

Vagrant southern elephant seal and human disturbance in Mossel Bay, South Africa

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An opportunistic observational study on human disturbance of a vagrant southern elephant seal that was hauled out on a tourist beach in Mossel Bay, South Africa, is presented. Incidences of pedestrians ignoring signage and the demarcation barrier around the seal raise questions about the management of such haulout events, public safety and the effects of disturbance.

Key words: human disturbance, *Mirounga leonina*, Mossel Bay, pinnipeds, southern elephant seal, tourism management, vagrant.

Southern elephant seals *Mirounga leonina* have a circumpolar distribution in the Southern Ocean with major breeding populations close to the Antarctic Polar Front (Laws 1994). Approximately 54% of the world population breeds at South Georgia (Boyd *et al.* 1996) some 4750 km from South Africa (Bester 1989). The closest breeding colonies to Mossel Bay, South Africa are the Prince Edward Islands (~46°46'S, 37°51'E) 1933 km to the southeast, Bouvet (54°25'S, 3°24'E) 2697 km to the south, and Gough Island (40°20'S, 9°54'W) 2922 km to the southwest (Bester 1980, 1989; Kirkman *et al.* 2001). Southern elephant seals are capable of travelling very long distances at sea covering hundreds to thousands of kilometres annually (*e.g.* Bester 1989; Jonker & Bester 1998; Tosh *et al.* 2009; Reisinger & Bester 2010). The longest recorded movement is of a juvenile female sighted on Peter Øy Island after being branded on Macquarie Island, approximately 5200 km away, returning to Macquarie Island subsequently (Hindell & McMahon 2000). It therefore comes as no surprise that Oosthuizen *et al.* (1988) reported on records of southern elephant seals on the South African coastline, and that an unconfirmed number has been recorded since then by three

separate regional authorities (M. Meyer, pers. comm., November 2010) resulting in a need to work towards a combined dataset in South Africa. It is unclear if these records of elephant seals on the South African coastline represent true vagrants or the outer fringe of normal dispersal (Oosthuizen *et al.* 1988). Oosthuizen *et al.* (1988) also reported that a high number of sighted animals were tagged upon discovery, which would counter the likely overestimate of vagrant presence due to re-sightings of unmarked animals, although an unknown number of individuals probably go unnoticed.

Occasionally, vagrant elephant seals may occupy beaches for a short period and create tremendous local interest. Recently an adult female southern elephant seal hauled out onto the popular Diaz tourist beach in Mossel Bay (34°09'32"S, 22°06'37"E) at 14:48 on 12 October 2010. The elephant seal had injuries which included a cut below the right eye (~5 cm) as well as through the left upper lip (~5 cm) and a tear on the lower abdomen (~15 cm) that did not penetrate very deeply (<5 cm). The abdominal wound was bleeding lightly on arrival on the first day, then stopped bleeding by that evening and the wounds appeared to be healing on the third day. She remained onshore for four days and was last seen at about 8:30 on 16 October.

While on land, the seal was visited by curious public almost continuously during daylight hours and was harassed on a number of occasions. The situation afforded an opportunity to (a) investigate the reaction of the public to the occurrence of an animal that they were unfamiliar with, and (b) suggest mitigating procedures to counter disturbance of the animal. An opportunistic study commenced on the third day after the seal's arrival to quantify pedestrian disturbance and examine the effect of the presence of a security guard on human disturbance of the seal.

Observations were made with binoculars (Fugi 8 × 10) from a nearby hotel (~50 m distant) for 84 min (21 encounters) as well as on site when the observer, dressed as a security guard, was visible to the public for a total of 232 min (28 encounters) spread over one day. For each encounter (when one or more humans approached the demarcated zone closer than a 20 m buffer distance) the number of pedestrians, duration of their presence within the buffer zone, minimum approximate distance from seal (20–10 m, 10–5 m, 5–3 m, <3 m = inside boundary of demarcated zone), the

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Table 1. Summary of encounter and disturbance measures during guard treatments.

	Total encounters	Encounter rate/min	Total pedestrians	Approach distance (m)		Disturbance score		%Time alert
				Mean	Min	Mean	Max	
Guard present	21	0.09	39	5–10	3–5	0.24	2	6.03
Guard absent	28	0.33	30	3–5	<3	0.46	4	26.19

type of disturbance (walking by, quiet, talking, shouting, waving, contact or attempted contact with the animal) and the behaviour of the seal (timed states: resting or alert; one-zero scored reactions: head lift, growl, lunge forward, moving away) was recorded. A disturbance score was calculated, using the four reactions (from high = 4/4, to low = 0/4) for each encounter. The total percentage time the seal was alert for each experimental treatment was calculated as well as the number of encounters, encounter rate, mean and minimum approach distance, number of pedestrian visitors and mean and maximum disturbance scores.

Other disturbance events, other than during the experiment, were observed by the principal investigator, except where a SANParks environmental control officer responded to reports of a dangerous encounter between the public and the seal. The disturbance scores of the 10 known encounters before, and 49 encounters during the experiment were pooled per minimum approach distance category and the disturbance score sum and range (max, min and mean) plotted (Figs 1 & 2).

The summary of human encounter and disturbance measures during experimental guard treatments with regards to the elephant seal is shown in Table 1. The number of encounters, encounter rate and number of pedestrians visiting were assumed to be independent of the guard presence/absence.

The ten other disturbance encounters recorded before the experiment, included six with minimum approach distances of less than 3 m. Three of these encounters were due to municipal incident response personnel and the observer establishing and maintaining the boundary and inspecting the animal for tags and injuries (disturbance scores 3/4, 4/4 & 4/4, respectively). The other three events each scored 4/4 and were due to members of the public ignoring the barrier and signage to gain access to the animal when a guard was absent. The seal temporarily returned to the water during one of these three encounters.

In the absence of a guard three encounters before and one during the experiment were recorded where pedestrians ignored a demarcated zone and signage around the seal and approached to within less than 3 m. The pedestrians were often trying to touch the animal or loudly shouting and waving to attract its attention. In one instance three boys tried to noose the animal around the neck with a rope.

The pooled disturbance scores of the 10 encounters before and 49 encounters during the experiment, grouped according to each distance category from the seal, are shown (Figs 1 & 2). The disturbance scores were summed and linearly linked (Fig. 1) and the disturbance score range (maximum, minimum and mean) was plotted with the means linked linearly. There is a large increase in the level of disturbance when the elephant seal is approached to within 5 m.

The first of three likely explanations why the female elephant seal hauled out is that she was pregnant and ready to give birth. Elephant seal females predominantly haul out at their breeding colony sites during October to give birth within five days of arrival (Laws 1994). Although a pup was not born at Diaz beach, it is possible that she could have hauled out and given birth at a nearby secluded location after her departure. On the other hand, it is also possible that the seal was nearing an early moult, although unlikely since the adult elephant seal moulting haul-out is from mid-November to mid-April (Kirkman *et al.* 2003) and although the coat was worn and light in colour no moulting was observed. Finally, the most plausible reason is that the animal was recovering from minor injuries during its four-day rest period. The injuries may have been due to a boat's propeller strike or entanglement and did not appear consistent with shark bites.

During the experiment the higher number of encounters and encounter rate occurred during the lunch break hour and is considered independent of guard presence/absence. The smaller mean and minimum approach distance of pedestrians,

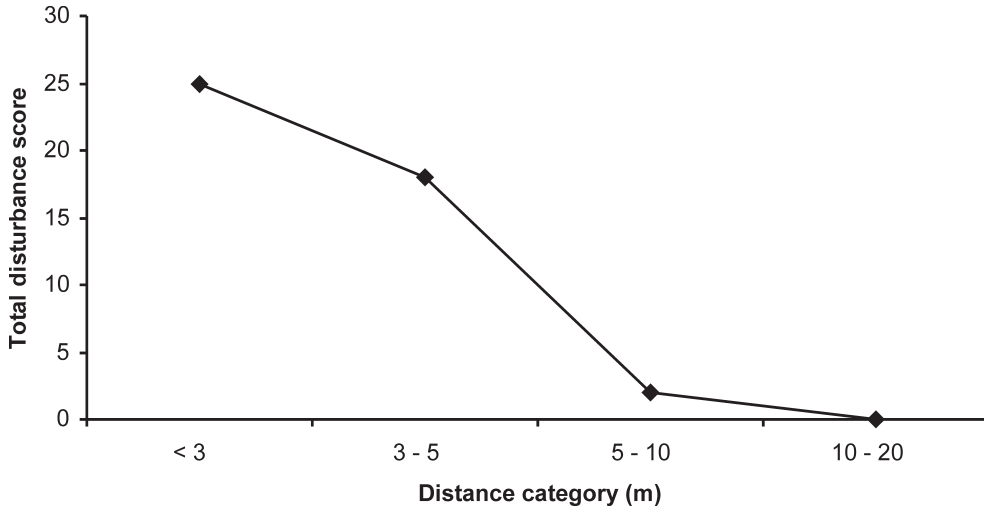


Fig. 1. The disturbance scores of encounters between the public and the southern elephant seal summed for each distance category.

higher mean and maximum disturbance scores, and the additional 20% of time that the seal spent in an alert state when the guard was absent indicate that guard presence may be an important factor in limiting pedestrian disturbance of these animals on public beaches. Although the evidence of disturbance of the southern elephant seal on the public beach is preliminary, other studies of pedestrian disturbance on seals and seabirds support our findings (*e.g.* Boren *et al.* 2002; Beale & Monaghan 2004; de Villiers *et al.* 2005; van Polanen Petel *et al.* 2008; Wheeler *et al.* 2009). It remains unclear whether the temporary departure of the elephant seal was due to the disturbance or

the need to thermoregulate effectively due to late-morning sunny weather.

Human disturbance effects are related to perceived predation risk and this varies both with the distance to humans and the number of humans present (Beale & Monaghan 2004). Usually southern elephant seals are very tolerant of close human presence whilst they are ashore on their native islands for pupping, mating and moulting (Burton & van den Hoff 2002), though it remains that the disturbance tolerance of any animal depends on how benign encounters are. Therefore concern remains for the safety of pedestrian tourists interacting with seals. Southern elephant seals

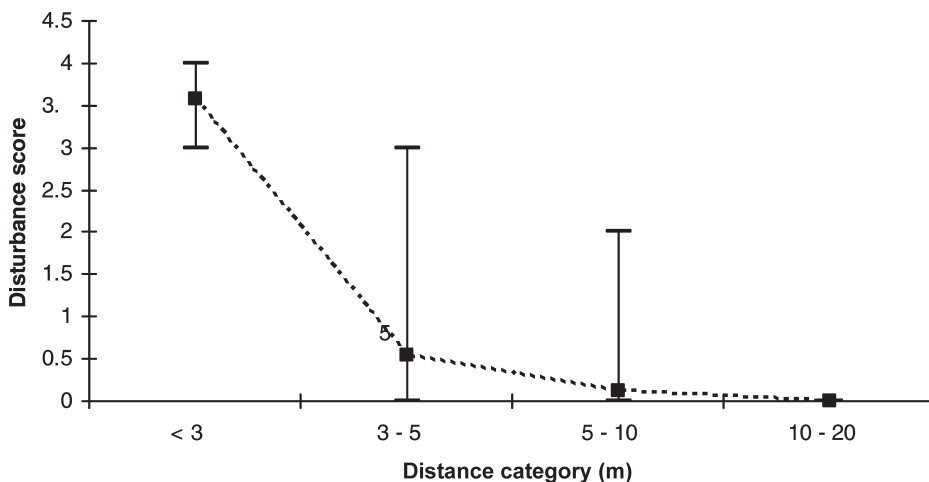


Fig. 2. The range of disturbance scores of encounters between the public and the southern elephant seal for each distance category with linked means.

often inflict minor to serious bite wounds to seal researchers that closely approach them on their natal islands (Mammal Research Institute, unpubl. data). The public's ignorant attitude towards wild seals does occasionally place them in danger as illustrated by incidents, e.g. in November 2005 on a Southern Cape beach a pedestrian was seriously injured when bitten in the face by a wild Cape fur seal (*Arctocephalus pusillus pusillus*) after attempting to return the seal to water (The Herald newspaper online: http://www.theherald.co.za/herald/2005/11/01/news/n08_01112005.htm).

Van Polanen Petel *et al.* (2008) showed that habituation of Weddell seals (*Leptonychotes weddellii*) occurred after repeated benign pedestrian approaches. This was evident in the decrease in proportion of seals that looked up with repeated approaches and a decrease in the time spent looking at the approacher (van Polanen Petel *et al.* 2008). Seabirds such as wandering albatross (*Diomedea exulans*) are sensitized to pedestrian approaches when exposed to high levels of chronic disturbance (de Villiers *et al.* 2005; Wheeler *et al.* 2009). The state of alertness prior to disturbance presents a compounding factor because the behaviour of New Zealand fur seals (*A. forsteri*) prior to disturbance influence their response; sleeping prior to the approach decreased the chances of response (Boren *et al.* 2002).

Our observations indicate the importance of novelty and the absence of authority as factors in pedestrian disturbance of animals unfamiliar to the local public. In South Africa there are no specific regulations on land-based approaches to seals, but in e.g. New Zealand minimal approach distances are 10 m by land (Kirkwood *et al.* 2003). Following the preliminary data of this study it is recommended that a clearly demarcated boundary with warning signs be placed at minimum of a 5 m radius around hauled out elephant seals (while maintaining an exit for the animal to the sea) and that a security guard be posted during daylight hours to minimise harassment and help ensure the public's safety.

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