

# DOLPHIN WATCH





A series of tragic dolphin deaths in the Swan Canning Riverpark in 2009 sparked the development of a citizen science research and education project, which has bolstered the management and conservation of some of Western Australia's most beloved marine mammals through unprecedented community engagement. Now, 10 years on, the program, known as *Dolphin Watch*, has been expanded to monitor dolphins in other parts of the State through the work of more than 1000 registered 'dolphin watchers', who provide invaluable information about the health of WA's dolphins and the ecosystems in which they live, and support other research projects.

**by Delphine Chabanne, Sarah Marley, Jason Menzies,  
Krista Nicholson, Holly Raudino and Chandra Salgado Kent**



In 2009 the Western Australian community was rocked by the sudden death of six Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) in Perth's Swan Canning Riverpark. An inquiry into the deaths was undertaken by Carly Holyoake and Dr Nahiid Stephens from Murdoch University, and it was recognised that the health of the local dolphins was an indicator of the state of the entire Riverpark ecosystem.

To this end, *Dolphin Watch* – a pioneering citizen science program – was launched in April 2009. The program was developed by the Swan River Trust (now part of DBCA) and run in partnership with Murdoch and Curtin universities to collect data to improve our understanding of the health of the Swan Canning Riverpark dolphin population. Now, 10 years on, it continues through a collaboration between DBCA and Murdoch and Edith Cowan universities and helps researchers and the community at large learn more about the dolphin community that calls the Riverpark home. Last year, *Dolphin Watch* reached another milestone, when it was expanded to help monitor the resident Indo-Pacific bottlenose dolphins in the Peel-Harvey Estuary, Mandurah, as well as the Australian snubfin dolphins (*Orcaella heinsohni*) in Roebuck Bay, Broome.

## COMMUNITY SPIRIT

*River Guardians* was launched in 2009 to help engage and educate all sectors of the Perth community, and to help keep our rivers and waterways healthy. *Dolphin Watch* quickly became the program's flagship project.

*Dolphin Watch* and other *River Guardians* training initiatives help its volunteers become better informed about conservation issues and provides them with opportunities to support the waterways and coastline, and the wildlife that inhabits them.

The community of more than 1000 volunteer 'dolphin watchers' receive training from researchers from Edith Cowan and Murdoch universities in techniques for monitoring the movement and behaviour of dolphins. These citizen



### Learn more about Indo-Pacific bottlenose dolphins

Scan this QR code or visit Parks and Wildlife Service's 'LANDSCOPE' playlist on YouTube.

scientists play an essential role in collecting data on the dolphins that occur in the Swan Canning Riverpark, Peel-Harvey Estuary and at Roebuck Bay to assist our understanding of population health

Using the *Dolphin Watch* smart phone app, volunteers record information – such as the location and behaviour of the dolphins they observed – and capture photographs and video. These data help build a picture of the dolphin communities that use the three survey areas. This information is then collated and shared with industry bodies, government authorities and the community to help inform management activities and policy-making.

## PROTECTING PERTH'S DOLPHINS

Anecdotal accounts indicate that Nyoongar people once used the dolphins that occur in what is now known as the Swan Canning Riverpark to help them catch fish. In fact, diaries written by early settlers suggest dolphins were so ubiquitous that they were killed to be used as dog food and their skin was used to make shoes. These accounts even suggest they were considered pests, as they ate the fish the early colonists relied on for



*Previous page*  
**Main** 'Bottomslice', 'Arrow' and 'Tworakes' chase fish in the Swan Canning Riverpark in Crawley.  
*Photo – Delphine Chabanne*

**Top** Registered 'dolphin watchers' contribute data about dolphin observations to research projects.  
*Photo – Chandra Salgado Kent*

**Above** 'Highnitch' fell victim to the dark side of inhabiting waters so close to where humans live.  
*Photo – Jason Menzies/DBCA*

food. Nowadays, a beloved population of Swan Canning Riverpark dolphins delight locals and visitors with their antics year-round. They can be long lived – up to 40 years in the wild – and some of the dolphins identified during surveys conducted between 2001 and 2003 are still alive today.

In 2010, the Coastal and Estuarine Dolphin Project (CEDP) was established to examine the health, ecology and



Jabberwocky, Roebuck Bay



Snow, Roebuck Bay



Grunge, Roebuck Bay



**DOLPHIN WATCH**<sup>®</sup>



Echo, Swan Canning Riverpark



Extreme, Swan Canning Riverpark



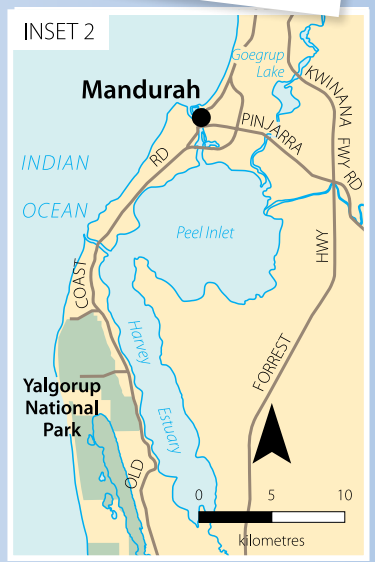
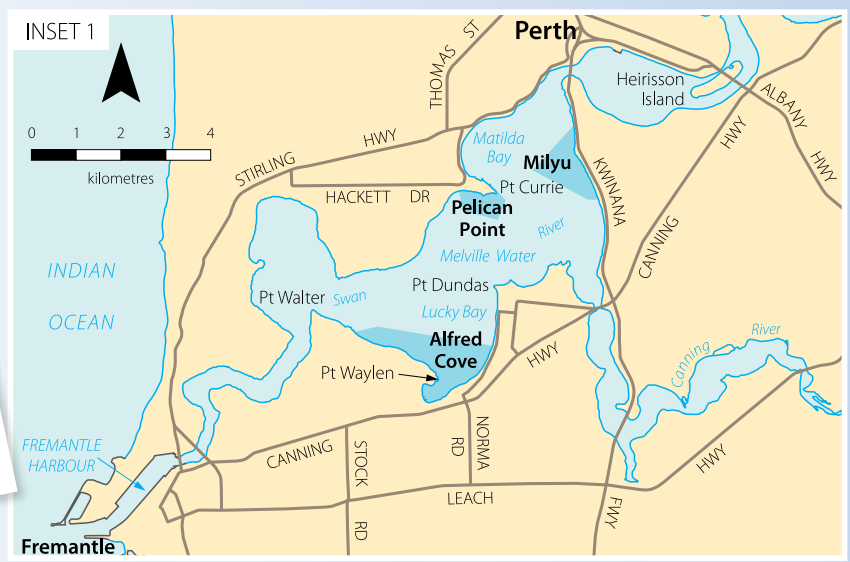
Nala, Swan Canning Riverpark



Lovis, Mandurah



Blake, Mandurah







**Top** Dolphin behaviour was observed from high vantage points.

*Photo – Phil Bouchet*

**Above** One of the river dolphins carries the scars of having been struck by a boat.

*Photo – Jason Menzies/DBCA*

**Above right** Dolphins provide a wonderful spectacle for users of the Swan Canning Riverpark.

*Photo – Delphine Chabanne*

conservation in the Perth region. With support from the Swan River Trust and Fremantle Ports, the project is driven by the premise that the best future for Perth's Indo-Pacific bottlenose dolphins lies with ecosystems that are healthy and resilient, which are protected by communities that are actively engaged in caring for their local dolphin populations. The project is a collaboration among researchers at the *Dolphin Watch* partner universities (Murdoch and Edith Cowan universities) and works in partnership with State and local government, industry bodies and the WA community.

Since the study's inception, researchers have been monitoring the community of dolphins in the Riverpark because of its small size and exposure to anthropogenic (human) activities. The research is

ongoing, and includes an assessment of abundance; distribution; how closely related Riverpark dolphins are to each other and to those found in coastal waters outside of the Riverpark; how dynamic the sound environment is that they depend on to navigate, forage and survive; their responses to human activities; and specialised foraging strategies specific to the Swan Canning Riverpark.

During boat-based surveys between 2011 and 2015, researchers found that some resident dolphins were making short visits to adjacent waters and interacting with dolphins from neighbouring communities. However, they always returned home to the Swan Canning Riverpark, a few times accompanied with visitors. Although the largest group of dolphins seen in the Swan Canning Riverpark was 19, including calves, dolphins are generally found in groups of four individuals, if not less. Dolphins spend considerable time with the same peers, over many years. They have been observed throughout the Swan Canning Riverpark, yet boat-based surveys detected them most often in the narrow channels up the estuary, as well as in the Fremantle Harbour. For logistical reasons, it has not been possible to survey the entire Riverpark, but data collected through *Dolphin Watch* indicates they also frequent areas not yet surveyed.

During the 2011–15 study, researchers also looked at the connection between dolphins in the Swan Canning Riverpark and other populations by comparing genetic material taken from skin and blubber samples. The results indicated that the Swan Canning Riverpark dolphins are genetically connected to neighbouring communities. In fact, the genetic results specifically indicated that the Swan Canning Riverpark acted as a 'sink', with dolphins from the adjacent coastal communities (the 'source') migrating into the Swan Canning Riverpark. This highlights the importance of the Fremantle Harbour in connecting these populations.

The study has examined dolphin behaviour at the water surface as well as beneath it. Underwater can be surprisingly dark and murky, and be difficult to see in, so dolphins have become 'acoustic specialists' and they use sound to communicate with each other, find food, avoid predators, and employ echolocation to sense objects around them.

Researchers have used underwater microphones called 'hydrophones' at several locations in the Riverpark, including Fremantle Harbour, Matilda Bay, Perth Waters and Heirisson Island, to record environmental sounds, such as wind and rain, as well as biological sounds from snapping shrimp, fish and



dolphins. While some sites remained relatively ‘natural’, other areas showed a strong anthropogenic influence. Human activities such as vessel traffic, shoreline construction, pile driving, and even traffic over bridges all emit noise into the aquatic environment. These all have the potential to change the natural ‘soundscape’, and mask important acoustic cues that the dolphins use, causing changes in their behaviour.

In order to see how dolphins alter their behaviour in the presence of pile driving activities, vessel traffic and underwater noise, researchers used a combination of visual and acoustic monitoring methods. Made possible through the support of Fremantle Ports, cameras were mounted on a tower and a surveyor’s theodolite was positioned at a high vantage point, to track the movement of vessels and dolphins. Meanwhile, acoustic recorders were used simultaneously to monitor underwater sounds. The results showed that dolphins occurred less frequently in areas where there was pile driving, than in areas where it was not occurring. The research also revealed that dolphins may remain in busy, noisy areas that are important for foraging, but then exhibit subtle changes in their behaviour. For example, during times of high vessel traffic, dolphins spend less time resting and socialising and tend to travel more quickly through these areas, than in quieter periods. Their communication whistles were also recorded. In noisy environments, their whistles tended to become longer in duration and covered a

wider frequency range. These responses could place additional pressure on dolphins. But all boaters can play a part in reducing these effects by slowing down when they spot a dolphin and giving them plenty of space. This will give them room to behave normally and reduce the amount of underwater noise they are exposed to. Boaters will be rewarded with a better view of the dolphins too.

This research is being complemented by data collected by *Dolphin Watch* volunteers to provide a ‘big picture’ view of the Swan Canning Riverpark dolphins. The information collected will help to identify any changes in the health of the Riverpark, including variations caused by human activities, as well as longer-term effects from climate change. These data indicate that high-use areas – including Fremantle Harbour, which is heavily used in autumn, winter and spring; Melville Waters near the Narrows Bridge, which is mainly used in autumn and winter; and the entrance to the Canning River – are consistently used by dolphins, mostly to forage and socialise. These locations include the. In other locations, dolphins will forage when opportunities arise and socialise when accompanied by others, but the dolphins are commonly observed travelling en route to areas where fish may be more abundant and their foraging efforts may pay off more quickly.

### **DOLPHIN WATCH DOWN SOUTH**

Further south, the Mandurah Dolphin Research Project (MDRP) was established

**Above left** A resident population of about 80 dolphins live in the Peel-Harvey Estuary.

**Above** Mandurah ‘dolphin watchers’ can now share their observations with researchers.  
*Photos – Krista Nicholson/AMRU*

**“Human activities ... all emit noise into the aquatic environment. These all have the potential to change the natural ‘soundscape’, and mask important acoustic cues that dolphins use.”**

in 2016 to determine the number of dolphins occupying the Peel-Harvey Estuary and adjacent coastal waters. MDRP is a partnership between Murdoch University and the City of Mandurah, with significant support provided by the Peel Development Commission, Mandurah Cruises, Mandurah Volunteer Dolphin Rescue Group, and John and Bella Perry. Since the project began, about 130 dolphins have been counted in the Peel-Harvey waterways, but there is a year-round community of about 80 individuals using the Peel-Harvey that have been identified. These dolphins occupy all areas of the estuary and some individuals occasionally venture out to coastal waters. About 30 coastal dolphins have showed high site fidelity to Dawesville Cut, which is one of





**Above** Dolphins herd fish into shallow waters and against the river's edge.

Photo – Matt Kleczkowski

**Above right** A Mandurah dolphin tosses an octopus before eating it.

**Right** 'Hayley' – one of the Peel-Harvey Inlet dolphins – displays scarring, caused by sunburn she received while stranded.

Photos – Krista Nicholson/AMRU

**Far right** Snubfin dolphins occur in the tropical waters of northern WA.

Photo – Deb Thiele



the two entrances connecting the estuary to the ocean. Although these individuals belong to a separate social community, they occasionally associate with the estuary residents who venture into Dawesville Cut.

The Mandurah dolphins have shown a remarkable variety of social and foraging behaviour. The peak calving and mating season appears to be early autumn, with calves mainly being born in March and April. Since 2016, 24 calves have been born into the community, of which, sadly, six did not survive. Interestingly, however, one of the 2016 calves was orphaned at eight months, and, although he was observed on his own for a long time, he has now become part of the community and is regularly seen with other resident juveniles, mainly in the Harvey estuary.

The dolphins use the many canals and rock walls to trap fish, and even tackle adult Western Australian salmon in autumn during the salmon run. Occasionally, they have also been observed catching octopus, and even

an eel on one occasion. They are skilled at catching estuary catfish, known as cobbler, and toss them around up to 30 times – presumably to ensure they are safe to eat. Most often, however, the dolphins feed on mullet, which they mostly catch in the shallows of the estuary, after a high-speed chase, sometimes by hydroplaning. Then they send the fish flying into the air with a whack of the tail.

Mandurah has been identified as a live stranding hotspot for dolphins in WA. Since 1987, there have been at least 40 live stranding events, of which some have been mass strandings, involving three or more dolphins. Of the current resident dolphin community, 25 per cent have live stranded at least once, some multiple times. Although more research is required to understand this local phenomenon, it is thought the dolphins venture to the shallows of the estuary in pursuit of fish and then get caught out by extreme low tides in between or on sandbars. While they are stranded, dolphins are at high risk of getting sunburnt. And, although many resident dolphins have survived severe sunburn, which has left bright white

scarring on their skin, others have lost their lives – two in 2018.

By studying historical records, we have identified that the stranding hotspots are at Lake Goegrup along Serpentine River and the southern end of the Harvey Estuary. We hope, through *Dolphin Watch*, citizen scientists can not only help us monitor how and when the resident dolphins use the estuary shallows, but also report any stranded individuals as quickly as possible so they can be relocated to deeper waters.

## **DOLPHIN WATCH GOES TROPPO**

Australian snubfin dolphins (*Orcaella heinsohni*) call the tropical waters of northern Australia home. Last year, the species was recognised as vulnerable on the International Union for Conservation of Nature's Red List of Threatened species. The population size of snubfin dolphins in Australia is thought to be fewer than 10,000 mature individuals across their range. And this number is declining. A few key sites in the Kimberley region, such as Roebuck Bay, Broome, are exceptional, and support a relatively large population of snubfins.



## Do it yourself

The *Dolphin Watch* app is available to download for free from the App Store (iPhone) or Google Play (Android). For more information about *Dolphin Watch* and to download your free copies of *FinBook*, visit [riverguardians.com/projects/dolphin-watch](http://riverguardians.com/projects/dolphin-watch)



In 2014, Dr Alex Brown of Murdoch University, estimated there were 130 individual snubfins using Roebuck Bay. Fortunately for the local snubfins, Roebuck Bay was declared the Yawuru Nagulagan / Roebuck Bay Marine Park in 2016. The marine park provides a refuge for snubfins and excludes activities, such as commercial gill net fishing, which can result in entanglement injuries and fatalities for dolphins. Other threats to snubfins include habitat loss through coastal development and resource extraction, vessel strikes, noise and chemical pollution, reduced prey and climate change.

This year, as part of the expansion of *Dolphin Watch*, DBCA marine research scientists and *Dolphin Watch* staff held two training sessions in Broome for Yawuru rangers and other interested local community members. The program enables locals to easily record which tropical dolphin species they see, particularly snubfin dolphins in Roebuck Bay, and identify individuals using the *Broome FinBook* – a photo-identification guide of more than 200 individual snubfin dolphins known to occur in the Broome

area – which builds on the earlier work by Dr Deb Thiele.

A bay-wide dolphin census is planned for Broome in April 2019 to determine how many dolphins are in Roebuck Bay and which individuals are present. This will be an opportunity for Broome locals to apply their newly acquired dolphin-watching skills and work together as part of a collaboration between DBCA, Yawuru country managers, Environs Kimberley, Roebuck Bay Working Group, commercial tour operators and residents. The aim of this dolphin ‘Big Day Out’ is to obtain an updated population estimate of snubfin dolphins in Roebuck Bay and hopefully confirm that a healthy population size of snubfins is being maintained. This information will be used by local country managers to track trends in the snubfin population over time.

Roebuck Bay not only supports an abundance of snubfin dolphins, but also a diversity of other tropical dolphin species, including Australian humpback and Indo-Pacific bottlenose dolphins. Occasionally, false killer whales visit the bay, much to the delight of tourists and locals. Now that these additional tropical species have been added to the *Dolphin Watch* app it is hoped that *Dolphin Watch* monitoring will reveal more on the frequency of these visits and other marine mammals using Yawuru Nagulagan / Roebuck Bay Marine Park.

By contributing information through *Dolphin Watch*, members of the public really can make a difference. The program is collecting much-needed data about the health, wellbeing and habits of WA’s beloved dolphins and much of it would not be collected without the help of these dedicated citizen scientists.

**Above** Humpback dolphins occur in the Yawuru Nagulagan / Roebuck Bay Marine Park.  
Photo – Holly Raudino/DBCA

**Above right** ‘Dolphin watchers’ contribute data about dolphins in the State’s north.  
Photo – Jason Menzies/DBCA

**Dr Delphine Chabanne** is a researcher from Aquatic Megafauna Research Unit at Murdoch University. Her research focuses on dolphins in WA, including Perth’s Swan Canning Riverpark

**Dr Sarah Marley** is a lecturer in Marine Vertebrate Zoology at the University of Portsmouth in the UK. Her PhD at Curtin University focused on the behavioural and acoustical responses of coastal dolphins to noisy environments in WA.

**Jason Menzies** is DBCA’s volunteers and community manager. He can be contacted on (08) 9278 0932 or by email ([jason.menzies@dbca.wa.gov.au](mailto:jason.menzies@dbca.wa.gov.au)).

**Krista Nicholson** is a PhD candidate at the Aquatic Megafauna Research Unit at Murdoch University. Her research focuses on the Peel-Harvey dolphin population while extending to coastal waters up to 20 nautical miles offshore.

**Dr Holly Raudino** is a research scientist in the Marine Science Program of DBCA, her research focuses on tropical dolphins in the Pilbara and Kimberley regions.

**Associate Professor Chandra Salgado Kent** is a researcher at the Centre for Marine Ecosystems Research at Edith Cowan University. Her research focuses on dolphins, whales and pinnipeds; threats on marine wildlife; and conservation and management.