



Final Minutes – World Flora Online

Council Meeting

Hosted by the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Brazil

Wednesday 21st October, 2015

- **Introduction and Update – Welcome to new WFO members.**

On behalf of the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Brazil, Dr Eduardo Dalcin welcomed everyone to the meeting at the venue of the National School of Tropical Botany.

Dr Peter Wyse Jackson, Chair of the World Flora Online Council, opened the meeting welcoming the participants and acknowledging Eduardo for the excellent preparations for this meeting. Thanks were also expressed to Pierre-André Loizeau for hosting the Geneva meeting last January. This last meeting provided us with a list of pending tasks and Dr Wyse Jackson was pleased to express that we have been successful in following them up this year, as the upcoming reports will surely show us during the next few days of the meeting. Dr Wyse Jackson also welcomed the new member: Dr John Parnell from Ireland's University of Dublin, Trinity College which is now a new member of the Council. After two fruitful days of working group meetings we'll see the presentations of the results achieved during this meeting.

The Chairman suggested that the Agenda of the meeting be reviewed as required but that it be used as a flexible framework of topics to discuss.

- **Self-introduction by members of the Council**

This point was considered unnecessary since everyone has had a chance to meet over the past days. (See list of Attendees in Annex 1.)

- **Review and adoption of the Minutes of the previous Council Meeting (Geneva, January 2015)**

The Chairman indicated that no responses had been received about the Minutes of the previous Council Meeting in Geneva when distributed by email. He opened the floor for

comments, corrections, changes or omissions to the Minutes from the Geneva Meeting Minutes. Pierre-André Loizeau asked for a correction on his name and proposed the minutes to be adopted with the modification. It was pointed out that last name ‘Smits’ in page 15 should be Smets. All in favor, no one against it. Minutes of the previous Council meeting in Geneva on January 2015 were ADOPTED.¹

- **Review and adoption of the Agenda for the Council meeting**

The Chairman proposed to discuss an additional topic - how to proceed with communications between meetings since emails between some members had not been received between meetings and that this had led to misunderstandings between some members. He also urged members not to have important offline discussions between groups and subgroups, which could leave some members feeling marginalized. The floor was opened for comments.

Eduardo Dalcin suggested that it would be useful to create a list server of email addresses, to ensure that everyone received messages sent to the whole group. Mark Watson agreed that it’s a good idea to have a list of emails, although it has to be used with caution because a reply goes back to all. Walter Berendsohn recommended answering to the person who sends the message only to reduce the number of emails and added that reminding to look at the webpage for information might be a good idea. Maïté Delmas said it’s very useful to have the list of attendees to the meeting in a timely fashion. Mark suggested and the Chairman agreed that William Ulate will try to get action points out within a month or so after the meeting².

The Chairman asked if there should be any modification to the Agenda. All accepted the Agenda, no dissenting voices.

- **Update on current signatories to the WFO. Pending WFO Consortium members. Expressions of interest from possible future members. WFO website. WFO logo and portal design**

Update on current signatories to the WFO. Pending WFO Consortium members. Expressions of interest from possible future members.

The Chairman indicated we have now about 30 members in the Consortium. Some members are looking for support for their participation at meetings. He also mentioned that he is regularly explaining the works of the Consortium whenever possible but we will be able to do this better in the future if we all participate.³

¹ Action Item: Upload Minutes from Geneva

² Action Item: Extract Action Items

³ Action Item : Presentations on WFO

Possible membership⁴: Flora Malesiana Foundation. The Chairman asked Erik Smets to give an update. Erik explained he thought he had signed that off when he was signing as Naturalis but he can give a copy and send the PDF.

The Chairman mentioned that he maintains a file of all signatories. He indicated that receipt of scanned copies of the signed MOU was acceptable for incoming members.⁵

Victoria Sosa explained that the Institute of Ecology in her institution in Mexico is willing to sign to become a Member of the WFO Consortium.

Gaps for possible membership: Botanical Society of India has been involved in the Consortium but has not signed the MOU to become a member. Also the Alexander von Humboldt Institute in Colombia has expressed an interest but there has been no recent progress towards their membership. The Indonesian Botanic Gardens had also expressed an interest. The Chairman mentioned that he would soon meet the Director of the Indonesian Botanical Garden and would discuss. He also asked whether REFLORA in Brazil might be interested to be part of the Consortium.

Marianne Le Roux mentioned that Namibia is also interested.

IAPT had expressed interest but no indication recently. Erik Smets has suggested that CETAF may be interested and he will follow up with them.

Walter Berendsohn asked the question as to what type of organizations are allowed into the Consortium? If it's not mandatory that it has a formal legal status, he would recommend including the Flora of Cuba. The Chairman supported this and asked Walter Berendsohn to investigate the possibilities and he said that if necessary, he could write a letter of invitation.

Mark Watson mentioned contacts in Japan (Flora of Japan [Tokyo University] and Flora of Myanmar [Makino Botanic Garden] and Taiwan [Cheng-i Peng].

William Ulate will make a list of names and suggestions to find the proper person to ask.⁶

Mark Watson asked if anybody has approached institutions in New Zealand to join. Abigail Barker offered to contact someone who could ask New Zealand [Landcare].

⁴ Action Item: Update current signatories.

⁵ Action item: Send copies of signatories' files.

⁶ Action Item: Keep a list of contact suggestions.

Abigail Barker informed she contacted Andrea from Australia and asked about their institutions and they said it was short notice and they didn't have funds to attend, but Abigail could keep the link going.

Haining Qin suggested to link with the institution writing a first volume of Flora of China.

WFO Information Website

The Chairman asked Chuck Miller to say a few words about the work done so far on the information website. Chuck mentioned that the main activity has been to update the information of the website as it comes in. If anybody Tweets, for example, it shows up automatically on the page. Also the minutes from the St. Petersburg meeting were updated.

Eduardo Dalcin indicated that WFO has a Facebook page and no update has been done since Richelle Weihe had left the Missouri Botanical Garden. John Parnell said that he thought that using Facebook is useful, especially for students. The Chairman indicated that updating a Facebook could help achieve more outreach for the project. Marianne Le Roux said it's useful but there should be some on-going activity. Eduardo Dalcin said that since we are a Flora Online we are delayed in setting it up. Barbara Thiers agreed that social media strategy is useful to develop.⁷

Erik Smets said that he brought a pamphlet about CETAF that could serve as an example⁸ and suggests that could provide a video or message so all organisations that are part of WFO could put it in their own website. The Chairman also suggested we could put videos of institutions on the WFO website⁹. John Parnell indicated that the current video of the Chairman, Peter Wyse Jackson, has only been seen by 61 people to date and that publicity or promotional activities would be necessary.

Maité Delmas mentioned that each member of the Consortium has a link to their website.

WFO logo

The Chairman asked if any of our institutions have used the logo? Barbara Thiers explained that their creative services team at NYBG reviewed the logo and found it to be a little problematic and got negative feedback. The Chairman explained that he was supportive of reviewing and improving the logo, but opposed to completely redoing it, because of time and money involved.

⁷ Action Item: Update Facebook page.

⁸ Action Item: Create a Pamphlet for WFO.

⁹ Action Item: Videos. Put videos of institutions on Website.

- **Reports from the Chairs of WFO Working Groups:**

The Chairman suggested separating these reports from the ones due to be delivered the next day. He also asked for any perspective about the work done.

Chuck Miller gave a presentation about the work done:

Two public portal prototypes had been developed at the Missouri Botanical Garden and at Kew and sets of use cases were listed and prioritized in the following two documents:

- WFO Use Cases version 7 June 2014.docx
<https://www.dropbox.com/s/kp3porrmfc2pt6w/WFO%20Use%20Cases%20Version%207%20June%202014.docx?dl=0>
- WFO Use Case importance assessments 112213.xls
<https://www.dropbox.com/s/9tz490hzcgx0fub/WFOTWG%20joint%20use%20case%20a%20assessment%20112213.xlsx?dl=0>

Also a DwCA Data Model was developed for our information:

- <https://www.dropbox.com/s/m6kwmxwffyo1kqf/WFO%20DwCA%20Model%202-Version%205%20062814.docx?dl=0>

And the information portal can be accessed at www.worldfloraonline.org

Since the Council meeting in Geneva, and according to the Plan established there, resources were found to prepare a Demo Portal, as follows: Markus Doring (GBIF), Natalia Queiroz (RJBG), Matt Blisset (Kew/GBIF), Paul Smock (MBG) and Trish Rose-Sandler (MBG) worked on its implementation. A Google Cloud Account was created, the eMonocot software baseline was migrated to Google, the eMonocot GUI was modified to adapt to the WFO brand, the Plant List v1.1 dataset was uploaded to the Demo Portal and descriptions were also uploaded for a few taxa.

Trish Rose-Sandler (MBG) had several recommendations in her Report for the Data Ingestion Project on the functionality needed for the Harvester to operate at scale, on the staffing needed for the project (data specialist and programmer in Java working in the same physical space), and on the additional tasks needed for testing how to load different types of data, adding production-level functionality code and fully documenting the Harvester's operation.

The Chairman stated that he considered it a general good progress in delivering what we knew would be a difficult outcome to achieve after Geneva.

- **Nomenclatural and Taxonomic Management System**

This was followed up with a presentation of the BOTALISTA system from Geneva by Raoul Palese. First he showed the Search functionality for Persons that allows choosing what

columns to display, sort and export the results. You can edit a Person, include a new Person, assign and modify initials, and register transactions history.

He then showed the screen to edit/modify authorships. He showed how complex queries could be constructed with the nomenclatural title list and demonstrated how creating a name from a specific epithet allows you to link it to an IPNI genus.

We saw how to modify the nomenclatural status, including qualifiers. The demo so far had been accessing by Name, and he then showed how it can be seen by Projects. Finally, he showed an example of the Flora of Paraguay and then demonstrated the button to Preview changes in the taxonomical hierarchy.

The Chairman thanked Raoul and asked for questions and comments from the attendees.

- **A WFO Specimen Portal**

The meeting continued with a presentation of the WFO Specimen Explorer for Plant Taxonomists by Walter Berendsohn. He explained the motivation behind this development:

1. Promote WFO with a useful tool.
2. What can Berlin contribute using existing technologies (Special Interest Networks based on GBIF and BioCASE technology)
3. Foment Data Quality improvements on the provider's side.
4. Promote Open Data!

It does Name Query Expansion based on the iPlant web service. It also links to details like URLs to images, Identifications and Identification History. It shares metadata as CC0 and a search allows bringing up the Type Specimen and other images.

Also, the B-HIT data cleaning tool was explained and the new improvements (software implementation) to come in the future were mentioned.

It was suggested the possibility of having a contact person in each of the WFO Consortium members and the question was raised on where should the WFO Specimen Explorer be linked so that it's not confused with the WFO Portal.

The Chairman asked the two Working groups to look at both presentations and come back with recommendations for the Council on how to proceed. Note: the recommendations were presented later in the meeting and adopted.

- **NYBG Contributions**

Melissa Tulig presented on the Contributions of the New York Botanical Garden (NYBG) to the WFO, particularly the Digitization of the Flora Neotropica.

She made the following points:

Taxon Treatments. They have digitized versions of most volumes in the Flora Neotropica series and are preparing these for ingestion into WFO. This involves OCR of the scanned text, and then mark up of the nomenclatural information and species descriptions. These are then uploaded into The New York Botanical Garden's Virtual Herbarium, for eventual export to the WFO website.

Supportive MultiMedia. The NYBG team works with individual curators to find images (digital or diapositives) that relate to the specimens and WFO treatments, and link these to the digitized species treatments wherever possible. Specimens at NY that are cited in the treatments that are digitized are also digitized and are linked to the species treatment and any related images.

Melissa wrapped it up by acknowledging the work of all those involved in the Flora Neotropica.

Meeting was adjourned for the day at 5:10pm.

Thursday 22nd October

12:45 Council meeting continues, addressing the following Agenda items

• **Report and Update from the Technical Working Group**

Mark Watson presented first a Discussion Summary indicating how the Technical Working Group has reviewed progress through Conference Calls, shared reports of lessons learned from programmers and data manager, discussed attribution, TPL quality indicators and the level of detail wanted. Similarly, the backbone data structure and identifiers were topics covered. A Use Case Coverage document was created to review the Portal functionality versus the Use Cases Requirements. Also during these days, there have been breakout sessions for addressing Content and the Taxonomic backbone along with discussions following the demonstrations of the Specimen Portal and BOTALISTA. Also next steps for the upcoming meeting in April had been considered to determine what can be delivered by then.

Resources

The Technical Working Group pointed to a first key issue: Resources. They suggested that without dedicated resources, few changes would occur besides loading of content data.

From a technical point of view, they suggested that the following four teams will be needed and coordinated for a fully functional WFO system:

- Software Development Team
- Content Data Ingestion Team
- Backbone Database Changes Administration

- WFO System Operation / Administration Team.

From experience and current knowledge, the Technical Working Group estimates that a short term scenario would need, at a minimum, one software developer and one data coordinator, but a workable scenario would require a core team composed of 2 software developers and 2 data coordinators (without including the outreach necessary to obtain providers).

The Technical Working Group came up with the following Recommendations:

1. As a first priority, the demo portal should be enhanced with descriptive data content as advised by the Data Content subgroup for the April meeting.¹⁰
2. Likewise, the development of a Harvester administration/operation guide should be carried out immediately through testing and collaboration.¹¹
3. No modifications to the taxonomic backbone should be done prior to the April meeting
4. A subgroup should be formed¹² to:
 - a. Test backbone data changes on a separate “sandbox” system.
 - b. Investigate how best to store author attribution for revisions to the backbone using the current demo portal database and software
 - c. Document the Darwin Core Archive elements needed to represent and be used to import backbone revisions.
 - d. Present report to the NY Meeting.
5. Complete a full analysis of the portal use case gaps, including severity of the gap, difficulty to remediate, resources to mediate and prioritization.¹³
6. Defer the creation of an actual plan to remediate the use case gaps until the April meeting.
7. WFO server infrastructure: revise it to tune it for production performance utilizing a configuration with development, test and production virtual servers.¹⁴
8. Acceptance of BGBM Specimen Portal with WFO as a taxonomic tool for contributors.¹⁵
9. Acceptance of the offer from Geneva to implement the Botalista software on the Google server.¹⁶
10. Recognizing that there are issues relating to the use of Identifiers (IDs) the Technical Working Group recommends a subgroup to be formed to look into the use of taxonIDs vs name ID in the demo portal and the issue of missing name IDs (eg. Bryophytes)¹⁷

Mark suggested the development of Exemplar groups. Chuck Miller pointed out that we don't know the magnitude of what we don't yet know. He explained that we are making a revision of

¹⁰ Action Item. Enhance Demo Portal with Descriptive Data.

¹¹ Action Item. Create a Harvester administration/operation guide

¹² Action Item. Form a Technical Subgroup.

¹³ Action Item. Complete gap analysis of the portal use cases.

¹⁴ Action Item. Revise WFO server infrastructure.

¹⁵ Action Item. Install BGBM Specimen Portal.

¹⁶ Action Item. Implement Botalista software

¹⁷ Action Item. Solve the use of Identifiers (IDs)

the software and trying it out where there's a lack of understanding. He suggested that it may not be possible to have it fully documented by April 2016, the date of the next Council meeting.

The Chairman suggested that the meeting should await the recommendations of the Taxonomic Group before approving them both.

- **Report and Update from the Taxonomic Working Group**

The report and recommendations of the Content Subgroup of the Taxonomic Working Group to the Council are included in Annexes 4, 5 and 6. The Taxonomic Working Group presented the following recommendations:

1st Recommendation: Adopt The Plant List (TPL) as the basis for the WFO Taxonomic backbone.

Discussion: Walter Berendsohn asked if the World Flora Online includes infra-species levels. Chuck Miller indicated that for the Plant List it only included infra-specific levels if they were the basionym or if they were the accepted name of a synonym. The Chairman said this recommendation intended to point out that WFO will not create new versions of the Plant List. Thomas asked why botanist would want to have two different sets. Mark Watson indicated that the reason is to have a citable, static source that could be referenced. Eric Smets said that the last line in the recommendation should be reworded to say: “*Updating the TPL will not be a concern for the WFO.*”

2nd Recommendation: Global WFO backbone is taken as a standard. A globally consistent taxonomy should be provided by the WFO. As a consequence, the WFO global backbone has priority in the WFO portal. Accepted names in existing original treatments have to be linked to the WFO backbone.

Recommendation: The Council may wish to note this view.

Discussion: Abigail Barker reminded the group who we are creating this for, and that it is for the end user or taxonomist. The discussion noted the following point: in the future we may evaluate if there should be a distinction between homo- or heterotypic synonyms.

3rd Recommendation: Achieving taxonomic coverage. There will be two cases:

1. A specialist network or specialist person is available who is adopting a taxon globally and is responsible for updating the taxonomic backbone and content.
2. No active working group, so a group is assigned by WFO to take care of what needs to be updated and look for advice on parts of the taxonomic backbone or content.

Recommendation: The Council may wish to note this view.

4th Recommendation: Implementing taxonomic treatments in case 1 (active Networks): The WFO Consortium recognizes that the active networks will continue to manage their own data using their systems. A contribution to WFO can be achieved if the respective data management systems of the taxonomic networks export their data according to Darwin Core Archive standards. Thus, the respective data can be ingested into the WFO.

Recommendation: A survey of existing taxonomic networks should be made, including a survey of the systems used by these individual networks/specialists.¹⁸ Also, the networks have to be asked if they are willing to be responsible for the matching of names or taxon concepts in relation to taxon treatments (incl. descriptions). In the latter case, the ingestion of taxonomic backbone and contents data would be organized with priority via the specialist network. Using a few exemplar groups, to demonstrate that this workflow is feasible and can be implemented. should be a high priority

Discussion: Last phrase was adapted.

As the e-monocot software is being used in the WFO portal, editing cannot be done online in a distributed way. Therefore a mechanism has to be organized for data ingestion. If appropriate, the ingestion tools could also include further complementary software to the current ingestion software¹⁹.

Recommendation: The establishment of practical tools and protocols for the ingestion of data from specialist networks into the WFO system shall be a priority.

5th Recommendation: Encourage specialist networks to become involved.

Recommendation: The Taxonomic Working Group will identify existing active taxonomic networks with worldwide scope and encourage their participation in WFO. The Working Group will also approach the networks. Once the participation is arranged on a working level, formal approval should be sent by the Chair of the Council to guarantee that the adoption of a taxonomic group is paralleled by an institutional commitment to sustain this adoption.

The need for institutional commitments to allocate resources for data curation and handling may arise as soon as the quantity of data to be processed increases.

6th Recommendation: Implementing taxonomic treatments in case 2 (no active Specialists Networks): WFO aims to use the best possible taxonomic backbone. Updating the backbone has to be organized as short-term deliverables including small contributions supplied according to available expertise.

¹⁸ Action Item. Make a Survey of existing global taxonomic networks.

¹⁹ Action Item. Organize a mechanism for data ingestion.

Family level classification is mostly stable for angiosperms and gymnosperms, while genera are less so. In that case, the task is mainly to provide standards for genus and species level classification. In ferns, bryophytes etc. families may be more in flux.²⁰

Suitable mechanisms will have to be established that include issues such as selecting and approaching specialists, taking care of data ingestion and data curation.

Recommendation: Identify specialists to review parts of the taxonomic backbone and/or assess the quality of the treatment in the current WFO backbone²¹. The Taxonomic Working Group should also work out a suggestion for a feasible organizational framework for the involvement of individual specialists.

The Chairman indicated that this is where we will recognize participation.

Recommendation: The establishment of practical tools and protocols for the ingestion of data from specialists regarding the taxonomic backbone into the WFO system shall be a priority. As e-monocot software is used in the WFO portal, editing cannot be done online in a distributed way. Therefore a mechanism has to be organized for data ingestion. Perhaps e-monocot software could be modified to include plug-ins of other software such as Botalista.

7th Recommendation: Promote crediting of contributors. It is crucial to have an Acknowledgement system implemented as soon as possible because this is an important incentive for specialists. The necessary tools should therefore be made available.²²

8th Recommendation: Policy on updating. WFO will present previously published treatments on different taxa at very different levels of knowledge, and work on different taxa that is taking place simultaneously. For the presentation for WFO it does not appear as useful to have different formal versions of WFO but this may be different with respect to exporting to other internationally recognized standards.

In case of the contributing networks or specialists, they will decide upon updating the respective parts (backbone and content). These respective parts will have a DOI or date of publication (marked up treatments will also have a publication date and reference). It remains to be seen how the work flows will develop. One scenario is that (A) the updating is organized in a distributed way, i.e. through logins of those who have a mandate, or (B) to send information to a central editorial office.

Recommendation: The Council may wish to note this view.

9th Recommendation: Revisiting Format

²⁰ Action Item. Provide standards for genus and species of angiosperms and gymnosperms.

²¹ Action Item. Identify specialists to review parts of the taxonomic backbone.

²² Action Item. Promote crediting of contributors.

Guidelines for contributors are available (version June 2014) and need to be updated.²³

Content:

1. Up to date taxonomy
2. Descriptions (morphological data; marked up and structured)
3. Distribution information: TDWG
4. Status: Native, introduced, doubtful, cultivated, naturalized etc.
5. Societal relevance
6. Habitat
7. External links to conservation status

Future steps

8. Reference specimen images – link to specimen portals?
9. Vernacular names

Recommendation: The Council may wish to note this view.

10th Recommendation: Policy in providing means for identification

Building upon recommendations from earlier meetings, published dichotomous keys could be marked up or linked like other published materials (descriptions). Interactive multi-entry keys are important but require structured character data; this goes beyond the current scope of WFO and therefore in the portal there should be links to sources providing such keys (usually maintained by a taxonomic or regional specialist network).

Recommendation: The council may wish to note this view.

11th Recommendation: Endorsement of contributing projects

Recommendation: To endorse the adoption of the projects ‘Botalista’¹⁶ and ‘WFO Specimen Explorer’¹⁵ as contributions to the WFO and supports that these can be branded under the WFO.

<Meeting break for Lunch >

- **Time Schedule – Work to be completed in time for the next WFO Council Meeting in New York, April 2016**

1. Look for existing nearly complete on-line treatments that are globally sliced (e.g. EDIT exemplar groups, etc). The purpose is to provide exemplar groups.²⁴

²³ Action Item. Update guidelines for contributors.

²⁴ Action Item. Look for existing nearly complete online treatments for exemplar groups

2. Taxonomic networks/specialists should accomplish an up-to-date globally sliced taxonomic backbone for their group as first priority.²⁵
3. Taxonomic networks/specialists should organize the link to ingest existing descriptions from Flora Treatments/Monographs²⁶
4. Prepare a short paper for TAXON²⁷ that explains the WFO taxonomic backbone approach. This will include a description of an acknowledgement structure, description of available technological tools (for ingestion). The Chairman will be the lead person in moving forward this paper, which will be authored by the Consortium members.

- **Approval**

The Chairman asked for a proposal to approve all recommendations.

All in favor, no one against, the recommendations of the Taxonomic Working Group were unanimously ADOPTED.

All in favor, no dissenting voices, all recommendations of the Technical Working Group were unanimously ADOPTED.

Topics for discussion the following day:

The following topics to be addressed the following day were quickly reviewed:

- Progress on Markup Tool.
- Software Development Needs.
Any possible In-Kind contributions for tomorrow so they could be paired with prioritized needs.
- Outreach and promotion of the World Flora Online.
Volunteers for the development of a Communications Strategy.
- Coordination.
Helpful to have more feedback from groups in between meetings.
- Committee and Working Groups structures.
Bring ideas on proposals for restructuring these groups.
- Resource mobilization.
Bring suggestions of resources we could mobilize.
- Election of Chairs of the Council and WGs.
after discussing whether any restructuring will be helpful.

²⁵ Action Item. Create an up-to-date taxonomic backbone by taxonomic networks/specialists for their groups.

²⁶ Action Item. Organize link to ingest existing descriptions by taxonomic networks/specialists.

²⁷ Action Item. Prepare a short paper for TAXON

- Date and arrangements for next meeting of the WFO Council.
Barbara Thiers to report.
- Other Symposia or Workshops.
Upcoming meetings.

The meeting adjourned for the day.

Friday October 23, 2015

- **Intellectual Property Rights**

Chuck Miller showed a slide on this issue from a previous meeting when discussion had been deferred to this meeting.

IPR Issue from St. Petersburg

Can data or images with restrictions on re-use be accepted by WFO?

- Software must be written to capture the restrictions and then omit restricted data or images from exports.
- CC0 or Public Domain enables unrestricted export
 - Much simpler software
 - But some institutions won't provide CC0, do we exclude their non-CC0 data?

Free Open and Widely Accessible Framework touches on the issue of IPR.

Melissa Tulig indicated that CC0 is not possible without further consideration. At the New York Botanical Garden, in addressing this issue they went back to the contract with authors and illustrators and have been dealing with them directly. eMonocot already shows some of the restrictions of the data. Whoever provides data has still the right and we will have to work with them.

Walter Berendsohn explained that, on the content side, we should not promote the NC clause because it prevents anyone from using the content. It's not known what issues data with NC could have. The other side is the backbone, which needs to be made accessible, legally advisable and we should make that a requirement.

The Chairman asked if we could have a draft policy in place by the next meeting, to be approved then. He suggested that this could include the points made by Chuck Miller, Abigail Barker and Walter Berendsohn. He asked if they, and Melissa Tulig, would be willing to work as a Task Force on the topic. Abigail Barker offered what is preparing at the Royal Botanic Gardens, Kew and Walter Berendsohn indicated GBIF is just undergoing a similar process.²⁸

John Parnell pointed out that some sort of best practices should be written to guide the users who don't know how to enforce it. Abigail Barker pointed out that Kew is also working on that.

²⁸ Action Item. Create a Policy on IPR for WFO.

- **Markup Tools**

The Chairman asked about the experience of the participants on Markup Tools and their eagerness to make their tools available.

Melissa Tulig explained there are different stages on how far to go with Markup. Chuck Miller indicated that there has been no change in the Markup Tool being prepared at the Missouri Botanical Garden since the Geneva Council meeting.

The Chairman suggested that we should try to consolidate the Markup Tools after the next Meeting Period, and develop it by the partners from their own experience until the New York meeting. He invited those current involved to progress their tools from now and until the next meeting for integrating a future WFO toolkit.²⁹

- **Communication Strategy**

Barbara Thiers indicated there are different categories of communication that need to be addressed as part of a Communications Strategy. Those to be communicated with include our colleagues, collaborators, people who we expect to be involved in the project, potential data providers, potential funders and the general public. This project does have traction with the public, we had several media groups interested although they want to see interesting things on video. Our colleagues within our own institutions are the ones who could develop such materials.

Chuck Miller indicated that, once identified, we can then create a strategy for each category of user. There is a video created by forestplots.net that he recommends as an example (see <https://vimeo.com/113901222>)³⁰

Barbara Thiers suggested that we could go for simple wins. Like JSTOR does, make available a PowerPoint and a poster template with pretty pictures and facts. Erik Smets suggested involving students in the work. Eduardo Dalcin believed that the Communication topic is closely related to the Social Media Strategy. The CDB Clearing House Mechanism (CHM) is working on a similar document for their Strategy and Eduardo offered himself to be part of any subgroup formed to work on this. The Chairman indicated this time before New York is particular important to prepare. There is currently not too much to show but Barbara mentioned categories (like our own colleagues) who should be informed about the WFO now, and we can think which other groups should be informed and when. Erik Smets was in agreement to create a FB page or something for outreach.

Eduardo Dalcin offered to create a document on a web strategy for the next meeting based on the work being done by the CBD CHM³¹. The Chairman suggested that other members could join

²⁹ Action Item. Develop Markup Tools for a Toolkit.

³⁰ Mark recommended later by email two similar “outreach” videos for the public: Ash Dieback in the UK - <https://www.youtube.com/watch?v=HIII-blL5c> and Tropical Dry Forest conservation uses - <https://www.youtube.com/watch?v=m6XN65eMtg4>

Eduardo in this work and asked for volunteers to act as co-Chairs with Eduardo. Barbara Thiers and John Parnell volunteered to head this new Communications Working Group. The group should provide suggestions and ideas on materials; for example, a list of meetings where WFO would like to have a presence. In July 2017, for example, a significant profile should be present at the International Botanical Congress (IBC). If possible it would be valuable to have a keynote speaker presenting about the WFO, or at least a Symposium on WFO at the Congress. The Chairman mentioned that he is on the Scientific Committee of the IBC so, if all are in accordance, he can approach them to show our interest in having a Symposium.³²

The Chairman indicated that all of his presentations on the WFO are available for others to use too. Barbara Thiers asked to make the presentations available in an easy to access place. Chuck Miller indicated we have two different Dropbox accounts, one for the Technical Working Group and another one for the Taxonomical Group.³³

The Communication Group will make sure we have the right structure of Dropbox.³⁴

Chuck Miller suggested having something easy to use like creating a list of members for things that require so. Eduardo suggested we use the Google space for this.

Pierre-André Loizeau indicated that during next Global Botanic Gardens Congress (Geneva June 26-30, 2017) it would be good to have a presentation on WFO as well.

- **Resources**

The Chairman said that in his opinion we can be very proud of the work being done with our own resources in each institution. It would be great if we could approach different donors next year to support our work, once it is much more visible and available through the WFO Portal. We have to find out what we need in terms of resources too to help us achieve what we want for next meeting and how to get these supports in our institutions.

The Chairman asked if there are any available in-kind resources that we could use between now and the meeting in April 2016. Erik Smets said he would give a presentation on the WFO to colleagues in his own institution to see if any ICT developer resources might be available.³⁵ Eduardo Dalcin said that Natalia could be involved for Phase II and until August 2016.

Erik Smets asked what is the role of a data coordinator. Chuck Miller explained (s)he makes sure the data are in the right format, loading the data into the database and making sure that they are well imported, including calls, conferences, emails, etc. The Chairman indicated that MBG will be willing to help and will provide a Data Coordinator from now and until the meeting in New York and William Ulate will serve in that role and collaborate in this project.

³¹ Action Item. Create document on web strategy based on CBD CHM work.

³² Action Item. Approach the IBC and express interest to have a Symposium at the IBC 2017

³³ Action Item. Make presentations available.

³⁴ Action Item. Create a proper space in Dropbox.

³⁵ Action Item. Follow up on Resources offers.

Pierre-André Loizeau indicated that three months of a programmer would be funded by the Swiss Government or other organizations.

John Parnell indicated that their Computer Science Department is always looking for projects, and this might be possible after April 2016.

Mark Watson asked for a letter from the Chair of the WFO to the heads of institutions asking for the help in resources needed and a document explaining about the technicalities of the software (programming language, etc.)³⁶

The Chairman recognized all the In-Kind contributions of all involved by financing their own participation in the WFO project and by the Royal Botanic Gardens, Kew providing eMonocot software for the Portal. He also highlighted the Google Cloud space that NYBG has organized and the Specimen Portal that the Botanic Garden and Botanical Museum, Berlin-Dahlem was providing. In all, these contributions he estimated were worth tens of thousands of dollars.

Walter Berendsohn pointed out that an important in-kind contribution is going to be to develop export utilities from our own systems. If you could name someone in your system that could provide the exported content to be uploaded, we could work with them.³⁷

Marianne Le Roux said she may be able to offer support after talking with her Institution.

Qin indicated he will be giving a report to his superiors and may be able to upload something online. The Chairman asked him to keep in touch to see how his presentation goes.

The Chairman then asked if at this stage we should be seeking significant external funds, or whether we should first put our effort in to further development of the portal and data content. Thomas Borsch indicated that we have a lot to do before and after New York.

Chuck Miller indicated that Donald Hobern (GBIF) has been supporting us by providing the services of Markus Döring and Matt Blisset who is now at GBIF. He will ask for an extension of such support.³⁸

The Chairman indicated that at the April Meeting we may want to re-structure the group to focus our attention on developing proposals. We could delay discussion on this topic until the New York meeting.

- **Committee and Working Group Structures**

The Chairman reminded the meeting that we currently have two Working Groups: Technical and Taxonomic and had just agreed to the formation of a third, a new one on Communication. He

³⁶ Action Item. Write letter from the Chairman to institution heads asking for help with Resources.

³⁷ Action Item. Identify contact to produce exported content for uploads.

³⁸ Action Item. Ask GBIF for continued support.

also mentioned that there had been discussions on the formation of subgroups on Backbone Changes, Specialists Networks and the Data Content.

Wayt Thomas added that Taxonomic work covers all of the topics but honestly, not enough work was being achieved between meetings, so maybe dividing our efforts by tasks may produce new progress.

Barbara Thiers suggested that if we have more subgroups we may need a Coordination Committee.

The Chairman said that the Coordination Committee is the Chair plus the Chairs of the different Committees, as defined in the Memorandum of Understanding.

Thomas Borsch said we should be driven by the leads in our recommendations.

Pierre-André Loizeau pointed out that, for the Taxonomic Backbone, Geneva, Missouri and Kew could check with NY, no problem. The chairman said that based on discussion, perhaps we don't need to create new Working Groups but instead set some subgroups to work.

Walter Berendsohn objected that he was not sure about separating backbone and content because making this separation of backbone and content may disrupt the existing process. The Chairman agreed adding that that was why he was hesitant to create new Working Groups but instead recommended the formation of specific task groups. Chuck Miller commented that it has worked for the Technical Working Group to plan these meetings with the Council and have a regular meeting conference call once a month.

Pierre-André Loizeau said we need to produce a list of who is creating what.³⁹

- Development of the Management of the Users Module
- Module to import a taxonomy from a specialist network to the taxonomic backbone
- Update the eMonocot DB backbone with the taxonomic backbone

The Chairman asked if it would be necessary to restructure the Working Groups given the tasks that we have before our meeting in New York? Mark Watson pointed out that most of the things related to the Taxonomic Backbone involve Technical issues. For example, linking synonyms may be needed and that is a topic that includes both Taxonomic and Technical. He suggested having a liaison group. He also said that ad-hoc subgroups could be formed. The Chairman indicated that we could certainly create new Working Groups and Task Forces but he is always worried of having too many because they need to be maintained. He recommended maintaining the three existing groups: Taxonomic, Technical and Communications.

Everyone agreed and said that changes after April may depend on how well results are delivered.

- **Election of Chairs of the Council and Working Groups (Leadership Issues)**

³⁹ Create a List of who is creating what.

The Chairman asked for nominations for two co-Chairs for the Working Groups.

He then nominated Thomas Borsch as co-Chair of the Taxonomic Working Group and Jim Miller nominated Wayt Thomas. Mark Watson seconded the nominations. All were in favor. Thomas Borsch and Wayt Thomas were elected co-Chairs of the Taxonomic Working Group.

For the nomination of co-Chair of the Technical Working Group, the Chairman didn't receive any proposals. Following discussions both Chuck Miller and Mark Watson indicated that they were willing to continue as co-Chairs. Jim Miller nominated them and John Parnell seconded. All were in favor. Chuck Miller and Mark Watson were therefore re-elected as co-Chairs of the Technical Working Group.

The Chairman then proposed Pierre-André Loizeau as a co-Chair of the Council. Wayt Thomas then nominated both Peter Wyse Jackson and Pierre-André Loizeau. All were in favor and Drs Peter Wyse Jackson and Pierre-André Loizeau were elected as co-Chairs of the Council.

- **Date and arrangements for the next meeting of the WFO Council (New York)**

Barbara Thiers presented information about the venue for the next meeting of the Council in New York in April 2016. She mentioned access through public transportation, lodging, facilities and food options.

The Council then discussed the possibility to have its second 2016 meeting in South Africa. Marianne Le Roux asked when it would be preferable and the group decided to have the meeting at the beginning of November.⁴⁰

- **Restructuring the Meeting**

Peter Wyse Jackson, asked about the structure of Council meetings, the group proposed to have four days of Council Meeting (having the first two days for breakout groups), leaving a day for Seminars or Symposia. Barbara Thiers suggested we might consider having a day of the Working Group Meeting before the Council Meeting and then another day after the Council Meeting.

- **Other issues**

Mark Watson suggested having a list server of the members of the Council and of the Working Groups.⁴¹ This was agreed.

- **Conclusions**

Peter Wyse Jackson thanked everyone for an extremely productive set of meetings. Good communications will be a key to achieving our future goals. He expressed thanks to the co-

⁴⁰ Action Item. Save the dates.

⁴¹ Create a list server for the Council and the Working Groups.

Chairs of the Working Groups for their leadership and to the Members of the Council and the support of all who have contributed these past months. He also thanked William Ulate for taking notes and expressed his grateful appreciation to Eduardo Dalcin for his great support of the meeting and for making the excellent arrangements to have us come to Rio de Janeiro.

Dr Wyse Jackson asked Dr Dalcin to please pass on our thanks to the President of the Garden.

The Meeting also expressed their formal thanks to Dr David Simpson of the Royal Botanic Gardens Kew who had been co-Chair of the Taxonomic Working Group and involved in previous meetings of the Council but who had recently retired.

Eduardo Dalcin indicated he received a call from the President of the Rio de Janeiro Botanic Garden apologizing for not being able to be there. Nevertheless the President thanked the participants and sent formal support for the achievement of the WFO targets.

The event was then formally closed. Thanks to all!

ANNEX 1

AGENDA (Original)



Agenda – World Flora Online

Council Meeting

Hosted by the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Brazil

Wednesday 21st October, 2015

- Introduction and Update – Welcome to new WFO members.
- Self-introduction by members of the Council
- Review and adoption of the Minutes of the previous Council Meeting (Geneva, January 2015)
- Review and adoption of the Agenda for the Council meeting
- Update on current signatories to the WFO. Pending WFO Consortium members. Expressions of interest from possible future members. WFO website. WFO logo and portal design
- Reports from the Chairs of WFO Working Groups:

Thursday 22st and Friday 23rd October

Council meeting continues, addressing the following Agenda items

- Report and Update from the Technical Working Group
- Report and Update from the Taxonomic Working Group

Other issues (*some of the following may be covered in discussions that result from the Working Group reports*).

- Web WFO Portal – processes, priorities, plans and procedures for data ingestion, searching, display and functionalities.

- The Taxonomic Backbone – modifications to The Plant List, procedures and processes for modifications, updates and accommodating differences of opinion, higher order ranks, documentation needs etc.
 - Content – mobilization of content and priorities, processes, plans and procedures for ingesting content into the portal. Data use agreements and Intellectual Property Rights – what will be needed and how should such agreements be negotiated? Progress on Markup tools.
 - Software development needs – addressing gaps; staffing software development, etc.
 - Nomenclatural and Taxonomic Management System – a proposal - *presentation by the Conservatoire et Jardin Botanique, Ville de Genève*
 - A WFO Specimen Portal – a proposal – *presentation by the Botanic Garden and Botanical Museum, Berlin-Dahlem.*
 - Outreach and promotion of the World Flora Online – including management and updates to the WFO information website, presentations and other promotional material. Management of social media aspects of the project. Guidelines for participants and content providers. Upcoming opportunities for WFO publicity, etc.
 - Coordination – how can we ensure that tasks and priorities are achieved between meetings?
 - Committee and Working Groups structures
 - Resource mobilization and fund-raising initiatives and strategies
 - Discussion and adoption of proposals
 - WFO Updates and Other Reports and Demos from participants
 - Election of Chairs of the Council and Working Groups
 - Date and arrangements for the next meeting of the WFO Council (New York)
 - Conclusion and Close of Meeting
- Breakout sessions by the Taxonomic and Technical Working Groups or other topic groups may be organized as required and agreed during the meeting.

ANNEX 2

World Flora Online

Hosted by the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Brazil

October, 2015

Attendee List

Botanic Garden Meise

BELGIUM

Marc Sosef

*Botanischer Garten und Botanisches Museum Berlin-Dahlem,
Zentraleinrichtung der Freien Universität Berlin*

GERMANY

Walter Berendsohn

Thomas Borsch

Conservatoire et Jardin botaniques de la Ville de Genève

SWITZERLAND

Pierre-André Loizeau

Raoul Palese

Institute of Botany, CAS

CHINA

Qin Hai-Ning

Instituto de Ecologia

MEXICO

Victoria Sosa

Instituto de Pesquisas Jardim Botânico do Rio de Janeiro

BRAZIL

Eduardo Dalcin

Natalia Queiroz

Missouri Botanical Garden

UNITED STATES OF AMERICA

Peter Wyse Jackson

Chuck Miller

Jim Miller

Paul Smock

William Ulate

Muséum National d'Histoire Naturelle

FRANCE

Maité Delmas

Thomas Haevermans

Naturalis Biodiversity Center

NETHERLANDS

Erik Smets

New York Botanical Garden

UNITED STATES OF AMERICA

Barbara Thiers

Wayt Thomas

Melissa Tulig

Royal Botanic Garden Edinburgh

UNITED KINGDOM

Mark Watson

Royal Botanic Gardens, Kew

UNITED KINGDOM

Abigail Barker

SANBI

SOUTH AFRICA

Marianne Le Roux

Trinity College Dublin

IRELAND

John Parnell

ANNEX 3

Action Items

#	TASKS	RESPONSIBLE PERSONS	WHEN?
1.	Upload Minutes from Geneva. Upload the Approved Updated Geneva Minutes to the Website	William Ulate	<i>Done</i>
	Follow-up: Minutes have been added to the communications portal.		
2.	Extract action Items. Get action items to the meeting participants after the meeting.	William Ulate	A month after the meeting
	Follow-up:		
3.	Presentations on WFO. Take advantage of the meetings we attend to present about the WFO.	All	<i>Continuously</i>
	Follow-up:		
4.	Update current signatories. Update the list of Consortium members on the website.		<i>ASAP</i>
	Follow-up: All MOU members have been added to the communications portal.		
5.	Send copies of signatories' files. Send scanned copies of signatories' files to Mark Watson.	Peter Wyse Jackson	?
	Follow-up:		
6.	Keep a list of contact suggestions. Make a list of names and suggestions to find the proper person to ask.	William Ulate	<i>ASAP</i>
	Follow-up:		
7.	Update Facebook page. Keep updating Facebook page with news and current information.	?	?
	Follow-up:		
8.	Create WFO Pamphlet. Create a pamphlet for WFO, taking the one from CETAF as an example.	?	?
	Follow-up:		
9.	Videos. Put videos of institutions on Website.	?	?
	Follow-up:		

10.	Enhance Demo Portal with Descriptive Data. Demo portal should be enhanced with descriptive data content as advised by the Data Content subgroup for the April meeting.	William Ulate	<i>April 2016</i>
	Follow-up:		
11.	Create a Harvester administration/operations guide. The development of a Harvester administration/operation guide should be carried out immediately through testing and collaboration	William Ulate	<i>April 2016</i>
	Follow-up:		
12.	Form a Technical Subgroup. A Technical subgroup should be formed to test backbone changes, investigate author attribution storage, document DwCA elements and report at NY meeting.	?	?
	Follow-up:		
13.	Complete gap analysis of the portal use cases. Complete a full analysis of the portal use case gaps, including severity of the gap, difficulty to remediate, resources to mediate and a prioritization.	?	
	Follow-up:		
14.	Revise WFO server infrastructure. Revise the WFO server infrastructure and tune it for production performance utilizing a configuration with development, test and production virtual servers.	?	?
	Follow-up:		
15.	Install BGBM Specimen Portal. Align the Specimen Portal with WFO as a taxonomic tool for contributors.	BGBM	?
	Follow-up:		
16.	Implement Botalista software. Implement the Botalista software on the WFO Google Server and work together to further develop it as collaborative tool for expert networks to contribute backbone data.	Geneva	?
	Follow-up:		

17.	Solve the use of Identifiers. Form a subgroup to look into the use of taxonIDs vs name ID in the demo portal and the issue of missing name IDs.	Subgroup?	Report in April at NY Meeting
	Follow-up:		
18.	Make a Survey of existing global taxonomic networks. Make a Survey of existing global taxonomic networks and the systems used and ask if they are willing to be responsible to match names to treatments.	?	?
	Follow-up:		
19.	Organize a mechanism for data ingestion. Demonstrate that the ingestion of taxonomic backbone and contents data into the WFO Portal is feasible using a few prioritized exemplar groups.	?	?
	Follow-up:		
20.	Provide standards for genus and species of angiosperms and gymnosperms.	?	?
	Follow-up:		
21.	Identify specialists to review parts of the taxonomic backbone. When no networks exist, identify specialists to review parts of the taxonomic backbone and/or assess the quality of the treatment in the current WFO backbone.	<i>Technical Group</i>	?
	Follow-up:		
22.	Promote crediting of contributors. Acknowledgement system implemented as soon as possible because this is an important incentive for specialists.	Technical Group	?
	Follow-up:		
23.	Update guidelines for contributors. Guidelines for contributors available (June 2014) need to be updated.	?	?
	Follow-up:		
24.	Look for existing nearly complete online	?	April 2016

	treatments. Look for existing globally sliced on-line treatments that could provide exemplar group.		
	Follow-up:		
25.	Create an up-to-date taxonomic backbone by taxonomic networks/specialists for their groups. Accomplish an up-to-date globally sliced taxonomic backbone for their corresponding group.	EachTaxonomic Network / Specialist	First Priority
	Follow-up:		
26.	Organize link to ingest existing descriptions by taxonomic networks/specialists. Organize link to ingest existing descriptions from Flora Treatments/Monographs.	EachTaxonomic Network / Specialist	?
	Follow-up:		
27.	Prepare short paper for TAXON. Prepare a draft explaining the WFO taxonomic backbone approach, describing the acknowledgement structure and the available technological tools (for ingestion).	Peter Wyse Jackson	?
	Follow-up:		
28.	Create a policy on IPR for WFO. Based on existing and current work on the topic, prepare a policy document for WFO on IPR, to be approved during our next meeting.	IPR Task Force (Melissa Tulig, Chuck Miller, Abigail Barker & Walter Berendsohn)	April 2016
	Follow-up:		
29.	Develop markup Tools for a Toolkit. Consolidate the Markup Tools being used; develop them from now and until the next meeting in New York to integrate them into a toolkit.	All (doing Markup)	April 2016
	Follow-up:		
31.	Create document on web strategy based on CBD CHM work. Create a document on web strategy for the next meeting based on the work being done by the CBD CHM. Suggest ideas on materials like meetings where WFO should present (e.g. IBC) a keynote or at least a Symposium on WFO.	Communications Working Group (Eduardo Dalcin, Barbara Thiers, John Parnell)	April 2016
	Follow-up:		

32.	WFO Symposium at the IBC. Approach the IBC Committee to express our interest in having a Symposium.	Peter Wyse Jackson	Done!
	Follow-up:		
33.	Make presentations available. Make all presentations available in an easy to access place.	?	?
	Follow-up:		
34.	Create a proper space in Dropbox. Make sure we have the right structure in Dropbox to share the presentations and documentation.	Communications Working Group	?
	Follow-up:		
35.	Follow up on Resources offers. Follow up on resources offers: a developer from Naturalis, Natalia from JBRJ, William from MBG, a developer for 3 months from Geneva, a project from the CS Dept. by John Parnell., support from SANBI, contribution from Institute of Botany in China,	Erik Smets, Eduardo, Peter Wyse Jackson, Pierre-André Loizeau, John Parnell, Marianne Le Roux, Qin Hai-Ning	?
	Follow-up:		
36.	Write letter to institution heads for help with Resources. Send a letter to the heads of Institutions to help gathering resources.	Peter Wyse Jackson	?
	Follow-up:		
37.	Indicate contact to produce exported content for uploads. Indicate contact person to produce exports of data in your Institution.	All	?
	Follow-up:		
38.	Ask GBIF for continued support. Ask Donald Hobern for their continued support with Markus Döring and Matt.	Chuck Miller	?
	Follow-up:		
39.	Create a list of who is creating what. Produce a	?	ASAP

	list of who is in charge of a certain task including the development of the Users Management Module, a module to import a taxonomy to the backbone and to update the eMonocot backbone database with the taxonomic backbone.		
	Follow-up:		
40.	Save the Dates. Save the dates for the 5th meeting 25-29 April, 2016 in New York. Marianne will confirm the dates and venue for the 6th meeting in South Africa.	All	ASAP
	Follow-up: The venue was later confirmed by Marianne and Dr Peter Wyse Jackson sent an email indicating that: the 5th meeting will be held in New York City, USA on 25-29 April, 2016, hosted by NYBG and the 6th meeting will be held in Pretoria, South Africa on 8-11 November, 2016, hosted by Pretoria National Botanical Gardens.	Peter Wyse Jackson, Marianne Le Roux	Done. Nov.13, 2015
41.	Create a List Server for the Council and the Working Groups. Produce an email list for the members of the Council and another one for each of the Working Groups.	Eduardo Dalcin	ASAP
	Follow-up: List Servers have been created.		

ANNEX 4

Taxonomic Working Group – Content Subgroup Recommendations

1. Categories of descriptive content

Hard copy

Digital images (e.g. scanned text)

Digital descriptions

- a. Floristic or monographic projects, largely completed
- b. Collaborative series currently in development (will likely result in major taxonomic changes)

2. Survey of Available content and status (see attached spreadsheets)

a. Approximately 140,000 species descriptions are available for ingestion; 120,000 of these are already in the correct format and have require no additional permissions or major changes to the taxonomic backbone

b. Attachments

1. Floristic content table
2. Current collaborative projects

3. Recommendations

a. Agree upon classification of content types

b. Refine and complete summary of content; store in a common place where all can use for reference and can update – Google doc?

c. Agree upon strategy to give highest priority to content that most ready to incorporate; within this group, strive to achieve a balance between monographic and floristic treatments, regions of the world and institutions represented

d. Work continually to line up future content following an agreed upon priority; both Flora Malesiana and Flora of Australia were discussed as high priority projects from whom to get an agreement to share content

E. Keep track of all content whether promised or desired, in a master list or spreadsheet that all can view at any time and is updated by appointed persons regularly

Notes:

Contact Cyrillic-based botanists for floras of former USSR

ANNEX 5

WFO Description Sources, October 2015

Source	No. Spp.	Link to site	Coordinator	When
TAXONOMIC				
Palms K	2585	http://www.palmweb.org/		
Grasses K	11290	http://www.kew.org/data/grasses-db.html	Clayton	
Comps-Chicorieae	2000	http://cichorieae.e-taxonomy.net/portal/node/8		
Melast-Miconieae	500	http://sweetgum.nybg.org/melastomataceae/	Michelangeli	
Caryophyllales	200	http://caryophyllales.org/caryophyllales2015	Borsch	
Solanum	1800	http://sciweb.nybg.org/science2/hcol/solanum/index.asp.html	Knapp	
Lecythidaceae Pages	400	http://sweetgum.nybg.org/lp/	Mori	
Euphorbs				
FLORISTIC				
Flora Tropical East Africa	12500	http://www.kew.org/science-conservation/research-data/science-directory/projects/flora-tropical-east-africa		
Flora Tropical West Africa	7072	http://www.kew.org/discover/news/flora-west-tropical-africa-ebook1		
Flora Zambisiaca	10350	http://apps.kew.org/efloras/search.do;jsessionid=2622427B0C634422525B93BAE585A164		
Flora Nepal				
Flora of Thailand				
Flora of the NE US	5000	NY		
Flora of China	31000			
Flora of North America	10000			
Flora of MesoAmerica	10000			
Flora of Nicaragua	6000			
Flora of Costa Rica	10000			
Flora of Panama	8000			
Flora Venezuelan Guyana				
Flora Brasil Online				
Flora Philippines				
Digital Flora Indonesia				

Digital Flora Newfoundland				
Flora of Australia Online	20000	http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/		
Flora Neotropica	8500			
Gabon				
South Africa	13000			
Ireland				
South Africa				
Arabia				
Afganistan				
Brunei				
Peru				
Bolivia				
Ecuador				
Nordica				
Ibirica				
France				
Flore d'Afrique centrale, Spermatophytes	6000	http://www.br.fgov.be/RESEARCH/DATABASES/FOCA/index.php	Bot. Gard. Meise	now
Flore d'Afrique centrale, Pteridophytes	100	http://www.br.fgov.be/RESEARCH/DATABASES/FOCA/index.php	Bot. Gard. Meise	now
Flore du Gabon (Pteridoph. & Spermatoph.)	2500		Naturalis Biodiv. Inst.	now
Flora of the Guianas	3000		Naturalis Biodiv. Inst.	2017?
Flora of the Netherlands	1500		Naturalis Biodiv. Inst.	?
Flora of Belgium	1500		Bot. Gard. Meise	2017?
BACKBONE				
Sapotaceae				
Caricaceae	35	http://herbaria.plants.ox.ac.uk/bol/caricaceae		now
HARD COPY				
Europaea				
Nordica				
Macaronesia				
Ethiopia				
USSR				
Mascarenes				

Turkey				
Arabia				
Afganistan				
New Zealand				
Tasmania				
Malesiana				
Intermountain Flora				

ANNEX 6

WFO Flora Sources by Region

EUROPE	AFRICA	W ASIA	E ASIA	AUSTRALASIA	N AMER	MESO AMER	S AMER
Currently Digital							
Ireland	Flora Tropical East Africa	Brunei	Nepal	Fl. Australia Online	Flora of the NE US	Flora of MesoAmerica	Flora Neotropica
Flora Iberica	Flora Zambisiaca	Arabia	China		Flora of North America	Flora of Nicaragua	Flora Brasil Online
France	South Africa	Afganistan	Philippines		Digital Flora Newfoundland	Flora of Costa Rica	Peru
Belgium	Gabon		Indonesia			Flora of Panama	Bolivia
	Central Africa					Flora Neotropica	Ecuador
	Flora Tropical West Africa						Flora Venezuelan Guyana
Currently Hardcopy							
Europaea	Ethiopia	USSR	USSR	New Zealand	Intermountain Flora	Central French Guiana	
Nordica	Turkey	Arabia	Fl. Malesiana	Tasmania			
Macaronesia		Afganistan					
USSR							