

**Survey of White-bellied Sea eagle (WBSE) in Southern Raigad and Northern
Ratnagiri post Nisarga cyclone with a special focus on the nesting activity
Final Report – October 2020 - March 2021**



Mangrove and Marine Biodiversity Conservation Foundation of Maharashtra



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Introduction

White-bellied Sea-eagle (*Haliaeetus leucogaster*) belongs to the family Accipitridae (a family of small to large birds with strongly hooked bills). It is a large bird measuring 75 - 85 cm in length, with a wingspan between 178 to 220 cm. The female bird weighs from 2,500 to 3,900 grams and is larger than the male weighing from 1,800 to 2,900 grams (Mahmood Syed Faheem, 2015). This species is distinctive, having a whitish head, breast, under-wing coverts and tail. The upper parts are gray and black. The under-wing flight feathers contrast with the whitish coverts. Although dimorphism is not observed in adult males and females, immature birds have brown plumage. The tail is short and wedge-shaped. The large hooked bill is blueish-gray in color with a darker tip. The legs and feet are yellow. The long talons are black. Its call is a loud goose-like honking sound (Grimmett. R et al. 2011).

White-bellied Sea-eagle is distributed on the coasts of peninsular India on both east and west coast and other countries such as Sri Lanka, Nepal, Pakistan, Bangladesh, South-east Asia, South China, Indonesia, Philippines and Australia (Debus, S. et al 2020).



Fig 1: White-bellied Sea-eagle (in flight)

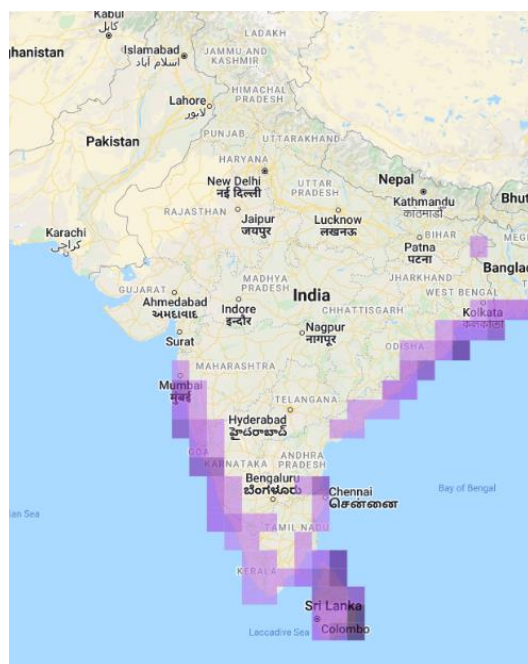


Fig 2: Distribution map of White-bellied Sea-eagle (eBird)

The White-bellied Sea-eagle normally inhabits coastal areas, inshore waters, islands, estuaries and wetlands. Majorly they feed on fishes, turtles, sea snakes and crustaceans (Satish Pande et al, 2011). Occasionally they have been observed feeding on small mammals, reptiles, birds and carrion. It is also known for its feed snatching behavior (L. Corbett et al, 2011).

As per IUCN Red List, it is listed as 'Least Concern' due to its extremely large range. But their population is declining (State of India's Birds factsheet: White-bellied Sea Eagle *Haliaeetus leucogaster*, SoIB 2020) at a considerable rate due to the loss of the breeding habitat caused by the clearance of water-edge vegetation. Hunting, poisoning and human activity near breeding sites are the key threats to their survival (Bio-white bellied sea eagle, 2022).

Background:

White-bellied Sea-eagle nesting behavior has been studied by few researchers along the east and west coast of India. Mostly they build their nests near the sea coast, tidal creeks and estuaries. They prefer huge trees for nesting, such as Mango *Mangifera indica*, *Casuarina equisetifolia*, Banyan *Ficus bengalensis*, Sacred Fig Tree *Ficus religiosa*, Coconut Palm *Cocos nucifera*, Tamarind *Tamarindus indica*, *Sterculia foetida*, *Terminalia paniculata*, Devil's Tree *Alstonia scholaris*, Baheda *Terminalia bellirica*, etc (Neema et al, 2021; Katdare & Mone, 1996-98). The distance from the sea and size of the tree are important factors in nest building.

The study by Neema et al, 2021 & Katdare & Mone, 1996-98 also concluded that the White-bellied Sea-eagle is predominantly known to nest on the tree commonly used in timber collection. The tree of *Casuarina equisetifolia* and *Mangifera indica* was the most commonly used tree by White-bellied Sea-eagles for nesting, the tree is planted in large areas by the locals to obtain timber, the trees in private land are often logged for raising money and also for firewood and it's already been mentioned that White-bellied Sea-eagle's majority of the nest were seen on these trees which also threatened the ecology of the bird. This might force the bird to leave its nest and relocate to suboptimal habitats where the success of breeding might get affected (Bell, 1983; Bilney & Emison 1983; Clunie, 1994; Dennis & Lashmar, 1996; Mayr & Cottrell, 1979).

According to Ali & Ripley (1978), White-bellied Sea-eagles are known to breed in the season of October to January however the study conducted in 1997-98 by Sahyadri Nisarga Mitra observed that

on the west coast of Ratnagiri the courtship and Nest-building occurred from the Mid-September to January, the well-developed chicks were been recorded in the nest by the end of March.

The Nisarga cyclone in 2020 severely affected some coastal areas of Maharashtra such as the northern parts of Ratnagiri district and southern parts of Raigad district. The cyclone also had a serious impact on the nesting sites of White-bellied Sea-eagles in the region. Many of the large trees previously used by White-bellied Sea-eagles for nesting have fallen due to the cyclone, resulting in the unavailability of their nesting sites.

Study area

To record the presence of White-bellied Sea-eagles and their nests, nine villages were selected from Raigad and Ratnagiri districts (which were affected during the Nisarga cyclone) which were as follows:

1. Diveagar
2. Arathi
3. Shrivardhan
4. Maral
5. Harihareshwar
6. Velas
7. Kelshi
8. Aade
9. Anjarle



Fig 3 Shrivardhan beach



Fig 4 Velas beach



Fig 5 Anjarle beach

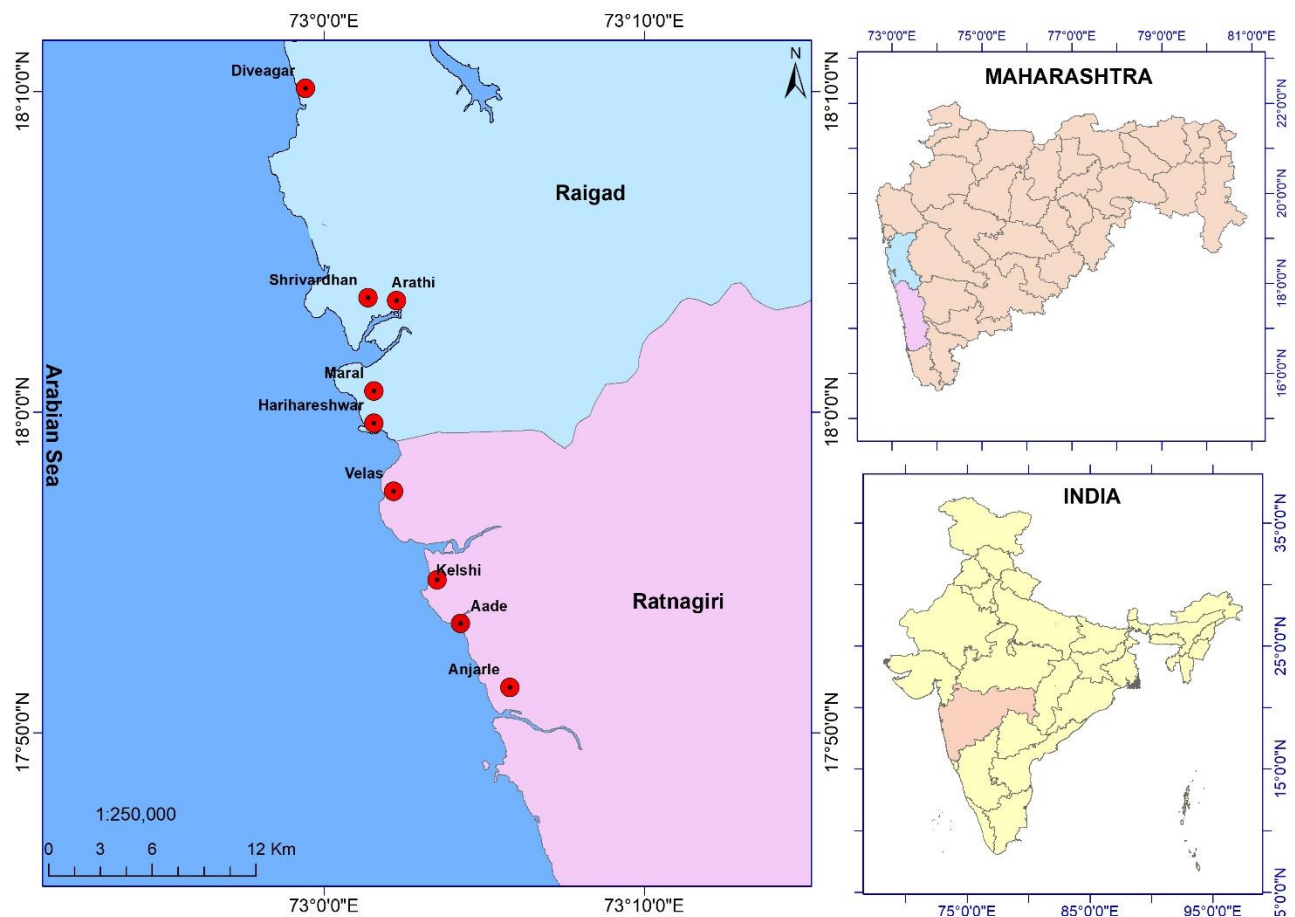


Fig 6 Map showing Nine villages from Raigad and Ratnagiri districts.

Methodology:

Systematic surveys were conducted for four days every month covering all nine villages from October 2020 to March 2021. The following data was collected during the surveys:

Date, area, presence of nest, presence of the bird, type of tree, bird activity and GPS location of the nest.

Observations:

Records of White-bellied Sea-eagles nesting along the coast of Konkan are found over many years. They are known to use the same nest throughout their lifetime. Their nests are built using sticks. October to November is generally the breeding season. They display parental caring till the juveniles are mature and ready to fly from the nest by the month of March to May (Zahm, S. 2015).

On 3rd June 2020, Nisarga cyclone affected the southern parts of Raigad and the northern parts of the Ratnagiri district. The speed of the wind was nearly 110-120 km per hrs. The cyclone led to the collapse and damage of many tall trees in the affected area. The major impact of the cyclone was observed between Diveagar (Raigad) and Anjarle (Ratnagiri) areas. The Nisarga cyclone had a severe effect on the tree species such as *Sterculia foetida* and *Casuarina equisetifolia* which are used by White-bellied Sea-eagle for constructing their nests (Bhave, V.J. et al 2022).

Post cyclone the first nest was recorded in Shrivardhan village of Raigad district. The previous nest in the area was on a *Sterculia foetida* tree which was nearly 12 years old on private land; this tree collapsed during the cyclone. The White-bellied Sea-eagle individual was observed building a new nest on the opposite side of the road on a *Sterculia foetida* tree. It was also noted that this same tree was occupied by Vultures for nesting three to four years back.

Nests were also recorded in Harihareshwar, Arathi, Diveagar, Maral of Raigad district as well as in Anjarle and Kelshi of Ratnagiri district. In Velas, due to the cyclone most of the huge trees had fallen down and none of them were available for nesting. Later, birds were observed building their nest on the *Mangifera* tree.

In the month of December, leaves were observed in the nests of the White-bellied Sea-eagle which indicated that the birds were ready to lay eggs during that period. White-bellied Sea-eagles were also seen hunting fish, eating fish and flying near the nest. It was documented that several times one individual was sitting inside the nest and the other was sitting near the nest. They were observed mating in a few villages. In Harihareshwar and Shrivardhan, crows were observed attacking the White-bellied Sea-eagles.

In total thirteen nests were observed in the nine villages. During the observations, a minimum of one nest and a maximum of two nests were documented on each study site. The majority of the nests were built on *Casuarina equisetifolia* followed by *Mangifera indica* & *Sterculia foetida*.

Table 1: Presence of nests in villages.

Sr.no	Village	Tree species	Presence of WBSE	Total number of Nest
1	Diveagar	<i>Casuarina equisetifolia</i>	Yes	1
2	Arathi	<i>Casuarina equisetifolia</i>	Yes	2
3	Shrivardhan	<i>Casuarina equisetifolia</i> , <i>Sterculia foetida</i>	Yes	2
4	Maral	<i>Casuarina equisetifolia</i>	Yes	1
5	Harihareshwar	<i>Casuarina equisetifolia</i>	Yes	1
6	Velas	<i>Mangifera indica</i>	Yes	1
7	Kelshi	<i>Mangifera indica</i>	Yes	1
8	Aade	<i>Casuarina equisetifolia</i> , <i>Mangifera indica</i>	Yes	2
9	Anjarle	<i>Casuarina equisetifolia</i>	Yes	2
Total number of nests reported in study areas				13

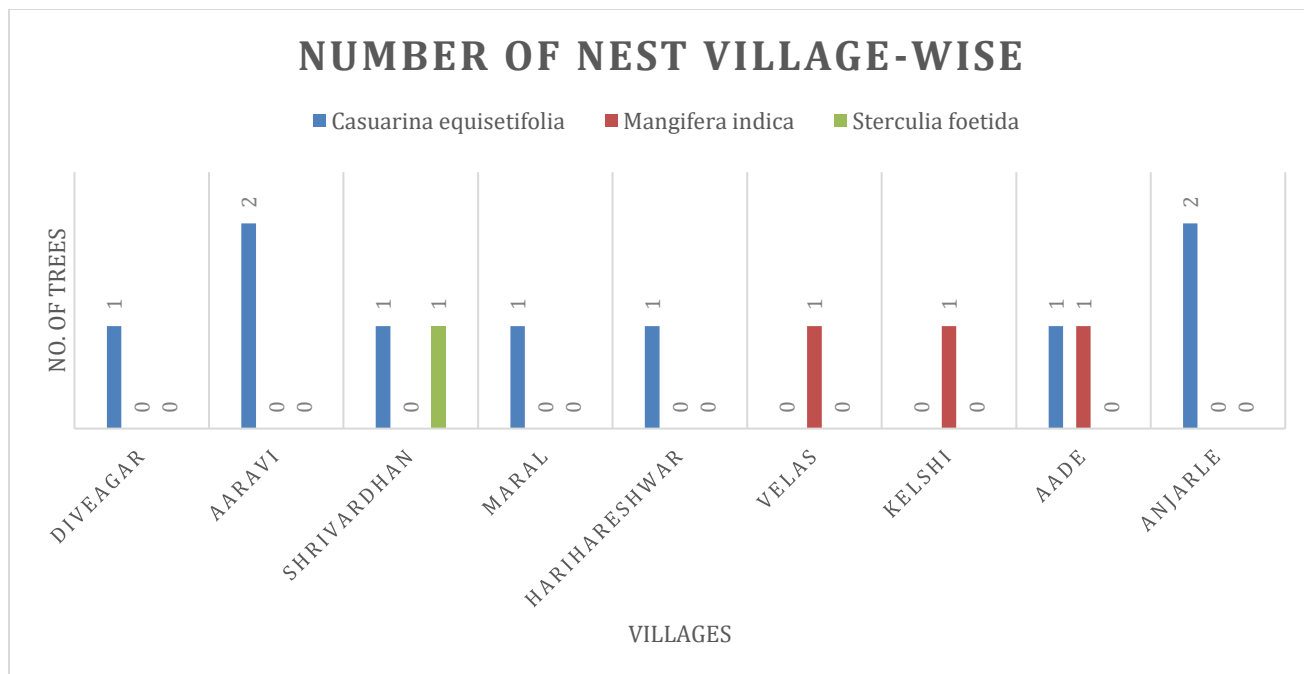


Fig 7. Graph representing the number nesting on trees species recorded from nine study locations

Village wise observations are as follows:

- **Diveagar**

Diveagar is a village located in Shrivardhan taluka of Raigad district in the Konkan region of Maharashtra. The beach is four km long and faces the Arabian sea. Only one active nest was recorded from Diveagar on the *Casuarina* tree. No fledgling was observed inside the nest.



Fig 8. Nest of White-bellied Sea Eagle

- **Arathi**

Arathi village is located in the Raigad district of Maharashtra. During the observation, two active nests were recorded from Arathi. The first nest which is nearby to the road had no fledging. In the other nest, a fledging was observed flying. Both the nests were built on the *Casuarina* tree.



Fig 9 Adult in the nest



Fig 10 Adult resting in the nest

- **Shrivardhan**

Shrivardhan beach is located on the Konkan coast of the Raigad district of Maharashtra. Two nests were observed one on *Sterculia foetida* and another on the *Casuarina* tree. Only one nest was active and a fledging was recorded flying from this nest.



Fig 11 Juvenile resting in the nest



Fig 12 Male and female in the nest

- **Maral**

Maral beach is located in the Raigad district and is one km away from Harihareshwar. Nest building activity was delayed in this village and no fledging was recorded till March 2021. The nest was built on a *Casuarina* tree.



Fig 13 Nest of White-bellied Sea Eagle



Fig 14 Adult resting in the nest

- **Harihareshwar**

Harihareshwar is a town located in the Raigad district of Maharashtra. Savitri river enters the Arabian sea from Harihareshwar town. It is surrounded by three hills. During the said study period, the nest was recorded on October 2020 on the *Casuarina* tree. Fledglings were not seen till March 2021.

- **Velas**

Velas is a coastal village in the northern Ratnagiri district. This beach is enclosed by mountains on three sides. One nest was recorded from the Velas beach on the *Mangifera* tree during the study period. Two pairs of White-bellied eagles were recorded foraging near the coast. It was observed that these individuals were mobbed for food by crows and Brahminy Kites when seating on trees. Furthermore, these White-bellied Sea-eagle individuals were also observed feeding on the beach which might have been to avoid conflict with the other birds.



Fig 15 Two adults WBSE with prey



Fig 16 Adult feeding on the shore



Fig 17 Nest of White-bellied Sea-eagle

- **Kelshi**

Kelshi Beach stretches for a length of 2.5km and is located in the Ratnagiri district of Maharashtra. It has a lush green and a dense patch of *Mangifera indica* trees along the coastline. One nest was observed during the study period built in October 2020 and fledging was observed to move out of the nest by February 2021.

- **Aade**

Aade is a small village in the Ratnagiri district of Maharashtra. It is situated exactly between Kelshi and Anjarle. Two nests were recorded during the study period, one each on *Mangifera* and *Casuarina* trees respectively.



Fig 18 Juvenile resting in the nest

- **Anjarle**

Anjarle is located in the Dapoli taluka of Ratnagiri district in Maharashtra. It is located near the Jog River. Two nests were recorded during the study period. Till the end of March 2021, no activity was observed in the first nest. Another nest had one fledging.



Fig 19 Adult resting in the nest

Conclusion & Discussion

Post-cyclone, the White-bellied Sea-eagles in the study area were observed to explore different areas for nesting. Before the cyclone, the White-bellied Sea-eagle nests were built on taller trees. Overall, White-bellied Sea-eagles are normally known to prefer tall trees, but post-cyclone they started building nests on shorter trees.

As observed during the study, *Casuarina equisetifolia*, *Mangifera indica* and *Sterculia foetida* are important tree species for the nesting of the White-bellied Sea-eagles along the coast of Maharashtra. Regular monitoring of the White-bellied Sea-eagle nesting activity needs to be carried out to understand the nesting behavior of the species on a long-term basis.

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