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Validating methods to determine walking rates of elephants within a zoological institution

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Abstract

Much controversy surrounds the welfare of elephants within zoological institutions. Among the many concerns are lack of exercise and the prevention of sedentary health and welfare issues due to smaller exhibits in comparison to the home-range sizes for elephants in Africa and Asia. While many scientists have used GPS to examine distances travelled by wild elephants, there is currently little information on distance travelled by elephants within zoological institutions. In the wild, it is necessary to chemically immobilise elephants using a dart gun in order to put on or take off collars which are used to acquire GPS data. Within a zoological institution, elephants can be trained to wear a collar with a GPS device but this training can be time consuming and also dangerous depending on the level of expertise of animal care staff. However, training an elephant within a zoological institution to wear an anklet outfitted with a GPS device can be much safer and less time consuming. The purpose of the current research was to validate methods for examining the walking rates of elephants in a zoological facility. This included testing GPS units, examining walking rates of eight elephants at the San Diego Zoo Safari Park using collars and conducting trials on a subset of elephants wearing both a collar and anklet outfitted with GPS devices to determine reliability. The average distance travelled by eight African elephants (*Loxodonta africana*) within a 24-h period was 8.65 (\pm 0.64) km which corresponds to a rate of 0.360 (\pm 0.033) kph. Trials comparing anklets to collars were found to be highly reliable except on days when weather conditions were overcast or there was rainfall at the park. The methods used for the current study can be utilised in future studies to examine walking rates as a component of animal welfare for elephants or other large mammals within zoological institutions.

Keywords: activity levels, African elephant, animal management, animal welfare, *Loxodonta africana*, zoological institution