DIRECTOR'S SUMMARY 2009

ATH
Australian Tropical Herbarium

Australian Tropical Herbarium

Our Values

Through leadership, integrity, service, innovation and team-building, these values and beliefs guide our actions:

- **We are committed to providing leadership in research and through such efforts be an exemplar for others**
- **We are dedicated to best practice in all our endeavours**
- **We are resolved to produce in a timely manner innovative and relevant outputs**
- **We are pledged to seek better ways and better science**
- **We value a collaborative, engaging, caring approach to team-building.**

Our Vision

To make the Australian Tropical Herbarium a leader in tropical plant biodiversity research, that conducts diverse, relevant and innovative research; converts that research into useful products; offers training, inspiration and engagement with the community; and, by collaborating with others, achieves a greater understanding of sustainable tropical systems.

ATH staff and students. Back row (l-r): Paul Gadek, Caroline Puente-Lelievre, Peter Bannink, Katharina Schulte, Sandra Abell-Davis, Mark Harrington, Andrea Lim, Louise Hucks, Melissa Harrison, Eda Addicott, Yumiko Baba. Front row (l-r): Fanie Venter, Frank Zich, Stuart Worboys, Darren Crayn, Gary Wilson, Mark Newton. Absent: Mason Campbell, Jonathan Cornelius, Craig Costion, Tony Page, Gerry Turpin.

Front cover: *Bowenia spectabilis*, photo Gary Wilson. Staff photo: Robyn Wilson.

Contents

From the Director

At the close of the second year of operation of the Australian Tropical Herbarium, it is rewarding to reflect on our activities and achievements over the last 12 months. We were able in 2009 to consolidate and build on the administrative and policy foundations that consumed much of our time in the previous, establishment year. It was heartening to see our publication outputs substantially increase, and our first external grants won.

We are nearly at our full complement of staff (as per the joint venture agreement) - the last position, a postdoctoral research fellow, will take up her appointment in early 2010. However, with externally funded project staff and postgraduate student numbers increasing we expect to outgrow our existing space in 2010. This is a positive sign, a consequence I believe of an institution building momentum. For this I credit our staff, students and volunteers who impress me daily with their enthusiasm and expertise.

Our engagement with the public continues to be healthy. This year usage of our Public Reference Collection – an important interface between our science and our stakeholders – increased considerably. We welcomed a wide range of visitors to the ATH, including several VIPs such as Senator the Hon. Penny Wong (Federal Minister for Climate Change, Energy Efficiency and Water) and Her Excellency Ms Penelope Wensley AO (Governor of Queensland).

The ATH team are very much looking forward to continuing in 2010 to build the Australian Tropical Herbarium into a leading international tropical plant and fungal biodiversity research institution.

It is my great pleasure to present this second annual Director's Summary report. I hope you enjoy reading it.

Prof. Darren Crayn
Director, Australian Tropical Herbarium

Above: ATH Director Darren Crayn conducting field work. Below: Sir Robert Norman building at James Cook University, Cairns Campus, housing the ATH.

Introduction

The Australian Tropical Herbarium (ATH) is a joint venture of the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Director National Parks (DNP), Queensland Department of Environment and Resource Management (DERM), Queensland Department of Employment, Economic Development and Innovation (DEEDI), and James Cook University (JCU). The ATH's activities are overseen by the ATH Board comprising representatives of the three main participants (CSIRO, JCU, DERM) and an independent chair. The ATH is physically located within the Sir Robert Norman building (housing the Australian Tropical Forest Institute - ATFI) on the Cairns campus of JCU, and administratively is part of JCU's Faculty of Science and Engineering (FSE).

The ATH boasts state-of-the-art facilities and infrastructure for specimen processing and curation, photography, pest and climate control, and field, herbarium and laboratory research. The main activity is management of the more than 160,000 plant specimens that comprise the CNS collection, a merger of the collections (and staff) of the Australian National Herbarium – Atherton (QRS), the Queensland Herbarium – Mareeba (MBA) and part of the JCU Herbarium collection (JCT) to form an unsurpassed representative collection of north Queensland's flora. Research at the Australian Tropical Herbarium covers a range of topics including tropical plant and fungal taxonomy and evolution, ethnobotany, ecology, climate change studies, development of identification products, agroforestry and regional ecosystem mapping.

The first activity of the ATH was the appointment of Mr Frank Zich as Curator of QRS in Nov 2006. The Sir Robert Norman Building (housing ATFI and the ATH) was completed in November 2007. Permission to occupy the new building was granted at the start of December and the MBA collection moved soon thereafter. The bulk of the QRS collection was moved over the 10 days prior to Christmas, and completed by the start of February 2008. The building was opened by the Hon. Anna Bligh, Premier of Queensland on the 4th of March 2008. The inaugural Director commenced duty on the 31st of March 2008, the Operational Date of ATH.

2009 Highlights

- **Publications:** Two Regional Ecosystem mapsheets and 13 scientific papers were published.
- **Research grants income:** over $120,000 in external competitive research grant income was received in 2009.
- **FNQ MycoBlitz 2009:** inaugural Wet Tropics fungal foray event was a great success, many new species and new occurrences of fungi discovered. Participants highly satisfied.
- **Postgraduate students:** two students began postgraduate studies based at the ATH.
- **Visitors:** nearly 600 visitors were welcomed during 2009, including 95 researchers visiting for scientific purposes, and a number of VIPs including Senator the Hon. Penny Wong, and Her Excellency Penelope Wensley, Governor of Queensland.
- **Collections:** nearly 1900 new specimens were added to the herbarium collection, and over 1500 DNA samples were added to the DNA/Tissue Bank.
- **Molecular Genetics Laboratory:** fitout of the lab was completed and staff and students began research on molecular projects.
- **Key Performance Indicators:** all KPI targets except one (number of postdoctoral researchers on staff) were exceeded.

Governance

Board

The ATH is governed by a Board whose role it is to oversee the operations of the ATH and set overall strategic management policy and objectives. The Board comprises two representatives of each of the Participants (CSIRO, DERM, JCU) and an independent Chairperson. The Board meets twice per year, in April and October.

As of December 31 2009, ATH Board members are:

- Dr Greg Leach (Independent Chairperson)
- Dr Jeremy Burdon (CSIRO)
- Prof Chris Cocklin (JCU)
- Prof Paul Gadek (JCU)
- Dr Gordon Guymer (DERM)
- Dr Judy West (CSIRO)
- Dr Christine Williams (DERM)

ATH Director

The ATH Director reports to the Pro Vice Chancellor (Science and Engineering) and to the ATH Board. The Director's role is to undertake the day to day management of the ATH, and to conduct research in accordance with the Research Themes.

JAMES COOK UNIVERSITY AUSTRALIA

Queensland Government

CSIRO

Australian Government
Director of National Parks

Major Achievements in 2009

Publications

Publications by ATH staff in 2009 for general and scientific audiences are detailed below (ATH staff in boldface).

Regional Ecosystem Map Sheets

Two RE map sheets were completed and publicly released:

1. Neldner VJ, **Addicott E, Newton M, Bannink P.** (2009) Vegetation Communities and Regional Ecosystem 1:100,000 Survey and Mapping of the Cape York Peninsula Bioregion and Gulf Plains Bioregion: Ebagoola 1:250,000 map sheet.

2. **Wilson G, Bannink P.** (2009) Vegetation Communities and Regional Ecosystem 1:100,000 Survey and Mapping of the Cape York Peninsula Bioregion and Gulf Plains Bioregion: Donors Hill 1:250,000 map sheet.

Scientific Papers

Thirteen refereed scientific papers were published by ATH staff:

1. Buerki S, Forest F, Acevedo-Rodriguez P, Callmander M, Nylander J, **Harrington M**, Sanmartin I, Kupfer P, Alvarez N (2009) Plastid and nuclear DNA markers reveal intricate relationships at subfamilial and tribal levels in the soapberry family (Sapindaceae) *Molecular Phylogenetics and Evolution* 51, 238-258.

2. **Cornelius JP,** Weber JC, Sotelo-Montes C, Ugarte-Guerra LJ (2009). Phenotypic correlations and site effects in a Peruvian landrace of peach palm (*Bactris gasipaes* Kunth). *Euphytica,* 1-11 (published online Nov 10 2009).

3. **Cornelius JP** (2009). The utility of the predictive decapitation test as a tool for early genetic selection for *Hypsipyla* tolerance in big-leaf mahogany (*Swietenia macrophylla* King). *Forest Ecology and Management* 257, 1815-1821.

4. **Cornelius JP** (2009). Manejo y desarrollo de germoplasma para la agroforestería en los trópicos: una orientación [Management and development of agroforestry germplasm in the tropics: an orientation]. Pp. 517-536 in Porro, R. (Ed.) Alternativa Agroflorestal na Amazônia em Transformação [Agroforestry Alternatives for an Amazonia in Transition]. EMBRAPA, Brasilia. 835pp.

5. **Costion C** (2009). New and noteworthy plant records from Palau: an annotated checklist. *Micronesica* 41(1), 1-19.

6. **Costion C,** Kitalong A, Holm T (2009). Plant endemism, rarity, and threat in Palau, Micronesia: a geographical checklist and preliminary Red List assessment. *Micronesica* 41(1), 131-164.

7. **Harrington MG**, Biffin E, **Gadek PA.** (2009) Comparative study of the evolution of nuclear ribosomal spacers incorporating secondary structure analyses within Dodonaeoideae, Hippocastanoideae and Xanthoceroideae (Sapindaceae) *Molecular Phylogenetics and Evolution* 50, 364-375.

8. **Harrington M, Gadek P** (2009) A species well travelled – the *Dodonaea viscosa* (Sapindaceae) complex based on phylogenetic analyses of nuclear ribosomal ITS and ETSf sequences. *Journal of Biogeography* (online early)

9. Henry RJ, Rice N, Waters DLE, Kasem S, Ishikawa R, Hao Y, Dillon S, **Crayn D**, Wing R, Vaughan D. (2009) Australian *Oryza*: Utility and conservation. *Rice* (published online 30 Dec. 2009).

10. Rossetto M, **Crayn D**, Ford A, Mellick R, Sommerville K. (2009) The influence of environment and life-history traits on the distribution of genes and individuals: a comparative study on rainforest trees. *Molecular Ecology* 18 (7), 1422-1438.

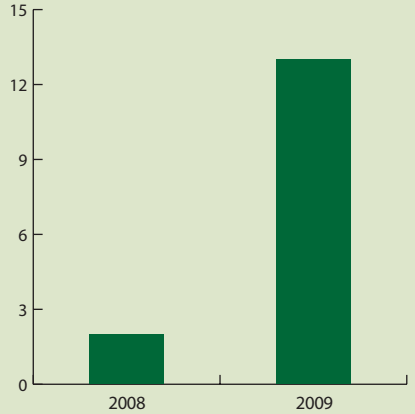
11. Thomas MB, **Turpin GP** (2009) Vascular plants collected during the Cravens Peak Scientific Study, 2nd-7th April 2007. *In* The Royal Geographical Society of Queensland (ed.), Cravens Peak Scientific Study Report, Geography Monograph Series No. 13, pp. 301-309 (The Royal Geographical Society of Queensland, Brisbane).

12. **Turpin GP,** Thomas MB (2009) A vegetation communities and regional ecosystem survey and mapping of Cravens Peak. In The Royal Geographical Society of Queensland (ed.), Cravens Peak Scientific Study Report, , Geography Monograph Series No. 13, pp. 311-328 (The Royal Geographical Society of Queensland, Brisbane).

13. **Venter S** (2009) Synopsis of the genus *Ledebouria* Roth (Hyacinthaceae) in South Africa. *Herbertia: Journal of the International Bulb Society* 62, 85-155.

Key Performance Indicator (KPI) Target: *Five refereed scientific publications on average per annum.*

TARGET ACHIEVED: Thirteen *refereed publications comprising 10 journal articles and three book chapters.*



General Articles (unrefereed)

1. **Crayn DM** (2009) The Australian Tropical Herbarium. *Weedshine – Newsletter of the Weed Society of Queensland*, 40, 8.

2. **Wilson GW** (2009) Travels in Sabah. *Journal of the Cairns Botanic Gardens*, 53.

3. **Wilson GW** (2009) Addressing Sumner-Miller's question: Why is it so? Form and Function in Plants. *Journal of the Cairns Botanic Gardens,* 54.

Research Seminars and Posters

1. **Baba Y, Crayn DM, Bannink P** (2009). *Elaeocarpus* in the Australian Wet Tropics – how many species? Australian Systematic Botany Society Conference, Armidale, NSW, Australia. [poster]

2. **Costion C**, Lowe A, **Crayn D**, Metcalfe D, Cross H (2009). Tree DNA-barcoding in the Wet Tropics of Australasia and its relevance to conservation and biogeography. SAGE (Southeast Asian Gateway Evolution) 2009 Conference, London, UK.

3. **Crayn D**, Lowe A and Cross H (2009). Australasian TreeBoL – an update. TreeBoL workshop, Third International Barcode of Life Conference, Mexico City, Mexico.

4. **Harrington MG, Crayn DM** (2009). The origins of the Australian tropical flora - a molecular phylogenetic approach. Australian Systematic Botany Society Conference, Armidale, NSW, Australia.

5. Lowe A, Cross H, **Costion C**, Wells J, **Harrington M**, Metcalfe D, Ford A, **Crayn D** (2009). Seeing the forest from the trees: Australian tree diversity. Third International Barcode of Life Conference, Mexico City, Mexico.

6. **Puente-Lelievre C**, Brown EA, Quinn CJ, Heslewood MM, **Harrington MG, Crayn DM** (2009). Molecular phylogenetic analysis of Styphelieae (Styphelioideae, Ericaceae). Australian Systematic Botany Society Conference, Armidale, NSW, Australia.

7. **Zich F** (2009). Development of an identification system for Australian tropical rainforest plants – past, present and future. ATFI Seminar Series, February 2009, Cairns, Australia

8. **Zich F** (2009). Australian Tropical Rain Forest Plants: trees, shrubs and vines. An identification system. Friends of the Cairns Botanic Gardens Meeting, February 2009, Cairns, Australia.

9. **Zich F** (2009). Australian Tropical Rain Forest Plants: trees, shrubs and vines. An identification system. MTSRF Annual Conference, April 2009, Townsville, Australia

Talks

1. **Crayn D** (2009) Species, Specimens, Science: The Australian Tropical Herbarium. 'SciCurious' Secondary Science Teacher Training, JCU Cairns Campus.

2. **Wilson GW** (2009) Walk and talk at the Cairns Botanic Gardens with members of the Scope Clubs Australia 2009 conference.

3. **Wilson GW** (2009) *Addressing Sumner-Miller's question: Why is it so? - form and function in the plant world.* Saturday morning seminar and interpretative walk, Cairns Botanic Gardens, Cairns.

4. **Wilson GW** (2009) Botanising in Borneo: *Travels in Sarawak and Sabah.* Friends of the Cairns Botanic Gardens April Meeting, Cairns, Australia.

5. **Wilson GW** (2009) *Botanising Borneo: travels with flora, fauna and tourism in Sarawak and Sabah*. ATFI Seminar Series, JCU.

6. **Wilson GW** (2009) *Sex at the bottom of the Garden: pollination in plants* - Walk and Talk. Cairns Botanic Gardens, Cairns.

7. **Wilson GW** (2009) *Abroad at Night* - Walk and Talk. Cairns Botanic Gardens, Cairns.

8. **Wilson GW** (2009) *Scientific nomenclature*. Kuranda Envirocare Workshop, Kuranda, Australia.

9. **Turpin G** (2009), Ethnobotany in NE Qld. DERM NAIDOC week seminar.

Events

MycoBlitz 2009

In February the ATH hosted FNQ MycoBlitz 2009 for 40 national and international mycologists. During the five-day conference five teams of expert and amateur mycologists surveyed the vegetation of the wet tropics for micro and macrofungi focusing on truffles, coral fungi, rusts/smuts (plant pathogenic fungi), slime moulds, boletes (mushrooms with pores) and *Entoloma* (pink-gilled mushrooms). In total more than 800 specimens were collected, 240 of these photographed, identified to species and lodged in the Australian Tropical Herbarium. Eighty-four specimens were of species targeted by the Fungimap program; 10 of these species were not previously known to occur in NE Queensland. Taxonomic work so far on the collections by participants indicate two new slime mould species records for Australia, 48 *Entoloma* species new to science and two new truffle genera recorded for the Wet Tropics. Feedback from the conference was positive with calls to make the FNQ MycoBlitz a biennial event.

CHAH/HISCOM Joint Annual Meeting

The Council of Heads of Australasian Herbaria (CHAH) is the peak body representing Australasian herbaria and the Herbarium Information Systems Committee (HISCOM) advises CHAH on electronic information systems. ATH hosted the 36th annual CHAH/HISCOM meetings (19-23 Oct) and one day fieldtrip (24 Oct). Heads of 10 Australian and 2 New Zealand herbaria participated, as did representatives of the Australian Biological Resources Study (ABRS). A key outcome was a resolution that amendments to the CHAH constitution be drafted to clear the way for core membership for the Australian Tropical Herbarium (currently restricted to Australian capital city herbaria). Core membership of CHAH would confer significant benefits to ATH.

MAHC Workshop

The ATH hosted a CHAH-sponsored workshop (14-16 Sep) and fieldtrip (17 Sep) for managers of herbarium collections in Australia (MAHC). The purpose of this workshop was to promote exchange of information on curatorial best-practice and develop strategies to streamline inter-herbarium processes (e.g. specimen exchange). There were 13 participants from 10 herbaria including all but one State herbaria. Workshop topics included curation materials and techniques, integrated pest management, policies for destructive sampling and loans/exchange. A key outcome was the implementation of a wiki to facilitate ongoing information exchange, and the training of all workshop participants in its use. Feedback on the workshop from participants was very positive.

Research Students

New enrolments:

Ms Yumiko Baba, James Cook Univ., PhD, commenced Apr 2009, supervisors Prof. D. Crayn , Prof. P. Gadek. Project: 'Systematics, origins and evolution of a rainforest tree genus *Elaeocarpus* (Elaeocarpaceae) in Australasia'.

Ms Caroline Puente-Lelievre, James Cook Univ., MSc, commenced Feb 2009, supervisors Prof. D. Crayn (JCU), Prof. P. Gadek (JCU), Dr E. Brown (Royal Botanic Gardens Sydney). Project: 'Molecular systematics and the evolution of pollen type in the *Astroloma-Styphelia* clade (Styphelioideae, Ericaceae)'.

Continuing students:

Mr Craig Costion, Univ. Adelaide, PhD, supervisors Prof. A. Lowe (U.Adel.), Prof. D. Crayn. Project: 'Phylogenetic diversity analysis of the Australian Wet Tropics flora'.

Ms Margaret Heslewood, Univ. of Adelaide, PhD, supervisors Dr M. Rossetto (Royal Botanic Gardens Sydney), Prof. D. Crayn, Prof. A. Lowe (U.Adel). Project: 'Phylogeography and biogeography of the family Cunoniaceae in Australasia'.

Completions:

Ms Hannah McPherson, Univ. of New England, PhD, supervisors Dr M. Rossetto (Royal Botanic Gardens Sydney), Prof. D. Crayn, Prof. C. Gross (UNE). Project: 'Phylogenetics and evolutionary dynamics of *Tetratheca* (Elaeocarpaceae)'.

Research Income

Total competitive research grant income to ATH in 2009 was **$121,211**. Details of grants are provided below (2009 component of grant value, funds source, project title, total grant value and duration, ATH grantee(s))

1. $5,125, Qld Environment Protection Agency, Effect of Fire on Northern Bettong Resources. $25,000 over 1 year (Jan-Dec 2009), **Abell-Davis S** (0.25 FTE at ATH).
2. $2,563, Qld Environment Protection Agency, Effect of Fire on Northern Bettong Resources. $25,000 over 1 year (Jul 2009-Jun 2010), **Abell-Davis S** (0.25 FTE at ATH).
3. $33,523, Australian Biological Resources Study (ABRS), A revision of generic limits within the *Astroloma-Styphelia* clade and an assessment of the phylogeny of Styphelioideae. $97,046 over 3 yrs (Jul 2008-Jun 2011), **Crayn D**.
4. $2,500, Skyrail Rainforest Foundation, Systematics, origins and evolution of the rainforest canopy tree genus *Elaeocarpus* (Elaeocarpaceae) in Australasia. $5,000 over 2 yrs (Nov 2009-Dec 2010), **Baba Y.**
5. $25,000, Marine and Tropical Scientific Research Facility (MTSRF), Identification Skills Workshops - Australian Tropical Rain Forest Plants. $50,000 over 1 yr (Jul 2009-Jun 2010), **Crayn D, Zich F, Lim A.**
6. $25,000 ACIAR, Development of a PNG timber industry based on community-based planted forests: design and implementation of a national germplasm delivery system. $1million over 5 yrs (2009-2014), **Cornelius J** (0.25 FTE at ATH).
7. $27,500 ACIAR, Development and delivery of germplasm for sandalwood and whitewood in Vanuatu and northern Australia. $1.1 million over 5 yrs (2010-2015), **Cornelius J** (0.25 FTE at ATH), **Page T** (0.25 FTE at ATH).

NOTE: For grants won by proportional ATH staff (Abell-Davis, Cornelius, Gadek, Page), grant value is proportioned by the staff member's ATH FTE (i.e. 0.25).

Total external non-competitive grants and donations to ATH in 2009 was $30000.

Visiting Scientists

ATH received **95** visitors undertaking scientific research. This includes visitors undertaking scientific studies on the collections and collaborative activities of a scientific nature (e.g. meetings) with ATH collaborators.

Another 504 persons visited the ATH for non-scientific reasons, many of whom were part of VIP delegations (see below) or group tours. Of these visitors, **32** were international.

VIP Visitors

- Her Excellency Ms Penelope Wensley AO, Governor of Queensland
- Senator the Hon. Ms Penelope Wong, Federal Minister for Climate Change, Energy Efficiency and Water
- Rt. Hon. Helen Liddell, British High Commissioner to Australia
- Ms Jan Jarratt, Qld. Parliamentary Secretary for Employment and Economic Development, and State Member for Whitsunday
- Mr Jim Turnour, Federal Member for Leichhardt
- Mr Steve Wettenhall, State Member for Barron River
- Mr Curtis Pitt, State Member for Mulgrave

Collaborative Projects

Commenced

Three major externally funded projects commenced: two involve international partners, two involve national partners, and one involves local partners.

In Progress

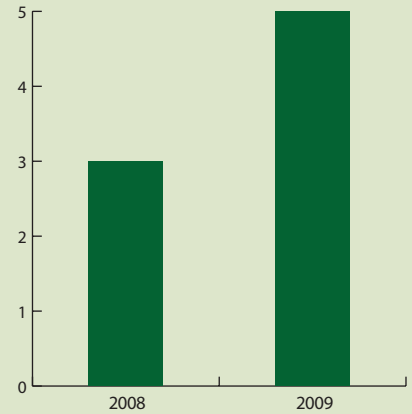
Eighteen projects were active during the reporting period.

Completed

One project was completed during 2008 (Ecology of Truffles).

KPI Target: *Enrol one Doctoral and Masters Degree student on average per annum, including 0.5 Queensland graduates/ 0.5 overseas graduates.*

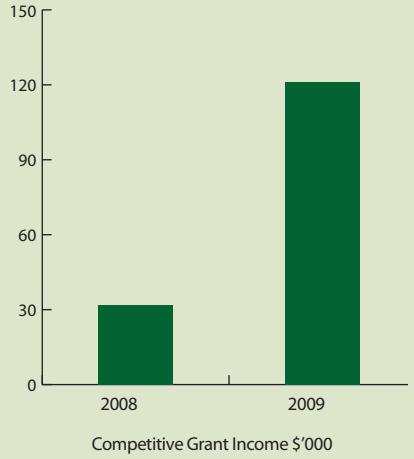
TARGET ACHIEVED: Two *research students began graduate programs at ATH/JCU in 2009.*



ATH Research Student Numbers

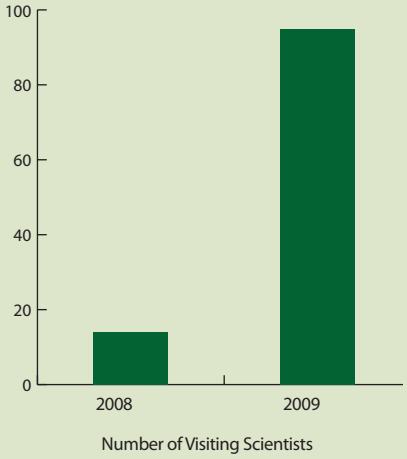
KPI Target: *$30000 of competitive or peer reviewed research grants on average per annum.*

TARGET ACHIEVED: $121,211 *competitive research grant cash income in 2009.*



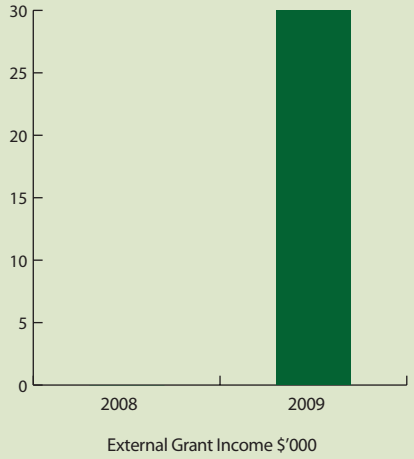
KPI Target: *Twenty visiting national and international scientists on average per annum.*

TARGET ACHIEVED: Ninety-five *visiting scientists in 2009.*



KPI Target: *$15000 of external grants or donations on average per annum.*

TARGET ACHIEVED: $30,000 *external grant cash income in 2009.*



KPI Target: *Enter into one local, one national, and one international multidisciplinary, collaborative projects on average per annum.*

TARGET ACHIEVED: One *local, one national, and one international collaborative projects initiated in 2009.*

Cattana wetlands, photo © Andrea Lim 2009.

Taxonomic work so far …

indicates two new slime mould species records for Australia, 48 Entoloma *species new to science and two new truffle genera recorded for the Wet Tropics.*

Above: Botanists Eda Addicott and John Neldner collect site data for the Cape York Peninsula Regional Ecosystem mapping program, photo Mark Newton, © DERM 2009.
Below: *Microporus xanthopus,* a common tropical Australian fungus. Photo © Andrea Lim 2009.

Facilities

Herbarium

The ATH collection, a fully databased and representative archive of preserved plant specimens that supports the ATH's research and botanical information delivery programmes, is comprised of:

- *c. 150,000 specimens that are pressed, dried and mounted on herbarium sheets held in the Collection Room*
- *c. 16,000 specimens that are pickled in 70% ethanol held in the Spirit Room*
- *c. 2500 wood blocks*

New herbarium specimens accessioned in 2009 totalled 1894. In addition 2893 collection records were edited and 2612 specimens were redetermined.

Usage of the main collections by scientific visitors totalled 339 hours. In addition ATH staff ran 36 tours for non-scientific visitors (total 314 persons).

Several staff were assigned herbarium duties on a part time basis to help clear the curatorial backlog resulting from wind-down of activities in the last years of CSIRO's Atherton herbarium, and the subsequent move of collections and startup lag. Processing (mounting, databasing and incorporation) of the backlog of new collections is now up to date.

ATH's integrated pest control strategy proved effective and no pests of concern for herbarium specimens were detected in any area of the ATH.

Public Reference Collection

The Public Reference Collection (PRC) is a collection of herbarium specimens, literature, interactive CD keys and other resources for identifying plants, available to the public, consultants, and other interested persons to identify their own collections.

Usage of the PRC by the public totalled 166 hours during 2009. New specimens added to the PRC specimens totalled 415. Almost all of these were species previously unrepresented in the PRC. The estimated ultimate size of the ATH PRC is > 4000 taxa.

Specimen Database

The ATH collections are fully databased within the Oracle database hosted at the Centre for Plant Biodiversity Research (CPBR) in Canberra and accessible by ATH staff via secure internet link for data entry, query and reporting. Web access, with password protection, will also enable public queries and data downloads. Records will also be visible through the Australia's Virtual Herbarium (AVH).

The specimen database, ATHIS, became operational in May 2009 and with the exception of two brief periods (due to construction works near the ANBG, Canberra) has operated reliably and with fast connection speeds. The use of web-based Oracle forms has proven very effective in enabling users to log on from any IT network. Protocols were established that will allow ATH data to be delivered through the AVH portal in 2010.

Library

The ATH library collection contains over 500 titles, including all the major serials on the taxonomy of plants relevant to tropical Australia.

Laboratory

The ATH maintains a state of the art molecular genetics lab capable of supporting a wide range of DNA-based biodiversity and evolutionary research methods including sequence analysis, genotyping using a range of techniques from RFLPs to microsatellite analysis, and in the future, genomics. At capacity the lab caters for 6-8 researchers and students.

During 2009 the great majority of the equipment purchased with fitout funds was installed, transforming the laboratory into a fully operational research facility. A functional workflow model was established and standard operating procedures and maintenance routines developed to ensure the safety of laboratory users and the longevity of the equipment.

Since becoming operational, the laboratory has undergone several AQIS audits – mandatory for the maintenance of our Quarantine Containment (QC) classification – and compliance achieved.

Toward the end of 2009 there were six regular users of the laboratory, including one volunteer.

DNA and Tissue Bank

The ATH is developing a cryo-bank of plant and fungal DNA and frozen tissue samples, archived at -80 deg. C. This bank will support molecular genetics studies as well as being an unrivalled resource for bioprospecting in tropical Australian plants and fungi.

During 2009, ATH students and staff added approximately 1500 DNA samples, representing the majority of the genera present in the wet rainforests of North Queensland, to the ATH DNA/Tissue Bank. The total number of samples now exceeds 3600, representing over 1300 species of Australian tropical plants.

We look forward to finalising the purchase of a 2D-barcoded tube racking/storage system in 2010 – the final step in establishing an extensive DNA archive collection.

…1500 DNA samples were added to ATH's DNA bank during 2009 …

Research Projects

Research at the Australian Tropical Herbarium falls into the following five themes:

- **Theme 1 – Biodiversity, Taxonomy, Evolution**
  Assessment of tropical plant biodiversity through tropical plant and fungal systematic and evolutionary studies, including taxonomy, biology, biogeography, ecology, and genetics of tropical plants and fungi;

- **Theme 2 – Threats And Impacts**
  Impacts of fragmentation, degradation, weeds and threatening processes on tropical flora, such as exploring genetics and reproductive strategies of environmental weeds leading to improved control strategies, and exploring ecophysiology and quantitative genetics in understanding climate change impacts on the tropical flora;

- **Theme 3 – Human Uses Of Flora**
  Ethnobotany, and innovative utilisation of tropical plant and fungal resources, such as biodiscovery and bioprospecting, novel crops and commercialisation;

- **Theme 4 – Planning And Management**
  Planning and management of tropical flora, or biodiversity and ecosystem management;

- **Theme 5 – Unlocking Our Knowledge**
  Training and capacity-building including developing more effective ways to deliver herbarium "products" to the community

Details of research undertaken by ATH staff during 2009 under each of these themes is provided below.

Theme 1 – Biodiversity, Taxonomy, Evolution

DNA-Barcoding Australian trees

DNA-Barcoding is the use of short, standardised DNA sequences to identify biological material. A global movement is progressing research on two major fronts: (1) developing the reference database of DNA-barcodes from all life, and (2) building a handheld DNA-barcode reader to allow anyone to identify any life form, anywhere.

During 2009, ATH students and postdoctoral fellows added approximately 1500 DNA samples to the ATH DNA/tissue Bank, representing c. 520 genera, the majority of the vascular genera present in the wet rainforests of North Queensland, and more than 20% of the species. Sequencing of the chloroplast 'barcode' markers *matK* and *rbcL* is proceeding well.

Research Team: Darren Crayn (ATH), Craig Costion (Univ. Adelaide and ATH), Brett Summerell (RBG Sydney), Andy Lowe (Univ. Adelaide and South Australian Herbarium). Hugh Cross (Univ. Adelaide).

Systematics of *Wilkiea* (Monimiaceae)

This project is assessing the distinctness and affinities of a potential new species of Wilkiea *from north east Queensland. Taxonomic assessment of this species has been held back until recently by the lack of flowering and fruiting material.*

A draft paper describing a new species of *Wilkiea* is close to completion and will be submitted in 2010. Collaborative research undertaken with Prof Suzanne Renner has confirmed, on the basis of molecular genetic data, the distinctness of this new species and it's relationships within the genus.

Research Team: Andrew Ford (CSIRO), Frank Zich (ATH).

Fungi of northeast Queensland

Mycology, the study of fungi, is an understudied field worldwide. Mycology in the wet tropics bioregion of far north Queensland has been especially neglected. There is a current surge in interest both nationally and internationally for research to be carried out within the wet tropics bioregion. One of the aims of the ATH is to facilitate and expand mycological research and collections within this region.

Organisation of FNQ MycoBlitz 2009 and followup research was the major activity on the fungal front for 2009. Taxonomic work on the collections by MycoBlitz participants indicate so far two new slime mould species records for Australia, 48 *Entoloma* species new to science and two new truffle genera recorded for the Wet Tropics.

Project Team: Sandra Abell (ATH/JCU) and numerous collaborators/participants.

Phylogenetics and evolutionary dynamics of Elaeocarpaceae

The phylogenetics, biogeography and within-species genetic diversity in Elaeocarpaceae, a worldwide family of over 500 species in 12 genera, is being studied. Molecular phylogenetic and biogeographic studies are being used to clarify origins and patterns of diversification among lineages within the Elaeocarpaceae/Tremandraceae complex. Within the phylogenetic framework, we are analysing population-level genetic diversity in selected species in order to provide an insight into comparative evolutionary responses and speciation mechanisms in dry-adapted shrubs and rainforest tree species.

PhD student Ms Yumiko Baba took up this project in April 2009. Since beginning active research in July she has focused on obtaining research materials, particularly DNA samples and testing various plastid loci for their potential utility for resolving phylogenetic relationships within *Elaeocarpus*.

Baba won a $5000 grant (Skyrail Scientific Research Fund) to undertake a taxonomic and ecological niche modelling study of three putative new species of *Elaeocarpus*. Preliminary results of this study were presented at the 2009 Australian Systematic Botany Society conference in Armidale (NSW) in December, and her poster was well received.

Baba Y, Bannink P, Crayn D. (2009). *Elaeocarpus* in the Australian Wet Tropics – how many species? Australian Systematic Botany Society Conference, Armidale, NSW, Australia.

A short field trip in N NSW was undertaken in December to collect and observe elaeocarps in the field.

Project Team: Yumiko Baba (PhD candidate, ATH/JCU), Darren Crayn (ATH), Maurizio Rossetto (National Herbarium of NSW), Hannah McPherson (National Herbarium of NSW), Mark Coode (Kew Gardens, UK).

Phylogeny and population dynamics of Cunoniaceae

Cunoniaceae is a family of mostly rainforest trees thought to be of Gondwanan origin. This project investigates the origins and evolution of the family and in particular the genus Ceratopetalum *using dated molecular phylogenies for* Ceratopetalum *species to evaluate the role of long distance dispersal and vicariance in explaining present distributions. Furthermore, present day genetic structure and geographic distribution of* Ceratopetalum *species will be determined to infer the strength and directions of gene flow within and between populations for each taxon.*

Field collections were made from populations of three Wet Tropics *Ceratopetalum* species. Data collection is now complete for: a phylogenetic analysis of Cunoniaceae using three chloroplast and one nuclear marker; population genetic analysis of coachwood (*Ceratopetalum apetalum*) across NSW using 16 nuclear (nSSR) and four chloroplast microsatellites (cpSSRs), and six species of *Ceratopetalum* from the Wet Tropics; phylogeographic analysis of all Australian *Ceratopetalum* species using 1 chloroplast and 2 nuclear markers. Results were presented at in-house workshops at the Royal Botanic Gardens Sydney and the State Herbarium of South Australia in 2009. Final analyses and preparation of a thesis and manuscripts will occur during 2010.

Project Team: Margaret Heslewood (PhD student, National Herbarium of NSW and Univ. Adelaide), Maurizio Rossetto (National Herbarium of NSW), Darren Crayn (ATH), Andy Lowe (Univ. Adelaide, State Herbarium of South Australia), Johan Pillon (Institut de Recherche pour le Developpement, New Caledonia).

Phylogenetic diversity analysis in the Wet Tropics flora

This study will investigate, using a plot based approach, the relative performance of taxonomic diversity (species counts) and phylogenetic diversity (branch lengths on molecular phylogenies) measures for conservation priority setting. This project is aligned with the tropical tree DNA-barcoding project and data will contribute to both projects.

At approximately two-thirds the way through the project is ahead on all milestones. Sample collection has been particularly successful with representatives of 520 genera collected from the wild, exceeding the project target of 480 genera by 8%. We have completed extraction of all 520 collected samples, optimised PCR protocols and sequenced the plastid locus *rbcL* for representatives of 340 genera, 71% of the project target 480. The remaining 140 genera will be sequenced ahead of the target completion date (Sep. 2010). The final two project components - data analysis and manuscript preparation – are scheduled to begin in Sep. 2010 and Jan. 2011 respectively.

Research Team: Craig Costion (PhD student, Univ. Adelaide and ATH), Prof. Andy Lowe (Univ. Adelaide, State Herbarium of South Australia), Prof. Darren Crayn (ATH), Dr Dan Metcalfe (CSIRO), Andrew Ford (CSIRO).

Phylogenetics and the evolution of ecophysiological traits in Bromeliaceae

This multidisciplinary project aims to clarify the evolution of key ecophysiological traits, such as Crassulacean acid metabolism (CAM) in the bromeliads and relatives. This is being achieved by: (1) using molecular data to build improved phylogenetic trees for the group, and (2) determining the occurrence of CAM in bromeliad species by carbon isotope analysis of plant tissue.

Compilation and analysis of data was completed and a manuscript submitted to *Evolution.* On the editor's recommendation the manuscript was withdrawn and will be split into two papers both to be submitted in 2010. One paper will focus on the systematics aspects of the research (*for American Journal of Botany*) and the second will focus on the evolutionary aspects (for *Evolution*).

Project Team: Darren Crayn (ATH), Andrew Smith (Univ. of Oxford, UK), Klaus Winter (Smithsonian Tropical Research Institute, Panama), Walter Till (Botanical Institute, Vienna, Austria), Thomas Givnish (Univ. Wisconsin, USA), Georg Zizka and Katharina Schulte (Senckenberg Institute, Germany).

Systematics and evolution of Styphelioideae (Ericaceae)

This project will resolve the generic limits within the Astroloma-Styphelia group, a problem clade of Ericaceae subfamily Styphelioideae, using nuclear and plastid nucleotide sequences. Patterns of relationship will be studied at genus and species level using established molecular techniques. The taxonomic assessment and publication of poorly known and/or undescribed species of high conservation value will be a priority.

PhD student Ms Caroline Puente-Lelievre took up this project in March 2009. Since beginning active research in June she has produced purified DNA from 40 species previously not sampled and assessed the utility of four loci for phylogenetic reconstruction in this group: *trnL-trnF, rpoC1, psbK-psbI, psbA-trnH.* On the basis of these results *trnL-trn* was selected for intensive work and by end 2009 32 taxa were sequenced for this locus. Also, 18 taxa were sequenced for *atpB-rbcL* and added to an existing database.

Analyses of these and pre-existng datasets allowed a preliminary estimate of ages of clade divergences in this group. A key finding was that several nodes bearing sister groups endemic to SE Aust. and SW Aust. respectively, are dated contemporaneously, around 10-5 Mya. This suggests the origin of a biogeographical barrier, likely the Nullarbor Plain, supporting postulations by other authors on the basis of analysis of other plant groups. Puente presented these results at the 2009 Australian Systematic Botany Society conference in Armidale (NSW) in December, and her talk was well received.

Project Team: Caroline Puente-Lelievre (PhD candidate, ATH/JCU), Darren Crayn (ATH), Elizabeth Brown (National Herbarium of NSW), Mike Hislop (Western Australian Herbarium), Chris Quinn (National Herbarium of NSW).

Origin and diversification of *Dracophyllum* (Ericaceae)

The genus Dracophyllum *contains cushion plants, shrubs and small trees distributed in Australia and the SW Pacific. We are investigating evolutionary processes that have contributed to the disparity in species richness and diversity seen between Australia and the archipelagos of New Zealand and New Caledonia.*

Our analysis indicates that the Western Australian genus *Sphenotoma* (c. 7 species) forms a distinct evolutionary lineage that diverged from *Dracophyllum* (c. 50 species) and *Richea* (11 species) during the Miocene. We recovered two distinct lineages of *Richea* recognized as *Richea* sect. *Cystanthe* and *R.* sect. *Dracophylloides;* these were nested within *Dracophyllum*. The New Caledonian and New Zealand species of *Dracophyllum* arrived by long-distance dispersal during the Pliocene. Low levels of sequence divergence suggest a rapid and relatively recent species radiation in these two island archipelagos – in New Zealand this accompanied Pliocene uplift of the Southern Alps and episodes of glaciation during the Pleistocene.

A paper was submitted and accepted (20 Oct) for Annals of the Missouri Botanical Garden vol 97 which should appear in mid-2010.

Wagstaff SJ, Dawson MI, **Venter S**, Munzinger J, **Crayn DM**, Steane DA, Lemson KL (accepted). Origin, diversification, and classification of the Australasian genus *Dracophyllum* (Richeeae, Ericaceae). *Annals of the Missouri Botanical Garden 97*.

Project Team: Steve Wagstaff (Landcare Research, NZ), Murray Dawson (Landcare Research, NZ), Fanie Venter (ATH), Darren Crayn (ATH), Kristina Lemson (Edith Cowan University, Western Australia), Jerome Munzinger (Institut de Recherche pour le Developpement, New Caledonia), Dorothy Steane (Univ. of Tasmania).

Origins, evolution and molecular identification of Lauraceae

Lauraceae is a large, globally distributed plant family of about 3000 species, mostly rainforest trees. This project aims to improve our understanding of the origins and evolution, and revise the taxonomy if necessary, of this family (focusing on the subfamily Cryptocaryeae) by conducting: (1) phylogenetic, divergence-time and historical biogeographical analyses; (2) phylogeographic studies on selected taxa to determine species limits and the relative importance of vicariance vs. dispersal in species radiation in Lauraceae. Furthermore, a DNA-barcode database for Cryptocaryeae will be developed.

A major collecting trip in the Australian Wet Tropics was undertaken to fill sampling gaps for constructing the species level phylogeny of the Australian Lauraceae and to collect samples representing populations for six species that have been identified as targets for an in-depth phylogeographic study. This trip and follow up work have obtained all but two species of Australian Lauraceae (excluding *Cassytha*) and DNA has been extracted from all collected material (around 300 samples). The chloroplast regions *psbA-trnH* and *trnL-F* have been sequenced for over 85% and 45% respectively, of the rainforest species. Preliminary phylogenetic results, with emphasis on in the Cryptocaryeae group, support the monophyly of *Cryptocarya* while the two genera *Endiandra* and *Beilschmiedia* seem paraphyletic. Thus far, while relationships amongst many species remain unresolved some of the groups proposed by Hyland in the last revision of the Australian Lauraceae received significant support from the molecular phylogenies.

Project Team: Marlien van der Merwe (National Herbarium of NSW), Darren Crayn (ATH), Maurizio Rossetto (National Herbarium of NSW), Henk van der Werff (Missouri Botanical Garden), Peter Weston (National Herbarium of NSW).

Plant Diversity of Mt Spurgeon

The plant diversity of Mt Spurgeon is being studied. Mt Spurgeon is a central feature of the floristically poorly known Carbine Tableland located c. 15 km W of Mossman (145º 14′ E, 16º 26′ S) which preserves contiguous savanna, rainforest and ecotonal habitat.

A multidisciplinary team including under- and postgraduate students and staff botanists undertook a three day exploratory trip in November to Coopers Camp at 1114 m on Mt Spurgeon to examine the potential of the site for further studies of high altitude flora. The site is in the Highland altitude zone of Tracey (1982) and compliments Upland (400-800 m) and Lowland (< 40 m) study sites at Tinaroo and the Canopy Crane (Daintree). It sits astride a dry sclerophyll, tall moist, and upland rainforest ecotone, and includes a suite of endemic species, e.g. *Prumnopitys ladei,* fine examples of emblematic species, e.g. *Agathis atropurpurea,* and an impressive array of orchid species. Initial results were promising; numerous botanical collections were made and five individuals of the rare undescribed entity *Elaeocarpus* sp. Mt Misery were found. The material collected is currently being processed and further field trips to the site are planned.

Project Team: Gary Wilson (ATH), Peter Cooper (JCU), Yumiko Baba (ATH).

Theme 2 – Threats and Impacts

Influence of climate change on phenology of tropical rainforest plants

Possible effects of climate change on the timing of life history events (phenology) in tropical rainforest plants is being studied by monitoring the flowering and fruiting times of selected rainforest tree species over a ten-year period.

The research team led by Dr Mike Liddell (JCU) has established the research sites, taxa to be studied and the methodology for this study. Phenological observations have been made at the Australian Canopy Crane Research Facility at Cape Tribulation, and the Skyrail Rainforest Cableway. ATH's contribution will be identification and vouchering of study taxa.

Theme 3 – Human Uses of Flora

Ethnobotany

Research is being undertaken into the ways in which indigenous peoples of the northern Australian region use plants for cultural practices, shelter, food, medicine, fibre, etc.

In 2009 the ethnobotany program was focused on establishing relationships with traditional landowners and research collaborators (especially CSIRO Sustainable Ecosystems), and developing an appreciation of existing knowledge gaps and research opportunities. A literature review of ethnobotanical knowledge in NE Queensland was completed. Projects and achievements for 2009 include:

1. Recording of traditional use of plants with local indigenous groups at Hopevale, Cape York Peninsula. Two major trips undertaken, resulting in over 100 plant collections and numerous audio recordings of interviews with traditional landowners.
2. Survey of wetlands and surrounding areas on indigenous land with traditional owners, Cape York Peninsula. 98 collections, 8 days
3. Preliminary work on recording of plant-focused cultural heritage with Mbarabaram group, Irvinebank.
4. Indigenous Knowledge and Western Science survey in collaboration with CSIRO Sustainable Ecosystems. Two major field trips were undertaken to Wujal Wujal and Mamu country, and 7 interviews conducted with key TOs.

Research Team: Mr Gerry Turpin (ATH), Dr Fanie Venter (ATH).

Agroforestry

The Agroforestry and Novel Crops Unit (ANCU) of James Cook University aims to enhance tropical livelihoods through sustainable use of plant biodiversity, with an emphasis on the Pacific region and Far North Queensland. ANCU staff are affiliated with the ATH. ANCU has two principal research foci: participatory tree domestication (genetic improvement and product development), and deployment of superior material in multifuctional agroforestry systems.

During 2009, further advances have been made in the projects reported on in 2008 and significant new activities have been initiated.

In PNG, ANCU continued work with research partner NARI (the National Agricultural Research Institute) on domestication of galip-nut (*Canarium indicum* (Burseraceae)), a widely-consumed local nut species. The emerging galip-nut industry is an important alternative in cocoa-producing provinces such as East New Britain, due to the continuing spread of the cocoa pod borer. During 2009 work advanced on two fronts: a valuable clone bank of local selections was established at NARI Kerevat while a study of the domestic market for galip nut was completed. Consolidation of the local market is considered a vital complement to the development of a viable export industry.

In Vanuatu, ANCU, in partnership with the national Forestry Department, completed a socioeconomic study of the sandalwood industry.

Three major new initiatives commenced in 2009. Work on sandalwood in Vanuata has taken a significant step forward with the inception of a major new tree improvement project (ACIAR funded). In PNG work began on a project aimed at developing national agroforestry tree germplasm supply systems focusing on teak as a model species. Also in PNG, ANCU has partnered with JCU colleagues and the Woodland Zoo's tree kangaroo conservation project on activities aimed at supporting the YUS conservation area, PNG's first such protected area. ANCU's work in YUS concentrates on building livelihood options for people within the Conservation Area.

Research Team: Dr. Jonathan Cornelius (ATH, JCU), Dr Tony Page (ATH, JCU), Anton Lata (MSc candidate, JCU), and research associate Anna Potrawiak.

Eucalyptus community on granite hills near Mareeba, Far North Queensland, photo Mark Newton, © DERM 2009.

Above: *Licuala ramseyi,* the iconic fan palm, photo Gary Wilson. Below: Montane vegetation with emergent *Leptospermum wooroonooran,* Mount Bellenden Ker, photo Andrea Lim.

Our analysis indicates that … New Caledonian and New Zealand species of Dracophyllum *arrived by long-distance dispersal during the Pliocene. Low levels of sequence divergence suggest a rapid and relatively recent species radiation in these two island archipelagos.*

Theme 4 – Planning and Management

Regional Ecosystem Mapping

As part of the Queensland Herbarium's State-wide Regional Ecosystems (RE) Mapping Programme, ATH staff are mapping (at 1:100,000 scale) REs for the Cape York Peninsula and Einasleigh Uplands bioregions and parts of the Channel Country bioregion and the Gulf Plains bioregion. Mapping and survey is being done in blocks of 1:250,000 scale map sheets.

Project Team: Eda Addicott (ATH), Peter Bannink (ATH), John Neldner (DERM), Mark Newton (ATH), Gerry Turpin (ATH), Gary Wilson (ATH).

Cape York Peninsula biogeographic region

Seamless pre-clearing and remnant coverages of vegetation communities and regional ecosystems at 1:100,000 scale were produced for the Ebagoola 1: 250,000 map sheet. Work commenced on the seamless pre-clearing and remnant coverages of vegetation communities and regional ecosystems at 1: 100,000 scale for the Coen 1: 250,000 map sheet. Work continued on the collation of all past survey data. These and some extra gap-filling field work performed in 2009 will provide a solid basis for provision of detailed web-based RE descriptions and keys.

Channel Country biogeographic region

Work continued on pre-clearing and remnant vegetation communities and regional ecosystems coverages at 1:100,000 scale for Durham Downs 1:250,000 map sheet.

Gulf Plains biogeographic region

Seamless pre-clearing and remnant coverages of vegetation communities and regional ecosystems at 1:100,000 scale were produced for the Donors Hill 1:250,000 map sheet.

Einasleigh Uplands biogeographic region

Work continued on detailed technical descriptions of the Einasleigh Uplands regional ecosystems to go with the seamless mapping coverage. Work continued on the collation of all past survey data. These and some extra gap-filling field work performed in 2009 will provide a solid basis for provision of detailed web-based RE descriptions and keys. Work continued on revising and updating the seamless Einasleigh Uplands bioregion RE mapping.

Theme 5 – Unlocking our Knowledge

Rain Forest Key

The "Australian Tropical Rain Forest Plants - Trees, Shrubs and Vines" (a.k.a. the Rain Forest Key, or RFK) is an interactive multiple-entry identification and information system, where the user decides which characters to choose based on the specimen in hand. A total of 138 characters, covering morphology - habit, bark, leaves, flowers, fruits and seedlings - and some geographic and ecological information ensure reliability and power of the key is high. Illustrated help notes assist with interpretation of characters. Plant images help to confirm identification. The latest version, published in 2003, includes 2154 species of trees, shrubs and vines of northern Australian rain forests. Further development will add modules for other plant life forms including orchids, herbs, ferns, parasites, saprophytes, palms and pandans – together adding c. 865 species. It is anticipated that the new identification system for all plant groups will be available on the web by end of 2010, as well as on DVD and other novel technologies.

CBIT programmers completed program modifications to Lucid software to enable loading of the RFK specimen-level coding and then loaded all original coding into the new version. The performance of the Lucid key was tested and confirmed to be operating correctly. Entry of coding data for herb species into the new Lucid platform was completed. The database of taxon profile information (descriptions, distribution and notes) is being continually updated. The database of images was updated and a significant number of additional images assessed and selected for use in the RFK.

Project Team: Frank Zich (ATH), Ashley Field (ATH, JCU), Jim Croft and John Connors (Aust. National Botanic Gardens), Peter Bostock (DERM), Trevor Whiffin (LaTrobe Univ.), Judy West (CSIRO), CBIT Programmers (CBIT, Univ. Queensland).

Ethnobotanist Gerry Turpin examines an *Acacia* specimen in the field, photo Mark Newton, © DERM 2009.

Participants in activities

Board

Dr Greg Leach (Independent Chairperson)

Dr Jeremy Burdon (CSIRO)

Prof Chris Cocklin (JCU)

Prof Paul Gadek (JCU)

Dr Gordon Guymer (DERM)

Dr Judy West (CSIRO)

Dr Christine Williams (DERM)

Staff

Dr Sandra Abell-Davis*

Ms Eda Addicott

Ms Yumiko Baba

Mr Peter Bannink

Mr Mason Campbell

Dr Jonathan Cornelius*

Prof Darren Crayn (Director)

Prof Paul Gadek*

Dr Mark Harrington

Ms Melissa Harrison

Ms Louise Hucks

Ms Andrea Lim

Mr Mark Newton

Dr Tony Page*

Ms Caroline Puente-Lelievre

Mr Gerry Turpin

Mr Gary Wilson

Mr Stuart Worboys

Mr Frank Zich

** together contribute one full-time-equivalent position*

Students

Ms Yumiko Baba (PhD, James Cook University, principal supervisor Prof Crayn, co-supervisor Prof Gadek)

Mr Craig Costion (PhD, University of Adelaide, principal supervisor Prof Andy Lowe, co-supervisor Prof Crayn)

Ms Margaret Heslewood (PhD, University of Adelaide, principal supervisor Prof Andy Lowe, co-supervisor Prof Crayn)

Ms Hannah McPherson (PhD, University of New England, principal supervisor Prof Caroline Gross, co-supervisor Prof Crayn)

Ms Caroline Puente-Lelievre (PhD, James Cook University, principal supervisor Prof Crayn, co-supervisor Prof Gadek)

Volunteers

Mr Murray Borrell

Mr Mason Campbell

Mrs Wendy Cooper

Mr Donn Corcoran

Mrs Nanette Fairbairn

Mrs Mary Gandini

Mr Iain Goodrick

Ms Melinda Greenfield

Mr Bob Jago

Mrs Catherine Kaehne

Mr Cameron Kilgour

Mr Gerald Krygsman

Ms Debra McKeown

Mr Luigi Montrasio

Ms Alessia Mortari

Mr Garry Sankowsky

Mrs Nada Sankowsky

Mr Damian Settle

Ms Lalita Simpson

Mr Lincoln Thompson

Ms Bronwyn Townsend

Dr Fanie Venter

Ms Susie Warner

Mrs Heather Winsor

Mrs Judith Woods

Mr Stuart Worboys

Representation on External Committees

Australian Biological Resources Study Advisory Board, Crayn D, member

Australian Canopy Crane Research Station Scientific Committee, Crayn D, member.

Australian Mycological Society, Abell-Davis S, Councillor.

Australian Systematic Botany, Crayn D, Associate Editor.

Australian Systematic Botany Society, Harrington M, NQld Chapter Convenor.

Australian Systematic Botany Society, Zich F, Councillor.

Council of Heads of Australasian Herbaria, Crayn D, ATH representative.

Journal of Systematics and Evolution, Gadek P, Associate Editor

NE Herbarium International Review Panel, Crayn D, member

TreeBoL - Australasian regional coordinator, Crayn D

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