



Potential Research Projects

Research with Nature Foundation SA

The following list of potential research projects has been developed by Nature Foundation SA to assist in the informed management of our nature reserves, and wetlands and floodplains where we work with private landholders, government and community. We are open to further development and collaborative refinement of these research projects and welcome partnerships with university students and researchers.

Nature Foundation SA offers a regular [grants program](#) that proudly funds research that contributes to the conservation of South Australia's biodiversity and habitats, and supports university students in their work and careers. We have been offering research grants to postgraduate students since 2003. Grants will be awarded preferentially to students working on or in close association with the listed research projects.

Access to [our nature reserves](#) for research purposes can be arranged by request and accommodation facilities are available at our two arid reserves, Witchelina and Hiltaba.

Research projects that partner with [Water For Nature](#) (WFN) in the South Australian Murray Valley will have access available for research field work at Clarks Floodplain near Berri, public sites at Loxton Riverfront Reserve, Thiele Flat and Ramco River Terrace, and access to other WFN sites on private land by negotiation.

Further Information

For further information about these potential research projects, contact Nature Foundation SA.

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Arid Nature Reserve Management

Project Description	Existing Data, Information and Resources Available
<p>Tracking Vegetation Change at Witchelina</p> <ul style="list-style-type: none"> Analyse and synthesise existing data to determine vegetation change at Witchelina Nature Reserve. Increase understanding of vegetation recovery post grazing and quantify the effectiveness of management actions. 	<ul style="list-style-type: none"> Data from a network of monitoring sites including pastoral sites assessing land condition (Jessup transects, crown separation ratio (cover), and photopoints) and vegetation monitoring sites (Jessup transects, photopoints, Rangelands Assessment Methodology)
<p>Total Grazing Pressure at Hiltaba/Witchelina</p> <ul style="list-style-type: none"> Quantify the impact of total grazing pressure on: <ul style="list-style-type: none"> flora (exclosures) fauna. 	<ul style="list-style-type: none"> Data from a network of monitoring sites including pastoral sites assessing land condition (Jessup transects, crown separation ratio (cover), and photopoints) and biological/vegetation monitoring sites
<p>Goat Browse at Hiltaba</p> <ul style="list-style-type: none"> Quantify the size of the goat population at Hiltaba Nature Reserve and assess the goat browse impact within the reserve. Potential link to short-tailed grasswrens project. 	
<p>Predator Control at Witchelina/Hiltaba</p> <ul style="list-style-type: none"> Response of fauna to feral predator control (shooting and baiting program) at Witchelina and/or Hiltaba Nature Reserves. 	<ul style="list-style-type: none"> Spotlight shooting data of relative fox and cat numbers at Witchelina (from 2012 onwards) and at Hiltaba (limited data)
<p>Artificial Water Points at Witchelina/Hiltaba</p> <ul style="list-style-type: none"> Explore the impact of artificial water points on fauna at arid reserves, including a literature review. 	
<p>Macropod Abundance and Impact</p> <ul style="list-style-type: none"> Quantify kangaroo populations, understand kangaroo population trends and quantify and monitor the impact on vegetation and biodiversity at Witchelina and/or Hiltaba Nature Reserves. Investigate what happens to kangaroo numbers when land use changes. 	<ul style="list-style-type: none"> Historical Department for Environment and Water data on macropod density

Fauna	
Project Description	Existing Data, Information and Resources Available
<p>Birds at Witchelina</p> <ul style="list-style-type: none"> Analyse and report on existing bird survey data at Witchelina. Review literature and existing data to propose appropriate survey methodologies that can be used to analyse abundance, occupancy and population dynamics of bird diversity at Witchelina Nature Reserve. 	<ul style="list-style-type: none"> Annual Birds SA survey data for sites at Witchelina for 2010-2018
<p>Thick-billed Grasswrens (<i>Amytornis modestus raglessi</i>) at Witchelina</p> <ul style="list-style-type: none"> Assess and understand population ecology (including abundance, occupancy and distribution) of the nationally vulnerable thick-billed grasswren at Witchelina. 	<ul style="list-style-type: none"> Birds SA survey data, biological survey data and opportune records Dr Marina Louter's PhD thesis on the behavioural ecology of thick-billed grasswrens
<p>Short-tailed Grasswrens (<i>Amytornis merrotsyi pedleri</i>) at Hiltaba</p> <ul style="list-style-type: none"> Assess and understand population ecology (including abundance, occupancy and distribution) of the nationally endangered short-tailed grasswren at Hiltaba. Identify an optimal fire management regime for short-tailed grasswrens at Hiltaba. Investigate the impacts of predation by foxes on the short-tailed grasswren at Hiltaba. Potential link to goat browse assessment project. 	<ul style="list-style-type: none"> Previous surveys by Carpenter and Kemper 2018, Lynch et al. 2017, Carpenter 2005-2007
<p>Yellow-footed Rock-wallabies (<i>Petrogale xanthopus xanthopus</i>) at Hiltaba</p> <ul style="list-style-type: none"> Assess the size and viability of the population of the nationally vulnerable yellow-footed rock-wallaby at Hiltaba. Investigate threatening processes, e.g. grazing pressure on vegetation condition and food resources, on the yellow-footed rock-wallaby population at Hiltaba. 	<ul style="list-style-type: none"> Recent camera trap data

<p>Plains Mouse (<i>Pseudomys australis</i>) at Witchelina</p> <ul style="list-style-type: none"> • Assess the population size and distribution of the nationally vulnerable plains mouse at Witchelina Nature Reserve. • Investigate the species at the south eastern edge of its distribution and its ecology and behaviour, and response to conservation management. 	<ul style="list-style-type: none"> • Records from 2011 EBS biological survey and 2015 SEG biological survey
<p>Native Freshwater Fish at Watchalunga</p> <ul style="list-style-type: none"> • Investigate the diversity, abundance and dynamics of the native freshwater fish population at Watchalunga. • Investigate the response of the native freshwater fish population at Watchalunga to future environmental change and specific active management (i.e. habitat restoration or reintroduction). • Assess the benefits of Typha and Phragmites management at Watchalunga for native freshwater fish. • Investigate the feasibility for reintroduction of key threatened freshwater fishes into aquatic habitats of the nature reserve. 	<ul style="list-style-type: none"> • Data and report from a baseline freshwater fish survey, which was undertaken in Spring 2018

Water For Nature (WFN)

Project Description	Existing Data, Information and Resources Available
<p>Surface Watering Black Box on the SA Murray Valley Floodplain</p> <ul style="list-style-type: none"> For mature black box and seedling/sapling regenerants on the SA Murray Valley floodplain, investigate the relationships between surface watering with penetration into the unsaturated soil and the root zones, assumed to be 50-100 cm below surface for juveniles, and 2-4 m for mature trees. Develop guidelines for appropriate application rates for penetration into floodplain clay soils. Compare application by surface flooding with application by high-throw sprinklers to simulate rain. 	<ul style="list-style-type: none"> Background information from NFSA WFN watering program, including Dr Anne Jensen's data Commonwealth Environmental Water Office black box watering strategy AWE watering model diagram
<p>Influence of Local Rainfall and Floods on Black Box on the SA Murray Valley Floodplain</p> <ul style="list-style-type: none"> For mature black box and successful germination of black box seedlings on the SA Murray Valley floodplain, investigate the relationships between local rainfall events and flood events with volume of seed production (closed mature fruit crop). Develop guidelines for suitable watering regimes to sustain crops on mature trees and maintain survival of regenerants. 	<ul style="list-style-type: none"> Background information from NFSA WFN watering program, including Dr Anne Jensen's data Dr Anne Jensen's PhD data Most reliable long term regional rain data from Loxton research centres Review of recent research for Commonwealth Environmental Water Office on watering regimes to sustain regenerants
<p>Phenological Cycles and Crops of Red Gums and Black Box on the SA Murray Valley Floodplain</p> <ul style="list-style-type: none"> For mature red gum and black box on the SA Murray Valley floodplain, investigate variations in the phenological cycles and relationships of crops volumes to water availability. 	<ul style="list-style-type: none"> Working hypothesis based on Dr Anne Jensen's PhD and WFN data is that both species vary from one biennial crop with reduced seed volume in extreme drought, to one biennial crop with normal volume in medium conditions, to dual opposite biennial crops in above average water availability (from rainfall and/or flood). Majority of seed fall occurs in summer Data available from Dr Anne Jensen's PhD and WFN data

<p>Ecological Importance of Smaller Managed Wetlands to Ecosystem Resilience in the SA Murray Valley</p> <ul style="list-style-type: none"> Investigate ways to demonstrate and measure the beneficial impact of smaller managed wetlands in the SA Murray Valley on improving wetland and river health, and increasing ecosystem resilience to forecast changes in climate. Use WFN sites as examples e.g. Riversleigh, Qualco, Plushs Bend, Cadell, subject to negotiation with relevant landholders and partners. 	<ul style="list-style-type: none"> WFN data on volumes of water for the environment delivered WFN data on scientific monitoring 'Building resilience to a changing climate – climate change adaptation plan for the South Australian Murray-Darling Basin' 'Climate Change adaptation to vulnerability project South Australian Murray-Darling Basin NRM region' 6 December 2013
<p>The Value of Smaller Managed Wetlands to Community Resilience in the SA Murray Valley</p> <ul style="list-style-type: none"> Investigate ways to demonstrate and measure the beneficial impact of smaller managed wetlands in the SA Murray Valley on community social and economic wellbeing in a changing climate e.g. Loxton floodplains, Ramco, Cadell, subject to negotiation with relevant landholders and partners. 	<ul style="list-style-type: none"> Access by negotiation to key stakeholders including private landholders, ecotourism operators, community groups, local councils and irrigation trusts that have actively participated in the WFN program 'Building resilience to a changing climate – climate change adaptation plan for the South Australian Murray-Darling Basin' 'Climate Change adaptation to vulnerability project South Australian Murray-Darling Basin NRM region' 6 December 2013