

**International Zoo Veterinary Group**

Station House, Parkwood Street

Keighley, West Yorkshire

BD21 4NQ, UK

T : 01535 692000**F** : 01535 690433**E** : admin@izvg.co.uk**W** : www.izvg.co.uk

Health and welfare assessment of the killer whale group held at Loro Parque, Tenerife.

On 29th September 2015 I carried out an assessment of the general health and welfare of a group of six killer whales (*Orcinus orca*) at Loro Parque. The group consists of five captive-bred animals imported from Sea World, United States, together with Morgan who arrived in 2011, having stranded as a juvenile in the Netherlands in 2010. It includes the following members:-

Keto – a 20-year-old male, captive-bred at Sea World, and father of Adan

Tekoa – a 15-year-old male, captive-bred at Sea World

Kohanna – a 13-year-old female, captive-bred at Sea World, and mother of Adan

Skyla – an 11-year-old female, captive-bred at Sea World

Adan – a 5-year-old male, captive-bred at Loro Parque

Morgan - a 9-year-old (estimated) female, wild stranded in the Netherlands.

My assessment included a close-up physical examination of each animal, examination of their health and management records, and a review of a public presentation.

Physical examination.

I examined each individual by observing it during the day at rest, from the surface and through underwater windows, at the poolside, on a slide-out on the weighing scale or on the beach, and during a public display. As the scale was out of order, weights are estimates based on previous measurements.

Keto.

An adult male, estimated weight 3500kg, in excellent body condition but with a drooping dorsal fin. Skin condition was very good and there was no drying or wrinkling of the skin on the concave side of the dorsal fin. A few historical rake scars (caused by the teeth of other whales during dominance behaviour or play) were present but they were faded to shadows and not visible from a distance. None of these scars had caused depigmentation, indicating that the wounds had been superficial and none was recent. His eyes were clear and normal in appearance underwater.

Keto showed some tooth damage which was under continuing treatment. Seven lower front teeth were worn and their dead pulp cavities had been drilled out and widened to allow regular flushing to prevent infection. Two such teeth had collapsed and small pieces had fallen out or been removed. Keto was also missing four upper teeth on his left side (which had occurred more than ten years ago before arrival at Loro Parque).

Keto was active in the pool and in the public display and his general physical condition was very good.

Tekoa.

An adult male, estimated weight 2250kg, in excellent body condition but with a bent (rather than drooping) dorsal fin. Skin condition was very good, with numerous old scars from the teeth of other whales. Most were well faded and did not show depigmentation. His eyes were clear and normal in appearance underwater.

Tekoa also showed some tooth damage, having seven worn teeth which had been drilled open, two of which had closed off the cavity with secondary dentine regrowth. Tekoa was active in the pool and in the public display and his general physical condition was very good.

Kohanna.

The oldest adult female, and mother to Adan, estimated weight 2000kg and in excellent condition. She had a small recent scar on the side of her head, probably from a gate, but otherwise her skin was very clean and relatively free of scarring, reflecting her position as the dominant animal. Her eyes were clear and of normal appearance. Most of her lower teeth at the front were worn at the side, but only five had open pulp cavities. The lower right 5th tooth had an infected socket and was under treatment. Kohanna was active in the pool and in the public display and her general physical condition was very good.

Skyla.

The younger adult female, estimated weight 2000kg, in excellent condition. She had a few old rake marks and scratches, all healed, and two rubbed patches on her saddle from rubbing on the gates; otherwise her skin was in very good condition. Her eyes were clear and of normal appearance. Tooth damage included eight worn with open cavities, one missing, and one broken with secondary dentine formation.

Skyla was active in the pool and in the public display and her general physical condition was very good.

Adan.

The young male born at Loro Parque, weight 1036 kg, in excellent condition. He had one patch of recent rake wounds on one side, otherwise his skin was in good condition. His eyes were clear and of normal appearance. Several teeth in his lower jaw showed wear down to the pulp level, but only one had been drilled open, the rest being still vital. One tooth was broken.

Adan was very active in the pool, but did not take part in the display.

Morgan.

The youngest female, moved to Loro Parque as a wild stranded animal (i.e. completely unrelated to the rest). She has an estimated weight of 2000kg, and is in excellent condition. Her age is not exactly known, but she stranded underweight and starving almost six years ago as a juvenile, so nine years seems a reasonable estimate. Her skin was almost unmarked and in very good condition. Her eyes were clear and of normal appearance. Five teeth in the lower jaw were worn to the pulp level but not drilled out, and two were broken. As a result of her early life experience, Morgan is recognised to be functionally deaf.

Morgan was very active in the pool, and in the public display and her general physical condition was very good.

Health and management records.

I reviewed the records for each animal for the last two years. Weights of all the animals are comparable to other captive whales of equivalent age. Unfortunately, there are no known-age weights of healthy wild animals available for comparison. Adan shows steady growth and weight increase, as expected. The animals are clinically examined on a regular basis, including the taking of blood samples and ultrasound examination. A complete ultrasound atlas for the killer whale has been developed using this group. The physiological parameters for all the members of the group have been remarkably stable, with very few fluctuations associated with minor health problems and treatments.

Water quality was excellent judging by chemical parameters, microbiology and visual appearance, and is continually monitored by Loro Parque in-house laboratory staff. The pool has the benefit of the addition of at least 20% new ocean water every day to top up the closed-circuit life support system. Diet for the whales is approximately 50:50 high and low fat fish, with occasional squid, and is properly supplemented. Food intake records are based on calorific value and are comprehensive.

Enrichment.

The highly-trained staff is very aware of the need for enrichment and, in addition to the activity that the animals get from social interaction within the group and from doing 4 to 5 public presentations daily, the trainers spend many hours a day interacting with the animals. This may be in the form of training sessions and free association, and also the addition of unusual items to the pool which I saw the whales actively investigating and using. Full records of these activities are kept. The park's research team carry out regular research into different aspects of the whales' welfare including, for example, determining Morgan's state of hearing and devising alternative methods of communicating with her,

Conclusion.

In general, the physical condition and health of the group is excellent. From what I was able to see from their behaviour and through their records, their psychological health is also good.

Social interaction within cetacean groups, in captivity and in the wild inevitably includes the use of their teeth, either in antagonistic or playful behaviour (as they have no other manipulative option, compared with cats or primates for example). This regularly results in the rake marks and scars which can be seen in most species in captivity and in the wild. In some species, wild individuals may be almost completely covered in scars, so this should not be regarded as necessarily indicative of poor social management in captivity. The fact that the great majority of marks were old and faded suggests that they resulted in past juvenile play and establishment of dominance when this group was first established. Tooth wear and damage is also common in wild cetaceans as a result of interaction with prey, substrate and one another, but it is clear that captive killer whales have a propensity to rub their lower teeth on hard objects in their pools, be they walls, pool edges, gates or other fixtures. Much of this is investigatory behaviour, some is unexplained. Every attempt has clearly been made at Loro Parque to eliminate the opportunity in the initial design, but still it persists and so the standard methods of alleviating the damage have been applied.

I was satisfied that this group of whales was being given the best of care.

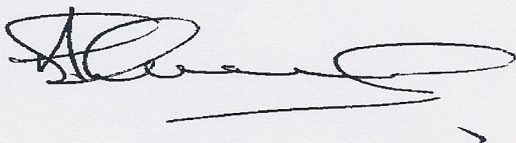
Qualifications and experience.

I am a qualified veterinary surgeon, with the degrees of MA, VetMB from the University of Cambridge, and Fellowship of the Royal College of Veterinary Surgeons. I hold the European Diploma in Zoological Medicine and am both a European and RCVS recognised Specialist in Zoo and Wildlife Medicine. I am also a Fellow of the Society for Biology and a Chartered biologist. I am a Past President of the European Association for Aquatic Mammals and I carry out accreditation inspections of member facilities for the Association.

I have worked in the field of marine mammal medicine for 40 years, including continuous responsibility for killer whales.

I have been veterinary consultant to Loro Parque since 1986, but I am not actively involved in the care of this group of whales, so am able to take a professionally independent view.

Andrew G. Greenwood MA VetMB DipECZM CBiol FSB FRCVS.

A handwritten signature in black ink, appearing to read 'Andrew G. Greenwood', with a long horizontal line extending from the end of the signature.