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FINAL REPORT

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CONTENTS

I. *INTRODUCTION*

Vera Imperatriz-Fonseca (Brazilian Pollinators Initiative) welcomed the workshop participants.

Laurie Adams (IABIN PTN Consortium, Coevolution Institute, USA) outlined the PTN vision -- the integration of information about pollinators that is easy and efficient to retrieve and gave a brief introduction about the status of pollinators in North America. She described pollinator population declines and implications in the United States and in Europe and international pollinator initiatives occurring throughout the world. She also discussed approaches for addressing the problem, including research (CCD[1] Study Group), private industry support (Burt's Bees, Haagen Daz); advocacy (U.S. Farm Bill – built in incentives for farmers and ranchers to work on pollinator issues), presentations before UN meetings, habitat guides (ecoregional, free, downloadable, outreach (US Postal Service pollination stamps), scientific information (NAS NRC[2] Study, pollinator-plant wheel) and data (making data available for decision makers, land managers, and planners).

Mike Ruggiero (IABIN PTN, Integrated Taxonomic Information System - ITIS) reported on the progress of the network. He discussed the PTN vision and partners and provided a brief outline of the PTN architecture and content. He also described the information needs assessment that was conducted during a series of meetings as well as on-line. The assessment identified five priority areas for content development delivery:

- Scientific and common names,
- Experts,
- Specimens and observations,
- Pollinator-plant relationships, and
- Literature.

The Integrated Taxonomic Information System (ITIS) has completed a World Checklist of Bees. The checklist contains scientific and common names for nearly 19,500 species is now available online at www.itis.gov. ITIS has also completed world checklists of bats and birds, and has started work on flies, beetles, butterflies and moths, and other pollinator groups.

Eighty-two major bee collections have been identified for the Western Hemisphere: 32 in South America, 30 in North America, 2 in Central America and 18 in Europe. About 1/3 are databased. The first priority is to make these collections accessible.

IABIN Content Grants have been given to investigators in Brazil, Colombia and Peru. Progress on these projects will be reported later. Grants from GBIF[3] have also been provided to York University (Canada), CRIA[4] (Brazil), Utah State University (Logan, USA) and University of California, Riverside (USA) for digitizing bee specimen collections

The IABIN PTN Data Portal and the Plant-Pollinator Relationship Digitization and Standardization Tool were also introduced and will be discussed in more detail later.

[1] Colony Collapse Disorder (CCD)
[2] National Academy of Sciences (NAS) National Research Council (NRC)
[3] Global Biodiversity Information Facility (GBIF)
[4] Centro de Referência em Informação Ambiental (CRIA)

Two classic texts have been digitized and made available on-line at no charge in 2008. *The Catalogue of Hymenoptera in America North of Mexico* is available online at the Biodiversity Heritage Library web site (http://www.biodiversitylibrary.org). The database for this catalog has also been located and is being evaluated for inclusion in the PTN. *The Catalogue of Bees in the Neotropical Region* is available on-line at http://moure.cria.org.br/catalogue.

Currently the PTN project is in the last year of the original grant. There are still funds available for additional content grants, training, and data quality. The discussions at this meeting will be critical to setting the PTN direction for the remaining year and beyond.

Antonio Mauro Saraiva (Universidade de São Paulo - Escola Politécnica, Brazil) presented an overview of the information technology aspects of the PTN. A summary of his presentation follows.

Architecture and Protocols

The principal content that PTN is providing includes linkage to or provision of specimen collections, plant-pollinator relationship data, an experts database, taxonomic checklists, and scientific literature.

There have been two important meetings in Indaiatuba, Brazil. The first was in 2003; it was not an IABIN meeting, but it was where the idea of a World Bee Checklist began. At the second meeting in Indaiatuba in 2006 (PTN start-up) we decided on the current system architecture. Important decisions were made there regarding the standards and protocols that we would use. They were mainly those already accepted by the biodiversity community and included TAPIR[5] and DiGIR[6] for data exchange, Darwin Core for specimen data exchange; and for plant-pollinator relationship information we needed to develop a new standard to exchange that kind of data.

The architecture shows that we have a data portal; we decided to base the portal design on the GBIF portal. INBio had already decided to use the same design for the IABIN Species and Specimens Thematic Network (SSTN) so it was a logical decision for us to do the same and share knowledge and expertise. It was not a simple task to implement. We needed to understand the GBIF tool and build the network which includes many different providers. We have the SpeciesLink connection working; SpeciesLink is a network of Brazilian collections.

We expect to have the connection with the SSTN and other specimen data providers completed soon. We plan to exchange data with SSTN and other GBIF providers. We might also have a central database where we could host data from small collections that might not be able to have their own providers.

We are working on customizing the GBIF tool to our needs. Very important to our network is the plant-pollinator relationship data. This is what differentiates us from the other networks. It is key information related to pollinators. We have started work on a schema that would allow us to exchange this data. We examined other schemas to see how this could be done. We reviewed Plinian Core which was being developed by INBio, but at the time the relationship field was not a structured field, it was a

[5] TDWG Access Protocol for Information Retrieval (TAPIR) standard
[6] Distributed Generic Information Retrieval (DiGIR) protocol

text field and was being designed to deal with species or observation data. We were more concerned about collection data. So the decision was made to extend Darwin Core to work with specimen data.

As part of our activities, we are working on setting up WebBee as one of the first providers of relationship data to IABIN. Vera Fonseca has received a grant from IABIN to enable relationship data. Etienne is working on changing WebBee so that it can support structured plant-pollinator relationship data and exchange the data with the portal.

Experts Database
There were very few options at the time, but we were given some PHP code from the Aquatic Nuisance Species Task force that we used to develop the pollinator experts database.

The checklist of species names was already mentioned by Mike Ruggiero.

Important things we have done:

- We have used another portal – Incubadora – a system that is available from FAPESP[7]. It provides us with a collaborative environment, supporting listserves; exchanging content; and for hosting code – the same way that SourceForge works.
- We have had a lot of contact with INBio and we want to strengthen our relationship with them, CRIA in Brazil and with GBIF (because they are the developers of the portal design) and with FAO[8].
- We have been working differently from some of the other networks; we are quite distributed. We have a group in Brazil, and two or three groups – NBII, ITIS, and Pollinator Partnership in the United States. We have been very successful at collaborating remotely. We have had many phone meetings, some with video, and we have been very successful at doing that.

Part of the challenge of putting up information on plant-pollinator relationships is that we need a tool for databasing this information that is based on the schema that we are developing and there is no such tool. We have been working on that in two directions:

1) Developing our own tool – a database that is internet-accessible with an interface for putting specimen relationship data based on Darwin Core schema and its extensions, and

2) Looking at other tools, including the SSTN input tool. However, we could not wait for this solution to be developed so at the same time we decided to see how we could do that using other solutions.

We found that we could use Specify (collections management software) to develop such a tool. It does not allow us to accommodate relationship data in an "elegant" way, but it allowed us to input the data using the capacity that Specify has to be programmed and customized. We decided to go both ways – we have our own tool that is almost ready, but we are also pursuing the idea of having Specify as an option for those that want to "manage" a collection. Our tool is not for collection management. We are working on Specify Version 6. Maybe with that next version we will be able to accommodate the relationship information extension more elegantly.

[7] Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)
[8] Food and Agriculture Organization (FAO) of the United Nations

II. *GRANT PRESENTATIONS*

Recipients of the PTN Content grants gave presentations reviewing the progress they had made. Following is a summary of each presentation.

Vera Lucia Imperatriz Fonseca (Universidade de São Paulo - Institute of Biosciences, Brazil)

This project evaluated the status of available information on the interactions between bees and plants. The approach was to collate all existing information on bee-plant interactions in Brazil. Data sources include bee surveys and pollen analysis studies, derived from a bibliographic survey of articles, dissertations and theses; pollen analysis studies etc. This included 82 Apoidea surveys, most near Universities and most lasting more than one year (71). Also, 9-84 genera and 14-259 species were found in each locality. 11 Surveys lasted less than one year. The data will be available through the PTN architecture. The African Pollinator Initiative is interested is using WebBee to include their data as well and have asked to use the same framework.

Carlos Eduardo Sarmiento Monroy (Universidad Nacional de Colombia - Instituto de Ciencias Naturales, Colombia)

The diversity in Colombia is very large due to three mountain ranges. The Instituto de Ciencias Naturales (ICN) at Universidad Nacional de Colombia has the goals of documenting Colombia's biodiversity and understanding its causes and providing tools for sustainable management.

The ICN collection currently has 900,000 specimens (mostly plants), but the insect collection includes approximately 200,000 specimens. The entomology collection started in 1940 along with the ornithological collection. A goal is to keep growing the collections and making them available to the public. We have 241,700 specimen records on the web, mostly from the botanical collection. We provide a catalog of common names, strongly related to scientific names of plants. It is almost finished. You can consult the database by genus, species, type of collection etc. We have multiple bioinformatics projects but the digitization of the different collections is a different story. The insect collection has only just started to be digitized. The goal for our project is to have 3,000 specimens of the ICN bee collection systematized, so far we have completed 1436. This is 100% of the bee collection but we have not worked with the butterfly collection (about 8,000 specimens).

The bat collection – pollinating bats – is about 1,000 specimens, we have completed 600. The LABUN bee collection has about 20,000 specimens. So far we have not worked much on this. We are using Specify to introduce all of the information.

Bee AAT or Taxonomic Authority Archives: we are working on this in order to provide the correct information for all of the specimen information. We are following Darwin Core for specimens, and Plinian core for species data. Our bottleneck now is the AAT list because that has to be done in a professional way. We are using postgraduate students working side by side with experts and that is taking time because we have to do it carefully, verifying names in the literature etc. Another stage of

the project – Plinian Core requires that you enter the taxonomic status of the species. That is a decision that is difficult to make if you are not an expert.

Another area we would like to discuss is that some of the fields in Plinian core require entry of information on endemism and habitat. We need to establish a vocabulary and definitions for this. We also need standards for habitats. There is a Colombian Pollinators Initiative. The leader works for the agricultural department.

Angie Romy Burgos Bastidas (Red de Acción en Agricultura Alternativa (RAAA), Peru)

Important agricultural products of Peru include cotton, rice, corn, and potatoes. In the forested areas, there are also citrus crops. The agricultural production and diversity of agro-ecosystems are threatened by loss of pollinators. Peru is a Party to the Convention on Biological Diversity and one of 139 countries involved in the International Initiative for the Conservation and Sustainability of Pollinators.

The Action in Alternative Agriculture Network (RAAA) is a decentralized national network for training and research on environmental sustainability. CONAM[9] is the Environment National Council that works as a Focal Point in this project. The Project of Pollinators of Peru was presented last year to IABIN and we began executing the project in December 2007.

In developing the first database of pollinators in Peru the principal approach was to search bibliographic resources and contact people involved in pollinator research. The five-step methodology included looking for bibliographies, looking for workshops, evaluating samples in museums, conducting interviews and surveys, and reviewing databases. We also searched theses from 31 universities and 50 faculties (biology, agricultural, engineer, and forest engineer). The principal university is in Lima and the major collections are at the Natural History Museum – UNMSM[10], URP[11], and the Entomology Museum of UNALM[12].

We are still working on the development of a database that will contain information about pollinator species, morphological characters, function in the ecosystem, names of plants associated, etc.

Activities include a 1st workshop in Lima (central coast) in August, a 2nd workshop in Chiclayo (north coast), and a 3rd workshop in Iquitos (forest).

Current products include 85 articles from magazines, 16 theses – 15 on species and 1 on birds, 60 congress events, and 10 others. There are very few theses available on pollinators. Investigations focus on insects (253) followed by birds, and mammals. The database allows entry of new pollinator and plant records, ambient environmental conditions; evidence of pollination. Future actions include completion of the project and finalization of the database and participation in the Entomology National Congress in Tacna, Peru in November.

[9] Consejo Nacional del Ambiente (CONAM)
[10] Universidad Nacional Mayor de San Marcos (UNMSM)
[11] Universidad Ricardo Palma (URP)
[12] Universidad Nacional Agraria La Molina (UNALM)

DISCUSSIONS ON SECTION II

Section II, Fonseca Presentation:

Rita: Specify is the tool that will be used to manage specimen collections; but is there another tool that will compliment Specify for accommodating interaction data.

Antonio: Many potential providers already have their own collection management applications or spreadsheets. We will have to deal with this heterogeneity. We cannot ask them to change the way that they are working. Which is the tool that we want IABIN PTN providers to use? One for specimen data, and another for relationship data. For specimen data we can suggest any collection management software, especially if people are already using a tool. We will need to install a DIGIR or TAPIR provider (also referred to by Boris and in IABIN documents as the "connector') on top of that tool. Since we were asked to choose one or suggest one, we decided to work on Specify because it already has the capability of accommodating the connector on top of it. But we know that it will only work for those who are willing to work with this software. Relationship – there was not another software application available that supported digitizing data and providing the data to our portal. So those are two different aspects. Databasing – Specify for collections; and our tool for relationships; and then Connecting…

Vera already works with us on the WebBee project. So we asked IABIN to allow us to change WebBee so that the database accepts and provides the data using the same protocols and to change the interface so that additional inputs can be done. But that is specific for WebBee. We plan to have a tool that anyone can download and use. That is the tool that we are developing.

Section II, Monroy Presentation:

Mike Frame: on habitats – the IABIN Ecosystems network has classification systems for habitats with cross-walks between TNC[13] and IUCN[14] etc. You should look at what they are doing because they have some online tools that you might be able to use.

Rita: ETN is working on a cross-walk between habitat standards.

Section II, Bastidas Presentation:

Mike Ruggiero: How is the PTN going to include the Peru data in the system?

Antonio: Some of this data is from specimens, including some relationship data.

Rita: Most of the information relates to species. You could use the SSTN database and tools that are already available to download. And then the information might be interoperable with the PTN.

Antonio: We are working with specimen and relationship data only.

[13] The Nature Conservancy (TNC)
[14] International Union for Conservation of Nature (IUCN)

Mike Frame: When you (Angie) designed your database, did you look at the Darwin Core or Plinian Core standards? It would be interesting to see how much of your data is compatible.

Mike Ruggiero: We have not yet elaborated the bibliography part and that could be another way to include the Peru data because they are examining and including references.

Carlos: what is the geographical coverage of the collections.

Angie: A lot of it is for Lima – mainly insects and birds.

Rita: the institute in Peru works closely with GBIF.

III. REVIEW OF TOOL DEVELOPMENT

Antonio Mauro Saraiva (Universidade de São Paulo - Escola Politécnica, Brazil)

Five presentations:

Experts Database (Diogo Krobath)
Darwin Core Extensions and PTN Data entry tool (Etienne Cartolano)
Specify (customized) data entry tool (Leandro Halle Najm)
PTN Portal (Pablo Salvanha and Paulo Venancio Lopez)
PTN Web site (Elizabeth Sellers)

Experts Database
Diogo Krobath (Universidade de São Paulo - Escola Politécnica, Brazil)

The Experts Database helps communication and collaboration and facilitates access to information on pollinator experts. The database also allows searching and editing (insertion/edit/delete) of experts information. It was developed using MySQL, PHP and Apache Web Service. The original code donated by the Aquatic Nuisance Species Task Force of the United States.

Search criteria include common names, scientific names, geographic location, and area of expertise. Results include expert personal information, taxonomic expertise, geographic location, and expertise such as discipline, taxonomic, and geographic scope of their expertise. Experts are divided into two access levels: publicly accessible, or hidden from the public. There are 4 types of users: expert user, administrator, and two others. An expert can edit, add, and delete taxonomic items. A live on-line demonstration of the Experts Database was provided.

Darwin Core Extensions
Etienne Cartolano (Universidade de São Paulo - Escola Politécnica, Brazil)

The schema is interpretable by many providers that already use Darwin Core. Modules cover all types of interactions and details increase at each module (e.g. at the highest level you can have an interaction between a bee and a plant). To have more details we have another schema for details of the interaction such as “Oil Removal.”

IABIN-PTN is working with CRIA, GBIF and FAO on development of 3 schemas: interaction data, pollination data, and at the same level as the pollination data, we have an environmental measures schema. You can use only interaction and environmental or you could use the interaction schema and pollination data; or you could use all three.

The schemas are described in detail on the TDWG web site. The first version is a replication of the Darwin Core Schema in the Interaction Schema. Interaction schema includes record-level elements, taxonomic elements, natural history elements and interaction elements. The pollination schema

includes the pollination elements and the environmental measures schema includes the environmental measure elements. If you already have both specimens registered at the user's computer, then he/she only needs the relationship information. We transformed the schema to optimize it and make it more efficient for data exchange.

The second version includes a global unique identifier of specimens in interaction schemas. With this schema only the relationship information is brought and if the detailed information about the specimens are required, then one/two Darwin Core requests are issued.

The next steps are to study **t**he impact of the interaction schema modifications (operational and technical, by digitization tool and PTN data portal) and address user comments from the TDWG Forum and the PTN Web site.

Digitization Tool
Etienne Cartolano (Universidade de São Paulo - Escola Politécnica, Brazil)

The Digitization Tool will provide an interface to digitize specimen data with Darwin Core schema (observed/collected specimens). It will also provide an interface to digitize pollinator interaction data with Darwin Core extensions: interaction, pollination and environment measures (based on the new version). It will also publish saved data with TAPIR provider.

Tool Features include:

- Save, view, delete and update records
- Internet access from any browser
- Multilanguage support
- Portability: Windows and Linux environment
- Use of Open-Source tools (Apache, MySQL, and PHP)

XML File for Fields Specification: Inside this XML file, I can specify the fields of the form. For example, I have a field named pollination evidence that's type longtext, and it is a type of percent of pollination. This field can be translated into Brazilian, Spanish, English and French. It is easy to modify this file because we have a well-defined schema.

Products/Results: a quadri-lingual online interface.

We need to define the terms of the specimen/observation data form – develop an authority file (e.g. should we include "Brasil" or "Brazil"?)

Specimen observation interaction form: * Use this form with Specify.

If a person uses Specify to manage their collection, they can use this form to publish only the interaction data. They can use the GUI of the collection and publish only the interaction data.

View interface: The user can view records.

Next Steps:

- Charge ITIS pollinators checklist
- Validate update features (30 July)
- Validate Draft Material Training (30 July)
- Create an Install Package (30 August)
- Study a Security Policy to Interface (30 August)
- Define the tool distribution policy
- Train data providers
- Define authorities for data (e.g. Brasil or Brazil?

A test exercise of the digitization tool, to save nine interaction records, was conducted and evaluated.

Specify Software to Store and Manage Collection Data
Leandro Halle Najm

Specify is a collection management platform for biodiversity data. The software comes with a prepared schema to work with the web and the DIGIR interface. It is for a native provider using DIGIR protocol. The final user application is to standardize collection data. It is a cataloger with field research and lab work functionality.

Specify was developed by the University of Kansas. It supports multiple platforms including Windows, Mac OS X, and LINUX. The software requirement is that Java 1.6 is installed. No installation is required; it works with a USB memory drive. Derby Database is an open source relationship database.

Features:

- Allows you to create a new dataset and choose fields to be included in the dataset.
- In the main screen of Specify 6.0 you can add rows of data using a spreadsheet style view.
- In the full version of Specify 6.0 you will also be able to create new reports and have other options and capabilities.
- Many data collectors use Excel spreadsheets to store and manage their data. You can import these spreadsheets into Specify just by defining the column headers (if they exist) etc. and you can choose which columns you want to import.
- You can also export rows into an Excel spreadsheet. The new version will also be internet-based.
- Reports include pie chart and bar chart representations; including labels.
- Data comparisons are easy using the tabs associated with multiple reports.

Limitations:

- This version can only import 2,000 rows at a time.
- Each import action creates one dataset.
- Specify does not work with data relationship but one way to deal with this is to customize Specify, creating a new field such as a text field that in which you can record a relationship.
- Creation of new fields, new reports (not available in the current version).

The full version of Specify 6 will solve these limitations (available this Fall, perhaps September 2008).

IABIN PTN Data Portal
Pablo Salvanha (Universidade de São Paulo - Escola Politécnica, Brazil)
Paulo Venancio Lopez (Universidade de São Paulo - Escola Politécnica, Brazil)

This tool is used mainly by end users allowing them to visualize information from the data providers. It brings all of the information together.

Objectives:

- Centralize information of different providers around the globe.
- Search for occurrences, scientific name, countries, **relationships** etc. (bold indicates PTN, not bold is GBIF version).
- **Get and store relationship information.**
- Positioning occurrences on the map.
- **Interactive exhibition of occurrence relationship.**
- **Personalized layout.**

Problems and Solutions:

- High demand for information.
- Information not only available from one source.
- This problem has already been solved by GBIF with centralized portals.

Features:

- Information exchange between providers and the portal.
    - Extended Darwin Core schema
    - GUID based schema
- Implementation
    - Providers
    - Centralized portals
- Personalized layout and exhibition of relationship information.

Architecture / Information Exchange:

Data providers store their data in various formats, so the providers have a protocol that can communicate with their database and get the information to the portal. The protocol is basically DIGIR and TAPIR. The protocol only gets information from one side to the other side. The data provider uses a protocol and the schema that the portal also uses.

Problem: Share relationships information to centralized portals.
Solution:

- Use extended Darwin Core schema. The portal and the providers need to exchange Darwin Core with extended Darwin Core. We need the relationship information but also the single information. Providers will need to remap the fields.

- Use GUID based schema. Create an additional harvesting process to ID and work only with relationship information. Providers will continue to use Darwin Core to collect singular information about specimens. Use a specific schema to exchange only the relationship information.

Pablo went on to outline the pros and cons of each of these options. The first option would be more work for the providers.

Paulo provided a demonstration of the PTN Portal search capability.

We need to review and improve the text on the About page of the Portal:

About
About this website
Welcome to the Data Portal of the Pollinators Thematic Network (PTN) from Inter-American Biodiversity Information Network (IABIN). For an introduction to the capabilities of the Portal, see the online tutorial. The Pollinators Thematic Network is a Consortium led by the Pollinator Partnership (USA).

The members of the consortium are:

Pollinator Partnership (USA)
University of Sao Paulo (Brazil)
Centro de Referencia em Informaio Ambiental, CRIA(Brazil)
National Biological Information Infrastructure, NBII(USA)

IABIN PTN and its many partners work to mobilize the data, and to improve search mechanisms, data and metadata standards, web services, and the other components of an Internet-based information infrastructure for biodiversity.

For more information about IABIN as an organization, visit our home page at www.iabin.net.

For more information about the Pollinators Thematic Network visit our home page at http://pollinators.iabin.net. The IABIN PTN makes data available that are shared by pollinator data providers within the Western Hemisphere.

These data are shared according to the IABIN Data Use Agreement, which includes the provision that users of any IABIN data will always give credit to the original providers.

Comments on Data Digitization Tool:

- Portuguese is misspelled on the “Settings” page.
- In Data Use Agreement – include statement saying something like “Please consult the data user agreement of the data owner in all instances.”
- Changing the view to “Portuguese” does not translate text inside graphics, or on the About page, and the “Home” link at the top of the page. We need to create translated versions of these sections of text.

Two options exist for exchanging relationship information. Both are based on an extension to Darwin Core. Should we exchange all of the specimen information in addition to the relationship information or should we only exchange the GUID's of each of the specimen records in addition to the relationship information? It is an extension to any schema that uses the GUID (e.g. Plinian Core, Darwin Core, or ABCD).

DISCUSSION ON SECTION III

Section III, Krobath Presentation:

Mike Ruggiero: We should freeze or standardize some of the taxonomic terms. – At least the upper hierarchies.

Carlos: Can Experts choose to have only portions of their profile available to the public?

Liz: No. We discussed doing this, but it was too difficult technologically.

Laurie: How will experts know that they can choose for their information to be available to the public or kept private?

Liz: That will be included in the instructions or manuals prepared for this tool.

Carlos: Why would an expert enter their information and then choose to keep it private?

Liz: Some experts only wish to be contactable by other pollinator experts but not by members of the public.

Laurie: Is there a page that experts can go to, to register themselves?

Liz and Antonio: No, not right now. We decided that people should not be able to register themselves because we will need to moderate their requests. One of the political things we need to work out is where and how we will provide experts with an email or phone number that they can use to tell us that they want to be added to the database. We also need to work on who will receive and respond to these requests. We also need to decide on the criteria for evaluating experts – perhaps ask them to provide us with the information about themselves that we would enter into the database as well as maybe some personal references (to people that know them whom we can contact).

Laurie: Contact Us Page – we should include a section for the media to find out how to get more information.

Carlos: How can we protect members experts' emails from spam? We could break the email field into two fields with the name in the first one, and the @ symbol hard coded on the interface, and the domain in a second field. But in the database it would still be stored in a single field. Or users can choose to type their email address in without the @ symbol – and use "AT" instead. We can include this as a tip in the user manual.

Angie: Same comment as Mike Ruggiero about making the taxonomic search hierarchical.

Antonio: Experts Database: How do we accept/determine if someone is an "expert"? Who should the email inquiries go to? Suggestions so far are 1) send in two references to one of our team members (who?) 2) have someone checking the information.

Carlos: Some scientific lists send you emails to check that your information is updated. That might be nice to have because it is very difficult to keep track of everyone's email. This could be automated.

Liz: DAISIE has something like this – and they also have criteria for removing records from their experts database.

Mike Ruggiero: It will be difficult to tell someone that they cannot participate – Laurie how do you evaluate people?

Laurie: If the person uses their association in NAPPC to further themselves, then we will not allow them to participate.

Mike Ruggiero: People in England in the bee, wasp, and ant recording society – would those be people you would leave off the list? If you associate an affiliation or organization with these people then that can be part of the criteria for evaluating people.

Carlos: If someone is invited and the system says no – that would not be good.

Liz: Is there a situation where we would invite people and then choose not to include them?

Laurie/Antonio: Possibly – we are about to invite around 300 people from the Brazil meeting.

Mike Ruggiero: Maybe we need to review terminology – expert versus source. It means different things to different people. If it is for communication – there are a lot of people that do not consider themselves experts but they may have money that they want to give to pollinators. Maybe there could be some categories in the database: e.g., contributors, supporters, rather than just "experts". There are also "interested people".

Vera: Some experts are coming to the bee meeting and we can consult them about this issue.

Send post-workshop comments on the Expert Database to Diogo Krobath – his email information is in the participants list.

Angie: We need to add "Entomology" to the disciplines list.

Liz: Add "invasive species" to the disciplines list.

Liz: Is this URL temporary? Are we going to change it to something like <http://pollinators.iabin.net/experts> or something when we are ready to make it public?

Additional Comments on Experts Database:

Make "*" required (red) fields.
Better label for "Profile"
Better label for Tier ½ (e.g. Hidden, …)
Geography – "Google Pick" – ability to pick a place from an interactive map
Search → "Continent" → Country (seemed to have to select both)
Reduce general user person to "add" taxa
Available to other IABIN-TN
Is available to IABIN - Catalog ?
URL - is it permanent / temporary, need something like "experts" (contacts now)

Section III, Cartolano Presentation:

Carlos: Is there a way to download this information for insertion into another analysis?

Antonio: Yes – through the Data Portal.

Mike Frame: We input data through this client. Is the TAPIR client running in the background of that also? How is this being served up? The objective is to provide the TAPIR provider and this tool together in the install package. Then the data provider can insert the data and also automatically provide the data for our portal.

Mike Frame: There will be some kind of registration of all of these TAPIR providers and then the portal will index that registration – how are you managing that piece?

Antonio: Right now we are showing the tool and the providers that are ready to be harvested…

Mike Ruggiero: Where does this information get saved to? To my server? What if I do not have a server?

Antonio: Maybe we can have a server to host your data.

Mike Frame: When we put this data in through this tool it went into a MySQL database which is not local.

Antonio: If you do not have database capabilities, then you could use a database that we could host. And you could connect to it remotely.

Mike Frame: In the US some really small museums use shared storage space. This works well.

Etienne: If we have the database, we can also assess the data for quality.

Antonio: we probably need a more automated way to do that.

Mike Frame: You could use GeoMancer to go back in and georeference and validate some of these place names. It has a web service that you can use. We are going to try to use it for the catalog project for place names.

Carlos: include instructions on the interface – that explain to the user how to enter data into the fields in a standard way. Include examples of how something should be typed.

Liz: include linkage to the instruction manual in the interface (hyperlinks).

Antonio: which schema for relationship should we adopt? There are different pros and cons – we could define the two GUIs and the relationship as the true "extension".

Antonio: What technology are we going to use for characterizing the relationship? We have used "pollination"… it is hard to tell whether something "pollinates". A better term to use is "visit". We started a survey to collect terms that researchers use to define interactions – so that we could develop a standard vocabulary. Or should we just leave that field open?

Antonio: We have received input from Barbara Herren, who forwarded an email from a person from New Zealand that is involved in the Oceania Pollinator Initiative – and she argued that we should leave it open and not tied to specific words.

Mike Ruggiero: If the end use of the data is to be able to put it into analysis, then we need to have a well defined controlled language and then provide an "other" field to accommodate additional terms.

Liz: We also cannot assume a "dependency" from relationship data and it is important that we recognize that too.

Mike Ruggiero: The catalog of life should be consulted about this too.

Section III, Najm Presentation:

Carlos: So this new version will address all of the limitations?

Leandro: Yes, William Ulate tells me that the next version will address these limitations – including relationships.

Carlos: How is it different to the tool that we saw earlier?

Leandro: The difference is that one you can carry with you into the field; but the other you need access to the internet. You can also use Specify to manage your collection.

Carlos: Will you be able to exchange information between Specify and the PTN tool?

Mike Frame: Specify has an embedded provider so they should be able to exchange data at that level. GBIF is pushing some of this Specify development for the next version of TAPIR and DIGIR – to

imbed it right in that collection management. If that tool really is going to manage relationships – but maybe not at the level that PTN needs.

Antonio: We talked with Jim Beach and after that we came up with the possibility of customizing Version 5 of Specify. But he says that the next version will allow you to have different collections inside the same installation of Specify. And you will be able to relate specimens from those different collections but we are not sure how they will relate.

Specify requires the taxonomic tree in order to be able to retrieve data. How will that affect data exchange between it and the PTN tool?

Section III, Salvanho, Lopez Presentation:

Mike Frame: We should highlight the relationship data more on the home page.

Mike Frame: IABIN should use that same approach – the GUIDs (ensure that the institution code is unique, and the IABIN needs to have a registry in order to know that the data providers and their GUIDs exist) – to access information from I3N and SSTN, and PTN.

Carlos: I do not understand why you are talking about Plinian Core and the Institution code because Plinian Core is only for species data, not specimens.

Mike Frame: In the SSTN network, on the species side they are creating species profiles (high level information) there is a relationship between that and the specimen records located throughout IABIN.

Carlos: Everyone who is using Specify should have a GUID.

Mike Frame: Maybe in the next month at the IABIN Technical Working Group meeting – I still think there has to be a service that advertises these GUIDs. ITIS is taking all of it is TSNs and creating LSIDs for each of them. So every item will have a unique ID. Unique IDs are never reused.

Antonio: Who will generate a species level relationship, and based on what? Who will generate species level information?
Liz: So the relationship record needs to be tied to or associated with the specimen record(s) it came from.

Mike Ruggiero: We are trying to nail down these bits of information – where an insect had a specific type of interaction with a plant at a specific time and a specific place. Is the situation where a relationship is associated with a specimen record and an observation record (because only one of the organisms was "collected") supported? Or one specimen might go to one collection, and the other specimen might go to another collection.

Antonio: Maybe we need to implement this discussion into the TDWG page – and instead of being a Darwin Core extension it is a relationship schema.

Mike Ruggiero: Do you have a way to also handle a one to many relationship? E.g. where a bumble bee visits 3 different species?

Pablo: three records.

Carlos: What happens when we have records of pollination visits on the specimen but no specimen of the plant? We do not have a GUID number for the plant specimen.

Antonio: How do you build a GUID for that plant that was not collected?

Mike Ruggiero: That's where you are getting into the difference between specimens and observations. Monitoring programs do not have specimens. Where the NPS does not have a specimen they have indicators of the quality of the data (e.g. park ranger saw it with binoculars).

Laurie: These records that we have rarely have the exact relationship defined. What has Angie been finding in terms of these relationships?

Angie: Some pollinators – I can find that they pollinate a specific plant. Also some plants are not defined to the species level.

Mike Frame: So it depends on whether you are starting fresh or going back into a collection that's not digitized.

Carlos: So we still will need some way to supply that additional GUID.

Mike Ruggiero: If somebody sees that piece of data about the specimen and the relationship you want to be able to trace back to the source of that information. So if you asked for everything seen visiting "sunflower"… you wouldn't have an accession number.

Antonio: You would not have a catalog number because there is no specimen, but you could have an ID.

Laurie: Rather than come up with a new number for the plant record, could you relate it to the first GUID for the insect specimen?

Mike Ruggiero: There will be a unique number attached to the observation.

Antonio: We need to be careful about what we do with the GBIF portal tool. Because if they make changes to it, then we might need to make changes to our code too, unless we keep them very separate.

Mike Ruggiero: You could change the interface very easily – especially so that it highlights this relationship data.

IV. TRAINING

Antonio led a discussion about training in an attempt to define the product and how it relates to people. Key considerations were:

- Target audience
- Content of the courses
- Schedule
- Resources
- Location
- Course Team (people who will prepare and apply training)
- Attendees (who do we want to train?)
    - trainers – people who will be able to train other people
    - users – who will use the tools immediately
    - train both in the same course or not?

We need to decide whether to train IT people, biologists, or both. Course content should include PTN data entry tools (our tool, and Specify-customized), Experts Database, PTN Portal (how to use it), Collaboration Portal (software development, general discussions, wiki), Foundations of Biodiversity Informatics (basics on biodiversity information, standards and protocols for data exchange, development tools and environments), and training on SSTN tools (optional). Course materials should include tools (description, installation, use, code (when applicable), development information; foundations (basic texts); and format (texts, slides, CD/DVD).

We should offer one course in 2008 (or early 2009) and another in late 2009 (for new grantees) if there are resources. The resources should come from IABIN Component 2. We need to find out how much funding is available, how to apply and if there are any constraints. We also need to determine where best to hold the courses. University of Sao Paulo is one option. Panama and a Caribbean Island location are also options. Perhaps courses can be taught in conjunction with other TN courses. The PTN Consortium should work on content and course development/teaching, proposal planning, development and other preparation procedures.

DISCUSSION ON SECTION IV

Rita: People may not need to be trained on the use of the tools because you have a very good manual. It is very difficult to ensure that the people that come to the training have the skills needed in order to understand the training. It might be a good idea to hold the training by region; and perhaps one in Spanish and one in English. There are advantages to holding the training where the infrastructure is available to support the training and the logistics; but it can be expensive to bring all of the students to that location; On the other hand, it may be cheaper to just send the trainer to multiple locations, but then who will do the logistics and provide the infrastructure for the training?

Mike Ruggiero: I think we need to write down one more item – the objectives of the training course – after the student has finished this course – they will be able to do what? What is the minimum that we will want them to be able to do? Certainly we want them to be able to enter data into the system – to provide data. We also want them to use the system for their advantage.

Laurie: I have a question for Carlos and Angie – how did you find out about this Content Grant program? And in just seeing what we have done today – how are you going to change your approach? This was not training, but you have leaned how it works. How are we going to find more people like you? Did you learn something just by seeing how this works?

Angie: I think that it is important that the person that gets the training must be familiar with the biological terms because they can give more ideas for the tools; and maybe before the training they can read manuals and then get the training.

I found out about applying for an IABIN content grant. I studied one course in University of Lima and I met a professor that told me about the IABIN web page and he told me about participating in this project.

Laurie: Was he a Focal Point?

Rita: He was Victor Morales; he is a member of the IABIN Friends listserve.

Carlos: We knew about IABIN because we had a previous grant for georeferencing so we knew about the network already. Once we found out about the call for funding, we applied because we have a collection there. What I have learned is several things that I have to discuss with our teams. We need to change or consider what schema we are using with respect to interacting with this project. How are we going to fill those plant-pollinator relationship fields? I am not a biologist, but I am learning about many of the details that need to be considered before we start filling the databases.

Laurie: So Vera do you have biologists doing this or IT people?

Vera: Biologists with IT support.

Mike Frame: So Carlos will you go back and potentially modify your data management systems to include these relationship items or will you use the tools that you saw to try to collect the relationship information?

Carlos: I might consider adding the fields into what we have now. It is better for us to extend the current system to what you are requiring. I will talk to the two IT engineers about this.

Mike Frame: That's the correct answer for sustainability. This is part of their normal data management system.

Laurie: We have two really distinct cases represented here. Carlos already has lots of data. Angie was figuring out what sources to look at to find data. That's a really good thing for us to include in our training. We cannot assume that they have that knowledge already, a knowledge of where the data is and how to find it.

Antonio: What is the objective of training? Do we want to produce users or replicators to result from this training?

Laurie: We need both; maybe data providers first and then users…

Liz: Some users also can turn into very good trainers because they have excellent experience of implementing the tools on their own datasets.

Antonio: It seemed to be that INBio had a very technical training, but it seems to me that we should not take the same approach. We should take the approach of training users but at a lower level.

Laurie: Carlos are you doing data entry?

Carlos: Yes. Our team is composed of two IT people, I am very close to the students – typing or entering information, checking for problems and working very closely with IT for solving problems.

Rita: How difficult is it to install the connector? If you are connector is easy to install then you will not need to train trainers as INBio had to.

Antonio: At least some IT support is needed to install the system.

Laurie: Angie, do you have IT support helping you?

Angie: No, only biologists.

Antonio: Probably at any university there must be someone that has some IT knowledge.

Jaime: The installation of DIGIR or TAPIR is easy for people from IT, but the configuration of the schema and mapping the records is difficult.

Antonio: In terms of installing the tool, what we will change is only to include training about the digitization tool, nothing about the portal or the experts database. What might be done is the idea of having the data served through our server. It will be complicated when people have a database of their own.

Mike Frame: To me the priority is to get content into the TN. So it sounds like you have some people that do not have any IT support and some people that can take that tool and set it up in their environment. The third case is the group that already has a tool and needs training on how to serve that content to the network. You may need to have two separate trainings for the first two situations; and just provide some documentation for the latter group that probably will not require training.

Pablo: Centralize the IABIN PTN portal server at an institution and then train or give a manual at each site. We could also preinstall the software for each institution and then train the biologists so they do not have to worry about the installation process.

Angie: She would be able to get access to an IT person

Laurie: As part of our RFP, we could ask applicants to come to us with a team that includes an IT person and a biologist.

Rita: We are not getting many responses to our RFPs but maybe if we have a deadline of late September will get more responses. For ETN we only have 2 responses and for invasive species we have 3 responses, but in February we had 21 responses to one of our RFPs.

Laurie: Can we talk about this to the people coming to this bee meeting? Can we mention that it is coming then there may be people interested in looking for it? We could ask them to also think about their contacts.

Rita: We always send our requests to the IABIN friends list, and to our Focal Points with a request that they forward it on to their friends etc. Let me work on it tonight, and we could have something ready to distribute on Wednesday.

Antonio: What about how to apply for a grant for the training?

Rita: That is more difficult. At the last IABIN Council meeting, we decided that the way for them to carry out this training was for them to select a champion from each country – a trainer that would receive training. The people who were trained then have to end in a proposal explaining how many people they plan to train, where they are going to have it, and a budget. Then OAS[15] requires three different quotes for their logistical expenses. We decided to allocate the funds according to the size of the country. What we do first is send invitations to the Focal Points, asking them to nominate someone from their country to take the training.

Antonio: My experience is that the Focal Points are not the best people to be the Focal Points when it comes to awareness of this technical expertise.

Rita: What we did was we allowed Focal Points to designate someone from an NGO[16]. If you can come up with any creative way to do this, it will be considered. I do not think the Focal Points would be against your ideas.

Antonio: How should we proceed in order to be able to give training on the SSTN tools?

Liz: Regarding the training, I think it would be good to also include a small portion in the training covering what a specimen is, what a species record is, what a species relationship is, what a plant-pollinator relationship is. Just some very basic biology and ecology is needed to make sure that even the biologists know what we mean when we use these terms during the training.

Rita: First you have to have the tools, the training module, and the training tools ready, describe how you will carry out the training including selecting students, and include the budget too.

[15] Organization of American States (OAS)
[16] Non-Government Organization (NGO)

V. RELATED ISSUES

IABIN Catalog and Search Tool
Mike Frame (USGS National Biological Information Infrastructure, USA)

What is the role of the IABIN Catalog for finding and integrating information?

We have thematic networks with particular purpose content and often unclear relationships between them. What does IABIN need to make sure that people know that those resources exist? That is the purpose of the catalog. It was the last consultancy to start. The catalog will provide an integrated, customized, multilingual search tool for IABIN, to be termed IABIN BioBot, which will build upon data and information made available through IABIN's TNs, the current NBII BioBot included. There are three products: a multilingual search tool, multi-lingual thesaurus capabilities, and code/scripts for delivering relevant content from TNs.

Year 1
We will produce a work plan, form a technical working group, and modify the NBII BioBot Search interface. Need capability to expand terms that people use to search, e.g. "Invasive species" may mean something different in different regions, e.g. "non-native", introduced, alien etc. The catalog accommodates this. The catalog is available in English, Spanish and Portuguese. Resources can be viewed by TN, content type (e.g. images), and geography.

<http://iabin-catalog.nbii.gov>

Live demonstration of IABIN catalog

The catalog runs off Dublin Core metadata records for resources such as images. There is a relation field that we use to display image thumbnails. We also display FGDC metadata records. The catalog contains 40,000 records (resource database). There are 20,000 metadata datasets. There are approximately 50,000 species profiles harvested from NatureServe and a database of 150,000 literature citations. The IABIN catalog is made up of multiple sources of content. We are developing a way to access thematic network content.

The first time we discussed this, we thought about referencing just the pollinator datasets rather than the individual specimen records.

DISCUSSION

Laurie: As a user, how do I know that there are these other thematic networks?

Mike Frame: You'll discover the individual records. There will be that metadata record on the right that has a reference to the IABIN thematic network for pollinators.

Antonio: This does not show the existence of each network. It would be interesting to include something on that interface that links to and advertises the existence of the TNs.

Mike Frame: We could include the IABIN navigation in the interface too.

Jaime: You could include a box that says something like – "Did you mean…" or "Are you looking for the Pollinators Thematic Network"?

Liz: How is this interface going to be incorporated into the IABIN.net web site?

Mike Frame: There will be a link in the navigation; and we will also pass out search scripts that say something like "Find Ecosystems content in the catalog"…

Laurie: You could have the top reference have an IABIN look to it or something.

Mike Frame: Should you create a little metadata image of the sites?

Liz: Do we have to go to the metadata record or can we just go directly to the resource?

Mike Frame: The reviewers wanted to see the metadata record first. But there may be opportunities in the future to allow for sending the user directly to the resource or give them a choice to see the metadata record if they want to.

Mike Frame: We wrote some scripts that we could pass out to the different thematic networks and we are working with ecosystems right now. Boris has included it on the main IABIN web site. With these scripts we can predefine what results would show up. I think we have to be careful though about predefining and limiting what someone would search from this box. If I am on the pollinators site and I have only limited the search box to pull back published literature for pollinators, could I potentially miss some records that I3N has provided that may be about invasive pollinators?

We use a collaboration area at my.nbii.gov and that is where this documentation is and where the members of the technical working group interact.

Year 2

There was talk of building an advanced search interface, but we do not have any plans to do that right now. The thought was, do we need the ability to search specific TN content from the catalog, and if we do, at what level? Some people wanted to be able to download results from the catalog. If you go to the pollinator or specimen portal, you could perhaps download specimen records into a spreadsheet, but this functionality does not make sense with the catalog, which only contains metadata records.

We are going to incorporate the GeoMancer web service so that users can do a bounding box or geographic type query. We are going to do the same for scientific names, using ITIS or the Catalogue of Life to expand the search based on the taxonomy.

We are building this terminology so that if someone types in a term or a phrase we create a relationship between that term and the same term in other languages.

Report from IABIN TWG Meeting, June 2008 (Mike Frame)

Recommendations for PTN:

1. Establish formal agreement with USP to support IABIN hosting and infrastructure needs. Secretariat will evaluate the possibility of providing a decommissioned IABIN server to USP.

2. PTN will develop Dublin Core records for each collection being served through the PTN network. One record per collection will be developed using the NBII Catalog tool.

> **Liz**: Mike can you work with Lisa to develop an example record for this that all of the TNs can use as a guide?

3. PTN will upgrade the GBIF portal to the latest source code to include modeling, tracking and other features.

> **Antonio**: I think we should try to coordinate with GBIF in terms of being more in contact with their implementing team so that we are not caught by surprise when a new version is released.
>
> **Mike Frame**: Tim and I are writing this paper that NBII and IABIN are going to work together on; it is very IT-oriented. We had said that it would be great to get all of these people using the portal together in a workshop for 3 days. I do think we will try to push GBIF to get together and hold some kind of workshop where everybody that's using the portal can get together. When it was first written, they did not intend for it to be adopted everywhere, so the architecture didn't necessarily take that into account. Updates need to be scheduled and more systematic.
>
> **Antonio**: IABIN is probably the biggest use of GBIF's portal, so it would be good if we had more of an agreement or a memorandum of understanding.
>
> **Mike Ruggiero**: But IABIN does have an MOU with GBIF.
>
> **Mike Frame**: IABIN is very dependent and what if GBIF decides they do not want to use that portal any more? What does that mean for the IABIN groups that are using it? If the interaction was more formal that might be better. Gladys is trying to draft something to make the relationship a little bit more formal.
>
> **Mike Ruggiero**: This should also be pushed at the governing board meeting.

Mike Frame: GBIF is talking about having regional node meetings now too. We may host one in Reston in D.C., so something like this would be on the agenda for that meeting.

4. PTN will register with SSTN and GBIF all PTN specimen providers. Coordination with SSTN and GBIF related to harvesting and replication will occur. There are still some providers of specimen data who do not want that data shared with GBIF. But this last item was trying to capture the situation where if there are any specimen collections within pollinators they would also be registered with SSTN. This goes back to some of the talk yesterday with regard to the pollinator-value added product which is the relationship data. But when someone comes to the PTN they are expecting to find all specimens that are considered to be pollinators. So there is some work to be done there to figure out how to do that.

Rita: IABIN is the regional node for GBIF. The Secretariat has to give their blessing for each one of the organizations that want to serve data to GBIF through IABIN.

Mike Frame: So any blessing you give, you have to make sure that it gets into SSTN.

Mike Frame: GBIF is still asking the Secretariat for this even if someone from the Americas wants to serve data to GBIF directly. The data provider still has to acknowledge the country-specific node to GBIF to ensure coordination.

Rita: Brazil as a country does not want to belong to GBIF, so any organization in Brazil has to go through IABIN.

Antonio: CRIA is one of the organizations.

Rita: Yes, CRIA has been approved through IABIN to be part of GBIF. Anything that CRIA wants to provide is covered by this.

Antonio: Does CRIA have to serve the data through IABIN or can it go directly to GBIF?

Rita: It depends on the type of data. At the time that they requested this, IABIN was not ready to serve data, but now I think it is going to be required that it goes through IABIN.

Laurie: Do the content grantees understand this connection?

Rita: Yes they do and they have a choice as to whether they want to serve their data to GBIF or not.

Mike Frame: This issue came up in Tennessee and Boris noted that we need to ask people whether they have a problem with serving data through IABIN and to GBIF.

Laurie: We are going to have to make sure that as we go forward that we are clear about that to our data providers.

Mike Frame: If CRIA is serving data to GBIF is it the same data that are in the pollinator portal?

Pedro: What about the agreement with GBIF? The agreement is to serve data, not to host the mirror from GBIF, do we need an agreement to do this or to establish a mirror?

Rita: You have to apply to GBIF in order to become a mirror site. Now that IABIN is a regional node of GBIF, data providers in the Americas need the approval of the regional node. GBIF has not been having a lot of success here because IABIN is free and GBIF is not. CRIA can only serve the data that the providers approved to be served in GBIF. They have to provide approval either electronically or in writing that your data is approved to be served through GBIF and this must be done on an individual basis.

Antonio: I am not really worried about this but it is a problem for the data providers to consider - especially with respect to the Brazilian policy about this. How much does a collection owner know about this Brazilian policy?

Rita: In talking with Braulio, Brazil does not want to do it as a country because Brazil would have to pay membership to GBIF, but individual organizations in Brazil can do it without penalty.

Antonio: IABIN should take the lead in sending this information to the organizations in Brazil.

Laurie: Yes, we should definitely include this in the RFP along with the need for an IT person as part of the applying team, or at least at the aware they would need an IT person, and the second is the understanding that data would be shared with no only IABIN but with GBIF.

Carlos: Rita, do you know what countries besides Brazil are not willing to be part of GBIF within the Americas?

Rita: Argentina, Colombia, Mexico, Costa Rica already participate in GBIF and I think Peru is also. But the others have been waiting to see what happens with IABIN. I think now that IABIN is up and running they would prefer it.

Carlos: Will not that stop some people from putting their information on the web?

Rita: I do not think so because their data will be served through one or the other or both. So as long as it is available to the public it really does not matter which network it is available through. It is really more of an administrative thing that things should go through IABIN. Most of the countries cannot even afford the $500 that it costs to go through GBIF.

Discussion/description of IABIN hosting options for the future (e.g. USP, Univ. of Tennessee, etc.)
Mike Frame (USGS National Biological Information Infrastructure, USA)

Jaime: INBio is hosting the SSTN portal and database on 2 servers.

The Secretariat had issues with basic access and the web site was "down" a lot so connectivity and basic infrastructure support was an issue.

Mike Frame: IABIN developed a geo-integrator a few years ago, a little bit before the TNs were really up and running. Several servers were installed, primarily in Central America. Training was given and they created various thematic layers and used open GIS to serve this. There was a portal developed for the geo-integrator, but the code itself was running on the servers in Panama and there were some issues with the servers. We really do not have any geospatial integration of the content across the network. We need a way to be able to visualize that at least at a high level. ETN, Protected Areas, and SSTN are going to be producing maps of various data types so we need a geospatial piece. There was some discussion about GBIF using some open source geoportal code that the EU is using among others, so there was talk about that code set. The ministry in Brazil is using an I3Geo product that they offered to IABIN. There was talk that Sao Paulo could support this function for IABIN, and what that would mean. The Secretariat needs to push OAS to get this problem resolved.

Rita: The trend now is to use open source, but also the institute in Colombia also is using CASSIA – a software application for dealing with geospatial data. So there are also other options.

Mike Frame: This will probably be the main topic of discussion at our next meeting.

Jaime: INBio will be using CASSIA, but I'm not sure if it is being used.

Rita: It is available to anybody that has the capability to use it and improve it. So for IABIN it would be really good to adopt it.

Antonio: We have been using the geospatial tools that are already imbedded in the GBIF portal.

Laurie: How closely does that relate to what is being discussed here?

Antonio: The portal allows us to pinpoint the records.

Mike Frame: The new portal code in GBIF so that it will produce some WMS layers so that an IABIN geospatial network could index and display it on a map. The portal base foundation will allow you to do that. There are some performance issues with it.

Laurie: With pollinators we want to be able to track temporal, migratory, or climate change effects. We want to be able to track Africanized bee sightings, and look with geospatial specificity not just at an original specimen record, but at species sightings. That is going to be really important for the users and decision makers that are going to be using this network.

Mike Frame: That type of function will be built at the TN level. The IABIN geospatial technology will be set up at a very high level.

Antonio: GBIF is already working on an integrating – you can already use the tool for modeling distribution based on the specimen records and build scenarios based on other layers. Up until now it has had very limited integration but they are working on improving it.

Laurie: Kansas has some good modeling software

Mike Ruggiero: That's where it is from.

Antonio: It is being developed by CRIA now.

Mike Ruggiero: But Kansas was working with CRIA too.

Antonio: It integrates with some data like GARP for example.

Mike Frame: With Open Modeler, the basic portal code that we are using is providing that wervic3, but Laurie has maybe identified some other services and functions that might be needed across IABIN and could be included in the package. The Open Modeler piece just came out in May – with the new GBIF portal code.

Pedro: We are working with CRIA on this project. The server will be hosted at USP.

Mike Frame: So from that aspect you guys may be able to be further along.

Mike Frame: IABIN is using a couple of universities to provide infrastructure and we have discussed some potential activities that could happen between the universities (Univ. of Tennessee, and USP).

The next meeting is scheduled for August.

SSTN Integration

NBII also hosts the GBIF mirror, so we queried the GBIF records for the 34 IABIN countries, and we gave that data to INBio to begin populating the TNs. These records may not be from a GBIF provider in IABIN countries – it may be from a provider in Germany with data collected in an IABIN country. So that data will be included in the GBIF mirror in the next couple of months. Those records are potentially already going to appear in the SSTN and PTN. It does not make sense for the SSTN to go and re-harvest all of these data providers.

Is the PTN only going to have specimen records that you support through your content grants that have the relationship piece?

Antonio and Laurie: No.

Pedro: we may have specimen records that do not include the relationship section.

Mike Frame: Are there any the specimen collections that would be in the pollinators TN? I guess they would be in SSTN. Is there anything that the PTN needs out of this GBIF mirror that we need to subset somehow? I do not think there is because there is no relationship data there.

Antonio: Then it comes back to the question of – should we not serve data on SSTN just because it is for pollinator species? Should we serve data other than from our grantees and will SSTN harvest data from our collections or the other way around? Right now the grantees that were granted through SSTN but for some reason, one of them applied to our RFP and it was not granted, and now two of them applied for SSTN because we recommended that they do that and they were granted.

Laurie: We are trying to make it easy for the user… There are a lot of pollinator-plant relationships that have not been described and we want the user to be searching only that universe. But there was this difference in the content that did not really get straightened out.

Rita: Really, you should have a record of anything related to pollinator species even if it is also in the SSTN. As you said – you want people who look for pollinators to be able to find it at the PTN. The discussion was mainly about how to allocate funding. The PTN should be able to pull any pollinator information that SSTN has.

Mike Frame: If we need to go in to the GBIF mirror – which will be very similar to what SSTN has – and pull out a group of specimens (bees etc.) and provide that to you, that is not a big deal to do. On the one hand, I agree with Laurie – that people coming to the PTN will expect to find something about pollinators whether they are species or

specimens. If there are some rules that we can build to do this, the PTN can pull some data from GBIF and some from SSTN or visa versa.

Jaime: It seems to me that both databases should have the same content at the specimen level. I think it would be better for performance to have one database or a mirror of that database. The difference will be that the PTN has the relationship data, but the SSTN will have the species profiles.

Mike Ruggiero: Going back to the origin of these thematic networks, PTN was one of the original ones and the idea was to get at the priority issues first so you do have that overlap. It seems to me that you can handle that with the GUIDs to avoid duplication of specimen records. It is just giving priority to the development of data for pollinators.

Mike Frame: We really need to define the scope of these TNs.

Laurie: I see this as a venn-diagram where each TN has information and there is overlap between the 3. Someone coming into the TNs have different users come in from different places looking for issue based solutions. Within our content, we have more than just specimen records – more than what would be found at the SSTN for example – the big piece would be the relationships.

Mike Ruggiero: What would prevent SSTN from harvesting that? If you are going to provide a species account, then you could harvest that relationship data.

Antonio: I think at some point in the future the SSTN profiles could include the relationship information.

Mike Ruggiero: The SSTN may be more at a survey level. They have a broad perspective. But if you know that you are looking for pollinator information you would probably come in through the PTN.

Liz: There may be a two–way exchange of species profiles and components (relationship data) between the SSTN and I3N and the PTN.

Mike Frame: I see some unique aspects of each of these TNs developing, but some of the underlying data used to generate these unique components, might be similar between them. Eventually there would be sharing.

Mike Ruggiero: We would like to see SSTN spend their money on pollinator specimen development because PTN does not have the budget for that. We do not have a problem with the other TNs developing data that the PTN can potentially use.

Antonio: It is essential for the user to be able to find the data that they want from the portal that they enter instead of being sent to a different portal. We can have each thematic network may have slight differences such as additional documents etc. It would

be better for the user if we have an agreement that all of the data, no matter where it comes from, will be served through all of the networks.

Laurie: So is that something that the TWG can decide – replicate rather than redirect?

Mike Frame: Yes I think so. We can provide the PTN with the same subset that we provided to the SSTN. It just makes it easier. But we still need to work out between PTN if there is a provider that's not in that collection we need to make sure that it is included. If you do not need all of those specimen records (50 or 60 million) – just certain taxa or groups, then you should decide that because right now the subset is just defined by geography.

Antonio: At the same time that does not diminish the catalog.

Mike Frame: No, because the catalog will have one record for each of those 250 collections, which will refer to one of the TNs.

Antonio: It is not only specimen data, it is other data types too?

Mike Frame: Yes.

Mike Ruggiero: So if I wanted to find all of the specimens for a particular bee species, could I do that through the catalog?

Mike Frame: It would include a pointer record that would point to the pollinators portal.

Mike Ruggiero: So I could go in through the SSTN or the PTN portal and get the same results.

Antonio: This should be something that has to be a decision from IABIN – all of the TNs plus the Secretariat. We need to have the same policy for how to integrate each provider. We should have all of our data providers registered in the SSTN portal – the same for I3N.

Mike Ruggiero: So at the specimen level, all of the TNS are linked.

Rita: Maybe just offer to the data provider that their data will be served through the IABIN.

Antonio: When the user gets to a portal, it would be better for them to have all of the information right there rather than having to go to different portals.

Mike Frame: The catalog could do this if it had all of the specimen records in it, but that's not its function.

Antonio: The catalog can serve as a high level access point.

Jaime: If I search for a species name in the catalog – the information could be on the SSTN or the PTN – the results will be the same – but on different portals.

Laurie: But what about this link across. Someone comes in to the PTN and there is a record over at the SSTN. Do we have the capability to redirect them?

Antonio: There might be two ways of doing that 1) sharing providers; or 2) portal integrated.

Liz: I think data providers would see it as a positive thing if their pollinator specimen data was available through more than one TN.

Antonio: We have to solve the problem where a data provider receives funding to digitize their data and that the funding source does not appear. It is different if the data appears through our portal, but the funding was from other TNs and from other initiatives – that will not be apparent.

Liz: Is that really a problem?

Antonio: Yes, we heard some complaints about that.

Mike Ruggiero: We require 3 levels of credit the data owner, compiler, and another piece of data.

Liz: But does that include the funder?

Mike Ruggiero: No, but it could.

Pedro: This could be addressed just by providing different levels of credit attribution.

Antonio: There is funding for digitizing and there is funding for networking the data.

Liz: GISIN has come up with a solution for maintaining the "chain of attribution" but it does not include the "funder".

Laurie: Angie and Carlos, are you concerned about attribution for the funding or the institution?

Carlos: For the institution , yes. We are using our collection and someone else's collection and the other person is making sure that her collection is kept separate and she wants to be listed as the person that is providing the data.

Laurie: Where will that appear?

Carlos: On our web page we list the collection name to keep it clear to the user that a record is from a specific collection.

Antonio: When we create metadata for that source, there is an element that allows us to link it back to the source.

Angie: If I found information in a museum, we credit the museum.

Laurie: Carlos, on your slides, you had funding from a variety of sources.

Antonio: But at our network, we might not see all of those supporters listed.

Jaime: In the metadata, you could list the data provider, and then include a statement about who funded the data collection, digitization etc.

Mike Frame: It is important to provide metadata for collection providers and funders. I should work with Liz, Laurie, Jennifer, and Mike to figure out what content in the catalog can be included on the PTN Web site. We could include an RSS reader on the PTN site to display resources from the catalog. We have a published literature database that we could replicate to PTN.

The other thing we are going to do is create some sample metadata records; we are also translating the NBII thesaurus. There are about 15,000 terms that will help improve retrieval. This will be a service where if you have your own databases that are indexed with keywords, you could use this thesaurus to look up and expand your results.

Liz: Will the multilingual version of the thesaurus be provided as a web service?

Mike Frame: Yes. The Spanish version will probably be done by the end of the year. We are doing some work with IBM on visualization tools and social networking applications.

We need to think about what else you want to expose through the catalog – e.g. the Bee image gallery and the experts database or the individual records. Laurie was saying that we4 need to look at some better collaboration tools – the TWG will take this up and figure out a better way for us to communicate across IABIN on sharing training and other materials etc. Last night I used Centura to participate in a class. We are working on an NSF[17] project and we have to come up with how we are going to collaborate on this project so we may be able to use some of the same approaches that we come up with through that research.

[17] National Science Foundation (NSF)

VI. SUSTAINABILITY

Sustainability Presentation
Laurie Adams (Pollinator Partnership, USA)

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1) make sure that the PTN functions
2) make sure that the PTN is useful

What does sustainability really mean? … 5 years from now…
Sustainability can exist at a variety of levels…. Basic maintenance, improvement, and optimal operation. What are the features at these levels, how frequently are they changed and modified, and how much does it cost in terms of money, people, and time?

The most important way to deal with this may be to explore or seek Government funding because the PTN should be useful to Governments.

Sustainability Presentation
Mike Frame (USGS National Biological Information Infrastructure, USA)

Different aspects of sustainability:

- Technical sustainability
- Economic sustainability
- Partner expertise, resources, capabilities

Economic Sustainability Approaches:

- Institution contributions
- Project driven model
- Endowments
- Fee-for service model
- Conference fees
- Creation of a (501)C3
- Technical approach leads to lower costs

DataNetONE Membership Model (pyramid) – additional services occur as you move up the pyramid. If an organization or an agency needed a particular service or tool at that level, then they might provide funding for such a tool.

Technical Sustainability Approaches:

- Distributed architecture – it is harder to sustain infrastructure if it is centralized.
- Working groups and user-centered design approach
- Adoption and participation in standards
- Open source development and archival solutions

- Identifying base level functions of IABIN – all of TNs are going to have to identify which tools really need to be maintained. What needs to continue? What can be maintained with the current funding?
- Educate stakeholders about best practices
- Development of quality assurance/control protocols and standards
- Metadata repositories
- Commercial service providers
- Wikipedia model – the community helps maintain content. The European thesaurus project has been a failure – but there is only a core set of people that are interested, so the community is small to start with and some of the quality assurance/control processes were not there.

Is your model too costly to maintain?

Keys to Sustainability

Core or inherent activities in an organization are more likely to be sustained. For example, invasive species is a priority research area of USGS so our support to the I3N network is likely to continue.

Activities that benefit an organization for participating will help support continued involvement.

Reliance on a single funding source is not a good approach.

Sustainability Issues

Funding sources
Current work plans
Collaboration with other TNs
Secretariat support and involvement
Role of other global organizations (GBIF, CHM[18] etc.)
Sponsorship for IABIN as an Inter-American Committee of OAS or as a (501)C3.

IABIN Sustainability Goal: To be a self-sustaining distributed network which provides open access to high quality, relevant information on biodiversity in the Americas, providing that information in a timely manner to user throughout the public and private sector in the Americas and to other interested parties worldwide."

Sources of recurring funding – what would this support (e.g. council meetings, training activities, and communication, secretariat staff salaries)?

[18] Clearing House Mechanism (CHM)

Sustained internal funding for IABIN – participating countries need to be assured of this. A few years ago, there was a certain level of uncertainty, but some of that has changed now as IABIN is seen to be making a difference.

Components of sustainability – TNs (five of them) and the catalog should be maintained and operating.

Slides do exist for discussions related to sustainability by the IABIN council during their January Council meeting in Panama.

DISCUSSION

Rita: The Focal Points wanted to talk to their ministers of the environment regarding making IABIN a commission. It would have to be presented at the Summit for sustainability and then ratified by the OAS. Carolina has been writing to the Focal Points about this. It has to be initiated by the OAS through the Focal Points.

Mike Ruggiero: If IABIN is designated as a commission, it means some existing funding?

Rita: If the countries are the ones that are requesting this, then the countries have to be willing to contribute some funds in order to provide some core funding. It is not very clear right now.

Laurie: There was an email from Richard with some sustainability concepts that he wanted us to react to. We have to send him something about our sustainability plan.

Rita: The idea would be that each one of the CIs would say – we will continue or integrate the TN into our long term activities. If you can work from that and see what you can provide., e.g. the ETN has been talking with NatureServe and the TNC who have an interest in the ecosystem products that we are working on and they have agreed to take it on and continue it in case the Secretariat does not continue. I have been talking to someone from Fundacion Boticario about integrating the protected areas TN into the Fundacion Boticario. INBio has already told us that they cannot sustain the SSTN if they do not have funding. They have not given us any funding ideas. If there is no funding provided from IABIN directly. INBio is an NGO so they already have their own national network that they have to maintain. If IABIN does not continue as its own organization, then all we are really is a project of the OAS – we do not have any legal status so if we want to continue as an organization we have to become a commission of the OAS. GBIF may be also interested in funding a node for the Americas and we may need that to sustain SSTN. The idea is mainly that each of the CIs could continue to take the TN and manage it as part of their regular activities. That was the main idea behind setting up a consortium in the first place because it is easier for consortiums to obtain funding.

Laurie: Management is different from fundraising. There is still another component that the CIs need to take on. So INBio is saying that they will continue with the management if someone else funds it.

Mike Ruggiero: You are taking a primarily government project and your turning it over to NGOs. Governments do some things well, and NGOs do other things well. In the US the Government is always trying to get rid of functions that they do not need to do exclusively. Are there some unique government functions of this? Research and things science-related are government functions because nobody else can really afford it and we are really in that world. Science usually exists as part of something else. Science for science sake is not sustainable. In one sense, it is going to be somewhere else. An institute can generate funding for innovation but then you are always in a grant node. The baseline funding is more institutional. But what is it that you do that's fantastic, and what is the unique commodity that you have got? Selling information has been very difficult in the past and it is usually sustained by governments.

Rita: Most governments right now do not have much funding for research. They usually use that funding to bring people from other countries to study. Their research is mostly carried out by universities with funding from other sources.

Mike Ruggiero: There are some other models like CONABIO

Rita: CONABIO is also sustained by the government. IABIN also needs to have the political support that the OAS provides and the power to have the countries participate comes from the OAS. We have been looking at a combined approach. We have been looking at holding a meeting in October to define IABIN's mission in the future. Would we have divest of some of our networks? Maybe GBIF would be best at managing SSTN. ETN is a very unique TN. Nobody else is doing this.

Mike Ruggiero: IABIN is part of GBIF so it is not completely separate.

Rita: We need to decide what we want to do and how best to do it and explore the possibilities that exist. What is best for the providers and users of the data, including the scientists and the decision makers. We want the information to become what CONABIO is for the Mexican government – who consults with CONABIO first without making any kind of decision affecting biodiversity. This is why we are asking each CI to send in ideas for sustainability with that long term view and this means defining the plans to continue at the minimum level or at other levels.

Laurie: This meeting in October will occur where?

Rita: We think in Washington – we do not know the date yet. We have to make a decision very soon so we will know within the next couple of weeks.

Laurie: On October 22nd, we are hosting a party in Washington at OAS so we are hoping to showcase this service. We plan to have at least something that - we will invite all of

the ministers of agriculture, the environment, the ambassadors and representatives and legislators and agencies, and have a way of getting them to understand the importance of this. But, that's a small step – it would be great if it was in conjunction with the IABIN meeting.

Mike Ruggiero: Another question to ask is from the network's point of vie w. Why do we need IABIN? What added value does it provide? Certainly there is that political linkage that's very helpful.

Sustainability Discussion I

What level can be supported for what amount of money?

We said, in theory, there are 5 levels of maintenance and what do they really mean? The minimum is at level one. All we would do is host and maintain our internal interactions. All of the data in our network would be available from now until the end of time.

The next level includes that but also interface with other providers – other TNs or GBIF for example. We also said it would be important to update codes as necessary and facilitate on an automatic basis, people who want to input content (no content grants or hand holding but a tool that facilitates this); and possibly some automatic data quality checks in place.

The third level would also include some marketing and training for content input – so we would solicit data.

On the fourth level, we would also have marketing and training for users on how to use our services. This is where we are now, but we are also developing products.

At the 5th level we would have some automatic harvest of content from searches and crawls, and work on developing collateral products and tools. This is where there is a potential for raising money – something that we market; tools we give to farmers or biologists, or seminars, whatever those products are – it takes money to develop them.

This is open for suggestion.

Administrative management of looking for funding is not in here, but that is assumed at each of these levels.

We can include some costs in this table. Mike had a really good point – it is very difficult to sell information. Google is doing this successfully - but they have a business model that includes advertising, sponsored links etc. They are also manipulating all of their data into tools. If pollinator or ecosystem services were mandated like carbon credits, we could help facilitate that through the information that is needed to evaluate the value of the ecosystem service and the mitigation that would be needed – that would be one

model. There are agricultural planning schema that we could interface with, but they are going to take a lot of money to do those sophisticated things. In holding data, we have power. Maybe we can leverage that power.

DISCUSSION

Rita: That way that we have been operating is that we have 5 TNs that we have to continue supporting and maybe growing. But it does not necessarily have to be like that – it could be all centralized and managed by one organization (not necessarily the Secretariat).

Mike Frame: I think you need to be very specific about sustaining the pollinator issues – what would be the ideal model or PTN?

1) What do we need IABIN?
2) Why do we need 5 networks?
3) What is the PTN ideal model?

Leandro: Can only governments give money or can anyone provide money? Some companies could make donations in lieu of taxes.

Rita: For that to happen the CI would have to be a 501(C)3

Laurie: We are. A donating company does need to know what they are going to get, what are we offering?

Mike Frame: His point is that today there is not much private sector or commercial contribution to this project.

Antonio: But what the companies can get may not be just economic revenue.

Leandro: Instead of paying to the government in taxes, they pay to an organization in donations.

Laurie: They could get a product that leads to sales, good will, and social/corporate environmental responsibility –they only do it if it leads to sales. When I go to beer companies – and say that they are going to get a lot of good will for supporting pollinators – they say that their beer drinkers do not care about bees or butterflies.

Rita: The food price crisis that is happening right now – pollinators are very related to production so we should try to find a connection there. How can we leverage food prices?

Angie: The politics is important also – different politics in different countries. They are not the same or apply the same importance to this topic.

Mike Frame: That's also an educational piece as to why this is important.

Antonio: The problem is for instance – the Focal Point for Brazil is the minister of the environment, they have not been present in any of those meetings. In terms of effective support or participation, it does not work. How tied to the Focal Points are we in terms of the current structure of IABIN?

Rita: We are tied because each government designates who the Focal Point is. In some countries – e.g. Venezuela, we have started to work sideways with NGOs and Universities, but we always need the blessing of the Ministry of the Environment and they can stop things. So we really need to have them on board. The Minister of the Environment in Brazil – we have been able to get them to make their main tool for protected areas available – it is their main catalog for protected areas. We think they will be more cooperative over the coming years. Braulio is very busy but he has designated somebody as an alternate.

Carlos: How do we make ourselves reachable or visible to funders and users? Sometimes people do not really know about these tools and services.

Rita: The question that Antonio had was how can we get the Focal Points more involved?

Antonio: There are funding rounds for research, but that only relates to research mainly in Brazil. Maybe we could find a way to try to coordinate funding from different countries and sources. There are agreements between some of the funding institutions to fund not only research, but development of tools.

Mike Frame: Working with the EU, it is difficult to coordinate funding cycles and proposal cycles.

Antonio: There is a program or initiative called WINDS? It means Research for the Environment in Europe and the Americas. They had a meeting last week and I suggested to them the topic of biodiversity as a possible topic to discuss and names of other institutions that might be involved. I think that if we propose this kind of project, building a network, and integrating initiatives like IABIN and the EU initiative or linking more closely to GBIF that might be something that might be considered for a project.

Pedro: What are the gaps in the research?

Laurie: Then we could propose a research project that would address that gap.

Sustainability Discussion II

The Global Pollinator Species Campaign will receive no additional funding from GBIF after this year. So that campaign is facing the same questions about sustainability. What

is the really big picture? From the management of information standpoint, we need to do a Global Pollination Assessment, similar to the Global Amphibian Assessment or the Millennium Ecosystem Assessment.

So we are going to transition from the "campaign" concept/name to an "assessment." We will need a lot of money to do it from foundations, governments, and other support.

Tied to biodiversity and agriculture

- produces outlooks at various scales
- reports status and trends
- monetizes ecosystem services
- manages information on a global, regional, and local basis (distributed portal structure)
- responds to international directives, e.g. of the 2010 Target
- stimulates research and innovation
- supports capacity building and poverty alleviation

Related to bee information, we need more research to produce more bee information. In Africa they have a lot of stingless bees and an opportunity to create a Melipona industry, but they do not have any of the background information like Brazil has. So we could exchange Brazilian experts with Africa.

PTN sustainability

- becomes coordinator of the western hemisphere part of this global assessment.
- manages the human communities and the data with the portal and the IT part.

DISCUSSION

Mike Frame: The Millennium Ecosystem Assessment had not planned for what they would do with the data at the end or how they would store and manage it. A lot of the data was lost because of this.

Mike Ruggiero: Their end point was the report itself, but in this case, it is a report, but a dynamic report and the data. In that context, we should seek out some very large funding. You have got to talk to international organizations that can go to the large foundations for funding. We have still got to think through a lot of that strategy. If we can tie in the capacity building and technology transfer to local people – where you could take bee boxes and get them to people who can put them on their houses and make money selling the products – honey, wax etc.

Laurie: Economics and human health need to be part of this.

Mike Ruggiero: African colleagues tell me that this is also a way to educate people about the environment.

Laurie: So the difference would be that this would be where the datasets would be evaluated and channeled to the end. Our goal right now is to create the ability for everybody to do that. But maybe to sustain ourselves we have to add to what we are doing so that's another level of administrative management.

Mike Ruggiero: This gives a purpose to the data that we are collecting.

Mike Frame: But you need to factor in the analysis piece of that and the costs of that.

Mike Ruggiero: We are working backwards from the end where we have identified what we want to achieve and then all of these other things are how we will achieve that.

Antonio: One of our main criticisms we had of the final format of the FAO project is that they asked for a tool for decision making regarding pollination – which is not possible if we do not have the data and steps that occur before it.

Mike Frame: But it is hard to get people to pay for that data digitization and steps that lead up to the final product. The key thing is to wordsmith your proposal that shows that final product.

Mike Ruggiero: Simon Potts displayed a map that showed different regions of the world that are at risk and dependent on pollinators – that is a compelling communication device.

Antonio: We were shown a map of the current distribution for legumes now and then in 50 years – using data from ALARM.

Laurie: If we wanted something like that for our OAS party – where we showed a map of the Western Hemisphere and showed where we grow things like coffee.

Mike Ruggiero: You could do that, the data is available to do that.

Antonio: Another argument is how global change will affect pollinators.

Mike Ruggiero: The interesting thing is that the nitrogen deposition is causing the loss of legumes and their associated pollinators as well. N deposition is so high – alpine habitats are becoming N-rich.

Mike Frame: So the question is, can you do some kind of a demonstration by October?

Laurie: Our real goal is to solve problems and we can make a good case for how vital these things are; and we really need to make the case for keeping track of this and of the data for long-term analysis and monitoring. The NSF study also recommended long term monitoring. We need to tie the two together – the tool that we are creating and the importance of data with the importance of pollinators to agriculture, etc.

Mike Frame: You should ask for all of the money you want so that we can maintain the network at level 5.

What people do you need to carry out Level 5 sustainability?

Administrative people, regional lead(s), lead technical person, 2-3 grads to work on things, fundraising, outreach and training, content grants system, help desk, infrastructure of the network (servers etc.), science expert/advisor (scientific advisory board?), committee or board or a mix of experts that serves as an advisory group at a high level

Mike Ruggiero: That is sort of the way you deal with NAPPC.

Administrative structure – 3 or 4 people that on a daily basis coordinate with all of the groups and the people. They interface with the regional representatives or leads. So right now we already have somebody that is dealing with some of the larger regions – like Australia and Oceania etc.

Laurie: Talk with Walter Reid (originally from World Resources Institute). Ask him how the Millennium Ecosystem Assessment went and obtain feedback from him and see whether Packard would emphasize this. They have a terrestrial section now. Doug Beard, Mike Frame, Rita, and Laurie could contact or talk about this with Walter Reid.

We also have to report something back to Richard Huber about what we want to do.

Mike Ruggiero: We do not have to take it to the global level right now either. We could restrict it to the Western Hemisphere.

Mike Frame: You could use this as a model for the global thing.

Laurie: That's what Vera is talking about, doing an assessment of all pollinators, not just bees. That is a manageable concept. It fits with what we have been doing already. Who would fund this, The Gates Foundation or The Moore Foundation? How much will we have completed at the end of next year?

Antonio: The tool will be ready. It will depend on how many providers we will have maybe 14 based on the number of content grants.

Laurie: We already have a lot of data from the bee checklist, John Ascher, and all of the people at our last meeting in Indaiatuba. Have we started to harvest that yet?

Antonio: We have those who are linked to the SpeciesLink – a Brazilian network.

Rita: And there are two providers for specimen records – EMBRAPA is one of them.

Antonio: We already have around 200,000 specimen records.

Mike Ruggiero: We are planning an assessment of US bumble bees for October.

Antonio: What would be a practical way for us to find out which collections have pollinator data so we could connect them to our portal? Could we use Mike's pollinator checklist so that we could run it against all of the specimens that we have?

Mike Ruggiero: Yes. There are various other sources for pollinator-plant associations, including the PCDL.

Laurie: The most important way that we can sell this is to have a really good product that really is useful. We are moving toward an assessment of just the western hemisphere. The goal in the next year has to be to get as much of this included and to get it to function as smoothly as we possibly can.

Mike Frame: It would be good to work out a way to show that the catalog has X holdings, but the Pollinators network also has X number of species available. Instead of just a link, indicate what the PTN has that is related to the search query.

Laurie: The catalog is not the index of everything, but it does not link to the TNs either. It is kind of right in the middle.

Mike Frame: In the short term I think, depending on what the query was, we will provide a link or some kind of advertisement to the different networks.

Laurie: I think we should not even announce the global part but work behind the scenes on the regional part.

Mike Frame: If the PTN gets more specimen records in before the SSTN does, that can be a good thing.

Laurie: SSTN was saying that they were going to be the administrative interface with GBIF too. We are talking about # 6 right now – how to consider politics in different countries.

Mike Ruggiero: We really need to go after some of the important regions, like the West Indies.

Rita: The world bank has given us permission to go after specific data providers.

Laurie and Mike Ruggiero: We should to the map and identify the hot spots/data providers.

Mike Frame: Regarding the issue with the Focal Points. I think you have to keep them aware. Do not let that structure limit what you can do.

Why do we need IABIN?

Mike Ruggiero: If we do not have IABIN then we need something like it – for the political umbrella or governmental structure. Most countries including the U.S. will not participate if you do not have that support.

If we have a strong secretariat that can help with the outreach and the training etc, that would be good. General activities could be centralized.

Mike Frame: It depends on the structure in terms of the TNs and their focus, but that umbrella helps coordinate complementary activities across those. I think the # 2 – why do we need 5 networks – I do not think that really matters and we probably do not really need to discuss that.

Rita: Considering the savings that you might get if you were to concentrate the TNs, such as if you had technical people centralized.

Mike Frame: But maybe not see any savings on the science side, and perhaps lose some buy in from other countries.

Pedro: IABIN is important for promoting integration of the networks.

Antonio: It may help us to get funding.

Pedro: We do not have a formal organization that can ask for funding.

Antonio: I agree that the number of networks is not important, but our PTN needs to have an important reason for existing. I think the PTN can survive.

Mike Ruggiero: I would be interested in what the other TNs could do for us – like if they could develop and provide us with maps.

Mike Frame: You are the only group of people doing this. Lots of organizations are working on species and protected areas, but for pollinators there are not a lot of people – if any - doing this.

What can we offer the private sector?

Products, good will, social responsibility, tax benefits?

* Nestle owns Haagen Daz, chocolate is reliant on pollinators, so we should approach Nestle too.

Rita: Here in Brazil it is easier to go and talk to big companies and have them sponsor projects.

Antonio: It is the same with the oil companies. The companies are willing to show themselves as being part of the community even if the product has nothing to do with their product. We need someone who is good at identifying what to offer to each of these organizations. And you would have to provide a seal that has some sort of a brand.

Laurie: We are doing this – the Pollinator Partnership has a brand. We have called it "Cause Marketing". You want to make sure that you are doing it with their marketing department rather than their philanthropy department. The marketing side has money and you want to get their logo on your poster, on your web site, so that's when we say "what can you actually offer" to them. It has worked for us more when their product does have a relationship with pollinators. Even for example, we are talking to a tire company now that is interested in a project that makes road corridors more pollinator friendly. They are interested in how this will help them sell more products.

Mike Ruggiero: Everybody now in the US is fighting to be green.

Laurie: The other down side is when they give money they usually want to give it for a specific project that has their name on it; they mostly want to do research (e.g. to solve the bee crisis). But we could easily call it the "Mobil Oil Pollinator Assessment."

Mike Ruggiero: Research on pollinators for sunflowers and canola could get funding from energy companies.

Laurie: Even that project that Dieter was talking about – bees that can carry oil – study their bodies and apply that design to a textile that would soak up oil spills (biomimetics – the application of biological methods and systems found in nature to the study and design of engineering systems and modern technology (Wikipedia)).

How can we connect/leverage the food crisis?

Mike Ruggiero: The crisis in the US is the quality of food and essential nutrients – eating more fruits and vegetables etc. You can eat lots of rice, but you need other nutrients.

Antonio: Link to food quality and nutrition.

Laurie: …and variety – and that is what pollination provides us.

Antonio: You could create a graphic that illustrates food options in the absence of pollinators (e.g. Thanksgiving with and without pollinators).

Laurie: The agriculture industry is looking into building self-pollinating crops so they are not necessarily concerned about loss of pollinators.

Marketing to Users

IABIN Friends Listserv
→ increase postings to this listserv

Academic Associations we could send announcements to
→ IUSSI – Central America, Brasil, Colombia, Venezuela
→ Colombian Society of Entomology (easy to advertise things on the web site) - SOCOLEN
→ SID system of the Humboldt Institute (monthly bulletin about new resources – email based)

ESP (SEP in Espanol) – Entomology Society in Peru
Natural History Museum of San Marcos University

Foundations
Ecological Societies
Government
EMBRAPA
Apicultural societies and associations
U.S. Department of State – Cable system

Major products in Colombia, Peru, Brazil that might have associations?
Coffee Growers Associations
Association of Coffee (Peru)
Bee Researchers → Vera
Plant Enthusiasts (e.g. orchid societies)
Conservation Organization
APACAME – Association of Apiculture
Association of Apiculture in Peru

Brazilian Oil Company (Petrobras – supporting many projects for advertising and for biofuels production)
Conservation Commons
IUCN Country Committees
USAID
United Nations
FAO

National Association of Science Teachers
UC Davis – ICE

OAS Party (Washington D.C.) 6 – 8 pm; part of the NAPPC Conference
* We always serve only pollinated foods
3 minutes to communicate to this group.

Digital posters
Products – displays from countries – exotic…
Miniature flags
Samples / Give away bag (Burt's bees samples…)
Bee costume
Lapel pins
Orchard bee houses, plans for how to make bee homes (for boy scouts)
Computer terminals
Products (not just produce)
Honey tasting competition
Big poster (truck sized)
Map showing vulnerability of agriculture to loss of pollinators
Collection of posters on display
Blow up of pollinator photos
Special ribbon or lapel pin indicating a family or historic involvement in bee keeping
Plasma TV showing high definition video of bees in action
Raffle – first price…
Get Batman to come
Get Audubon to come – Gary Allport
Pollinator wheels and regional guides
Big facts telling economic impact ($ + numbers)
Social impacts of bee keeping

How do we encourage people to come?
Have bee keepers associates in their political regions encourage them to come and represent them at the event

VII. GROUP CONCLUSIONS

Sustainability Group Report

We discussed the idea of a global pollinator assessment and decided that we could conduct assessments region by region. We could use the data that we are collecting to help prepare an ongoing assessment of pollinators in the Western Hemisphere. That is the reason we are collecting the data. We would gather our resources around those kinds of outputs. Our web site could have lots of information but also serve as a collection point and source for these reports.

We developed the following chart for the various tasks that we could carry out at the different levels of sustainability for the network. We still need to apply some dollar values to it.

SUSTAINABILITY LEVELS AND COSTS

LEVEL OF SUPPORT	I	II	III	IV	V
Maintenance Level	X	X	X	X	X
Host and Maintain Internal Interactions		X	X	X	X
Interface with Other Providers		X	X	X	X
Code Updates and Content Facilitation (Automatic)		X	X	X	X
Data Quality Checks			X	X	X
Marketing/Training for Content Input			X	X	X
Marketing/Training for Users				X	X
Automatic Harvest & Updates of Content					X
Develop Collateral Products and Tools					X
ESTIMATED COST	?	?	?	?	?

We worked through many of the questions that we raised earlier and reached the following conclusions:

- PTN needs IABIN in order to have a political framework and for coordination of certain issues.

- PTN needs a new central focus, e.g., a regional role in a Global Pollinator Assessment.

- PTN needs a new name (Pollinator Information Network of the Americas) for marketing purposes and a marketing strategy (like NAPPC).

- PTN needs to determine its appropriate sustainability level commensurate with support.

Tools and IT Group Report

We were looking at the details of fusing Specify 5 or 6 for databasing our information. We found with solutions for certain situations but one that I would like to point out is that we as a provider have many specimens with the label saying "collected in rose or sunflower, or honeysuckle" any common name of the plant. How are we going to connect that with a scientific name? In some cases it might be possible link back to a single scientific name, but in several species, that common name might refer to species in 3 different families and that is not going to fit in certain systems. So are we going to lose all of that information? How do we deal with that information?

Mike Frame: I think it has to be collected and captured up front because we definitely do not want to lose that.

Carlos: We have the best dictionary for common names, but specify requires a taxonomic tree that links every name to a single taxon. But it cannot handle linkage of a common name to multiple families (for example).

Leandro: The DIGIR – what fields do they need to provide this information – if they need a field that is blank.

Carlos: Every record requires taxonomic information.

Mike Ruggiero: Is there a dummy taxon that you could use? Do they allow that?

Antonio: It could be used or included in a comment field. You have to match that with the schema and the schema only relates specimens right now.

Mike Frame: Why not send this issue to the Specify people and see what they say?

Jaime: We need to define an association between a species with one taxonomy and another species with a different taxonomy.

Liz: So the question really is the same as the one that Carlos asked yesterday – does Specify support a one to many relationship for when we cannot narrow down the plant species any further than 2 or 3 genera?

* Carlos will write this up and send it to the Specify developers in Kansas.

Angie: I showed Etienne the database that we have in Peru – the database and the software. I asked about the possibility of working with this software and then all of the records could be included in the portal. He is going to talk with Mike Ruggiero to verify that this would be possible.

There are many articles that I have that are on paper but not digital. I do not know how to show this in the portal. We need to provide them as a PDF but we do not have permission to do that right now. There are records in our Dublin Core catalog that just cite the reference and include a link but not the actual document.

We could modify the tool to accommodate data entry for species associations sourced from references.

Liz: We are also providing a data structure against which future data collectors of new data can design their data collection against.

Annex 1. List of Participants

IABIN PTN Principal Investigators

Laurie Adams (Coevolution Institute, USA)
Antonio Mauro Saraiva (Universidade de São Paulo - Escola Politécnica, Brazil)
Mike Ruggiero (IABIN PTN, Integrated Taxonomic Information System - ITIS)

Other IABIN

Rita Besana (IABIN Secretariat)
Jaime Guitierrez Alfaro (IABIN Species and Specimens Thematic Network - SSTN, INBio, Costa Rica)

Data Content Grantees

Angie Romy Burgos Bastidas (Red de Acción en Agricultura Alternativa (RAAA), Peru)
Carlos Eduardo Sarmiento Monroy (Universidad Nacional de Colombia - Instituto de Ciencias Naturales, Colombia)
Vera Lucia Imperatriz Fonseca (Universidade de São Paulo - Institute of Biosciences, Brazil)

Other IABIN PTN Support

Jennifer Tsang (Pollinator Partnership, USA) (**Logistics**)
Mike Frame (USGS NBII, USA) (**IABIN Catalog**)
Elizabeth Sellers (USGS NBII, USA) (**Rapporteur**)

IABIN PTN IT Support (Universidade de São Paulo - Escola Politécnica, Brazil)

Pedro Luiz Pizzigatti Corrêa
Etienne Cartolano
Pablo Salvanha
Paulo Venancio Lopez
Diogo Krobath
Leandro Halle Najm

Appendix 2. Agenda

SUNDAY, JULY 20, 2008

Time	Presenter	Activity
10:30 AM		Transportation from GRU Airport to Ribeirao Preto (4 hours) check-in around 3:30 PM Will stop somewhere for lunch/bathroom break
7:30 PM		IABIN PTN team Dinner in the hotel
9:00 PM	**Everyone**	Meet and greet in hotel lobby

MONDAY, JULY 21, 2008

Time	Presenter	Activity
		Breakfast – Hotel dining room
Technical Workshop – Day 1 (LDA will Chair)		
9:00 AM	**LDA**	**Introductions** ▪ 15 min. Overview of objectives and agenda LDA ▪ 15 min. Short PTN progress overview MR: general; AS: technical ▪ 30 min.
10:00 AM	**AS, PC**	**Demonstration and review** Part 1: 30 min.
20 min.		Break Digitization tool: http://groselha.pcs.usp.br/sowb/ Experts Database: http://groselha.pcs.usp.br/experts/search.php Data Access Portal: http://iabinptn.pcs.usp.br IABIN PTN website (ES maintains): http://pollinators.iabin.net/
11:00 AM	**AS, PC**	**Feedback on network tools** Major portion of the morning devoted to demo/feedback (90 min.) Time allotted for participant's feedback Ask participants for language help like Spanish (ES will take notes and also pass out a feedback follow-up for participants to fill out)
12:30 PM		Lunch
2:00-5:00 PM	**AS**	*Develop curriculum and outline for training courses* Bring user survey results with us

Should be extremely simple – how to input data (not the architecture); how to retrieve data; how to update data; portal as a user, not as a developer
Main objective is to have one portal and many contributors
AS/USP team will develop a simple outline
Keeping in mind the training funds

8:00 PM Dinner at the hotel
Everyone eats together

9:30 PM PTN Team touch base
Location TBA
Review the day
Prepare for next day (PTN network sustainability strategy decision)
If time – integrating all our websites

TUESDAY JULY 22, 2008

Time	**Presenter**	**Activity**
		Breakfast
Technical Workshop – Day 2 (LDA Chairs)		
9:00 AM	**AS**	**Network Integration** – 5 year timeframe Report from Elizabeth Sellers (integration possibilities) Report from Mike Frame (catalog) Feedback
10:00 AM	**LDA and discussion**	**PTN Network sustainability strategy** Audience Tentatively: Co-PIs, PTNs, Rita Hosting just for PTN Institutional agreement Administration and agreements Budget How much are we aiming to accomplish and define sustainability at minimal, medium (maintain with changes), and optimal levels (maintain with changes and solicit and market for new users) What supporting management do we need to keep TN going
12:00 PM		Lunch
1:30 PM	**LDA and discussion**	**Funding** Government funding from US and Brazil OAS / World Bank Private sponsorship International Funding between countries Framework7 Network providers Regional specific grants
2:30 PM		Marketing Interrelationship between other networks IABIN (SSTN, Invasive Species) and global networks (FAO (Braulio), and GBIF)

3:30 PM	**MR**	**Review draft report outline of workshop**
4:15 PM		**Discussion of OAS reception** Suggestions for people to invite What we want to push at the reception
4:45 PM		**Conclusions**
7:00 PM		Dinner in town (not hotel) AS will make a restaurant reservation for Tuesday night We will take taxis

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WEDNESDAY JULY 23, 2008

Time	**Presenter**	**Activity**
8:00 AM		**Bee Research Meeting** MR will be presenting to the Bee Meeting in the afternoon Participants depart (via van) or can continue on and join the Brazilian Bee Research Meeting http://rge.fmrp.usp.br/abelhudo/ at their own expense. Sat: 10 pollinator celebration
10 AM	**CS, RB, JT**	**Taxi to GRU** Meet in hotel lobby
1:30 PM	**everyone else**	**Transportation**: Ribeirao Preto to GRU Airport Meet in hotel lobby to board the scheduled van