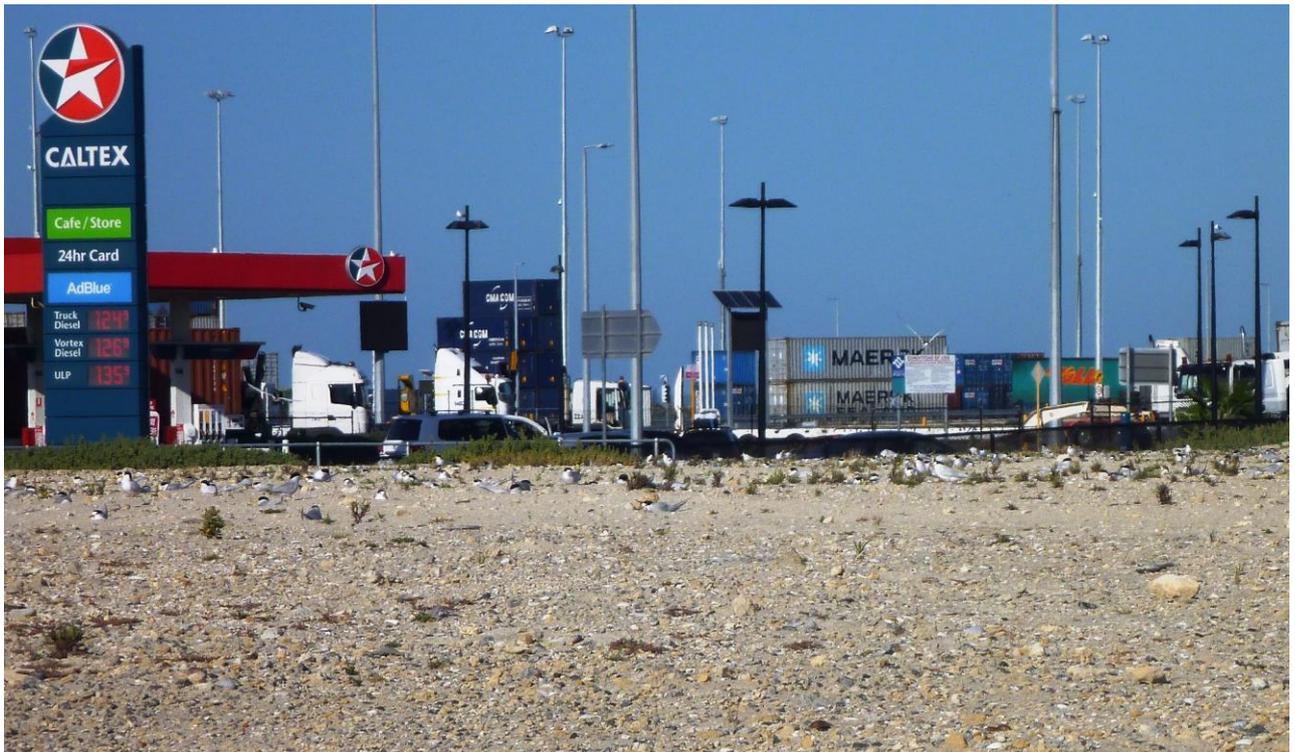


LOCAL FAIRY TERN CONSERVATION STRATEGY FOR THE SOUTH WEST COASTAL REGION

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1. SPATIAL DEFINITION

The *South West Coastal Region* is an interim Fairy Tern management unit in the region from Fremantle to Bunbury including three sub-units. The sub-units are:

Perth Metropolitan - the region between Fremantle and Becher Point including Cockburn and Warnbro Sounds, Rottnest, Carnac, Garden and the Shoalwater Islands, Cooloongup and Walyungup Lakes and the Swan River.

Peel / Yalgorup Region - including the Peel / Harvey Inlet and the Yalgorup lake system

Bunbury Region - including Koombana Bay and the Leschenault Inlet and Estuary

It is anticipated that future research and community surveillance will refine our current understanding of management units and realistic local conservation objectives.

2. NUMBERS, RECENT BREEDING HISTORY AND OBSERVATIONS FROM 2015 SURVEILLANCE

Perth Metropolitan Region

During October 2015 a pre-breeding night roost of 400+ adults was detected at Parkin Point, an artificial sand spit on the northern side of the Garden Island causeway, west of the causeway bridge. This night-roost may have replaced one that used to occur in September and October on the Penguin Island tombolo during the late 1980s (a sand spit now much changed by coastal erosion).

There are numerous sites where Fairy Terns have been reported breeding within about a 40km radius of this night-roost including on Rottnest Island (Government House Lake, Cape Vlaming, Lake Bagdad and Strickland Bay), the main eastern and smaller western beaches on Carnac Island, Garden Island (Broun Bay, Gilbert Point, Collins Point, Parkin Point and the causeway - Erin Clitheroe pers.com.), Tern Island in Safety Bay, the Point Peron boat ramp (dredge spoil), Woodman Point in Cockburn Sound, Rous Head in North Fremantle and Point Walter and Pelican Point in the Swan River. An adult colour-banded at Parkin Point in October 2015 was observed 40 km away at Nairns in Peel Inlet on 1 January suggesting that the metropolitan local population may also extend to the Peel / Yalgorup sub-region.

In November/December breeding colonies were observed at Rottnest (Strickland Bay), Rous Head, Collins Point and the Garden Island Causeway with an aggregate number of 400-500 breeding pairs. Maintaining an average annual breeding population of 450 pairs might be a reasonable target for this sub-unit.

Peel Yalgorup Sub-Region

For many years Fairy Terns regularly nested on the reclaimed (dredge spoil) at the natural mouth of Peel Inlet, an area now incorporated in the Mandurah Marina development. A parcel of land on the southern side of the entrance channel was proposed as a 'Fairy Tern'

offset for that development but the land transfer was never finalized by government. In recent years Fairy Terns have attempted to breed at a number of sites within Peel Inlet including at Nairns (Serpentine River delta), Boundary Island, Creery Island, Mandurah Quay Island, Len Howard Island and Channel Island. About 60 terns were observed to be nesting on Lake Clifton in 2014, with the breeding adults foraging in the ocean to the west.

All the colonies observed on islands in the Peel inlet have failed in recent years due primarily to colony flooding during high storm tides at some stage in the nesting cycle. There appears to be no secure and flood-free breeding sites available for Fairy Terns within Peel Inlet these days. However it is likely that breeding attempts will continue because of the relatively high prey availability within the estuary. Recent breeding attempts have involved between 40 and 120 pairs. An average of 60 breeding pairs (with some evidence of breeding success) may be a realistic conservation target for the Peel/Yalgorup sub-unit. Alternatively the terns breeding in the Peel/Yalgorup could be included in the metropolitan target of 450 pairs as no nesting was recorded in the sub-region in the 2015/16 season.

Bunbury Sub- Region

On 10 December 2015 a breeding colony of around 70 pairs was discovered on the sand spit on the southern side of McKinnon Point (tip of Bunbury Port breakwater). Later monitoring indicated the colony was successful. An area of compacted sand on the northern-side may have been functioning as a night-roost (Christine Fleay pers.com.). Five pairs attempted to nest near on the northern side of the Cut in the Leschenault Peninsular in January. Probably re-layers from the earlier nesting at McKinnon Point. Although protected with temporary signage these terns failed to hatch any young.

In 2007/08 about 200 pairs of Fairy Terns nested on Barr Island at the mouth near the mouth of the Collie River within Leschenault Inlet (Kim Onton pers.com.). More recent breeding attempts in the sand-dunes north of the 'Cut' in 2013 and 2014 failed, probably due to human disturbance.

An interim objective for the Bunbury sub-region might be an average breeding numbers of 70-100 pairs.

3. LOCAL CONSERVATION OBJECTIVE

To maintain sufficient breeding success and natal recruitment to maintain an average regional breeding population in the SW Coastal Region (counted in the October to December period) of 550 nesting pairs (or 1100 adult individuals). By sub-region the target should be 450 pairs in the greater Perth Metropolitan Region (including the Peel / Yalgorup Region) and 100 pairs in the Bunbury Region.

4. KEY FUNCTIONAL AREAS

Perth Metropolitan Region

The known key functional areas for Fairy Terns in this region would appear to be:

1. The night-roost at Parkin Point. A potential night-roost site at natural jetty (Phillip Point) on Rottnest Island.
2. Nesting sites on the islands. The most frequently used nesting sites on Rottnest (Cape Vlaming beach, Lake Bagdad Islet and Government House Lake), Carnac (beaches) and Garden Islands (Broun Bay, Gilbert Point and Parkin Point).
3. The manageable mainland breeding sites including Rous Head and possibly Point Walter.
4. The inappropriate breeding sites. Locations such as the Point Peron Boat Ramp and the Garden Island Causeway embankment (where there has been significant adult mortality from collisions with vehicles) and Rottnest Island beaches frequented by visitors need to be managed to prevent further breeding attempts.

Peel / Yalgorup Region

At this stage no local night-roost aggregation has been identified and none of the recent nesting locations appear to be sustainable due to high estuary levels and intense human disturbance pressures.

Bunbury Region

1. There is a possible night roost on McKinnon Point.
2. Nesting sites at McKinnon Point and Barr Island appear to be manageable.
3. A nesting area at north of the 'Cut' on Leschenault Peninsular that is probably not defensible with current surveillance capacity and management resources.

5. CURRENT CONDITION OF EACH FUNCTIONAL AREA AND EXISTING PRESSURES

Perth Metropolitan Region

1. Parkin Point Night Roost

This site abuts the Garden Island Causeway and is within naval waters and actively controlled by the Department of Defence. The sand spit is probably accreting. The location is secure with respect to public activity but difficult to monitor due to significant constraints on access by civilian scientists/wildlife managers. The breakwater may provide access and cover for Tiger Snakes and Carpet Pythons from Garden Island and foxes, cats and Black Rats from the mainland.

2. Nesting Sites on the Islands

The night roost at Parkin Point on Garden Island is quite secure. The natural jetty roost site on Rottneest Island can be heavily disturbed, particularly by jet-skis users from Thompson's Bay.

Most nesting locations on Garden Island are relatively secure although there is high public access to some areas (e.g. Collins Point). Nesting on the crushed limestone shoulders of the Causeway has led to adult and chick losses from collisions with vehicles.

The Rottneest Island Authority does not permit public access to the islets and banks in the Rottneest Island lakes, although intrusions no doubt occur. The beach nesting sites are accessible to people using the beaches, but most nesting sites can be protected with effective surveillance for colony formation and temporary fencing and signage.

The eastern beach on Carnac Island is the focus of intense recreational boating activity during the summer months and establishing a sufficient buffer between people and nesting birds is difficult. Sealions hauling out on this beach may also crush nests or displace incubating / brooding Fairy Terns. The smaller western beaches are less frequently used by nesting Fairy Terns but are potentially more defensible.

3. The Mainland Nesting Sites

The roles of the Point Walter sandspit and Tern Island breeding sites need further risk assessment before committing to a future management strategy. Recently the tip of the Point Walter spit has been fenced (with a temporary barrier) to protect nesting Swans. This action if continued could assist the establishment of Fairy Tern colonies although a buffer zone in the shallows to prevent incursions by recreational water users may be necessary if nesting is to be successful.

The Rous Head project (Fremantle Ports) successfully attracted breeding colonies to the managed area in the 2014/15 and 2015/16 seasons with some issues with fledglings spilling out onto the adjacent cycleway and road. Adult mortality and chick production at this artificial site will need to be monitored closely before long-term decisions about the sites role and management can be made. In 2015 the Rous Head colony of around 215 pairs produced about 180 runners (large mobile chicks - J.N. Dunlop pers.obs). This translates to potential breeding success of 0.83 fledglings per pair which would be relatively high for this species. One runner banded at Rous Head on 5 January was observed with another fledgling and some attending adults at Woodman Point on 27 January (Ken Glasson pers.com). Another was photographed at Nairns, in Peel Inlet 9 February and up to 3 on the Point Walter Spit in early February. This suggests that young of the year raised in the metropolitan region may disperse widely within it after fledging. On 31 March 2016 a Rous Head fledgling was recaptured on migration 415 km north of Fremantle at Rat Island in the Houtman

Abrolhos. The Abrolhos may be a staging area for the northward movements of Fairy Terns breeding on the lower south-west coast and on the south coast of WA.

The breakwall bounding the Rous Head site could provide cover for Black Rats and the current presence of rabbits could attract foxes. Foraging conditions near the Rous Head site appeared to be sustained through the 2015 breeding period and reliable prey resources will encourage continued nesting. Blue Sprats were the main prey item during colony formation. Flying-fish (a novel prey item) were being fed to the large runners in early January.

6. CONSERVATION STRATEGY

Surveillance, Monitoring and Research

1. Surveillance Program

Within season surveillance is essential for predicting the location of Fairy Tern breeding colonies and facilitating a timely response to threats. However human resources within the relevant management jurisdictions including DPaW, Department of Defence, the local Governments, Swan River Trust, the Fremantle and Bunbury Port Authorities and the Rottnest Island Authority are limited. These could be augmented by a community-based surveillance program involving, for example, local Coast Care and NRM groups and BirdLife WA and its sub-branches.

The network established through the Mandurah Fairy Tern workshop could provide the foundation for a structured, community-based annual surveillance program however resources for effective coordination are not currently available. The establishment of a community group specifically oriented around Fairy Tern conservation in the south-west region may be one way to coordinate a surveillance program utilising internet and social-media platforms.

2. Monitoring & Research

Monitoring of population dynamics and structure, inter-regional movements and the migration would be most effectively undertaken using capture-mark-release-recapture (bird-banding) methods at night roosts, with sampling before and after the main breeding period (e.g. in October and March). This work would have to be undertaken by a collective of WA bird-banders authorized by the Australian Bird & Bat Banding Scheme. A regional-cohort colour-banding project is currently underway (ABBBS Project 0811-19).

The night-roost at Parkin Point in Cockburn Sound has been identified as an important aggregation site in the greater metropolitan region and this location should be prioritized for future population monitoring. Night roosts sites may also be available on Rottnest Island

(not confirmed). More workable access arrangements for Garden Island will need to be negotiated with the Department of Defence.

A probable night roost at McKinnon Point within an area controlled by the Bunbury Port Authority should be further investigated as a study site for monitoring the Fairy Tern population in the Bunbury-Leschenault sub-region. As yet no night roost locations have been identified in the Peel-Yalgorup sub-region.

3. Nesting habitat management

None of the recently utilized 'natural' colony sites in the south-west region currently require any habitat modification.

The limestone rip-rap shoulders on the Garden Island Causeway need to be modified to reduce attractiveness to breeding Fairy Terns. This could involve bituminizing, hydro-mulching or vegetating the surface. The dredge-spoil at berm at the Point Peron boat ramp should be covered (e.g. hydro-mulched with a dark dye), brushed or vegetated by September each year to prevent the site becoming a colony area.

The Rous Head (Fremantle Ports) managed colony area needs more marginal shelter for runners (both for shade and predator protection). More chick shelters would be useful and the current pipe shelters need to be half-buried to reduce the entrance apertures.

4. Protecting Colonies from Encroachment

The desertion of the eastern beach on Carnac Island in recent years may have been the result of unmitigated disturbance from the boating public. It is likely that the Rous Head and Carnac colonies represent a 'neighbourhood' of Fairy Terns that interchange between these two sites. If policy and legal constraints make it impossible for DPaW to keep the boating public away from the nesting area on Carnac's eastern beach then facilitation approaches could be adopted to try and get the terns to use the more defensible smaller western-beaches (see colony facilitation below).

Fairy Terns sometimes attempt to nest on the island at the tip of the Point Walter sandspit and there were successful colonies there in the 1990s. However current access controls and buffering from water-based recreational activity are probably not sufficient to support successful breeding attempts. If sites are not defensible then the strategy should shift to deterrence to prevent wasted reproductive effort. The site needs a seasonal, well marked buffer zone extending out into the water to protect Fairy Tern colonies. This would need to be supported by appropriate legal zonation, patrolling rangers or community-based volunteer wardens.

Purpose designed signage and barriers need to be stockpiled at Rottnest Island (Rottnest Island Authority) and at Shoalwater, Mandurah and Bunbury (DPaW) for rapid deployment at colonies within areas that are accessible to the public.

5. Protecting Breeding Colonies from Predators

Predation has not been identified as a significant factor in the failure of colonies in the south-west coastal region at this stage (at least in the absence of human disturbance as the primary factor). The breakwater rock-walls at Rous Head and the Garden Island Causeway may harbour predators. Black Rats could become a predator issue at Rous Head over time and it is suggested that the rock wall be baited for Rats prior to the start of nesting (i.e. in August / September each year). The rabbits currently occupying the Rous Head Fairy Tern protected area need to be removed to avoid attracting foxes.

Ravens and / or Silver Gulls may become a predator issue at Rottnest (particularly on the salt lakes). Conditioned aversion methods may be appropriate if high levels of Raven predation are observed.

6. Colony Facilitation

Colony facilitation methods (including substrate enhancement, decoy presentation, colony noise playbacks etc.) can be used to encourage Fairy Terns to nest within secure, manageable sites to increase the probability of successful chick production.

Decoy colonies could be deployed at the Lake Bagdad Islet and/or Cape Vlaming beach on Rottnest Island, or the western beaches on Carnac Island. This method has been successfully utilized at Rous Head to get most of the breeding Fairy Terns into the protected area.

Secure breeding sites can no longer be identified within Peel Inlet due to the coastal development, an increased tidal range (from the Dawesville Cut), high sea-levels and disturbance from high levels of water-based recreational activity. The high availability of forage fishes taken by Fairy Terns will however encourage on-going nesting attempts. One solution would be the provision of nesting rafts in relatively secure supra-tidal areas close to locations where forage fishes tend to concentrate. The rafts would be covered with shallow beach sand and shell material with decoys to attract terns in breeding condition.

6. SUMMARY OF CONSERVATION STRATEGY

The following actions are recommended to the Fairy Tern Conservation Objectives for the South-west Coastal Region.

- Establish a surveillance and wardening network to work with the management agencies to protect breeding colonies within the South-west Coastal Region.
- Continue research into the size and structure of the migratory Fairy Tern population using capture-mark-release-recapture and DNA fingerprinting methods.
- Take action to render hazardous (e.g. Garden Island Causeway) or conflicted sites (Point Peron boat ramp) nesting locations unattractive to breeding Fairy Terns.
- Conduct a risk assessment for Tern Island and Point Walter locations at decide whether to provide adequate protection or deter occupation by Fairy Terns.
- Increase the number and improve design of chick-shelters at the Rous Head Fairy Tern protection area.
- Stockpile purpose designed, rapid deployment colony protection signage and barrier materials at key locations in the South West Coastal Region.
- Bait rock-wall at the Rous Head Fairy Tern protected area for Black Rats prior to the breeding period. Eradicate the rabbits from the area.
- Actively facilitate colony formation at secure high quality natural nesting sites such as the Cape Vlaming beach and/or Lake Bagdad Islet on Rottnest Island or western beaches on Carnac Island and McKinnon Point at Bunbury.
- Construct and trial breeding rafts for Fairy Terns at sites within the Peel Inlet.