IUCN-SSC Crocodile Specialist Group
Student Research Assistance Scheme (SRAS) Report

Project title: Acoustic Communication in Gharial *(Gavialis gangeticus)*

Gharial is a critically endangered crocodilian that was spread across Indian subcontinent once, now restricted to India and Nepal only. National Chambal sanctuary holds the last strong hold population of wild gharials. Above 80% of wild gharials resides in National Chambal Sanctuary the only protected river sanctuary in India.(Lang J.W., Chowfin,S., Ross, 2019). Communication in crocodilians is complex in nature. In general, crocodilians use visual, acoustic and chemical signals or cues as the medium of communication (Vergne et al., 2011). There are studies conducted to explain the social signals and related behaviours in both Alligatoridae and Crocodylidae (Garrick and Lang, 1977). There is only little known about Gharial (Gavialidae) communication. Early studies shows gharials vocalize rarely, and reported do not produce infrasound. (Dinets, 2013). But acoustically Male gharial with grown "ghara" can produce "Pop" signals preceded by SAVs. (Jailabdeen A et al., 2017, 2018a, 2018b).

Male gharials produce "pop" all-round the year, but it intensifies during social behaviour seasons like courtship/mating, hatching, post-hatch/guarding/parenting, and nesting seasons. This intensification of the "pop" can be used as an indicator for validate the viable population in a non-invasive method. A "pop" usually produced underwater in and near the breeding arena of the big ghara male. Since sound travels faster in water than air, All the aquatic sympatric species can sense the "pop" signal before the audible signal transmits through air. There is a Sub Audible Vibrations (SAVs)(Garrick and Lang, 1977) precedes before the audible pop, which clearly observed and recorded in many instances when the male performing "pop" in shallow water. The purpose and the characters of the SAVs is unknown, but the process of making the SAVs is possibly like the alligators bellowing.

Our main findings are
1) Each individual males' popping signals are unique and consistent to that male, 2) these patterns are seeming to relate with the context of the environment of the male during the production of the "pop", 3) There is an intensification in the production of the pop during social behavioural seasons. The preliminary qualitative analysis suggest that the males use pop signals as individual signatures in a variety of contexts, including male-male, male-female, disturbance, and patrolling contexts. These results will be 2 long chapters in my PhD thesies also published as research papers.

Student Research Assistance Scheme (SRAS) fund helped me to kick start my research through funding some field transport expensense for this study during the beginning stage.

presentations/publications related to: Acoustic Communication in Gharial
https://drive.google.com/drive/folders/1dwxc_fDibX_GXxUkVm0NK_SOY3YQI9Cv?usp=sharing

general information in folder, Gharial Ecology Project 2020-2022
https://drive.google.com/drive/folders/1WNWVxLEhmqjVba9TgE7C-72NTxFZHD1e?usp=sharing

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