

observation and mitigating threats such as disturbance of nesting turtles and illegal take of eggs; this task was easier than usual during the lockdown because there was no crowding and disturbance. A setback was that biologists and central researchers could not move to the field. This challenge was overcome by the well-trained CAs sharing their data via cellphone and social media. Another major

impact of the lockdown was that ecotour operators who previously provided financial support for MLA conservation activities could not do so. The lack of tourists has allowed beach vegetation and invertebrates to flourish during the lockdown, with sand dunes forming along the beach and beach morning glory (*Ipomeas pp.*) growing to protect the shoreline and support beach biodiversity.

COVID-19, CYCLONES AND SEA TURTLES IN INDIA

ADHITH SWAMINATHAN¹ & NUPUR KALE^{2,#}

¹Dakshin Foundation, Bengaluru, India

²Wildlife Conservation Society-India, Bengaluru, India

#nupur.kale03@gmail.com

The COVID-19 pandemic resulted in a sudden nationwide lockdown in India on 24th March 2020. The nesting season of leatherback and olive ridley turtles start from November and lasts until April both on the Indian mainland coast and Island territories, while green and hawksbills nest throughout the year. The nationwide lockdown did not have any significant influence on sea turtle nesting, monitoring and conservation activities.

On the east coast, olive ridley turtles usually nest from December to March, and hence most of the nesting had concluded when the national lockdown was announced. In the state of Odisha, mass nesting (*arribada*) took place at Rushikulya rookery from the 21st to 26th March 2020, including a day-time nesting event, which partially overlapped with commencement of the lockdown. While it is not uncommon to have turtles nesting during the day in these *arribadas*, some of the Indian media channels reported this phenomenon to be a result of reduced human activity on the beach (e.g., Das, 2020; Express News Service, 2020; Gill, 2020).

Researchers from Dakshin Foundation continued to monitor the beach till the 24th March 2020. It was estimated that over 200,000 turtles had nested during the first three days of the *arribada*. Despite the lockdown, the Odisha Forest Department personnel were present for the mass hatching to ensure that disoriented hatchlings were released at the water's edge. During the lockdown, there was a cyclonic event (Cyclone Amphan) on the 16th May 2020 that was expected to affect the Odisha coast; however, the cyclone moved north towards West Bengal and resulted in no damage to the critical nesting beaches of Odisha.

In Tamil Nadu, the Students' Sea Turtle Conservation

Network (SSTCN) reported that the nesting season had ended prior to the lockdown, however, the clutches relocated to the hatcheries continued to hatch till May. In collaboration with the Tamil Nadu Forest Department, SSTCN members were granted permission from the local authorities to visit the hatchery and ensure that the hatchlings were released in a timely manner.

The west coast of Maharashtra has low-density nesting. Nevertheless, the village of Velas hosts an annual "Turtle Festival", a sea turtle-based ecotourism initiative jointly run by the village *panchayat* (local government) and the Mangrove Foundation of the Maharashtra Forest Department. Since the lockdown led to cancellation of all tourism related activities, the Mangrove Foundation hosted the Turtle Festival on Facebook Live and broadcast hatchling releases every morning and evening for viewers to witness from their homes. However, on 1st June, 2020, the Maharashtra coast was hit by Cyclone Nisarga which caused heavy damage to sheds and other structures used to protect the nesting sites in Velas and other sea turtle nesting beaches in Anjarle, Dabhol, Kelshi etc. Fortunately, there was no damage to the beach, and since the cyclone had occurred after the end of the nesting season, monitoring and ecotourism activities were not been hampered.

With most organisations working from home and online, there was an increase in outreach sessions conducted in the form of webinars, especially on the occasion of World Turtle Day (23rd May 2020). The themes of these webinars varied from understanding sea turtle biology and conservation to the work being conducted in the region and the experiences of sea turtle biologists. These sessions were conducted in vernacular and English and were hosted by a range of news media outlets like the

Mumbai MTB, research centres like the Kalinga CRE and government organisations like the Mangrove Foundation.

On the whole, the lockdown did not have a major impact on any monitoring activities since the nesting season across India was nearing its end. Most organisations and individuals, approved by relevant local Government authorities, were able to continue any required monitoring activities without much disruption. With the reduction in fishing activities and other anthropogenic activities on the beaches during the lockdown, the impact of associated threats to sea turtles and their habitats were considerably lessened, though temporarily.

Literature cited:

Das, K.S. 2020. Undisturbed mass nesting of olive ridleys at Odisha's Rushikulya rookery. *The Hindu* March 25, 2020. <https://www.thehindu.com/sci-tech/energy-and-environment/>

coronavirus-lockdown-undisturbed-mass-nesting-of-olive-ridleys-at-odishas-rushikulya-rookery/article31166566.ece. Accessed on June 11, 2020.

Gill, P. 2020. Endangered olive ridley sea turtles nest in peace at empty Odisha beaches as Coronavirus keeps people in lock down. *Business Insider India* Mar 26, 2020. <https://www.businessinsider.in/science/environment/news/endangered-olive-ridley-sea-turtles-nest-in-peace-at-empty-odisha-beaches-as-coronavirus-keeps-people-in-lock-down/articleshow/74822132.cms>. Accessed on June 11, 2020.

Express News Service. 2020. Lockdown keeps tourists away from Olive Ridley nesting spots in Odisha. *The New Indian Express* May 3, 2020. <https://www.newindianexpress.com/states/odisha/2020/may/03/lockdown-keeps-tourists-away-from-endangered-olive-ridley-nesting-spots-in-odisha-2138586.html>. Accessed on June 11, 2020.

PAKISTAN

MUHAMMAD MOAZZAM# & AISHA HAMERA

WWF-Pakistan, Karachi, Pakistan

#mmoazzamkhan@gmail.com

The COVID-19 pandemic triggered a major lockdown in Pakistan. There have been some positive outcomes for biodiversity and conservation, including local marine turtle populations, from this response. Adjacent to the metropolis city of Karachi in the Sindh Province are two major nesting beaches- Sandspit and Hawksbay- which are usually thronged by large numbers of picnickers. However, the beaches have been deserted since the last week of March 2020 because of the national lockdown. The peak visiting period is usually between March and September, which overlaps with the peak turtle nesting period from July to December (although nesting may occur year-round). Previously, high human presence on these beaches has disturbed nesting turtles by trampling the nests, damaged eggs after opening the nest and leaving it exposed to sun, scavengers and predators, and disrupted the seaward movement of emerged hatchlings by blocking their movement or picking them up and releasing them when the hatchlings are exhausted. The amount of solid waste pollution, which may be an obstacle for nesting turtles and hatchlings, has also reduced during the lockdown. A similar situation has prevailed on other beaches along the Sindh coast and on Astola Island in the Balochistan Province, where security

forces did not allow fishing or tourist boats to visit.

However, the situation is different elsewhere in the Balochistan Province. The number of people visiting Daran Beach at Jiwani substantially increased during the lockdown, due to low compliance with the order for restricted movement, and could have affected sea turtles and hatchlings as it did in Karachi. However, a major portion of Daran beach was extensively eroded by Cyclone Kyarr in late October of 2019, and it has not yet been reestablished by wave and tidal action; no turtles have been reported nesting since November 2019. Therefore, nesting turtles and hatchlings at Daran have not been impacted by the lockdown.

Despite strict control of the Sindh Wildlife Department, a small illegal trade of turtle hatchlings in pet shops, aquaria and the Sunday pet market occurs in Karachi. Hatchlings are removed from the nests along the Karachi and Balochistan coast and are illegally sold in these outlets. Since all markets have been completely closed during the lockdown, no such illegal sales have occurred since the last week of March 2020.

The government imposed a ban on fishing as part of the lockdown along the entire coast of Pakistan since