Kate Buckley PhD Project Outline (CDU: RIEL)

Public aquariums and conservation of the Freshwater Sawfish *Pristis microdon*; impacts and benefits of keeping a threatened species

The sawfishes (Family Pristidae) are considered one of the most threatened groups of aquatic species, with all seven species listed as Critically Endangered on the IUCN Red List of Threatened Species. The Freshwater Sawfish *Pristis microdon* is recognised in Australia as Vulnerable under the Environment Protection and Biodiversity Conservation Act 1999 and the Territory Parks and Wildlife Conservation Act 2000. Although *P. microdon* have a population stronghold across northern Australia, the species has still undergone considerable (albeit unquantified) declines in abundance and extent of its distribution. Anthropogenic impacts on *P. microdon* populations include mortality associated with fishing (recreational, commercial, indigenous or illegal), habitat modification and live harvest for display in public aquariums.

P. microdon is listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), allowing closely monitored trade is after exporting countries provide evidence that such trade is not detrimental to populations of the species in the wild (a Non-Detriment Finding). Since the completion of Australia's Non-Detriment Finding for the Freshwater Sawfish in 2011, international trade from northern Australia in live *P. microdon* for public aquariums has ceased. The Non-Detriment Finding found that "it is not possible to conclude with a reasonable level of certainty that any harvest of *P. microdon* for export purposes would not be detrimental to the survival or recovery of the species". Domestic harvest for aquariums is ongoing.

Although harvesting *P. microdon* for display in public aquariums is considered to be a low-medium level impact (DSEWPaC 2011), it remains unquantified. In the Northern Territory two public aquariums continue to collect *P. microdon* for display purposes but many individuals are reintroduced into the natal river system after some time in captivity. The survivorship and reintegration into the wild of the released sawfish has never been properly assessed and so the overall impacts of the aquarium trade is unknown. Knowledge of impacts on populations is crucial for the conservation of species, and the survivorship of reintroduced *P. microdon* therefore needs to be assessed.

The longevity of *P. microdon* suggests that individuals legally traded from northern Australia in the past will remain on display in international aquariums for many years. This trade was permitted by CITES 'to appropriate and acceptable aquaria for primarily conservation purposes' but no studies have been undertaken to quantify these conservation benefits. Furthermore, the conservation benefits of displaying *P. microdon* in domestic aquaria are more likely to relate to local populations of the species than those displayed in international aquariums. Clearly any conservation benefits of keeping the species in captivity need to be quantified to support management decisions.

This multidisciplinary project combines ecological and social science components to consider the impacts and benefits of displaying Freshwater Sawfish in public aquaria.

This project aims to:

1. Determine whether the post-release survivorship and behavioural ecology of aquarium kept *P. microdon* differ to that of the equivalent wild cohort
2. Develop a methodology to quantify the conservation benefits of keeping a species on public display in a zoo or aquarium
3. Quantify the conservation benefits of keeping *P. microdon* on public display in domestic and international zoos and aquariums
4. Assess the impacts and benefits of the legal national and international aquarium trade in *P. microdon* captured from Northern Australia

Expected outcomes:

1. Deliver improved ecological understanding of movement patterns, habitat use and requirements and spatial dynamics of juvenile *P. microdon*
2. Provide an estimate of the overall impacts of keeping and releasing *P. microdon* from Northern Territory public aquariums
3. Development of innovative, quantitative methods to assess impacts and benefits of keeping species in zoos and aquariums
4. Provide an estimate of the benefits arising from keeping *P. microdon* in domestic and international public aquariums
5. Deliver an improved understanding of the conservation implications for *P. microdon* of their international and national trade and aquarium display