

出國報告（出國類別：其他）

出席「2008年生物多樣性資訊標準
組織年會」報告

服務機關：行政院農業委員會林業試驗所

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派赴國家：澳洲

出國期間：97 年 10 月 18 日 ~ 97 年 10 月 26 日

報告日期：98 年 01 月 15 日

目 次

一、目的	1
二、過程	1
三、心得	7
四、建議	9
五、附錄	10

一、目的

生物多樣性資訊標準組織(Biodiversity Information Standards)之前稱做分類學資料庫工作小組(Taxonomic Database Working Group, TDWG, 目前學界仍慣以此名稱稱之)成立於 1985 年, 為一致力於生物多樣性資訊儲存及流通標準之研究、開發、制定及推廣的國際性組織。最初任務是整合世界主要植物標本館共同合作之標本資訊, 至 1994 年時拓展其涵括生物類群, 因此目前 TDWG 的成員已包含世界各地動物學、地質學、微生物學等典藏研究機構。

在目前全球生物多樣性資訊整合的分工架構中, TDWG 扮演著技術研發及推廣的角色。目前世界上主要的生物多樣性資訊服務提供者如各標本館、博物館、全球生物多樣性資訊機構、生命大百科等, 其資料庫系統、網路服務的設計、架構人員均與 TDWG 有非常緊密、積極的互動, 亦有許多是 TDWG 的核心成員。

TDWG 有多個主題小組(interest group)及工作小組(task group), 分工進行資訊及開發需求整理和實際開發工作。目前的主題小組中, 「觀測及標本資訊」主題小組下有「生物蒐藏品資料存取概要(ABCD)」及「達爾文核心集(Darwin Core)」兩個工作小組, 「TDWG 架構」主題小組有「全球唯一識別碼(GUID)」及「TDWG 資訊擷取存取協定(TAPIR)」兩個工作小組, 這四個工作小組的成果是近年 TDWG 積極推廣、同時也獲得像是全球生物多樣性資訊機構(GBIF)或是密蘇里植物園等大型生物多樣性資訊服務提供者所採用。本所最近也有多項計畫積極引入這些學術資訊技術標準。

本次會議的重要性在於, 參與此會議對於未來本所生物多樣性資訊(標本館、生態調查、生態監測…等主題)管理技術之引入, 並藉以應用於現有生物多樣性典藏資料之管理, 與國際接軌等議題有重要之助益。並期藉由此一國際性學術場合, 與各國相關學者及研究人員進行溝通交流, 有助於未來技術合作之可能性, 或對國際學術社群產生實質貢獻。

二、過程

一、會議地點及日程：

今年年會由澳洲方面主辦, 地點在柏斯(Perth)西南方海港城市佛里曼特爾(Fremantle)的 Western Australian Maritime Museum 舉行, 會議為期

共 7 天。

The screenshot shows the homepage of the Biodiversity Information Standards (TDWG) Annual Conference 2008. The header features the TDWG logo and a navigation menu on the left with links like Home, About TDWG, Standards, Activities, Membership, and 2008 Conference. The main content area is titled 'Biodiversity Information Standards (TDWG) Annual Conference 2008' and provides details about the location (Western Australian Maritime Museum, Victoria Quay, Fremantle) and dates (Sunday 19 - Saturday 25th October 2008). A large aerial photograph of Fremantle is featured, with a small inset image of the Western Australian Maritime Museum. The right sidebar contains a 'News' section with several articles, including '15-Jan-2009 NCD Public Review', '12-Nov-2008 Chairman's Message', '29-Oct-2008 TDWG 2008 a success!', and '04-Jun-2008 TDWG 2008 in Fremantle'. The footer includes copyright information (Copyright 2007 - Biodiversity Information Standards - TDWG), a Creative Commons Attribution 3.0 license, and logos for the Moore Foundation and W3C XHTML 1.0.

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Fremantle
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Biodiversity Information Standards (TDWG) Annual Conference 2008

Western Australian Maritime Museum
Victoria Quay, Fremantle (Perth), Australia
Sunday 19 - Saturday 25th October 2008

Western Australian Maritime Museum

(thanks to Gail Kampmeier for the composite)

News

15-Jan-2009 [NCD Public Review](#)

TDWG announces the Public Review of the proposed Natural Collections Descriptions (NCD) standard. NCD has been reviewed by the TDWG Executive Committee and we now seek comment from the community. The NCD abstract can be...

[more]

12-Nov-2008 [Chairman's Message](#)

TDWG members and friends, TDWG Conference 2008 took place in Fremantle a couple of days ago. I would like to thank all those who took the time to travel to this remote location and those who contributed to the success of the conference.

[more]

29-Oct-2008 [TDWG 2008 a success!](#)

TDWG 2008 concluded successfully in Fremantle, with a record turnout and a great deal of interest in the work presented.

With some 180 participants coming from all over the globe to the most remote city on the planet, attendance...

[more]

04-Jun-2008 [TDWG 2008 in Fremantle](#)

Registration for TDWG 2008 is now open at www.TDWG.org/conference2008/registration. The conference will be held at the Maritime Museum of Western Australia in Fremantle, about 20km southwest of Perth.

Details about the...

[more]

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圖 1. 2008 TDWG conference 的大會首頁

二、會前小組討論會：

正式會議於 10 月 20 日召開，但前一天(Oct/19)亦舉行了組織內的主題小組及工作小組(Interest/Task Group)的討論會。討論會共分為調查及標本主題小組(Observations & Specimens Interest Group)、文獻主題小組(Literature Interest Group)、地理資訊主題小組(Geospatial Interest Group)、技術架構主題小組(Technical Architecture Group)、生物親緣遺傳主題(Phylogenetics)、觀測調查工作小組(Observations Task Group)、影像及多媒體資訊工作小組(Image & Multimedia Resources Task Group)、後設資料工作小組(Metadata Workshop)，及入侵種主題小組(Invasive Species Interest Group)。本人由於工作任務關係，選擇參加了與自身工作內容較具相關性的調查及標本主題小組以及觀測調查工作小組與會。

在調查及標本主題小組會議中，有成員提出目前所推行的生物觀測資訊欄位標準，由於部份欄位過於複雜，在推廣及實際應用時往往難以實現，故可能需要更多的討論，針對有所爭議的欄位或資訊標準進行適當修訂。另外，由於 TDWG 以往多以標本館、植物園所典藏的資料庫為主要服務對象，然近年開始嘗試納入生態調查及觀測資訊，因此主持人特別請美國長期生態研究資訊管理團隊的 Matt Jones 進行簡報，介紹目前美國長期生態研究團隊的現有資訊服務及資料庫，並提出生態資料及生物多樣性資料之整合建議。

下午的觀測調查工作小組討論會議，則由 Matt Jones 擔任主持人。會議首先討論中介紹了此一新成立的工作小組所將肩負的任務，接著介紹了美國長期生態研究團隊目前正在發展的資訊整合技術-OBOE(Extensible Observation Ontology)，並比較了 OBOE 與現行幾種相似技術間的差異，並說明知識本體論(ontology)及語意(semantic)技術對於下一代生物多樣性資訊服務的重要性。

三、大會內容：

為期 7 天的會議，共分成了下列主題進行研討：

1. 生物多樣性資訊的共享
2. 生物多樣性資訊技術現有成果
3. 文獻資訊相關技術發表
4. 知識本體論(ontology)
5. 親緣遺傳領域資訊學

6. 生物多樣性應用工具的開發
7. 多媒體資料內容
8. 全球入侵種資訊網路
9. 生態學觀測資料與生物多樣性資訊之整合

本年度會議中提出了 TDWG 本身目前面對的幾項課題及挑戰。包括，

1. 資訊技術過於複雜以致阻礙了標準之推行：

雖然一直以來，TDWG 以作為生物學家以及資訊專家之間的合作橋樑為己任，協助將生物學家對於資訊處理的需求，以符合生物學原理的資訊邏輯和架構，藉助資訊專家的技術支援實現。但是，在任務行之多年後，部分成員組織依然反應 TDWG 所推行的標準過於複雜，以致於研究成果的建置產生窒礙難行的窘狀。遂提出針對部份目前 TDWG 與生物多樣性機構之間的合作及服務方式需進行檢討的聲浪。

2. 提升 TDWG 能見度以提升國際合作機會：

目前 TDWG 仍以歐洲生物多樣性研究社群為主要成員群，標準推行和計畫合作也多以歐洲組織（如：GBIF、EDIT...）為主。為增加與世界各大洲（尤其是亞洲、非洲）之資訊交流和合作機會，TDWG 認為現今仍須積極爭取組織在世界各種生物學研究社群的能見度。為達成此一目標，目前 TDWG 的諸多技術也應開始針對多語系的需求開始思考因應對策。

3. 小眾研究社群以及業餘研究社群的合作機會：

除了植物園、博物館、大學研究機構等大型專業研究機構或政府組織之外，TDWG 也開始將合作機會延伸至小型研究單位、個人研究專家，及業餘性團體。由於這些組織，往往亦累積了數量可觀，或是具特定領域專業性的珍貴生物多樣性資料庫，卻由於組織規模或性質，缺乏與專業生物研究機構接軌及交流資訊的機會。TDWG 為避免遺珠之憾，也將積極開拓與小眾/業餘研究社群進行對話及尋求合作機會，此一發展方針亦於本次大會揭示。

此外，新領域資料集的納入工作，例如：1)生態學方面的觀測資料，2)影像/聲音/影片等多媒體記錄資訊內容，以及 3)分子生物領域的生物資訊，也成為 TDWG 必須面對的資訊開發任務。

四、大會專題-「澳洲生命大地圖」：

大會期間，除提供組織成員發表最新技術及任務成果之外，地主國澳洲特別安排了一個專題，介紹目前正在進行的一項生物多樣性資訊整合計畫-「澳洲生命大地圖」(The Atlas of Living Australia, ALA)。該計畫希望藉由澳洲本土所有生物多樣性資訊庫之整合，完成一綜合性、專業性且具自由使用性之物種資訊連結網絡。提供澳洲本土各生物資源相關領域任務（如：土地利用規劃、生物災難預防、保育議題、作物栽培、生醫資源、休閒遊憩…等）進行時之參考資料來源。

日期	起訖地點	工作任務
10/17(五)-10/18(六)	台北→新加坡→伯斯	去程轉機
10/18(六)	伯斯→佛里曼特爾	去程
10/19(日)	佛里曼特爾	主題小組及工作小組 (Interest/Task Group)討論會
10/20(一)~10/25(六)	佛里曼特爾	參加會議
10/26(日)	佛里曼特爾→伯斯	返程
10/26(日)	伯斯→新加坡→台北	返程轉機

三、心得

本次出席 TDWG 2008 年會，除觀摩到世界各國目前對於生物多樣性資訊管理及整合及資訊技術研發等諸多實務課題之外，對於目前生物多樣性資訊國際合作計畫之發展趨勢及因應課題亦有所心得：

1) 資料的倉儲、資訊管理及分享：

生物多樣性資料是透過大量的人力物力及時間累積出來的自然襲產。長期的調查觀測工作雖然累積了質量可觀的資料群集，但亦隨著缺乏存儲及資訊管理的規劃而逐漸流失其內涵的完整性。本次大會有許多講者即提出應加緊進行生物多樣性資料的倉儲保存和管理工作，並積極說服更多的專家學者、研究機構，更慷慨地分享他們的資料。

2) 更廣泛的資料整合任務：

正如大會一開始所揭櫫的發展方針，更廣泛的跨國際、跨文化性的生物多樣性資訊整合也是刻不容緩。在此方針之前提下，生物多樣性資訊管理必須將多語系化、多文化性之考量，列入其往後系統發展之必要元素。

3) 分散式資料存儲及處理：

拜現今網際網路技術之進步，國際間生物多樣性資訊之交流幾已可完全透過網路進行資料傳輸。因此，生物多樣性資料庫之資訊同步 (mobilization) 已經被許多區域性生物多樣性資料整合計畫列為標準功能。例如：澳洲 GAIA RESOURCES 計畫所使用的「HermesLite」，便是一套可達成資料移轉及資訊同步的系統。

另外，透過網際網路進行各項線上協同作業，也已經被許多研究團隊提出，作業項目包括：GoldenGate 具有藉助外界伺服器提供學名資訊以進行本身的資料處理之能力；BHL(Biodiversity Heritage Library)網站也藉由 uBio 的 TaxonFinder 服務進行文獻科學文獻的學名標記作業；GEOLocate 軟體可藉由網路資料來源用於地理資訊參照(Georeferencing)工作的進行。

除了資訊處理程序可藉由網路進行分散協同工作之外，如果研究單位本身可獲挹注資源有限，生物多樣性資料庫的管理系統也可透過許多網路資源完成串連建置。PlantCollections 計畫展示了其藉由現有套裝軟體及網路服務(BG-Base、Google Base、MorphBase 及 Google GeoRSS…)所達成的生物多樣性資料庫系統。

4) 資訊技術及資訊整合的新領域：

許多大型規模的生物多樣性資訊庫已經成形，並逐漸成熟運作。因此，下一階段要面對的課題，還有如何更加利用龐大的資訊庫以及快速發展的資訊技術，提供研究人員產出更多的研究成果。語意學(semantic)以及知識本體論(ontology)是目前被提出的解決方案，知識本體論可讓資訊庫內的資料欄位更精確而有效率地使用，更可能是生物多樣性資訊與生態觀測資訊(ecological observation data)以及生物遺傳親緣(phylogeny)資訊整合的關鍵方案。例如：TTO (Teleost Taxonomy Ontology)便具有橋接 **clade** 和 **taxonomic taxon concept** 之能力。生物多樣性資訊與生物親緣資訊/生態觀測資訊的串連，應可帶給研究人員更多的新思維及觀點，因此亦有研究團隊進行嘗試。例如：Biodiverse 即是一套可將 **phylogeny tree/data** 與物種分布連結呈現的軟體。

四、建議

國際間生物多樣性資訊的整合計畫目前正蓬勃地展開中，透過研究機構資料庫間的整合，區域性合作計畫陸續呈現了許多成果，更說明了資訊整合的價值。台灣具有世界難得的自然資源，且同時更具備了強大的資訊能力，由於兼具此兩發展要素，使得台灣更不應自外於現今國際生物多樣性資訊整合的潮流。對外，應積極地爭取研究人員的交流對話、合作計畫的參與、資訊技術的引進，甚至共同開發的機會；對內，則如文前所提，對資料存儲方案及管理程序之缺乏，導致的後果即是資訊內涵的逐漸流失。因此，對於本土目前已累積的生物多樣性資訊庫應加緊研擬及推行資料管理和倉儲方案，以延長資料之可用性。

五、附錄

TDWG 2008 年會議程

Biodiversity Information Standards (TDWG) 2008 Conference Theme: The Atlas of Living Australia				
Saturday 18th October			Chair	Venue
1100-1700	Executive Committee meeting (<i>committee members only</i>)		Donald Hobern	Notre Dame University Education Centre - Room 36.119 (seats 20)
Sunday 19th October			Chair	Venue
0900-1700	Group meetings as required (all welcome)			
	0900-1300	Observations & Specimens Interest Group	Steve Kelling	Notre Dame University Education Centre room 36.118 (seats 25)
	0900-1300	Literature Interest Group	Anna Weitzman	Notre Dame University Education Centre room 36.119 (seats 20)
	0900-1300	Geospatial Interest Group	Reed Beaman	Notre Dame University Education Centre room 36.102 (seats 35)
	0900-1300	Technical Architecture Group	Roger Hyam	Notre Dame University Education Centre room 36.103 (seats 45)
	0900-1700	Phylogenetics	Nico Cellinese & Hilmar Lapp	Notre Dame University Education Centre room 36.117 (seats 32)
	1400-1700	Observations Task Group	Matt Jones	Notre Dame University Education Centre room 36.118 (seats 25)
	1400-1700	Image & Multimedia Resources Task Group	Bob Morris	Notre Dame University Education Centre room 36.119 (seats 20)
	1400-1700	Metadata Workshop	Donald Hobern and Éamonn Ó Tuama	Notre Dame University Education Centre room 36.102 (seats 35)
	1400-1700	Invasive Species Interest Group	Annie Simpson and Jim Graham	Notre Dame University Education Centre room 36.103 (seats 45)

1800-2000	Welcome Reception	Hosted by the TDWG 2008 Local Organising Committee	Moore's Building Art Gallery : 46 Henry Street Fremantle
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Monday 20 October	WELCOME AND INTRODUCTIONS			Chair	Venue
09:00-10:15	Welcome by the Chairman and introductions to TDWG			Donald Hobern	Theatre
	0900-0915	Opening and Welcome	Diana Jones , Acting CEO of the WA Museum and formerly Executive Director, Collection and Content Development		
	0915-0925	Housekeeping and Logistics	Adrian Rissone		
	0925-0945	TDWG - Looking Back and Looking Forward	Donald Hobern		
	0945-1015	TDWG standards architecture	Roger Hyam		
1015-1045	Coffee				Function Centre
1045-1230	Session 2 - From Small to Big: How to Capitalize on Small Contributions to the Big Dreams of Sharing Biodiversity Information			Gail Kampmeier	Theatre
	1045-1050	Introduction: From Small to Big	Gail Kampmeier		
	1050-1115	Every Datum Counts! Capitalizing on Small Contributions to the Big Dreams of Mobilizing Biodiversity Data	Vishwas Chavan , Éamonn Ó Tuama, Samy Gaiji, David Remsen and Nicholas King		
	1115-1135	Experiences in mobilizing biodiversity data - the story of HermesLite	Piers Higgs and Tim Carpenter		
	1135-1155	Small pieces loosely joined: Building scientific web communities with Scratchpads	Simon Rycroft , Dave Roberts, Kehan Harman and Vince Smith		
	1155-1215	Designing a global network to accommodate contributions from all sources and technical abilities	Tim Robertson		
	1215-1230	Discussion	Gail Kampmeier		
1230-1400	Lunch				High Street
1400-1530	Session 3 - An Introduction to ...			Adrian Rissone	Theatre
	1400-1420	An Introduction to Taxonomic Names of Organisms	Rich Pyle		

	1420-1440	An Introduction to Data Exchange Protocols in TDWG	Renato De Giovanni		
	1440-1500	An introduction to biological descriptions	Kevin Thiele		
	1500-1515	Globally Unique Identifiers in Biodiversity Informatics	Kevin Richards		
	Session 3 discussion				
1515-1545	Coffee				Function Centre
1545-1715	Session 4 - Biodiversity Informatics: Key Organizations and Projects			Lee Belbin	Theatre
	1545-1615	GBIF: From Prototype Towards Full Operation	Éamonn Ó Tuama, Vishwas Chavan, Markus Döring, Samy Gaiji, David Remsen and Tim Robertson		
	1615-1630	DataNetOne: A Distributed Environmental Data Archive	Matt Jones		
	1630-1645	European Distributed Institute of Taxonomy (EDIT)	Walter Berendsohn		
	1645-1700	Biological Collections Index (BCI)	Roger Hyam		
	1700-1715	Key2Nature	Wouter Addink		
Tuesday 21 October	Sessions 5-8			Chair	Venue
0900-1030	Session 5 - Biodiversity Informatics Literature and More			Anna Weitzman	Theatre
	0900-0920	Plazi: Providing access to taxonomic literature through semantic enhancements and exposure of descriptions. An overview	Donat Agosti and Guido Sautter		
	0920-0940	The Plazi Markup System Plazi: Prospects for Mark up of Legacy and Prospective Publications	Guido Souttr Terry Catapano		
	0940-1000	An Evaluation of Taxonomic Name Finding and Next Steps in BHL Developments	Chris Freeland		
	1000-1020	Precision in Accessing the Descriptions, Keys and Other Contents of Digitized Taxonomic Literature: The INOTAXA prototype	Chris Lyal and Anna Weitzman		

	1020-1030	Discussion	Anna Weitzman		
1030-1100	Coffee				Function Centre
1100-1230	Session 6 - Ontologies			Stan Blum, Hilmar Lapp, and Todd Vision	Theatre
	1100-1115	Development of the Generation Change Program Domain Models and Ontology Management Embedded in the GCP Platform	Rosemary Shrestha, Jeffrey Detraas, Thomas Metz, Martin Senger, Graham Mc Laren, Elizabeth Arnaud , Tom Hazekamp, Adriana Alercia, Guy Davenport, Reinhard Simon, Jayashree Balaji and Richard Bruskiewich		
	1115-1130	Taxonomic ontologies: Bridging phylogenetic and taxonomic history	Peter Midford		
	1130-1145	Lessons learned from semantic web prototyping in ecology	Cynthia Sims Parr, Joel Sachs , and Tim Finin		
	1145-1200	SERONTO: a Socio-Ecological Research and Observation oNTOlogy	D.C. (Bert) van der Werf , Mihai Adamescu, Minu Ayromlou, Nicolas Bertrand, Jakub Borovec, Hugues Boussard, Constatin Cazacu, Toon van Daele, Sabina Datcu, Mark Frenzel, Volker Hammen, Helena Karasti, Miklos Kertesz, Pirjo Kuitunen, Mandy Lane, Juraj Lieskovsky, Barbara Magagna, Johannes Peterseil, Sue Rennie, Herbert Schentz, Katharina Schleidt, and Liisa Tuominen		
	1200-1215	SONet (Scientific Observations Network) and OBOE (Extensible Observation Ontology): facilitating data interoperability within the environmental and ecological sciences through advanced semantic approaches	Mark Schildhauer , Shawn Bowers, Matt Jones, and Josh Madin		
	1215-1230	A standard information transfer model scopes the ontologies required for observations	Simon Cox and Laurent Lefort		
1235-1400	Lunch				High Street
1400-1530	Session 7 - Phylogenetics standards			Nico Cellinese & Hilmar Lapp	Theatre
	1400-1405	Introduction: TDWG Interest Group on Phylogenetics Standards	Nico Cellinese		
	1405-1420	Obstacles and Avenues Facing Phyloinformatic Research	William H. Piel		
	1420-1435	Integrating space, time and form; the challenge of developing standards for geophylogenies	David Kidd		
	1435-1450	Data standards in phylogenetics: the NeXML project	Rutger A. Vos		
	1450-1505	Emerging Data Standards for Phylogenomics Research	Christian Zmasek		
	1505-	Emerging standards in phylogenetic nomenclature	Nico Cellinese		

	1520				
	1520-1530	Towards a Simple, Standards-Compliant, and Generic Phylogenetic Database Module	Hilmar Lapp, Todd J. Vision		
1530-1600	Coffee				Function Centre
1600-1800	Session 8 - Tutorials and Posters 1			Gail Kampmeier & Arturo Ariño	Function Centre
	1600-1800	TAPIR Tutorial	Renato De Giovanni		Function Centre
	1600-1800	TDWG Architecture Workshop	Roger Hyam		Theatre
	1600-1800	The NCD Toolkit	Wouter Addink		Notre Dame University Room 43.102
	1600-1800	GoldenGate	Donat Agosti		Notre Dame University Room 43.301
1630-2200	Spotlighting trip to Karakamia (tickets in advance)				Karakamia
Wednesday 22 October	The Atlas of Living Australia			Donald Hobern	Venue
0900-1030	Session 9 - Atlas of Living Australia - Australian biodiversity informatics			Donald Hobern	Theatre
	0900-0915	Introducing Australia’s Virtual Herbarium (AVH)	Ben Richardson		
	0915-0930	CMKb: Integrating Australian Customary Medicinal Plant Knowledge with the Framework of Atlas of Living Australia	Jitendra Gaikwad and Shoba Ranganathan		
	0930-0950	TAXAMATCH, a “fuzzy” matching algorithm for taxon names, and potential applications in taxonomic databases	Tony Rees		
	0950-1010	Making Effective Use of the Atlas of Living Australia in Conservation Assessment Through Advances in Spatial Analysis and Modelling	Simon Ferrier		
	1010-1030	Linking phylogenetic trees, taxonomy & geography to map phylogeography using Biodiverse	Dan Rosauer and Shawn Laffan		
1030-1100	Coffee				Function Centre
1100-1230	Session 10 - Atlas of Living Australia - Architecture and deliverables			Dave Martin	Theatre

	1100-1130	Introduction to the ALA	Donald Hobern, Nick dos Remedios, Dave Martin, Wolf Wanjura and Lynette Woodburn			
	1130-1150	Taxonomy Research & Information Network (TRIN): Seeking Biodiversity Data Standards	Margaret Cawsey, Gary Jolley-Rogers and Jim Croft			
	1150-1210	Australian Faunal Directory (AFD) and Australian Plant Census (APC): Content, Architecture and Services	Greg Whitbread, Helen Thompson and Matthew Hand			
	1210-1230	Providing Annotation Services for the Atlas of Living Australia	Ron Chernich			
1230-1400	Lunch					High Street
1400-1530	Session 11 - Atlas of Living Australia - Exploring user scenarios 1 - John Tann				Paul Flemons, Lynda Kelly & John Tann	Function Centre, Theatre & Boardroom
	1400-1530	Breakout 1: Providers				
	1400-1530	Breakout 2: Integrators				
	1400-1530	Breakout 3: Consumers				
1530-1600	Coffee					Function Centre
1600-1730	Session 12 - Atlas of Living Australia - Exploring user scenarios 2				Paul Flemons, Lynda Kelly & John Tann	Function Centre, Theatre & Boardroom
	1600-1700	Breakout 1: Providers				
	1600-1700	Breakout 2: Integrators				
	1600-1700	Breakout 3: Consumers				
	1700-1730	Reports	Breakout Conveners			
1800-1900	Public Lecture by Donald Hobern "Atlas of Living Australia - Sharing Biodiversity Knowledge to Shape Our Future"					Social Sciences Lecture Theatre, University of Western Australia
Thursday 23 October	SESSIONS 13-16				Chair	Venue
0830-1000	Session 13 - Tutorials and Posters 2				Gail Kampmeier & Arturo Ariño	Function Centre

	0830-1000	TAPIR Tutorial	Renato De Giovanni	Function Centre
	0830-1000	TDWG Architecture Workshop	Roger Hyam	Theatre
	0830-1000	The NCD Toolkit	Wouter Addink	Notre Dame University Room 43.301
	0830-1000	GoldenGate	Donat Agosti	Notre Dame University Room 36.120
1000-1030	Coffee			Function Centre
1030-1200	Session 14: Keynote Speakers			Kevin Thiele
	1030-1115	Blood, Sweat and Tears: Biodiversity Data in the Real World.	Neil Burrows	
	1115-1200	Biodiversity Information Standards: are we going wrong, or just not quite right?	Jim Croft	
1200-1330	Lunch			High Street
1330-1500	Session 15 - Biodiversity-Related networks and Tools			Greg Whitbread
	1330-1350	SpeciesLink and openModeller: Network and Tool Enabling Biodiversity Research	Renato De Giovanni, Alexandre Marino, Sidnei de Souza, Dora Ann Lange Canhos, Marinez Ferreira de Siqueira, and Vanderlei Perez Canhos	
	1350-1410	EDIT Platform for Cybertaxonomy – An Overview	Andreas Müller, Andreas Kohlbecker, Pepe Ciardelli, Niels Hoffmann and Patricia Kelbert	
	1410-1420	Data Integration Services for Biodiversity Informatics: An Example from Plant Collections and Morphbank	Greg Riccardi and Boyce Tankersley	
	1420-1440	Community Building and Collaborative Georeferencing using GEOLocate	Nelson Rios and Henry L. Bart	
	1440-1500	Halt the Loss of Biodiversity Data: Towards a New Archiving Infrastructure for Biodiversity Information	Anton Güntsch and Walter G. Berendsohn	
1500-1530	Coffee			Function Centre
1530-1650	Session 16 - Species Profile Model			Éamonn Ó Tuama
	1530-1550	A Gentle Stroll Through the Species Profile Model	Bob Morris	
	1550-1610	Plazi: Implementing SPM	Terry Catapano	

	1610-1630	Experiences in Consuming SPM Marked-up Data	Patrick Leary		
	1630-1650	The Species Profile Model from an Avian Perspective	Jeff Gerbracht and Steve Kelling		
1900-late!	Banquet (tickets in advance)				Esplanade Hotel
Friday 24 October	SESSIONS 17-20			Chair	Venue
0900-1030	Session 17 - Multimedia in Biodiversity Informatics			Bob Morris	Theatre
	0900-0915	Introduction to the session: The relationship of the GBIF Multimedia Resource Task Group to the presentations and to the aims of the TDWG Image Interest Group	Bob Morris and Vishwas Chavan		
	0915-0930	The NBII's Digital Image Library – bringing together diverse images means quality control and standards	Annette L. Olson		
	0930-0945	Creative Commons – Have Your Copyright and Share It Too	Chuck Miller		
	0945-1000	Using Fedora Commons to create a persistent archive for digital objects	Phil Cryer		
	1000-1015	Using the JPEG2000 image format for storage and access in biodiversity collections	Chris Freeland		
	1015-1030	OntoMorphBankSter: Image-driven Ontology and/or Ontology-driven Image Annotation	Greg Riccardi, Austin Mast, Daniel Miranker and Ferner Cilloniz		
1030-1100	Coffee				Function Centre
1100-1230	Session 18 - The Global Invasive Species Information Network			Annie Simpson	Theatre
	1100-1115	Developing a Cyberinfrastructure: Experiences From a Regional Network of Plant Taxonomists	Zack Murrell, Derick Poindexter and Michael Denslow		
	1115-1130	Building a TAPIR-Lite Toolkit for the Global Invasive Species Information Network (GISIN)	Jim Graham		
	1130-1145	Invasive species information management and exchange in the Americas: the IABIN Invasives Information Network (I3N)	Fournier		
	1145-1200	Ensuring the relevance of invasive species information management tools for policy development and effective management	Judy Fisher		
	1200-	Data Models to share invasive species information	Annie Simpson		

	1215	through the Global Invasive Species Information Network (GISIN)			
	1215-1230	Discussion			
1230-1400	TDWG Business Meeting		Adrian Rissone		Theatre
1400-1530	Session 19 - Bringing Organism Observations into Bioinformatics Networks			Steve Kelling	Theatre
	1400-1420	The significance of observations to biodiversity studies	Steve Kelling		
	1420-1440	Towards Global Observation Networks: GBIF's plans for mobilizing primary biodiversity data	Vishwas Chavan		
	1440-1500	New directions in observational data organization and federation: from EML to observational ontologies	Mathew Jones		
	1500-1520	The issues with sensitive species: managing access, issues of data quality, and data ownership	Arthur Chapman		
	1520-1530	Domain-centric observation networks: Experiences gained from the Avian Knowledge Network	Denis Lepage		
1530-1600	Coffee				Function Centre
1600-1730	Session 20 - Wild Ideas!!			Markus Döring and Tim Robertson	Theatre
	1600-1615	A Hadoop-Based Prototype for the Filtered-Push Project	Zhimin Wang , Hui Dong, Maureen Kelly, James A. Macklin, Paul J. Morris and Morris A. Robert		
	1615-1630	Data Exchange Standards – The Case for Being Stupidly Simple	Chuck Miller		
	1630-1645	3D for a demanding audience (General Processing Graphical Processing Unit GPGPU)	Bart Meganck and Patricia Mergen		
	1645-1700	SpeciesIndex: A Practical Alternative to Fantasy Mashups?	Roger Hyam		
700	Close		Donald Hobern		Theatre