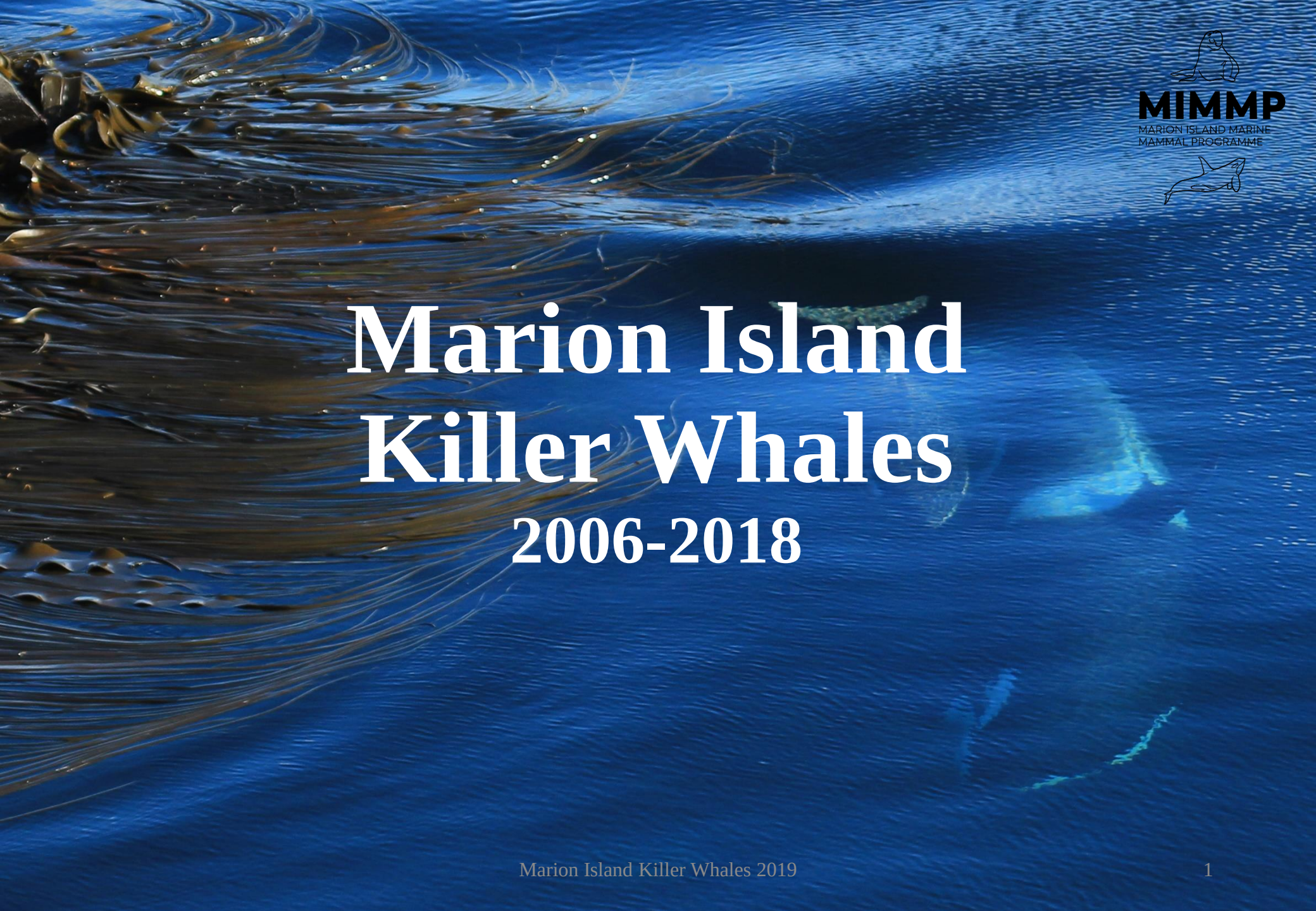

MIMMP
MARION ISLAND MARINE MAMMAL PROGRAMME

Marion Island Killer Whales
2006-2018

Marion Island Killer Whales 2006-2018

Rowan K Jordaan, Ryan R Reisinger & PJ Nico de Bruyn

2019

Mammal Research Institute

Department of Zoology and Entomology

University of Pretoria

www.marionseals.com

MIMMP

MARION ISLAND MARINE MAMMAL PROGRAMME

Contents

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Mammal Research Institute

South African National Antarctic Programme
SANAP
understand, develop, conserve

Southern Ocean Research Partnership

صندوق محمد بن زايد
للمحافظة على الكائنات الحية
The Mohamed bin Zayed SPECIES CONSERVATION FUND

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Introduction

Marion Island, along with Prince Edward Island, make up the Prince Edward Island archipelago, a seemingly insignificant group of islands in the Southern Ocean. Marion Island (30 000 ha) is larger than Prince Edward Island (4500 ha) and both are approximately 1 800 km south east of Cape Town. The islands are the breeding homes to millions of seals and seabirds and therefore extremely important. Some of the animals supported by these islands include southern elephant seals, Subantarctic and Arctic fur seals and king, macaroni, rockhopper and Gentoo penguins. These are of particular importance as they attract and provide food for killer whales, the oceans apex predators.

Killer whales are the most widespread non-human mammals on earth. They have been recorded in every sea and ocean and are known to predate on over 140 different species. This distribution and diet is accompanied with highly adaptable behaviour that they use to exploit resources other mammals cannot. Killer whales have complex social groups that are vital for protection, learning, hunting and breeding. They have large energy requirements, weigh up

to 6 600 kg, males measure up to 9 m long and females 7,7 m. Killer whales may therefore have a extremely strong influence on marine ecosystems.

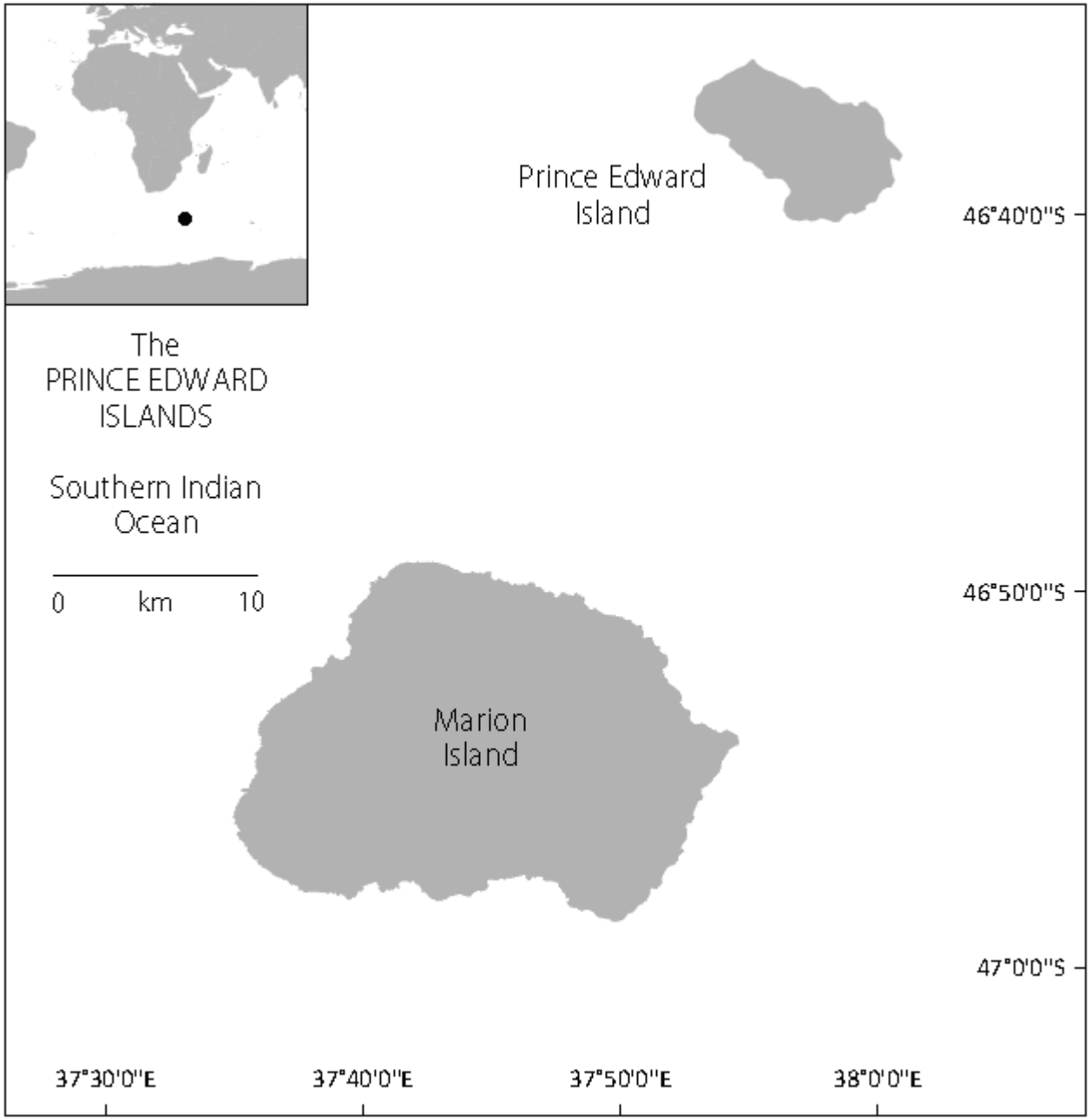
At Marion Island, the presence of killer whales is greatest during the summer months as this is when seals and penguins breed on the island. The leeward eastern coast of Marion attracts the most seals and penguins making it the most patrolled area by the killer whales. Whales are often seen moving close to the shore and waiting in ambush in the shallows of beaches for any unsuspecting prey. Elephant seals are presumably the most preferred prey item as they have high fat contents making them energy-rich. They have also been recorded taking Subantarct fur seal pups as well as all four of the penguin species recorded at the island namely king, rockhopper, Gentoo and macaroni penguins. Interestingly, adult fur seals are ignored entirely most probably due to their lower fat content and greater mobility in the water.

Group composition is relatively stable as killer whales are highly matrilineal societies. Offspring typically remain associated with their mothers their entire lives unless groups are energetically constrained causing them to temporarily, or sometimes permanently, disperse. Groups of 3 are most commonly encountered although group size varies throughout the year. Similarly, some killer whales are present at the island year round whilst others only visit yearly during the summer months. Details on where the whales go when they leave the island are sparse although it is known that eight of Marion Island's individuals visit the Crozet Islands (the closest landmass to Marion Island, some 950 km to the east). Evidence suggests that killer whales feed on Patagonian toothfish when they are not at

Marion. These are sometimes ‘stolen’ from longliners operating within the Crozet Islands’ Exclusive Economic Zone where where an estimated catch of 27% is lost to the whales.

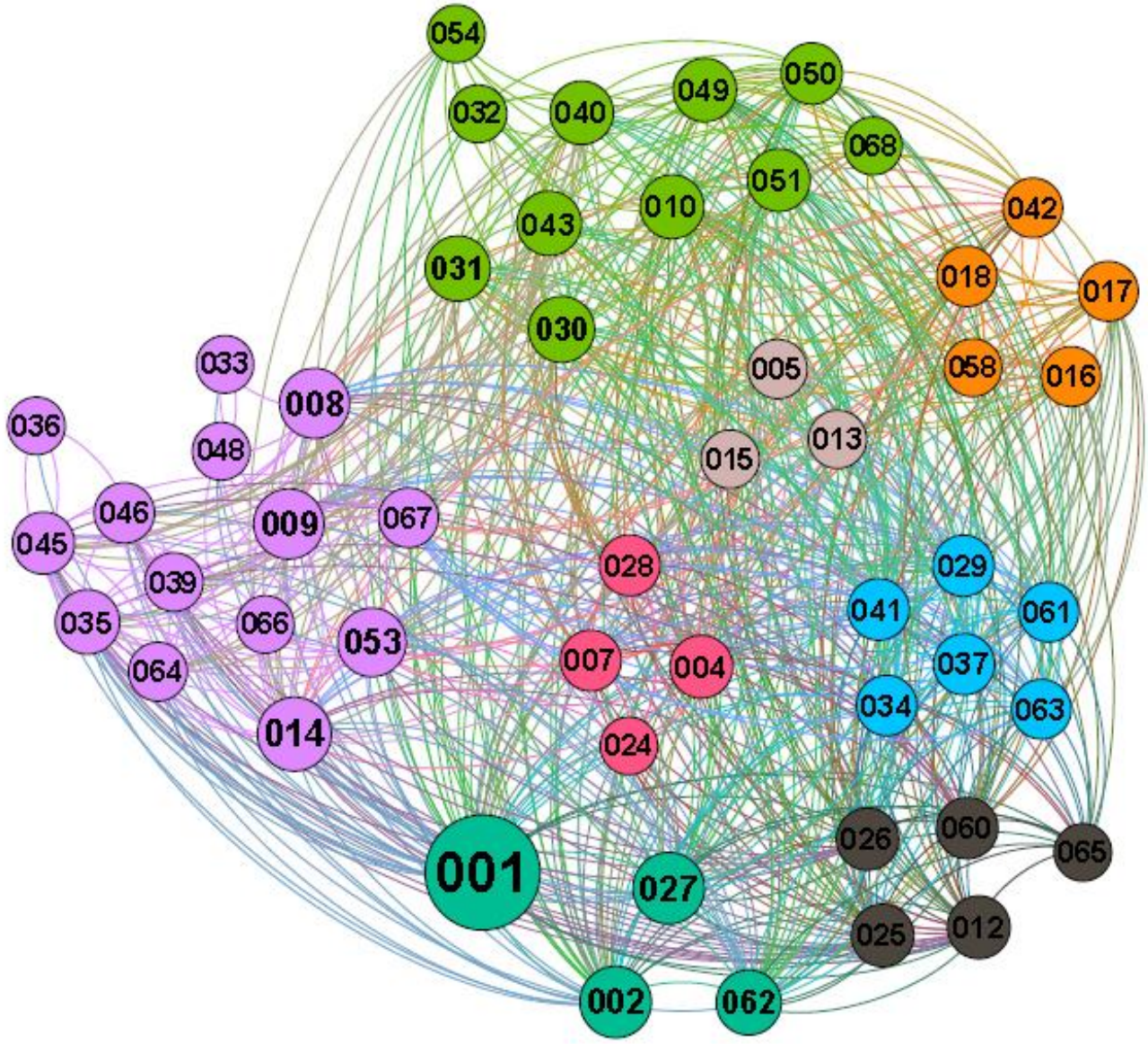
Long-term killer whale identification datasets have been made possible through insight by the late Michael Biggs. Biggs noted that individuals can be reliably identified through unique natural markings such as scars, mutilations and colouring of their dorsal fins and saddle patches. It was only in 2006 when the Mammal Research Institute started intensive research on killer whales at Marion and compiled a comprehensive photographic catalogue. The catalogue now represents 70 individuals showcasing the efforts of dedicated Mammal Research Institute field assistants namely Sealers and Whalers.

Uniquely, all the killer whale work conducted on Marion is shore based. This has not proved to be a limitation as the research outputs arising from this project are held highly in the global science community. To date, this database has been used to estimate the size of the population at Marion and its social organisation. This is in addition to other research based on genetics, diet and tracking. Future research aims to focus on the population’s demography which will facilitate comparisons with other populations. One of these will be the ‘resident’ killer whale population in the Northeast Pacific where killer whales survive up to ages of 90. The deployment of satellite tags and collection of biopsy samples will continue as there are still many questions that need to be answered regarding the offshore ecology of Marion’s killer whales.


Prince Edward
Island
46°40'0"S
The
PRINCE EDWARD
ISLANDS
Southern Indian
Ocean
0 km 10
46°50'0"S
Marion
Island
47°0'0"S
37°30'0"E
37°40'0"E
37°50'0"E
38°0'0"E

Association network

Each node (coloured circle) represents an animal and each vertex (line between two nodes) represents the association between two animals. The larger the node, the more social the individual. Individuals are divided into social units (different colours) using a community detection algorithm.



Key

Dorsal fin ID image

Unique ID
Name
Age-sex class

M002
Linus
Adult female
~ 2018

Known (solid line) or presumed (dashed line) mother-offspring relationship

An M prefix indicates Marion Island. Eight individuals have been sighted at the Crozet Islands as well as Marion; they additionally have a Crozet ID, indicated with a C prefix.

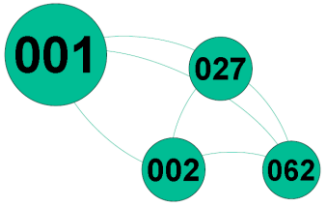
Year last seen if presumed dead

M027
Seabiscuit
Subadult female
2008 -

Year of birth and death

Sub-network representing the social unit.

Each node (coloured circle) represents an animal and each vertex (line between two nodes) represents the association between two animals. The complete network is shown on page 11.



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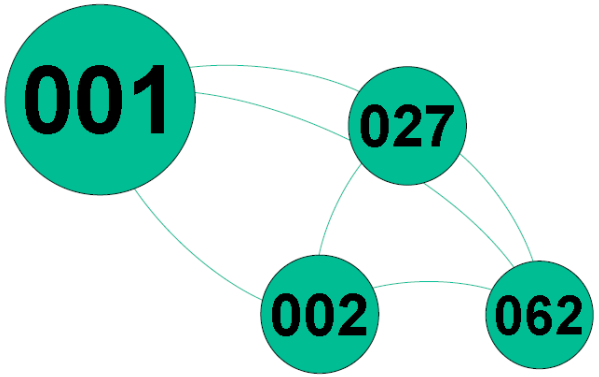
Part 1

Frequently observed individuals

M001
Halfmoon
Adult male

M002
Linus
Adult female
~ 2018



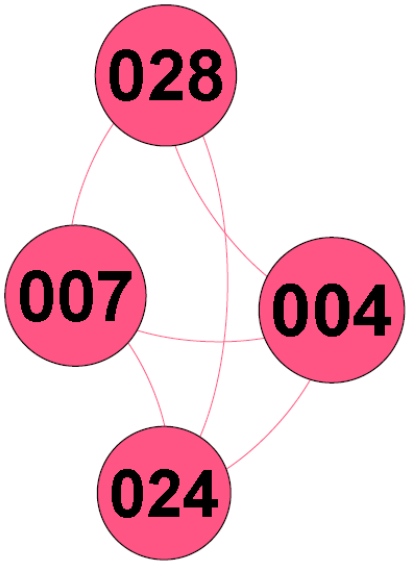
M062
Ella
Juvenile
2014 -

M027
Seabiscuit
Subadult female
2008 -

M028
Ink
Adult female
~ 2016

M007
Max
Adult male

M004
Dot
Adult female



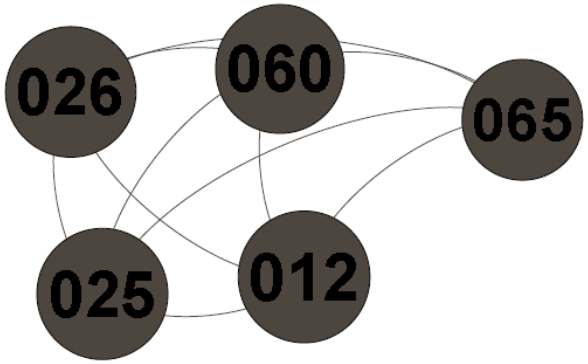
M024
David
Juvenile
2008 - 2012

M012
Valentine
Adult female

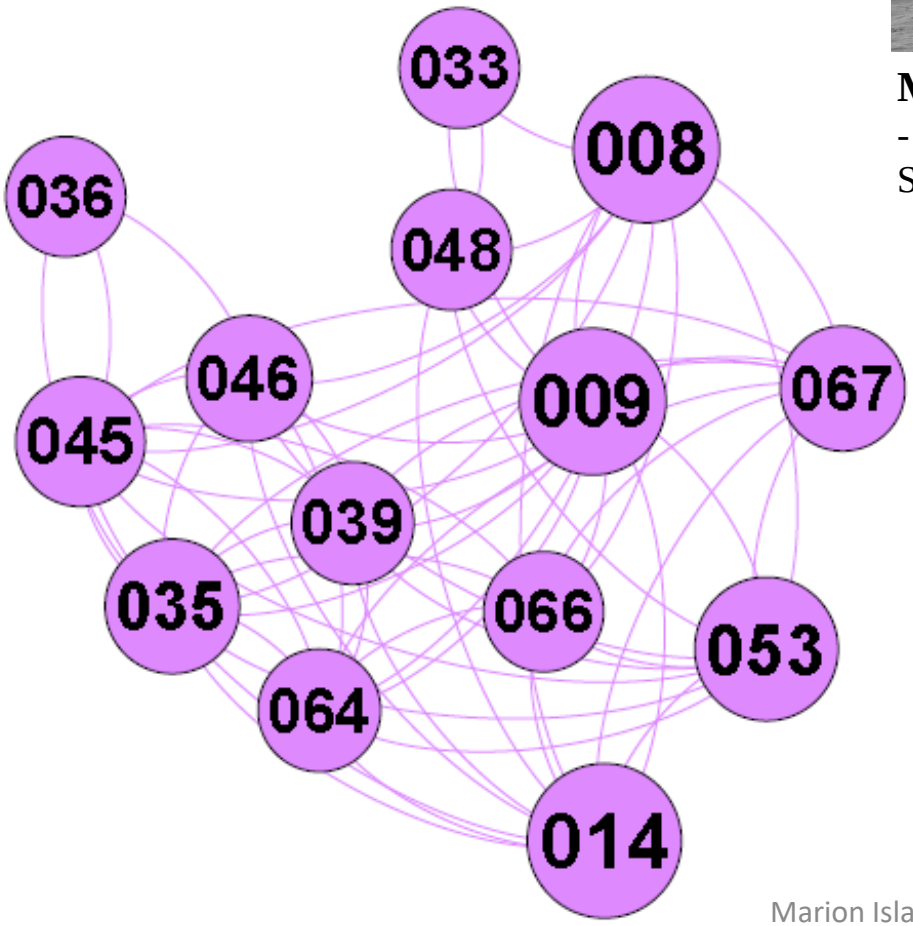
M025
Agent 25
Subadult

M026
O'Neill
Adult female

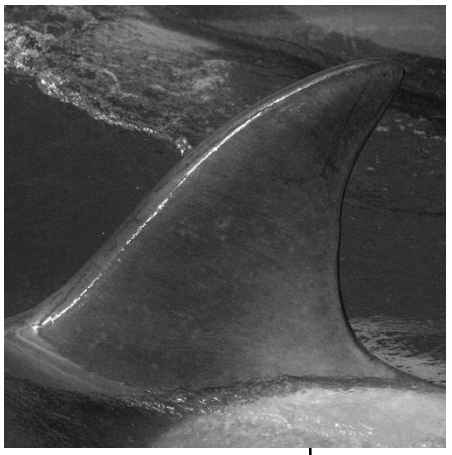
M060
Griffin
Juvenile
2013 -



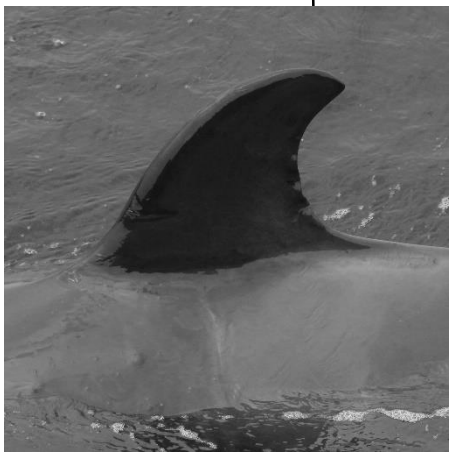
M065
Peanut
Calf
2015 - 2016



M053
-
Subadult



M014
Scratches
Adult female



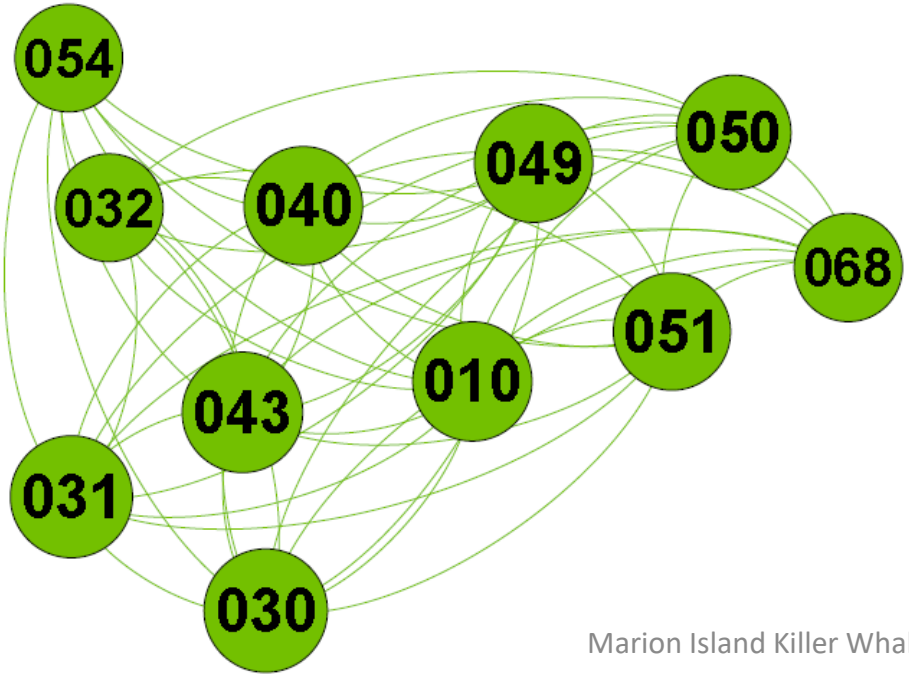
M066
Ringo
Calf
2017 -

M040
Bullseye
Subadult

M030
Top Notch
Adult male

M031
Bent
Adult female

M043
BJ
Subadult



M010
Bruce
Adult male

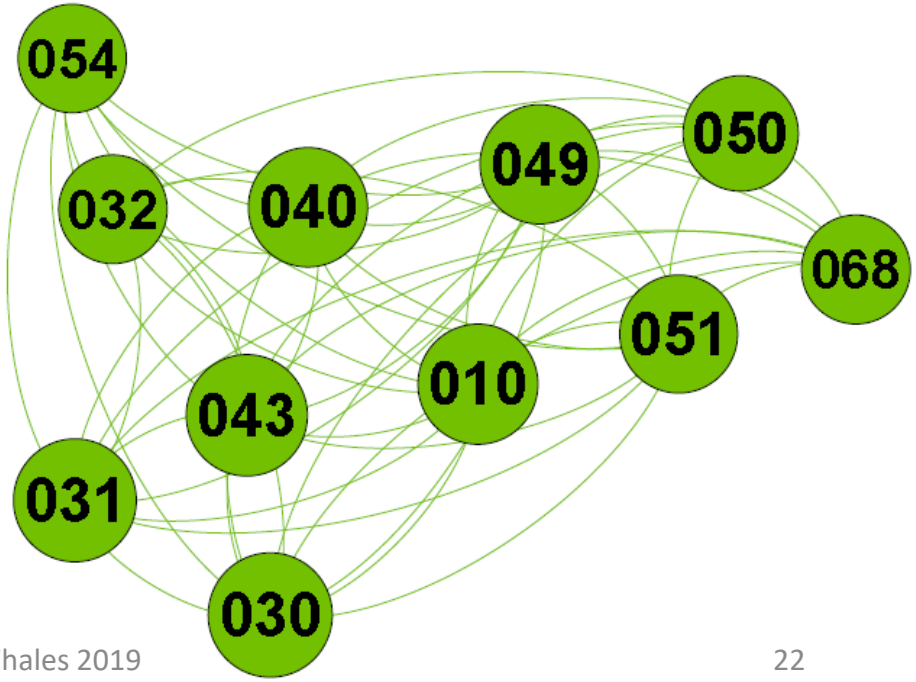
M049
Angle Fin
Adult female

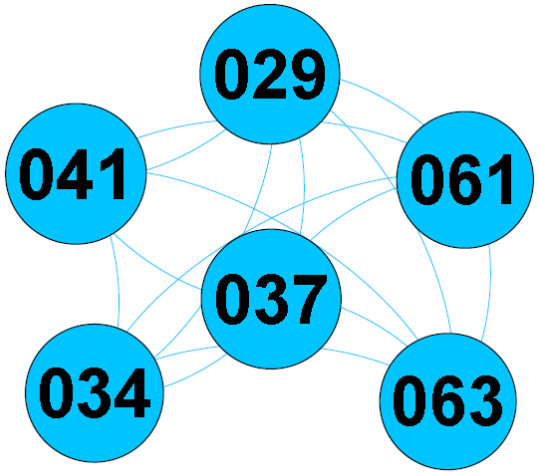
M032
-
Adult female
~ 2009

M054
-
Subadult
~ 2009

M050
Dent
Adult female

M051
-
Adult





M037
Titus
Adult female

M029
Ebony
Adult female

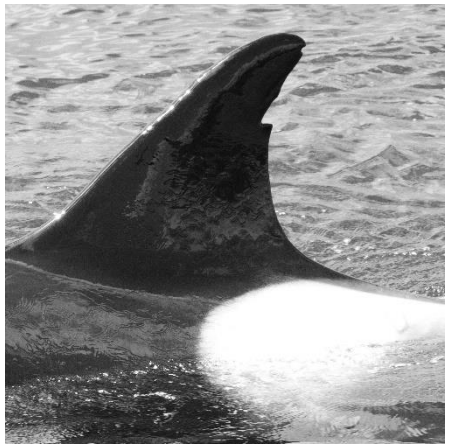
M063
Jaws
Juvenile
2014 -

M041
Magnum
Subadult

M034
Ivory
Subadult
2008 -

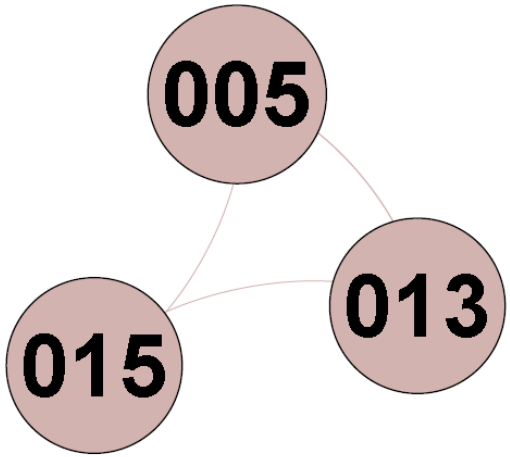
M061
Panda
Juvenile Male
2014 -

M005
Atlas
Adult male

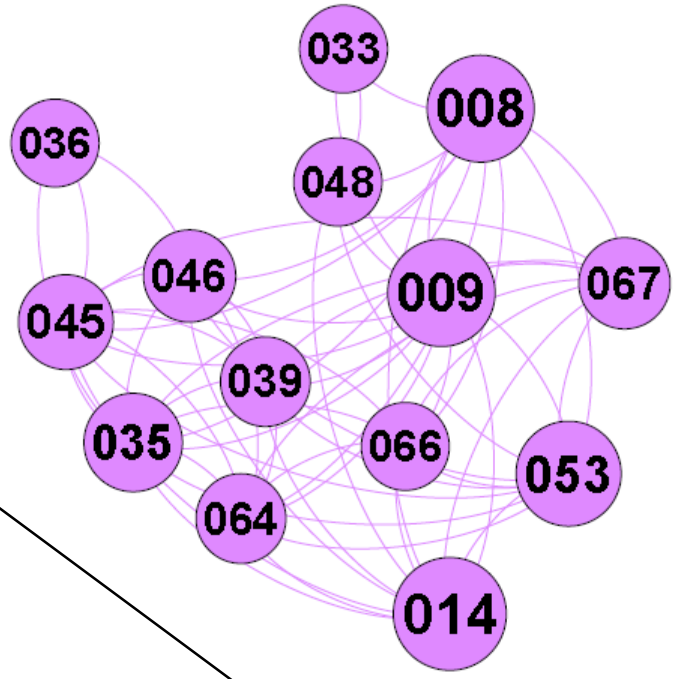


M013
Blade
Adult female

M015
Clymene
Adult female
~ 2015



M035
Supernova
Adult female



M045
Sirius
Adult female

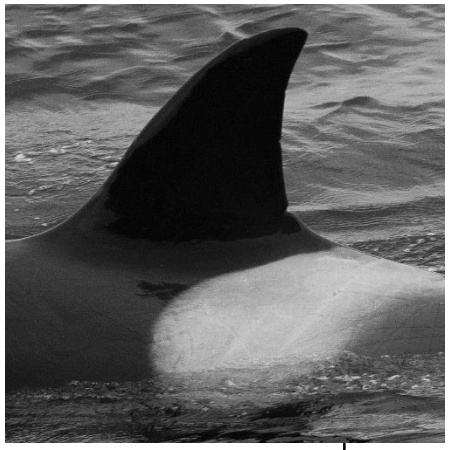
M039
Nova
Juvenile

M064
Shaula
Juvenile
2014 -

M046
Jackson
Subadult

Part 2

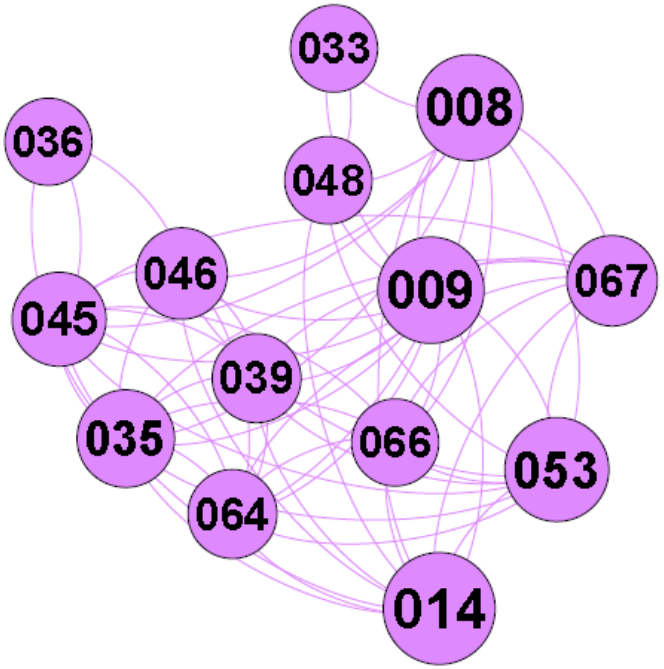
Marion Island/Crozet Islands



M033/C160
Phoenix
Adult female
~ 2013

M048
Jasper
Juvenile
2012 - 2015

M008/C134
Poseidon
Adult male

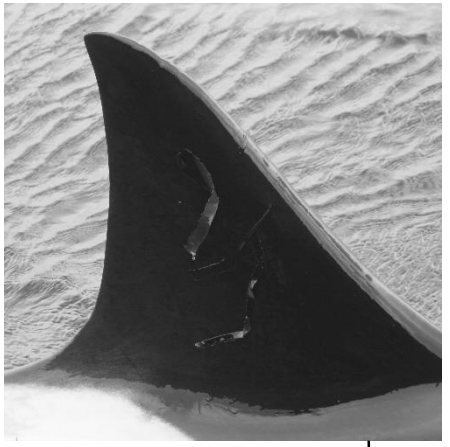


M009/C159
Razor
Adult female

M067
Nimrod
Calf
2017 -

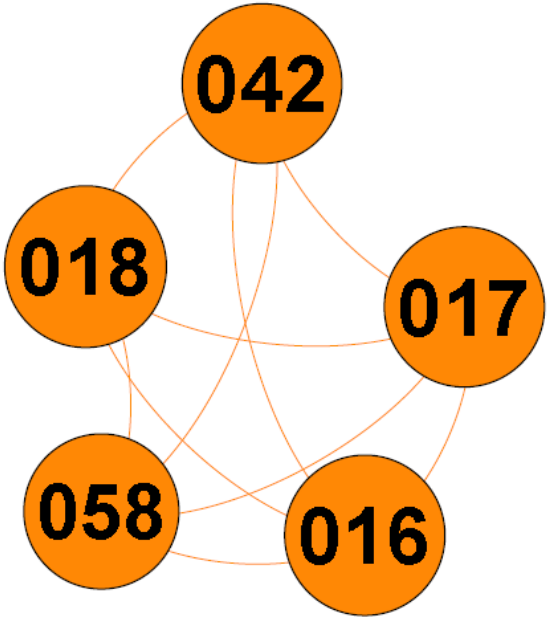
M018/C119
Aishah
Adult female

M016/C025
Hercules
Adult male



M017/C127
Xena
Adult female

M042/C188
Shahkhan
Juvenile
2009 -



M058
-
Calf
2013 - 2015

Part 3

Infrequently observed individuals

M003
-
-
~ 2007

M006
Harriet
Adult female
~ 2006

M011
Michael
Adult male
~ 2006

M019
-
Adult male
~ 2006

M020
-
Adult female
~ 2007

M021
-
Subadult
~ 2007

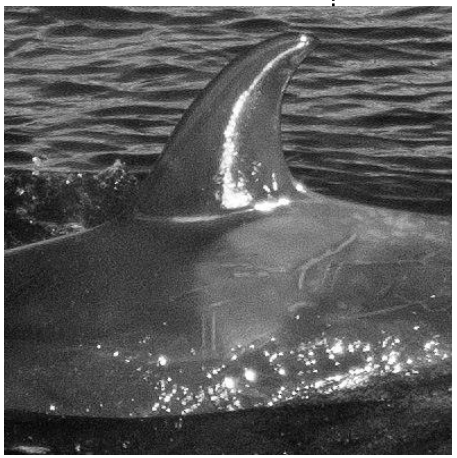
M023/C012
-
Adult female
~ 2012

M036
Rake
Adult male
~ 2016

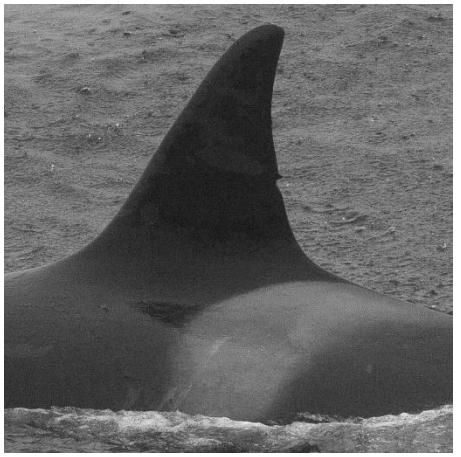
M022
-
Adult female
~ 2008

M038
-
Subadult
2008 –
~ 2008

M055
-
Adult female
~ 2010



M056
-
Subadult
~ 2010



M047
-
Adult female
~ 2011

M057
-
Adult male
~ 2008

M059
-
Adult male
~ 2012

Part 4

New individuals

M068

-

Juvenile
Seen with:
M049 et al in 2013
M017 in 2014
M049 et al in 2017 & 2018

M069

-

Adult male
Seen with M016 in 2014

Index of individuals

Index of individuals continued