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**Report for Research Licence No: R04/ 2016 - *Dolphins of the kelp* - genetic diversity and population structure of Commerson's and Peale's dolphins around the Falkland Islands**

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**Summary.** The nearshore waters of the Falkland Islands host a unique inshore community of two small dolphins: Commerson's (*Cephalorhynchus commersonii*) and Peale's (*Lagenorhynchus australis*). To better understand the abundance, habitat use and genetic diversity of these two species, the South Atlantic Environmental Research Institute (SAERI) initiated a collaborative research programme referred to as *Dolphins of the Kelp* (DOKE), with funding from the Darwin Plus Initiative. As part of this larger collaborative framework, investigators from SAERI and the Oregon State University undertook collection of small skin samples for genetic analyses using a minimally intrusive biopsy dart under research licence issued to Dr. Scott Baker by the Falkland Islands Government (FIG). Full details of the first year of the project are available in the annual report to the funding agency, Darwin Plus Initiative.

As described in the application for the research licence, biopsy samples were collected with a lightweight dart using a modified veterinary capture rifle (PaxArms) or with a dart attached to a lightweight pole (see Fig 1 and 2). Samples were collected during small-vessel surveys from 3-12 January 2017, with logistic support of the Shallow Marine Surveys Group (S. Cartwright), and from 23-27 February 2017, aboard the M/V *Condor* (Fig 3). During the January surveys, the Principal Investigator (Baker) was aboard to collect the biopsy samples and to train Costa and Garcia. During the February surveys, Costa and Garcia were responsible for the sample collection using the biopsy pole system donated to the project by Baker. Where possible, photographs were collected for the purposes of individual identification. As required by the research licence, the FIG veterinarian, Dr. Steve Pointing, joined the field team on 7 January to observe the sample collection. In an email of 8 January, Dr Pointing confirmed that he was satisfied the sampling was being conducted under the conditions of the research licence.

In accordance with the conditions of the licence, a total of 60 samples were collected from Commerson's dolphins and 60 samples were collected from Peale's dolphins. The behavioural reaction of the dolphins was judged following a standard scale of behavioural responses from 0, for no observable response, to 5 for multiple leaps and high-speed avoidance of the sampling boat (Krützen *et al.* 2002; Tezanos-Pinto and Baker 2011). For the Commerson's dolphins, 42% of the samples resulted in a 'no or low' reaction (scale 0-1) and 58% resulted in a mild reaction (scale 2), usually indicated by a tail flick or quick dive. For the Peale's dolphins, 92% of the samples resulted in a 'no or low' reaction (scale 0-1) and only 8% resulted in a mild reaction (scale 2). There were no moderate or strenuous responses (a 3-5 in the standard scale) and no evidence of any injury, other than the small biopsy wound, or avoidance of the boat by the dolphins. These responses were comparable to, but somewhat milder, than observed for other species of dolphins (Tezanos-Pinto and Baker 2011) (Oremus *et al.* 2012).

Following the two vessel surveys, samples were consolidated by Costa and Garcia and exported to Baker under permit from the FIG officer (M. Floyd) for the Convention on International Trade in Endangered Species (CITES). Analyses are now underway at the Laboratory for Cetacean Conservation and Genomics, at OSU. Using standard genetic markers (i.e., DNA profiling), we will estimate diversity and divergence using previous published results from continental populations and, in the case of Commerson's dolphins, to the subspecies described from the Kerguelen Islands of the Indian Ocean.

#### Literature Cited

- Krützen, M., L.M. Barré, L.M. Möller, M.R. Heithaus, C. Simmer and W.B. Sherwin. 2002. A biopsy system for small cetaceans: darting success and wound healing in *Tursiops* spp. *Marine Mammal Science* 18:863-878.
- Oremus, M., R.M. Hamner, M. Stanley, P. Brown, C.S. Baker and R. Constantine. 2012. Distribution, group characteristics and movements of the Critically Endangered Maui's dolphin *Cephalorhynchus hectori maui*. *Endangered Species Research* 19:1-10.
- Tezanos-Pinto, G. and C.S. Baker. 2011. Short-term reactions and long-term responses of bottlenose dolphins (*Tursiops truncatus*) to remote biopsy sampling. *New Zealand Journal of Marine and Freshwater Research* Available online: 21 Jun 2011:1-17.

**Figure 1:** The deployment of a biopsy dart for genetic sampling of a Commerson's dolphin with the Paxarms rifle. The lightweight plastic dart has just struck and is bouncing off of the dolphin.



**Figure 2:** An example of the pole biopsy system for genetic sampling of a Commerson's dolphins.



**Figure 3:** The location of number of genetic samples collected from Commerson's and Peale's dolphin during the 2017 austral summer season.

