
WORLD HERITAGE NOMINATION - IUCN SUMMARY

BELIZE BARRIER REEF RESERVE SYSTEM (BELIZE)

Summary prepared by IUCN/WCMC (March 1996) based on the original nomination submitted by the Government of Belize. This original and all documents presented in support of this nomination will be available for consultation at the meetings of the Bureau and the Committee.

1. LOCATION

Lies on the Belize Caribbean coast, and extends from the border with Mexico to the north, to near the Guatemalan border to the south. The site consists of seven disjunct units with a total area of 96,300ha.

2. JURIDICAL DATA

Includes seven separate sites which have been gazetted as protected areas. Legal protection measures are provided under the national constitution, the Fisheries Act, and the National Parks Act, both of which are now under revision, and other legal instruments. A Coastal Zone Management Plan (CZMP) is currently being prepared and will provide a comprehensive zoning scheme for marine and coastal habitats.

3. IDENTIFICATION

The Belize submarine shelf and its barrier is 250km long, representing the world's second largest reef system and the largest reef complex in the Atlantic-Caribbean area. Outside the barrier, there are three large atolls: Turneffe Islands (33,000ha), Lighthouse Reef (12,600ha) and Glover's Reef (13,200ha). Approximately 12% of the total area is within the seven sites which make up the nomination. The specific sites are: Bacalar Chico (10,700ha), Blue Hole (4,100ha), Half Moon Cay (3,900ha), South Water Cay (29,800 ha), Glovers Reef (30,800ha), Laughing Bird Cay (4,300ha) and Sapadilla Cayes (12,700ha).

Around 450 sand and mangrove cays are confined inside the barrier and atolls. A total of 178 terrestrial plants and 247 taxa of marine flora have been described from the area. Most of the cays are mangrove dominated, although some are of sand with shrub vegetation. There are over 500 species of fish, 65 scleritian corals, 45 hydroids and 350 molluscs in the area, plus a great diversity of sponges, marine worms and crustaceans. The area harbours a number of species of conservation concern including West-Indian manatee, green turtle, hawksbill turtle, loggerhead turtle and American crocodile. Several sea and waterbirds reproduce in the cays and atolls. Major colonies include those of red-footed booby on Half-Moon Caye, brown booby on Man O'War Caye and common noddy on Glover's Reef.

4. STATE OF PRESERVATION/CONSERVATION

The Government of Belize is currently developing a National Protected Areas System Plan and the nominated sites will form part of this system. Day-to-day management of the reef system is carried out by the Fisheries and Forest Departments. In some cases, management is delegated to NGOs and local communities, the government providing support and assistance as required. An overall coordinating mechanism will also be developed, possibly in the form of a Protected Areas Coordinating Unit, the structure of which is being developed with the assistance of the UNDP/GEF Coastal Zone Management Project. Either of these bodies could oversee management of the World Heritage Site.

Potential problems include over-exploitation of reef resources by the fishing and tourist industries. Other major disturbances are habitat alteration caused by coastal development; nutrient enrichment from run-off of agrochemicals and sewage pollution; erosion of the shoreline by removal of vegetation; and choking of corals by siltation resulting from dredging and sand mining.

5. JUSTIFICATION FOR INCLUSION ON THE WORLD HERITAGE LIST

The Belize Ministry of Agriculture and Fisheries has presented the following justification for designation as a World Heritage natural property:

- (ii) **Contains examples of on-going ecological and biological processes.** The site is unique for its array of reef types within one, relatively self-contained, area. Provides a classic example of the evolutionary history of reefs through fringing, barrier and atoll reef types. The geological history of the reefs and coastline of Belize differs from that of the Caribbean islands, the other main area of reefs in the region. The history of the Belize Barrier Reef Complex illustrates the major role that reefs have played in the history of humankind. Such interaction between human and reefs is particularly evident in Belize today, where a large part of the economy is dependent on the Barrier Reef through fisheries and tourism.
- (iii) **Contains superlative natural phenomena and areas of exceptional natural beauty and aesthetic importance.** The site is one of the most pristine reef ecosystems in the Western Hemisphere. As early as 1842, Charles Darwin referred to it as 'the most remarkable reef in the West Indies'. The barrier reef and atolls exhibit some of the best reef growth in the Caribbean.
- (iv) **Contains the most important and significant natural habitats for threatened species.** The site provides an important habitat for a number of internationally threatened marine species. Remaining pristine areas of the cays, with remnant stands of littoral forest, provide critical habitat for several endemic and migratory bird species. The area is also of major importance for research.

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WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

BELIZE BARRIER REEF RESERVE SYSTEM (BELIZE)

1. DOCUMENTATION

- (i) IUCN/WCMC Data Sheet (15 references)
- (ii) Additional Literature Consulted: Freestone, D. 1995. Institutional Arrangements for Coastal Zone Management in Belize. UNDP/GEF; Littler, M. et.al. 1995. Introduction to the Biology and Geology of Tobacco Range, Belize. Smithsonian; GEF, n.d. Belize -Sustainable Development and Management of Biologically Diverse Coastal Resources. Project Document; Middleton, N. 1994. Diving Belize. Aqua Quest; IUCN et.al. 1995. A Global Representative System of Marine Protected Areas. Volume 2; Government of Belize/ UNDP. 1996. State of the Coastal Zone Report. 255p.
- (iii) Consultations: 11 external reviewers, Belize Government officials, UNDP/GEF project staff, local conservation NGO's, University College of Belize, Fishermen Cooperative Societies.
- (iv) Field Visit: January 1996. J. Thorsell

2. COMPARISON WITH OTHER AREAS

105 countries in the world and all countries in the Caribbean have coral reefs. Marine biodiversity in the Caribbean is significantly lower than in the Indo-Pacific as a result of the geological and evolutionary history of the Caribbean basin. For example, the Great Barrier Reef site (Australia) has 400 species of corals compared to 65 in Belize, 4000 species of molluscs compared to 350 in Belize, and 1500 species of fish compared to 500 in Belize. Within the Caribbean, however, Belize has a species diversity as high as other known areas and it is considered in a more pristine condition than most.

Currently on the World Heritage list there are 30 natural sites with a marine or coastal component. Ten of these have coral reefs but only two were designated primarily for their coral reef values: the Great Barrier Reef in Australia and Tubbataha Marine Park in the Philippines. Although the Great Barrier Reef is a vastly larger reef ecosystem, it does not have as wide a range of geological features and reef types. Tubbataha consist of two atolls, has a different species complement and is much smaller than the Belize Reef. Aldabra in the Seychelles is a raised atoll but its natural values are more terrestrial than marine. The only other faros found in the world outside of Belize are in the Maldives. They are a very restricted phenomena which adds to the natural features of the Belize reef system.

Within the Caribbean the Belize Reef stands out as special, a fact noted by Charles Darwin in 1842 when he referred to it as the "most remarkable reef in the West Indies". The major distinction in Belize is that it has a barrier reef (i.e. a reef tending parallel to but separated by a lagoon from a shore). Although 260 km in length, it is much shorter than the Great Barrier Reef (1900 km long) but it is still considered the second longest in the world and the longest in both the northern and western hemispheres.

The only other major barrier reef in the Caribbean is that off Andros Island in the Bahamas which is a significantly smaller ecosystem.

There are 96 marine protected areas in the Caribbean and three existing natural World Heritage sites with marine components: Sian Ka'an, Rio Platano, and Everglades. Only the nearby site of Sian Ka'an is comparable. Here the reef system contains many elements also found on the Belize Barrier Reef but the area is much smaller and does not include faros and atolls. There are other regionally significant reefs protected in Tobago, Bonaire, Cuba, Bahamas and the Cayman Islands but none have the size, variety or range of geophysical features as does the Belize Barrier Reef.

In summary, as stated in the IUCN/UNEP Directory of Coral Reefs of the World (1990): The Belize coral reef ecosystem is distinctive in the Western Hemisphere on account of its size, its array of reef types and the luxuriance of corals thriving in such a pristine condition. There are several unusual geophysical features including the nearby contiguous shelf edge barrier reef, the complex maze of patch reefs and faros in a relatively deep shelf lagoon, the unusual diversity of reef types in a small area, the presence of atolls, and the large offshore mangrove cays.

Finally, going by popular scuba diving magazines and dive books (such as Carl Roessler's **Great Reefs of the World**), the Belize Reefs are certainly recognized by recreational divers as one of the world's most recognized underwater attractions.

3. INTEGRITY

The nomination document presents a very direct and accurate summary of the management challenges and threats facing the nominated site. It also notes that management plans are available for all 7 of the units that make up the nomination and summarizes the detailed activities that are required (for example: provide a boat, build a visitor center, install mooring buoys).

Factors affecting the integrity of the site are common to most marine protected areas world-wide but are less intense in Belize due to relatively low (but now growing) population pressure. They include:

Overharvesting of Marine Resources: Commercial fish stocks are declining as stocks of many species have been over-exploited. Catches of conch and lobster have significantly dropped over the past decade. Marine turtles and manatee numbers have also been severely reduced due to hunting.

Coastal Development and Tourism: Effluents and sediments from urban settlement and agriculture are having increasing impacts on the reefs. Over the past decade the number of tourists in the coastal zone has tripled and has added to the human pressure on marine resources.

Industrial Development: Shipping is still a small scale activity though companies have revived interest in offshore oil exploitation. The Government of Belize has recently issued permits for drilling near one of the nominated reefs (Glover Atoll).

Considering the growing pressure from these three factors, the Government of Belize, with support from the Global Environment Facility (GEF) initiated a five year \$3 million project on "Sustainable Development and Management of Biologically Diverse Coastal Resources" in 1993. This project is centered in a special Coastal Zone Management (CZM) Unit within the Fisheries Department. This CZMU is attempting the challenging job of coordinating all activities in the coastal zone, undertaking environmental impact statements, preparing zoning and management plans, training staff and establishing various regulatory mechanisms.

The Great Barrier Reef Marine Park in Australia was initially viewed as a model for management of the Belize Barrier Reef. However, in Belize the more holistic approach of coastal zone management was chosen to ensure that management will cover all land-based activities that might have an impact on the marine environment. Marine protected areas are one element in the coastal zone management plan being prepared. This has led to a very different concept in the formulation of this nomination which is a serial nomination of seven separate marine sites.

The three basic questions that arise in this approach are as follows:

- Does the serial nomination approach in the marine setting have justifiable rationale? The fluid nature of marine environments and the multiple use schemes that most of them are under means that areas of high nature conservation value selected as reserves exist as one part of a wider matrix. Rather than putting the whole and very large area of the reef under a World Heritage management regime, (as has been done in Australia) Belize has chosen to identify only those portions within it that are protected and contain the major natural values. In this case, IUCN agrees with this approach as it excludes large areas that have no World Heritage values and in that it omits areas of commercial activity, development and private lands. The proviso, however, is contained in the answers to the following two questions.
- Are the individual elements functionally linked and do they all contribute to the overall unity of the nomination? The seven sites, as the map indicates, are spread over a distance of some 200 km from North to South. All contribute certain features that reflect the values of the reef as a whole. The exception to this is the smallest of the seven sites (Hol Chan) which does not add anything special and is probably too small to serve a significant conservation function. What is of more concern here are some specific areas of the reef that were not incorporated at this time. These include, in particular, the famous "Blue Hole", as well as a site on Turneffe Atoll, the Mexico Rocks and several other reefs. The nomination does suggest that a second phase would consider adding these which would then result in a site which IUCN would consider "complete". Phase I, however, with the exception of the one unit at Hol Chan, is a good start but does omit several important natural features.
- Do the individual clusters in the serial nomination have an overall framework which serves to integrate them into a broader whole and ensure integrity? Any serial nomination, particularly one in a marine setting, raises concern about the use and management of the surrounding area. Obviously, damaging development on one reef or inputs of excessive nutrients from an area outside the site into a moving mass of water can affect reef systems over a wide area. It is an accepted principle of marine protected area planning that effective conservation of reserves can only be achieved under the umbrella of a wider management regime which considers other surrounding uses. So, even though all seven sites that comprise the nomination have management plans, their integrity cannot be assured if exploitation of the marine resources around them is not controlled.

The objective of the CZM project, of course, is to set up mechanisms to provide these controls. The project objectives, however, have not yet been completed and the focus to date has been on planning. The key decision on the setting up of a CZM Authority is soon to be made and such a step would do much to satisfy concerns over integrity.

While the overall framework for the management of the coastal zone is being advanced there is an associated concern with the legal status of the individual sites. Only three of the seven sites have legally gazetted boundaries. Action to complete the process for the other four is pending and awaits final Government approval (as of May, 1996).

4. ADDITIONAL COMMENTS

The name chosen for the site was discussed with the Belize authorities and it was agreed to shorten it to the "Belize Barrier Reef Reserve System". This will need to be confirmed in writing.

This is Belize's first World Heritage nomination and there is a need for a public education programme to explain to the local population the meaning and responsibility and values that are associated with the Convention and this nomination.

It is noted that NGO's in Belize play a major role in conservation of the reef including site management responsibilities as well as research, education and planning. During the field inspection IUCN met with representatives of the various groups and was most impressed with their abilities and commitment. Their role in implementing the management plans for the sites will be critical.

5. EVALUATION

The coastal area of Belize is an outstanding natural system consisting of the largest barrier reef in the northern hemisphere, three offshore atolls, patch reefs, seagrass beds, several hundred sand cays, mangrove forests, coastal lagoons and estuaries. The serial nomination consisting of seven sites provides a good but not complete cross-section of all these elements. Only one of the seven sites in the nomination (Hol Chan) does not substantially contribute, however, and three or four other outstanding parts of the reef are not yet included (particularly the Blue Hole).

As the Belize Barrier Reef Reserve System provides an array of examples of the evolutionary history of reef development with fringing, barrier and atoll reef sites it meets criterion *ii*. It also meets criterion *iii* as a superb natural phenomenon with diverse and luxuriant reef growth and spectacular underwater scenery. The site also meets criterion *iv* as a significant habitat for threatened species such as marine turtles, manatee and the American crocodile. It also hosts substantial seabird and waterfowl colonies. It has been a location of many research studies by scientists from many countries and is the best natural marine laboratory in the region.

Despite the presence of these significant natural values, the Bureau felt that the site does not currently meet Condition of Integrity *vi* in that the final gazettement process for four of the sites has yet to be concluded. Also, as progress on the functioning of the overall CZM framework is not yet in place there was some concern that the nomination was premature. Without this overall framework the sites would be isolated fragments vulnerable to ex-situ perturbations. Finally, to ensure that the different conservation units that make up the site are carefully selected, some adjustments should be made. First, the Hol Chan reserve should be omitted as it is of much less importance than the other six. Second, it must be understood that the site would not be considered "complete" until several of the missing elements mentioned in section three are incorporated (e.g. The Blue Hole). In addition the Bureau wished further information on oil exploitation activities and thus referred the site back for the above reasons.

By the deadline of 1 September, the Government of Belize responded to all the above concerns and noted:

- A revised boundary omitting the Hol Chan site and adding the Blue Hole which has been newly classified as a Natural Monument. A full description of this 4.1 km² site has been provided.
- A statement confirming the legal protected area status of all seven areas included in the nomination as well as copies of the instruments.
- A statement from the Minister establishing a Coastal Zone Management Authority.

- A Statement from the Ministry of Energy on the nature, extent, and controls applying to exploratory oil drilling on the reef.

These materials have been reviewed by IUCN and are considered to satisfy all the questions raised above. Despite the many pressures the Belize Barrier Reef is under, the commitment of the Government to conservation is clearly demonstrated in this positive response. The revised boundary with the seven sites now incorporates the most important areas (through some extensions in future are expected). The legal and administrative foundations are strengthened and implementation of the management plans for each of the sites has begun.

6. RECOMMENDATIONS

The Belize authorities should be commended for submitting an excellent nomination document, for their effort with the GEF/UNDP project in protecting their coastal and marine resources, and for their actions in responding to the concerns of the Bureau. The site meets criteria *ii*, *iii* and *iv* and should be inscribed on the World Heritage List.

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