

## Relative abundance and diversity of waterbirds in a *Rhizophora* mangrove forest in Iran.

### Abstract

This study determined the abundance and diversity of waterbirds at Gaz and Hara River Deltas (GHRD) mangroves, southern of Iran. Point count sampling method that included 35 points along three transects was employed in this study. A total of 16687 waterbird observations, belonging to 38 waders, 15 seabirds and only one waterfowl species were recorded at GHRD international wetland. The observations were categorized based on different season, where a total of 4813 (37 spp.), 9445 (48 spp.), 1759 (30 spp.) and 670 (15 spp.) observations were recorded in the fall, winter, spring and summer, respectively. The Eurasian Curlew (3689 observations, 22.11%), Great Cormorant (1309 observations, 7.84%) and Terek Sandpiper (1065 observations, 6.38%) dominated the area. The Scolopacidae (7500 observations, 44.95%) and Laridae (2631 observations, 15.77%) were the most abundant family and Dromatidae (6 observations, 0.04%), Podicepedidae (4 observations, 0.02%) and Recurvirostridae (2 observations, 0.01%) were among families with the lowest number. The mean number of observations of waders during fall, winter, spring and summer were  $104.11 \pm 36.60$ ,  $222.32 \pm 67.74$ ,  $22.62 \pm 6.82$ , and  $10.16 \pm 3.91$  respectively, while of seabirds were  $56.53 \pm 25.05$ ,  $71 \pm 28.15$ ,  $54.24 \pm 21.15$  and  $17.29 \pm 9.52$ , respectively. The similarity between seasons of fall and winter were highest (72 %). Abundance of waterbirds was positively correlated with density of molluscs and mudskipper, *R. mucronata* height and stand basal area as well as percentage of clay in soil ( $R^2 = 0.99$ ,  $p < 0.01$ ). In addition, species of Oriental White-eye Warbler (*Zosterops palpebrozus*) is a new record for GHRD. The great importance of GHRD for migrant waders and seabirds, and also for landbirds, must be recognized and the protection of this site from threats must be thoroughly enhanced.

Keyword: Waterbirds; Waders; Seabirds; Abundance; Diversity; Mangrove forest; Wetlands; Season; Gaz and Hara River Deltas; Iran.