

Backyard Bandicoots:

engaging communities in monitoring endangered Southern Brown Bandicoots in residential areas in Cranbourne, Victoria.



Community bandicoot spotlighting crew in the Royal Botanic Gardens Victoria, Cranbourne.



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Victorian National Parks Association

The Victorian National Parks Association (VNPA) is a community-led nature conservation organisation. Our vision is to ensure Victoria is a place with a diverse and healthy natural environment that is protected, respected, and enjoyed by all. We work with all levels of government, the scientific community and the general community to achieve long term, best practice environmental outcomes and help shape the agenda for creating and managing national parks, conservation reserves and other important natural areas across land and sea in Victoria.

NatureWatch

NatureWatch is VNPA's citizen science program that engages the community in collecting scientific data on Victorian native plants and animals. The program builds links between community members, scientists and land managers and develops scientifically based, practical projects which contribute to a better understanding of species and ecosystems, and the management of threatened species and natural areas.

Project Partners

Dr Sarah Maclagan, bandicoot researcher who provided technical expertise to the project and assisted with spotlighting walks.

Dr Terry Coates and Charlotte Fletcher, Royal Botanic Gardens Victoria, assisted with local promotion of the project events, management of the project Facebook page and technical expertise with spotlighting walks and backyard camera set ups.

Acknowledgements

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- Thank you to the members of the Southern Brown Bandicoot Recovery Group for their project input and advice.
- Thank you to the Royal Botanic Gardens Victoria and the City of Casey for providing extra support for spotlighting walks.
- Thank you to all the amazing local volunteers who enthusiastically supported our spotlighting events, shared their local bandicoot knowledge and opened their backyards to camera monitoring.

Introduction

Backyard Bandicoots is an exciting, collaborative, citizen science project helping to improve the protection of Southern Brown Bandicoots in residential neighbourhoods around the Royal Botanic Gardens Victoria property in Cranbourne, Victoria. In 2019-2020, community volunteers participated in a range of activities aimed at increasing awareness and recording sightings of bandicoots in target residential areas. This project trained 90 local volunteers in spotlight surveying methods for bandicoots across four spotlighting events. An additional eight local households were trained on installing motion-detection cameras in their backyards to monitor for bandicoots. Cameras were installed for 149 days and recorded 3784 photos of a mix of six native, six introduced and four domestic animal species. Southern Brown Bandicoots were recorded on two private priorities.

Southern Brown Bandicoots (*Isoodon obesulus*) are an endangered, native marsupial that are threatened by habitat loss and fragmentation, most recently due to urban expansion. A key population live within the Royal Botanic Gardens Victoria, Cranbourne (RBGC) which is now flanked by industrial development, sporting fields, residential estates, golf courses and large roads. Rapid urbanisation has reduced bandicoot habitat to private land (backyards) in new urban estates and into local parks and golf courses. As a result, homeowners are now critical habitat managers for this endangered species, though most will be unaware of this.

This project focusses on a collaborative effort to engage, educate and empower residents to support bandicoot survival in the residential areas around the RBGC. This is an innovative approach to threatened species conservation because rather than having volunteers monitor the species in protected areas or public land, we are enabling them to monitor them in their neighbourhood and own backyards so they can become community advocates for the species locally. Citizen science is a powerful way to engage large number of volunteers to collect scientific data in a timely way. This project is innovative in that the knowledge that is gained will be locally relevant and therefore we are likely to have greater success with future efforts to protect and enhance bandicoot habitat in the area because planning can integrate the local habitat and community preferences associated with protecting bandicoots in this area.

Ultimately, this project aims to increase people's understanding and awareness of Southern Brown Bandicoots in their neighbourhood to increase the likelihood they will become active in protecting bandicoots and their habitat. This is a very interesting opportunity to engage directly with many people who each hold a piece of the puzzle to saving this species from extinction in an increasingly urbanised landscape.

Project Objectives:

- To increase community awareness of local SBB populations and the value of the RBGC for habitat.
- To improve community identification skills of bandicoots and their habitat

- To increase number of residents acting to help preserve bandicoots and their habitat in their neighbourhood
- To educate the community on creating backyard bandicoot habitat
- To build a relationship with the RBGC Bandicoot Outreach Officer and key members of the Bandicoot Recovery Group to support their conservation campaigns for the bandicoots.

Project Actions:

- 1. Create an online bandicoot reporting and information system for the community
- 2. Conduct neighbourhood bandicoot spotlighting surveys
- 3. Conduct bandicoot monitoring in residential backyards

Project Partners:

This project was an exciting opportunity to partner with some key people working in bandicoot conservation in the project area. We worked closely with Charlotte Fletcher, the RBGC Bandicoot Outreach Officer to promote the project to community, to develop educational materials on bandicoot identification and spotlighting techniques, to run the spotlighting walks and to install the backyard cameras. Charlotte is a fantastic link to the local community and with the role being relatively new at the beginning of this project, our partnership helped to take the RBGC bandicoot conservation programs outside of their property and into the neighbourhoods around the gardens. The Bandicoot Outreach Officer will continue to be an important contact point for the local community for all things bandicoot related. Dr Terry Coates, Research Scientist at the RBGC, manages the bandicoot population in the botanic gardens. Terry assisted with project design and implementation of backyard cameras and overall support for the Bandicoot Outreach Officer.

Dr Sarah Maclagan is an expert on bandicoot habitat use in altered landscapes. Sarah has provided expert input on bandicoot identification and habitat use into the project's educational materials and assisted with guiding community volunteers at each spotlighting walk.

All project partners are members of the Southern Brown Bandicoot Recovery Group and kept them apprised of the project development and implementation stages.

Project Timeline:

The project officially started in August 2019 and was active in the field until March 2020 when COVID-19 restrictions limited work. Spotlighting walks occurred in late November to early December 2019 and backyard cameras were installed between November 2019 and March 2020.

Project Area:

Cranbourne is located approximately 47 kilometres southeast of Melbourne and is an area of rapid urban development converting farmland and remnant habitat for native wildlife, such as bandicoots, into high density residential estates. This project focussed on older and newer residential developments around the RBGC, specifically the estates of Settlers Run, Junction Village, Botanic Ridge and Brookland Greens (figure 1).

Figure 1: Project area map including the areas of the spotlighting walks shaded in pink.



Project Action 1: Create an online bandicoot reporting and information system for the community

The aim of this action was to create an online reporting system for bandicoot sightings in the project areas to increase community awareness of the local bandicoot population and to document the types of altered habitats (private backyards, local parks, golf courses, nature strips) where bandicoots persist.

All project partners collaborated to create a new Southern Brown Bandicoot Facebook group called '*Bandicoot Crew – Victoria: a place for fans of the bandi to share stories, tips, pictures and videos related to our adorable little ecosystem engineers*'. It provides information about bandicoot identification, habitat use, when and where you may see them in residential

neighbourhoods and how to report sightings. This group is managed by the RBGC Bandicoot Outreach Officer and currently has 30 members. [www.facebook.com/groups/BandiCrew]



In addition, a more general Facebook page was promoted within the new 'Bandicoot Crew-Victoria' group. The Friends of the Bandicoot page is "*dedicated to the conservation of the Southern Brown Bandicoot in south-central Victoria and beyond. A place to share all the latest news, events and information about our bandicoot friends*". [www.facebook.com/pg/TheBandiwagon/posts/]



An information sheet for project participants was developed with tips for spotlighting bandicoots, bandicoot identification and online reporting of bandicoots for citizen science projects on the iNaturalist platform (figure 2).

Figure 2: Bandicoot information sheet for project participants



The iNaturalist reporting platform was recommended to residents as an easy and effective platform to report bandicoot and other wildlife sightings. iNaturalist is a phone app that allows people to report animal sightings quickly, results immediately show on the system and it links into the Atlas for Living Australia national online database. An easy search brings up all the bandicoot sightings in an area and details can be explored for each sighting. This is an easy mechanism for community reporting and monitoring of bandicoots (figure 3). [www.inaturalist.org/taxa/43280-Peramelidae]

Figure 3: Details from the Southern Brown Bandicoot page on iNaturalist (retrieved 10/08/2020)





Action 2: Conduct neighbourhood bandicoot spotlighting surveys

The aim of this action was to monitor for Southern Brown Bandicoots in residential areas around the Royal Botanic Gardens Cranbourne through night-time, spotlight, surveys in local parks, along nature strips and golf courses and along the fence line for the botanic gardens.

Four spotlighting evenings were run between 22 November 2019 and 3 December 2019. Each was delivered in a different area and the local community were invited via letterbox drops of invitations (figure 4). See figure 1 for the map of the spotlighting locations.

Figure 4: Promotional flyer for bandicoot spotlighting surveys



Each spotlighting evening was hosted by Sera Blair from VNPA, Charlotte Fletcher from RBGC and Sarah Maclagan, bandicoot expert. The evening started with a fun introductory talk from each host followed by some spotlighting instructions and a safety briefing. Then participants were divided into groups, each with a host, and provided with spotlight torches. All participants received a package including take home bandicoot information sheets, bandicoot brochures, a bandicoot-shaped cookie cutter and some indigenous plant seedlings.

Overall, these were very fun and engaging evenings where the residents ranged from those who were aware of the local bandicoot populations to those who had not been aware and who wanted to learn more about them. They were an excellent way to bring neighbours together and more aware of the need to protect bandicoots in their neighbourhood. It also provided an excellent link for residents with the RBGC Bandicoot Outreach Officer, Charlotte, which gives them a local contact for all bandicoot related questions they may have and someone to share their local knowledge and bandicoot sightings with.

Families were invited to attend the first spotlighting evening in the Royal Botanic Gardens and there was a large turnout with many children eager to see a bandicoot. The spotlighting walk in the botanic gardens was the only one where bandicoots were seen, along with many other interesting animals. It was very clear that the garden provides excellent habitat for a diversity of native wildlife not found in the adjoining suburbs and new developments where large areas of vegetation has been lost.

Spotlight Night #1: 22 November 2019

- Number of volunteers: 37
- Location: Stringybark Picnic Area, Royal Botanic Gardens Cranbourne

Participants divided into three groups, each with a project leader and walked trails and roads starting from and returning to the Stringybark Picnic Area car park. Families with younger children in strollers used the sealed road while other groups went further into the gardens.

Animals spotted or heard during the spotlighting: Southern Brown Bandicoots, Ringtail Possums, Brushtail Possums, Sugar Gliders, Tawny Frogmouth, Bush Rat, Microbats, Koala (clearly heard, not sighted).



Spotlight Night #2: 26 November 2019

- Number of volunteers: 13
- Location: Horse Training Precinct (less residential than other areas)

The spotlighting walk followed roads and trails around the horse training precinct. This was a mix of tracks behind houses, a loop through vegetation at the edge of a sporting oval and a track through a vacant block of land.

Animals spotted or heard during spotlighting: Ringtail Possum.





Spotlight Night #3: 29 November 2019

- Number of volunteers: 17
- Location: Brookland Greens

This spotlight walk followed all the trails throughout the Brookland Greens Nature Reserve, along Ballarto Road and back through the reserve.

Animals spotted or heard during spotlighting: Ringtail Possum, Brushtail Possum, Eastern Grey Kangaroos.

Surprisingly few animals were noted on this walk. It was raining at the start of the walk which may have made it more difficult to see or hear animals as most participants were using umbrellas.





Spotlight Night #4: 3 December 2019

- Number of volunteers: 23
- Location: Settler's Run Golf Course

This spotlighting walk was conducted along the edges of the golf courses (with permission from the Settler's Run golf course management) in the dense vegetation at the sides and along walking tracks that separate the golf course with the adjacent houses.

Animals spotted or heard during spotlighting: Brushtail Possums, Ringtail Possums, Eastern Grey Kangaroos.



Overall outcomes from the spotlighting walks:

A total of 90 residents joined the spotlighting walks. We received very positive feedback during the spotlighting evenings including new skills in spotlighting and monitoring for nocturnal animals but also in bandicoot identification and habitat use. We are confident these walks increased community awareness of bandicoots in neighbourhoods and built important new connections with residents and the Bandicoot Outreach Officer at the RBGC which will lead to future engagement and increased community interest in supporting bandicoot conservation. Wildlife spotted on the spotlighting walks were added to iNaturalist.

Action 3: Conduct bandicoot monitoring in residential backyards

The aim of this action was to use motion-sensor cameras ('camera-traps') to monitor where and how bandicoots utilise private backyards as habitat in residential areas around the botanic gardens.

We recruited 10 households willing to participate in the backyard camera monitoring. This was done through a mailbox drop of a promotional flyer to residents in target locations (figure 5). Target locations were determined by the project partners based on gaps in knowledge of where bandicoots were present and where habitat areas were under threat of clearing or new development.

Figure 5: Promotional flyer for recruiting residents for backyard bandicoot camera monitoring.



Cameras were placed at 8 houses as the final two were cancelled due to COVID-19 lockdown restrictions in March 2020. The cameras were in place for approximately three weeks at each location. Across all sites the cameras were in place for a total of 149 days between November 2019 and March 2020.

In total, 3784 photos were taken by the motion-detection cameras. They revealed a mix of native, introduced and domestic species of animal – as was expected for domestic backyards in a peri-urban area. Six native animal species, six introduced species and 4 domesticated species of animal were caught on camera. Table 1 provides a list of animals photographed.

Native animals		Introduced & domesticated animals			
Common name	# sites	Common name	# sites		
Southern Brown Bandicoot	2	Rabbit	1		
Brushtail Possum	1	Black Rat	2		
Spotted Dove	3	House Mouse	1		
Eastern Rosella	1	Indian Myna	2		
Magpie	1	Blackbird	4		
Little Wattlebird	1	Cat	3		
		Fox	2		
		Dog	1		
		Chicken	1		
		Cow	1		

Table 1: List of animals recorded and the number of sites (n=8) they were photographed on.

Bandicoots

Southern Brown Bandicoots were recorded at two of the eight sites, at site 8 in the southwest of the project area and at site 3 in Earlston Circuit adjacent to the botanic gardens and the racecourse (figure 6). Earlston Circuit is an older neighbourhood with large gardens and bandicoots are regularly sighted by residents. This site also had the greatest diversity of animals overall (table 2).

Bandicoots were photographed on open backyard lawns and in the shrubby gardens at the edges of lawns. Bandicoots generally appeared late afternoon and were recorded sporadically across dusk, night and early dawn (figures 7 & 8). The earliest recording of the bandicoots was 4:21 pm (sunset time 7:35 pm) and the latest morning recording was 5 am (sunrise time 7:24 am).

The bandicoots seemed to co-exist with rabbits well as they were frequently recorded in the same area as rabbits at a similar time. There was evidence of bandicoots digging in the garden lawn for food (figure 9), which can be a complaint from homeowners.

Figure 6: Map of backyard bandicoot monitoring sites in residential areas around the Royal Botanic Gardens Cranbourne. Southern Brown Bandicoots were photographed at sites 3 and 8.



Figure 7: Afternoon photograph of a Southern Brown Bandicoot at site 3 (4:21 pm).



Figure 8: Evening photograph of a Southern Brown Bandicoot at site 3 (8:52 pm). 2020–03–17 8:52:02 PM M 1/3



Figure 9: Evidence of holes left behind from bandicoot diggings.



Distribution of animals by site

One site, number 7, had no animals recorded. The camera was only triggered by humans. The other sites provided a range in the number of photos taken at each site from 105 photos at site 2 and 1426 photos at site 3.

Species	Site							
	1	2	3	4	5	6	7	8
Southern Brown Bandicoot			1					1
Brushtail Possum		1						
Spotted Dove			1	1	1			
Eastern Rosella								1
Magpie			1					
Little Wattlebird			1					
Rabbit			1					
Black Rat					1	1		
House Mouse					1			
Indian Myna	1							1
Blackbird			1			1		1
Fox	1	1	1					
Cat	1							1
Dog	1							
Chicken					1			
Cow				1				
Total	4	2	7	2	4	2	0	5

Table 2: Distribution of animal species recorded by site.

Bandicoot predation risk

Cats and foxes are known predator risks for Southern Brown Bandicoots. New residential developments around the RBGC ban cat ownership and older areas regulate cats to be restricted to the owner's property.

Cats were recorded at two sites, site 1 and site 8 (table 2). It is unclear if these were pet cats, stray or feral. No collars were visible (see Appendix 1 for sample cat photos). Site 1 is in an older neighbourhood where cats are permitted but should be contained to the owner's property. Site 8 is within the newer Botanic Ridge development and cats are banned. Southern Brown Bandicoots were also photographed at site 8 indicating a potential predation risk of bandicoots by cats in that area.

Foxes were recorded at three sites, including one where bandicoots were also recorded. There are no current fox control programs in this area.

Figure 10: A Southern Brown Bandicoot photographed at site 8 (7:47 pm). 2020–03–28 7:47:29 PM M 1/3



Figure 11: A fox photographed at the site 8, five hours after a Southern Brown Bandicoot was recorded at 7:47pm (Figure 10).



Project Outcomes

This project has successfully met all its objectives. Community awareness of the local Southern Brown Bandicoots has been increased as demonstrated by the strong spotlight walk attendance, the growing membership of the 'Bandicoot Crew – Victoria' Facebook group, and the willingness of landowners to participate in backyard camera monitoring. All the promotion and events of this project have taken the opportunity to educate the community in bandicoot identification and to increase the understanding of their habitat value and the threats on their survival. Now there are more residents who are not just more aware of bandicoots, but aware of local programs to save the bandicoots and a key contact person to go to for information or to report bandicoots, the RBGC Bandicoot Outreach Officer. And through the promotion of the iNaturalist platform, more people will be recording bandicoot sightings in their neighbourhood, within and beyond the project area, to help provide important information on areas of habitat that need protecting to help the bandicoots survive in the area.

A positive new relationship has come out of the shared interest in engaging the community in bandicoot conservation around the RBGC by project partners. This foundation will serve to support future actions to help protect bandicoot populations within the project area and beyond. Dividing the efforts of implementing the actions and sharing knowledge, skills and resources made this project a very enjoyable and successful endeavour.

This project has also inspired some new research into bandicoot use of backyards in the project area with a new Honours student from Deakin University conducting a series of interviews and a broader survey to investigate bandicoot presence and use of different types of backyard habitat.

This project has started off an incredible effort to engage the community in Southern Brown Bandicoot conservation in the area around their stronghold habitat in the RBGC. We hope to continue this project further to survey for bandicoots across the area, particularly areas with new developments planned to help secure additional threat mitigation efforts to protect the bandicoots. This project is in a valuable area of conservation, working to reduce the impacts of rapid urbanization from destroying important wildlife habitat and threatening the loss of Australian native animals. It is also a very positive and enjoyable way to engage the community as threatened species land managers right in their backyard!

Thank you to all the community volunteers and project partners who supported this project and contributed to new knowledge about Southern Brown Bandicoots in the area.

Thank you also to the support of the Hazel and Arthur Bruce Bequest fund for their generous support of the project.

Appendix 1:

Sample photographs of animal species recorded on the backyard cameras.

Native species:

Southern Brown Bandicoot 2019–11–30 5:52:14 PM



Brushtail Possum (eating geraniums) 2020–03–03 8:12:14 PM M 1/3



Spotted Dove



Eastern Rosella







Introduced species:

Rabbit





House mouse (bottom right corner) 2020-03-12 1:06:16 AM M 3/3





Male Blackbird



Female Blackbird



Fox



Domesticated animals:

Cat 1



Cat 2





Chickens



Cow



Appendix 2:

VNPA's Parkwatch magazine article published December 2019.



Bandicoots can adapt to modified landscapes, including suburban backyards

This summer our NatureWatch program's new project 'Backyard Bandicoots' will begin in residential neighbourhoods adjacent to the Royal Botanic Gardens Cranbourne (RBGC). We are working with the local community, Friends of the Bandicoot, and the RBGC to monitor the local population of endangered Southern Brown Bandicoots on public land and in private backyards!

Southern Brown Bandicoots (Isoodon obesulus obesulus) are medium-sized marsupials that can be mistaken for possums or rats in urban areas. They have lost a lot of their natural habitat in Victoria, but they are adaptable little creatures that can survive in highly modified landscapes, including suburban backyards.

They are actually quite nice neighbours to have. They won't eat the garden, though they may nibble on pet food. They forage by digging small holes, which they may do in lawns, but this helps increase nutrient cycling – so a win-win!

A key population of Southern Brown Bandicoots live at the RBGC, which is fenced to reduce predation from foxes and cats. Rapid residential development has replaced farmland with a maze of new houses, roads and fences that disrupt the ability of bandicoots to disperse into new habitat areas beyond the botanic gardens. As a result, homeowners in the area are now effectively habitat managers for this endangered species. This provides us with an interesting opportunity to work with this community to monitor the local bandicoot population and to increase awareness and acceptance of bandicoots as neighbours.

New residential developments in this area were approved under the Victorian Government's Melbourne Strategic Assessment (MSA) which considered the impact of the developments on remaining bandicoot populations and habitat. The MSA's Southern Brown Bandicoot program endorses the creation of bandicoot-friendly suburbs, improving scientific understanding of the bandicoots, creating a habitat connectivity network and to development of a genetic rescue strategy for the species. It released a draft Sub-regional Species Strategy for the Southern Brown Bandicoot for consultation in 2011. The strategy championed the retention of bandicoot habitat corridors as a key conservation management action. The Victorian National Parks Association contributed to the development of this strategy, highlighting the need to protect threatened species habitat in areas of urban growth boundary expansion, and supported the retention of 'bandicoot biolink' habitat corridors (see our Melbourne's Urban Expansion - Threatened Species on Our Doorstep on our website).

However, after consultation, the Victorian Baillieu government released the final strategy in 2014 that revealed a new cost-benefit approach to conservation actions, favouring integrated predator control

Left: Remnant bandicoot habitat in neighbourhoods around Cranbourne across a larger management area and devalued habitat corridors. As a result, a large proportion of the habitat corridors were removed from the final plan, and new restrictions on

cat ownership were added to new residential developments within 1.5 kilometres of the RBGC.

For our new Backyard Bandicoots project, we have a fantastic set of partners to work with in the local community to improve bandicoot identification, teach online reporting, and highlight bandicoot habitat needs. We will be conducting evening spotlighting walks to look for bandicoots in residential areas, recording sightings and noting habitat use as we go. Later in the year we will be recruiting ten households to place motion-detection cameras in their backyard to monitor for bandicoot visits and beneficial garden habitat values.

Our partners at the RBGC include Dr Terry Coates, experienced bandicoot scientist, and Charlotte Fletcher, Bandicoot Outreach Officer. We will also be assisted by bandicoot experts Dr Sarah Maclagan (Deakin University) and David Nicholls (Bandicoot Recovery Group).

If you live in a neighbourhood around the RBGC (e.g. Botanic Ridge, Brookland Greens, Settlers Run, Junction Village) and you would like to be involved in spotlighting events or to volunteer your backyard for camera monitoring, please get in touch with Sera at sera@vnpa.org.au or (03) 9341 6510 or visit www.vnpa.org.au/naturewatch * PW

A baby bandicoot.

PARK WATCH - DECEMBER 2019 NO 279 29



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