced by publishers of primary data;
- Provide requirements for taxonomic tools and services for national/regional checklist building, data validation, and other uses;
- Offer taxonomic data validation services via GBIF recommended practices to improve overall biodiversity data quality;
- Utilise GBIF taxonomic name services and tools.

2.3. IIP (Informatics Infrastructure and the GBIF Portal)

Introduction

The GBIF mission is to make the world's biodiversity data freely and universally available via the Internet. As a megascience initiative, GBIF aims to provide an essential global informatics infrastructure for biodiversity research and applications worldwide. The primary challenge for the IIP Work Area is to meet the infrastructural requirements of Participants in terms of:

- **growth** through richer content and greater volume of primary biodiversity data (e.g. specimen and observations, names/nomenclatures, metadata etc.);
- **scalability** through a GBIF informatics distributed network building on a core GBIF architecture;
- **capacity** through the provision of appropriate tools, products and services;
- **visibility** through access to a powerful and user-friendly GBIF Portal[†] and other vehicles (e.g. Nodes, thematic portals, Rich Internet Applications).

Vision

By the end of 2011, the GBIF distributed architecture and services provide the world's pre-eminent mechanism for the publishing, integration, access and use of biodiversity data.

Rationale

GBIF's primary objective is to facilitate the publishing, integration, access and use of primary biodiversity data by building a global informatics infrastructure that makes those biodiversity data openly and freely available to everyone. To achieve this, GBIF promoted in 2009-2010 the use of appropriate data publishing frameworks. Through our current Data Portal, services and integration, GBIF provides a one-stop entry point to rich biodiversity data while also enabling other portals to access the same data and apply to those data whatever analytical and synthetic tools they wish for the purpose of informing, for example, policy makers.

In 2009-2010, the Informatics Work Area has focused on the delivery of appropriate standards, tools and services to the GBIF data publishers as well as the uptake by Participants. During 2010 there have been developments focusing on improving the GBIF architecture with an enhanced Registry and research into the integration of new data types (Names, Metadata and Polygons) into the Data Portal.

Critical components of the architecture are still under development and not yet fully functional and thus not yet released as final versions. However, by the end of 2010, a stable version of the IPT will be available, and a prototype version of the HIT and enhanced Registry that are meeting the needs of Participants. Continuous improvements of the GBIF Data Portal in 2010 will be further built upon in 2011.

In 2011, it is expected that continuous efforts will be required to maintain the IPT (e.g. addition of new features), the enhanced Registry, the HIT as well as the GBIF Data Portal. Other critical components of the central architecture are to be developed in 2011 such as the persistent identifier resolution and annotation services. Therefore 2011 is a critical Informatics consolidation year before the new phase of GBIF (2012-2016). Activities in 2011 will be focused on streamlining the data publishing frameworks through the architecture as well as to strengthen the mechanism to report back to publishers and improve fitness for use of the primary biodiversity data published through GBIF.

Strategy

In order to meet the critical challenges set in the GBIF Strategic Plan 2007-2011, the strategy for the IIP Work Area is to focus on consolidation of the new GBIF architecture and tools as well as supporting the uptake of these by Participants:

- **Development of a comprehensive GBIF publishing framework** in support of Participants, built on top of existing GBIF tools such as the Integrated Publishing Toolkit (IPT). Existing and new standards (e.g. Darwin Core) will be further developed, with the addition of extensions meeting the needs of various communities. Particular attention will be given to the creation of Hosting Centres.
- **Strengthening of the GBIF core data integration mechanisms** building from the Harvesting and Indexing Toolkit (HIT) and appropriate registration services through the Registry and Portal, focussing on the integration of names, spatial, statistical and reporting components within the existing architecture.
- **Expansion of the GBIF discovery and access mechanism** on top of the existing architecture will be a priority for 2011 with a focus on the development of a new GBIF Data Portal fully integrating all data types shared by the community (i.e.

observation, names, metadata and spatial data). Particular attention will be given to the further development of discovery web services underpinning the existing infrastructure.

- **Support of the uptake of the GBIF architecture by Participants** starting with the coordination of development of the Nodes Portal Toolkit (NPT). A toolbox tutorial for Participants will be developed with the aim to catalyse the development of new tools, applications and portals by the community. Support to strategic applications with a particular focus on names/checklist and geospatial services will also be pursued.

These main outputs are the Informatics response to the Participation Thematic area. They respond directly to the most urgent needs expressed by Participants and Nodes in their uptake of the new GBIF standards, tools and services.

2011 Goals and Activities

Goal 1: Strengthen the GBIF publishing framework

Data publishers require not only appropriate tools to make their data easily accessible on the Internet through the GBIF Informatics infrastructure but also a comprehensive publishing framework responding to a variety of demands (e.g. publishing of metadata and observation information). Therefore, the IIP Work Area in 2011 will focus on building on successful 2009-2010 experiences and ensure that Participants have access to a robust publishing toolkit, well-documented as well as associated technical guidelines for the most critical publishing frameworks.

Activity 1: Sustain the development of the Integrated Publishing Toolkit (IPT)

Particular attention will be given to addressing the stability and robustness of the tool as well as the development of proper documentation for both developer and first users (e.g. tutorial). This activity will be undertaken in close coordination with all Work Areas in GBIFS.

Activity 2: Support publishing frameworks through distributed Helpdesk support

Focus on providing a remote and whenever possible an on-site support to Participants in the form of technical informatics Helpdesk or visits. Particular attention will be given to coordinate with the Participation Work Areas in the context of the regionalisation, mentoring activities and distributed Helpdesk.

Goal 2: Strengthen the core GBIF integration mechanisms

In 2009-2010, the GBIF architecture logically expanded to cover related content to specimen and observation data, namely metadata and names/checklists. The 2011 goal in integrating such content will focus primarily on improving the core mission of GBIF by enhancing the value of primary biodiversity data published through GBIF. In particular, activities will focus on strengthening the Registry and ensure that content mobilised is integrated into the core primary biodiversity data stores.

Activity 1: Manage the GBIF Registry

Ensure that the Registry is meeting the most critical requirements of the community and investigate the feasibility of distribution to other Participants locations.

Activity 2: Mobilise and integrate content through harvesting, indexing and Helpdesk operations

Focus activities on the uptake of the IPT in support of the mobilisation of more content; it is expected that a lot of effort will be required to integrate metadata and checklists/names resources with the existing specimen and observation information.

Goal 3: Strengthen the GBIF discovery and access services

In GBIF Portal is the most visible face to the GBIF Network and provides a unique mechanism to discover and access primary biodiversity data. In 2011, the focus will be to ensure that the GBIF Portal is sustained through sound core coordination from GBIFS and a highly skilled development team. Critical components of the architecture to be addressed include: the resolution service (e.g. persistent identifiers of resources and records as well as their resolution) and an annotation service; such an annotation service is critical to ensure that users of primary biodiversity data can contribute to the constant improvement of data quality through appropriate feedback mechanism to the publishers.

Activity 1: Prototype a central resolution and annotation service

A central resolution service built on persistent identifiers will be prototyped following the recommendation of the LGTG Task Group, to enable the architecture to meet the reporting from data users/consumers to publishers.

Activity 2: Sustain the development of the GBIF Data Portal

The further development of the existing GBIF Portal is a critical activity. In 2011, the focus will be on enriching the existing GBIF Portal with access to more integrated information covering specimen and observation data together with additional critical information resources such as metadata and checklist/names. The GBIF Portal code will be further improved and better documented. The lag time for fixing bugs reported by users will be reduced. Investments in improving geospatial services based on primary biodiversity data will also be prioritised.

Activity 3: Strengthen GBIF Portal services API

In order to ensure that GBIF Portal as well as other portals, applications, tools are building on top on the GBIF architecture, the existing services API will be strengthened and expanded (e.g. resources, metadata, names, primary biodiversity records etc. These service APIs are providing a machine-to-machine mechanism to tap into the content and services available. For example such services are used by Participants to retrieve large data sets to feed other systems in their Portal development efforts.

Goal 4: Support uptake of the GBIF architecture by Participants

The NPT is a response to the most urgent informatics infrastructure needs expressed by Participants and Nodes. In order to become fully functional, Nodes require to be actively engaged with data holders by assisting them in publishing biodiversity data. The NPT is aimed at providing a set of informatics tools enabling Nodes not only to be active in terms of data indexing but more importantly in promoting and facilitating the development of portals, applications and services serving directly their end-user needs (e.g. policy makers, researchers, general public. In 2010, an NPT prototype will be developed with the objective to pave the way toward a more operational version in 2011.

Activity 1: Support the development of the Nodes Portal Toolkit (NPT)

Provide a coordination role as well as funding support for the further development of the

NPT as a prototype meeting the most critical needs of Participants in 2009-2010. Particular attention will be given to exploring additional support from participants in the form of in-kind contribution or direct funding support.

Activity 2: Develop a toolbox tutorial for Participants to support the uptake of the GBIF architecture

In order to ensure optimum uptake of the GBIF informatics suite and architecture, access to proper documentations and tutorials for developers is critical; this will be in the form of a toolbox covering the various ways to use the existing services in the GBIF architecture.

Goal 5: Manage the informatics infrastructure of the Secretariat

The Secretariat operates and maintains computer servers for both administrative systems and services providing discovery and access to biodiversity data.

Activity 1: Manage the GBIF Secretariat information systems

The day-to-day operation of the Secretariat relies on access to internal systems such as email, calendaring and document management. The ongoing support and administration will be provided to maintain a robust and secure environment.

Activity 2: Manage the GBIF core infrastructure

The servers required for deploying the tools and applications developed in this work programme will be maintained and administered.

Budget

Goal	Activity	2011 (=2010)
Goal1	Strengthen the GBIF publishing framework	€ 100,000
Activity 1	<i>Sustain the development of the Integrated Publishing Toolkit (IPT).</i>	€ 80,000
Activity 2	<i>Support publishing frameworks through distributed help desk support.</i>	€ 20,000
Goal 2	Strengthen the core GBIF integration mechanisms	€ 25,000
Activity 1	<i>Manage the GBIF registry tool.</i>	€ 10,000
Activity 2	<i>Mobilise and integrate content through harvesting, indexing and Helpdesk operations.</i>	€ 15,000
Goal 3	Strengthen the GBIF discovery and access services	€ 95,000
Activity 1	<i>Prototype a central resolution and annotation services.</i>	€ 10,000
Activity 2	<i>Sustain the development of the GBIF Data Portal.</i>	€ 75,000
Activity 3	<i>Strengthen GBIF Portal services API.</i>	€ 10,000
Goal 4	Support uptake of the GBIF architecture by Participants	€ 30,000
Activity 1	<i>Support the development of the Nodes Portal Toolkit (NPT).</i>	€ 20,000
Activity 2	<i>Develop a toolbox tutorial for Participants to support the uptake of the GBIF architecture.</i>	€ 10,000
Goal 5	Manage the informatics infrastructure of the Secretariat	€ 30,000
Activity 1	<i>Manage the GBIF Secretariat information systems</i>	€5,000
Activity 2	<i>Manage the GBIF core infrastructure</i>	€25,000
	TOTAL	€ 280,000

Key outputs by the end of 2011

Key GBIF Secretariat Outputs:

- The GBIF publishing framework and informatics suite of tools (e.g. IPT, HIT) are developed, documented and promoted.
- The GBIF distributed Helpdesk is strengthened in collaboration with Participants.
- The GBIF Registry is improved and provides the ability to register, locate and use resources published through GBIF.
- The Node Portal Toolkit (NPT) development is supported.
- The core GBIF architecture is in place covering specimen and observations, checklist/Names, metadata and geospatial datatypes.
- The GBIF Portal is enriched with new features and access to richer content.
- Documentation in a form of a toolbox covering all GBIF services to Participants is made available (incl. tutorials etc).

Key GBIF Participant / Network Outcomes / Contributions:

- Adoption and uptake of the new GBIF informatics suite (e.g. IPT, HIT) by Nodes and their rapid diffusion down to the data publishers;
- Active contribution to the constant improvements of the GBIF Informatics suite;
- Participation in and use of the Informatics Helpdesk in the adoption of the GBIF Informatics suite;
- Contribution to and adoption of a global Informatics strategy for the further distribution of the GBIF Informatics architecture;
- Contribution to and adoption of the Node Portal Toolkit;
- Active contribution of fully functional Nodes in the implementation of the global Informatics strategy, in particular in the further mobilisation of biodiversity data;
- Register existing institutions, collections, resources and other discovery information in the GBRDS in order to strengthen the discovery of resources;
- Use of the GBIF networked service and application layer in the development of national, regional and thematic Portals/Applications;
- Ensure that by end 2011 that Nodes are fully contributing to the GBIF distributed architecture.

Annex 1: Overall WP Budget Summary 2009-2010 with WP Budget Proposal Summary 2011

Work Programme Budget Overview 2009-2010-2011			
	Approved budget for WP 2009-2010		
	EUR 2009	EUR 2010	EUR 2011
Total	2,700,000	2,950,000	3,200,000
All Work Areas - activities	1,090,000	1,290,000	1,200,000
All Work Areas - implementation cost (salaries)	1,610,000	1,660,000	2,000,000
PARTICIPATION:	1,055,000	1,160,000	1,175,000
NODES: Participants Data Service Units	125,000	165,000	200,000
TRN: Training	90,000	120,000	110,000
Help Desk			30,000
Outreach & Communication	100,000	115,000	100,000
Internationalisation			15,000
Strategic Applications	200,000	200,000	70,000
Implementation Implementation (Nodes, TRN, O&C, SA)	540,000	560,000	650,000
INFORMATICS	1,645,000	1,790,000	2,025,000
IDA: Data Inventory, Discovery and Access	110,000	110,000	105,000
DIGIT: Digitisation and Mobilisation of Primal Biological Data	135,000	175,000	170,000
ECAT: Electronic Catalogue of Names of Known Organisms	100,000	125,000	120,000
IIP: Infrastructure and Data Portal	230,000	280,000	280,000
Implementation Implementation (IDA, DIGIT, ECAT, IIP)	1,070,000	1,100,000	1,350,000

Annex 2 - Glossary

ABCD

The Access to Biological Collection Data (ABCD) Schema is the product of a joint TDWG and CODATA initiative to develop a standard for distributed data retrieval from collection databases. The schema seeks to cover data exchange for all kingdoms and for both specimen and observation records.

Active (Participant) Node

A GBIF Participant Node is active when - independently of its current level of development - it is a) supporting the Participant in the establishment, coordination, or maintenance of a biodiversity information network or facility in the context of GBIF, and b) moving towards becoming fully functional. According to this definition any functional Participant Node must be active, but an active Node is not necessarily fully functional (e.g. a Node in an early stage of development).

API

Application Programming Interface - en.wikipedia.org/wiki/API.

BCI

The Biodiversity Collections Index (BCI) is building a central index to biodiversity reference collections. By issuing a globally unique identifier (GUID) for every natural history collection researchers will be able to unambiguously identify the location of specimens they work on, and curators will be able to track usage of collections. BCI is thus a core component of the global infrastructure for biodiversity informatics and will be integrated in GBIF's Global Biodiversity Resources Discovery System (GBRDS).
www.biodiversitycollectionsindex.org

BioCASE

The Biological Collection Access Service (BioCASE) Protocol is derived from the DiGIR protocol and supports web-based searches for XML data. It has been used in particular for data exchange using the ABCD schema - www.biocase.org.

Biodiversity data

Biodiversity data refers to any data which presents information about the world's biodiversity, including species/observation data, general resource data and names data.

BIS, TDWG

Biodiversity Information Standards (formerly known as the Taxonomic Database Working Group -TDWG) is an international body established to define standards for use in biological data projects - www.tdwg.org.

CBD

Convention on Biological Diversity - www.biodiv.org

CEPDEC

Capacity Enhancement Project for Developing Countries (GBIF Strategic Plan 2007-2011).

CHM

Clearing House Mechanism of the Convention on Biological Diversity - www.biodiv.org/chm.

CITES

Convention on International Trade in Endangered Species of Fauna and Flora - www.cites.org.

CMS

Convention on the Conservation of Migratory Species - www.cms.int.

CoL, CoLp

The Catalogue of Life partnership - www.catalogueoflife.org.

Conservation Commons, CC

The Conservation Commons is an international endeavour with the goal of promoting conscious, effective, and equitable sharing of knowledge resources to advance conservation - www.conservationcommons.org.

Core funds

Financial contributions made by GBIF Voting Participants to the GBIF Budget. These funds used as stipulated in the Budget approved by the Governing Board.

Darwin Core

The Darwin Core is a federation schema used in the search and retrieval of natural history collections and observation databases. It includes only core data elements which are likely to be available for the vast majority of specimen and observation records - www.tdwg.org/activities/darwincore.

Data provider

see Data Publisher.

Data publisher

Individual, institution or network that facilitates discovery and access to primary biodiversity data or metadata through national, regional, thematic or global networks such as GBIF. Earlier GBIF Work Programmes referred to these contributors as 'Data Providers'.

Decentralised (implementation)

Refers to the implementation/carrying out of activities remotely from the Secretariat (in GBIF-speak, NBIFs, ReBIFs, ThemeBIFs, i.e. via Participant Nodes in general).

DIGIT

Digitisation and mobilization of primary biodiversity data. One of the GBIF Work areas presented in this Work Programme.

Distributed (network architecture)

Arrangement of networked computers that are capable of working both independently and jointly as required. IT infrastructure to enable a global network (of networks), as GBIF is.

E-learning

E-learning is the use of information and computer technologies to create learning experiences. e-learning can be presented in the form of standalone courses, virtual-classroom courses, learning games and simulations, embedded e-learning in software, blended learning (mix of traditional and digital learning strategies), mobile learning or knowledge management, among others.

ECAT

Electronic Catalogue of Names of Known Organisms, one of the GBIF Work areas.

EDIT

European Distributed Institute of Taxonomy - www.e-taxonomy.eu.

Encyclopedia of Life, EoL

The Encyclopedia of Life - www.eol.org.

EuroGEOSS

A project proposal in the EU 7th framework addressing a European approach to developing sustained operational capacities for GEOSS (see GEOSS).

Fitness-for-use

Suitability, effectiveness or usefulness of GBIF mediated data in delivering accurate, authentic, replicable, as well as scientifically valid analysis and forecasting for user defined conservation and natural resources management purposes.

Functional (Participant) Node

A GBIF Participant Node is considered as functional when it effectively helps the Participant to establish, coordinate, and maintain an active biodiversity information network or facility, using for that purpose the general framework, principles and infrastructure of GBIF. Among other roles, a functional Participant Node: a) helps the GBIF Participant to assess and address its own biodiversity information needs, b) actively engages data holders and users within the Participant's domain, c) assists the data holders to share and publish biodiversity data, d) helps build biodiversity informatics capacity at the Participant level, e) promotes and facilitates the development of applications to serve end-user needs, f) shares its capacity and experience with other Participant Nodes, particularly those in early stages of development, g) helps to implement and deploy the GBIF informatics infrastructure, and h) actively contributes to achieve GBIF's mission, targets, and goals.

GBIF network

The GBIF network is the entire network of people, computers and infrastructures which comes together to provide the common pool of biodiversity data accessible via GBIF.

GBIF Portal

The GBIF Portal is a unified access point to all the data shared using the GBIF network. It has three components: data, metadata and names (the two later to be developed as parts of this Work Programme) - data.gbif.org.

GBIF mediated data

Primary biodiversity data or its metadata discovered and/or accessed through the GBIF network using GBIF promoted data interoperability, exchange/sharing standards.

GBIF web site

The GBIF web site, also known as the GBIF Communications Portal, provides news, articles, events, documents and other linkages of use to the GBIF community - www.gbif.org.

GBRDS

GBIF's Global Biodiversity Resources Discovery System (GBRDS) can be viewed as an extended Universal Description, Discovery and Integration (UDDI) registry. In addition to the standard UDDI business information (e.g. names, addresses, service URLs), it also acts as a registry for globally unique identifiers (GUIDs) that have been issued for biodiversity specific information. Many cross-references can be set up by means of the registry, e.g. datasets can be linked to metadata, to

standards' definitions, to web service URLs, and to various GUIDs.

GNA

The Global Names Architecture (GNA) is a term used to refer to the activities of the GBIF ECAT programme in concert with other collaborating initiatives to develop a common methodology for discovering and accessing sources of taxonomic and nomenclatural data. These data can be collated and employed to provide syntactic and semantic information regarding names that facilitate discovery and access to biodiversity data and enable more effective linking of these data to relevant taxonomic concepts.

GEOSS

Global Earth Observation System of Systems - www.earthobservations.org/geoss.shtml

GIS

Geographic Information Systems (GIS) are computer systems and software which allow the combination of multiple georeferenced data layers, each providing information about some characteristics of a geographic area. Such systems provide tools for mapping and analysing the data.

Governing Board, GBIF Governing Board

The highest executive body of GBIF, comprising representatives of all GBIF Participants who have signed the MoU, both Voting and Associate and which meets on an annual basis.

GUID

A Globally Unique Identifier (GUID) provides an unambiguous reference to an object in a software application. LSIDs are one implementation of a GUID system.

ICT

Information and Communications Technologies

IDA

Inventory, Discovery and Access. One of the GBIF's work areas presented in this work programme. This work area was known as DADI in previous GBIF Work Programmes.

ILTER

International Long Term Ecological Research - www.ilternet.edu

Informatics

The use of ICT to make data and information automatically available via the Internet. In this text, one of the Thematic areas of the GBIF Work Programme.

IPR

Intellectual Property Rights. In law, particularly in common law jurisdictions, intellectual property or IP refers to a legal entitlement which sometimes attaches to the expressed form of an idea, or to some other intangible subject matter.

IPT

The GBIF Integrated Publishing Toolkit (IPT) allows for efficient and easy publishing (sharing and hosting) of organism occurrence data, taxonomic and nomenclatural information, and general dataset metadata.

ISO

International Organisation for Standardization - www.iso.org.

IUCN

The International Union for the Conservation of Nature - www.iucn.org.

Lifewatch

Lifewatch is a European project within the 7th Framework Programme that aims to create a virtual laboratory for the analysis of the biological diversity of the European environment - www.lifewatch.eu

LSID

Life Science Identifiers (LSIDs) are a Globally Unique Identifier (GUID) system designed specifically for the Life Sciences and adopted by BIS/TDWG as the GUID system of choice for biodiversity resources. LSIDs provide a way to persistently and uniquely identify biological data resources on the internet. Resolving an LSID returns a metadata description of the resource. LSIDs provide the means to discover, track and relate information on all kinds of biological entities, e.g., specimens, observation events, taxon names, taxon concepts, Barcodes, datasets, collections, collectors, institutions - lsids.sourceforge.net.

Metadata

Metadata are data records that provide descriptive information about other data. In the context of GBIF, metadata provides information about the suppliers of biodiversity data and about the origins and purpose of those data.

Metadata profile

A metadata profile is a recommended subset of the elements of a metadata standard for use by a particular community of users.

MoC

Memorandum of Cooperation

MoU

Memorandum of Understanding

Names data

Names data refers to structured data providing information about taxonomic names and their relationships.

National Node, NBIF

An NBIF, or National Biodiversity Information Facility is defined as the institution mandated by a country to be the national focal point/liaison on all things GBIF, and the national network coordinating institute, representing a de facto 'mini-GBIF Secretariat' in its role and functions, such as provision of training. Ideally such institutes should have a nationally mandated role of facilitating mobilisation of biodiversity data and information for the country.

Node

see Participant Node.

NODES

In uppercase, one of the Work areas described in this Work Programme.

Nodes Committee

The GBIF committee comprising the managers of all Participant Nodes.

Node Portal Toolkit

The Node Portal Toolkit (NPT) is a suite of tools aimed at facilitating the easy indexing of occurrence data, taxonomic and nomenclatural information, and general dataset metadata (e.g. published by the IPT or other similar tools). The NPT is aimed at supporting in particular the work of the Participant Nodes to fully participate in the GBIF distributed network.

NPT

see Nodes Portal Toolkit

OGC

The Open Geospatial Consortium, Inc. (OGC) is a non-profit, international, voluntary consensus standards organization that is leading the development of standards for geospatial and location based services. www.opengeospatial.org.

Online Resource Centre (for Nodes and Training)

Specific sections of the GBIF web site where all the information about Nodes and Training are centralised, so all information about those topics is organised and accessible from a single point.

Participant Node, Node

A GBIF Participant Node is a unit, agency or institution designated by a GBIF Participant to coordinate the development and activities of a biodiversity information network or facility at the Participant's level (e.g. national, regional, or thematic). The main role of a Participant Node is to promote, coordinate, and facilitate the mobilisation and use of biodiversity data among all the relevant stakeholders within the Participant's domain, primarily to help address the Participant's information needs and priorities. Participant Nodes serve as communication gateways among GBIF Participants and the Secretariat. They are also the conduit by which GBIF Participants contribute to and benefit from the central services, infrastructure, and capacity provided by GBIF as a globally decentralised network of networks. This definition of a Participant Node expands and complements the one provided in the current GBIF Memorandum of Understanding (GBIF MoU 2007-2011). See also NBIFs, ReBIFs and ThemeBIFs, all of which are 'Participant nodes'.

PESI

Pan-European Species Directories Infrastructure - <http://www.eu-nomen.eu/pesi/>

Primary Biodiversity Data

Primary Biodiversity Data is defined as: Digital text or multimedia data record detailing facts about the instance of occurrence of an organism, i.e. on the what, where, when, how and by whom of the occurrence and the recording.

Ramsar

The Convention on Wetlands, signed in Ramsar, Iran, in 1971 - www.ramsar.org.

Registry

The registry component of the GBRDS

Regional Node, ReBIF

A ReBIF, or Regional Biodiversity Information Facility is defined as an institution/organisation mandated by two or more countries in a region to be the regional focal point/liaison on all things GBIF, and a regional network coordinating institute, representing a de facto 'mini-GBIF Secretariat' in its role and functions, such a provision of training, especially where one or more countries locally do not have the capacity to establish NBIFs. Ideally such institutes should have a politically regionally mandated role of facilitating mobilisation of biodiversity data and information for the countries of the region.

REST

Representational State Transfer -

en.wikipedia.org/wiki/Representational_State_Transfer

Science Committee, GBIF Science Committee

A formal Standing Committee of the GBIF Governing Board, comprising elected representatives from Participants and with a mandate to oversee the scientific basis for all GBIF activities.

SPM

The Species Profile Model (SPM) is a standard under development by BIS/TDWG as part of their LSID vocabularies. It is designed to allow a user to publish facts/statements about a particular taxon in a way that facilitates discovery, access and re-use, and is based on a simple model featuring a subject (taxon) having properties whose content can be free text or terms from a controlled vocabulary - wiki.tdwg.org/SPM.

Standard, Data Standard, Metadata Standard

Technical standards define a set of properties that a product or service should have. Standards are laid down by an organisation, such as OGC, ISO, BIS/TDWG and GBIF, that brings together representatives of producers and users of the type of product or service to establish the standard(s) in question.

Supplementary Funds

Additional financial contributions made by Voting Participants, Associate Participants or other funding agencies to fund specific parts of the GBIF Work Programme, or for other special purposes agreed by the Governing Board. These contributions are held by the GBIF Secretariat, kept separate from other contributions, and used only for the purposes specified by the Participants making them.

TAPIR

TDWG Access Protocol for Information Retrieval is the "next generation" protocol for primary biodiversity data exchange which combines the capabilities of BioCASE[†] and DiGIR

TDWG

see BIS.

Thematic area

Thematic Areas in this WP context refer to the two major focus areas within the GBIF Secretariat,

namely Informatics, and Participation, which coordinate a number of defined Work areas within GBIF.

Thematic node, ThemeBIF

A ThemeBIF, or Thematic Biodiversity Information Facility is defined as an institution / organization / initiative with a mandate to be a Secretariat, network coordinating institute, or similar role for a given thematic area, either regionally or globally, and thus potentially representing a de facto 'mini-GBIF Secretariat' in its role and functions for such a thematic area. Ideally such institutes should have a mandated role of facilitating mobilisation of biodiversity data and information for the thematic area.

UDDI

Universal Description, Discovery and Integration (UDDI) is a registry technology and protocol available for use in creating web-based registries of web service implementations - www.uddi.com.

User feedback service

The GBIF network allows users of its data services to provide feedback to the data providers. This function is implemented as the User Feedback Service, a web service offering an interface to pass a text message to the provider of any data item. This message is transmitted to the relevant Data Provider administrator as an e-mail.

WCMC

UNEP World Conservation Monitoring Centre - www.unep-wcmc.org.

Web services

A web service is any computing service which is published and accessible across the Internet and offers a standardised XML interface allowing users to invoke its function. Most of the web services discussed in this document provide access to biodiversity data.

Work areas

Specific subject areas identified by GBIF as requiring attention and usually with a dedicated Programme Officer employed at the Secretariat; combinations of Work areas make up each Thematic area of the GBIF WP.