



PROJECT O.R.C.A. Orca Research and Conservation Australia

Killer Whales of the Bremer Sub-Basin: A Photo-ID Catalogue



Curtin University

Project O.R.C.A. and CMST Curtin University

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Orca Research and Conservation Australia

www.projectorca.com.au

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Christine Erbe



The catalogue aims at creating a connection between science and the general public. It also serves as a baseline and reference document for future publications. The contents of this catalogue, including identification images and illustrations, are not to be reproduced without prior written permission.

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We are very grateful for photos donated to assist in building this catalogue. Connecting research and the general public creates a powerful tool for education. By contributing photographs to the project, people are contributing crucial information to this study. Citizen-science is widely used for the monitoring of diverse animal species in the world.

Photo credit: All photographs in this catalogue were taken by Rebecca Wellard except WA044 RHS, WA037 RHS, WA027 RHS, WA044 RHS, which were generously donated by Keith Lightbody.

Introduction

To date, there has been no reliable estimate of the population size of killer whales in Australian waters due to their unpredictability and transient nature.

Population trends are unknown, with much of the information on killer whale distribution and occurrence obtained from incidental sightings.

The limited knowledge of the spatial and temporal extent of killer whale movements throughout the Australian region means dedicated surveys of killer whales are required to quantify their distribution, movements, habitat use, population size and trends.

While encounters with killer whales are typically rare and unpredictable in Australian waters, the area offshore from Bremer Bay appears to support abundant killer whales during the austral summer, and provides an opportunity to study this little-known population.

All images were taken under the Australian Government Department of the Environment research permits (Permit No. 2013/0010; Permit No. 2014/0008) and university animal ethics approvals (Curtin University Animal Ethics Approval No. AEC_2015_06; University of Sydney Animal Ethics Approval No. 568).

The following catalogue presents photo-identification images collected since 2014 of killer whales sighted off Bremer Bay, Western Australia. This catalogue has been compiled and made publicly available to whale-watch operators, whale watchers, researchers and the general public to enhance observations and facilitate identification of the Australian killer whale population.

This catalogue is the first edition and a work in progress, and therefore, far from complete. Missing pictures will be added as data analysis continues and in upcoming seasons as sightings allow, and the catalogue will be expanded to include additional pictures of individuals not yet photographed.

Future Scope

This catalogue will also be expanded to not only include the Bremer and south-west region, but also the Western Australian coast. There have been multiple sightings along the west coast of Australia, and with citizen science, we hope to add these to this growing catalogue. We are currently still going through photos donated to us of other sightings along the Western Australian coastline and hope to include these additions in the following editions.

Very little is known about the killer whale population in Australia. We are continuously collecting images to add to our ever-growing database and collaborate with colleagues. Citizen science is the key! Should you have any sighting information or images you would like to donate, please email becwellard@gmail.com.

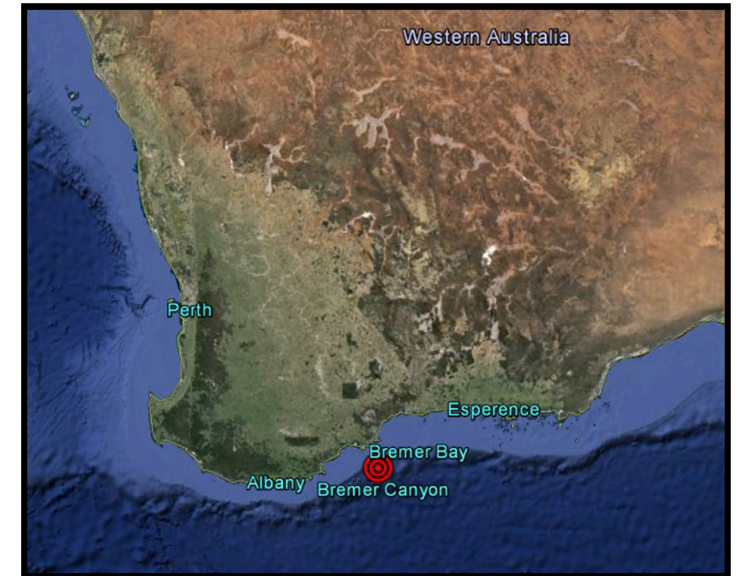


Photo-Identification

Photo-identification is a non-invasive technique that has been used by scientists around the world since the 1970's to study whale and dolphin populations. The basis of photo-identification is that each animal within a population is unique and has certain physical characteristics and distinctive markings which distinguish it from other individuals. Photo-identification helps obtain valuable information on the population demographics of the species, including group structure, site fidelity, movement patterns and population size.



Catalogue Key

Dorsal Fin

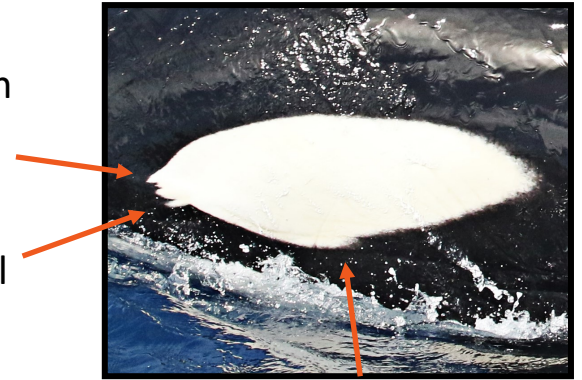
The dorsal fin is unique as a human's fingerprint, with each animal having different curvatures, nicks and notches. This catalogue uses features such as fin shape, tears, nicks and scars found on the dorsal fin as the primary method to identify individuals.

Saddle Patch

The saddle patch is the grey-white patch found directly behind the dorsal fin and can be used as a secondary feature for identification. Visibility and degree of shading can vary from animal to animal, with some individuals having no visible patch while others' are clear enough to see unique contrasting scars. The degree of shading, shape and scars on the saddle patch are used for identification.

Eye Patch

The white eyepatch found behind the killer whale's eye is also used for identification purposes. Each eyepatch is unique to an individual, and the eyepatch can be very helpful for identification if the animal has a 'clean' dorsal fin, i.e. the dorsal fin has no noticeable nicks and notches, or if there are no good-quality images of the dorsal fin and saddle patch.



Quality of Images for Identification

Each selected image is analysed and scored whether acceptable for identification. For photo-identification purposes, the image ideally should encompass:

- Both the dorsal fin and the entire saddle patch on a 90° angle
- Best sharpness, i.e. in focus
- Optimal light
- Optimal contrast
- Entire diagnostic feature (dorsal fin, saddle patch, eye patch must be visible)

If the image meets these criteria, it is then analysed for individual identification using the aforementioned diagnostic features.

Quality of Images for Identification

However, due to unfavourable weather conditions, poor light conditions, or briefness of encounters, such criteria cannot always be met, resulting in images of medium to poor quality. While these images may not be ideal for effective identification, highly distinctive features displayed by some individuals can be distinguishable and allow for positive identification. Hence, images of medium to poor quality have still been included in this catalogue, pending until more optimal images can be obtained from re-sightings of these individuals in the future.

To further assist with positive identification of individuals, and at times when we have not yet had the opportunity to photograph both left and right sides of the eyepatch, saddle patch and dorsal fin, we have included either multiple side photos or a whole body photo of the individual to display any distinctive features.



CATALOGUE



WA001 "COOKIE"



WA002 "EL NOTCHO"



WA003 "AKAMA"



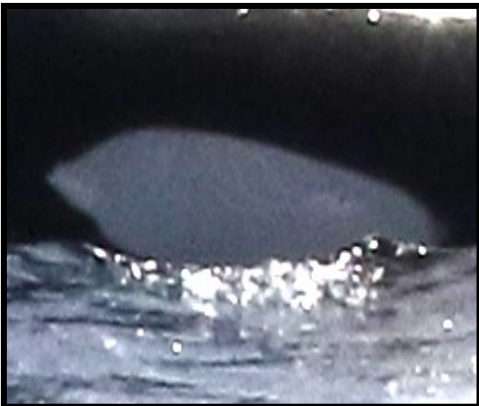
WA004 "OREO"



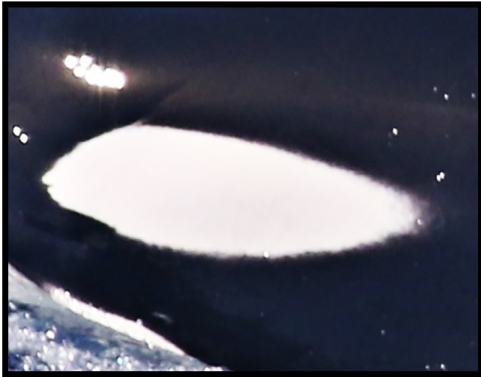
WA005 "KALIMNA"



WA006 "SPOCK"



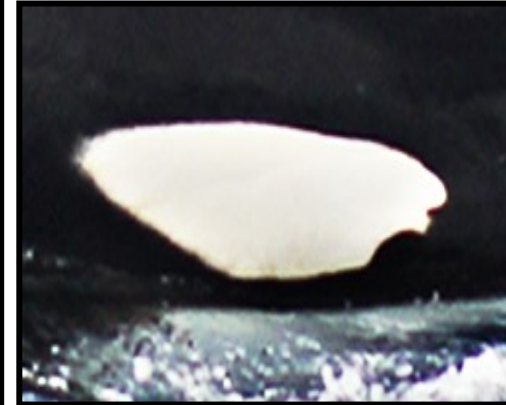
WA007 "SWIRL"



WA008 "SPLIT TIP"



WA009 "RAZOR"



WA010 "B-SLICE"



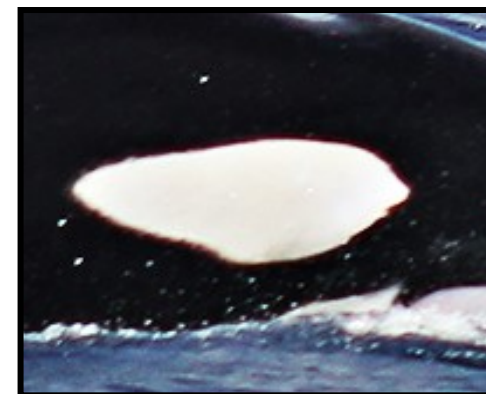
WA011 "CC"



WA012 "SHREDDER"



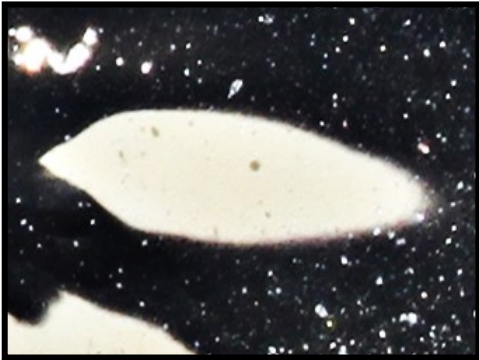
WA013 "DASH"



WA014 "MIA"



WA015 "DORITO"



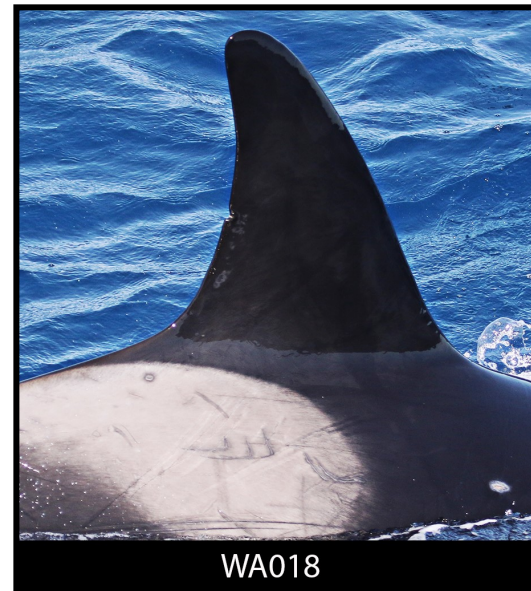
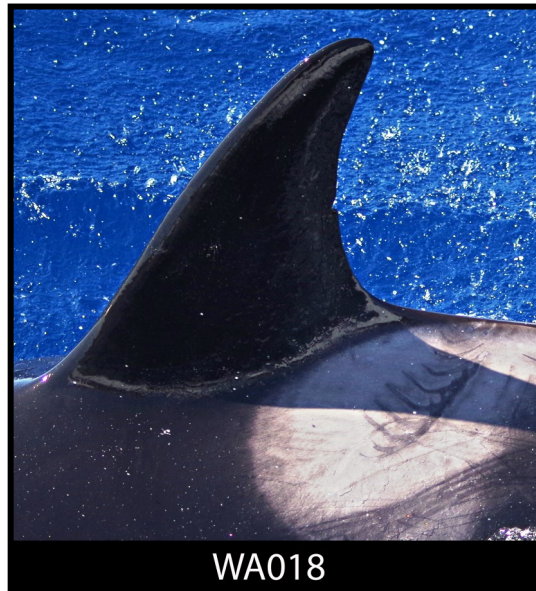
WA016 "SLUG"



WA017 "BIG-W"



WA018 "KIRRA"



WA019 "KODJA"



WA020 "TATTY"



WA021 "TRICKY"



WA021



WA021



WA022 "HOLEY"



WA022



WA022



WA023 "WASCO"



WA024 "KIDJI"



WA025 "MIRO"



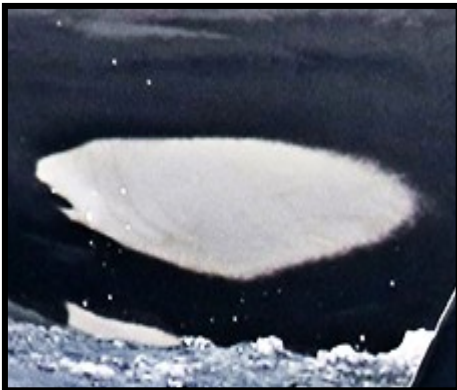
WA025



WA025



WA026 "FLAPPER"



WA026



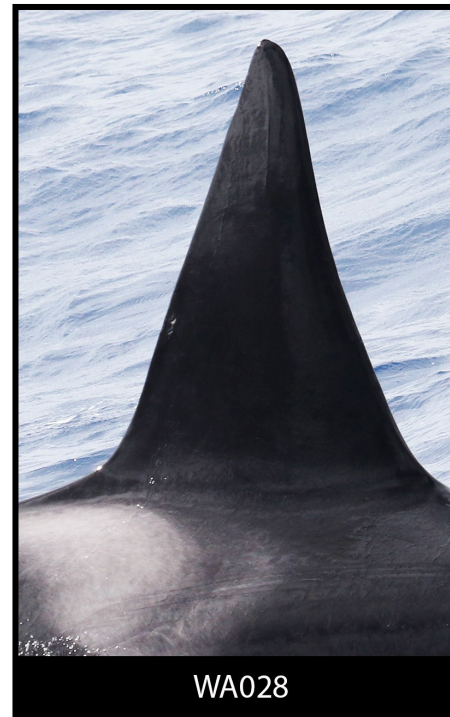
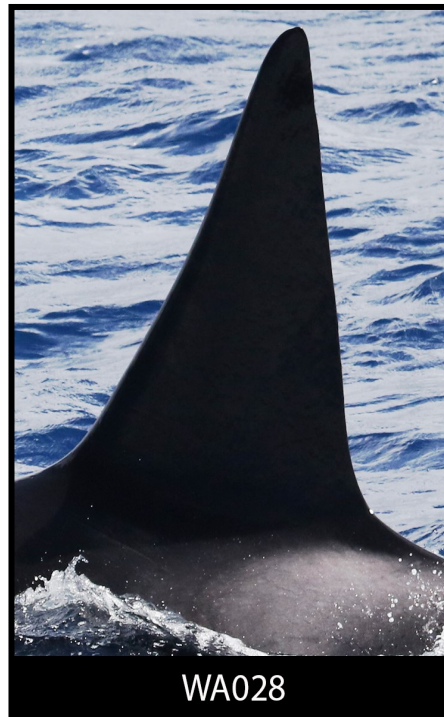
WA026



WA027 "LUCKY"



WA028 "CHALKY"



WA029 "PAINTBALL"



WA030



WA031 "CHOMP"



WA032 "JET"



WA033 "MALEKO"



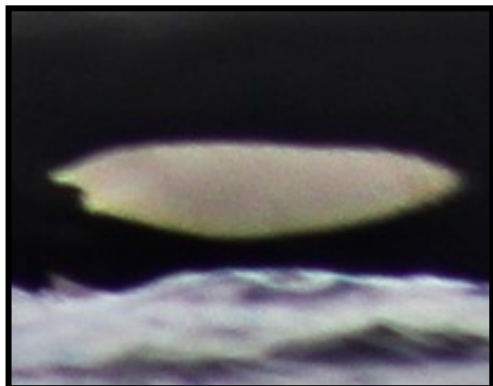
WA034 "LEONARDO"



WA035 "ECHO"



WA036





WA037 "BLACKBERRY"



WA037



WA037



WA038 "NANI"



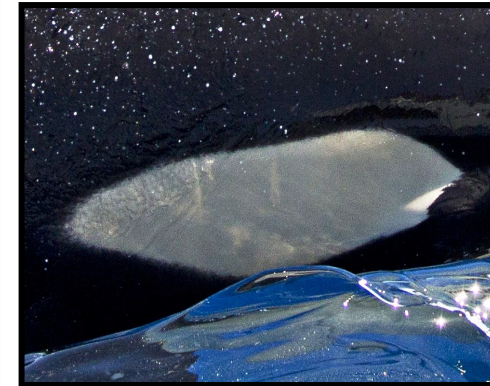
WA038



WA038



WA039 "ADINA"



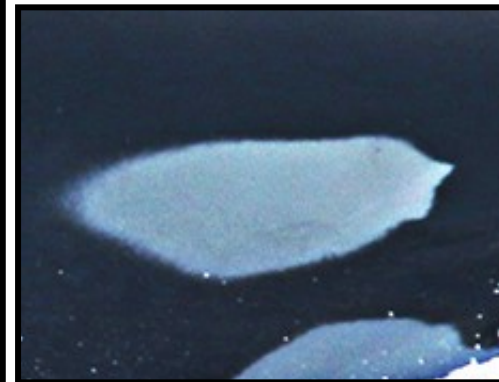
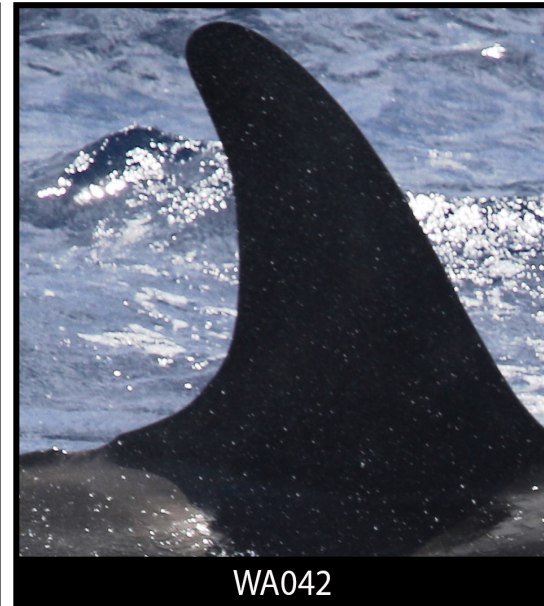
WA040 "NOOSA"



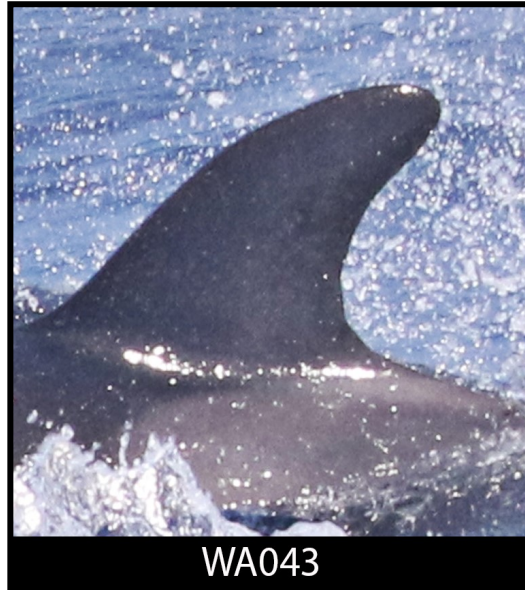
WA041 "URKEL"



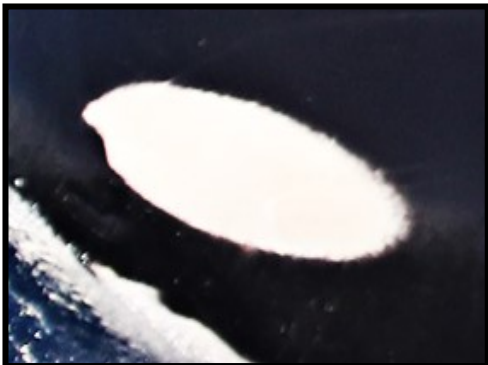
WA042 "NICKI"



WA043 "MADISON"



WA044 "STUMPY"



WA045 "MALIBU"



WA045



WA045

WA046 "BINDI"



WA046



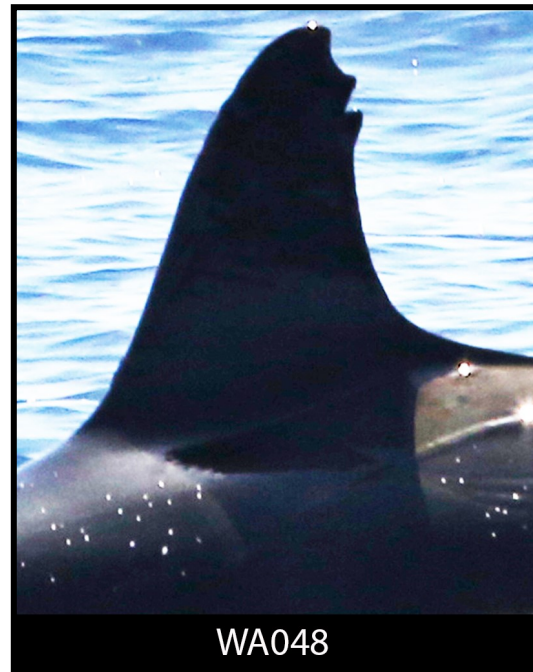
WA046



WA047 "SUPREME"



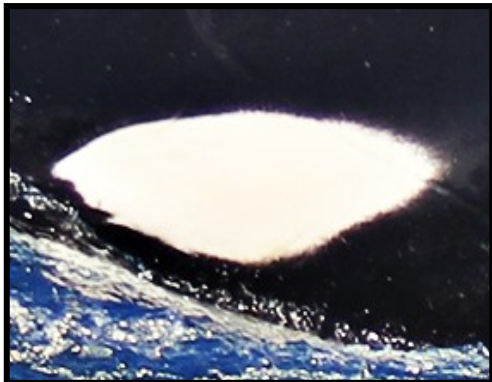
WA048 "SPICE"



WA049 "DOT"



WA050 "WONKS"



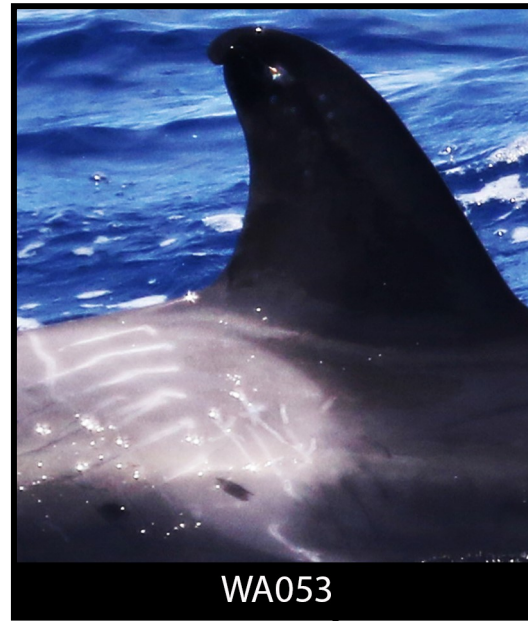
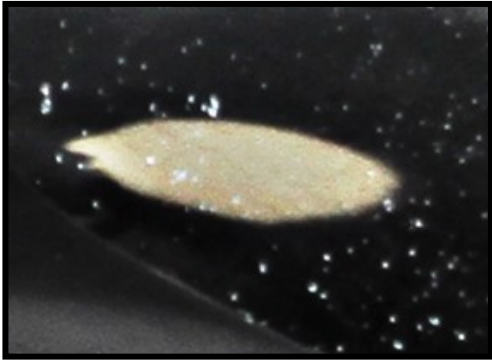
WA051 "MOON"



WA052 "ASHA"



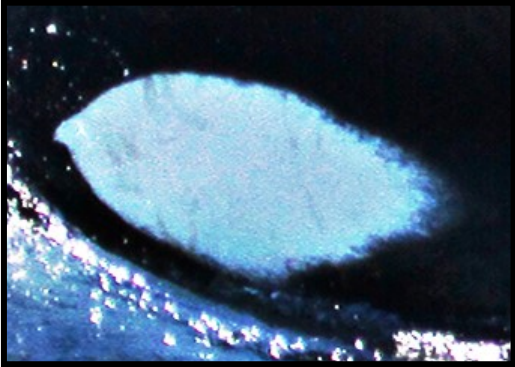
WA053 "BONKERS"



WA054 "IRWIN"



WA055 "BANJO"



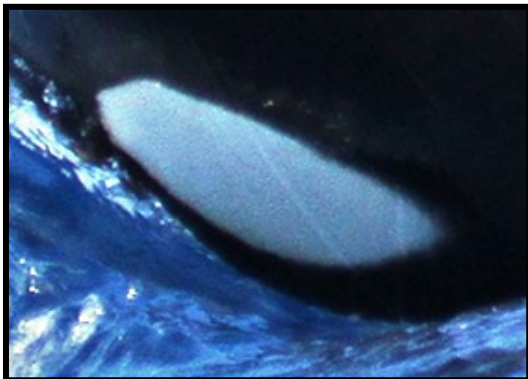
WA055



WA055



WA056 "BILLIE"



WA056



WA056



WA057 "ALKI"



WA058 "KWILANA"



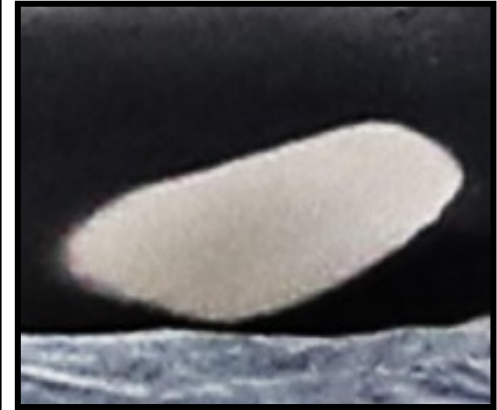
WA059 "BEAR"



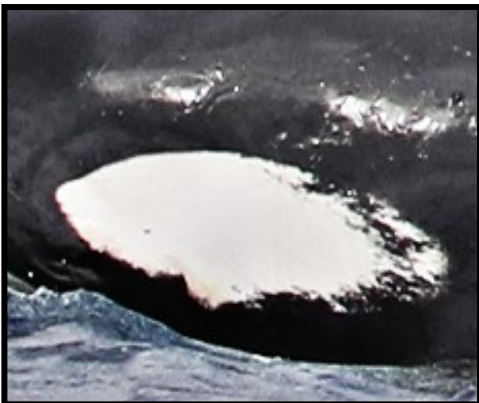
WA060 "JAGGER"



WA061 "JEDDA"



WA062 "PATCH"



WA063 "PICASSO"



WA064 "HERMES"



WA065



WA065



WA065



WA066



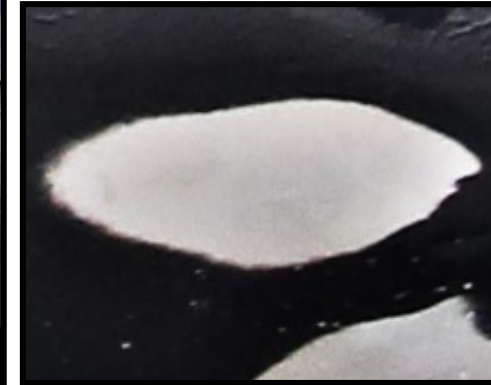
WA066



WA066



WA067



WA068 "KOOMBA"



WA069 "KAI"



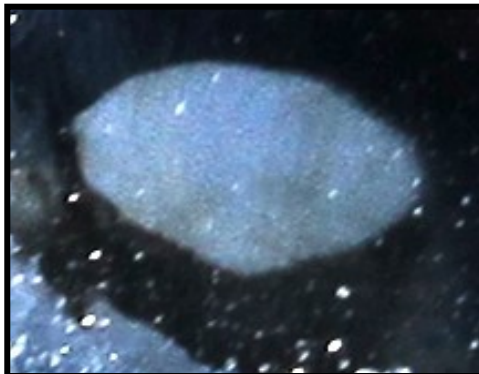
WA070



WA071



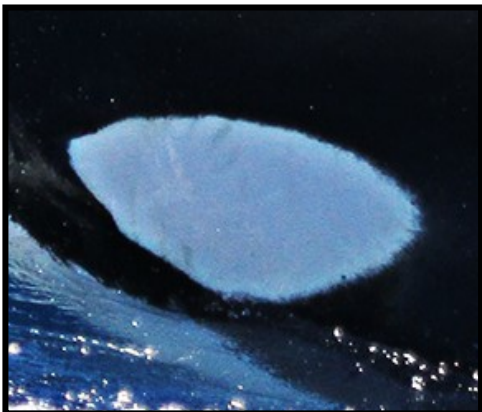
WA072



WA073 "TWOBITES"



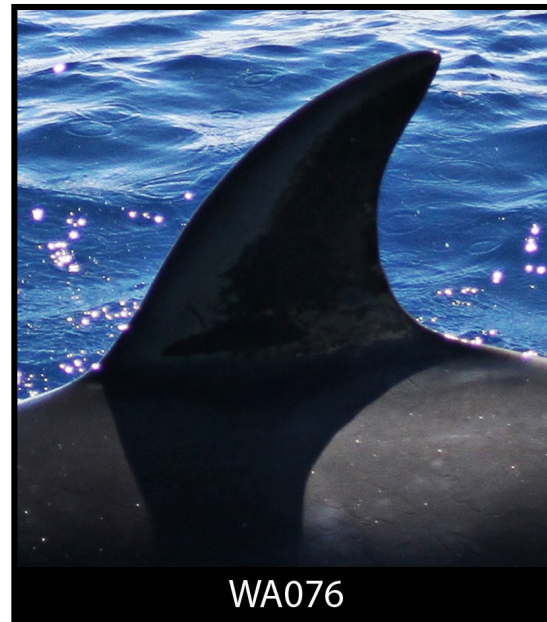
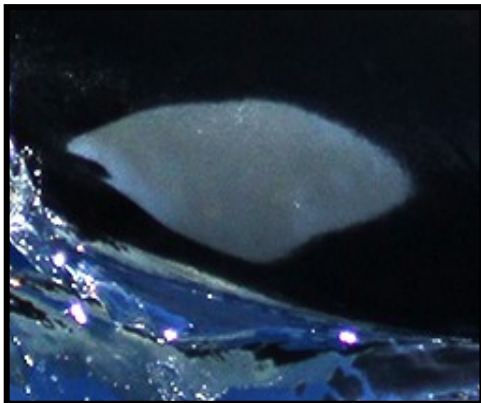
WA074 "EEVIE"



WA075 "SHELL"



WA076



WA077



WA078



WA079 "SLATER"



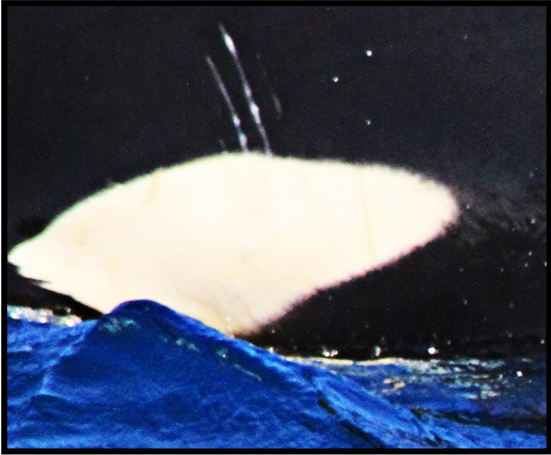
WA080





WA082 "THREE STRIPES"





WA083



WA083



WA084



WA084



WA085



WA085



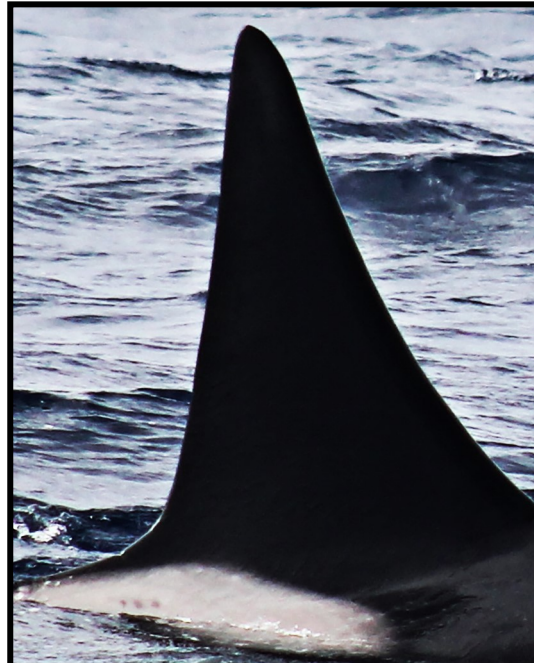
WA085



WA086 "MAKO"



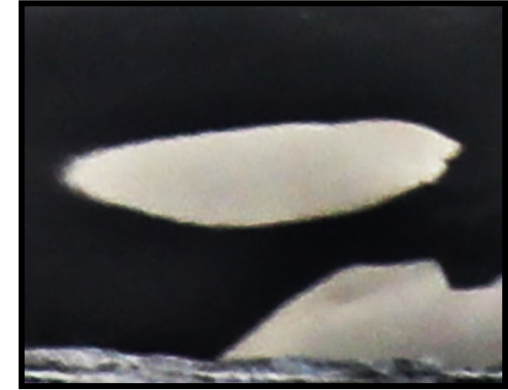
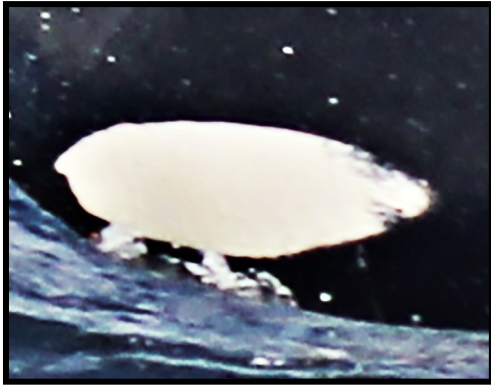
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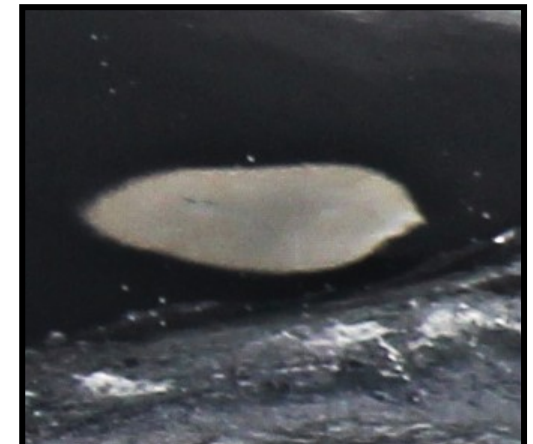
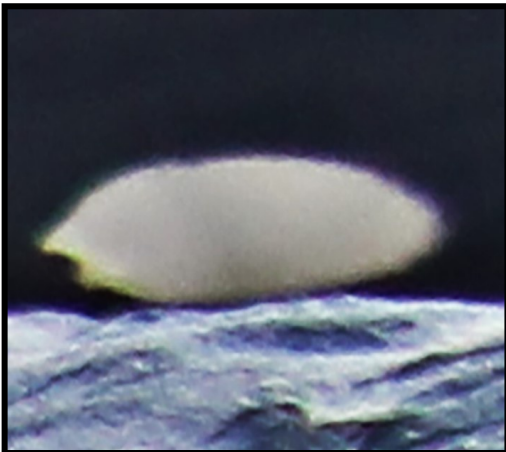
WA086



WA087



WA088



WA089 "TARNI"



WA090 "HOOKFIN"



WA091

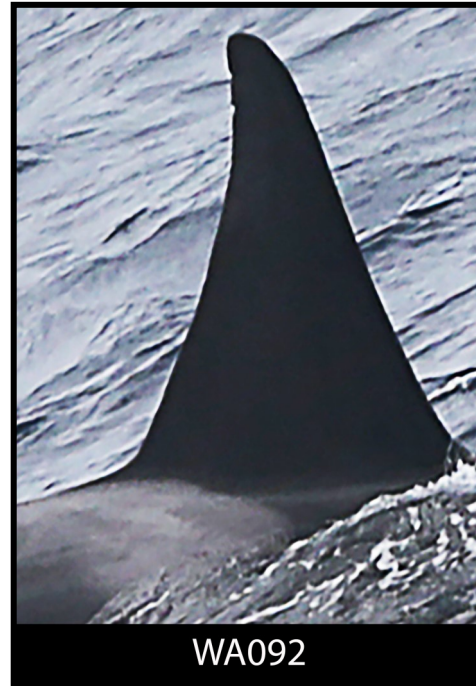


WA091

WA092



WA092

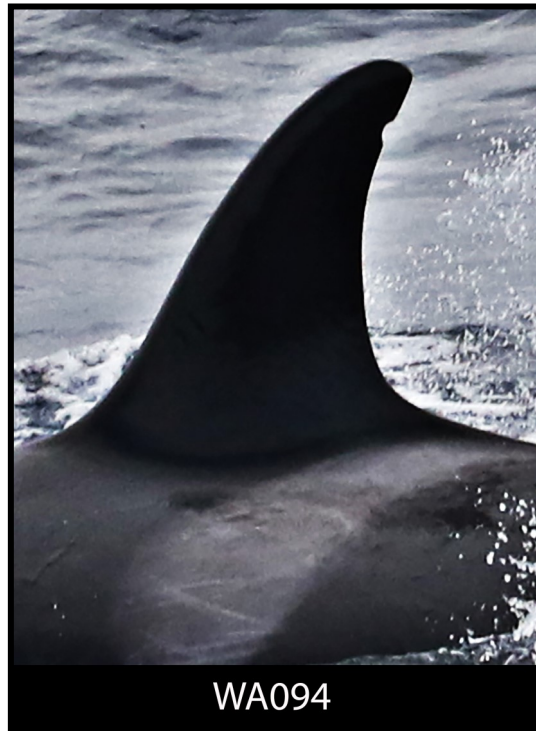
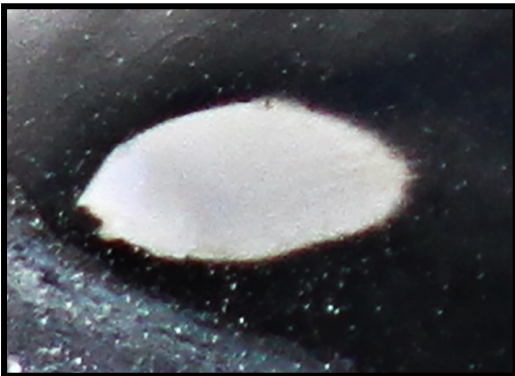


WA092

WA093 "JANDAMARRA"



WA094

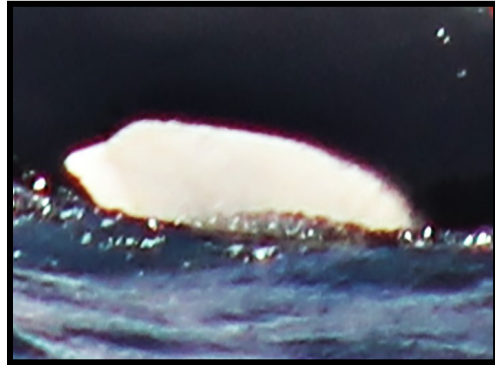




WA096



WA097



WA097



WA097

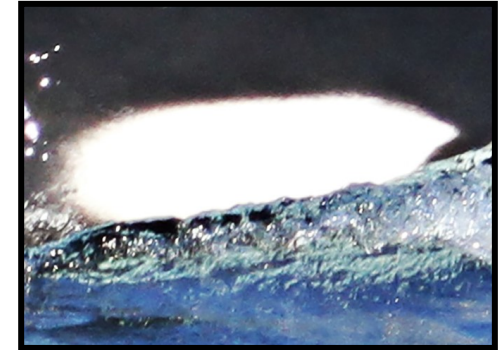
WA098



WA098



WA099



WA100



WA101 "SPOT"



WA102



Acknowledgements

Project O.R.C.A. and CMST, Curtin University, would like to acknowledge and thank all contributors, collaborators, supporters and citizen scientists. Whether it was the donation of photos, time, resources, or boat space - all is appreciated. Observations in 2015 and 2016 were made on Naturaliste Charters' ecotourism vessel, and 2018 on Whale Watch Western Australia's vessel, without whom many of these photos could not have been taken.

Thank-you to Kylie Bracknell for her assistance in correcting the use of Noongar language in this catalogue. Noongar is the official language of the Aboriginal people of the south-west of Western Australia, and to show our respect to their heritage, we have used the Noongar language to name some of the killer whales seen in this region.

Volunteers, whether assisting in the field or in the office, are highly valued and their hard work and enthusiasm is greatly appreciated. Thank-you to all our volunteers: Ashleigh Roddick, Emily Evans, Zoe Gillam, Claire Charlton, Alexa Hasselman, Elise Godwin, Ciara Browne and Elisa Chillingworth.





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Keith Lightbody

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David Donnelly, Killer Whales Australia

Shaun Wilson, Michelle Blewitt, Daniel Mantle, Plaxy Barratt

Whale Watch Western Australia and crew

Naturaliste Charters team and crew

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