



# NAKID PROJECT

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## Morgan

A young killer whale was found in the Wadden Sea in the Netherlands on the 23<sup>rd</sup> June 2010. The whale, a female, was rescued and taken to the [Dolfinarium Harderwijk](#) for rehabilitation and was given the name Morgan. Morgan was 3.5 m long and was extremely underweight at 430 kg at the time she was rescued. Based on her length, which was compared with lengths and tooth growth layers of Norwegian killer whales from an International Whaling Commission report, she was estimated to be 1-2 years old.

Finding such a young killer whale travelling alone is not common. Killer whales have very strong social bonds within their families and offspring stay with their mothers throughout their lives. It is difficult to know what route Morgan's journey took, and how and when she separated from her natal group, started travelling on her own and ended up in Holland.

Killer whales are not commonly found along the Dutch coast, in fact no killer whale strandings had been reported there since 1963. There were also no sightings of killer whales in the Southern North Sea by the [Dutch Sea Bird](#) group during their surveys between 1970-2005. Given there were no reports of killer whales regularly occurring in this area the question arose of where Morgan had come from.

### Where did Morgan come from?

Killer whales can be found in many parts of the North Atlantic but it was more likely Morgan came from somewhere nearby. We know there are killer whale populations around Iceland, Norway, Shetland, in the North Sea and in Gibraltar. But how could we find out where Morgan came from? There were three main pieces of information that could be used to identify Morgan's population: photo-identification, genetics and acoustics. Project NAKID was involved in the research to find out Morgan's population using these three methods, by comparing it to the data we have been gathering on North Atlantic killer whales.

#### **Photo-identification**

Photo-identification catalogues exist from several study sites around the North Atlantic and over 1,000 individuals have been catalogued over the past three decades. The advantage of photo-identification is that it can identify not just the population, but also the pod. This would be vital for any chance of releasing Morgan back to the wild, as such a young animal would still be heavily dependent upon its mother for milk and to learn the hunting skills needed in adulthood. However, at such a young age killer whales don't usually have distinctive features on the dorsal fin and saddle patch that are used to recognise individuals (see picture below and [Photo-identification](#)). The Dolfinarium also provided photographs of both eye patches and the underside of the tail fluke, which we had recent photographs of for some Scottish killer whale calves. Moreover, there was a chance she was born since the last field efforts around Norway (in spring 2009), probably the largest local population, and therefore would not be included in the photo-identification catalogues. Unfortunately, despite an extensive search through our catalogue we could not find a photographic match and it became clear that there was a small chance of knowing where she came from using photo-identification. But it was still possible to use genetics and acoustics.

#### **Genetics**

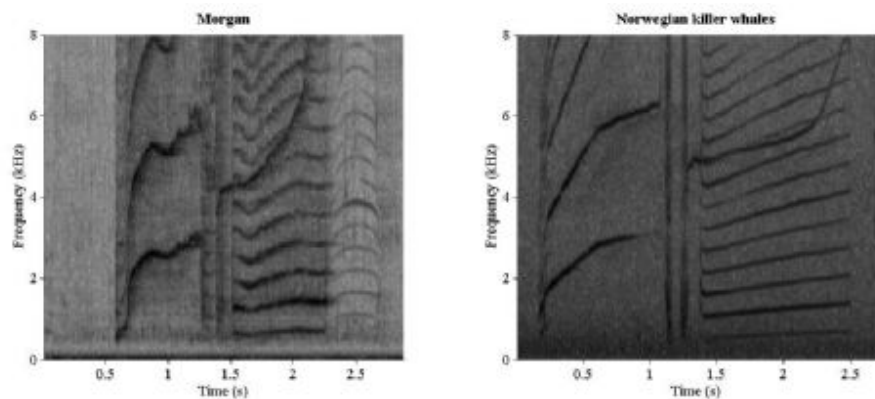
Analysing Morgan's DNA had a very high potential chance of successfully identifying her population as we had sampled individuals from most of the local populations. However, it was unlikely to provide the resolution necessary to identify Morgan's pod. A recent study that we had participated in had analysed the DNA of all the local Northeast Atlantic populations and found DNA regions that were population specific. We therefore decided to sequence several fragments of the mitochondrial genome that would identify Morgan's population. The result was a match with individuals sampled from the Norwegian herring-eating population.

#### **Acoustics**

During most of the summer while being cared for at the Dolfinarium Harderwijk Morgan did not produce many sounds. However, by the end of summer she started vocalising more. Using a hydrophone we recorded Morgan's sounds continuously during one week. Because killer whales produce group specific

recorded Morgan's sounds continuously during one week. Because killer whales produce group specific sounds, we could attempt to match Morgan's sounds to known sounds recorded from wild killer whale groups. We found matches of 4 of Morgan's sounds to killer whales in Norway, supporting the genetic results that Morgan did come from the Norwegian herring-feeding killer whale population. However, it was impossible to know exactly what group she belonged to because her repertoire did not match completely with known group repertoires.

The spectrograms (graphs of frequency vs. time) below show an example of a call type produced by Morgan (left) and the same call type produced by Norwegian herring-eating killer whales (right).



Morgan at the Dolfinarium Harderwijk (courtesy of Dolfinarium Harderwijk)



Detail of Morgan's saddle patch (courtesy of Dolfinarium Harderwijk)

The Dolfinarium Harderwijk gathered all the information on the research on Morgan and sent it to a panel of 7 scientific advisors for their advice on the suitability of Morgan as a release candidate. These advisors had a broad range of experience among them and included some of the world's leading killer whale researchers. As we had helped prepare this information upon which the panel were basing their advice, no members of our project were included in this panel, to maintain its independence. A report was then compiled summarising all the information and expert opinions that formed the basis for government advice and the final decision on whether or not to release Morgan. This report is available (in English) [here](#). The scientists were unanimous that Morgan was not a good release candidate. The main concerns expressed were that she would not be accepted into a wild group and that on her own she would not be able to hunt successfully based on her extremely underweight state when she was found. The lack of information on the whereabouts of Norwegian killer whales, since the herring has changed its migration pattern, further complicated a possible release. Based on the unlikelihood that Morgan would have good chances of surviving if released, it was finally decided not to return Morgan to her natural habitat.

The Dolfinarium will now research the best option for Morgan's future, with high priority to finding a group of conspecifics and proper housing.

The fact that it was possible to pinpoint Morgan's origin to the Norwegian herring-feeding killer whales is an example of how important the research on wild North Atlantic killer whales is. On the other hand, the fact that it was not possible to find out in detail which group Morgan comes from is a testimony to how little we know of wild killer whales in the North Atlantic and how important it is to keep studying them. More detailed information on wild killer whale populations of the North Atlantic might change the outcome of events like this in the future.

*If you would like any further information on the work project NAKID conducted please contact Filipa Samarra or Andy Foote*

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