Scottish Killer Whale Photo Identification Catalogue 2021

Andrew J Scullion Hugh R Harrop Karen Munro Steve R Truluck Andrew D Foote

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Above: Female 015 (foreground) 2009. Photograph: Andy Foote

Front Cover: Males W008 Aquarius (left) and W001 John Coe (right). Photograph: Steve Truluck, 2019

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Contacts

Andrew Scullion - orca.survey.scotland@gmail.com
Hugh Harrop - info@shetlandwildlife.co.uk
Karen Munro - kasmunro2@aol.com
Steve Truluck - stevetruluckatsea@gmail.com

Preface

In 2006, I started my PhD at the University of Aberdeen investigating the population structure of killer whales in the Northeast Atlantic. As part of that study I wanted to compare the photo identification catalogues between Iceland and Norway. Scotland was an obvious location to try to add to this comparison; killer whales were occasionally sighted around Scotland, but very little was known about them and there was no photo ID catalogue. As a first step I travelled around the North coast of Scotland and to Shetland giving talks on the aims of the study, hoping to find out more about the whales (when and where they are most frequently sighted) from the local communities and to engage them to send me any photographs that could be used for photo ID.

It was during these talks that I first met Karen Munro in Thurso, and members of the Shetland Sea Mammal Group, including Hugh Harrop. It was a great learning experience and it was clear that in a good year (and 2006 had been just such a year in Shetland), there could be several sightings of killer whales close enough to shore to get ID photos from land. Furthermore, photographs taken by Caithness-based photographer Keith Parkes off Stroma in 2005 made available for my PhD studies showed that 'Citizen Science' data could be used for photo identification. That encounter photographed by Keith included the 19s and 15s groups hunting together and provided the first basis to start a make-shift Scottish photo identification catalogue.

It was through the support of Paul Harvey of the Shetland Biological Records Centre and Karen Hall of Scottish Natural Heritage, that the project was able to progress towards dedicated field work. In 2007, myself and Masters student Harriet Bolt tried a reconnaissance land-based summer field season on Shetland. On our last day, we caught our only glimpse of killer whales in the distance from the Yell Sound ferry. The experience highlighted the difficulty of running a land-based study on a complex archipelago such as Shetland, but it did provide invaluable experience of the geography of Shetland and built important bonds with the local community that were to play a crucial role in future fieldwork.

In 2008 and 2009 we returned to Shetland with a bigger budget and a crucial upgrade: a boat! Funded by the Carnegie Trust, Marine Scotland, Scottish Natural Heritage, Shetland Amenity Trust and NorthLink Ferries we were able to spend the summer months looking for whales. Towing a state-of-the-art RIB, which was coastguard certified for offshore waters, we were able to launch at the nearest slipway when we had a sighting. The field work was co-led by Dr Volker Deecke from the Sea Mammal Research Unit, who was hoping to collect the first sound recordings of Scottish killer whales using a hydrophone towed behind the boat. We put posters all around Shetland and appealed through the Shetland Times and local radio asking people to call us if they saw killer whales. It was this community response that resulted in most of the encounters that we had in 2008 and 2009. Thanks once again to the community of Shetlanders the field seasons were a success.

The photo identification data collected during boat-based fieldwork has some important differences to the citizen science photographic data collected from land. Typically, we were able to stay with the whales for up to four hours (working under a research permit) and collect hundreds of photographs of each individual present in the group on their left and right sides. Thus, a dedicated boat-based encounter typically results in a complete high quality photographic record of all individuals within a group. In contrast, land-based photographs are constrained by the proximity, the speed and the direction of travel of the whales, and typically result in an incomplete photographic

record. However, the citizen science photographs taken from land have the advantage of covering a much greater geographic range than a dedicated research team. Therefore, the dedicated photo identification data provided the backbone of the 2009 photo identification catalogue, but the citizen science data was crucial for the bigger picture of the biology of these whales.

By 2008 we were receiving photos on a regular basis from the public. The hundreds of photographs sent by the citizen scientists from dozens of encounters allowed us to quantify movement patterns between areas, estimate site fidelity and residency to an area, estimate the strength of social associations between individuals within a group, and to ultimately monitor the demographics of the local community of killer whales.

This work resulted in several scientific papers published in peer-reviewed journals. Here is a summary of our key findings:

- There is a summer peak in sightings coinciding with the harbour seal pupping season and up to an estimated eight hundred seals would need to be consumed annually to support the whales during this season (Bolt *et al.* 2009).
- There is annual movement by some groups between Iceland and Scotland, in which these individuals apparently switch from feeding upon herring around Iceland to feeding at least partially upon seals in Scottish waters (Samarra and Foote 2015).
- The analysis of acoustic data by Dr Volker Deecke highlighted that the whales typically hunt in silence in Shetland waters, but some groups recorded offshore while feeding on herring were highly vocal (Deecke *et al.* 2011).
- Groups exhibit a relatively stable social structure, with individuals preferentially associating with the same group members over several years and forming groups of an average size of five individuals, hypothesised to maximise dietary intake while hunting seals (Beck *et al.* 2012). Social structure is much more fluid even over short timescales on the herring grounds in Iceland (Tavares *et al.* 2017).

During the years conducting fieldwork around Shetland, I also had the opportunity to go offshore during the mackerel fishery with skipper George Anderson and the crew of the Adenia out of Whalsay. Large groups of killer whales could be seen and, in some cases photographed, feeding close to the fishing vessels. Again photo identification played a key role in identifying that these groups appear to be distinct from those that are regularly seen close to shore. Comparing photographs with the long-term dataset collated by the Hebridean Whale and Dolphin Trust (HWDT) revealed that a core set of 10 individuals, all of which were linked through association patterns, were never seen in association with any other killer whales. Gradually a picture formed that this group was isolated and in decline. Taken together, these observations highlight that Scottish waters appear to be home to more than one population of killer whales.

Subsequent to finishing my PhD in 2010, I have become increasingly focused on genetic studies and unable to work on analysing photo identification data. However, during this time the rapid growth of social media has become a key factor in the maintenance of the photo identification record by the local communities. Local naturalists, wildlife guides and photographers working together as an online community are able to track the movements of individuals real-time in an unprecedented manner – something not possible when I was undertaking my PhD. As such, this new digital era has the potential to reveal new insights into the behaviour and ecology of this

community of killer whales.

Many local naturalists are now better able than me to identify individual killer whales, arguably none more so than Hugh Harrop of Shetland Wildlife, Karen Munro from Caithness, Andrew Scullion from Orca Survey Scotland and Steve Truluck from Hebridean Whale Cruises. All four are passionate naturalists and talented wildlife photographers and dedicate a significant amount of their time to surveying for whales in Shetland, Caithness, Sutherland, Moray and the Hebrides. Between them they have collated a valuable continuation of the photo identification record of this community of killer whales that is already proving an invaluable resource for the next generation of marine biologists.

Lucy Herbert and Victoria Pace, students at Bangor University, have been analysing the photographs of Hugh, Karen and others to estimate how movement and social affiliations among the whales have changed over the last decade as part of their dissertation projects. Thanks to funding from the Bangor Fund, they were able to visit Dr Filipa Samarra at the Marine Research Institute in Reykjavík to learn first-hand how to estimate association indices and movement transition probabilities from photo identification data.

This catalogue represents an effort to combine and improve the reference photographs from the 2009 and 2019 photo identification catalogues. The hope is this will facilitate future photo identification matching and be a useful tool for naturalists and researchers in years to come. The catalogue represents a record of a community of killer whales and reflects the (human) community effort that made that possible. To all the many people who have contributed to that effort over the last decade, thank you.

Dr Andy Foote
February 2021

Above: Male 109 (foreground) West of Unst, Shetland 2009.
Photograph: Andy Foote

Acknowledgements

This catalogue is very much a collaborative project and many people from all corners of Scotland and beyond have assisted us. We would like to offer our thanks to everyone who has helped widen our knowledge of these special creatures in Scottish waters and thank the following for providing us with detailed sightings information, photographs for photo identification and inspiration:

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Watching: Code of Conduct

Watching from land

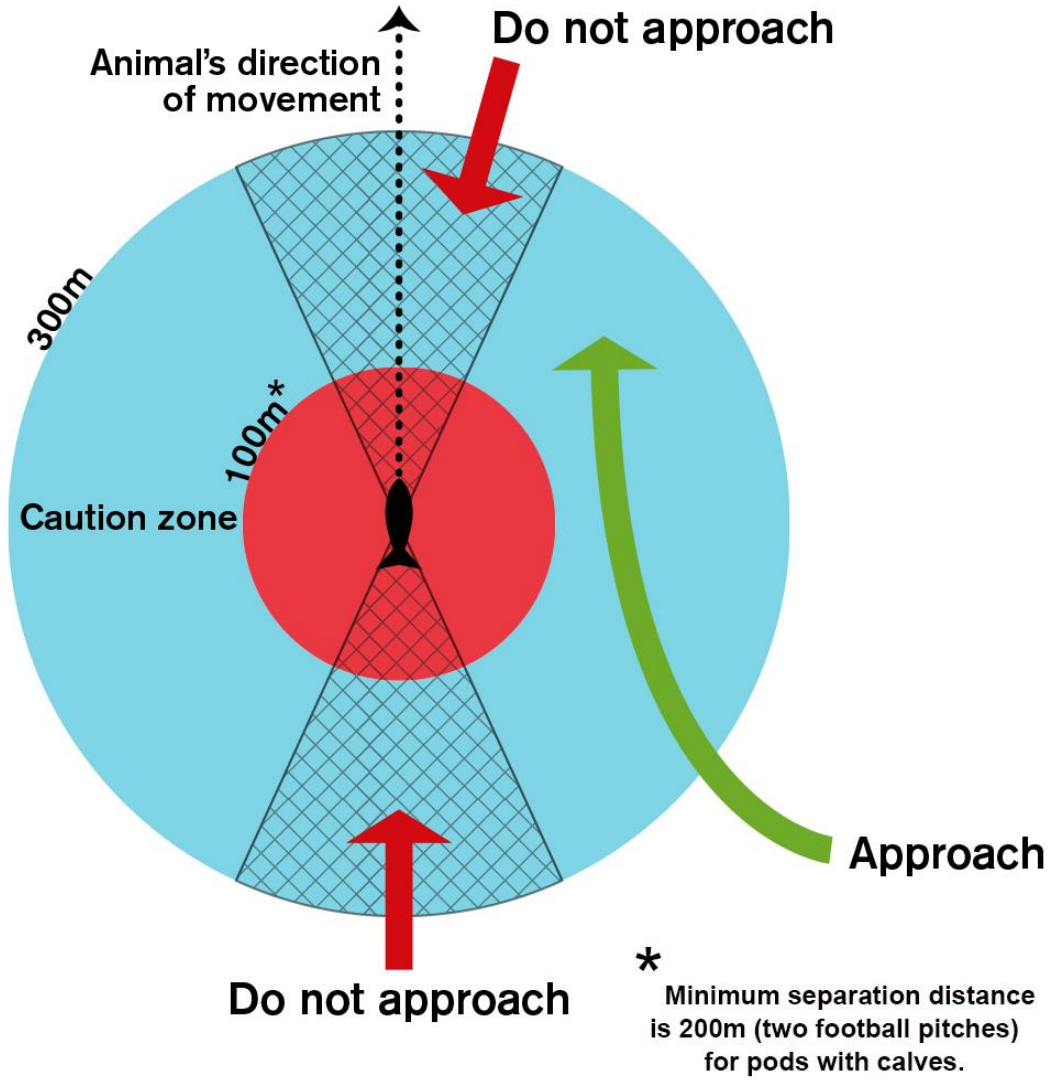
Scotland is blessed with incredible cetacean watching opportunities from land and reference should be made to *The Scottish Marine Wildlife Watching Code* published by NatureScot (formerly Scottish Natural Heritage). Please be mindful of other wildlife in the area, such as hauled out seals and breeding birds.

Watching at sea

A good encounter is one which is enjoyable for you and neither threatening nor harmful to the cetaceans. The whales, dolphins and/or porpoises should be in control of the encounter and their choices respected.

The key to good practice when watching from a vessel is the manner of the approach and behaviour by the boat operator. Skippers, boat owners and crew should familiarise themselves with the NatureScot document *A Guide to Best Practice for Watching Marine Wildlife*. Some of this guidance is reproduced here:

- **On sighting a cetacean, slow down and take time to assess** what they are doing and, if possible, what the group composition is. If they are hunting, feeding or resting, the impacts of your approaching could be more serious as you could disrupt these important behaviours.
- **Always approach cautiously**. In practice this means slowing down to less than 6 knots when you are a good distance away – an absolute minimum of 300 metres, with a recommendation of 1 kilometre. This is called the caution zone.



Above: Reproduced from *A Guide to Best Practice for Watching Marine Wildlife* with the permission of NatureScot.

- **Once in the caution zone, do not approach them directly** as this is potentially threatening. Approach at an oblique angle and keep above the recommended minimum approach distance. If the cetacean/s are moving in a consistent direction, maintain a steady parallel course. Do not approach from directly behind, and do not cut them off by moving across their path.

- **Do not go too close**. Groups with calves, those actively hunting, feeding or in transit (moderate to fast swimming in a single direction) should be given a minimum separation distance of 200 metres – preferably 400 metres. In Scotland, particularly Shetland and Orkney, most groups of inshore killer whales contain calves and juveniles. It should therefore be assumed that a minimum separation distance of 200 metres, preferably 400 metres, should be maintained.

- **If you find yourself unexpectedly close, slow down or stop (if it is safe to do so)** and allow them to pass. Put the engine into neutral to ensure there is no danger of propeller injury. Remember to have a good look around before re-engaging the propeller/s.

- **Be predictable**. Minimise changes in direction, speed, gear or engine noise so the cetaceans are not surprised or startled. Avoid turning a motoring boat stern-on to them, as they may be startled by the sudden increase in propeller noise or come too close to the propeller/s.

- **Do not crowd them**. It is not possible to say how many vessels are acceptable near whales and dolphins, but a rule of thumb is probably a maximum of two at any one time within the caution zone, as long as they keep to one side and do not encircle or trap them (e.g. within a bay or harbour).

- **Minimise your time with them**. A good rule of thumb is 15 minutes if there is more than one boat and 30 minutes if you are alone. However, if at any time you see signs of agitation or stress you should depart as slowly and carefully as you can. Make sure you take a good look around before making any changes in direction.

- **Remember**, it is an offence to deliberately or recklessly capture, kill, injure, harass or disturb any whale, dolphin or porpoise; to damage or destroy a breeding site or resting place of any whale, dolphin or porpoise; to knowingly cause or permit any of the above offences.

Disturbance

The most obvious sign of disturbance is if the cetaceans move away, but there are also more subtle signs:

- Sudden and erratic movements (although these may also be associated with play or feeding).
- Ceasing previous behaviour such as feeding, socialising or resting.
- Bunching together.
- Tail or head slaps on the water surface.
- Changes in diving behaviour and less frequent surfacing.
- Changes in breathing patterns.
- Increased vocalisation (which you will be able to hear if you have a hydrophone).
- Aggression directed at the people watching or at each other.
- Females manoeuvring to shield their calves.
- Increased swimming or travelling speed.
- ‘Trumpet blows’ in the case of whales (loud, sharp exhalations).

Should you see activity by others that is causing disturbance, take video footage and photographs and report it to Police Scotland on 101.

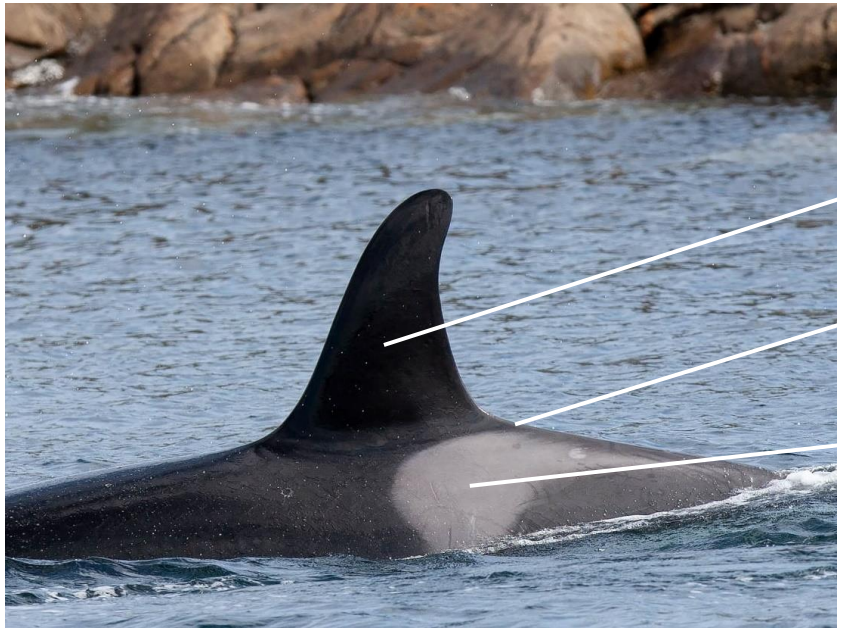
Photo Identification

The photographic identification of individual cetaceans (whales and dolphins) is one of the principal techniques in modern-day cetacean research. Recognition of an individual is key in unlocking and understanding life history, population dynamics (birth and death rates, immigration and emigration), social structure and patterns of movement. Even in acoustic studies, photo identification can play an important supporting role.

The system for photographically identifying killer whales was developed by the late Dr Michael Bigg and colleagues in the early 1970s. The underlying principle is that all individuals are visually distinguishable from one another using naturally occurring 'tags'. At first glance this may seem like an impossibility – the most striking difference between predominantly black killer whales with white and grey patches is the sexually dimorphic size of adult males in relation to females – but on closer detailed inspection, the variations become clear.

Unsurprisingly, the natural tags of interest relate to those body parts that routinely breach the surface of the water when a whale comes up for air. The primary features are the dorsal fin and saddle patches. These vary in shape, size and the presence of previous injuries (scars). On the dorsal fin these injuries present as nicks, notches, tears and indentations, generally along the trailing edge. It is important to note whilst these injuries do not heal completely, they may change slightly with growth (elongating and becoming shallower) or completely as new injuries are accrued over time.

Both dark and light scars are often visible on the saddle patches. These are not always permanent and minor injuries may only last months. The saddles



Dorsal fin

Dorsal ridge

Saddle patch (left)

Above/Below: Male 034 in Mousa Sound, Shetland 2008 (Above) and 2019 (Below). Photographs: Hugh Harrop

Nick/notch

Tooth rake marks

Pigmentation edge detail

Scars

also show differences in their greyscale pigmentation and position. The edge detail and position in relation to an individual's dorsal ridge being of note.

The white postocular eye patches are secondary features for photo identification and are not always visible during a surface. Like the dorsal fin and saddle patches, variation can be seen in the shape, size, presence of scars and irregular edge detail. Because their dorsal fin and saddle patches have not fully developed, calves are normally identified by their orangey-yellow eye patches and general association with their mother.

Other features can also be used for identification purposes including injuries or deformities (e.g. nicks/notches in pectoral fins and tail flukes, or bumps/indentations), pigmentation spots and the edge detail of the black/white junction at the corner of the mouth. These tend to be of tertiary importance but, where encounters are brief and few photographs exist, they can provide important identification opportunities.

For some distinctive individuals with prominent well known identification features it is possible to identify them 'on the fly' during an encounter. Others require subsequent detailed inspection of the photographs in comparison with a reference photo identification catalogue.

When identifying individual killer whales it is important to take account of factors such as sun glare, airborne water droplets and backlighting/shadow. These can falsely indicate the presence of small nicks along the trailing edge of the dorsal fin, cast shadows and cause saddle edge detail to be lost, sharpening the black/grey transition. Positive identifications tend to include multiple natural tag features.

The best reference photographs for inclusion in an identification catalogue tend to be those taken at right angles and from a slightly elevated plane to

Above: 158 *Trinkie* off Wick, Caithness 2017. Photograph: Karen Munro
Below: Male 072 in Mousa Sound, Shetland 2019. Photograph: Helen Perry

the whale. Photographs taken off axis, horizontally and/or vertically, can significantly alter the appearance of identification features and inhibit positive matches.

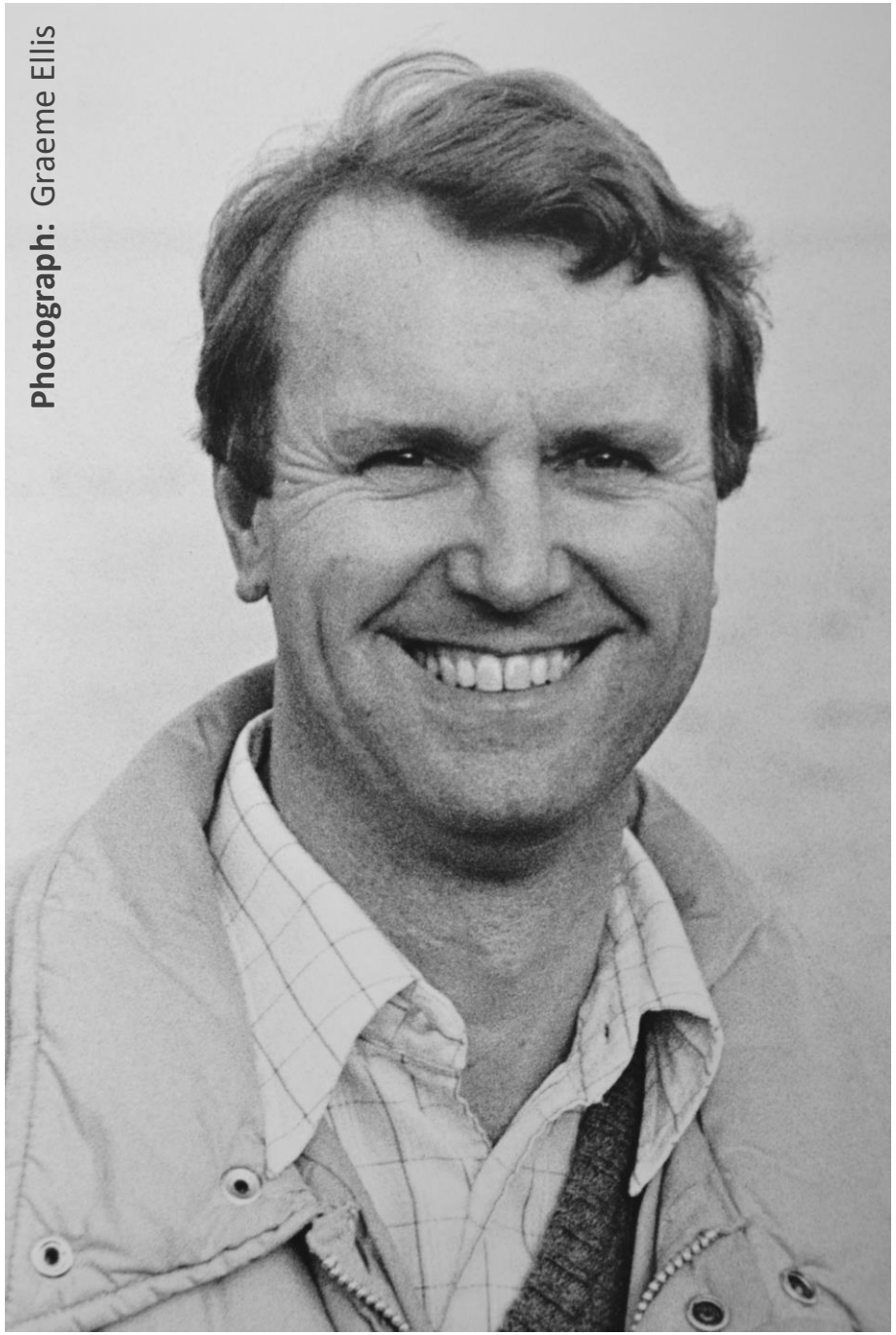
When Bigg *et al.* developed the photo identification technique they acknowledged the left and right side of an individual can vary in appearance. However, to simplify and standardize the system, they arbitrarily chose to use the left side of the whale for identification. This remains the case today, not only in the Northeast Pacific but also in the Northeast Atlantic Norwegian catalogue. Others, including the Icelandic catalogues, have expanded to include images of both the left and right sides.

Photo identification catalogues are constantly in development as individuals change in appearance, new whales are born, encountered and/or are considered deceased. Gaps in time of photo identification image data can make positive reidentification of the same individual challenging.

Sun glare (not nicks/notches)

Above: Female 113 West of Unst, Shetland 2009. Photograph: Andy Foote
Below: 064 in Bressay Sound, Shetland 2017. Photograph: Hugh Harrop

Airborne water droplets casting shadows on saddle (not pigmentation spots)



Photograph: Graeme Ellis

Dr Michael Andrew Bigg (1939 - 1990)

Following the unintended live capture and display of *Moby Doll* in 1964, public opinion of killer whales began to change from one of fear to fascination. Having piqued the interest of marine aquaria, the proceeding years saw a rapid growth of the live capture industry in the waters of British Columbia and Washington State. Amid no controls, concern over the impact of the fishery grew and by 1970 Canada's Department of Fisheries and Oceans (DFO) decided to act.

Bigg had only recently taken up the position of head marine mammal scientist at DFO's Pacific Biological Station when they tasked him with providing advice on how best to manage the live capture fishery. Were the removals endangering the local population and, if more whales were to be removed, what restrictions should be put in place?

To answer the questions, Bigg needed to know about the abundance, population dynamics (birth and death rates, immigration and emigration) and population structure of the killer whales. However almost nothing was known about them, either in the area of British Columbia and Washington State or elsewhere. To compound the issue further, there was no data collection methodology to obtain it.

Bigg's initial approach was to obtain a rough estimate of how many killer whales were in the area and where best to find them. A conventional aerial or vessel survey was considered impractical due to the vast area of British Columbia and so he instead settled on an organised public sightings program. Between 1971 and 1973 Bigg and his colleague Ian MacAskie annually distributed some 15,000 questionnaires to lighthouse keepers, ferry operators, fishermen and others who lived and worked along the coast. To avoid multiple sightings of the same individuals biasing the estimate, the surveys were limited to between just one and three days per year. From the approximately 500 questionnaires returned each year, a rough population estimate of 200 to 350 whales was made for British Columbia and Washington State.

In August 1972 Bigg and MacAskie travelled to Johnstone Strait, a summer sightings hotspot identified by the 1971 survey, and spent a few days observing killer whales from a boat. They took many photographs, mainly to record the magnificence of the whales rather than for scientific purpose. However subsequent detailed examination of these photographs led to a revelation. Several individuals were noted to have distinctive nicks and gouges, apparently old wounds, in their dorsal fins. The pigmented saddle also varied and often bore visible scratches. If these 'naturally tagged' whales could be reidentified, they would be able to follow them and learn about their daily lives.

Bigg gambled. The pair returned to Johnstone Strait in August 1973 and undertook a month of field work. Within days they had not only found those individuals seen the previous year, but also many other whales identifiable by their natural markings. Bigg soon realised every individual bore its own natural tags; all they needed was a good photograph of the dorsal fin and saddle patch for repeat identification. He reasoned, if every whale were identified photographically, the population could be counted rather than estimated. They would also be able to examine movements and features of their natural history.

At the time many were sceptical about the radical unproven photo identification technique. Bigg however was convinced it was the key to understanding the lives of killer whales. In 1974 and 1975 the survey expanded to the waters East and South, and then North of Vancouver Island. Graeme Ellis had joined Bigg's team and, with the help of a volunteer public sightings network, they undertook an intensive census photographically identifying and cataloguing killer whales.

In early 1976 Bigg presented a preliminary report summarising his team's findings. Their photo identification studies had resulted in a similar population census of about 275 whales to their earlier public survey. Groups typically contained five to 20 individuals of random age and sex. They were almost always of stable composition and therefore considered to be breeding units. Movement patterns and group social associations highlighted two, apparently socially isolated, 'resident' communities occupying the waters North and South of Vancouver Island. They had also made early observations of small 'transient' groups who travelled throughout the residents' range but never mixed with them.

The population was too small to support the live capture industry of the late 1960s and early 1970s. If further removals were to be permitted, their report recommended no killer whale be taken off Canada's West coast other than to replace those who died in Canadian aquariums. They noted "… *the high esthetic and recreational value which many people from British Columbia and Washington place on seeing killer whales in the wild*." Shortly afterwards that public sentiment, and outrage at the harassing tactics of the captors, effectively brought an end to the commercial fishery in the region.

Hoping to add to their recruitment and mortality rate data, Bigg and his team intended to continue their photo identification work with historical images and ongoing periodical censusing. However, having completed the primary management assignment, DFO cut the funding for killer whale research and he was given new priorities relating to seals and sea lions.

Bigg was just getting started. He had become fascinated by killer whales and was convinced they had only begun to scratch the surface of what the new photo identification technique could tell them. There was still a small budget to continue some field work, but it was insufficient to tackle his questions about residents' social structure, their relationship with transients, population dynamics and the feeding ecology of the whales. Driven by a relentless passion to find out more, Bigg continued his research mostly

Above: Male Bigg's killer whale T20 *Kwatsi* off British Columbia, Canada 2010. Photograph: Andrew Scullion

unsupported and in his spare time. He opportunistically took advantage of killer whale encounters while out studying other species in the field and at the weekends travelled the coast in search of whales, soliciting help from anyone and everyone.

Immensely likeable and with a quick-witted sense of humour, Bigg's dedication to science and the whales was infectious. Reports and photographs from the volunteer public sightings network continued to arrive at his office in Nanaimo. They were not alone. His research had inspired many other researchers and students who also made the pilgrimage. Ever giving of his time and knowledge, Bigg encouraged and supported them to undertake their own research to further the understanding of killer whales.

In the summer of 1976 Ken Balcomb began a long-term photo identification study of those killer whales frequenting the waters around the San Juan Islands and Puget Sound, Washington. He worked closely with Bigg to standardise the data collection methodology and catalogue naming system.

In 1977 John Ford joined Bigg's team and began studying killer whale acoustics in relation to their behaviour and social structure. Ford's suggestion the whales could have group level dialects was unthinkable at the time, but he had gradually won Bigg over who in turn sourced some funding and a research boat. Photo identification was a fundamental part of Ford's study in Johnstone Strait and he amassed many identification images.

Thanks to the collaborative effort of many researchers and students, the annual killer whale census continued uninterrupted. By the spring of 1983 Bigg and his team alone had taken and examined about 23,000 photographs. Most of these were of the same individuals taken at different locations and times of the year. The numerous repeat sightings had resulted in the identification of 260 individuals distributed among some 30 groups.

Historical photographs of the earlier live captures had enabled most of the cropped groups to be identified. They had calculated annual birth and mortality rates and were unlocking other elements of killer whale life history. The lineage between mothers and adult males within a group was still unclear, but they had started looking at mother-calf relationships and were beginning to uncover the whale's matriarchal social structure. By now the travelling transients were considered to be a third separate community. A clear dietary separation was evident with residents specialising primarily on salmon, while transients preyed on marine mammals.

In 1984 Bigg was diagnosed with leukaemia. The prognosis was not promising and added a new impetus to his work. He began meticulously documenting everything he had learnt about killer whales into two manuscripts. In 1987, together with Ellis, Ford and Balcomb, he published the first book on killer whale identification, genealogy and natural history. The book compiled almost 15 years of research and was targeted at biologists and whale enthusiasts alike.

With the data analysis assistance of Peter Olesiuk, Bigg *et al.* completed the second paper describing the social organisation of resident killer whales in the coastal waters of British Columbia and Washington State. But it seemed unlikely Bigg would ever see it in print. Ellis pulled strings, calling the publisher in England, and a copy was rushed across the North Atlantic to Bigg's side. He looked through the report in hospital.

Michael Andrew Bigg passed away shortly afterwards on the 18th October 1990, he was 50. His ashes were scattered on the waters of Johnstone Strait; several killer whales, including a new calf, appeared during the ceremony.

Bigg's photo identification technique remains the backbone of killer whale research today and much has been learnt about them worldwide. Whilst *Orcinus orca* remains a single species, we now recognise ten different 'ecotype' forms, each with their own unique lifestyle specialisms. Over the years there have been many tributes paid to Bigg, the most recent of these is the move to rename transients 'Bigg's killer whales'. A fitting honour indeed for the remarkable pioneer who gave so much for the whales he came to know and love.

Above: Members of the Northern resident A34 Matriline in Johnstone Strait, British Columbia, Canada 2010. Photograph: Andrew Scullion

The Catalogue

To the best of our knowledge, this catalogue presents the most recent or best photographic images that identify the known individual killer whales frequenting Scottish waters. All individuals known or believed potentially alive as of January 2021 are included.

Identification photographs (left side dorsal fin/saddle, right side dorsal fin/saddle, left side eye patch, right side eye patch, with additional insets of any other known distinguishing features) are provided as available. Where we have been able to highlight more than two of these identification features, each whale is presented on a single page. In the remaining cases two individuals share a page and are separated by a centrally positioned grey text box. This is not meant to indicate any association between them.

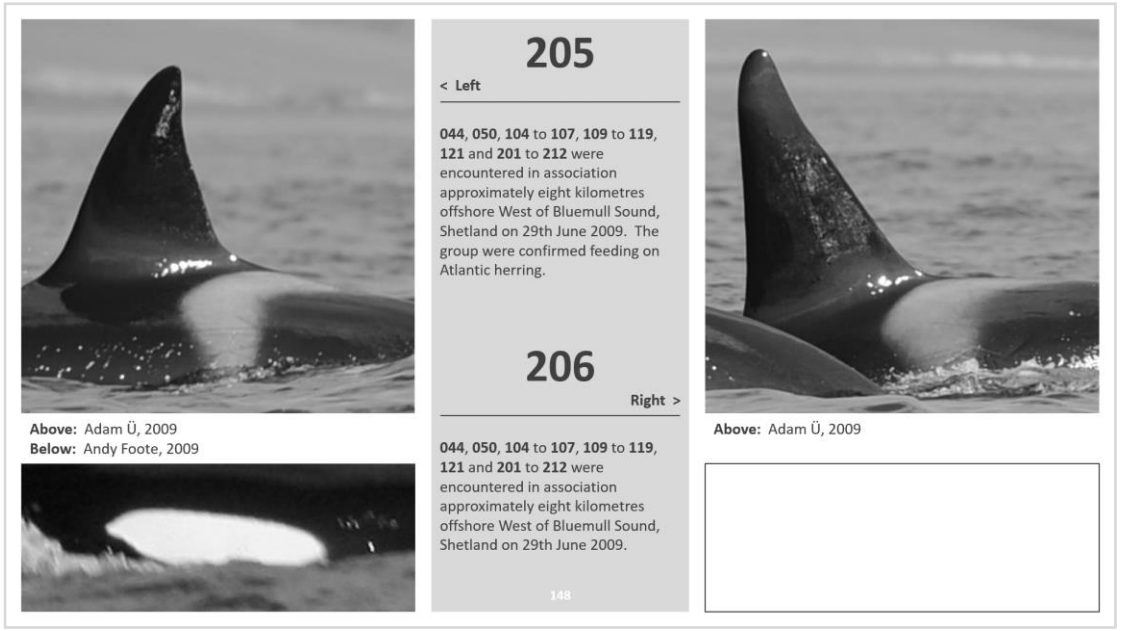
Each individual has been given a unique identification (ID) number following the three-digit system of Foote (2009 and 2019). Individuals have only been given an ID number if they have reached at least one year of age and have been re-sighted following this point in time. The West Coast Community IDs are preceded by the letter W (i.e. W001).

We have begun the process of expanding on the ID system with a view to highlighting relationships. At present this has only been included for the 27s group where the relationship between all individuals is either known or strongly suspected. The alphanumeric system adopted is based on the ID number of the matriarch (027), followed by alternating letters (e.g. 027A, 027B etc.) and numbers (e.g. 027C1, 027C2) in order of birth. This latter example (027C2) shows the grandmother relation between 027 and the second calf of her third offspring. For now, both ID systems are shown.

Above: Female 027 *Vaila*
Below: 153 (027C2)

The catalogue is primarily organised in the numerical order of the ID numbers. However, this would see groups and some associating individuals being numerically separated by many places. To highlight these associations and make the catalogue easier to use, we have kept these whales together. The numerical position of the adult female believed to be the group matriarch, or an adult male, has been used to achieve this. Upon reaching the believed matriarch/adult male the catalogue deviates from numerical order and instead she/he is followed by the other members of their group or associating individuals. The catalogue then returns to numerical order. For example: W001, W002, W003, W005, W007, W008, W009, W010 (community of associating individuals), 012, 163, 160, 161, 162 (group), 013 (numerical order), 014, 018 (associating individuals) and so on. Where offspring relationships are known or strongly suspected, calves follow their mother in order of known or suspected birth.

Pages 18 to 22 present an index of all the individuals within the catalogue for quick reference.



Above: 205 (left) and 206 (right)

Above: 032 *Busta* (Left) off Shetland. Photograph: Hugh Harrop

West Coast Community

In 1980 an adult male killer whale with a large notch near the base of his dorsal fin was first recorded by researchers off the West coast of Scotland. A crew member named him ***John Coe*** after a character in the book *Mile Zero* they were reading at the time. ***John Coe*** was later found to be a member of a small and unique community of killer whales referred to as the **West Coast Community**.

Hebridean Whale and Dolphin Trust (HWDT) began studying this community back in 1992, collating photographs and sighting reports from whale watching companies, citizen scientists and later from dedicated cetacean surveys on their research vessel *Silurian*. HWDT originally catalogued ten individuals: five adult males (**W001**, **W002**, **W004**, **W005** and **W008**) and five females (**W003**, **W006**, **W007**, **W009** and **W010**). However, since 2001 there have been no sightings of **W004** ***Moon***, who is believed to have died, and in January 2016 **W006** ***Lulu*** was found dead stranded on the Isle of Tiree having succumbed to rope entanglement.

The **West Coast Community** are physically larger than the other killer whales found in Scottish waters and all of them share a characteristic posterior sloping eye patch. No member of the **West Coast Community** has ever been observed interacting with other killer whales, nor have they been seen with a calf. Adult females **W003** and **W007** were first photographed in 1992 and 1998 respectively and would have been expected to have borne calves if reproductive.

Their range includes confirmed sightings from the waters around the whole of Ireland, the West coast of Wales, the Moray Firth and round to Girdle Ness, Aberdeen. However, most sightings have been made around the Hebrides and West coast of mainland Scotland. To the best of our knowledge, the **West Coast Community** have never been recorded outside of UK and Irish waters.

In 2016, Conor Ryan of HWDT and Andy Foote matched **W005** to the River Foyle, Ireland in 1977 from photographs uploaded to social media. Dubbed 'Dopey Dick' by locals, there was increasing concern he was unable to navigate his way back out through the Foyle sandbanks. However, after spending two days five kilometres upriver, **W005** made his own way back out to the North Atlantic.

The **West Coast Community** are known to predate on cetaceans. Feeding at a high trophic level makes them more susceptible to persistent anthropogenic pollutants such as polychlorinated biphenyls (PCBs). PCBs are known to impair fertility and suppress immune system function. When the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) analysed the blubber sample collected by the Scottish Marine Animal Stranding Scheme (SMASS) during their necropsy of **W006**, they found her sum PCB level to be 100 times the toxicity threshold for physiological effects in marine mammals. SMASS' examination of her teeth and ovaries suggested she was at least 20 years old and had never been pregnant. Interestingly, genotyping of **W006's** DNA suggested her to be highly inbred. This is also known to affect fertility and the immune system.

The **West Coast Community** are critically endangered. The remaining eight members are included in this catalogue, but since 2016 only two of these (**W001** and **W008**) have been encountered. **W001** is believed to be around 60 years old and a conservative age estimate for **W008** suggests he is greater than 30 years old. Unfortunately, extinction looms for this isolated and unique community.

Above/Below: Steve Truluck, 2019

Above/Below: Steve Truluck, 2019

W001

John Coe

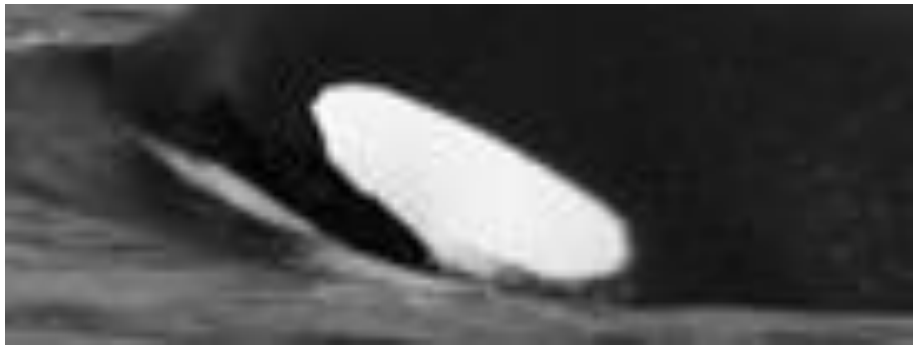
Member of the **West Coast Community**.

Approximately the top third of his dorsal fin bends to the right.

On 1st June 2008 **W001** was photographed off Pembrokeshire, Wales with a large chunk out of his left tail fluke. He also has a smaller chunk out of his right fluke.

Above: Lyndon Lomax, 2008

Above: Hebridean Whale and Dolphin Trust, 2008
Below: HWDT.org, date unknown



Above: Hebridean Whale and Dolphin Trust, 1998

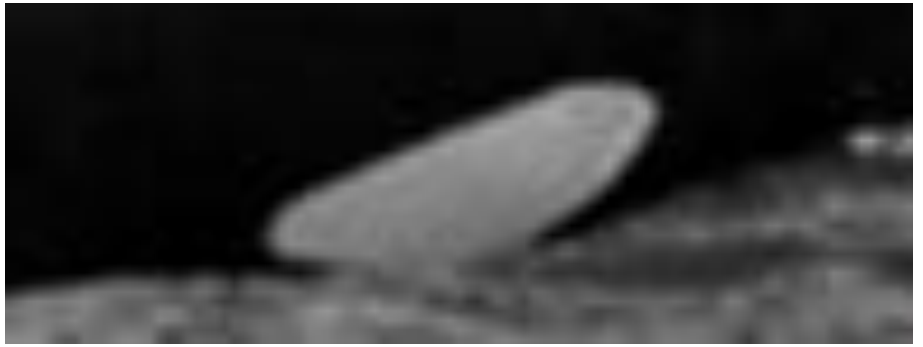
W002

Floppy Fin

Member of the **West Coast Community**.

Above: Hebridean Whale and Dolphin Trust, 2005

Above: Lewis Drysdale, 2008
Below: HWDT.org, date unknown



W003

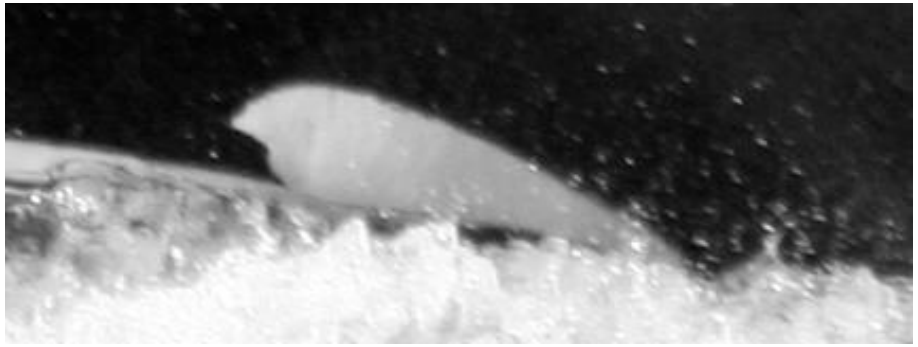
Nicola

Member of the **West Coast Community**.

W003 was first catalogued by Hebridean Whale and Dolphin Trust in 1992.

Above/Below: Genevieve Leaper, 2007

Above/Below: Genevieve Leaper, 2007



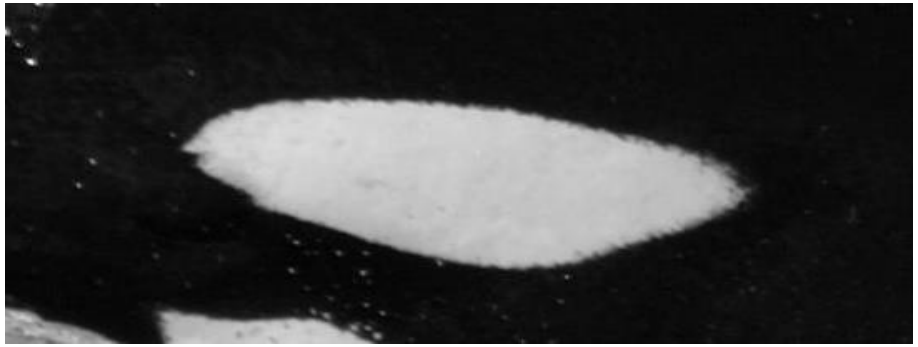
W005

Comet

Member of the **West Coast Community**.

W005 was first catalogued by Hebridean Whale and Dolphin Trust in 1998.

Above: Hebridean Whale and Dolphin Trust, 2004
Below: Tom Reade/HWDT.org, 2014



Above: Hebridean Whale and Dolphin Trust, 2009
Below: HWDT.org, date unknown

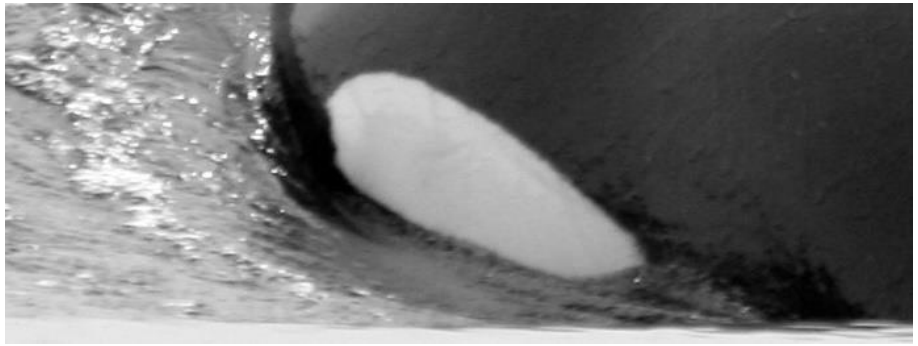
W007

Moneypenny

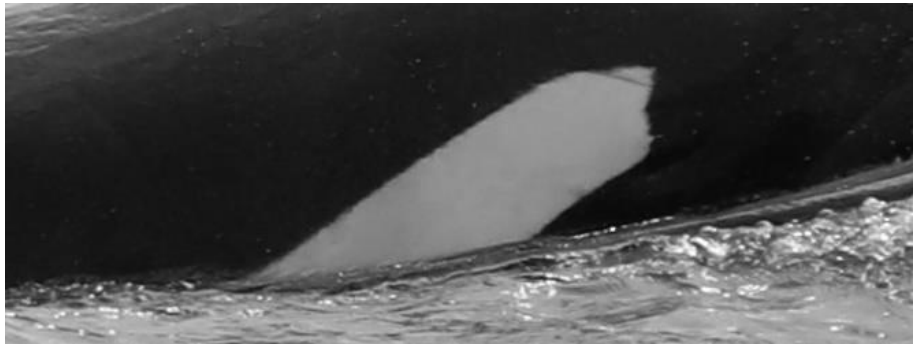
Member of the **West Coast Community**.

W007 was first photographed in 1998.

Above: Steve Truluck, 2019
Below: Genevieve Leaper, 2008



Above: Nigel Spencer (www.nigelspencer.co.uk), 2018
Below: Steve Truluck, 2019



W008

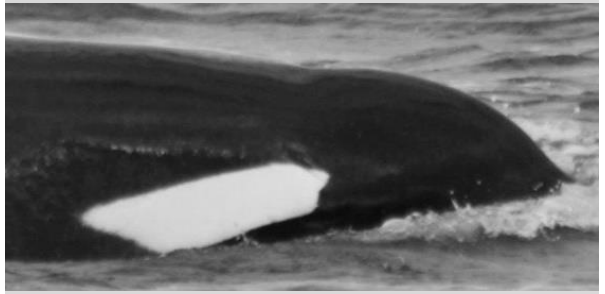
Aquarius

Member of the **West Coast Community**.

The tip of **W008's** dorsal fin tilts slightly to the left.

W008 was first catalogued by Hebridean Whale and Dolphin Trust in 2004.

W001 and **W008** have often been seen travelling together in recent years.



Above: HWDT.org, 2014

W009

Puffin

Member of the **West Coast Community**.

W009 was first catalogued by Hebridean Whale and Dolphin Trust in 2000.

Above: Genevieve Leaper, 2007
Below: HWDT.org, date unknown

Above/Below: Genevieve Leaper, 2007

Above: Hebridean Whale and Dolphin Trust, 2005
Below: Genevieve Leaper, 2008

Above: Hebridean Whale and Dolphin Trust, 2005

W010

Occasus

Member of the **West Coast Community**.

W010 was first catalogued by Hebridean Whale and Dolphin Trust in 2005.

Above: HWDT.org, date unknown

12s Group

In 2017 and 2018 the **12s group** consisted of five individuals: adult female **012**, two adult males **161** and **162**, a female/juvenile male **160** and a calf **163**.

The **12s** are one of several Icelandic groups that have been recorded in Scottish waters.

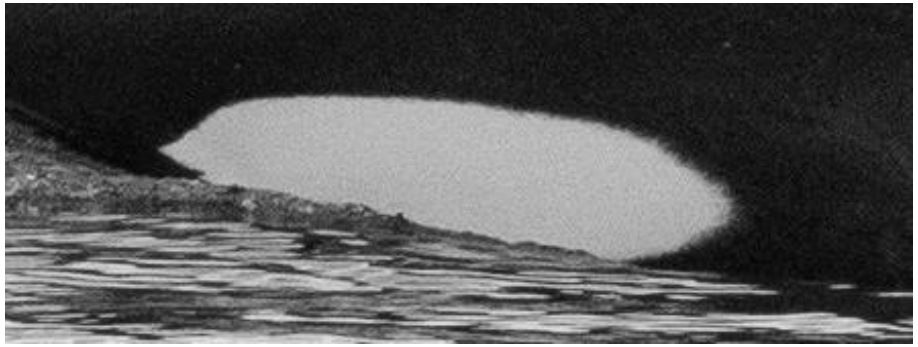
There were seven confirmed sightings of the group in Scottish waters between 2017 and 2018, but none in 2019 or 2020.

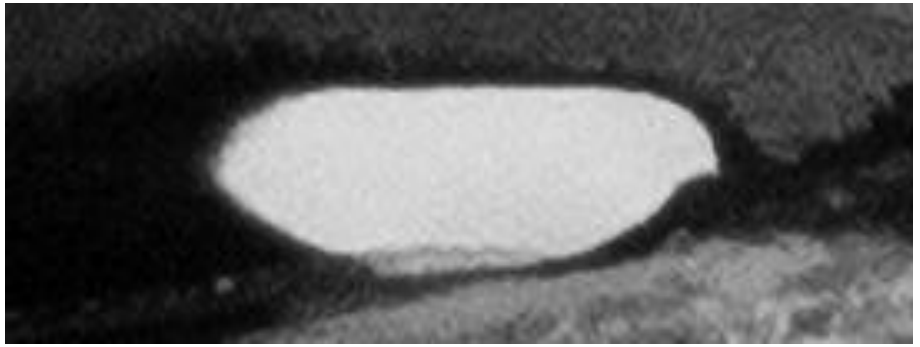
Above: 12s group, 012 *Brèagha* (right foreground), off Sumburgh Head, Shetland 2017. Photograph: Hugh Harrop

Above: 163 *Tili* (foreground), 160 (middle) and 162 (behind) off South Mainland, Shetland 2018. Photograph: Hugh Harrop

Above/Below: Hugh Harrop, 2018

Above: Hugh Harrop, 2018
Below: Hugh Harrop, 2017





012

Brèagha

Iceland ID numbers:
IS106, SN0200, T-38

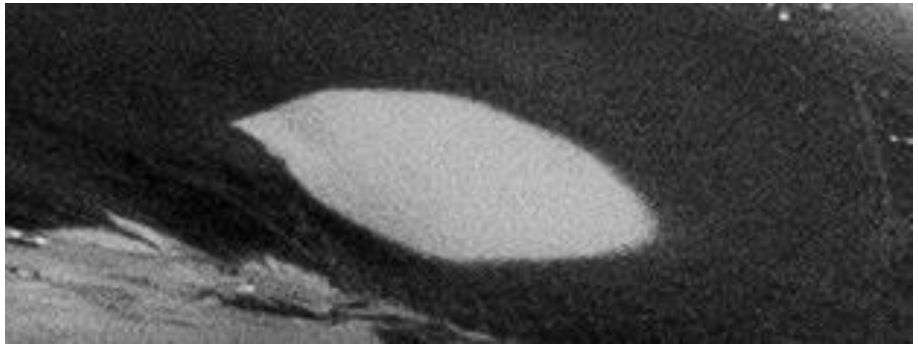
Believed to be the matriarch of the **12s group**.

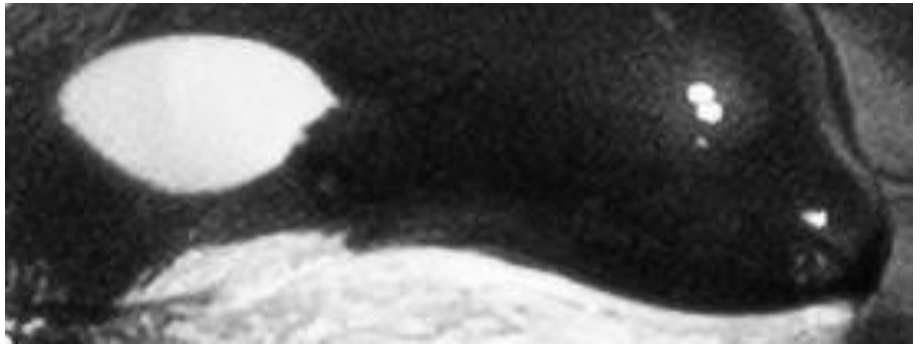
012 is a known traveller between Iceland (winter) and Scotland (summer).

The distinctive double notch and saddle patch pattern make her easy to match.

Above/Below: Hugh Harrop, 2018

Above: Marie Mrusczok (Orca Guardians Iceland), 2016
Below: Hugh Harrop, 2017





163

Tili

Iceland ID Number:
SN0201

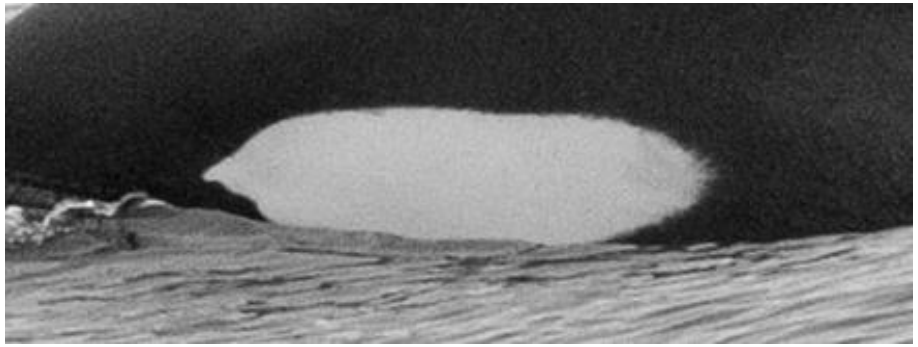
Member of the **12s group**.

163 is the offspring of **012**. Orca Guardians Iceland first encountered them together off West Iceland in November 2016.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Hugh Harrop, 2017
Below: Hugh Harrop, 2018

Above: Marie Mrusczok (Orca Guardians Iceland), 2016



160

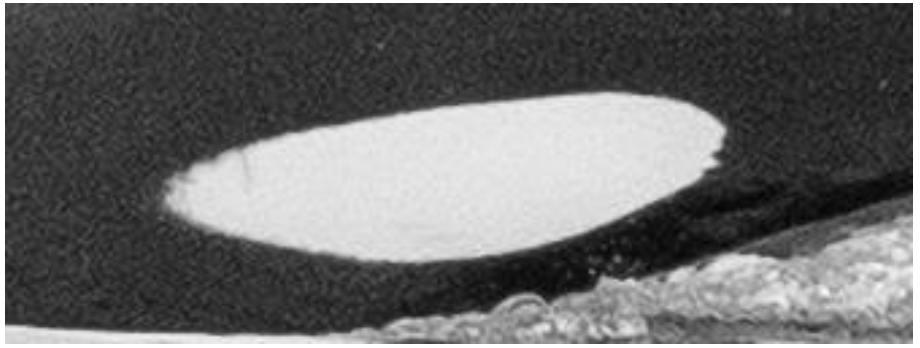
Iceland ID Numbers:
IS432, SN0202

Member of the **12s group**.

Known traveller between Iceland (winter) and Scotland (summer).

Above/Below: Hugh Harrop, 2018

Above/Below: Hugh Harrop, 2018



161

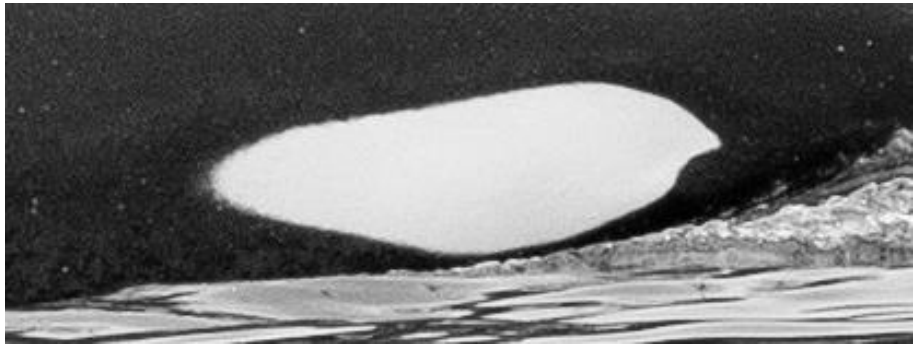
Iceland ID Numbers:
IS431, SN0203

Member of the **12s group**.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Hugh Harrop, 2017

Above/Below: Hugh Harrop, 2018



162

Iceland ID Number:
SN0323

Member of the **12s group**.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Hugh Harrop, 2017

197

Iceland ID Number:
Unknown

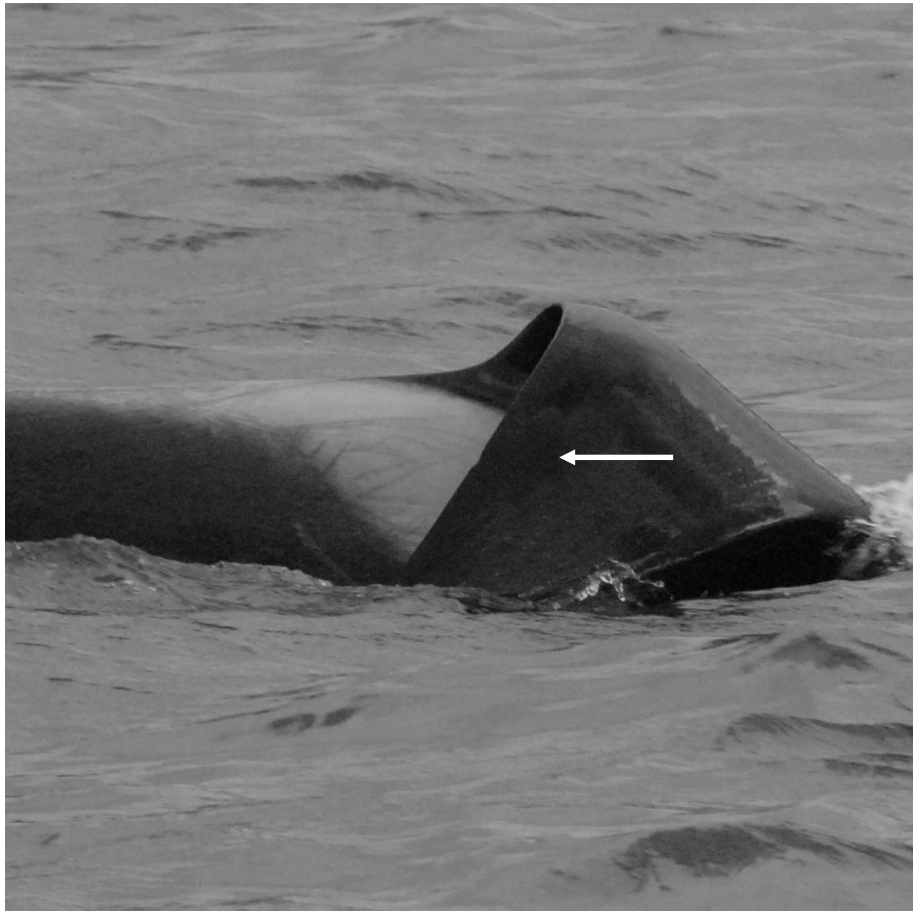
This female/juvenile male was photographed with the **12s group** off Shetland on 12th May 2017.

013

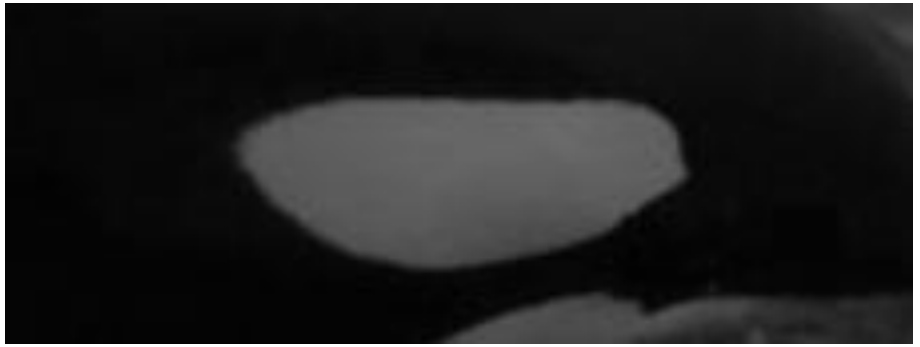
Iceland ID Numbers:
IS202, SN0375

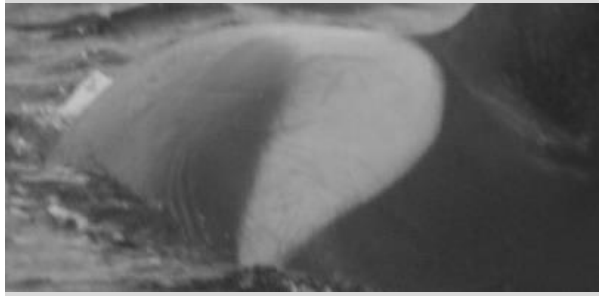
Previously a member of the **12s group**. In recent years adult male **013** has not been seen travelling in tight association with them.

Above/Below: Jerry Boyle, 2008



Above: Cathy Harlow, 2013
Below: Vivian Clark, 2015





Above: Jerry Boyle, 2008 (left and right saddles)

014

Bigga

Previously one of the most frequently sighted individuals around Shetland.

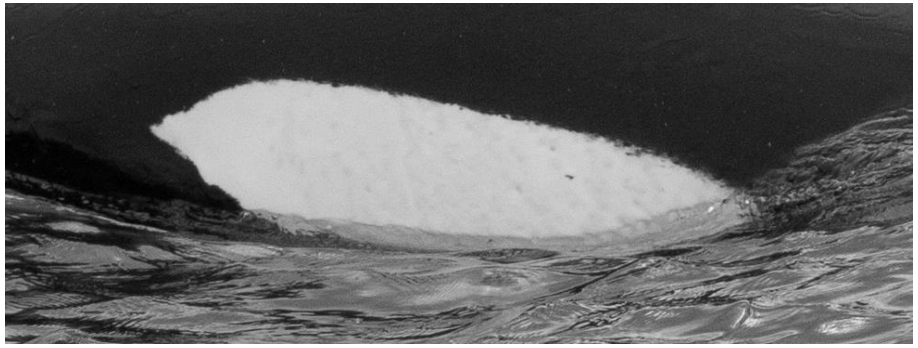
014 was photographed with **018** off Eshaness, Shetland in summer 2011. To our best knowledge, **014** has not been photographed since.

014 was most frequently sighted alone, but occasionally travelled with other groups for short periods.

Above: Andy Foote, 2008

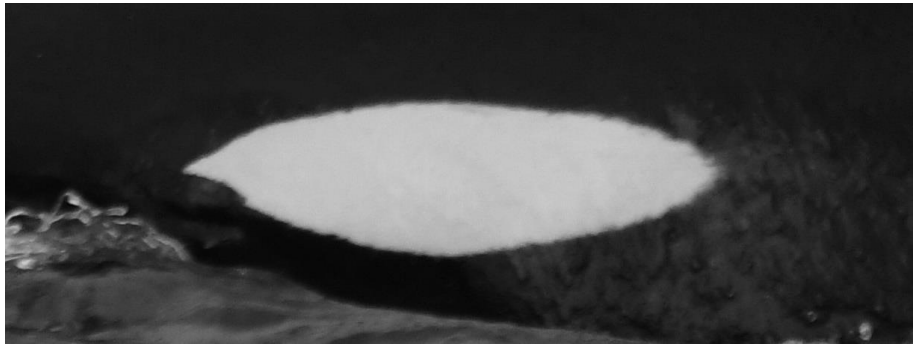
Above: Hugh Harrop, 2011

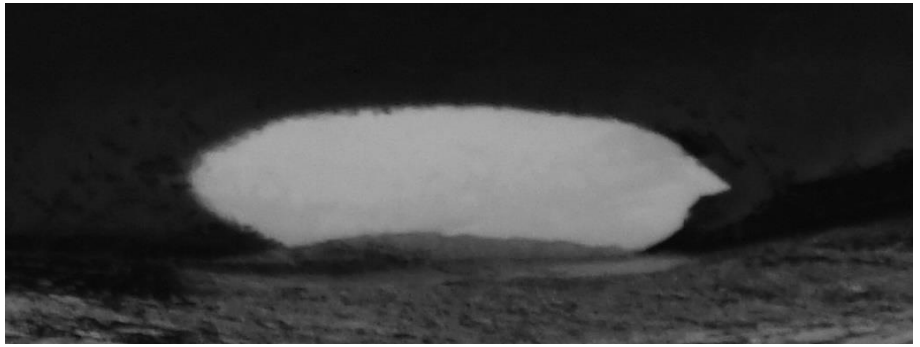
Below: Hugh Harrop, 2011



Above/Below: Marie Mrusczok (Orca Guardians Iceland), 2021

Above: Marie Mrusczok (Orca Guardians Iceland), 2019
Below: Marie Mrusczok (Orca Guardians Iceland), 2021





018

Iceland ID Number:
SN0428

First photographed as an adolescent male in a large aggregation of at least 13 individuals off Levenwick, Shetland in 2009. **018** was not a well known individual at the time.

On 15th June 2017 **018** was observed off Fair Isle in an aggregation of six whales, including **062** and **155**.

On 12th July 2019 **018** was photographed off Orkney in association with the **64s group**.

Known traveller between Iceland (winter) and Scotland (summer).

15s Group

In July 2009 this group consisted of six individuals: two adult females **015** and **017**, three adult males **020**, **026**, **033** and a juvenile **036**.

The **15s group** have been encountered relatively infrequently in Scottish waters and a sparse photographic record exists of them. On 20th July 2010 they were observed together with the **29s group** off Orkney. In 2012 there were two sightings, one on the 28th May between St Kilda and the Isle of Harris, and a second off the Flannan Isles. The last confirmed sightings in Scottish waters were in July 2016, firstly off St Kilda and then seven days later off Shetland. **032** and **199** (of the **65s group**) were photographed in association with them off Shetland.

In both 2012 and 2016, **015** was observed in close association with a young calf. It is unclear if this was the same individual, but the calf with her in 2016 looks too young to be four to five years old.

A significant amount of time has elapsed since **036** was first identified in 2009. Add to this the relatively infrequent sightings of the **15s group** and it is unsurprising s/he has proved tricky to re-identify. However, a potential candidate has been identified. **220** was photographed together with **015**, **020**, **026** and **033** off the Southeast Mainland of Shetland on 21st July 2016. The profile of **220's** dorsal fin and saddle patch appear to be consistent with those of **036** and thus she represents our best candidate for a match. To reflect the remaining uncertainty, **220** has been given a new ID number.

In February and December 2019, male **033** was photographed in the Faxaflói area of West Iceland. **220** was encountered together with **033** in December 2019. These are the only members of the **15s group** known to have travelled between Iceland and Scotland.

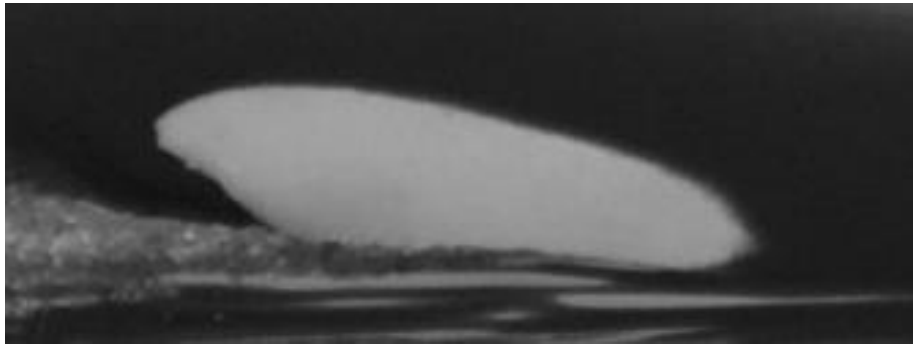
Above: 15s group off Shetland 2016. Photograph: Hugh Harrop

015

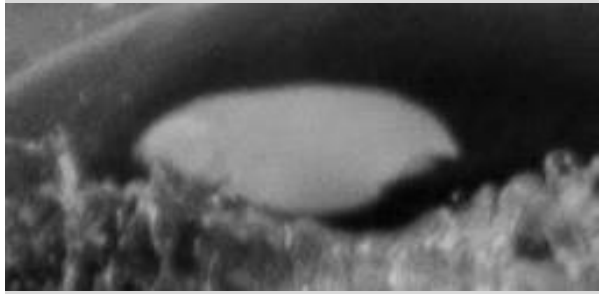
Believed to be the matriarch of the **15s group**.

In July 2016 **015** was photographed in association with a young calf (below). Whether the calf has survived is unknown and therefore it has not been given an ID number.

Above: Hugh Harrop, 2016
Below: Ben Wilson, 2010



Above: Andy Foote, 2009
Below: Nicola Kulesza, 2016



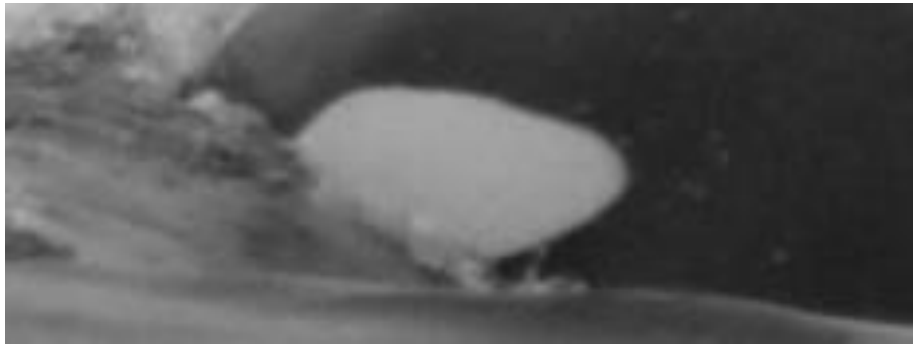
Top: Hugh Harrop, 2016
Bottom: Nicola Kulesza, 2016

017

Member of the **15s group**.

Above: Andy Foote, 2009
Below: Ben Wilson, 2010

Above: Brydon Thomason, 2009

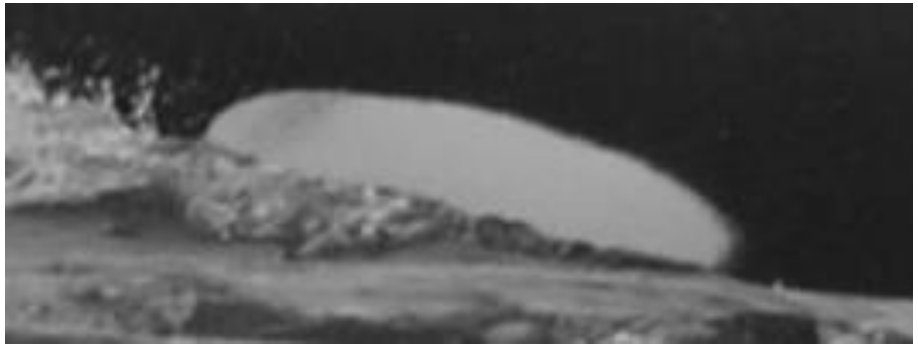


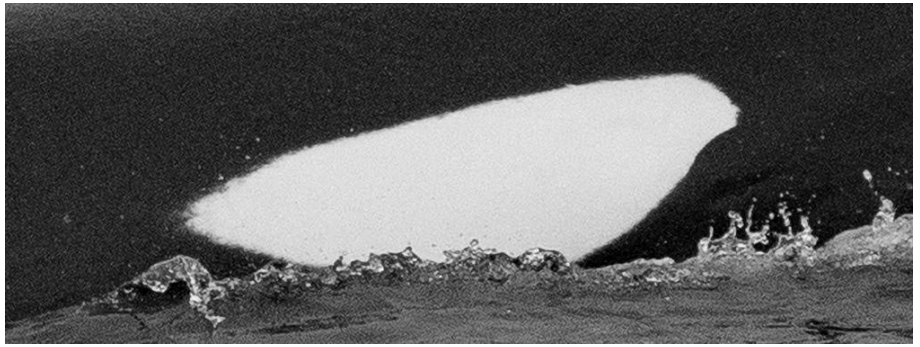
020

Member of the **15s group**.

Above/Below: Ben Wilson, 2010

Above: Andy Foote, 2009
Below: Hugh Harrop, 2016





026

Member of the **15s group**.

Above: Hugh Harrop, 2016

Above: Hugh Harrop, 2016
Below: Ben Wilson, 2010

033

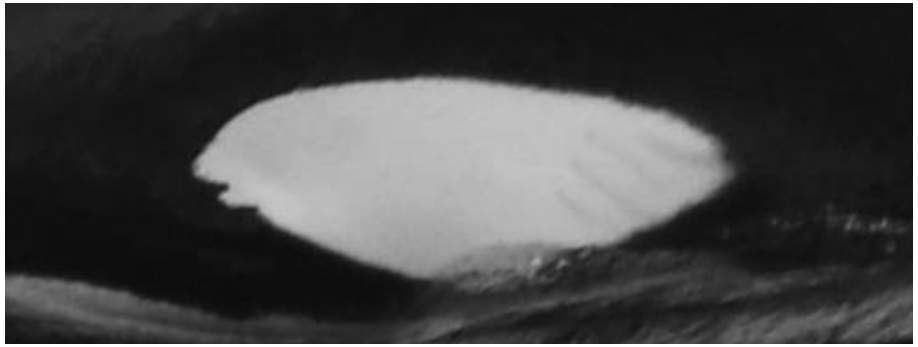
No Iceland ID number

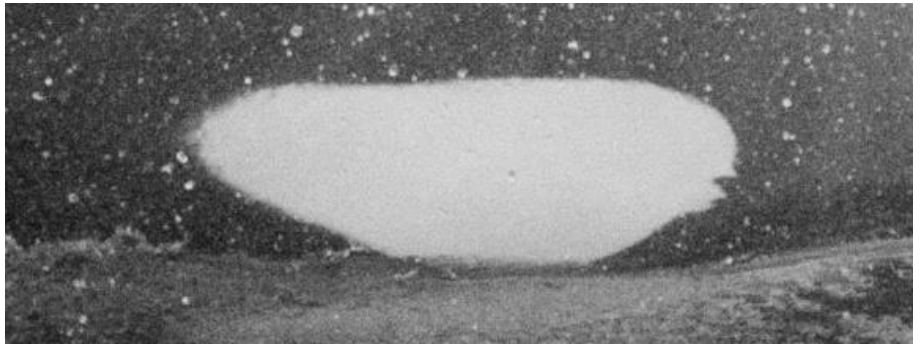
Member of the **15s group**.

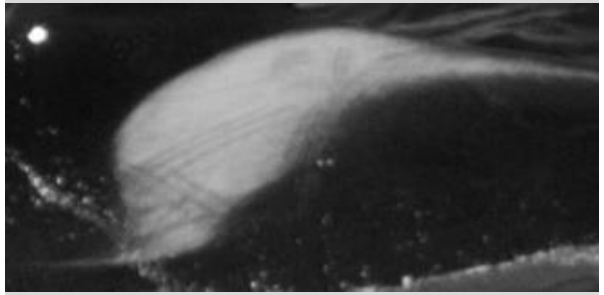
Known traveller between Iceland (winter) and Scotland (summer).

Above: Andy Foote, 2009
Below: Jim Nicolson, 2016

Above/Below: Hugh Harrop, 2016







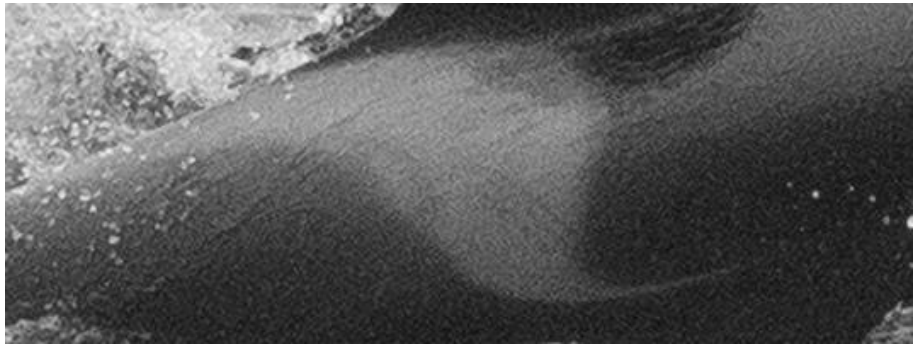
Above: Mike Greenfelder, 2012

036 - 220

No Iceland
ID number

< Top left - Right & bottom left >

Above: Andy Foote, 2009
Below: Hugh Harrop, 2016 (220 right saddle)



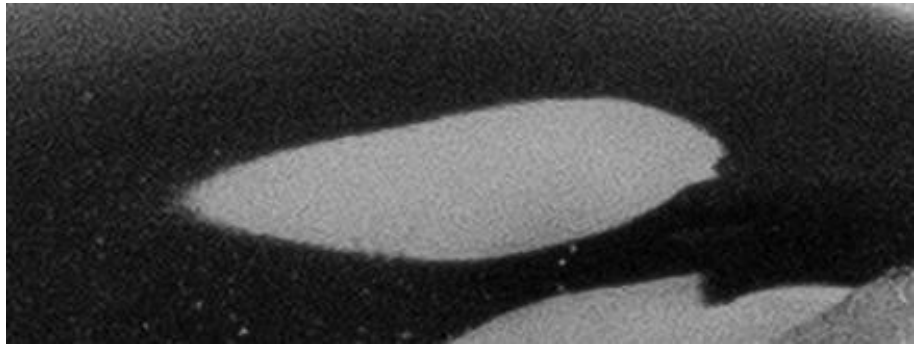
Member of the **15s group**.

220 was photographed together with the **15s group** off Shetland in July 2016. The profile of **220's** dorsal fin and saddle patch appear to be consistent with those of **036** and thus she represents our best candidate for a match. To reflect the remaining uncertainty, **220** has been given a new ID number.

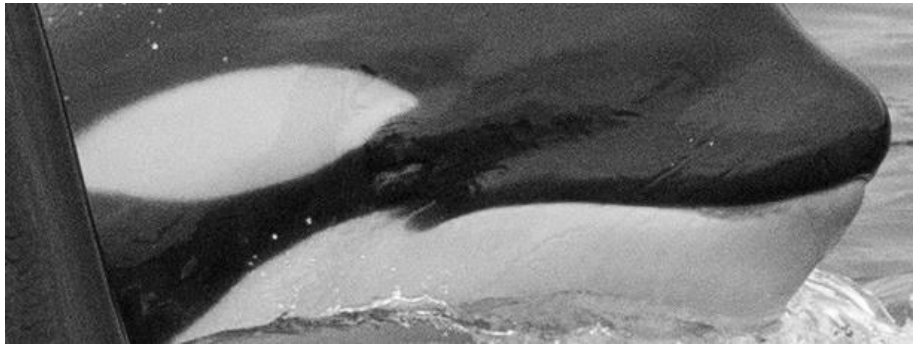
220 is a known traveller between Iceland and Scotland.

220 was photographed in close association with a young calf in 2016 (see page 49) and 2019. These were not the same individual.

Above/Below: Hugh Harrop, 2016



Above/Below: Hugh Harrop, 2016



No ID

Believed to be a member of the **15s group**.

This young calf was photographed off the South Mainland of Shetland in close association with **220** (see page 48).

Due to the scarcity of sightings for the **15s group**, we are unsure if the calf has survived and therefore s/he has not been given an ID number at this time.

On 15th December 2019 **220** was photographed with a different calf in the Faxaflói area of West Iceland.

Above: 029 (left), 019 *Mousa* (right foreground) and 159 *Tide* (right behind) off Sumburgh Head, Shetland 2018. Photograph: Hugh Harrop

19s Group

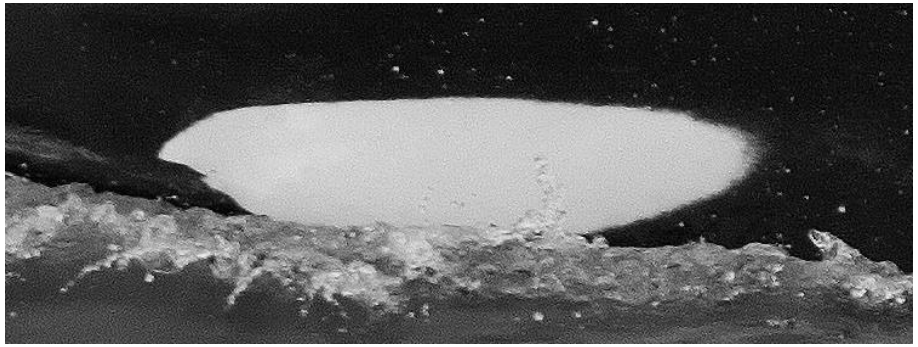
Late on 31st May 2008 Andy Foote and his research team encountered **019** and her group in Mousa Sound, Shetland. It was the only encounter of the group during his Shetland fieldwork (2008-2009) and as a result the photo identification data in the 2009 catalogue was known to be incomplete.

Although we refer to them as the **19s** today, back in 2008 they may well have been the **21s group**. Surveys undertaken by the Marine Research Institute, Iceland in the 1980s and 1990s recorded female **021** on the East coast Icelandic summer-spawning herring over-wintering grounds. She was subsequently photographed in association with **019**, **062** and other individuals at least once a year in Scottish waters. However, since May 2014 **021** has not been photographed in Iceland or Scotland. The last images of her in Scottish waters (13th May 2014) showed she had lost a significant amount of bodyweight in comparison to those in Iceland (28th March 2014). As a result, **021** is believed to be deceased.

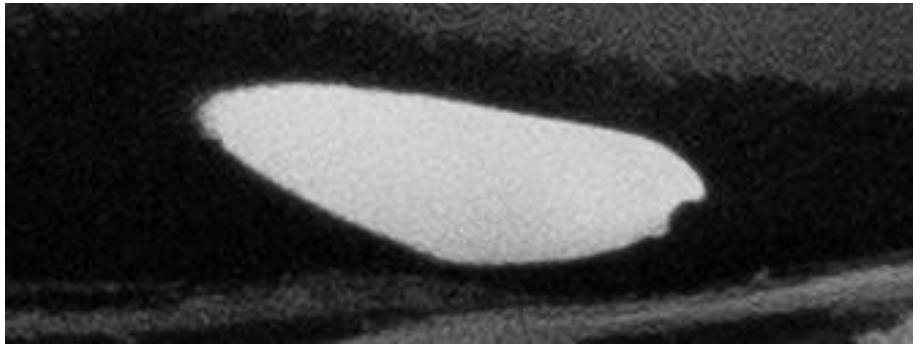
Following the loss of **021** the social association between **019** and **062** (potentially the offspring of **021**) has changed. In Scottish waters **062** is now more frequently encountered together with male **155**. The pair have been observed associating with the **19s group** off West Iceland.

019 is a whale of many firsts. She was the first individual for whom citizen science photographs facilitated a match in Scottish waters, the first to be matched to the Icelandic photo identification catalogue (collated by the Marine Research Institute of Iceland in the 1980s and 1990s) and one of the first individuals confirmed to move between Iceland (winter) and Scotland (summer) on an annual basis.

Above: Karen Munro, 2017
Below: Rob Lott/WDC, 2013



Above/Below: Hugh Harrop, 2018



019

Mousa

Iceland ID Numbers:
IS086, SN0069 *Vendetta*, 997

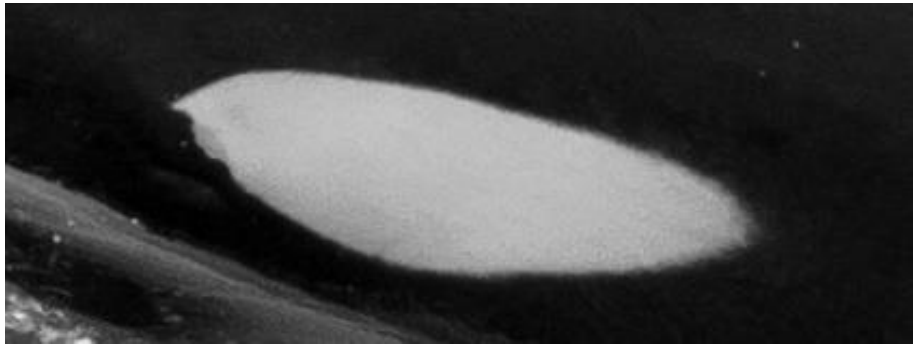
Believed to be matriarch of the **19s group**.

Known traveller between Iceland (winter) and Scotland (summer).

019 was named after Mousa Sound, Shetland (where she was encountered by Andy Foote and his research team in May 2008) and the light 'm' tooth rake scar on her right saddle.

Above/Below: Karen Munro, 2019

Above: Marie Mrusczok (Orca Guardians Iceland), 2016



063

Gunnar

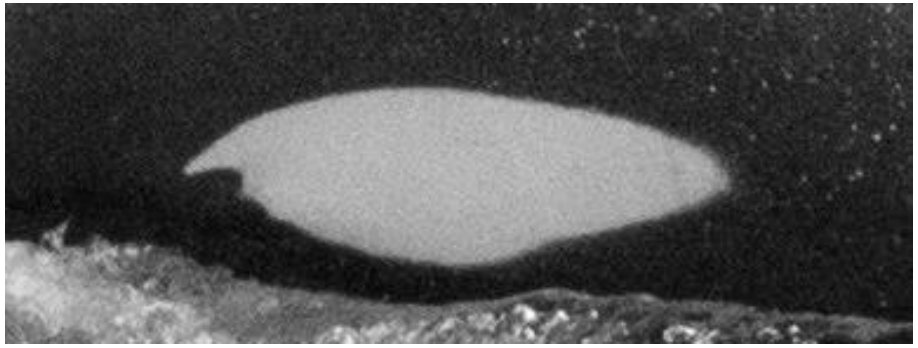
Iceland ID Numbers:
IS172, SN0068

Member of the **19s group**.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Karen Munro, 2019
Below: Hugh Harrop, 2016

Above: Marie Mrusczok (Orca Guardians Iceland), 2016



157

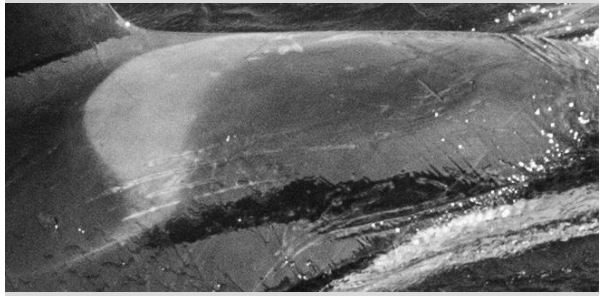
Summer

Iceland ID Numbers:
IS408, SN0070 *Attack*

Member of the **19s group**.

Known traveller between Iceland (winter) and Scotland (summer).

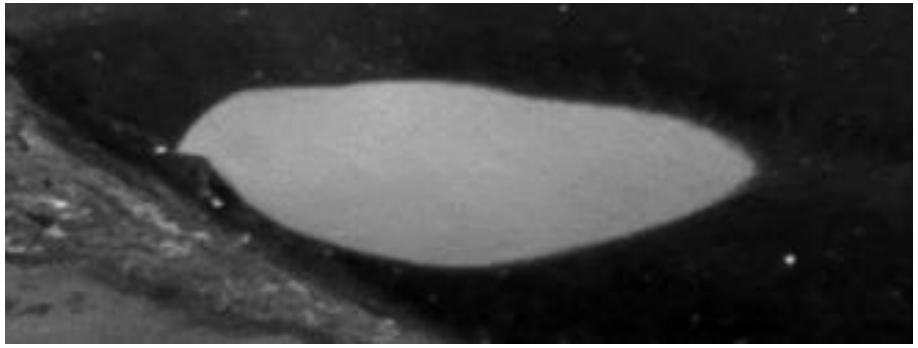
157 is an adolescent male.

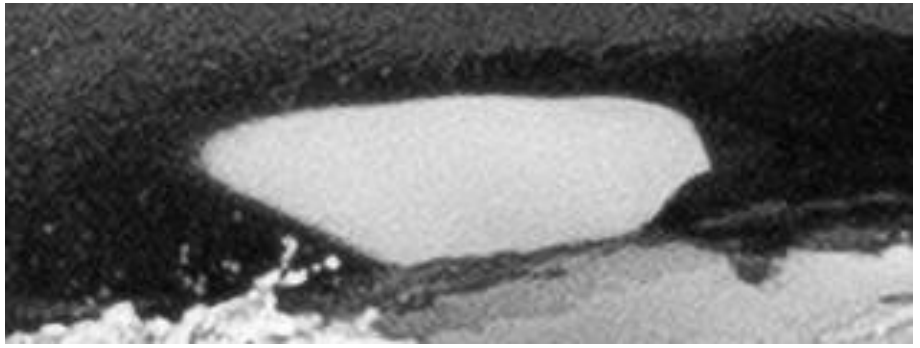


Above: Karen Munro, 2018

Above/Below: Karen Munro, 2019

Above/Below: Hugh Harrop, 2018





159

Tide

Iceland ID Number:
SN0199

Member of the **19s group**.

159 is the offspring of **019**. Orca Guardians Iceland first encountered them together off West Iceland in December 2015.

Known traveller between Iceland (winter) and Scotland (summer).

Named ***Tide*** by Sunnyside Ocean Defenders of Sunnyside Primary School, Glasgow back in 2016.

158

Trinkie

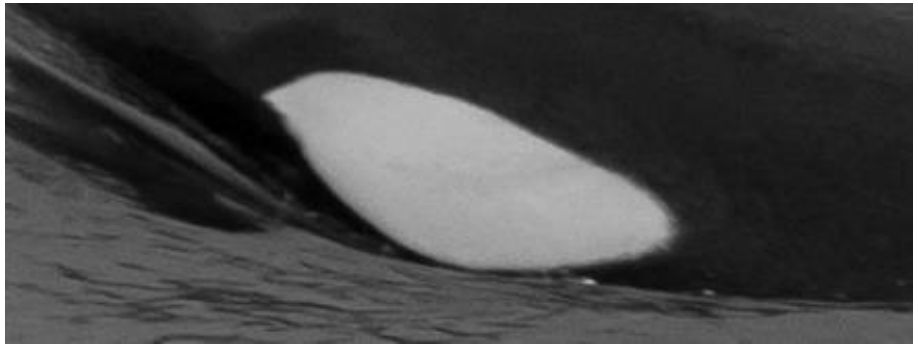
Iceland ID Numbers:
IS244, SN0207

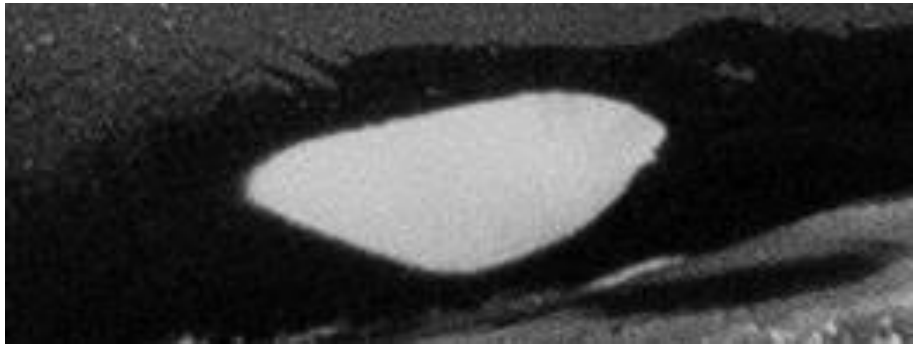
Member of the **19s group**.

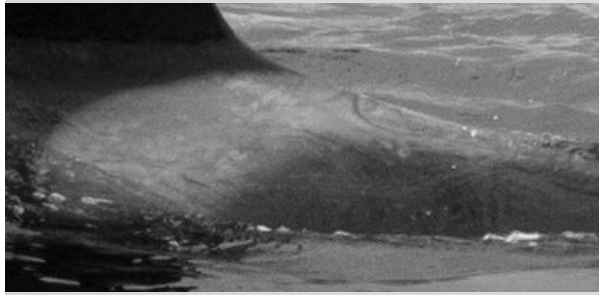
Known traveller between Iceland (winter) and Scotland (summer).

Above: Karen Munro, 2018
Below: Karen Munro, 2019

Above/Below: Hugh Harrop, 2018



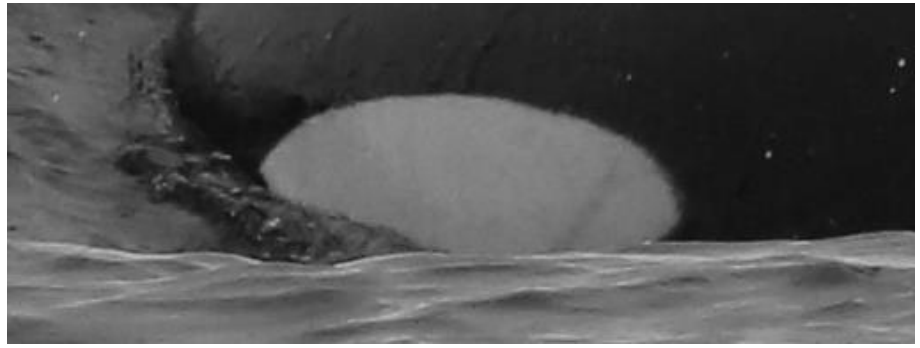




Above: Karen Munro, 2019

Above/Below: Alexa Kershaw, 2014

Above: Marie Mrusczok (Orca Guardians Iceland), 2014



156

Iceland ID Numbers:
IS153, SN0071

Known to associate with the **19s group**, but no confirmed sightings in recent years.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Keith Parkes, 2005

022

< Left

023

Right >

Above: Mick Mellor, 1998

27s Group

In July 2006 this group consisted of just four individuals: **027**, **034**, **072** and **073**. At that point in time **027**, **034** and **072** were all roughly the same size, whilst **073** was just a juvenile. Subsequently **034's** and **072's** dorsal fins 'sprouted' as the two males matured.

Given the demography, **027** is potentially the mother of **034**, **072**, **073**, **152** and **150**, and thus is believed to be the group matriarch. If **034** was her first born offspring, that would suggest **027** is approximately 40 years old. The average calving interval for most reproductive female killer whales is five years, which fits with our age estimates for **034**, **072**, **073**, **152** and **150**.

034 is now an adult male. His dorsal fin started to 'sprout' in 2009, which would indicate he is approximately 25 years old and should be fully grown.

072 is a sub adult male approaching sexual maturity. His dorsal fin started to 'sprout' in 2014, indicating he is now approximately 20 years old. He may continue to grow for another two years or so.

In May 2010, **027** was photographed with a calf which was born after the group were encountered in July 2009. **152** was present with the **27s group** off Sumburgh Head, Shetland in July 2016, off Fair Isle in June 2017 and throughout 2018 to 2020. **152** is therefore a good candidate for being the calf born in 2009/10, but there remains a level of uncertainty due to the difficulty in trying to maintain a record of pedigree with discontinuous sightings data.

150 is usually in very close association with **027**, suggesting **150** is **027's** offspring. The pair were photographed together off Sumburgh Head, Shetland in July 2016; **150** was a young calf at the time.

Since July 2016 **073** has been photographed in close association with a calf **151**. This association remains to present day and would suggest **151** is **073's** first calf.

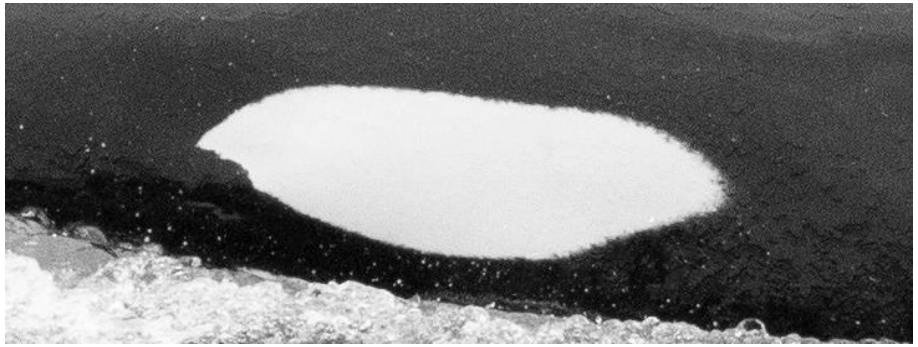
At the beginning of August 2019, **073** was photographed off Shetland with a new calf **153**. S/he was not seen with **073** off Orkney at the beginning of July 2019 and thus, at most, was approximately a month old. **073** has regularly been observed with **151** on one side and **153** on the other.

Since the start of photo ID records in 2006, the associations between **027**, **034**, **072** and **073** have been strong and stable. This remains the case to the present day, with all eight group members (including **150**, **151**, **152** and **153**) consistently sighted together.

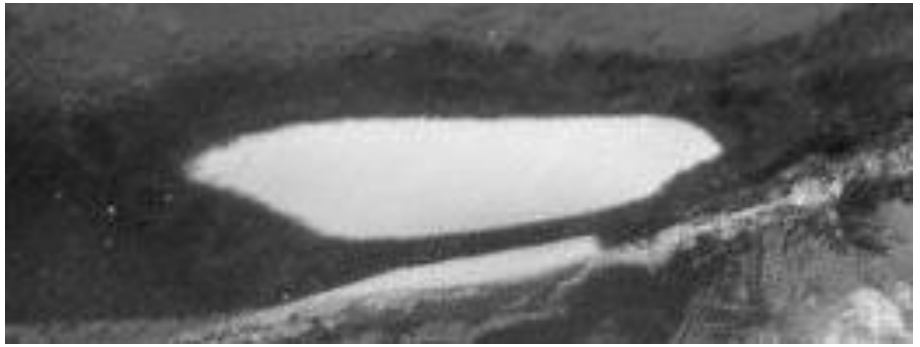
The **27s** were the most frequently encountered group in 2019 and 2020. Since 2017, sightings have been recorded throughout all months of the year, with the majority of these from Shetland. It is likely the **27s group** are semi-resident to Scottish waters. With this in mind, we refer to them as being part of the Northern Isles Community (also including the **64s** and **65s groups**).

The **27s group** have previously been photographed off the Faroe Islands on several occasions and in September 2017 **027**, **034**, **072**, **073**, **150**, **151** and **152** were encountered hunting harbour porpoise in Eyjafjörður, North Iceland. There are no known records of them in Norwegian waters.

Above: Ian Towriess, 2020
Below: Hugh Harrop, 2017



Above: Brian Gray, 2020
Below: Gavin Bird, 2019



027

Vaila

No Iceland ID number

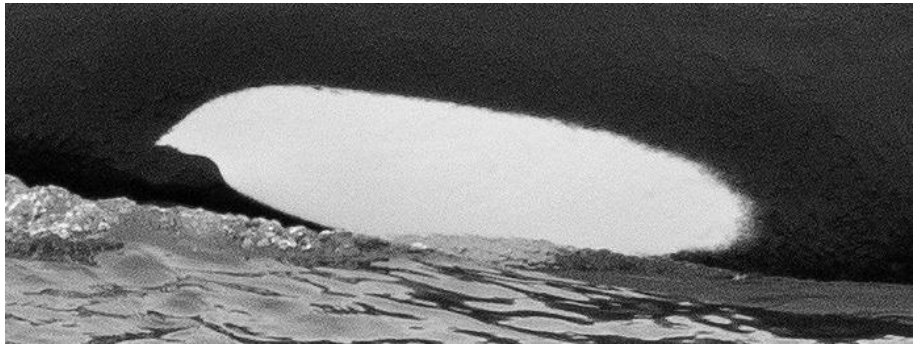
Believed to be the matriarch of the **27s group**.

034 (027A)

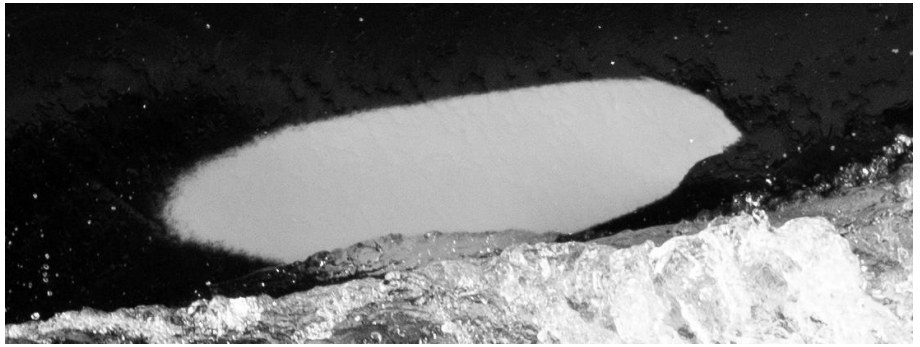
No Iceland ID number

Member of the **27s group**.

Above: Hugh Harrop, 2020
Below: Hugh Harrop, 2018



Above: Ryan Leith, 2019
Below: Brian Gray, 2019



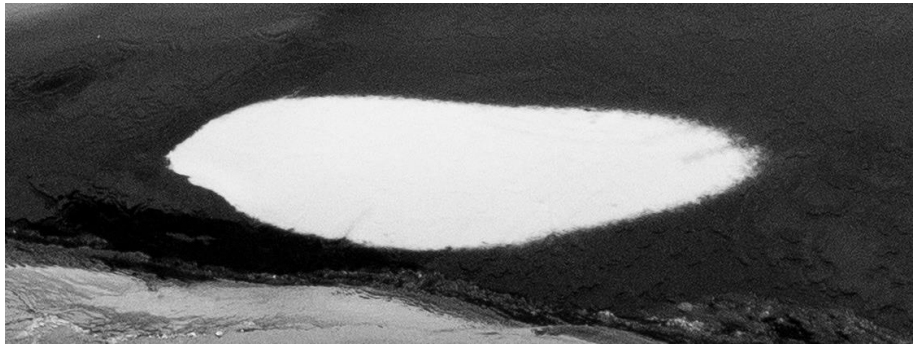
072 (027B)

No Iceland ID number

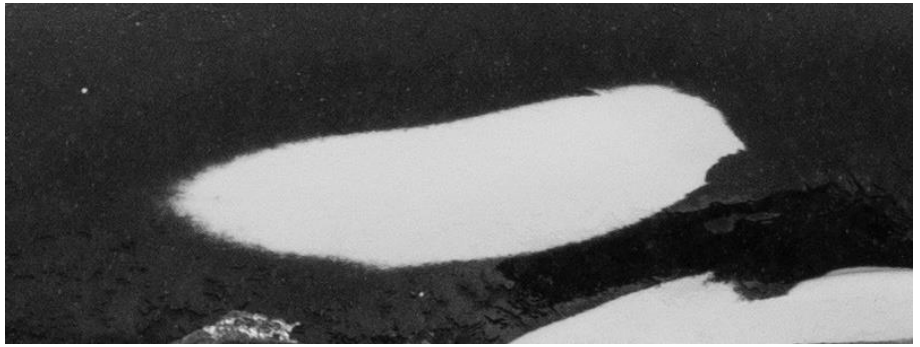
Member of the **27s group**.

072 has a damaged/misshapen left pectoral fin, with a chunk missing from the end and trailing edge (see images below).

Above: Hugh Harrop, 2020
Below: Hugh Harrop, 2017



Above: Steve Truluck, 2020
Below: Brian Gray, 2019



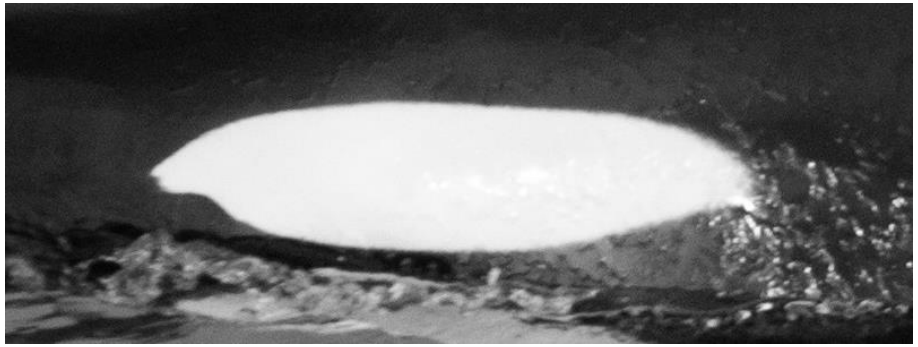
Top: Helen Perry, 2019
Bottom: Brian Gray, 2019

073 (027C)

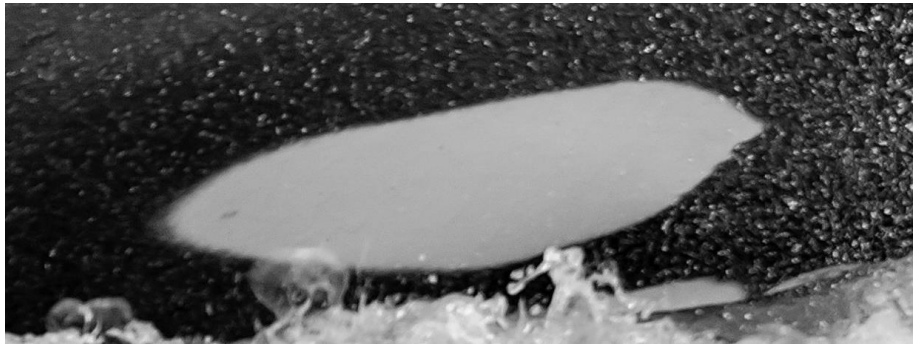
No Iceland ID number

Member of the **27s group**.

Above: Hugh Harrop, 2019
Below: Brian Gray, 2019



Above: Hugh Harrop, 2019
Below: Leszek Stankiewicz, 2020



Above: Hugh Harrop, 2020

151 (027C1)

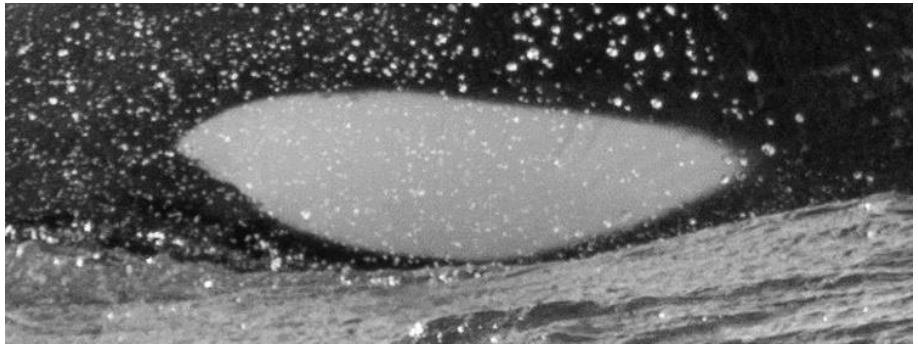
No Iceland ID number

Member of the **27s group**.

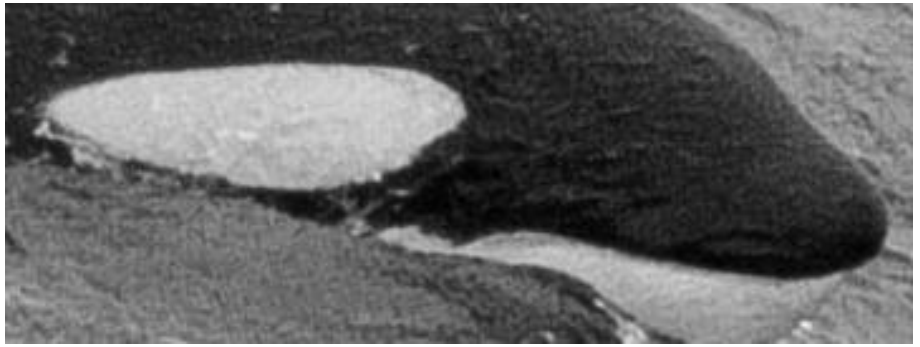
151 was a calf in 2017. A historical photograph would suggest s/he was born approximately 2015/16.

This is not the same individual described as 151 in Deecke *et al.* (2011).

Above: Karen Munro, 2018
Below: Sue MacCallum-Stewart, 2019



Above: Leszek Stankiewicz, 2020
Below: Hugh Harrop, 2019



153 (027C2)

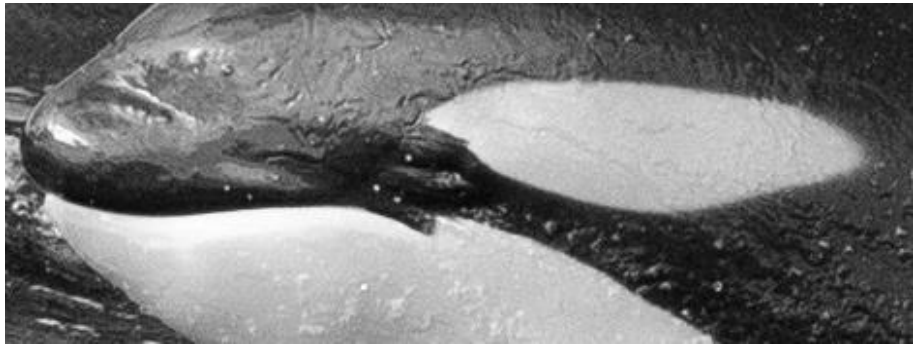
Member of the **27s group**.

153 was born to mum **073** at some point between the 5th July and 2nd August 2019.

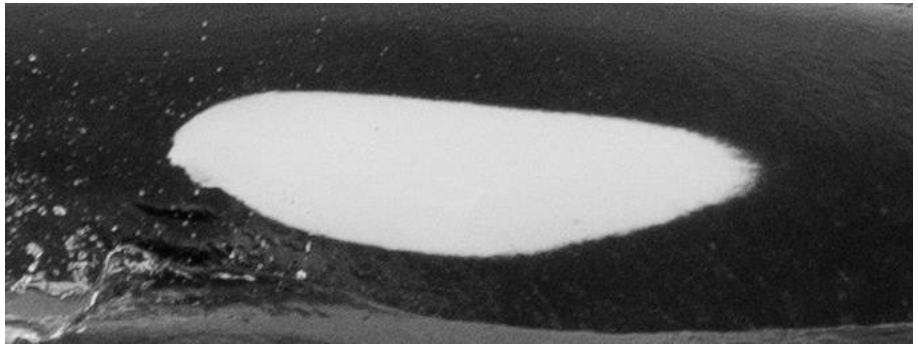
153 is not known to have travelled to Iceland.

Above: Hugh Harrop, 2020
Below: Hugh Harrop, 2019

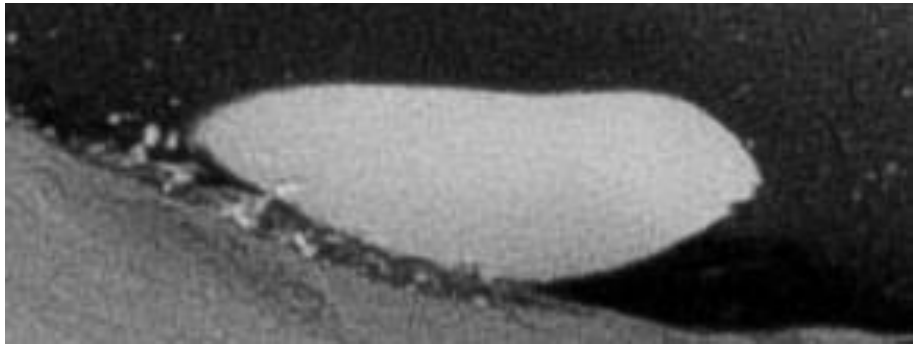
Above/Below: Hugh Harrop, 2019



Above: Hugh Harrop, 2018
Below: Brian Gray, 2019



Above: Hugh Harrop, 2019
Below: Hugh Harrop, 2018



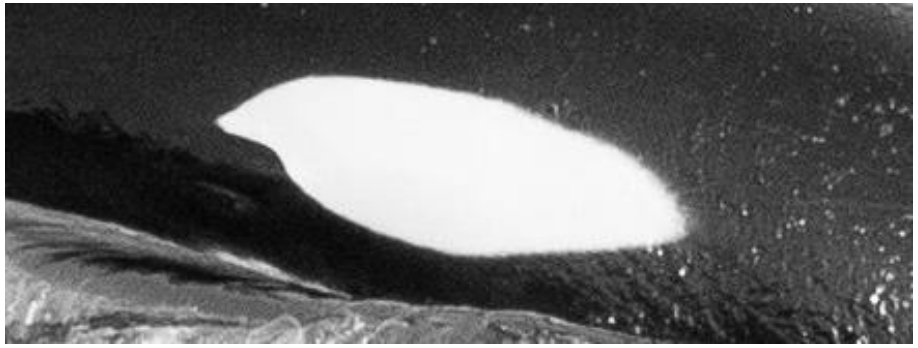
152 (027D)

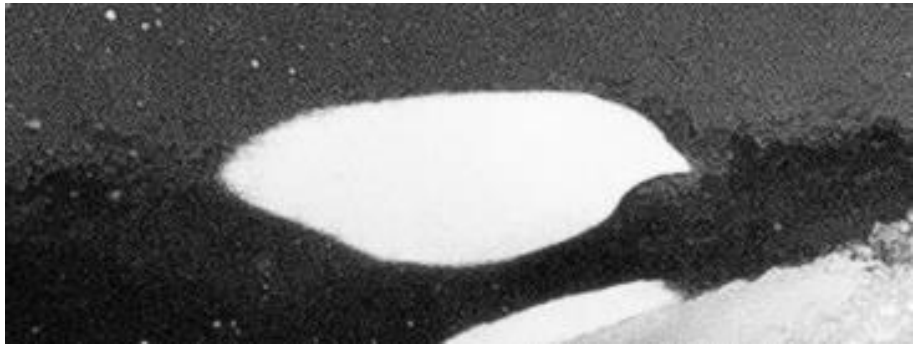
No Iceland ID number

Member of the **27s group**.

Above/Below: Hugh Harrop, 2018

Above/Below: Hugh Harrop, 2019





150 (027E)

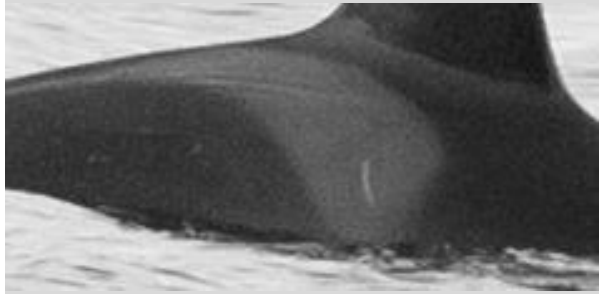
No Iceland ID number

Member of the **27s group**.

150 had an impressive set of tooth rake scars down both sides in 2017. These have faded over time and were already less visible in 2018.

150 was a calf in 2017. A historical photograph would suggest s/he was born approximately 2015/16.

This is not the same individual described as 150 in Deecke *et al.* (2011).



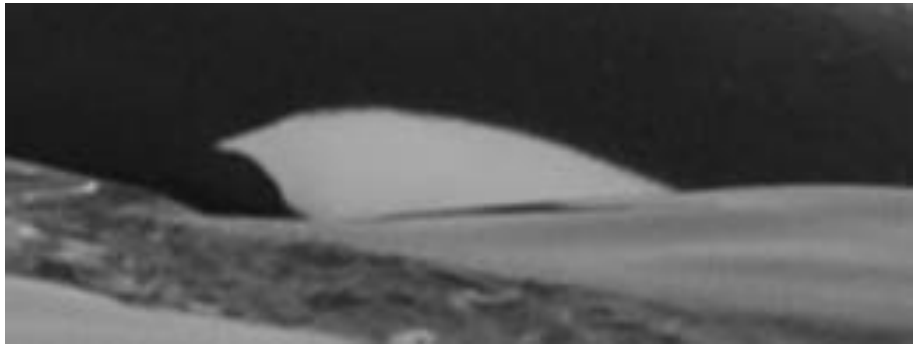
Above: Karen Munro, 2020

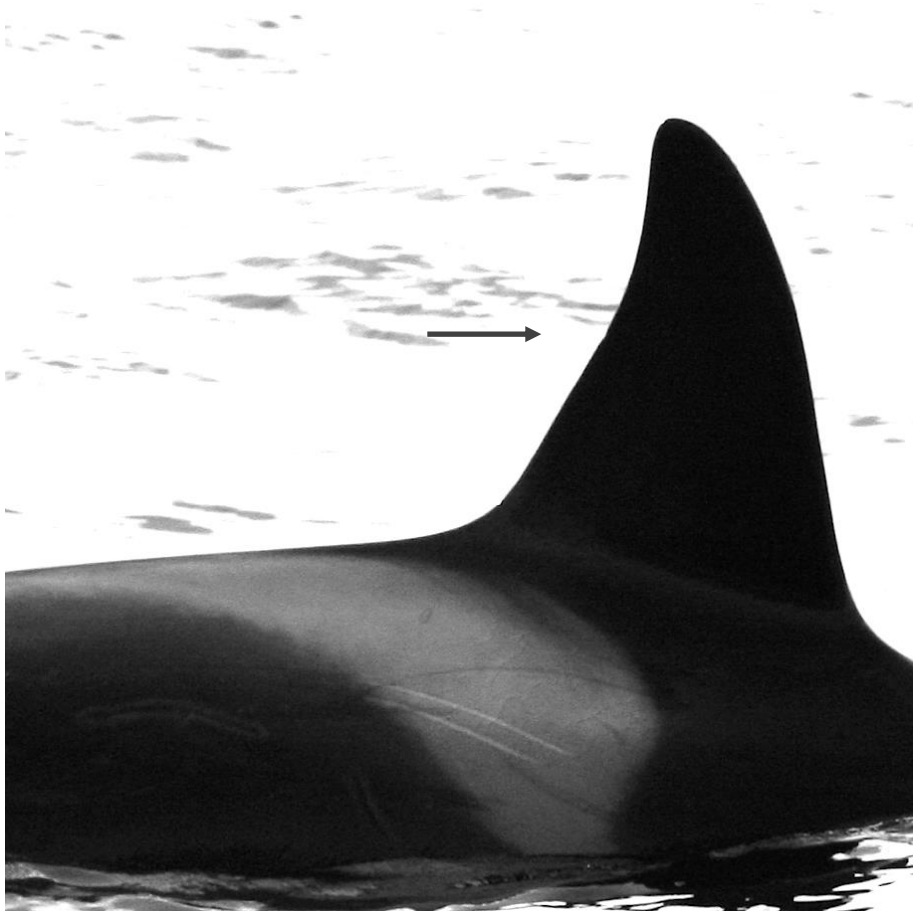
029

Believed to be the matriarch of the **29s group**.

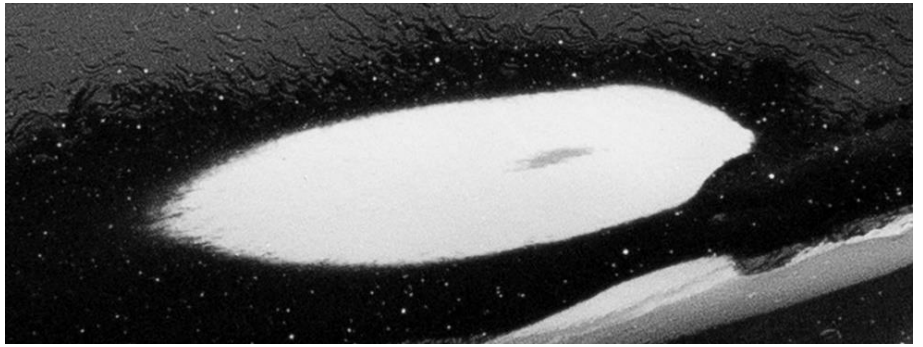
029, **193** and **194** were photographed together with the **19s group** off Sumburgh Head, Shetland on 3rd July 2018.

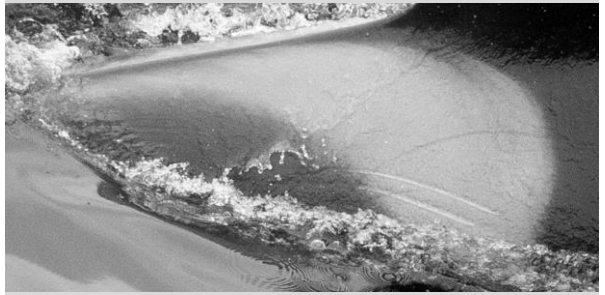
Above: Andy Foote, 2009
Below: Ben Wilson, 2010





Above: Andy Foote, 2009
Below: Hugh Harrop, 2018



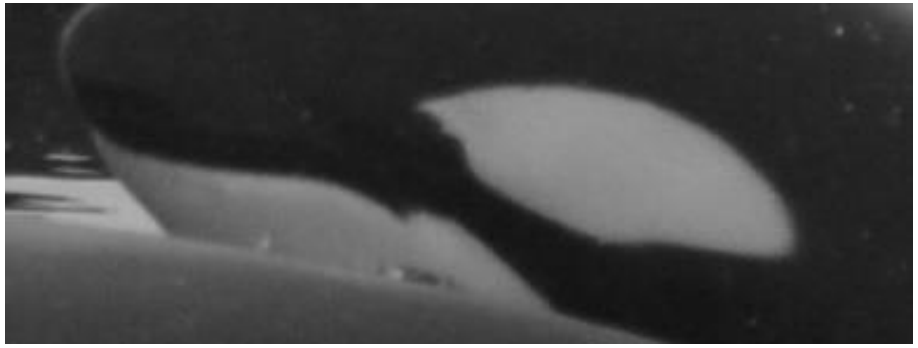


Above: Hugh Harrop, 2018

024

Above: Andy Foote, 2009
Below: Ben Wilson, 2010

Above: Andy Foote, 2009



Member of the **29s group**.

024 was photographed in close association with **029** in both 2009 and 2010. S/he is likely to be **029's** offspring.

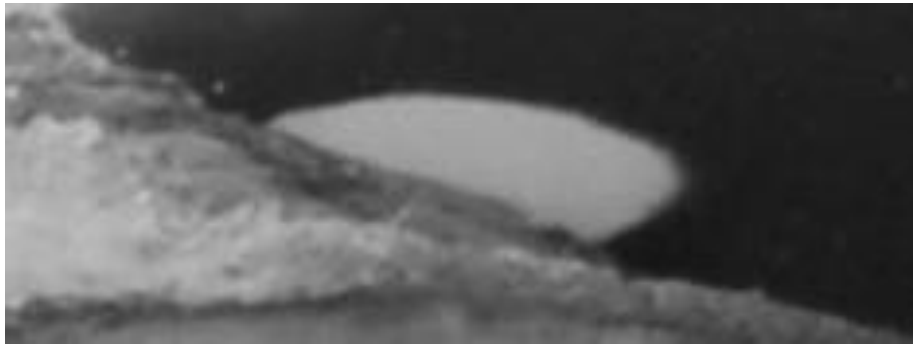
Eleven years on, matching **024** to these photographs is expected to be difficult. The small nick in the dorsal fin may be of assistance.

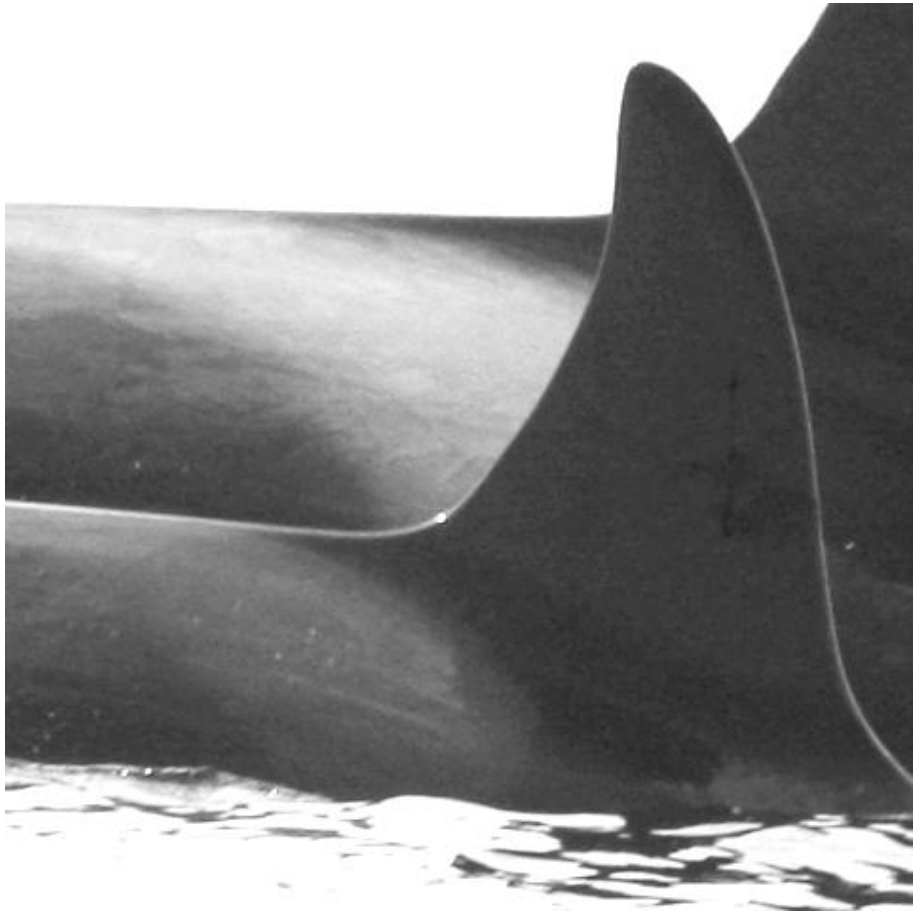
030

Member of the **29s group**.

Above: Andy Foote, 2009
Below: Ben Wilson, 2010

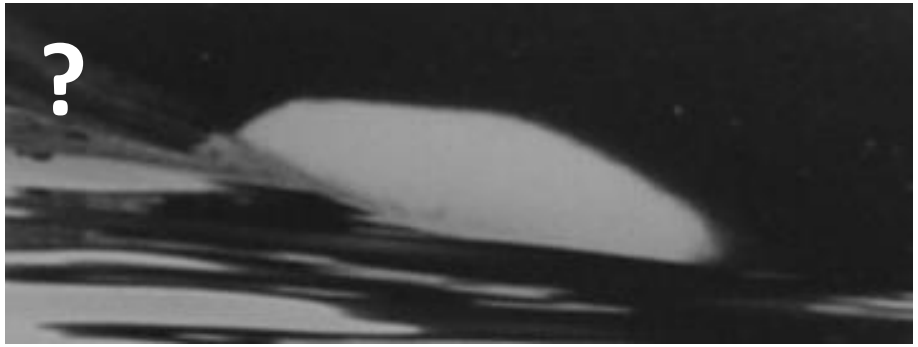
Above: Mark Breaks, 2007

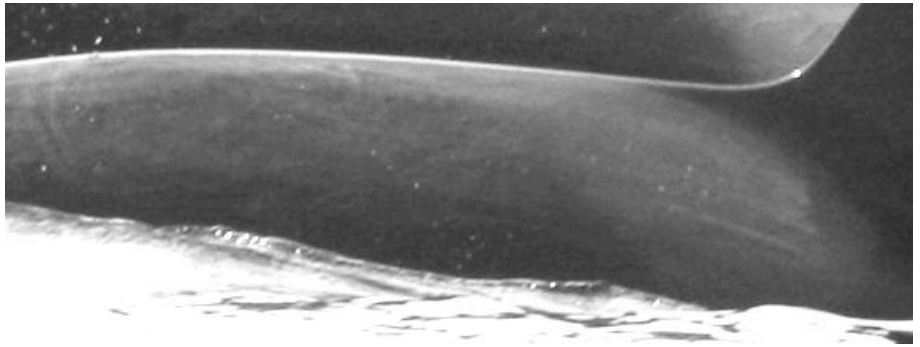




Above: Andy Foote, 2009
Below: Ben Wilson, 2010

Above/Below: Andy Foote, 2009





028

Member of the **29s group**.

028 was photographed in close association with **030** in 2009.

NB. This is believed to be **028's** left eye patch but we are not certain.

Above/Below: Andy Foote, 2009

025

Neapaback

Member of the **29s group**.

025 has a pronounced hump in front of his dorsal fin. This could be due to a spinal deformity or some form of tumour.

This hump earned **025** the name ***Neapaback*** after a clifftop on Yell, Shetland.

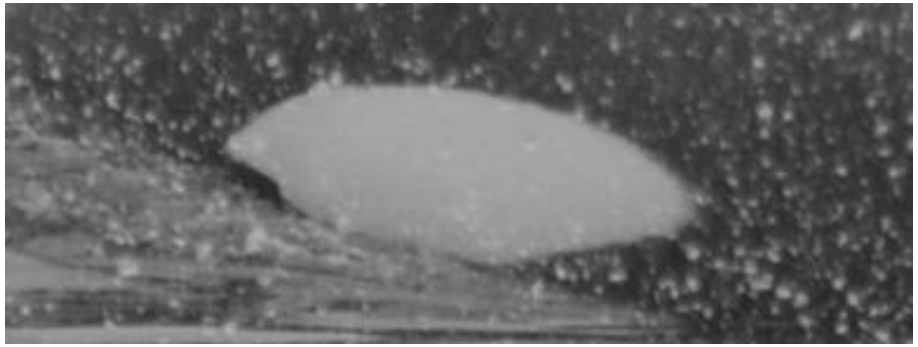
Above: Mark Breaks, 2007

031

Member of the **29s group**.

Above: Andy Foote, 2009
Below: Ben Wilson, 2010

Above: Andy Foote, 2009



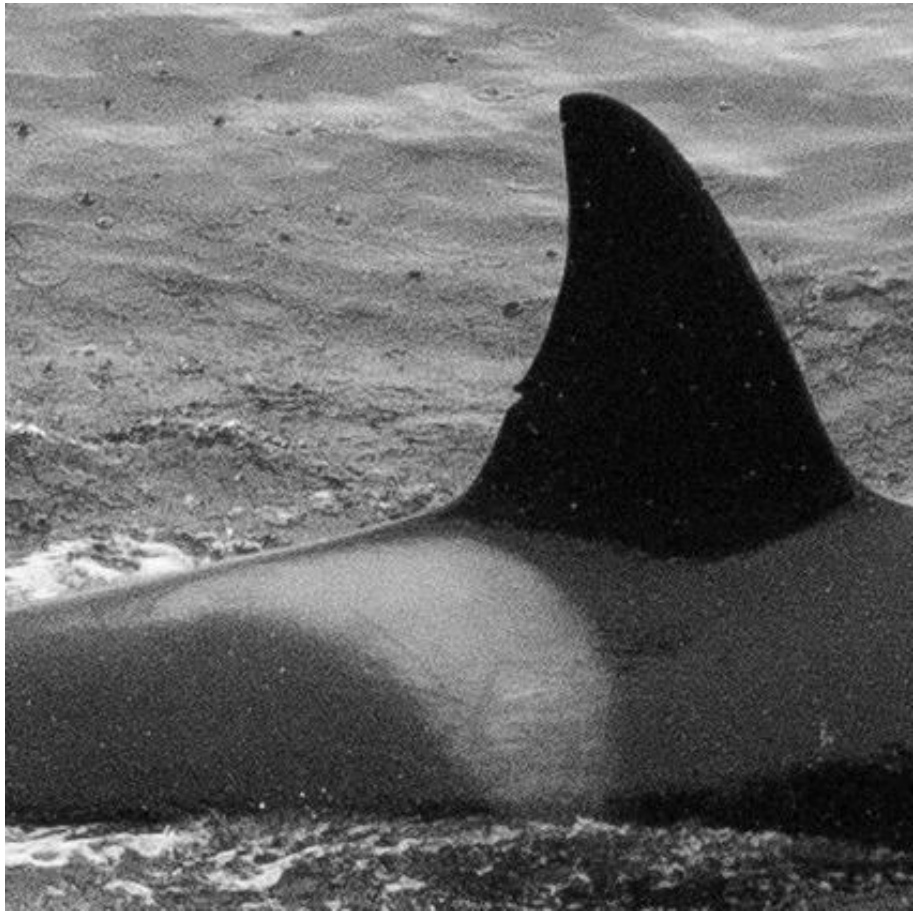
Above/Below: Andy Foote, 2009

035

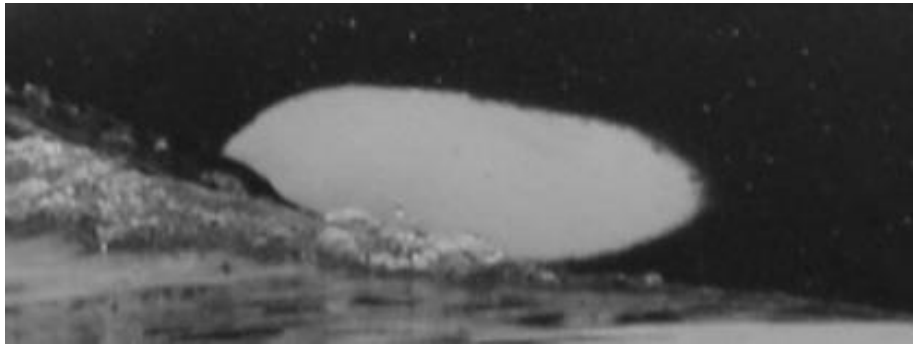
Member of the **29s group**.

193

Above/Below: Ben Wilson, 2010



Above: Hugh Harrop, 2018

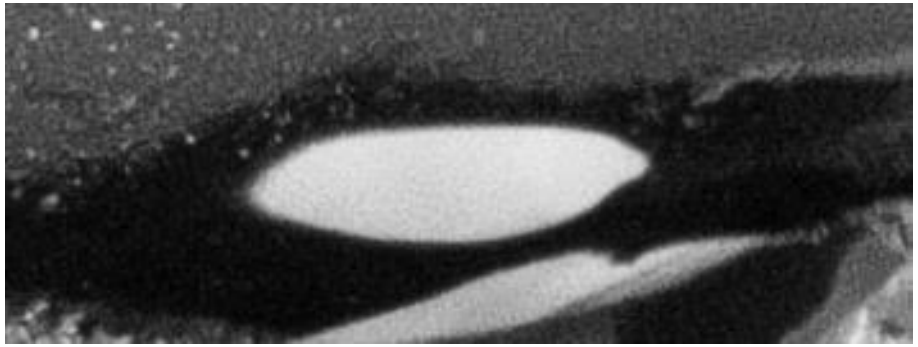


Member of the **29s group**.

029, **193** and **194** were photographed together with the **19s group** off Sumburgh Head, Shetland on 3rd July 2018.

Juvenile **194** was photographed in close association and in the echelon position with **193** in July 2018. This would suggest **194** may be the offspring of **193**.

Above/Below: Hugh Harrop, 2018



194

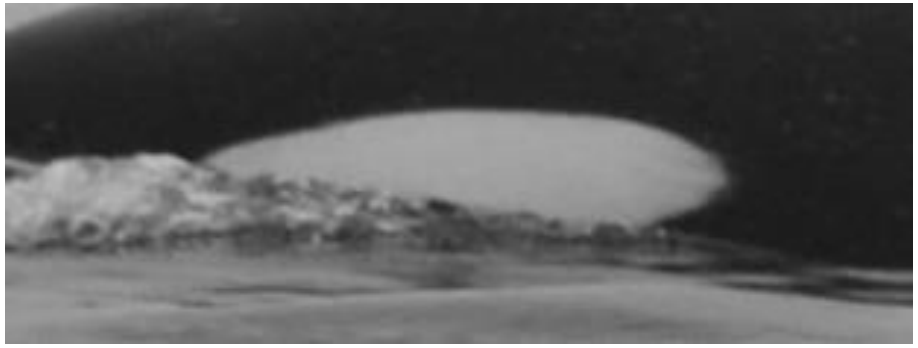
Member of the **29s group**.

029, **193** and **194** were photographed together with the **19s group** off Sumburgh Head, Shetland on 3rd July 2018.

Juvenile **194** was photographed in close association and in the echelon position with **193** in July 2018. This would suggest **194** may be the offspring of **193**.

154

Above/Below: Ben Wilson, 2010



Below: Ben Wilson, 2010 (left saddle)

154 was encountered in association with both the **15s** and **29s groups** off Orkney on 20th July 2010. S/he was photographed close by **029** and so has been placed together with the **29s group**, but **154's** affiliation is uncertain.

Above: Marijke de Boer/WDC, 2007

037

< Left

038

Right >

Encountered by Fisheries Research Service on 4th October 2005.

Above: (Fisheries Research Services) Marine Scotland, 2005

Above: (Fisheries Research Services) Marine Scotland, 2005

039

< Left

Encountered by Fisheries Research Service on 4th October 2005.

041

Right >

Encountered by Fisheries Research Service on 14th October 2005.

Above: (Fisheries Research Services) Marine Scotland, 2005

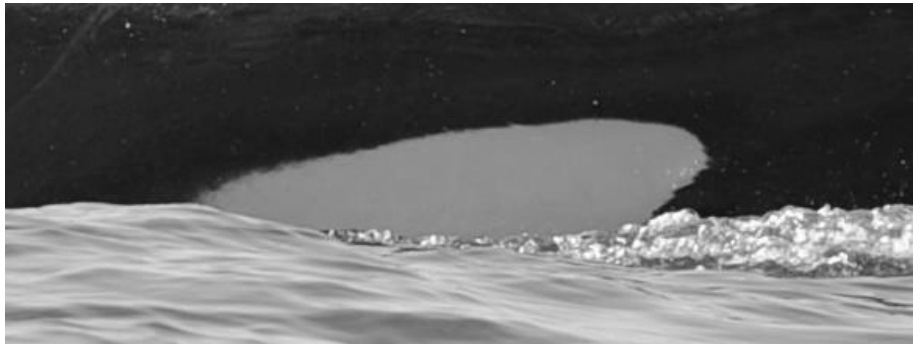
Above: (Fisheries Research Services) Marine Scotland, 2005

042

Encountered by Fisheries Research Service on 14th October 2005.

Above: (Fisheries Research Services) Marine Scotland, 2006

Above: Andy Foote, 2009
Below: Adam Ü, 2009



044

Encountered by Fisheries Research Service on 8th October 2006.

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above: Adam Ü, 2009

Above: (Fisheries Research Services) Marine Scotland, 2006

045

Encountered by Fisheries Research Service on 8th October 2006.

046

Encountered by Fisheries Research Service on 8th October 2006.

046, **049** and **218** were photographed in association off Fair Isle in both September 2019 and 2020.

046 and **217** were observed in association with mackerel fishing operations offshore from Shetland on 22nd January 2020.

Above: (Fisheries Research Services) Marine Scotland, 2006

Above: Magnus Polson, 2020

Below: Alex Penn, 2020

Above: Alex Penn, 2020

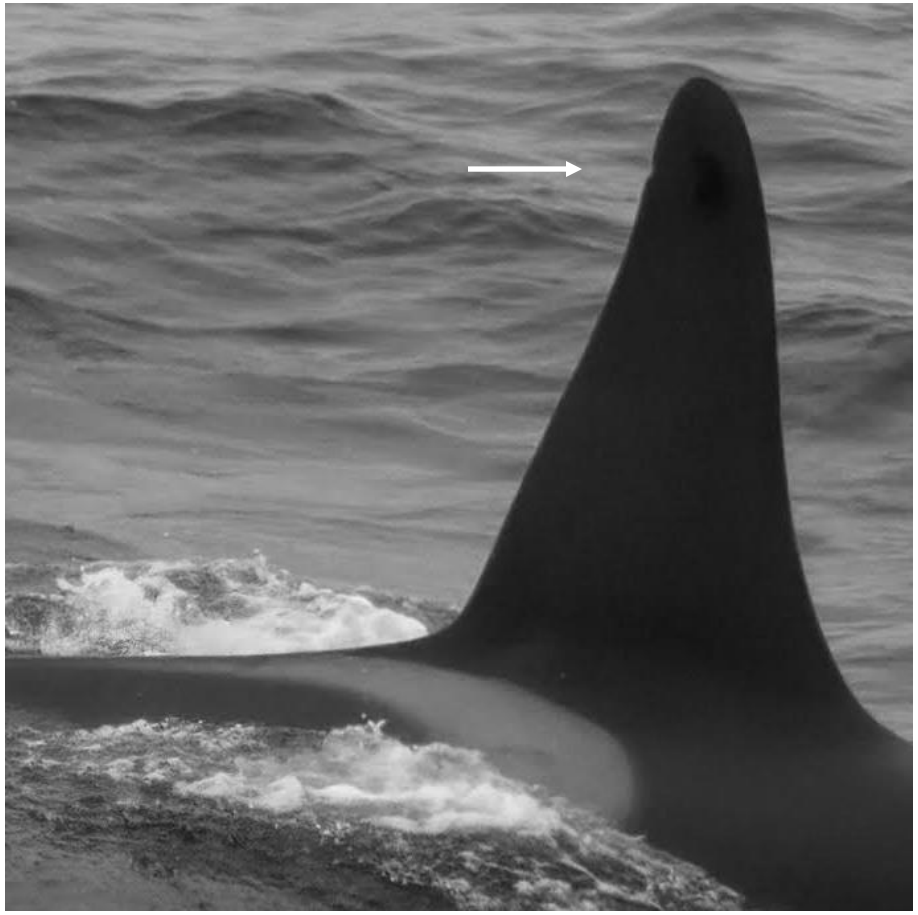
Above: Magnus Polson, 2020

217

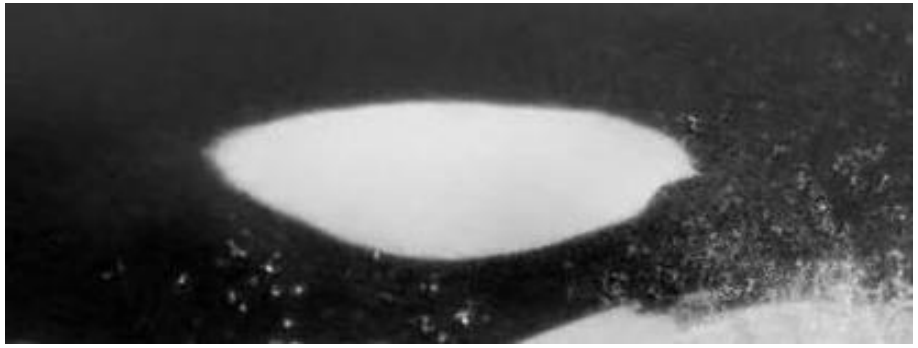
046 and **217** were observed in association with mackerel fishing operations offshore from Shetland on 22nd January 2020.

The male below was photographed in close association with **217**. Due to the incomplete primary identification features, he has not been given an ID number at this time.

Above: Magnus Polson, 2020



Above/Below: Alex Penn, 2020



218

< Left

046, **049** and **218** were photographed in association off Fair Isle in both September 2019 and 2020.

049

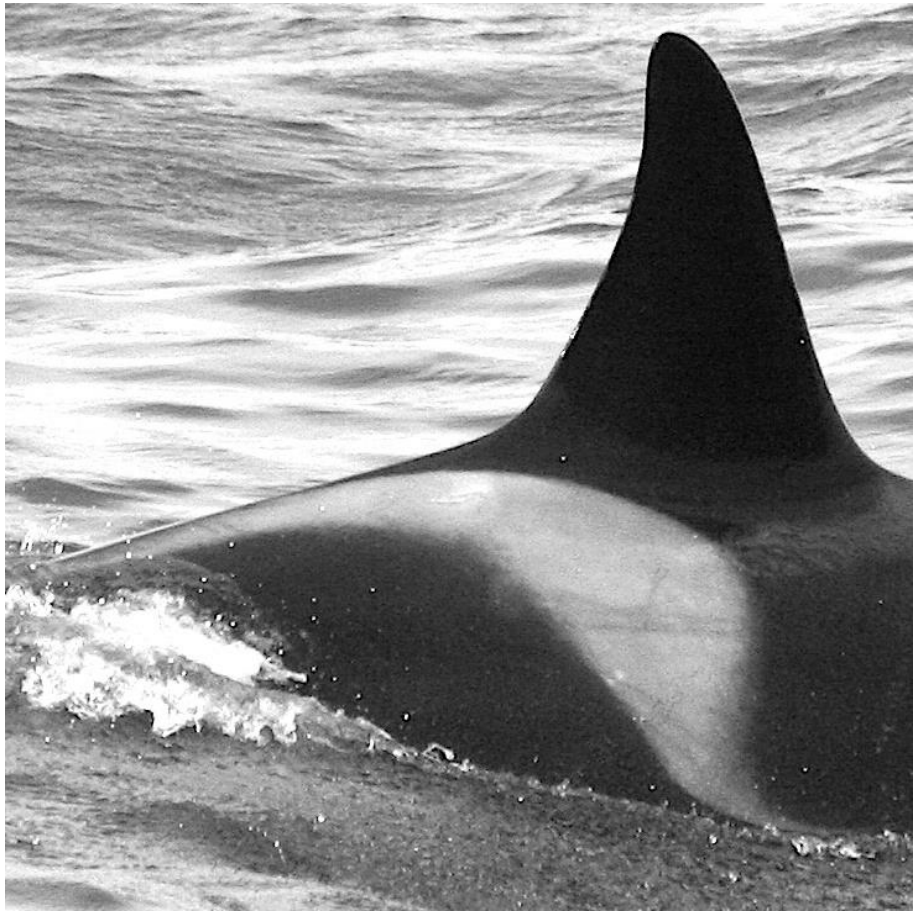
Right >

Encountered by Fisheries Research Service on 8th October 2006.

046, **049** and **218** were photographed in association off Fair Isle in both September 2019 and 2020.

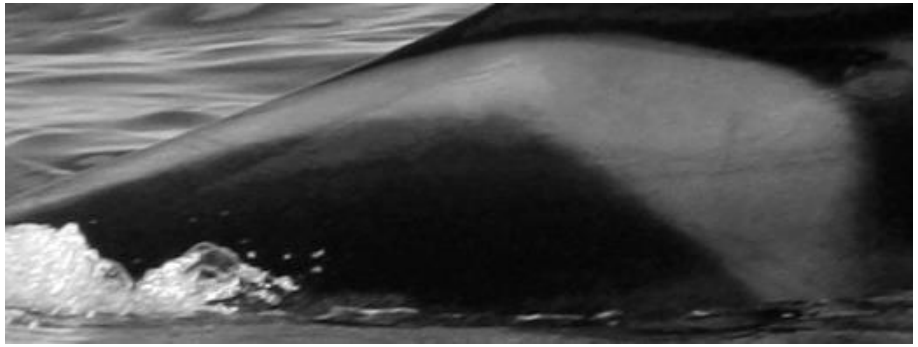
Above: (Fisheries Research Services) Marine Scotland, 2006

050

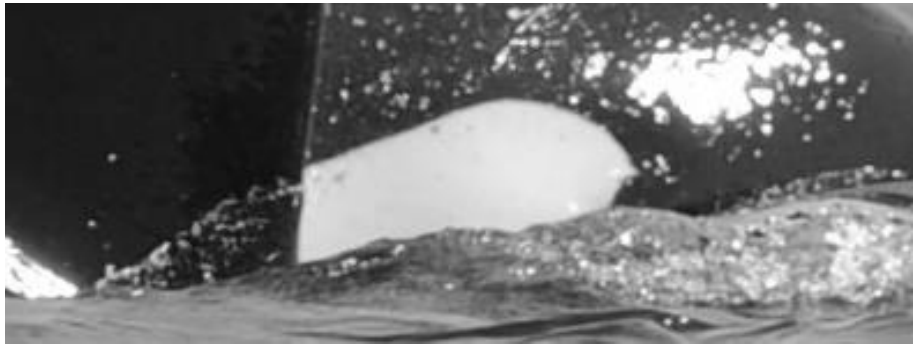


Above: (FRS) Marine Scotland, 2006

Below: Andy Foote, 2009 (right saddle)



Below: Adam Ü, 2009



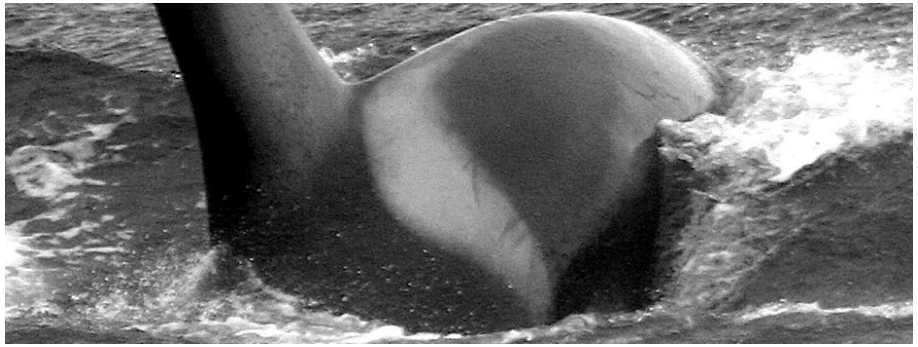
Encountered by Fisheries Research Service on 8th October 2006.

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

050 was photographed in close association with a juvenile in June 2009.

Above: Andy Foote, 2007
Below: Harriet Bolt, 2007

Above: Harriet Bolt, 2007



051

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 10th (left) and 11th (bottom left, right) October 2007.

Above: Andy Foote, 2007

052

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 10th October 2007.

053

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 10th October 2007.

Above: Andy Foote, 2007

Above: Andy Foote, 2007

054

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 10th October 2007.

055

Above: Andy Foote, 2007

Above: Harriet Bolt, 2007

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 10th (left) and 11th (right) October 2007.

Photographed from shore off the Shetland mainland in 1991.

Above: Andy Foote, 2007

060

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 10th October 2007.

057

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 11th October 2007.

Above: Harriet Bolt, 2007

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

056

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 7th October 2008.

Above: Harriet Bolt, 2008

059

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

062 & 155 Group

Male **062** was strongly associated with females **019** and **021** (the latter believed to be deceased) in the citizen science photographs collected during the 2000's. However, the social dynamics appear to have changed. In Scottish waters, **062** has more recently been photographed in a seemingly stable association with male **155** and seldom together with the **19s group**. A possible cause of this change in social dynamics may surround the loss of **021** – potentially the mother of **019** and **062**. Such events can lead to group fission and the establishing of new social relationships.

Above: 062 *Hulk* (left) and 155 *Nótt* (right) off Shetland 2020.
Photograph: Steve Truluck

Above: 062 *Hulk* (foreground) and 155 *Nótt* (behind) off Shetland 2017.
Photograph: Hugh Harrop

062

Hulk

(Previously also 016)

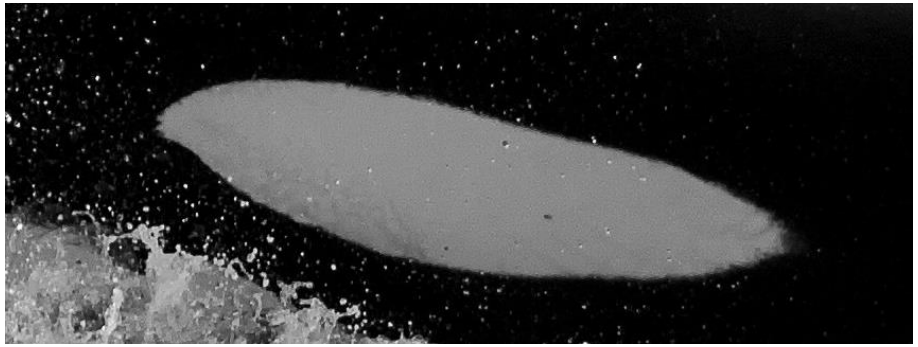
Iceland ID Numbers:
IS015, SN0066 *Supreme*, 993

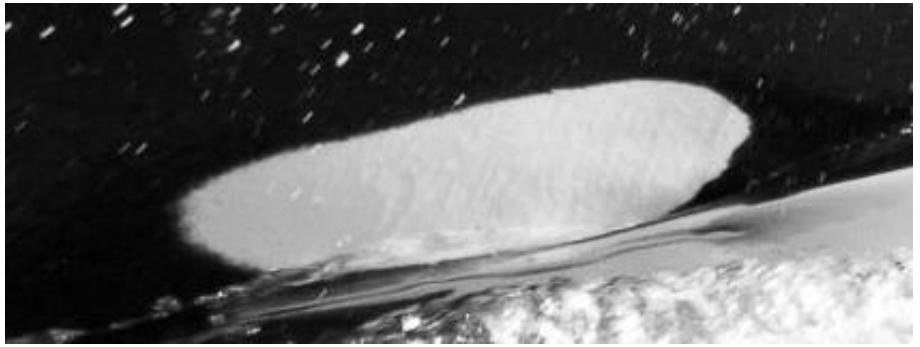
Known traveller between Iceland (winter) and Scotland (summer).

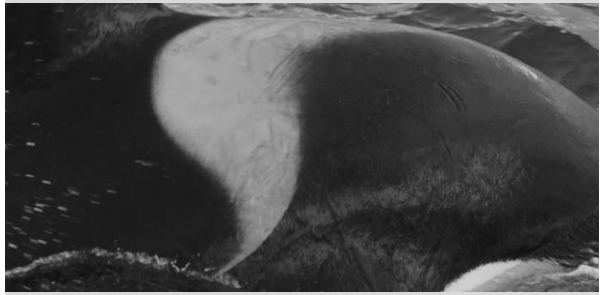
016 and **062** of the 2009 catalogue are the same individual. The ID number **062** has been retained.

Above: Steve Truluck, 2020
Below: Rob Lott/WDC 2014

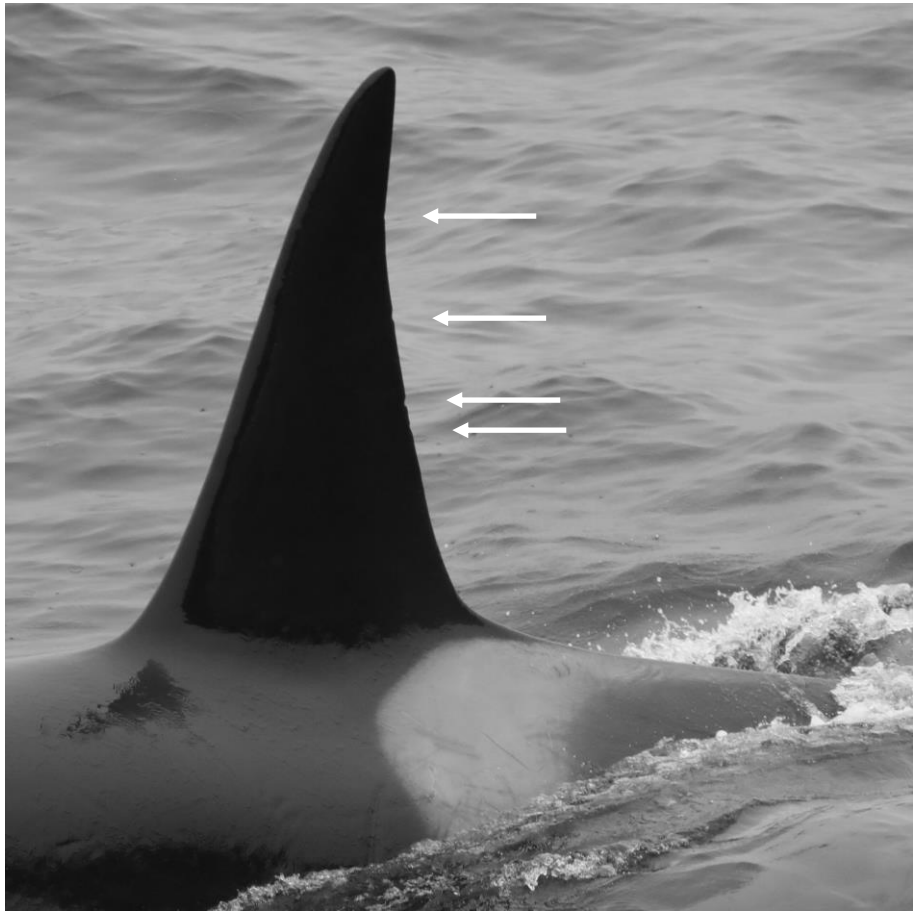
Above: Marie Mrusczok (Orca Guardians Iceland), 2014
Below: Mick Kemp, 2017



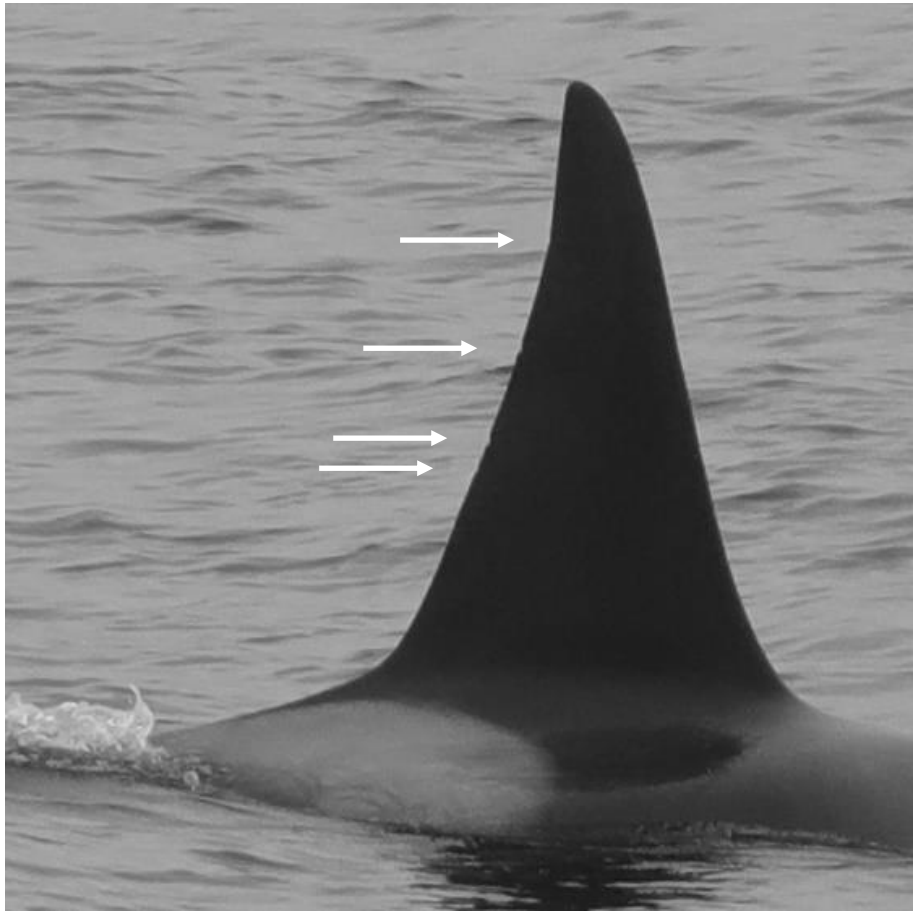




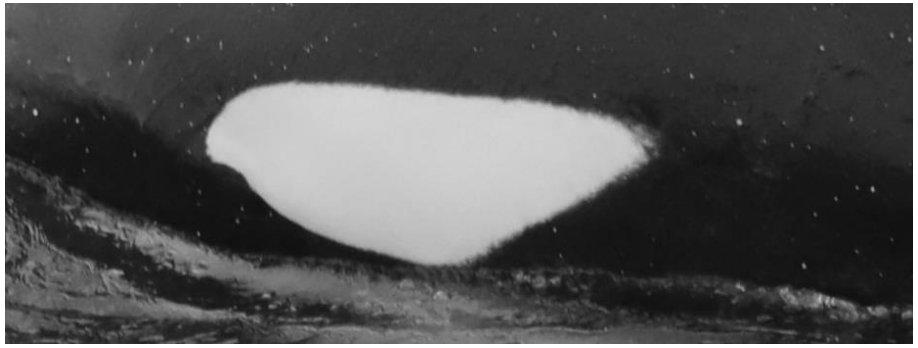
Above: Marie Mrusczok (Orca Guardians Iceland), 2019

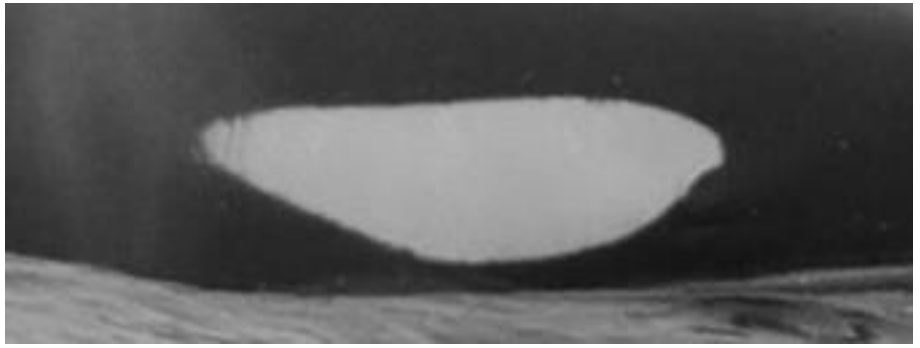


Above/Below: Steve Truluck, 2020



Above/Below: Steve Truluck, 2020



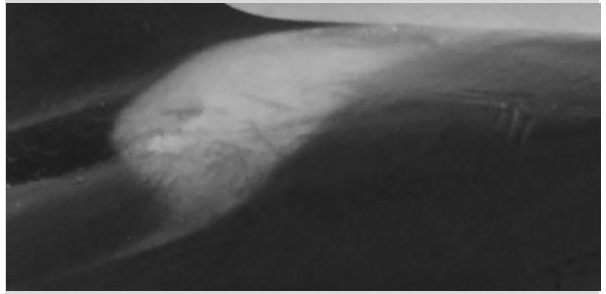


155

Nótt

Iceland ID Numbers:
IS229, SN0067

Known traveller between Iceland (winter) and Scotland (summer).



Above: Marie Mrusczok (Orca Guardians Iceland), 2019 (left and right saddles)

64s & 65s Groups

In 2008 and 2009, adult male **032**, adult females **064**, **065** and **066**, and juvenile **067** formed a single group. They were by far the mostly frequently encountered group during the fieldwork undertaken by Andy Foote (2008 and 2009), who believed **066** to be the group matriarch at that time.

A number of calves have been born since 2010 and with the addition of **065's** 2018 calf **168**, the group size increased to nine individuals.

The group remained one of the most frequently encountered around Shetland from 2016 to 2018, but unfortunately discontinuous sightings data between 2010 and 2015 has meant the identity of many members of the group have remained unclear. Since the beginning of 2017 there have not been any positive identifications of **066** and no positive matches of **067**.

The end of 2018 marked the beginning of change with the group splitting in two and becoming what we now know as the **64s** and **65s groups**.

At some point between mid-December 2018 and the beginning of May 2019, **064** had a new calf (**200**). The **64s group** were sighted off Sanday, Orkney at the beginning of May 2019 and numbered only four individuals: **064**, her new calf **200**, a sub-adult male **196** and a juvenile (likely **195**). Following a further handful of sightings off Orkney, all four members of the **64s** were encountered together with the **27s group** off South Mainland, Shetland in early June 2019. In July 2019, the **64s** were observed in association with travelling male **018** off Orkney.

Three days prior to the **64s** Sanday sighting (May 2019), **065** and **199** were photographed in a group of six individuals, including an adult male, off the Northwest coast of mainland Scotland. At the end of June 2019, Hebridean Whale and Dolphin Trust encountered a group of five to six individuals, including **032**, **065** and **221**, off Loch Laxford, Northwest Scotland. All six members of the **65s group** (**032**, **065**, **168**, **198**, **199** and **221**) were recorded off Northeast Mainland, Shetland in early July 2019.

It is unclear exactly when and why the **64s/65s** split occurred. Group fission is known to take place following the loss of a matriarch and has also been linked to optimal foraging group size in Northeast Pacific mammal-eating Bigg's killer whales.

A sighting off the Brough of Deerness, Orkney on 15th October 2020 suggests a temporary reunion of the **64s** and **65s groups** has taken place. Adolescent male **196** (**64s group**) was photographed close to shore together with **032** and **065** (**65s group**); it has not been possible to identify the other individuals with them. Six killer whales, likely the **65s group**, were filmed off Levenwick and Quendale, Shetland on 12th November 2020. All four members of the **64s group**, including **196**, were photographed as they headed North along the Central Mainland, Shetland coastline on 31st December 2020.

Both the **64s** and **65s groups** form part of the Northern Isles Community (together with the **27s group**) and it is likely they are semi-resident to Scottish waters. To the best of our knowledge, neither the **64s** nor **65s groups** have been sighted off Iceland. There is however an equivocal photographic match of **032** from the Faroe Islands and **067** has an alphanumeric Faroe ID number. There are no known records of them in Norwegian waters.

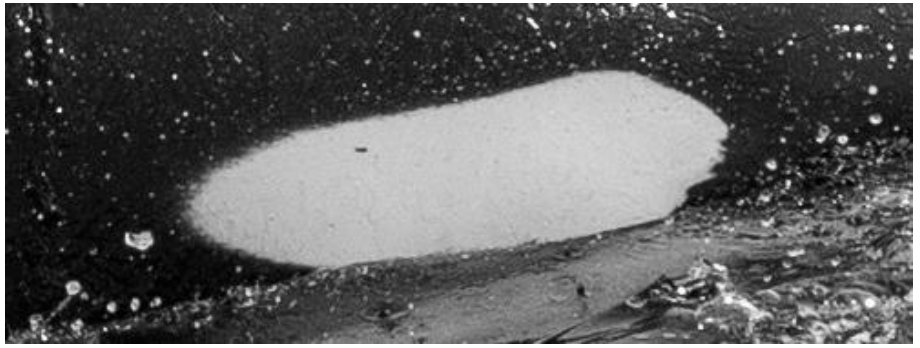
064

Believed to be the matriarch of the **64s group**.

064's dorsal fin bends to the right and as a result, the fin shape can look different depending on the camera angle to her. The fin can resemble that of a sprouting sub-adult male.

Above: Mary Stevenson, 2017
Below: Steve Truluck, 2019

Above/Below: Hugh Harrop, 2018



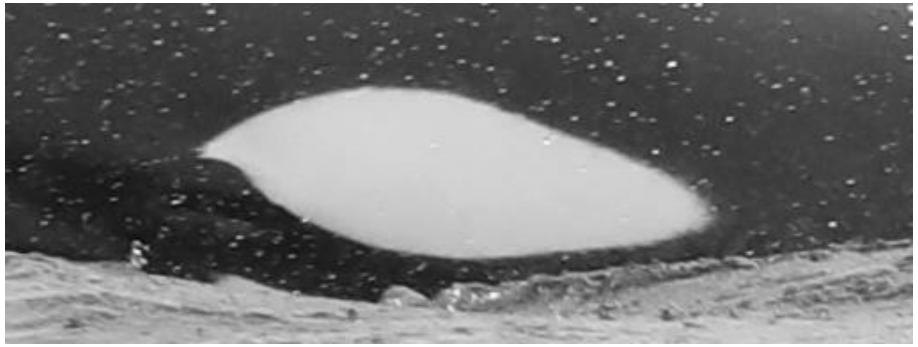
195

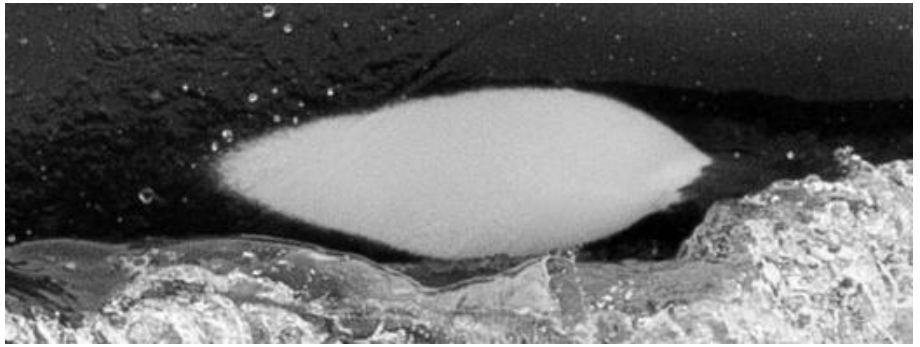
Member of the **64s group**.

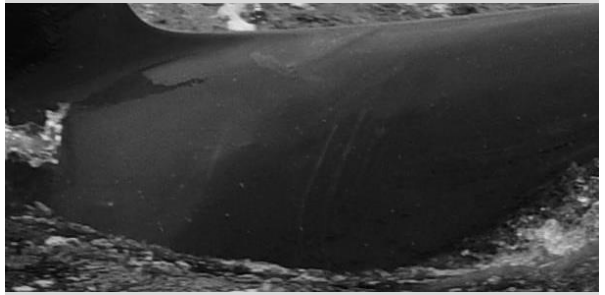
Judging by the close association and size in a photograph taken by Hugh of the **64s group** passing North through Bressay Sound, Shetland in April 2017, **195** is believed to be **064's** 2015/16 calf.

Above/Below: Steve Truluck, 2019

Above/Below: Hugh Harrop, 2017







Above: Robert Foubister, 2019

200

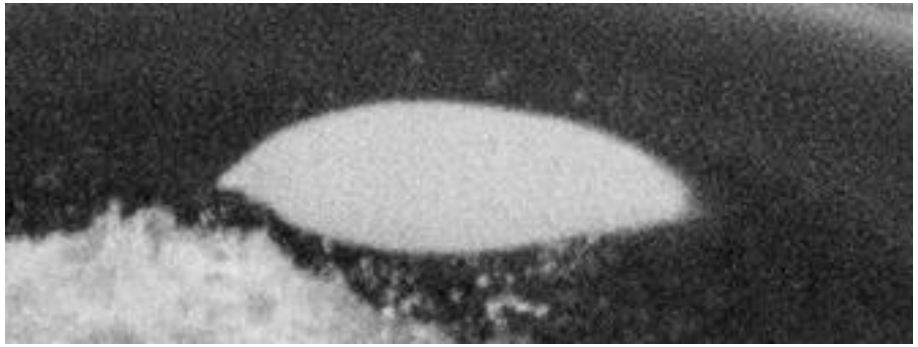
Member of the **64s group**.

200 was born at some point between December 2018 and May 2019. S/he is the offspring of **064**.

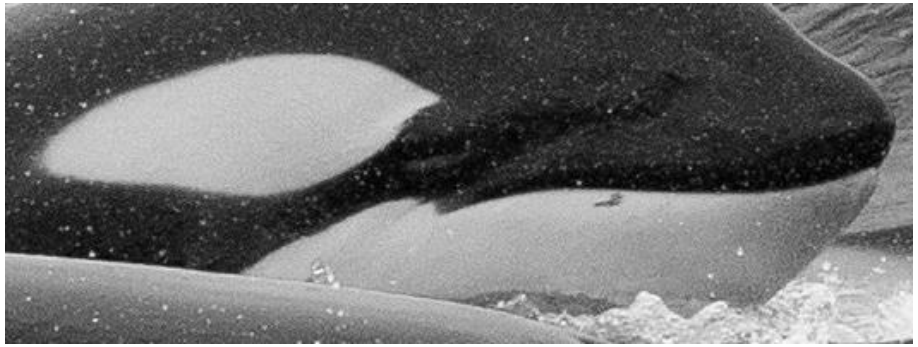
Above: Steve Truluck, 2019

Top: Ryan Leith, 2020

Below: Hugh Harrop, 2020



Below: Hugh Harrop, 2019



Bottom: Robert Foubister, 2019

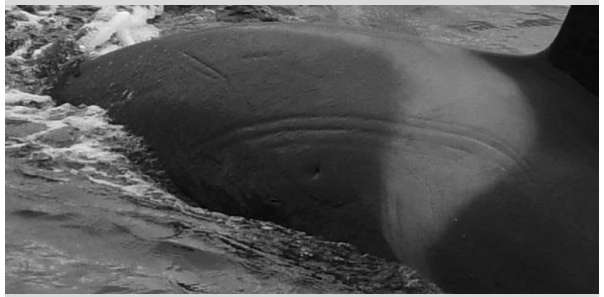
196

Member of the **64s group**.

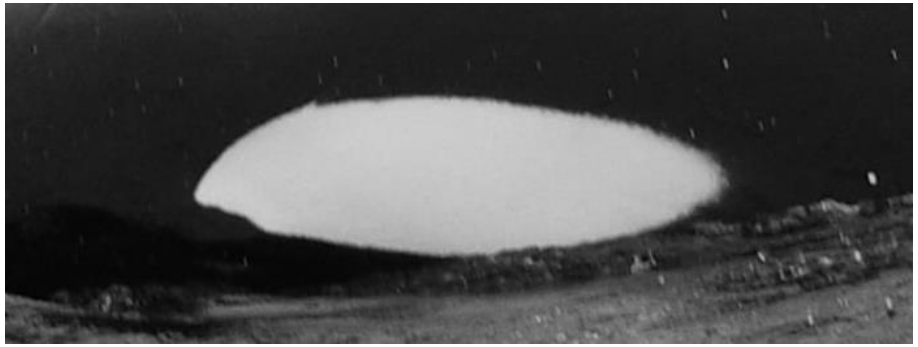
196 is an adolescent male.

Above/Below: Robert Foubister, 2019

Above: Hugh Harrop, 2019
Below: Hugh Harrop, 2017



Above: Robert Foubister, 2019



Above: Andy Foote, 2009

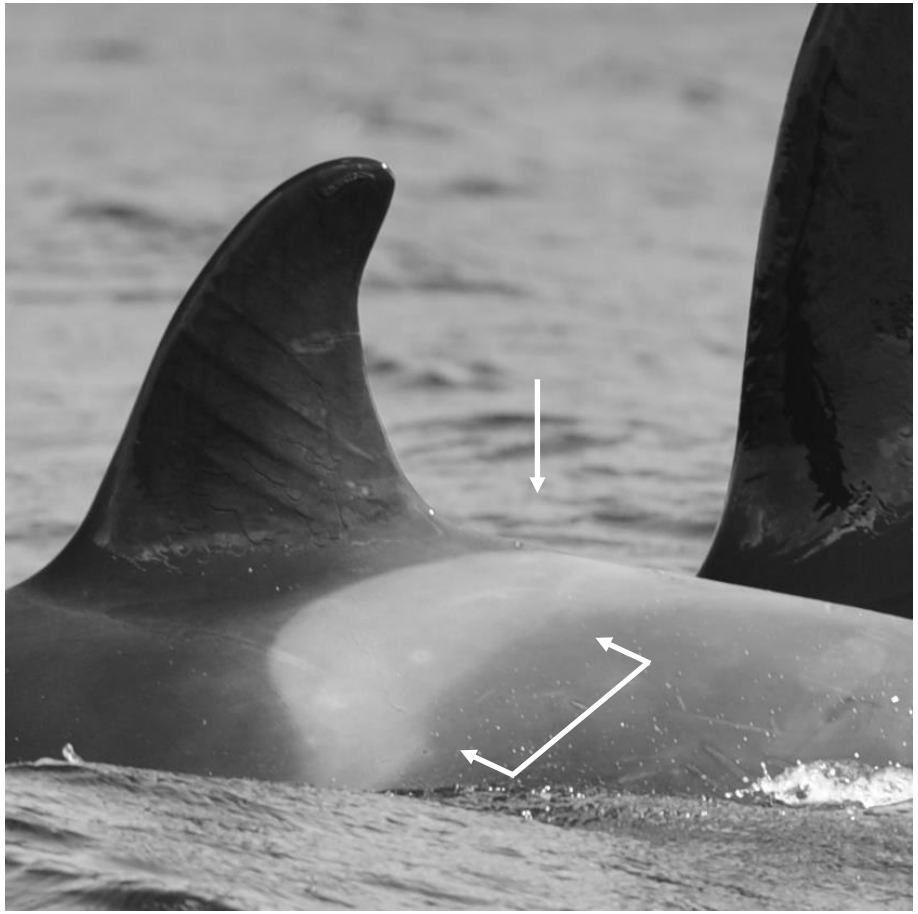
Above: Andy Foote, 2009

066

Believed to have been the matriarch of the **66s group** (combined **64s** and **65s groups**).

There have not been any clear identifications of **066** since the beginning of 2017. She may be deceased or have acquired new scars and nicks making her difficult to match with the 2009 reference images.

The close association between **066** and **067** in the 2009 reference images could suggest **067** is the offspring of **066**.



Above: Andy Foote, 2009

067 - 221 (L)

Ossa

Faroe Islands
ID Number:
A5

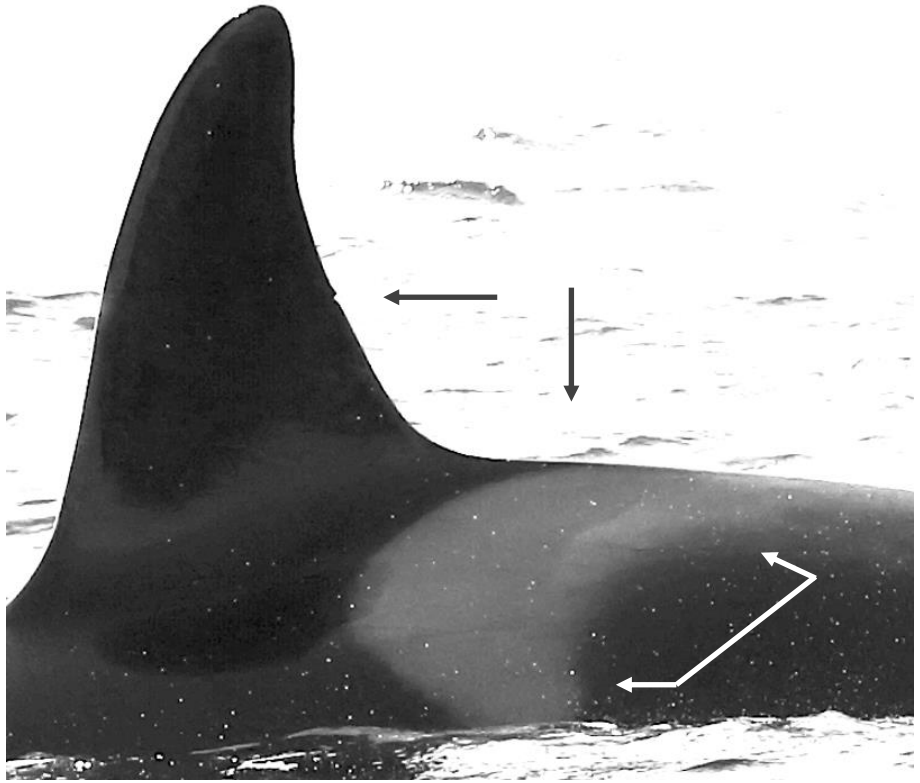
< Left - Right >

Member of the **66s group** (combined **64s** and **65s groups**).

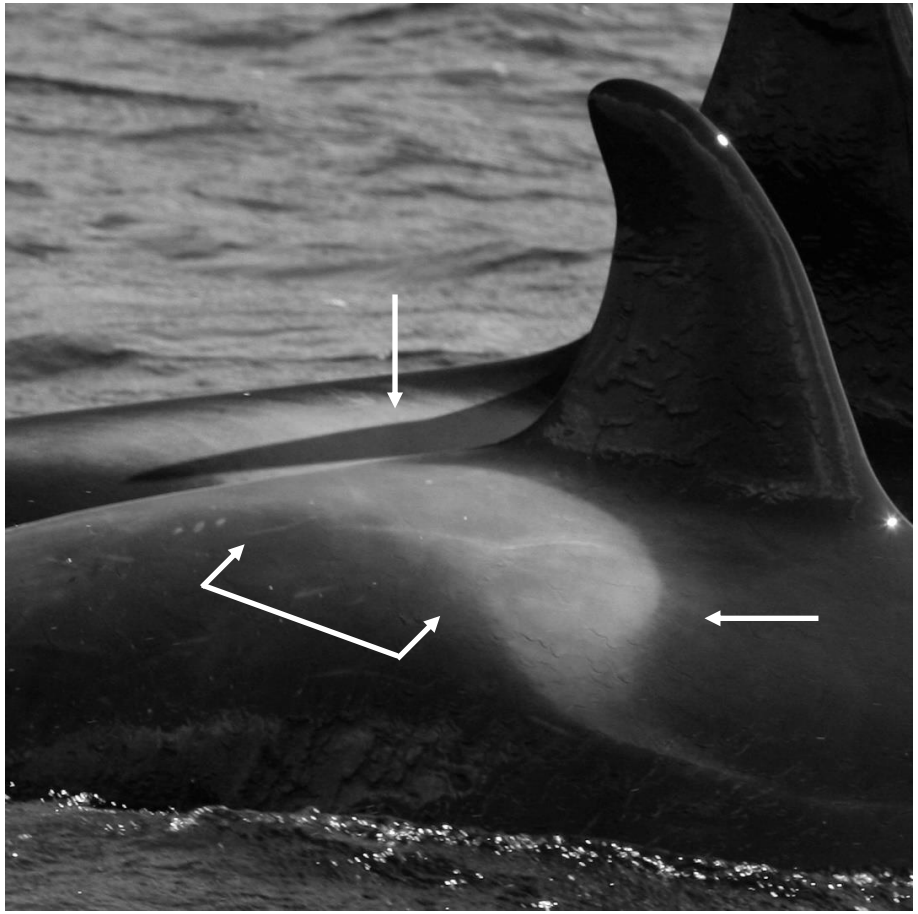
The close association between **066** and **067** in the 2009 reference images suggests **067** is the offspring of **066**.

067 had few markings and was a juvenile of unknown sex back in 2009. Given the passage of time, its unsurprising s/he has proved difficult to re-identify.

221 has been photographed travelling with the **65s group** and represents our best guess of a …
(continued over)



Above: Hugh Harrop, 2016-2018
Below: Karen Munro, 2019



Above: Andy Foote, 2006

067 - 221 (R)

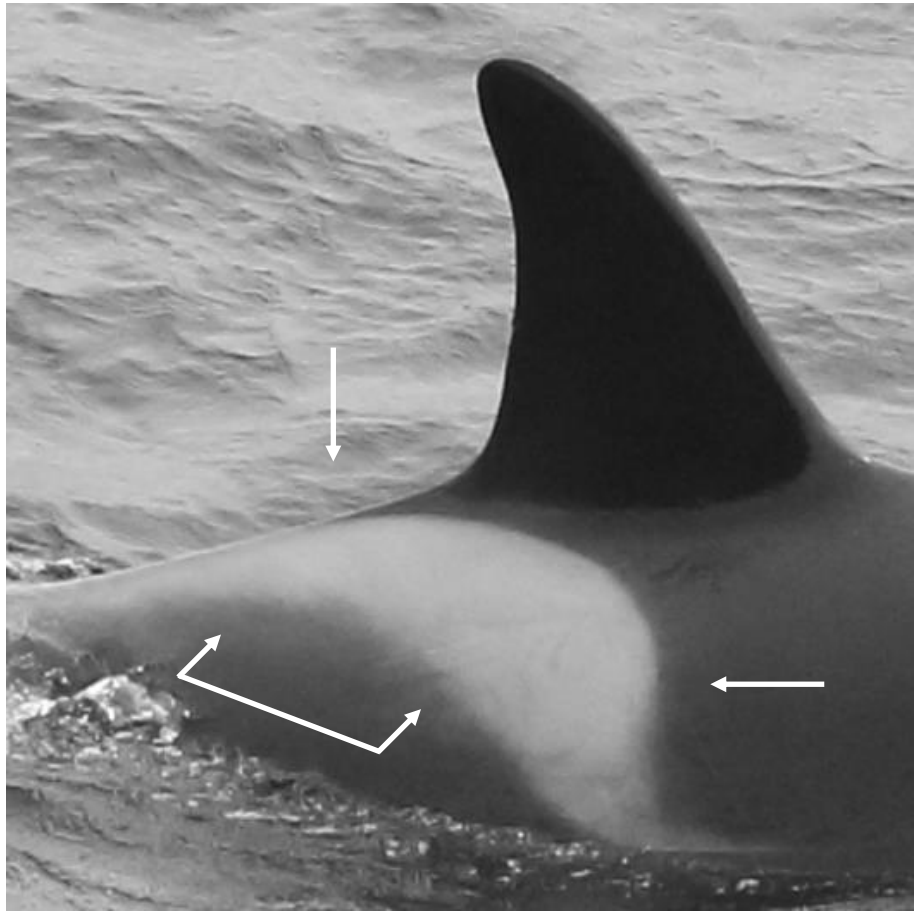
Ossa

Faroe Islands
ID Number:
A5

< Left - Right >

… match to **067**. This is based primarily on the outline shape of the left and right saddle patches, together with a plausible growth elongation of the dorsal fin with age. To reflect the remaining uncertainty, **221** has been given a new ID number.

067 was named ***Ossa*** by Kay Johnson of Burravoe School back in 2009.



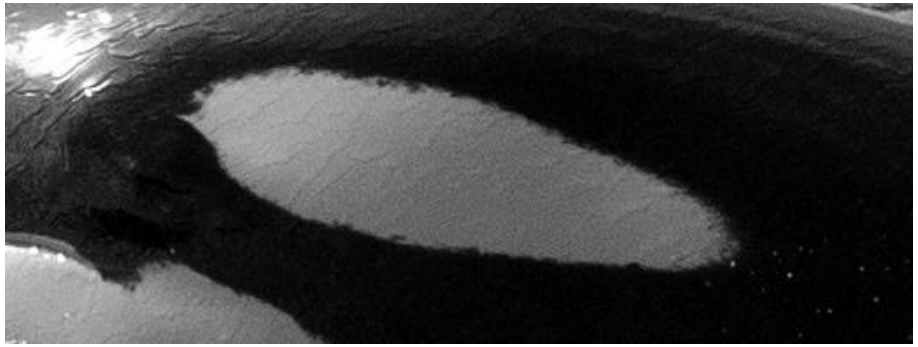
Above: Hugh Harrop, 2016-2018
Below: Robert Foubister, 2018

065

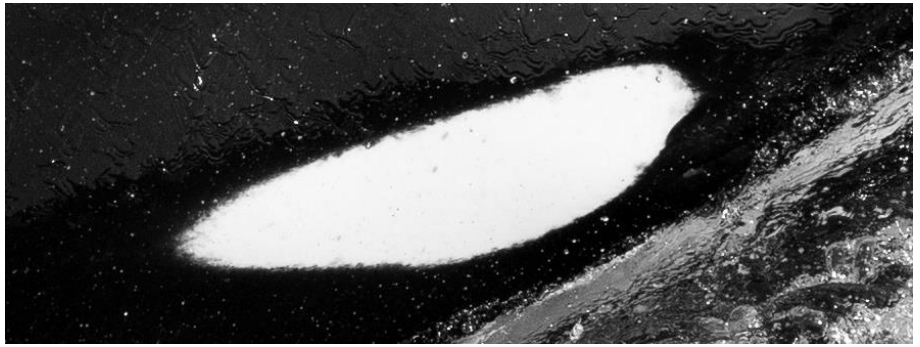
Razor

Believed to be the matriarch of the **65s group**.

Above: Karen Munro, 2019
Below: Hugh Harrop, 2018



Above: Hugh Harrop 2017
Below: Hugh Harrop, 2018



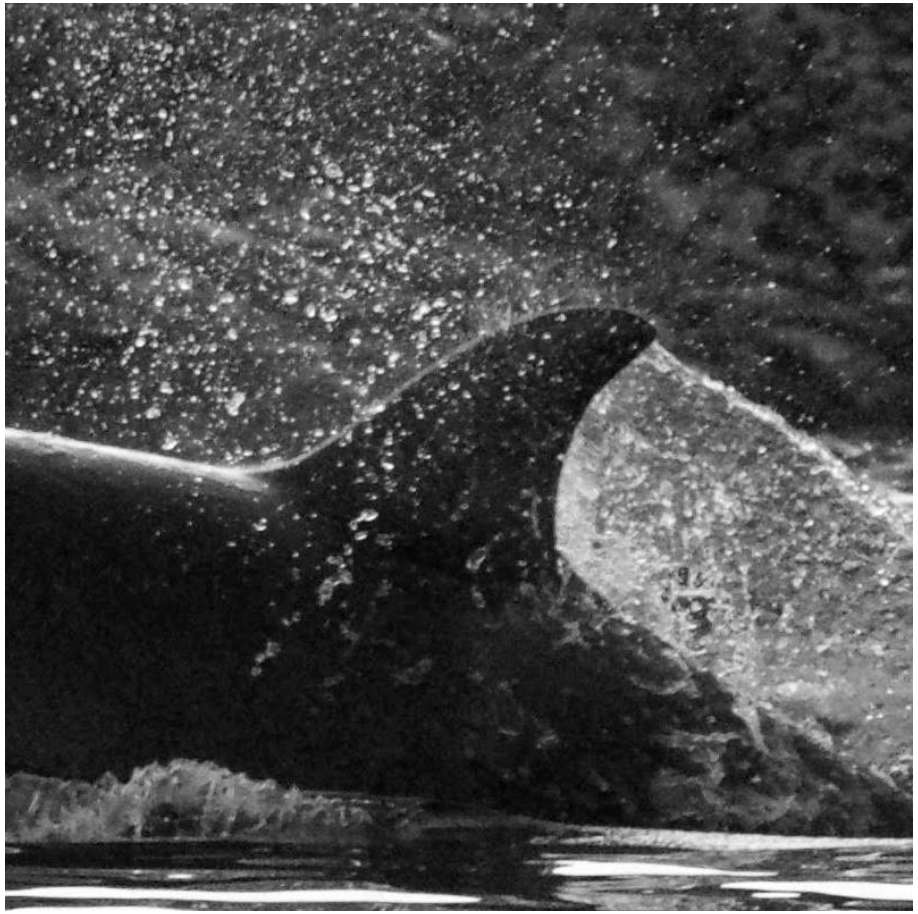
198

Above: Hugh Harrop, 2016

Above: Hugh Harrop, 2020

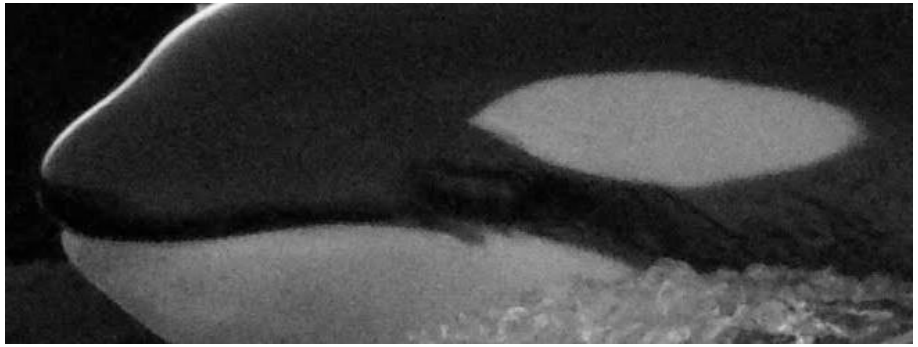
Member of the **65s group**.

In March 2016 **065** and **198** were photographed side by side, with **198** in the echelon position. This would suggest **198** may be the offspring of **065**.



Above/Below: Ryan Nisbet, 2018

Above/Below: Ryan Nisbet, 2018



168

Member of the **65s group**.

Born to believed matriarch **065** prior to April 2018, **168** was first observed with **065** in the River Clyde.

032

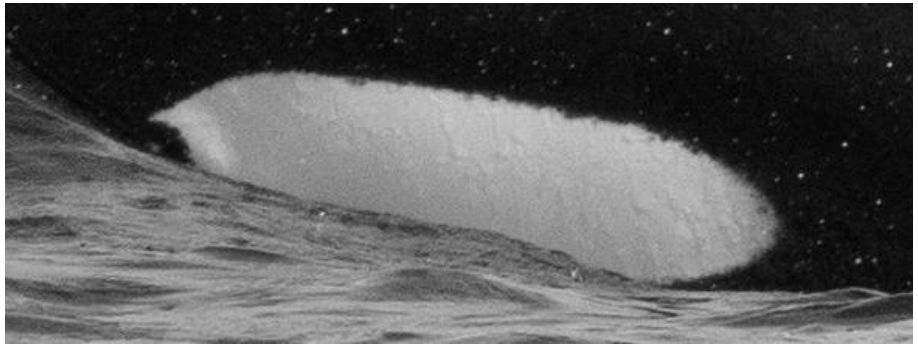
Busta

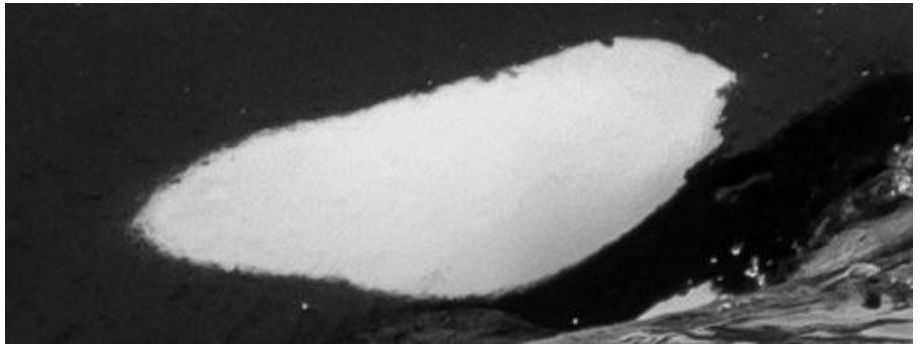
Member of the **65s group**.

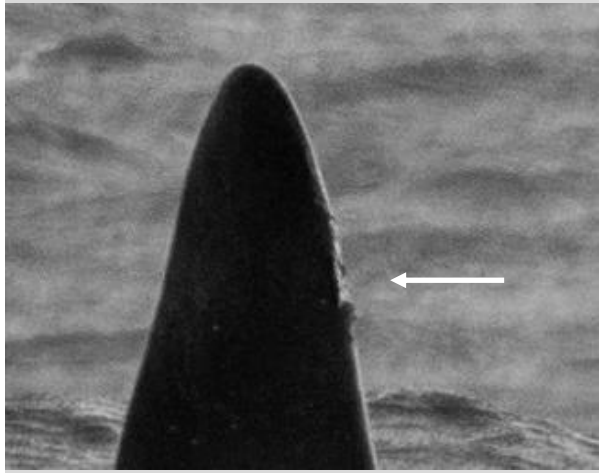
032 was photographed with the **65s group** off Stenness, Shetland in March 2020. He had an injury on the leading edge of his dorsal fin (see below).

Above: Karen Munro, 2019
Below: Hugh Harrop, 2018

Above: Hugh Harrop, 2018
Below: Karen Munro, 2019

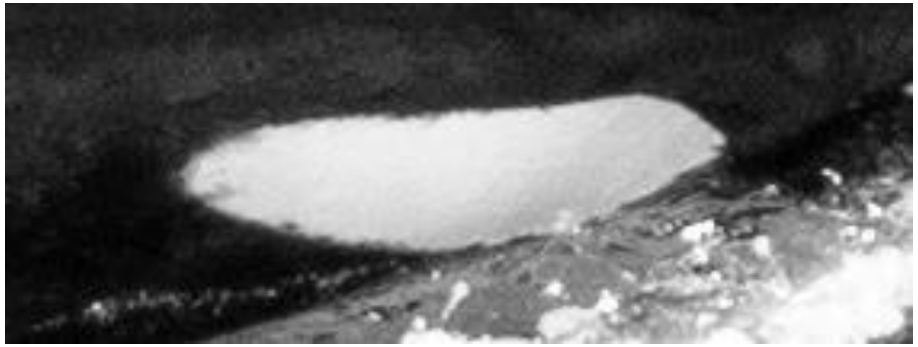






Above: Ryan Leith, 2020

Above/Below: Hugh Harrop, 2020



199

Member of the **65s group**.

Above/Below: Marie Mrusczok (Orca Guardians Iceland), 2020

Above: Marie Mrusczok (Orca Guardians Iceland), 2020

068

Iceland ID number:
SN0419

Known traveller between Iceland and Scotland.

Encountered by Orca Guardians Iceland off the Snæfellsnes peninsula, West Iceland in June 2020.

Above: Jerry Boyle, 2008

Above: Gareth Pratt, 2009

074

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

075

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 4th October 2008.

Above: Andy Foote, 2008

076

< Left

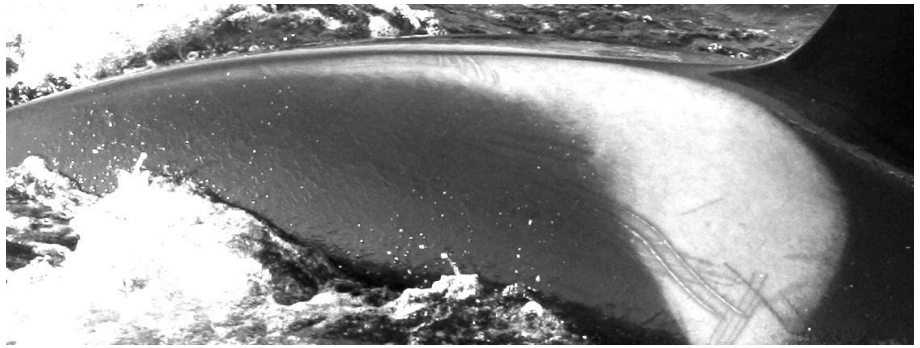
Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 4th October 2008.

077

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 6th October 2008.

Above/Below: Harriet Bolt, 2008



Above: Harriet Bolt, 2008

078

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 6th October 2008.

079

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 6th October 2008.

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

080

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 6th October 2008.

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

081

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 6th October 2008.

082

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 6th October 2008.

Above: Harriet Bolt, 2008 (right saddle)

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

083

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 7th October 2008.

Above: Harriet Bolt, 2008

085

< Left

085 and **086** were photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

086

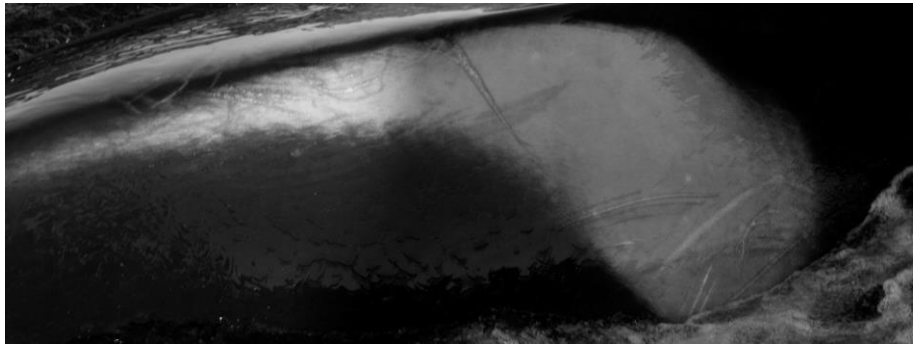
Right >

086 and **085** were photographed side by side, with **086** in the echelon position. This would suggest **086** may be the offspring of **085**.

Above/Below: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

Above/Below: Harriet Bolt, 2008



087

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

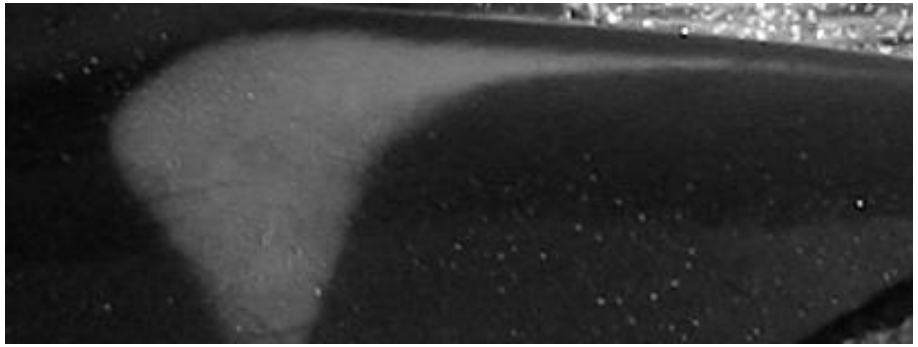
Above: Harriet Bolt, 2008

088

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above/Below: Harriet Bolt, 2008

Above: Harriet Bolt, 2008



089

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

090

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

091

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

092

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

093

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

094

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

095

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

096

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

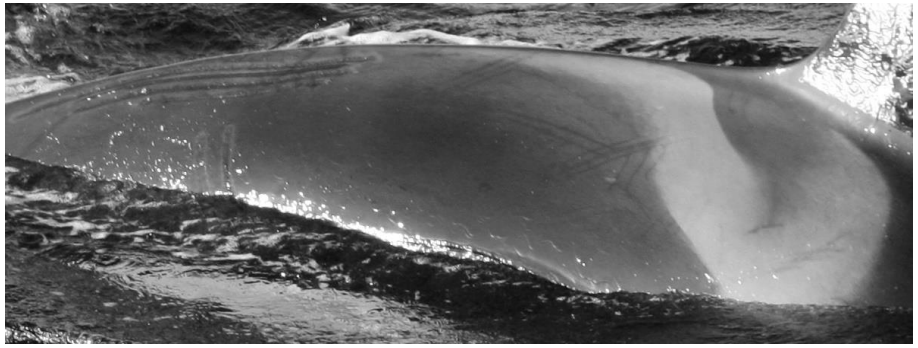
097

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above/Below: Harriet Bolt, 2008



098

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

099

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above: Harriet Bolt, 2008

100

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

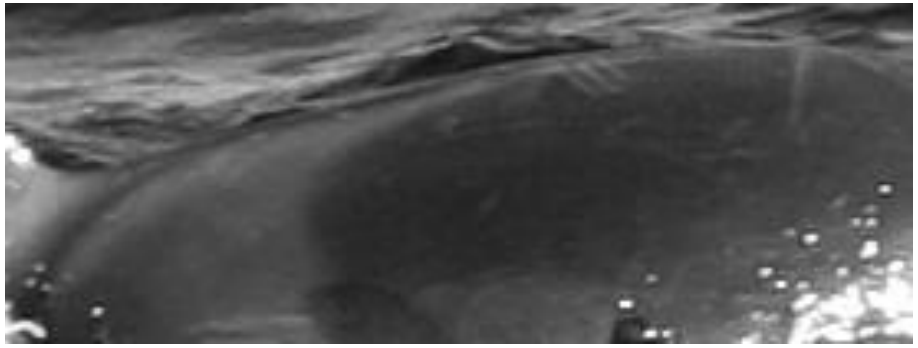
101

Right >

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above/Below: Harriet Bolt, 2008



102

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

103

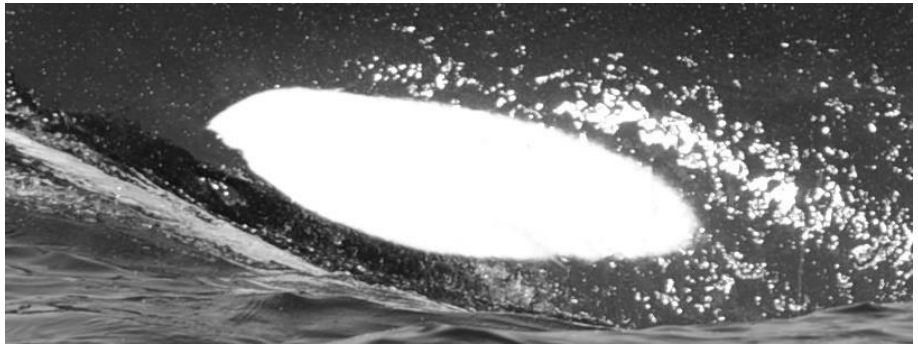
Right >

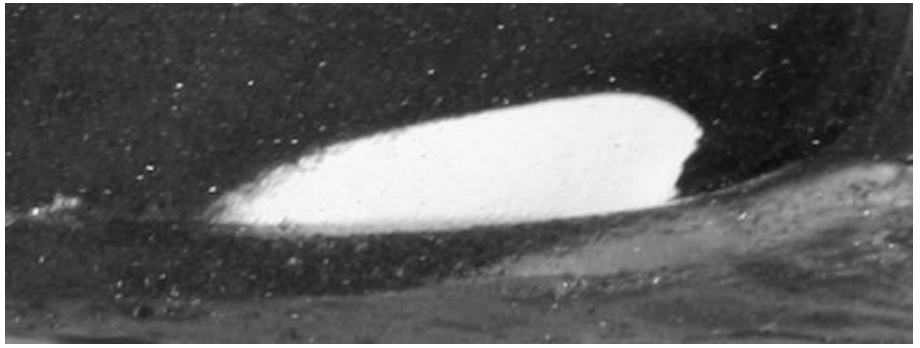
Photographed associating with mackerel fishing operations in the Northern North Sea, ten kilometres or more offshore from Shetland, on 9th October 2008.

Above: Harriet Bolt, 2008

Above/Below: Adam Ü, 2009

Above: Adam Ü, 2009
Below: Andy Foote, 2009





104

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above: Adam Ü, 2009 (right side)

Above: Adam Ü, 2009

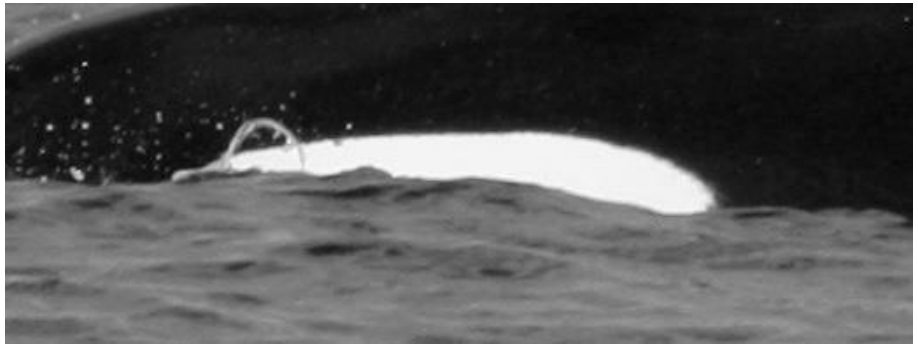
105

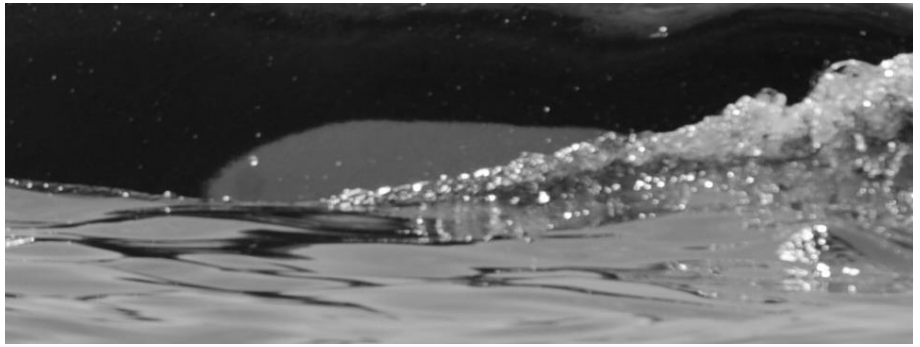
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

106

Above: Adam Ü, 2009
Below: Andy Foote, 2009

Above/Below: Adam Ü, 2009

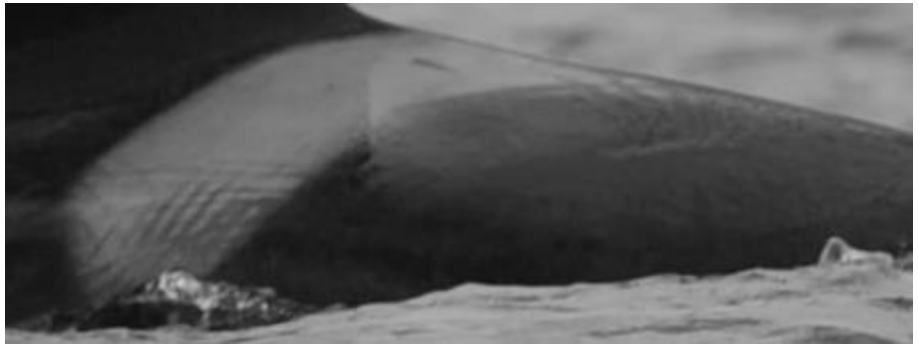




044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above/Below: Adam Ü, 2009

Above/Below: Adam Ü, 2009

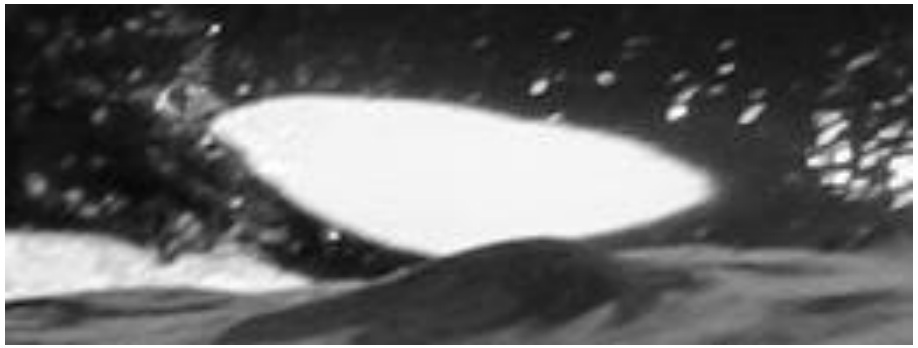


107

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Reviewing the encounter images for this catalogue, we have discovered males **107** and **108** are the same individual. The ID number **107** has been retained.

Above: Adam Ü, 2009
Below: Andy Foote, 2009



Above: Adam Ü, 2009

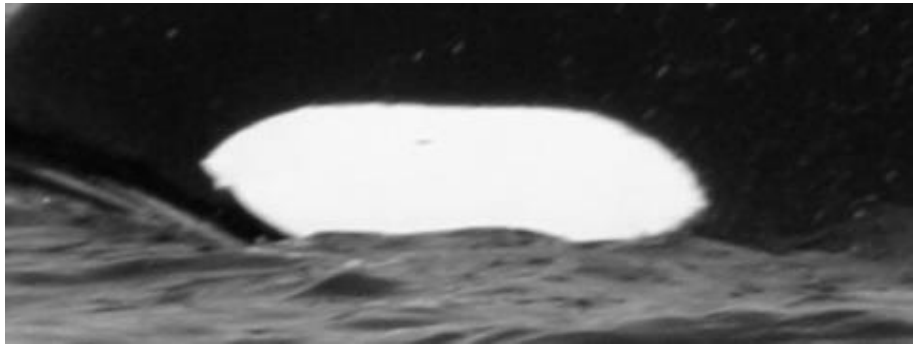
109

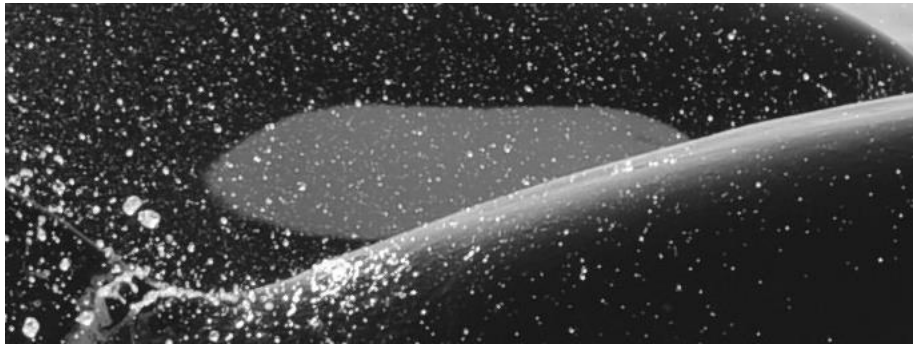
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

111

Above: Adam Ü, 2009
Below: Andy Foote, 2009

Above/Below: Adam Ü, 2009





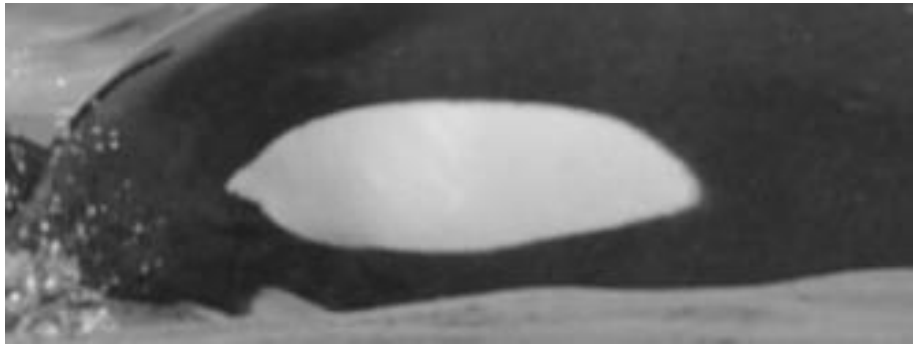
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

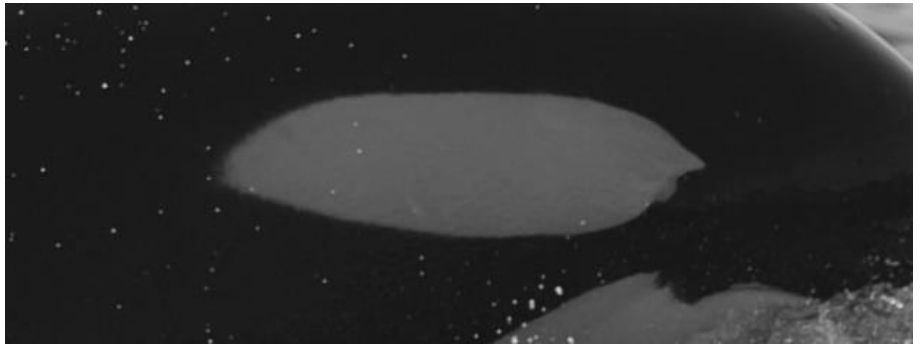
111 and **121** were often photographed side by side, with **121** in the echelon position. This would suggest **121** may be the offspring of **111**.

121

Above: Andy Foote, 2009
Below: Adam Ü, 2009

Above/Below: Adam Ü, 2009





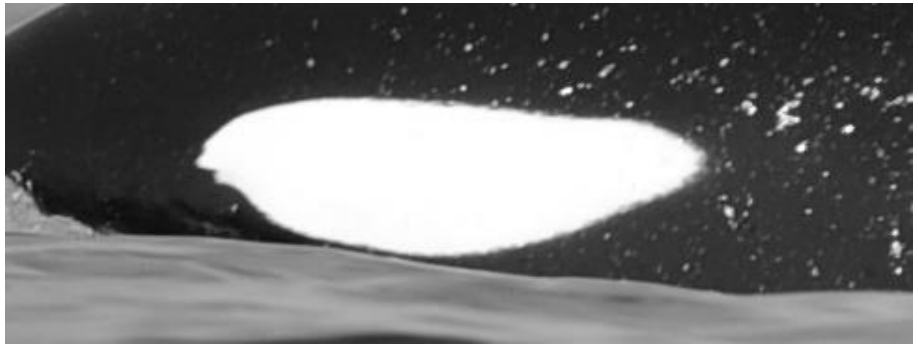
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

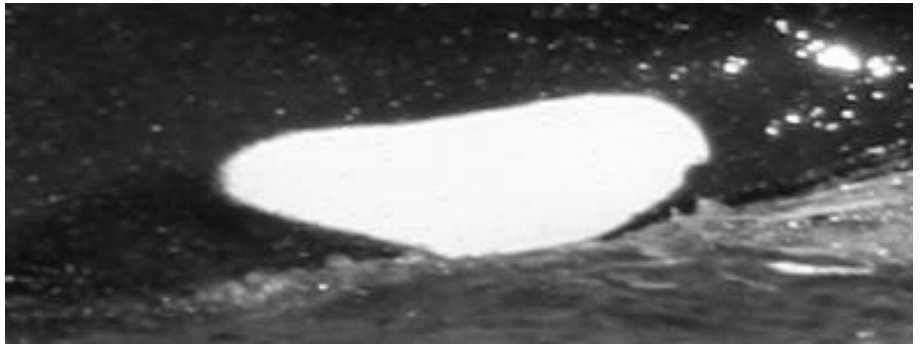
111 and **121** were often photographed side by side, with **121** in the echelon position. This would suggest **121** may be the offspring of **111**.

112

Above: Andy Foote, 2009
Below: Adam Ü, 2009

Above: Adam Ü, 2009
Below: Andy Foote, 2009





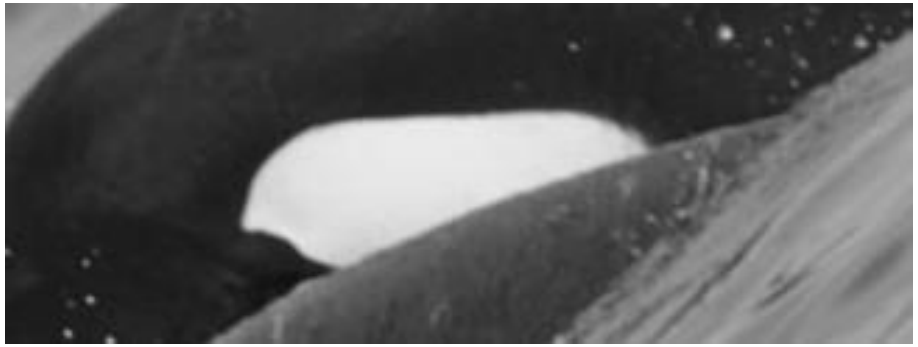
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

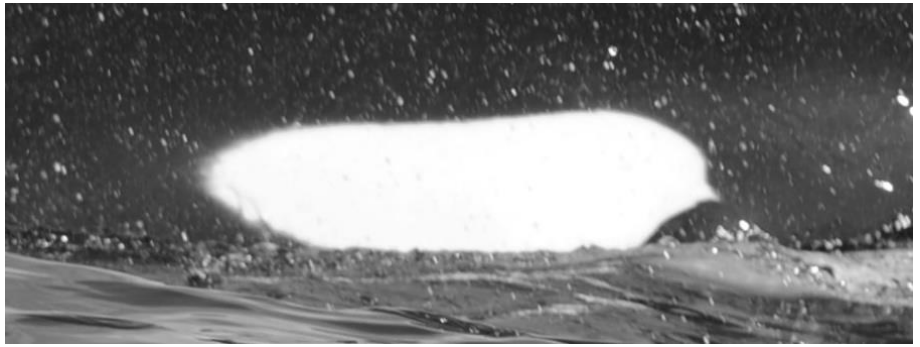
110 and **112** were often photographed side by side, with **110** in the echelon position. This would suggest **110** may be the offspring of **112**.

110

Above: Andy Foote, 2009
Below: Adam Ü, 2009

Above/Below: Adam Ü, 2009





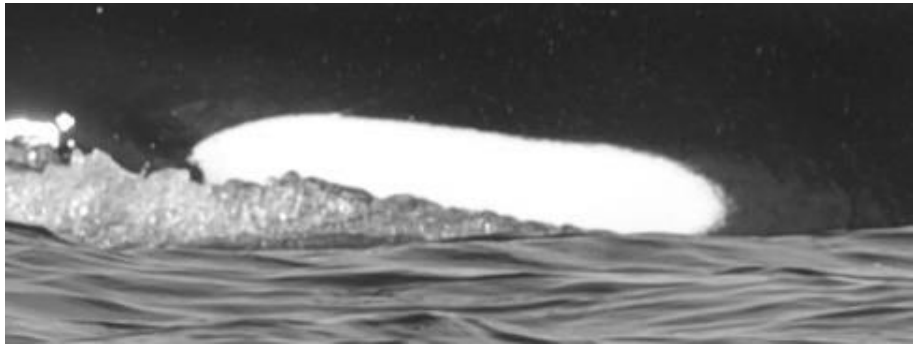
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Reviewing the encounter images for this catalogue update, we have discovered **110** and **120** are the same individual. The ID number **110** has been retained.

110 and **112** were often photographed side by side, with **110** in the echelon position. This would suggest **110** may be the offspring of **112**.

Above/Below: Adam Ü, 2009

Above/Below: Adam Ü, 2009

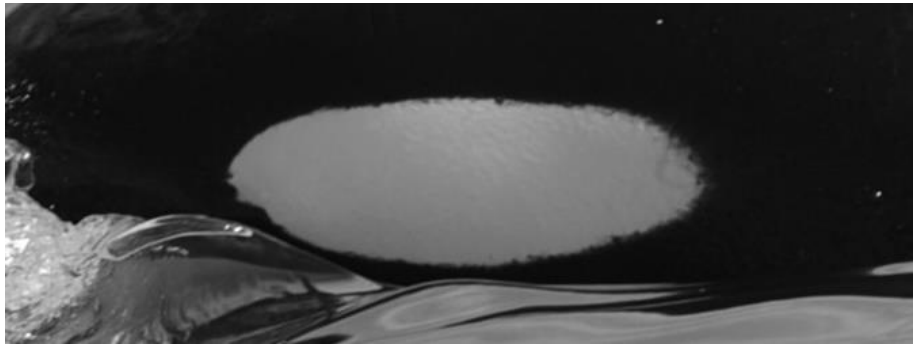


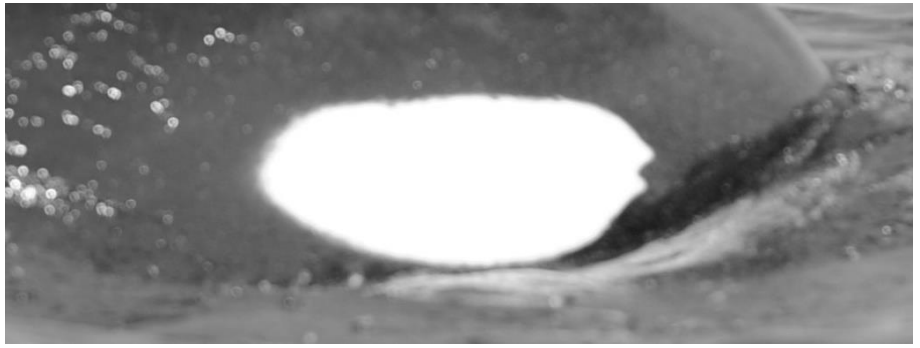
113

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above/Below: Adam Ü, 2009

Above: Andy Foote 2009
Below: Adam Ü, 2009





114

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote 2009
Below: Adam Ü, 2009

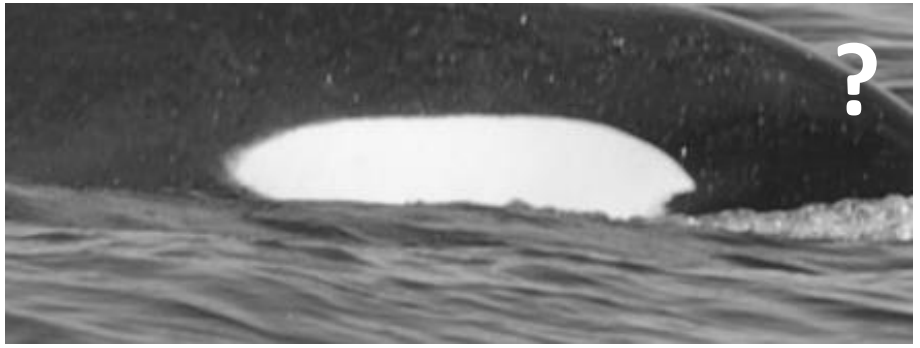
115

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

116

Above/Below: Adam Ü, 2009

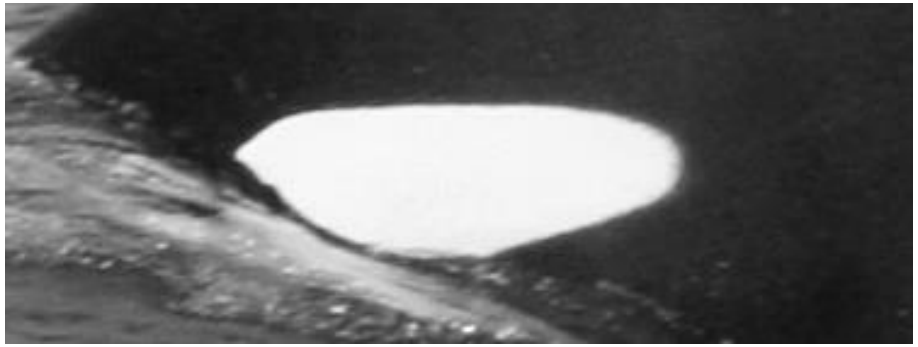
Above: Andy Foote 2009
Below: Adam Ü, 2009



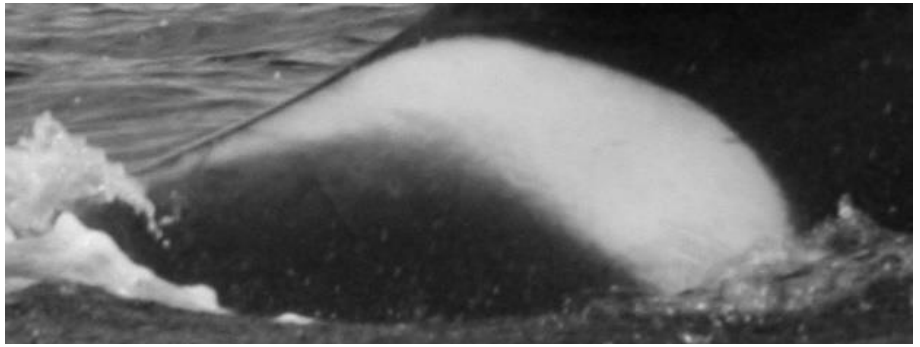
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

NB. This is believed to be **116's** right eye patch but we are not certain.

Above: Adam Ü, 2009
Below: Andy Foote, 2009



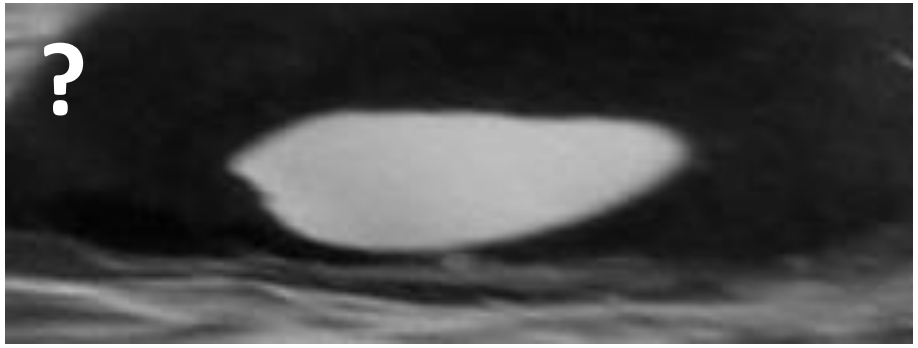
Above: Adam Ü, 2009
Below: Andy Foote, 2009



117

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above: Marie Mrusczok (Orca Guardians Iceland), 2018
Below: Andy Foote, 2009



118

Iceland ID number:
SN0493, *Longstride*

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

118 was encountered off West Iceland by Orca Guardians Iceland in 2018.

NB. This is believed to be **118's** left eye patch but we are not certain.

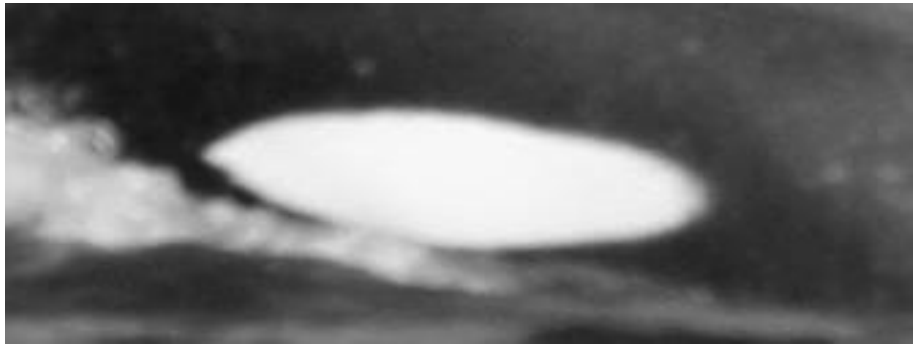
Above: Andy Foote, 2009

Above: Adam Ü, 2009

119

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above: Adam Ü, 2009
Below: Andy Foote, 2009



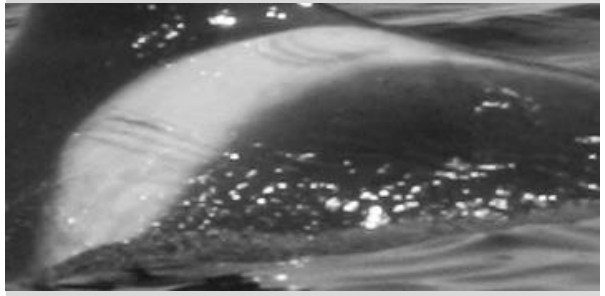
201

< Left

Above: Andy Foote, 2009

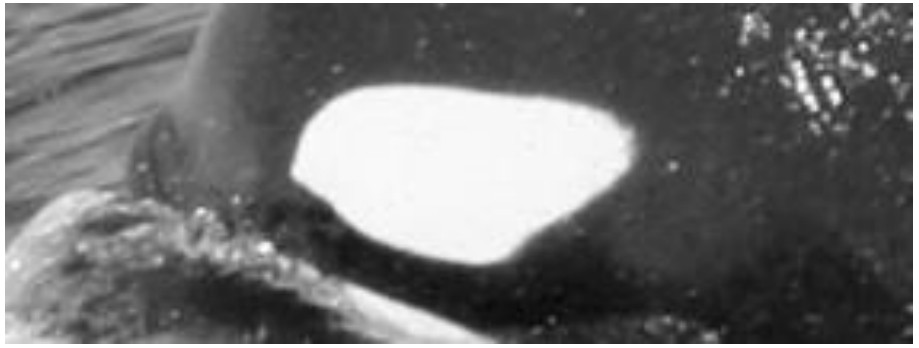
202

Right >



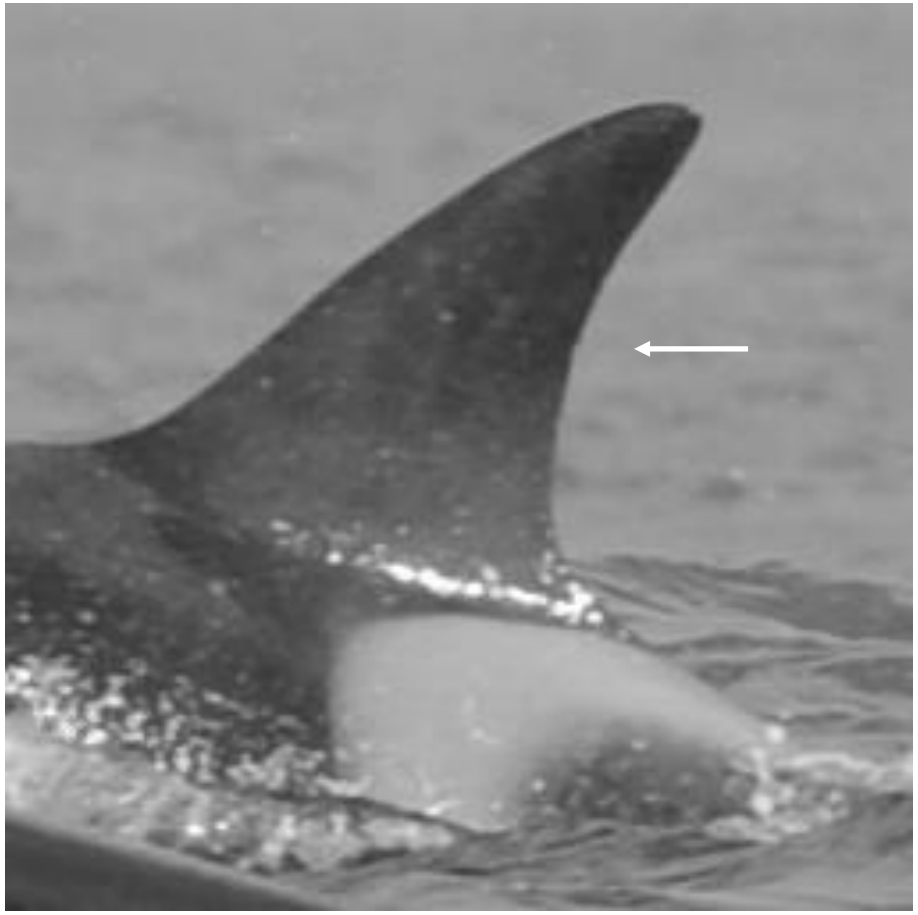
Above: Andy Foote, 2009

Above/Below: Andy Foote, 2009



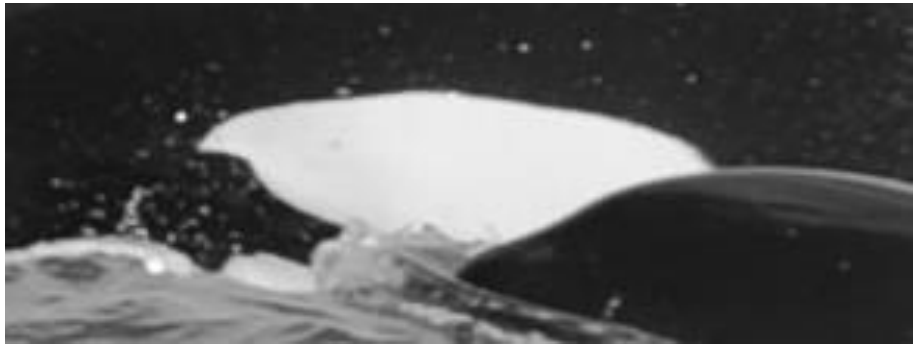
203

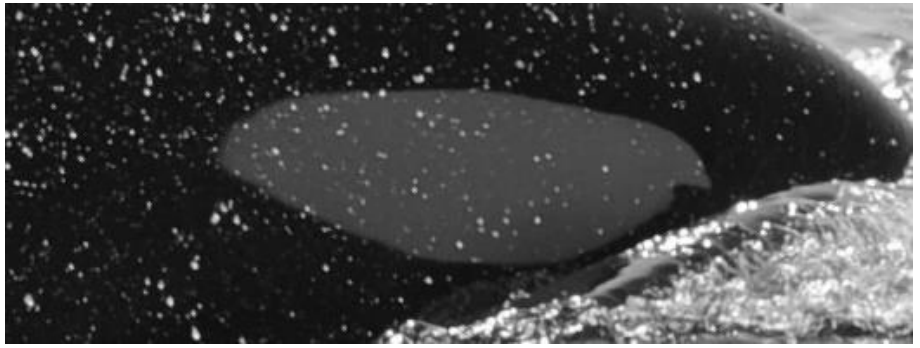
044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.



Above/Below: Adam Ü, 2009

Above/Below: Adam Ü, 2009

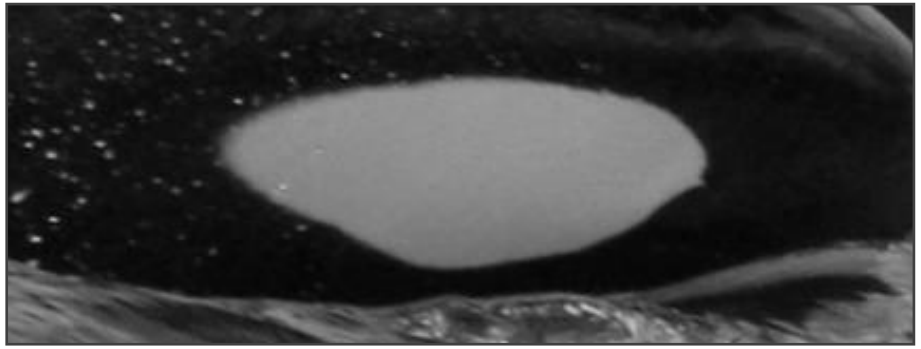




Above: Adam Ü, 2009 (right saddle)

Above: Adam Ü, 2009

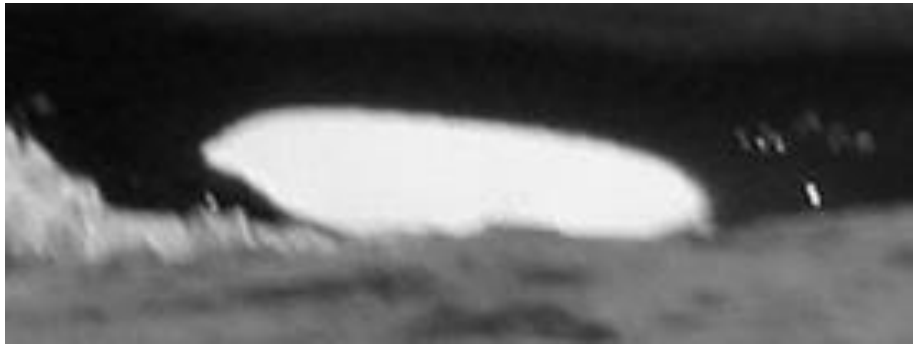
Above: Adam Ü, 2009
Below: Andy Foote, 2009



204

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

Above: Adam Ü, 2009
Below: Andy Foote, 2009



205

< Left

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

206

Right >

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009.

Above: Adam Ü, 2009

Above: Andy Foote, 2009
Below: Adam Ü, 2009

207

< Left

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

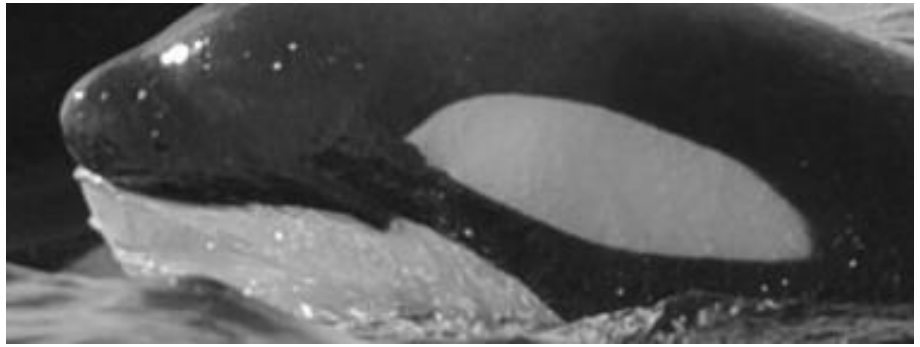
208

Right >

This juvenile was photographed in association with **207**.

See **207**.

Above/Below: Adam Ü, 2009



Above: Adam Ü, 2009
Below: Andy Foote, 2009

209

< Left

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

210

Right >

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009.

Above: Andy Foote, 2009

Above: Andy Foote, 2009

211

< Left

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009. The group were confirmed feeding on Atlantic herring.

212

Right >

044, **050**, **104** to **107**, **109** to **119**, **121** and **201** to **212** were encountered in association approximately eight kilometres offshore West of Bluemull Sound, Shetland on 29th June 2009.

Above: Adam Ü, 2009

Above: Andy Foote, 2009

122

Iceland ID Numbers:
IS039, SN0374, 9479

< Left

---

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

123

Right >

---

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

Above: Brydon Thomason, 2009

124

< Left

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

125

Right >

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

Above: Brydon Thomason, 2009

Above: Brydon Thomason, 2009

126

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

127

< Left

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

128

Right >

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

Above: Andy Foote, 2009

129

< Left

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

130

Right >

Likely also photographed in association with **122** to **129**, **131** to **134**, **136**, **138** and **139**.

Above: Andy Foote, 2009

Above/Below: Andy Foote, 2009

131

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

132

< Left

---

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

136

Right >

---

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

136 and **132** (background) were photographed side by side, with **136** in the echelon position. This would suggest **136** may be the offspring of **132**.

Above: Andy Foote, 2009

Above: Andy Foote, 2009

133

< Left

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

134

Right >

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

Above: Andy Foote, 2009

135

< Left

Likely also photographed in association with **122** to **129**, **131** to **134**, **136**, **138** and **139**.

137

Right >

Likely also photographed in association with **122** to **129**, **131** to **134**, **136**, **138** and **139**.

Above: Andy Foote, 2009

Above: Andy Foote, 2009

138

< Left

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

139

Right >

122 to **129**, **131** to **134**, **136**, **138** and **139** were encountered in association on 1st July 2009. The group were confirmed feeding on Atlantic herring.

Above: Andy Foote, 2009

140 Group

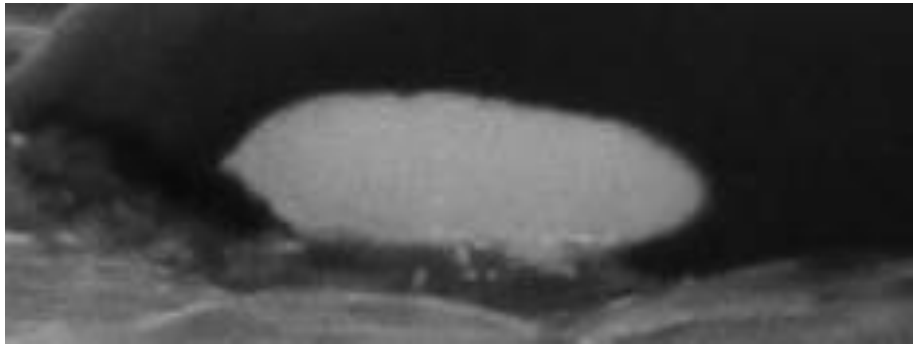
The **140 group** (including individuals **140**, **141** and **172** to **176**) were first photographed off Fair Isle on 26th March 2011. They have since been photographed in several different years (April 2017, 2018 and 2019) off Shetland. These encounters have not always included all members of the group – in April 2019 males **140** and **141** were seen alone. As such, whilst some degree of group cohesion appears to exist, the stability of the social relationships is not fully understood and could potentially be more dynamic. The group are to some extent site-faithful.

On 22nd April 2018 the group (**141**, **172** and **175** confirmed) were photographed in association with **169** and **170** of the **169s group** off Sumburgh Head, Shetland.

Above: 174 (left) and 141 (right) with a fulmar off Fair Isle in 2011. Photograph: David Parnaby

Above: 140 (left foreground), 172 (left middle), 173 (left behind) and 176 (right) off Fair Isle in 2011. Photograph: David Parnaby

Above/Below: David Parnaby, 2011



140

Part of the **140 group**, including individuals **140**, **141** and **172** to **176**. At present the identify of the group matriarch is unknown.

Males **140** and **141** have previously been encountered on their own.

140 has a similar dorsal fin shape to **122** (who is not part of the group), but there are differences in the saddle patch shape and scars. This highlights the importance of using a combination of features for photo identification.

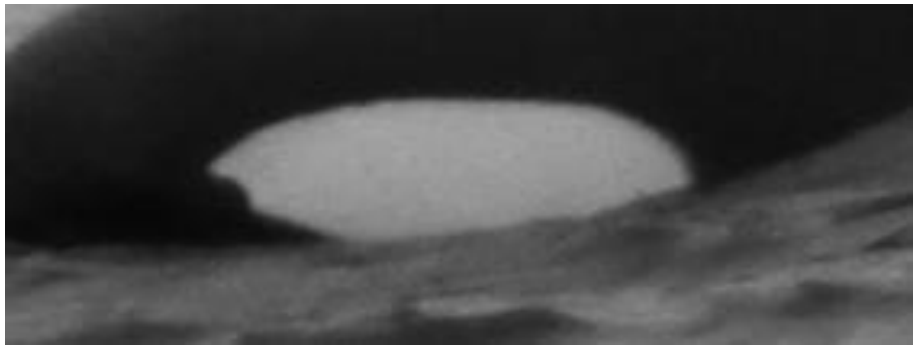
141

Approximately the top quarter of **141's** dorsal fin bends to the left, however at times it can also appear straight (see below). The fin shape can look very different depending on the angle it is viewed/ photographed from.

Above/Below: David Parnaby, 2011

Above: Gina Rathbone, 2017

Above: David Parnaby, 2011



Above: David Parnaby, 2011

172

< Left

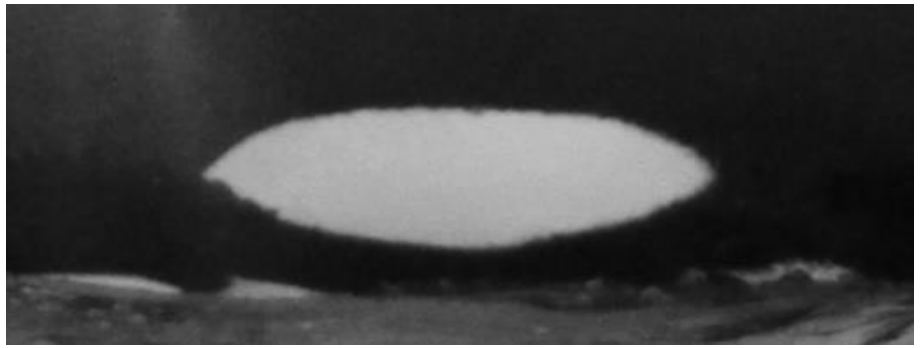
Part of the **140 group**, including individuals **140**, **141** and **172** to **176**. At present the identify of the group matriarch is unknown.

173

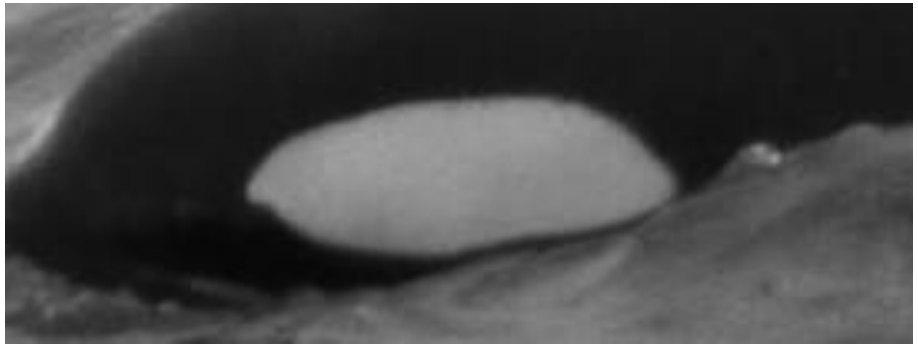
Right >

Part of the **140 group**, including individuals **140**, **141** and **172** to **176**. At present the identify of the group matriarch is unknown.

Above/Below: David Parnaby, 2011



Above/Below: David Parnaby, 2011



174

< Left

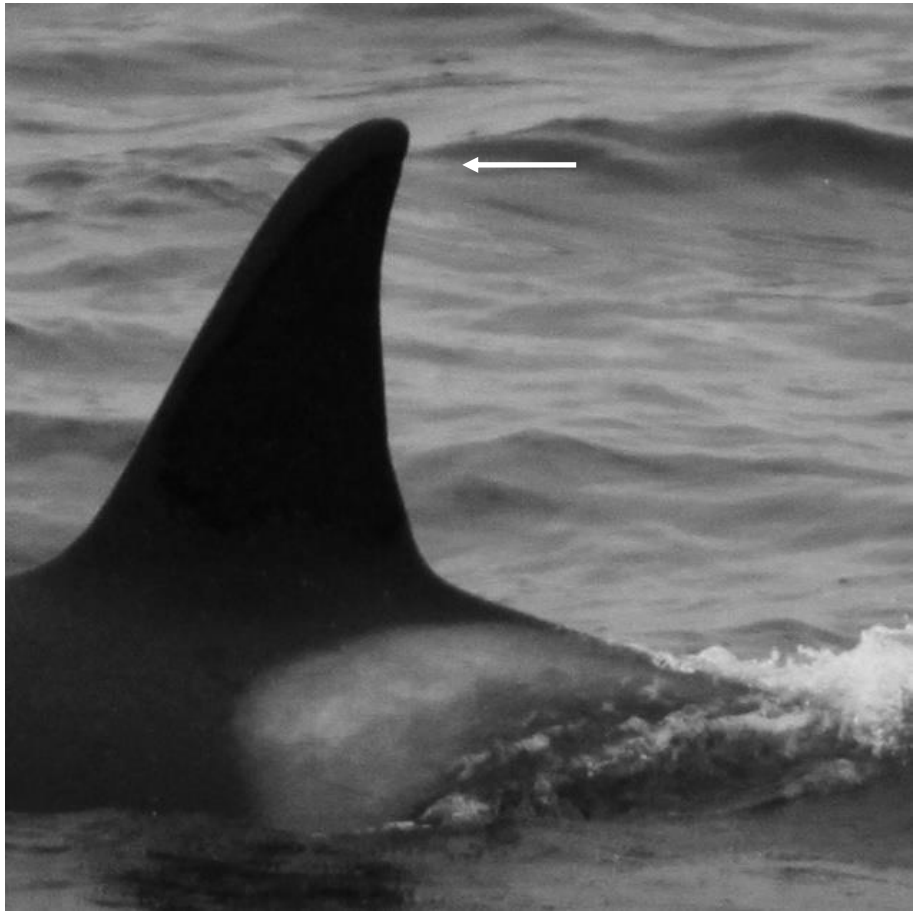
Part of the **140 group**, including individuals **140**, **141** and **172** to **176**. At present the identify of the group matriarch is unknown.

175

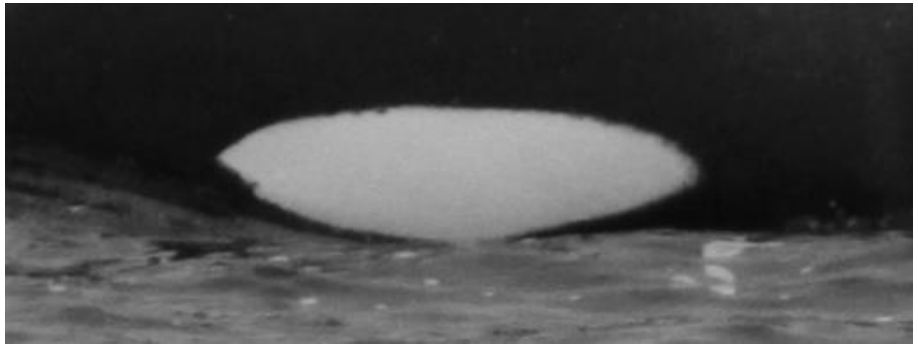
Right >

Part of the **140 group**, including individuals **140**, **141** and **172** to **176**. At present the identify of the group matriarch is unknown.

Above: David Parnaby, 2011



Above/Below: David Parnaby, 2011



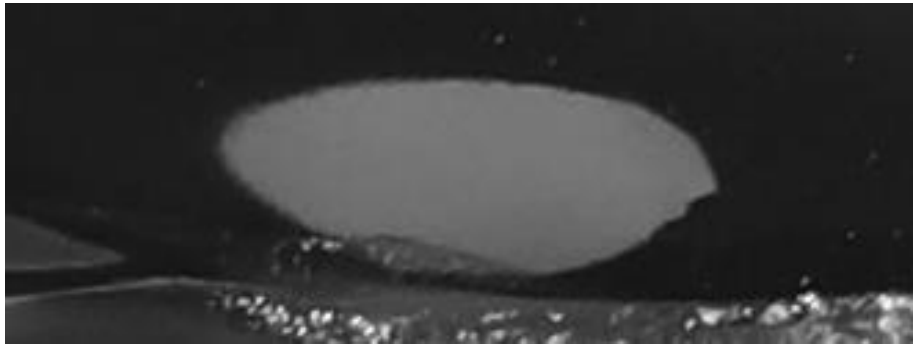
Below: David Parnaby, 2011 (left saddle)

176

Part of the **140 group**, including individuals **140**, **141** and **172** to **176**. At present the identify of the group matriarch is unknown.

Above: Marie Mrusczok (Orca Guardians Iceland), 2016
Below: Hugh Harrop, 2018

Above: Marie Mrusczok (Orca Guardians Iceland), 2016
Below: Steve Truluck, 2018



164

Melrakki

Iceland ID Numbers:
IS241, SN0206

Part of the **164 group**, including individuals **164** to **167**.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Marie Mrusczok (Orca Guardians Iceland), 2014

Above: Marie Mrusczok (Orca Guardians Iceland), 2016

Below: Wouter-Jan Strietman, 2018

165

Flangi

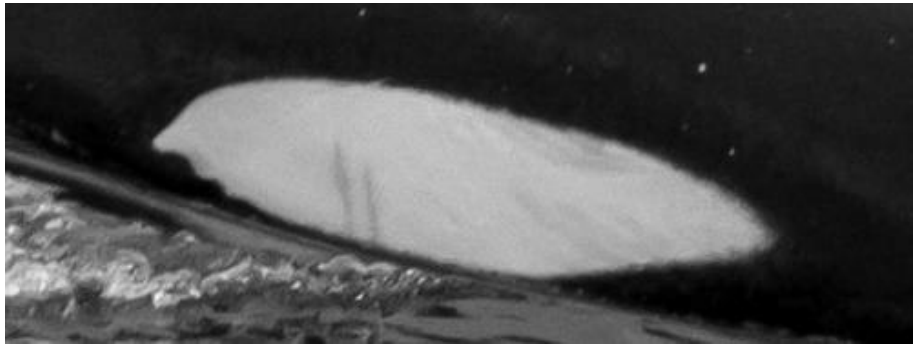
Iceland ID Numbers:
IS240, SN0149

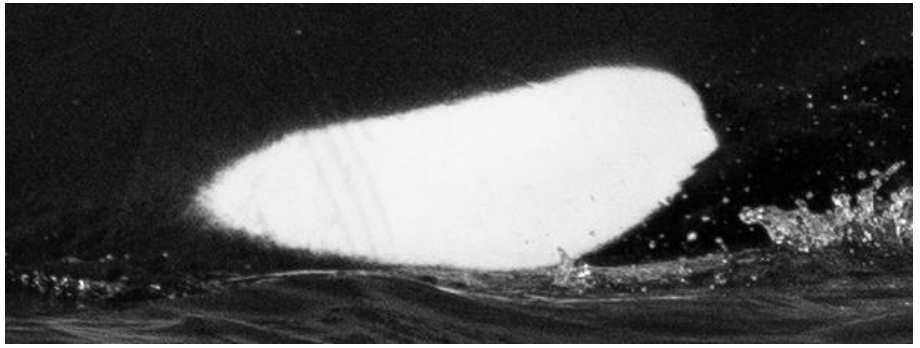
Part of the **164 group**, including individuals **164** to **167**.

Known traveller between Iceland (winter) and Scotland (summer).

Above/Below: Karen Munro, 2019

Above: Peter Hazlehurst, 2018
Below: Helen Perry, 2019





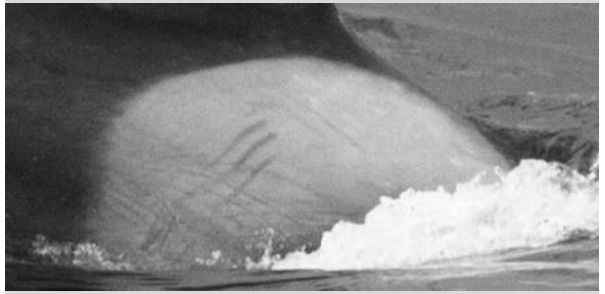
166

Úlfur

Iceland ID Numbers:
IS243, SN0204

Part of the **164 group**, including individuals **164** to **167**.

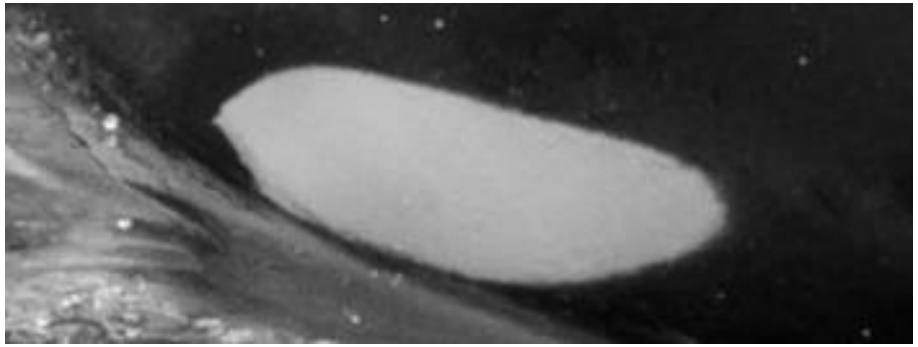
Known traveller between Iceland (winter) and Scotland (summer).

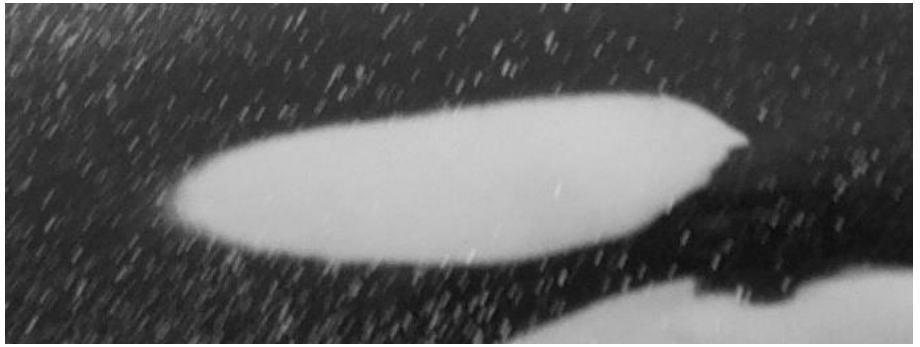


Above: Karen Munro, 2019

Above/Below: Karen Munro, 2019

Above: Wouter-Jan Strietman, 2018
Below: Ryan Nisbet, 2018





167

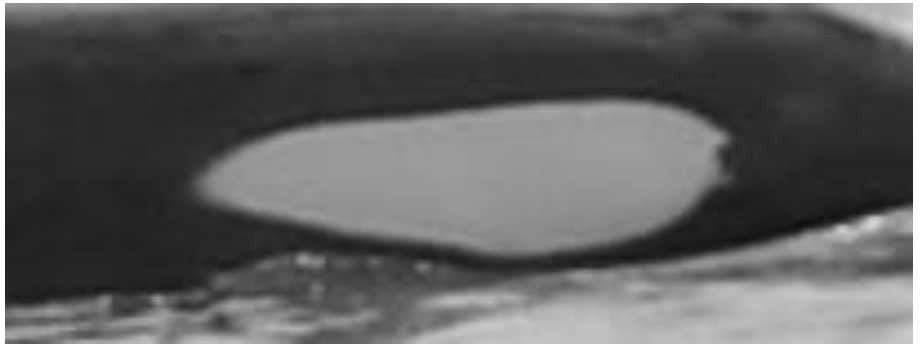
Iceland ID Number:
SN0205

Part of the **164 group**, including individuals **164** to **167**.

Known traveller between Iceland (winter) and Scotland (summer).

Above: Peter Hazlehurst, 2017
Below: Mick Kemp, 2018

Above: Peter Hazlehurst, 2017
Below: Hugh Harrop, 2020



169

Believed to be the matriarch of the **169s group** (inc. **169** to **171**).

The **169s** were first photographed from Duncansby Head, Caithness on 21st May 2017 in association with males **062** and **155**.

On 22nd April 2018, **169** and **170** were encountered off Sumburgh Head, Shetland with the **140 group** (**141**, **172** and **175** confirmed). During this sighting **169** was photographed in association with a new calf estimated to be less than a year old (see below).

Above: Mick Kemp, 2018

170

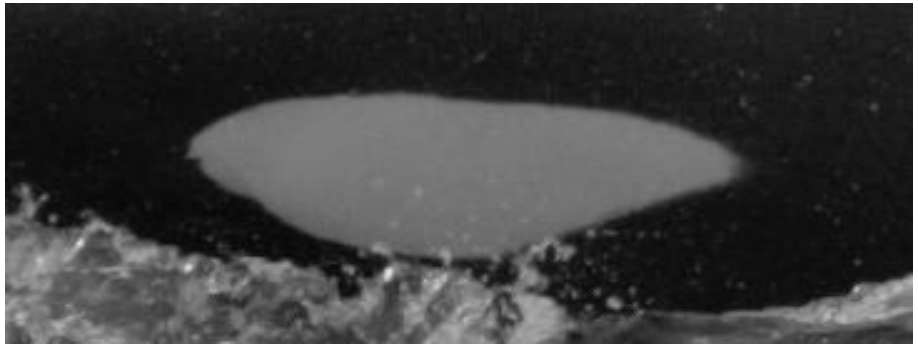
Member of the **169s group**, including individuals **169** to **171**.

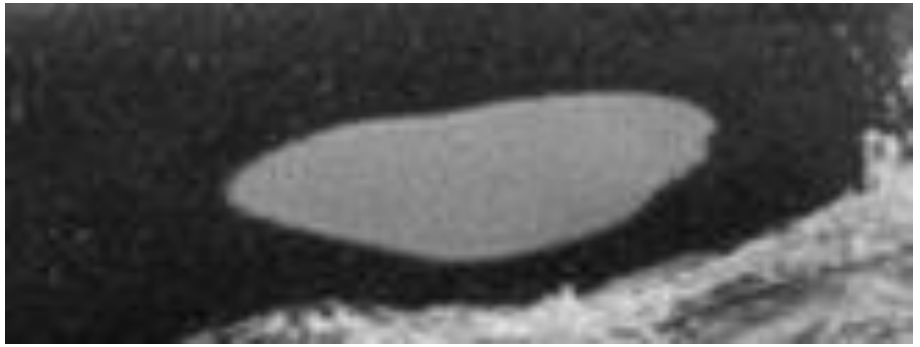
On 10th May 2019, **170** was photographed in association with the **19s group** offshore from Lossiemouth in the Moray Firth.

On 8th June 2020, **169**, **170** and two other individuals were photographed hunting harbour porpoise off Sumburgh Head, Shetland.

Above/Below: Peter Hazlehurst, 2017

Above: David Parnaby, 2018
Below: Hugh Harrop, 2020





Above: David Parnaby, 2018 (left saddle)

171

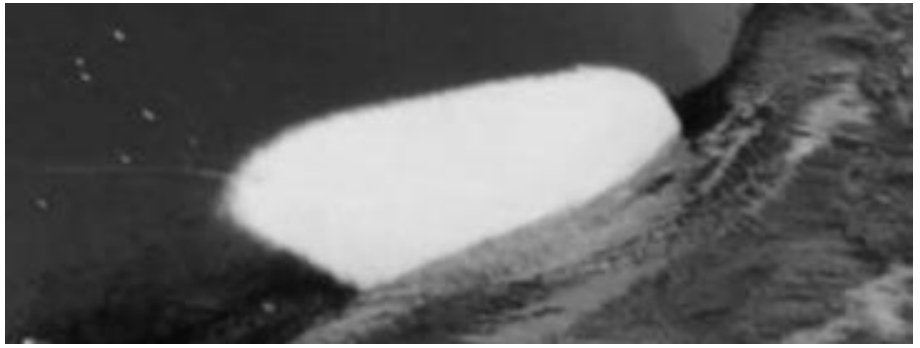
Member of the **169s group**, including individuals **169** to **171**.

Above: Peter Hazlehurst, 2017

Above: David Parnaby, 2018

Above/Below: Robbie Stanger, 2018

Above/Below: Robbie Stanger, 2018



177

Three males **177**, **178** and **179** were encountered in Scapa Flow, Orkney on 29th April 2018. They were observed across the Northern and Eastern areas of Scapa Flow over a period of ten consecutive days.

Above: Robbie Stanger, 2018

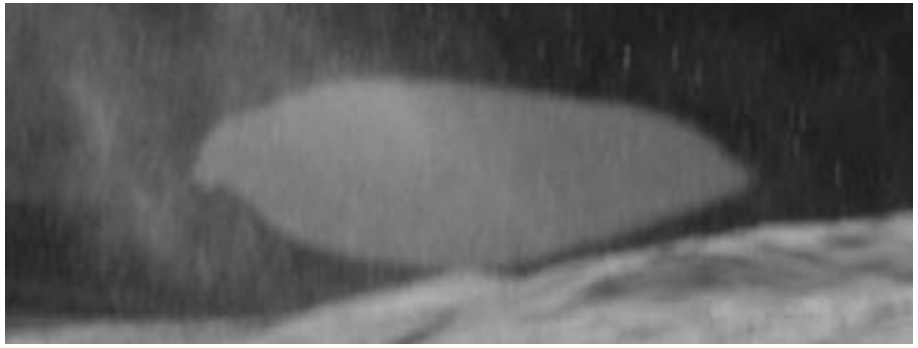
Above: Robbie Stanger, 2018

178

Three males **177**, **178** and **179** were encountered in Scapa Flow, Orkney on 29th April 2018. They were observed across the Northern and Eastern areas of Scapa Flow over a period of ten consecutive days.

Above/Below: Robbie Stanger, 2018

Above: Robbie Stanger, 2018



179

Three males **177**, **178** and **179** were encountered in Scapa Flow, Orkney on 29th April 2018. They were observed across the Northern and Eastern areas of Scapa Flow over a period of ten consecutive days.

Above/Below: Steve Truluck, 2018

180

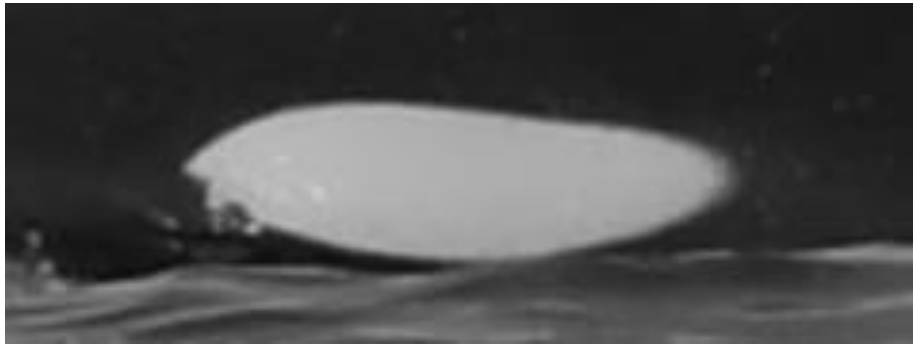
< Left

Individuals **180** to **184** were photographed together as they crossed the Pentland Firth heading for Orkney on 1st June 2018.

180 was in close association with juvenile **181**.

Above: Wouter-Jan Strietman, 2018

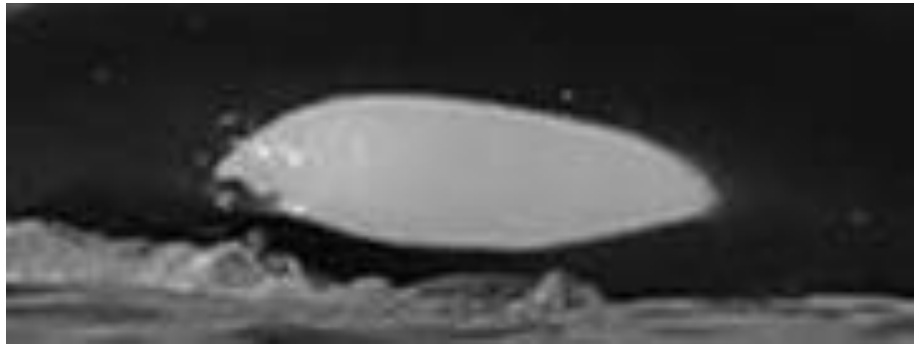
Above/Below: Steve Truluck, 2018



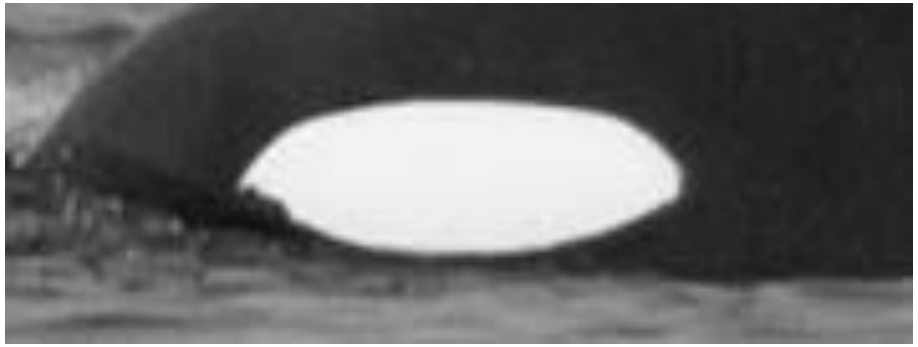
181

Right >

See **180**.

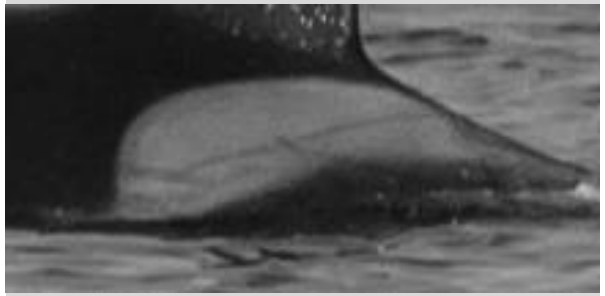


Above: Steve Truluck, 2018
Below: Wouter-Jan Strietman, 2018



182

< Left



Above: Wouter-Jan Strietman, 2018

183

Right >

Above: Wouter-Jan Strietman, 2018

Above: Steve Truluck, 2018
Below: Wouter-Jan Strietman, 2018

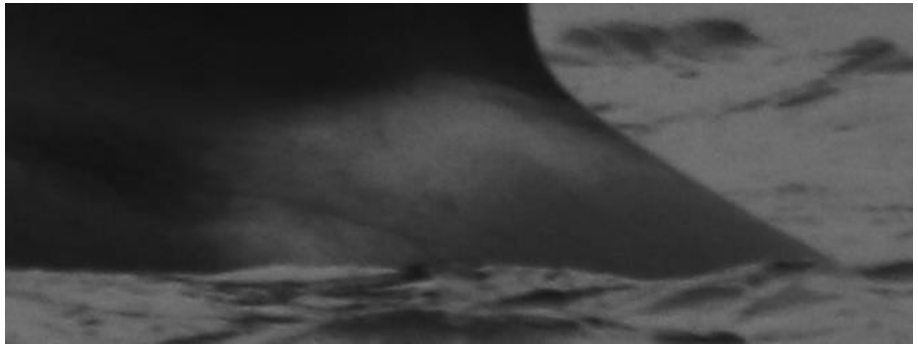
Above: Steve Truluck, 2018

Above: Steve Truluck, 2018 (left side)

184

Individuals **180** to **184** were photographed together as they crossed the Pentland Firth heading for Orkney on 1st June 2018.

Above/Below: Hebridean Whale and Dolphin Trust, 2018



185

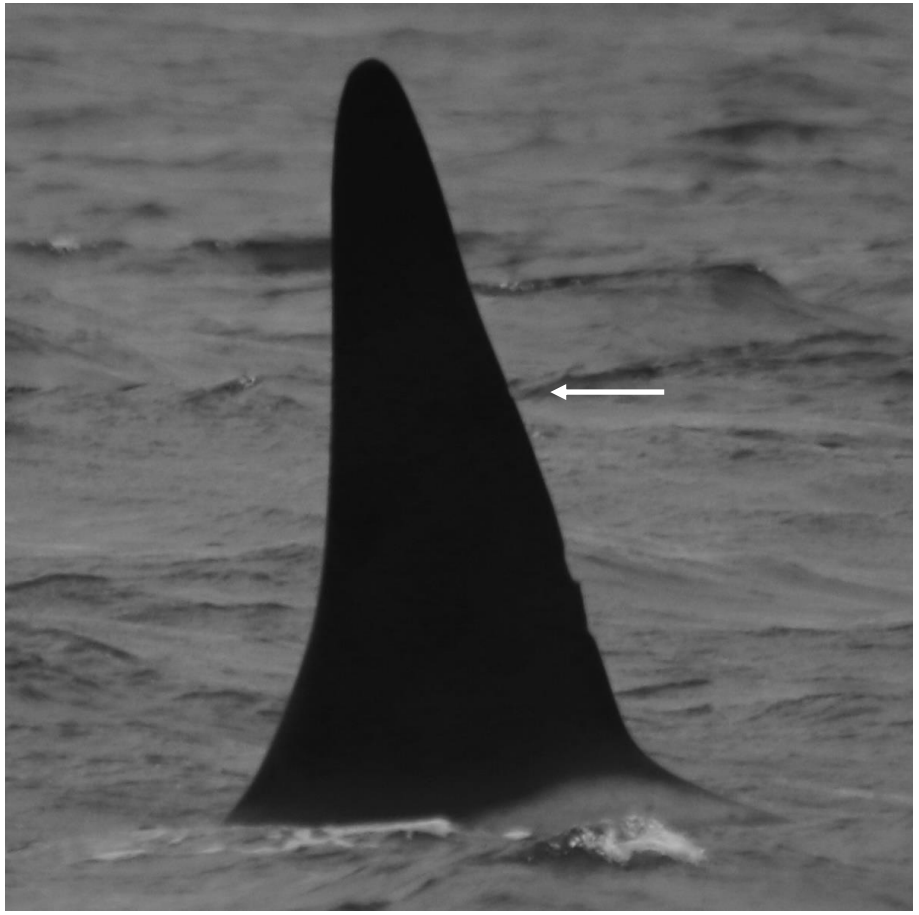
< Left

Hebridean Whale and Dolphin Trust encountered a group of at least nine individuals (including **185** to **192**) off Vatersay, Outer Hebrides on 23rd June 2018. A juvenile was photographed with them. However, due to the incomplete primary identification features, it has not been included in this catalogue.

186

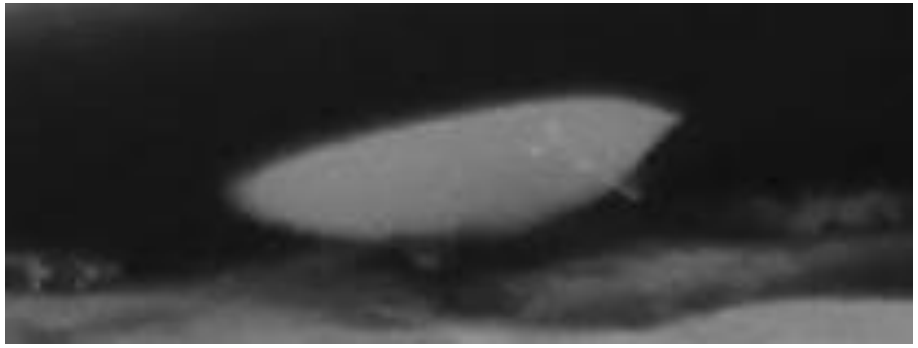
Right >

Above: HWDT.org, 2018



Above/Below: Hebridean Whale and Dolphin Trust, 2018

Above/Below: Hebridean Whale and Dolphin Trust, 2018 (right eye patch)



187

< Left

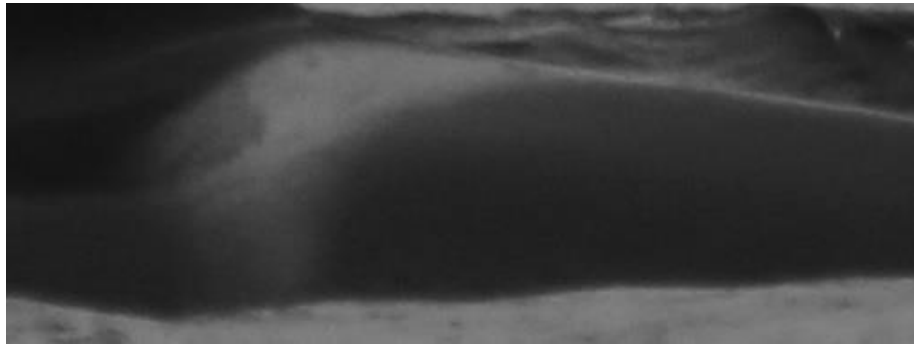
Hebridean Whale and Dolphin Trust encountered a group of at least nine individuals (including **185** to **192**) off Vatersay, Outer Hebrides on 23rd June 2018. A juvenile was photographed with them. However, due to the incomplete primary identification features, it has not been included in this catalogue.

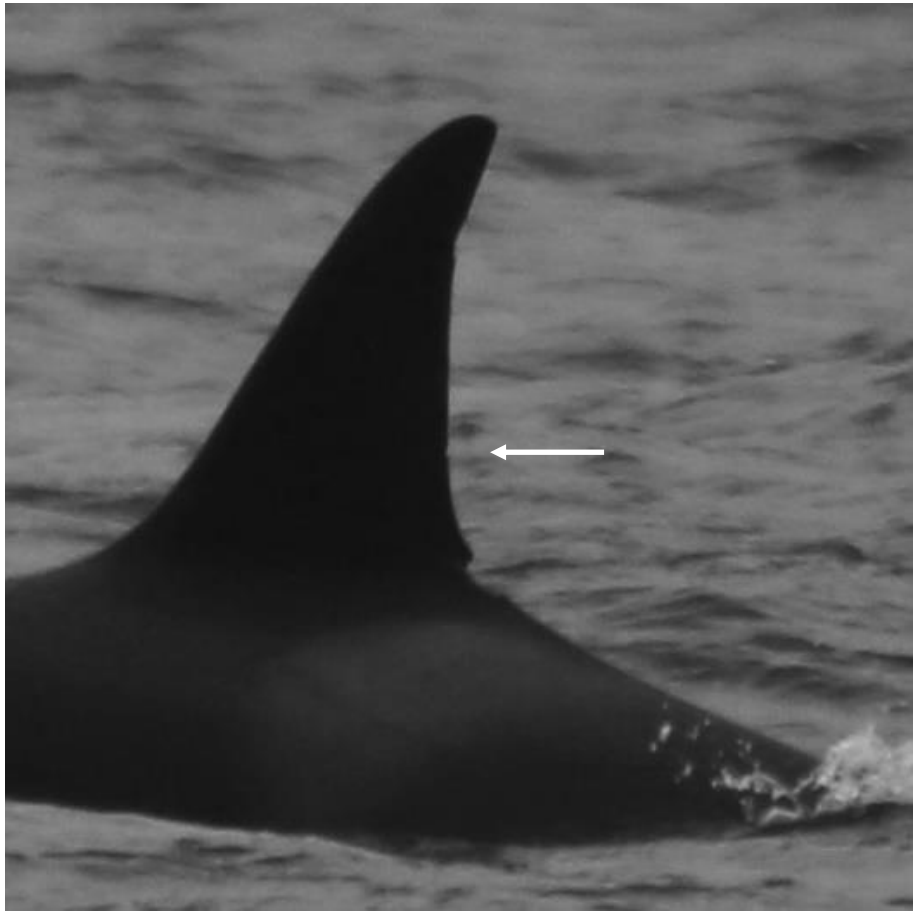
188

Right >

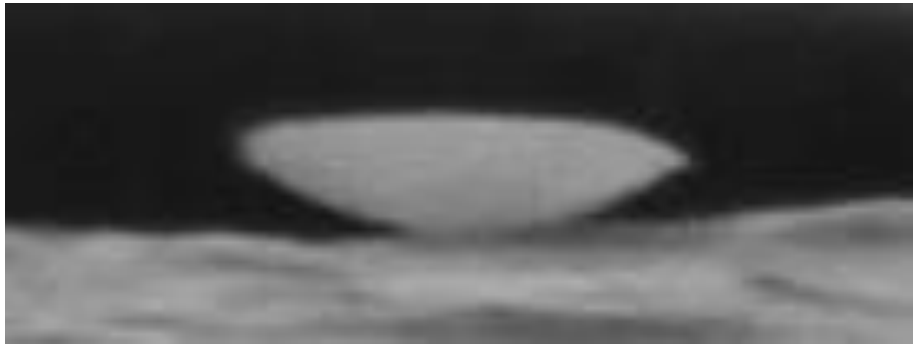
See **187**.

Above/Below: Hebridean Whale and Dolphin Trust, 2018





Above/Below: Hebridean Whale and Dolphin Trust, 2018 (right eye patch)



189

< Left

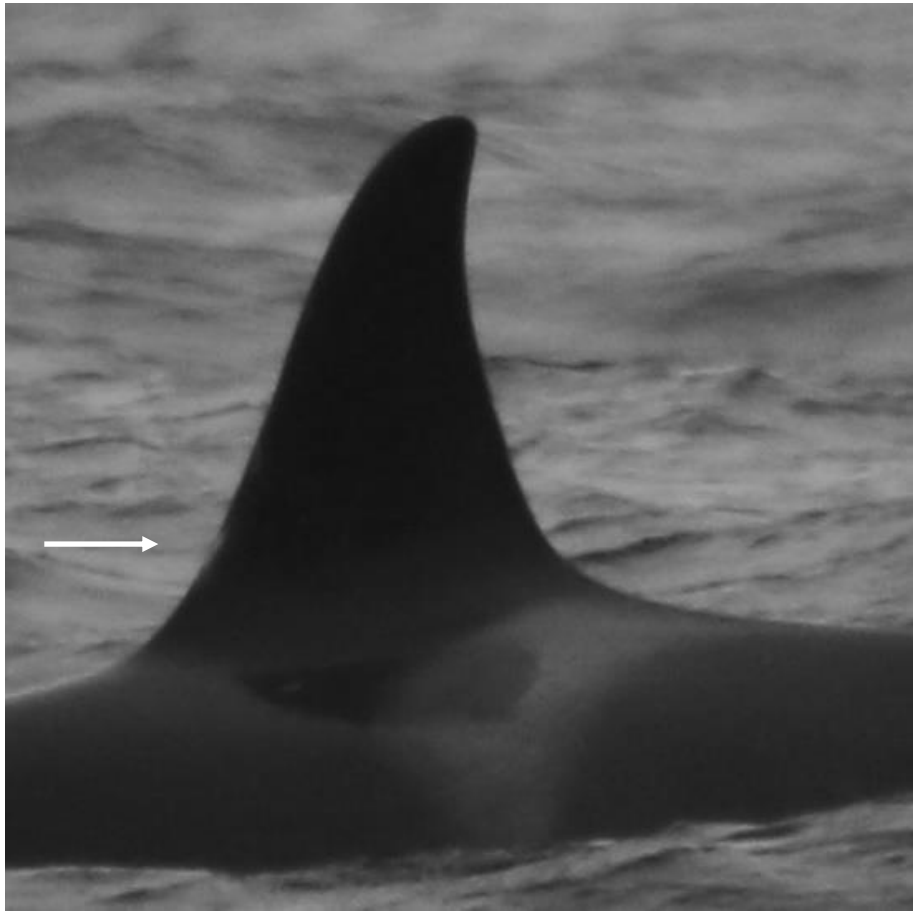
Hebridean Whale and Dolphin Trust encountered a group of at least nine individuals (including **185** to **192**) off Vatersay, Outer Hebrides on 23rd June 2018. A juvenile was photographed with them. However, due to the incomplete primary identification features, it has not been included in this catalogue.

190

Right >

See **189**.

Above: Hebridean Whale and Dolphin Trust, 2018



Above: Hebridean Whale and Dolphin Trust, 2018

191

< Left

191 had a pale mark at the base of the leading edge to it's dorsal fin. The mark was consistent between the Hebridean Whale and Dolphin Trust encounter images.

192

Right >

Hebridean Whale and Dolphin Trust encountered a group of at least nine individuals (including **185** to **192**) off Vatersay, Outer Hebrides on 23rd June 2018. A juvenile was photographed with them. However, due to the incomplete primary identification features, it has not been included in this catalogue.

Above: Hebridean Whale and Dolphin Trust, 2018

Above: John Lowrie Irvine, 2018

213

< Left

214

Right >

Above: Geoff Atherton, 2019

Above/Below: Magnus Polson, 2019

215

< Left

Photographed associating with mackerel fishing operations in the Northern North Sea off Shetland on 29th October 2019.

216

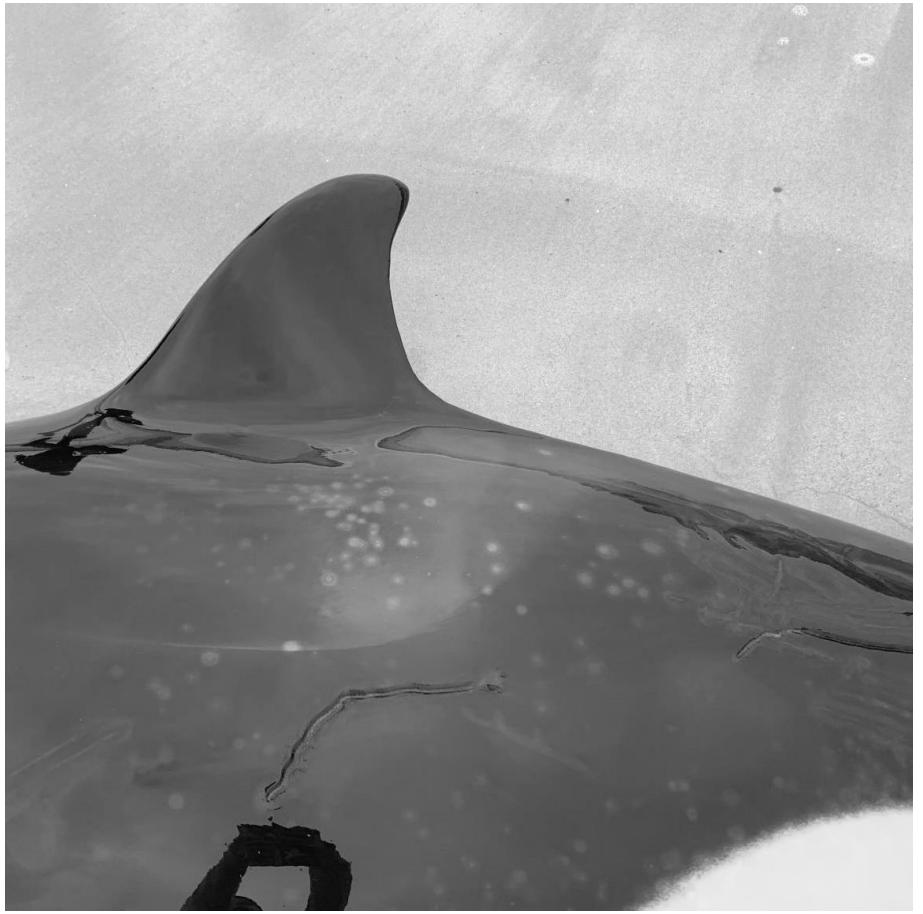
Right >

Photographed associating with mackerel fishing operations in the Northern North Sea off Shetland on 29th October 2019.

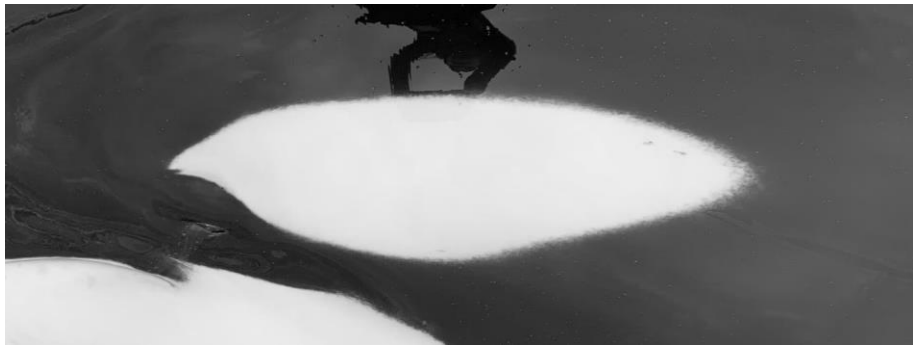
Above: Magnus Polson, 2019

219

Above/Below: Emma Neave-Webb/BDMLR, 2021



Above: Emma Neave-Webb/BDMLR, 2021 (left side)



219 was discovered live stranded in the surf at the Bay of Newark, near Tres Ness, Sanday, Orkney on 4th January 2021. Medics from British Divers Marine Life Rescue (BDMLR) were alerted to the stranding and, with the assistance of islanders, were able to refloat the whale on the incoming tide. After being stabilised for about an hour, **219** made its own move back out to the open sea. BDMLR medics continued to monitor the area and after an hour were happy the whale had stayed out and was no longer in the area. A fantastic effort by all involved!

219 was in good body condition and at 3.43m in length is believed to be approximately three to four years of age. Photographs suggest the whale to be male.

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