



Foraging ecology of wading birds in  
the Bundala Ramsar wetland  
in relation to weed mats

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## Abstract

Wader populations in the Bundala National Park have shown a decline during past few decades. Eutrophication induced weed mats on the foraging grounds of waders appeared to have influenced wader populations. It was hypothesized that reduction of wader populations were due to adverse effects of weed mats. Thus, current study was designed to test the influence of weed mats on the dispersion and foraging ecology of waders in the Bundala Lagoon. Dispersion and foraging behaviour of Common Redshank, Black Tailed Godwit, Marsh Sandpiper, Black Winged Stilt and Curlew Sandpiper were studied in relation to weed mats from December 2005 to June 2006. To test the hypothesis, wader counts in the Bundala Lagoon and adjacent water bodies with different weed cover were carried out, Direct observation on foraging behaviour and visual estimation of weed cover were done, Wet and dry biomass of weed, density of invertebrate populations in benthos and water quality were assessed.

Foraging behaviour of selected species of waders were examined in weed mat covered and weed mat free areas in natural occurring sites and manipulated experimental plots. Weed cover below 25% (biomass of weed < 1kg fresh weight / m<sup>2</sup>) was considered weed mat free and weed cover above 75% (biomass of weed > 3kg fresh weight / m<sup>2</sup>) was considered as weed mat covered.

Redshank fed among weed mats has shown lower feeding efficiency and higher feeding effort, which indicated unfavourable effects of the weed mats. However, Redshank pulled the weed mat to expose and capture weed infauna. This adaptation increased food intake rate resulting in no significant difference of the rate of feeding success. Black Tailed Godwit fed among weed mats has shown a reduced rate of both feeding success and feeding efficiency. Feeding effort has shown an increase as frequent switching between feeding sites by godwit has associated with increased pace rate. Marsh sandpiper and Curlew sandpiper have shown a reduced feeding efficiency and rate of feeding success while feeding in mat covered areas. Marsh Sandpiper and Curlew Sandpiper have not shown increased feeding effort to maintain a constant food intake rate in weed mat covered sites. Unlike other species of waders, Black Winged Stilt has not shown any difference in feeding behaviour in weed mat free and mat covered areas. Black Winged Stilt has employed both visual and tactile foraging to capture prey associated with weed mats and drifting weed in shallow areas of the lagoon.

There were no statistically significant positive correlation between dispersion of waders and presence of weed mats; however, it was evident that Redshank, Godwit, Curlew Sandpiper and Marsh sandpiper have a preference to weed mat free areas than mat covered sites. In contrast, Black Winged Stilt has evenly occupied both weed mat free and weed mat covered areas.

Opportunistic gastropod mollusk *Hydrobia* Spp. has dominated the invertebrate community of the lagoon. Density of total invertebrates has not shown any statistically significant difference between weed mat free and weed mat covered areas. However, Gammarid amphipods and insect larva found associated with weed cover.

Weed mats have shown a rapid growth phase from March to May 2006, reaching its peak biomass in May and at the same time started the phase of decline indicating no stationary phase. Seaweed *Ruppia maritima* dominated the flora until May and by June macroalgal beds seem to start dominating the benthic floral community.

Mesohaline water of the lagoon was a rich in nitrate and phosphate but according to relative abundance primary producers limited by phosphorus. pH levels were not supporting the aquatic community in the lagoon. Weed mat covered areas had

significantly high DO and BOD<sub>3day</sub> levels. Water level receded from April onwards thus resulting in mud flats being exposed. Water level variation which has shown a single peak from February to April seemed to have greatly influenced the water quality of the lagoon.