

The Howard Sand Plains occurs in small patches within an outlined area of conservation significance. This area covers 264 km² within the Howard River region, approximately 30 km east of Darwin in the Northern Territory. This is an 'at-risk' ecosystem in the Darwin coastal bioregion and is one of the 12 national priority High Environmental Value Aquatic Ecosystem sites. It has been classified 'at risk' due to the nature of plant and animal species found in the area and its proximity to encroaching urban development.



Sand sheet heath is generally made up of lightly scattered trees (*Melaleuca nervosa*, *Grevillea pteridifolia* and *Banksia dentata*) over a dense herbaceous layer made up of a large diversity of sedges and herbs. Due to the unique drainage and conditions created by these sand pockets, a wide range of plant and animal species specifically occur within this landscape type. It also includes a range of slightly different plant communities on the sand pockets.



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The area is a high priority for conservation as Rare and endangered species include the small carnivorous bladderwort plants of the genus *Utricularia*, for which the area is considered a diversity hotspot. At least 26 species have been found within the Howard Sand Plains. The site also supports the endangered herb *Typhonium taylori* and the Howard River Toadlet (*Uperoleia daviesae*). The toadlet species is known only from the greater Darwin region and seems that breeding is confined to the seasonally flooded sand plains of this area. In addition, 36 species recorded from the site are listed under international conventions protecting migratory birds. Within the area a number of high conservation sites are considered a priority as they are the best representative sites to support conservation of the endangered species which depend on this habitat.



The area as well as hosting a number of endangered species is also an area holding a sand resource that is utilised by the mining industry. The area also is an important source of water, supplying Darwin with 12 % of its water. It is additionally an area of recreational use for motorsports and also within an area of urban growth, with its boundaries including parts of Howard Springs, Girraween and Coolalinga.



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About 22 % the landscape type classified as Sand sheet Heath Vegetation has already been cleared, mined for sand and gravel, disturbed by roads, or planted with exotic trees and crops. Weeds, fire, fertiliser, hydrological changes and recreational vehicles are all additional threats.



The project, which builds on previous work, is currently being undertaken through funding provided by Commonwealth Government under a Biodiversity grant and is facilitated by Greening Australia in partnership with Charles Darwin University, the Department of Land Resource Management and the Extractive Industries Association. The project aims to build on existing findings and aims

- To undertake post-mining revegetation trials.
- To reduce the impact of weeds and fire at high priority conservation sites.-
- To raise awareness of the area and its importance and engage the community in its protection

Post- Mining revegetation Trials

Post mining re-veg trials are being undertaken in association with and supported by The Extractive Industries Association. These trials aim to trial the best practice for post mining rehabilitation on Sand Sheet Country within this area. Additional trials are also in place on Gravel country that has been mined. The results will be used to develop the guidelines for the extractive industry for effective rehabilitation.

These trials look at 2 recently mined areas and use an experimental design to test different revegetation treatments. Within the sites different plots have been introduced and differing treatments applied within these. These differing treatments include varying substrates being applied (eg. differently aged topsoil, no substrate etc.) Additionally treatment using seed, with provenance from the area, or tube stock grown from provenanced seed, have been added. These plots are monitored over a 2 year period and the presence of different species recorded; with particular focus on the endangered and rare species.

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These trials are being done on both an area mined for sand, on Sand Sheet Heathland and on an area mined for gravel on Open Woodland vegetation.

The process of setting up the trials has been in collaboration with Greening Australia nursery, Larrakia Rangers, Conservation Volunteers, Indigenous Conservation Land Management Students, Charles Darwin University students and researchers and mine operators and contractors.



Analogue sites, sites acting as a control in unmined areas of both landscape types, are also monitored to give comparison. Trials are also being carried out through Charles Darwin University to test the effects of the inundation of water and other variables.

Analysis of natural regeneration on previously mined sites is also being undertaken. This looks at sites within the area that have been mined over different periods of time since the 1960s. Using spatial data such as aerial photography, infrared and satellite images, various layers of landscape feature data, and mining lease information the area is being mapped. This information alongside on ground vegetation analysis will be evaluated to see the rate of re-vegetation and the changes in vegetation type over areas of previously mined sand sheet. This research will also give some scope on the percentages of this vegetation type that are still present, that have been disturbed, recovered, changed or

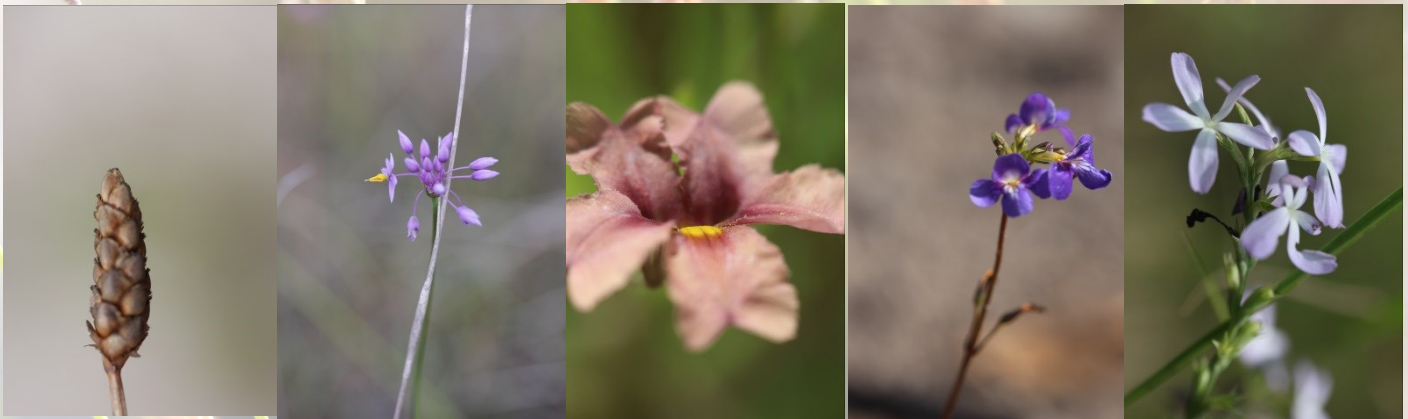
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Raising Awareness of the area and its importance

The project also encompasses a community engagement component, which includes engaging significant land holders, stake holders and the wider community in raising awareness about the landscape type and its ecological importance.

- Local schools are being engaged with education programs, displays and donations of sand sheet plant species.
- The program is seeking collaboration with higher education programs, such as Conservation Land Resource Management and Environmental Science.
- Field days and information is being delivered about the area at community events
- Media, such as fact sheets and posters are being produced and a web presence with links to other resources and reports and information about the region is being developed
- Collaboration and engagement with Power and Water Corporation, Territory Land Resource Management, Extractives Industry Association, Government Departments,



Reducing the impact of fire and weeds at high priority conservation sites

- The project is collaborating with Bush Fires NT and The Fire and Rescue Service to protect areas of Sand Sheet vegetation that have been initially outlined as areas of high conservation significance, as well as trial sites. This information is being integrated into current fire management plans.
- Weed management at these high priority sites is additionally being incorporated in the project, including weed control.
- The community engagement and education elements aim to also reduce threatening processes within the areas.

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The project funding is until June 2015. At this point we hope to engage further resources to work towards an integrated management plan for the area.

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The logo for PowerWater, featuring the word "PowerWater" in a blue, sans-serif font with a green leaf icon above the letter "a" in "Water".



The logo for the Northern Territory Government, featuring a stylized black and white flower icon to the left of the text "Northern Territory Government".

The logo for Conservation Volunteers, featuring a blue circular icon with a white figure inside, above the text "Conservation Volunteers" in a blue, sans-serif font.

The logo for Charles Darwin University, featuring a red shield with a white cross and a blue banner, above the text "CHARLES DARWIN UNIVERSITY" in a bold, blue, sans-serif font.

The logo for the Australian Government, featuring the Australian coat of arms (a kangaroo and an emu flanking a shield) above the text "Australian Government" in a black, serif font.

The logo for Greening Australia, featuring a stylized green tree icon above the text "Greening Australia" in a bold, sans-serif font.