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Advisory Committee (STAC) to the Protocol
Concerning Specially Protected Areas and Wildlife
(SPA) in the Wider Caribbean Region

Gosier, Guadeloupe, France, 2-5 July 2008

REVISED DRAFT

**ANNOTATED FORMAT FOR PRESENTATION REPORTS FOR THE
AREAS PROPOSED FOR INCLUSION IN THE SPAW LIST**

OBJECTIVE

The objective of this Annotated Format is to guide the Contracting Parties in producing reports of comparable contents as requested in Article 19 (2) of the Protocol, including the information necessary for the adequate evaluation of the conformity of the proposed site with the criteria set out in the Protocol and in the Guidelines (Guidelines and Criteria for the Evaluation of Protected Areas to be Listed under SPAW).

CONTENTS

The presentation report shall include the following main information on: (i) identification of the proposed protected area (ii) site description (iii) its Caribbean importance (iv) the activities in and around the areas and their impacts (v) legal framework (vi) management measures (vii) human and financial resources available for the management and the protection of the site.

SUBMISSION OF REPORTS

The reports should be submitted to the SPAW/RAC two months before the meeting of STAC for SPAW in English, Spanish or in French.

Dossier should be compiled on A4 paper, with maps and plans annexed on paper with maximum size of an A3 paper. Contracting parties are also encouraged to submit the full text of the proposal in electronic form.

The requested annexes should be submitted on paper and, if possible, also in electronic form. They are following:

- Copies of legal texts
- Copies of planning and management documents
- Maps: administrative boundaries, zoning, land tenure, land use, and distribution of habitats and species, as appropriate
- Existing inventories of plants and fauna species
- Photographs, slides, films/videos, CD-ROM's
- List of publications and copies of the main ones concerning the site
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1. AREA IDENTIFICATION

COUNTRY: Belize

ADMINISTRATIVE PROVINCE OR REGION: Caribbean/ Central America

NAME OF THE AREA: Glover's Reef Marine Reserve

DATE OF ESTABLISHMENT: 1993

GEOGRAPHIC LOCATION

Describe its geographical boundaries, e.g. rivers, roads, geographical or administrative boundaries (do not describe the co-ordinates here; please make a separate Annex with a map and a description of geographical co-ordinates as stated in the legal declaration of the area.)

Glover's Reef Marine Reserve is located on the most southern of the three atolls that form part of the Barrier Reef System and lies approximately 45 Kilometers east of the Belize main land (75km southeast of Belize City). GRMR is located 31 miles South East of Dangriga Town.

SURFACE OF THE AREA (total)

(in national unit) 86,653 acre	(in ha)
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LENGTH OF THE MAIN COAST (km):

35km long, 7.5km wide

2. EXECUTIVE SUMMARY (maximum 3 pages)

Supply a summary of the information contained in sections 3 to 9

3. SITE DESCRIPTION

TYPOLOGY OF THE SITE:

Terrestrial surface, excluding wetlands (ha):

Wetland surface (ha):

Marine surface (sq. km) under sovereignty,

sovereign rights and jurisdiction: 200 sq. km

MAIN PHYSICAL FEATURES

Geology /Geomorphology

Give a brief description of: (i) geological aspects (lithologic and tectonics); (ii) processes of sedimentation and erosion observable in the area; (iii) coastal geomorphology, and (iv) island system. Indicate bibliographical sources.

(i) The main Barrier Reef sits on top of a prominent northeast-southwest fault, running parallel to the coast of Belize. A series of tilted submarine escarpments (major fault blocks caused as a result of the eastward subsidence of the Bartlett Trough during the Pliocene, about seven million years ago (Schafersman 1972) (Figure 12)), have resulted in the development of three offshore atolls – two of these (Lighthouse Reef and Glover’s Reef) being located on the third, most easterly escarpment furthest from the mainland. Glover’s Reef Atoll is the most southerly of the three atolls of Belize, covering approximately 200km², being 35km long and up to 7.5km wide. The Atoll sits on metamorphic rock, which has been identified at a depth of between 777 m and 959 m below Glover’s Reef. This base rock is overlain with about 250 m of calcareous siltstone of Late Cretaceous age (100 million years ago), and 560 m of Tertiary (64 million years ago to the present) reef accumulation. It is thought to have been formed in areas where limestone build-up has been at a rate equal to or greater than the subsidence caused by the movement on the faults, resulting in the formation of carbonate platforms surrounded by water that gets progressively deeper to the east, reaching 4000m. The reef platform is probably a wave-cut reef of last interglacial age on which the overall physiography of the atoll, including the rim, lagoon, patch reefs, and channels, have developed following rising sea levels.

Sediments from reef and fore reef are comprised of fragments of coral, red algae and *Halimeda*. In contrast, sediments of the back reef area contain more mollusk fragments and have lower percentages of *Halimeda* (Gischler 1994).

Sediments associated with the patch reefs are poorly sorted coarse-grained carbonates, composed primarily of *Halimeda*, coral, coralline algae, mollusc and other skeletal particles. The lagoon floor is muddy, composed of fine-grained carbonate sand, with the sand fraction rich in *Halimeda*, mollusc and foraminifer grains (James & Ginsburg 1979).

(ii) Long Caye North (Lomont Caye) This small shingle caye or islet originally had an area of 0.5ha but was heavily impacted and eroded by Hurricane Mitch in 1998. It now has very little sand and has the characteristic of a sandbore.

(ii)

Other interesting physical features: Such as hydrodynamics, volcanic formations, caves, underwater formations, etc

Length of beaches (in km), including islands:

- a) Length of sandy beaches: Unknown
- b) Length of pebble or stony beaches: Unknown
- c) Length, height and depth of active sand-dunes: Unknown

FRESHWATER INPUTS

Mean annual precipitation (in mm) 1750mm

Main water courses (permanent and seasonal):

None

Estuarine areas: Existence and brief description

None

Freshwater springs: Existence and brief description, including marine offsprings

None

BIOLOGICAL FEATURES (Point B of the Guidelines; ecological criteria)

Habitats: a brief description of dominant marine and terrestrial habitats

Ecosystem mapping divides the Atoll ecosystems into six major ecosystem categories, each with a number of subcategories. Fore Reef, Patch Reef, Other Reef, Shallow Lagoon Floor, Other Habitats, Caribbean Open Sea. These are further broken down as follows: Shallow lagoon floor – sparse seagrass, Shallow lagoon floor - medium density seagrass, Shallow lagoon floor - dense seagrass, Sand and sparse algae, Diffuse patch reef, Dense patch reef, Forereef – dense massive and encrusting corals, Forereef - sparse massive and encrusting corals, Low relief spur and groove, Deep reef/wall/escarpment, Reef Crest and Reef channels.

Terrestrial Habitats: Mangrove, Rubble beach, Sandy beach, Caye littoral forest, Brackish pond and Palm.

List of species (flora and fauna)

List here ONLY those species protected by international agreements, particularly those species included in Annexes I, II and III of the Protocol, which are present in the area. Any other species may be listed if it is clearly considered of regional importance given its high representation in the area. Display the species under the headings Marine Plants, Terrestrial Plants, Invertebrates, Fish, Amphibians and Reptiles, Birds, and Mammals. For each species state:

- Its relative abundance as Common (C), Uncommon (U) or Occasional (O),
- Its global status as rare (r), endemic (e), and/or threatened (t), and
- Its status as an important resident population (R), or important for its breeding (B), feeding (F) or migratory passage (M).

SPECIES	Rel. Abundance (C) (U) (O)	Global STATUS (r) (e) (t)	Local STATUS (R) (B) (F) (M)
REPTILE: Hawksbill Turtle (<i>Eretmochelys imbricate</i>)	(C)	(t)	(R, B, F, M)
PEPTILE: Green Turtle (<i>Chelonia mydas</i>)	(U)	(t)	(B,F)
REPTILE: Loggerhead Turtle (<i>Caretta caretta</i>)	(U)	(t)	(B,F)
FISH: Nassau Grouper (<i>Epinephelus striatus</i>)	(U)	(t)	(R,B,M)

FISH: Rainbow Parrotfish (<i>Scarus guacamaia</i>)	(O)	(r,t)	(R)
FISH: Goliath Grouper (<i>Epinephelus itajara</i>)	(O)	(r,t)	(R)
FISH: Queen Triggerfish (<i>Balistes vetula</i>)	(O)	(r,t)	(R)
FISH: Cubera Snapper (<i>Lutjanus cyanopterus</i>)	(U)	(r,t)	(R)
FISH: Mutton Snapper (<i>Lutjanus analis</i>)	(C)	(t)	(R)
FISH: Hogfish (<i>Lachnolaimus maximus</i>)	(C)	(t)	(R)

Flora: Description in a few sentences of the main plant assemblages significant in the area

A total of 34 naturally occurring native species of plant, representing 22 families, have been reliably identified as currently occurring within the littoral forest and herbaceous beach community of the cayes of Glover's Reef Atoll (Meadows 1998; Walker, 2007). Whilst earlier surveys recorded up to 40 species, past anthropogenic impacts have had huge impacts upon the flora of the cayes – and the introduced coconut palm continues to have a very major impact. An comprehensive, updated vegetation assessment of the cayes would be beneficial.

There is quite a diverse species assemblage for this ecosystem type, especially in view of the distance of Glover's Reef Atoll from other island and mainland populations. As previously noted (Stoddart, 1962), the flora of island ecosystems is dynamic in species occurrence and stature – changes often reflecting both natural cycles and anthropogenic impacts.

Species of the littoral forest and of the herbaceous beach community play critical roles in the stabilization of the cayes, and in providing habitat for the fauna. The main plant assemblages can be seen in the table below.

Plant Species of Glover's Reef Atoll

Family	Species	Common name
Marine Species		
Hydrocheritaceae	<i>Thassalia testudinum</i>	Turtle grass
Terrestrial Species		
Amaryllidaceae	<i>Hymenocallis littoralis</i>	Spider lily
Areaceae	<i>Cocos nucifera</i>	Coconut
	<i>Thrinax radiata</i>	Chit, Salt-water Palmetto
Asteraceae	<i>Ageratum littorale</i>	
	<i>Borrchia arborescens</i>	
	<i>Sphagneticola trilobata</i>	Creeping daisy
Boraginaceae	<i>Cordia sebestena</i>	Red-flowering zericote
	<i>Tournefortia gnapheloides</i>	
Burseraceae	<i>Bursera simaruba</i>	Gumbo limbo
Combretaceae	<i>Conocarpus erecta</i>	Buttonwood
	<i>Laguncularia racemosa</i>	White Mangrove
	<i>Terminalia catappa</i>	Almond
Convolvulaceae	<i>Ipomoea pes-caprae</i>	Beach morning glory
Cyperaceae	<i>Cyperus ligularis</i>	
Euphorbiaceae	<i>Chamaesyce blodgettii</i>	Chicken weed

	<i>Chamaesyce mesembrianthemifolia</i>	Chicken weed
Fabaceae		
Mimosoideae	<i>Pithecellobium keyense</i>	Xo-coy, red fowl
Papilionoideae	<i>Canavalia rosea</i>	Seaside bean
	<i>Sophora tomentosa</i>	
Graminae	<i>Andropogon glomeratus</i>	Bromstraw rush
Lauraceae	<i>Cassytha filiformis</i>	Jaundice tie-tie
Moraceae	<i>Ficus citrifolia</i>	Fig
Nyctaginaceae	<i>Neea psychotrioides</i>	Salat
Passifloraceae	<i>Passiflora suberosa</i>	Passionflower

Family	Species	Common name
Polygonaceae	<i>Coccoloba uvifera</i>	Sea-grape
Rhizophoraceae	<i>Rhizophora mangle</i>	Red Mangrove
Rubiaceae	<i>Erithalis fruticosa</i>	Black torch, botoncillo
	<i>Ernodea littoralis</i>	Wild cherry
Sapotaceae	<i>Pouteria campechiana</i>	Mamey cerilla, sapotilla
	<i>Sideroxylon americanum</i>	Mol-che
Solanaceae	<i>Solanum donianum</i>	Solanum
Surianaceae	<i>Suriana maritima</i>	Bay cedar
Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Stachytarpheta
	<i>Avicennia germinans</i>	Black Mangrove

Glovers Reef Marine Reserve – Management Plan

Wildtracks / Wildlife Conservation Society, 2007 142

Plant Species of Glover's Reef Atoll

National populations of several of the plant species found on the cayes of the Atoll have undergone significant decline in recent years, as coastal beaches are cleared and developed for coconut plantations, tourism and residential use. Those cayes with significant areas of littoral forest and herbaceous beach communities, such as Middle Caye and Northeast Caye, in particular, play a crucial role in the continued survival of these ecosystems.

Fauna: Description in a few sentences, which are the main fauna populations present in the area

Mammals

Whilst the cayes themselves have no native mammal fauna, there are reports of small rodents on two of the cayes, presumably transported to the Atoll in materials, from the mainland.

Spotted, bottlenose and spinner dolphins are seen all year in the deeper waters outside the Atoll and bottlenosed dolphins also venture into the Atoll lagoon, through the channels, and a recent sighting of a large West Indian Manatee (*Trichechus manatus*) on the outer edge of Glover's Reef Atoll in May, 2007, confirms that this vulnerable species (IUCN, 2007) does occasionally reach the Atoll (Gibson, pers com., 2007).

Birds

The first recorded bird survey of the Atoll was conducted by Salvin in 1862. In 1998 Meadows also carried out a bird survey of Middle Caye (Bright, 1999), and a more recent visit to the Atoll (Balderamas, pers. com. 2007) produced a complimentary species list, bringing the total number of species recorded for the Atoll to 84. These last two surveys, both coinciding with the autumn and spring migrations, emphasized the importance of the cayes for monitoring the movements of these migratory species, and protecting the caye vegetation on which they rely for food. Only a few species, such as brown pelicans (*Pelecanus occidentalis*), kingfishers, herons and ospreys (*Pandion haliaetus*), are resident on the caye, as is the near-threatened white-crowned pigeon (*Columba leucocephala*). Ospreys nest both on the island and artificial nesting platforms (Gibson 1988, Bright 1999). Least terns were reported as nesting on the ground on Long Caye North during April and May, though this small caye has been heavily eroded by Hurricane Mitch, and it is uncertain whether it is still utilized by the terns.

As with the other Atolls of Belize, Glover's Reef is considered important as a migratory bird stopover refueling point. Many thousands of migrants that have meandered off course end up on the Atoll cayes every spring and fall.

The species composition of Glover's Reef is very comparable with that of Half Moon Caye, on Lighthouse Reef Atoll (Walker and Walker, 2005), - a comparison of the migratory species on these Atolls with those of migratory species surveys on the remote San Andres Island, offshore of Columbia shows an approximately 87% overlap of migratory species. Of these, the bluewinged, golden-winged, yellow, blackburnian, cerulean, magnolia, prothonatory, worm-eating, Swainson's and hooded warblers are largely believed to fly trans-gulf, relying on making landfall on the Yucatan Peninsula (N. Bayly, pers. com.). An interesting addition to the list of migrants making a stopover on the island is the cedar waxwing, with a flock of approximately 80 individuals observed feeding on the fruit of *Erythralis fruticosa*, an important food source for many of the migratory birds passing through (Figure 31; Walker, 2007). Other migrants that might occur on the caye but have not yet been recorded include the American kestrel, black-necked stilt, common tern, least tern, white-winged dove, mourning dove, common nighthawk, olive-sided, alder and least flycatcher, gray kingbird, and Lincoln's sparrow (L.Jones, pers. com.).

Reptiles of Glover's Reef Atoll

The herpetofauna of Glover's Reef Atoll is comprised entirely of reptile species. No amphibians have been recorded there, as the saline conditions, absence of freshwater sources, and distance from the mainland are the main determinants precluding their presence.

Seven reptile species have been recorded from Glover's Reef, four terrestrial (residents of the littoral forest), and the three marine turtles (loggerhead, green and hawksbill). The three marine turtles are all considered to be globally threatened, the hawksbill being listed as 'critically endangered', and the green and loggerhead being 'endangered'. Additionally, the island leaf-toed gecko is rated as Near Threatened on Belize's National List of Critical Species (Meerman, 2005). A crocodile, presumed to be the American Crocodile (*C. acutus*), has been observed on the Atoll - it is believed that fishermen brought a juvenile crocodile there from Turneffe Islands sometime during the period 1993 -1995 (M. Paz, pers. com). Recent reports suggest that it has possibly been killed.

A second gecko species, St. George's island gecko (*Aristelliger georgeensis*), was recorded on Middle Caye for the first time (Walker, 2007), and was found to be significantly more abundant than the endemic *Phyllodactylus insularis*. *Aristelliger georgeensis*, is considered to be a human commensal (Lee, 2000), but it is unclear whether it is a recent colonizer on the island, or whether females and sub-adults had previously been mistaken for *Phyllodactylus insularis*. The Brown anole (*Anolis sagrei*) is abundant on the cayes, and is principally active on the ground and up to 2m elevation on vegetation. Black iguanas (*Ctenosaura similis*) are common on the cayes of Glover's Reef, and are considered part of the natural fauna.

There are two invertebrate species of commercial importance to the Glover's Reef fishery - the Caribbean Spiny Lobster (*Panulirus argus*) and Queen conch (*Strombus gigas*), both of which are fished extensively throughout Belize.

There are a number of fin fishes present on the Atoll but some of the more economically important species include the Nassau Grouper, Black Grouper and Mutton Snapper. Sport fishing fishes include the Permit and Bonefish are present. There are also a number of parrotfish's and grazers present.

HUMAN POPULATION AND USE OF NATURAL RESOURCES (Point B of the Guidelines; Cultural and Socio-economic criteria).

Human population

a) Inhabitants inside the area:

Permanent	46	2007
Seasonal number (additional to permanent)		

Description of the population:

Number	Date of data
17	2010

There are 6 resorts on the Glover's Atoll but only 5 are operational as Mata Ray Resort is up for sale. One Caye, Middle Caye does not have a resort but it has a research station and the Belize Fisheries Department is located there as well. The research station has guest periodically throughout the year and varies from year to year. The Fisheries Department has staff working on rotations but always has someone on site. The other resorts have minimum of a cook, a boat captain and a watchman on staff at any given time unless it's a resort that the owners live at. Visitation to the resorts is seasonal.

Main human settlements and their populations

b) Inhabitants within the zone of potential direct impact on the protected area
Number Date of data
Permanent Seasonal number (additional to permanent) SAME AS ABOVE

Description of the population:

Main human settlements and their populations

Current human use and development

- a) Briefly describe the current use of the area by subsistence, artisan, commercial and recreational fishing, hunting, tourism, agriculture and other economic sectors.

The Atoll is a traditional fishing area for lobster, conch and finfish, with the greatest activity occurring during the opening of the lobster and conch seasons. Thirty-five boats were recorded as active within the Atoll in 2005, primarily from Sarteneja, Hopkins, Dangriga, Belize City and occasionally Placencia, with an estimated total of 108 fishermen (73 sailboat fishermen, and 35 using skiffs) (Gibson and Hoare, 2006). In 2009, 50 boats were recorded to be actively using the Atoll from the communities of Sarteneja, Hopkins and Dangriga with an estimate total of 130 fishermen. Peak times for fishing were recorded as the opening of the Lobster and Conch season.

Tourism is becoming an increasingly important economic activity on Glover's Reef Atoll, though with accessibility far harder than Lighthouse and Turneffe, much of the tourism is based on live aboards, or based from the five resorts currently operating from the cayes within the Atoll. Visitors also arrive from other resorts on the mainland and other cayes on a daily basis, such as Hamanasi Adventure and Dive Resort, from the mainland near Hopkins, and from hotels on Tobacco Caye. Sailboats from The Moorings charter yacht business based in Placencia visit the atoll for snorkeling and diving, and other private boats and yachts also visit the reserve, but on a relatively small scale.

Activities concentrate on scuba-diving, kayaking, wind surfing, sport fishing and fly fishing, with the impressive reef structures of the reef edge and the sheltered waters of the inner lagoon providing perfect conditions for these activities.

At peak occupancy, there are estimated to be approximately 120 guests on the Atoll in total, though the average occupancy is 50% of that. Residential staff number approximately 38 (these figures do not include Middle Caye, the location of the WCS research station and the Fisheries Department base). With the high costs of transport, the majority of the resorts operate on a weekly itinerary, offering all-in packages with a single arrival /departure day. Two of the companies – Slickrock and Island Expeditions – focus on kayak activities, based from camp facilities, whilst Isla Marisol and Off the Wall have a much greater investment in infrastructure. Most of the resorts close for one to two months of the year, or in some cases longer. Most are open, however, from October to April/May.

Whelks have been harvested at Glovers in the past under special license; however a moratorium has been put in place by Fisheries Department, pending further data on abundance and distributions of this species (Fisheries Department, 2005). Research was conducted in 2005 under the Department, showing that the whelks had a limited distribution, being confined to the reef crest, and that there were signs of over-harvesting, with densities being higher within the Conservation Zone, and greater numbers of individuals occurring in the larger size categories.

b) Enter how many of the users depend on these resources, seasonality:

ACTIVITY AND CATEGORY	Estimated No. of users	Seasonality
FISHING Subsistence Commercial, local Commercial, non local Controlled recreational Un- controlled recreational Other	Assessment column deleted 130	
TOURISM Regulated Unregulated Indicate the type of tourism Tourism facilities	> 2803	July – October is the slow season
FOREST PRODUCTS Subsistence Non-timber commercial, local Non-timber commercial, non-local Timber commercial, local Timber commercial, non-local	0	
Agriculture Stockbreeding Aquaculture	0	
EXTENSIVE STOCK GRAZING Subsistence Commercial, local Commercial, non-local		
OTHER ACTIVITIES		

Traditional economic or subsistence uses

Name any environmentally sound traditional activities integrated with nature, which support the well being of the local population. E.g. land, water use, target species, if closed seasons or closed zones are used as management techniques.

Nassau Grouper: closed season from December 1st to March 31st of the following year. Size limit for this specie is between 20 – 30 inches during the open season. The spawning aggregation site for this specie is closed to fishing all year round.

4. BIOLOGICAL AND SOCIOECONOMIC IMPORTANCE OF THE SITE

This section aims at stressing the importance of the site in sustaining the natural resources of the nation and the region, as set in Art.4 of the Protocol.

PRESENCE OF REPRESENTATIVE TYPES OF COASTAL AND MARINE ECOSYSTEMS/HABITATS (Art. 4 para. 2(a))

Name the type of habitats considered of Caribbean representativeness and their estimated cover (ha).

PRESENCE OF HABITATS THAT ARE CRITICAL TO ENDANGERED, THREATENED OR ENDEMIC SPECIES (Art. 4 para. 2(b))

A critical habitat is an area essential to the conservation of species concerned and in particular to those species included in Annexes I, II and III of the Protocol. E.g; undisturbed sand beaches where marine turtle nesting occurs; coastal lagoons where threatened fish or bird species feed or breed, nursery areas for some endangered or commercially extinct locally fishes, etc.

Name the habitat types and the species linked to it.

- Reef shelf at the Nassau Grouper Spawning Aggregation site which is closed to fishing all year round.
- Sand Flats and sea grass beds that are Conch Habitat.

PRESENCE OF PRODUCTIVE ECOSYSTEMS OR NATURAL RESOURCES that provide economic or social benefits and upon which the welfare of local inhabitants is dependent. (Art. 4 para. 2(c) of the Protocol and B. *Cultural and Socio-Economic Criteria* (a and b) of the Guidelines)

Name the habitat types and the economic or social benefit to local inhabitants linked to it.

OTHER RELEVANT FEATURES (Art. 4 para 2(d) of the Protocol and B. *Cultural and Socio-Economic Criteria* (b and c) of the Guidelines)

Educational Interest

E.g. particular values for activities of environment education or awareness

Scientific Interest

Explain if the site represents a particular value for the research in the field of natural sciences.

Research and monitoring are essential activities to ensure informed, effective management, and to assess the effectiveness of the Marine Reserve in achieving its objectives. The Reserve Biologist is the officer primarily responsible for this programme. At Glover's Reef, Fisheries Department works closely with Wildlife Conservation Society in the areas of research and monitoring, with much of the WCS research being focused on providing information for identified gaps and filling research and monitoring priorities. The Wildlife Conservation Society research station is located on Middle Caye within the marine reserve, and provides a mechanism for conducting much of the management-related research required. As such, it serves as a valuable resource to the reserve management team.

Research proposals are reviewed by the Fisheries Department, and if approved, a research license is granted on an annual basis. Plans are underway to establish a research review committee to carry out this function, thus expanding the knowledge base feeding into the decision-making process.

Historical and archaeological features

Name and briefly describe any outstanding historical features, monuments or sites.

Aesthetic Interest

Name and briefly describe any outstanding natural features, landscapes or seascapes (example: the presence of pristine sites for their use as reference sites)

Main cultural features

Indicate if the area has high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature, which support the well-being of local populations such as indigenous communities.

5. IMPACTS AND ACTIVITIES AFFECTING THE AREA (Article 19 (2)(h) of the Protocol)

IMPACTS AND ACTIVITIES WITHIN THE SITE

Exploitation of natural resources

Assess if the current rates of exploitation of natural resources within the area (sand, water and mineral exploitation, wood gathering, fishing, grazing...) are deemed unsustainable in quality or quantity, and try to quantify these threats, e.g. the percentage of the area under threat, or any known increase in extraction rates.

Threats to Glover's Reef Atoll, whilst far from the mainland, is an important resource for a number of the coastal communities – primarily Sarteneja, Hopkins and Dangriga, with an estimated maximum of 170 or more fishermen using the area (using the maximum number of fishermen per boat, Glover's Reef Annual Report, 2006). Whilst the presence of prime commercial species such as grouper and snapper indicate that marine resources are relatively healthy by regional standards, the pressure on marine stocks is increasing, with an increasing number of fishermen, and incursions from neighboring countries. Overfishing of commercial marine species has resulted in reduced catch per unit effort and a shift in the community and population structures of both fish and invertebrates harvested. Overfishing was identified as occurring throughout the General Use Zone, and illegal fishing activities were recorded from the Conservation Zone and the Seasonal Closure Zone. Lobster fishing out of season was also reported habitats and species.

Whilst the majority of extractors are artisanal fisherman, free diving primarily for lobster and conch, and spear fishing fin-fish, the impact on the commercial marine species of the atoll has been immense, with the majority of fishermen and tour guides reporting reduced numbers of lobster and conch and commercial species (Consultations, 2007). LAMP surveys in 2006 showed that whilst there were similar numbers of conch recorded in both the Conservation and General Use Zones, there were significant differences in the ratio of adults to juveniles within these two zones. Over 90% of individuals recorded within the General Use Zone were juveniles, as compared with 58% in the Conservation Zone, an indication of severe fishing pressure on the resources. This is representative of the national pattern, with depressed numbers of commercial marine species generally, and a drastic decline in numbers of conch in particular, throughout Belize (Gillet, 2003). The higher percentage of adults in the Conservation Zone suggests that enforcement activities in the Glover's Reef Marine Reserve are relatively effective.

Fishermen target different sectors of Glover's Reef during different times of the year and for different species (Figures 45, 46 and 47). The northeastern channel is a Nassau Grouper spawning site and has been fished in the past by hand-line from December to March, coinciding with the spawning event. In addition to targeting Nassau grouper, the fishermen also target Yellowtail, Black and Deep-water Grouper, several species of Jack, and Mutton Snapper. A snapper spawning site inside the Conservation Zone and just east of Northeast Caye is impacted by illegal fishing (mostly at night) from April to June, a time that also coincides with spawning events.

Both the inside and outside of the western side of the atoll, is fished year-round, and several species are targeted (barracuda, blackfin snapper and yellow eye being the most fished species) (Figure 48). The area surrounding the southwestern channel has highest fishing pressure in March and April, whilst the central lagoon of the atoll is primarily fished for conch and lobster from June to February by divers on sailboats, and who will also opportunistically spear reef fish. Sharks are sporadically fished in the northern and southeastern sectors throughout February and

March. All fishing occurs in 160 ft of water or less and all conch and lobster, in particular, are fished at 80 ft or less.

Mention any serious threats to terrestrial, marine or coastal habitats (e.g. fragmentation, desiccation, disturbance, pollution) or to species (e.g. disturbance, poaching, fishing and hunting, introduced alien species...) within the area.

Lionfish poses a serious threat to the area.

Demand by an increased population and infrastructures

Assess whether the current human presence or an expected increase in visitation (tourism, passage of vehicles and boats) and any human immigration into the area, or plans to build infrastructures, are considered a threat.

Historic and current conflictsHabitat loss through land development for tourism

This includes the removal of mangroves and littoral forests. In addition, shoreline structures such as piers, marinas, and seawalls can lead to loss and/or alteration of habitats. Red mangrove, littoral forest and herbaceous beach communities play a critical role in stabilizing island structure, reducing coastal erosion, beach loss and sedimentation. Among the most under-represented ecosystems within the protected area system of Belize, their loss is accelerating as the developmental value and demand for beach frontage escalates. This ecosystem is critical for nesting sea turtles, for the Island leaftoed gecko, a species with extremely disjointed distributions, and for numerous migratory bird species. Clearance on the cayes of the Atoll greatly reduces connectivity within an already seriously fragmented ecosystem, reducing the scope for gene-flow and recolonization after natural and anthropogenic impacts. It also greatly undermines the stability of the islands themselves, making them, and any infrastructure thereon, a great deal more susceptible to the impacts of hurricanes. The long-term sustainability of cayebased tourism and residential developments can be made significantly more financially viable through the maintenance of this ecosystem.

Make a brief statement of any historic or current conflicts between users or user groups

IMPACTS AND ACTIVITIES AROUND THE SITE

Pollution

Name any point and non-point sources of external pollution in the nearby areas, including solid waste, and especially those affecting water up-current.

Solid waste originating from the cayes and mainland is another concern. Some types of garbage have been shown to be very detrimental to marine wildlife, such as plastics to sea turtles. There is also concern over the increasing levels of solid waste originating from international shipping, particularly with the increase in cruise shipping and freight shipping destined for, and departing from, Belize.

Liquid Waste & Sewage: A more insidious impact is the leaching of nutrients and chemicals into the ground water or fresh water lens of the cayes, which then percolate through the sandy soil into the sea. Groundwater is an important source of freshwater on the cayes, and is also important for supplying the mangrove areas and coral reefs with fresh water. If the groundwater becomes polluted, these ecosystems are affected. The leakage of sewage from island resorts can cause algal blooms, visible as a ring around the cayes or patches of increased algal growth near the highest impacted areas, due to nutrient enrichment. This impact, however, is relatively low due to the current small scale of operations and low level of visitation, as well as the use of closed sewage systems on a couple of the islands.

At present, although there is little sign of the impacts of water contamination by excessive nutrients, and the majority of developments on the cayes appear to include adequate sewage treatment, results of recent nutrient testing (Gibson and Hoare, 2005) when compared with previous results (Tomasko and LaPointe 1991), suggest that nutrient runoff from the cayes should be carefully monitored. Whilst development activities are generally low key, and there is an appreciation among most cayes owners / lease holders of the fragility of the environment and the need to ensure minimal impact, there is currently little guidance given in areas such as wood preservatives, herbicides and pesticides, and contamination of waters by biocides and detergents is likely to become an increasing problem as more tourism accommodation is developed on the cayes, affecting not only the waters adjacent to these cayes, but potentially all the fragile ecosystems of the Atoll. Very few resorts in Belize have adequate training in chemical storage, use, and spill response, or attempt to find environmentally friendly alternatives to more toxic options - availability of alternatives in Belize is also a limiting factor. Little thought, too, is generally given to problems of chemical contamination following flooding through storm events...such as pre-empting the problem by storing bulk chemicals on the mainland, ensuring only minimal amounts are kept on the cayes.

Fishing

Name any type of fisheries that is not regulated or the regulations that are not efficiently enforced, in the nearby areas, including finfish, lobster, shrimp and sea turtle.

Other external threats, natural and/or anthropogenic

Briefly describe any other external threats to the ecological, biological, aesthetic or cultural value of the area, such as regulated exploitation of natural resources, serious threats on habitats or species, increase of human presence, significant impacts on landscapes and cultural values, pollution problems, any sectoral development plans and proposed projects that are likely to influence the area in question, etc.

Sustainable development measure

Comment whether the area is covered by an integrated coastal management plan, or bordering upon a zone under such a plan. Are there other opportunities for sustainable development provided for in the neighbouring areas?

6. EXPECTED DEVELOPMENT AND TRENDS*

The foreseeable development and trends of the site do not appear in the list of common criteria for the choice of protected marine and coastal areas that could be included in the SPAW List, as established in the Protocol and "the Guidelines and Criteria for the Evaluation of Protected Areas to be listed under SPAW". Moreover, this is not always easy to assess and it is necessary to have knowledge about the site, which is not always available to all managers of protected areas; thus, it is not obligatory to fill in the boxes in this section 6.

However, the assessment of this foreseeable evolution and trends constitutes a dynamic supplement to the static knowledge of the site, as it appears in Sections 3,4 and 5 above. Moreover, it is of significant importance for the definition of the objectives and the management plan of the site.

It thus appears desirable to bringing out the main outlines at least in respect to the following points:

EXPECTED DEVELOPMENT AND TRENDS OF THREATS TO AND PRESSURES UPON THE AREA

Deal briefly in succession with:

- The demographic development in and around the site
- The development of economic activities (other than tourism and recreation) within the area
- The development of local demand on tourism and recreation
- The development of tourism pressure on the area

—

POTENTIAL CONFLICTS IN THE AREA

Make a brief statement of potential use conflicts between the users or group of users of the site.

*By expected development and trends are meant the development, which is thought most likely to occur in the absence of any deliberate intervention to protect and manage the site.

EXPECTED DEVELOPMENT AND TRENDS OF THE NATURAL LAND ENVIRONMENT AND LANDSCAPES OF THE AREA: as expected arising from the evolution of the pressures.

EXPECTED DEVELOPMENT AND TRENDS OF THE MARINE ENVIRONMENT AND SEASCAPES OF THE AREA: as expected arising from the evolution of the pressures.

7. LEGAL FRAMEWORK (Articles 3, 4, 5 et 6 of the Protocol and Para. C of the Guidelines)

LEGAL STATUS

Historical background of the protection of the site

The approximately 86,653 acre Glover's Reef Marine Reserve was established as a protected area in 1993 (SI 38 of 1993) under the Fisheries Act (Ch. 210), and encompasses the marine area of the Atoll, managed under the Fisheries Department of the Ministry of Agriculture and Fisheries. It is considered one of the highest priority areas in the Mesoamerican Caribbean Reef system, providing recruitment, nursery, feeding and dwelling areas for lobster, conch and finfish, and providing unique fish habitat in the interior lagoon (WWF, 2002). It is an important component of not only Belize's national marine protected areas system, but also at a regional and international level, being designated by UNESCO in 1996 as one of seven protected areas that together form the Belize Barrier Reef Reserve System – World Heritage Site.

Legal texts currently ruling the protection on the site

Enter the national conservation category, the dates and the present enforcement status of the legal instrument declaring the protection of the area. Consider both the land and the marine areas of the site. Include the full text(s) as an annex.

The Glover's Reef Marine Reserve Statutory Instrument was updated in 2001 (SI 137 of 2001), and currently designates five different management zones: the General Use Zone, a Conservation Zone, a Wilderness Zone and a Seasonal Closure Zone, with each zone having regulations defining activities that can and can't be done. The protected area is considered to be within IUCN category IV – a Habitat/Species Management Area, with active management targeted at conservation through management intervention (IUCN, 1994).

Objectives

Name in order of importance the objectives of the area as stated in its legal declaration

Goal I: To provide protection for the physical and biological resources of Glover's Reef, in order to maintain and sustain these resources for the benefit of current and future generations

Objectives

- to preserve the outstanding beauty, uniqueness and naturalness of the atoll
- to regulate use of the area to ensure the sustainability of its resources, resilience of its ecosystems, and maintenance of ecological processes
- to provide protected habitats for commercially important species in order to enhance recruitment and replenishment, thus achieving sustainable yields, and to demonstrate these benefits to fishermen
- to protect critical habitats for endangered species
- to manage the area based on sound scientific information, and based on adaptive management principles

Goal II: To increase awareness and understanding of the natural resource of Glover's Reef through education and research

Objectives

- to encourage use of the atoll for applied scientific research by the national and international scientific community, and to feed the results of research into the marine reserve's management-decision process
- to foster use of the atoll as a study center by both local and international students
- to foster awareness of the importance of the marine environment, and the marine reserve specifically, through educational and interpretive programmes to encourage use of the reserve as a training center in marine resources and MPA management, and for demonstrating the benefits of MPAs

Goal III: To provide a resource for recreation and tourism

Objectives

- to provide undisturbed areas for tourism and recreation in a controlled and well informed manner
- to enhance the social and economic benefits of the area by promoting uses compatible with conservation and sustainable development principles

Indicate whether the national protection regime arises from international treaties enforced or from implementation measures of treaties (Art. 5 of the Protocol). _____

INTERNATIONAL STATUS

International category

Mention if an area, or part of it, has been designated and on what date, with an international conservation category (e.g. Biosphere Reserve, Ramsar site, World heritage site, etc.)

IUCN category IV – a Habitat/Species Management Area, with active management targeted at conservation through management intervention (IUCN, 1994).

PREVIOUS LEGAL BACKGROUND AND LAND TENURE ISSUES

Briefly mention if the area or part of it is subject to any legal claim, or to any file open in that connection within the framework of an international body. Describe the land tenure regimes within the area, and append a map if existing.

LEGAL PROVISIONS FOR MANAGEMENT (Article 5 of the Protocol)

Basic regulations

Mention the provisions, which apply to the area concerning the implementation of Article 5 of the Protocol.

Legal competencies

Mention in which way do the legal provisions clearly establish the institutional competencies and responsibilities for the administration and conservation of the area, and if being the case, their co-ordination means, including those between land and sea authorities.

Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan, the establishment of a local participation body, binding measures for other institutions or economic sectors present in the area, allocation of financial resources and tools, or any other significant measures concerning the protection and management of the area or its surrounding zones.

8. MANAGEMENT

Article 6 of the Protocol state that each Party shall adopt and implement planning, management and enforcement measures for Protected areas. Through paragraph D of the Guidelines, the Parties also agree that the sites included in the SPAW List must have a management framework and a research and monitoring programme that allows for assessing the effectiveness of the management scheme.

INSTITUTIONAL LEVEL

Authority/Authorities responsible for the area (management body) Guidelines Paragraph D.I.(b)

Belize Fisheries Department, Government of Belize

Other participants in the management body

Such as other relevant stakeholders and local communities, as stated in section D.III. of the Guidelines.

Participants in other committees or bodies

Such as a scientific committee, advisory board or a body of representatives from the local stakeholders, the public, the professional and non-governmental sectors.

Members of the Glover's Reef Advisory Committee

MANAGEMENT FRAMEWORK

Management framework (D.I in the Guidelines)

State if there is a management framework or management plan and include the documents as an annex.

Management Plan Exists

Formulation and approval of the management framework

Mention how the management framework was formulated, e.g. by an expert team and /or under consultation and/or participation with other institutions or stakeholders. State the UNEP(DEC)/CAR WG.29/4.Rev.1 Page 22 legal status of the management framework, whether it is officialized, and how, and if it is binding for other institutions and sectors involved in the area.

Zoning and objectives. (Para. D(I)(c) of the Guidelines.)

Briefly state if the management framework provides for different zones to allocate different management objectives of the area (e.g. core and scientific zones in both land and sea, fishing zones, visitation, anchoring, gathering, restoration zones, etc.) and in this case the surface area in ha of these zones. Include a map as an annex.

Yes Glover's Reef has special management zones.

Glover's Reef Marine Reserve has been divided into four zones to allow for the management of resource for sustainability, to ensure the multiple uses of the marine protected area to continue (Map 5). These range from the least regulated to the most restrictive:

- General Use Zone
- Seasonal Closure Zone
- Conservation Zone
- Wilderness Zone

A fifth zone has recently been created to offer greater protection to the north-east spawning aggregation site.

Information and knowledge available. (Para D(I)(d) of the Guidelines)

- a) Briefly describe the extend of knowledge of the area, considering at least specific maps, main ecological processes, habitat distribution, inventories of species and socio-economic factors, such as artisan fishing. Assess the state of knowledge in each field (low, medium, satisfactory).
-

b)

- b) Quote the main publications, information on traditional, scientific, technical and management knowledge that have been used to set up planning, management and enforcement measures.

Contents of the management framework

State the degree of detail in the framework by entering YES or NO in the following list of potential contents: _____

Detailed management objectives

Existin	ginM
YES	
YES	
YES	
YES	

Zoning

Regulations for each zone

Governing body(s)

Management programmes as:

Administration

Protection

Natural resources management

YES	
	NO
YES	

Tourism and visitation Education
and training Research and
monitoring

Services and concessions Fund raising
activities Periodic revisions of the MF

CONSERVATION AND MANAGEMENT MEASURES

By Article 6 of the Protocol the parties agree to adopt and implement planning, management and enforcement measures for protected areas to ensure the effective implementation of the measures set out in Article 5.

Boundaries and signing

Briefly state if the boundaries of the area and its zones are adequately marked in the field, both on land, in the sea, and at the principal points of access.

Yes it has been demarcated. _____

Institutional collaboration

Name the different national and local institutions or organizations with legal responsibilities or involved in the protection and surveillance of land and sea zones, and any measures or mechanism through which their co-ordination is pursued.

Belize

Fisheries

Department

Surveillance

Consider the adequacy of the existing protection means (human and material), and your present ability to survey land and sea uses and accesses.

We are understaffed and need more rangers and fuel allotment

Enforcement

Briefly consider the adequacy of existing penalties and powers for effective enforcement of regulations, whether the existing sanctions can be considered sufficient to dissuade infractions, and in the field staff is empowered to impose sanctions.

No the sanctions, fines/ penalties are not sufficient however the Department is working on the existing laws and revising them at the moment.

IMPLEMENTATION MECHANISM. (Paragraph D.IV of the guidelines).

Public awareness and education programme

Mention if the management framework has public awareness and education programmes for users, decision-makers and the public (Guidelines paragraph D.IV(b)) and in this case briefly describe the main thrust of the programmes.

Public Awareness needs strengthening as the current plan that exists is not being implemented.

Monitoring programme

Mention if the management framework has a research and monitoring programme that allows for the effectiveness of the management scheme to achieve the conservation goals. (Guidelines paragraph D.IV(c)).

a) Is there a monitoring programme?

YES

b) If NO, are there plans to start one, and when?

c) If YES, briefly describe the main thrust of the monitoring programme with regard to the conservation goals. Assess as low, medium, satisfactory, its adequacy and present level of development:

The monitoring program is viewed as being satisfactory.

- c) If YES, who is/are carrying out the monitoring programme?

The monitoring program is being carried out by the reserve staff and some programs in conjunction with Wildlife Conservation Society.

- d) If YES, briefly describe how the monitoring programme will be used in reviewing the management framework.

Recommendations from the monitoring program is reviewed by the Fisheries Department and used in amending the Statutory Instruments of the area.

EVALUATION

Briefly describe the indicators set up to measure the management success (Guidelines paragraph. D.II). (Indicators may, for instance, supply information about species status, condition of the ecosystem, land-use changes, extraction of natural resources; sand, water, game, fish, visiting, adherence to the provisions of the management plan, etc.)

Management effectiveness

As stated in section D.V. of the Guidelines, assess as very low, low, moderate, satisfactory very satisfactory, and comment as needed on the following aspects:

- a) Effectiveness of the conservation and management measures on biophysical features with regard to this objective:
-
-

- b) Quality of involvement by the public, local communities, economic sectors, scientific community:

9. AVAILABLE RESOURCES

HUMAN RESOURCES (Article 6.2(i) of the Protocol)

Available staff

Assess the adequacy of the human resources available to the management body, in number of employees and training level, both in central headquarters and in the field. Indicate if there is staff training programmes.

1 Manager, Bachelor's Degree

1 Biologist, Associate's Degree

1 Ranger.

1 Ranger.

Yes there are training programs that occur throughout the year for field staff

If

Permanent field staff

Answer YES or NO on the current existence of the following FIELD staff categories.

YES, enter the number of staff either permanent or part-time in that category.

	YES/NO	NUMBER
		Permanent/Part-time
Field Administrator	YES	Permanent
Field Experts (scientific monitoring)	YES	Permanent
Field Technicians (maintenance, etc)	NO	
Wardens	YES	Permanent
Of which marine wardens	YES	
Guides	NO	
Others	NO	

Additional support

Briefly describe if the area currently has the advantage of other external human resources in support of its objectives, either from other national or local institutions, volunteer programmes, non-governmental organisations, academic or international organisations. Mention if there are any significant changes in prospect for the near future.

We sometimes get assistance from Central Office Staff from the Conservation Compliance Unit when we need assistance in enforcement.

FINANCIAL RESOURCES AND EQUIPMENT

By Article 6 of the Protocol the Parties agree to adopt measures or mechanisms to ensure the financing of the Specially protected areas (Art. 6.2(f)), and the development of an appropriate infrastructure (Art.6.2(i)). Paragraph D of the Guidelines call upon the Parties to provide the areas with adequate management means.

Present financial means

Note if the basic financing is ensured: a core funding for basic staff, protection and information measures. Who provides the core funding? Briefly assess the degree of adequacy of the present financial means for the area, either low, moderate, satisfactory; e.g. the implementation of the management plan, including protection, information, education, training and research.

Funding is gotten from Central Government and funds are also collected from Park Fees. This is used to pay staff and maintain engines and so forth. More funding is needed but with the current financial situation of the country it is seen as moderate.

Expected or additional financial sources

Briefly describe any alternative sources of funding in use or planned, and the perspectives for long-term funding from national or other sources.

We sometimes get additional monitoring funding from Non-governmental organizations such as Wildlife Conservation Society and The Nature Conservancy.

Basic infrastructure and equipment

Answer YES or NO to the following questions.

	YES/NO	
	YES	NO
Office and/or laboratory in the field		NO
Signs on the main accesses	YES	
Guard post on the main accesses	YES	
Visitors information centre		NO
Self guided trails with signs		NO
Terrestrial vehicles		NO
Marines vehicles	YES	
Radio and communications		NO
Environment awareness materials		NO

Capacity to respond to emergencies		YES	
Comment on basic infrastructure and equipment: There is a headquarters that provide housing and kitchen for the staff while out in the field. The reserve has vessels to do enforcement and there is basic monitoring equipment/			

10. CONTACT ADDRESSES (name(s), position(s) and contact address(es) of the person(s) in charge with the proposal and that compiled the report)

Alicia Eck, Reserve Manager, eck.allie@gmail.com, Belize Fisheries Department, Princess
Margarite Drive, Belize City Belize

**11. SIGNATURE (S) ON BEHALF OF THE STATE (S) PARTY/PARTIES MAKING
THE PROPOSAL**

12. DATE