

## Report of the 18th World Flora Online (WFO) Council

The 18th World Flora Online Council meeting held on Tuesday, 21<sup>st</sup> December, 2021. The meeting was held virtually and was two and a half hours in duration, starting at 7.00am, St Louis, USA time. A draft agenda for the meeting was circulated in advance.

### Attendance:

Adil Güner	Nezahat Gökyiğit Botanik Bahcesi, Istanbul, Turkey
Alan Paton	Royal Botanic Gardens, Kew, London, UK
Chuck Miller	Missouri Botanical Garden, St Louis, Missouri, USA
Colin Pendry	Royal Botanic Garden Edinburgh, Edinburgh, UK
Dalila Espirito Santo	European Consortium of Botanic Gardens, Lisbon, Portugal
Dmitry Geltman	Komarov Institute of Botany, Russian Academy of Sciences, St Petersburg, Russia
Eduardo Dalcin	Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro, Brazil
Erik Smets	Naturalis Biodiversity Center   Flora Malesiana Foundation, Leiden, Netherlands
Fabian Michelangeli	New York Botanical Garden Institute of Systematic Botany, New York, USA
James Miller	Missouri Botanical Garden, St Louis, Missouri, USA
Joe Miller	Global Biodiversity Information Facility, Copenhagen, Denmark
Lauren Raz	Universidad Nacional de Colombia, Bogotá, Colombia
Lorenzo Peruzzi	Garden & Botanical Museum of the University of Pisa
Marc Sosef	Meise Botanic Garden, Meise, Belgium
Mark Watson	Royal Botanic Garden Edinburgh, Edinburgh, UK
Murat Aydınlık	Nezahat Gökyiğit Botanik Bahcesi, Istanbul, Turkey
Olaf Banki	Species2000/Catalogue of Life, Leiden, Netherlands
Patrick Herendeen	International Association for Plant Taxonomy
Peter Fritsch	Botanical Research Institute of Texas, Fort Worth, Texas, USA
Peter Wyse Jackson	Missouri Botanical Garden, St Louis, Missouri, USA
Pierre-André Loizeau	Conservatoire et Jardin Botaniques, Geneva, Switzerland
Rashad Salimov	Institute of Botany, Azerbaijan National Academy of Sciences, Baku, Azerbaijan
Richard Chung	Forest Research Institute Malaysia (FRIM)
Roger Hyam	Royal Botanic Garden Edinburgh, Edinburgh, UK
Visotheary Ung	Muséum National d'Histoire Naturelle, Paris, France
Thomas Haevermans	Muséum National d'Histoire Naturelle, Paris, France
Walter Berendsohn	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
Warren Wagner	Smithsonian National Museum of Natural History, Washington, DC, USA
William Ulate	Missouri Botanical Garden, St Louis, Missouri, USA
Xiaohua Jin	Institute of Botany, Chinese Academy of Sciences, Beijing, China & GBIF
Kathy Farris	Support Staff Missouri Botanical Garden
Nye Hughes	Support Staff RBG-Edinburg, UK

## **1. Welcome**

The Co-chairs, Peter Wyse Jackson and Pierre-André Loizeau welcomed all participants in the meeting. They also thanked the teams in St Louis and Edinburgh for their outstanding work on the WFO over the last few months. A new member, the Botanic Garden and Museum of the University of Pisa, Italy (represented by director Lorenzo Peruzzi) was welcomed. The work by the WFO teams at Missouri and Edinburgh was highlighted including updates in portal content, the taxonomic backbone, the new portal interface, progress on the WFO Plant List, the about pages, and a new proposal from RBG Edinburgh for the management of the Taxonomic Backbone. An update item had been published in Taxon on 15<sup>th</sup> December announcing the new look portal, about pages and WFO Plant List.

The Draft Agenda was adopted as follows:

1. Welcome ..... Peter Wyse Jackson and Pierre-André Loizeau
2. Apologies for absence
3. Adoption of the Report from the 17th meeting of the WFO Council (held virtually on 6<sup>th</sup> July, 2021).
4. New Consortium Members
5. Update on the WFO Portal - taxonomic backbone and content ..... William Ulate
6. Report from the Taxonomic Working Group..... Mark Watson and Alan Elliott
  - a. Discussion and adoption of recommendations from the Taxonomic Working Group.
  - b. Update on the new WFO Portal – New Portal UI, New About page, and WFO Plant List
7. Report from the Technical Working Group ..... Chuck Miller and Walter Berendsohn
  - a. Discussion and adoption of recommendations from the Technical Working Group
8. Botanical Developments ..... Pierre-André Loizeau and Raoul Palese
9. Proposal for new WFO Taxonomic Backbone software ..... Mark Watson and Roger Hyam
10. Review of action points from the last meeting (other than those that would have been covered in the Working Group reports)
11. 19th Council meeting – 26-30 April, 2022 (tentative in-person at the Meise Botanic Garden, Belgium)
12. Any Other Business

## **2. Apologies for absence**

Apologies for absence from the meeting were received from John Parnell (Trinity, Dublin), Maïté Delmas (MNHN Paris), Raoul Palese (Geneva), Geoff Levin (FNAA, Illinois) and David Middleton (Singapore).

## **3. Adoption of the Report from the 17th meeting of the WFO Council (held virtually on 6<sup>th</sup> July, 2021).**

The Report of the 17<sup>th</sup> WFO Council meeting was adopted.

## **4. Update on the WFO Portal and Content**

William Ulate, WFO Gatekeeper, provided an update on progress made with the WFO portal since the last meeting. The report below is given in the form of the Powerpoint slides presented and received.



World Flora Online  
www.worldfloraonline.org




MISSOURI  
BOTANICAL  
GARDEN

## Update on the WFO Portal - taxonomic backbone and content


William Ulate, WFO Gatekeeper

WFO Tech Meeting  
December 21, 2021




World Flora Online

## Public Portal (Current)




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## Test Portal (35.223.12.126)




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## Stage Portal (35.188.196.236)




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World Flora Online

## About Page



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World Flora Online

## Consistency checks

- synonym of synonym (21)
- synonym as parent of accepted name (19)
- accepted names with no parent
- synonyms with no accepted name
- taxa with no family
- taxa with no taxonomic status
- taxa with no taxon rank
- excluded name as a parent of valid name



BRYOPHYTES  
Mosses and liverworts



PTERIDOPHYTES  
Ferns and allies



GYMNOSPERMS  
Conifers, ginkgos and allies



ANGIOSPERMS  
Flowering plants

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## Consistency checks

- synonym of an excluded name
- excluded name used as Original Name
- two space between epithets in names
- leading and trailing spaces in WFO-ID
- NULL value in publication (different than empty)
- invalid nomenclatural status
- invalid taxon rank



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## Duplicates

# Records	ScientificName	ScientificNameAuthorship	Family	taxonomicStatus	NamePublishedIn	URL
Equal duplicate	450	Exact match	Exact match	Exact match	Exact match	Match
Different URL	556	Exact match	Exact match	Exact match	Exact match	Not Match
Diff. Publication	930	Exact match	Exact match	Exact match	Exact match	Not Match
Diff. Publ. & URL	1,800	Exact match	Exact match	Exact match	Exact match	Not Match
Diff. Tax. Status	1,370	Exact match	Exact match	Exact match	Exact match	Not Match
Similar Author, Same Tax. Status	21,372	Exact match	Near match	Exact match	Exact match	Not Match
Similar Author, Diff. Tax. Status	9,494	Exact match	Near match	Exact match	Exact match	Not Match
Similar Scientific Name	2,453	Near match	Exact match	Exact match	Exact match	Match
<b>TOTAL</b>	<b>38,985</b>					

- Small backlog of duplicated
- Valid names with parents not accepted
- Duplicates with different sources (which to exclude)
- Duplicates with diff. Publications (401 to exclude)
- Duplicates with diff. Tax. Status (633 to exclude)

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## WFO Taxonomic Backbone

- Taxa with no major group or parent families
- Names with taxonomic issues
- Parent Rank relation issues (infraspecific & genera, species & suprageneric)
- Some trinomial resolution

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## Loading the new WFO Taxonomic Backbone

- Total: 830 families with 1,377,496 names  
Up to 42% (572,885)      Up to 53% (739,968)

OfficialFamily	Names
Asteraceae	147268
Orchidaceae	86472
Fabaceae	82997
Poaceae	70975
Rosaceae	39480
Rubiaceae	39014
Lamiaceae	32386
Cyperaceae	28820
Euphorbiaceae	22858
Brassicaceae	22609

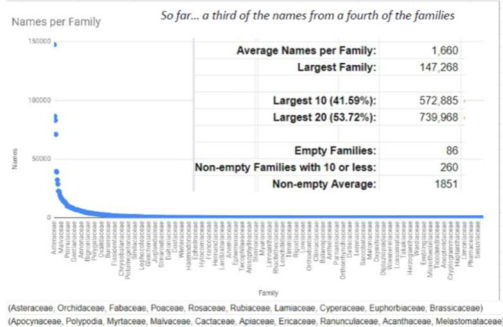
OfficialFamily	Names
Apocynaceae	21523
Polypodiaceae	19212
Myrtaceae	18257
Malvaceae	17391
Cactaceae	16407
Apiaceae	16150
Ericaceae	15187
Ranunculaceae	14494
Acanthaceae	14256
Meistomataceae	14206

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## Loading the new WFO Taxonomic Backbone



## Content: ZA e-Flora

- New WFOIDs assigned and Alan and Ronell's suggestions on the Matching report for ZA e-Flora were implemented.
- Names temporarily excluded in preharvester DB waiting for additional details to include them:
  - AcceptedNameID for Synonyms,
  - ParentNameID for Valid Names
  - Family for all taxa
  - NamePublishedIn
- On Dec. 3<sup>rd</sup> we received data corrections from Dr. Ronell and will include them in the Taxonomic Backbone after backbone is complete.

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## Content: Peninsular Malaysia

- Name Matched 957 names from Peninsular Malaysia.
- Matched 851 in first run.
- Alan provided comments, later reviewed by Dr. Richard Chung Cheng Kong
- They will need to convert the rest of the PDF's manually.
- Dr. Richard sent us more information on Nov. 12<sup>th</sup> with data corrections, waiting to be processed and included in the Taxonomic Backbone.

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## Content: Flora of Thailand

Explore the data  
Find out about  
Check a plant name

**WFO**  
The World Flora Online

Browse Classification Browse Images Contribute Data Download Data

## eFloraOfThailand output

DATA TYPE  
○ Description (10697)  
○ Distribution (10697)  
○ Images (11338)  
○ References (10697)  
○ Taxa (10697)  
○ Taxonomic Name (10697)

Showing 1 to 10 of 10697 results

Sub Category	Category	Details
Info	Create	

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## Content: Brazilian descriptions

- Ready for incorporation after first match.
- 26,683 descriptions, each in 3 languages

Accession	Accession	Accession	Accession	Accession
10001	10001	10001	10001	10001
10002	10002	10002	10002	10002
10003	10003	10003	10003	10003
10004	10004	10004	10004	10004
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10211	10211	10211	10211	1021



 <h2>Next Steps</h2>			
• <b>Action Item 39. Catalogue of Life/GBIF</b>			
	In CoL	In WFO	
Out of: 524 Orders	238 Orders		45%
- 264 Accepted	- 173 Accepted		66%
- 260 Synonyms	- 65 Synonyms		25%
	In CoL	In WFO	
Out of: 2509 Families	576 Families		23%
- 1493 Accepted	- 373 Accepted		25%
- 959 Synonyms	- 159 Synonyms		17%
- 48 Ambiguous Synonym	- 44 Ambiguous Synonyms		92%
- 9 Provisionally Accepted			0%
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## 5. Report on the Taxonomic Expert Groups (TENs)

Alan Elliott (unable to attend the meeting) presented a recorded report from the Taxonomic Expert Groups (TENs). He outlined updates achieved since the last meeting (6<sup>th</sup> July, 2021) and reminded the meeting that fuller details would be provided in the report from the Taxonomic Working Group (to follow). He addressed the following topics:

- Deduplication [Task 44]
- Gap Analysis [Task 13.3]
- Activity updates from approved TENs
- About Pages [Task 73]

There were no new TENs to approve



He reported that he had harvested about 32% of the names from 25% of the families (28% if only from the families with child records). Once the backbone is in, the content goes in and then the old portal data gets swapped out. William is estimating this would be completed by the end of January.

### Deduplication [Task 44]

There were c. 17k duplicate records. TPL artefacts. We reviewed the current situation. It will be done once the new release is finished. More than doubled to ca.39k. 24 months ago we would have

considered 17k names a significant task, but given what we've been through in the past 12 it is almost trivial.

3k checked – 1259 excluded. A bit of progress had been made.

- Equal duplicates (225 excluded)
- Duplicates with different sources (283 excluded)
- Duplicates with diff. Publications (401 excluded)
- Duplicates with diff. Tax. Status (633 excluded)

	# Records	ScientificName	ScientificNameAuthorship	Family	taxonomicStatus	NamePublishedin	URL	Sheet
Equal duplicate	450	Exact match	Exact match	Exact match	Match	Exact match	Match	Sheet1
Different URL	566	Exact match	Exact match	Exact match	Match	Exact match	Not Match	Sheet2
Diff. Publication	930	Exact match	Exact match	Exact match	Match	Not Match	Exact Match	Sheet3
Diff. Publ. & URL	1,800	Exact match	Exact match	Exact match	Match	Not Match	Not Match	Sheet4
Diff. Tax. Status	1,920	Exact match	Exact match	Exact match	Not Match			Sheet5
Similar Author, Same Tax. Status	21,372	Exact match	Near match	Exact match	Match			Sheet6
Similar Author, Diff. Tax. Status	9,494	Exact match	Near match	Exact match	Not Match			Sheet7
Similar Scientific Name	2,453	Near match	Exact match	Exact match	Match			Sheet8
<b>TOTAL</b>	<b>38,985</b>							

Around 40K names were processed, several were left as were (not duplicates) and others requiring some crossed double-checking were left for later.

### Gap Analysis

#### Order/Family Coverage [Task 13.3]

taxonRank	ACCEPTED	DOUBTFUL	HETEROTYPICSYNONYM	HOMOTYPICSYNONYM	SYNONYM	UNCHECKED	Total Of taxonID
FAMILY	719				103	9	831
GENUS	18099	1157	18	1	8760	2581	30616
SPECIES	381687	33161	36	3	595208	85538	1095633
SUBSPECIES	20703	798			36479	3751	61731
VARIETY	19088	4386			154060	15200	192734

Family	Number of Accepted Species
Acanthaceae	5400
Achariaceae	190
Achatocarpaceae	10
Acoraceae	2
Acrobolbaceae	36
Actinidiaceae	385
Adelanthaceae	79
Aextoxicaceae	1

Aizoaceae	1871
Akaniaceae	2
Alismataceae	121
Alseuosmiaceae	9
Alstroemeriaceae	261
Altingiaceae	15
Alzateaceae	1
Amaranthaceae	2029

#### Activity updates from approved TENS

We currently have 37 approved TENS, with 18 active TENS. 2 that are preparing data:

- Aquifoliaceae, Bryophytes

16 that have name matched (including partial):

- Arecaceae, Begoniaceae, Bryophytes, Caryophyllales, Conifers, Cordiaceae, Ericaceae, MADCAT, Musaceae, Styracaceae, Cycads, Hypericum.

3 that have partial backbone updates:

- Begoniaceae

4 that have fully updated:

- Caryophyllales: Nepenthaceae, Cactaceae, Aizoaceae, Irvingiaceae, Solanaceae, Zingiberaceae, Meconopsis & Cathcartia

Fabaceae – DwCA :

- Name matching is underway, has WCVF identifiers so should hopefully be straight forward.

MadCat - DwCA classifications ready:

- Sphaerosepalaceae
- Sarcolaenaceae

Name matching finished and with me:

- Begoniaceae



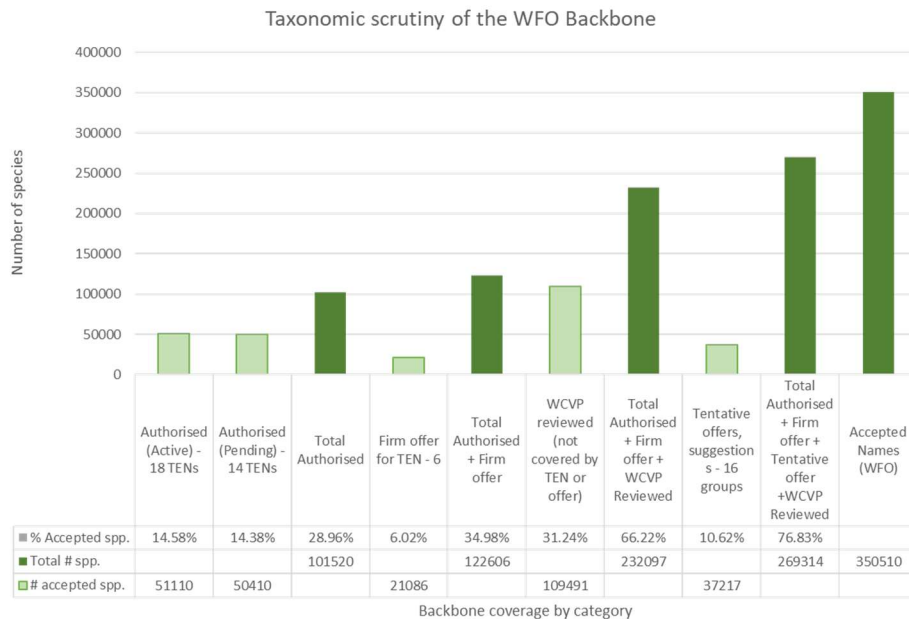
## Name matching corrections finished

- Cycads

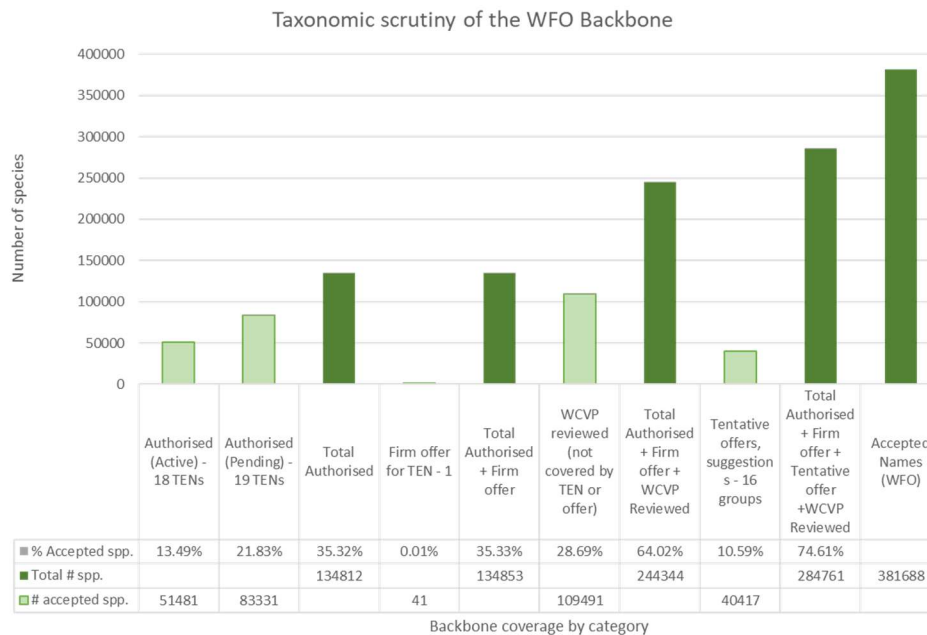
## Name matching corrections finished

- Styracaceae & Musaceae

## Backbone coverage - July 2021



## Backbone coverage - Dec 2021



Take home change – 101K of authorised oversight. Compared to 87K in July. 29% of backbone with a TEN. With WCVF in it's about 60% scrutiny, well would be if we have updated families. Another 16%

with initial or tentative contact. WCVF – figure take with a pinch of salt. I need to get a more updated list.

### Possible new TENS

- Paeoniaceae – ca. 33 spp.
  - Dr. Nicodemo G. Passalacqua (Director Natural History Museum of Calabria and Botanical Garden). He has published on the European Paeonia and is working on the taxonomy of the family. Currently engaged fieldwork.
- Rubiaceae – ca. 13k spp.
  - A Rubiaceae TEN is not likely at the moment” Brecht Verstraete is not able to lead. They have a pipeline to update WCVF so we get can get update via that route.
- Orchidaceae [Regional] – ca. 500 spp.
  - Anthony Whalen was contacted about possibly forming an Australian and near neighbour TEN dealing with Acianthinae, Caladeniinae, Drakaeinae, Prasophyllinae, Pterostylidinae (all Tribe Diurideae).
- Ochnaceae – ca. 650 spp.
  - Marc Sosef is currently trying to pull create an Ochnaceae TEN building on the existing Quiinoideae TEN.
- Urticaceae – ca. 2.6k spp.
  - Combination of Sanger and target-enrichment markers supports revised generic delimitation in the problematic ‘Urera clade’ of the nettle family (Urticaceae). Alex Monro (K) had made contact and is willing to form a TEN.

### About Pages - [Task 73]

All Consortium Members have text content, most have at least one image. Pisa added (23rd Sept). All the approved TENS have a page. Legume Phylogeny Working Group: Taxonomy page populated with text and images.



## TEN Progress – Active

TEN	#spp	TEN FOCAL	Last Contact	Notes
<b>Aquifoliaceae</b>	480	P.-A. Loizeau (G)	Jun-20	Established the links between existing database (+- 2300 names) and an extract of the Aquifoliaceae of the WFO backbone. Check of missing names in the WFO to receive an WFO ID will be done in Botalista when the software developed when ready.
<b>Arecaceae</b>	2400	B. Baker (K)	May-20	I completed the WFO to WCV data name match (late March) – 31hrs and 4 min of work for 9k names. William and Sunitha sent DwCA to (G) in May. This is testing and final correction in Botalista. Pending
<b>Begoniaceae</b>	1900	M. Hughes (E)	Apr-21	Name match complete. Next Phase.
<b>Bryophytes</b>	20000	J Brinda (MO)	Apr-20	TEN curating data currently in Tropicos. John massive help in getting the Higher Taxonomy of Liverwort and Hornworts ready and finalising the Bryophyte Higher Taxonomy.
<b>Caryophyllales</b>	12000	T. Borsch (B)	Dec 21	Nepenthaceae, Cactaceae, Aizoaceae – update received. Some new name are currently excluded pending publication late July. Other small families?

Caryophyllales - The compilation tasks are currently mostly done in Berlin. Once completed, they will be (or have been) turned over to specialists in the Caryophyllales Network for further taxonomic scrutiny and aggregation of further data. However, we think that the compilation will already represent a significant improvement as compared to the current WFO backbone. We therefore intend to provide data for a major update of the WFO backbone ASAP. Large families such as Cactaceae, Amaranthaceae s.str., Plumbaginaceae and Aizoaceae are complete or very close to completion, besides many of the small families that have been complete for some time now. A problem in the ingestion process is its dependence on family treatments – in Caryophyllales many genera have changed their family assignments across several families, and one of the larger families – Amaranthaceae – is treated in the strict sense by the Network (i.e. treating Chenopodiaceae as a separate family). This will make it necessary to handle the updates of these families together, to avoid the introduction of contradicting classifications. An exception are the Cactaceae, which are rather clearly delimited and for which the compilation will be finished by the end of July, so that an import could be possible by the end of August. Cactaceae will provide a test case for the import process with a large family.

TEN	#spp.	TEN FOCAL	Last Contact	Notes
<b>Cycads</b>	355	Michael Calonje (MBC)	Apr 2021	Name Matching done. For next pahse
<b>Conifers</b>	620	P Thomas (E)	Feb-20	Initial name match done and back with Philip.
<b>Cordiaceae</b>	450	J. Miller (MO)	Mar-21	Initial Name Match done using Tropicos backbone data. I will revisit with Jim to progress this.
<b>Ericaceae</b>	5400	A Elliott (E)	Sept-20	3 Small subfamilies curated Harrimanelloideae, Cassiopoideae, Enkianthoideae. Ericoideae. About 50% Complete. Vaccinioideae underway several Malesian genera curated. Neotropical Ericaceae specialists have joined
<b>Gesneriaceae</b>	3540	H. Atkins (E)	Jun 21	Continuing with curation. Integrating data has not been straightforward. Progress Impacted by Covid.
<b>Hypericum</b>	370	S. Crockett (Graz); N. Nürk (U of Bayreuth)	Aug 20	Initial name matching, and Ten Manager suggestions complete. With TEN Focal for corrections.
<b>Irvingiaceae</b>	10	D. Harris (E)	Feb-20	Curation Completed.

TEN	#spp.	TEN FOCAL	Last Contact	Notes
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<b>Irvingiaceae</b>	10	D. Harris (E)	Feb-20	Curation Completed.

## TEN Progress – Authorised Pending

TEN	# spp	TEN FOCAL	Last Contact	Notes
<b>Alooideae</b>	520	R. Klopper (SANBI)	Nov 19	to follow up.
<b>Asteraceae</b>	23,600	M. Bonifacino UDELAR	Nov 20	MOU signed off. WoRMS working on data export.
<b>Brassicaceae</b>	3400	M. Koch (Heidelberg)		SP2000 Family. Also a CoL GSD. Was felt that we should wait for outcome of data sharing meeting.
<b>Dioscoraceae</b>	870	L Raz (COL)	Nov 19	Pending WCVF integration to WFO Backbone and Botalista..
<b>Dipterocarpaceae</b>	720	M. Newman (E)	Nov 20	Dataset looks equivalent in terms of size. Taxonomy of non-Timber trees needs curated. Name matching once Zingiberaceae is incorporated.
<b>Melastomataceae</b>	5150	F. Michelangeli (NY)	Aug 19	Guidance documents and registration file sent. Still unclear how authorship of WFO content would be assigned & several (unspecified) concerns about process of incorporating data. They want to wait until the 700 new nomenclatural changes have been published and incorporated before passing over data.
<b>Picramniaceae</b>	45	W. Thomas (NY)	Aug 19	Asked for status update 13/8/2019. No contact
<b>Quiinaceae</b>	50	Georg Zizka (Senckenberg)	Sept19	I contacted them asking if they has and electronic Dataset to work with. No reply.
<b>Sapotaceae</b>	1800	P. Wilkie (E)	Nov 19	This is in the pipeline for as one of next WCVF to WFO name matching. The WCVF should effectively overwrite as it's the taxonomy curated by the TEN currently.

TEN	# spp	TEN FOCAL	Last Contact	Notes
<b>Fagaceae</b>	1100	C. Canon (Morton)	June 2020	
<b>Annonaceae</b>	2400	H. Rainer (W)	June 2020	
<b>Poaceae</b>	10,550	M. Vorontsova (K)	Jan 2020	
<b>Bruniaceae</b>	75	R. Klopper, SANBI	Nov 219	Can be harvest via SA Endemics.
<b>Apocynaceae</b>	2400	Sigrid Liede-Schumann	May 21	Planning to speak to about next steps with them soon
<b>Commelinales</b>	885	Marco Octávio de Oliveira Pellegrini	June 2021	
<b>Legumes</b>	16400	Marianne Le Roux (SANBI)	Dec -20	DWC received name matching underway.
<b>Mayaceae</b>	5	Marco Octávio de Oliveira Pellegrini	Jun-21	
<b>Cabombaceae</b>	6	Marco Octávio de Oliveira Pellegrini	June 2021	

## Prospective TENS

Taxon	# spp	Contact	Last Contact	Notes
<b>Australian Endemic Families</b>	100		Dec-19	SUGGESTED. Several names as contacts added. Effectively revised with endemic names being added to receive content. Barbara Briggs - TEN relevant to Anarthriaceae and Ecdiocolleaceae; also likely to be interested in being involved with most of the Australian Restionaceae (Sporadanthoideae and Leptocarpoideae), with Peter Linder in Zurich being relevant to the African Restionaceae (i.e. the Restionoideae). Karen Wilson – Doryanthaceae; also Casuarinaceae. Russell Barrett - Blanfordiaceae, Boryaceae and Dasypogonaceae.
<b>Balsaminaceae</b>	1000	Prof. Eberhard Fisher	Jul 2020	Initial contact made and WFO documents sent. He is interested to establish and coordinate the Family.
<b>Chrysobalanaceae</b>	531	W. Thomas (NY)		SUGGESTED. Contact made prior to my participation. To follow up
<b>Cucurbitaceae</b>	965	H. Schaefer (TUM)	Feb-20	TENTATIVE OFFER. Now working on putting data in BRAHMS. Current excel sheets have generated www.cucurbit.de

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<b>Australian Endemic Families</b>	100		Dec-19	SUGGESTED. Several names as contacts added. Effectively revised with endemic names being added to receive content. Barbara Briggs - TEN relevant to Anarthriaceae and Ecdeiocolaceae; also likely to be interested in being involved with most of the Australian Restionaceae (Sporadanthoideae and Leptocarpoideae), with Peter Linder in Zurich being relevant to the African Restionaceae (i.e. the Restionoideae). Karen Wilson – Doryanthaceae; also Casuarinaceae. Russell Barrett - Blanfordiaceae, Boryaceae and Dasypogonaceae.
<b>Balsaminaceae</b>	1000	Prof. Eberhard Fisher	Jul 2020	Initial contact made and WFO documents sent. He is interested to establish and coordinate the Family.
<b>Chrysobalanaceae</b>	531	W. Thomas (NY)		SUGGESTED. Contact made prior to my participation. To follow up
<b>Cucurbitaceae</b>	965	H. Schaefer (TUM)	Feb-20	TENTATIVE OFFER. Now working on putting data in BRAHMS. Current excel sheets have generated <a href="http://www.cucurbit.de">www.cucurbit.de</a>

Taxon	# spp	Contact	Last Contact	Notes
<b>Cyperaceae</b>	5000	W. Thomas (NY)	Aug 2019	SUGGESTED. Emailed for update
<b>Euphorbia</b>	2000	R Riina (Madrid)	Feb-20	SUGGESTED/POSSIBLE. Provisionally interesting in sharing data. Existing dataset in TOLKIN database. We received an extract to look at data, some issues that was Feb. I have not followed up
<b>Euphorbiaceae s.l. (excl. Euphorbia)</b>	5500	G. Levin (ILL)		SUGGESTED. Contact made prior to Jun 2019
<b>Juncaceae</b>	440	W. Thomas (NY)		SUGGESTED. Yes but no funds to update. Contact made prior to my participation. To follow up
<b>Lauraceae</b>	2900	J Rohwer (U of Hamburg)	Oct 2019	UNLIKELY. Concerns over time limitations and deadlines. Family not sufficiently resolved to make judgements.
<b>Lecythidaceae</b>	311	W. Thomas (NY)	Oct-19	SUGGESTED. Potential TEN to develop. Species Plantarum Project. 13/8/19 emailed to ask if interested

Taxon	# spp	Contact	Last Contact	Notes
<b>Mycoheterotrophic plants</b>		Vincent Merckx, Leiden		SUGGESTED. To Follow up
<b>Myrtaceae</b>	5000	To be confirmed		SUGGESTED. Syzygium, Eugenia & Eucalyptus
<b>Nymphaeaceae</b>	70	Marco Octávio de Oliveira Pellegrini	Jun-21	Offer to curate pending
<b>Rubiaceae</b>	12000	B Verstraete (BR)	Jun-21	Not in a position to form
<b>Santalales</b>	2200	Dan Nickrent		SUGGESTED. To follow up with Peter F

## 6. Report of the Taxonomic Working Group

Mark Watson provided a report that the Taxonomic Working Group had met virtually on Friday 17<sup>th</sup> December, 2021. The following is its report.

### Attendees

- Mark Watson, Co-chair (coordinator) Edinburgh, UK
- Thomas Haevermans, Co-chair Paris, France
- Alan Elliott, TEN Manager Edinburgh, UK
- John Brinda Missouri, USA
- Ethan Fried Eleuthera, Bahamas
- Peter Fritsch Texas, USA

- |                        |                     |
|------------------------|---------------------|
| • Adil Güner           | Istanbul, Turkey    |
| • Peter Wyse Jackson   | Missouri, USA       |
| • Pierre-André Loizeau | Geneva, Switzerland |
| • John Parnell         | Dublin, Ireland     |
| • Alan Paton           | London, UK          |
| • Colin Pendry         | Edinburgh, UK       |
| • Lauren Raz           | Bogotá, Colombia    |
| • Marc Sosef           | Meise, Belgium      |
| • William Ulate        | Missouri, USA       |

## Main Discussion Topics

- TEN Manager update
- WFO website launch of the new look
- Periodicity of WFO Plant List updates
- What to do with The Plant List
- WFO Promotion Group
- RBGE proposal to manage the Taxonomic Backbone (see Agenda Item 8)
- Review of other Taxonomic WG Action Items

## TEN Manager Update [Tasks 13 & 44]

- Issues with the Taxonomic Backbone have been resolved by Sunitha, William and Alan – needing checking and correcting of ca. 5,000 records. New TB data dump created in December 2021 and included into the new WFO Plant List.
- Duplication of names in the Taxonomic Backbone has risen from 17K to 39K caused by bringing new data into the system, but has been reduced by 3K.
- Gap analysis for non-TEN families has started using the new Taxonomic Backbone.
- Update from TENs – ongoing activities of approved TENs, Urticaceae as a new prospective TEN, no new TENs to approve at this Council.
- Level of scrutiny of Taxonomic Backbone now at: TENs (35%), TENs+WCV reviewed (64%), with additional 11% covered by tentative TENs [75% total].
- About Pages updated for approved TENs and new member of Council.

## WFO Website soft launched

16 December 2021

- **WFO Plant List**      *wfoplantlist.org*
  - fully functional with December 2021 Taxonomic Backbone data.
- **WFO About Pages**      *about.worldfloraonline.org*
  - fully functional with up to date information.
- **WFO Portal**      *worldfloraonline.org*
  - fully functional with old Taxonomic Backbone and Content data  
– data will be updated by end of January 2022.



Council members were requested to test the portal.

### **WFO Plant List – periodicity [Task 101]**

- WFO Portal – dynamic data, constantly changing as new updates are made.
- WFO Plant List – static data that users can refer to and cite in publications.
- Data providers would like to see their data incorporated as soon as possible (this is achieved in the WFO Portal). General users want stability from WFO Plant List.
- As we are in an active curation phase of the Taxonomic Backbone it was felt that updates should be made available every six months, with a view to extending this to an annual update when changes are less frequent.
- Updates should be timed to feed into the Catalogue of Life Annual Checklist

### **WFO Promotion Group [Task 100]**

- Thomas Haevermans has formed a group working on the promotion of the WFO to build on the new look and data update (end January 2022) – discussions by email and a virtual meeting.
- Taxon article in Plant Systematics World published (15 Dec) <http://dx.doi.org/10.1002/tax.12557>
- Press release in English, to be translated into other languages as required, and sent out by Consortium Partners via their media networks when the portal is updated (Jan/Feb 2022).
- Data paper to be published in February in ?Taxon (working with editors for this).
- Need DOIs for data archive: suggest using Zenodo (@CERN) or becoming a DataCite member – Lauren Raz is leading the work on this, in discussion with GBIF.
- Need to clarify links between WFO, GBIF and CoL.

Looking to publish a policy paper.

### **Updates on other tasks**

- **CoL/GBIF collaboration** [39]: ongoing.
- Review results of **WFO Taxonomic Backbone and CoL** [85]: pending CoL/GBIF making the comparison.
- Develop criteria for judging **authorisation Content providers** [80]: pending the strategic review.

### **Next steps for the next meeting of Council**

- Conduct a new order/family gap analysis review of taxonomic scrutiny of the Taxonomic Backbone [Task 13.3]
- Conduct a stock take of Content providers (TEN Manager and WFO Gatekeeper) [Task 93]
- Review taxon name duplication with Taxonomic Backbone [Task 44]
- Continue liaison with CoL/Sp2000/GBIF [Tasks 35, 85]
- Continue with promotion of WFO following completion of the data upgrade [Task 100]
- Decide on what mechanism for issuing DOIs WFO should use [New Task]

## **7. Recommendations from the Taxonomic Working Group and Council Decisions**

**Recommendation 1: Council to approve the creation of new versions of the WFO Plant List every six months, and review the situation in future years. APPROVED**

**Recommendation 2:** Council to approve the greying out of The Plant List website, and updating of the yellow warnings to make it clear that users should now use the WFO Plant List, and look to add redirects on pages. **APPROVED**

**Recommendation 3:** Council to delegate the Taxonomic Working Group to decide what option to use for assigning DOIs. **APPROVED**

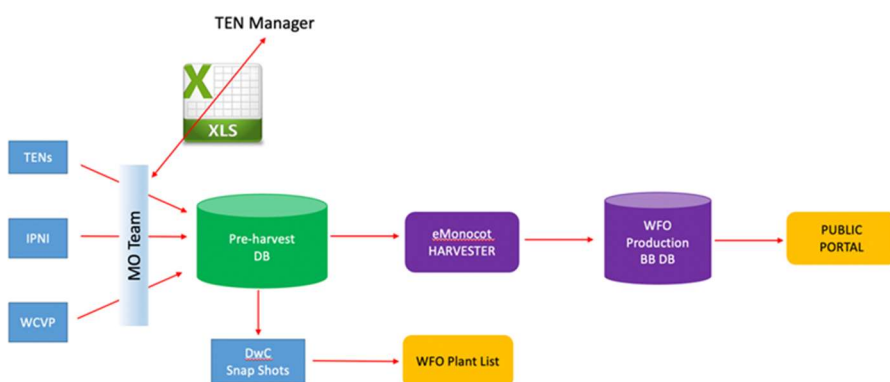
## 8. Proposal for new WFO Taxonomic Backbone software

Royal Botanic Garden Edinburgh's (RBGE) Proposal to manage the Taxonomic Backbone:

Building on the experience of Botalista workflows, discussions between MBG & RBGE had been held and trialing a test dataset undertaken. RBGE offers to build standalone, open source software to:

- manage the WFO Taxonomic Backbone
- incorporate updates from data providers
- provide clean datasets back to MBG for Content matching and for updating the WFO Portal
- be a component of a future replacement system for eMonocot

RBGE offered to maintain this for the foreseeable future on the Google Cloud, but it can be handed over to another custodian in the future.



**Recommendation 4:** The Council adopted a recommendation from the Technical and Taxonomic Working Groups to approve the proposal from RBGE to manage the Taxonomic Backbone.

## 9. Report from the Technical Working Group

Chuck Miller presented the Report of the Technical Working Group, on behalf of its co-chairs, Chuck Miller and Walter Berendsohn. He listed the current members of the Group:

- |                               |  |
|-------------------------------|--|
| • Chuck Miller, Co-Chair      | Missouri BG                                      |
| • Walter Berendsohn, Co-Chair | Berlin BG and Botanical Museum                   |
| • Murat Aydinkal              | NGBB Istanbul                                    |
| • Liu Bing                    | Institute of Botany, Chinese Academy of Sciences |
| • Eduardo Dalcin              | Rio de Janeiro BG                                |
| • Brenda Daley                | South African National Biodiversity Institute    |
| • Anne Fuchs                  | Australian National BG                           |
| • Roger Hyam                  | RBG Edinburgh                                    |
| • Sunitha Katabathuni         | Missouri BG                                      |

- Marianne LeRoux South African National Biodiversity Institute
- Raoul Palese Geneva BG
- Visotheary Ung MNHN Paris
- William Ulate, Secretary Missouri BG

He highlighted the progress made since the previous meeting in July and highlighted that the Group had held one virtual meeting since the last Council meeting.

- Virtual Meeting
- Portal, Backbone and Content Progress
- William's report
- About Pages Progress
- Mark's report
- WFO Plant List Progress
- Mark and Roger's report
- Pre-Harvest Backbone Management
- RBG Edinburgh proposal

Chuck highlighted a series of ongoing or pending Action Items as follows:

6. **Add descriptive data – As reported by William**
9. **Botalista – As reported by Raoul.**
29. **New Names – As reported by William**
39. **DOIs for datasets and downloads - Lauren & William met with Markus Doering, recommending use of Zenodo for DOIs for backbone datasets**
48. **Portal Modifications – New Portals in Production, as reported by Mark**
91. **Google Cloud Account – Google Cloud billing account moved from NYBG to MBG pending other hosting approaches.**

Ongoing/Pending Action Items were described as follows:

7. Create a Harvester/Admin Guide - **Ongoing**
15. Develop Markup Tools for Toolkit – **Deferred at St Louis**
30. WFO Darwin Core Extensions – **Deferred at St Louis**
31. Request WFO tailored IPT from GBIF – **Deferred at St Louis**
58. Assess adding the BGCI Threat Search and Global Tree Search Databases - **Pending**
69. Explore use of Frictionless Data for backbone data ingestion – **Pending more community adoption**
81. Give percentages of what data have been uploaded from what is published for each source of Content – **Pending**
82. Investigate repurposing the WFO Plant List software developed by RBG Edinburgh to replace the Portal Browse/Classification submenu – **Cancel after Portal revision**
96. Investigate modification of TPL and WFO Portals to lower Google Search result standings for TPL below WFO - **Pending**
99. Evaluate needs for pre-harvesting process tools. – **Cancel. Part of RBG Edinburgh Proposal**
102. Relook at Catalogue of Life's COLDP data exchange format vis a vis Darwin Core Archive - **Pending**

## Next Steps

The following next steps were outlined:

- Complete Taxonomic Backbone Data Reload, now in progress
- Load More Content Data
- Continue work on RBG Edinburgh Taxonomic Backbone Pre-Harvest system
- Upload Backbone Datasets to Zenodo and assign DOIs

## 10. Recommendations from the Technical Working Group and Council Decisions

**Recommendation 5.** The recommendations from the Technical Working Group to use Zenodo service to upload and assign DOIs to taxonomic backbone datasets (Zenodo.org) was retracted in favor of the Taxonomic Working Group's Recommendation 3.

## 11. 19th Council meeting

It was agreed that the 19th Council meeting would be held on 26-30 April, 2022 (tentative in-person at the Meise Botanic Garden, Belgium). The Meise Botanic Garden was thanked for this generous offer.

**Subsequent to the Council meeting the date was postponed to 18<sup>th</sup> to 22<sup>nd</sup> July, 2022.**

## 12. Any Other Business

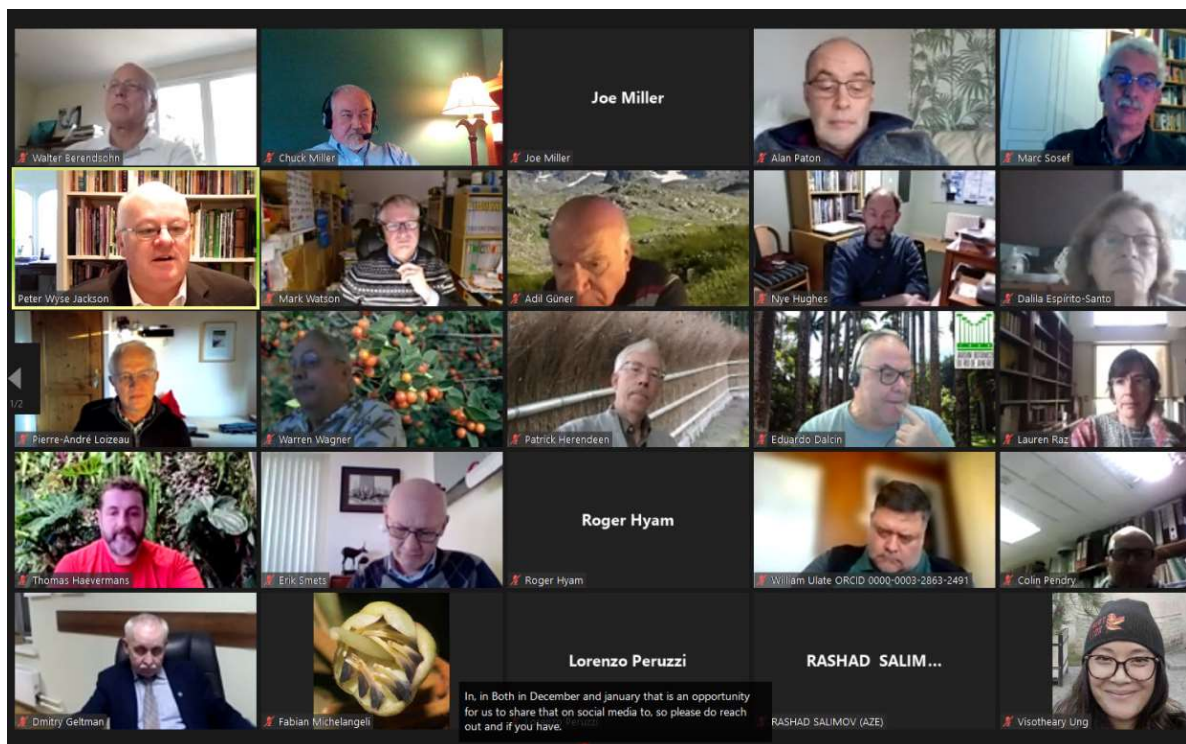
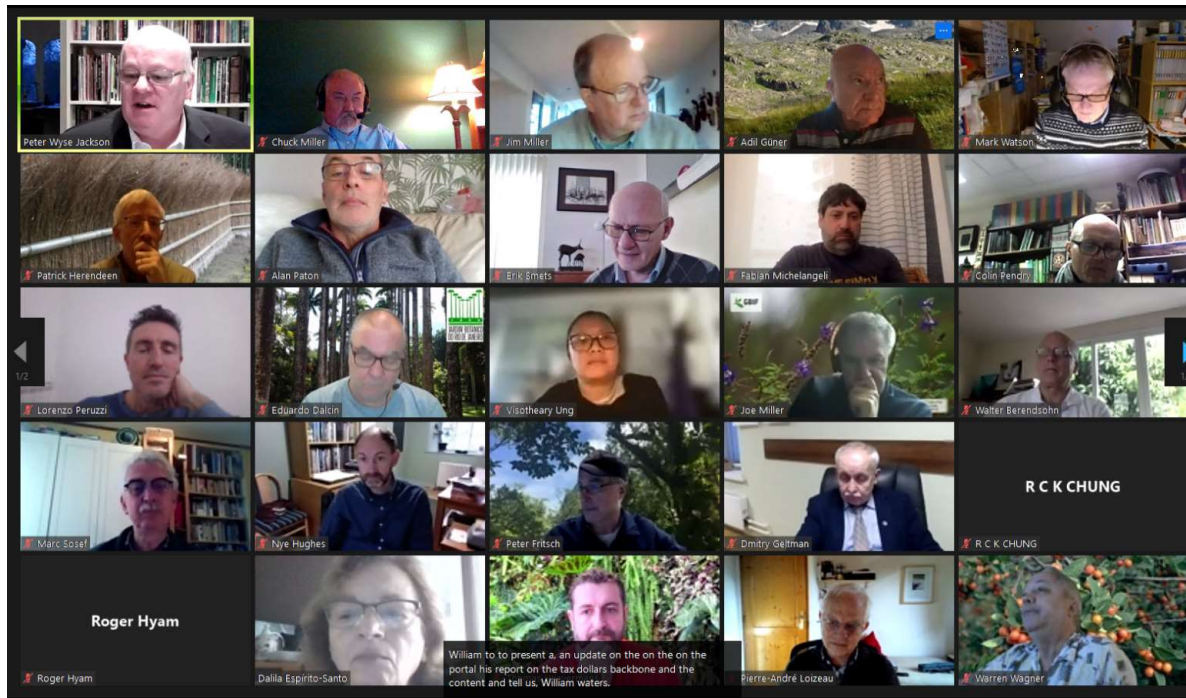
Under any other business, Peter Wyse Jackson provided an update on negotiations that were ongoing with the Convention on Biological Diversity (CBD) to update the Global Strategy for Plant Conservation within the context of the Global Biodiversity Framework that is currently being negotiated by the Parties to the Convention. The GSPC Target 1 up to 2020 had provided the impetus for the development of the World Flora Online.

There being no further business the co-chairs thanked all of the presenters and participants and closed the meeting.



## Annex 1

### 18<sup>th</sup> WFO Council Meeting Virtual Attendance Images



## Annex 2

### WORLD FLORA ONLINE –ACTION ITEMS FROM COUNCIL MEETING - ZOOM DECEMBER 2021

(fully completed or merged tasks are shaded grey pending deletion at next meeting of Council)

#	TASKS	WHO?	WHEN?	COMMENTS
1	<b>Presentations on WFO.</b> Take advantage of the meetings we attend to promote the WFO. Presentations to be uploaded to WFO Presentations folder in ownCloud.	All	Standing Item	Recent and next presentations:  William Ulate, Alan Elliott, Sunitha Katabathuni, <i>Challenges, Solutions, and Workflows Developed for the Taxonomic Backbone of the World Flora Online (WFO)</i> , TDWG 2021
2	<b>Update current signatories.</b> Secretariat to maintain an archive of hard copies of any formal agreements with WFO. List of Consortium members on the WFO website to be updated.	Peter Wyse Jackson	Standing Item	New signatories since last meeting of Council:  Orto e Museo Botanico dell'Università di Pisa
3	<b>Update Facebook page.</b> Keep updating FB page with news and current information.	Comms Working Group	Ongoing	Richelle Wiehe (MBG) will update FB, send images and news items to her.
5	<b>Videos.</b> Links to videos by partner institutions to be included on WFO Website.	All	Ongoing	Anyone with videos relevant to WFO, please send to the William Ulate & Alan Elliott.
6	<b>Enhance Production Portal with Descriptive Data.</b> Production portal should be enhanced with descriptive data content as advised by Taxonomic WG/Council. Send a tweet as content is loaded to Production.	William	Ongoing When ready, William Ulate will touch base with the intermediary contacts of the Content providers for the next digital resources to bring into the WFO Portal, as determined by the Taxonomic WG in order to increase the diversity of content and geographic coverage.	See Tax WG report for revised priority list for harvesting.  Initial harvesting of content for names matched in first name-matching process prioritized for as many datasets as possible (rather than resolving the residual un-matched names). <ul style="list-style-type: none"><li>• Fl. Trop. East Africa &amp; Fl. Trop. West Africa (Kew) – descriptions divided, need to be combined</li><li>• IUCN Conservation Status – Pending new Version.</li><li>• Improve Metadata for Images from Solanaceae &amp; Flora of China - Pending</li></ul> Continue to load remaining and new datasets: <ul style="list-style-type: none"><li>• Solanaceae Source – Contacted back to coordinate an updated dataset</li></ul>



#	TASKS	WHO?	WHEN?	COMMENTS
				<ul style="list-style-type: none"> <li>• NYBG – Harvested all descriptions in Test: NorthEastern US, Neotropica, Brittonia &amp; NYBG Memoirs</li> <li>• Catalogo de las Plantas de Colombia –26K names - Waiting for content.</li> <li>• Australian Floras – First dataset of descriptive data harvested in Test.</li> <li>• Flora of Nepal – No data received.</li> <li>• Illustrated Treatments for Korea - Got a response, coordinating to convert Word documents into structured data</li> <li>• Fl. Helvetica –French descriptions pending.</li> <li>• Flora do Brazil – more descriptions being provided.</li> <li>• eMonocot descriptions (Kew, TBC) –PalmWeb descriptions pending harvesting</li> <li>• New FNA data - Got data and content sample. Issues with Authors format. Reviewed file's DwCA format. Repeated Name Matching process as requested.</li> <li>• African Plants Database – (distributions, ecology, biology) 200K names, 78K taxa. - Pending.</li> <li>• eFloramaghreb.org - 6400 taxa – Pending.</li> <li>• Flora of Ireland – Implementing corrections to Name Matching Report.</li> <li>• Caryophyllales- Harvested Nepenthes taxa. Pending other taxa and all content from EDIT platform.</li> </ul>
7	<b>Create a Harvester administration/operations guide.</b> The development of a Harvester administration/operation guide should be carried out immediately through testing and collaboration.	William	Ongoing	New updates should be included. Created documentation for “Name-Matching” process and made code and SQL Stored Procedures available for Geneva in Github (private MBG-CBI repository)
10	<b>Implement Botalista software.</b> Work together to further develop Botalista as collaborative tool for expert networks to contribute backbone data. (Related to Item 99)	Pierre-André and Raoul	Done	WFO Instance of Botalista created and ready for use by TENs. Users to contact Raoul Palese and Alan Elliott. <a href="http://wfo.botalista.community">wfo.botalista.community</a>

#	TASKS	WHO?	WHEN?	COMMENTS
13	<b>Taxonomic Expert Networks (TENS).</b> 1) 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. 2) Make a survey of existing global taxonomic networks and the systems used and ask if they are willing to participate in WFO 3) Update and publish the Order/Family coverage/gap analysis on About Pages of WFO website 4) Engage with WCSP Reviewers for potential TENS 5) Explore links with Yuri Roskov and COL GSDs as potential WFO TENS 6) Build on the offer of a Fern TEN to involve wider community opinions	TEN Manager	Standing Item	1) TENS approved by Council December 2021: None 2) Ongoing 3) Gap analysis for plant families to be updated for higher classifications has started. 4) Ongoing. 5) Ongoing. 6) Ongoing.
15	<b>Develop markup Tools for a Toolkit.</b> Consolidate the Markup Tools being used; develop them to integrate them into a toolkit. - SANBI has developed Markup tools and are available for others to use. Available from GitHub: <a href="https://github.com/rudivs/SpeciesMarkupAddIn">github.com/rudivs/SpeciesMarkupAddIn</a>	Technical Working Group	Deferred at St Louis	
16	<b>Communicate document on web strategy based on CBD CHM work.</b> 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 a keynote or at least a Symposium on WFO. - Communications Committee will define Communication plan as a bigger topic. - Put someone in charge of the Social Media - Separate production of content from the website administration, tailor-make the strategy for each group in order to facilitate the prioritization. - Launch of our communications strategy to raise awareness when we have a portal that people could	Comms WG. (Eduardo Dalcin, John Parnell)	Pending	We need to have a clear strategy on how the WFO is integrated into all of the outcomes of CBD, which requires an understanding on how the CBD works and a lot of promotion of the WFO within the CBD Mechanisms. For the Communication Strategy, define what WFO is doing in the next 6 months to be able to know what to communicate. We need to define what audience we want to attend first and use appropriate platforms to reach them. Peter Wyse Jackson may send a message to the Council asking for names of specialists who could collaborate on a Communication Plan, once

#	TASKS	WHO?	WHEN?	COMMENTS
	<p>use. Communicate key advances and specific strategy.</p> <ul style="list-style-type: none"> <li>- Demonstrate a joint Consortium web site to promote fundraising.</li> <li>-For a Strategy define Who they are? What to tell them? How to tell them? Who's going to tell them? And when are they going to be told?</li> <li>- Create a list of institutions relevant to promote WFO and interact with (previously #19)</li> </ul>			<p>we know what we want to communicate.</p> <ul style="list-style-type: none"> <li>• Draft Web Strategy created. – Istanbul</li> <li>• ResearchGate WFO project has been set up</li> </ul>
18	<b>Save the Dates.</b> Save the date for the 17 <sup>th</sup> meeting	Peter Wyse Jackson	19 <sup>th</sup> Meeting – Meise, 19-22 April 2022 (tentative)	Post the report of the previous Council Meeting on the WFO website. Date of physical meeting at Meise to be reviewed by Co-Chairs as Covid situation develops.
29	<b>DOIs for datasets and downloads.</b> Evaluate using GBIF-generated DOIs for WFO contributed datasets and downloads (related to #68 and #75)	<p>Technical Working Group DOI Process Subgroup</p> <p>Lauren Raz, lead</p>	Decision of Zenodo vs DataCite to be taken at July 2022 Meeting	<p>Requires code change Creation of metadata for downloads for DOI. Evaluate the adding DOIs to uploaded datasets and downloaded reports. Tech WG recommended in Sep 2020 formation of a DOI subgroup to assess the GBIF DOI process. Adopted by Council.</p> <p>Subgroup met in July 2021 with Markus Doering who suggested using Zenodo (hosted by Cern) to upload backbone datasets and get DOI, or become a DataCite member.</p> <p>Joe Miller (GBIF) informed the Council that any dataset added to GBIF's Checklist Bank receives a DOI automatically.</p> <p>Topic to be further discussed between Taxonomic and Technical Working Groups.</p> <p>Tax Working Group was delegated at December 2021 Zoom meeting to decide between Zenodo and DataCite DOI options.</p>

#	TASKS	WHO?	WHEN?	COMMENTS
30	<b>WFO Darwin Core extensions.</b> <b>WFO Terms not included in Darwin Core standard:</b> <ol style="list-style-type: none"> <li>1. <b>localID:</b> Record identifier used by the data contributor. E.g. Tropicos ID, Flora of S Africa ID, EDIT ID</li> <li>2. <b>Alternate Taxon/Name IDs:</b> E.g. Catalogue of Life ID</li> <li>3. <b>taxonomicStatusReference:</b> Accepted or Synonym status by/according to publication. E.g. Accepted according to GrassBase</li> <li>4. <b>sourceCitation (of the name record):</b> Not namePublishedIn or bibliographicCitation. E.g. Solanaceae Source is source of the Backbone name record.</li> <li>5. <b>VerbatimSpecimenList:</b> Currently using Specimens extension.</li> <li>6. <b>VerbatimDistribution:</b> Using "Distribution" Description Type in Descriptions.txt file</li> <li>7. <b>Protologue:</b> Using Description Type of Original Publication in Descriptions.txt file</li> <li>8. <b>nomenclaturalNote</b></li> </ol>	Technical Working Group	Deferred at St Louis	Write a white paper on Darwin Core extensions needed for WFO Formally request Darwin Core extensions from TDWG for WFO
31	<b>Send formal request to GBIF for WFO-tailored versions of IPT and DwCA Validator, involving SANBI and Flora do Brasil</b>	Technical Working Group	Deferred at July 2020	
33	<b>Resolve insufficient resources to support:</b> <ol style="list-style-type: none"> <li>a) Software development staffing.</li> <li>b) Institution to maintain OwnCloud</li> </ol>	WFO Council	Ongoing	<p>a) Missouri is committed to providing William's role, but we have an issue with software development staffing.</p> <p>December 2021 – RBGE committed one programmer (Roger Hyam) for a year to develop a Taxonomic Backbone Management System.</p> <p>b) Defer decision to next meeting.</p>
39	<b>Catalogue of Life/GBIF</b>	Pierre-André Loizeau	Ongoing	Pierre-André Loizeau is the WFO representative on CoL Advisory Board, Lauren Raz

#	TASKS	WHO?	WHEN?	COMMENTS
				<p>and Ann Fuchs are members of CoL Global Team</p> <p>CoL+ project nearing completion, CoL has been restructured</p> <p>GBIF will conduct a comparison between WFO taxonomy and CoL (see #85). Ongoing – delayed due to delays in CoL+ project</p>
42	<p><b>New Names.</b> Implement a mechanism to deal with new names coming from Content Providers or IPNI and updating the Taxonomic Backbone, as recommended by the Taxonomic Working Group.</p> <p>A 'new name' is an Effectively Published name not already in the Taxonomic Backbone. Content Providers only provide one name, their accepted name of the taxon for which they are providing content</p>	Technical Working Group	<ul style="list-style-type: none"> <li>• IPNI IDs awaiting reharvesting of Taxonomic Backbone.</li> <li>• New IPNI names were loaded with Status of Unchecked.</li> <li>• New TEN names will be loaded with Status of Accepted, Synonym or Ambiguous</li> </ul>	<p>Create a feedback mechanism as needed to alert TENs when a new name is incorporated in the pre-harvesting Taxonomic Backbone</p> <p>Make an agreement with IPNI to receive their annual updates of new names and new combinations.</p> <p>Treat new names from IPNI as if coming from a non-TEN Content Provider</p> <p>Export new names in the backbone in a data format appropriate for the TENs to incorporate into their own system.</p>
44	<p><b>Duplicates.</b> There are ca. 40K name duplications in the Taxonomic Backbone due to TPL artifacts and import issues</p>	Taxonomic Working Group	In progress	Some de-duplication has been done and will continue in 2022 after the portal update
47	<p><b>Nomenclatural Registration.</b></p>	Pierre-André Loizeau	Ongoing	<p>Expression of interest to become a Registration Centre made.</p> <p>Further work pending future developments in other Registration Centres</p>
48	<p><b>Make modifications to the Portal</b></p> <p>17. Assess if order of Descriptions can be prioritized (for display).  18. Assess how to provide page hit statistics by data provider.  28. Reveal hidden fields (e.g. Basionym)</p>	Technical Working Group	Ongoing	<p>NB Code changes required</p> <p>17. Pending  18. Pending  28. Deferred at St. Louis  29. Deferred at St. Louis  30. Pending</p>

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	29. Enable alternate classifications 30. Advise on display options to have descriptive data on the Taxon Page with alternate views: order by content provider vs by description type.			
58	<b>Assess adding the BGCI Threat Search database</b> as this includes national level and non-standard conservation assessments  <b>BGCI Global Tree Search</b> country-level distribution data into mapping in WFO when this functionality is developed (merged from #83).	William	Pending	
59	<b>Re-run IPNI-WFO Name Matching after the WCSP/IPNI Update</b> to improve the number of matching names from 68% and analyse the results.  <b>Update Protologue information for matched names using IPNI data</b> (Related to #44)	William	WFO/IPNI matching done after WCVF update in 2021. Ongoing.	
66	<b>Negotiate with Kew to add a WFO link to IPNI name pages.</b>	WFO Council	Ongoing	Discussed in March 2021 Council. Alan Paton to follow up
68	<b>Create a data paper of the WFO Backbone data with a DOI. Use this DOI for backbone download.</b> (related to #29)	Technical Working Group	In progress	WPL backbone datasets enable creation of a data paper.  Data paper to be added to Thomas Haeverman's Taxon Paper.
69	<b>Explore use of Frictionless Data for backbone data ingestion</b>	Technical Working Group	Pending more community adoption	
80	<b>Develop Criteria for judging authorisation of potential Content Providers</b>	Taxonomic Working Group	Pending (revisit with strategic review)	Criteria (scientific credibility, completeness, substantial contribution, currency, etc.), similar to those used for assessing TENS
81	<b>WFO to give percentages of what data have been uploaded from what is published for each source of Content</b>	Technical Working Group	Pending	Possibly include in a Content stock take and show against source in the Flora page in About Pages. Derive percentages from table of content data records maintained by William.



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84	<b>Contact Consortium Members to solicit additional Content datasets</b>	WFO Council Co-chairs	Ongoing	
85	<b>Review results of the comparison of WFO Taxonomic Backbone with CoL</b> (Related to #39)	Taxonomic Working Group	Pending the completion of the comparison of the two datasets by GBIF/CoL	
86	<b>Explore formalising WFO's relationship with IPNI with a written agreement covering the nature of the collaboration and the exchange of data</b>	WFO Council	Pending	
87	<b>Investigate repurposing the WFO Plant List software developed by RBG Edinburgh as the Taxonomic Browser for viewing the current Public Portal Backbone, replacing the Browse/Classification submenu.</b>	Technical Working Group	Ongoing	<p>Roger Hyam has joined the Tech WG.</p> <p>The software is being reimplemented as a JSON Web Service to facilitate use as the Taxonomy Browser</p> <p>New Public Portal retains the Browse/Classification submenu with original eMonocot function.</p>
91	<b>Google Cloud servers</b> Credit for use of the Google Cloud will run out in 2021. Investigate options for additional sponsorship by Google and other options for hosting WFO servers	Council	Ongoing	<p>Awaiting outcomes of various contacts.</p> <p>At July 2021 Council Dr Wyse Jackson offered to pay the Google monthly bill until December 2021, if needed while alternatives are explored.</p> <p>NYBG grant ran out.</p> <p>Starting December 2021, Missouri is being invoiced for the Google Cloud account.</p> <p>This is temporary until long term solution is found.</p>
92	<b>WFO post 2020 strategic review and forward planning</b>	Council to lead	2022 (when physical meetings possible)	<p>Consider Garnett et al. (2020) '<i>Principles for creating a single authoritative list of the world's species</i>'</p> <p>Review the WFO Portal interface (previously #63) – Tax WG</p> <p>Review suppressing display of Taxonomic Status for names above Species in the search results and Taxon Page and adding them to</p>

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				Taxon Pages (previously #77) – Tax WG
93	<b>Conduct stock take of Content and approved providers</b>	WFO Gatekeeper and TEN Manager	For next Council	To be done after December/January relaunch
94	<b>Request Naturalis to authorize the Flora Malesiana text content now in the EDIT platform to be ingested into the WFO Portal until the full Linneaus NG-based dataset becomes available in 2022 and will then replace the EDIT text.</b>	WFO Council	2022	Using the available EDIT text enables WFO to include the available 10,500 Flora Malesiana descriptions while awaiting the new more complete version in 2022.
96	<b>Investigate modification of TPL and WFO Portals to lower Google Search result standings for TPL below WFO.</b>	Technical Working Group	2022	Requires portal code changes
99	<b>Evaluate needs for pre-harvesting process tools.</b>	Technical Working Group	Deleted at December Zoom	Without the planned Botalista system, the pre-harvesting process lacks automation. Earlier Botalista designs need to be re-evaluated to document gaps to be filled.
100	<b>Use the major upgrade to promote WFO, especially in response to Leipzig List</b>	Taxonomic Working Group	In line with the major update to the WFO website	WFO Promotion Group formed, chair Thomas Haevermans. Reported to Dec Tax WG and Council.
101	<b>Review the periodicity of the WFO Plant List</b>	Taxonomic Working Group	Decided at December Zoom	New editions to be published every 6 months in the first instance.
102	<b>Relook at Catalogue of Life's COLDP data exchange format vis a vis Darwin Core Archive</b>	Technical Working Group	2022	Conduct an analysis of pros and cons of COLDP for WFO.
103	<b>The Plant List website to be 'greyed out', and the yellow warnings updated to make it clearer that users should now use WFO Plant List. Look to add redirects on TPL pages</b>	Technical Working Group	2022	

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104	<b>RBGE to produce standalone, open source software to:</b> <b>manage the WFO Taxonomic Backbone</b> <b>Incorporate updates from data providers</b> <b>Provide clean datasets to MBG and to take responsibility for managing the WFO Taxonomic Backbone</b>	RBGE	Dec 2022	Roger Hyam to work for a year on developing and implementing the backbone management software.