

the potential causes behind tag failure is essential for advancing satellite tagging technology.

Brucella in Scottish Harbour Seals

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Since 2000 there has been a major decline in the abundance of Scottish harbour seals (*Phoca vitulina*), particularly along the East coast. While many potential causes of the decline have been suggested, the contributing factors remain uncertain. The aim of this work was to establish the extent to which the harbour seals in the regions of greatest decline have been exposed to *Brucella*. *Brucella pinnipedialis* has been isolated from 23 stranded Scottish harbour seals over the last 20 years, and although not associated with lesions, has the potential to cause reproductive failure that may therefore affect population dynamics. Serum samples collected from 327 live captured individuals between 1997 and 2012 were tested for *Brucella* antibodies using the Rose Bengal antigen plate test. The seals were sampled in five main regions; the North-East, North-West, South-East, South-West and Orkney, across all seasons. No signs of clinical disease were seen in any of the seals although titres ranged from 1:1 to 1:64. Binomial Generalised Linear Models including region, sampling year, sex, age class and an index of body condition as explanatory variables were used to investigate differences in sero-prevalence among the five regions. Results suggest that the antibody prevalence on the East coast is significantly higher than on the West coast, with 22.7% and 8.33% respectively. In the South East specifically, there has been a significant increase in antibody prevalence post-2000 ($p=0.014$), and females had a higher prevalence than males with 28.1% and 17.0% respectively. In all other regions however, there was no significant increase in prevalence over time and males and females were equally seropositive. These results will be confirmed by quantifying *Brucella* antibodies in serum using ELISAs, but these initial results suggest that further studies into the impact of *Brucella* infection on the health of Scottish harbour seals are required.

Indigenising Management Frameworks for Coastal Dolphins in Australia

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Dolphins are both ecologically and culturally significant keystone species, however, concerns for the health and wellbeing of these animals is rising as exposure to potentially harmful human activities and threatening processes increases. Limited knowledge regarding the population ecology along with the challenges in obtaining robust scientific data have hindered the advancement in the conservation of coastal dolphins in Australia and abroad. Indigenous science represents the cumulative place-based observations of natural phenomena that includes humans and non-human others, and fully integrates and acknowledges humans as part of the natural world and its ecosystem processes. It is being increasingly recognized that indigenous science and knowledge are essential for advancing aspects of dolphin populations including trends in abundance, habitat use and behavioural ecology. This project takes an innovative approach to integrating western scientific methodologies and traditional ecological knowledge to advance the knowledge of populations, habitat use and feeding ecology of coastal dolphins in northern New South Wales, Australia. This integrative, inclusive and collaborative

approach provides a framework for culturally appropriate protocols and best-practice environmental management for the conservation of cetaceans and their marine habitats that incorporates cultural protocols.

Auditory Structures that Impact Sensitivity and Acuity in Cetaceans: Location, Location, Location

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Microchiropteran bats and odontocete cetaceans have sophisticated echolocation capabilities dependent upon good high frequency hearing, but they operate in radically different media. By contrast, larger terrestrial mammals and mysticetes share the ability to generate and respond to low frequency sounds, although little is known about their hearing abilities. The similarity of tasks and information that odontocetes and microchiropterans obtain acoustically suggest their auditory systems have some commonalities for ultrasonic signal processing mechanisms and differences related to media dependent elements such as interaural time differences, peak spectra of echolocation signals, and latencies. In this study, the heads, outer, middle, and inner ears of 12 specimens from five species of bats, dolphins and whales (*Eptesicus fuscus*, *Pipistrellus abramus*, *Phocoena phocoena*, *Tursiops truncatus*, *Balaenoptera acurostrata*) were analyzed based on micro-imaging at resolutions of 11 to 100 micron isotropic voxels obtained from a Siemens helical (CT) scanner (<http://csi.whoi.edu>) and X-Tek micro CT. Outer and middle ears anatomies varied widely amongst all species in terms of canal length, middle ear stiffness and volume, and ossicular anatomy. The minke whale inner ear was most similar to that of mid to low frequency terrestrial mammals, particularly human and pig inner ears. The ears of the echolocators were significantly different from the mid to low frequency ears, with increased stiffness, thicker membranes and outer osseous laminae supporting up to 60% of the basilar membrane. The high frequency species also had “foveal” regions with “stretched” frequency representation for peak spectra of echolocation signals. Stapedial inputs to the cochlea in cetacean echolocators differed from the bat and baleen ears, with more complex canal configurations and higher placement that suggest a novel anatomy and mechanics that improves high frequency acuity. Supported by NIH, JIP/OGP, CNO/N45-US Navy Environmental Division, and the Office of Naval Research

The better to eat you with: The comparative feeding morphology of phocid seals

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Phocids (true seals) evolved feeding strategies to capture and consume prey underwater. Previous qualitative research hypothesized the existence of four feeding strategies in phocids: filter, grip and tear, pierce, and suction feeding. Most species are generalists, employing either pierce or suction feeding. Grip and tear and filter feeding are specialized strategies used by *Hydrurga leptonyx* (leopard seal) and *Lobodon carcinophaga* (crabeater seal), respectively. The objectives of this study were to 1) determine whether the hypothesized feeding strategies were supported by qualitative and quantitative data, and 2) determine the feeding strategies used by extant