



## FIRST MARINE PROTECTED AREA OF PAKISTAN: ASTOLA ISLAND

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### ABSTRACT

The island supports large numbers of wintering birds, including *Larus hemprichi* and several species of terns. The island is an important site for *Chelonia mydas* and *Eretmochelys imbricata* and for an Endemic Viper (*Echis carinatus astoli*). This paper deals with the data collected during a general survey regarding the fauna and flora of the first ever declared Marine Protected Area of Pakistan. During the present study, as many as 41 species of birds, eight species of reptiles and six dominant and widespread species of plants have been recorded from the site. 29 species of corals and 75 fin fish species have previously been reported from the area. The need to develop and revive the area as a Ramsar Site has been emphasized. In view of the fact that the island has been left over as a neglected site by the concerned Wildlife Department, the need for future monitoring and management is suggested, particularly for gulls, terns, cetaceans, corals, Green Turtle, Hawksbill Turtle and marine snakes and as an ecotourism hotspot.

**Keywords:** Astola island, protected area, corals, green turtle.

### INTRODUCTION

The Arabian Sea is very rich in marine biodiversity, a large number of marine animals and plants are found along the coast of Pakistan. Astola Island (Fig. 1) is a significant offshore island along the north coast of the Arabian Sea, largest island along coast and first Marine Protected Area (MPA) of Pakistan declared by the Government of Balochistan. The Island is located at the latitude and longitude coordinates of 25° 7'21.51"N and Longitude 63°50'51.53"E, situated in Balochistan province of Pakistan. Island covers an area of about 400 square km and is located 39 km east of Pasni, Balochistan (Ilyas, 2017). The island comprises of rocky hills which are about 246 feet above sea level (Sadia, 2011) and covers an area of about 3 km in length and 1 km wide. The island is also a Ramsar site based on nesting area for Green Turtle and biodiversity of birds.

The coastline along the base of the cliff comprises of a small sandy-cum rocky beach. The eastern portion of the cliff is mostly sandy. It is home to several species of marine and terrestrial animals and plants. The island is reported to support large number of breeding sea birds, including *Larus hemiprichi* and several species of terns. Marine turtles are also said to nest on the island.

There is a distinct possibility that Hawksbill Turtle (*Eretmochelys imbricata*) nests there (Scott, 1989).

It is a Ramsar Site selected on the following Criteria:

1. It is considered as a biogeographically important region having extraordinary ecological environment.
2. Its great importance is due to the presence of variability of genetic assortments in the form of diversity of animals and plants.
3. Its specificity according to growth of particular fauna and flora with their prominent ecological niches and sophisticated stages of their life cycles.

MPAs play a very significant role to conserve the marine biodiversity of the oceans and to maintain productivity, especially of fish stocks (Kelleher, 1999). An MPA is any area of intertidal or sub tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment (Kelleher and Kenchington, 1992; Kelleher, 1999).

The upper plain area of the cliff is also rocky and sandy. Most of the area is flat with some crevices and depression towards the northern edge of the cliff (Khurshid *et al.*, 1995).

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### **Declaration of Astola Island as a Marine Protected Area**

The government of Balochistan June 15, 2017 declared Astola Island situated in District Gawadar, Balochistan as Protected Area with the nomenclature " *Astola Island Marine Protected Area Balochistan, Pakistan*", for achieving the objectives of the aforesaid Act as well as specified here under, with immediate effect:

#### **Objectives**

a). Protect, conserve and restore species, habitats, biodiversity and ecological processes which may be adversely affected as a result of human activities or otherwise.

b). Prevent degradation of and damage to species, habitats, biodiversity and ecological processes, following the precautionary principle.

c). Protect and conserve areas that best represent the range of species, habitats, biodiversity and ecological processes in the Biosphere Reserve/ Conservation Areas.

d). Maintain Astola Island Marine Protected Area Balochistan, Pakistan, Herein after referred as "AIMPA-Balochistan", under the Convention on Biological Diversity (CBD).



Fig. 1. A view of Astola Island Marine Protected Area, Balochistan.

## MATERIALS AND METHODS

As regards the review of previous work done on the fauna of the area, it was found that there is very little information available on the subject such as Scott (1989), Khurshid *et al.* (1995), Anon (2005) and Siddiqui *et al.* (2008). Amazingly, no published baseline study nor any feasibility report for declaring the site as MPA is available for reference. Nor any AWC data on waterbirds counts on this Ramsar Site seems to have been collected to determine the trends in waterbirds populations and their status. The purpose of this paper is to provide the recent survey findings with a review of the scientific knowledge for future studies.



Fig. 2. *Prosopis juliflora*.

### Mammals

No notable species of mammals have been recorded from the island due to non availability of favorable habitats particularly for the large mammals.

## RESULTS

On the basis of field surveys conducted in October, 2017, the following data were collected with reference to biodiversity of the area.

### Vegetation

Vegetation of Astola Island comprises of halophytic plants which are permanent and seasonal plants which flourish after the rains. Lithophytes (lichens), aquatic weeds, sea urchins, sea anemones and corals have also been seen on the coast. The dominant and widespread Vegetation includes *Prosopis juliflora* (Fig. 2), *Indigofera oblongifolia*, *Sueda fruticosa* (Fig. 3), *Salvadora persica* (Fig. 4), *Aerva javanica* (Fig. 5) and *Tamarix dioca*.



Fig. 3. *Sueda fruticosa*.

### Birds

Forty one species of birds belonging to 9 orders and 22 families including 12 Resident species, 27 Winter Visitors, one Passage Migrant, and one Migrant were recorded during the recent surveys (Table 1).

Fig. 4. *Salvadora percia*.Fig. 5. *Aerva javanica*.

Table 1. List of Species of Birds recorded from Astola Island.

S. No.	Family	Scientific name	Common name	Seasonal Status	Population Status
1.	Pelecanidae	<i>Pelcanus onocrotalus</i>	White or Rosy Pelican	WV	C
2.	Pelecanidae	<i>Pelecanus crispus</i>	Delmatian Pelican	WV	A
3.	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Large Cormorant	WV	A
4.	Phalacrocoracidae	<i>Egretta intermedia</i>	Intermediate Egret	R	C
5.	Phalacrocoracidae	<i>Casmerodius albus</i>	Great Egret	WV	C
6.	Phalacrocoracidae	<i>Ardea cinerea</i>	Grey Heron	WV	LC
7.	Phalacrocoracidae	<i>Egretta gularis</i>	Reef Heron	R	LC
8.	Accipitridae	<i>Accipiter badius</i>	Shikra	R	SC
9.	Falconidae	<i>Falco tinnunculus</i>	Common Kestrel	WV	SC
10.	Pandionidae	<i>Pandion haliaeetus</i>	Osprey	WV	SC
11.	Haematopodidae	<i>Haematopus ostralegus</i>	Oystercatcher	WV	C
12.	Charadriidae	<i>Vanellus indicus</i>	Redwattled Lapwing	R	C
13.	Charadriidae	<i>Tringa hypoleucos</i>	Common Sandpiper	WV	LC
14.	Charadriidae	<i>Tringa totanus</i>	Redshank	WV	LC
15.	Charadriidae	<i>Calidris minutus</i>	Little Stint	WV	A
16.	Scolopacidae	<i>Phalaropus lobatus</i>	Rednecked Phalarope	WV	C
17.	Stercoraridae	<i>Stercorarius parasiticus</i>	Arctic Skua	WV	C
18.	Laridae	<i>Larus hemiprichi</i>	Sooty Gull	WV	A
19.	Laridae	<i>Larus ridibundus</i>	Blackheaded Gull	WV	A
20.	Laridae	<i>Larus cachinnans</i>	Caspian Gull	WV	A
21.	Laridae	<i>Larus heuglini</i>	Heuglin's Gull	WV	A

22	Laridae	<i>Gelochelidon nilotica</i>	Gullbilled Tern	WV	C
23	Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	M	C
24	Combumbidae	<i>Streptopelia sengalensis</i>	Little Brown Dove	R	C
25	Strigidae	<i>Asio flammeus</i>	Short-eared Owl	WV	SC
26	Apodidae	<i>Apus pallidus</i>	Pallid Swift	WV	LC
27	Hirundinidae	<i>Riparia paludicola</i>	Plain Martin	R	C
28	Alaudidae	<i>Galerida cristata</i>	Crested Lark	R	C
29	Alaudidae	<i>Ammonanes deserti</i>	Desert Lark	R	C
30	Alaudidae	<i>Alaemon alaudipes</i>	Greater Hoopoe Lark	R	LC
31	Alaudidae	<i>Alauda arvensis</i>	Common Skylark	WV	SC
32	Laniidae	<i>Lanius meridionalis</i>	Southern Grey Shrike	R	LC
33	Turdidae	<i>Oenanthe picata</i>	Variable Wheatear	WV	LC
34	Sylviidae	<i>Hippolais caligata</i>	Booted Warbler	WV	SC
35	Sylviidae	<i>Sylvia nana</i>	Desert Warbler	WV	SC
36	Sylviidae	<i>Oenanthe isabellina</i>	Isabelline Weatear	WV	LC
37	Passeridae	<i>Passer domesticus</i>	House Sparrow	R	A
38	Motacillidae	<i>Motacilla flava</i>	Yellow Wagtail	PM	C
39	Motacillidae	<i>Matocilla alba</i>	White or Pied Wagtail	WV	C
40	Emberizidae	<i>Emberiza striata</i>	House or striped Bunting	R	C
41	Turdidae	<i>Oenanthe deserti</i>	Desert Wheatear	WV	C

**Legend:** A = Abundant, C = Common, LC = Less Common, SC = Scarce.

**Reptiles**

Eight species of reptiles belonging to one order were recorded during the recent surveys (Table 2, Fig. 13).

The Island’s sandy beaches are a good nesting ground for Green Turtles (Figs. 6-12).



Fig. 6. Green Turtle track at Astola Island.



Fig. 7. Green Turtle tracks at Astola Island.



Fig. 8. Green Turtle track at Astola Island.



Fig. 9. Nesting pit of Green Turtle at Astola Island.



Fig. 10. Hatchlings of Green Turtle (*Chelonia mydas*) at Astola Island.



Fig. 11. Hatchlings of Green Turtle (*Chelonia mydas*) at Astola Island.



Fig. 12. Dead Green Turtle at Astola Island.



Fig. 13. Small headed Sea Snake at Astola Island.

Table. 2. Reptiles of Astola Island.

S. No.	Order	Family	Scientific Name	Common Name	Status
1	Squamata	Agamidae	<i>Laudaka lirata</i>	Yellow Agama	Common
2	Squamata	Agamidae	<i>Phrynocephalus ornatus</i>	Toadhead Agama	Rare
3	Squamata	Agamidae	<i>Phrynocephalus clarkorum</i>	Afghan Toad Agama	Common
4	Squamata	Viperidae	<i>Echis carinatus astolae</i>	Astola Viper	Common
5	Squamata	Hydrophiidae	<i>Hydrophis ornatus</i>	Reef Sea Snake	Common
6	Squamata	Cheloniidae	<i>Chelonia mydas</i>	Green Turtle	Common
7	Squamata	Cheloniidae	<i>Lepidochelys olivacia</i>	Olive Ridley Turtle	Rare
8	Squamata	Hydrophidae	<i>Microcephalophis gracilis</i>	Small headed Sea Snake	Scarce

### Corals

About 29 species of hard corals (Figs. 14 and 15) has been documented from coast line of Pakistan. High level of deposits of Coral have been seen from surroundings of Churna Island and Astola Island. Highly populated areas have been recorded as northern dive sites of Astola which

shows the 80% area covered from coral growth included huge diversity of corals. *Coscinaraea monile*, *Favites complanata*, *Favites pentagona*, and *Porites nodifera* recorded as most sighted species while *Favites complanata* included as the less common species from waters of Astola (Ali *et al.*, 2014).





Fig. 14. Hard corals at Astola Island.



Fig. 15. Hard corals at Astola Island.

### Threatened Species

No threatened species of birds was recorded during the present study except Dalmatian Pelican. Green Turtle and Olive Ridley Turtle are the two threatened species recorded during the visit.

During the present survey we observed the following of potential threats to species and their habitat:

1. Fishermen occasionally visit the island for stay and fishing activities in the nearby areas. This causes a lot of disturbance in the area.
2. Damaged nets are left over by the fishermen in the island area, causing entanglement to the fauna moving about.
3. Quail trappers visit the island to erect nets for catching / netting the Common Quails during October to November.

### CONCLUSION

The Astola Island helped in conserving and maintaining the endangered Green Turtle, Hawksbill Turtle nest on the beach, and a large breeding site for waterbirds. The island is Ramsar site based on nesting area for Green Turtle and biodiversity of birds. This island has played an important role in the conservation of unique biodiversity and revenue via eco-tourism has motivated the government to protect and proper managed marine protected area. Presently, the site appears to be a neglected Ramsar Site like the other Ramsar Sites of the Province /area such as Hub Dam, Jiwani Coastal Wetlands, Miani Hor and Ormara Turtle Beach. If developed as an MPA, it may prove a potentially important biodiversity area in the days to come.

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