

World Heritage Sites

Protected Areas and World Heritage



TUBBATAHA REEFS NATURAL PARK PHILIPPINES

Tubbataha is in the centre of the Coral Triangle between Indonesia, Malaysia and the Philippines, locus of the world's greatest coral diversity and is one of the few remaining examples of a highly diverse near-pristine coral reef. Its huge assemblages of corals, fish, marine mammals and seabirds are invaluable to science as a wildlife refuge and field laboratory, and to the regional economy as a dive site of exceptional quality and beauty.

COUNTRY Philippines

NAME Tubbataha Reefs Natural Park

NATURAL WORLD HERITAGE SITE

1993: Inscribed as Tubbataha Reef Marine Park on the World Heritage List under Natural Criteria vii, ix and x.

IUCN MANAGEMENT CATEGORY

II (National Park)

INTERNATIONAL DESIGNATIONS

1990: Designated part of Palawan Biosphere Reserve under the UNESCO Man & Biosphere Programme (1,150,800 ha: includes Puerto-Princesa Subterranean River National Park).
2000: Designated a Wetland of International Importance under the Ramsar Convention (33,200 ha).

BIOGEOGRAPHICAL PROVINCE

Philippines (4.26.13)

GEOGRAPHICAL LOCATION

Situated in the middle of the Sulu Sea in the southwestern Philippines, 175 kilometres southeast of Puerto Princesa City on Palawan Island, between 8°41' 33" to 9°06'05"N and 119°45' 46" to 120°03'20"E.

DATES AND HISTORY OF ESTABLISHMENT

1988: Tubbataha Reef Marine National Park (33,200 ha) established under Proclamation No.306; it was also protected under Presidential Decree No.705;
1990: The Department of Environment & Natural Resources (DENR) with The Tubbataha Foundation agreed to manage the Park; the site designated part of Palawan UNESCO Biosphere Reserve;
1995: The Presidential Task Force on the Tubbataha Reefs established by Memorandum Circular 128;
1999: Tubbataha Protected Area Management Board created;
2000: Designated a Ramsar Wetland site;
2006: Tubbataha Reef Natural Park including Jessie Beasley reef established by Presidential Proclamation 1126.

LAND TENURE

Government, in the municipality of Cagayancillo. Managed by the Tubbataha Management Office (TMO) for the Tubbataha Protected Area Management Board (TPAMB).

AREA

33,200 ha. The Park boundaries are set at 3-nm (5.4 km) from the reef edges. A 10-nm no-take buffer zone has been proposed but not yet approved by the national Congress.

ALTITUDE

Approximately +2m to 100m below sea-level.

PHYSICAL FEATURES

The site is a group of low reefs lying midway along the Cagayan Ridge, a 400 km ridge running northeast-southwest across the Sulu Sea in the southwest Philippines along a line of extinct submarine volcanoes formed at the collision of the Ridge with the Philippine Arc some 15 million years ago. It is the only coral atoll in the Philippines, and consists of North and South Atoll, 8 km apart, and Jessie Beazley Reef, 20 km north. The atolls have two main very different habitats: outer reef slope and lagoon. The North Atoll is an oblong platform 16 km long by 4.5 km wide, which completely encloses a sandy lagoon. The reef flat, which is shallow with parts emerging at extreme low tide, surrounds Bird Islet, a 0.3 ha coralline sand cay. The South Atoll is a small triangular-shaped reef about 5 km long by 3 km wide. It is also a shallow platform enclosing a sandy lagoon with South Islet, a coralline sand cay of about 0.08 ha, at its southern tip. Both islets are lightly vegetated and provide nesting sites for seabirds and marine turtles. Jessie Beazley Reef is 5 km long by 3 km wide and becomes a cay at low tide. These are classic reef formations with extensive reef flats, which to seaward fall 100m below sea level with often perpendicular 40-50m walls of coral-hung crevices, overhangs, ledges and caverns. The outer reef slopes have very clear water, strong wave action and currents, high oxygen, low nutrient content and a very wide depth range from about 1m to over 40m. They have much higher coral diversity and greater beauty than the lagoons. The lagoons have turbid water, little wave action, few currents, higher nutrient but lower oxygen content, higher temperatures, and a depth range from under 1m to 25m.

CLIMATE

Tubbataha is exposed to two monsoons a year. The seas are rough from June to October during the southwest monsoon and again from November to March during the northeast monsoon. Breaks between monsoons bring a week of calmness, usually before monsoonal shifts. Moderate winds from the northeast between April and June allow for regular visits to the area. The reefs are particularly vulnerable to water temperature increase due to their position in the middle of the Sulu Sea open to the flow of warm water from the north through the Mindoro Strait, and from the south through the Balabac Strait. The clear waters of Tubbataha make this even more of a threat as high light intensity contributes to bleaching.

VEGETATION

Four species of tree grow on the islets: sea almond *Terminalia catappa*, white popinac *Leucaena leucocephala*, *Pisonia grandis* and *Argusia argentia* and there are two stands of coconut *Cocos nucifera*. The sticky seeds of *Pisonia* often entrap young birds. Four species of grass, *Melapodium divaricatum*, *Portulaca oleracea*, *Chloris inflata* and *Setaria geniculata* grow on both islands. The shallower reef flats have extensive beds of ten species of sea grass, the four dominant species being *Thalassia hemprichii*, *Halophila ovalis*, *Halodule uninervis* and *H. pinifolia*. On the seaward side 79 species of algae have been recorded (DENR, 1992).

FAUNA

The Reefs, in the Indo-west Pacific faunal province, are in the world centre of coral diversity where their remoteness preserved them almost untouched until the 1980s. Despite destructive exploitation since then, the Park contains 396 species of corals or almost 90% of all species found in the Philippines, and 80% of all coral species found in the Sulu-Sulawesi Seas. Tubbataha has a higher species diversity per square metre than the Great Barrier Reef (Alinio & Licuanan, 2006). Moreover, by 2005 it had almost recovered from the 1998 El Niño devastation. The two distinct habitats harbour very different coral populations. In the lagoons there are extensive seagrass beds. Between 1-2m, dense coral grows, mainly *Acropora hyacinthus*, and species of *Pocillopora* and *Millepora* with some faviids; in the deeper water, growth is more patchy. 30 coral species previously unrecorded in the Philippines have been found there. Micro-atolls of *Porites* spp. and branched *Porites* characterise the back-reef (NRMC, 1982). The reef edge to the reef slope is an *Acropora* zone with branching *Montipora*, *Pocillopora*, *Porites* species and some faviids. The top of the front wall has little coral; between 1-5m growth is increasingly dense, and from 3-7m some areas are dominated by the branching *Acropora bruggmanni*. Lower on the wall is a band of soft corals, algae and sponges (these also occur on Jessie Beazley reef). At a depth of 12-20m, massive species of *Diploastrea*, *Platygyra* and *Porites* grow. The deeper stretches of

the drop-off between 20-30m show foliose or plate-like species of *Pachyseris*, *Leptoseris* and *Montipora*, and lower still occur zooanthellate corals with low need for light. A species list is given in Pichon (1977).

The marine life is very rich. Sharks, turtles and rays are seen in the lagoons; eleven species of cetaceans (all listed in CITES) and eleven sharks are recorded. Big schools of pelagic fish such as species of barracuda, trevally, jack and tuna, manta and eagle rays *Mobula dibolus* and *Aetobatus narinari*, black-tip sharks *Carcharinus melanopterus* and whale sharks *Rhincodon typus* (VU) are common in the outer waters. The area also supports the world's highest densities of whitetip reef sharks *Triaenodon obesus*. The presence of top predator species such as tiger shark *Galeocerdo cuvier* and hammerhead shark *Sphyræna* spp. validate the ecological balance of the reef. There are 479 species of fish. Rare species include humphead wrasse *Cheilinus undulatus* (EN). There are also topshells *Trochus niloticus*, giant, crocus, scaly and bearpaw clams *Tricadna gigas*, *T. crosea*, *T. squamosa* and *Hippopus hippopus*. The endangered hawksbill and green turtles *Eretmochelys imbricata* (CR) and *Chelonia mydas* (EN) nest on the islets. Tubbataha is a major nursery for fish and decapod larvae and, via the monsoon-driven currents, important to their dispersal, colonising and enriching the fisheries of Palawan and other islands of the Sulu Sea. The fish biomass and abundance are lower in the Jessie Beazley Reef as a result of overfishing before its inclusion, but these are still higher than in other reefs in the Sea. A checklist of fish species and macroinvertebrates is given in DENR (1992).

The Park is one of the few remaining refuges for a diversity of seabirds in southeast Asia. 99 species of birds, resident and migrant, have been recorded on the cays. Seven species of seabirds breed there and are found only in the Park, one being an endemic subspecies of black noddy *Anous minutus worcestri*. Bird Island has a colony of brown boobies *Sula leucogaster* and some red-footed boobies *S.sula*. South Island has a greater variety including brown boobies, red-footed boobies, common noddy *Anous stolidus*, sooty and crested terns *Sterna fuscata* and *S. bergii*. The endangered Christmas Island frigate bird *Fregata andrewsi* (CR) is a regular visitor and the Japanese night heron *Gorsachiu goisagi* (EN) and Chinese egret *Egretta eulophotes* (VU) occur.

CULTURAL HERITAGE

Cultural artefacts have been found on the reefs and will be studied (TPAMB/ WWF, 2003). A wide range of fisheries is practised in the Sula Sea, including traditional line fishing, trawling, spear fishing, offshore long line fishing and reef gleaning (PAWB, 1992). The Cagayagon annual fishing expedition to the reefs were also an initiatory experience for young boys.

LOCAL HUMAN POPULATION

On the Tubbataha reefs, there were no permanent inhabitants though during the fishing season, fishermen from Cagayancillo used to visit for a month gathering turtle and birds eggs, seabirds and fish. Patrolling Park rangers, Navy sailors and Coastguard staff use the ranger station.

VISITORS AND VISITOR FACILITIES

The reefs were first dived commercially in 1979 when the extent of damaging inroads by fishermen from distant islands became apparent. Its great biodiversity led to the area being publicised in the books *Top Ten Dive Sites of the World* and *Top Dive Sites of the World*, which attracted wide interest and a discriminating form of ecotourism: in the 1990s it was visited by approximately 1,500 national and international divers. 692 visitors in 2001 swelled to 1,422 in 2006; an average of 1,000 visitors now visits the Park during the three-month diving season in parties of about 10 per vessel. Between 2000 and 2006, 36% of the visitors were Philippino, 32% American and 32% other foreigners. The reefs can only be reached by live-aboard boats and only from the end of March to June. Visitors may land only at the Ranger Station; all other islands are off-limits. Currents are strong and changeable and strong winds and high waves make mooring very difficult as there is no shelter.

SCIENTIFIC RESEARCH AND FACILITIES

Extensive surveys were carried out in 1982 to assess the suitability of the site as a marine reserve (NRM, 1982). White studied five sites on Tubbataha in 1984; data from Palaganas & White (1989) indicated a reduction in coral cover (mean 24% decline) and chaetotomid diversity (mean 28% decline) in the same five sites. A general account was given in UNEP/IUCN (1984) and a bibliography is given in Palaganas and White (1989). Later surveys to determine reef quality, substrate cover, fish diversity and abundance, the presence of large marine fauna, and recommending management activities, revealed that the reefs had benefited from two years of protective management though this had not prevented

destructive fishing (White & Calumpong, 1992). The Park's unique mid-sea location, its reef formations, emergent islands, submerged structures and high biodiversity make it an ideal laboratory for the study of ecological and biological processes, in particular larval dissemination, fish recruitment and the coral populations of the lagoons which are less studied. In 2006 a study of the benthos community structure concluded that the present management was very effective (Alinio & Licuanan), that cetacean species diversity was high (Dolar, 2006), and rich in aggregations of fish larvae (Campos *et al.*, 2006).

CONSERVATION VALUE

The nearly pristine coral reef of Tubbataha in the heart of the world centre of marine biodiversity, is the most biologically diverse coral system in the Philippines, and of great importance for the surrounding fisheries. It lies within a Conservation International-designated Conservation Hotspot, a WWF Global 200 Eco-region, a UNESCO Biosphere Reserve and is a Ramsar wetland.

CONSERVATION MANAGEMENT

The reef is protected under the National Integrated Protected Areas System Act, the Local Government Code, the Strategic Environmental Plan for Palawan, the Philippines Fisheries Code and the Wildlife Resources Conservation & Protection Act. Earlier management was replaced in 1999 by the Tubbataha Protected Area Management Board (TPAMB) chaired by the Secretary of Defence since only the resources of the army could ensure protection of so isolated a site. TPAMB is composed of 15 members from national and local government agencies, NGOs, academics and popular organizations. It holds quarterly meetings in Puerto Princesa or Cagayancillo and has successfully adapted its strategies to the challenge of administering the site. An Executive Committee of the Navy, Coast Guard, Palawan Council for Sustainable Development, the Provincial Environment & Natural Resources Office, Dept. of Environment & Natural Resources and WWF-Philippines meets once a month to decide on operational matters and endorse TPAMB programs. Decisions are implemented by the Tubbataha Management Office (TMO) which manages the Park following annual action and financial plans. A project for a Protection, Information and Education Campaign for the Conservation of Tubbataha Reef Marine Park was launched in 1996, which aimed to train local people to participate actively in conservation of the reef (replacing frequently changed service personnel), and to explore the development of community based tourism (TPAMB/WWF, 2003).

The Master Plan and management program were approved in 1999 and updated in 2002 and 2004 to incorporate practical experience of managing the reefs. Its principles are to be applied in the expanded site. The principal goals for long-term management are protection and management, survey and investigation, community development and management, focusing on the municipality of Cagayancillo; improved publicity is to be added from 2008. Patrolling and surveillance is undertaken by the Tubbataha Management Office, the Navy and the Coastguard service in 3-monthly stints. The whole Park is managed under a no-take policy. Commercial fishing, spear fishing and coral gathering are illegal under the provisions of Proclamation No.306 and are successfully prosecuted. By 2005, hard coral cover had increased since 1997 by 45.9% and soft coral cover by 12.3% - to almost the same level as before the 1997 El Niño event. (WWF, 2005), though there was a 10% decrease in 2006. Monitoring is conducted by WWF-Philippines. The chief indicators are coral cover, fish numbers and visitor numbers; others, biophysical, socio-economic and managerial, include species, habitats, communities, fish-take, conflicts, management effectiveness and stakeholder recommendations. These have been studied and the conclusions absorbed into the management cycle. The whole Cagayan Ridge is also within the tri-nation marine Sulu-Sulawesi Seascape project of Conservation International.

MANAGEMENT CONSTRAINTS

Tubbataha long remained pristine due to its inaccessibility and its isolation from population centres. However, the reefs are in a region of high fishing pressure, especially after the introduction in the 1980s of motorised fishing boats from more distant islands with the use of dynamite and cyanide. Despite the establishment of the Park in 1988, a 52% decline in live coral cover was observed by 1989 due to a combination of destructive fishing and inadequate enforcement to safeguard the area. There was also increased collection of seabird and turtle eggs, aquarium fish, giant clams and topshells (DENR, 1992). An illegal seaweed farm on the islands employing up to 24,000 people was dismantled after six months. Much of the damage to Tubbataha in the 1990s was by subsistence fishermen from Cagayancillo, where stocks have been overexploited, as well as by foreign fishing operations and the large number of diving tours. Although this pressure gradually decreased, by 2004 the fish density of Jessie Beazley Reef was only 75% of that of the main reefs as a result of open access fishing before its

inclusion in the Park. Poaching for endangered fish and surreptitious nocturnal collection of topshells continue.

Climate change is a threat but with strict protection the coral reef ecosystem has demonstrated more resilience and recovered more rapidly than more heavily exploited systems, exemplified by its quick recovery after bleaching had affected some 21% of its benthic communities in 1998. Oil exploration has been initiated by the government which prompted a plan for the mitigation of oil spills. One contract arranged before the expansion covers 16,500 ha of the north of the Park. Spills, sewage and waste water discharged from passing tankers could introduce pollution and alien species into the reefs. Concrete moorings dragged across the bottom and groundings by dive boats damage the coral. In addition, the protection of the reefs directly affects the Cagayangons and in 1997 UNESCO reported past resentment amongst the local people for being excluded from the conservation process.

STAFF

The Park Manager is assisted by a Finance & Administrative officer, an administrative assistant, 2 research assistant/rangers and 2 park rangers. These are supplemented by 40 trained personnel from the Navy and Coastguard who also work from the Ranger Station in the North Atoll when on the islands. These bodies patrol the Park on 3-monthly rotation. A lighthouse keeper is occasionally stationed at the lighthouse on South Islet. Extensive training is provided by TMO.

BUDGET

Early funding was very dependent on outside organisations. Between 1996 and 1998 WHF granted \$US100,000. The TMO was set up with GEF-UNDP and Packard Foundation funding. Between 2000 and 2005, WWF-Philippines contributed \$US80,000 annually, which, with contributions from the Navy and Coastguard and other donors covered the costs of operations and some 20 research programs (TPAMB,2003). By 2007, the Government contributed \$10,000 directly and \$40,000 through the Navy and Coastguard service, the WWF-Philippines grant continues and GEF-UNDP supports a conservation monitoring project. Dive tourism generated US\$60,000 in 2005. But \$160,000 (ideally \$240,000) is needed annually for management, operations, equipment, prosecutions and training.

LOCAL ADDRESSES

Tubbataha Protected Area Management Board and Tubbataha Management Office, 2nd Floor, Basaya Building, San Miguel, Puerto Princesa City 5300 Palawan, Philippines.
Protected Areas and Wildlife Bureau, Department of Environment and Natural Resources, Region 4 Regional Office, Ninoy Aquino Parks & Wildlife Center, Quezon Ave, Quezon City 1100.
United Nations Commission of the Philippines, G/F Department of Foreign Affairs Building, 2330 Roxas Boulevard, Pasay City, Philippines.

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