Human impacts on Australian sea lions, *Neophoca cinerea*, hauled out on Carnac Island (Perth, Western Australia): implications for wildlife and tourism management

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Photo: Jean-Paul Orsini

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DECLARATION

I declare that this thesis is my own account of my research and contains work which has not previously been submitted for any degree at any tertiary institution.

...........................
Jean-Paul Giordano Orsini
ABSTRACT

Over the last 15 years, pinniped tourism has experienced a rapid growth in the Southern Hemisphere, and particularly in Australia and New Zealand where at least four sites attract more than 100,000 visitors per year.

Tourism focused on the Australian sea lion (*Neophoca cinerea*), a protected species endemic to Australia, occurs in at least nine sites in South Australia and Western Australia. Australian sea lions haul out on several offshore islands in the Perth region. Carnac Island Nature Reserve is one of the main sites where people can view sea lions near Perth, either during recreational activities or on commercial tours.

This study sought (1) to investigate the potential impact of human visitors on Australian sea lions hauled out on Carnac Island, (2) to consider implications of the results for the management of Carnac Island Nature Reserve, and (3) to examine under which conditions tourism and recreation around sea lions can be sustained in the long term.

Sea lion numbers, rate of return to the site, behavioural response to human presence and incidents of disturbances of sea lions by visitors were recorded over a period of four months on Carnac Island. A survey of 207 visitors was also carried out.

Findings indicated that there were two main types of human impacts on the sea lions:

- A specific state of sea lion vigilance induced by low level, but ongoing, repetitive disturbances from human presence, sustained at various approach distances ranging to more than 15 m, vigilance that is different from the behaviour profile observed in the absence of human disturbance,

- Impacts resulting from incidental direct disturbances of sea lions by visitors from inappropriate human recreational activities or from visitors trying to elicit a more ‘active’ sea lion response than the usual ‘sleeping or resting’ behaviour.
on display; these impacts included sea lions retreating and leaving the beach, or displaying aggressive behaviour.

Impacts on sea lions from these disturbances may range from a potential sea lion physiological stress response to sea lions leaving the beach, a reduction in the time sea lions spend hauling out, and, in the longer term, the risk of sea lions abandoning the site altogether.

Repeated instances of visitors (including unsupervised young children) approaching sea lions at very short distances of less than 2.5 m represented a public safety risk.

Results also indicated that (1) the numbers of sea lions hauled out and their rate of return to the beach did not appear to be affected by an increase in the level of human visitation (although longer-term studies would be required to confirm this result); and (2) there appeared to be a high turnover rate of sea lions at the site from day to day, suggesting that there are frequent arrivals and departures of sea lions to and from Carnac Island.

The visitor survey indicated that many visitors to Carnac Island had a recreational focus that was not primarily directed towards sea lion viewing (‘incidental ecotourists’). Although many visitors witnessed incidental disturbance caused by humans to sea lions, they did not seem to recognise that they themselves could disturb sea lions through their mere presence. Visitors also seemed to have a limited awareness of the safety risk posed by sea lions at close range. Visitors expressed support for the presence of a volunteer ranger on the beach and for more on-site information about sea lions. Finally, visitors indicated that they greatly valued their sea lion viewing experience.

It is anticipated that the continued increase in visitation to Carnac Island from recreation and from tourism will result in intensified competition for space between humans and sea lions. Long-term impacts of human disturbances on sea lions are
unknown, but a physiological stress response and/or the abandonment of haulout sites has been observed in other pinniped species.

The findings of this study highlight the need to implement a long-term strategy to reduce disturbance levels of sea lions by visitors at Carnac Island to ensure that tourism and recreation around sea lions can be sustained in the long term. Recommendations include measures to control visitor numbers on the island through an equitable allocation system between various user groups, the development of on-site sea lion interpretation and a public education and awareness program, the setting up of a Sea Lion Sanctuary Zone on the main beach, ongoing monitoring of sea lion and visitor numbers and other data, and a system of training and accreditation of guides employed by tour operators.
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<th>Abbreviation</th>
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<tbody>
<tr>
<td>APB</td>
<td>Agriculture Protection Board</td>
</tr>
<tr>
<td>CALM</td>
<td>Department of Conservation and Land Management (Western Australia)</td>
</tr>
<tr>
<td>CCWA</td>
<td>Conservation Commission of Western Australia</td>
</tr>
<tr>
<td>CRC</td>
<td>Co-operative Research Centre</td>
</tr>
<tr>
<td>EBP</td>
<td>Environmentally-Based Planning system</td>
</tr>
<tr>
<td>EPBC Act</td>
<td>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>LAC</td>
<td>Limit of Acceptable Change</td>
</tr>
<tr>
<td>MPRA</td>
<td>Marine Parks and Reserves Authority (Western Australia)</td>
</tr>
<tr>
<td>TOMM</td>
<td>Tourism Optimization Management Model</td>
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