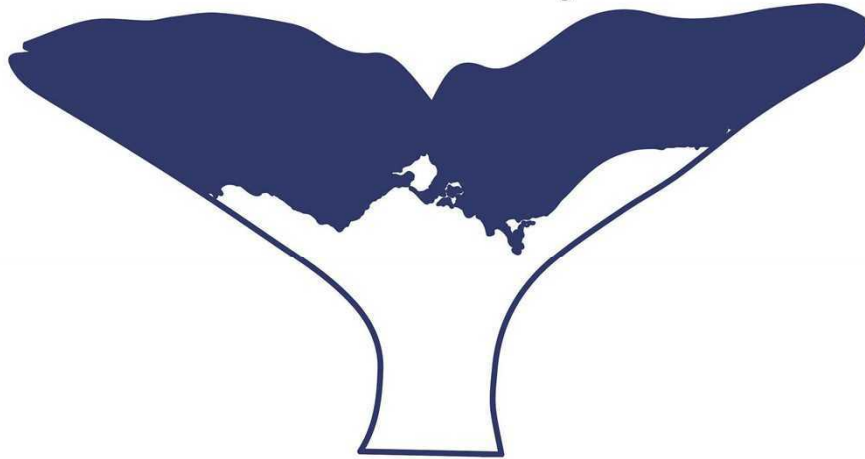


Two Bays

Whale Project



DOLPHIN RESEARCH INSTITUTE

Two Bays Whale Project Summary 2023

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2023 Two Bays Whale Project Summary

The Dolphin Research Institute and Wildlife Coast Cruises acknowledge the Bunurong People, the Traditional Owners of where we reside. We acknowledge Aboriginal and Torres Strait Islander peoples as Australia's First Peoples, and we acknowledge the Traditional Owners of the customary lands, seas, skies and waterways in which we work, travel and meet.

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1. Introduction

1.1. Background

The Two Bays Whale Project (TBWP) is a citizen science initiative created through collaboration between the Dolphin Research Institute (DRI) and Wildlife Coast Cruises. The project officially began in 2015 and is designed to formalise the recording of sightings of large cetacean species within Port Phillip, Western Port and adjacent State waters (Barwon Heads to Inverloch to 3 nautical miles seaward). The current dataset dates back beyond the commencement of the project to 2000 with some supplementary sightings from previous years; 1984 - 2000. Since the project's inception, a growing need for expansion beyond the current project boundaries has arisen. This need has been predominantly driven by concerns around the potential impact of proposed offshore developments on large whales and the current lack of information available to inform regulatory processes. To address this need in 2023, the TBWP successfully extended into the Inverloch to Wilsons Promontory area and to a lesser extent, into eastern Bass Strait off the 90 Mile Beach area. The project expansion is discussed further in Chapter 6 of this document. Data from these new regions will not be presented here.

The key species for this citizen science project are: humpback whale (*Megaptera novaeangliae*) and southern right whale (*Eubalaena australis*) but may also include other species, such as killer whale (*Orcinus orca*), minke whale (*Balaenoptera acutorostrata*) and blue whale (*Balaenoptera musculus*), also occasionally sighted in the observation area.

The project is intended to have the capability to provide a repository for and subsequently a catalogue of humpback whale flukes (tails). All sighting details and images of southern right whale callosities (unique head patterning composed of raised pale hardened skin) and lateral images of heads are submitted to WhaleFace, an online reporting platform integrated with the State-wide Integrated Flora and Fauna Teams (SWIFFT). Additionally, images of killer whale dorsal fins, eye patches and saddles are contributed to the Killer Whales Australia database and catalogue. Data from the project are also contributed to the Southern Hemisphere Whales and Climate Project. Finally, the image repository may also accept images of other cetacean species which may assist in validating any unidentified species photographed within the Two Bays region.

1.2. Two Bays Whale Project Objectives

The objectives of this project are to:

- Create, maintain and build a strong and reliable sightings network through engagement of key stakeholders and the general public (citizen scientists).
- Accurately record and archive sightings and movements of large whale species within Port Phillip, Western Port and adjacent waters (Barwon Coast to Inverloch) (Figure 1).
- Provide a repository for identification images (primarily for humpback whales but also other cetacean species), which may then be shared with researchers and key stakeholders.
- Provide accurate information on seasonal timing and movements of large cetaceans within the observation area.
- Contribute these data to support current and future cetacean management plans, environmental planning and research projects.

1.3. Observation area

The observation area is split into two regions; Port Phillip (Barwon Heads to Cape Schanck) and Western Port (Cape Schanck to Inverloch) (**Figure 1**). Expansion of observation areas occurred in 2023, with four new zones added. This is discussed further detail in Chapter 6 of this document. Inverloch to Sandy Point region labelled as Cape Liptrap (Figure 12),

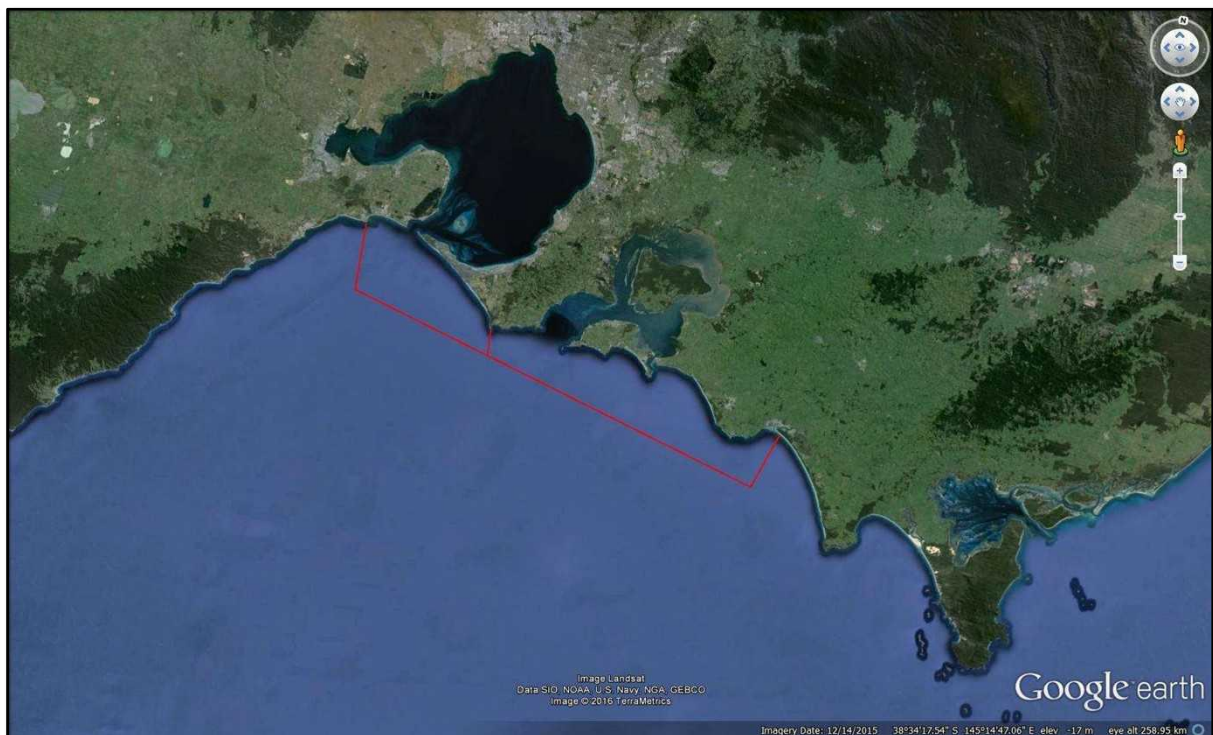


Figure 1. Observation area of the Two Bays Whale Project.

2. Season summary

2.1. Obtaining sightings

Sightings were gathered from land and vessels, with some opportunistic sightings contributed by scientists transiting the area while conducting aerial surveys. To standardise data collection, sighting information from Wildlife Coast Cruises was gathered from the Phillip Island circumnavigation whale watch cruises only. The majority of sighting information was gathered through a citizen science approach, using a range of reporting tools.

2.2. PodWatch

The web-based app 'PodWatch' was again used as the project's primary form of reporting for citizen scientists. The system functions in essentially the same way as a native app, the main differences being that it resides on the host's (Dolphin Research Institute's) website and the user is not required to create a log in profile.

This web-based app option enables:

- reduced costs in development and hosting (initial and on-going),
- data residing on the DRI website database giving security and control,
- one version to operate on any phone, tablet or PC without additional downloads or updates,
- launching from a home-screen icon in its own window, as with a native phone app.

The use of PodWatch decreased in 2023, with 169 contributions received. This is a drop 101 contributions from 2022, when 270 contributions were logged. Of the 169 sightings reported via PodWatch, 110 were sightings of large whales and killer whales, the remainder being of dolphins (**Figure 2**).

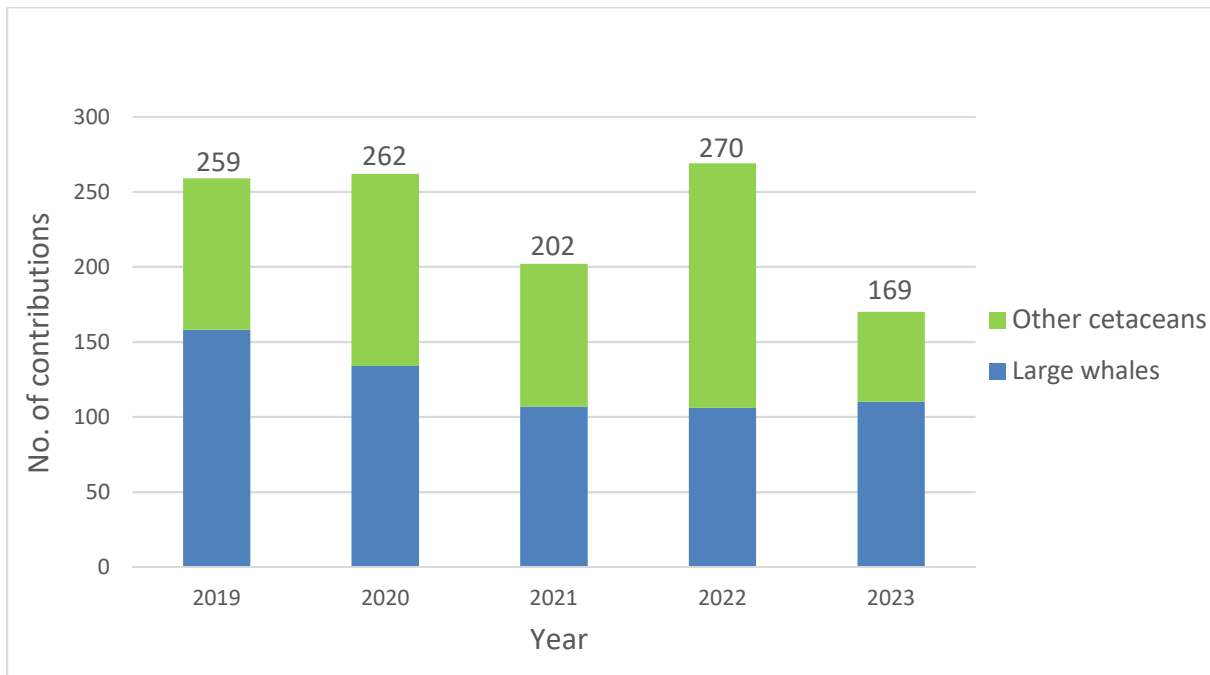


Figure 2. Sighting contributions per year via PodWatch.

Despite the drop in usage, the value of PodWatch as a reporting platform continues to enable coastal communities to readily log sightings as we move into a phase of baseline data collection for offshore development activities. These baseline datasets may be used to inform environmental plans and regulatory decision making with regards to new and existing operations in the marine environment. We expect an increase in use of PodWatch as new observation areas begin to generate data.

2.3. Citizen Science

Outside of sightings information collected by Wildlife Coast Cruises, citizen science is the primary source of data for the Two Bays Whale Project. In season 2023 sightings were reported by citizen scientists, totalling 117 records (109 land-based and 8 vessel-based) with all remaining sightings coming via Wildlife Coast Cruises (34 records).

Citizen science contributions are received via four data streams:

- PodWatch
- social media reporting (Messenger)
- mobile phone text and calls
- word of mouth

Before being added to the Two Bays Whale Project dataset, all contributions must first pass through a validation process at the Dolphin Research Institute. This process includes:

- Scanning each sighting contribution to ensure all required information is present.
- Reviewing date, time and location information to ensure these all align.
- If supplied, review coordinates through plotting on Google Earth to visualise the location of the sighting. If the plotted sighting location does not align with sighting details, the observer will be contacted to seek clarification.
- If supplied, review images to validate species identification. If the species identification is found to be incorrect, this will be corrected before entry.
- Any species which is not immediately recognisable from images will be assigned a placeholder name before the images are reviewed by a secondary taxonomic expert.
- Once feedback is received from the taxonomic expert, a species or morphospecies will be assigned.
- Compare the record against all other records from the same day to search for possible re-sights. If a re-sight is confirmed or thought to be likely, the most comprehensive sighting record from that series of events is entered into the dataset with all other re-sights archived.
- All work to this point is then reviewed by a second researcher.
- Any corrections made by the second researcher are discussed and applied if all agree.
- Data is then entered into the Two Bays Whale Project dataset.

2.4. Sightings

Sighting reports were scored for reliability using a 1 to 5 system, with 1 being unlikely to have occurred and 5 being a confirmed sighting event, supported with imagery. Only sightings with a score of 4 or 5 were included in analysis.

Sighting events were spread across the region with the highest density being along the southern side of Phillip Island (**Figure 3**).

Overall sighting figures for 2023:

- 152 separate validated sighting events
- Estimated 266 individual animals recorded
- Three confirmed species (southern right, humpback and killer whale)
- Number of humpback whales per sighting ranged from 1 to 5 individuals, with an average of 1.75 whales per sighting. This average is similar to 2022 and 2021 averages ~ 1.70 .

Note the figure of 266 individuals is a best estimate after omitting probable and known re-sights of the same pods. The actual number of individuals is likely to be higher.

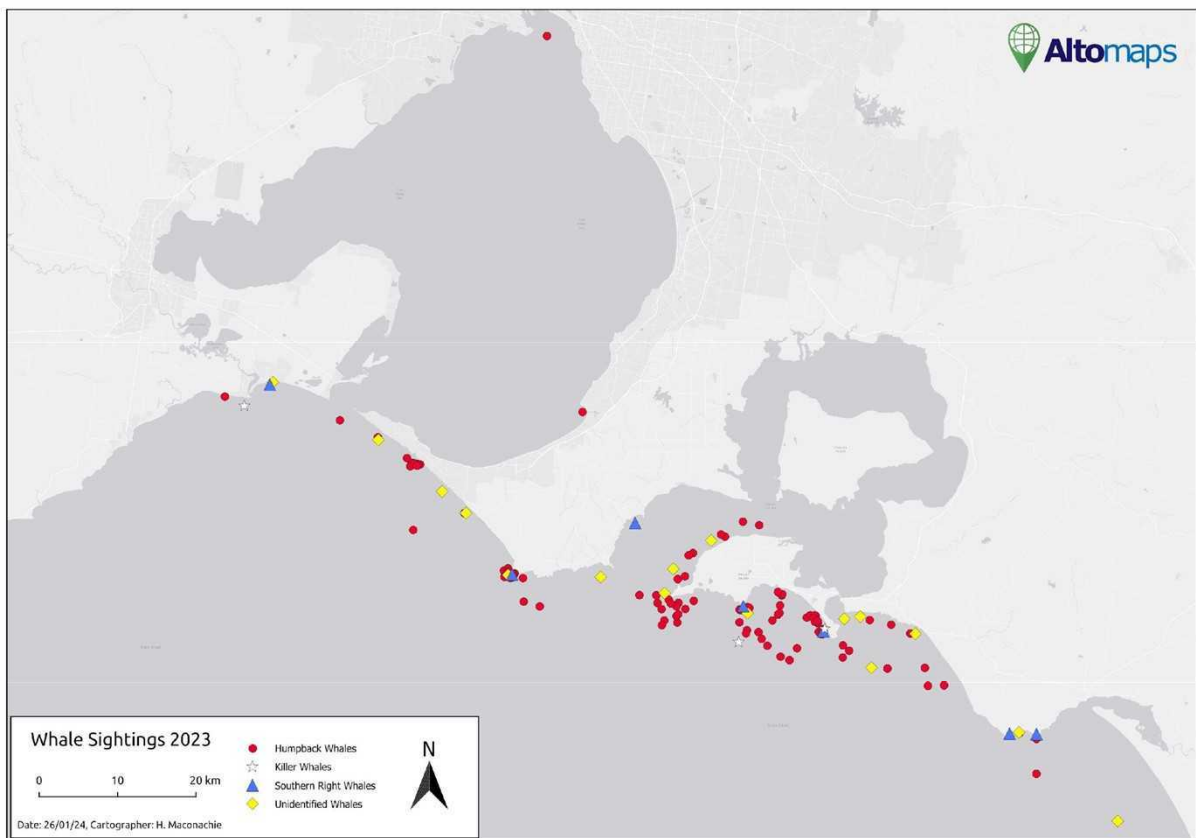


Figure 3. Distribution of large cetacean sightings for the 2023 whale season.

2.5. Yearly comparisons

The number of validated sighting events decreased slightly in 2023 (**Figure 4**). Observer effort appeared to be similar compared to 2022 though in citizen science, this can be a difficult variable to accurately measure. Weather patterns through the peak humpback whale migratory season were similar to previous years, which suggests that sightability would likely have also been similar.

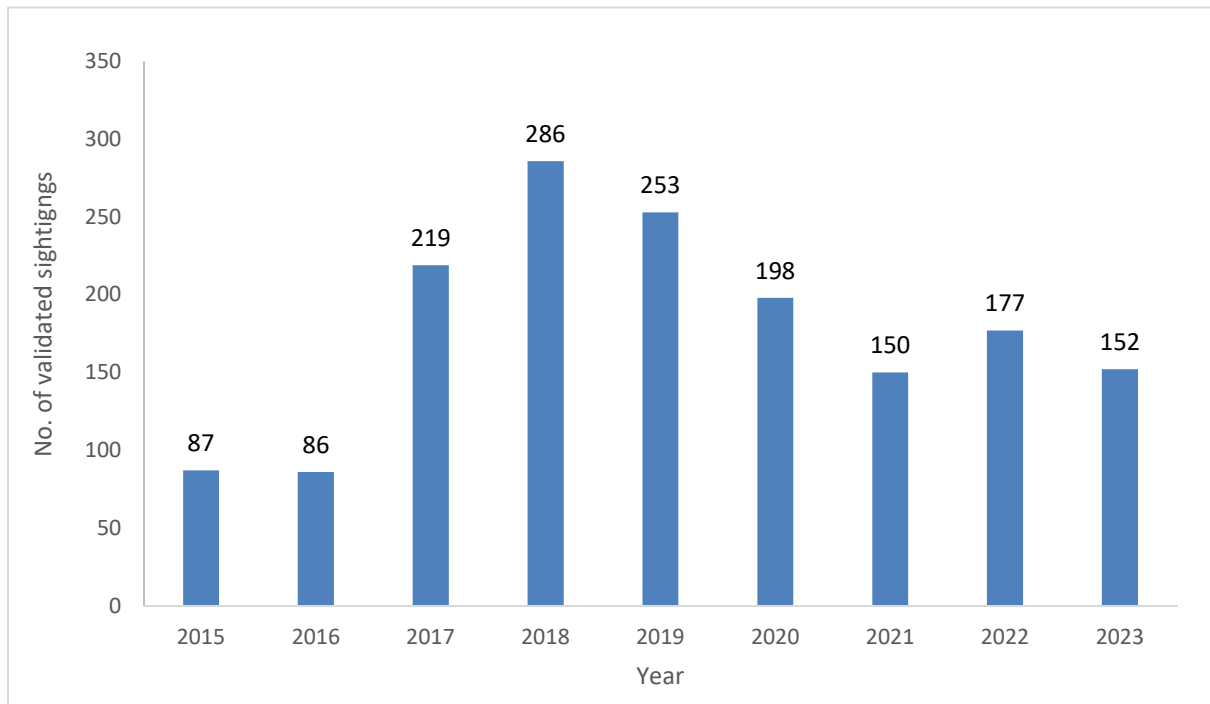


Figure 4. Number of validated sighting events for all recorded species for each year.

2.6. Recorded species

Three targeted cetacean species were validated through the use of diagnostic imagery in season 2023, these being: humpback, southern right and killer whale.

Humpback whales

Humpback whales were the most abundant large whale species recorded during season 2023 (**Figure 5**). A total of 119 validated sightings were recorded, which involved an estimated 212 individual animals. This result shows a decrease in sightings when compared to season 2022 (152 sightings, 259 animals). There is no clear understanding as to why this decrease has occurred. One explanation could be linked to a slightly lower observer effort in 2023 however, this alone does not account for the drop in sighting numbers. Questions that could be legitimately raised here may be:

- Could some whales simply be migrating further off the coast and out of visual range of land-based observers?
- Do these results reflect a breeding cycle whereby fewer females were migrating to the east Australian breeding grounds in 2023?
- Are we seeing an effect of climate change on migratory timing and positioning?
- Could the lower numbers be representative of a population-level effect of a yet to be understood environmental and/or anthropogenic pressure?

Additional data from future seasons will be critical in the attempts to address these questions.



Figure 5. Humpback whale, Cape Schanck. Image courtesy of Ben Eriksson.

Southern right whales

Season 2023 saw a slight increase in sightings of southern right whales (**Figure 6**) (seven sightings) compared to 2022 (five sightings). However, this number is down significantly on seasons 2020 (13 sightings) and 2021 (12 sightings). It remains unknown why sighting numbers remained lower than 2020 and 2021 but it may be possible that this decrease is linked to the calving cycles of this species, which influences the number of individuals using the northern Bass Strait coastline. Long-term monitoring may provide insights to help determine the answer to this question. To ensure the best possible data is available, the Two Bays Whale Project will continue to direct observers to reporting sighting events of this species to southern right whale data portal, WhaleFace.



Figure 6. Southern right whale (*Eubalaena australis*) off Pyramid Rock. Image courtesy of Lachlan Moore.

Killer whales

Three killer whale sightings were recorded during 2023 one being in the Port Phillip region (**Error! Reference source not found.**), and two from the Western Port region. Sightings of killer whales along the Victorian coast are a regular, but uncommon occurrence which show some seasonality with peaks in sightings during July and early to mid-Summer. Being a highly mobile species in the region, it is very difficult to predict when they may present in the Two Bays area.

The Two Bays Whale Project, is proud to be joined by Killer Whales Australia this year as a Dolphin Research Institute project. This move will enable the progression of knowledge on this species at an increased rate, providing important information on the species within and outside the Two Bays Whale Project observation area.

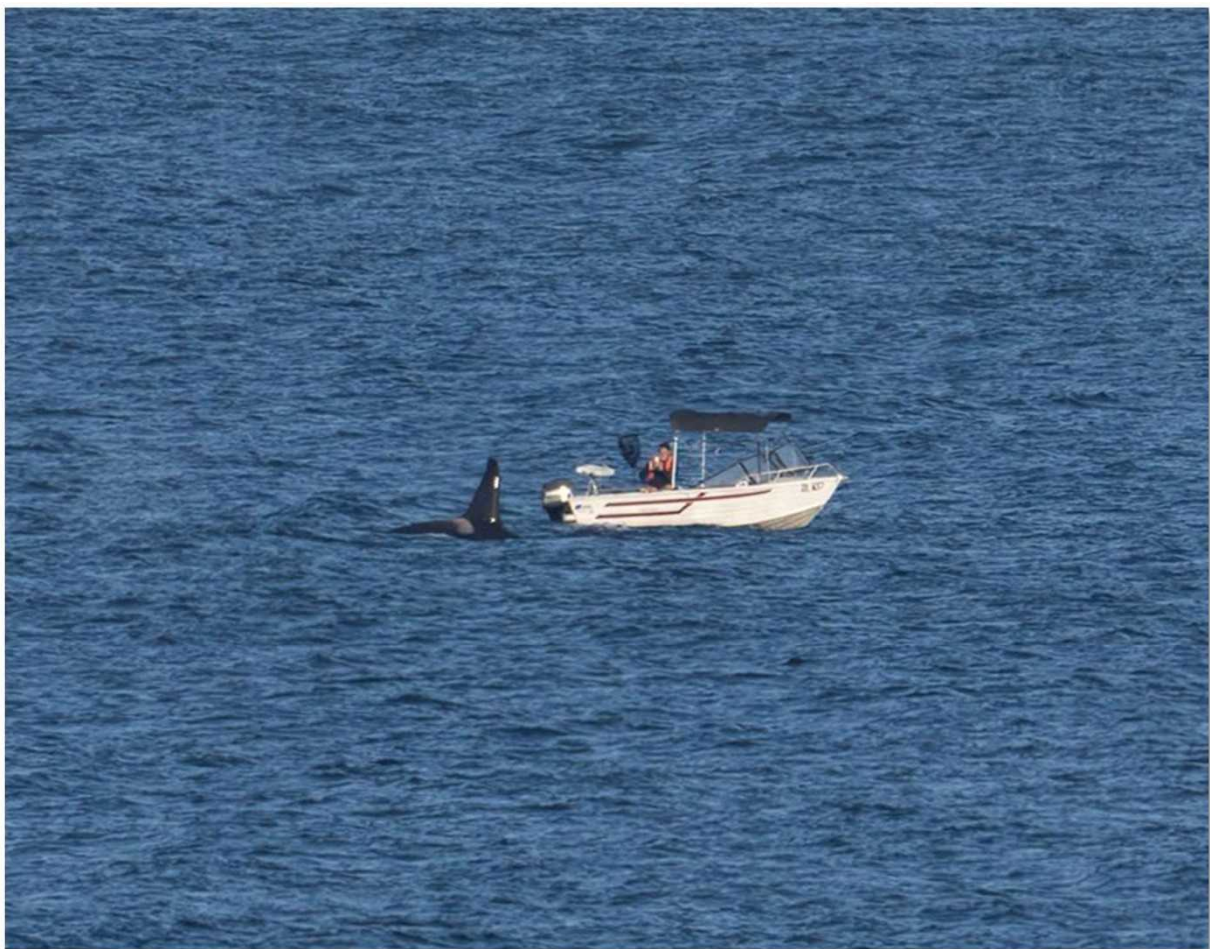


Figure 7. Killer whale (*Orcinus orca*) off Barwon Heads. Images courtesy of Marcia Riederer.

2.7. The Victorian Humpback Whale Identification Catalogue

Both during and prior to the Two Bays Whale Project's existence, images of the underside of humpback whale flukes have been archived by DRI (**Error! Reference source not found.**). Over the course of many decades, images such as these have shown to be a reliable means of identifying individual humpback whales globally (much like a human fingerprint). These fluke images are therefore useful in tracking individual whale movements over time and across vast distances as well as locally, within and across seasons. The archive of images curated by DRI has been used to populate a catalogue of flukes for this species in Victoria (the only one of its kind). This catalogue now holds 286 individual whales, an increase of 40 individuals since 2022 (**Figure 9**). The Victorian catalogue is small in comparison to other east Australian catalogues. Nonetheless, it is a very useful reference and a great achievement, particularly given the catalogue relies almost entirely on citizen science contributions.

Images from this catalogue are shared with the online citizen science fluke matching platform 'Happywhale' (**Figure 10**). This platform provides an automated fluke ID matching system which operates at the global level. To date, flukes contributed by citizen scientists via the Two Bays Whale Project have been matched to sightings in Queensland, New South Wales, Tasmania, Western Australia and Victoria. One match in 2023 linked an image taken off Wilsons Promontory in September of 2023 to an image taken off Karratha, Western Australia in 1998! The number of additions to the catalogue for 2023 totalled 35, of which 11 were contributed by project partner Wildlife Coast Cruises. The remaining 24 were contributed by citizen scientists from across the State. The total of 35 represents a drop of six additions to the catalogue when compared to 2022.



Figure 8. The fluke of whale VIC_0283. Image courtesy of Stav Mihelakos.

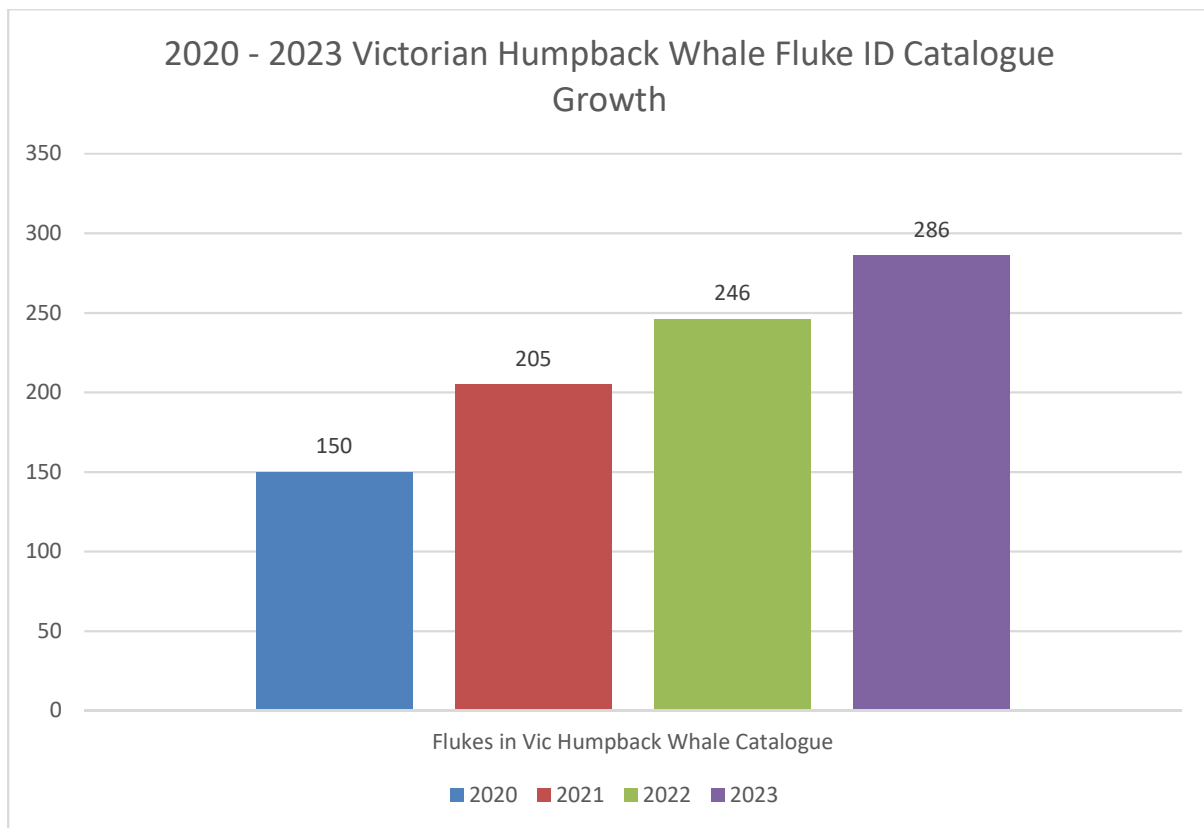


Figure 9. Growth of new flukes added to the Victorian Humpback Whale Fluke Identification Catalogue.

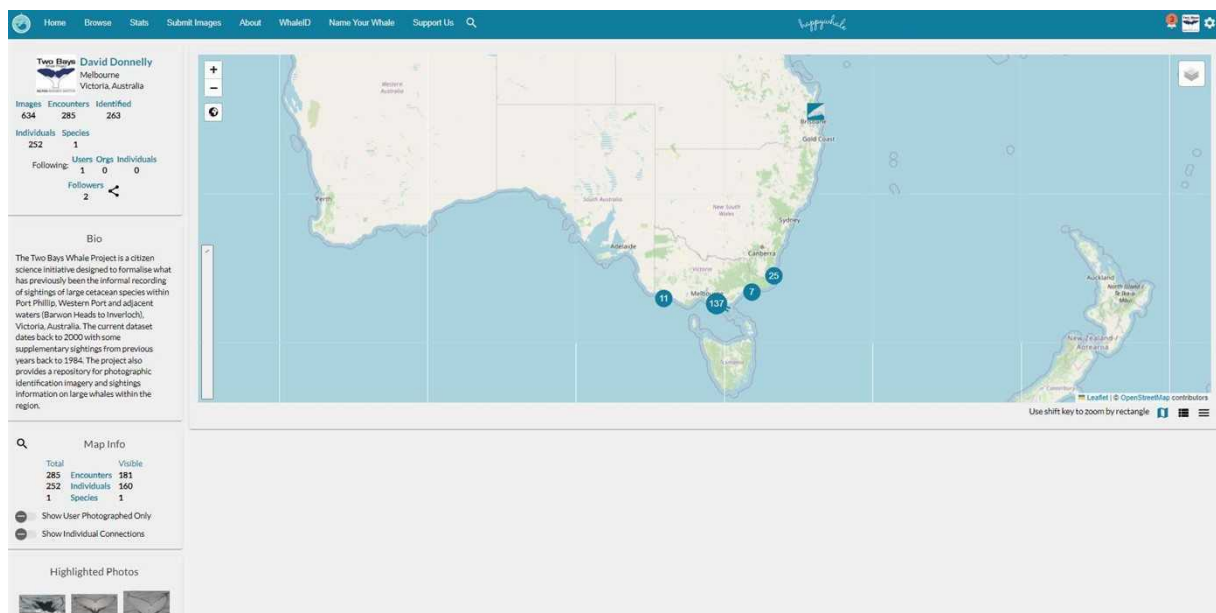


Figure 10. Example of Happywhale citizen science web page.

2.8. Two Bays Tracker

The 'Two Bays Tracker' dedicated observer program was operational again in 2023. To date, this program has accrued 831.25 hours of dedicated observer effort and made 230 observations of large whales during this period.

In 2023, the program involved seven reliable and experienced observers who dedicated time to observing for whales from eight designated sites, three in the Western Port region and four in the Port Phillip region:

Western Port region

- Pyramid Rock
- The Nobbies
- Cape Woolamai Surf Club
- Anzacs

Port Phillip region

- Cape Schanck
- Koonya Beach
- Number 16 Beach
- Portsea Back Beach

The Two Bays Tracker app was used by observers who recorded:

- Effort (length of survey from start to end)
- Sighting conditions
- Sightings within the survey time
- All relevant sighting details, including species, direction of travel etc.

The 2023 season saw a total of 243.5 observer hours recorded. This was a decrease of 72 hours on the 2022 effort (**Figure 11**). During the observation period, 33 sightings of one species (humpback whale) were made. The Two Bays Tracker observer team are a highly valued group of passionate individuals who fill an integral role in building our understanding of large whales in the Two Bays region and beyond.

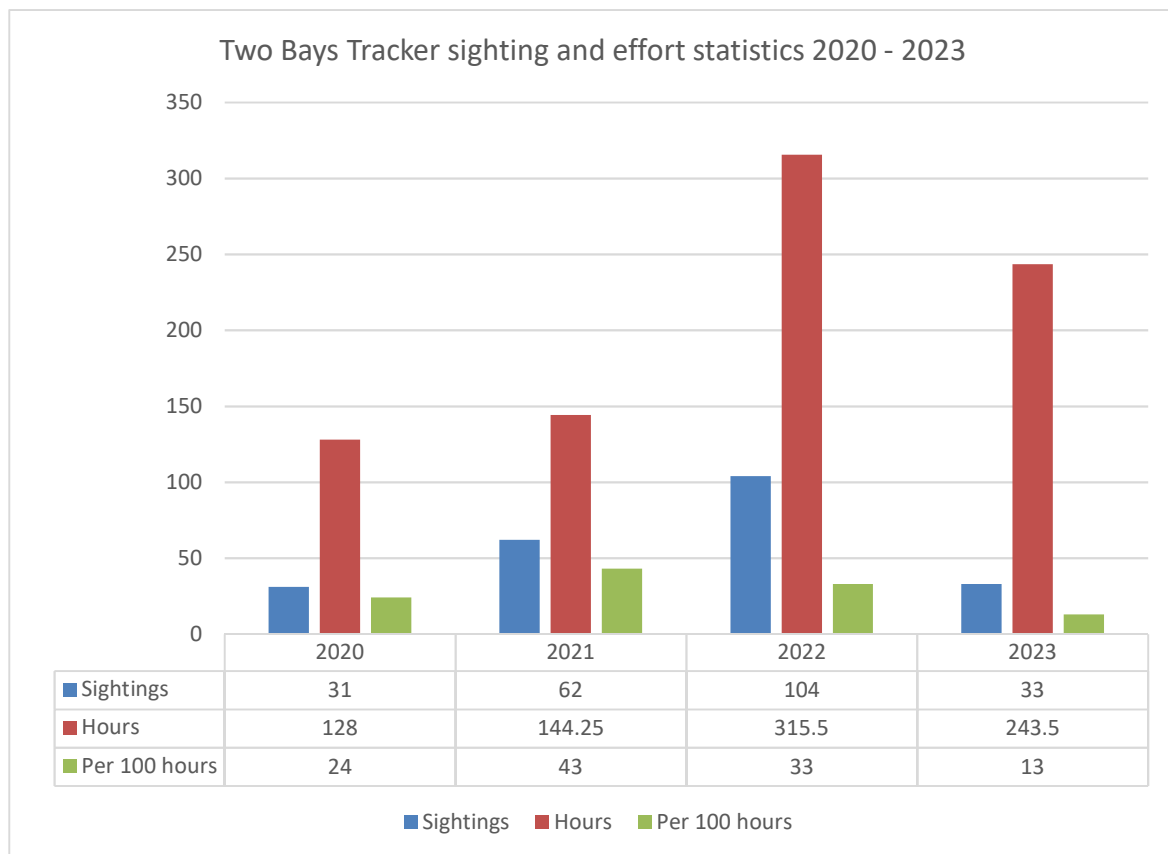


Figure 11. Two Bays Tracker sightings and effort statistics.

3. Cetacean emergencies

No large cetacean-related emergencies were reported in the Two Bays region during the 2023 season.

The Department of Energy, Environment and Climate Action (DEECA) are tasked with responding to cetacean emergencies and should be contacted in the event of a cetacean emergency, such as strandings, vessel strikes or entanglement. See details below.



4. Two Bays Whale Project Outreach

4.1. Island Whale Festival

The Two Bays Whale Project's primary outreach event for the last seven years has been the Island Whale Festival. This three-day event is held annually on Phillip Island and was again, a key outreach function for the Two Bays Whale Project. A total of 9996 attendees were recorded by organisers in 2023 which was an increase of 2896 visitors on the previous year. As co-founders of the Island Whale Festival, the Two Bays Whale Project collaborators (DRI and Wildlife Coast Cruises) were again, directly involved in planning and running this event with a range of other organisations, notably Destination Phillip Island, the Bass Coast Shire and Phillip Island Nature Parks.

The Dolphin Research Institute team delivered a series of nine presentations (six Spot-A-Whale, two Cetaceans of Victoria and one careers guidance presentation) over the weekend, which were attended by a total of 515 people. They were also present throughout the day running ad hoc whale tail identification activities.

The Wildlife Coast Cruises crew assisted with website content and development, sponsored entertainment, had a presence at the festival hub and ran a series of activities on whale watch cruises over the weekend.

At the time of publishing this report, plans were underway for the 2024 Island Whale Festival.

4.2. Social media

The Two Bays Whale Project Facebook page again proved to be a useful communication tool. This platform, combined with the DRI outreach workshops, formed the basis of the 2023 community outreach program. Project partner, Wildlife Coast Cruises continued with the operation of their App Wildlife Whales which enabled the user to both report sightings and receive sighting information.

Below are some dot-points relevant to assessing the value of these forms of communication.

- The Two Bays Whale Project Facebook page continued to grow with the total number of 'Likes' now at 8,900 (up from 8,600 in 2022) and 10,034 followers.
- It remains the case that many of the Facebook followers live in, near to or regularly visit the observation area.
- The Facebook page continues to be an integral part of the communication and outreach component of the Two Bays Whale Project. It provides a central hub that is accessible to anyone interested in contributing sightings or simply wishing to learn about whale movements in and around our bays and nearby coasts.

4.3. Wildlife Whales App.

The 'Wildlife Whales' app. operated in 2023 with approximately 16,477 subscribers with varying levels of use. This is an increase of 4,940 subscribers on the previous year. Communication through these means continues to improve community awareness of the presence of whales and significantly contributes to winter tourism to Phillip Island and the Bass Coast.

5. Collaborations

During season 2023, the Two Bays Whale Project maintained and strengthened its collaboration with the Tasmanian Fluke Project. We continue to share information and imagery of humpback whale flukes between the two groups and maintain a good level of communication through the humpback whale season.



Through 2023 the Dolphin Research Institute formalised and grew its partnership with environmental consulting firm, Fathom Pacific. This partnership has enabled data sharing processes and also provided young scientists with career and mentoring opportunities beyond DRI through inclusion in marine mammal fieldwork and exposure to the world of environmental consulting. This partnership will continue into 2024 with an aim to consolidate the collaboration and grow the next generation marine scientist program.



6. Project expansion

Over the last three years, the Two Bays Whale Project has received numerous enquiries and requests for expansion into neighbouring regions. However, due to funding restrictions, a complete rollout of this program has been beyond the capability of the project. We are pleased to report that as a result of receiving a funding grant, the Two Bays Whale Project has now expanded into four new regions;

- Inverloch to Sandy Point region labelled as Cape Liptrap (**Figure 12**),
- Sandy Point to South Point (Prom West)
- South Point to Snake Island (Prom East) and
- Snake Island to Lakes Entrance (90 Mile)

This expansion was achieved through travelling to the regions and engaging with local community groups such as Wildlife In Sandy Point (WISP) (**Figure 13**) and Loch Sport Fishing Association. The project is now seeing a slow but steady increase in sighting contributions from these regions. We plan to continue to nurture these new relationships and grow the knowledge base of large cetaceans in these regions.

The plan for 2024 is to expand further into areas west of our current Two Bays region, with a community engagement event already scheduled for August 2024. We look forward to this expansion and are excited to meet and hopefully add new enthusiastic citizen scientists to the Two Bays Whale Project program.



Figure 12. Two Bays Whale Project team with WISP at Cape Liptrap.

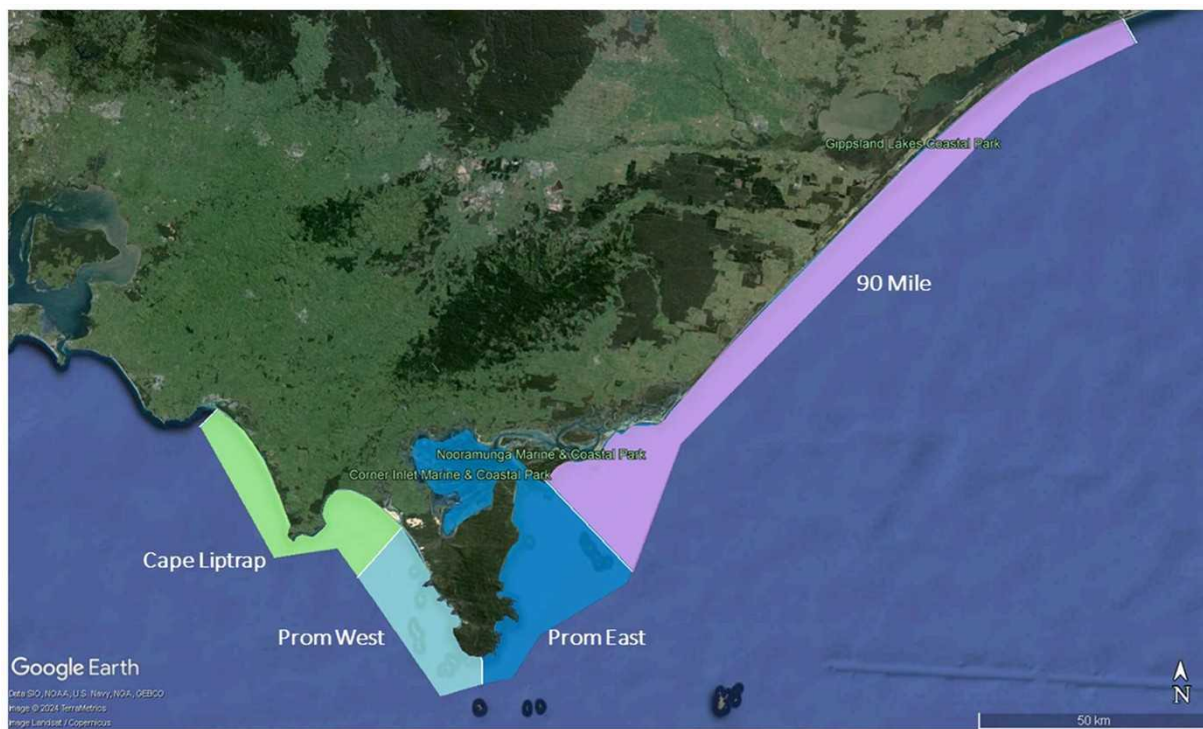


Figure 13. TBWP expansion areas.

7. Summary

The Two Bays Whale Project again proved that a citizen science approach to data collection that includes the use of social media communication and scientific expertise is a useful and reliable means of monitoring whale presence and movement. Without the citizen science component, the project would not have functioned in any meaningful way.

The success of the 2023 season can be attributed to an excellent collaboration between the Dolphin Research Institute and Wildlife Coast Cruises, as well as a growing network of enthusiastic supporters and dedicated citizen scientists. Broader collaborations with State agencies and domestic organisations were also greatly beneficial to data collection and validation of events. This overall success has ensured the continuation and expansion of the project into 2024.

The plan for season 2024 is to

- Expand the project into the Surf Coast area west of the current observation area.
- Increase dedicated field efforts using the Dolphin Research Institute's research vessel.
- Increase effort into growing the citizen science component of the project through targeted pre-season community engagement,
- Maintain regular social media updates.
- Maintain the Two Bays Tracker program.
- Continue to build capacity through investment in next generation scientists.

Finally, the Dolphin Research Institute Research Fellow position will be maintained through the generous support of the Williamson Foundation.

Acknowledgments

The authors of this summary would like to acknowledge the contributions made by our Citizen Scientist community, particularly our Two Bays Tracker team of dedicated observers; Tory Guy, Ben Eriksson, Beck Holder, Barb Wallace, Serra Clisby, Alyn Spencer and Sharon Christopher. Without these people a large percentage of sightings would not have been available for this report. We would also like to acknowledge:

- Parks Victoria
- Phillip Island Nature Parks
- Destination Phillip Island
- Killer Whales Australia
- Port Phillip Sea Pilots
- Polperro Dolphin Swims
- Moonraker Dolphin Swims
- Sea-All Dolphin Swims
- RedBoats Diving
- WaterMaarq
- Searoad Ferries
- The Williamson Foundation
- Heath Maconachie from Alto Maps for GIS assistance
- Victorian Volunteer Coast Guard
- Fathom Pacific Pty Ltd
- Barwon Coast Committee of Management
- Victoria Police Search and Rescue