

Status of leatherback turtles in Saudi Arabia

1. Introduction

Saudi Arabia's Red Sea coastline extends southward approximately 1,840 km from the Jordan border north of Haql (29°30'N) to the border with Yemen at Oreste Point (16°22'N). The continental shelf extends offshore for distances < 1 km in the Gulf of Aqaba to > 100 km in the Farasan Bank. The Saudi Arabian Gulf extends southward approximately 1072 km from the Kuwaiti border (28°30'N) to the border with Qatar (25°15'N).

Over 15 % of the population lives in the Red Sea coastal zone and over 5 % in the Arabian Gulf coastal zone. Urban and industrial development has had severe impacts on the coastal lands and waters, particularly adjacent to the major coastal towns and cities. Much of this development has involved extensive land-filling and dredging which destroyed substantial areas of the intertidal and sub tidal near shore habitats (Chiffings 1989). In addition, an average 25,000 to 30,000 ships are associated each year with the oil production and petrochemical industries on both coasts (Lintner et al. 1995). In the Red Sea a smaller proportion of the coastline has been developed, but in some areas (for instance around Jeddah) impact on the marine environment is severe. The presence of most of Saudi Arabia's oilfields in the Gulf has been a significant factor in attracting development to the region (MEPA/IUCN 1989).

The Red Sea and Arabian Gulf exhibit markedly different bio-physical conditions, with the Arabian Gulf exhibiting more extreme changes in water temperature, in part related to the comparatively shallow nature of the Gulf, in particular close to shores (over 25 % of the Gulf is only 5 - 10 m deep; MEPA/IUCN 1992). In the Arabian Gulf, wind speeds range between 1 m/s in September to 4 m/s in June and July. Air temperatures range from 12 °C in January to 37 °C in August. Average annual maximum temperature is 46.5 °C and water temperature generally ranges between 15 and 33 °C, with extremes recorded at 10 °C and 40 °C (MEPA/IUCN 1992). The narrow straits of Hormuz restricts water exchange with the Arabian sea, which combined with high evaporation rates creates high-salinity water within the Gulf, with a turnover rate of three to five years (Hunter 1983).

Saudi Arabia has a relatively long history of being involved with marine turtle research and conservation work, starting with a two-year project sponsored by the Meteorological and Environmental Protection Administration (MEPA) in 1986 and 1987 (Miller 1989), and followed by four continuous years of work by the National Commission for Wildlife Conservation and Development (NCWCD) from 1999 to 2002 (Al-Merghani et al. 2000; Pilcher 1999a,b; Pilcher 2000; Pilcher and Al-Merghani 2000). A synopsis of much of the work carried out in Saudi Arabia is presented in Al-Merghani et al. (2000). Since that time the NCWCD have continued sporadic monitoring on key nesting beaches, but the data are unpublished.

2. The legal protection status for leatherback turtles

2.1 Overview

Saudi Arabia is signatory to regional and international agreements which place obligations upon it for prevention of pollution and protection of resources, including coral reefs. Among these are a number of international agreements and memoranda of understanding, and a series of national laws and royal decrees that are pertinent to coral reef conservation. Relevant to marine turtles, the Kingdom is a signatory to the Kuwait Regional Convention on the Protection and Development of the Marine Environment from Pollution (1978); the Regional Convention for the Conservation of the Red Sea and Gulf of Aden against Pollution from Land-based Sources (1982); the Protocol on Marine Pollution Resulting from Oil Exploration Activities in the Arabian Gulf Region (1989), the ROPME protocol for Protection of Pollution of the Sea from Land-based Sources (1990) and the Declaration of the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (1995). The Kingdom is also a signatory to the IOSEA Marine Turtle MoU.

A number of national decrees and laws also affect marine conservation measures in the Kingdom, including the Environmental protection Standards Document No. 1401-01 (1402 H); the Council of ministers Decision no. 271 (23.11.1404) obliging the use of best available technology to reduce pollutant emissions (such as cement dust); the Rules and Regulations for Saudi Arabian Seaports; the

draft national Fisheries Regulations (Royal Decree No. 7/505M 28/3/1406); and the establishment of the National Commission for Wildlife Conservation and Development (NCWCD).

2.2 Management agencies responsible for marine turtle conservation

The National Commission for Wildlife Conservation and Development (NCWCD): NCWCD is responsible for management of protected areas (Royal Decree No. M/22, dated 12/9/1406). The NCWCD's main role is to preserve, protect and develop the wildlife within the Kingdom. Specific objectives are to develop and implement projects to protect wildlife and their habitats, conduct surveys and promote research and public interest in environmental issues related to the wildlife in Saudi Arabia; and co-ordinate different ministries, authorities and national and international institutions to accomplish these objectives. The Meteorology and Environmental Protection Administration (MEPA) was established by Council of Ministers decision No. 157, Dated 20/11/1411 and Royal Decree No. 7/505M, dated 28/3/1406, MEPA has jurisdiction for prevention of pollution in the territorial seas. MEPA is the central environmental agency in the Kingdom of Saudi Arabia. However, the Kingdom distinguishes between the establishment of environmental criteria such as standards, and actual operational management. Thus operational agencies such as the Ministry of Petroleum, Ministry of Agriculture and Ministry of Industry and Electricity retain regulatory control over activities carried out under their respective mandates while MEPA sets environmental performance standards, monitors the activities of operational agencies and serves as a central coordinator for environmental management. MEPA is the Kingdom's central coastal zone management agency. Despite this, institutionalisation of authority for centralised coastal zone management has not been achieved, and each individual agency operates under its own specific mandate and numerous overlaps and potential conflicts abound. Day-to-day coordination mechanisms and central planning authority specific to the coastal zone are lacking. MEPA also has jurisdiction for oil spill response (coordination mechanism established under Royal Decree 7/B/13307, dated 22/7/1411), and for prevention of pollution including effluent from land fill ports (Royal Decree No. 7/505M, dated 28/3/1406). MEPA is responsible for setting standards for the environment (Royal Decree No. 7/M/8903, dated 2/14/1401) and for carrying out a program of environmental impact assessment. It is also the designated coastal zone management agency. The Ministry of Agriculture has jurisdiction for fishery activities (Royal Decree No. 7/505M, dated 28/3/1406), and issues permits for extensive filling of submerged lands have been granted in the Eastern Province. Finally, the Saudi Arabian Coast Guard, established by Royal Decree No. 33, dated 27/7/1377, has jurisdiction between the border of the territorial seas (12 miles offshore) and 10 km inland.

3. Nesting populations

No records exist of leatherback turtles nesting on any part of the Saudi Arabian Red Sea shoreline, nor its shoreline along the Gulf.

4. Foraging populations

4.1 Overview

No specific reports exist for leatherback turtles in the Saudi portion of the Red Sea, although Ross (1995) and Gasparetti et al. (1993) both report the presence of the leatherback turtle in the Red Sea.

4.2 Threats to leatherback turtles

Despite turtles and their nesting habitats in Saudi Arabia receiving legal protection there is still illegal catching of marine turtles by locals in the Farasan Islands, although none of this can be attributed to leatherback turtles. Local threats include oil spills, land filling, pollutant discharges, effluents from desalination activities and a number of other major impacts. Most acute damage is localised and restricted to offshore islands (in the Gulf) and around major urban areas (in the Red Sea).

4.3 Protection of foraging areas

Protection of marine habitats in Saudi Arabia has a fairly recent history. In 1977, the small island of Umm al-Qamari was given *de facto* protected area status by the national hunting regulations of 1977. Following this, MEPA identified forty-six coastal areas for inclusion in a system of coastal protected areas (MEPA/IUCN 1987). Under Saudi Arabia's Environmental Protection Coordinating Committee (EPCCOM) these were designated Environmentally Sensitive Areas. In 1987, the National Commission for Wildlife Conservation and Development (NCWCD) was formed with the express mission of handling the Kingdom's wildlife and conservation management issues, and its own classification system. By 1989, this program had placed 2.4 % of Saudi Arabia's total area (51,405 km²) under protected status. In 1990, the NCWCD published its "Plan to Protect Areas in Saudi

Arabia” that presented a system of protected areas which, if designated, would place 12.8% of Saudi Arabia’s land mass under conservation management.

The Kingdom of Saudi Arabia has few marine protected areas. Many areas have been proposed and suggested, dating back to the mid- and late 1980s, and remain that way to date. Actual MPAs include the Yanbu Royal Commission Protected Area which covers an area of ca. 5 km²; Umm al Qamari, covering an area of 2 km²; the Farasan Islands, covering an area of 3310 km², is a Terrestrial and Coastal Reserve archipelago of small islands at the southern extreme of Saudi Arabia's Red Sea shores. It is an important habitat for marine turtles, and is threatened by fishing, development and recreation activities. Finally, the Jubail Wildlife Sanctuary is a *de facto* protected area awaiting Royal declaration. Established in 1994 and covering an area of 2300 km², research and baseline surveys to identify the main ecosystems were carried out after the Gulf war. The Sanctuary encompasses important nesting areas for sea turtles.

4.4. Gaps in capacity and requirements for improved conservation

One of the major gaps in the process of turtle conservation, in particular in the Red Sea, is the lack of established marine protected areas. In particular, research needs to be carried out in order to update baseline environmental conditions, and follow-up monitoring should refer to these baselines to detect changes in environmental quality; there is a need to integrate current research into global initiatives such as ICRI and GCRMP, and regionally among PERSGA members. There is a need to develop community education programmes that highlight the role of communities in turtle biology and ecology, including at sea stages. The Kingdom needs to take bold steps in the establishment of marine protected areas, and monitor the implementation of legislation concerning these areas with regard to coastal development, fisheries and tourism. Finally, a larger proportion of funds need to be allocated to protected areas and environmental research needs to be appropriated for marine conservation efforts. With the NCWCD for instance, this would also require the expansion of the Marine Department which is currently staffed by only three people with limited research funds and equipment.

5. References

- Al-Merghani M, Miller J, Pilcher NJ, Al-Mansi A (2000) The green and hawksbill turtles in the Kingdom of Saudi Arabia: Synopsis of nesting studies 1986-1997. *Fauna of Arabia*.
- Chiffings AW (1989) 'A draft Marine Protected Area System Plan for the Kingdom of Saudi Arabia.' IUCN/NCWCD Specialist Report, Riyadh, Saudi Arabia.
- Gasparetti J, Stimson A, Miller J, Ross P, Gasparetti P (1993) Turtles of Arabia. *Fauna of Saudi Arabia* **13**, 170-367.
- Hunter JR (1983) A review of the residual circulation and mixing processes in the KAP region with reference to applicable modelling techniques. In 'Symposium on oceanographic modelling of the Kuwait Action Plan'. Dharhan, Saudi Arabia
- Lintner SF, Arif S, Hatzios M (1995) The experiences of the World Bank in the legal, institutional and financial aspects of regional environment programmes: Potential application of lessons learned for the ROPME and PERSGA programs. Background papers from the Sea to Sea conference. In. (Jeddah)
- MEPA/IUCN (1989) 'Red Sea and Arabian Gulf: An assessment of national coastal zone management requirements. Report No. 7.' MEPA, Jeddah, Saudi Arabia.
- MEPA/IUCN (1992) Saudi Arabia: An assessment of biotopes and coastal zone management requirements for the Arabian Gulf. *MEPA Technical Report* **5**, 248.
- Miller JD (1989) 'Marine Turtles, Volume 1: An assessment of the conservation status of marine turtles in the Kingdom of Saudi Arabia. Report No. 9.' MEPA, Jeddah, Saudi Arabia.
- Pilcher NJ (1999a) Cement dust as a cause of sea turtle hatchling mortality at Ras Baridi, Saudi Arabia. *Marine Pollution Bulletin* **38**, 966-969.
- Pilcher NJ (1999b) The Hawksbill turtle *Eretmochelys imbricata* in the Arabian Gulf. *Chelonian Conservation Biology* **3**(2): 312-317.
- Pilcher NJ (2000) The Green turtle *Chelonia mydas* in the Arabian Gulf. *Chelonian Conservation Biology* **3**, 730-735.
- Pilcher NJ, Al-Merghani M (2000) Reproductive biology of the green turtle *Chelonia mydas* at Ras Baridi, Saudi Arabia. *Herpetological Review* **32**, 142-149.
- Ross JP (1985) Identification of sea turtles in the Red Sea. *Journal of the Saudi Arabian Natural History Society* **2**, 12-21.