

Operation Kachhapa: An NGO Initiative for Sea Turtle Conservation in Orissa

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From October to May each year, large numbers of olive ridley turtles congregate in the offshore waters of Orissa on the east coast of India. Their mass nesting occurs primarily at three beaches—the Nasi islands inside Gahirmatha marine sanctuary, and the mouths of the Devi and Rushikulya rivers (Pandav et al 1994). During the early 1990s, conservationists and biologists started to observe an increasing number of dead turtles being washed ashore along the Orissa coast. Fishing nets, with bodies of turtles entangled in them, were also found washed up on the beaches. By the late 1990s, 15,000 turtles were being killed every year, mostly breeding females (Pandav 2000). This is perhaps the highest death toll of an endangered species in the world today.

A chain of factors has led to the mass mortality of turtles—in particular a surge in mechanised fishing, unsustainable fishing practices, and deliberate violations of the law. All of these problems are compounded by poor enforcement by the state authorities. An estimated 16,000 fishing boats operate along the Orissa coast, of which about 8,000 are large mechanised fishing trawlers and gill-netters (Operation Kachhapa, unpubl. data). Unfortunately the peak fishing season coincides with the breeding season of the turtles. Sea turtles are air breathers and drown when they get trapped and entangled in the trawler and gill nets. They are the victims—and not the targets—of mechanised fishing practices.

With the aim of preventing these tragic deaths, the Wildlife Protection Society of India launched Operation Kachhapa in 1988 (*kachhapa*=turtle in Oriya and Sanskrit). The programme is run in close cooperation with the Wildlife Society of Orissa and the Orissa forest department. Operation Kachhapa (OpK) has since successfully built a public image for sea turtle conservation in Orissa, and helped bring national and

international attention and concern to the problem. The objective of OpK is to reduce turtle mortality and safeguard the future of the species by concentrating on three main activities: (i) the prevention of turtle mortality by improving patrolling in no fishing zones and the protection of nesting sites, (ii) supporting legal action on turtle conservation issues and fishing law violations, and (iii) building up public support and awareness of sea turtle conservation issues, including sensitising the media, enforcement agencies and the judiciary about the large-scale turtle deaths (see Shanker and Mohanty 1999, Wright et al 2001a,b for reviews of OpK's activities).

Activities conducted by Operation Kachhapa

SUPPORT TO GOVERNMENT ENFORCEMENT

Since enforcement of fisheries laws ultimately lies with government authorities, OpK has worked to cooperate with and assist the Government of Orissa. This has been done by hiring patrol boats and donating fuel and equipment for patrol staff, and by serving as a coordinator for the various agencies involved in sea turtle protection. These include the Orissa forest department, the fisheries department, the coast guard, the Ministry of Environment and Forests, the Defence Research and Development Organisation (DRDO), the Marine Products Export Development Authority, the Chilika Development Authority, the state and central government turtle committees, and district administrations.

There are two pieces of legislation that are important for protecting sea turtles and curbing destructive fishing practices. The first is the Indian WildLife (Protection) Act, 1972 where the olive ridley turtle is listed under Schedule I and has the highest degree of protection under the law. The second is the Orissa Marine Fisheries Regulation Act, 1982 (OMFRA), which along with the Orissa Marine Fisheries Regulation Rules, 1983 sets sustainable fishing standards, limiting both the number of mechanised fishing boats and the areas open to them for fishing. Only non-mechanised traditional fishing boats are allowed to operate without restrictions. The law expressly prohibits any form of mechanised fishing within 5 km of the shoreline throughout the entire coastline of Orissa. From 5–10 km from the shoreline, only mechanised fishing boats with a length of less than 15 metres or weight of less than 25 gross tonnes are permitted to fish, while all mechanised boats larger than this are only permitted to fish beyond 10 km from the shoreline. The use of turtle excluder devices (TEDs) is also mandatory under Section 29B of OMFRA. Additionally, in December 2000, the Government of Orissa also prohibited mechanised fishing within 20 km from the high tide line along a 150 km stretch—from the mouth of the Jatadhar River to the mouth of the Devi River, and from the mouth of Chilika Lake to the mouth of the Rushikulya River—between 1 January and 31 May each year.

These regulations were promulgated for the long-term sustainability of marine life in Orissa and to protect the rights and livelihood of traditional fishermen using traditional fishing practices. However, these laws were openly flouted until the authorities were pressurised by Operation Kachhapa. Even now enforcement is poor and virtually no action has been taken to implement the use of TEDs. Furthermore, the government



has issued 6,000 fishing licenses—to about 900 trawlers and 5,000 gill-netters—against the official OMFRA quota of 1,080 (1,000 for boats up to 25 metres in length, and 80 for larger ones). OpK exposed this discrepancy in the license figures in an affidavit to the Orissa High Court in March 2002.

During the 1998–99 turtle season, OpK hired a sea-going patrol boat, for 102 days, for the forest department to patrol the Gahirmatha marine sanctuary and adjoining high-density turtle areas. The programme also provided a support boat to the authorities for 140 days, along with fuel for both the boats, medical requirements for the crew, and basic equipment such as life jackets, life buoys, blankets, mosquito nets, groundsheets and torches. Additionally, a spotting scope, GPS unit, spotlight, nightscope binoculars and regular binoculars were supplied for the patrol vessels. During the first season of OpK's programme, 61 trawlers and gill netters were seized by the state authorities for illegally operating within the Gahirmatha marine sanctuary and charged under the Indian Wildlife (Protection) Act. This was the first time large-scale prosecutions of this kind had been made under the Act. However, a number of problems were also encountered, including the reluctance of trawler-owners (and their union) to hire boats to OpK for patrolling. In January 1999, OpK's patrol boat was rammed (intentionally or unintentionally) while minor repairs were being carried out. While the boat was out of service, there was a spate of illegal fishing activity.

In October 1999, a massive cyclone devastated the Orissa coast. OpK immediately put its resources and staff into community relief efforts. These efforts greatly helped strengthen the relationship between OpK and local fishing communities, particularly in the Devi and Kadua river regions. Due to the government relief work, enforcement staff was limited for this turtle season. OpK hired a patrol trawler for a total of 57 days from mid-January to mid-March. The trawler was used briefly in the marine sanctuary before being shifted to Devi river mouth, where a smaller support boat was also provided to transport patrol personnel. Other assistance from OpK included a four-wheel-drive vehicle that was hired for the Puri forest division to assist in enforcement operations. The Rajnagar forest division utilised funds from the central government to hire a patrol boat that was based at Agarnasi. However, since officers were engaged in both cyclone relief and the state elections that were held in February 2000, there were long periods when no patrolling occurred. The forest department and the coast guard seized a total of 25 fishing boats. Most of these were from the state of Andhra Pradesh and one was from Myanmar.

OpK hired a patrol trawler for four months during the 2000–01 turtle season. The boat was based at the mouth of the Devi river and used to patrol the coastal waters between Paradeep and Rushikulya, using staff from the Puri forest division and local police personnel. Apart from fuel, equipment (including wireless communication), and night patrol incentive awards, a small support boat was also provided by OpK to transport patrol personnel. The coast guard patrolled the marine sanctuary (which covers 40 km of the coastline) until February, when the Rajnagar wildlife division took over using their new patrol boat. A total of 31 fishing trawlers and gill-netters were seized between November and March. In addition, the coast guard seized 61 fishing boats that were

operating illegally in the area. Hundreds more were scared away by the presence of the patrol boats.

In the 2001–02 turtle season, OpK hired and provided fuel and operational support for two sea-going patrol boats (along with a smaller support boat). One was based at Gahirmatha (and used for 75 days) and the other at the mouth of the Devi river (and used for 59 days). The authorities seized a record number of 120 trawlers and gill-netters that were operating within the prohibited zone. Of these, 43 were seized at Gahirmatha with the help of the OpK patrol boat, which was also used to deliver boats seized by the coast guard. The Devi river patrol boat was withdrawn after serious threats to project staff, crew members and the forest staff by a group of trawler-owners in February. The local police had been reassigned to election duty at the time and could not offer assistance. Such problems, along with the sheer number of boats and the length of the coastline that needed to be patrolled, make enforcement a daunting task. Illegal mechanised fishing and turtle mortality outside the marine sanctuary remained high. Due to tension between India and Pakistan, the coast guard was busy in other coastal areas for the first half of the season and unable to carry out regular patrols along the Orissa coast.

The fisheries department provided three patrol boats, two of which were sea-going, to the Orissa forest department for the 2002–03 turtle season. OpK field staff however accompanied the forest staff on a number of sea patrols. The coast guard also increased its activities along the coast this season and introduced shallow water patrols using inflatable boats. The authorities seized about 40 fishing vessels within the marine sanctuary in December 2002 and January 2003. Many of the illegal mechanised fishing boats come from the states of Andhra Pradesh and West Bengal and one or two every year come from as far as Bangladesh, Thailand and Myanmar

Turtle conservation efforts in Orissa received a major setback in February 2003, when three forest guards were abducted by crew members of two gill-netters that had been seized inside the marine sanctuary for illegal fishing. One of the forest guards, Shyam Singh, resisted and was pushed overboard. Like many of the forest guards, he could not swim. His body was washed ashore on Babubali Island the next day. OpK immediately provided funds and support for the funeral arrangements and along with three other NGOs, made an *ex gratia* payment to his family. Ten people involved in the murder have since been arrested. This was the first fatal attack on forest staff. However there have been a number of assaults including an attack on a forest guard who was guarding the new turtle nesting site near Pentha village in March 1999. He received serious head injuries when he was attacked by about a hundred fishermen who had earlier been caught setting illegal zero-mesh nets for prawn seedlings.

MONITORING AND RESEARCH

Since 1998–99, OpK has supported field camps on the Orissa coast to monitor turtle mortality and nesting (Table 1). During the 1998–99 turtle season, OpK supported three additional camps for WII turtle biologists at Agarnasi, Chinchiri and Rushikuya. Two research assistants and 17 field assistants were also hired, and a boat was provided for



the Agarnasi camp. Financial assistance was provided to Wildlife Institute of India (WII) scientists to attend the 19th Annual Symposium of Sea Turtle Biology and Conservation in the USA to present the conservation scenario in Orissa and garner international support.

Table 1. Monitoring of the Orissa coast by Operation Kachhapa.

Year	No. of camps	Location of camps	Coastline covered	Number of dead turtles
1998-99*	5	Nasi, Chinchiri, Devi, Chilika, Rushikulya	240 km	13,602
1999-00**				10,247
2000-01	2	Devi and Rushikulya	240 km	16,799
2001-02	5	Devi, Kadua, Chilika, Chandrabagha, Rushikulya	240 km (+Balasore and Bhadrak)	11,593 [#]
2002-03***	4	Devi, Jatadhar, Chilika (new and old mouth), Rushikulya,		7,853 [#]

* collaboratively between WII and OpK.

** mortality between Chinchiri and Nasi not verified.

*** up to the end of March 2003.

[#] does not include mortality in the Gahirmatha marine sanctuary (35 km) which is estimated to be 4,000 in 2001-02, and 3,000 in 2002-03 (DFO, Rajnagar, pers. comm.).

During the 1999-2000 season, OpK field assistants counted 10,247 dead turtles, down from 13,602 turtles in 1998-99. They were unable, however, to verify the government counts in the important area between Nasi and Chinchiri. In the same year, OpK supported a study on the distribution of olive ridleys in the offshore waters of Gahirmatha (Ram 2000a,b). Ram (2000b) reported that the distribution of nesting females is restricted to a reproductive patch of 57 sq km, within a distance of 5 km from the coast of Gahirmatha. Travel support was also given for WII scientists to attend the 20th sea turtle symposium in the USA, to present a paper (Wright et al 2001) and to generate international support for sea turtle conservation in Orissa.

Turtle mortality reached an all time high of 16,799 in the 2000-01 season. OpK staff carried out counts every two weeks along 240 km of the coastline, and increased protection and trawler monitoring efforts outside the Gahirmatha marine sanctuary. In December 2000, field camps were set up at Devi river mouth and at Rushikulya, with six OpK field assistants, to monitor turtle mortality, nesting activity, disturbance along the beaches and illegal trawler movement. The camps were operational until June 2001.

OpK set up five field camps in the 2001-02 season; at the mouths of the Devi river and Kadua river, and at Chandrabhaga, Chilika new mouth, and Rushikulya (Table 2). For the first time, a turtle mortality count was conducted north of the Dhamra River, covering the beaches of Bhadrak and Balasore districts. The field assistants counted 350 dead turtles along this stretch, providing evidence of turtle activity north of the site of the proposed new port at Dhamra.

Table 2. Dead turtles counted along the Orissa coast from December 2001 to March 2002.

	Paradeep– Devi river mouth			Devi – Kadua river mouth			Kadua– Arakhuda			Arakhakuda– Rushikulya			Monthly Total			
	M	F	UK	M	F	UK	M	F	UK	M	F	UK	M	F	UK	
Dec '01	469	476	272	88	91	44	114	16	411	218	71	29	889	654	756	2,299
Jan '02	219	1,023	94	462	1,921	198	306	781	235	125	63	36	1,112	3,788	563	5,463
Feb '02	42	228	23	42	618	19	197	230	70	224	262	161	505	1,338	273	2,116
Mar '02	3	127	25	24	704	0	24	141	30	157	395	85	208	1,367	140	1,715
Area	733	1,854	414	616	3,334	261	641	1,168	746	724	791	311	2,714	7,147	1,732	11,593
Total	3,001			4,211			2,555			1,826						

* - The above figures exclude the Gahirmatha marine sanctuary where dead turtles have been counted by the Rajnagar WL division (~4000, DFO Rajnagar, pers. comm.)

Four field camps were established in the 2002–03 turtle season; at the mouths of the Devi and Jatadhar rivers, at Rushikulya, and at the new mouth at Chilika. An additional camp was set up at the old mouth of the Chilika at Arakhakuda after significant nesting was reported there. OpK field staff continued to assist the forest department in monitoring turtle mortality (Table 3).

Table 3. Dead turtles counted along the Orissa coast from November 2002 to April 2003.

	Paradeep– Devi river mouth			Devi– Kadua river mouth			Kadua– to Arakhuda			Arakhakuda– Rushikulya			Rushikulya– Bahuda river mouth			Monthly Total			
	M	F	UK	M	F	UK	M	F	UK	M	F	UK	M	F	UK	M	F	UK	
Nov '02	55	99	13	12	16	3	20	18	11	10	26	2				97	159	29	285
Dec '02	379	151	105	168	130	45	170	74	94	472	90	62				1,189	445	306	1,940
Jan '03	341	163	81	257	237	36	114	76	68	243	145	51	254	144	173	1,209	765	409	2,383
Feb '03	252	411	76	151	202	23	66	52	80	85	200	116	92	49	21	646	914	316	1,876
Mar '03	3	14	2	4	88	1	58	76	57	32	120	43	38	53	11	135	351	114	600
Apr '03					766	3											766	3	769
Area	1,030	838	277	592	1,439	111	428	296	310	842	581	274	384	246	205	3,276	3,400	1,177	7,853
Total	2145			2142			1034			1697			835						

* - The above figures exclude the Gahirmatha marine sanctuary where dead turtles have been counted by the Rajnagar WL division (~ 3000, DFO Rajnagar, pers. comm.)

Up to the end of March 2003, 7,074 dead turtles had been counted along the coast. The OpK field staff also kept daily records of sightings of illegal trawlers and gill-netters operating in the prohibited zone near the nesting sites at Devi river mouth and Rushikulya. In January 2003, 269 vessels were sighted near the Devi River, and 53 vessels near Rushikulya. In February 2003, 943 vessels were sighted near Devi and 176 vessels near Rushikulya. In March 2003, 801 vessels were sighted near Devi (the highest count was 259 illegal mechanised boats on 24 March 2003) and 83 vessels were sighted near



Rushikulya. Illegal night fishing by trawlers was also prevalent. All details were passed on to the authorities, urging them to curb illegal fishing and enhance the patrols.

In recent years, the Rajnagar wildlife division has set up field camps and conducted turtle mortality counts along the coast of the Gahirmatha marine sanctuary. OpK has monitored the coast from Paradeep to Sonapur, at the Andhra Pradesh border. In 2001–02, a mortality count was also done along the Balasore and Bhadrak coasts.

PROTECTION OF NEST SITES

Despite the fact that turtles were recorded congregating and mating off shore, there was no mass nesting on the Orissa coast during 1997–98. However, during OpK's first year of activity, about 180,000 olive ridleys nested on Nasi I and II islands near Gahirmatha from 25–31 March 1999 (Shanker et al 2004). Although many of the eggs were washed away during high tide in early April, the remaining eggs hatched between 12–17 May 1999. A few thousand turtles also nested at Pentha beach (about 27 km from Gahirmatha) and there was sporadic nesting at Rushikulya.

There was mass nesting at three sites along the coast between 13–24 March 2000—at the islands of Nasi I, Nasi II, Babubali in Gahirmatha, and at the mouths of the Kadua and Devi rivers. During 2001, nesting was recorded on Nasi II and Rushikulya in February and March. At Rushikulya, OpK field assistants and ten nest protection watchers (hired locally) worked in close cooperation with state government personnel to monitor and protect the nests. OpK field staff rescued thousands of hatchlings that had been disoriented by artificial lights from the nearby highway and become entangled in the thick grass and reeds, and released them into the sea. Over 5,000 turtles nested again at Rushikulya in April 2001.

The turtles failed to mass-nest during the 2001–02 season and only sporadic nesting occurred at Rushikulya and the Devi river mouth. Mass nesting occurred at Rushikulya in March 2003, and significant nesting was also recorded at Pentha beach within the marine sanctuary. OpK's camp at Rushikulya assisted the forest department in counting the nesting turtles as well as protecting the sites from predators such as village dogs, jackals, crows, and gulls. The field staff noticed that a number of the nesting females had been tagged in earlier years in Gahirmatha. In April, 1.2 km of netting (jointly funded by OpK and the forest department) was erected to prevent hatchlings from moving towards artificial lights. OpK engaged extra human resources once the hatchlings began to emerge on 25 April 2003.

Rushikulya is the only accessible mass-nesting site and thanks to media coverage, there was once again an influx of local tourists to see the nesting turtles. Government personnel, volunteers and OpK staff were involved in controlling the crowds to prevent them from disturbing the turtles and their nests.

OpK has also lobbied the state and central governments over a number of issues concerning the fate of the turtles. These included an ammonia gas leak in November 2000 from the Oswal fertiliser factory at Paradeep. The leak affected more than 42 villages of Rajnagar and Kharnasi districts and some of the mangroves along the Mahanadi coast. After intense lobbying, the state government finally ordered the closure of the

factory in May 2002, and all operations there have now ceased. OpK has also strongly opposed a number of proposed irrigation canals originating from the Samal barrage as they would reduce the flow of water in the Brahmani River in the Bhitarkanika estuary.

Another major threat to the olive ridleys is artificial lighting. Turtles usually nest at night and lights are known to disturb them. Turtle hatchlings are also severely disoriented by even faint illumination, and lights near the nesting beaches affect their chances of survival. The DRDO installation at Outer Wheeler Island, which is adjacent to the Nasi II mass-nesting beach at Gahirmatha, has large artificial lights throughout the night, contrary to an explicit undertaking that was given by the defence advisor to DRDO a few years ago. The turtle nesting beach at Rushikulya is also threatened by artificial lights from the Jayshree chemical plant, and the street and construction lights of the nearby national highway.

Fortunately, most nesting sites are remote and inaccessible. However, there is heavy predation of nests by jackals and village dogs at the Rushikulya and Devi river nesting sites. Another serious problem is the extensive *Casuarina* plantations that have been established by the forest department in an uninformed attempt at cyclone protection. Not only is this ineffective in terms of prevention of erosion, it is also a major impediment to turtle nesting. OpK has repeatedly informed the forest department about the negative impact of *Casuarina* plantations and the issue has been raised in a petition before the Central Empowered Committee.

TRADITIONAL FISHER FOLK

Turtle conservation along the Orissa coast is inextricably linked to sustainable fishing practices. Large-scale mechanised fishing has not only impacted the breeding turtle population, but also adversely affected the traditional fishermen. The OpK programme has found that the traditional fishermen on the coast of Orissa are surprisingly ignorant of their rights, and of the government fishing regulations that have been established to protect their livelihood. A number of meetings have been held with local fishing communities to discuss these issues and increase awareness of turtle conservation. The fishermen say that not only is their daily catch decreasing rapidly, but their nets are often torn and destroyed by the propellers of the larger boats. In 2001, after an OpK meeting at Agasti-Nuagaon, every fisherman in the village (80 in all) signed a petition complaining about the lack of implementation of the fishing laws. The petition was submitted to the director of the fisheries department. The loss of income by traditional fishermen has meant that many of them have turned to the illegal practice of casting zero-mesh nets along the beaches and river mouths for shrimp seedlings. These are purchased by traders who transport the seedlings to prawn farms in neighbouring states. Very little action has been taken by the authorities to stop this destructive, illegal practice.

An awareness programme was developed by OpK to educate local fishing communities about laws that exist to protect their livelihood, and of the ecological role of the sea turtles, using 'wandering minstrels' who travel along the coast performing in fishing villages using traditional methods like song, dance, and story telling (see Mohanty and Wright 2001). A 'Turtle Song' was composed and scripted in Oriya by Dwivedi and



Mohapatra (Anon 2001) and two minstrels were employed to perform in fishing villages along the coast. The backdrop to their performances are four large hand-painted scrolls depicting: (i) live turtles nesting on a beach, (ii) dead turtles with a mechanised fishing trawler, (iii) an image of Lord Vishnu in the turtle *avatar* (=incarnation), and (iv) a country fishing boat with a trawler in the background showing the prohibited fishing zone.

Using a music organ and a *dholak* (=a traditional drum) the minstrels performed in 168 coastal villages between 2000–2002 in the districts of Ganjam, Puri, Khurda and Jagatsinghpur. At each fishing village, they sang the turtle song and displayed the scrolls and had long discussions with the people, answering questions about sea turtles and the fishermen's rights. The scrolls were a major attraction in the villages and the fisher children took particular delight in the catchy turtle song. This relatively simple and inexpensive initiative has proved to be an effective way of spreading awareness. The minstrels even had the courage to perform at the trawler port at Paradeep, surrounded by a large hostile crowd of more than 1,000 people. Ironically, an OpK poster was even posted in the office of the Trawler Owners' Association.

LEGAL INITIATIVES

Operation Kachhapa supports a number of legal initiatives related to turtle conservation. These include a public interest litigation (PIL) in the High Court of Orissa regarding encroachment and illegal prawn farms in Bhitarkanika National Park and the olive ridley. The case was originally disposed of in May 1998; among other instructions, the court directed the authorities to evict encroachers and remove illegal prawn farms (which cover an area of 8,500 acres), to adopt turtle-friendly fishing practices by the use of turtle excluder devices (TEDs), and to curtail illegal mechanised trawling and gill-netting in the restricted zone. Unfortunately the state government carried out none of the directives. A second petition was then filed by OpK pointing out the lack of compliance of the court's earlier directives. In 2001, OpK's lawyer from Delhi appeared in nine hearings at the Orissa High Court in order to present examples to the court of inaction by the authorities.

Acting on directives issued by the court as a result of the PIL, the forest department has demolished a large number of illegal aquaculture farms in the mangrove forests of the Mahanadi Delta, including 1,000 acres in August 2001. However, these farms have been reconstructed. Part of the problem is that encroachers often file counter claims against the forest staff. In one such instance in 2002, prawn farmers filed a case of harassment against forest officers of the Rajnagar wildlife division. In this and a number of other occasions, OpK provided legal aid to the forest staff. Under pressure from the PIL, the fisheries department was also compelled to cancel some fishing licenses of trawlers that were not using TEDs. However thousands more continue to operate along the coast.

OpK has filed objections to a proposed crude oil terminal off Rushikulya, which would result in large pipes passing directly across the turtle mass nesting beach and the installation of powerful illumination. The Orissa government has also announced plans to construct a harbour near the mouth of the Dhamra River to service large cargo ships.

The site is directly opposite Bhitarkanika National Park and close to the turtle mass-nesting site at Nasi I and II islands in Gahirmatha. In OpK's petition objecting to the proposed port, the High Court was provided with detailed maps and reports showing the close proximity of Dhamra to the major turtle-breeding and mass-nesting sites at Gahirmatha. A scientific review of the project's Environmental Impact Assessment—which was conducted by a consultant for the port construction company and did not cover the impact on sea turtles—was also provided to the court. The court has been requested to order a scientific study to assess the full effect of the proposed port on the breeding and nesting of sea turtles. The Dhamra project receives the highest level of political support and a lot of tension has surrounded this case, of which OpK is the most vocal opponent.

The judiciary in Orissa has been extremely supportive of efforts to protect the state's wildlife and environment. On 7 March 2003, the High Court passed a strongly worded order stating that 'forest wealth and ocean wealth are allowed to be looted and destroyed' and that 'steps taken by the State are half-hearted'. The court ordered the state government to remove encroachments on a 'war footing', penalise officials who had not prevented encroachments in their areas, and to request the central government for manpower if necessary.

The Supreme Court of India set up a Central Empowered Committee (CEC) in September 2002 to look into and speedily dispose of issues concerning illegal encroachment in protected areas and wildlife conservation. Using detailed information provided by OpK, a petition was filed before the CEC in New Delhi. The petition asked the Orissa government to enforce the fishing limits and the compulsory use of TEDs set by OMFRA, to protect nesting beaches from *Casuarina* plantations, and to pass any other orders for the protection of sea turtles. The CEC has taken a keen interest in the case. It has issued interim directions ordering the Orissa government to set up turtle protection camps, to hire boats for patrolling, and to provide armed police support to the fisheries and forest departments for patrols. When the Orissa government gave a written statement in March 2003 stating that it had complied with all the directions, OpK provided the CEC with current information to show that most of the orders had not in fact been followed. The petition is still being heard.

PUBLIC AWARENESS

At the start of the project in 1998, very little information on sea turtles was publicly known, either about their mass mortality or of wildlife laws protecting them. A major objective of OpK has therefore been to create public awareness and support to protect ridleys. It has also been necessary to provide lawmakers and enforcers in Orissa with accurate and timely information. Considerable interest has been generated and the plight of the sea turtles in Orissa has received immense support and coverage from the print and TV media. National and international TV crews—including Star TV, BBC, National Geographic, Doordarshan, Zee TV, Aaj Tak and ETV—have made field trips with OpK's project coordinator to document mating congregations, mass nesting and large-scale deaths. This has led to a growing level of public concern and frequent questions in the state assembly and in the Indian parliament in New Delhi.



To increase awareness among decision-makers, OpK's project coordinator regularly meets and lobbies with ministers, members of the legislative assembly and senior officers about problems related to sea turtle conservation and the protection measures that need to be implemented. OpK personnel have also assisted the authorities in TED trials and were involved in the Sea Turtle Project's workshops in 2001 and 2002, and on the development of a National Sea Turtle Conservation Action Plan.

During the 1998–99 turtle season, OpK printed 2,000 posters in Oriya, which were posted at all the important fishing villages and harbours along the Orissa coast. One thousand car stickers (in English and Oriya) were widely circulated and terracotta turtle paperweights were given out to the press and government officers. OpK has also printed and distributed T-shirts and caps with a turtle conservation message in fishing villages, and to enforcement personnel. In 2001, OpK also placed newspaper advertisements about the turtles' plight and commissioned a billboard on the Bhubaneswar–Cuttack highway. In 2001–02, three large billboards carrying turtle conservation messages were put up in Bhubaneswar, on National Highway 5, and on the Bhubaneswar–Puri road. Another large billboard was commissioned in 2003.

OpK's sea turtle interpretation centre was established in 2002 at Bhubaneswar. The centre is a resource and education base with displays of photographs, posters, life size models, equipment for slide shows and films, and a small library with books and journals on marine life. The centre also hosts illustrated talks, quiz competitions and theatre programmes for school children and local fishing communities.

In March 2003, a state-level quiz was held on sea turtles for school children at Bhubaneswar. Another quiz for college students was held in May 2003. Five large rallies were also organised by OpK in March and May 2003 for local students in the Devi river and Rushikulya area (from Balabhadrapur UGM school, Papira prathamika vidyalaya, the Purunabandha primary school and the Gokharkuda primary and upper primary schools) to spread the word on threats to olive ridleys. The students first learnt about the subject and then took an oath to spread awareness about sea turtles in their communities. They also visited a number of villages shouting slogans and carrying placards, and handed out flyers with messages to protect the turtles and put up posters at various locations within the villages. The students, along with some of the villagers and fishermen, were given woven sacking bags with an image of a turtle and a message to save them. Two meetings were also held at Kantiagada and Podampeta primary schools in the Rushikulya area.

In November 2002, a film *The Ridley's Last Stand*, by Shekar Dattatri, was premiered in New Delhi to government officials and turtle enthusiasts. This was followed by a panel discussion. OpK has since distributed 500 copies of a 17-minute version of the film on CD in order to raise awareness on the issue.

OpK has supported *Kachhapa* since the first issue was published in 1999. The newsletter contains research articles, information and updates on sea turtle conservation in South Asia and the Indian Ocean, with a focus on the Indian subcontinent. OpK also supports the website www.kachhapa.org. The site includes the *Kachhapa* newsletter, and provides information on sea turtles, the situation in Orissa and activities of Operation Kachhapa.

Conclusion

Operation Kachhapa was initiated to highlight and bring down the appalling number of unnecessary deaths of the endangered olive ridley turtle in Orissa. How far it has succeeded in achieving its initial objectives will have to be judged on two counts—firstly, whether turtle mortality has actually been reduced, and secondly, whether the publicity campaign has managed to sensitise people to turtle deaths.

On the publicity front, OpK has certainly achieved a large part of what it set out to do. Nesting, hatching and the annual slaughter of the turtles all get extensive media coverage. As a result, the issue has moved into the public consciousness and the turtle deaths certainly no longer go unnoticed. But on the primary point, mortality levels continue to be depressingly high. Despite support to the enforcement agencies in terms of human resources and equipment, pulling them up in court for negligence of duties, and orders given to them by the state High Court and the Central Empowered Committee of the Supreme Court of India, the turtles continue to die in tens of thousands and illegal mechanised fishing is still widespread.

Between December 1998 and August 2002, Rs 5.6 million (about US\$ 132,700)—an average of Rs 1.4 million (or just over US\$ 33,000) a year—was spent on the OpK programme. This included the entire scope of activities, from field camps to court cases, and patrol boats to newsletters. But even with this investment, it has not been possible to solve some fundamental hurdles.

The problems encountered are numerous, not the least of which include the lack of urgency and commitment on the part of the state government; the lack of government patrol staff (the OpK boats have sometimes lain idle for days as a result); the inclement weather; the thousands of mechanised fishing boats, many of which operate without licenses, within the prohibited fishing zone and at night (all motivated by a multi-million dollar shrimp export industry); conflicts with trawler operators and their reluctance to hire out patrol boats; the lack of fast sea-going boats for enforcement; the sheer length of the coastline that has to be monitored; and the lack of coordination between the different government agencies. There is a critical need for better coastal management, of which turtles are just a small part, which will benefit all the inhabitants of the coast.

Even now, if the existing laws were enforced, it is possible to save the rich fishing nurseries of the Orissa coast and to restore the beaches of Orissa to their pristine state, no longer littered with the bodies of olive ridleys. We believe that this can only happen with public and legal pressure. Orissa's forest and fisheries departments must be forced to implement existing laws, not only for the benefit of the turtles, but also for the benefit of the local fishing communities, and the people of Orissa. To this end, OpK has supported the enforcement of the law, monitored and helped to protect the turtles and their habitat, and gathered and disseminated information as widely as possible to the public and the government.

The work is far from complete and much more needs to be done if the turtles are to survive, but OpK's success means that Orissa's failure to protect these gentle giants no longer goes unchallenged.



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