

Best Poster – Doctoral Student- Stephan Chan

Title:

Survival or extinction of a declining population? Indo-Pacific humpback dolphins at the brink in Hong Kong and the Pearl River Estuary

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Abstract:

The Indo-Pacific humpback dolphins (*Sousa chinensis*) inhabiting the Pearl River Estuary (PRE), southeast China, are among the world's most anthropogenically impacted coastal delphinids. Although early research and conservation efforts date back to mid-1990s, much of the population ecology remained little known. We used multi-year photo-ID data collected in Hong Kong waters to generate socio-demographic mark-recapture model system quantifying the population processes, parameters, size and structure, and projecting the eco-demographic threshold of population long-term persistence. Social network analyses indicate that across the eastern reaches of the PRE, humpback dolphins form several closely interacting social clusters with different core areas but overlapping ranges. Movement models suggest that individuals at different key habitats across the main body of the estuary are fully mixed within days, at the most weeks. Of the estimated several hundred individuals, ~400 dolphins use Hong Kong waters as part of their range; their movement governed by seasonal pattern of Pearl River discharge and oceanographic fluctuations in shallow-water coastal habitats; their seasonal pattern of distribution/abundance corresponding with seasonal fluctuation in prey availability. With non-calf survival rate close to the threshold value equivalent of IUCN's Critically Endangered status, under the best (stationary) demographic scenario, the PRE population would have to be at least ~2000 strong with access to at least ~3000 km² of key habitats to withstand demographic stochasticity and persist across ~40 generations. None of these, however, is currently met in the PRE, whilst ongoing/proposed coastal development projects are likely to further deteriorate the state of the local environment. According to our demographic model projection, even slight increase in adult mortality may have detrimental effects on the population viability. Consequently, with the current trend of 2.5% decline/annum, the PRE dolphin population is doomed for extinction unless management pitfalls are acknowledged and effective conservation measures rapidly reverse the current population trend.