RAKALI, RIPARIAN AND RIVER HEALTH PROJECT

2021 Community Stewardship Grant

GOVERNMENT OF WESTERN AUSTRALIA

natural resource management program

River Pool Survey Summary

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We acknowledge the Ballardong Noongar people as the original custodians of this land and their continuing connection to its rivers and bushland. We pay respect to their Elders past, present and emerging and the pivotal role that they continue to play in caring for country.

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Introduction

In 2021 the River Conservation Society Inc. was awarded a State Natural Resource Management Community Stewardship Grant to carry out a three-year survey to ascertain the health and distribution of rakali (*Hydromys chrysogaster*), the native water rat, in the Avon River/Gogulyar Bilya within the Shire of York, Western Australia.

The River Conservation Society currently uses the name *rakali* for these native rodents. This common name is now widely used across Australia and was adopted to try to lift their profile by removing the negative connotations associated with the word “rat.” Rakali are known as *moyitj* by the local Ballardong Noongar Aboriginal people.

The rakali is a distinctive rodent well adapted to an aquatic existence. It is a large animal between 23 – 40 cm in body length (not including tail) with large, webbed hind feet and a waterproof fur coat. It can be identified relatively easily by its large body length, long and thick fur covered tail with a distinctive white tip at the end and webbed hind feet.

Rakali diet consists of large insects, fish and crustaceans and can even include frogs, small lizards, small mammals and birds, and turtles. Once it catches its prey it usually carries it back to a regular feeding site, known as a midden, to consume it. Rakali are strong swimmers, allowing them to pursue their prey both on the surface and under water.

Rakali habitat is usually near permanent bodies of fresh or brackish water, in the Avon River/Gogulyar Bilya in the Shire of York, they shelter and breed in burrows in riverbanks.

Rakali survival, especially in the highly altered riverine environment of the Western Australian Wheatbelt, is threatened by habitat destruction both past and present, a decline in water quality due to flood mitigation and urbanisation, and predation by foxes, cats, and dogs.

Rakali are an important indicator of aquatic ecosystem health. The purpose of the Rakali, Riparian and River Health Project undertaken by the River Conservation Society was to establish if there are permanent, breeding populations of rakali and are they under serious threat of extinction in the Avon River system in the Shire of York.

Prior to the project commencement there was no current information on rakali, a Priority 4 endangered native fauna, in the Western Australian Wheatbelt. Rakali were believed extinct in the area until rediscovered by the River Conservation Society in 2015.

The project aim was to survey twelve Avon River/Gogulyar Bilya pools in the Shire of York for evidence of rakali and suitable rakali habitat, existing riparian vegetation, invasive weeds, and feral animals. Pools chosen to be surveyed were Oakover Pool, Gwambygine Pool, Gwambygine Park Pool, Railway Pool, Parkers Reach, Blands Pool, Mile Pool, Meares Pool, Tipperary Pool, Little Pool, Church Pool, and Wilberforce Pool. These pools appeared to be the most likely to have a rakali presence.

Rakali

Artist Elizabeth Rippey

Project Activities

The State NRM Community Stewardship Grant funding enabled the River Conservation Society to purchase equipment for safe and efficient access to survey areas and effective monitoring of the selected survey sites. This equipment included a rough terrain vehicle, two double kayaks and safety equipment, a GPS and sixteen motion activated wildlife cameras.

River pool survey protocols were established, volunteer training conducted, and Ballardong Aboriginal cultural knowledge acquired.

River Pool Surveys

The Avon River/Gogulyar Bilya in the Shire of York is an ephemeral river, drying up in the hot summer months to form a chain of river pools which sustain river life during this period. The larger deep pools are crucial to the survival of river fauna, including rakali.

From July 2022 to April 2025, surveys of varying intensity, during different weather conditions and river flows, were carried out on the twelve Avon River/Gogulyar Bilya pools. After initial surveys some of these river pools were deemed not suitable to support rakali due to heavy siltation leading to a lack of deep water, poor water quality, a lack of suitable riparian vegetation and the absence of suitable food. These river pools were not intensively surveyed over the whole three-year period as they were considered to be transit pools that formed part of the extended river channel and were only used by rakali in times of high-water flow to travel from one pool with suitable habitat to the next. Pools that presented better rakali habitat were studied more thoroughly by River Conservation Society volunteers.

Gwambygine Pool

Survey Areas

Oakover Pool – Survey Area 1

Oakover Pool consists of an area of water approx. 20m wide by 50m long with a depth varying from 1m to a few millimetres. Extending downstream from the pool there is a long narrow 1km channel, which varies in depth from a few millimetres to 1m. This offered a good opportunity for wading birds feeding on the many small fish and glass shrimps trapped in the drying pool.

Survey method

1. A land survey of the sand plug and the riverbanks at the upstream end of the pool was conducted in summer when the river was not flowing.

2. A drone survey was also conducted along a 1km section of the river where this pool once existed.

Outcome

1. No suitable rakali habitat or evidence of rakali was detected.

2. A large sand plug covered with upper story vegetation (trees) and negligible understory was present at the upstream end of the pool. Historically this river pool was six metres deep at this location.

3. A narrow strip of riparian vegetation on the left bank was similar to that on the sand plug with a mix of *Eucalyptus rudis, Casuarina obesa and Melaleuca rhaphiophylla* with very little understory except for some introduced wild oats and rye grass. The right bank provided a wider strip of riparian vegetation consisting of *Casuarina obesa* and *Melaleuca rhaphiophylla* with an understory of Frankenia, Bluebush and Samphire, about 20m wide, however this narrowed down to just a few metres wide about 100m downstream.

Conclusion

1. Substantial silt movement within the river channel has led to this pool almost totally disappearing.

2. Low water levels, poor water quality, degraded riparian vegetation and a lack of suitable food makes Oakover Pool unsuitable to support a rakali population.

Recommendation

1. No further rakali monitoring of this river pool be carried out at this time.

2. Extensive dredging or sand excavation would be required to restore Oakover Pool to a level where it could sustain permanent populations of large river fauna such as rakali and south-western snake-necked turtles.

Gwambygine Pool – Survey Area 2

Gwambygine pool is where River Conservation Society volunteers first discovered rakali in 2015. Gwambygine Pool is regarded as one of the most significant of the remaining deep Avon River/Gogulyar Bilya pools in the Shire of York, this pool has now been added to the Department of Water and Environmental Regulation's Healthy Rivers assessments.

Gwambygine Pool is a large pool approx. 1.2km long and up to 50m wide. The pool varies in depth in summer from an exposed sand plug to 2.5m with normal winter flows increasing the depth by about 1m. It has a hard clay bottom covered with large amounts of silt in some areas. It contains a good variety of submerged logs and snags and has good overhanging vegetation along much of the pool's edges.

Survey method

1. A total of thirty-seven motion activated wildlife cameras were deployed at various locations on Gwambygine Pool between February 2022 and April 2025

2. Multiple surveys of the pool and riverbank were conducted by kayak. Several land surveys were also conducted in accessible areas over this time.

Outcome

1. A total of forty three rakali on camera traps and one physical rakali sighting occurred over the survey period. All of these were during the night or early dawn hours.

2. Rakali footprints were found in several locations and several feeding middens were also observed.

3. One large rakali was filmed frequenting a midden in a small cave in the riverbank on multiple occasions and on one occasion, dragging a large, south-western snake-necked turtle, into the cave.

4. During one nighttime land survey, an adult rakali was observed foraging for food along the water's edge.

5. Apart from the upstream end of the pool, on the left bank where an approx. 4ha Conservation Reserve adjoins the river reserve, there is only a narrow strip of riparian vegetation extending along both banks of the pool for approx. 1.2km. There is vegetation overhanging the pool edges, submerged logs and snags, and tree roots extending into the water.

6. On the right bank is *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla* with very little understory. Cultivated farmland is setback approx. 100m. This setback contains introduced wild oats and rye grass with a few trees scatted through it.

7. The left bank is unfenced for approx. 1,800m and livestock access the river along this section. An upper story of *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla* dominate this unfenced area with virtually no understory. Sheep shelter under the trees in this area during the hot summer months and deposit large amounts of manure on the riverbank which washes into the river pool during rain events and flooding.

8. Dead gilgies, *Cherax quinquecarinatus,* were sometimes observed in the entrances to their burrows, possibly caused by high salinity and nutrient levels.

9. Feral cats and foxes were recorded on multiple occasions.

10. In March 2023 flash flooding resulted in the loss of several wildlife cameras.

Conclusion

1. There is a permanent population of rakali in Gwambygine Pool and the presence of small rakali suggests that they are breeding here.

2. The discovery of dead gilgies, *Cherax quinquecarinatus,* indicates a decline in water quality during the hot summer months.

3. The decline in the number of gilgies living in the pool has reduce the amount of the rakali's preferred food, which is forcing them to hunt larger prey, such as turtles.

4. The continued presents of predatory feral cats and foxes poses a threat to the rakali population in Gwambygine Pool and may be the reason that no rakali or evidence of a feeding midden was observed during the final (2025) stage of the survey.

5. Extended hot dry summer periods may be affecting water quality and food availability.

6. A large silt deposit is accumulating about 100m downstream from the upper end of the pool, which is decreasing the water depth near a known rakali breeding burrow. This could have a negative impact on rakali food sources in this area and make this burrow no longer viable as a breeding site.

7. Native species riparian vegetation along this pool varies greatly in quantity and quality.

8. Sheep entering the riparian zone along the left bank of the pool have destroyed the understory. This has affected the stability of the riverbank, resulting in soil erosion, with soil and manure washing into the pool during heavy rain events. This erosion is exposing the roots of the upper story trees. Damage to these exposed roots by livestock hooves appears to be having a detrimental effect on the health of these trees.

Recommendation

1. Investigate installing predator exclusion fencing along a selected section of right-hand riverbank to protect known breeding and midden areas.

2. Consult with the adjacent landowner and relevant regulatory authorities to try to resolve the issue of sheep entering the river reserve and riparian areas. Have exclusion fencing installed along this section of river.

3. Revegetate selected areas with suitable native species to improve riparian vegetation.

4. Consult with the relevant regulatory authorities to determine if the silt plug can be removed.

5. Work with other groups such as the Balardong Aboriginal Corporation, Wheatbelt Natural Resource Management, and local landholders to try to reduce the amount of silt and chemical run off entering the river upstream of this important rakali habitat.

6. River Conservation Society volunteers continue to monitor Gwambygine Pool for evidence of rakali.

Gwambygine Park Pool – Survey Area 3

Gwambygine Park Pool is a narrow pool approx. 450m long and 15m to 20m wide with mostly steep sides. The pool varies in depth in summer from about 1m to 2.5m. This increases by 1m to 1.5m with normal winter flows. It has a hard clay bottom with a good variety of submerged logs and snags. There is little overhanging vegetation or tree roots in the water, except for a small section at the downstream end.

Survey method

1. Four motion activated wildlife cameras were deployed at various locations on Gwambygine Park Pool in 2023 and 2024.

2. Several surveys of the pool and riverbank were conducted by kayak.

3. A land survey was also conducted along accessible areas of the righthand bank.

Outcome.

1. The riparian zone on the left bank is flat and varies from 50m to 100m wide and consist mainly of *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla* and a dense understory of introduced grass. The right bank is much narrower with a flat area of about 5m, then rising to the adjoining farm cropping land about another 10m away. This flat area is also dominated by *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla* and an understory of wild oats and rye grass with some couch grass at the water's edge.

2. A single, large, adult rakali was captured on a camera on two consecutive nights in October 2023. It was foraging for food among tree roots at the downstream end of the pool.

3. No evidence of rakali was found on subsequent surveys.

Conclusion

1. Due to the small size of this pool, the lack of overhanging protective vegetation and no evidence of a good food supply such as gilgies, *Cherax quinquecarinatus*, it is unlikely to support a permanent rakali population.

2. Due to its proximity to Gwambygine Pool this pool may only be visited occasionally by rakali or be used as a transit pool by rakali moving along the river during the breeding season.

Recommendation

1. River Conservation Society volunteers continue to monitor Gwambygine Park Pool for evidence of rakali.

Railway Pool – Survey Area 4

Railway Pool is a small pool approx. 400m long and 20m wide. The pool varies in depth in winter from 1m to 2.5m. This pool almost disappears in summer when it is reduced to about 100m long, 10m wide and less than 1m deep.

Survey method

1. Five motion activated wildlife cameras were deployed at various locations on Railway Pool in 2022 and 2024.

2. Several surveys of the pool and riverbank were conducted by kayak. A land surveys was also conducted.

Outcome

1. This pool is heavily silted and almost completely dries up during summer.

2. Riparian vegetation is restricted to a narrow strip of sparsely distributed *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla* with an understory of wild oats, rye grass with some couch grass at the water's edge in places.

3. There was no evidence of rakali found during surveys.

4. The pool edges and riparian zone did not offer suitable rakali habitat.

5. No rakali were photographed at this pool.

6. A single, large, African Boxthorn *Lycium ferocissimum* plant, a Weed of National Significance, was identified and treated and follow up monitoring was carried out.

Conclusion

1. Substantial silt movement within the river channel has led to this pool almost totally disappearing.

2. Low water levels, poor water quality, degraded riparian vegetation and a lack of suitable food makes Railway Pool unsuitable to support a rakali population.

Recommendation

1. No further rakali monitoring of this river pool be carried out at this time.

2. Extensive dredging or sand excavation would be required to restore Railway Pool to a level where it could sustain permanent populations of large river fauna such as rakali and south-western snake-necked turtles.

Parkers Reach – Survey Area 5

River Conservation Society volunteers had observed and photographed rakali in this area prior to this three year project. Parkers Reach is approx. 450m long and varies in width from a narrow steep sided channel about 5m across to a low sided open pool about 30m wide. The upper reach is approx. 1.5m deep with a hard bottom littered with snags. The lower reaches are heavily silted and average less than 1m in depth.

Survey method

1. Eight wildlife cameras were deployed on Parkers Reach from 2023 to 2025.

2. The area was surveyed on several occasions by kayak.

Outcome

1. Rakali footprints were observed during one survey.

2. No rakali were captured on wildlife cameras.

3. In March 2023 flash flooding resulted in damage to two wildlife cameras.

Conclusion

1. Rakali may only inhabit this pool when food is in good supply.

2. This pool may only be used as a transit pool by rakali moving along the river during the breeding season.

3. Significant changes in river habitat, damage to riparian vegetation and substantial silting up of the river channel as a result of flooding in 2023 has made this pool unsuitable to support a permanent rakali population.

4. Low water levels and poor water quality during summer months is leading to a lack of suitable rakali food.

Recommendation

1. River Conservation Society volunteers to occasionally survey this pool for rakali activity.

Blands Pool – Survey Area 6

River Conservation Society volunteers had observed and photographed rakali in this area prior to this three year project. Blands Pool is approx. 900m long and varies in width from 35m to about 10m. It also varies in depth from about 2.5m to less than 1m. This pool is heavily silted in places, while other section has a hard rock or clay bottom. These areas are often exposed during the drier summer months.

Survey method

1. Eight wildlife cameras were deployed on Blands Pool 2023 to 2025

2. The area was surveyed on six occasions by kayak.

Outcome

1. Rakali were recorded on two wildlife cameras on six different days.

2. In March 2023 flash flooding resulted in damage to two wildlife cameras.

3. Approx. 45 African Boxthorn *Lycium ferocissimum* plants, a Weed of National Significance, were identified and treated and follow up monitoring was conducted.

Conclusion

1. Low water levels and poor water quality during summer may be leading to a lack of suitable rakali food.

2. Domestic geese have been allowed to live on the river in Blands Pool resulting in the loss of riparian vegetation and water fouling. This appears to be having an adverse effect on the limited riparian vegetation and negatively effecting water quality.

3. An off lead dog exercise park next to the river and dogs swimming in Blands Pool may be having an adverse effect on rakali habitat.

Recommendation

1. Approach appropriate authorities to have domestic geese removed from all areas of the river.

2. Consult with local authorities to have the dog park fenced off from the river.

3. Revegetate the riparian zone with suitable native plant species.

4. River Conservation Society volunteers continue to survey this area for rakali activity.

Mile Pool - Survey Area 7

River Conservation Society volunteers had observed and filmed rakali hunting and feeding in this area prior to this three year project. Mile Pool is approx. 500m long and varies in width from 20m to 5m. Depth varies from 2.5m at the upstream end to less than 1m in the silted lower section.

Survey method

1. Multiple land and kayak surveys were caried out from 2022 to 2025.

2. Four wildlife cameras were deployed on Mile Pool.

Outcome

1. There was no evidence of rakali found during surveys.

2. No rakali were photographed at this pool.

3. The pool edges and riparian zone did not offer suitable rakali habitat.

4. Riparian vegetation on the right bank is sparce and consists of a single line of *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla*. However, an intensive revegetation program was undertaken alongside the pool by the River Conservation Society volunteers in collaboration with Wheatbelt Natural Resource Management in 2023.

5. Riparian vegetation on the left bank consists mainly of *Melaleuca rhaphiophylla* with a few *Casuarina obesa* and an understory of invasive wild oats. At the upstream end of this area extensive revegetation was carried out in 2022 by River Conservation Society volunteers. This revegetation consists of *Casuarina obesa* and *Melaleuca rhaphiophylla* and various species of saltbush. This has resulted in dense riparian vegetation in this area. However, it does not extend to the water's edge at this stage.

6. Approx. 17 African Boxthorn *Lycium ferocissimum* plants, a Weed of National Significance, were identified and treated and follow up monitoring was conducted.

Conclusion

1. There is a lack of overhanging vegetation and tree roots along the edges of the pool, which diminishes the likelihood of suitable rakali habitat.

2. There is an absence of suitable rakali food.

3. This pool has become a regular place for people to swim their dogs.

Recommendation

1. Consult with local authorities to educate dog owners about the risk to native wildlife caused by allowing dogs to swim in the river pools and the legal requirement to always keep dogs on leads.

2. Further rehabilitate the riparian vegetation.

3. River Conservation Society volunteers continue to occasionally survey this pool for evidence of rakali.

Controlling invasive weeds at Mile Pool

Meares Pool - Survey Area 8

Meares Pool is 400m long, 30m wide and varies in depth from 2m in a small deep section at the upstream end to less than 1m. Most of this pool is heavily silted.

Survey method

1. Multiple surveys by kayak were caried out from 2022 to 2024.

2. Five wildlife cameras were deployed on Meares Pool.

Outcome

1. There was no evidence of rakali found during surveys.

2. No rakali were captured on wildlife cameras at this pool.

3. No evidence of suitable rakali food was found at this site.

4. Riparian vegetation on the right bank is severely depleted as a result of this area not being fenced and farm cropping occurring within metres of the pool's edge. Vegetation consists of a single line of mixed *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla*.

5. Riparian vegetation on the left bank is approx. 10m wide and consists mainly of *Melaleuca rhaphiophylla*, *Casuarina obesa* and a few *Eucalyptus rudis*, with an understory of invasive wild oats.

6. At the upstream end of the pool there is a small area approx. 2m deep with several good snags, however the remainder or the pool is heavily silted with an average depth of less than 1m.

7. At Mackie Siding Crossing, an elevated road and small bridge crosses the river at the downstream end of the pool. Just downstream of this bridge, a circular pool about 15m across and 3m deep with vertical sides has been eroded in the riverbed. This pool sits approx. 1m above the summer level of the main pool and is fed by a fresh spring and has become a summer refuge for a large number of South-western snake-necked turtles, *Chelodina oblonga*. Up to fifteen turtles have been observed here at one time.

Conclusion

1. There is an absence of suitable rakali food.

2. The average shallow depth of this pool and the overall lack submerged logs and snags does not provide a suitable habitat to support a permanent rakali population.

3. The proximity of farm cultivation to the pools edges maybe contributing to the siltation of the pool.

4. The spring fed pool downstream of the bridge has become an important south-western snake-necked turtle haven and may also be important for rakali transiting through the area in drier times.

5. This pool does not provide suitable habitat to support a permanent rakali population.

Recommendation

1. Extensive dredging of silt would be required to restore Meares Pool to a level where it could sustain permanent populations of rakali.

2. Consult with the adjoining land holder to discuss the possibility of providing a setback and fencing the right bank of the pool to allow for future revegetation.

3. During the recent upgrading of Mackie Crossing, the Shire of York consulted with the River Conservation Society to ensure that no damage was done to the adjacent turtle pool. It is recommended that this consultation continues for any future road or engineering works in this area.

4. No further rakali monitoring of Meares Pool be carried out at this time.

Turtle pool downstream of Meares Pool

Tipperary Pool - Survey Area 9

Tipperary Pool is approx. 1.3km long and 50m wide in winter, but due to large silt deposits, in the drier months it shrinks back to a pool at the upstream end of about 150m long by 40m wide with a depth of between 2m and a few millimetres.

Survey method

1. Several land surveys were caried out on the downstream end of the pool in early 2022.

2. Several surveys by kayak were caried out in December 2022 and January 2023.

3. Five wildlife cameras were deployed on Tipperary Pool in December 2022.

Outcome

1. A single, large, adult rakali was captured on two adjacent cameras swimming downstream on the night of December 9th 2022. No other rakali were detected during the month-long deployment of the wildlife cameras. This was the only evidence found of rakali in Tipperary Pool suggesting that this pool does not support a permanent rakali population.

2. No evidence of suitable rakali food was found at this site.

3. Riparian vegetation on the right bank consists of a narrow strip separation the pool from adjacent farmland. It comprises *Eucalyptus rudis, Casuarina obesa* and *Melaleuca rhaphiophylla*, with an understory of Frankenia, Bluebush and Samphire and introduced grass. Riparian vegetation on the left bank is approx. 40m wide and consists mainly of *Melaleuca rhaphiophylla*, *Casuarina obesa*, a few *Eucalyptus rudis* and *Eucalyptus loxophleba*. The understory is mainly invasive wild oats and rye grass, with some couch grass along the edge of the pool.

4. Several Spiny Rush plants, *Juncus acutus* subsp. *acutus,* an invasive environmental weed, were identified and treated and follow up monitoring was conducted.

Conclusion

1. There is an absence of suitable rakali habitat in Tipperary Pool

2. This pool almost disappears during summer due to the large silt deposits that are entering from adjoining farmland through several creeks that flow into the pool.

3. Although the upstream pool has good, submerged logs and snags, it is not large enough to support a permanent rakali population.

4. Tipperary Pool may only be used as a transit pool by rakali moving along the river.

Recommendation

1. Extensive dredging of silt would be required to restore Tipperary Pool to a level where it could sustain a permanent rakali population.

2. No further rakali monitoring of Tipperary Pool be carried out at this time.

Little Pool - Survey Area 10

Little Pool is almost totally filled with silt and is now no more than a narrow chain of shallow pools approx. 1m deep, stretching over approx. 0.5km that retain some water throughout the summer.

Survey Method

1. A survey of this pool was carried out by drone.

Outcome

1. Riparian vegetation is restricted to a sparse upper story of *Eucalyptus rudis*, *Casuarina obesa* and *Eucalyptus loxophleba*. The understory almost entirely consists of invasive wild oats with small patches of Frankenia, Samphire and couch grass growing in the riverbed.

2. Some river braiding was observed over the next 0.5km downstream with a few shallow permanent pools.

Conclusions

1. Little Pool does not contain suitable rakali habitat.

2. Little Pool would only be used as a transit pool by rakali moving along the river.

Recommendation

1. No further rakali monitoring of Little Pool will be carried out at this time.

Church Pool - Survey Area 11

Church Pool appears to have once been approx. 1.5km long. However, currently it has large silt deposits along approx. 1km of the upstream end.

The remaining pool is approx. 500m long x 25m wide and appears to have good water depth along the right bank.

Survey Method

1. A survey of this pool was carried out by drone in January 2024.

Outcome

1. Difficulty accessing this pool through private property and along the river reserve resulted in limited surveying.

2. Riparian vegetation is sparsely distributed and mostly consists of *Eucalyptus loxophleba,* and *Eucalyptus rudis*. These trees are dispersed over a large area, up to 150m in depth, and separates the pool from farmland on both banks. A narrow strip of *Casuarina obesa* and *Melaleuca rhaphiophylla* line the right bank. Although now fenced from farmland, this area appears to have been once heavily grazed and contains very little understory except invasive wild oats.

3. Although it was hard to accurately determine from the drone survey, water depth along the right bank appears to be more than 2m and equally as deep in places along the left bank. Multiple fallen trees descend into the water on both sides of the pool which would provide good shelter and rakali habitat. These trees and logs could be see extending into the water by several metres which would seem to indicate a good depth of clear water.

2. Further upstream, in the silted-up area, a variety of water birds including native black swans, *Cygnus atratus,* were observed in several shallow pools.

Conclusions

1. Church Pool appears to provide good rakali habitat and the apparent depth of water should be able to support a suitable food source to sustain rakali.

2. Church Pool is large enough to support a permanent rakali population.

Recommendation

1. Further attempts be made to secure access to this pool through private property.

2. Re-survey the river reserve to find an alternative track to access this pool by rough terrain vehicle. Current access track is blocked by a change in the river channel.

3. Explore the feasibility of conducting a down river expedition by kayak from Burges Crossing through Church Pool to Wilberforce Crossing.

4. Conduct further drone surveys to continue to monitor pool conditions.

Wilberforce Pool – Survey Area 12

Wilberforce Pool is a large deep river pool. It is 950m long, up to 40m wide 3m deep in some places. It has many submerged logs and snags, and the bottom supports a variety of aquatic plants.

Survey Method

1. A total of nineteen motion activated wildlife cameras were deployed at various locations on Wilberforce Pool between November 2022 and April 2025

2. Multiple surveys of the pool and riverbank were conducted by kayak. Several land surveys were also conducted in accessible areas over this time.

Outcome

1. During the kayak surveys, evidence of rakali feeding middens and rakali footprints were observed. The remains of a large freshly eaten gilgie were found at a midden; this was later confirmed by the Department of Water and Environmental Regulation (DWER) to be a gilgie displaying a typical rakali chewing pattern.

2. Rakali were recorded on nine cameras on 106 separate occasions. This included small adults or juvenile rakali. On several occasions, two rakali were filmed swimming and hunting together and on another occasion two rakali were swimming together and physically interacting with one another. On another occasion a large rakali was filmed hunting and feeding in the early daylight hours.

3. Following flash flooding 2023, many dead gilgies were found washed up on the riverbank at Wilberforce Pool, indicating that there is a healthy gilgie population in the area.

4. The pool contains many submerged logs and snags.

5. Water quality in the upstream billabong was good during winter but declined dramatically during summer. Rakali were only recorded here when water quality remained high.

6. The water in the main pool remained clear all year round although salinity increased significantly in the drier months.

7. The riparian zone upstream of the pool consists of a braided section of river, well vegetated with *Casuarina obesa* and *Melaleuca rhaphiophylla* with an understory of Frankenia, Samphire and couch grass as well as some wild oats and other introduced weeds.

8. Riparian vegetation on both banks varies greatly in width from about 50m down to 5m and consist mainly of Eucalyptus rudis, *Casuarina obesa* and *Melaleuca rhaphiophylla* and an understory of mainly introduced grass and weeds. However, there are some area of

Frankenia, Samphire and couch grass towards the upper end of the pool. In places land slips have eroded this area back almost the fence line dividing the river from the adjoining farmland.

9. A feral cat was observed hunting in the riparian vegetation, and foxes and feral cats were recorded on wildlife cameras at night during this period.

Conclusion

1. Wilberforce Pool is possibly the most important rakali site on the Gogulyar Bilya/Avon River in the Shire of York. There is a permanent population of rakali and the presence of small rakali suggests that they are breeding in Wilberforce Pool.

2. The recording of high numbers of gilgies indicates the presence of a plentiful rakali food source.

3. The abundance of submerged logs and snags provides good rakali habitat.

4. The continued presents of cat and fox predators poses a threat to the rakali population in Wilberforce Pool.

Recommendation

1. Take all possible steps to protect and improve Wilberforce Pool to ensure the survival of rakali.

2. Investigate means of reducing the feral predator population.

3. Consult with adjoining land holders to increase the width of the riparian vegetation area along the edges of the pool.

4. River Conservation Society volunteers to continue to monitor the status of the rakali population in Wilberforce Pool.

Rakali Conclusions

Along the Gogulyar Bilya/Avon River in the Shire of York, Gwambygine Pool and Wilberforce Pool have healthy, permanent, breeding, rakali populations. Church Pool may also have a permanent rakali population, this will be determined once more in depth surveys of Church Pool can be conducted.

Ongoing monitoring of rakali populations and habitat restoration along the Gogulyar Bilya/Avon River in the Shire of York will be required to ensure they continue to survive and thrive in a challenging environment. Collaboration on rakali monitoring with other environmental groups along the Avon River will be crucial to ensuring rakali survival.

Rakali

Artist Elizabeth Rippey