

**A Preliminary Study on the Impacts of Recreational Disturbances on Selected Water-Birds
in Bundala Ramsar Wetland**

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Abstract

Increasing popularity of bird watching and unplanned tourism activities in ecologically important wetland habitats in Sri Lanka can potentially cause detrimental impacts on wetland birds. Yet scientific evidences to assess the extent of these impacts are limited in literature in the tropics. This study investigated the impacts of recreational disturbances on the behavior of six selected water-bird species along highly visited nature trails in an internationally important Bundala Ramsar wetland, Sri Lanka, from July to December 2017. Bird behaviors were observed in five wetland locations where water-birds are known to occupy regularly. Bird behaviors were observed and ethograms were prepared using Ad-libitum sampling. Detailed behavioral information was gathered using focal sampling and scan sampling techniques. For the purpose of this study, only the disturbance caused by moving vehicles were considered, and the intensity of disturbance was defined in terms of the speed of passing vehicles. Accordingly, four intensities of disturbance were considered, i.e. vehicles moving at 10, 20, 30 and 40 km/h speeds. The behavioral changes when subjected to disturbance was statistically compared. Of the studied species, the foraging behavior of Painted Stork (*Mycteria leucocephala*) and Lesser Whistling-Duck (*Dendrocygna javanica*) was negatively affected by recreational disturbances. Overall, the studied birds showed significant negative correlations between the response and the distance to the source of the disturbance except the Eurasian Spoonbill (*Platalea leucorodia*). The highest sensitivity to moving vehicles was shown by the Kentish Plover (*Charadrius alexandrinus seebohmi*) ($r_s=-0.882$, $p=0.001$), followed by the Caspian Tern (*Hydroprogne caspia*) ($r_s=-0.834$, $p=0.001$) i.e. birds are more disturbed as the distance to the source of disturbance decreases. Spearman's correlations suggest that the Painted Stork is more sensitive to fast moving vehicles. Eurasian Spoonbill showed no consistent behavioral responses for disturbances indicating possible habituation. The Asian Openbill (*Anastomus oscitans*) showed a consistent pattern of flushing or avoidance behavior for passing vehicles close by irrespective of the speed. The study findings call for sound visitor management strategies in highly visited coastal wetlands to minimise the disturbances to water birds. Maintaining a minimum distance to areas of the wetland that are highly utilised by water birds for foraging, resting and breeding, and strictly imposing speed limits for vehicles inside the wetlands may be particularly useful in minimising the disturbances to coastal water birds.

Keywords: Coastal birds, Recreation ecology, Motorized disturbances, Flushing, Habituation