

Expert report, October 2021

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# MOANA

CAPTIVE-BORN 10-YEAR-OLD MALE ORCA,  
WITH SUBDERMAL TISSUE DAMAGE



**Figure 1.** Moana, on 28 April 2016, showing a faint pink area on his chin area (compare to later images, below). Note the poor enclosure conditions ('raw' concrete (with no paint), rust marks and cracks as well as a rim of dark green algae on the tank edge at water level) Photo: supplied.

Report prepared for OneVoice by Ingrid N. Visser (PhD)

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Moana, a captive-born (16 March 2011) male orca, held at Marineland Antibes, France, shows concerning subdermal tissue damage. The extent of this damage has escalated in recent months. Similar damage has been reported for another orca held at this same facility. There is clearly an underlying health and welfare issue for the orca held at this facility.

The facility is small and in poor (and deteriorating) disrepair and the ongoing poor water quality is of concern. It is my professional opinion that the feeding, health, behaviour and aggression records for Moana and the water quality records should be made available to external independent orca experts. This would allow an accurate assessment of the full extent of the issues Moana faces.

It is my recommendation that Moana is retired into a seaside sanctuary where he would have more space, natural seawater and appropriate medical attention. Moana has been made to perform circus-like tricks whilst he is exhibiting subdermal tissue damage. His participation in the shows should be ceased immediately and he should no longer be expected to perform circus-style tricks in return for his food.

## MOANA'S BACKGROUND

Moana is a male orca, born at Marineland Antibes, France on 16th March 2011 (i.e. he is approximately 10 years old at the time of this report). His mother is Wikie, who was also born at Marineland Antibes on 1st June 2001. She was artificially inseminated at just 8 years old and gave birth to Moana. His father is Ulises, a wild born orca captured in the water of Iceland on the 19th of November 1980. He has been held in captivity ever since; first in Barcelona Zoo and since 1994, at SeaWorld San Diego, USA.

Moana was the first calf to be successfully conceived and born through artificial insemination in Europe and the third in the world. The most recent measurements that I could find online for him were from March 2014<sup>1</sup>, when he measured 3.66 m and weighed approximately 800 kg. It is possible to identify him using a number of unique identification features, including but not limited to his eye patches (e.g., see Figure 2). I am familiar with identifying orca based on their eye patches and I published the first peer-reviewed article about this technique<sup>2</sup>.

In April 2016, I visited Marineland Antibes and observed the four orca held there, including Moana, who at the time was 5 years, 1 month, 8 days old. He performed tricks in the show that day. I have since seen a number of examples of him performing circus-like tricks in shows, whilst he is exhibiting subdermal tissue damage. His participation in the shows should be ceased immediately

and he should no longer be expected to perform circus-style tricks in return for his food. (A wide range of photos and videos are available online and I have been supplied images by OneVoice).



**Figure 2.** The right eye patch of Moana, showing some of the distinctive features which allow for individual identification. The blue arrow indicates a 'wide-C' shaped scar, whilst the brown circle shows some of the unique pigmentation variation at the front of his eye patch.

<sup>1</sup> <https://inherentlywild.co.uk/captive-orcas/>

<sup>2</sup> Visser I.N. & Mäkeläinen P.H. 2000. Variation in eye-patch shape of killer whales (*Orcinus orca*) in New Zealand waters. *Marine Mammal Science*. 16(2):459-469.

## MARINELAND ANTIBES ORCA TANKS

The facilities at Marineland Antibes are in disrepair, of poor quality and clearly showing neglect. This shows in aspects such as peeling or missing paint, rust stains, cracks in the structures (particularly the orca tanks) and the poor water quality.

When I visited Marineland Antibes in June 2016, I noted the poor water quality at the facility. I provide some examples from 2016 as they are appropriate

for comparing to the current situation, which has not improved since my visit. At the time of my visit the water was so 'cloudy' it was not possible to see the bottom of any of the orca tanks (see Figure 3 and Appendix I). The water was full of particulates of algae (Figures 4 & 5), as well as particulates of unidentified origin, but likely orca faeces, dead fish and other detritus giving it an aqua-marine colouring. Also, I noted a significant amount of algae growing on the tank walls, on tank bottom and floating at the surface (Figure 6). The algae floating at the surface also became a reservoir for floating rubbish (Figure 6).



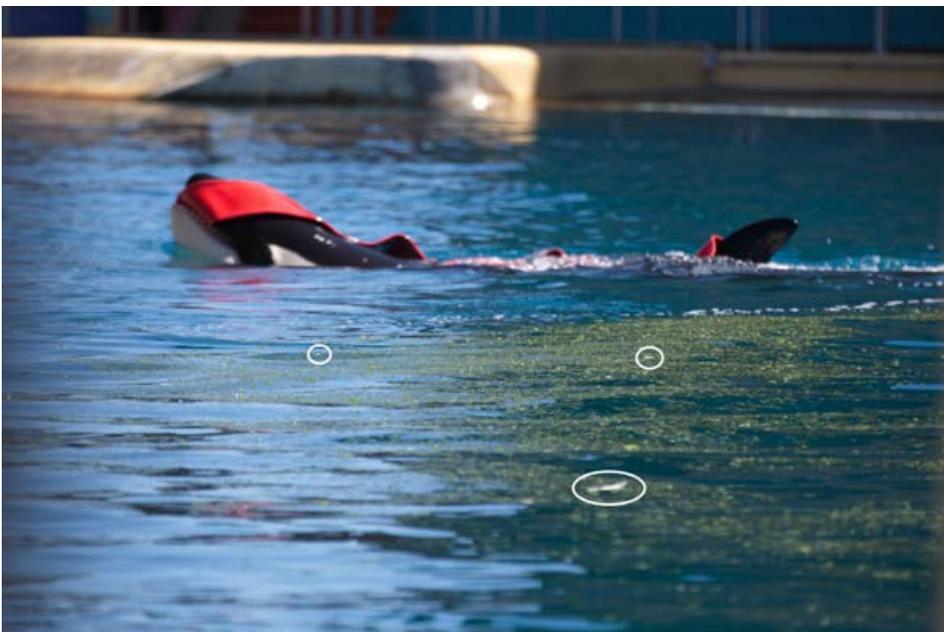
**Figure 3.** The show tank on 25 April 2016, illustrating how cloudy the water was, as the bottom cannot be seen. This is the largest of the tanks at Marineland Antibes. It measures a maximum of 66.5 m across at the widest point and is only 11 m deep.



**Figure 4.** An orca swims in the show tank on 25 April 2016, illustrating how cloudy the water was, as the bottom cannot be seen. The large particulates of algae can be clearly seen (circled, but note there were so many particles in the upper section of the water that it was not possible to circle them all – also see water over the white chin area of the orca, where the particulates can also be seen).



**Figure 5.** The west orca tank on 25 April 2016, showing the amount of algae floating in the water, creating an overall green colouring to the water in this part of the facility.



**Figure 6.** An orca with a red fire hose in its mouth and wrapped over its head, swims in the show tank on 25 April 2016. Note the large raft of algae floating at the surface in the foreground. Pieces of rubbish can be seen floating in the algae.

Of note is that a government inspection of Miami Seaquarium (Florida, USA) on 8 June 2021, found that there was also algae growing in one of the seapens and that “The attending veterinarian evaluated samples of the algae floating in Flipper pool and observed several species of parasites – nematodes, arthropods, and other unidentified species.” A manatee living in that same water system was evaluated and “... severe clinical presentation of diffuse nematode larval migrans with a secondary bacterial infection. Skin biopsies showed nematodiasis. Parasites that were identified include arthropods (mites), copepods, and nematodes.” The increase in algae was noted as occurring “without [the water] being adequately treated to prevent the overgrowth of algae...” and this led to health issues for the animals.

The findings by the USA Government are highly relevant to the situation at Marineland Antibes because the

increased algae observed at this French facility is also indicative of an ongoing and systemic problem with their own filtration system. Clearly the pumps at Marineland Antibes are not appropriately circulating the water and the chemicals in the water are not adequate. Such an excessive growth of algae can only happen if the water is also nutrient-rich; here, the source of such nutrients are the cetacean’s urine and faeces as well the remains of dead fish which are fed to the orca, all of which are not adequately filtered out of the water. Any suggestion that such algae growth is a sign of ‘good water’ (e.g., the plants can grow because of a balanced pH level) is a distortion of the facts. I provide a series of images downloaded from the publicly available ‘Google Earth Pro’ timeline history section, showing Marineland Antibes in October 2006, September 2014, June 2015, April 2016, April 2018, August 2018, March 2019 and September 2019. Of those seven images none show the facility clear of algae (see Appendix I).

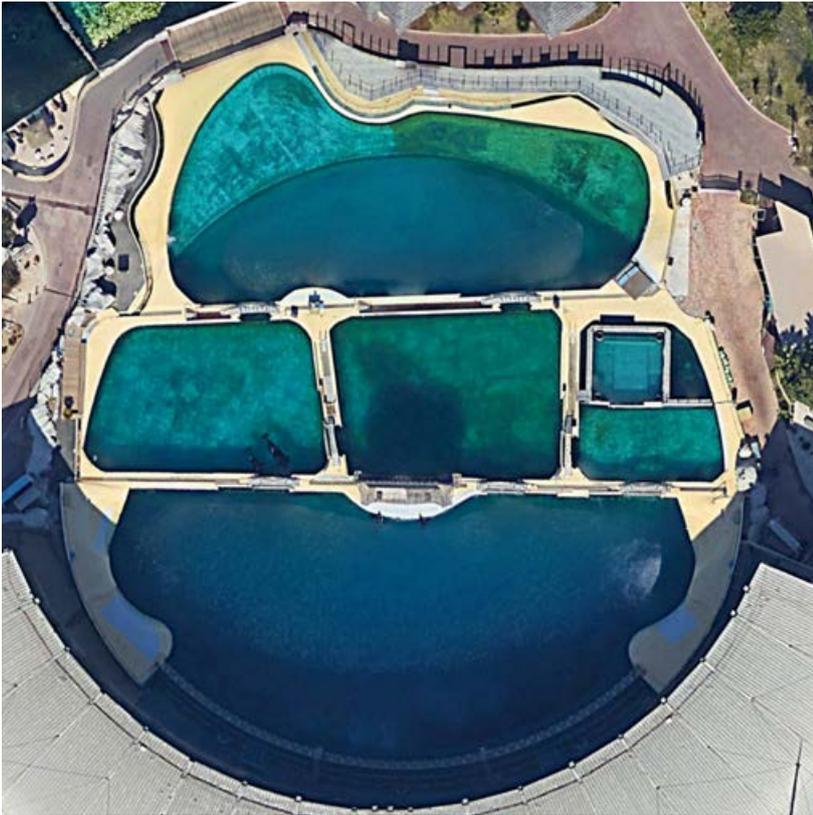
The tanks at Marineland Antibes are small – the largest tank is the ‘show’ tank and that is only 66.5 m long (Figure 7) and see Visser et al (2019)<sup>3</sup>. To put the size of the tank into perspective for the orca, if Moana remained at only 3.66 m in length (i.e., this measurement is 7 years ago, so he will be larger than this), he could only swim a maximum of 18 body lengths

in a straight line, before having to turn. The deepest tank at Marineland Antibes is also the show tank and that is only 11 m deep (of the 10 other facilities where orca are kept on public display, at least three show tanks are deeper). The orca at Marineland Antibes have no access to any other areas, including any areas ‘off view’ from the public.



**Figure 7.** The show tank, with a yellow line indicating maximum distance (66.52m) as calculated by Google Earth Pro. Given the small size, Moana can only swim a maximum of 18 body lengths in a straight line, before having to turn. Photo from Google Earth Pro (dated 21 March 2019).

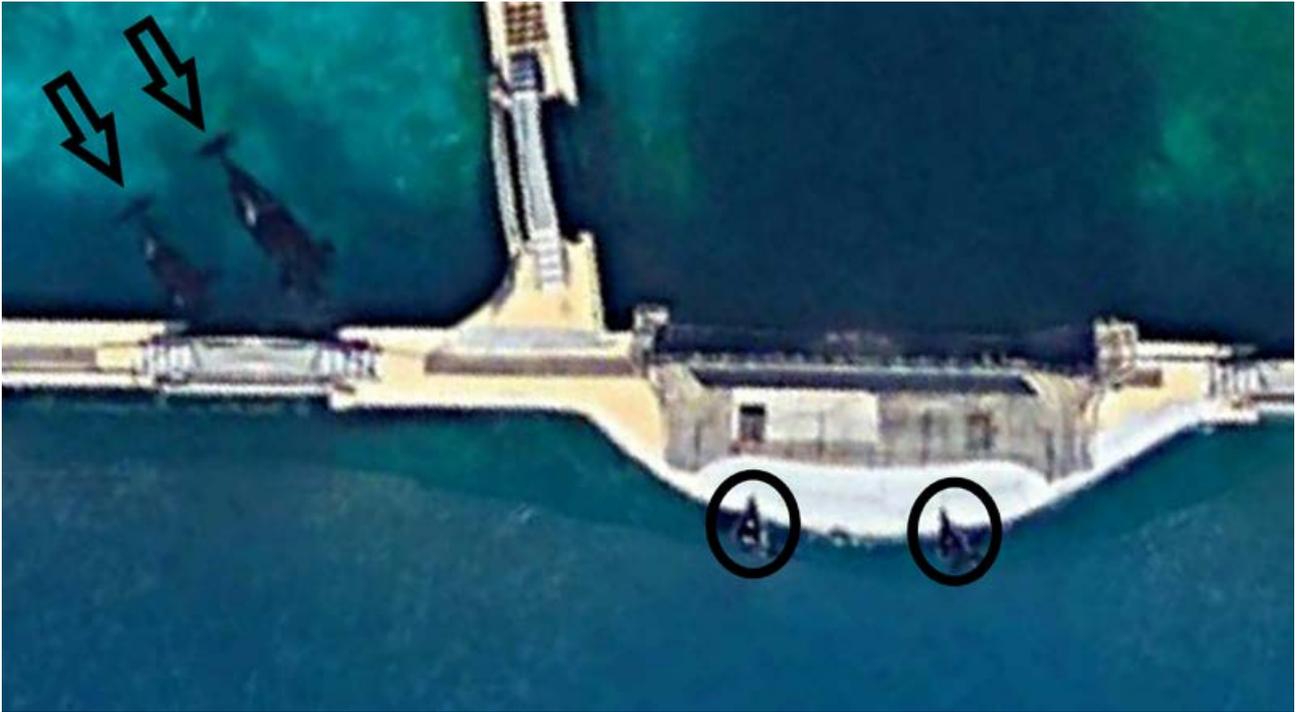
<sup>3</sup> Visser, Ingrid N; Jett, John; Ventre, Jeff (2019). *INOUK – Captive 20-year-old male 382 orca, with chronic and extensive tooth damage*. Report prepared for OneVoice ([www.one-voice.fr](http://www.one-voice.fr)) 383 March 2019. Pp25.



**Figure 8.** In March 2019, a Google Earth image shows the clearest water documented via their satellite in the 13 years between October 2006 and September 2019 (see Appendix I). Due to this relatively clearer water, the dark green algae growing in the orca tanks is more visible, for example, see the upper top right area, which is greener than the upper left. Additionally, 'tracks' can be seen in the upper left area, illustrating how dirty the bottom of the tank is. The centre tank is darker green than the show tank and patches of dense algae can be seen in the left (west) tank. However, compare this algae growth to Figure 9, taking particular notice of the difference between the darker and lighter areas to see the algae growth in six months. This image shows the entire area that the four orca have to live in. It includes the extremely shallow zones in the upper end of the northern most tank. However, of note is that typically each orca is restricted in the areas they can access, as the trainers frequently shut the gates to separate the orca for various reasons (e.g., aggression, to prevent unwanted pregnancies etc, see Figure 10).



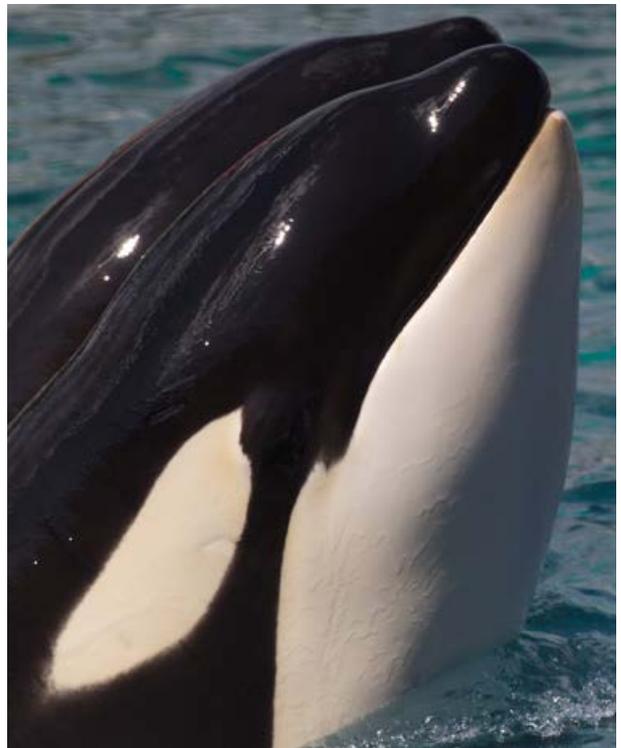
**Figure 9.** In September 2019, the most recent Google Earth image available, the dark green algae growing in the orca tanks is visible. Note the dramatic difference between the upper left area in this figure and Figure 8. Additionally, note the lighter green areas in the west and middle tanks, suggestive of higher water flow or more concentrated chemical dispersal.



**Figure 10.** A zoomed in section of the March 2019 Google Earth Pro image (Figure 8), showing two orca at the closed gate (arrows) of the west tank, and two orca (circled) at the show tank platform. Separation of orca into different tanks is standard practise in entertainment facilities.

## COMPARISON OF MOANA'S SUBDERMAL TISSUE OVER TIME

In April 2016, when I photographed Moana, I did not document any subdermal tissue damage (Figure 11). However, more recent photographs show damage to his 'chin' area. There also appears to be an escalation of this subdermal tissue damage as evidenced by these images (Figures 12 to 23).



**Figure 11.** Moana, beside another orca, lifts his head from the water to observe a trainer. Note the 'clean' white area of his chin. Photo taken on 24 April 2016.



**Figure 12.** A faint pale pink 'blush' can be seen on the right side of Moana's chin (upper photo). The identical photo has been adjusted to under-expose and enhance contrast (lower), which then shows area of tissue damage more clearly. Photo by Olivia Thévoz (downloaded from [www.inherentlywild.co.uk](http://www.inherentlywild.co.uk)), presumed to be taken prior to September 2020.





**Figure 13.** The pale pink area is darker in the centre and on the left side of Moana's chin (upper photo) than on his right side. The identical photo has been adjusted to under-expose and enhance contrast (lower), which then shows area of tissue damage more clearly. Photo by Olivia Thévoz (downloaded from [www.inherentlywild.co.uk](http://www.inherentlywild.co.uk)), presumed to be taken prior to September 2020.





**Figure 14.** The pale pink area is extends down the left side of Moana's chin (upper photo). The identical photo has been adjusted to under-expose and enhance contrast (lower), which then shows area of tissue damage more clearly. Photo by Olivia Thévoz (downloaded from [www.inherentlywild.co.uk](http://www.inherentlywild.co.uk)), presumed to be taken prior to September 2020.



**Figure 15.** The pale pink area is darker in the centre of Moana's chin, than on his right side. The identical photo has been adjusted by under-exposing and enhancing the contrast, which then shows area of tissue damage more clearly. Photo supplied by One Voice, taken 13 November 2021.

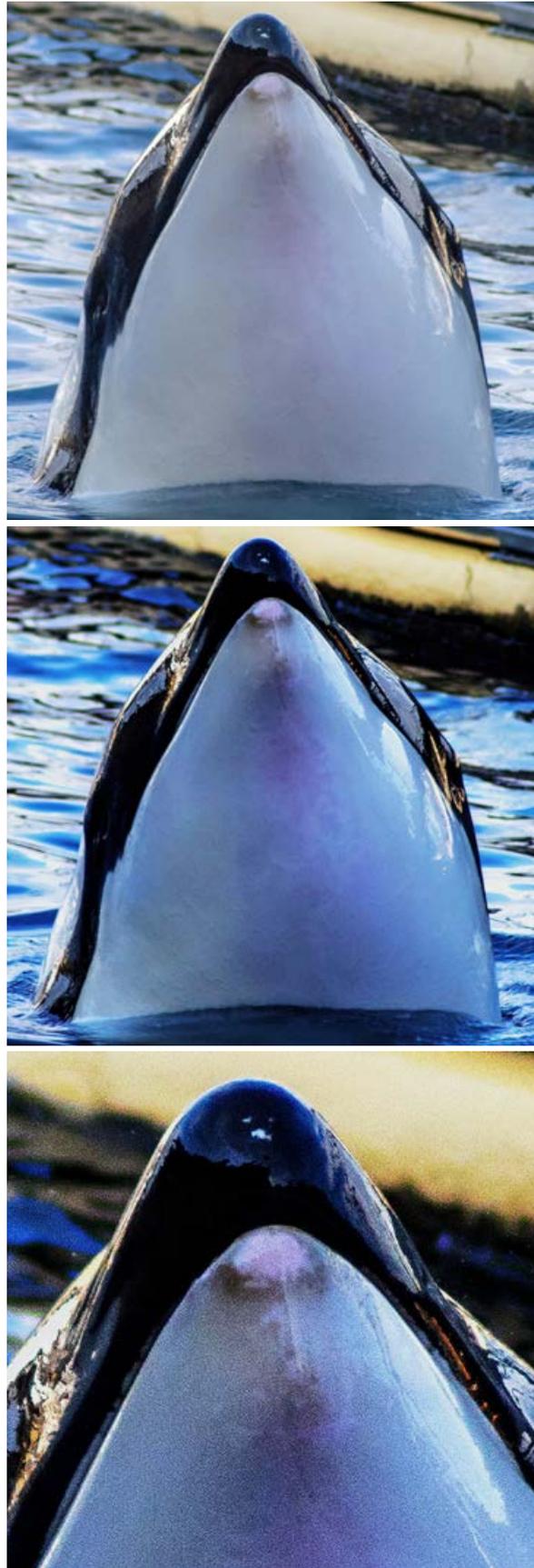


**Figure 16.** The pale pink area is darker in the center of Moana's chin and gradually becomes more noticeable as the photo is adjusted (the first photo is not adjusted, the middle one is adjusted for exposure and contrast, and on the last are the "levels" and the removal of "magenta/pink." Photo provided by One Voice, taken on November 13, 2021.

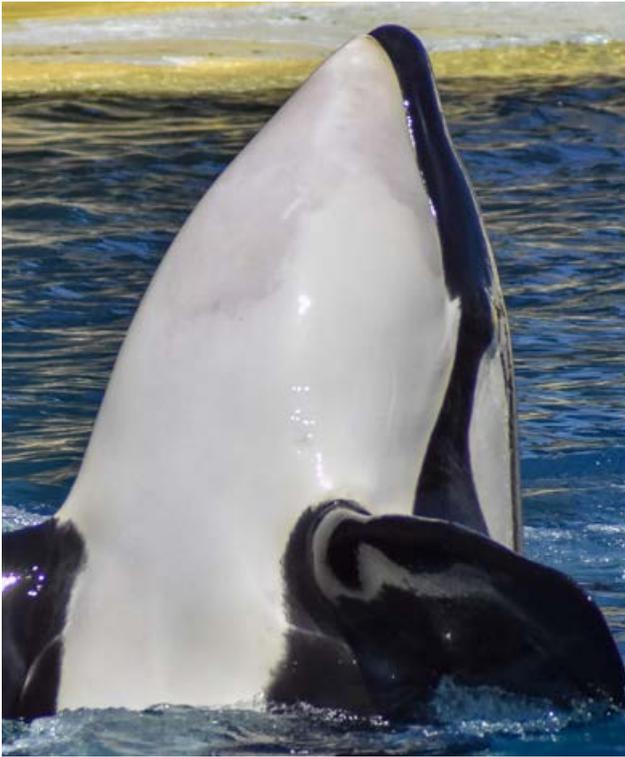


*Figure 17. Despite having sub-dermal tissue damage, Moana is required to haul out onto the platform and perform tricks such as spinning on his side. In the photo on the below, the identical image has been adjusted for exposure and contrast to show the sub-dermal tissue damage. Photo supplied by One Voice, taken 13 November 2021.*

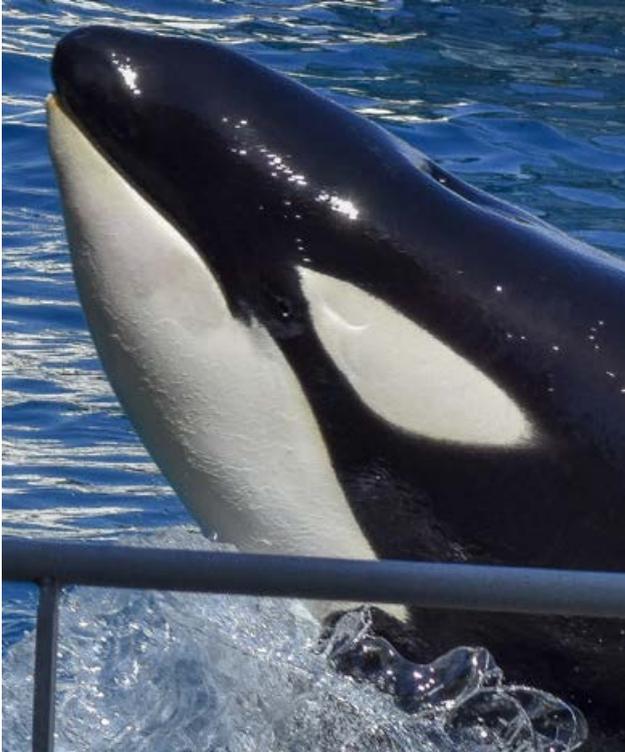




**Figure 18.** Moana has not only the band of pink tissue down the centre of his throat area, but also, on the tip of his lower jaw he exhibits 'hypertrophic tissue damage' (a pale area surrounded by a darker tissue -see close-up). Such damage is from a stereotypic behaviour, which may be either self-harming and/or boredom related and typically occurs if the chin is pushed frequently against a hard surface. Photo supplied by One Voice, taken 13 November 2021.



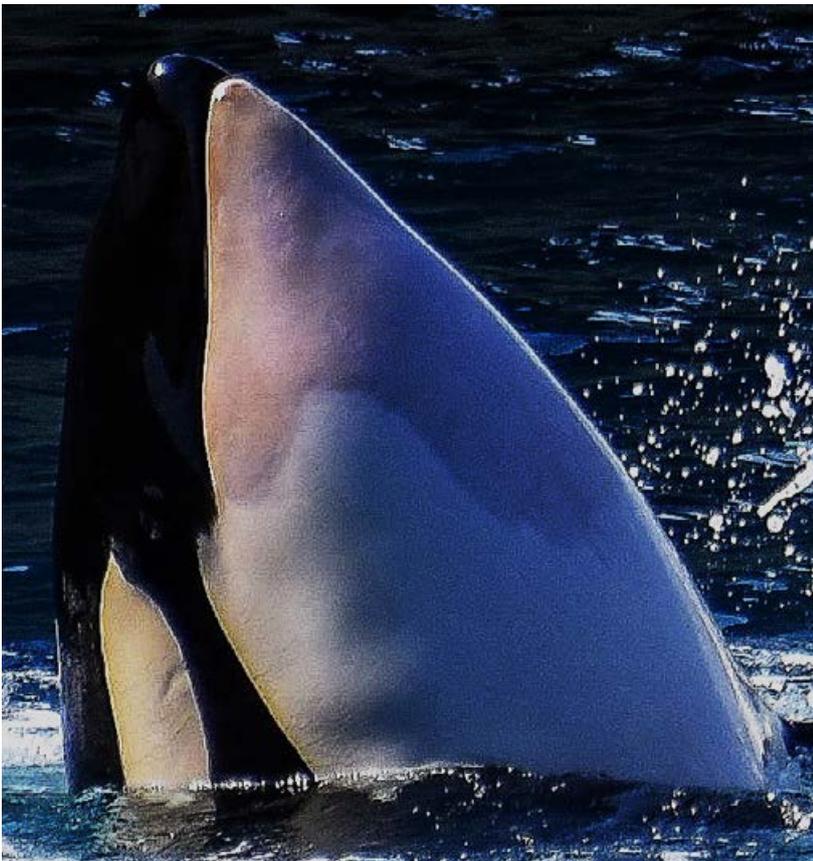
**Figure 19.** In this image, the uneven spread of the damage across the chin of Moana is apparent. The identical photo has been adjusted to under-expose and enhance contrast (right), which shows the damage more clearly. Photo supplied. Taken 21 July 2021.

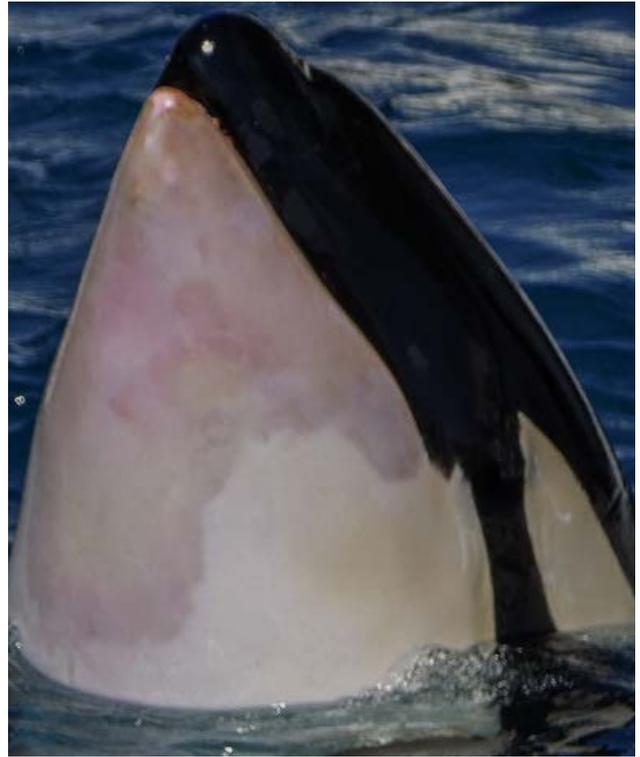


**Figure 20.** Taken during a show, Moana is made to perform tricks whilst exhibiting subdermal tissue damage. The identical photo has been adjusted to under-expose and enhance contrast (right), which shows the damage more clearly. Photo supplied. Taken 21 July 2021.

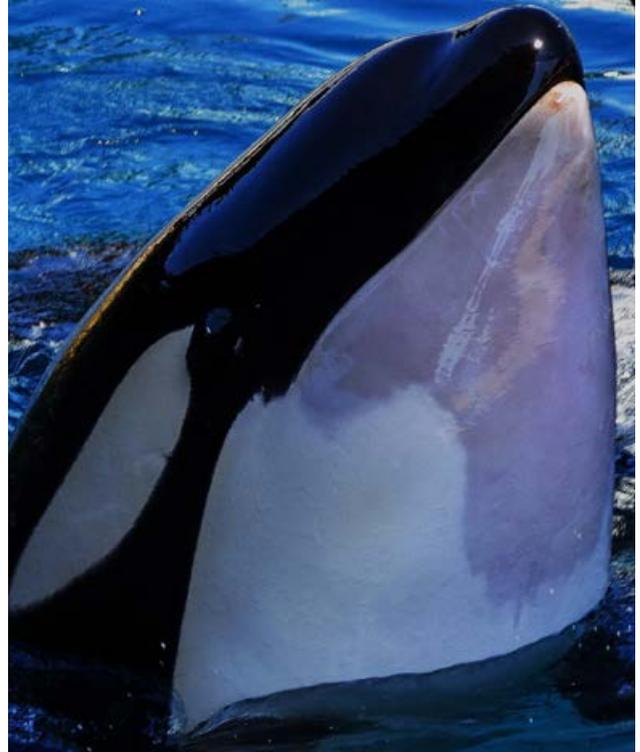


**Figure 21.** A month later, the spread of the damage across the chin of Moana is apparent even without adjusting the image. The identical photo has been adjusted to under-expose and enhance contrast (lower), which shows the damage more clearly. Photo supplied. Taken 27 August 2021.





**Figure 22.** Now the subdermal tissue damage appears to also be more focused in some areas, showing up as darker pink. The identical photo has been adjusted to under-expose and enhance contrast (lower), which shows the damage more clearly. Photo supplied. Taken 27 August 2021.



**Figure 23.** Also, on right side the damage across the chin of Moana is apparent even without adjusting the image. The identical photo has been adjusted to under-expose and enhance contrast (lower), which shows the damage more clearly. Photo supplied. Taken 27 August 2021.

Without the full records for Moana it is not possible to determine what the etiology of this subdermal tissue damage is. Of note is that Inouk, Moana's older uncle, who is also held at Marineland Antibes has similar subdermal tissue damage, which I reported on in 2020<sup>4</sup>. It is not possible to determine if what is observed on either orca is the same issue or caused by the same pathogen/behaviour/water quality, based solely on photographs. However, what is apparent is that there are very real welfare and health issues for the orca held at Marineland Antibes.

Based on the evidence presented here, it is my professional opinion that Moana has suffered over an extended period from subdermal tissue damage. As such, the health (including veterinarian, medication and laboratory records), behaviour and aggression records for Moana (and for all the other orca held at Marineland Antibes, i.e., Inouk, Keijo and Wikie), as well as the water quality records, should be made available to external independent orca experts. This would allow for a more accurate assessment of the full extent of the issues these orca face. Additionally, these health records would facilitate appropriate steps that need to be taken in order to address the plethora of health and welfare issues that are clearly evident at this facility.

It is my recommendation that Moana is retired into a seaside sanctuary where he would have more space, natural seawater and appropriate medical attention.

At the very least, he should no longer be expected to perform circus-style tricks in return for his food and his participation in the shows should be ceased immediately and he should not be expected to perform whilst exhibiting this subdermal tissue damage. Other less stressful activities can be implemented to assist in maintaining Moana's physical fitness, including daily exercise sessions where he is not required to 'perform'. The escalation of the subdermal tissue damage is of concern as it indicates an underlying issue at this facility. That it has also been documented on Inouk is evidence that there are fundamental health care and welfare issues for these orca.

I have visited all the facilities in the world with captive orca on public display and the conditions at Marineland Antibes are what I would consider some of the worst in the world. For example, no other facility has rafts of algae floating at the surface.

In conclusion, Moana suffers from acute and chronic stressors associated with unnatural confinement in an extremely poorly maintained facility. In effect, he has a reduced quality of life due to captivity.



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<sup>4</sup> Visser, Ingrid N; (2020). INOUK – Captive 20-year-old male orca, with chronic and extensive tooth 409 damage. Update August 2020. Report prepared for OneVoice ([www.one-voice.fr](http://www.one-voice.fr)) August 2020. Pp11.

## APPENDIX I

A series of images from Google Earth Pro 'History', showing the poor state of the water quality at Marineland Antibes.



*Figure A.* October 2006.



*Figure B.* September 2014.



*Figure C.* June 2015.



*Figure D.* April 2016.



Figure E. April 2018.



Figure F. August 2018.



Figure G. March 2019.



Figure H. September 2019.



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