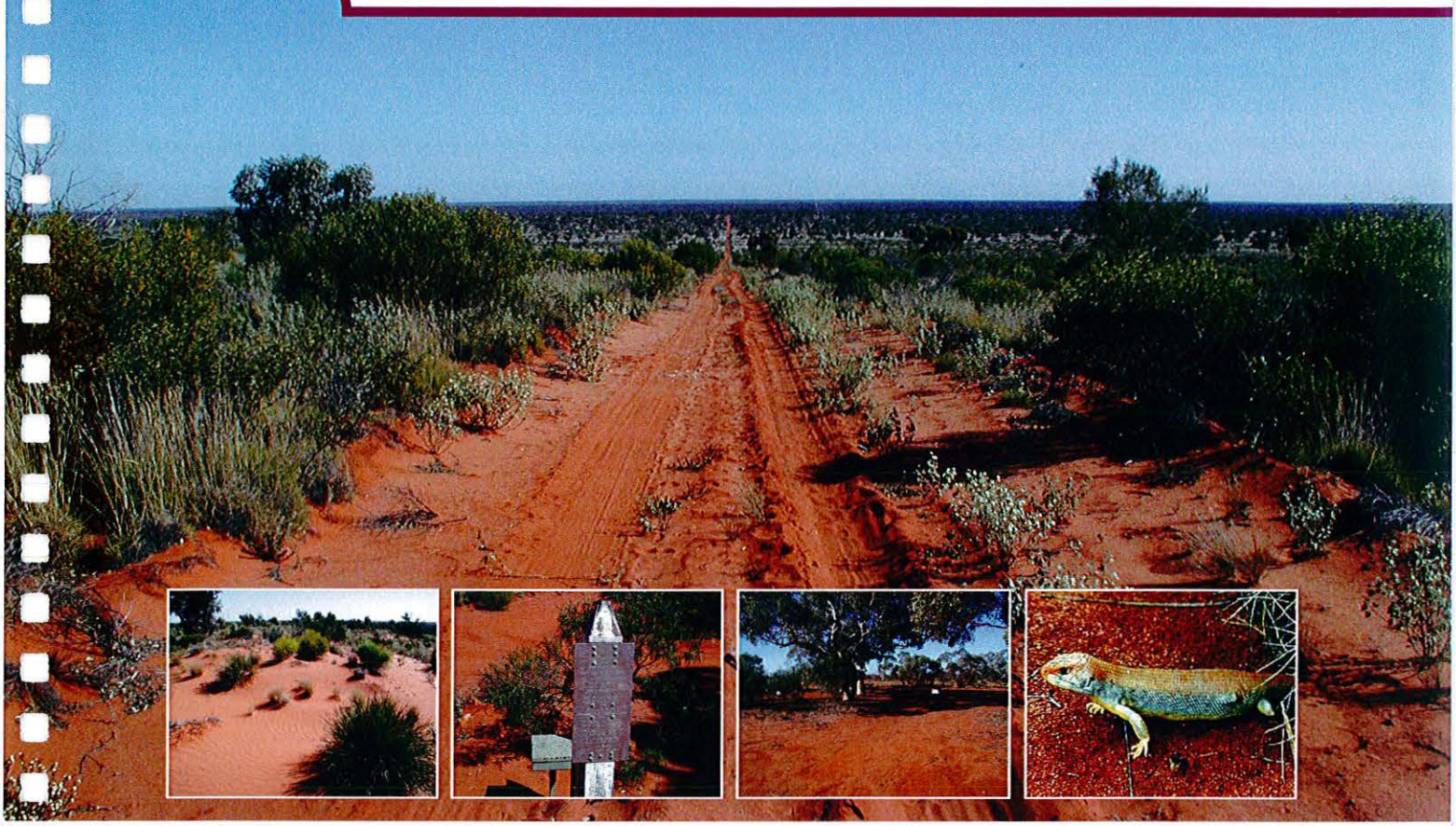
LANDSCOPE EXPEDITIONS
Working at the Frontier of Discovery

Expedition **Briefing**



(Main) The Connie Sue Highway in the Great Victoria Desert (photo – Karl Brennan). (Insets from left) Dunes in the Great Victoria Desert; Len Beadell marker at Neale Junction; Neale Junction camping area; great desert skink (*Egernia kintorei*) (photos – Karl Brennan/DEC).

In the Tracks of Len Beadell

Plants and animals of Neale Junction Nature Reserve

28 September–11 October 2008

Leaders:

Barry Hooper	Regional Leader Parks and Visitor Services, DEC Goldfields Region, Kalgoorlie
Dr Karl Brennan	Regional Ecologist, DEC Goldfields Region, Kalgoorlie
Gary Hearle	Conservation Officer, DEC Goldfields Region, Kalgoorlie

This expedition is offered by LANDSCOPE, the Department of Environment and Conservation's (DEC's) quarterly magazine devoted to wildlife, conservation and environmental issues in Western Australia. LANDSCOPE Expeditions are run in association with UWA Extension, The University of Western Australia.

LANDSCOPE Expeditions - Working at the Frontier of Discovery

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In the Tracks of Len Beadell
Plants and Animals of the Neale Junction Nature Reserve
Goldfields Region

28 September – 11 October 2008

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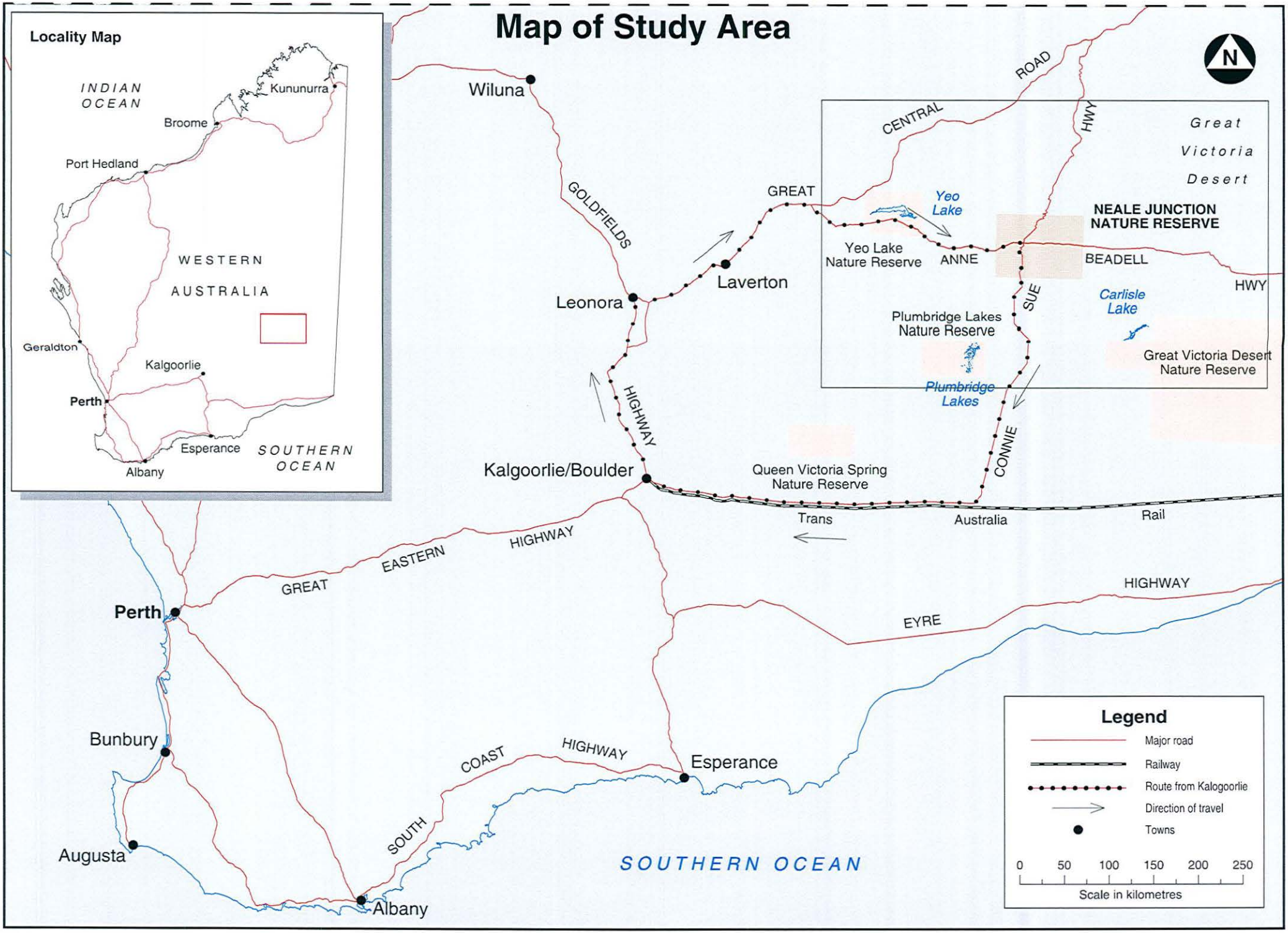
Map of Study Area
Locality Map
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Port Hedland
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Major road
Railway
Route from Kalogoorlie
Direction of travel
Towns
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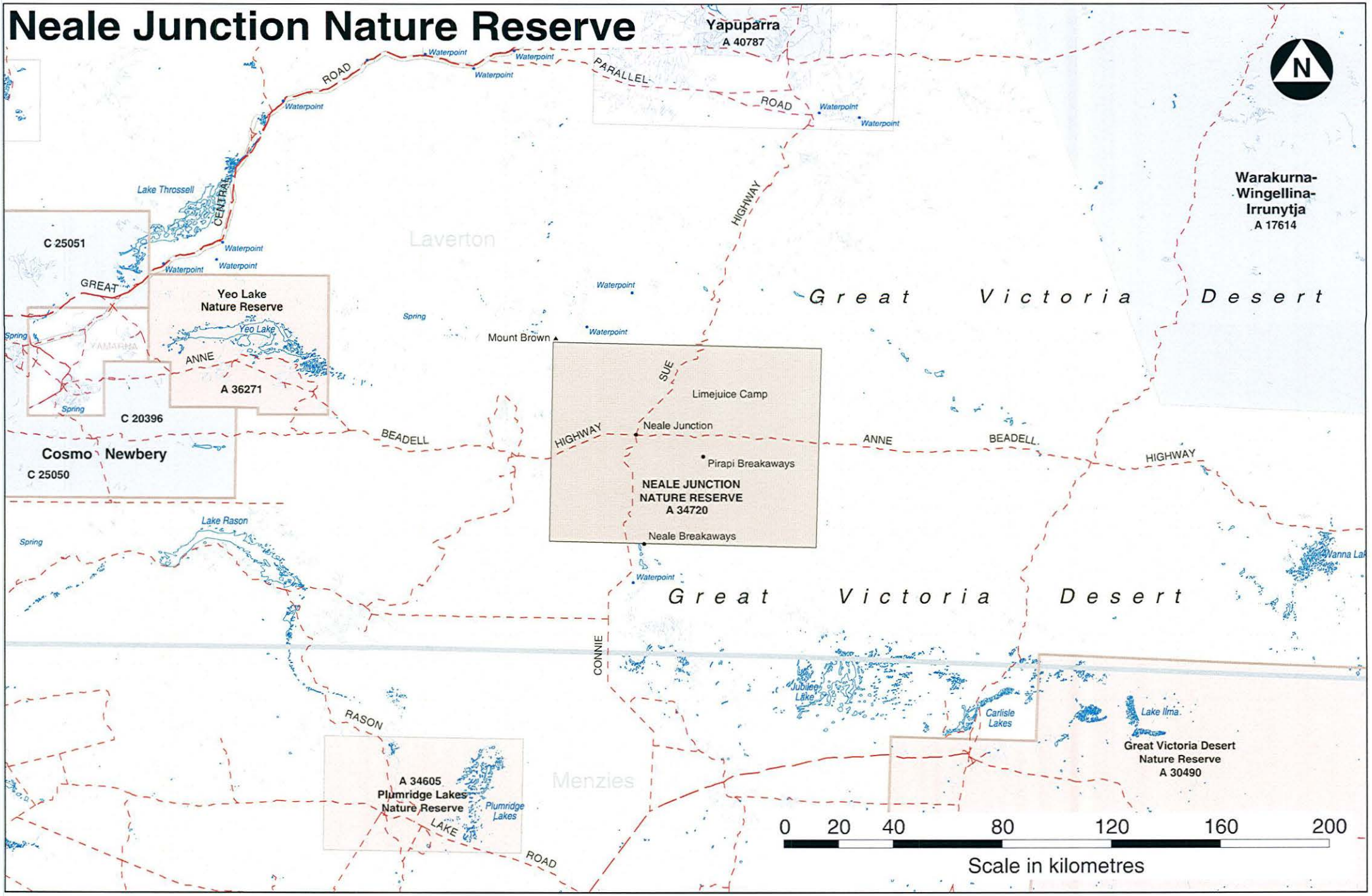
Scale in kilometres


Neale Junction Nature Reserve
Yapuparra
A 40787
Waterpoint
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Plumridge Lakes
Nature Reserve
Plumridge Lakes
LAKE
Menzies
0 20 40 80 120 160 200
Scale in kilometres

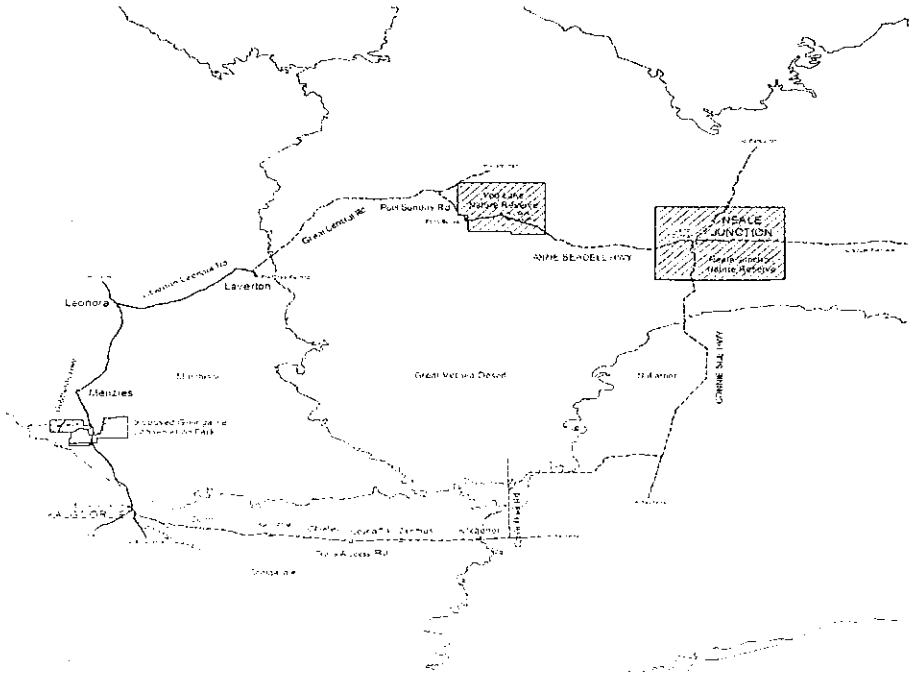
RESEARCH PROJECT

RESEARCH LOCATION

Neale Junction Nature Reserve (NJNR) is located in the heart of the Great Victoria Desert (GVD) approximately 500 km north-east of Kalgoorlie. It covers a massive 725,000 ha and east-to-west spans approximately 98 km and north-to-south 74 km. However, despite its large size, access is restricted as there are only two tracks running through the reserve – the Anne Beadell and Connie Sue Highways (actually just rough 4WD tracks that are often only the width of a single vehicle). These highways intersect at Neale Junction from which the reserves name is derived. The Nature Reserve was established for the conservation of flora and wildlife in 1978

The GVD is an area of active sand-ridges of deep Quaternary aeolian sands, that in the central part of the desert where NJNR is located, overlay Permian strata of the Gunbarrel Basin. Landforms within the GVD include plains of red sands and dunefields (with an average height in some areas of 10 m). On the floor of major valleys there are chains of salt lakes that may be surrounded by dunes derived from lake sediments. The GVD also contains silcrete-capped mesas (flat-topped hills) and plateaus (breakaways). Aside from mesas, these landforms are all represented within NJNR.

On the Western Australian side of the border the land tenure through which the Anne Beadell Highway traverses is pastoral lease, 'A' Class Nature Reserves and Unallocated Crown Land (UCL). The Connie Sue Highway passes through Aboriginal lands, UCL, 'A' Class Nature Reserve and pastoral lease. Parts of the UCL along which the Anne Beadell and Connie Sue Highways traverse are subject to unresolved claims for native title from Aboriginal people associated with the Cosmo-Newberry, Coonana and Tjuntjuntjarra Communities.



Neale Junction Nature Reserve's status as an 'A' Class Nature Reserve gives it the highest level of protection available within Western Australia. 'A' Class reserves require legislation to be passed through both houses of State parliament before activities that could threaten the

values of the reserve can be undertaken. Subsequently it meets the International Union for the Conservation of Nature's (IUCN) criteria for Category 1a.

Plants

Unlike many deserts around the world, Australia's deserts are well vegetated. The GVD contains a range of different vegetation types. Perhaps the most characteristic is a tree steppe of marble gum *Eucalyptus gongylocarpa* with scattered mallees of yarldarlba (*E. youngiana*) and *E. kingsmilli* over a hummock grassland of hard spinifex *Triodia basedowii*. This vegetation type occurs on sandy soils. Native pines (*Callitris*) occur in sandy areas where there has been infrequent fire. On colluvial substrates these species are replaced by mulga (*Acacia aneura*) with an understorey of *Eremophila* and *Santalum*. Near salt lakes and saline drainages halophytes such as salt bush (*Atriplex*), bluebush (*Kochia*) and samphire (*Tecticornia*) occur.

Animals

There is limited knowledge of both the vertebrate and invertebrate animals of NJNR. Pianka (1969) surveyed reptiles at two locations within the western and southern parts of the reserve recording 31 species. Pianka and Pianka (1970) reported 30 species of birds from these locations. Burbidge *et al.* (1976) then surveyed mammals, reptiles and birds at two areas; one in the northern and the other in the southern sections of the reserve. These authors recorded ten mammal species and added an extra four species of reptiles and 11 species of birds. Since these early surveys, however, and despite its vast size and potential home to a range of threatened taxa, NJNR has not received any further survey effort until this year. In Autumn 2008 a DEC-led expedition (in collaboration with the staff from the Western Australian Museum, La Trobe University, Anglo-Gold Ashanti and their consultants Ecologia) established 27 survey sites through the reserve and surveyed both vertebrate and invertebrate animals. The *LANDSCOPE* Expedition scheduled for spring will add to this work by markedly increasing the survey effort and most importantly sampling during a different season when different species are likely to be detected. Moreover, it will particularly focus on detecting threatened species some of which require specialized survey techniques.

Mammals

Mammals known from NJNR include the echidna (*Tachyglossus aculeatus*), the threatened crested-tail mulgara (*Dasycercus cristicaudata*), ride's ningaui (*Ningaui ridei*), various species of dunnarts (*Sminthopsis* spp.), the red kangaroo (*Macropus rufus*), the western Grey kangaroo (*Macropus fuliginosus*), and the euro (*Macropus robustus*). The dingo (*Canis lupis*) is also present. Species introduced since European settlement are the rabbit (*Oryctolagus cuniculus*), the fox (*Vulpes vulpes*), the cat (*Felix catus*), and the one-humped camel (*Camelus dromedarius*).

Threatened mammal species that have the potential to occur in the reserve but are yet to be recorded include the greater bilby (*Macrotis lagotis*), brush-tailed mulgara (*Dasycercus blythi*), southern marsupial mole (*Notoryctes typhlops*), long-tailed dunnart (*Sminthopsis longicaudata*) and sandhill dunnart (*Sminthopsis psammophilla*).

Reptiles

Reptiles known from NJNR include various species of goannas (*Varanus*), skinks (*Ctenotus, Egernia, Erameascincus, Lerista Menetia, Morethia,* and *Tiliqua*) and geckos (*Diplodactylus, Gehyra, Heteronotia, Lucasium, Nephrurus, Rhynchoedura, Strophurus*).

Threatened reptile species that have the potential to occur in the reserve but are yet to be recorded include the woma python (*Aspidites ramsayi*) and great desert skink (*Egernia kintorei*).

Amphibians

Frogs have never been recorded within NJNR but many species have the potential to occur there including various species of burrowing frogs (e.g., *Neobatrachus centralis, Neobatrachus kunapalari, Neobatrachus sudelli, Neobatrachus wilsmorei*), the orange-crowned toadlet (*Psedophryne occidentalis*), the water-holding frog (*Cyclorana platycephala*) and the desert tree frog (*Litoria rubella*).

Birds

A wide range of parrots have been recorded from NJNR including the threatened princess parrot. Other parrots recorded from NJNR include the budgerigar, cockatiel, galah, Major Mitchell's cockatoo mulga parrot, Australian ringneck and scarlet-chested parrot. Other threatened birds or species of conservation interest recorded from NJNR include the striated grasswren, Australian bustard, and grey falcon. The threatened malleefowl also has the potential to occur within the reserve.

Pianka and Pianka (1970) recorded 30 species of bird at two locations within NJNR. Burbidge et al. (1976) added an added 10 species to this list. Other authors who recorded anecdotal observation of birds within NJNR include Ford and Sedgewick (1967) and Ford (1971).

Invertebrates

As noted above, almost nothing is known of the terrestrial insects, arachnids and myriapods that inhabit the reserve. As the reserve contains areas of calcrete that contain water and air-filled voids, it is likely that these are inhabited by stygofauna and troglofauna. To date, however, no one has ever looked for stygofauna or troglofauna within NJNR.

NEALE JUNCTION – A BRIEF HISTORY

In the late 1800's several exploration parties led by famous explorers such as Ernest Giles, John Forrest, Peter Warburton, moved through the Neale Junction area. Another one of those expeditions included the Elder Scientific trip which traversed previously uncharted sections of the Great Victorian Desert. At the time this was one of the largest exploring parties assembled with six officers, four afghan cameleers and 44 camels. The main objective was to carry out exhaustive scientific exploration of the Great Victoria Desert including the Neale Junction area. This area then began to be subjected to an intensive period of visitation to around 1930's. Concerted attempts were made to map and document the features of this area.

This exploration phase also provided contact between Aboriginal people of this area and Europeans. In the late 1910's the government of the day focussed on 'protecting' Aboriginal

communities. Christian missions were eventually set up at locations on the fringe of the desert, but not at Neale Junction. These remained in place for many decades as Aboriginal people were leaving their traditional nomadic lifestyle in the desert areas and began to be accustomed to European way of life. There is a strong spiritual bond between the desert and its traditional custodians and there are many dreaming tracks and sites of cultural importance interwoven across the Great Victoria Desert landscape.

Len Beadell, outback road construction legend, spent 10 years of his life building a network of roads in the Great Victoria Desert area including Neale Junction. He pushed desert tracks in all directions from the junction and named one the Connie Sue Highway, which linked Rawlinna with Warburton. In the early 1960's Beadell then bulldozed and graded a track from Serpentine Lakes near the south Australian border to Yeo Lake to the west. These tracks are still open today for travellers to enjoy.

Neale Junction was named after Frank Neale a World War One flying ace who carried out private aerial surveys for prospectivity from 1930 to 1935.

PROJECT BACKGROUND

Owing to the remoteness of Australia's western deserts, the geographical distribution of the plants and animals that inhabit these regions is poorly documented. This project seeks to improve our understanding of the biota that inhabits the central part of the Great Victoria Desert by surveying the plants and animals that occur in an area that has received scant systematic survey for animals and plants.

THE PROJECT

This expedition will conduct a detailed systematic biological survey of NJNR and opportunistic collection of biota along the Anne Beadell and Connie-Sue Highways. In particular it will survey for reptiles, small mammals, frogs and marsupial moles; collect terrestrial insects, arachnids and centipedes; conduct surveys for vascular plants and undertake opportunistic observations for birds, in particular rare birds such as the princess parrot, grey falcon and striated grass-wren.

Small mammals, reptiles and frogs will be censused by using pitfall traps, Elliott traps, funnel traps, supplemented with diurnal and nocturnal hand collecting. The presence of marsupial moles will be assessed by excavating trenches and inspecting them for mole tunnels (moles back-fill their tunnels as they burrow and where present these tunnels can be seen when the side walls of trenches are rubbed smooth). As moles are preyed upon by cats, foxes and dogs we will also collect scats for later examination for hair and/or bone fragments of moles. Medium and large mammals will also be censused by direct observation and searching for their tracks. As NJNR contains breakaways with short caves (to 1.5 m length), will we excavate the floor of one of these caves for bones of mammals. We are particularly interested in documenting species that are either globally extinct such as the lesser stick-nest rat (*Leporillus apicalis*) or locally extinct such as the brushtail possum (*Trichosurus vulpecula*) and chuditch (*Dasyurus geoffroii*).

Plants will be surveyed at the sites where traps are installed. Opportunistic collections will also be made particularly for rare plants or those of current taxonomic interest. Plant

specimens will be made into a field herbarium and later voucher specimens will be lodged with the Western Australian Herbarium.

Insects, arachnids and myriapods will be collected from the pitfall traps used to sample the small vertebrates. Spiders will also be collected by searching for burrows and looking for the reflectance given off by their eyes at night when illuminated by a torch. Scorpions will also be collected by excavating burrows and black lighting (scorpions fluoresce when illuminated at night by a hand held black light). Nocturnal insects will be collected by light-trapping.

VOLUNTEER ASSIGNMENTS

Conservation Volunteers

Being a volunteer allows you to discover first hand what the Department is doing. You will be part of a force of 4000 people involved in a wide range of activities that include tree planting, trail building, interpretation and assisting with scientific projects. If you wish to be involved with future DEC Volunteer projects, please contact DEC's Community Involvement Coordinator, Margaret Buckland, on (08) 9334 0251 on your return. The Department relies very much on its volunteer work force. In 2006/2007 volunteers supplied 497 000 hours of effort. Volunteer assistance with remote area work, such as this expedition plans to carry out, is especially helpful.

Field Tasks

Volunteers will assist with the following research activities in the field:

- Survey and collection of plants
- Daily checking of pitfall traps, funnel traps and Elliott traps for small mammals, reptiles, millipedes, scorpions and trapdoor spiders (when traps are set) and transporting these animals back to camp for processing and then back to their point of capture for release
- Surveys for birds
- Excavation of sub-fossils from caves
- Identifying tracks of animals known to be present in the reserve (e.g. cats, foxes, dingos, camels, echidnas, emus and Australian bustards) and attempting to find tracks of threatened species the have not yet been recorded from the reserve but have the potential to occur there (e.g. malleefowl, bilbies and brush-tailed mulgaras)
- Digging trenches to see past evidence of marsupial moles and recording this information onto datasheets
- Opportunistic collection of predator scats and owl pellets for later identification of small mammals based on hair and bone fragments (in particular marsupial moles)
- Opportunistic observation of rare and threatened birds (e.g. princess parrot, grey falcon, striated grass-wren)
- Hand foraging for small reptiles (e.g., geckos and skinks) and short-range endemic invertebrates (e.g. pseudoscorpions, millipedes, trapdoor spiders)
- Spotlighting for nocturnal birds, reptiles and spiders

Base Camp Tasks

- Identifying captured animals and database these records
- Assist in compilation of data at the end of the day
- Confirm identification of small vertebrates
- Curate specimens of insects, arachnids and myriapods
- Plant and identification and curation
- Write up notes

Base Camp Maintenance

- Set up/strike camp when necessary
- Assist with general camp maintenance
- Assist with meal preparation and clean up

Field Training

In addition to orientation, there will be briefings on safety, research procedures and objectives. There will also be formal daily reviews of progress, sharing of participants' discoveries and briefings of the activities planned for following days. Team leaders will be available to discuss aspects of their work with expedition members, and are looking forward to a shared learning experience.

Application of Results

This type of research is fundamental in documenting and monitoring the biodiversity values of Western Australia. Importantly, reference collections made here will be lodged with the WA Museum and the WA Herbarium where they contribute in the broader context to our understanding of biogeography throughout WA and Australia. Additionally, lodging specimens in these institutions permits ready access by taxonomists so that if new species are discovered they can be formally described and named.

Expedition Leaders

Dr Karl Brennan is DEC's Regional Ecologist for the Goldfields. His specialty is terrestrial invertebrates including arachnids, insects and myriapods (millipedes and centipedes). For his PhD from Curtin University, Karl studied the effects of mining and burning on jarrah forest spiders. He then lectured at Curtin for two years in zoology, ecology and conservation biology and supervised research projects on arid spiders in Western Australia's interior. Later as a post-doctoral fellow at the University of Melbourne he researched the effects of fire on terrestrial invertebrates in tall NSW coastal forest and Tasmanian high altitude buttongrass moorlands. Karl's current work includes reintroducing threatened mammals to proposed conservation reserves that are jointly managed with Aboriginal people and inventorying both the vertebrate and invertebrate fauna in the spinifex deserts of the Goldfields.

Gary Hearle has been employed with DEC for 4 years. Based in Kalgoorlie, he began working with maintenance crews as overseer before moving into the role of Reserves Officer in 2006. He participated in the volunteer program for 5 years before commencing

employment with DEC. Gary has participated in several biological surveys in the Goldfields Region and has a particular interest in arid zone reptiles. Gary has also been involved in feral herbivore (camels) and predator (cats) monitoring projects as well as joint management with traditional people and general reserve management.

Barry Hooper is the Regional Leader Parks & Visitor Services for DEC's Goldfields Region based in Kalgoorlie. Barry has spent the last 7 of his 20 year career with CALM/DEC in the Goldfields and has extensive knowledge of the region, including the Neale Juction area. He is responsible for developing works programs for the regions extensive reserves, including the recent pastoral station acquisitions purchased for conservation. His other duties include liaising with remote Aboriginal communities to achieve the department's joint management/working together initiatives.

EXPEDITION DIARY AND REUNION

An exercise book will be provided for volunteers to take turns recording each day's events. Anything goes! Each person takes a turn. This will be transcribed and a copy distributed to each expedition member as a memento of the trip. Please include highlights of each day, interesting data, and anything of interest to you. Much information can be gleaned at 'Show and Tell' and 'Meet the Scientist' each evening when the leaders summarise the day's activities and plan for the following day. So, if you have the diary for the day, take it to 'Show and Tell' and record the day's events. A copy of the expedition diary will be provided soon after the conclusion of the expedition.

A reunion for all 2008 expeditions will be held in November in Perth. An invitation will be issued with details of the venue and other arrangements approximately one month prior to the evening. The reunion provides an opportunity to catch up with old friends, see other participants' photographs and records of their trips, and review the results of the *LANDSCOPE* Expeditions program.

FIELD LOGISTICS

RENDEZVOUS

Expedition members will meet at **1400 hrs on Sunday 28th September 2008** at the Department of Environment and Conservation Offices, 32 Brookman Street, Kalgoorlie.

If you are delayed for any reason on the day of rendezvous, please contact Barry Hooper on 0417 917 612.

Gear will be loaded and the expedition will depart Kalgoorlie at **1500 hrs** sharp for overnight accommodation at Goongarrie Station, approximately one hours travel north along the Goldfields highway from Kalgoorlie.

Tag-alongs are welcome to join the expedition at this point or meet the convoy at a prearranged meeting point as agreed to by the expedition leaders. IMPORTANT If you plan to meet the expedition convoy at an alternative location, please contact Rohan Swan on (08) 9334 0401 as soon as possible to confirm if this can be arranged.

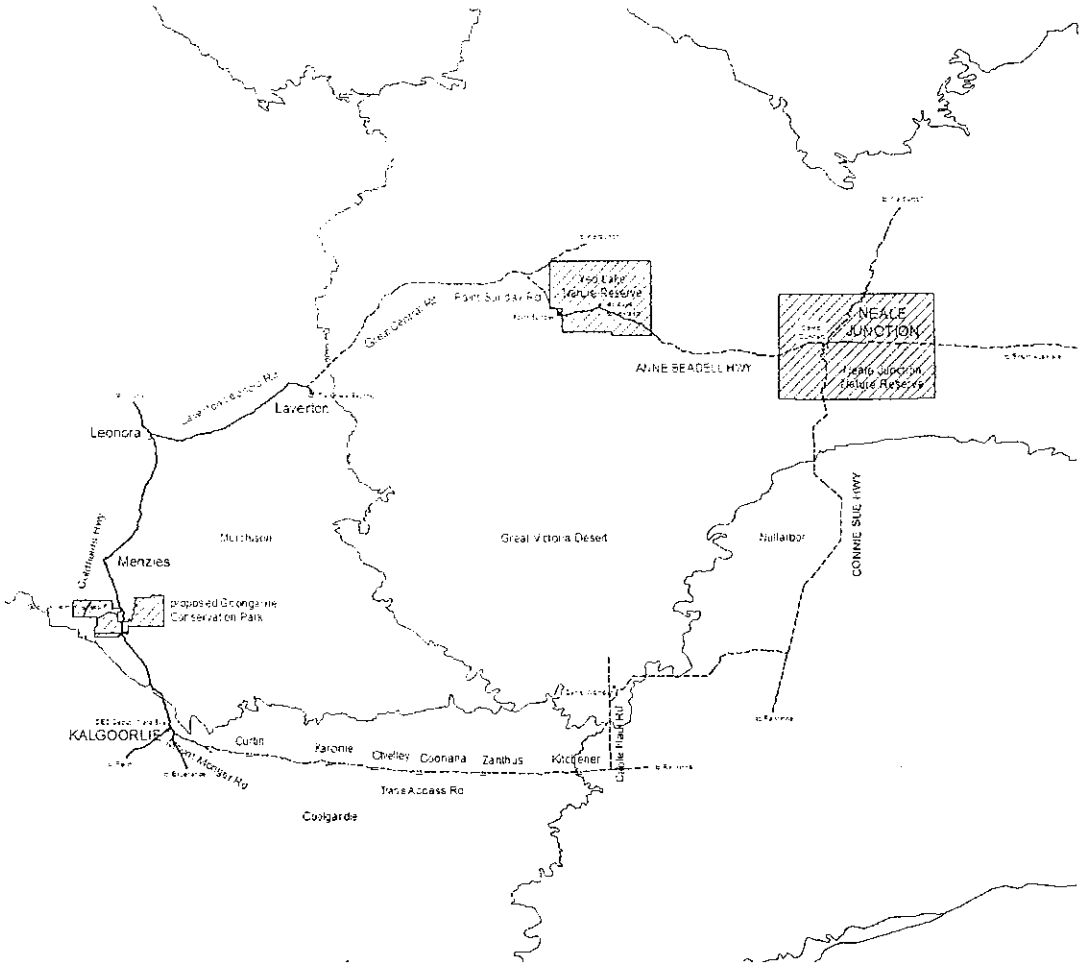
EXPEDITION ROUTE

After departing Kalgoorlie the expedition will travel north along the Goldfields Highway to the old Goongarrie Homestead for the first evening. The following morning we will depart Goongarrie and travel via the Goldfields Highway to Leonora, then via the Leonora – Laverton Road to Laverton. We will then follow the Great Central and Point Sunday Roads to Point Sunday for afternoon tea. From there we will follow the Anne Beadell Highway to our overnight campsite in the Yeo Lakes Nature Reserve. On day three, we will continue along the Anne Beadell Highway to Neal Junction where we will set up base camp for the next ten nights.

We will return to Kalgoorlie by travelling south along the Connie Sue Highway and various tracks to an overnight camp near the north-eastern border of Kananda Station near Kitchener. We will then follow the Cable Haul Rd, the Trans Access Rd (which runs adjacent to the Trans-Australia railway line) and Mt Monger Rd to return to Kalgoorlie late in the afternoon of Saturday October 11.

ABORIGINAL LAND

The area to the east of Neal Junction Nature Reserve is part of the Central Australian Aboriginal Reserve. The closest community is Tjuntjuntjarra, which is approximately 160 kms to the south east of Neale Junction. There is no native title claim over the Neale Junction Nature Reserve, but there are two registered Aboriginal sites within the reserve that are protected by Commonwealth and State law. Access to these sites is restricted. There is also other sacred sites that are yet to be registered where access is restricted. There may be opportunities to access these sites after consultation with the community.



ITINERARY

Day 1 **28 Sep** **Sun**

Kalgoorlie to Goongarrie
Depart Kalgoorlie and travel to Goongarrie for overnight accommodation. Expedition briefing and presentation from Ian Keally, Regional Manager, Goldfields Region.
O/N Goongarrie.

Day 2 **29 Sep** **Mon**

Goongarrie to Yeo Lakes
Travel from Goongarrie to Yeo Lakes Nature Reserve via Leonora, Laverton and Yamarna. Set up overnight camp. O/N Yeo Lakes Nature Reserve. Light-trapping for nocturnal insects.

Day 3 **30 Sep** **Tue**

Yeo Lakes to Neale Junction Nature Reserve
Sampling of stygofauna from the well and bore at Yeo Lakes. Travel via Anne Beadell Highway to Neale Junction. Set up base camp. Inspection of Len Beadell's sign at Neale Junction. Set traps

Day 4	**1 Oct**	**Wed**	**Neale Junction Nature Reserve** Biological Survey
Day 5	**2 Oct**	**Thu**	**Neale Junction Nature Reserve** Biological Survey
Day 6	**3 Oct**	**Fri**	**Neale Junction Nature Reserve** Biological Survey
Day 7	**4 Oct**	**Sat**	**Neale Junction Nature Reserve** Biological Survey
Day 8	**5 Oct**	**Sun**	**Neale Junction Nature Reserve** Biological Survey
Day 9	**6 Oct**	**Mon**	**Neale Junction Nature Reserve** Biological Survey
Day 10	**7 Oct**	**Tue**	**Neale Junction Nature Reserve** Biological Survey
Day 11	**8 Oct**	**Wed**	**Neale Junction Nature Reserve** Biological Survey
Day 12	**9 Oct**	**Thu**	**Neale Junction Nature Reserve** Biological Survey. Close and collect traps.
Day 13	**10 Oct**	**Fri**	**Neale Junction Nature Reserve to Kitchener** Pack up base camp and depart. Travel via Connie Sue Highway and other tracks to the Trans Access Rd near Kitchener. O/N Kitchener. Light-trapping for insects and spotlighting for southern hairy-nosed wombats, cats and foxes.
Day 14	**11 Oct**	**Sat**	**Kitchener to Kalgoorlie** Travel via Trans Access Rd to arrive in Kalgoorlie late in the afternoon. End of expedition. A wind up evening meal at the Tower Hotel on Maritana St, Kalgoorlie will be a great way for everyone to wind up the expedition.

This itinerary is provisional and may be varied at the discretion of the expedition leaders.

DAILY SCHEDULE

Please note: For the well-being of the animals caught in traps it is important that we get an early start. When traps are not open, however, we can make a later start.
At Neale Junction during our stay daylight & nightfall will be as follows:

- Daylight: first light is from approx. 0445 hrs, with sunrise at approx. 0515 hrs;
- Nightfall: sunset is at approx. 1730 hrs, with twilight extending until approx. 1800 hrs (see http://www.ga.gov.au/bin/astro/sunrisenset)

When traps are closed the start time for breakfast will be set back to 0700 hrs

0530 hrs	Arise and have breakfast
0600 hrs	Check traps if traps set previous evening
1000 hrs	Morning tea
1030 hrs	Processing of animals and plants / rest
1200 hrs	Lunch
1300 hrs	Continue fieldwork
1530 hrs	Afternoon tea
1600 hrs	Continue fieldwork and return to camp
1730 hrs	Dinner preparation / washing. Set up light trap for nocturnal insects and begin collecting
1800 hrs	Dinner
1900 hrs	Discuss day's events, complete pressing of plants, record keeping, plant notes, spotlighting for nocturnal birds and reptiles, and collect nocturnal insects

TEAM DEVELOPMENT

Team spirit will initially be built by travelling together in the expedition convoy to the Neale Junction Nature Reserve. There will be regular stops, and team members will be rotated between vehicles. Travelling as a convoy, having meals together, sharing in preparation and clean-up, working and living together in the remote outback, and being involved with this exciting project will enhance team spirit.

ACCOMMODATION

After the overnight stop at Goongarrie, where we will be accommodated in shared quarters, conditions will be basic. We will be camping for twelve nights in isolated bush camps with few facilities. The expedition will be accommodated in swags and tents. A covered area will be set up under which research work will be completed. A pit toilet is available.

Drinking water and water for other purposes (cooking, dishwashing, showers etc) will be provided. A bush shower will be set up a couple of times during the expedition to allow participants to wash.

Full fee paying volunteers should have four items of luggage – **your *LANDSCOPE* Expeditions duffel bag, daypack, small pillow and sleeping bag (lightweight, compact but warm – recommended rating 0°C)**. Bag labels are provided, however, as all the bags look the same, you may wish to mark your bag with a coloured ribbon, or something else that helps you spot your bag quickly. You may also wish to bring a large plastic heavy duty garden bag with ties to protect your bag from damp, dust, or rain.

Tag-alongs: ***PLEASE READ THE TAG ALONG GUIDELINES CAREFULLY.*** All transport during the expedition, fuel, meals, water and camping gear are your own responsibility. Nothing is provided. You will need to arrange your own accommodation at the beginning and end of the expedition. Tag-alongs should note that for this expedition it is essential to fit a UHF-CB radio to your vehicle. Tag-alongs are welcome to travel with the DEC convoy from Kalgoorlie on September 28th or at a pre-arranged rendezvous points agreed to by the leaders. Your contribution includes camping at Goongarrie Homestead on the first night of the expedition where an expedition briefing will occur.

Food and Drinks

Food will be provided, and participants and organisers will share in the preparation of meals each day on a rotational basis. Please advise Cheryl Tonts immediately if you have special dietary needs (work 08 9334 0319 or email: cheryl.tonts@dec.wa.gov.au). As we are in a remote environment with few facilities, meals will be prepared in camp conditions.

After we leave Kalgoorlie there will be no opportunity for you to restock your personal supplies, so we recommend you bring all you need with you at the start of the trip. If you like to have "something extra" to enjoy with your evening meal, we recommend that you bring a **small supply** (as space in the vehicles is very limited) with you from Kalgoorlie. You may also wish to bring a small supply of lollies, snacks or "trail mix" to your liking. Please bring your *LANDSCOPE* Expedition thermal mug with you and have it readily accessible in your daypack for use during breaks and meals.

Tag-alongs: All meals, snacks and drinks are your responsibility. Nothing is provided by the expedition. Please ensure that you have meals prepared and finished in good time so that you can join the nightly information and "Meet the Scientist" sessions.

Rubbish/Waste Disposal

All rubbish will be removed by the expedition. Rubbish must not be buried in holes as animals can dig it up. Do not put rubbish down toilet holes. **Tag-alongs are responsible for the removal of their own rubbish.**

Physical Condition

The expedition will not demand an elite level of fitness. However, some level of physical fitness is required to service the traps and make opportunistic observations each day. You

should be prepared to cope with warm days and very cold nights. There will be as much walking, exploring and searching as you want, so ensure that you have comfortable, solid boots. You will maximise your enjoyment of the activities by ensuring a reasonable level of fitness in the weeks leading up to the commencement of the expedition.

ENVIRONMENTAL CONDITIONS

Climate: The climate of the GVD is arid with annual rainfall varying between 150 to 190 mm. The nearest weather stations are located at Yarmana and Rawlina. Records at Yarmana indicate that between 1971-1997 that the mean maximum temperature over the year was 27.6 °C and the mean minimum was 12.9 °C. The hottest month was January which had a mean maximum of 36.0 °C and minimum of 20.6 °C. The coolest month was July which had a mean maximum of 18.8 °C and minimum of 4.3 °C. During the period of our expedition (October) records indicate a mean maximum of 28.7 °C. Mean rainfall was 12.6 mm with the mean numbers of day with rain being 3.0.

Terrain: Walking through the desert landscape will be an essential part of the field work during this expedition. The ground in the desert region is a mix of sandy surface with some areas of scattered rock. The land surface is generally flat with parallel sand dunes (up to 20 m high) and some higher rocky areas and breakaways. The vegetation is predominantly *Acacia*, eucalyptus and mulga scrub over hummock grasses.

SAFETY AND HEALTH

Your safety, health and comfort are of paramount importance.

Sunburn: Is possibly the greatest medical problem that arises. You must guard against it. Loose-fitting, long-sleeved shirts, full-brimmed hats, sunglasses, sunscreen lotion, and lip-block are all essential.

Dehydration: It is vital to always ensure you drink plenty of water as dehydration is a significant issue particularly in high temperatures, even during the evenings. You must keep water bottles (minimum of 2 litres) with you in your daypack and refill them regularly. **This is essential.**

Safety Mates: To improve volunteer safety in the field, expeditioners will be assigned a 'safety mate' for the duration of the expedition. At all times, you should know where your 'safety mate' is. If you cannot locate your mate and are concerned as to their whereabouts, please advise a leader. This system is designed to improve safety in the field. Leaders will explain the 'safety mates' protocol on Day 1.

Snakes: Several highly venomous snakes are present in the desert region. The king brown or mulga snake, the western brown snake or gwarda and the desert death adder inhabit the region in which we are working. For safety reasons, volunteers are not to handle snakes. Two elastic pressure bandages should be carried with you at all times as a first aid treatment for snakebite. When moving around at night, a good head torch and a spare, small, back-up torch are recommended.

Clothing and footwear: Long pants and boots that protect your ankles are recommended. If you prefer wearing shorts, bring some Gore-Tex® gaiters or legging. Shorts leave your legs susceptible to sunburn, insect bites and scratches. Leather boots with ankle protection (well

worn in to avoid blisters) suitable for walking around in desert conditions are recommended. You will need comfortable light shoes to wear in camp and in the evenings and a pair of thongs for use during bush showers will be helpful. Warm clothing and a beanie for the evenings will be essential as the desert nights can be very cold. Canvas garden gloves may be used to protect the hands when in the field. Although rainfall is infrequent, it can occur and it is advisable to bring some form of rain protection. A plastic poncho, available from camping and outdoor stores is a cheap, lightweight alternative to a bulky raincoat or jacket.

Insect pests: Insects can be problem in the outdoors. Repellents and creams are advised if you are particularly susceptible to insect bites. Your doctor can prescribe any necessary antihistamines. Make sure that you shake any clothing out before putting it on in the morning in case any insects or animals have taken up residence. Put you boots into a plastic bag at night time so that nothing crawls into them. *Please familiarise yourself with the enclosed brochures from the Health Department of Western Australia.*

Medications: Check that you have any required prescriptions filled beforehand and make sure that you bring an extra supply in case of damage or loss. If you think you may need antihistamines for possible allergic reactions, see your doctor and obtain appropriate medication.

Personal hygiene: Peter G's liquid soap is a good soap to use in hard water. Medicated soaps such as gamophen, or sandalwood, which is natural to the bush, are also good choices. Baby wipes can be used for washing in the absence of water.

Wilderness survival: Please familiarise yourself with the enclosed Wilderness Survival Card and carry it at all times in your day pack along with water bottles, a whistle, compass, signal mirror, torch, matches and elastic bandages at all times in your daypack. It is very easy to become disoriented when walking away from tracks, vehicles and campsites in the desert. It all looks very much the same and is often featureless and vast. Take careful note of any landscape features to guide you back to the vehicle, campsite or study area. If you do become lost, follow the instructions on the wilderness survival card. Light a fire only as a last resort and be sure to clear an area to prevent a wildfire.

First Aid Kit: The expedition will carry a comprehensive first aid kit however we ask that you bring along some of your basic own personal first aid supplied (betadine, bandaids, 2 elastic pressure bandages, pain relief tablets etc) for your own convenience. Minor cuts and scratches should be attended to promptly as they can quickly become infected in the outdoor environment.

Avian Influenza: Wild birds in Australia pose a negligible avian influenza risk to humans at the present time, however, all birds, particularly water fowl (ducks, geese, swans) are potential carriers of the disease. As there may be some contact with birds on expeditions, volunteers are advised that they are not permitted to handle birds, especially those who appear sick or injured. For further information please refer to the following Commonwealth Department of Health and Ageing website on Avian Influenza.

http://www.health.gov.au/internet/main/publishing.nsf/content/health-avian_influenza-index.htm

Bats: Expedition members are not to handle bats due to the possible presence of lyssavirus, a potentially fatal rabies like virus. Should you come across a sick or injured bat, do not attempt to handle or 'rescue' it. Avoid it and advise expedition leaders.

Dingoes: Be alert to the presence of dingoes and do not encourage them in any way. Dingoes have been known to attack and kill humans.

FIELD COMMUNICATIONS

Satellite phones and HF (RFDS) radios will be carried in DEC vehicles to be used for regular contact with the DEC office in Kalgoorlie and for use in the case of an emergency. UHF radios will be utilized for intra expedition communications.

The expedition will be in regular contact with the DEC office in Kalgoorlie. If you need to be contacted urgently while you are away, *LANDSCOPE* Expeditions administration has facilities to contact DEC's office in Kalgoorlie **but only in an emergency**. The office will in turn contact the expedition. It is most likely that any messages will only be passed on to the expedition leaders during scheduled contacts which maybe up to 24 hours after you have contacted *LANDSCOPE* Expeditions.

Telephone *LANDSCOPE* Expeditions on (08) 9334 0401

Mobile phones do not work in this area.

CRISIS / EMERGENCY MANAGEMENT

The expedition, in consultation with the Royal Flying Doctor Service (RFDS) has developed a crisis management plan in case a medical or other emergency should arise.

ADVANCE PREPARATION

FIELD SUPPLIES

Check each item carefully. Swags with mattresses will be provided, but you will need to bring your own small pillow and sleeping bag. We recommend that you bring everything you need with you from Perth or purchase in Kalgoorlie prior to the rendezvous. Once we have left Kalgoorlie, the opportunity to restock supplies will be extremely limited.

Check List
❑ sturdy, comfortable, worn-in walking boots or shoes with good tread
❑ light shoes for around camp
❑ thick walking socks
❑ underwear
❑ long trousers, loose and tough
❑ long-sleeved, loose-fitting shirts
❑ casual clothes for travelling and around camp
❑ t-shirts
❑ jumper, warm jacket, or 'polarfleece'
❑ warm beanie or cap to wear at night
❑ cord or scarf to anchor hat (if not using your volunteer's hat)
❑ lightweight rain jacket or plastic poncho
❑ sunglasses
❑ fly net (essential - drops over hat)
❑ gaiters – essential to protect legs from spinifex
❑ canvas garden gloves
❑ sleeping bag (recommended rating 0°C) + inner sheet / liner (protects the bag and adds warmth)
❑ mosquito net and plastic ground sheet if you plan on sleeping outside
❑ pillow
❑ *LANDSCOPE* Expeditions Thermal Mug (in backpack for ease of access during breaks)
❑ 2 X 1-litre water bottles, leak-proof
❑ personal toiletries, including tissues
❑ towel
❑ moisturised wipes
❑ insect repellent and sunscreen
❑ 2 elastic pressure bandages (for snake bite first aid) - essential
❑ personal first aid, prescription medicine and spectacles
❑ matches or lighter
❑ head torch (leaves hands free) plus spare batteries and globe
❑ small robust torch as a back up, plus spare batteries and spare globe
❑ small daypack to carry camera, water bottle, snacks, etc
❑ camera, spare batteries, memory card (film if necessary)
❑ binoculars (field glasses), and field guides if you have an interest in the local bird life
❑ hand lens if you have an interest in botany
❑ notebook and pen
❑ Compass, whistle and signal mirror (available at camping stores)
❑ small clothesline and a few pegs
❑ pocket knife
❑ lots of enthusiasm and smiles

LANDSCOPE Expeditions will supply a canvas bag for your gear, a luggage tag, a wide brimmed volunteer's hat, a stubby holder and a thermal mug.

REFERENCE MAPS

The following maps cover the area in which the Neale Junction Nature Reserve lies.

Neale SH 51-4 1: 250 000 Australian topographic map sheet
Vernon SH 52-1 1:250 00 Australian topographic map sheet
Kalgoorlie 1: 1 000 000 Australian map sheet
Goldfields 1: 1 000 000 Landgate Western Australian General Reference Map

REFERENCE LIST

Burbidge, A.A., McKenzie, N.L., Chapman, A. and Lambert, P. (1976) *The wildlife of some existing and proposed reserves in the Great Victorian Desert and Gibson Deserts, Western Australia.* Wildlife Research Bulletin Western Australia 5: 1 – 16.

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Jessop, J. (ed). (1985) *Flora of Central Australia.* Reed Publishing.

Mitchell, A.A. & Wilcox, D.G. (1994) *Arid Shrubland Plants of Western Australia.* UWA Press, Perth.

Paczkowska, G. and Chapman, A.R. (2000) *The Western Australian Flora: A descriptive catalogue.* Western Australian Herbarium, DEC, Perth.

Pianka, E.R. (1969) *Habitat specificity, speciation and species density in Australian desert lizards.* Ecology 50: 498 – 502

Pianka, H.D. and Pianka, E.R. (1970) *Bird censuses from desert localities in Western Australia.* Emu 70: 17 - 22

Thackway, R. and Cresswell, I. D. (Ed's). (1995) *An interim biogeographic regionalisation for Australia*: A framework for setting priorities in the national reserve system cooperative program. Version 4.0. Australian Nature Conservation Agency, Canberra.

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***LANDSCOPE* magazine articles** (in chronological order of publication)

Burbidge, Dr A. et al 'Vanishing Desert Dwellers', *LANDSCOPE*, Winter 1987

Burbidge, Dr A. 'Desert Bigfoot', *LANDSCOPE* Summer 1989/90

Pearson, D. 'Dragons of the Desert' *LANDSCOPE* Winter 1991

Cooper B., and Gough, D. 'She'll be right, mate!' *LANDSCOPE* Autumn 1992

Christensen, Dr. P and Liddelow, G. 'Ninu Magic' *LANDSCOPE* Winter 1992

Christensen, Dr. P. and Thompson, C. 'Back in the Outback' *LANDSCOPE* Summer 1992/93

Burrows, N. and Christensen, Dr. P. 'Hunting the Hunter' *LANDSCOPE* Summer 1994/95

Burrows, Dr. N. 'Restoring the Red Centre' *LANDSCOPE* Summer 2003/04

Burbidge, A. 'Milestones and Stepping Stones' *LANDSCOPE* Spring 2007

WEB SITES AND ONLINE REFERENCES

www.naturebase.wa.gov.au
Department of Environment and Conservation website

www.environment.gov.au/parks/nrs/ibra
Commonwealth Department of Environment and Water Resources information on Interim Biogeographical Regionalisation of Australia

NOTES

APPENDICES

LANDSCOPE Expeditions 2008

Lend your body to research...

LANDSCOPE Expeditions are non-profit, self-supported study and research projects. Since their inception in 1992, the expeditions have been offered by the Department of Environment and Conservation's (DEC's) *LANDSCOPE* magazine, a quarterly publication devoted to wildlife, conservation and environmental issues in Western Australia. The expeditions are offered in association with UWA Extension, a department of The University of Western Australia (UWA).

DEC is responsible for the management and sustainable use of WA's 27 million hectares of national parks, conservation parks, marine parks, State forests and timber reserves, nature reserves and marine nature reserves. It is also responsible for conserving the State's rich diversity of plants and animals.

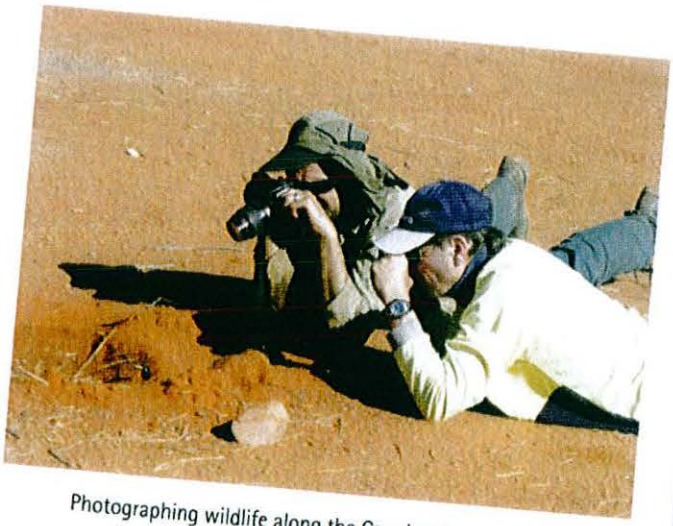
UWA Extension has been operating as a public outreach arm of UWA since 1913. It is a Centre for Continuing Education and promotes community awareness in a variety of ways, including educational travel.

Scientists and regional staff identify the research projects and lead the expeditions. DEC and UWA administer the expeditions. The private sector and local communities are contracted to provide logistical support.

LANDSCOPE Expeditions answer the need for research to protect the environment and respond to the demand for first-class interpretation by scientists and specialists. They provide paying volunteers with an opportunity to work alongside scientists and promote wider cooperation in addressing conservation and land management challenges in WA. Anyone can be involved subject to fitness and provided they are over 13 years of age.

The expeditions give you the opportunity to visit and gain an understanding of remote places and natural ecosystems and take part in important wildlife recovery programs. You can have the satisfaction of knowing you have contributed to our knowledge of threatened environments and endangered species. Unique photo opportunities and close encounters with unusual animals are a bonus.

Participants are not the only ones who benefit. The community also profits from the enriched lives of its members and from the benefits that flow on from research findings and outcomes. Future generations benefit from the natural and cultural resources that volunteers help to identify and conserve. And, on a global scale, *LANDSCOPE* Expeditions help to perpetuate cultural and biological diversity.



Photographing wildlife along the Canning Stock Route.
Photo – Andrew Spiers

LANDSCOPE Expeditions 2008

Distant places, close encounters... of the scientific kind

WA covers almost a third of the Australian continent, stretching from the tropical Kimberley to temperate areas west of Albany. The coastline alone is nearly 13,000 kilometres long. Of Australia's 80 recognised natural biogeographic regions, no fewer than 26 occur in WA – more than in any other State. These biogeographic regions are defined principally by landform, soils and vegetation types. They range from the monsoon forests (rainforests) and savannas of the northern Kimberley through the diverse desert regions and the mulgas and mallees of arid inland WA to the tall karri forests of the Warren Region in the south-west. Coastlines cover a similar diversity of environments from the extensive coral reefs, mudflats and mangroves of the tropical Kimberley through the shallow sandy embayments of the west coast to the granite promontories and islands in the ocean off Albany and Esperance to the south.

These extensive land and seascapes provide a magnificent natural setting for a vast array of plant and animal species. It is in this huge natural laboratory that scientists can pursue their research interests. However, such a diverse and extensive State also poses a formidable hurdle for scientists in determining the first among many questions that are essential to effective research and conservation – what occurs where? A major emphasis of the scientific research undertaken by *LANDSCOPE* Expeditions is directed towards answering this intriguing and pivotal question.

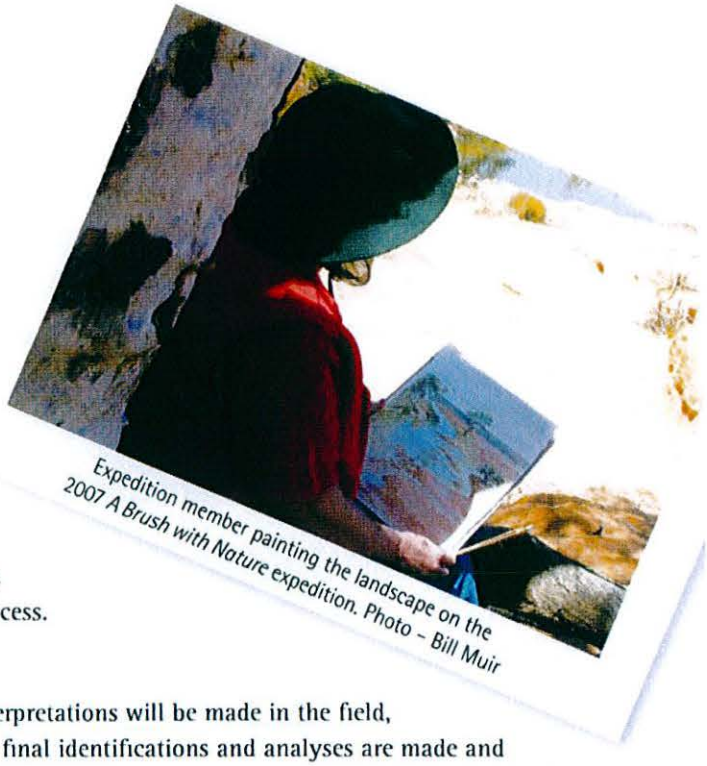
In the sparsely populated western third of the continent, the distribution of most plant and animal species is very poorly known and many *LANDSCOPE* Expeditions focus on trying to improve scientists' understanding of species' distributional patterns. Detailed records and prudent collections are made of many species, using the most scientifically acceptable methods and techniques, so that biologists from many institutions can carry out more detailed studies. Such documentation and collection helps define the distribution of many botanical and zoological species and facilitates research by State herbaria and museums on the level of variation within species. Studies of specimens and records of species from a wide geographic area are often the precursors to the description of species new to science.

WA's conservation reserve system aims to be comprehensive, adequate and representative. However, many land surface types and their associated wildlife are not represented in reserves, or are very poorly represented. This pattern was documented in the 1995 'Interim Biogeographic Regionalisation for Australia (IBRA) Report', which demonstrated that many of Australia's major bioregions are poorly served by the existing conservation reserve system. While some land systems may have been well represented within reserves, others remain completely unrepresented. Bioregions provide a framework for identifying gaps in the reserve system. Conservation reserves should protect representative samples of each bioregion. *LANDSCOPE* Expeditions help identify which areas should be included to protect and enhance the State's biodiversity.

LANDSCOPE Expeditions encourage the public to travel with us to distant places for close encounters of the scientific kind. You are a vital partner. Join us and be part of a scientific team – record observations, collect, prepare and help identify specimens. Many conservation goals are difficult to achieve by scientists working alone – your support can make the difference.

Examining pit fall traps along the Canning Stock Route. Photo – Graeme Liddelow

You can make a difference



Expedition member painting the landscape on the 2007 A Brush with Nature expedition. Photo – Bill Muir

When you travel with *LANDSCOPE* Expeditions, you help in a variety of ways:

Funding

You and your financial contribution make the research possible. This alone is a significant factor in making the expedition a success.

Scientific discovery

You can help by collecting key information. Although some interpretations will be made in the field, much of the synthesis takes place back in the laboratory, where final identifications and analyses are made and results prepared for publication. You will discover that field work can be repetitive and time consuming as it has to be done in a systematic way. Outcomes are not always obvious at first – but there's always the chance of that surprise discovery.

Extra pairs of hands and eyes are of great benefit in helping to achieve goals, as field work is very intensive. Leaders will maximise time spent on fieldwork but will provide instruction in techniques as time permits.

You may be asked to collect plant specimens and make animal sightings to increase our knowledge of the distribution of species. However, with plants, only representative specimens will be kept. Do not be disappointed if some are discarded as redundancy is often part of the scientific process. With bird observations, it is the collective experience that confirms the sighting and produces advances in our knowledge.

You don't need to be a scientist

Anyone can help – be assured that your assistance will make a contribution to nature conservation in WA. Remember scientists and leaders have spent many years developing their level of expertise – they welcome your questions and are there to guide you.

Your point of view or personal expertise may help in unexpected ways. Please feel free to share your ideas.

Expect to return home with a broader understanding of the natural world, the role of scientific methods, the value of nature conservation and the rewards of knowing you have contributed to pioneering studies in remote areas. *LANDSCOPE* Expeditions aim to whet your appetite for nature, give you a taste of scientific discovery, and provide an experience that may not otherwise be a part of your life.

It's not all science

Many elements combine to make an expedition successful, not just the scientific activities. An affinity for team work, a flexible approach and a willingness to help in whatever way you can, help to create the best results for nature conservation.

PLANT LIST FOR NEALE JUNCTION NATURE RESERVE

Abutilon otocarpum F.Muell.
Abutilon sp.
Acacia abrupta Maiden & Blakely
Acacia aneura var. microcarpa Pedley
Acacia aneura Benth. var. aneura
Acacia burkittii Benth.
Acacia colletioides Benth.
Acacia desertorum Maiden & Blakely var. desertorum
Acacia eremophila numerous-nerved variant (A.S. George 11924) PN P3
Acacia gilesiana F.Muell.
Acacia helmsiana Maiden
Acacia ligulata Benth.
Acacia melleodora Pedley
Acacia minyura Randell
Acacia murrayana Benth.
Acacia nyssophylla F.Muell.
Acacia papyrocarpa Benth.
Acacia prainii Maiden
Acacia quadrimarginea F.Muell.
Acacia ramulosa var. linophylla (W.Fitzg.) Pedley
Acacia rhodophloia Maslin
Alectryon oleifolius subsp. canescens S.T.Reynolds
Alternanthera denticulata R.Br.
Aluta maisonneuvei subsp. auriculata (F.Muell.) Rye & Trudgen
Alyogyne pinoniana (Gaudich.) Fryxell
Amphipogon caricinus F.Muell. var. caricinus
Anthotroche pannosa Endl.
Aristida inaequiglumis Domin
Atriplex vesicaria Benth.
Austrostipa nitida (Summerh. & C.E.Hubb.) S.W.L.Jacobs & J.Everett
Austrostipa platychaeta (Hughes) S.W.L.Jacobs & J.Everett
Austrostipa plumigera (Hughes) S.W.L.Jacobs & J.Everett
Brachyscome ciliaris (Labill.) Less.
Brachyscome sp.
Brunonia australis R.Br.
Calandrinia eremaea Ewart
Calandrinia sp.
Callitris sp.
Calocephalus sp.
Calotis erinacea Steetz
Calytrix warburtonensis Craven P2
Casuarina pauper L.A.S.Johnson
Centipeda sp.
Chenopodium gaudichaudianum (Moq.) Paul G.Wilson
Chenopodium saxatile Paul G.Wilson
Choretrum glomeratum var. chrysanthum (F.Muell.) Benth.
Chrysocephalum apiculatum (Labill.) Steetz
Chrysocephalum eremaeum (Haegi) Anderb.
Chrysocephalum pterochaetum F.Muell.
Corymbia opaca (D.J.Carr & S.G.M.Carr) K.D.Hill & L.A.S.Johnson
Cratystylis subspinescens S.Moore
Cyperus iria L.
Dactyloctenium radulans (R.Br.) P.Beauv.
Dampiera ramosa Rajput & Carolin
Dampiera stenophylla K.Krause
Daviesia benthamii subsp. acanthoclona (F.Muell.) Crisp
Daviesia ulicifolia subsp. aridicola G.Chandler & Crisp
Dicrastylis costelloi F.M.Bailey
Dicrastylis doranii F.Muell.
Dicrastylis exsuccosa (F.Muell.) Druce
Digitaria brownii (Roem. & Schult.) Hughes
Dodonaea adenophora Miq.
Dodonaea lobulata F.Muell.
Dodonaea microzyga var. acrolobata J.G.West

Dodonaea rigida J.G.West
Dysphania glomulifera subsp. eremaea Paul G.Wilson
Enneapogon avenaceus (Lindl.) C.E.Hubb.
Enneapogon caerulescens (Gaudich.) N.T.Burb.
Enneapogon sp.
Enteropogon ramosus B.K.Simon
Eragrostis eriopoda Benth.
Eragrostis falcata (Gaudich.) Steud.
Eragrostis kennedyae F.Turner
Eragrostis leptocarpa Benth.
Eragrostis setifolia Nees
Eragrostis sp.
Eremophila alternifolia R.Br.
Eremophila clarkei A.F.Oldfield & F.Muell.
Eremophila forrestii F.Muell. subsp. forrestii
Eremophila georgei Diels
Eremophila gibsonii F.Muell.
Eremophila gilesii subsp. variabilis Chinnock
Eremophila gilesii F.Muell. subsp. gilesii
Eremophila glabra (R.Br.) Ostenf. subsp. glabra
Eremophila latrobei F.Muell. subsp. latrobei
Eremophila longifolia (R.Br.) F.Muell.
Eremophila platythamnos subsp. exotrachys (Kraenzlin) Chinnock
Eremophila platythamnos Diels
Eremophila platythamnos Diels subsp. platythamnos
Eremophila scoparia (R.Br.) F.Muell.
Eremophila serrulata (A.DC.) Druce
Eremophila undulata Chinnock P2
Eremophila youngii F.Muell. subsp. youngii
Eriachne mucronata R.Br.
Eucalyptus aff. lucasii
Eucalyptus concinna Maiden & Blakely
Eucalyptus eremicola Boomsma
Eucalyptus gamophylla F.Muell.
Eucalyptus glomerosa Brooker & Hopper
Eucalyptus gongylocarpa Blakely
Eucalyptus gracilis F.Muell.
Eucalyptus gypsophila D.Nicolle
Eucalyptus intertexta R.T.Baker
Eucalyptus kingsmillii subsp. alatissima Brooker & Hopper
Eucalyptus leptopoda subsp. elevata L.A.S.Johnson & K.D.Hill
Eucalyptus lucasii Blakely
Eucalyptus oldfieldii subsp. Millar Range (M. French 303) PN
Eucalyptus oldfieldii F.Muell.
Eucalyptus oleosa Miq.
Eucalyptus rosacea L.A.S.Johnson & K.D.Hill
Eucalyptus socialis subsp. eucentrica (L.A.S.Johnson & K.D.Hill) D.Nicolle
Eucalyptus socialis subsp. victoriensis D.Nicolle
Eucalyptus socialis Miq.
Eucalyptus sp.
Eucalyptus sp. Little Sandy Desert (D. Nicolle & M. French DN 4304) / youngiana
Eucalyptus sp. Little Sandy Desert (D. Nicolle & M. French DN 4304) PN
Eucalyptus trivalva Blakely
Eucalyptus youngiana F.Muell.
Euphorbia drummondii Boiss. subsp. drummondii
Euphorbia tannensis Spreng.
Exocarpos aphyllus R.Br.
Frankenia interioris Ostenf. var. interioris
Gnephosis tenuissima Cass.
Gompholobium polyzygum F.Muell.
Goodenia centralis Carolin
Goodenia glandulosa K.Krause
Goodenia ramelii F.Muell.
Goodenia xanthosperma F.Muell.
Grevillea berryana Ewart & Jean White

Grevillea juncifolia Hook. subsp. juncifolia
Grevillea nematophylla subsp. supraplana Makinson
Grevillea pterosperma F.Muell.
Grevillea sarissa S.Moore subsp. sarissa
Grevillea stenobotrya F.Muell.
Gyrostemon ramulosus Desf.
Gyrostemon tepperi (H.Walter) A.S.George
Hakea francisiana F.Muell.
Halgania cyanea var. Allambi Stn (B.W. Strong 676) PN
Halgania cyanea Lindl.
Hannafordia bissillii F.Muell. subsp. bissillii
Heliotropium pleiopterum F.Muell.
Hibiscus sturtii var. truncatus Fryxell
Iseilema eremaeum S.T.Blake
Isoetopsis graminifolia Turcz.
Jacksonia arida Chappill ms
Jasminum calcarium F.Muell.
Kennedia prorepens (F.Muell.) F.Muell.
Keraudrenia velutina subsp. elliptica C.F.Wilkins ms
Keraudrenia velutina Steetz
Laxmannia arida Keighery
Lechenaultia striata F.Muell.
Leptosema chambersii F.Muell.
Leptospermum fastigiatum S.Moore
Leucochrysum stipitatum (F.Muell.) Paul G.Wilson
Logania nuda F.Muell.
Lomandra leucocephala subsp. robusta A.T.Lee
Maireana aff. planifolia
Maireana planifolia (F.Muell.) Paul G.Wilson
Maireana tomentosa Moq. subsp. tomentosa
Maireana triptera (Benth.) Paul G.Wilson
Maireana villosa (Lindl.) Paul G.Wilson
Marsilea hirsuta R.Br.
Marsilea sp.
Menkea sphaerocarpa F.Muell.
Micromyrtus flaviflora (F.Muell.) J.M.Black
Micromyrtus hymenonema (F.Muell.) C.A.Gardner
Minuria leptophylla DC.
Mirbelia microphylla (Turcz.) Benth.
Monachather paradoxus Steud.
Muelleranthus stipularis (J.M.Black) A.T.Lee
Newcastelia bracteosa F.Muell.
Newcastelia cephalantha F.Muell.
Newcastelia sp. Hamersley Range (S. van Leeuwen 4264) PN
Nicotiana occidentalis subsp. obliqua N.T.Burb.
Olearia arida E.Pritz. P2
Olearia eremaea Lander
Olearia incana (D.A.Cooke) Lander ms
Olearia subspicata (Hook.) Benth.
Omphalolappula concava (F.Muell.) Brand
Paspalidium basicladum Hughes
Paspalidium gracile (R.Br.) Hughes
Pimelea trichostachya Lindl.
Pittosporum angustifolium Lodd.
Pityrodia loricata (F.Muell.) E.Pritz.
Podaxis pistillaris
Podolepis capillaris (Steetz) Diels
Pomax sp. desert (A.S. George 11968) PN
Prostanthera sericea (J.M.Black) B.J.Conn
Prostanthera wilkieana F.Muell.
Ptilotus sessilifolius (Lindl.) Benl
Ptilotus sessilifolius (Lindl.) Benl var. sessilifolius
Rhodanthe charsleyae (F.Muell.) Paul G.Wilson
Rhodanthe maryonii (S.Moore) Paul G.Wilson
Rhodanthe propinqua (W.Fitzg.) Paul G.Wilson

Rhodanthe stricta (Lindl.) Paul G.Wilson
Rutidosis helichrysoides DC.
Scaevola amblyanthera var. centralis Carolin
Scaevola basedowii Carolin
Scaevola collaris F.Muell.
Scaevola ovalifolia R.Br.
Scaevola parvifolia subsp. acuminata Carolin
Scaevola parvifolia Benth. subsp. parvifolia
Schoenia cassiniana (Gaudich.) Steetz
Sclerolaena cuneata Paul G.Wilson
Sclerolaena gardneri (Ising) A.J.Scott
Sclerolaena johnsonii (Ising) A.J.Scott
Sclerolaena lanicuspis (F.Muell.) Benth.
Sclerolaena parviflora (R.H.Anderson) A.J.Scott
Sclerolaena patenticuspis (R.H.Anderson) Ulbr.
Senna artemisioides subsp. x artemisioides
Senna artemisioides (DC.) Randell
Senna glutinosa subsp. chatelainiana (Gaudich.) Randell
Senna pleurocarpa (F.Muell.) Randell var. pleurocarpa
Sida ? calyxhymenia
Sida ectogama W.R.Barker & R.M.Barker
Sida intricata F.Muell.
Sida lyprocarpa W.R.Barker ms
Solanum coactiliferum J.M.Black
Solanum ellipticum R.Br.
Stackhousia sp.
Stenanthemum petraeum Rye
Stenopetalum anfractum E.A.Shaw
Stenopetalum lineare DC. var. lineare
Stylidium humphreysii Carlquist
Stylidium induratum M.B.Scott
Swainsona canescens (Benth.) F.Muell.
Swainsona kingii F.Muell.
Swainsona microphylla A.Gray
Swainsona tenuis E.Pritz.
Themeda triandra Forssk.
Thryptomene biseriata J.W.Green
Thryptomene nealensis J.W.Green P3
Thysanotus sp. Eremaean (S. van Leeuwen 1067) PN
Thysanotus sp. Great Victoria Desert (A.S. George 8406) PN
Triodia basedowii E.Pritz.
Triodia concinna N.T.Burb.
Triodia helmsii (C.E.Hubb.) Lazarides
Triodia melvillei (C.E.Hubb.) Lazarides
Triodia scariosa N.T.Burb.
Triraphis sp.
Velleia connata F.Muell.
Velleia glabrata Carolin
Velleia rosea S.Moore
Vittadinia eremaea N.T.Burb.
Waitzia acuminata Steetz
Waitzia acuminata Steetz var. acuminata
Wurmbea deserticola T.Macfarlane
Zygophyllum aff. aurantiacum
Zygophyllum iodocarpum F.Muell.
Zygophyllum ovatum Ewart & Jean White

LEN BEADELL, OAM, BEM, FIEMS (Aust.)
1923 - 1995
A short Biography

Len Beadell earned his sobriquet as 'The Last Australian Explorer' because of his lifetime of work surveying, mapping and creating access to a vast portion of the Australian Outback.

Len was a young man in the service of the Australian Army when he was ordered to "start a rocket range" as he would recall later; it was an order that would have been akin to a prison sentence to some, but Len later acknowledged he would have done it for free had the Army ever bothered to ask him.

Living in the bush and surveying was deeply in his blood - a fusion which began years earlier when as a young lad in 1930, he joined the 1st Burwood Scout Group. *(pictured, below)*

It gave him experience in surveying, going on many weekend survey trips with his Scout Leader, Mr John 'Skip' Richmond. It also brought out the best in his pioneering spirit.

Len regarded 'Skip' Richmond as his mentor. Len later stated: *"He showed me it was possible to enjoy all the pleasures of the bush (particularly camping) while at the same time still doing something useful and constructive (that is, surveying)."*

These survey trips were conducted within a 150 kilometre radius of Sydney, mainly around Kiama and in the Blue Mountains. Skip would pick up the willing helpers on a Saturday morning in his bull-nosed Morris and return them home late on Sunday night. The children brought only a small back pack and a frypan.

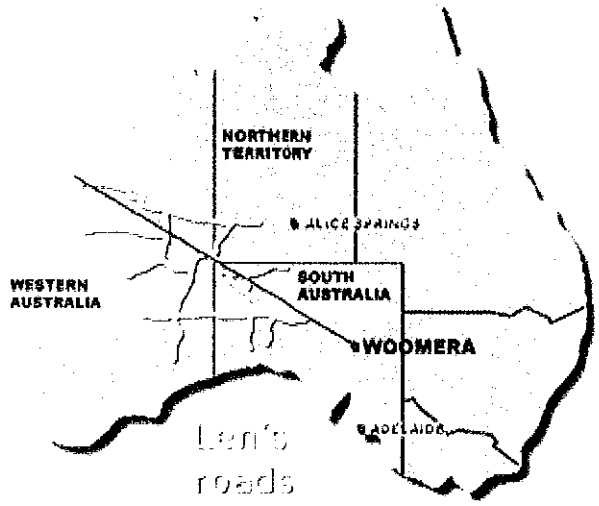
They loved camping in the bush, cooking (and burning) porridge, trudging up and down hills carrying theodolites and other equipment, and searching for old survey markers, as if on a treasure hunt. The purpose behind each excursion was to establish a trigonometric network for the Water Board and to plan the location and pipeline between major dams supplying water to Sydney.

It was an experience which sparked in Len a lifetime passion for surveying and bush living, the crowning achievement of which came in 1947 when he was tasked by the Australian government to locate and survey the site for a rocket testing range in northern South Australia stretching across West Australia almost to the Indian Ocean. The town that was the base for the range was later named *Woomera.*

Len was responsible for the initial Woomera town survey and launch sites -

and in the years to follow, he led a gang of roadmakers to create over 6,500 kilometres of access roads for scientific observations of various weapons tests.

The best known of these roads is the Gunbarrel Highway which runs from the Stuart Highway west to Carnegie Station, a distance of 1500 kilometres.



The names of some these roads and intersections in this giant grid reflect Len's love of his family from which he was absent from for up to nine months in a year. The Gary Highway, the Connie Sue Highway, Jackie Junction and the Anne Beadell Highway, from Coober Pedy SA to Laverton WA, are visited now by his widow, children and grandchildren.

The atomic bomb test sites at Emu and Maralinga in South Australia were also located and laid out by Len during the cold war years of the 1950's.

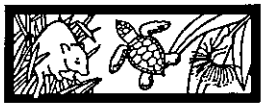
During these years Len and his workmates were subject to the extremes of the Australian bush coping with the heat, cold, dust storms, rain, floods and flies and all the time his navigation, both solar and stellar, was crucial to their own safety and the success of the rocket range.

It was a task Len tackled with enthusiasm, energy and unfailing good humour.

Source: www.beadell.com.au

2002

LANDSCOPE EXPEDITIONS



WORKING AT THE FRONTIER OF DISCOVERY

IN THE TRACKS OF LEN BEADELL
PLANTS AND ANIMALS OF NEALE JUNCTION NATURE RESERVE

PARTICIPANTS' DIARY

Day 1 Sunday–28 September We all met at the Kalgoorlie DEC Office at 1400 hours and expeditioner's gear was loaded into the vehicles. The Department of Environment and Conservation (DEC) staff was introduced and a brief trip outline given, and expeditioners assigned to vehicles. We departed on time, 1500 hours for Goongarrie where we arrived at 1630 hours for our first night's camp. We had a barbecue dinner followed by introductions to DEC Goldfields Region by Ian Kealley, the Regional Manager, with a slide presentation and discussion around the campfire. We all retired early in preparation for an 0800 hour departure.

Neville Hague

Day 2 Monday–29 September Goongarrie to Yeo Lake via Laverton.

You sometimes wonder if the organization of a landscope expedition starts with the cry 'round up the usual suspects'. The start of every expedition usually involves familiar faces.

After what proves to be a leisurely start the convoy hit the road for Yeo Lake via Menzies, Leonora, Laverton and the Great Central Road, travelling initially through pastoral and mining country. The road kill around Menzies is a sign of just how busy and hazardous these roads can be.

After fuel top ups in Leonora and Laverton and a lunch stop at the latter, it is on to the gravel and the romantically named Great Central Road. What a great road it is too, wide and well maintained so a good speed is possible. The party leaves this bush highway at the Sunday Point turn-off and all at once the track is more familiar – single-vehicle-wide, winding through the scrub.

After a tea stop at Point Sunday it is on to Lake Yeo for camp, a bit later than planned

Ross McGillivray

Day 3 Tuesday–30 September Lake Yeo to Neale Junction – Camp Dunnart.

Dr Karl Brennan fires us up for an early start with the news that it might take six hours to reach camp; we do it in a bit over four thanks to better road conditions than expected. Nobody is complaining about that!

Camp Dunnart is warm and windy and there is a lot to do – unloading vehicles, setting up the 'laboratories', organizing tents with the willing crew from Anglo Gold who are running the camp for us – what a good bunch. They look after all the tiniest details, even down to the pink tape on the tent guy ropes so we don't fall over in the dark.

Dr Karl's white board is a truly wondrous thing and the plan for opening the traps tomorrow would do an army general proud.

Ross McGillivray

Day 4 Wednesday–1 October Camp Dunart – first day trap opening and setting.

Now we start to get serious. The party splits soon after breakfast; each allocated a number of sites where the traps must be opened, fences repaired, Elliott and funnel

traps laid. It is a warm day and it takes a bit of prompting to get started on the afternoon shift. Those doing the southern route are rewarded with a visit to Neale Breakaway. Truly a magic spot which for some reason is outside the park.

Heading home in the dark we return to the sight of a new moon and Venus prominent in the western sky. After five landscope trips the stars still amaze.

Dr Karl unveils another masterpiece on the whiteboard and tomorrow we are on the road early to check all those traps.

The lamb shanks were magnificent.

Ross McGillivray

Day 5 Thursday–2 October Camp Dunart – Trapping Day One.

Bacon and eggs is not a good idea on day one when we make breakfast a bit too leisurely and we miss the target for the road, not by much, but I reckon it might be off the menu tomorrow!

Once again the mob heads bush, north, south and east to their assigned sites, the botanical people head off on their way as well.

The first trappers are back at camp a bit before 1000 hours and there is plenty of enthusiasm and questioning about who caught what.

The scientists disappear into their tents and the rest of us are left to sit, chat, observe and reflect on what lies ahead for the next week.

Afternoon it was back to some sites for some maintenance with a marvelous sunset and thunderstorms to the north. A few spots of rain caused a few moments of panic before dinner and the unveiling of tomorrow's battle plan. A 0500 hours breakfast and 0530 hours on the road is the target. We got an interesting talk from Bobbie Hitchcock who is a PhD student from Australian National University Canberra, who is studying moths. She surveyed the moth assemblages wherever we were. Her moth talk was a follow-up to similar presentations from Danielle Edwards who is a Postdoctoral Research Fellow at ANU studying lizards with Jane Melville.

The wind comes up at 2300 hours and blows hard all night. Now I have this diary up-to-date, I am free for the rest of the trip!

Ross McGillivray

A big day for all – Danielle was here to clear up some of the confusion surrounding these species and was desperate to catch one (or a few!) for her research. Josh caught her one. Actually this was entirely correct - Josh caught a new dragon lizard species called *Ctenophorus* cf *femoralis* which, in some circles is called *Ctenophorus fordi* to go with her *Ctenophorus femoralis*. And someone made Jane happy with a *Diporiphora winneckei* that wasn't, being one of the desirable new species instead.

Pat processed her mulgara. First step was to don the leather ladies gloves, purchased in Boans probably and looking as if they had taken walks down St George's Terrace before falling on hard times.

The mulgara was moved, or dropped, from the Elliott into a bag. There was some confusion over whether Pat was going to grasp the mulgara firmly by the scruff of its neck, or whether the mulgara would win and grasp Pat anywhere handy. After some scuffling Pat won and the mulgara revealed a lot of teeth and six pink sausages looking alarmingly underdone. There was an attempt to examine its tail, and the previously bushy tail was smoothed out to reveal a nice black fringe on one side.

At this point the mulgara began to gain the upper hand and was relegated to its bag.

After a short rest and a bit of a think, Pat tried again, hastily recounted the sausages, re-did the tail, and suffered a severe bite to the jumper if I remember correctly and wrestled the animal back into its bag.

On points, I think the mulgara won the physical stand-off, but Pat has probably won the battle with another unknown (to me) identifier over which species of mulgara we are looking at out here. (Identified as *Dasycercus blythi* by P.A. Woolley)

Elizabeth Atahan

Day 6 Saturday–4 October Well! Another fine morning, although a little cloudy. We managed a timely departure and would you believe that Kat, the cook from Anglo Gold, provided scrambled eggs before we left at 0530 hours!

There was not such a vast collection of specimens today but enough to keep the scientists busy, particularly the ecological spiderman whose table was piled high. There was one exceptional exemption and I will leave space here for Ross to describe this. *How to deal with a one metre king brown in funnel trap: Pick up trap, hold up to light, spot snake. Put the trap down very quickly and very gently! Back away and yell for help!*

The botanists once again packed their lunch and disappeared for the day, returning with the news that a Priority Two *Eremophilla undulata* had been found.

Peter, Garry, Alex and Lesley were dispatched to release the 'reptilia rossii' which was accomplished with aplomb and no drama by Gary.

After lunch teams were sent in all directions to release captured animals and then search for scats on the return journey. Alex and I went south and as the afternoon wore on five car loads of traditional owners plus two dogs passed us, smiling and waving. They will camp near us and join us tomorrow. We will be working together tracking animals and looking for scats – maybe they will share some of their Dreaming stories with us. Thank you Kat for a delicious roast lamb dinner. News is that we have an early start again tomorrow.

Lesley Kerr

Day 7 Sunday–5 October We had aboriginal children catching lizards around the campsite and exchanging them for ice creams. Overheard from the reptile/invertebrate tent . . . .

Small child – Lizard, got lizard
Pause
Dan: It's dead.
More children arrive.
Dan: You used a noose, that's good. It doesn't look healthy, perhaps you squeezed it.
Another pause.
Child: It's not dead.
Dan: It's not quite dead but it doesn't look good. Perhaps you should have put it in a bag. Here, take this bag.
Child: Ice-cream?
Dan: It's sick. We'll wait five minutes and see how it goes.
Children leave, Dr Death takes over. (Dan playing role of Dr Death).

Later

Vicki enters holding dragon – Have you guys lost a lizard?
All look.
Dan – I've caught that three times. Was it over by the wood looking at you?
It needs a green dot.
Penny obliges and the dragon exits.

Elizabeth Atahan.

Day 8 Saturday–6 October Went this morning with the traditional owners, after taking pictures of each other at Len Beadell's Neale Junction plaque and writing in the diary there.

Sarah Barrett drove and did a great job over some rather challenging terrain. Lesley, Claire and I went in the car with us and Teresa and her five year old daughter, Regina.

We started out near the airstrip, where the ladies quickly found some *Solanum* that had been stripped of ripe berries, they said by bush turkeys. They found another bush loaded with ripe 'tomatoes' and we

were encouraged to have a taste. Found them a bit bitter.

Back to the breakaways where they showed us an overhang that they had been told had been used as a shelter in a time of great rain. Certainly evidence of charcoal on the floor. They pointed out some bottle-shaped, mud nests adhering to the ceiling. We wandered around in an unsuccessful search for a rock hole.

Returned to near the airstrip and Teresa became the guide for the convoy to a sacred site which told the story of seven sisters, who had travelled great distances and are now a group of stars. I found it really interesting that their culture also has a 'seven sisters' constellation. Teresa was the only one who had been there before and that only once. Even the older ladies had never been there before. The site was about 100 m x 20 m and consisted of carefully arranged stones with cleared areas on a treeless ridge. Men may visit the site as well.

We returned to the breakaways and, following radioed directions from the men's group, made our way up a faint track to the top of the escarpment. After driving for some time across faint but fresh tracks, we met the men at a trig station near a rock hole. The hole was about 15 - 20 cm across and about 80 cm deep. There was damp sand in the bottom of it, which was much wider than the opening. The young men had caught a black goanna which has been brought back to camp for recording.

We drove for about an hour around the top of the escarpment. One boggy patch (now dry) was <u>full</u> of camel tracks. We were taken to a rocky gully, not sure if any of them had been there before but we found quite a few 'different' sharpened rocks that Carlene said were old cutting tools. The gully had a solitary quondong tree about 5 – 6 m high in amongst the vegetation. Dylan Ferguson, from Alice Springs Desert Park, pointed out a lot of dead trees, 2 – 3 m high, that he said were quondongs killed by camels, who had grazed all the leaves off.

Took us about another hour's wandering over the escarpment and then back along the Anne Beadell Highway. Teresa asked us to stop at one place so that she could pick some *Eremophila*, which she said was good bush medicine. The leafy twigs are put into boiling water and the infusion used as a rub 'when you're sick'.

At about 1445 hours our small group returned for lunch. Thank goodness for nut bars! The traditional owners seemed to be 'grazing' frequently on the food supplies they'd brought on the foray.

Most of the others either returning mammals to their 'homes' on the trap lines or collecting seats, or both.

The weather has been kind again, sunny with a cool breeze. Another very interesting day.

Wendy Minchin.

Day 12 Thursday–9 October Today, Thursday, is packing up day. Yesterday after collecting the animals out of the traps, the cleaning duties started. That is removing everything from site (the 25 plus sites). Once the pits, traps and funnels were at the campsite we started the cleaning of the Elliott traps and the sifting of the sand in the pit traps. What the scientists were looking for in sand were pseudo scorpions. They are very small and take a lot of searching for. We were rewarded by finding a number.

This all happened after a barbeque with the traditional owners on Tuesday evening. It was interesting to see everyone together enjoying a meal. That day some of our group with a number of the Traditional Owners had been out at a breakaway. The highlight of that day was bringing back part of a stick nest rat's 'nest' that will one day be displayed in the Kalgoorlie Museum.

The Traditional Owners returned home yesterday morning, after camping at the junction for about three nights. I was

surprised at the number of young people in the group. Would the kangaroos have known that they were going home? I have never seen so many in one day.

What have I got out of this expedition? First of all an appreciation for the mammals, reptiles and insects that I did not have. I came here for the birds and the desert. While both have been fulfilling, the trip has been more about the reptiles and mammals. Never, ever in a thousand years would anyone have thought that I would be taking an animal out of a pit bucket. My appreciation has also increased for the people who do the science. I found the desert to be very alive, be it with fauna or flora. The marble gums are absolutely beautiful and we are amazed at the number of flowers that we see every where. Thank you all for making it an enjoyable two weeks and putting up with me.

Jane Slobbe

Day 13 Saturday–10 October Today we leave Neale Junction camp. Everything has been packed and loaded onto the trucks. At the big camp some tents and the kitchen remain which Anglo Gold staff will dismantle. This campsite will return to a simple site that our presence transformed, as Ross said at the beginning of this adventure. It is a base for a sort of military operation whose goal was to detect and catch quite unknown plants and animals. For being successful a survey in such a remote area requires a lot of preparation, work and thanks a lot to Anglo Gold for their support.

Now we start the return journey that tomorrow will bring us into Kalgoorlie where it all started two weeks ago – the time has just flown.

We found a place full of life, (there are more reptiles here than in the rest of the world). This is very different from the image that most people have when they hear the word desert. Australian deserts are very vegetated and rich with flora and fauna.

This country is very special and still surprises and amazes me each time I visit.

Farewell and thanks to all for making my travel here such a good experience.

Grazie and ciao

Fiorenzo Conforti