

Report of the 19th Meeting of the World Flora Online Council

Organised by Meise Botanic Garden, Meise, Belgium

18 to 22 July 2022

The 19th meeting of the World Flora Online (WFO) Council was held in hybrid format (in person and with online virtual participation) from midday Thursday 21 to midday Friday 22 July, in Meise Botanical Garden, Belgium. This meeting was preceded by meetings of the WFO Taxonomic and Technical Working Groups from Monday 18 to midday Thursday 21 July, including Joint Sessions to discuss common topics including strategic planning, and a mini symposium on Wednesday afternoon. Over the five days, 20 individuals participated in person, and 11 virtually, representing 19 institutions, organizations or projects.

Attendance:

Adil Güner	Nezahat Gökyiğit Botanik Bahçesi, Istanbul, Turkey
Alan Elliott	Royal Botanic Garden Edinburgh, Edinburgh, UK
Alan Paton	Royal Botanic Gardens, Kew, UK
Alex Monro	Royal Botanic Gardens, Kew, UK
Ann Fuchs ^{*w}	Canberra, Australia
Choki Gyeltshen ^{*c}	National Biodiversity Centre, Thimphu, Bhutan
Chuck Miller	Missouri Botanical Garden, St Louis, Missouri, USA
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
James Machin ^{*c}	Agriculture and Agri-Food Canada, Ottawa, Canada
Gunter Fischer	Missouri Botanical Garden, St Louis, Missouri, USA
John Parnell ^{*w}	Trinity College Dublin, Dublin, Ireland
Joe Miller [*]	Global Biodiversity Information Facility, Copenhagen, Denmark
Lauren Raz	Universidad Nacional de Colombia, Bogotá, Colombia
Marc Sosef	Meise Botanic Garden, Meise, Belgium
Marianne Le Roux	South African National Biodiversity Institute (SANBI), Pretoria, South Africa
Mark Watson	Royal Botanic Garden Edinburgh, Edinburgh, UK
Martin Ricker ^{*c}	National Autonomous University of Mexico (UNAM), Mexico City, Mexico
Nicola Schoenenberger	Conservatoire et Jardin Botaniques, Geneva, Switzerland
Nye Hughes [*]	Support Staff RBG-Edinburgh, UK
Olaf Banke	Catalogue of Life/Species2000
Olwen Grace ^{*c}	Royal Botanic Gardens, Kew, UK
Peter Wyse Jackson	Missouri Botanical Garden, St Louis, Missouri, USA
Rob Turner	Royal Botanic Gardens, Kew, UK
Roger Hyam ^{*w}	Royal Botanic Garden Edinburgh, Edinburgh, UK
Ronell Klopper ^{*w}	South African National Biodiversity Institute (SANBI), Pretoria, South Africa
Steven Dessein	Meise Botanic Garden, Belgium
Thomas Haevermans	Muséum National d'Histoire Naturelle, Paris, France

Thomas Borsch	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
Walter Berendsohn	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
William Ulate	Missouri Botanical Garden, St Louis, Missouri, USA

**Online, ^wWorking Group sessions only, ^cCouncil Only*

The following is a summary report of the meeting and decisions adopted.

1. Welcome

Council Co-chair Peter Wyse Jackson welcomed all participants in the meeting, and gave apologies and good wishes from his former Co-Chair Pierre-André Loizeau, who had recently stepped down from this role following his retirement from his directorship at Geneva. Peter Wyse Jackson welcomed Nicola Schoenenberger, who has succeeded Pierre-André at the Conservatoire. He also welcomed Steven Dessein, Director of the Meise Botanic Garden, thanked the team at Meise for hosting the meetings, and congratulated the Garden on its 225-year anniversary. He also thanked the teams in St Louis and Edinburgh for their outstanding work on the WFO over the last few months.

Martin Ricker, from UNAM in Mexico City, and Choki Gyeltshen from the National Biodiversity Centre in Bhutan were welcomed, representing new members of the WFO Consortium. The WFO has now reached the landmark of 50 consortium members.

The draft agenda was adopted as follows:

1. Welcome and adoption of the draft agenda Peter Wyse Jackson
2. Apologies for absence
3. Adoption of the Report from the 18th meeting of the WFO Council (virtual, 21 December 2021)
4. New Consortium Members
5. Update on the WFO Portal, including Content..... William Ulate
6. TEN Manager update, including Rhakhis..... Alan Elliott
7. Report from the Taxonomic Working Group.....Mark Watson and Alan Elliott
 - a. Discussion and adoption of recommendations from the Taxonomic Working Group.
8. Report from the Technical Working GroupChuck Miller and Walter Berendsohn
 - a. Discussion and adoption of recommendations from the Technical Working Group
9. Report and discussion on a draft WFO Strategic Plan, 2022–2030
10. Update on the new CoL/GBIF infrastructure, including Checklist Bank
11. IPNI/WFO cooperation
12. Review Action Points from the last meeting (other than those covered above)
13. Election of WFO Officers
14. Plans for 20th Council meeting
15. Any Other Business

2. Apologies for absence

Apologies for absence from the meeting were received from Patrick Herendeen (International Association for Plant Taxonomy), David Middleton (Singapore), John Parnell (Dublin) and Colin Pendry

(Edinburgh). It was noted that the Council meeting clashed with that for the Flora of Thailand Editorial Committee.

The following had retired from Council since the last meeting: Maité Delmas (MNHN Paris, France), Pierre-André Loizeau (former Council Co-chair, Conservatoire et Jardin Botaniques, Geneva, Switzerland), James Miller (Missouri Botanical Garden, St Louis, Missouri, USA), Wayt Thomas (former Taxonomic Working Group Co-chair, New York Botanical Garden, New York, USA).

3. Adoption of the Report from the 17th meeting of the WFO Council

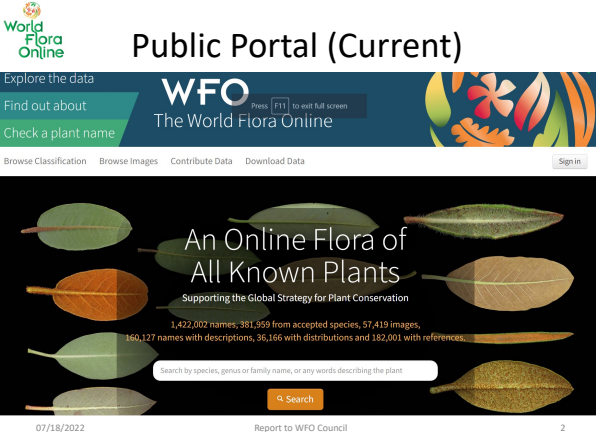
The Report of the 17th WFO Council meeting, held virtually on 6th July, 2021, was adopted and will be posted on the WFO About Pages.

4. New Consortium Members

National Autonomous University of Mexico (UNAM), Mexico City, Mexico, and the National Biodiversity Centre, Thimphu, Bhutan, have joined the Consortium since the last meeting of Council.

5. 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 was given in the form of the Powerpoint slides presented and received (copy available in the WFO File store on OwnCloud).



Public Portal (Current)

Explore the data
Find out about
Check a plant name

WFO
The World Flora Online

Browse Classification Browse Images Contribute Data Download Data

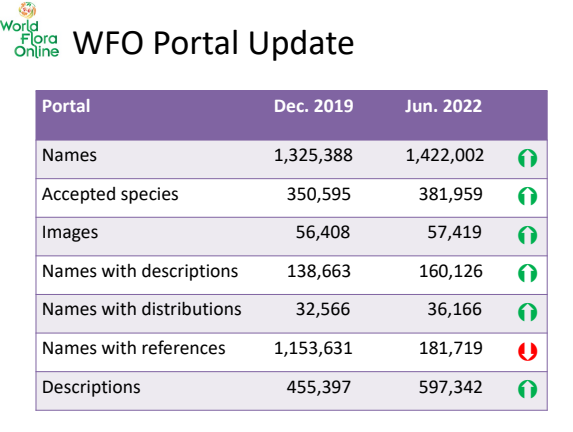
An Online Flora of All Known Plants

Supporting the Global Strategy for Plant Conservation

1,422,002 names; 381,359 from accepted species; 57,419 images; 160,127 names with descriptions; 36,166 with distributions and 182,001 with references.

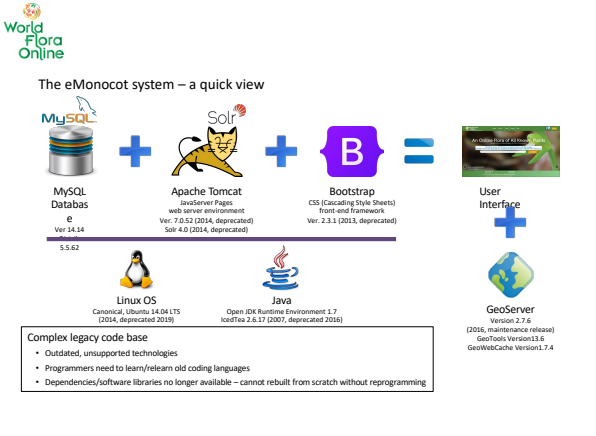
Search by species, genus or family name, or any words describing the plant

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WFO Portal Update

Portal	Dec. 2019	Jun. 2022
Names	1,325,388	1,422,002
Accepted species	350,595	381,959
Images	56,408	57,419
Names with descriptions	138,663	160,126
Names with distributions	32,566	36,166
Names with references	1,153,631	181,719
Descriptions	455,397	597,342



The eMonocot system – a quick view

MySQL Databases Ver 5.5.62

Apache Tomcat JavaServer Pages web server environment Ver. 7.0.52 (2014, deprecated) Ver. 7.0.52 (2014, deprecated)

Bootstrap CSS (Cascading Style Sheets) Front-end Framework Ver. 3.3.1 (2013, deprecated)

User Interface

Linux OS Canonical, Ubuntu 14.04 LTS (2014, deprecated 2019)

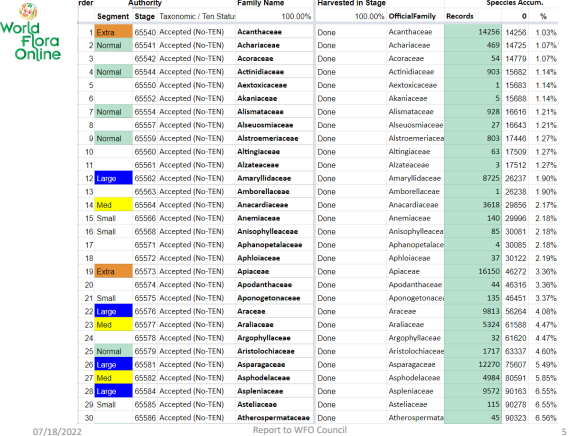
Java OpenJDK Runtime Environment 1.7 (2014, deprecated 2019)

GeoServer Version 2.7.6 (2016, maintenance release) GeoTools Version 2.8.4 GeoWebCache Version 1.7.4

Complex legacy code base

- Outdated, unsupported technologies
- Programmers need to learn/relearn old coding languages
- Dependencies/software libraries no longer available – cannot rebuilt from scratch without reprogramming

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WFO Portal Update

Order	Segment	Authority	Stage	Taxonomic / Ten Status	Family Name	Harvested in Stage	Official Family	Records	0 %
1	Extra	65540	Accepted (No-TEN)	100 00%	Acanthaceae	Done	Acanthaceae	14256	1.03%
2	Normal	65541	Accepted (No-TEN)	100 00%	Achariaceae	Done	Achariaceae	469	14725 1.07%
3	Normal	65542	Accepted (No-TEN)	100 00%	Acoraceae	Done	Acoraceae	54	14779 1.07%
4	Normal	65544	Accepted (No-TEN)	100 00%	Actinidiaceae	Done	Actinidiaceae	903	15662 1.14%
5	Normal	65550	Accepted (No-TEN)	100 00%	Asteraceae	Done	Asteraceae	15683	1.14%
6	Normal	65552	Accepted (No-TEN)	100 00%	Alismaceae	Done	Alismaceae	15688	1.14%
7	Normal	65554	Accepted (No-TEN)	100 00%	Alliaceae	Done	Alliaceae	928	16616 1.21%
8	Normal	65557	Accepted (No-TEN)	100 00%	Alstroemeriaceae	Done	Alstroemeriaceae	27	16643 1.21%
9	Normal	65559	Accepted (No-TEN)	100 00%	Alstroemeriaceae	Done	Alstroemeriaceae	803	17446 1.27%
10	Normal	65560	Accepted (No-TEN)	100 00%	Altingiaceae	Done	Altingiaceae	64	17509 1.27%
11	Normal	65561	Accepted (No-TEN)	100 00%	Albizziaceae	Done	Albizziaceae	1	17512 1.27%
12	Large	65562	Accepted (No-TEN)	100 00%	Amaryllidaceae	Done	Amaryllidaceae	8725	26237 1.90%
13	Small	65563	Accepted (No-TEN)	100 00%	Amborellaceae	Done	Amborellaceae	1	26238 1.90%
14	Med	65564	Accepted (No-TEN)	100 00%	Anacardiaceae	Done	Anacardiaceae	3618	26956 2.17%
15	Small	65566	Accepted (No-TEN)	100 00%	Anemaceae	Done	Anemaceae	140	26966 2.18%
16	Small	65568	Accepted (No-TEN)	100 00%	Anisophylloideae	Done	Anisophylloideae	85	30081 2.18%
17	Small	65571	Accepted (No-TEN)	100 00%	Aphanopetalaceae	Done	Aphanopetalaceae	4	30085 2.18%
18	Small	65572	Accepted (No-TEN)	100 00%	Aphiliaceae	Done	Aphiliaceae	37	30122 2.19%
19	Extra	65573	Accepted (No-TEN)	100 00%	Apiaceae	Done	Apiaceae	16150	46272 3.36%
20	Small	65574	Accepted (No-TEN)	100 00%	Apodanthaceae	Done	Apodanthaceae	44	46316 3.36%
21	Small	65575	Accepted (No-TEN)	100 00%	Aponogonaceae	Done	Aponogonaceae	135	46451 3.37%
22	Large	65576	Accepted (No-TEN)	100 00%	Araceae	Done	Araceae	9813	56264 4.09%
23	Med	65577	Accepted (No-TEN)	100 00%	Araliaceae	Done	Araliaceae	5328	61568 4.47%
24	Normal	65578	Accepted (No-TEN)	100 00%	Argophyllaceae	Done	Argophyllaceae	32	61620 4.47%
25	Normal	65579	Accepted (No-TEN)	100 00%	Aristolochiaceae	Done	Aristolochiaceae	1717	63337 4.60%
26	Large	65581	Accepted (No-TEN)	100 00%	Asparagaceae	Done	Asparagaceae	12270	75007 5.49%
27	Med	65582	Accepted (No-TEN)	100 00%	Asphodelaceae	Done	Asphodelaceae	4984	80591 5.85%
28	Large	65584	Accepted (No-TEN)	100 00%	Aspleneaceae	Done	Aspleneaceae	9572	90163 6.52%
29	Small	65585	Accepted (No-TEN)	100 00%	Asteraceae	Done	Asteraceae	115	90178 6.52%
30	Small	65586	Accepted (No-TEN)	100 00%	Atherospermataceae	Done	Atherospermataceae	45	90323 6.56%

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	28826
Euphorbiaceae	22858
Brassicaceae	22609

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

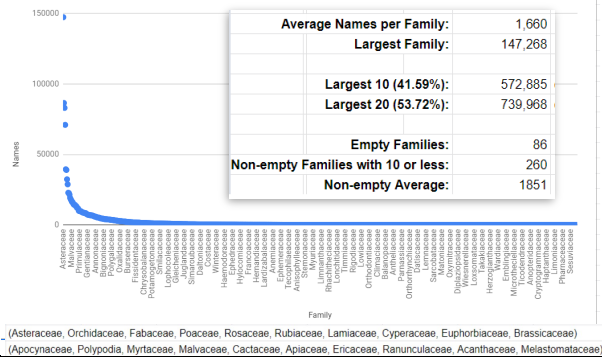
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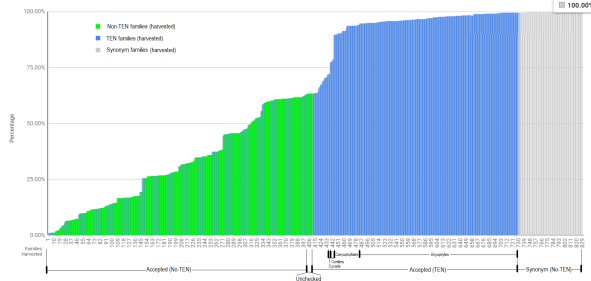
Loading the new WFO Taxonomic Backbone

Names per Family

(Asteraceae, Orchidaceae, Fabaceae, Poaceae, Rosaceae, Rubiaceae, Lamiaceae, Cyperaceae, Euphorbiaceae, Brassicaceae)
(Apocynaceae, Polypodiaceae, Myrtaceae, Malvaceae, Cactaceae, Apiaceae, Ericaceae, Ranunculaceae, Acanthaceae, Melastomataceae)

Loading the new WFO Taxonomic Backbone

Estimated Percentage of Total Names Harvested in WFO Portal by Number of Families, as of March 2022



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Regenerating and reharvesting Families

- New Names added from Flora of Thailand
- Names from Synonym to Accepted Families
- New Names added from Flora of Italy
- New Names added from Flora of Peninsular Malaysia
- Fix some NULL Scientific Names
- Eugenia campylocarpa misspelt Eugenia campylocarpa
- New Names added from WCVP Fabaceae.

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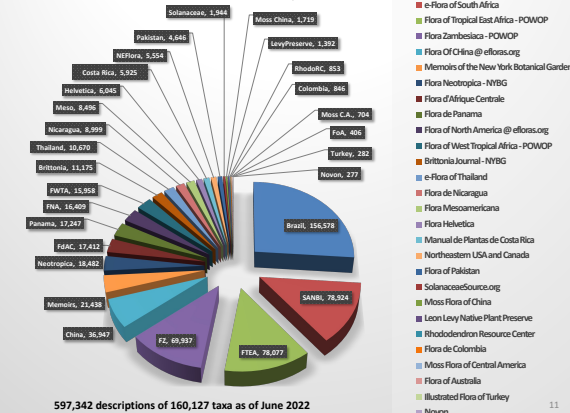
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Content Harvested

Org. ID	Org. Name	Org. Title	Rev. ID	Rev. Title	parameter
0	00000	Solanaceae	18107	Solanaceae DuCA Descriptions	REPORT, DESCRIPTIONS
1	11077	FOCH	10180	Flora of China Descriptions	REPORT, DESCRIPTIONS
2	11077	FOCH	10180	Flora of China Descriptions	REPORT, REFERENCES
3	11077	NYBG	10184	NYBG North Eastern Flora	REPORT, DESCRIPTIONS
4	11077	NYBG	10184	NYBG North Eastern Flora	REPORT, REFERENCES
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99	11077	NYBG	10184	NYBG North Eastern Flora	REPORT, REFERENCES
100	11077	NYBG	10184	NYBG North Eastern Flora	REPORT, REFERENCES

7/11/2022

Current Content Status - descriptions



Global Tree Search

- Received newer version of GlobalTreeSearch
- MeasurementOrFact

Data

Habitat

Life Form

tree

Provided by: [B] Global Tree Search

IUCN Red List Status

Critically Endangered

Provided by: [C] International Union for Conservation of Nature v.3.

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Performance issue

CPU Utilization

- Moved Stage content into Production
- Updated Code with latest modification
- Added CPU resources to Database VM
- DB performance issue depleted CPU resources
- Added Index to Database table

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Performance issue

1. Improve Harvesting Time

Resources

Dec 31, 2021 – 13:48:26.742

Resource Name	Type	Status	Started	Duration	Exit Code	Total Records	Written	Job Output
Orchidaceae	Darwin Core Archive	COMPLETED	Dec 31, 2021 2:51:07 PM	13 hours, 48 minutes, 26 seconds and 742 milliseconds	COMPLETED	449140	448894	See Report

Resources

Jul 18, 2022 – 02:17:15.570

Resource Name	Type	Status	Started	Duration	Exit Code	Total Records	Written	Job Output
Orchidaceae	Darwin Core Archive	COMPLETED	Jul 18, 2022 6:16:54 PM	2 hours, 17 minutes, 15 seconds and 570 milliseconds	COMPLETED	448907	448909	See Report

Metaxya rostrata

/ipni/17147720-1 /tpl/tro-26606568

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Aphanopetalum resinum

/ipni/urn:lsid:ipni.org:names:790237-1 /tpl/kew-2643409

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6. TEN Manager Update, including Rhakhis

Alan Elliott, WFO TEN Manager, provided an update on progress made since the last meeting, including, developing the Rhakhis software to manage the taxonomic backbone (WFO checklist), improving data in the backbone, and activities of TENs. The report below is given in the form of the Powerpoint slides presented and received (copy available in the WFO File store on OwnCloud).

WFO Plant List

Snapshots of the taxonomy

Explore the data
Find out about
Check a plant name

Browse the WFO Plant List Snapshot Archive Background Information

Q Search WFO Plant List

WFO Plant List

Snapshots of the taxonomy

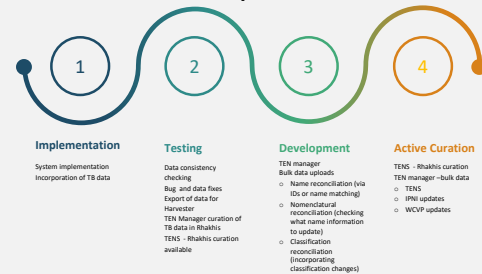
June 2022

- Fabaceae - partial update
 - 6326 new names
- New names added via content providers (name matching process)
 - Flora of Thailand
 - 20 – ssp. & var.
 - Flora of Italy
 - 108 – mix of sp., ssp. & var.
 - 25 IDs assigned by Walter

June 2022

- Corrections
 - Feedback via users. (*Quercus*, *Syringium* + others)
 - 10 Fern and Caryophyllales names attached to Zingiberaceae.
 - & fixing placement of 90 accepted names from syn families to accepted family.
- This will be the last update derived from the pre-harvest DB.
- December 2022 will be generated from Rhakhis.

Rhakhis Roadmap



Activity updates from approved TENS

- We currently have 38 approved TENS
 - Updated via WCVP (as primary curation tool)
 - Areaceae
 - Poaceae
 - Sapotaceae
 - Apocynaceae (?)
 - Dioscoraceae (?)

Activity updates from approved TENS

- We currently have 38 approved TENS
 - Updated from TEN datasets
 - Caryophyllales: Achatocarpaceae, Aizoaceae, Cactaceae, Nepenthaceae
 - Irvingiaceae
 - Solanaceae
 - Zingiberaceae

Activity updates from approved TENS

- We currently have 38 approved TENS
 - Partial Update
 - Fabaceae – Partial update via (their) WCVP update
 - Hybrid Update
 - Tribe Papaverae – Partial from TEN dataset
 - *Meconopsis*, *Cathcaria*, *Parameconopsis*
 - Additional curation has happened in Rhakhis

Activity updates from approved TENS

- We currently have 38 approved TENS
 - Baseline curation updated via WCVP, will continue in Rhakhis
 - Cabombaceae
 - Fagaceae
 - Halograceae (Tetracarpaeaceae, Penthoraceae & Aphanopetalaceae)
 - Mayaceae
 - Musaceae
 - Ochnaceae subfam. Quinoideae (?)
 - Sapindaceae subfam. Hippocastanoideae
 - Styracaceae (additional curation in Rhakhis already happened)
 - Picramniaceae (?)

Activity updates from approved TENS

- We currently have 38 approved TENS
 - Baseline curation updated via WCVP, TENS will likely update from their own datasets
 - Asphodelaceae tribe Alloioideae
 - Boraginaceae subtribe Amsinckiiinae
 - Boraginaceae subfam Cordioideae
 - Bruniaceae
 - Commelinales
 - Gesneriaceae
 - Brassicaceae (?)

Activity updates from approved TENS

- Classification pending incorporation
 - MadCat
 - Sphaerosepalaceae
 - Sarcolaenaceae
- TENS that need followed up
 - Annonaceae
 - Aquifoliaceae
 - Conifers
 - Melastomataceae – a partial update has been offered

- Name matching
 - Begoniaceae
 - Name matching corrections finished
 - Cycads
 - Name matching corrections finished
 - Hypericum
 - Need to follow up
 - Dipterocarpaceae (1.7k names)
 - Name Matching finished (133 new names added to Rhakhis. 150 WFO names need assessed by TEN).
 - Ericaceae
 - Name Matching finishes (14119 had WFO IDs, 1710 received IDs. New names added from IPNI. 736 are not in WFO backbone.)

- Name matching
 - Bryophytes (90K names)
 - Name Matched using Tropicos IDs
 - John checked linked names happy with matches
 - 70K matched
 - 4.5K new accepted & 15K new synonyms need added to WFO
 - Another 15-20k new names John didn't supply at this time.
 - 158 to depreciate.
 - We'll update with the supplied classification

- Name matching in process/pending
 - Asteraceae (in process)
 - Gesneriaceae (pending)

Taxonomic scrutiny of the WFO Backbone

Category	Number of species
Author's id (Active or updated) - 31 TEUs	13,661
Author's id (Pending) - 8 TEUs	1,345
Total Author's id	12,916
Firm offer for TEUs-2	490
Total Author's id + Firm offer	12,966
WCP reviewed (not covered by TEU or offer)	10,841
Total Author's id + Firm offer + WCP Review id	23,937
Tentative offers, suggestions or 1-6 groups	4,917
Total Author's id + Firm offer + Tentative Review id	27,954
Accepted Name (WFO)	38,195

Bar chart showing the number of species for various taxonomic categories. The y-axis is 'Number of species' (0 to 40,000). The x-axis categories are: Author's id (Active or updated) - 31 TEUs, Author's id (Pending) - 8 TEUs, Total Author's id, Firm offer for TEUs-2, Total Author's id + Firm offer, WCP reviewed (not covered by TEU or offer), Total Author's id + Firm offer + WCP Review id, Tentative offers, suggestions or 1-6 groups, Total Author's id + Firm offer + Tentative Review id, and Accepted Name (WFO). The chart shows that the total number of species is significantly higher when including the WFO Backbone and Accepted Name (WFO) compared to the initial Author's id (Active or updated) - 31 TEUs.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[AA]	[AB]	[AC]	[AD]	[AE]	[AF]	[AG]	[AH]	[AI]	[AJ]	[AK]	[AL]	[AM]	[AN]	[AO]	[AP]	[AQ]	[AR]	[AS]	[AT]	[AU]	[AV]	[AW]	[AX]	[AY]	[AZ]	[BA]	[BB]	[BC]	[BD]	[BE]	[BF]	[BG]	[BH]	[BI]	[BJ]	[BK]	[BL]	[BM]	[BN]	[BO]	[BP]	[BQ]	[BR]	[BS]	[BT]	[BU]	[BV]	[BW]	[BX]	[BY]	[BZ]	[CA]	[CB]	[CC]	[CD]	[CE]	[CF]	[CG]	[CH]	[CI]	[CJ]	[CK]	[CL]	[CM]	[CN]	[CO]	[CP]	[CQ]	[CR]	[CS]	[CT]	[CU]	[CV]	[CW]	[CX]	[CY]	[CZ]	[DA]	[DB]	[DC]	[DD]	[DE]	[DF]	[DG]	[DH]	[DI]	[DJ]	[DK]	[DL]	[DM]	[DN]	[DO]	[DP]	[DQ]	[DR]	[DS]	[DT]	[DU]	[DV]	[DW]	[DX]	[DY]	[DZ]	[EA]	[EB]	[EC]	[ED]	[EE]	[EF]	[EG]	[EH]	[EI]	[EJ]	[EK]	[EL]	[EM]	[EN]	[EO]	[EP]	[EQ]	[ER]	[ES]	[ET]	[EU]	[EV]	[EW]	[EX]	[EY]	[EZ]	[FA]	[FB]	[FC]	[FD]	[FE]	[FF]	[FG]	[FH]	[FI]	[FJ]	[FK]	[FL]	[FM]	[FN]	[FO]	[FP]	[FQ]	[FR]	[FS]	[FT]	[FU]	[FV]	[FW]	[FX]	[FY]	[FZ]	[GA]	[GB]	[GC]	[GD]	[GE]	[GF]	[GG]	[GH]	[GI]	[GJ]	[GK]	[GL]	[GM]	[GN]	[GO]	[GP]	[GQ]	[GR]	[GS]	[GT]	[GU]	[GV]	[GW]	[GX]	[GY]	[GZ]	[HA]	[HB]	[HC]	[HD]	[HE]	[HF]	[HG]	[HH]	[HI]	[HJ]	[HK]	[HL]	[HM]	[HN]	[HO]	[HP]	[HQ]	[HR]	[HS]	[HT]	[HU]	[HV]	[HW]	[HX]	[HY]	[HZ]	[IA]	[IB]	[IC]	ID]	[IE]	[IF]	[IG]	[IH]	[II]	[IJ]	[IK]	[IL]	[IM]	[IN]	[IO]	[IP]	[IQ]	[IR]	[IS]	[IT]	[IU]	[IV]	[IW]	[IX]	[IY]	[IZ]	[JA]	[JB]	[JC]	[JD]	[JE]	[JF]	[JG]	[JH]	[JI]	[JJ]	[JK]	[JL]	[JM]	[JN]	[JO]	[JP]	[JQ]	[JR]	[JS]	[JT]	[JU]	[JV]	[JW]	[JX]	[JY]	[JZ]	[KA]	[KB]	[KC]	[KD]	[KE]	[KF]	[KG]	[KH]	[KI]	[KJ]	[KK]	[KL]	[KM]	[KN]	[KO]	[KP]	[KQ]	[KR]	[KS]	[KT]	[KU]	[KV]	[KW]	[KX]	[KY]	[KZ]	[LA]	[LB]	[LC]	[LD]	[LE]	[LF]	[LG]	[LH]	[LI]	[LJ]	[LK]	[LL]	[LM]	[LN]	[LO]	[LP]	[LQ]	[LR]	[LS]	[LT]	[LU]	[LV]	[LW]	[LX]	[LY]	[LZ]	[MA]	[MB]	[MC]	[MD]	[ME]	[MF]	[MG]	[MH]	[MI]	[MJ]	[MK]	[ML]	[MN]	[MO]	[MP]	[MQ]	[MR]	[MS]	[MT]	[MU]	[MV]	[MW]	[MX]	[MY]	[MZ]	[NA]	[NB]	[NC]	[ND]	[NE]	[NF]	[NG]	[NH]	[NI]	[NJ]	[NK]	[NL]	[NM]	[NN]	[NO]	[NP]	[NQ]	[NR]	[NS]	[NT]	[NU]	[NV]	[NW]	[NX]	[NY]	[NZ]	[OA]	[OB]	[OC]	[OD]	[OE]	[OF]	[OG]	[OH]	[OI]	[OJ]	[OK]	[OL]	[OM]	[ON]	[OO]	[OP]	[OQ]	[OR]	[OS]	[OT]	[OU]	[OV]	[OW]	[OX]	[OY]	[OZ]	[PA]	[PB]	[PC]	[PD]	[PE]	[PF]	[PG]	[PH]	[PI]	[PJ]	[PK]	[PL]	[PM]	[PN]	[PO]	[PP]	[PQ]	[PR]	[PS]	[PT]	[PU]	[PV]	[PW]	[PX]	[PY]	[PZ]	[QA]	[QB]	[QC]	[QD]	[QE]	[QF]	[QG]	[QH]	[QI]	[QJ]	[QK]	[QL]	[QM]	[QN]	[QO]	[QP]	[QQ]	[QR]	[QS]	[QT]	[QU]	[QV]	[QW]	[QX]	[QY]	[QZ]	[RA]	[RB]	[RC]	[RD]	[RE]	[RF]	[RG]	[RH]	[RI]	[RJ]	[RK]	[RL]	[RM]	[RN]	[RO]	[RP]	[RQ]	[RR]	[RS]	[RT]	[RU]	[RV]	[RW]	[RX]	[RY]	[RZ]	[SA]	[SB]	[SC]	[SD]	[SE]	[SF]	[SG]	[SH]	[SI]	[SJ]	[SK]	[SL]	[SM]	[SN]	[SO]	[SP]	[SQ]	[SR]	[SS]	[ST]	[SU]	[SV]	[SW]	[SX]	[SY]	[SZ]	[TA]	[TB]	[TC]	[TD]	[TE]	[TF]	[TG]	[TH]	[TI]	[TJ]	[TK]	[TL]	[TM]	[TN]	[TO]	[TP]	[TQ]	[TR]	[TS]	[TT]	[TU]	[TV]	[TW]	[TX]	[TY]	[TZ]	[UA]	[UB]	[UC]	[UD]	[UE]	[UF]	[UG]	[UH]	[UI]	[UJ]	[UK]	[UL]	[UM]	[UN]	[UO]	[UP]	[UQ]	[UR]	[US]	[UT]	[UU]	[UV]	[UW]	[UX]	[UY]	[UZ]	[VA]	[VB]	[VC]	[VD]	[VE]	[VF]	[VG]	[VH]	[VI]	[VJ]	[VK]	[VL]	[VM]	[VN]	[VO]	[VP]	[VQ]	[VR]	[VS]	[VT]	[VU]	[VV]	[VW]	[VX]	[VY]	[VZ]	[WA]	[WB]	[WC]	[WD]	[WE]	[WF]	[WG]	[WH]	[WI]	[WJ]	[WK]	[WL]	[WM]	[WN]	[WO]	[WP]	[WQ]	[WR]	[WS]	[WT]	[WU]	[WV]	[WW]	[WX]	[WY]	[WZ]	[XA]	[XB]	[XC]	[XD]	[XE]	[XF]	[XG]	[XH]	[XI]	[XJ]	[XK]	[XL]	[XM]	[XN]	[XO]	[XP]	[XQ]	[XR]	[XS]	[XT]	[XU]	[XV]	[XW]	[XX]	[XY]	[XZ]	[YA]	[YB]	[YC]	[YD]	[YE]	[YF]	[YG]	[YH]	[YI]	[YJ]	[YK]	[YL]	[YM]	[YN]	[YO]	[YP]	[YQ]	[YR]	[YS]</
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Family	Acquired species	unpublished species
Lamiaceae	1326	1387
Euphorbiaceae	971	1276
Myrtaceae	1068	990
Cypripetaceae	544	544
Rosaceae	4147	26620
Malvaceae	6076	3022
Ranunculaceae	6361	3117
Bromeliaceae	6546	2215
Piperaceae	8113	3990
Lauraceae	1068	1068

Figure 10. Higher taxonomic clusters of 144 (100% bootstrap support) species.

Family	Unplaced names	Accepted species
Rosaceae	2215	6546
Ranunculaceae	2297	1704
Malvaceae	3002	6076
Myrtaceae	3117	6363
Flacitaphagaceae	3385	2184
Salicaceae	3775	2184
Myrtaceae	3990	8135
Cyperaceae	4147	5444
Ranunculaceae	4868	3711
Rosaceae	26360	6067

Legend: ■ Unplaced names ■ Accepted species

Mark Watson presented the following report from the meetings of the Taxonomic Working Group earlier in the week (copy available in the WFO File store on OwnCloud)..

Thomas Borsch, Co-chair
Alan Elliott, TEN Manager
Gunter Fischer
Adil Güner

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Thomas Haevermans, Co-chair
Alex Monro
Alan Paton
Lauren Raz
Nicola Schoenenberger
Erik Smets
Marc Sosef
Mark Watson, Co-chair
Peter Wyse Jackson

Paris, France
London, UK
London, UK
Bogotá, Colombia
Geneva, Switzerland
Leiden, The Netherlands
Meise, Belgium
Edinburgh, UK
Missouri, USA

Virtual

Ronell Klopper
Joe Miller
John Parnell

Pretoria, South Africa
Copenhagen, Denmark
Dublin, Ireland

7.2 Rhakhis Update [Task 104]

- ☐ **Phase 1: January to June 2022.** Data management system implemented, populated, used for manual curation, and data export into eMonocot. Completed.
- ☐ **Phase 2: July to December 2022.** Batch updates enabled, updates incorporated from Asteraceae TEN, WCVF and IPNI. Deduplication of names **[Task 44]**. Work has started.

7.3 Taxonomic Backbone Development [Task 13]

- ☐ TEN Proposals – two proposals considered, further development/information required
- ☐ TEN Gap Analysis – sub-group formed to develop the work to publication
- ☐ Supporting the development of new TENS
- ☐ Default classifications for non-TEN groups

1) Tax WG Recommendation: To authorise the Taxonomic WG to decide on the use of selected published classifications in preference to WCVF for non-TEN groups in the WFO Taxonomic Backbone.

7.4 What names are included in the Taxonomic Backbone/Rhakhis?

- ☐ Currently 'All effectively published names'
- ☐ Correctable original spellings?
- ☐ Orthographic variants from providers?
- ☐ Used for name-matching and providing feedback on searches
- ☐ For internal use, not to be shown on the public portal
- ☐ Sub-group set up to support the development of names handling in Rhakhis

7.5 Registration of Nomenclatural Novelties [Task 47]

- ☐ WFO promotes the use of nomenclators IPNI and Tropicos (Bryophytes) as the 'Single Source of Truth' for nomenclatural information.
- ☐ WFO will incorporate updates from nomenclators on a regular (weekly) basis.
- ☐ WFO will feed corrections from WFO data providers to nomenclators.

2) Tax WG Recommendation: WFO does not establish a Registration Centre for plant names.

7.6 Use of DOIs by WFO [Task 29]

- ☐ Zenodo and DataCite – options investigated by Laurant Raz and William Ulate
- ☐ Agreed with the decision to use Zenodo

3) Joint Recommendation: WFO uses Zenodo to issue DOIs for versions of the whole Taxonomic Backbone and subsets of this.

7.7 Catalogue of Life ChecklistBank [Tasks 39 and 85]

- ☐ Datasets used in Catalogue of Life and GBIF are taken from ChecklistBank
- ☐ WFO can publish versions of the complete backbone dataset to ChecklistBank
- ☐ WFO-branded data from TENs should also be published to ChecklistBank
- ☐ Steps towards WFO supplying data for all plants to CoL and GBIF
- ☐ Negates the need for GBIF comparisons of WFO Taxonomy with CoL.

4) Joint Recommendation: WFO to publish Backbone data and WFO-TEN data updates to ChecklistBank.

7.8 Content

- ☐ WFO still needs to formalize the Content vetting/approval process, this is ongoing [Task 80]
- ☐ Still a need for a stock take of approved Content in the pipeline, this is ongoing [Task 93]

7.9 BGCI ThreatSearch [Task 58]

- ☐ This is a database of published conservation assessments, usually at the national level, often using different criteria/categories to current IUCN standards.
- ☐ They are a valuable source of references when preparing IUCN assessments, but not a primary data source and so should not be brought in as Content.
- ☐ WFO should look to link via name string search.

7.10 Major Update Promotion [Task 100]

Thomas Haevermans is leading a Task Force on a media promotion of WFO and gave a verbal report. A press release was prepared but will require extensive revision based on discussions of the subgroup earlier today. New target date is December 1, 2022 just ahead of the COP. Should be released mid-week as this is most advantageous to get pick-up in the press.

WFO's first Data paper can be quickly produced, and needs to be assigned as an action item. It is suggested that William Ulate could take the lead on this. The Task Force outlined some possible topics to cover in a future scientific paper that can be developed during the year. A case study paper on how TENs work could be a stimulus for more TENs being formed.

Thomas Haevermans agreed to lead on a reconstituted Communications Working Group incorporating the Promotion Task Force. Nicola Schoenenberger agreed to draft a media campaign around the press release in order to maximise impact.

8. Report of the Technical Working Group

Chuck Miller presented the following report from the meetings of the Taxonomic Working Group earlier in the week (copy available in the WFO File store on OwnCloud).

In-Person





Walter Berendsohn, Co-chair
 Steven Dessein
 Marianne Le Roux
 Chuck Miller, Co-chair
 Alex Monro
 Rob Turner
 William Ulate, WFO Gatekeeper

Berlin, Germany
 Miese, Belgium
 Pretoria, South Africa
 Missouri, USA
 London, UK
 London, UK
 Missouri, USA

Virtual

Eduardo Dalcin
 Anne Fuchs
 Roger Hyam

Rio de Janeiro, Brazil
 Canberra, Australia
 Edinburgh, UK

 <h3>Technical Working Group Issues Discussed</h3> <ul style="list-style-type: none"> ○ Strategic Planning ○ Standard Terminology ○ WFO-ID Duplication ○ Google Servers Migration ○ Accelerating Portal Update Process ○ Standardizing Portal Texts ○ Action Items <p>7/21/22 Meise, Belgium 4</p>	 <h3>Strategic Planning</h3> <ol style="list-style-type: none"> 1. Seek to move off and replace the eMonocot platform 2. Complete the Distribution data for all accepted taxa 3. Add a full mapping functionality <ul style="list-style-type: none"> • Selection of polygon areas • Search using WFO data • Incorporate specimens from GBIF • Add overlay maps and select overlay(s) 4. Assess concept relations between Floras <ul style="list-style-type: none"> • Particularly Threat Status and CITES – “Beware there are different opinions regarding this taxon” <p>7/21/22 Meise, Belgium 5</p>
 <h3>Standard Terminology</h3> <p>Checklist – a hierarchy of (accepted, ambiguous and unchecked) scientific names, with linked synonyms (often used in a thematic context, e.g. geographic)</p> <p>Taxonomic backbone – a checklist when used as a structure to arrange other name-based data</p> <p>Content data – descriptive data, including geographic distributions, that are connected to a taxonomic backbone</p> <p>Dynamic dataset – one which may change at any point in time</p> <p>Static dataset – one which does not change.</p> <p>Dataset snapshot – a downloaded static dataset taken at a specified point in time.</p> <p>Dataset version – one in a series of citable updated/changed static datasets</p> <p>Public webpages – of the part of a website that is accessible without login.</p> <p>Restricted webpages – of the part of a website that requires login/authentication before us</p> <p>7/21/22 Meise, Belgium 6</p>	 <h3>Standard Terminology</h3> <ul style="list-style-type: none"> • WFO Portal – everything accessible at www.worldfloraonline.org • WFO Flora Pages – the part of the portal displaying descriptive information linked to the WFO Taxonomic Backbone (“Explore the data”). • WFO About Pages – the part of the portal displaying information about the WFO project (“Find out about”). • WFO Plant List – the part of the portal displaying snapshots of the current and past versions of the WFO Taxonomic Backbone (“Check a plant name”). <p>7/21/22 Meise, Belgium 7</p>

WFO-ID Duplication

- Multiple WFO-IDs for one name

Recommendation 1: Create an Action Item to assess and resolve multiple WFO-IDs issue.

7/21/22

Meise, Belgium

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WFO Google Cloud Servers

Total 15 Linux, 1 Windows VMs

[illegible]

7/21/22

Meise, Belgium

Google Cloud Servers

- Missouri Botanical Garden proposes to migrate the 16 servers from Google Cloud to their infrastructure.

Recommendation 2: Accept Missouri's proposal

7/21/22

Meise, Belgium

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Accelerating Portal Update Process

- Table indexing has significantly sped harvesting

Recommendation 3: Add an Action Item to evaluate additional steps to accelerate updates:

- Turn off checks for Organization
- Turn off or reduce Annotations/logs
- Automate Harvesting server steps
- Harvest Backbone as one single file
- Change order of Harvesting – do large ones first

7/21/22

Meise, Belgium

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Standardizing Portal Texts

- First drafts of Portal text revisions

Recommendation 4: Add new Action Item to standardize text across the pages of the Public Portal, including About and WPL.

Recommendation 5: Draft new and replace Download Data page including instructions to perform all available downloads in the WFO Portal, including WPL.

7/21/22

Meise, Belgium

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Action Items Progress

6. Add descriptive data – **As reported by William**
29. New Names – **Rhakhis to be used for new names and assignment of WFO-IDs.**
31. Formal request to GBIF for custom IPT & DwCA Validator – **Andrea Hahn to contact William.**
42. New Names – **Rhakhis will be used to add new names and assign WFO-IDs.**
48. Portal Modifications – Added 3 changes – **popup texts, Search instructions**
59. Rerun IPNI Matching – **Rerun of 2022 IPNI data before December version**
103. Grey Out TPL – **Multiple text and color changes to be made to make Superceding of TPL more blatant.**

7/21/22

Meise, Belgium

13

Action Items to Close

30. WFO Darwin Core extensions – **No longer needed**
39. DOIs for datasets and downloads - **Adopt Zenodo**
58. BGCI Threat Search and Tree Search –
 - Tree Search data added to Habit field
 - Threat Search not to be added. Add External Link to search Threat Search via namingring.
87. WFO Plant List as Classification Browser – **Merger of WFO and WPL into WFO Portal enables the intended function of backbone browser for the Portal**
91. Google Cloud Servers – **Migrate to Missouri**
94. Request Naturalis authorize Flora Malesiana – **XML text is available**

7/21/22

Meise, Belgium

14


Ongoing/Pending Action Items

7. Create a Harvester/Admin Guide - [Ongoing](#)
15. Develop Markup Tools for Toolkit - [Deferred at St Louis](#)
31. Request WFO tailored IPT from GBIF - [Deferred at St Louis](#)
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](#)
96. Investigate modification of TPL and WFO Portals to lower Google Search result standings for TPL below WFO - [Pending](#)
102. Relook at Catalogue of Life's COLDP data exchange format via a vis Darwin Core Archive - [Pending](#)

7/21/22

Malice, Belgium

15

 <h2 style="text-align: center;">Next Steps</h2> <ul style="list-style-type: none"> • Complete December Taxonomic Backbone Data Reload • Load More Content Data • Continue integration of Rhakhis into Content Harvesting process • Assess options to accelerate Portal Updates • Upload Backbone Datasets to Zenodo and assign DOIs <p>7/21/22 Meise, Belgium 16</p>	
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9. Strategic Planning – Key Objectives

Lauren Raz reported on the sessions discussing strategic planning for the coming decade. The following notes also incorporates a strategic planning session held in the afternoon after Council.

The previous Strategic Plan and Use Case report was revisited, with the suggestion that this should be revised using User Stories.

Marc Sosef offered to review the WFO webpages and user guidelines for consistency in the use of terms.

To support the formulation of further TENs, the following benefits were noted as a potential for inclusion in an About Page:

- ☐ contributing to a community-supported global resource by international taxonomists, and strengthening the sustainability of WFO
- ☐ opportunity to develop a consensus classification used in the global consensus checklist, making search impactful and relevant, direct contribution to CBD objectives
- ☐ international networking opportunities for researchers, such as catalyzing new research, promoting social interactions, driving consensus, accessing community data
- ☐ promoting cross group awareness and interaction among the TENs
- ☐ justification of research activity/grant writing/institutional support
- ☐ facilitating access to electronic sources
- ☐ increased visibility of their work and data exchange/publication through WFO, GBIF, Zenodo, ChecklistBank, etc., with usage metrics on downloads, page views, etc.
- ☐ publication of WFO TEN datasets in data papers/ChecklistBank
- ☐ attribution of contribution on the WFO website, online presence on TENs page in WFO About Pages, branding of TENs
- ☐ opportunity for TEN portals on GBIF platform (e.g. Legume website), using ChecklistBank
- ☐ WFO “brand” authorization/accreditation of an expert network providing “peer reviewed” and data consistency products
- ☐ data quality checks and feedback from WFO Gatekeeper and TEN Manager, etc.
- ☐ receiving alerts when new species papers are published
- ☐ access to and support for Rhakhis for classification curation

WFO governance should be considered, including should WFO be registered as formal international NGO. Formalizing the Consortium would obligate us to have statutes, conflict resolution mechanisms, etc. which would protect us from risks and give a way to manage donations/grants. Nicola Schoenenberger offered to explore options under Swiss law as Switzerland might be a good option for registration of WFO. Developing regional hubs, similar to IUCN Specialist Groups, could help strengthen the long term stability of WFO as well as giving input into regional distribution.

2022-2030 Draft Objectives/Goals/Targets for WFO:

- ☐ WFO will strengthen resilience of its informatics architecture by moving off the eMonocot system into a new, modular infrastructure.
- ☐ By 2030, taxonomic coverage by the TENs will be comprehensive, covering over 80% of all known plant species.
- ☐ WFO will seek to increase the geographic diversity of the TENs leadership.
- ☐ Descriptive Content of WFO will grow to include information from over 90% of all known plant species, and comprehensive for every region of the world.
- ☐ WFO will promote collaborative capacity building programs for early career taxonomists, with special emphasis on working with biodiverse countries and focus on addressing knowledge gaps [career development].
- ☐ WFO will double the number of Consortium members (to at least 100), with special emphasis on research institutions from biodiverse countries.
- ☐ WFO will support and encourage increased activity in collaborative global level revisionary studies
- ☐ Distribution data will be comprehensive [target?], resolved to at least country-level distributions and with links to specimen data
- ☐ WFO will [be the best] and provide the plant content for Catalogue of Life and GBIF
- ☐ WFO will contribute to the development, achievement and monitoring of targets for the Post-2020 Global Biodiversity Framework, and an agreed plant conservation action agenda
- ☐ The WFO Council will achieve a balanced diversity (gender, geography...EDI) at its meetings and within its membership.
- ☐ Enhance the use of WFO to support plant conservation, and habitat conservation and restoration

It was recommended that the next steps would be to form a subcommittee of Council co-chairs and WG co-chairs to consider these objectives, including considering governance, funding and promotion, and draft a strategic planning document to have ready for next WFO Council meeting.

10) Joint Recommendation: A strategic planning subgroup is formed to take forward the key objectives drafted by during the strategic planning sessions.

10. Council decisions on Working Group Recommendations

- 1) Tax WG Recommendation:** To authorise the Taxonomic WG to decide on the use of selected published classifications in preference to WCVP for non-TEN groups in the WFO Taxonomic Backbone.

APPROVED

- 2) **Tax WG Recommendation:** WFO does not establish a Registration Centre for plant names.
APPROVED
- 3) **Joint Recommendation:** WFO uses Zenodo to issue DOIs for versions of the whole Taxonomic Backbone and subsets of this.
APPROVED
- 4) **Joint Recommendation:** WFO to publish Backbone data and WFO-TEN data updates to ChecklistBank.
APPROVED
- 5) **Tech WG Recommendation:** Create an Action Item to assess and resolve multiple WFO-IDs issue.
APPROVED
- 6) **Tech WG Recommendation:** Accept Missouri Botanical Garden's offer to host the 16 WFO servers currently on the Google Cloud on their infrastructure.
APPROVED
- 7) **Tech WG Recommendation:** Add an Action item to evaluate ways of accelerating updates of Content into the Portal
APPROVED
- 8) **Tech WG Recommendation:** Add new Action item to standardize text across the pages of the Public Portal, About Pages and WFO Plant List
APPROVED
- 9) **Tech WG Recommendations:** Draft new Download Data page text to include instructions to perform all available downloads in the WFO Portal, including WFO Plant List
APPROVED
- 10) **Joint Recommendation:** A strategic planning subgroup is formed to take forward the key objectives drafted by during the strategic planning sessions.
APPROVED

11. Update on new CoL/GBIF infrastructure, and ChecklistBank

Joe Miller presented an update on the new Catalogue of Life/GBIF infrastructure and ChecklistBank. ChecklistBank is a repository of open access data and now has 42,000 checklists, including many small datasets which are harvested from Plazi daily. There is now a set of tools available to compare any set of checklists and to compare across all checklists in ChecklistBank, and APIs for moving data around. There are some branding issues relating to Checklist Bank, but it is an open infrastructure that was developed jointly by CoL and GBIF, and is open for others to use.

Olaf Banke gave a workshop at SPNCH on how to use the checklist comparison tools. A joint COL-GBIF-WFO workshop could be organized to introduce Rhakhis and find further synergies (e.g. alert systems can be developed for new species publications processed by Plazi).

The comprehensive CoL checklist is produced by combining multiple sources in ChecklistBank. Moving forward CoL will take in TEN-curated datasets from WFO as they become available in ChecklistBank.

12. IPNI/WFO cooperation

Alan Paton reported that IPNI data updates have been made available to WFO. IPNI currently has links to POWO and BHL, and it is intended to include links to WFO in September at the same time as rollout of new nomenclatural registration system.

13. Review of Action Points

All were covered in previous discussions.

14. Election of WFO Officers

The term of office is considered to be from one in-person meeting to the next. Peter Wyse Jackson indicated that he would be happy to continue as a Council Co-chair, and proposed two new Council Co-chairs: Lauren Raz and Mark Watson. Peter Wyse Jackson said that would be happy to continue providing WFO secretariat support (maintaining registry of MoUs, etc.). There being no other proposals, these were accepted by the Council.

Thomas Borsch, Thomas Haevermans and Mark Watson accepted renewal of their terms as co-chairs of the Taxonomic Working Group, and Technical Working Group will continue under the leadership of Walter Berendsohn and Chuck Miller.

The Communications WG is being reactivated with membership from the Promotion subgroup of the Taxonomic WG, under the leadership of Thomas Haevermans.

15. 20th meeting of the WFO Council and future meetings

It was agreed that the 20th Council meeting would be held during the week starting 13 April 2023 at Royal Botanic Gardens, Kew, London, UK. Kew Gardens was thanked for this generous offer. In due course, the offer to have the meeting in Australia should be reconsidered.

16. Any Other Business

Opportunities to Promote WFO at upcoming meetings were discussed, these included:

- ☐ Colombian Botanical Congress in November 2022
- ☐ IBC 2024: deadline for proposals for symposia for December 2022
- ☐ LABC: Deadline for proposals for side meetings is Oct 2022 (Canadian \$1,200 fee)
- ☐ COP: side meetings
- ☐ TWDG: there will be a WFO symposium

Marc Sosef gave a presentation on WFO at EAFAT in Zambia and was struck by how many people did not know about WFO

There is a presentation folder in the Own Cloud. Please add materials there that can be shared/recycled/translated. And please let Rachelle at MO know when we will be presenting so she can post on social media. She is also asking for stories we can tell, things to tweet.

Erik Smets thanked Peter Wyse Jackson for his leadership and all WFO participants for our collaborative work. Although he is retiring as director of Naturalis, and so stepping down from Council, he would like to stay on the mailing list and will forward info to his successor.

Mark Watson commented that Kew is editing an upcoming volume of New Phytologist focused on analysis of WCVF list. Mark is coauthor on a paper comparing WCVF, Leipzig List, WFO and World Plants.

Joe Miller mentioned that GBIF will be hiring a taxonomist (could be specialist in any group).

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

Annex 1

19th WFO Council Meeting Group Photograph



Annex 2

WFO –ACTION ITEMS FROM 19th COUNCIL MEETING – MEISE JULY 2022

#	TASKS	WHO?	WHEN?	COMMENTS
1	Presentations on WFO. 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: TDWG 2022, October 2022: Chuck Miller, Walter Berendsohn, William Ulate, <i>Linking World-wide Plant Data – World Flora Online, WFO Plant List, IPNI, and beyond.</i> Roger Hyam, Alan Elliott, William Ulate, <i>Rhakhis: A workflow for managing the WFO taxonomic backbone</i>
2	Update current signatories. Secretariat to maintain an archive of hard copies of any formal agreements with WFO. List of	Peter Wyse Jackson	Standing Item	New signatories since last meeting of Council:

#	TASKS	WHO?	WHEN?	COMMENTS
	Consortium members on the WFO website to be updated.			<input type="checkbox"/> Institute of Biology, Universidad Nacional Autónoma de México (UNAM), Mexico <input type="checkbox"/> National Biodiversity Center, Bhutan
3	Update Social Media. Keep updating FaceBook, Twitter, etc with news and current information.	Comms Working Group	Standing Item	Richelle Wiehe (MBG) will update FB, send images and news items to her.
5	Videos. Links to videos by partner institutions to be included on WFO Website.	All	Standing Item	Anyone with videos relevant to WFO, please send to the William Ulate & Alan Elliott.
6	Enhance Production Portal with Descriptive Data. 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	Standing Item 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). <input type="checkbox"/> Fl. Trop. East Africa & Fl. Trop. West Africa (Kew) – descriptions divided, need to be combined <input type="checkbox"/> IUCN Conservation Status – Pending new Version. <input type="checkbox"/> Improve Metadata for Images from Solanaceae & Flora of China - Pending Continue to load remaining and new datasets: <input type="checkbox"/> Solanaceae Source – Contacted back to coordinate an updated dataset <input type="checkbox"/> NYBG – Harvested all descriptions in Test: NorthEastern US, Neotropica, Brittonia & NYBG Memoirs <input type="checkbox"/> Catalogo de las Plantas de Colombia –26K names - Waiting for content. <input type="checkbox"/> Australian Floras – First dataset of descriptive data harvested in Test. <input type="checkbox"/> Flora of Nepal – No data received. <input type="checkbox"/> Illustrated Treatments for Korea - Got a response, coordinating to convert Word

#	TASKS	WHO?	WHEN?	COMMENTS
				documents into structured data <input type="checkbox"/> Fl. Helvetica –French descriptions pending. <input type="checkbox"/> Flora do Brazil – more descriptions being provided. <input type="checkbox"/> eMonocot descriptions (Kew, TBC) –PalmWeb descriptions pending harvesting <input type="checkbox"/> New FNA data - Got data and content sample. Issues with Authors format. Reviewed file's DwCA format. Repeated Name Matching process as requested. <input type="checkbox"/> African Plants Database – (distributions, ecology, biology) 200K names, 78K taxa. - Pending. <input type="checkbox"/> eFloramaghreb.org - 6400 taxa – Pending. <input type="checkbox"/> Flora of Ireland – Implementing corrections to Name Matching Report. <input type="checkbox"/> Caryophyllales- Harvested Nepenthes taxa. Pending other taxa and all content from EDIT platform.
7	Create a Harvester administration/operations guide. 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)
13	Taxonomic Expert Networks (TENS). 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	TEN Manager Alan Elliott	Standing Item	1) TENS approved by Council July 2022: None 2) Ongoing 3) Gap analysis for plant families to be updated for higher classifications has started. 4) Ongoing. 5) Ongoing. 6) Ongoing. Taxonomic WG to decide on the use of selected published classifications in preference to WCVP for non-TEN groups in the WFO

#	TASKS	WHO?	WHEN?	COMMENTS
	<p>4) Engage with WCSP Reviewers for potential TENS</p> <p>5) Explore links with Yuri Roskov and COL GSDs as potential WFO TENS</p> <p>6) Build on the offer of a Fern TEN to involve wider community opinions</p>			<p>Taxonomic Backbone. (Meise decision)</p> <p>What names are included in the Rhakhis? Currently 'All effectively published names'</p> <ul style="list-style-type: none"> • Correctable original spellings? • Orthographic variants from providers? • Used for name-matching and providing feedback on searches • For internal use, not to be shown on the public portal • Sub-group set up to support the development of names handling in Rhakhis
15	<p>Develop markup Tools for a Toolkit. Consolidate the Markup Tools being used; develop them to integrate them into a toolkit.</p> <p>- SANBI has developed Markup tools and are available for others to use. Available from GitHub: github.com/rudivs/SpeciesMarkupAddIn</p>	Technical Working Group	Deferred at St Louis	
16	<p>Communicate 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 a keynote or at least a Symposium on WFO.</p> <p>- Communications Committee will define Communication plan as a bigger topic.</p> <p>- Put someone in charge of the Social Media</p> <p>- Separate production of content from the website administration, tailor-make the strategy for each group in order to facilitate the prioritization.</p> <p>- Launch of our communications strategy to raise awareness when</p>	Comms WG. (Eduardo Dalcin, John Parnell)	Closed	<p>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</p>

#	TASKS	WHO?	WHEN?	COMMENTS
	<p>we have a portal that people could use. Communicate key advances and specific strategy.</p> <ul style="list-style-type: none"> - Demonstrate a joint Consortium web site to promote fundraising. -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? - Create a list of institutions relevant to promote WFO and interact with (previously #19) 			<p>Communication Plan, once we know what we want to communicate.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Draft Web Strategy created. – Istanbul <input type="checkbox"/> ResearchGate WFO project has been set up <p>Closed at Meise as Communication WG reforming and will sets new terms of reference</p>
18	Save the Dates. Save the date for the 20 th meeting	Peter Wyse Jackson	20 th Meeting – RBG Kew, 14-17 March 2023 (tentative)	Post the report of the previous Council Meeting on the WFO website. Date of physical meeting at Kew to be reviewed by Co-Chairs
29	DOIs for datasets and downloads. Evaluate using GBIF-generated DOIs for WFO contributed datasets and downloads (related to #68 and #75)	Technical Working Group DOI Process Subgroup	Closed	Meise: WFO uses Zenodo to issue DOIs for versions of the whole Taxonomic Backbone and subsets of this.
30	<p>WFO Darwin Core extensions. WFO Terms not included in Darwin Core standard:</p> <ol style="list-style-type: none"> 1. localID: Record identifier used by the data contributor. E.g. Tropicos ID, Flora of S Africa ID, EDIT ID 2. Alternate Taxon/Name IDs: E.g. Catalogue of Life ID 3. taxonomicStatusReference: Accepted or Synonym status by/according to publication. E.g. Accepted according to GrassBase 4. sourceCitation (of the name record): Not namePublishedIn or bibliographicCitation. E.g. Solanaceae Source is source of the Backbone name record. 5. VerbatimSpecimenList: Currently using Specimens extension. 6. VerbatimDistribution: Using "Distribution" Description Type in Descriptions.txt file 	Technical Working Group	Closed	<p>Write a white paper on Darwin Core extensions needed for WFO</p> <p>Formally request Darwin Core extensions from TDWG for WFO</p> <p>Meise: No longer needed</p>

#	TASKS	WHO?	WHEN?	COMMENTS
	7. Protologue: Using Description Type of Original Publication in Descriptions.txt file 8. nomenclaturalNote			
31	Send formal request to GBIF for WFO-tailored versions of IPT and DwCA Validator, involving SANBI and Flora do Brasil	Technical Working Group	Deferred at July 2020	
33	Resolve insufficient resources to support: a) Software development staffing. b) Institution to maintain OwnCloud	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	Catalogue of Life/GBIF	Pierre-André Loizeau	Closed	<p>Lauren Raz and Ann Fuchs are members of CoL Global Team</p> <ul style="list-style-type: none"> Datasets used in Catalogue of Life and GBIF are taken from ChecklistBank <p>WFO to publish Backbone data and WFO-TEN data updates to ChecklistBank. (Meise decision)</p> <ul style="list-style-type: none"> WFO-branded data from TENs should be also be published to ChecklistBank Steps towards WFO supplying data for all plants to CoL and GBIF Negates the need for GBIF comparisons of WFO Taxonomy with CoL.

#	TASKS	WHO?	WHEN?	COMMENTS
42	<p>New Names. 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	March 2023	<p>Rhakhis will be used to add new names and assign WFO-IDs. (Meise decision)</p> <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>New IPNI names were loaded with Status of Unchecked.</p> <p>IPNI IDs awaiting reharvesting of Taxonomic Backbone.</p> <p>Export new names in the backbone in a data format appropriate for the TENs to incorporate into their own system.</p> <p>New TEN names will be loaded with Status of Accepted, Synonym or Ambiguous</p>
44	<p>Duplicates. 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>Nomenclatural Registration.</p>	Pierre-André Loizeau	<p>Closed</p> <p>WFO does not establish a Registration Centre for plant names. (Meise decision)</p>	<p>Expression of interest to become a Registration Centre made.</p> <p>From Meise Council:</p> <ul style="list-style-type: none"> WFO promotes the use of nomenclators IPNI and Tropicos (Bryophytes) as the 'Single Source of Truth' for nomenclatural information. WFO will incorporate updates from

#	TASKS	WHO?	WHEN?	COMMENTS
				<p>nomenclators on a regular (weekly) basis.</p> <ul style="list-style-type: none"> WFO will feed corrections from WFO data providers to nomenclators.
48	<p>Make modifications to the Portal</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) 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.</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> <p>Meise update - Added 3 changes – popup texts, Search instructions</p>
58	<p>Assess adding the BGCI Threat Search database as this includes national level and non-standard conservation assessments</p> <p>BGCI Global Tree Search country-level distribution data into mapping in WFO when this functionality is developed (merged from #83).</p>	William	Closed	<p>Tree Search data added to Habit field</p> <p>Threat Search not to be added. (Meise decision)</p> <p>Add External Link to search Threat Search via namestring.</p> <p>GTS is a valuable source of references when preparing IUCN assessments. Look to link via name string search.</p>
59	<p>Re-run IPNI-WFO Name Matching after the WCSP/IPNI Update to improve the number of matching names from 68% and analyse the results.</p> <p>Update Protologue information for matched names using IPNI data (Related to #44)</p>	Roger Hyam, Alan Elliott and William	WFO/IPNI matching done after WCVP update in 2021. Ongoing.	Rerun of 2022 IPNI data before December version
66	Negotiate with Kew to add a WFO link to IPNI name pages.	WFO Council	Ongoing	Discussed in March 2021 Council. Alan Paton to follow up

#	TASKS	WHO?	WHEN?	COMMENTS
68	Create a data paper of the WFO Backbone data with a DOI. Use this DOI for backbone download. (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	Explore use of Frictionless Data for backbone data ingestion	Technical Working Group	Pending more community adoption	
80	Develop Criteria for judging authorisation of potential Content Providers	Taxonomic Working Group	Pending (revisit with strategic review)	Criteria (scientific credibility, completeness, substantial contribution, currency, etc.), similar to those used for assessing TENS
81	WFO to give percentages of what data have been uploaded from what is published for each source of Content	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.
84	Contact Consortium Members to solicit additional Content datasets	WFO Council Co-chairs	Ongoing	
85	Review results of the comparison of WFO Taxonomic Backbone with CoL	Taxonomic Working Group	Closed	See Item #39. Meise: task no longer relevant.
86	Explore formalising WFO's relationship with IPNI with a written agreement covering the nature of the collaboration and the exchange of data	WFO Council	Pending	
87	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.	Technical Working Group	Closed	The software is being reimplemented as a JSON Web Service to facilitate use as the Taxonomy Browser New Public Portal retains the Browse/Classification submenu with original eMonocot function. Merger of WFO and WPL into WFO Portal enables the intended function of

#	TASKS	WHO?	WHEN?	COMMENTS
				backbone browser for the Portal. Meise: task no longer relevant
91	Google Cloud servers Migrate WFO servers on Google cloud to Missouri.	Missouri	March 2023	Dr Wyse Jackson has paid the Google monthly bill starting December 2021, while alternatives are explored. This is temporary until long term solution is found. Missouri offer to host WFO Servers accepted.
92	WFO post 2020 strategic review and forward planning	Council Co-chairs to lead	2022/23	Consider Garnett et al. (2020) ' <i>Principles for creating a single authoritative list of the world's species</i> ' Review the WFO Portal interface (previously #63) – Tax WG Review suppressing display of Taxonomic Status for names above Species in the search results and Taxon Page and adding them to Taxon Pages (previously #77) – Tax WG At Meise: a strategic planning subgroup to be formed to take forward the key objectives put forward by the Working Groups.
93	Conduct stock take of Content and approved providers	WFO Gatekeeper and TEN Manager	For next Council	To be done after December/January relaunch
94	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.	WFO Council	Completed	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. XML text is available

#	TASKS	WHO?	WHEN?	COMMENTS
96	Investigate modification of TPL and WFO Portals to lower Google Search result standings for TPL below WFO.	Technical Working Group	2022	Requires portal code changes
100	Use the major upgrade to promote WFO, especially in response to Leipzig List	Taxonomic Working Group	In line with the major update to the WFO website	WFO Promotion Group formed, chair Thomas Haevermans. Reported to Dec 2021 Tax WG and Council.
102	Relook at Catalogue of Life's COLDP data exchange format vis a vis Darwin Core Archive	Technical Working Group	2022	Conduct an analysis of pros and cons of COLDP for WFO.
103	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	Technical Working Group	2022	Multiple text and color changes to be made to make Superseding of TPL more blatant.
104	RBGE to produce standalone, open source software to: manage the WFO Taxonomic Backbone Incorporate updates from data providers Provide clean datasets to MBG and to take responsibility for managing the WFO Taxonomic Backbone	RBGE	Dec 2022	Roger Hyam to work for a year on developing and implementing the backbone management software. <ul style="list-style-type: none"> Phase 1: January to June 2022. Data management system implemented, populated, used for manual curation, and data export into eMonocot. DONE. Phase 2: July to December 2022. Batch updates enabled, updates incorporated from Asteraceae TEN, WCVF and IPNI. Deduplication of names [Task 44]
105	Reconstitute a Communications Working Group to promote WFO	Thomas Haevermans	By March 2023 Council	Nicola Schoenenberger to draft a media promotion campaign
106	Explore registration of WFO as an NGO in Switzerland	Nicola Schoenenberger	By March 2023 Council	

#	TASKS	WHO?	WHEN?	COMMENTS
107	Check WFO webpages and guidelines for consistency in the use of terms	Marc Sosef	By March 2023 Council	
108	Review guidance on Data Downloads on the WFO website	William Ulate, Alan Elliott	By March 2023 Council	Replace text on 'Download Data' page of the WFO Portal with instruction on how Content and classification data can be downloaded, e.g. links to Zenodo, ChecklistBank, WFO Plant List, Portal downloads by registered users, etc.