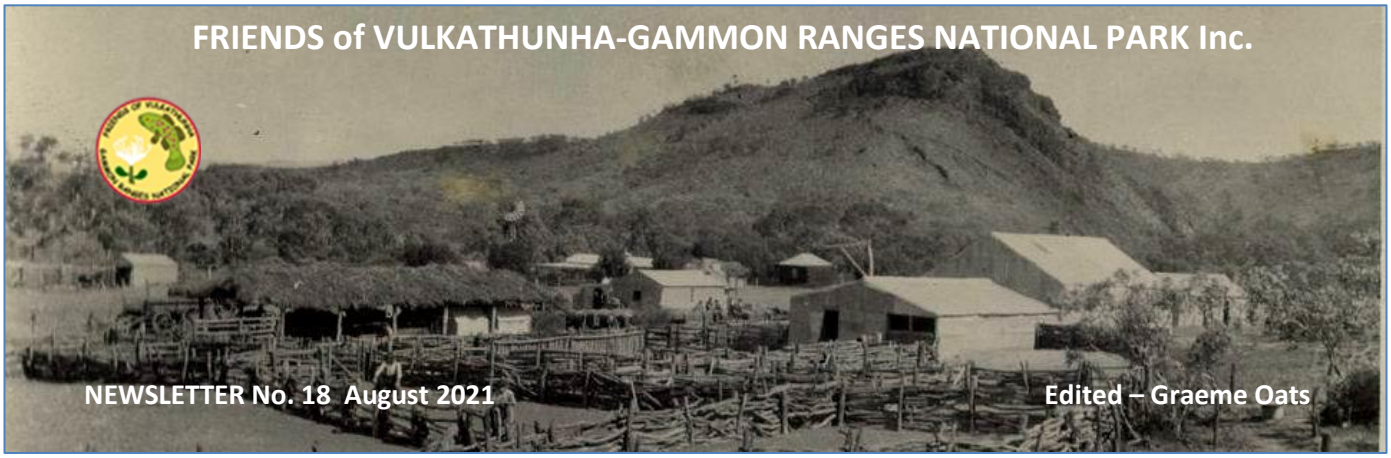


Flying Gudgeons: the Friends' role in their translocation.

The Friends have been monitoring the Flinders Ranges Gudgeon (*Mogurnda clivicola)* in V-GRNP for some time. Our aim has been to increase the knowledge about the fish and thus contribute to ensuring that its status does not progress from critically endangered to extinct. Establishing new "insurance" populations of the fish in other Flinders Ranges locations with permanent water, and currently without any fish, would decrease the risk of extinction should the Weetootla population of this fish suffer an adverse event. For this reason the **Bounceback and Beyond** program have been planning for this translocation on the 26th May, 2021 for 10 years. I jumped at the chance to be involved when Rob Brandle (from DEW) invited the Friends to provide the needed workforce.

The day of fish capture was put off for a day as the forecast strong winds on Monday would have made landing the helicopter – which was used to transport the fish to their new location - somewhat problematic. The briefing at Balcanoona on Tuesday 25rd allowed all people involved in the translocation to assemble in the lounge room and to get introduced to each other. Eight members of Friends of V-GRNP were involved (Martin Caon, Colin Conor, Robert Gabb, Helen Johnson, Janet Stone, Mike Tanner, Garry Trethewey and Annette Vincent). Others present were DEW staff, Arid Lands staff, and contractors from Ecoknowledge. Sian Johnson welcomed us all to country. Mark Lethbridge described the capture plan: two-person teams, each with 4 mesh-traps baited with *Dine* cat food. The traps had two entry points for the fish. Three teams of Friends were deployed to Nepouie, and one team to Weetootla; the traps were set at pre-assigned pools; captured fish were to be tipped into 5L buckets, then walked to the collection point adjacent to the helicopter landing site. Mark suggested an early departure from Balcanoona (6:30am) to allow lots of time to catch the fish before the arrival of the helicopter.

We entered the Nepouie Gorge from the Arkaroola road on the west via an easily missed track, (rather than from the Innamincka Rd) and left the cars at the end of the track where the esky-carrying sling that was to be hung from the helicopter, had been delivered earlier. The baited traps worked well, Annette and I caught 18-25 fish within 20 mins in each of the first 2 traps we had set. We also caught 2 large yabbies that had entered a trap. The bait was drawing them in. The traps seem to preferentially catch large fish. That is, fish longer than 6-7cm.

The number of fish in each bucket load was estimated and their length approximated, then they were transferred to the Engel eskies for transport: ~105 fish per esky. Chemicals were added to counter the waste ammonia that is produced by the fish and to relieve stress that the fish may experience. A dissolved oxygen meter was used to check water oxygenation. The tally of 420 fish from Nepouie were caught with plenty of time to spare. 180 fish were caught at Weetootla. Fish from both locations were sourced in order to maximise the genetic variety among the translocatees. The helicopter landed at Nepouie to load four Eskies into the sling, then at Weetootla to load two more before flying to the release sites at Spring Creek, Ikara National Park, and then further south to the Hookina release site. Neither site is easily accessible to

the public, so are protected from interference. After the helicopter left, the Friends went back to Balcanoona to pack up and then drive south to stay at the Shearer's quarters at Wilpena Homestead. From here we would visit the release sites over the next two days. Other members of the release party stayed at Oraparinna.

Above: - Fish near the baited trap.

Below:- A pool at the Spring Creek release site

The Spring Creek release site is in a pretty gorge, accessed by road through a locked gate then by foot via a narrow path that descends the southern face of the tall gorge wall, to the creek floor. We were met by two Rangers from Ikara NP and walked into the three pools where fish were released. The pools are in rock and

without overhanging reeds. However they do have some algae cover. It will be interesting to see what happens when a flood roars down the gorge. Any vegetation would be swept away.

The Hookina Valley release site is within the Yappala Indigenous Protected Area and lies below the dirt plain that forms the eroded north cliff. Two Yappala IPA Rangers showed us the way down to the valley floor via the steep cliff path. There is lots of water there, with many pools of varying depths up to a metre (plus?) in the multi-braided stream that snakes throughout the valley floor. The pool substrate is sandy with deposited sand eroded from the cliff. The valley is overgrown with a variety of weeds (pepper trees, castor oil plants, tobacco bush, etc.). Perhaps as a legacy from the days when cattle wandered about. There are a few young red gums, none that seem 100 years old, but some new growth which is promising. There is much myoporum regrowing. Perhaps in the foreseeable future, more native vegetation will establish now that the IPA exists.

A recent flood had scoured away the bull rushes and any floating algae (and invertebrates?) from the pools leaving most of them open and without cover. Hopefully it will be some time before predatory birds become aware that fish are now present, and hence allow some cover vegetation to re-establish to provide shelter for the fish.

Left:- Hookina Spring release site, looking downstream.

We saw some fish the at the release sites, two days after their release, but not many. Pools with bull rushes seem suitable habitat but there are many pools without sufficient cover to provide good habitat. Presumably the fish will re-distribute themselves to where there is the best habitat.

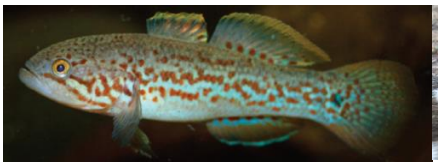
It is anticipated that the Friends will have a role in the ongoing monitoring of the translocated fish. It is a rare, perhaps a once-in-a-lifetime event to be involved in a sanctioned translocation exercise and it will be illuminating to follow the progress of these fish to see if a breeding population of fish does become established and so secures their continued survival. Read the media releases at: https://www.landscape.sa.gov.au/saal/news-resources/media-releases/Flying_fish_in_the_Flinders_Ranges And

https://www.abc.net.au/news/2021-06-11/fish-helicopter-flinders-ranges-purple-gudgeon/100208078

And more re-introductions: The funding partnership between the South Australian Government and the Foundation for Australia's Most Endangered Species (FAME) will support the establishment of new populations of the Western Quoll, locally known as Idnya, and the locally extinct Red-Tailed Phascogale to V-GRNP. In late 2021, Western Quolls and Red-Tailed Phascogales will be released in a phased reintroduction, making use of suitable habitat to boost their chances of early survival. Want to know more? read https://www.fame.org.au/projects/native-species-return-repopulation-of-the-quoll-and-phascogale

Martin Caon, 13 July 2021.

Reducing the risk of extinction for Wirti Udla Varri, Idnya and Kenngoor

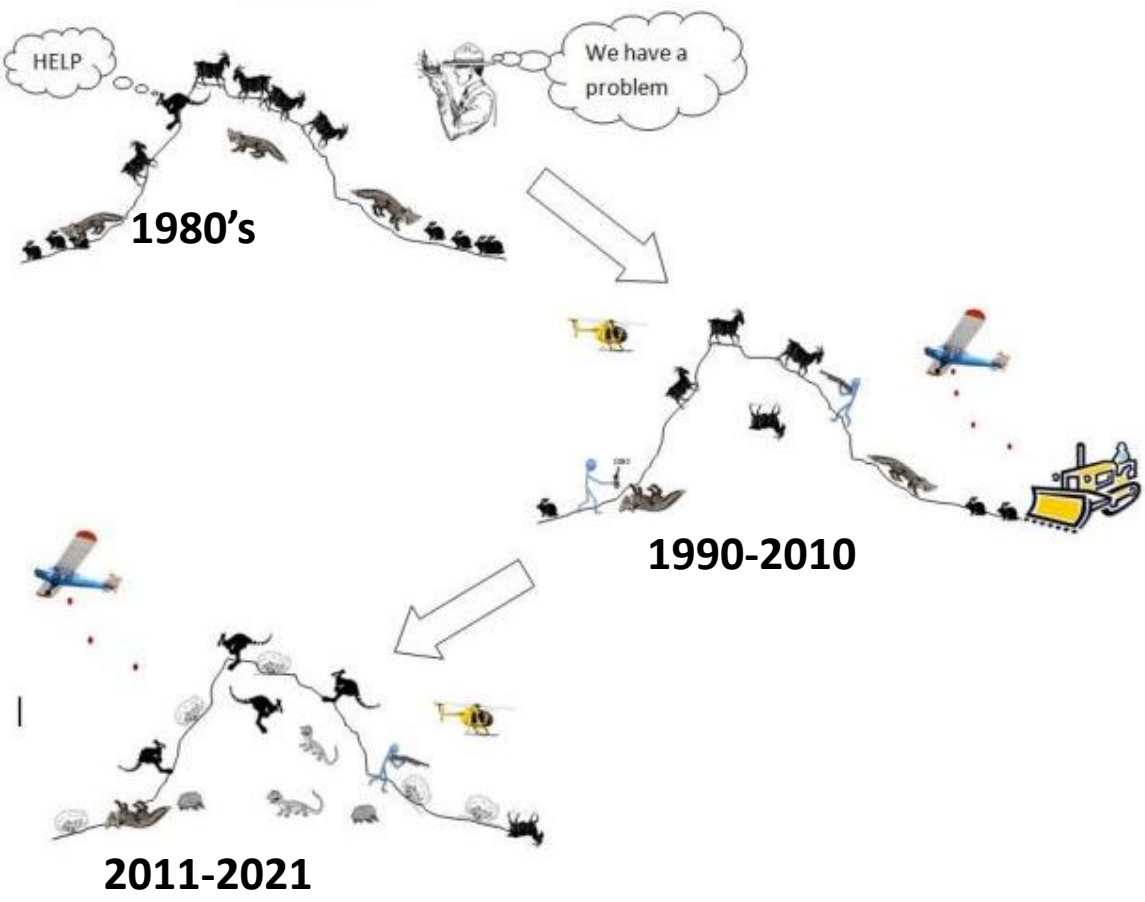

Flinders Ranges Purple-spotted Gudgeon


Western Quoll


Red-tailed Phascogale

BOUNCEBACK & BEYOND through Landscape-scale wildlife management

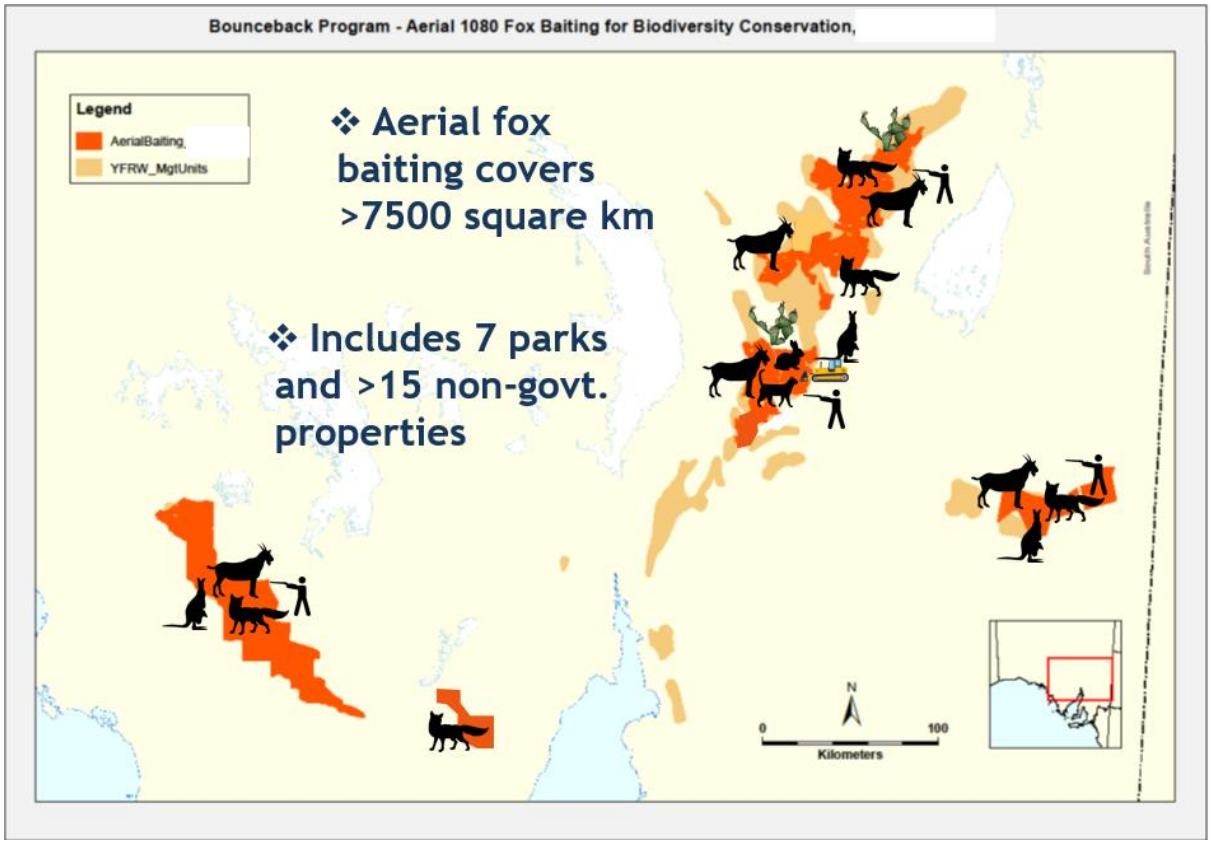
Bounceback began in 1992 as a concerted effort by National Parks and Wildlife staff in the Flinders Ranges National Park and Adelaide to improve the survival outlook for yellow-footed rock-wallaby populations by managing their introduced predators (mainly foxes) and feral competitors (goats and rabbits). Leaning on the cliché "a picture says a thousand words" I am using the picture below to explain the history of the Bounceback Program



Through its focus on managing threats to wildlife and habitat at landscape-scales, Bounceback has been spectacularly successful in recovering yellow-footed rock-wallaby populations across its management footprint. The focus on broad-scale fox control has effectively removed foxes from more than 7500 sq km of the Flinders, Olary and Gawler Ranges, with goat populations consistently managed to low levels across the same area.

Fox control involves twice yearly aerial 1080 fox bait drops followed by complementary ground baiting along tracks and roads which are excluded from the aerial baiting. Goats are managed through a combination of mustering, followed by ground shooting by staff and volunteer hunting organisations, primarily the Conservation and Wildlife Management Branch of the SA Branch of Sporting Shooters Australia Association. These shoots are followed by an annual helicopter goat cull to reduce numbers in the least accessible areas of the ranges. Cats, rabbits, cactus and kangaroos are also managed in areas where

they pose significant conservation concern. On the map below, the orange areas are where the majority of ongoing management is focussed, the paler shading highlights areas identified as prime yellow-footed rock-wallaby habitat.



The results of monitoring the effectiveness of the management regimes show that foxes are very well controlled, goats significantly reduced, though there are always small flocks that escape our attempts to remove them. Rabbits have fluctuated, with early ripping being successful and then followed up even more successfully by the escape of calici virus which kept numbers low until the mid-2000s. Numbers have been building since with occasional knock downs by calici and our management in specific target areas. Cactus was similarly reduced in extent but has made a comeback in a few areas where current management activities are focussed. Cat control using cat specific 1080 baits has proved very successful in reducing numbers in a trial on Ikara-Flinders Ranges National Park (IFRNP) and Arkaba Station to protect the reintroduced western quoll population.

Whilst kangaroos grew to unmanageable levels from 2011-2019, three years of drought and culling activities on park have substantially reduced their numbers. Current kangaroo management that includes harvesting by an Adnyamathanha professional kangaroo shooter will hopefully prevent future over-population.

MANAGEMENT OUTCOMES

An observant visitor to any of the four large conservation reserves in the Bounceback footprints will note the difference between the more trees and shrubs tasty to livetock and goats when compared to surrounding pastoral leases. The two pictures below illustrate this with bullock bush browsed up to about 2m on the left (Hiltaba just after Nature Foundation purchased the lease) compared with foliage to the ground and multiple young recruits on the right (IFRNP after 20 years of herbivore control).


Animal populations have also responded with big increases in number and distribution across the landscape. Aerial survey counts conducted along transects from Dutchman's Stern Conservation Park to Arkaroola and across the Olary Ranges show two stories, a positive one for Bounceback managed areas and a negative one in other areas.

Camera monitoring across Bounceback managed areas and surrounding properties have shown higher detections of echidnas and larger reptiles such as sand goannas within fox managed areas.

BOUNCING BACK & BEYOND through translocations and reintroductions of extinct fauna

Re-introductions within the Bounceback area have met with varying success. The first serious attempts involved brushtail bettongs (woylies) which were trialled during 1999 and 2000 in the north-east of the IFRNP and in Wilpena Pound. Unfortunately, our fox and cat control methods at that time did not reduce predator populations to a low enough level for the released animals to successfully breed and survive beyond six months.

We waited another 14 years before trialling another species, this time the carnivorous western quoll which was released over three years (2014-2016) but need a stronger focus on cat control to be successful. During the same period but starting in 2015 the arboreal brushtail possum was also released. Both species weathered three years of intensive drought remarkably well and since 2020 have significantly expanded their populations beyond release areas.

This success has inspired expanding the western quoll population and reintroducing the Red-tailed Phascogale to the Vulkathunha-Gammon Ranges National Park (VGRNP) over the next three years. The Flinders and Outback Region of the National Parks and Wildlife Service are collaborating with the South Australian Arid Lands Landscape Board to deliver the Bounceback program beyond the public managed conservation reserves through the Bounceback and Beyond Project which is funded by the Australian Government National Landcare Program. This funding is supporting cat management and reintroduced species monitoring work and will continue to support reintroduction related management and monitoring in VGRNP. The new reintroductions will also be supported with funding from the Foundation for Australia's Most Endangered Species Inc. (FAME) raised through sponsorship campaigns to the Australian community.

Whilst the cute and cuddly mammals have dominated the stage, a slow burning campaign to reduce the risk of extinction to one of South Australia's most vulnerable fish species (Flinders Ranges purple-spotted gudgeon) has quietly burbled along like a Flinders Ranges spring. An Honours project investigating habitat parameters in 2016 helped to secure the funding required to support the translocation work through the Bounceback and Beyond Project. The work of the Friends of Vulkathunha-Gammon Ranges National Park (FoVGRNP) in monitoring water quality and fish occupancy at the only springs at which the Flinders Ranges

Purple-spotted gudgeon is known to occur have provided time series data on how these systems behave, useful for comparison with the springs to which 600 fish have now been transported.

Pre-translocation assessment work included genetic analyses from fish taken from Weetootla and Nepouie Springs. The results showed very low levels of genetic diversity indicating that the population has suffered some severe declines with only a small number of fish surviving to repopulate the streams. I t was also evident that the Nepouie population was a recent offshoot from the lower pools at Weetootla, supporting unconfirmed suggestions that the fish had been translocated to Nepouie during the early 1970s. However, the Nepouie population was more numerous than evident at Weetootla and showed a higher level of genetic fitness. For these reasons the translocation would take 420 fish from Nepouie and the remaining 180 from the more divergent upper pools at Weetootla. The release sites would get 300 each with even proportions from both source springs being released at each of the new population springs.

At the time I presented this talk to the AGM of the FoVGRNP we were still planning the translocation and the role that group members could play in the translocation and subsequent monitoring. The professional translocation team were very impressed and grateful for the enthusiasm and skill that the FoVGRNP brought to collecting the fish for transport by helicopter to their new habitat in Ikara-Flinders Ranges National Park (IFRNP) and Yappala Indigenous Protected Area. For a more detailed description of the event read: https://www.landscape.sa.gov.au/saal/news-resources/media-releases/Flying_fish_in_the_Flinders_Ranges or https://www.abc.net.au/news/2021-06-11/fish-helicopter-flinders-ranges-purple-gudgeon/100208078

To date monitoring has been observational, with mostly ranger staff recording numbers and sizes seen during a 15-minute period, plus any dead fish observed. We now have an honours student interested in taking on the analyses for monitoring the fish using a go-pro style video camera fixed to a baited monitoring platform. I would like this system used at Weetootla and Nepouie for comparison with the results for the new populations. Success with these translocations will be when the fish have successfully bred and inhabit all suitable pools between and beyond the three release pools at IFRNP and Yappala.

Key elements for reducing the risk of extinctions that have ensured the ongoing success of Bounceback

- Commitment to ongoing strategic threat management.
- Seize opportunities when they arise.
- Involve others with an interest.
- Question the efficacy of activities with research.
- Be open to new ideas.

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Department for Environment and Water | SA Arid Lands Landscape Board.