

A safe and standardized technique to identify individual dolphins in human care

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Summary

So far no satisfying identification technique for individual dolphins in human care has been developed. This paper proposes a photographic method to identify dolphins. To reduce stress and to improve the safety of the animals a lift was designed and constructed. Details of this method of hoisting dolphins out of the water are discussed.

Introduction

Some techniques have been developed to identify individuals cetaceans in the wild. Watkins & Scheville (1976) described an underwater paint marking technique for porpoises. Evans (1974) used a radio tag to follow individual cetaceans in the oceans. Watkins (1982) described the use of a discovery mark that was shot into a cetacean.

Individual dolphins in marine mammal facilities can be easily recognized by their trainers and animal care personnel. Subjectively they recognize the animal by means of a number of parameters such as size, shape, colour patterns, scars, and behaviour. Recently, in many countries, the governments have expressed the desire to be able to identify individual dolphins in marine mammal facilities. Also for veterinary purposes it is often crucial to make positive identifications.

So far no satisfying identification technique for individual dolphins in human care has been developed. Thomas *et al.* (1987) described the use of a transponder chip as a tag in sea otters to recognise individuals. This technique has not been tried on dolphins yet. Also with this method the scanner has to come within 8 cm of the chip to read the code which means that the dolphins have to be trained to approach the reader or have to be taken out of the water. If this transponder technique would be used by government agencies it would mean that only one system should be used worldwide, something that is not very likely to happen.

For studies in the wild another safe method has been developed to identify cetaceans. Photographs of

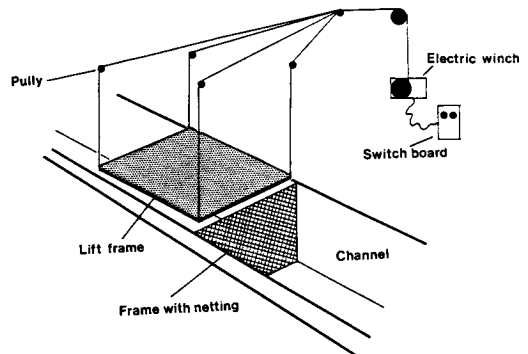


Figure 1. A schematic view of the dolphin lift.

external body parts such as heads, dorsal fins and tailflukes are used for identifying individual animals. The size, shapes and colour patterns and distribution of external parasites make individual recognition possible. This technique has been successfully used on several species of baleen whales (Dorsey, 1983; Katona *et al.*, 1980; Payne *et al.*, 1983; Price & Winn, 1981; Kraus *et al.*, 1986) and toothed whales such as killer whales (Bigg *et al.*, 1983; Perrin, 1982 & Leatherwood *et al.*, 1984) and on bottlenose dolphins (Santos & Lacerda, 1987).

Our proposed identification technique is derived from the photo-identification techniques in the wild. In marine parks dolphins can be taken out of the water to record more details. Especially the dorsal fin and tailflukes are very characteristic. Also scars, some of which are caused by social interactions (Norris, 1967; Johnson & Norris, 1986), can be used for identification.

Taking dolphins out of the water with nets can cause injuries. To prevent these injuries a dolphin lift was constructed.

Materials and Methods

Dolphin lift

To take accurate pictures of body parts of a dolphin it is necessary to take the dolphin out of the water.

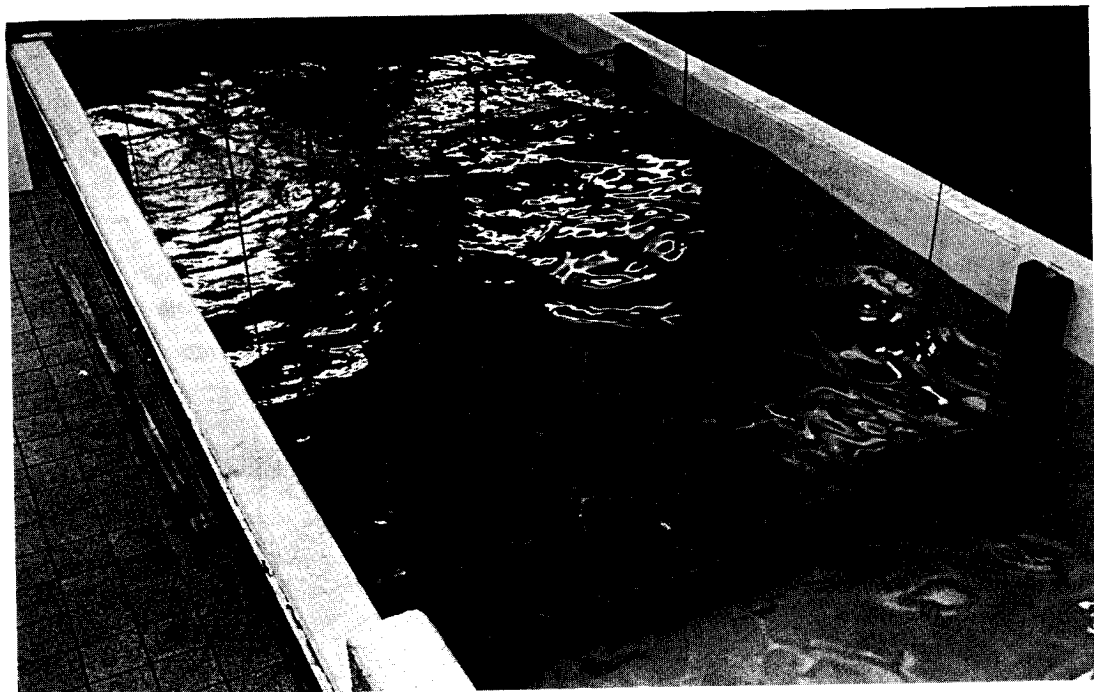


Figure 2. The lift frame on the bottom of the channel.

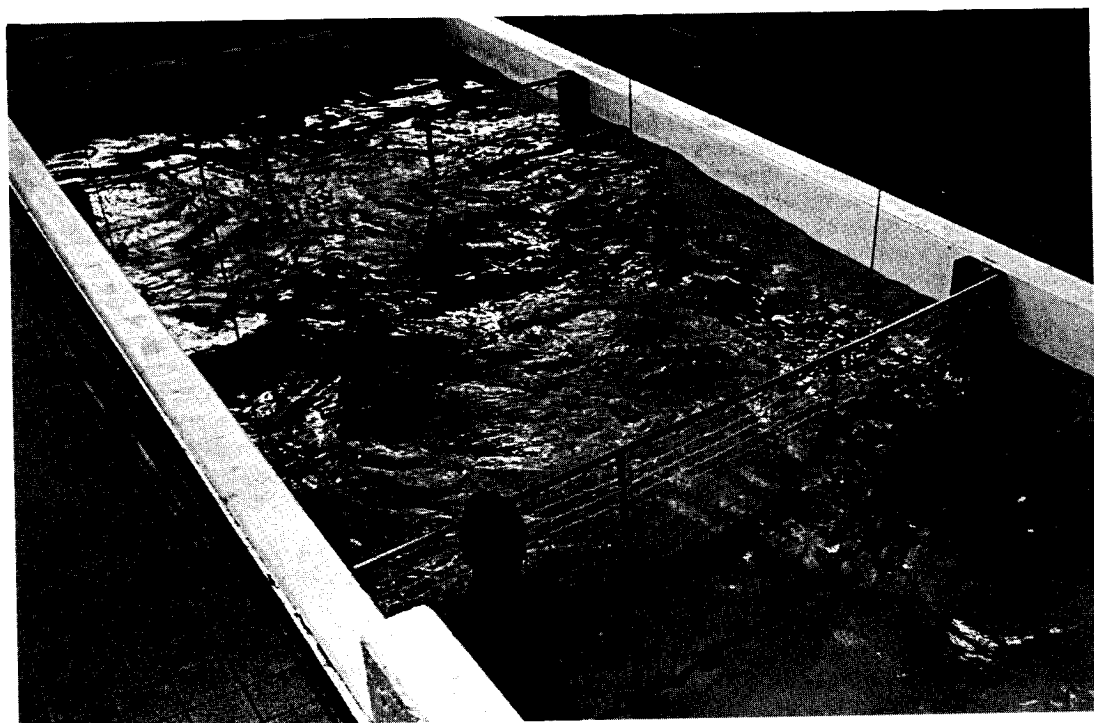


Figure 3. The dolphin is directed into the area above the lift frame.

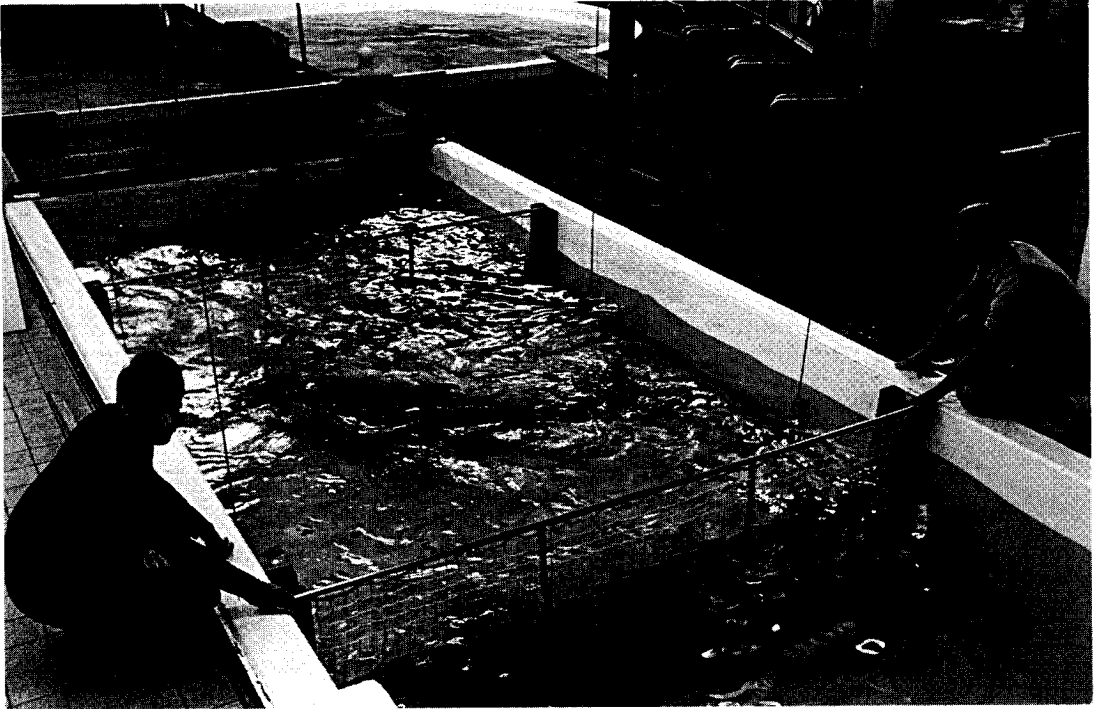


Figure 4. The lift frame and dolphin are slowly hoisted out of the water.

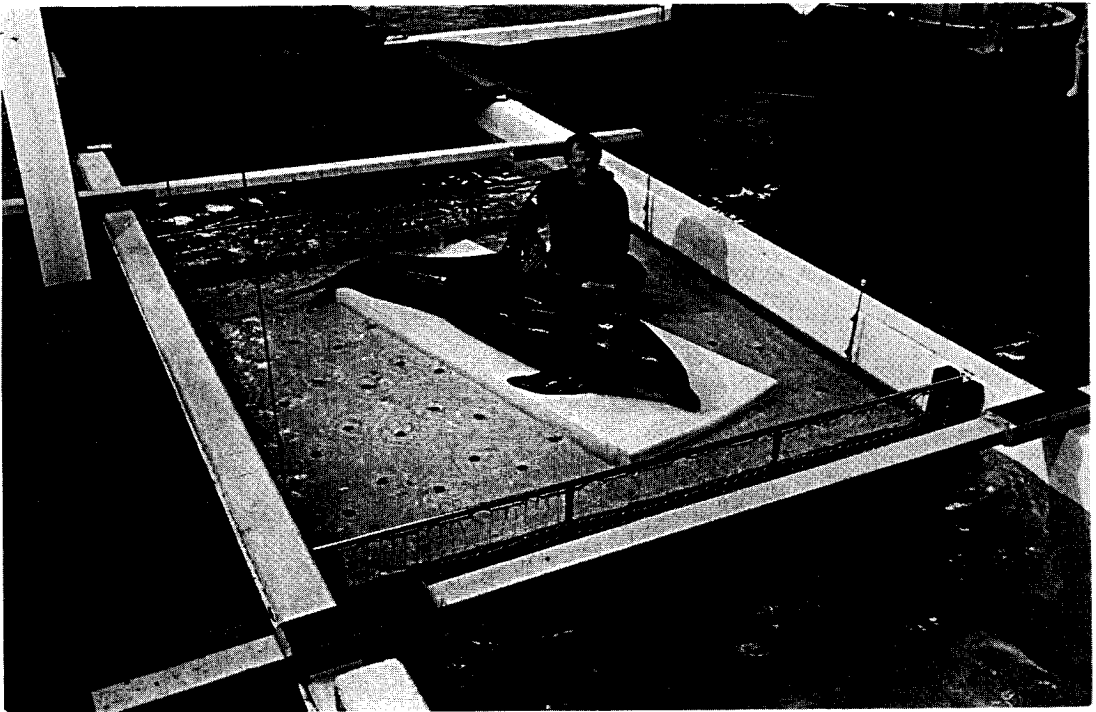


Figure 5. A rubberized foam mattress is placed under the dolphin.

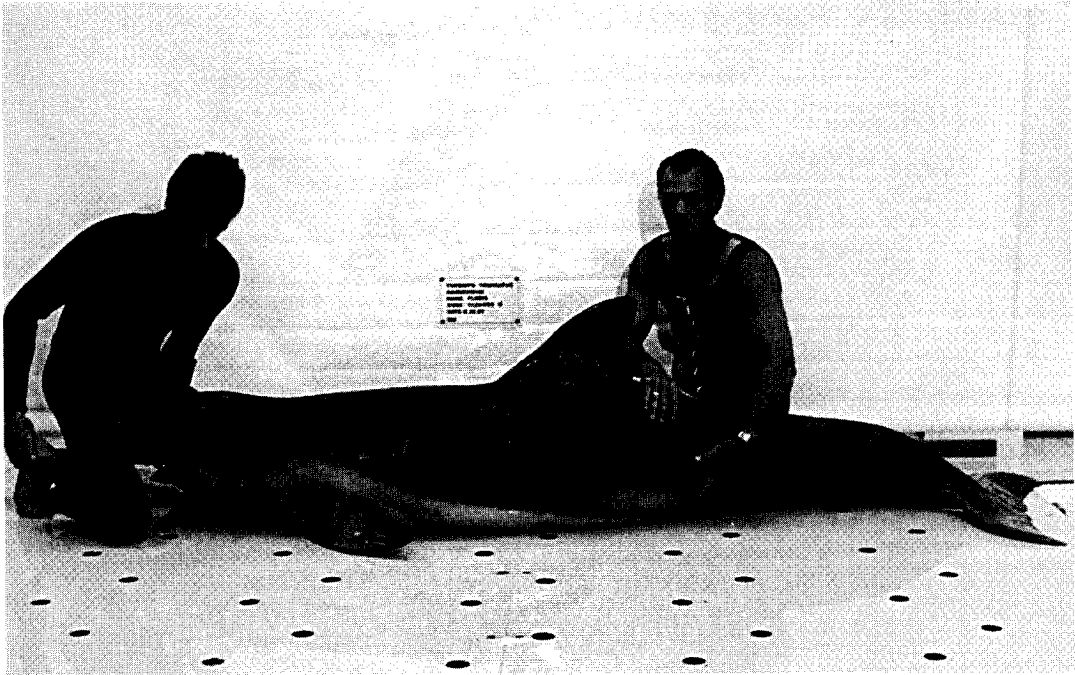


Figure 6. An overall picture of the left side of a dolphin.

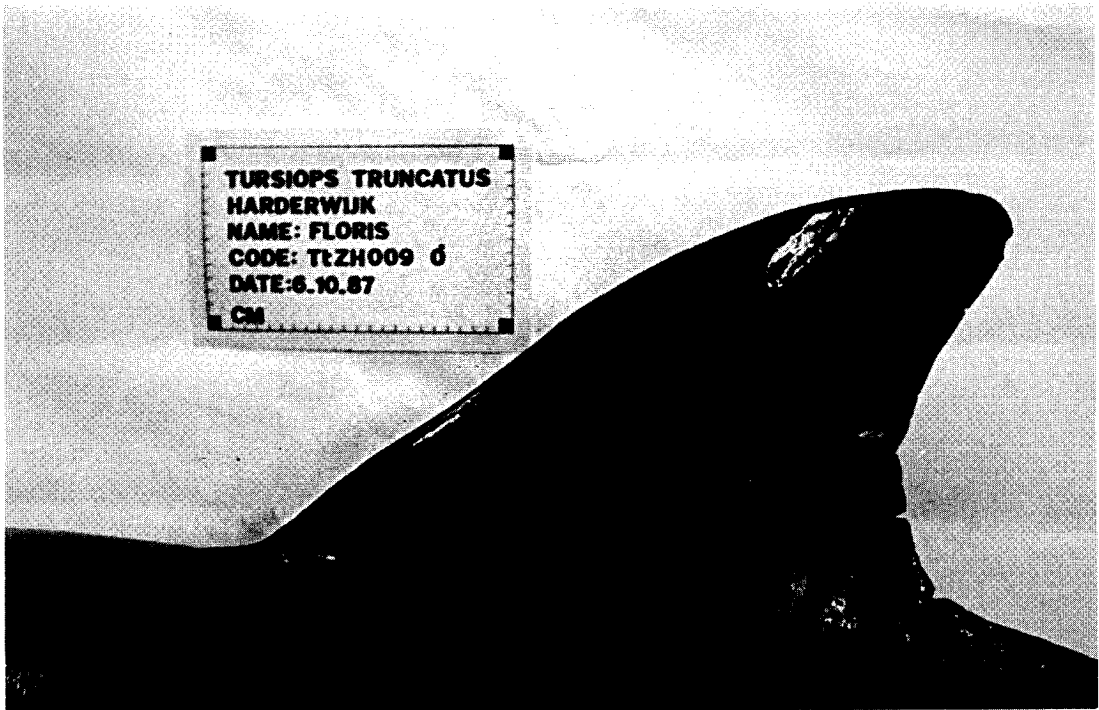


Figure 7. The dorsal fin of a dolphin showing individual markings.

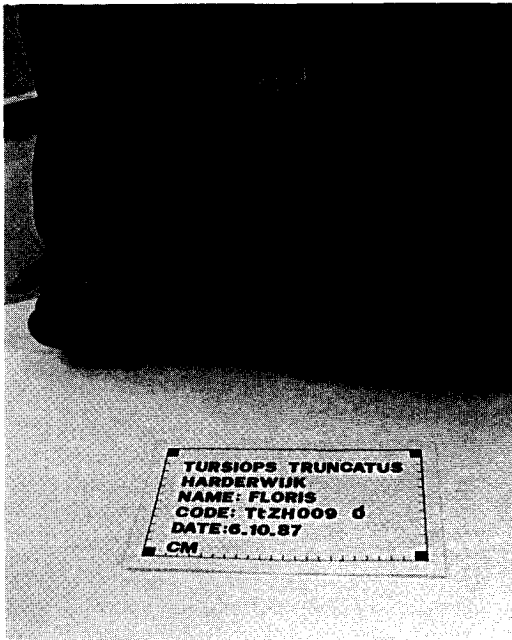


Figure 8. The head of a dolphin.

A dolphin lift was constructed to do this in a way that is physically safe and that causes as little mental disturbance as possible.

This lift is constructed in the following way (Fig. 1): A stainless steel lift frame of 3 m × 3 m is covered by a solid plastic plate in which smooth holes are drilled to let the water drain through. Four stainless steel cables are attached at the four corners and go through four pulleys on the ceiling. After passing through the pulleys they merge into one stainless steel cable. Via another pulley this cable runs to an electric winch (preferred lift speed is between 2.5 and 5 metres per minute). This winch is purposely placed far away from the salt water to minimize corrosion. The winch is attached by only two strong bolts so that it can easily be removed during periods of non-use. This is also done to minimize corrosion.

The waterproof electric switch board is placed 7 metres away from the water. The person who controls the lift has a good view of the lift and the work area.

The lift frame is placed above a channel of water (3 metres wide). To guide the lift frame in the channel, wooden strips are placed against the walls of the channel. These wooden strips also serve to attach two stainless steel frames with 3 cm mesh netting to prevent the dolphins from leaving the area above the lift. The lift is built to carry at least 1000 kg (300 kg (dolphin) + 200 kg (two person) + 200 kg (water displacement) + 300 kg (safety)).

To take a dolphin out of the water the following actions have to take place.

- The lift frame is lowered on the bottom of the channel and one of the stainless steel frames with netting is put beside it (Fig. 2).
- With the other stainless steel frame with netting the dolphin is directed along the channel until it is above the lift frame (Fig. 3).
- When the animal is above the lift frame the lift is slowly hoisted out of the water (Fig. 4).
- Just before the dolphin is completely out of the water a waterproof rubberized foam mattress is placed under the dolphin to make the stay above the water more comfortable and to prevent injuries (Fig. 5).
- Then the dolphin is completely hoisted out of the water.
- Wooden beams are put over the channel under the lift and the lift is slowly lowered. This way the lift is transformed into a stable work platform.

Identification method

Photo technique

High quality black and white pictures are taken by means of a professional 6 cm × 6 cm camera.

Several flashlights with reflecting umbrellas are placed around the dolphin to prevent shadows on the pictures. These flashlights have to be placed high to prevent water drops from splashing dolphins from hitting the lamps.

Care should be taken to protect connections in the electric wire for the flashlights from water.

Body parts

First an overall picture of the left side of the animal is taken (Fig. 6). To minimize disturbance in the background a white plastic screen is placed behind the animal. In the Harderwijk situation the screen is rolled on an aluminum pipe and can be descended by remote control (by the same person who controls the lift winch). On this screen the following information is visible:

- Latin species name
- Park where picture is taken
- Name of the animal
- Code of the animal
- Sex
- Date
- A centimetre division

This information is printed on plastified paper to protect it from salt water. When the picture is taken, as few people as possible should be present next to the animal. However, often two people are needed for safety reasons. After the overall picture, details of several body parts are photographed. Each time the above mentioned information should be visible on the photo. For the dorsal fin the screen can serve as a

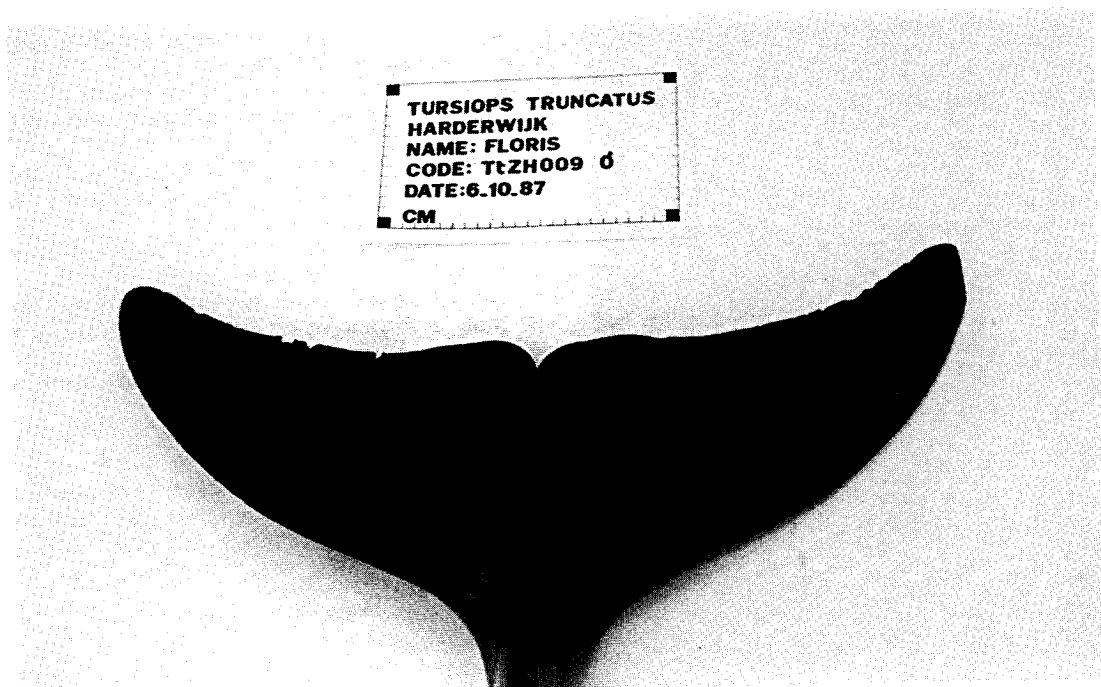


Figure 9. The tail fluke of a dolphin.

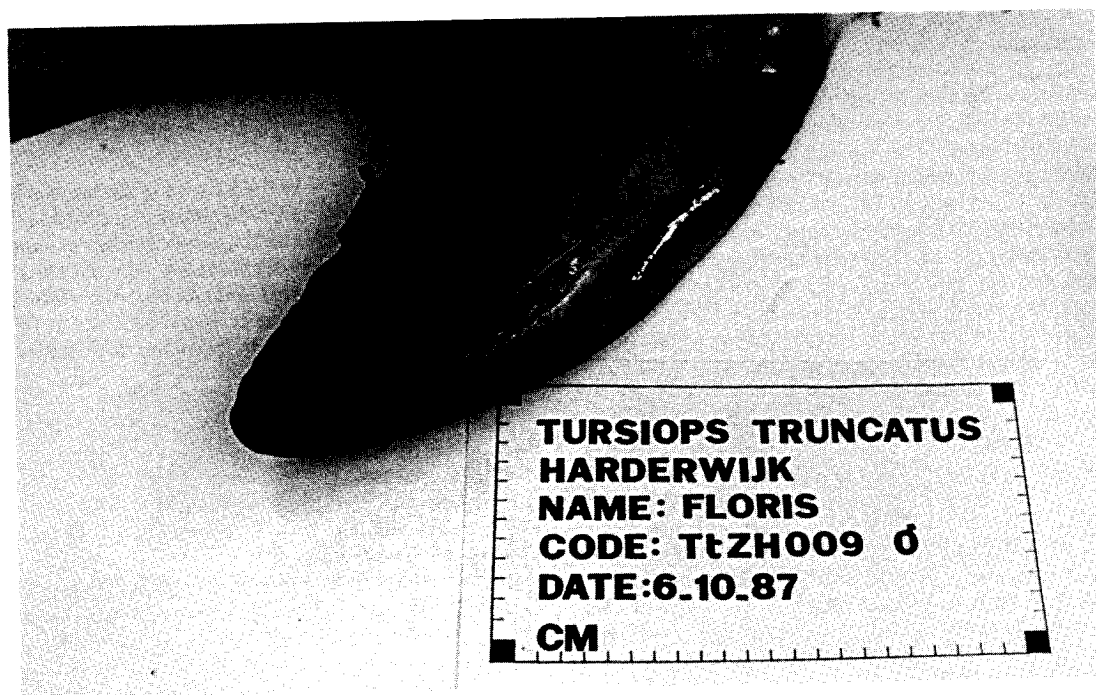


Figure 10. The right pectoral fin of a dolphin showing a conspicuous scar.

background (Fig. 7). For the head (Fig. 8) and tail flukes (Fig. 9) a white board can serve as a background. After these standardized areas a picture can be taken of a particularly conspicuous area such as a scar or an irregular pigmentation (Fig. 10).

Weight

While the animal is out of the water for identification pictures, additional information such as body weight can be collected. For those facilities that do not have a weighing machine the weight can be estimated by means of body measurements (Lockyer *et al.* 1987). The formula is as follows:

$$W = 34.67 \times L^{1.23} \times G_1^{1.36} \times G_2^{0.39}$$

W is the estimated weight in kg.

L is the total body length in m.

G₁ is the girth in front of the pectoral fins in m.

G₂ is the girth behind the pectoral fins in m.

Record Keeping

The following information should be stored at the facility where the dolphins are kept and a copy should be sent to the national government:

- latin species name
- exact or estimated date of birth
- waters or facility of origin
- if known, name and code of the parents
- arrival date at the facility
- 4 standardized identification pictures and in some cases pictures of additional conspicuous body parts.
- body size and weight of the animal.

Discussion and Conclusions

This identification technique is not very disturbing to the dolphins and can be synchronized with medical examinations such as blood sampling and ultrasonography. Using this identification technique the dolphins only have to be taken out of the water for 15 minutes. It is recommended to cool the animal during this period with water.

Because the scar patterns on young dolphins change relatively often we suggest that identification pictures of animals up to 8 years old should be taken every 3 years. For older animals it is probably sufficient to take photographs every 5 years.

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