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Dolphin health - toxicogenomics and pathology investigations

Rivers and Estuaries Science

Project Core Team

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Project Team	granted
Program Leader	granted
Directorate	granted

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Context

In 2009, following the deaths of six dolphins in one year in the Swan Canning Riverpark, a collaborative project with Murdoch University was established for on-going support in post-mortem investigations of individual strandings and unusual mortality events. That work was instrumental in understanding the underlying factors in the dolphin mortality event of 2009 and effort to understand dolphin health continues to be supported through the department and Murdoch University. Pathology investigations are linked with a university based research project examining toxicogenomics and contaminant exposure in live dolphins.

Aims

- Undertake post-mortem investigations of individual strandings and unusual mortality events in the Riverpark.
- Evaluate if there is any evidence of sub-lethal adverse effects on the immune, endocrine and nervous systems of the dolphins that use the Riverpark in comparison with dolphins in Shark Bay as a 'control' population.

Progress

- Necropsies have been undertaken on nine dolphins. Six of these were undertaken on dolphins found within the Swan Canning Riverpark and three were from the wider coastal area. Three of the dolphins died as a result of entanglements.
- Necropsy and pathology testing on five of the dolphins suggested an aetiology that is indicative of immune suppression with an underlying causal pathogen.
- Further testing for evidence of a viral pathogen using molecular techniques and immune-histochemistry were undertaken by Murdoch University.
- Results of molecular testing provide evidence of cetacean morbillivirus (CeMV) in three of the dolphins, including the two resident Riverpark dolphins. The two other dolphins showed some immune-histochemistry evidence of CeMV, but results were less conclusive.

Management implications

- The Swan Canning Riverpark dolphin sub-population is small and vulnerable to pressures associated with a habitat comprising a major industrial harbour and an urban estuary with high recreational usage and a large agricultural catchment.
- Identifying patterns in injury and disease provides valuable information on pressures affecting the dolphin subpopulation. The information is used in awareness raising and public information events.
- There are important implications of the presence of CeMV in the Riverpark subpopulation. The virus last affected the subpopulation in 2009, meaning that many resident individuals have not been previously exposed to this virus, most notably six calves and six juveniles. In addition, some of the adult dolphins may not have previously been exposed. Dolphin Watch and management groups in regional areas are being alerted to the potential impact of CeMV on cetacean populations.

Future directions

- Necropsy and pathology testing will include a wider area and range of species in order to understand the spread of this disease.