

Great Southern Ark

Frequently asked questions



Brush-tailed Bettong (*Bettongia penicillata*)

The Great Southern Ark project seeks to re-establish ecological function on southern Yorke Peninsula to forestall the decline of the district's unique vegetation, improve the resilience of the system in the face of climatic shifts, and deliver tangible outcomes for local farmers and the economy.

Q: What is the definition of 'rewilding' and what does it mean for southern Yorke Peninsula?

A: Emerging as a land management practice in the late 1990s, 'rewilding' refers to the reinstatement of natural processes through the re-establishment of key species - species which had previously played a significant role in maintaining natural systems. Overseas, focus has been placed on the role that large predators and herbivores play in keeping systems in balance. More recently, the concept has expanded to recognise the importance of *ecosystem engineers*; those species whose activities beneficially influence their environment (e.g. improving soil characteristics, enabling the regeneration of bushland). It is important to recognise that agricultural landscapes are also ecosystems, and depend on a range of processes to function productively – as with natural systems, the more disturbed they are, the more management is required to maintain them.

With an emphasis on reinstating key processes, 'rewilding' need not imply the return to some idealised natural state. The *Great Southern Ark* project fits this mould – rather than seeking to return southern Yorke Peninsula to its pre-European condition, the project focuses on building self-sustainability into the system, thereby reducing the input costs required to manage the natural and agricultural components of the district.



There is growing concern that many Australian native species are dwindling and face extinction. By utilising some of these species to deliver beneficial outcomes across our landscapes, we can also contribute to their long-term conservation and ensure they remain for future generations. This shift in focus recognises the inherent value of our native species and the beneficial role they play in supporting our economy and lifestyle.

To enable the reintroduction of key native species, an intensive fox and feral cat control program will commence in 2019, along with the construction of a fence across the peninsula to restrict the movement of foxes onto the "foot" of the peninsula.

Q: What have been the benefits of the current *Baiting for Biodiversity* program?

A: Following six years of baiting across the foot of the peninsula, both fox and cat densities are relatively low. However, the percentage of baits being taken remains high, suggesting that foxes are immigrating into the area from higher up on the peninsula. The *Baiting for Biodiversity* program has already delivered some achievements; bush stone-curlews have re-appeared on the peninsula following a 40 year absence, and landholders are increasingly reporting sightings of echidnas (absent for 20 years). In addition, farmers are reporting improvements in lamb survival rates of up to 60%.



Q: Are there any significant risks to human health from the ongoing baiting program?

A: The current *Baiting for Biodiversity* program uses 1080 baits to control fox numbers across the foot of the peninsula. 1080 is a highly target specific poison that is particularly effective when used on canids (foxes and dogs) and cats. The fox baits carry a 3mg dose of 1080, which is lethal to foxes, cats and dogs. In contrast, humans have a much higher tolerance to 1080 poison. An average adult (80kg) would need to consume more than 19 baits and an average toddler (10kg) two baits before lethal effects occurred. To further reduce the risk of humans (and non-target wildlife species) encountering baits, baits are buried at a depth of 10 centimetres, placed away from dwellings and spaced 0.5 km apart. Baiting operations are only undertaken on properties with prior consent by the owners, with baited areas clearly sign-posted and all neighbouring properties notified in advance.

Q: What is the risk of 1080 building up in the environment?

A: The 1080 compound is broken down into harmless compounds on contact with soil and water, and does not build up within the environment.

Q: Are farm dogs at risk from 1080 poisoning?

A: Yes. Domestic dogs have the same level of susceptibility to 1080 poison as foxes, cats and wild dogs. This risk is currently managed in the *Baiting for Biodiversity* program through the kennelling of dogs while the baits

are in the paddock. However, it is anticipated that baits will need to be left permanently in place along the new fence. There are two options available to reduce the risk of accidental poisoning of farm dogs; (i) the muzzling of dogs when in the fenced paddocks, and (ii) the possible future use of the PAPP poison instead of 1080, for which an antidote is available.

Q: Will the baiting activities along the fence line and roads follow 1080 regulations?

A: Yes. Following 1080 regulations, baits will not be laid within 5 metres of a boundary fence, 20 metres from a public road and within 500 metres of any house.

Q: How will you prevent tourist's dogs from taking baits on roads, beaches, and campgrounds?

A: 1080 baiting regulations are designed to minimise the risk of dogs taking baits and will be strictly adhered to. Areas where baits are laid will be heavily signed. In areas where there is a higher risk of accidental off-target damage, steps will be taken to mitigate the risk by increasing the distance that baits are laid from roads, property entrances, beaches etc.

Q: Will the baiting be undertaken on the eastern side of the fence?

A: Yes. All landholders in South Australia have a legal obligation to manage declared pest species (and weeds) on their properties (NRM Act 2004). It is anticipated that landholders to the east of the fence will continue to implement their current fox and cat management obligations on their lands.



Q: What about landholders along the fence who don't want to bait on their property?

A: There will be no obligation for any landowner to bait their land as part of this project. All baiting activities will take place in close partnership with the landholders, in a similar fashion to the current *Baiting for Biodiversity* program. Regardless, all landholders in South Australia have a legal obligation to manage declared pest species (and weeds) on their land (NRM Act 2004).

Q: Will details of where baits are laid be made public and available on a website?

A: No. The privacy of participating landowners will be protected and the details of which properties are participating in the program will not be made public. Northern & Yorke NRM Board staff will retain detailed maps of participating properties and bait locations, should they receive queries regarding when/where baiting is being conducted.

Q: Could there be a bounty on cats and foxes?

A: Bounties have been proven to be an ineffectual way in which to manage feral species, because shooting alone does not remove sufficient numbers to reduce populations. Bounties also incur an expensive administrative responsibility, making them cost prohibitive.

Q: Foxes are a major predator of rats and mice – will fox control result in more mouse plagues?

A: Yes, foxes do eat rats and mice, but the extent within their diet remains uncertain. However, the negative impacts of having foxes in the landscape outweighs any positive benefits. Landholders have a responsibility to control foxes on their properties (NRM Act 2004) to minimise their impact on agricultural production and biodiversity. The *Great Southern Ark* project aims to replace foxes and cats with native predators – phascogales, quolls and barn owls. Barn owls have been used very successfully to manage the impact of rodent populations around the world.

Q: Are you going to pay for extra mouse bait for farmers, following the loss of the fox from the system?

A: No. The *Baiting for Biodiversity* program has already seen a reduction in fox numbers to relatively low levels over the past four years, and there has not been an apparent increase in mouse numbers. The fencing strategy being employed by the *Great Southern Ark* project simply aims to reduce the ongoing costs of maintaining foxes at their present low abundances. It is likely that foxes will always remain in the system, in low numbers. Regardless, by encouraging barn owls into the area, the project is initiating the biological control of mice (a pair of owls is known to be able to take up to 3000 mice per year).



Q: Who will build, maintain and pay for the fence?

A: The consortium of organisations involved in the project have secured funds to construct the fence from the *National Landcare Program*, the Department for Environment and Water, and philanthropic contributions. The integrity of the fence will be monitored on a 2-3 weekly basis, with running repairs made where required. The ongoing cost of fence maintenance will be built into any funding bids that are developed for future components of the project. Other avenues that are being explored include the establishment of a volunteer group and/or by working with supportive landholders.

Q: Who pays for the maintenance/replacement of the fence in case of fire?

A: The project's fence maintenance budget provides insurance for damage in case of fire.

Q: What happens in the advent of a bushfire?

The plan is currently working to have the fence listed as a *structure in the landscape*, within the local bushfire management plan. In case of an emergency, people can cut the fence, the same as any current farm fence. Peoples' lives are more important than the fence during an emergency.

Q: I can see the benefits of the project to my farm business, but my property lies outside of the proposed fence. Can the fence be shifted northwards?

A: There are several opportunities for increasing the amount of land within the project area. The initial scope of the project is to construct the fence in a north-south direction, in the vicinity of Warooka. The location of the fence was based on the maximum area of land over which it is thought feasible to significantly reduce fox and cat abundances, at any one time. A second fence is planned (approximately year 10-15 of the project), running in an east-west direction in the vicinity of Hardwicke Bay to Stansbury. This second fence would increase the area of land within which agricultural productivity is improved. This sequence of fencing provides a "rolling front" behind which fox and cat numbers are reduced. There has been some interest from farmers to construct a third fence, cutting across the peninsula around Curramulka, i.e. where livestock numbers begin to increase. Any future fencing work will be carried out through consultation with local landholders and the community

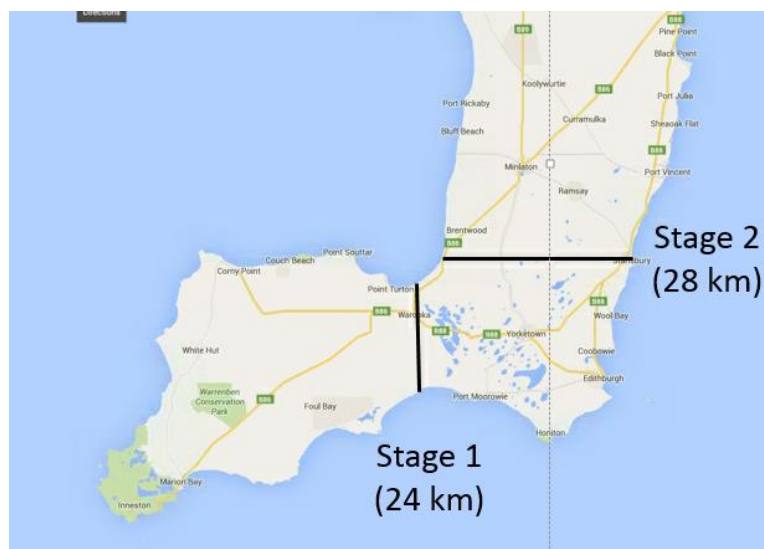
Q: Did you consider fencing along the eastern side of the Peesey Swamp, to include this nationally significant wetland and shorebird area?

A: Yes. However, if the initial fence encompassed the Peesey Swamp, the area within the fence would be too large to achieve the required knockdown of fox and cat numbers. This important area could be encompassed by the construction of a second fence in the vicinity of Hardwicke Bay to Stansbury in the future.

Q: Why do we need a fence across the peninsula? Why can't the project simply fence Innes National Park and Warrenben Conservation Park, and then construct a wildlife corridor to allow for the movement of animals between the two?

A: There are a number of reasons why this suggestion is not the best approach.

Firstly, during the initial planning phase of the project the community made it clear that they wished to see the project deliver a range of outcomes for all residents of southern Yorke Peninsula, not just on National Park Estate - improvements to the sustainability and profitability of local agriculture, increased local economic activity, in addition to the better management of the peninsula's bushland.



Approximate location of fence lines.

Secondly, the project aims to reinstate ecological processes to improve bushland condition, boost agricultural productivity and improve the local economy. These processes will not be self-sustaining unless they occur at a landscape-scale. In addition, many of the agricultural benefits will not be realised unless management occurs across both farmland and remnant vegetation.

Thirdly, the intent of the fence is to significantly reduce fox and cat movement onto the foot of the peninsula, reducing the ongoing cost of pest management to landholders. By encompassing a large area of agricultural land, improvements will also be seen in farm productivity - higher lamb production, reduced impacts of livestock disease, improved pastures and a reduced occurrence of mouse plagues in crops.

Fourthly, the small area of Innes National Park (9,232 ha) and Warrenben Conservation Park (4,065 ha), is unlikely to be sufficient to enable the establishment of self-sustaining populations of the reintroduced species. It is anticipated that, as their populations increase, the reintroduced animals will spread across the landscape into other areas of dense native vegetation.

Q: We have heard that some native species are already coming back to the peninsula, as a result of the current fox baiting program. So why do we need a fence?

A: Yes. Some native species are returning to the peninsula. However, these species have the ability to either migrate back into the area, e.g. birds (bush stone-curlew) or already existed in very low numbers, and are being noticed more now that their abundance has increased, e.g. echidnas. However, there are no nearby populations of the majority of native species missing from the peninsula, making it impossible for them to move back to the peninsula without direct assistance.

All feral pest management programs create a vacuum, into which animals from surrounding areas move. In this case, the *Baiting for Biodiversity* program has created an area of low fox abundance, and animals are migrating into this space from higher-up on the peninsula – particularly juveniles seeking to establish a territory. With a constant in-flow of new foxes, intensive baiting would be required on an ongoing basis, to continue to deliver the biodiversity and farm production outcomes that have been reported. The fence is simply a mechanism to reduce this influx of foxes and reduce the cost of pest management over the longer term.



Bush stone-curlew (*Burhinus grallius*)



Echidna (*Tachyglossus aculeatus*)

Q: Will the fence guide kangaroos towards roads and increase the risk of vehicle accidents?

A: Where roads cross the fence line, 200 metre long fenced wings will be constructed back along the road, to deter wildlife moving into the road corridor. Further measures will also be used, e.g. virtual fencing devices, to further reduce the risk of vehicle accidents. Following the construction of the fence, animal movement at road crossings will be closely monitored and management actions taken.

Q: Kangaroos often dig under fences, creating a hole for foxes to gain access. Will the fence be pegged down and patrolled?

A: Animals generally attempt to dig under fences at the point where the vertical section of fence hits the ground. To reduce the possibility of animals digging under the fence, a 30 cm wire mesh skirt will be attached

to the fence and laid on the ground – the skirt will be either pegged down, or have rocks placed upon it, to secure it in place.

Q: How are you going to manage the migration corridors that will be severed by the fence? Genetic diversity will be lost if native animals are not able to move across the landscape.

A: It is likely that the movement of the remaining wildlife on Yorke Peninsula will be interrupted by the construction of the fence - goannas, snakes, sleepy lizards, etc. However, the answer to this question is, in large part, provided by the scale of the project. By encapsulating a large area of land (~130,000 ha), there will be sufficient individuals remaining on either side of the fence to maintain genetically viable populations. Most animal populations only require the exchange of low amounts of genetic material each generation, to remain viable. Such an exchange would be made possible by the few animals that wander through the gaps in the fence at road crossings and beaches.

Although there have been no studies of the effects of fenced areas on animal genetics, it may possibly occur at other sites in Australia. In contrast to the *Great Southern Ark* project, the use of fencing to protect wildlife has only previously been used at small sites, where these effects could eventuate, e.g. Arid Recovery at Roxby Downs only encloses 12,300 hectares. The enclosure of an entire landscape by the *Great Southern Ark* project is a world first (130,000 ha to 170,000 ha), and is made possible by the peninsula's unique geography.



Western quoll (*Dasyurus geoffroi*)

The Great Southern Ark project seeks to reintroduce key Australian native species back into the landscape, to generate biodiversity, agricultural and economic outcomes. The main species chosen for reintroduction include brush-tailed bettongs, red-tailed phascogales and western quolls.

Q: Where will the animals to be reintroduced come from?

A: The animals to be reintroduced to Yorke Peninsula will be sourced from wild populations in Western Australia, populations on South Australian off-shore islands and from captive populations on wildlife sanctuaries, e.g. Scotia Sanctuary and Karakamia Sanctuary. The sourcing of brush-tailed bettongs for reintroduction is currently being negotiated with the species' National Recovery Team.

Q: Are any of the reintroduced species likely to become a problem in the long term?

A: The intent of the *Great Southern Ark* project is to establish a self-managing ecosystem (albeit highly modified by the agricultural nature of the landscape), where the various interactions between the species act to regulate each other's populations. For example, predation by western quolls will limit how large the populations of brush-tailed bettong, southern brown bandicoot, and red-tailed phascogale can get. As a higher order predator, the population of western quolls will be self-limiting because each female defends their own large territory. A self-managing ecosystem can be achieved due to the large size of the project

area; initially 130,000 ha, expanding to 170,000 ha in future years. The abundance of the various species will be closely monitored through time.

Q: How will the reintroduced small mammals survive if predatory quolls are also reintroduced?

A: The *Great Southern Ark* is envisaged as a twenty year project, with the various reintroductions staged along the way. The reintroduction of western quolls is not scheduled to occur until year ten, allowing plenty of time for the reintroduced smaller species to successfully establish robust, sustainable populations that can cope with a balanced level of predation. Although the project seeks to significantly reduce mouse numbers, they will always exist in the landscape. This background abundance of mice will continue to outnumber any native species reintroduced, and provide the main food source for the quolls.

Q: Is there suitable habitat on the peninsula for the reintroduced species?

A: Yes. The native species planned for reintroduction inhabited southern Yorke Peninsula until the early 1900s. Although the vegetation has been fragmented by the creation of farms, it is currently in good condition and enough remains to maintain viable populations of the selected native species. Surveys will be conducted in spring 2019, to identify the most suitable site for the reintroduction of the brush-tailed bettongs.

Q: Will the reintroduced native species have any impact on native plants?

A: It is anticipated that the reintroduced animals will have an overall positive effect on native plant populations by improvements to soil conditions, the movement of essential soil fauna through the landscape, and the creation of suitable conditions for seedling establishment. Regardless, the composition and condition of the native vegetation will be monitored through time, to ensure no negative impacts are occurring.



Green-comb Spider Orchid (*Caladenia stricta*)



Silver Daisy Bush (*Olearia pannosa pannosa*)

Q: Why are you considering introducing the Tasmanian devil?

A: Tasmanian devils are a higher-order predator that once existed across mainland Australia. Their reintroduction could potentially make a significant contribution to the natural control of rabbits, mice and over-abundant western grey kangaroos. There is also emerging evidence to suggest that they may be able to control feral cat populations. For both of these reasons they have the potential to make a valuable contribution to boosting agricultural production. Regardless, these conversations are only in the preliminary stage and it will be at least 20 years before the idea is discussed with any meaning.

Q: Are you considering releasing dingoes?

A: No. The reintroduction of dingoes to the peninsula has never been, and will never be, considered. As outlined above, one of the primary goals of the project is to maximise agricultural production. The

reintroduction of dingoes to Yorke Peninsula would be counter-productive to this goal because dingoes significantly impact on sheep production.

Q: If the project seeks to establish a large-scale wildlife sanctuary, what are the implications for pet dogs and cats within the sanctuary?

A: The term "sanctuary" has been used at several community meetings and has led to some confusion, for which we apologise. The notion of creating a legal conservation sanctuary across the peninsula (or large National Park) could not be further from the truth. By undertaking coordinated fox and feral cat control across the peninsula, the project will create a "safe haven" for native wildlife, in much the same way that it will create a safe haven for sheep producers and contribute to improved farm gate returns. Indeed, one of the primary goals of the project is to demonstrate the value of native species to primary production and, as such, the conversion of land to National Park estate would be at odds with the project's goal. Following on, the project will have no impact on the community's pet cats and dogs, but responsible pet cat ownership will be promoted.

Q: Will the reintroduction of native species restrict how farmers manage their land?

A: The range of native species chosen for reintroduction are reliant on dense native vegetation for their survival, will rarely venture into open space, and will not have any negative effects on agricultural production. Because these species inhabit dense native vegetation, current farming practices do not need to change to enable their successful reintroduction.

It is envisaged that, over time, some of these native species will make a contribution to farm productivity by managing mouse numbers in native vegetation adjacent to farmland. Landholders who wish to further enhance the effects of mouse control on their properties may choose to have owl nest boxes installed on their properties. The choice sits with individual landholders.



Barn Owl (*Tyto alba*)

While a significant number of farmers on southern Yorke Peninsula already take part in the landscape-scale fox baiting program and have witnessed improved lamb survival rates, participation in the program will be entirely voluntary. Likewise, landholders may choose whether to participate in the feral cat control program, which seeks to reduce the current level of lamb losses to toxoplasmosis (current losses approximated at 15%). Many local farmers are happily reporting seeing wildlife that they haven't seen in 50 years – echidnas, malleefowl, bush stone-curlews, goannas – as a result of the fox control program.

As with all land management practices, the success of these initiatives is somewhat dependent on the area of land that is covered by the program, and the project hopes that the majority of landholders will join the program, to ensure that maximum benefits are gained for the district's farming community.

Q: Does the *Great Southern Ark* project have any implications for fire management within the district?

A: Fire is an important and essential component of the ecosystems on southern Yorke Peninsula. However, fire management is a difficult balancing act between ensuring an appropriate mosaic of vegetation age classes following fire, and burning for the protection of life and assets. Some species are dependent on long unburnt patches, while others favour the vegetation successional phases after fire. The appropriate management of fire across the landscape is an important consideration for the ongoing conservation of the peninsula's unique bushland. The *Great Southern Ark* project hopes to secure future resources for the development of a landscape fire management plan.

The Great Southern Ark project seeks to expand the resident population of barn owls on the peninsula, to aid in the control of mouse numbers. With a family of owls consuming up to 3,000 mice each year and a potential density of one family/100 hectares, owls could contribute to a reduction in mouse numbers by 3,000,000 each year.



Barn owls (*Tyto alba*) utilising nest boxes on southern Yorke Peninsula.

Q: Would barn owls be susceptible to secondary poisoning through the consumption of poisoned mice, following the current practice of using zinc phosphide baits to control mice in crops?

A: Barn owls only eat live prey and are unlikely to ingest poison by eating dead mice. However, they may consume poison through the consumption of mice that are in the process of dying. As such, baiting for mouse control may present a risk to the owl population. By demonstrating the ability of owls to control mouse populations, it is hoped that farmers will take advantage of this free biological control agent, and reduce their baiting activities.

Q: Barn owls will balance mouse numbers in the future, but will there be a gap where mouse numbers will increase dramatically while the system transitions from one predator to the other?

A: The *Baiting for Biodiversity* program has already reduced fox abundance to relatively low levels, with no corresponding increase in mouse abundance to date. Regardless, the abundance of barn owls can be rapidly increased to suitable levels through the provision of nest boxes. Echoing the results of other studies, a pilot study on southern Yorke Peninsula (Meaney 2019) found that within seven months, owls had located and

taken up residency in 82% of nest boxes. Funding is currently being sought to implement the barn owl component of the *Great Southern Ark* project.

Q: What will happen to the barn owls when mouse numbers decline? Will they perish?

A: Barn owl populations tend to track the abundance of their prey – during times of high mouse abundance, the breeding success of owls increases, resulting in more owls. Conversely, barn owls will move out of the landscape when prey abundance falls, shifting to areas where food is more plentiful. So the answer to this question is yes and no – when owl populations are too large to be sustained by declining mouse populations, some may die but the majority will shift to other areas, e.g. upper Yorke Peninsula. These population cycles and range shifts happen naturally, and are beyond our control. What is within our control is increasing the availability of hollows (nest boxes) in the landscape, which would have historically existed in larger numbers than they do now, allowing barn owls to take advantage of periods of high mouse abundance when they occur.

Coupled with the reintroduction of the red-tailed phascogale and increased numbers of barn owls, the reintroduction of western quolls is expected to have a significant impact on rabbit and mice abundance.

Q: Will western quolls attack sheep or poultry?

A: Although they may scavenge on dead sheep and lambs, western quolls are not known to prey on sheep. Being the size of a domestic cat, quolls generally feed on animals up to the size of rabbits, including; mice, birds, lizards and smaller mammals. Quolls may prey on domestic chickens, but since foxes will still exist in the landscape (albeit at a reduced density) chicken coops will still be required.



One-on-one interactions with native wildlife.

Southern Yorke Peninsula has a high visitation rate by South Australians seeking authentic experiences in a natural environment. Low-impact eco-tourism opportunities linked to the Great Southern Ark project will provide the base to expand this niche market and provide a "pull factor" for national and international tourism.

Q: Will an increase in tourism provide benefits for locals?

A: Like many regional areas, Yorke Peninsula is in a state of slow demographic and economic decline – younger generations are leaving the district to find jobs, businesses are closing and services being wound down, or withdrawn, due to low demand. During the early planning phase of the project the community made it clear that they wished to see the project deliver economic opportunities for the community on southern Yorke Peninsula. An increase in tourist visitation would generate employment, provide opportunities for the creation of new businesses, and help retain local businesses and services.

Q: Will local infrastructure cope with an increase in the number of tourists visiting the District?

A: The provision of services within a community is a difficult balancing act. If demand for a service declines, then government agencies (local, state, federal) need to evaluate whether they can afford to continue to provide the service, or need to increase the cost to provide the service. With a declining population base, the creation of a demand for services by visitors on southern Yorke Peninsula will help the justification for the ongoing provision of services.

Q: Has an economic analysis been undertaken for the project?

A: Yes. A preliminary economic analysis was prepared by Econsearch in 2018. However, as it was difficult to provide accurate cost and benefit figures for some of the factors, e.g. savings to farmers from owl predation reducing mouse abundance, average figures from similar international projects were provided. In addition, some estimates have shifted since the study was undertaken. Regardless, the results suggest that the project would be a more efficient allocation of resources (and therefore, use of public money) compared to current practices. At 20 years, the project was estimated to be generating an additional \$1.7M of economic activity per annum across southern Yorke Peninsula, with an additional \$600K across the rest of South Australia.



Feral and native species are being monitored across the camera trapping grid on southern Yorke Peninsula.

The Great Southern Ark is a unique and ambitious project, which seeks to deliver multi-generational environmental, agricultural, and economic outcomes over the next 20 years.

Q: How will the risks of the project be assessed?

A: A preliminary risk assessment was undertaken during the scoping phase of the project. It is hoped that this risk assessment can be further refined with the assistance of the Community Reference Group, that will soon be established.

Q: How will you know if the project is successful?

A: There are a range of approaches being used to gauge the project's success. Both the level to which pest species have been successfully managed and the success of the native species reintroductions can be assessed over the short term (1 – 5 years), while the reinstatement of ecological processes will take longer to detect (10 – 20 years).

A grid of 70 camera trapping stations have been operational across the foot of the peninsula since 2014, providing information on the abundance of foxes, cats, goannas and other species. This information will enable an assessment of how well the feral predator control program is working, and provide data on the responses of both native and pest species to the reduction in foxes and cats. Camera traps will also be placed

at locations where the fence is crossed by a road and at beaches, to evaluate the extent to which foxes, cats and other species utilise these gaps.

Animals being released as part of the reintroductions will be fitted with radio tracking collars, to allow for the monitoring of their movements and survival. Trapping will occur bi-annually at the chosen release sites, to provide information on population size, animal health and reproductive output. The radio collars will be fitted with mortality sensors, enabling any deceased animals to be detected quickly, and an autopsy performed to determine cause of death. If predation is suspected, DNA swabs will be taken from the radio collars, to provide an identification of the predator species. Over the longer term, the data from the camera trapping grid will allow the spread of reintroduced species across the landscape to be tracked.

The effects of returning the soil engineers to the peninsula (bettong, bandicoot) will be monitored through a comprehensive sampling program, commencing in 2019. At the reintroduction sites, changes to soil profiles will be monitored at 80 locations, collecting information on a range of soil characteristics, including water infiltration rate, soil moisture content, soil organic matter, seedling recruitment rates, etc. Longer term changes in soil characteristics will be monitored at an additional 100 locations within bushland across the foot of the peninsula. These sites will be monitored every five years, to detect longer term trends.

Surveillance cameras will be placed on owl nest boxes, to record information on occupancy, breeding activity, fledging rates, and the rate at which prey items are brought back to the nest. Regurgitated owl pellets will be collected from under nest boxes, to provide more insight into their diets. Commencing in 2019, house mouse abundance will be tracked at 20 locations within bushland, 20 locations within cropland in the project area, and 20 locations within cropland outside of the project area. Monitoring will follow the standard CSIRO protocols, allowing for comparison to other areas across South Australia. The monitoring program is based around counts of active mouse holes and *chew cards* along transects.

Long-term trends in vegetation condition and the abundance of native plants and animals will be monitored through repeated surveys across southern Yorke Peninsula's 105 *Bush Condition Monitoring* sites and 57 *Biological Survey* sites. In addition, 20 *Terrestrial Ecosystem Research Network* sites will be established over the next five years.

Information on agricultural productivity will be collected in collaboration with participating farmers, including lambing rates, lamb survival rates, prevalence of toxoplasmosis and sarcosporidiosis, and expenditure on mouse baiting programs.

Q: Where do you see the project in 20 years?

In 20 years, we anticipate that the construction of the predator management fence, followed by ongoing low intensity predator management, will enable the successful reintroduction of key native species to southern Yorke Peninsula. The return of native soil engineers (brush-tailed bettong, bandicoot) to the system will increase nutrient turnover within soils, improve water infiltration and soil moisture, and create micro-habitat conditions that will facilitate germination and establishment of native plant seedlings. The reintroduction of native predators is anticipated to reduce the abundance of vertebrate pest species, including; house mice (red-tailed phascogale, barn owl, western quoll) and rabbits (western quoll). The return of these native Australian species to the landscape is expected to generate positive conservation and agricultural production outcomes.

The Great Southern Ark will create healthier ecosystems and more wildlife. It will see the return of species that are highly interactive with humans, which will facilitate one on one wildlife encounters that are personal and memorable, opening up many ecotourism opportunities.

The Great Southern Ark project will produce tangible, long-term biodiversity outcomes across southern Yorke Peninsula, and make a significant contribution to the district's social and economic sustainability by:

- creating a safe haven for some of Australia's most iconic and threatened species,
- restoring ecological function and building resilience into the landscape,
- delivering integrated pest management,
- improving farm-gate returns,
- building sustainability into the agricultural sector, and
- providing the foundation for an economic renewal program.

The Great Southern Ark is a proof-of-concept project that brings together expertise from a wide range of organisations to build a sustainable and prosperous future for southern Yorke Peninsula.