Partnerships in dolphin research

Research into the wild dolphins of Koombana Bay is the major objective of the South West Marine Research Program (SWMRP). Founded on an initial partnership between Bunbury Dolphin Discovery and Murdoch University with support from the South West Development Commission, the SWMRP is now composed of partners from industry, government, research and the community. The impact of these partnerships is to empower a dedicated research team in Bunbury working on a number of projects on the biology of the dolphins and the ecosystem that supports them. The vision that drove the establishment of this research is now being realised. The year 2007 has seen many achievements made possible by financial and in-kind resources provided by the partners. These research partnerships and the people who work to maintain them are gratefully acknowledged. Synergy between the partners is essential to sustain the certainty of this enterprise for the future. This bulletin reports on the progress made in 2007 and the highlights anticipated for 2008.

Strategic directions

A four year research program to assess the long-term viability of the bottlenose dolphin population around Bunbury is the first stage goal in the research strategy. Other directions include visiting international scientists working on Bunbury dolphins, international workshops and specialist short courses for Australian and international post-graduate students delivered in Bunbury. Future research topics and educational opportunities will naturally develop from the discoveries of the initial projects.

Murdoch University Funds Research Leader

A significant achievement for the SWMRP has been the prestigious award of a Research Leadership Fellowship to Dr Lars Bejder by Murdoch University. This funding secures Dr Bejder to lead the dolphin research in Bunbury until March 2010 and strengthens the commitment of Murdoch University to the solid partnerships already established around this program. Dr Bejder is a highly productive, internationally recognised specialist on marine mammals. His experience and international profile are essential to the research and the international collaborations that emanate from this program.

Research students commence

Three PhD students, Holly Smith, Anna Sellas and Shannon McCluskey have commenced on their research programs in Bunbury. An early highlight was the award of funds from the South West Development Commission by Minister McGowan to the students in support of their research. Each student is working on a unique project as defined by the overarching research strategy.

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Genetic sampling of dolphins in the South-West

Anna Sellas has commenced very successfully, obtaining biopsy samples of dolphins in Koombana Bay to permit DNA typing of individual dolphins. To date, 34 new samples from the Bunbury area, 18 samples from Geographe Bay off Busselton and 11 samples from Cockburn Sound have been collected. Dolphins previously seen in Koombana Bay were sighted off Busselton, confirming that some dolphins are moving between these two areas. Early analyses of samples collected in 2006 showed 10 of the Koombana Bay dolphins were females and 9 were males. Of the 19 samples analysed, 3 unique DNA sequence types (haplotypes) were identified. One of these haplotypes was shared among 70% of the sampled dolphins, while the other two haplotypes were less common, occurring in only a few individuals. A preliminary comparison of these haplotypes to those found in dolphins of Shark Bay, WA, showed all three haplotypes found in Bunbury dolphins were also found in Shark Bay.

Sampling in areas further to the north and south of Koombana Bay will allow us to determine the amount of gene flow that is occurring among populations of bottlenose dolphins found in south-west WA. This information will allow for definition of conservation units and thus improve current management policies of bottlenose dolphins in WA.

Dynamics of dolphin prey species and foraging behaviour

Shannon McCluskey has commenced her study investigating the diet of the bottlenose dolphins in Koombana Bay and the Leschenault Estuary. Areas of high foraging activity will be determined using spatial analysis techniques that will aid in the directed conservation of foraging habitats. Potential prey species will be collected using beach seine nets and fish traps in foraging and non-foraging areas. Relative composition and abundance of prey species will be compared across areas and seasons. The relationships between area, prey species, and cooperative versus individual foraging behaviour will also be investigated. Dolphin diet will be inferred through visual observations of foraging bouts, analysis of prey parts found in the scats of free ranging dolphins and the stomach contents of dolphins that have died and washed ashore. Results from this project will aid in the conservation of both a dynamic predator and the prey upon which they depend.

Dolphin population abundance and distribution

Holly Smith is using photo-identification methods and the newly updated fin catalogue (the dolphin equivalent of a fingerprint database) to obtain an accurate estimate of dolphin population size. Boat based surveys are being conducted year round to gather data on the identity and location of individual dolphins along pre-determined transect routes. The boundaries of the habitat utilisation study area extend south to Capel, north to Binningup and about one nautical mile offshore. Measurements of variables including water turbidity, depth and temperature are being collected to determine whether they influence the seasonal movements of the dolphins. Survey information is being stored into a database called ‘Finbase’. This program has been customised for the purposes of this project in collaboration with a Technical Officer (Jeff Adams) from the National Oceanic and Atmospheric Administration of the United States of America.

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International Whaling Commission workshop in Bunbury, 2008

Thanks in part to the support of the partnerships in the SWMRP, this research initiative is gaining international recognition and Bunbury will be centre stage in hosting a workshop for the International Whaling Commission on the “Strategic Planning of Large-scale Whale-watching Research” from 31st March to 3rd April 2008. The IWC workshop involves forty of the world’s leading scientists who will focus on researching sustainable levels of whale and dolphin watching to establish world-best practice for marine-based tourism. Hosting this event profiles Western Australia as a world leader in sustainable whale- and dolphin watching and it is a stepping-stone to the goal of Western Australia hosting the Annual International Whaling Commission meeting in the near future. This also leads to potential for the Biennial Conference on the Biology of Marine Mammals to come to Perth.

International Research Collaborations

This project has attracted significant interest and engagement from international research scientists. Each of these recognises the unique attributes and attraction of studying the Bunbury dolphins.

Associate Professor Michael Krueetzen from the University of Zurich, Switzerland, is a key collaborator and co-supervisor of the genetics study. Assoc Prof Krueetzen visited Bunbury in 2006 and 2007 and will do so again in June 2008.

Associate Professor Peter Madsen from Aarhus University in Denmark and Associate Professor Magnus Wahlberg from University of Southern Denmark are specialist acousticians whose skill is to quantify sound levels in the underwater environment inhabited by dolphins and interpret their effects on dolphin behaviour. During their first trip (accompanied by four Danish graduate students) they were excited by the rare opportunity to collect high-quality data from wild dolphins so close to shore. These data give unique insight into the use of sound by dolphins for communication and prey location. Professors Madsen and Wahlberg return in 2008 with more post-graduate students to continue their work.

Dedicated research vessel arrives

With so many new projects underway there is competition for the limited resources available. Another highlight was the purchase of a research vessel desperately needed by the students. Funds to purchase the boat, a centre console Quintrex Legend with a 100hp four-stroke Yamaha engine, were awarded from the Winifred Violet Scott Estate Fund. Millard Marine provided a very favourable rate for the vessel and is also contributing to its running costs.

New building for researchers

The research and volunteer building will be finished in February 2008. It will house the growing research program, two research vessels, a wet laboratory and associated equipment. The construction of the building is a collaborative effort between Hassell Architects, Tallwood Constructions, Ausco, Outdoor World Bunbury and Bemax Cable Sands with funds from the WA Government.

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Australian Research Council grant submission results

The research team suffered a serious disappointment with the announcement in October of the non-award of the linkage grant sought from the Australian Research Council (ARC). While the project received excellent reviewers comments for the rigour of the project design and research capacity of the scientists it was unfunded in the final decision. Competition across Australia for these limited research funds is intense and complex. There was no statement of why the project was unfunded. Despite this setback the SWMRP is committed to the research as planned and is now seeking alternate sources of funding, including the re-framing of another application to ARC.

Impact for research partners

The implication of non-funding of the ARC linkage grant for the research partners is two-fold. Firstly, with the award of the Research Leadership Fellowship by Murdoch University to Dr Bejder, the tenure of the research leader is secure until March 2010 and the research is progressing as planned. The funding given by the research partners provided an excellent leverage for the award of the Fellowship and for the funds to purchase the vessel. Secondly, the funding support of research partners is more important and powerful than before as it is this that funds the real costs of the research team. It cannot be overstated how valuable the contributions from the key partners for research are. Without these supporting funds the research team would be unable to operate.

Benefits to the Region and Individual Partners

The SWMRP is aware that successful partnerships must be mutually beneficial. The research program aims to: deliver benefits to partners by providing information relative to the activities of the partners; develop a high profile of the research and the partnerships that will create a variety of opportunities locally, nationally and internationally; and publicise the project, the partners and the region. The SWMRP seeks mechanisms to further engage the people of Bunbury in understanding the research discoveries and the value of science in the region.

Ongoing need for support

The commencement in 2007 of large-scale research into the dolphins of Koombana Bay and surrounding waters has been supported by key partners whose financial and in-kind contributions are gratefully acknowledged: South West Development Commission, Western Australian Government, Bunbury Port Authority, City of Bunbury, Department of Environment and Conservation, Bemax Cable Sands, Iluka, Worsley Alumina, WA Plantations, Lyondell Millenium Chemicals, Millard Marine, Naturalist Charters Ecotours and Bunbury Dolphin Discovery. The research team have launched a web-site (http://www.cffr.murdoch.edu.au/mucru/) that communicates the research being undertaken, the research partnerships and includes links to the partners own web-sites. It is envisioned that these partnerships will continue and grow as the research program delivers results.

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