

STATUS OF SEA TURTLES IN INDIA WITH EMPHASIS ON ANDAMAN AND NICOBAR ISLANDS

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ABSTRACT

Five species of the sea turtles viz. olive ridley, green, hawksbill, leatherback and loggerhead make their habitats along the Indian coast. Except for the Loggerhead *Caretta caretta*, all other four species nest along the Indian coast. Olive ridley is the most common and well known for 'arribadas' or annual mass nesting. The occurrence of four species of sea turtles viz. olive ridley, green, hawksbill and leatherback has been reported in Andaman and Nicobar Islands and among them Green turtle is the most common and nests year around. Nine seagrass species make their habitats along Andaman and Nicobar Islands. The seagrass meadows in Andaman and Nicobar islands are small and their distribution is discontinuous all along the coast. Also, fifty five species of seaweeds have been recorded in Andaman and Nicobar group of Islands. In recent years, the turtles migrating to the Indian waters are on the decline due to habitat disturbance and growing mechanized fishing in inshore waters near nesting beaches. Considering the threat to the sea turtles, all the five species have been given legal protection under schedule I of the Indian Wildlife Protection Act (1972). But concentrated and dedicated efforts with peoples participation is needed to safeguard these turtles.

INTRODUCTION

India is the 7th largest country in the world and 2nd largest in Asia. India has a coastline of about 7,516 kms. In India, sea turtles are considered as the second incarnation of the Hindu God 'Vishnu' and a dedicated temple is located in north Andhra Pradesh state along southeast coast of India. Five of the seven species occur along the coast of India. They are *Lepidochelys olivacea* (olive ridley), *Chelonia mydas* (green turtle), *Eretmochelys imbricata* (hawksbill), *Dermochelys coriacea* (leatherback) and *Caretta caretta* (loggerhead). Out of these five reported species, four species nests along Indian coast. But the loggerhead which has been reported along the Indian coast has not been found to nest. Olive ridley is the most common and well known for 'arribadas' or annual mass nesting along Indian coast. India has three such mass nesting beaches along the Orissa coast and is located in

the northeast coast of India. They are Gahirmatha, Devi river mouth and Rushikulya. Tamil Nadu and Andhra Pradesh coasts are considered as the migratory pathways of olive ridleys for approaching mass nesting beaches in Orissa (Tripathy and Choudhury, 2001). Tamil Nadu coast is known to be the dense nesting ground for olive ridleys next to Gahirmatha coast in Orissa. All the five species are legally protected under Schedule I of the Indian Wildlife (Protection) Act 1972 and listed in Appendix I of Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES). In spite of the legal protection, large turtle mortality occurs along the north east coast due to inshore trawling and gill netting.

STATUS OF SEA TURTLES ALONG THE MAIN LAND

West Bengal

The state (or province) West Bengal is located along the northeast coast of India. It has a coastline of about 220 kms. The state possesses the unique Sundarban mangrove forest which covers around 9,630 km². The Sundarban has been declared as biosphere reserve in 1989. Sundarban is also famous for tigers and interestingly tigers have also been reported as threats to turtles along with inshore trawling, wild boars and feral dogs. In West Bengal, olive ridley, hawksbill and green turtles have been reported and among them olive ridley is the most common. Olive ridley nests along the coast of West Bengal during November to first week of April. Illegal turtle meat trade has been reported in Raidighi, Kakdip and Namkhana in Sundarban area and in Gharichak, Thakurchak, Botipur and Ramnagar in Digha-Sankarpur area (Roychowdhury, 2001). The meat is sold at a price of 0.31 to 0.42 US\$ per kg.

Orissa

This state is located south of West Bengal along the northeast coast of India (Fig.1). Orissa has 480 km. long coast. Four species of sea turtles, olive ridley, hawksbill, green and leatherback occur along this coast. This coast is famous for the annual mass nesting of olive ridley turtles. Many research activities on sea turtles in India have been concentrated along this coast and Kar (2001) has reviewed the research carried out on olive ridleys in Orissa. The other three species are not common. The three major rookeries of olive ridley are Gahirmatha, located at northern Orissa coast, Rushikulya, located about 320 km. south of Gahirmatha and Devi river mouth, located 100 km south of Gahirmatha. Among the three, Gahirmatha is the largest rookery in the world and is a part of Bhitarkanika Wildlife Sanctuary. Normally over 100,000 nesting turtles have been reported every year which sometimes rise to 600,000 nesting turtles (Karthik Ram, 2000). However, the mass nesting got reduced during 1997-98 due to illegal trawling in the nearshore waters of Gahirmatha and other coastal areas of Orissa. Around 30,000 dead turtles off Orissa coast were recorded during 1995-98. The incidental catch due to trawl and gill netting, habitat degradation due to Casuarina plantation and artificial illumination at Rushikulya and Gahirmatha coasts are the detrimental factors (Kar, 2001). The super cyclone in October 1999 has also left much impact on the Orissa coast (Kar, 2001).

Andhra Pradesh

Andhra Pradesh has a coastline of about 1000 km. which extends from Bahuda river in the north near Orissa to the Pulicat lake on the south near Tamil Nadu. Four species have been reported to occur along this coast (Tripathy and Choudhury, 2001). Among the four species olive ridley turtles are common and sporadic nesting has been reported in Kopaskudd in north Andhra Pradesh, Sacramento shoal beach, Krishna river mouth in central Andhra Pradesh and Pennaru river mouth and Sriharikota island in south Andhra Pradesh. Green turtles are reported to nest along Visakhapatnam beach. Hawksbill nesting has been reported along Krishnapatnam basin in south Andhra Pradesh. Peak nesting has been observed in January. The eggs collection by fishermen community near Kapaskudi and Pudimadaka area, killing for meat in some areas, incidental catch, aquaculture and non-human predation are considered the threats along this coast.

Tamil Nadu

The Tamil Nadu state, located at southeast coast of India has 950 Km coastline. Interestingly all 5 species of the sea turtles have been reported. Olive ridley nests sporadically along Tamil Nadu coast and high nesting was observed along Nagapattinam and Chennai coasts. The other turtle nesting areas are the coasts between

Tranquebar and Pazhayaru, Mamallapuram and Chennai, Point Calimere and Nagapattinam and Kanyakumari and Trichendur. In the Kanyakumari to Trichendur stretch, the core nesting area has been identified as between Manapad and Periatthalai (Fig.2), 20 kms. south of Tiruchendur (Bastian Fernando, 1983). Turtle nesting has been reported during December to February and also during April to June. Live turtle trade existed in this coast in 1960s with Sri Lanka. It was estimated that about 3000 to 4000 turtles landed annually between Rameswaram and Mimisal. The green turtle constituted three fourth of the catch (Rajagobalan, 1984). Death or injury due to turtle poisoning has also been reported along Tuticorin coast (Silas and Bastian Fernando, 1984). Turtle meat and blood is believed to cure the piles and is used in some select pockets along Gulf of Mannar area.

Gujarat

Gujarat has the long coastline among the Indian states and runs in to 1600 km. It is located along the northwest coast of India. Olive ridley and green turtles are reported to breed along this coast while leatherback

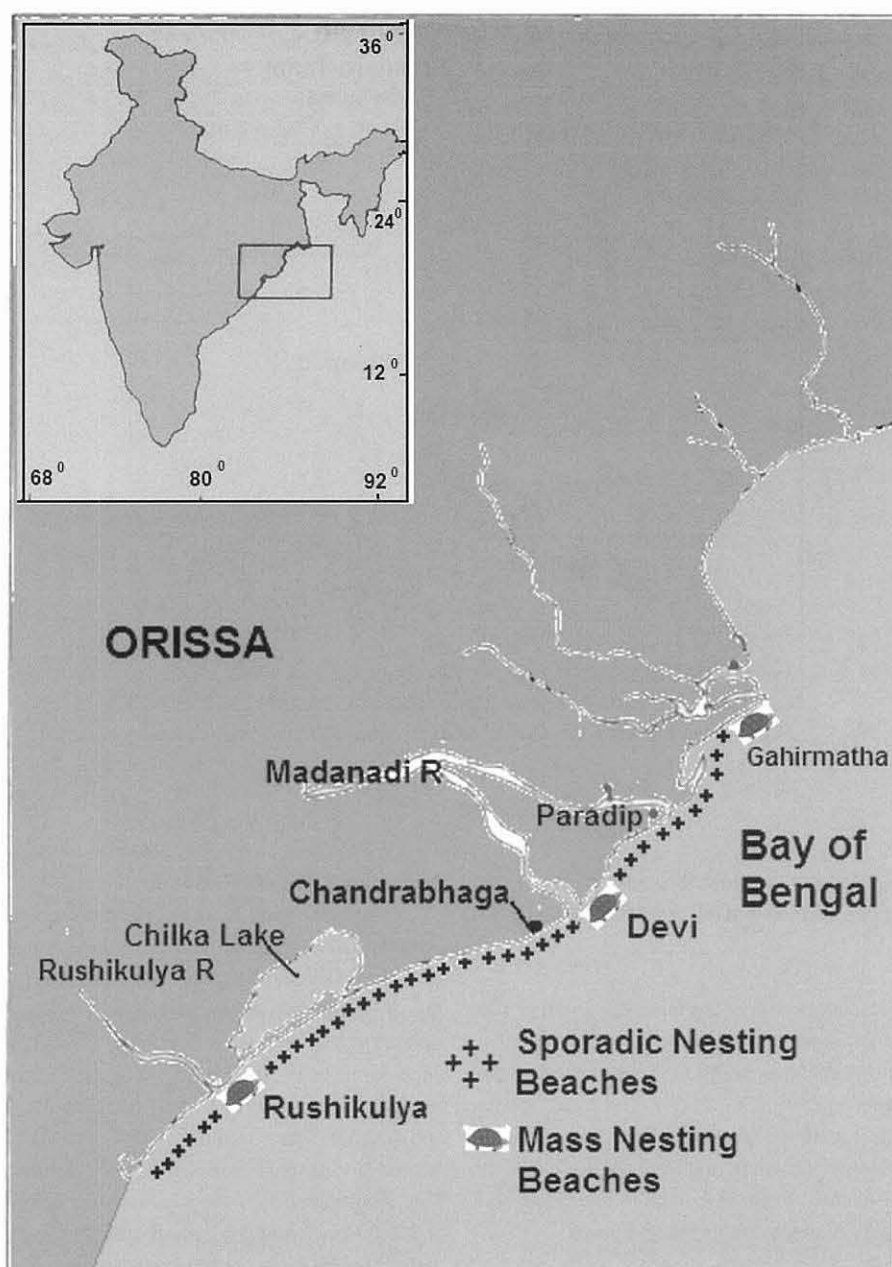


Fig.1 - Map showing the Orissa coast

and hawksbill have been sighted (Bhaskar, 1978). Highest nesting of olive ridley has been reported in Jamnagar followed by green turtle. Olive ridley has also been reported in Kachchh and Bhavnagar districts. Green turtle also occurs in Junagadh district. The habitat loss i.e. beach erosion due to cyclones during 1998 and 1999 resulted in low nesting density. Egg predation by animals and local people and incidental catch in fishing gears like

trawl and gill nets are the major threats to turtles along this coast.

Maharashtra

Maharashtra coast extends to about 700 km. Olive ridley is the common among the four species of turtles that have been reported to occur in this coast. Green turtles are common near Malvan (Giri, 2001). Nesting has

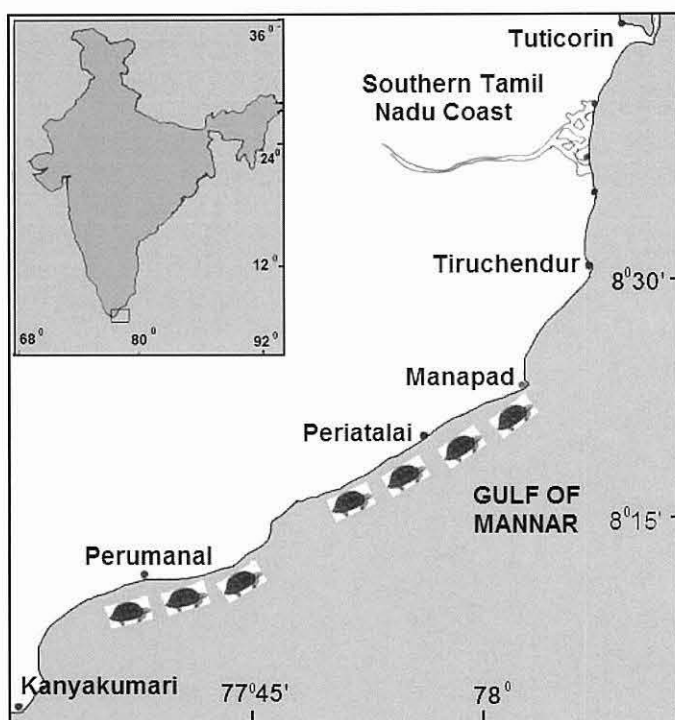


Fig.2 - Map showing the Gulf of Mannar area of Tamil Nadu coast

been reported all along the coast especially in Hareshwar in Rajgad district, Shiroda-Aravali and Motemal.

Goa

Goa is located south of Maharashtra and has 160 km. coastline. Olive ridley is the common turtle. Morjim in north Goa and Galjibag in south Goa are the two main olive ridley nesting sites (Giri, 2001). The local people and the wildlife department jointly manage the turtle nesting beach in Morjim. Querium and Palolem are the other two places of nesting. Incidental catch in trawl nets and egg poaching by humans are the main threats.

STATUS OF SEA TURTLES ALONG THE ISLANDS

Lakshadweep Islands

These islands are located in the Arabian Sea along the west coast of India. Nesting by green, olive ridley and hawksbill turtles have been reported in these islands. Hunting of the Hawksbill for the shell and that of green and olive ridley for fat is the main threatening factors.

Andaman & Nicobar Islands

Andaman and Nicobar Islands is located between 60°N to 140°N and 920°E to 940°E (Fig. 3 and 4). The total land area is about 8249 Km². It is separated by Andaman Sea from South East Asian Coast to the east, Bay of Bengal to the west from the Indian Peninsula and Malacca Strait in the south from Sumatra. Andaman and Nicobar islands is divided into two districts - Andaman and Nicobar. The coastline which is irregular, deeply indented and broken at several points extends to 1926 Kms. Andaman and Nicobar islands has a coral reef area of 953.3 Km² represented by patchy, fringing and barrier reefs. The average rainfall is 300 cm/yr.

Andaman group of islands consist of over 325 islands covering 6408 Km² and only 21 are inhabited. This group of islands is divided into North Andaman, Middle Andaman, South Andaman (including Ritchies Archipelago) and Little Andaman. Nicobar group of islands comprise more than 23 islands covering an area of 1841 Km² and among them 12 islands are inhabited. The Nicobar group of islands has been divided into Car Nicobar, Nancowrie group of islands and Great Nicobar group of islands.

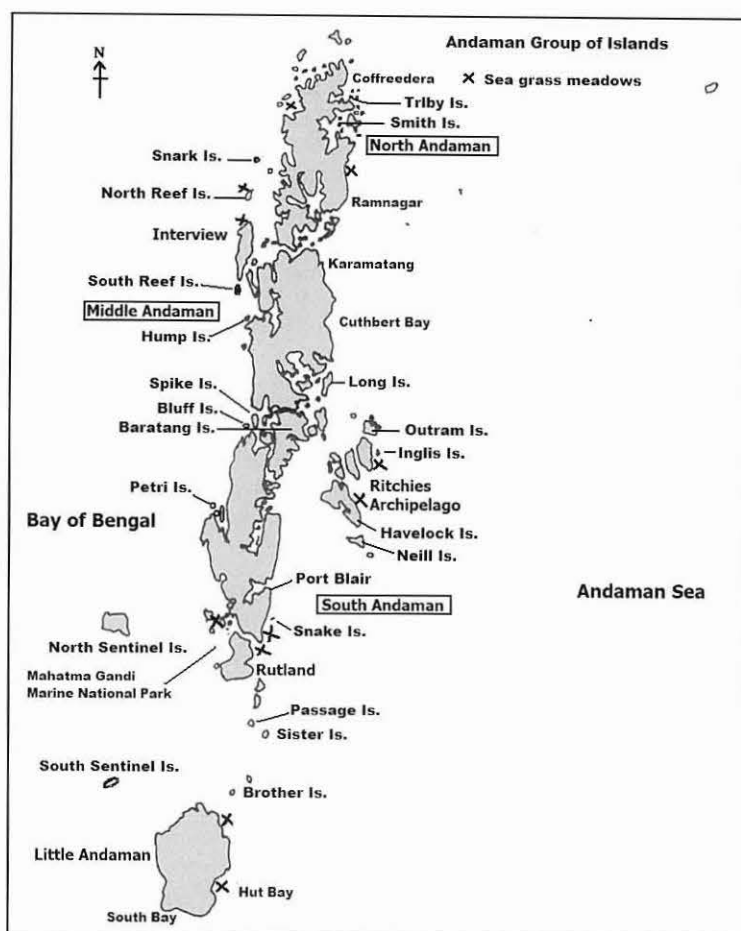


Fig.3 - Map showing Andaman Group of Islands

Seagrass Meadows

Andaman and Nicobar group of islands is unique for sea grass meadows which are small in size and discontinuously distributed (Das, 1996). Fourteen seagrass species are known from the Indian coast (Ramamurthy et al, 1992). Coromandal coast has the rich diversity of seagrass represented by all the 14 species. Nine species of seagrass were recorded from Andaman & Nicobar Islands (Das, 1996). They are *Enhalus acoroides*, *Cymodocea rotundata*, *Cymodocea serrulata*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila ovalis*, *Halophila ovata*, *Syringodium isoetifolium*, *Thalassia hemprichii*. *Syringodium isoetifolium* has been found only in English island and *Thalassia hemprichii* is the most common species. *Chelonia mydas* and *Lepidochelys olivacea* are the frequently encountered sea turtles in sea grass meadows (Das, 1996).

In the Andaman area, seagrass meadows extend from 100m X 300m to 300m X 3000m (Das, 1996). South Andaman is species rich represented by 8 species of seagrass followed by 6 species in Little Andaman and 4 species in North Andaman. Large areas of seagrass cover are found in Havelock, Chidiyatapu and English-Henry Lawrence areas. Among the three, English-Henry Lawrence areas has 80% cover followed by Havelock with 78%.

In Nicobar area seagrass meadows extend from 100m X 500m to 250m X 5000m (Das, 1996). Large areas of seagrass meadows are found in Camorta harbour, Katchal Westbay (Ponda) in Noncowry group of island and Little Nicobar in Great Nicobar area. The Pilomilow south in Great Nicobar area has the highest cover of 69.9% sea grass. The Car Nicobar, Camorata east and Pilomilow South were represented by 2, 9 and

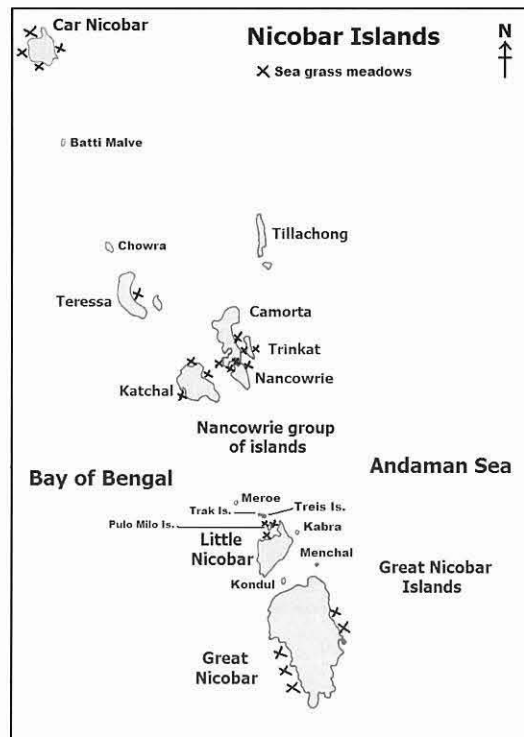


Fig.4 - Map showing the Nicobar Group of Islands.

7 species of seagrass respectively. *Cymodocea rotundata*, *Thalassia hemprichii* are the most common species.

Seaweed Resources

Fifty five seaweed species have been recorded in Andaman and Nicobar islands (Gopinathan and Panigrahy, 1983). They are represented by 16 species belonging to Chlorophyceae, 17 species belonging to Phaeophyceae and 22 species belonging to Rhodophyceae. The alginophytes, *Turbinaria*, *Padina* and *Sargassum* are the dominant species. The agarophytes, *Gracilaria* sp., *Gelidiella acerosa* and *Gelidium* sp. are poorly represented.

Turtles of Andaman and Nicobar islands

Chelonia mydas, *Eretmochelys imbricata*, *Dermochelys coriacea* and *Lepidochelys olivacea* occur along the Andaman and Nicobar Islands (Bhaskar, 1979 and Bhaskar and Rao, 1992). Among the four species, green turtle is the most common. In 1987, 94 islands in the Andamans have been notified as sanctuaries which include 30 islands as confirmed sea turtle nesting sites (Bhaskar, 1993). Twenty four nesting sites have

been reported in Nicobar group of islands. Andrews et al (2001) have studied the status and distribution of marine turtles around Andaman and Nicobar Archipelago.

The leatherback turtle nests in twenty three sites in Andaman and Nicobar islands and mouths of Galathea, Alexandria and Dagmar rivers are the popular leatherback nesting sites in Great Nicobar Island (Bhaskar, 1979). All four species occur along the southeast coast of Great Nicobar island (Sivakumar, 2002). The leatherbacks tagged in Australia have also been observed in Galathea beach on the southeast coast of Great Nicobar Island (Andrews, 2000).

The reports indicate twenty seven hawksbill nesting sites in Andaman group, twelve sites in Nicobar group and three in Little Andaman groups. Most important hawksbill nesting sites include south reef Island in Middle Andaman and North Brother and Snake Islands in the South Andaman (Bhaskar, 1993). Hawksbill feeding grounds are reported all around Andaman and Nicobar Islands. The peak nesting season is from September to October. Hawksbill is the most commonly hunted turtle for meat and eggs. Incidental catch is also one of the threats to this turtle. Poaching by the indigenous people

is considered the major threat especially in Great Nicobar Island area.

Green turtle is the most common species in Andaman and Nicobar Islands. They nest year around (Sivakumar, 2002) with main nesting season from June to November with peak in July. Thirty seven green turtle nesting sites have been identified in Andamans including Little Andaman and twelve sites have been reported in Nicobar group of Islands (Bhaskar, 1993). The main nesting sites include three nesting sites on the east coast of Baratang Island in Horsford, Rawlen's and Grieve Bays, north of Outram Island, Long and North Passage Islands and Petri and Bluff Islands along West coast, Robert Bay in Middle Andaman Islands, and South Sentinel Island which is an important nesting ground. Poaching for meat and eggs and sand mining are the major threat to these turtles.

Olive ridleys have been reported to nest in twelve sites along the east coast Andaman Islands and three sites along Nicobar group of Islands. The nesting period is during October to April with peak from January to February. The main nesting sites in Andaman Islands are Madhuban in South Andaman, Cuthbert Bay (major site) and Karamatang in Middle Andaman, Ramnagar and Coffeeder beaches in North Andaman and Smith, Trlby and Hump Islands, 3 beaches on the West coast of Little Andaman Islands. Great Nicobar is the major location for Olive ridleys with four nesting beaches in Nicobar group of Islands followed by Teressa Island (Bhaskar, 1993).

IN RECENT YEARS

The sea turtles migrating to Indian waters are on the decline. The incidental catch is more along the east coast than the west coast in the main land. This may be due to the fact that olive ridleys migrate in large numbers along the east coast towards Orissa for mass nesting. A survey for six months in 1994 along the 480 kms. Orissa coast indicated 5000 dead olive ridley turtles. Also, the increasing construction activities in the beaches, Casuarina plantation and artificial illumination are detrimental to the turtles. Apart from these factors, the predation by wild pigs, jackals and feral dogs and beach erosion are the other threats to the turtle population. In Andaman and Nicobar Islands, poaching, sand mining, tourism and predation and incidental catch are the main threats. The important nesting beach in Rutland Island has been lost in 1980s due to sand mining. The use of turtle excluder device (TED) in trawl nets has not been fully implemented. The incidental catch due to trawl and gill netting is high along Orissa coast. Though the turtles are protected under the Indian Wildlife (Protection) Act 1972, it is pathetic to note that large numbers of turtles die every year due incidental catch or injury sustained through trawl and gill net fishing. So, awareness creation among the coastal people, their participation in conservation measures and determination on the part of government machinery are considered vital for the protection of the deteriorating turtle population.

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