Report for Aage V. Jensen on
Cambodian Mekong Dolphin Conservation Project’s (CMDCP)
dolphin mortality programme

Project: Diagnosing the cause of Irrawaddy dolphin calf mortality in the Mekong River
WWF Project No.: 9S076605-3505
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Organisation: WWF

Project output assessment

1. Background
The largest freshwater population of Irrawaddy dolphins occurs along the Mekong River in Cambodia and southern Laos. This subpopulation is classified as ‘Critically Endangered’ by the IUCN with estimates of 80-100 individuals. Between 2001 and 2006, 72 dolphins – 60% of which were calves, died along the Mekong River. These figures underestimate true mortality as they do not reflect undetected deaths. Without understanding the etiology of dolphin mortality, extinction of the Mekong population will be unavoidable. Research to date has found that at least 64% of adult deaths are due to anthropogenic causes, particularly entanglement in fishing gear. Measures are underway to address this and encouragingly fewer dead adults are now being found. In contrast, aetiology has only been determined for one calf. Diagnosing the cause of calf mortality is vital to designing mitigation strategies to improve recruitment and ensure the survival of the population.

The project seeks to diagnose the cause of calf mortality, information that is critical to the long term survival of the Mekong population of Irrawaddy dolphins. Concurrently, the project will establish capacity in personnel and infrastructure that will ensure that detailed investigation of Irrawaddy dolphin mortality will continue along the Mekong River in the long term.

2. Overall assessment of project
The overall goal of the project: to diagnose the cause of calf mortality, has not yet been achieved. The reasons for this will be discussed in section 3. below.

However a number of project outputs were achieved:
1. Standard protocols covering collection of epidemiological data from the field, post mortem procedures and the correct handling and storage of tissue samples were developed.
2. Five project officers and three Fisheries Officers were trained by Dr Verne Dove in techniques of data collection and management, and post mortem procedures.
3. A field lab in the town of Kratie, adjacent to the most important populations of Irrawaddy dolphins along the Mekong River, was established and outfitted.
4. Standardized training materials pertaining to epidemiological investigation and post mortem examination of cetaceans are in the process of development. These will be made available to researchers working on Irrawaddy dolphins in Indonesia, Thailand, India and Myanmar as well as other riverine cetaceans by the middle of 2008.
5. 13 dolphin carcasses (11 calves) reported to CMDP were recovered, necropsies were performed according to established protocol and tissue samples collected and safely stored.

3. Major challenges and solutions developed
   - Potential conflict of interest with the Government’s Dolphin Conservation and Ecotourism Development Commission. The Chair of the Commission believes dolphin mortalities are due entirely to gillnet entanglement, and has gone public with this. Despite banning gillnets within dolphin habitat mortalities continue unabated. The Commission’s desire to promote its conservation efforts as a success and develop dolphin ecotourism has meant that the Commission has not been fully co-operative with the dolphin necropsy work and has sought to suppress information on dolphin mortalities. CMDCP is working on developing a co-operation agreement with the Commission that clearly sets out roles and responsibilities that includes research work.
   - The most serious challenge that has hindered the project’s ability to achieve its core objective is the delay in receiving the diagnostic results from the 2006 mortality samples sent to North America. The project has been waiting for more than a year for the laboratories to undertake this work and complete reports. To date, half of this work is still incomplete. The facilitator for this work in North America blames a backlog of work at Government labs caused by the New Orleans flood disaster and the low priority accorded to wildlife diagnostic work. The delay in receiving the results from 2006 samples has meant that the Cambodian Government refuses to issue CITIES permits to export the 2007 samples, until the 2006 results are secured. WCS, WWF’s partner in this mortality project, now has a staff member in the US who is seeking to expedite this work by meeting with the labs and exploring alternative labs within the US which can undertake this work. He is hopeful to get the 2006 results by March next year. Consequently WWF has requested an extension of the mortality project period to end of 2008 to enable export and analysis of the 2007 collected mortality samples. To ensure these samples are analysed in a timely fashion WWF and WCS will explore new labs, most likely within the Asian region, that can guarantee completion of the diagnostic work within the project time frame.
   - The logistics of getting viral cultures done in Cambodia are non existent, and make identifying certain pathogens extremely difficult, for example dolphin pox is very high on the differential list as a pathogen that may be responsible for neonatal mortalities, as has been identified in previous studies on transient Killer Whales, however proving that dolphin pox exists in this population without doing viral isolation in-country is extremely difficult.
   - It has been difficult working up a potential epidemiological investigation in a population with very little known information on accurate abundance estimation, and limited information on species ecology and behaviour. CMDCP has now completed population abundance research and is conducting ongoing behavioural ecology research.

4. Unexpected outcomes
   - As a result of necropsies and photo-identification work on live dolphins, the project has been able to determine that pox like lesions are apparent on some dolphins. Further investigations are required to determine if this is a factor contributing to calf mortality.
• Dr Dove developed links with a Cambodian laboratory which has the capacity to do microbiological work on tissue samples. Diagnostic work on tissue samples from neck lesions found on some dead calves resulted in a pathogen called *Aeromonas hydrophilia* being isolated, further research is required to determine whether this bacteria could result in the death of immuno-compromised calves.

5. Methodology: involvement of stakeholders
The most relevant stakeholders participating in the project have been National and Provincial Fisheries Administration staff. These staff have been trained in necropsy protocol and proper tissue collection and storage. Communities have been involved in reporting strandings as well as the collection and correct preservation of carcasses.

6. Capacity building and partnership
Project officers and Fisheries Administration staff have been involved in the development and outfitting of the field laboratory as well as training in necropsy procedures, data collection, tissue sample collection and storage. Close partnerships have been built between WWF and the Fisheries Administration in this project, with national and provincial staff now having the capacity to undertake necropsy work based on standardized protocols. A partnership has also been created between the project and a Cambodian laboratory (Pasteur Laboratory).

7. Communications & stories
Presentations were made on Mekong dolphin mortality at the following symposiums:
10th International Rivers Symposium, Brisbane, 3-6 September 2007 (Appendix 1)
17th Biennial Conference for The Society of Marine Mammalogy, 29 Nov - 3 Dec 2007 (Appendix 2)

There were no media articles on dolphin mortality work due to Government sensitivity on this issue.

8. Future issues / challenges
• Ongoing delay in receiving diagnostic reports for 2006 samples - see section 3 above for explanation and strategy to address this problem.
• Government unwillingness to issue CITIES permit for the 2007 samples due to the long delay in acquiring the 2006 results. WWF and WCS are searching for new labs particularly within the Asia region to conduct future diagnostic work within designated time frames. By developing a good case, with supporting guarantees from the identified labs, the project would hope to convince the Government that results will be retrieved according to schedule.
Assessing the overall project impact

1. Lessons learned
As has been discussed in section 3 above, the major problem encountered by the project has been the delay in receiving the results form the 2006 sample shipment, which has prevented shipment of the 2007 samples. This problem could not have been foreseen and the project has made frequent follow up enquiries to try to expedite the diagnostic work without success. In the future labs in the Asia region will be sourced as well as contractual guarantees on delivery of results.

2. Sustainability
   - Project staff as well as local and national Fisheries Officers have been trained in necropsy techniques, protocols for tissue collection and storage, and data collection.
   - A field lab has been outfitted at the field site within the Fisheries Administration offices.
   - Training materials pertaining to epidemiological investigation and post mortem examination of cetaceans are in the process. These will be made available not only to Cambodian Fisheries Administration but also to researchers working on cetaceans elsewhere in the SE Asia region.
   - A network of community “rangers” have been established that facilitate the reporting of stranded dolphins.
   - Community members (fishermen) along the river have reported dolphin strandings and been trained in the correct handling and storage of mortalities.
Appendix 1: Photos of necropsy on dead calf at the Kratie field lab