

DESERT KNOWLEDGE CRC

The Working Paper Series

Plants for People: Aboriginal wild harvest and land management

Louis Evans

Working Paper

34

2009

Seminar convened at the Centre for the
Management of Arid Environments, Kalgoorlie,
Western Australia, 21 April 2006

Plants for People:
Aboriginal wild harvest
and land management

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Louis Evans

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Executive summary

A seminar on Aboriginal wild harvest and land management was convened by the Centre for Sustainable Mine Lakes (CSML) and the Centre for Management of Arid Environments (CMAE) on Friday, 21 April 2006 in the CMAE Seminar Room, Department of Agriculture, Kalgoorlie. The seminar was sponsored by the Desert Knowledge CRC and CSML and was attended by over 30 people, with approximately half of the attendees being Aboriginal people.

The aim of the seminar was to explore opportunities and processes for Aboriginal groups to develop natural resource enterprises or participate in management of national parks, and was directed at Aboriginal organisations, government agencies and private industry personnel with interests and involvement in Aboriginal enterprise development and sustainable land management.

The morning session of the seminar comprised a series of presentations of relevance to the wild harvest of plant products and Aboriginal involvement in land management (see program; Appendix 1), with the keynote address being delivered by Dr Mary Stockdale, the 2006 Haydn Williams Fellow. Other presentations dealt with medicinal plant harvesting, the Plants for People (P4P) program, WA Department of Conservation and Land Management and Goldfields Land and Sea Council (GLSC) programs of relevance to wild harvest and land management, a video on Aboriginal land management, and a report on a workshop on soap and body product manufacture. The afternoon session comprised a strategic planning discussion on opportunities and constraints to wild harvest and land management by Aboriginal people.

The afternoon session comprised a two-hour discussion on a wide range of topics including land management on pastoral stations, Indigenous Land Corporation (ILC) support for land purchases, non-government organisations' (NGO) involvement in land management activities in the Kalgoorlie region, mining industry involvement and support for land management activities, the role of the GLSC in enterprise and land management and opportunities for wild harvest, and land management projects conducted by Aboriginal people.

The group recommended that P4P initiate discussions aimed at developing a project proposal for the Goldfields region on cultivation, wild harvest and sustainable management of medicinal and food plants involving Aboriginal and NGO groups, GLSC, ILC and mining companies.

Overview

The Aboriginal Wild Harvest and Land Management Seminar was convened by the Centre for Sustainable Mine Lakes (CSML) and the Centre for Management of Arid Environments (CMAE), with sponsorship provided by the Desert Knowledge CRC (DKCRC) and CSML. The one-day seminar was conducted at CMAE, Department of Agriculture, Kalgoorlie on Friday, 21 April 2006.

Seminar aim

The aim of the seminar was to explore opportunities and processes for Aboriginal groups to develop natural resource enterprises or participate in management of national parks, and was directed at Aboriginal organisations, government agencies and private industry personnel with interests and involvement in Aboriginal enterprise development and sustainable land management.

Seminar program

The morning session of the seminar comprised a series of presentations on topics of relevance to Aboriginal enterprise development and land management with emphasis on strategies for success in Aboriginal initiatives in these areas and on the application of traditional ecological knowledge and multimedia technologies to enterprise and management practices. In the afternoon a strategic planning session was held at which representatives from Aboriginal communities, a mining company, a non-government organisation (NGO), Goldfields Land and Sea Council (GLSC), Indigenous Land Corporation (ILC) and university research groups discussed opportunities for projects in the wild harvest and land management areas. The seminar program is shown in Appendix 1 and details of presenters and presentation topics are provided in Appendix 2.

Attendees

The seminar was attended by 30 adults and seven children. Over half of the attendees were Aboriginal people, some from government-funded organisations and agencies (CALM, GLSC) but the majority from Indigenous communities. All major agencies with an interest and involvement in Aboriginal enterprise and land management were represented (CALM two attendees; GLSC two; Goldfields Esperance Development Commission (GEDC) two; ILC one) plus attendees from NGOs (four), the WA Department of Education (one), DKCRC/CSML/Haydn Williams Fellowship group (five) and one mining company sustainability adviser.

Seminar presentations

The seminar was opened with a 'welcome to country' by Mr Dennis Sambo, a traditional owner from the Kalgoorlie region. Associate Professor Ben Norton, CMAE, then provided a thoughtful and entertaining talk about an ancient, now extinct, medicinal plant, *Silphium*, that was once as valuable as gold. The plant became extinct due to over exploitation. The talk was a very appropriate opening to a seminar on sustainable wild harvest and land management of native plants. Professor Louis Evans, Project Leader, DKCRC and Executive Director, CSML, made a presentation on the Plants for People program (P4P), a capacity building and research program jointly coordinated by CSML and DKCRC. This talk gave an overview of P4P, provided information on various P4P projects and their achievements, and raised issues of relevance to the afternoon strategic planning forum. The next session comprised a discussion forum on Aboriginal land management and enterprise, led by Tania Donovan, CALM, and Dennis Forrest, GLSC. The presenters, both Aboriginal people, outlined their agency's programs in the area of land management and Aboriginal enterprise and employment.

The keynote address was provided by the Curtin University 2006 Haydn Williams Fellow, Dr Mary Stockdale. Dr Stockdale, an eminent ethnoecologist, has had extensive experience in wild harvest

enterprises in Indonesia, the Philippines and other countries. Mary's lecture drew on her work with Indigenous communities and described how traditional ecological knowledge (TEK) has an important role to play in sustainable land management practices. Information was provided on how Indigenous communities are documenting their TEK in written and digital (multimedia) formats, and how this knowledge is being applied in managing natural resources as well as in influencing decision-makers outside the community on important environment-related issues. Dr John Corbett, who accompanied Dr Stockdale and who has expertise in the use of multimedia as a capacity building and educational tool in Indigenous communities, joined with Kado Muir, an Aboriginal leader from the Tjupan Ngalia community at Leonora, to present a 30-minute video on Aboriginal land management practices and opportunities. The video had been prepared by the Tjupan Ngalia group with the assistance of Dr Corbett, Dr Stockdale and a DKCRC PhD student, Guy Singleton, in the two weeks leading up to the seminar.

The final presentation was by the two community members from Collie: Merika Hayward, a young woman in her early twenties, who is planning on starting up her own soap-manufacturing business; and an unnamed male who is vice president of the Ngalang Boodja Council and who accompanied Merika to Titjikala, NT in February, 2006 to attend a soaps workshop conducted by First Australians Business. Merika showed some PowerPoint slides about the soaps workshop and outlined her plans for enterprise development to the audience.

Strategic planning discussion

After lunch about half of the seminar attendees participated in a two-hour discussion on a wide range of topics including land management on pastoral stations, ILC support for land purchases, NGO involvement in land management activities in the Kalgoorlie region, mining industry involvement and support for land management activities, the role of the GLSC in enterprise and land management, and opportunities for wild harvest and land management projects conducted by Aboriginal people. A report on the strategic planning discussion is provided in Appendix 4.

Recommendation

The group recommended that P4P initiate discussions aimed at developing a project proposal for the Goldfields region on cultivation, wild harvest and sustainable management of medicinal and food plants involving Aboriginal and NGO groups, GLSC, ILC and mining companies.

Appendix 1: Aboriginal Wild Harvest and Land Management Seminar program





ANNOUNCEMENT

Plants for People - Aboriginal Wild Harvest and Land Management Seminar

A half-day seminar aimed at exploring opportunities and processes for Aboriginal groups to develop natural resource enterprises or participate in management of national parks.

WHEN:
Friday 21st April 2006
8.30am to 2.00pm

WHERE:
Seminar Room,
Centre for the
Management of Arid
Environments,
Department of
Agriculture,
55 McDonald St,
Kalgoorlie

To reserve your place at this no cost seminar and for catering purposes, please contact Lisa at the Centre for Sustainable Mine Lakes, on 9266 2642, or L.forward@curtin.edu.au by April 13th

The seminar will comprise a series of presentations on topics of relevance to Aboriginal enterprise development and land management with emphasis on strategies for success in Aboriginal initiatives in these areas. A core focus will be the application of Traditional Ecological Knowledge and multimedia technologies to enterprise and management practices that support sustainable Aboriginal plant-based enterprise activities occurring in Australia and overseas.

The key note address will be provided by the Curtin University 2006 Haydn Williams Fellow, Dr Mary Stockdale. Dr Stockdale, an eminent ethnoecologist, has had extensive experience in wild harvest enterprises in Indonesia, the Philippines and other countries. Mary's lecture will draw on her work with Indigenous communities to describe how Traditional Ecological Knowledge has an important role to play in sustainable land management practices. Dr Stockdale will discuss how Indigenous communities are documenting their TEK, in written as well as digital (multimedia) formats and how this knowledge is being applied in managing natural resources as well as in influencing decision-makers outside the community on important environment-related issues. Dr Jon Corbett, who is accompanying Dr Stockdale and has expertise in the use of multimedia as a capacity building and educational tool in Indigenous communities, will also contribute to the seminar program.

The seminar will be of interest to Aboriginal organisations, government agencies and private industry personnel with interests and involvement in Aboriginal enterprise development and sustainable land management. The seminar is being jointly convened by the Centre for Sustainable Mine Lakes (CSML) and the Centre for the Management of Arid Environments (CMAE) with sponsorship provided by the Desert Knowledge CRC.

Seminar Program

8.15am – 8.45am	Coffee and registration
8.45am – 9.00am	Welcome to Country
9.00am – 9.10am	Scene setting: Professor Louis Evans, CSML, Curtin University
9.10am – 9.30am	Plant resources and their utilisation by Indigenous peoples – some examples from ancient and modern times: Dr Ben Norton, CMAE, Curtin University
9.30am – 9.50am	Plants for People – a process for Aboriginal empowerment and enterprise: Professor Louis Evans, CSML, Curtin University
9.50am – 10.30am	Aboriginal land management and enterprise forum - CALM partnerships, Aboriginal caring for country, Ngalang Boodja education and enterprise case study: Tania Donovan (CALM), Phil Drayson, Dennis Forrest (GLSC), James Khan, Merika Hayward (Ngalang Boodja Council, Colliie)
10.30am – 11.00am	Morning tea
11.00am – 11.45am	Traditional Ecological Knowledge (TEK) and its application in Aboriginal enterprises and land management activities: Dr Mary Stockdale, 2006 Haydn Williams Fellow
11.45am – 12.15pm	Geographic Information Communication Technologies (GICTs) and multimedia technologies as useful tools in Aboriginal enterprises: Dr Jon Corbett, University of Victoria
12.15pm – 1.00pm	Questions and Panel Discussion
1.00pm – 2.00pm	Lunch and close

Appendix 2: Presenters and presentation topics

Ben Norton

Plant resources and their utilisation by Indigenous peoples: some examples from ancient and modern times

The speaker

Ben Norton completed his PhD in botany at the University of New England in NSW. He then moved to the United States and joined the Department of Rangeland Resources at Utah State University, where he taught a variety of subjects and was involved in projects in several countries in South America, Africa and the Middle East. Prior to serving as the Director of Curtin University's Centre for the Management of Arid Environments, Ben was based in Aleppo, Syria, with the International Centre for Agricultural Research in the Dry Areas. His current work includes collaboration with Omar Al Mukhtar University in the Cyrenaica region of eastern Libya.

The Centre for the Management of Arid Environments (CMAE) is located within the Muresk Institute in Curtin University, but operates from Kalgoorlie as a joint venture between the university and the Department of Agriculture and Food, WA. The CMAE's activities are focused on improving the sustainability of pastoral production systems in Australia's semi-arid zone. The CMAE was heavily involved with the development of a Natural Resource Management Strategy for the rangelands of WA. On behalf of the Natural Heritage Trust, the CMAE managed the Ecosystem Management Understanding project devoted to improving the understanding of landscape ecology and ecosystem processes among land managers in the pastoral zone.

The presentation

The harvest of wild native plants for medicinal purposes has a long history on every continent, most of which has not been documented. The presentation reflected on opportunities and difficulties for Aboriginal enterprises based on wild harvest by drawing from historical accounts of economies based on harvest of medicinal plants, such as the harvest of wild *silphium* in Cyrenaica two thousand years ago, and on analogies between traditional knowledge of traditional medicines among Berbers and Arabs of North Africa today and that of Australian Aboriginal peoples.

Louis Evans

Plants for People: a process for Aboriginal empowerment and enterprise

The speaker

Louis Evans completed her PhD in endocrinology at UWA and was awarded a Personal Chair in Aquatic Science at Curtin University in 2001 in recognition of 20 years research and education in aquaculture and aquatic environmental management. She is the Executive Director of the Centre for Sustainable Mine Lakes (CSML), a WA State Government Centre of Excellence, and the Director of the Curtin-based Centre for Natural Resource Enterprise. During the course of her research career she has conducted research projects in widely diverse areas including human endocrinology, human pathology, aquaculture technology, fish health management, ecotoxicology, beneficial end uses for mine lakes and Aboriginal empowerment and capacity building.

Over the past five years Professor Evans has led the Plants for People (P4P) program, a capacity building and research program focused on improving the wellbeing of Aboriginal people through research, education and enterprise programs based on cultural knowledge of plants and their uses. P4P, which is jointly coordinated by DKCRC and CSML, is currently managing three projects: one funded by the DKCRC and CSML involving the development of soap and body-product manufacturing enterprises at Titjikala and Collie; a second funded by AngloGold Ashanti Limited at Laverton that

aims to assist in the development of desert-based Aboriginal enterprises; and a third project, funded by the Australian Government's Department of Education, Science and Training and being conducted by primary and secondary schools in Collie, Leonora and Laverton, that aims to improve mathematics and science education through the use of multimedia resources based on traditional Aboriginal knowledge about plants and their uses. A fourth P4P project on Aboriginal medicinal plants is also being conducted in partnership with Aboriginal communities in NT, SA and WA.

The presentation

The presentation described the process that P4P has developed to build Aboriginal community group capacity to conduct social and business enterprises, and presented a series of case studies that illustrated strategies for success in Aboriginal enterprise development and land management activities.

Tania Donovan

Partnerships with Aboriginal people

The speaker

Tania Donovan is the Business Development Officer for the Indigenous Heritage Unit in the WA Department of Conservation and Land Management (CALM). Tania was employed to manage Aboriginal recruitment program through CALM before progressing to the Indigenous Heritage Unit as the Business Development Officer. The role of Business Development Officer involves the development of business planning for the Indigenous Heritage Unit, policy development and small business development.

CALM is the state government agency responsible for the management of WA's national parks, conservation parks, marine parks, state forests and timber reserves, nature reserves, marine nature reserves, and all associated forest produce, native plants and animals. It is also responsible for conserving native plants and animals throughout the state and managing their sustainable use.

The presentation

This presentation provided an insight into the current partnerships between CALM and Aboriginal communities, referring to the Mentored Aboriginal Training and Employment Scheme (MATES), Demonstration Park Councils and the Indigenous Heritage Unit.

CALM recognised the unique role and expertise that Aboriginal people had both as traditional owners with a cultural responsibility to care for country, and as managers of conservation lands and waters for the state. CALM had a strong commitment to improving employment and training opportunities for Indigenous people, as evidenced by the MATES, which was recognised at the prestigious national Diversity@work awards. The aim of MATES was to ensure that Indigenous people were strongly represented in conservation and land management employment throughout WA. The multi-faceted program was run in conjunction with non-government training providers and land management organisations and contributed to CALM's aim to achieve just and equitable Aboriginal employment outcomes through a 10-year plan to ensure Indigenous people comprised 10–15 per cent of its full-time workforce.

Demonstration Park Councils operate in Millstream, Karijini and Purnululul national parks, with consultations underway for Cape La Grand National Park. They comprise up to 15 people, with the majority of members being Aboriginal. Demonstration Park Councils are resourced through CALM and met at least three times per year, reporting to and advising the minister.

The Indigenous Heritage Unit maintained its core business of providing cultural education to pre-primary through to university student groups, corporate groups and community groups; it had a number of different cultural programs to meet the area of interest and age of the participants. The

Indigenous Heritage Unit's role within CALM was to assist CALM staff learn more about Aboriginal culture, with a strong focus on cultural change via a number of programs designed for CALM staff. The Indigenous Heritage Unit linked CALM staff with Aboriginal community members, increasing CALM staff's cultural knowledge through formal and informal training opportunities.

Phil Drayson

Caring for country and management of national parks

The speakers

Phil Drayson and Dennis Forrest, Goldfields Land and Sea Council (GLSC), made a presentation on the involvement of Aboriginal people in land management in general, and in management of national parks, in particular.

The presentation

The presentation covered the following topics:

- the management of Aboriginal reserves
- joint management/ownership with shires
- joint management issues with CALM-managed reserves
- ownership of Crown reserves
- management and ownership issues with unallocated Crown land
- mining related issues affecting land management
- funding for local land management initiatives in the Goldfields region, including support at a regional level to establish the capacity to support these initiatives from funding sources including:
 - rangelands natural resource management
 - South Coast Regional Initiative Planning Team Inc
 - Indigenous Land Corporation

The GLSC was the official Native Title Representative Body for the Goldfields region of Western Australia and enjoyed widespread support from communities, organisations and individuals throughout the region. Aboriginal people of the Goldfields region saw the GLSC as a voice for representing their interests on matters to do with land and waters, governance, social and economic development, heritage and other matters of justice. The GLSC was a strong public advocate for Aboriginal people and existed for the purpose of helping to advance the place of Indigenous people in the Goldfields community.

James Khan and Merika Hayward

Ngalang Boodja Education and Enterprise case study

The speakers

James Kahn and Merika Hayward, Ngalang Boodja Council, shared their experiences in education and enterprise activities conducted by Ngalang Boodja community members from Collie, Western Australia.

The presentation

The Ngalang Boodja Council administered the affairs of the Ngalang Boodja Council Aboriginal Corporation (NBCAC). NBCAC was incorporated as an association under the *Aboriginal Council and Association Act 1976* (Commonwealth) on the 12 September 1999. It was established for the purpose of:

- securing land for Noongar peoples and protecting Noongar heritage
- making policy on Noongar land in accordance with Noongar tradition and values
- seeking legal, political and historical recognition of Noongar rights
- maintaining, developing and advancing Noongar culture and language
- promoting harmonious community relationships
- managing and maintaining land given to the council.

Since 2002 the NBCAC has worked with the CSML in several initiatives aimed at building the interest and capacity of community members to engage in private enterprise and employment. These initiatives included:

- enrolment of community leaders in a Enabling Foundations Course in science, providing remedial numeracy and literacy training as well as a foundation in business management and natural resource science
- partnering with CSML in an Indigenous aquaculture project
- commencement of a soaps and body-products project aimed at manufacturing and selling body products containing local plant ingredients.

NBCAC members also participated in two successful business enterprises, managed by Noongar Employment and Enterprise Development Aboriginal Corporation (NEEDAC), the local CDEP organisation – the Ngalang Boodja Nursery and the Ngalang Boodja Wood Yard. The latter enterprise involved harvesting firewood from national forests. The wood yard team developed a proposal to combine its harvesting operations with provision of a service to government and private industry organisations in weed eradication and silviculture. The long-term vision is for a self-sustaining operation with income coming from the firewood sales and land management activities.

Mary Stockdale

Traditional ecological knowledge (TEK) and its application in Aboriginal enterprises and land management activities

The speaker

Dr Mary Stockdale completed her PhD and postdoctorate research fellowship at the University of Oxford in the UK in the Oxford Forestry Institute, after which she was appointed to the position as co-manager at a new, interdisciplinary Center for Social Forestry at the University of Mulawarman in Samarinda, East Kalimantan, Indonesia. During the course of Mary's research career she was the recipient of a number of scholarships and research grants from the Canadian International Development Agency, the UK's Department of International Development and the World Wildlife Fund Indonesia. Although based in Victoria, British Columbia, Canada, most of her work has been carried out in South-East Asia, particularly in Indonesia and Philippines.

Mary trains and facilitates mainly Indigenous community members to determine the abundance, sustainability (optimal sustainable harvest) and marketability of native species to enhance the livelihood of the community and has facilitated training workshops in South-East Asian countries on community-based management of non-timber forest product (NTFP) resources, in particular on the use of participatory mapping and inventory methods, for participants from local communities and other forest stakeholder organisations. Since being awarded the prestigious Haydn Williams Fellowship at Curtin University in 2006, Dr Stockdale has applied her knowledge and expertise in Aboriginal enterprise development projects at Leonora and at a remote community near Alice Springs where she has assisted in the development of multimedia resources and community plans for cultural tourism and land management projects.

The presentation

The presentation described some ways in which researchers support Indigenous communities in documenting and applying their TEK under modern contexts, drawing from experiences of working in Borneo, Indonesia, and British Columbia, Canada. In particular, Mary discussed how Indigenous communities were documenting their TEK, in written as well as digital (multimedia) formats. The applications for this documented TEK included influencing decision-makers outside the community on important environment-related issues such as the sustainable management of NTFPs and building a stronger sense of cultural identity within the community, particularly amongst the youth.

Jon Corbett

Geographical information communication technologies and multimedia technologies as useful tools in Aboriginal enterprises

The speaker

Jon Corbett is an Assistant Professor in Geography at the University of Victoria, British Columbia, Canada and has worked closely with Indigenous peoples in Indonesia and in British Columbia on issues relating to resources and their sustainable management, and on topics ranging from illegal logging disputes in East Kalimantan through to traditional Coast Salish cedar-stripping, processing and weaving on Vancouver Island. He is also a founding member and director of a British Columbia-based NGO called Land and People Information Sharing, which seeks to network with and support partners in developing countries with initiatives aimed at securing traditional rights and fostering community- and ecosystem-based land and resource management.

Jon has a PhD in Geography and has had 12 years experience in research and teaching in the area of human interactions with their cultural and natural environment. His primary research interest lies in evaluating how information communication technologies applied using participatory methodologies can serve the needs of local communities. This research has focused on how multimedia technologies can enable communities to document, store, manage and communicate their culture, language, history and traditional ecological knowledge, all of which are embedded in their traditional landscapes.

The presentation

This presentation provided an overview of how geographical information systems and multimedia communication technologies could be applied to cultural revitalisation and enterprise initiatives by Aboriginal peoples. Case studies from Indonesia, Canada and Australia gave examples of the application of these technologies by different Indigenous groups in land management and enterprise development. Interactive digital mapping systems and audiovisual resources such as DVDs were emphasised.

Appendix 3: Seminar papers

Ben Norton

Plant resources and their utilisation by Indigenous peoples: some examples from ancient and modern times

**Centre for the Management of Arid Environments, Kalgoorlie
Curtin University of Technology & Department of Agriculture and Food WA**

When walking across the rangelands of the Middle East, my Jordanian colleague would delight in pointing out native plants renowned for their medicinal properties. Prominent among them is white sage, *Artemisia herba-alba* (commonly known by its Arabic name *shee-ah*) which relieves indigestion and abdominal pain, and whose leaves contain an aromatic oil similar to that found in the Australian sage (*Cratystylis subpinescens*) that grows in the rangelands of WA. We know that Aborigines harvested foods and remedies from Australian vegetation, but the traditional exploitation of native plants for health, sustenance and comfort is common among Indigenous peoples all over the world. We should not forget its importance in contemporary Western society.

For example, the common aspirin is derived from the chemical compound salicylic acid, which occurs naturally in willow bark. Willows belong to a northern hemisphere genus called *Salix*, a member of the plant family *Salicaceae*. Indigenous Europeans and North American First Nation peoples knew that chewing willow bark would ease toothache, and a brew made from the bark relieved headaches. The name ‘aspirin’ was coined by the German company Bayer, which first developed salicylic acid into a commercial product in 1899.

Perhaps the most successful medicine extracted from native plants is quinine, used to treat malaria. Malaria was the bane of both ancient Rome and Washington DC, and used to flair up in the marshy lowland counties of England. It was largely eradicated from the United States in the early twentieth century. Quinine has saved the lives of millions of people – including the author – infected with the malarial parasite, which is a single-cell protozoan flagellate organism (not a bacterium) transmitted by the bite of the *Anopheles* mosquito. Quinine is extracted from the bark of several species of *Cinchona* tree (in family Rubiaceae, to which the coffee tree, *Coffea* species, also belongs) found only in South America. Even though synthetic forms of quinine have been developed, such as chloroquine and mefloquine, used mainly as prophylactics, the pure bark extract is still one of the best cures for malaria. The highest quality quinine-bearing bark occurs on *Cinchona calisaya* which grows in secluded patches of rainforest in Peru and Ecuador on the western slopes of the Andes mountains. The curious thing about the ability of quinine to cure malaria is that malaria did not occur in South America before the arrival of Europeans and Africans. The Indigenous peoples of Peru used *Cinchona* bark extract for other medicinal purposes.

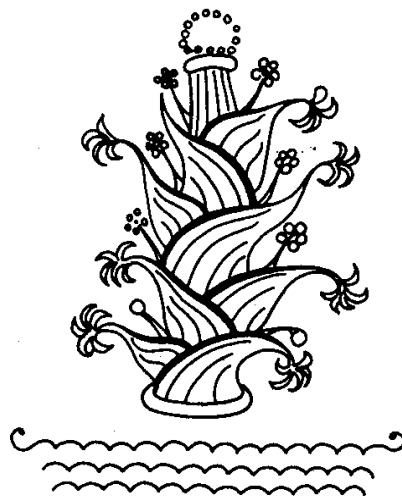
The ancient historical record is full of references to the exploitation of native plants for personal use and for trade. These include frankincense and myrrh, which were so valuable 2000 years ago that they shared a place next to gold in the gifts brought by wise men to Bethlehem. Frankincense is still harvested from mountains in the Horn of Africa, and I have seen it cultivated in nurseries near Mogadishu. Both frankincense and myrrh are fragrant gum resins obtained from two trees in family Burseraceae (*Boswellia carteri* and *Commiphora abyssinica*, respectively) that grow in Ethiopia, Somalia and Yemen. They are among many plants found from Arabia to India that historically were processed into spices, ointments, medicines and perfumes.

There is one plant, however, that stands out in the annals of medicinal plants, namely, silphium, first recorded by the Greek historian Herodotus in the fifth century BC. All parts of the silphium plant – leaves, stalk, fruits and roots – yielded products highly valued in North Africa, Greece and Rome for medicinal, recreational and culinary purposes. It was a spice, a stimulant, a medicine, and a contraceptive. Juice extracted from silphium was said to cure just about every ill or misfortune you could imagine: sore throat, cough, fever, indigestion, nervous disorders, seizures, aches and pains,

warts, even baldness. It was used to treat leprosy and as an antidote to poison. It was the perfect pharmaceutical drug. And it prevented or terminated pregnancy, which was probably the primary cause of its celebrated status. A contraceptive was made by dissolving a pea-sized ball of plant resin in a glass of wine, or by brewing tea with the leaves. The stylised heart shape that we associate with romantic love in general and Valentine's Day in particular bears little resemblance to the true shape of the human heart, but it is identical to the shape of the seed of the silphium plant, as depicted on ancient coins. Silphium was the friend of lovers.

The demand for silphium was high but the supply was limited. Silphium, a species of fennel in the genus *Ferula*, family Umbelliferae (Apiaceae), grew naturally in an area of only about 20 000 km² in a hilly region in eastern Libya known as Cyrenaica, centred on the ancient Greek city of Cyrene. When the Greeks arrived in 630 BC, silphium was already being traded to Carthage (near modern Tunis) by the indigenous Libyan people. The Greeks took over the business. Silphium became the most important economic plant in Cyrenaica, and was featured on Cyrene's gold coins. Attempts to cultivate silphium in Cyrenaica and Greece, however, were unsuccessful. The plant could not be farmed, and wild harvest was the only source. To prevent extermination of this most valuable natural resource, the Cyrene government imposed strict harvesting regulations, carefully determining how much could be taken each year. Under rigid control, the government kept the price high and stable, so that silphium acquired a status similar to gold bullion. The Romans assumed control over Cyrenaica in 93 BC (partly for the potential wealth of the silphium trade) and stored the almost imperishable silphium juice, in the form of a resinous gum, in the Treasury in Rome. In 93 BC about 15 kg of silphium resin was shipped to Rome; by 49 BC the Treasury had an inventory of 700 kg.

For more than five centuries the Greeks managed the silphium harvest very carefully, but after the Romans arrived, short-term commercial interests gained the upper hand over conservation. Within 50 years the supply had shrunk to a trickle, and by the middle of the first century AD it had almost vanished. In AD 64 the Roman Emperor Nero was presented with a single stalk, perhaps the last silphium plant collected from Cyrenaica. Silphium, the ultimate bush medicine, is the first plant species known to have been forced into extinction by reckless exploitation.



Lasor Cyrenaicum Invecuire Vi Poterit
Scrib. Latq.

Figure 1: Drawing of the *Silphium* plant made from the image on an ancient Greek gold coin found in the ruins of Cyrene in 1957

Louis Evans

Plants for People project report: Ngalang Boodja Economic Development Project

Centre for Sustainable Mine Lakes

Curtin University of Technology

1. Project description

Plants for People (P4P), an Aboriginal traditional knowledge and enterprise development program conducted by the Centre for Sustainable Mine Lakes (CSML) and the Desert Knowledge CRC (DKCRC), commenced an Aboriginal economic development project in Collie, Western Australia, in January 2004. The project is aimed at facilitating the successful development of sustainable Ngalang Boodja-owned and operated enterprises through a phased approach based on empowerment and inspiration, sourcing of enterprise resources, strategic planning and governance training and education and skills development. The first phase of the project is described in this report.

The project is being conducted by a partnership group comprising P4P staff and students and the Ngalang Boodja Council Aboriginal Corporation (NBCAC), an Aboriginal corporation that represents Noongar people from Collie and whose members are involved in three successful Community Development Employment Projects (CDEP) projects: the establishment of the first accredited native plant nursery in Australia, the development of firewood collection enterprise and the establishment of an arts and crafts centre in the NEEDAC building in Collie. P4P and NBCAC are also collaborating in project activities with other economic development support agencies operating in Collie, including the Office of Aboriginal Development, WA Department of Industry and Resources, the Department of Indigenous Affairs and the SW College of TAFE.

2. Project activities

Activities being conducted in the Ngalang Boodja Economic Development Project are focused around five core themes:

1. strategic planning and governance training
2. empowerment through community networking
3. education and training
4. funding applications for enterprise resources
5. collaborative research on traditional knowledge about plants and their uses.

Core members of the project team, and the input they are providing to the project, are shown in Appendix 1 (available upon request).

This progress report provides information on achievements during the period 2004 to 2006 in the five core project area.

3. Strategic planning and governance training

3.1 Partnership meetings, January 2004 to December 2005

Strategic planning for the project commenced in January 2004 with a P4P presentation by Professor Louis Evans to a NBCAC meeting at the CSML headquarters in the Collie TAFE. It was agreed that P4P and NBCAC would work together to scope out a project, later titled the Ngalang Boodja Economic Development Project. Joseph Northover was employed as a CSML Research Officer for a three-month period to assist with project planning and an Natural Heritage Trust application was submitted for a proposed river restoration project. Further planning meetings were held in April, June and August 2004 (including one with Dennis ah Kee, Australian Government of Department of Agriculture Forestry and Fisheries (DAFF), who has subsequently facilitated the resourcing of a Ngalang Boodja aquaculture project at Collie), and in February, June, July and December 2005.

3.2 CAG planning meetings, January 2004 to March 2004

In early 2004, CSML collaborated with the Office of Aboriginal Economic Development and the Department of Indigenous Affairs (DIA) in an effort to establish a Collie Action Group (CAG) that would comprise representatives from all Aboriginal family groups in Collie. A series of meetings aimed at coordinating the development of the CAG were conducted by the DIA (with assistance from the Office of Aboriginal Economic Development (OAED)), CSML and NBCAC. Jay Cook, DIA, and John Gill, OAED, met with the NBCAC in early 2005 and explained the proposal. CSML convened a meeting at the Collie TAFE on 8 March 2005 to discuss the proposal further and commence the process of identifying the main family groups in Collie. This meeting was attended by the core project team members (Jay Cook, John Gill, Louis Evans and Philip Ugle (representing NBCAC)) and 30 community members. The main families in Collie were listed (38 family names) and arranged into five core family groups (Ugle 1, Hayward, Hart, Ugle 2 and Turvey groups). John Gill subsequently conducted a detailed family mapping project that identified 189 different Aboriginal families in Collie, all of whom were assigned into one of the five CAG family groups. A family picnic was convened by DIA to progress the formation of the CAG and along with several other meetings.

Despite a determined effort by DIA and OAED to consolidate the formation of the CAG, there was only limited support for the proposal and no further progress has been made in this initiative.

3.3. Ngalang Boodja Council Strategic Planning Meeting, 10 February 2006

In February, 2006 CSML assisted the NBCAC convene a strategic planning meeting to scope out key development issues for Collie Noongars and to obtain a consensus view on future activities. The meeting provided an opportunity for governance training for NBCAC leaders, who developed the agenda, arranged for invitations to be forwarded to nominated representatives of the five main Ngalang Boodja family groups identified in the CAG meeting, and chaired the meeting. Representatives from four of the five family groups attended. Several government agencies showed an interest in participating in the meeting (DIA, OAED and DEEWR) and were also invited to attend.

Seven strategic priorities were identified (listed below in priority order; Appendix 3 available upon request):

1. Improving health services to Noongar people in Collie.
2. Creating and establishing employment and enterprise opportunities.
3. Improving educational outcomes by supporting children, and youth and encouraging adults to undertake training or further study;
4. Obtaining ownership of land and seeking control of cultural heritage management.
5. Building the infrastructure and functional capacity of Ngalang Boodja Council.
6. Developing ways to enable Noongar people to own their homes.
7. Addressing important family and cultural issues.

3.4. Land acquisition and proposed future ventures

During the course of the project, the NBCAC has acquired a block of land near the Collie industrial estate, the site of a previous Aboriginal reserve. The vesting of the land in the NBCAC was facilitated through the Shire of Collie. The OAED has been facilitating the transfer of vesting rights over another block of government land on the outskirts of Collie and a successful outcome to this facilitation is expected in the near future. An aquaculture venture is planned on this block and a land management project will be conducted on the town block if the NHT grant application submitted in March 2006 is approved.

4. Empowerment through community networking

P4P conducts an Aboriginal networking project, funded by a range of agencies including the Indigenous Land Corporation, DKCRC and CSML. The program facilitates representatives from

different Aboriginal communities gathering together for workshops and meetings to discuss common issues and initiatives, plan enterprises or projects, undertake short courses, receive practical hands on training and undertake action research activities. These workshops:

- create a vision for Aboriginal people to participate in the mainstream economy
- create an awareness of the potential and opportunities available in natural resource enterprises and land management
- provide a forum for dialogue where participants can identify business opportunities and undertake preliminary planning for small community enterprises or natural resource management projects
- provide a forum where Aboriginal people can network, collectively solve problems, and develop entrepreneurial skills
- provide skills training
- incorporate Aboriginal knowledge into the planning and learning experience to enable the participants to develop new methods and skills which are in harmony with their cultural practices and social structures
- facilitate Aboriginal people conducting and directing participatory action research projects aimed at documenting and applying traditional knowledge about plants and their uses.

To date, P4P has convened six networking events (visits to different communities, seminars, workshops, P4P Annual Meeting; Appendix 4 available upon request) and also participated in the convening of a major workshop in Broome on capitalising on natural resources and Indigenous knowledge. Two of the networking workshops were aimed at skills development: the Integrated Aquaculture Workshop convened by P4P in Northampton, November 2005; and the Soaps and Body Products Workshop conducted by First Australians Business at Titjikala in February 2006. Ngalang Boodja project team members have attended all seven events.

The networking project has helped to build the confidence and enthusiasm of community members for enterprise development, as evidenced by comments made by workshop attendees (Evans & Cronin 2006), the ongoing communication between some of the networking groups (Collie and Titjikala – occasional telephone conversations (J Kahn, pers. comm.)) and the independent decision of the NBCAC to initiate an invitation to First Australians Business to conduct business management and soaps manufactures workshop at Collie in 2006. The forwarding of the invitation to First Australians Business was arranged through the NBCAC at the instigation of Ngalang Boodja community members Mareka Hayward and James Kahn following their attendance at the workshop in Titjikala. This outcome provides evidence of empowerment resulting from participation in networking workshops. Largely as a result of attendance at these networking workshops, Mareka Hayward has decided to develop her own health and beauty products business when she completes her university course.

5. Education and training

5.1. Education and training courses at Collie

Soon after the commencement of this project, an informal survey was conducted by NBCAC and P4P of the availability and willingness of Collie Aboriginal people to participate in a TAFE Aboriginal Aquaculture Certificate course and a Curtin University Uni-Ready (bridging) course majoring in natural resource management and enterprise. Twenty-three Aboriginal students enrolled in the TAFE certificate course and four people enrolled in the Uni-Ready course, both of which commenced in February 2005. Only one student successfully completed the TAFE course. An investigation was conducted into the reason for the high dropout rate and it was found that many of the students who enrolled were primarily interested in obtaining Abstudy rather than pursuing a career in aquaculture.

Of the four students from Collie who enrolled in the foundations studies course, three successfully completed the first mathematics unit in Semester 1, 2005 with one student achieving a grade of 87 per cent. The assessment used in this unit was the same for all students throughout the state, making this achievement even more commendable. The same three students have now completed four of the eight unit course and will complete the remaining four units by the end of 2006. A further two students

enrolled but withdrew without completing any units, primarily because they obtained employment, a prime objective of P4P projects. Two Aboriginal students from Leonora also enrolled but subsequently withdrew. In this case the lack of personal contact with tutors and the lecture-based approach to tuition appears to have been major contributing factors to the decision to withdraw.

5.2. Delivery of culturally appropriate education programs

The delivery of culturally appropriate education and training programs to Aboriginal people was one of four topics discussed at the workshop on capitalising on natural resources and Indigenous knowledge held in Broome in August 2004 (Batty et al. 2005). The workshop was attended by 60 people, mostly Aboriginal community members. The workshop proceedings were written by Professor Louis Evans, P4P and Wendy Smith, WA Department of Education, and are now published on various websites including espace@Curtin.

The main comments and recommendations from the discussions on culturally appropriate education and training programs were as follows:

- Engage good teachers: some trainers exhibit unacceptable attitudes.
- Engage Aboriginal elders in training: involve Aboriginal people in the training program.
- Culturally appropriate assessments are required.
- Flexibility in delivery is required. If you are working in Aboriginal education you need to be aware that everything is different for different groups.
- There is a lack of recognition of Aboriginal knowledge and skills, e.g. Aboriginal health workers.

Culturally appropriate strategies to address these key issues are:

- Hands-on training and practical demonstrations are important in course delivery.
- There should be more involvement of community elders and other community members in curriculum development.
- The community want ownership on who delivers the training – they want to vet the prospective trainers and decide whether they have the communication skills and appropriate attitude to conduct the training program

P4P has addressed some of the abovelisted issues and recommendations in its education programs. Efforts are made to ensure that:

- lecturing staff have the communication skills and appropriate attitudes to teach Aboriginal people
- course delivery is flexible, and teaching schedules are altered to allow for attendance at funerals, involvement in important meetings and for other cultural matters
- community leaders and elders participate in curriculum planning discussions
- practical demonstrations are incorporated into the teaching program where possible
- course participants are encouraged to provide feedback about different lecturers and teaching and learning activities

5.3. Partnerships with other education providers

P4P has negotiated a collaborative education and training arrangement with the SW College of TAFE, whereby students enrol full-time (two days a week) in a Certificate II in Conservation and Land Management at TAFE, but also complete two units in the Curtin Foundations Studies course. Since the TAFE program is mostly practically based, and is linked into CDEP, this arrangement has provided the students with both the resources and the opportunity to acquire practical skills and a certificate qualification in conservation and land management, whilst also completing a course that will provide entry into a university undergraduate program.

5.4. Skills training in oral presentations

P4P has assisted one of the community members (Mareka Hayward) to prepare a PowerPoint presentation describing the Soap and Body Products workshop she attended at Titjikala in February 2006. Mareka first presented this talk at an NBCAC meeting comprising mostly family members and, as a result of the confidence gained from this experience, made a similar presentation at the P4P Kalgoorlie Seminar. P4P staff have recently worked with Philip Ugle to submit an abstract for an oral presentation at the forthcoming 2nd Australian Aboriginal Enterprises in Mining and Exploration Conference to be held in Perth in October 2006.

6. Funding applications for enterprise resources

Since commencing working together, P4P and the NBCAC have submitted seven funding applications to NHT (two), SW Development Commission (two), ILC (two), DIA (one), DEST (one), Shire of Collie (one) and DAFF as follows:

- NHT: River reclamation project (2004, \$48,000; not funded).
- DAFF: Aquaculture infrastructure (2005, \$16,200; funding approved).
- DIA: Heritage project (2005, \$2,500; funding approved).
- DEST: ASISTM school multimedia project (2005, \$84,000; with Leonora and Bunbury schools; funding approved).
- ILC: sponsorship of Integrated Aquaculture Networking Workshop (2005, \$10,000; funding approved).
- Shire of Collie: sponsorship of Integrated Aquaculture Workshop (2005, \$2000 – not funded).
- ILC: sponsorship of a 3 year Aboriginal networking project (2006, \$240,000; not funded).
- NHT: weed control and habitat restoration project (2006, \$47,000 requested;

These funding applications have yielded significant funding for resourcing projects involving NBCAC community members, though insufficient to establish an enterprise.

To date the Ngalang Boodja economic development project has been largely funded by CSML through the CSML project Mining for Country. This funding will cease in December 2006 and future funding options are presently being canvassed. To this end, the CSML Research Fellow, Darryl Cronin, has worked with NBCAC to prepare a scoping document describing the next phase of the Ngalang Boodja Economic Development Project. The scoping document is shown in Appendix 5 (available upon request).

7. Collaborative research

The central focus of the P4P research program is to work within two knowledge systems – traditional Indigenous knowledge and Western science – to record traditional knowledge about plants and their uses, improve livelihoods and develop enterprises. P4P conducts participatory action research in which a desired goal or outcome is scoped and formulated through a series of structured workshops involving researchers and Aboriginal community members. Activities are then conducted in partnership to achieve those goals. This approach is recognised as an effective method of empowering Indigenous people to participate in activities that will improve livelihoods or sustain and manage natural resources. New knowledge is obtained by observation and evaluation of strategies used to attain the stated goal.

Several of the funding applications prepared by P4P and NBCAC had a research focus. However, little work has been conducted to date on the traditional knowledge of the Ngalang Boodja people. This work is planned to commence in the recently approved DIA and ASISTM projects.

8. Conclusions

The Ngalang Boodja Economic Development Project has achieved significant outcomes over the first two and a half years of operation. The governance skills of the NBCAC committee members have improved, as has their self-esteem. Strategic planning events have brought a focus to goals that the group want to achieve in the future, and a strong commitment to achieving these goals is apparent.

Core members of the Ngalang Boodja Council are working closely as a team, a process that was not occurring at the commencement of the project. Three team members have successfully completed 50 per cent of the Curtin University Uni-Ready course and are expected to complete the course and achieve matriculation into a university degree program in November 2006. Three other community members have decided to enrol in the Uni-Ready program as well as in a TAFE certificate course in land management and conservation.

A new direction of combining CDEP operations with land management activities has been scoped and sponsors for this initiative are currently being sought. Attendance at workshops on integrated aquaculture and soap and body products manufacture, and at networking events, have built skills and determination to develop enterprises in these areas. Resources have been sourced to commence an aquaculture venture and employment in projects funded through grant applications has started to occur. Scholarship support from mining companies for education and training initiatives is being negotiated.

A future goal is to take over the NEEDAC-managed enterprises in Collie and manage them through the NBCAC.

9. References

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(Appendices available upon request)

Mary Stockdale

Traditional ecological knowledge (TEK) and its application in Aboriginal enterprises and land management activities

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What is TEK?

Traditional ecological knowledge is possessed by Indigenous people in many different places in the world. It is increasingly recognised for its potential to contribute to a more sustainable relationship between humans and the environment. Thus, TEK as a term has become quite commonplace in discussions about sustainable development.

In the past decade and a half, there has been an explosion of conferences, symposia and workshops dedicated to the topic. As well, a substantial academic literature has begun to build up to describe and analyse it.

So what is TEK? Well, I like the definition of Fikret Berkes (1999), a Canadian ethnoecologist, who describes it as ‘a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission’.

From this definition, we can see that the concept of TEK encompasses much more than just knowledge in the way that we commonly understand the term. So, in order to build a deeper understanding of this concept, I am going to break this definition down into its separate parts.

1. Accumulative body of knowledge, practice and belief

The first part of this definition describes TEK as a cumulative body of knowledge, practice and belief, I’d like to talk about each of these briefly.

A. Knowledge: The knowledge that an Indigenous culture develops over time is considered to be a very place-based (‘situated’) form of knowledge, derived from generations of living within the same area, observing the area and experimenting with ways to live within it...

This has led to a detailed understanding of the local environment, including knowledge of the different features of the landscape, the progress of the seasons over the course of a year, as well as the complex ecological principles governing the patterns and behaviors of local plant and animal populations.

B. Practice: The practices of Indigenous people are the ways in which they act upon this knowledge to manage a diverse set of local species, as well as the landscapes within which these species are found. These practices are used in order to secure a flow of resources (for food, medicine, materials etc.) as well as various environmental services (such as the provision of water, air, local climate and so on).

C. Belief: Knowledge and practice are deeply influenced by an underlying belief system or worldview about how people fit into or relate to their environment.

A good illustration of this worldview is the following poem by Nuuchah-nulth hereditary Chief Richard Atleo (1998). It is called *Everything is one*; let’s look at this poem line by line:

The Creator made all things one...
All things are related and interconnected.

An anthropological term for this is ‘kincentric ecology’. This refers to the many different stories about the origin of life that are possessed by Indigenous peoples, that describe how humans, animals, plants, rocks and water, were born or created from one common mother, a sort of Mother Earth figure. For

many Indigenous people, these origin stories show that humans are related, as kin, as relatives, to all other animate and inanimate beings, and this has a very powerful influence on their worldview.

All things are sacred.

I take this line to refer to the spirit world, which is seen to be as real as the everyday world that we see around us. All beings move in and out of both worlds, often taking very different forms. Thus, what appears to be a plant or animal in this world is understood to be an ‘other-than-human person’ that in the spirit world might behave much like a human being, with similar social relationships, emotions and physical needs. At the same time, many of these spiritual beings are understood to have the ability to exert great power over human affairs ...

All things are therefore to be respected.

If all beings are our relatives, or kin, and if they are all spiritual beings, they should therefore be treated with respect by humans. Respect is a central concept to the worldviews of the Indigenous cultures that I am describing today, although the word ‘respect’ does not adequately capture its meaning. Respect should be shown to all beings through observances such as ritual feasts, ceremonies or uttering ‘words of praise’ when harvesting (for example it is common in First Nations culture to say ‘thank you’ three times to the Creator for the first handful of berries harvested in the season). Disrespect should be avoided, particularly disrespect in the form of speaking or thinking badly of animals or plants, bothering them or playing with them, and wasting them or disposing of their remains improperly. It is felt that disrespect might result in spiritual sanctions for the person displaying this attitude.

2. The second part of this definition refers to TEK as ‘evolving by adaptive processes’

The word ‘traditional’ in TEK is sometimes questioned, as it could be interpreted to mean that this knowledge system is fixed in the past, and that any innovation is untraditional or inauthentic. In fact, TEK has always been adaptive and has responded to social, economic or technological change.

3. The final part of this quotation is that TEK is ‘handed down through generations by cultural transmission’

Integral to TEK are the cultural mechanisms by which these knowledge, practices and beliefs are transmitted amongst the people of a particular cultural group, as well as from one generation to the next. These cultural mechanisms take a variety of forms.

- One of the most important ones is children’s observation of and participation in management activities: this is where children obtain firsthand experience through going out on the land with their elders.
- Another is through instruction by parents, grandparents and other elders. Stories and teachings, told over and over again to children and adults alike have been integral to the passing on of TEK.
- Language is very important to the process of knowledge transfer, due to the importance of specialised words, phrases and metaphors carrying valuable messages about peoples’ relationships with the environment
- Other major cultural mechanisms for TEK communication include ceremonies, songs, dances ... and of course there is much more that I could say, but there isn’t the time for it...

So that wraps up my description of TEK. Although it may appear to be a fairly complicated concept, a simpler way to think of it is in the way that a member of the Kluane Nation of northern Canada described it, who said, ‘Well, it’s not really “knowledge” at all; it’s more a way of life’.

Issues with TEK in modern times

I have said that TEK evolves by adaptive processes; however, TEK is not able to adapt to all forms of change. The way of life of Indigenous people has changed quite dramatically in many parts of the world, although more so for the people I will be describing from Canada than the ones from Indonesia.

Some of the causes of change to the traditional way of life include:

Social/cultural causes

- This would include change due to the impacts of residential schools, churches and government.

Economic causes

- The two major influences here would be Indigenous people joining the wage economy (and therefore having less time to engage in subsistence activities on the land).
- Also the introduction of new technologies such as chainsaws, guns or motorised boats, all of which can have various impacts on the way in which people interact with their environment.

Environmental causes

- Loss/deterioration of resources have had an enormous impact on Indigenous people's way of life.
- Loss of access to land has had a similar effect.

Such dramatic changes in the traditional way of life are bound to result in the disruption of TEK, and in the most extreme cases, in its demise.

Examples of TEK

I would like to now describe to you some examples of TEK from the places where I have had the privilege of living and working.

The first place is Victoria, the capital city of the province of British Columbia (BC), Canada. This is where I and my family have been based for the past few years. I have recently become a lecturer and adjunct professor at the University of Victoria (UVic) there, but am only beginning to develop research that is based locally, as I have long been focused on work overseas. British Columbia is a province that is rich in natural resources, with forestry, mining, oil and gas development. Long houses, traditional forms of dwelling for First Nation peoples, symbolise the Indigenous peoples who have lived in the Victoria area for many generations. I refer to them by their preferred term, First Nations, which is used to emphasize that these different peoples were the first nations to live in these lands, followed by other, secondary, nations after colonisation.

The second place is Samarinda, the provincial capital of East Kalimantan, in Indonesian Borneo. I have had a long, 15-year association with Samarinda and many areas in the interior of the province, having conducted my PhD and post-doctoral research here. As well, I have worked at the University of Mulawarman in Samarinda for two years, where I assisted in establishing and managing an interdisciplinary Centre for Social Forestry, funded by the Canadian International Development Agency. East Kalimantan, like British Columbia, is a province that is heavily reliant upon its natural resources, including forestry, mining, oil and gas ... and, as well, this province is developing an increasing interest in oil palm plantations. Long houses are also traditional forms of dwelling for the Indigenous peoples of Borneo, generically described as Dayaks. As with the First Nations of BC, the Dayak peoples now share the province of East Kalimantan with other ethnic groups who have come from the more populated islands of Java, Bali as well as other places.

So, we can see a lot of similarities between the two places. There are also a number of differences, including the less-developed status of Indonesia compared to Canada. This has meant that the Dayak peoples have a poorer infrastructure, and less access to money, education, and health care compared to

those of the First Nations; on the other hand the Dayak peoples have retained relatively intact ways of life, languages, and cultures.

1. British Columbia

First, I will give you an example of TEK from BC. The territory outlined here, on parts of Vancouver Island and the lower mainland, have long been inhabited by Indigenous people who are referred to as the Coast Salish peoples. Traditionally, these people travelled mostly by dugout canoes made from western red cedar and lived in large, multi-family longhouses. These people moved around their traditional territory in seasonal rounds, returning to their long houses in the winter. Their major food consisted of the different species of Pacific salmon and other fish, marine mammals, shellfish, berries and various greens and root vegetables. Finally, the way in which hunting and gathering were conducted was very much delineated along gender lines

I would like to describe to you just one of the many different systems that these people used for managing their lands and resources. On the southern tip of Vancouver Island, where Victoria is located, there is a unique ecosystem, or habitat type, called the Garry oak savannah. This ecosystem consisted in the past of sunny meadows adorned with numerous wildflowers, and studded with large, spreading Garry oaks (*Quercus garryana*). These savannahs were very similar in appearance to the parklands of a stately English home, which is probably what made them so instantly appealing to one of the first English explorers to arrive in the area. Captain Vancouver has been said to comment on the appearance of the forests, but ascribed this to having been cleared by 'art'. In other words they looked like they might have been manipulated by humans, but Captain Vancouver couldn't quite bring himself to believe this.

However, recent research has indicated that these ecosystems were maintained by the Coast Salish people through the lighting of fires, since Garry oaks respond very well to low-intensity ground fires, both because the fires enhance their regeneration, and because the fires have very little impact on the adult trees.

This quotation, from an anonymous newspaper article in 1849, talks about the Coast Salish fire management system: 'Miles of the ground were burnt and smoky, and miles were still burning. The Indians burned the country in order to promote ... more especially the roots which they eat' (see Barsh 2004 for further information on the Coast Salish fire management system). So what roots were these?

These roots were in fact from the camas lily (*Camassia quamash* and *C. leichtlinii*), a very beautiful wildflower with bulbs that provided an important staple food for the Coast Salish people. People would congregate in the late spring/early summer to pick these bulbs. There is a record from the nineteenth century of Coast Salish families living close to Victoria collecting several 50-pound gunnysacks of camas bulbs each in one season, adding up to an annual harvest of more than one million bulbs for one community! This indicates that at that time, the camas fields were highly productive.

After harvesting them, women would carry the bulbs in baskets to the place where they would be steamed. Men would help the women with steaming the camas in pits that were used year after year. Stones were set in the bottom of the pit and a fire built. When the stones were hot, the ashes were removed and the camas bulbs put in, surrounded by kelp, salal boughs, grand fir boughs and sword fern fronds, leaving a post to make an opening to pour water through. After water was poured in, the pit was covered with earth and tamped down. The camas had to be steamed for a day and a half to break down their starch compound, inulin, into sweet and digestible fructose. After steaming, the bulbs could be dried and stored for winter use.

The way the camas patches were managed is very interesting. It appears that in some places the fields were open to everyone, whereas in places where they grew more abundantly, women had their own patches, marked off so that no one else could harvest there. In all places, however, the resources were shared widely because of obligations to extended family. To harvest camas, women and children

would use digging sticks to pry up a piece of sod consisting of solid camas bulbs. The harvests took place after the camas seeds were ripe, making it possible for these seeds to be sown back into the newly broken soil; similarly, all the small bulblets aggregated on the larger bulbs were tossed back; these bulblets would become the large bulbs of the following season. Other management practices included breaking up the soil and weeding away all competing vegetation to enhance camas regeneration and growth. Later, when the fields were all dry, people would burn them over.

This is just one of the many different management systems of the Coast Salish people. Other examples include the management of patches of bracken fern, wapato tuber and bog cranberry, clam gardens and salmon fisheries, all of which were under complex systems of ownership and responsibility.

Unfortunately, these systems of land and resource management were not recognised by the early English colonists. This lack of recognition led the Governor of BC, Sir James Douglas, to craft a set of treaties, the Douglas Treaties, which did not recognise the claims of First Nation peoples over tracts of land. In these treaties, the land in the Victoria area was by and large alienated from the Coast Salish people to become farmland for the settlers.

Development continues to this day, from farmland to the development of suburbs; as people continue to want to locate their farms, and now their houses, on these lovely Garry oak parklands

Thus, much of the Garry oak savannah ecosystem has been lost, and where it remains, it is under conservation status, which means it is no longer managed using the traditional practices that I have just described to you. As a result, we find other plant species, both local and introduced, colonising the remaining Garry oak savannahs and suppressing the regeneration of Garry oaks as well as the growth of wildflowers, including the camas lily.

What is being done now?

I have described this example to you because it gives me the opportunity to discuss some interesting research being done to address some of these issues. One approach, in which my colleagues at Environmental Studies at UVic are leading the way, is called ‘eco-cultural restoration’. The idea is to work together with local First Nations communities to restore degraded ecosystems, relying extensively on what is still understood about their TEK.

In a number of sites around Victoria, UVic researchers and Coast Salish community members are experimenting with the use of traditional management methods in the restoration of the Garry oak savannahs. Already they are having some interesting results, including an increase in the size of the camas bulbs, from the size of a garlic clove to something more resembling a hen’s egg. What is interesting is that these activities are causing not just the restoration of the ecosystem, but also the restoration of a culture, as young children learn how to harvest camas from their elders, and enjoy the communal experience of holding a pit-roast. With modern lifestyles and dietary changes being seen as a major cause of diabetes, heart disease, and other ailments in the First Peoples, the harvesting and eating of traditional foods like camas roots is seen as a path to better health.

A major problem, however, for these eco-cultural restoration initiatives is the politically fraught and ongoing issue of access to Garry oak savannahs where traditional camas harvests can be allowed. For example, one of the local First Nations groups, the Songhees Nation, used to have traditional harvesting grounds in the area that is now occupied by the University of Victoria. Last year, an Honors student called Pamela Tudge, under the supervision of my husband Jon Corbett, initiated a project to develop a university–community agreement that would enable a camas harvest to take place on university land. The first camas harvest and pit-roast ever to be held on campus grounds was held last June, and it was a wonderful and inspiring cross-cultural event. At present, I, as the lecturer in ethnoecology, am carrying out discussions with the various parties involved in order to ensure that this event can be carried on this summer and into the future.

2. Borneo

I am now going to move on to describe the situation in Indonesian Borneo, in particular, I will be talking about the Benuaq Dayak people, who live upriver from Samarinda in the remote district of West Kutai. These people still live a fairly traditional lifestyle, some of them being still based in their long houses, from which they conduct numerous activities, including swidden cultivation of rice (swidden cultivation is also known as shifting cultivation, or slash and burn), the use of ‘gardens’ (or orchards, really) where rattan clumps, fruit trees or rubber trees are grown, as well as the use of ‘forests’, whether they are primary forests or fallow forests that are in various stages of successional recovery from rice cultivation.

As with my BC example, I am going to focus on one specific traditional management system, as I haven’t the time to describe to you the Benuaq Dayaks’ entire system of land and resource management. This traditional system is the rattan garden.

But before I start, I am wondering whether many of you know what rattan is? The form in which you are probably most familiar with rattan is as furniture – rattan stems, when whole, can be made into chairs and tables, of the type that you often see in street-side cafes or garden patios. Rattan stems can also be split and made into baskets, mats, and other items. Rattan as a plant is actually a climbing palm, and over 600 species of rattan are found in the world’s tropical humid forests, ranging from equatorial Africa through South-East Asia as far as northern Australia! (I have been amused to learn that rattans are called ‘wait-a-whiles’ in Australia, on account of their sharp hooks, which they use to hold themselves up in the forest canopy, but which are also very good at grabbing hold of people who are trying to walk past them!)

All over the world, the majority of rattan is harvested by local people, mainly Indigenous people, who live near the forests in which rattan is found. The rattan then gets processed and then sold for cash to a long chain of traders, eventually ending up in an international market that is estimated to be worth US\$6.5 billion per year.

A large proportion of the world’s rattan comes from the province of East Kalimantan, and this trade has taken place for at least 100 years. I would speculate that this high output of rattan is because the Dayak people in parts of this province have developed traditional rattan gardens, which are a very innovative way of intensifying the production of rattan, by building it into their swidden rice cultivation cycle.

It is likely that many of you are familiar with swidden cultivation, also known as shifting cultivation or slash and burn. Swidden cultivation involves clearing an area of forest by cutting down the trees and burning them. This creates a clearing with sunlight and a shot of nutrients from the ash, which are ideal conditions for growing rice. However, the fertility of the soil tends to be very poor in the areas where swidden cultivation is practiced, and so rice is only cultivated for one to two years before the farmer abandons the field, moving on to clear another field and plant rice there. In the meantime, the abandoned field becomes a fallow field and is recolonised by forest vegetation. Here, seeds from the forest are dispersing into this field and forest vegetation is beginning to recolonise the clearing. With time passing, that the fallow field comes to resemble the surrounding forest in structure and species composition. Such sites will be returned to for a new rice field eventually, although the time between clearings varies greatly, from seven to 40 or even more years.

Now here comes the interesting part. What the Dayaks of East Kalimantan have learned to do is plant rattan seedlings in the rice field so that the rattan grows up in the field during the fallow time, climbing up on top of the recolonising fallow vegetation. In the end the farmer will have a mature and productive rattan garden, but one that is very difficult to walk through.

The farmer is very careful to manage the rattan garden in ways that enhances its productivity. The farmer will allow many wild species to colonize the garden, but is selective in which species he encourages and which ones he eliminates. For example, many timber species are allowed to grow as

support trees for the rattan, but competing vegetation is cut down. Most rattan grows in clumps, and so the farmer is very careful about how he harvests the mature rattan stems, so as to ensure the survival and growth of the immature stems as well as the young stemless shoots in the centre of the clump.

This is just one example of how Dayak farmers manipulate the fallow stage of swidden cultivation. Other examples include the planting of fruit tree species to develop fruit tree gardens called *simpukng*, or in more recent times, the planting of rubber trees to develop traditional rubber gardens.

All of these gardens can become very old – my colleagues and I have found gardens that were planted over 80 years ago – and they can come to resemble primary forest in terms of their diversity of species and the size of the trees in them – the only difference being that there is a particularly high abundance in these forests of plant species that are of high cultural importance such as rattan, fruit trees, rubber, timber etc. The ownership of these gardens can become quite complex, as all descendants of the original farmer have shares in their products.

The pressures facing Dayak rattan farmers in Borneo are somewhat similar to those faced by the Coast Salish First Nations in BC, except that they are happening now, rather than 100 years ago. One major threat is the failure of government to recognise these rattan gardens for what they are. This is because outsiders tend to see only the rice fields as land that can legitimately be claimed by Dayak villagers. The remaining areas are classified as primary or secondary forest, and therefore become the property of the state. This makes these lands available for development, the most recent trend being to establish oil palm plantations. Thus, despite great efforts being made by local people to obtain recognition of their land claims, many rattan gardens have been lost to oil palms.

What is being done now?

This example leads me to talk about my research, which has been based not only in Borneo but in other countries in South-East Asia and, generally speaking, has been conducted in areas where the environment, and the traditional cultures that live within it, are still relatively intact.

Here, I have worked with Indigenous communities on the management of forest lands and resources. My focus has been on supporting the development of sustainable and community-based enterprises for selling forest products such as rattan, fruit, wild honey, medicinal plants, and so on, all of which tend to be classified as a group under the label ‘non-timber forest products’, or NTFPs.

One example of this is a project that I was involved with in 2002, in which I worked with the Association of Rattan Farmers and Craftspeople (P3R) based in the West Kutai district of East Kalimantan, as well as a supporting NGO called the Consortium for Traditional Forest Management Systems (SHK).

This project also involved IKEA. I am sure that many of you are familiar with IKEA – perhaps you’ve had that overwhelming IKEA experience of wandering around one of their megastores, and suddenly realising that your life won’t be complete without a rattan basket for your dog!

Well, to get back to my project, what happened was that a representative from IKEA made a trip upriver to meet with P3R. She told them that IKEA would be interested in selling rattan table mats, coasters and napkin rings from rattan that had been grown by the farmers (who are usually men), and made into various handicrafts by the craftspeople (who are usually women).

IKEA wanted to promote these items as being supportive of rainforest conservation, as well as supportive of the cultures and livelihoods of the Dayak people. This would be good for IKEA, as it would make these products more attractive to the consumer, it would also be good for the Dayak people as the prices that they would receive from IKEA would be higher, and such a project could additionally help them in their attempts to obtain more secure legal claims to their rattan gardens.

However, for IKEA to be able to promote these handicrafts in this way, the rattan gardens of P3R would have to be certified as coming from forests that have been managed in a ecologically, socially, and economically sustainable manner.

I don't have time today to talk further about certification, but the role that I and a colleague of mine from the University of Mulawarman, Dr Fadjar Pambudhi, had in this project was to assist P3R and SHK in developing a management plan that would ensure that the criteria for sustainable forest management were met. Some of the work that we included:

- Firstly, we worked with the farmers' TEK: This involved drafting a protocol that described, in detail, the way in which land and resources were managed in the traditional rattan gardens, and what farmers felt were the 'best practices' to follow for long-term sustainability. Secondly, we worked with scientific knowledge. This involved developing methods, with the farmers, for mapping their gardens and for conducting an inventory of the amount of rattan in each garden, in order to estimate how much rattan P3R had in total, and how much they could harvest annually to ensure a sustainable supply to IKEA.

To sum up my work on sustainable and conservation-based NTFP management, I have increasingly come to respect the wealth of TEK possessed by these community members. As a result, the approach that I have developed towards NTFP management emphasises the use of TEK as the starting point for management planning, with scientific approaches being brought in if and when necessary, and always under the control of the communities themselves.

As well, an area of interest shared by my husband Jon Corbett and myself is the use of multimedia to document TEK in order to explain and promote it to outsiders.

Conclusions

So, in conclusion, I hope that I have managed to convey to you the sophistication of the TEK that has been developed by the Indigenous cultures of BC and Borneo. These two groups of people have developed management systems that maintain a diversity of habitats in the landscape, resulting not only in an increased *diversity* of species, but also an increased *productivity and availability* of resources.

As Sandra Peacock and Nancy Turner (1999) say of the lands that were previously managed by the Coast Salish Nations:

It is no accident or coincidence that the richest, most productive root-harvesting grounds, the best seaweed and eel-grass meadows, the most diverse and productive berrying grounds, and the richest clam-beds are within areas that have been visited routinely for hundreds and in some cases, thousands of years, as indicated by the presence of archaeological features such as root-roasting pit depressions.

Landscapes that are dependent upon deliberate human intervention are called cultural or 'anthropogenic' landscapes. Their dependency on humans is illustrated by the fact that when this constant, purposive human intervention ceases, a process of environmental change takes place that leads to a decline in the number, range, and diversity of many of the habitat types and native species that once flourished there. When elders are asked why this decline is taking place, they say it's because 'no one is gathering there any more'.

Indigenous people in both BC and Borneo tend to see their interactions with these landscapes as being integral to their proper maintenance; indeed, within their worldview, it has been seen as their sacred responsibility.

This differs quite markedly from the way in which we in the Western world have come to see our role in landscapes that we manage. Often, our landscapes are divided into two categories: on the one hand, there are landscapes where human activity is allowed, that are often under greatly simplified and

intensive forms of management (however there are growing questions regarding the long-term sustainability of these systems); on the other hand, there are landscapes where human activity is not allowed, that are designated as protected areas. However, we should ask ourselves, if traditional human activity is what created the diversity of these protected areas in the first place (as with the Garry oak ecosystem I described earlier), is removing all human activity the best way forward, or is a more nuanced approach to management needed?

Perhaps some of the lessons we can learn from the longhouse are about ways for our societies to live within our landscapes in a more integrated and sustainable manner, managing for production of food and other human needs as well as for biodiversity.

Speaking more broadly, I would say that there are lessons from the longhouse also about the change in attitude that is necessary for a more sustainable future.

Our modern, globalized societies have distanced themselves from nature and as a result have developed a dysfunctional relationship with the environment. Ultimately, the earth's diversity requires us to learn how to develop a diversity of localized human-environment relationships all united by a common closeness to and respect for nature. In developing a stronger commitment to the place in which we live, and in improving our understanding of how to live within it, there is much that we can learn from Indigenous people and their TEK.

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Appendix 4: Strategic planning discussions report

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Description

The afternoon session of the Kalgoorlie Aboriginal Wild Harvest and Land Management Seminar comprised an informal discussion of issues of relevance to wild harvest and land management enterprises. Notes were taken during the discussion and displayed on a screen so as to ensure that clarity was achieved with respect to issues raised and participant comments. A summary of some of the key points raised is provided below.

Wild Harvest

- Wild harvest of natural materials has to be done on a large scale.
- Need to have groups from a wide geographical area to collaborate to ensure reliability of supply.
- Wild harvest is an *ad hoc* activity, but if there was money being paid then people would be interested.
- Entrepreneurial activity will alienate the people from the rest of the community.
- Markets need to be identified.
- Harvesting timber is an opportunity.
- Forest Products is concerned that the harvesting of sandalwood is not sustainable; it seems that the government views harvesting of precious timbers is an open market for Forest Products – this is a weak link; there are questions about the replacement strategy.

Land Management

- Aboriginal people know what grows in this country and what should be planted.
- Aboriginal people should be recognised as the custodians of country and be consulted and their knowledge respected.
- What is missing is that government is not recognising traditional knowledge.
- Non-Aboriginal people are becoming interested in traditional knowledge and in incorporating traditional knowledge into land management activities.
- Should action a policy so that Aboriginal people become the environmental managers in mining companies; Aboriginal people understand the land – they could contribute to rehabilitation activities; the understanding of water courses and the need to preserve them isn't there in the mining industry. The mining operations change the land – if there was more consultation with Aboriginal people the impacts could be minimised.
- Lack of money for Indigenous land management in the Goldfields – should put together a project involving GLSC, mining companies; P4P, CMAE to select plants and trial them for mine-site rehabilitation.
- Strategic water points should be maintained – sustainable management is what is required.

Intellectual Property Rights

- The concept of IP is a major problem – have to solve this first.
- Plant knowledge should be copyright.
- Financial returns from plant knowledge can come from manufacturing plant products, e.g. wattle seed coffee.
- Aboriginal people get together with land councils and academia to lobby for IP legislative introduction.
- Aboriginal people should have the same right over plants as over kangaroos – why should they not have royalty rights over plants?

Mining Company Projects

- Suggested that should work with mining companies.
- Most of regulations have to do environmental management assessment.
- Some cynicism was expressed – before Mabo no rehabilitation was done.
- Contact with mining industry would be welcomed; old water reserves could be used in collaborative projects.
- Some mining companies appear to be genuinely interested in working with Aboriginal community.
- Mining companies should employ people with known connection to country in their land management activities.
- Barrack Gold Group has had a consultancy done on plant cultivation for relinquishment of mine sites; could make their research centre available for future research.
- Because of the long lead time for sandalwood it is preferable that plants with essential oils, medicinal properties be considered for cultivation; what is needed is to identify the plant species that should be grown.

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