

**Management Plan for Anguilla's Marine Park
System and Associated Shallow Water Habitats
and Fisheries (2015-2025)**



Prepared By:

*Department of Fisheries and Marine Resources
Government of Anguilla P.O Box 60 The Valley Anguilla B.W.I
Email: fisheriesmr@gov.ai
Telephone: (264)497-2871/8705
Fax: (264)497-8567*



This document is a consolidated version of Wynne S.P. (2015) 'Developing an Adaptive Management Plan for Anguilla's Marine Park System and Associated Shallow Water Habitats and Fisheries (2015-2025)', which is an adapted version of Chapter 5 taken from the Ph.D. thesis: 'Developing management strategies against regional eutrophication in Caribbean small island nations with limited financial and logistical resources' (Wynne, 2016).

This second consolidated version is designed to be a working adaptive document and as such will be updated periodically.

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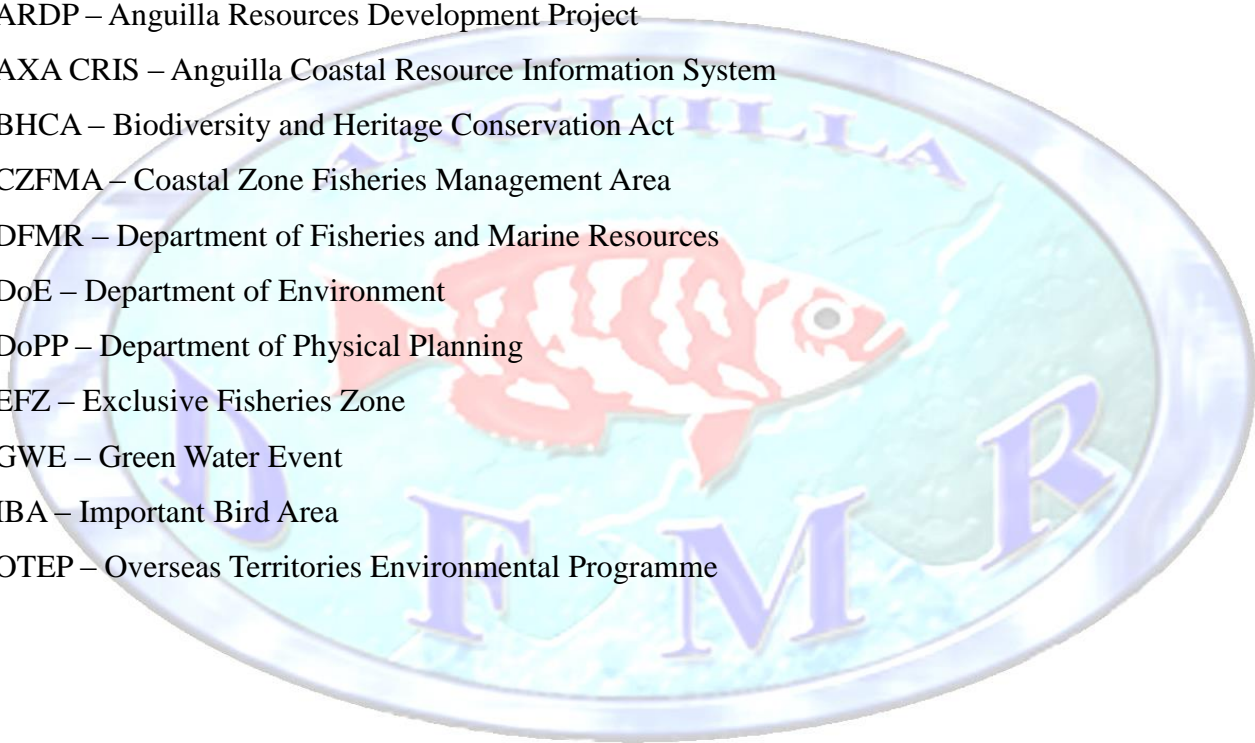
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List of Acronyms Used

- ACRAMAM - Anguilla Coastal Resource Assessment Mapping and Monitoring Project
- AFDP – Anguilla Fisheries Development Plan
- AMMA – Anguilla Marine Management Area
- AMMP – Anguilla Marine Monitoring Programme
- ANT – Anguilla National Trust
- ARDP – Anguilla Resources Development Project
- AXA CRIS – Anguilla Coastal Resource Information System
- BHCA – Biodiversity and Heritage Conservation Act
- CZFMA – Coastal Zone Fisheries Management Area
- DFMR – Department of Fisheries and Marine Resources
- DoE – Department of Environment
- DoPP – Department of Physical Planning
- EFZ – Exclusive Fisheries Zone
- GWE – Green Water Event
- IBA – Important Bird Area
- OTEP – Overseas Territories Environmental Programme



Executive Summary

Anguilla's Marine Park System was officially established in the early 1990s, but to date no management plan has been implemented to facilitate the reaching of the marine parks intended goals. Despite the production of a draft management plan in 2001, unaddressed legislative insufficiencies ultimately led to it not being officially adopted and continued managerial stagnation. These legislative inadequacies have been identified as:

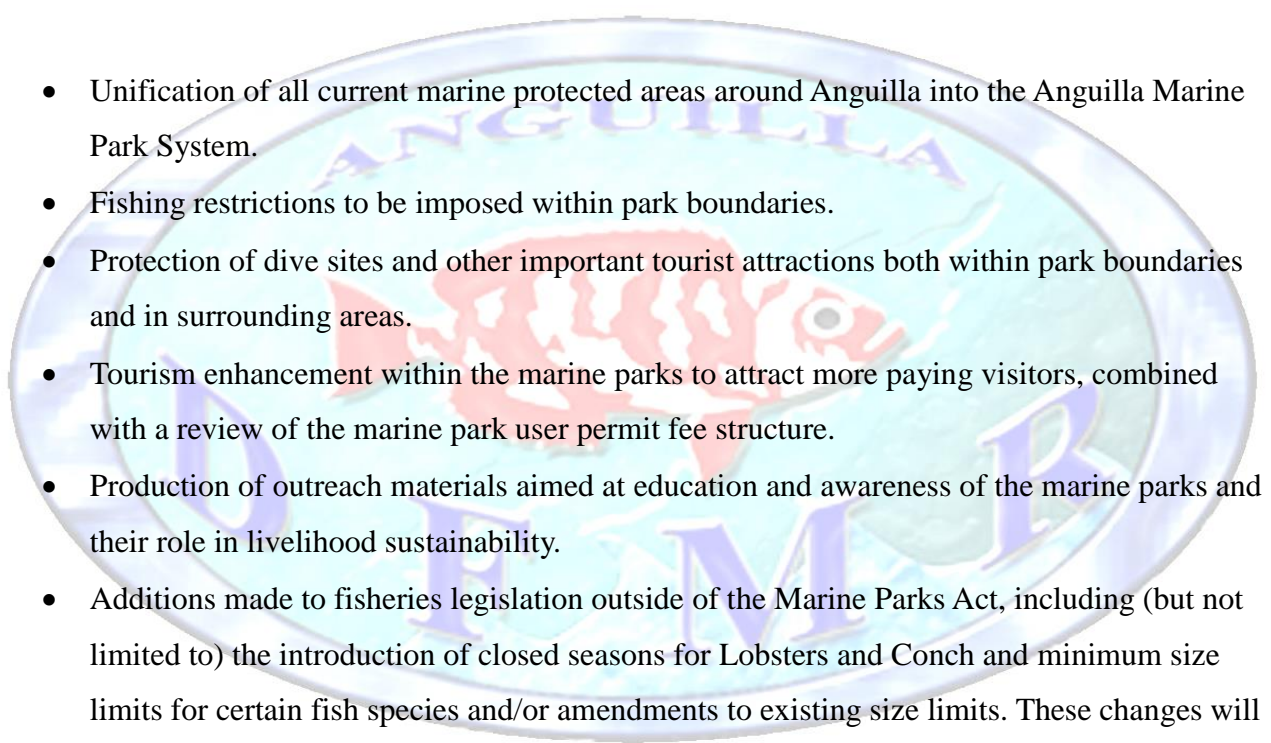
- No officially designated managerial agency.
- Incorrect and/or ambiguous designation of which areas are true marine parks.
- Insufficient regulations within the Marine Parks Act and other legislation.

Since its establishment, the Department of Fisheries and Marine Resources (DFMR) has assumed an *ad-hoc* role in the management of these areas, working within the limited legislation as it currently stands. Despite limited financial and logistical resources, DFMR has spent over a decade filling the knowledge gaps necessary to produce a comprehensive management plan. It has also developed a strategy to overcome the legislative road block that has prevented the success of past initiatives, in the hope that it will kick-start the long overdue managerial process essential for the success of the Anguilla Marine Park System.

The strategy put forward is for DFMR to continue its assumed management role for the marine parks until they are named legally as such, but to do so in a more assertive manner by taking the lead role in the design and implementation of this management plan. Headed by DFMR, other members from key government agencies, non-governmental organisations, and stakeholder group representatives will be involved to ensure the cross-disciplinarian nature of this initiative is addressed effectively. Through this means DFMR will strive to effectively achieve the administrative success of this plan and ensure, to the best of its ability, that all necessary legislative changes are made to allow this.

The management plan has been designed to allow Anguilla's Marine Park System to reach its originally intended potential, that being 'To protect fish, flora and fauna found in the park areas

while preserving and enhancing the natural beauty of such areas' (statement first published in Policy Statement on Marine Parks for Anguilla, Government of Anguilla, c.1978). The overall goal is to reduce anthropogenic pressure on the degraded nearshore ecosystems through effective management of visiting tourists, coastal developments and extractive fishing activities. In terms of this latter pressure, a long term strategic plan is to encourage the development of offshore fisheries resources, a goal that this plan aims to achieve in combination with a sister document, the Anguilla Fisheries Development Plan (Gumbs *et al.*, 2015). For this reason, and due to the inherent intricacies and interactions between marine areas, the management of marine parks also needs to consider surrounding marine environments, and (at least in part) their associated fisheries. Key management actions identified within this plan include:

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- The logo for the Anguilla Marine Management Area (AMMA) is a large, semi-transparent oval watermark in the background. It features a central illustration of a red fish with a white eye, surrounded by the text 'ANGUILLA' at the top and 'AMMA' at the bottom in a stylized, blue font.
- Unification of all current marine protected areas around Anguilla into the Anguilla Marine Park System.
 - Fishing restrictions to be imposed within park boundaries.
 - Protection of dive sites and other important tourist attractions both within park boundaries and in surrounding areas.
 - Tourism enhancement within the marine parks to attract more paying visitors, combined with a review of the marine park user permit fee structure.
 - Production of outreach materials aimed at education and awareness of the marine parks and their role in livelihood sustainability.
 - Additions made to fisheries legislation outside of the Marine Parks Act, including (but not limited to) the introduction of closed seasons for Lobsters and Conch and minimum size limits for certain fish species and/or amendments to existing size limits. These changes will apply to all marine areas, not just those within the marine park system.
 - Strict enforcement of Fishery Protection Act in nearshore regions (Coastal Zone Fisheries Management Area) to create a buffer zone that will link the marine parks with surrounding coastal regions.
 - Based around current financial and logistical constraints, the area that can realistically be regularly patrolled by the marine police and/or DFMR to become known as the Anguilla Marine Management Area (AMMA).
 - A ten year initial structured plan of action with annual revised editions of this plan produced bench-marking adaptive management intervals.

Section 1: Introduction

Anguilla (18°12.80N and 63°03.00W), is the most northerly of the Lesser Antilles leeward island chain and forms part of the British West Indies (Figure 1), with a comprised area of 91 km². It is a flat, low-lying island formed mainly of uplifted fossil corals surrounded by a variable shelf with several uninhabited offshore cays. The largest of these cays include Sandy Island, Dog Island, Prickly Pear Cays, Seal Island, Anguillita Island, Scrub Island, Scilly Cay, and the distant Sombrero Island. These islets support a variety of reef habitats, the majority of which are fringing, with the largest of which running from Prickly Pear Cays almost parallel to the mainland north coast for a distance of approximately 10 km. The crest of this reef breaks the surface in a number of places and runs down to a depth of 15 m or more. The northern leeward coast of Anguilla is characterised by extensive patch reefs interspersed with sand flats and seagrass beds. The south coast historically housed extensive fringing *Acropora spp.* reefs, the vast majority of which are now severely degraded. There are also extensive seagrass beds in the area. There are over forty beaches around the island and its offshore cays, most of which consist of white sand derived from fine ground coral remains and *Halimeda spp.* fragments. Seven marine parks are currently recognised in Anguillian waters, five of which form the Anguilla Marine Park System: Three of these parks surround the offshore cays of Dog Island, Prickly Pear Cays and Sandy Island, one encompassing the patch reef system of Shoal Bay and Island Harbour, and one in the seagrass regions close to Little Bay. Areas around Sombrero Island and Junks Hole are also legally marine parks, but are more important as heritage sites rather than of ecological significance. An eighth protected area not legislated officially as a marine park is at Rendezvous Bay. This important seagrass area has recently been adopted by DFMR as a marine park but has yet to be fully encompassed in the Marine Park System. A number of dive sites, including seven purposefully sunk ship wrecks, exist around the island but are under no official protection. Currently no formally adopted management plan exists for these areas, although it has long been recognised that this is a management gap that urgently needs filling. It is the objective of this report to do just this, not just for a fully unified Marine Park System, but also for the associated fisheries and other shallow water habitats. The legislative situation is clarified further in the following paragraphs.

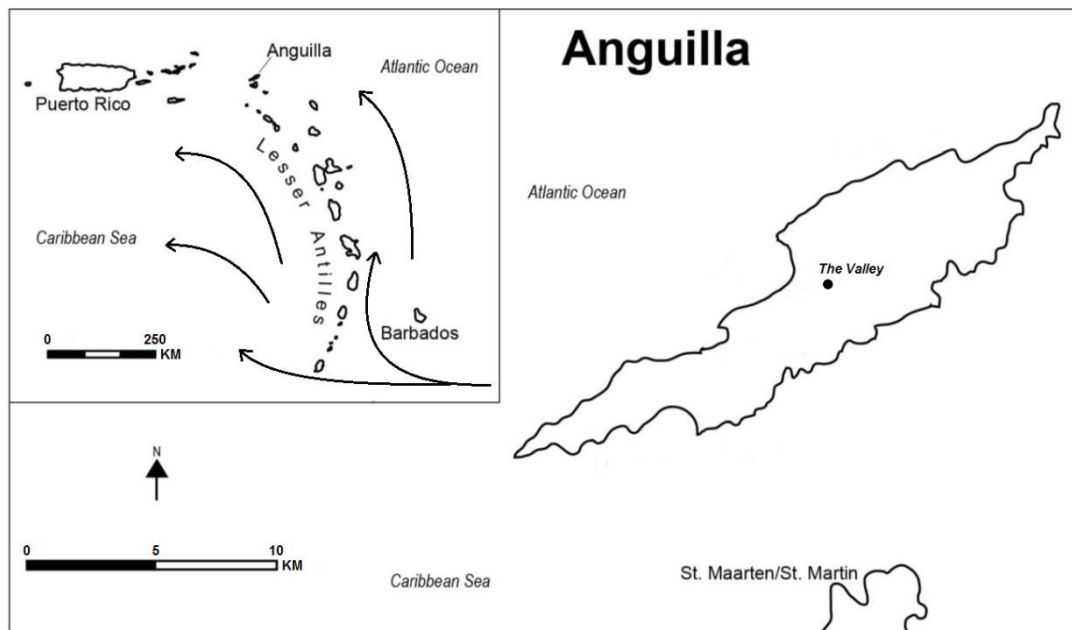


Figure 1: Anguilla situation map, illustrating geographical location and prevailing currents.

A Brief History of Anguilla's Marine Park System

Although the original Marine Parks Ordinance was produced in 1974, with draft regulations produced c.1978 (Gov Axa, c.1978), it is usually documented that Anguilla's marine parks (Figure 2) were originally designated under the later Marine Parks Ordinance of 1982 (Lum Kong, 2008). This Ordinance was again superseded by the Marine Parks Act (2000) which was revised again in 2010 following previous amendments in 2007. However, the parks actual designation is more officially cited as occurring in 1993 (CaMPAM, 2010) when the Marine Parks Regulations came into force. Under the regulations one marine park was listed for demarcation, the Junks Hole Marine Park - the waters surrounding the site where the wreck of the Spanish Galleon El Buen Consejo is situated. Notwithstanding this, the Junks Hole Marine Park is not usually cited as part of Anguilla's Marine Park System as it is more recognised as a heritage site rather than being of ecological importance.

The five areas normally cited as being part of Anguilla's Marine Park System were not designated under the Marine Parks Act until the amendments made in 2007. Instead, four (Dog Island, Sandy Island, Little Bay and Prickly Pear) were listed within the Cruising Permit Act (1980, later superseded in 2000) as areas with anchoring restrictions. Also listed in this Act is Rendezvous Bay

which, until recently, was not considered a marine park and thus not part of the Anguilla Marine Park System. These five areas would therefore have been better described as marine protected areas until 2007, rather than marine parks as they were technically only under anchoring restriction. Shoal Bay-Island Harbour has never been listed under the Cruising Permits Act and so only became a true protected area when it was listed under the amended Marine Parks Regulations in 2007. Despite this Shoal Bay-Island Harbour has always been considered part of the Anguilla Marine Park System. It remains unclear how this area was originally designated as no mention of it has been found in the legislation prior to the 2007 amendment. It is thought this area was instead listed in the Government of Anguilla's official Gazette, although confirmation and publication date of this has not been able to be obtained. In 2010 the revision of the Marine Parks Act added Sombrero Island to the list of marine parks. Currently Rendezvous Bay is the only area listed in the Cruising Permit Act that is not listed in the Marine Parks Act.

This legislative confusion has led to it sometimes being cited that (prior to 2007) Anguilla did not have any marine protected areas (Lum Kong, 2008) even though the areas listed under the Cruising Permits Act were afforded some protection and Junk's Hole Marine Park was designated under the Marine Parks Act. Furthermore, these areas, as with all of Anguilla's marine systems, were also subject to the generic protection afforded by the Fisheries Protection Act (2000). Such restrictions under this legislation include (but are not limited to) fish pot mesh size, size limits for the *Panulirus argus* and *Strombus gigas*¹ fisheries, and controls on all turtle fisheries.

For the purpose of this document, Anguilla will be considered to have eight marine parks: six designated for ecological purposes; one (Junk's Hole) designated for heritage purposes; and one (Sombrero Island) for heritage and potential ecological purposes, pending marine survey work. As a final clarification, until only a few years ago, Rendezvous Bay was not considered a marine park but rather an area under special management, and so not included in Anguilla's Marine Park System. This is no longer the case however as it has now been adopted as an unofficial marine park and hence included within this management plan. To avoid future confusion, one of the main recommendations under this management plan will be to unify the legislation governing marine systems and to ensure all these areas are correctly listed under the Marine Parks Act.

¹ Now reclassified as *Lobatus gigas*

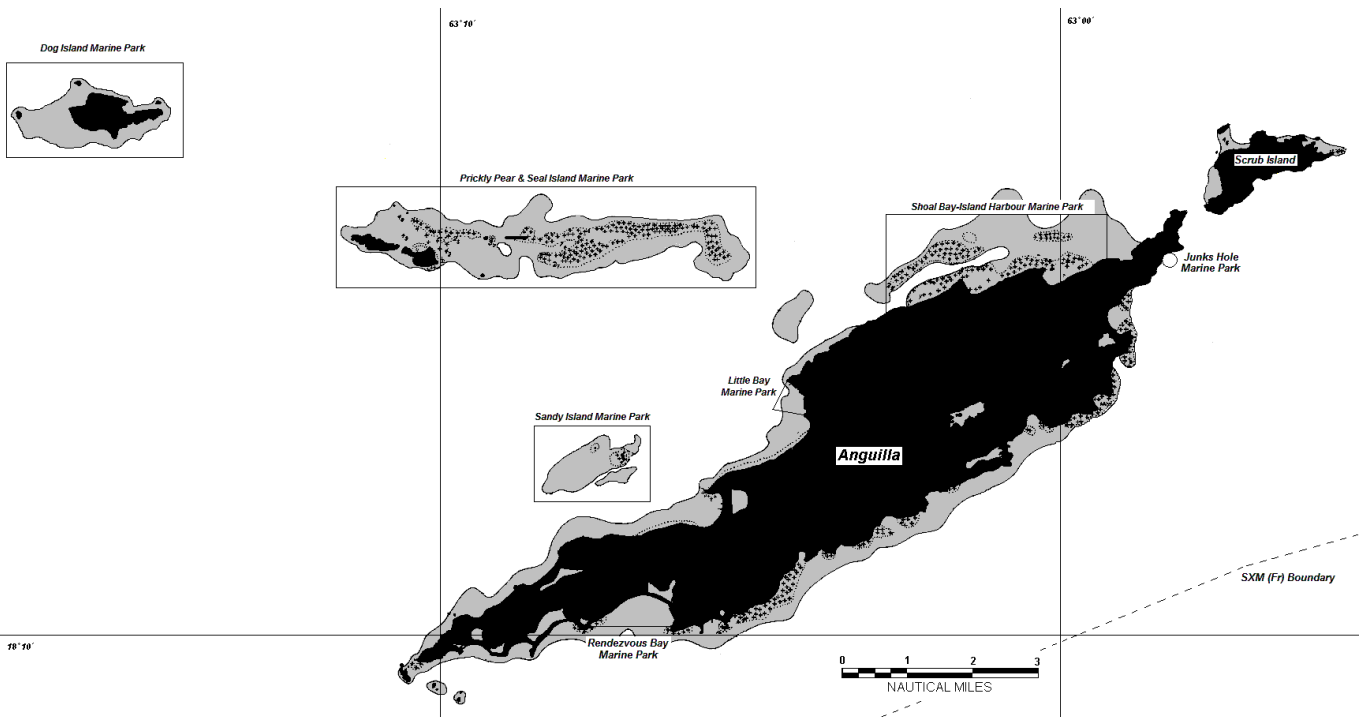


Figure 2: Map of Anguilla illustrating locations of marine parks, including Rendezvous Bay and shallow water areas (<10m). The distant Sombrero Island is not illustrated. The shallow areas are proposed to become the Coastal Zone Fishery Management Area (CZFMA), a buffer zone and link between the marine parks and surrounding coastal regions where surveillance efforts will be concentrated. The entire area depicted on the map, excluding that which belongs to French St. Martin, will become the Anguilla Marine Management Area (AMMA). Future enhanced surveillance will focus on this area should resources allow (i.e. area practical for one vessel to patrol on a daily basis).

Note on future legislation: The Biodiversity and Heritage Conservation Act (2010) is reportedly set to supersede the Marine Parks Act. The regulations for the BHCA have yet to be finalised and so the potential for this remains unclear. The BHCA states under Section 90(2) that ‘the marine parks existing on the coming into force of those [BHCA] regulations are deemed to have been established as protected areas under [the BHCA]’; and under Section 90(3) that the Governor in Council may repeal the Marine Parks Act and the Marine Parks Regulations.

Management of the Marine Park System

Current management of the Marine Park System, including Junks Hole Marine Park and Rendezvous Bay, is the responsibility of the DFMR, not because it is the official managing agency (none has yet been designated), but rather due to the Department's general mandate of promoting sustainable use of the marine environment. Furthermore, DFMR's quasi-managerial role has necessitated an *ad hoc* approach as no official management plans exist for these areas (OTEP ANG402, 2007). As part of this assumed management role DFMR installs and maintains mooring fields in three of the marine parks (Prickly Pear, Sandy Island and Little Bay), with plans to extend this to Shoal Bay-Island Harbour. In a similar way, on top of its regular mandated work, DFMR also conducts regular beach monitoring surveys, which although technically (or at least partially) outside of their jurisdiction, they conduct for similar reasons as they do the management of marine parks.

This lack of designation of an official management agency is largely due to the inevitably complex political nature of small island developing states such as Anguilla, especially when considering the management of areas with jurisdictional cross-overs and their multi-disciplinary nature. For example, DFMR is mandated to manage marine and coastal resources only up to the high water mark, with other agencies responsible for terrestrial areas (for example the Department of Environment, Anguilla Air and Sea Ports Authority, etc.). For this reason, it is likely that for the successful management of these areas, new legislation or amendments to existing legislation will be needed. This appears to be one of the functions behind the Biodiversity and Heritage Conservation Act, which deals with the multi-disciplinary nature of marine and coastal systems by jointly assigning the administration of this Act between the Minister of Fisheries and Marine Resources and the Minister of Environment. This is the first jointly administered Act in Anguilla and potentially paves the way for more unified and successful management of protected areas: where the Minister of Fisheries and Marine Resources is the competent Minister with respect to aquatic species, their habitats, and protected areas that are established and maintained to primarily protect aquatic species and their habitats; and the Minister of Environment is the competent Minister with respect to terrestrial species, their habitats, and protected areas that are established and maintained to primarily protect terrestrial species and their habitats. Until the production and enactment of the BHCA regulations the full implications of this Act remains unclear, although problems relating to the lack of an official management agency may be resolved. Prior to this taking place, or prior to the Marine Parks Act naming DFMR as the lead agency, their *ad hoc* role will continue.

Historical Record of Marine Management Plans

Although management plans have been produced in the past, none have officially been adopted for Anguilla's Marine Park System, or indeed any of Anguilla's Marine habitats and/or fisheries. According to Oxenford & Hunte (1990), the Anguilla Resources Development Project (ARDP) conducted in 1980 was one of the first steps towards the management of coastal resources and habitats in Anguilla. This work, initiated by the Government of Anguilla and the Eastern Caribbean Natural Area Management Programme resulted in three reports: Salm (1980); Olsen & Ogden (1980); and Jackson (1981). This latter report proposed a preliminary management strategy for Anguilla's critical marine resources and essentially became Anguilla's first marine management plan. This plan also contained the first recorded management zonation map for Anguilla's immediate marine areas and cays, and proposed national marine parks at Sandy Island and Shoal Bay East together with a number of other multiple use zones with varying degrees of protection and/or management. As a side note, a policy statement on marine parks for Anguilla (Gov Axa, 1978), which was probably still being discussed while Jackson collected his field data, although not a management plan, did suggest four areas around Anguilla be established as marine parks: the reefs around Sandy Island; the waters around Prickly Pear Cays; the reefs and waters at Little Bay in the Flat Cap Point region; and the reefs around Shoal Bay East.

The work by Jackson, combined with reports of habitat degradation in other parts of the Caribbean, led to an increasing recognition of the urgent need to manage Anguilla's coastal resources (Oxenford & Hunte, 1990). Indeed, the importance of protecting coastal marine resources was stressed further in the 1987-1997 Fisheries Development Plan for Anguilla (Stephenson, 1987). Thus a program was initiated to establish a number of marine protected areas around the island, and an action plan produced by Jackson (1987) laid out a road map for the development of marine parks. This action plan used the same zonation plan as his earlier 1981 paper, which was again used (Goodwin, 1989) in a simplified form by in what appears to be a sister project conducted by the Caribbean Conservation Association, the same body who requested the action plan produced by Jackson (1987). Goodwin cites a number of unavailable reports that appear to have been assessing the various areas around Anguilla being proposed as protected areas (namely: Dog Island; Sombrero Island; Seal Island; Prickly Pear Cays; Scrub Island; Shoal Bay East; Sandy Island; Corito Bay; and Little Harbour).

The marine park areas that were eventually established in 1993 were only partially complimentary to those proposed by Jackson (1981) and Goodwin (1989), and as such the zonation plan became somewhat outdated. At the same time though, Jackson's rationale was still being used as a general guideline for the development of management approaches for the coastal resources of Anguilla up until Oxenford and Hunte (1990), and on into the mid-late 1990s. The work conducted by Oxenford and Hunte does give detailed descriptions of Jackson's recommendations and contributes a number of suggestions as to how to update the work based on the ecological monitoring they conducted. Despite this, and their recommendations for management of marine resources at their study sites, Oxenford and Hunte did not describe a detailed management strategy for the island and thus no up-to-date management plan was in effect during the establishment of the marine parks in 1993. Regardless, it is generally agreed that the marine parks are located in optimum locations, although it may have been beneficial to have included additional areas in the Marine Park System (Scrub Island and Anguilla Island-Blowing Rock, for example).

A decade later in 2001 a new management plan was produced for Anguilla's marine parks (Hoggarth, 2001). It was prepared for the Organisation of Eastern Caribbean States Natural Resources Management Unit in St Lucia, under a project funded by the Department for International Development in the Caribbean. No known record exists of the Government of Anguilla directly requesting the production of this plan although acknowledgements of help are given to members of DFMR and other stakeholders. The plan, based on seven days of research in Anguilla and those data available at the time, is a thorough attempt at organising action towards the management of Anguilla's marine parks, although the plan itself was never formally adopted. The plan is cited as being a draft interim management plan only, and states that "this management plan should be regarded only as a first attempt at describing the status and management of Anguilla's marine parks". It goes on to say that "As guided by the terms of reference, the main focus was placed on assessing needs for monitoring the status of marine habitats. In this and other areas, much further analysis, consultation and design remains to be done", and "This interim plan should be upgraded to a first full management plan upon completion of a further participatory planning process as described in the following sections. Anguilla's marine resource stakeholders need to agree the future goals and institutional arrangements for the marine parks system, and the objectives, zonation, and regulations specific to existing parks and any new parks" (Hoggarth, 2001, page 6).

At the time of its writing, the 2001 management plan was based on the ecological data collected by Oxenford and Hunte (1990) and recognised the fact that these data were in need of updating and as such that the initiation of a long-term monitoring scheme be of immediate and utmost importance. Thus, although this interim plan was not upgraded directly as recommended, it may have contributed to the priority that DFMR placed on collecting such data five years later (see following Section). Furthermore, the relative completeness of the plan means it is an ideal foundation for the current management plan being developed and, as such, this plan may be viewed as the upgraded version that Hoggarth recommended.

Historical Record of Ecological Data Collection

The earliest known report specifically aimed towards fisheries management in Anguilla was authored by Camacho R.V. (1974). As no known copies of this report were able to be located it is unclear whether any data were collected as part of its production. It is, in fact, unlikely that they were as a later report by Olsen and Ogden (1980), the earliest known surviving report orientated towards fisheries management in Anguilla, states that “there has been little previous work in Anguilla” and that “These fisheries are poorly known since they have been largely overlooked by the United Nations Development Project of the 1960's and have not been visited by the Western Central Atlantic Fisheries Common which has recently produced many useful analyses of the fishery potential of many of the Caribbean Islands” (Olsen & Ogden, 1980, page 3). As fisheries were themselves of prime concern back then, and little attention given to the habitats that they existed in, it is unlikely any ecological data had, at that time, been collected. Indeed, as Olsen and Ogden (1980) were part of the ARDP that also yielded the preliminary management strategy put forth by Jackson (1981), it is also highly probable, albeit not possible to confirm, that the zonation map proposed was not based on any ecological data either, although it did describe the nearshore marine resources and recommend a system of marine parks (Oxenford & Hunte, 1990). Also falling under the umbrella of the ARDP, the surveys conducted by Salm (1980) and outlined in his associated report, although representing the first known work on Anguilla's reefs, are believed to have contained mainly qualitative descriptions with only limited quantitative data. Reef Watch (1989, page 1) writes “Both the north and south coasts have fringing and patch reefs, together with coral assemblages on limestone terraces (Salm, 1980). The terrace assemblages are more extensive in the south, forming a 17 km reef area which was considered by Putney (1982) to be one of the

most important largely unbroken reef areas in the Eastern Caribbean. These southern reefs are however more exposed to hurricane generated damage as is evidenced by the higher percentage of dead and broken coral recorded by Salm (1980). From the limited published information available, the northern reefs seemed to support a higher percentage cover of living coral with fields of intact *Acropora palmata* and *Acropora cervicornis*".

Based on the recommendations from the ARDP, the Government of Anguilla selected a number of candidate sites for consideration in the management scheme. These sites included Prickly Pear/Seal Island, Sandy Island/Dowling Shoal, Shoal Bay, Island Harbour, Black Garden Bay, Crocus/Little Bay, Little Harbour, Corito Bay, Forest Bay, Sandy Hill Bay, Dog Island, Scrub Island, and Sombrero Island (Oxenford & Hunte, 1990). This led, in 1989, to a Cambridge-Anguilla Expedition that was mounted to examine marine habitats, initiate permanent monitoring sites and make management recommendations for the first three of these areas. This expedition collected data at these sites (Shoal Bay, Sandy Island & Prickly Pear/Seal Island), although surveys were relatively generic in nature (Reef Quality Index; Environmental Impact Index; substrate type by depth and by site; grouper species abundance; surgeonfish abundance; angelfish abundance; and butterflyfish abundance). The report from this work only presents analysed data and hand drawn maps and so only limited quantitative temporal comparisons are possible.

The Government subsequently requested assistance from the British Development Division to carry out a 'Coastal Inventory and Analysis Project' to examine the remaining candidate sites and to develop a management strategy. The project administered by the then Department of Agriculture and Fisheries, and conducted by the Bellairs Research Institute of McGill University in Barbados (Oxenford & Hunte, 1990), is the result of this request and represents the most rigorous known surviving marine and coastal ecological data for Anguilla during this period. Surveys were conducted at eight of the candidate sites (Black Garden Bay; Crocus/Little Bay; Little Harbour; Corito Bay; Forest Bay; Sandy Hill Bay; Dog Island, and Scrub Island), which diverged somewhat from what appeared to be the general site consensus of the time. Unfortunately this work did not cover Shoal Bay, Sandy Island or Prickly Pear, a fact that may be due to the Cambridge Expedition having surveyed these areas the year earlier. As it appears that this expedition was less rigorous in data collection than Oxenford & Hunte, information at these sites from the time is more limited. It is unknown if more detailed data were presented in a final report of this 1989 expedition as only an informal draft is currently known to exist. For these reasons it is only the Oxenford and Hunte data

that were used by Hoggarth (2001) to develop the first detailed management plan for Anguilla, which means significant knowledge gaps were present as only two of the five marine parks (Little Bay and Dog Island) had any detailed available data. These Oxenford and Hunte data are still used today for temporal analysis of those sites surveyed during the study (Wynne, 2010).

Following Oxenford and Hunte, in 1995 the coastal and sub-littoral habitats of the islands and reefs were surveyed and mapped under the Anguilla Marine Resources Inventory Project by rapid ground truth data collection using aerial photography from 1991 (Blair-Myers *et al.*, 1995). The output of this project provided the most accurate map of Anguilla's benthic environments at that time and was used extensively during the following two decades as the definitive reference material for planning decisions. In 1995 Hurricane Luis hit Anguilla and, according to an impact assessment study (Bythell & Buchan, 1996), significant damage to the coral reefs and seagrass beds occurred. This study used a methodology identical to that of Blair-Myers *et al.* (1995) so to allow realistic continued use of the benthic habitat map. The scale of these two projects, combined with the necessary rapid approach to surveying, does however mean that no detailed quantitative data were produced.

Early the following decade limited survey work that formed part of the Reef Check initiative was conducted on a reef 100m north of Blackgarden (Hoetjes *et al.*, 2002) and yielded a small amount of data. Additional surveys elsewhere around Anguilla do not appear to have been conducted. Following this, the Anguilla Coastal Resource Assessment Mapping and Monitoring Project (ACRAMAM) was conducted during 2004-2005, which aimed to use a similar methodology as Blair-Myers *et al.* (1995). Once completed the collected habitat data were rendered into a Geographical Information System (GIS), which became known as the Anguilla Coastal Resource Information System (AXA CRIS). The rapid assessment methodology yielded only generic ecological data but produced an important resource for future planning purposes. For a number of years this intranet resource was available to Anguilla Government employees for work related purposes. Unfortunately, glitches with the coordinate system used meant data were not always reliable, which ultimately lead to the systems discontinuation. During this time other ecologically based studies were conducted by visiting overseas students indirectly yielding data for various areas around Anguilla. The most notable of these were conducted on the Spotted Spiny Lobster (*Panulirus guttatus*) in 2004 (Wynne, 2004; Wynne & Côté, 2007) and reef fish surveys conducted during 2003-2004 as part of a wider ranging Ph.D. thesis (Molloy, 2006).

The first detailed ecological data collected for the Anguilla Marine Park System were obtained as part of a project entitled 'Enhancing marine protected areas management in Anguilla – Phase 1'² funded by the Overseas Territories Environment Programme (OTEP), where stationary point counts, roving diver surveys and benthic habitat quadrats were used to survey thirty sites within five of the marine parks. Rendezvous Bay was not surveyed at that time as it was not considered a marine park but rather an area under special management. This survey work was undertaken jointly by the Anguilla National Trust (ANT) and DFMR and produced a dataset that serves as a baseline from which future temporal comparisons can be made (Wynne, 2007). Following this project DFMR initiated a Government funded permanent monitoring scheme known as the Anguilla Marine Monitoring Programme (AMMP). This project, which started in 2007, ultimately established fifteen monitoring sites around the island, ten at coral reef sites and five at seagrass sites. Sites were located in certain areas within the marine park system as well as within non-marine park sites, thus expanding Anguilla's ecological dataset to include representative sites within other shallow water habitats. These data, combined with that collected at the thirty OTEP sites, form the basis of the current management plan.

In 2010 DFMR began its first detailed fish catch data collection and analysis, although these data are only currently used to provide fish landing statistics to requesting agencies, with no dedicated official report yet produced. Ultimately, these data will fill an important gap in marine ecological data for Anguilla, and be used as reference materials for fisheries related management decisions and report writing.

A second important gap in ecological information that needs filling is that for benthic habitats and fish populations around Sombrero Island. Based on its inclusion within the Marine Parks Regulations (2010), this area needs to be encompassed by this management plan, but until ecological data are collected no informed management recommendations can be made. To date, the only evidence of survey work conducted around Sombrero Island is an unavailable and undated report produced by Christoph Grueneberg, an overseas student working in collaboration with the Anguilla National Trust entitled 'Survey of the Fish & Coral Fauna on Sombrero Island' (Wynne, 2010). It is probable that Sombrero Island will in fact be more relevant to the Anguilla Fisheries Development Plan (AFDP) currently in production (Gumbs *et al.*, 2015). The AFDP will serve as a

² OTEP Ref: ANG402-2007

sister document to this management plan. Overlap intentionally occurs between these two plans to link them together, but the AFDP is more relevant to deeper offshore areas where pelagic fish stock are potential targets (see following Section). It is the aim of both plans combined to steer fishing in Anguilla more towards these offshore resources to protect shallow coastal areas. This common goal, but difference in ultimate focus, is the reason the AFDP has not been included as part of this plan, yet will be developed in unison with it.

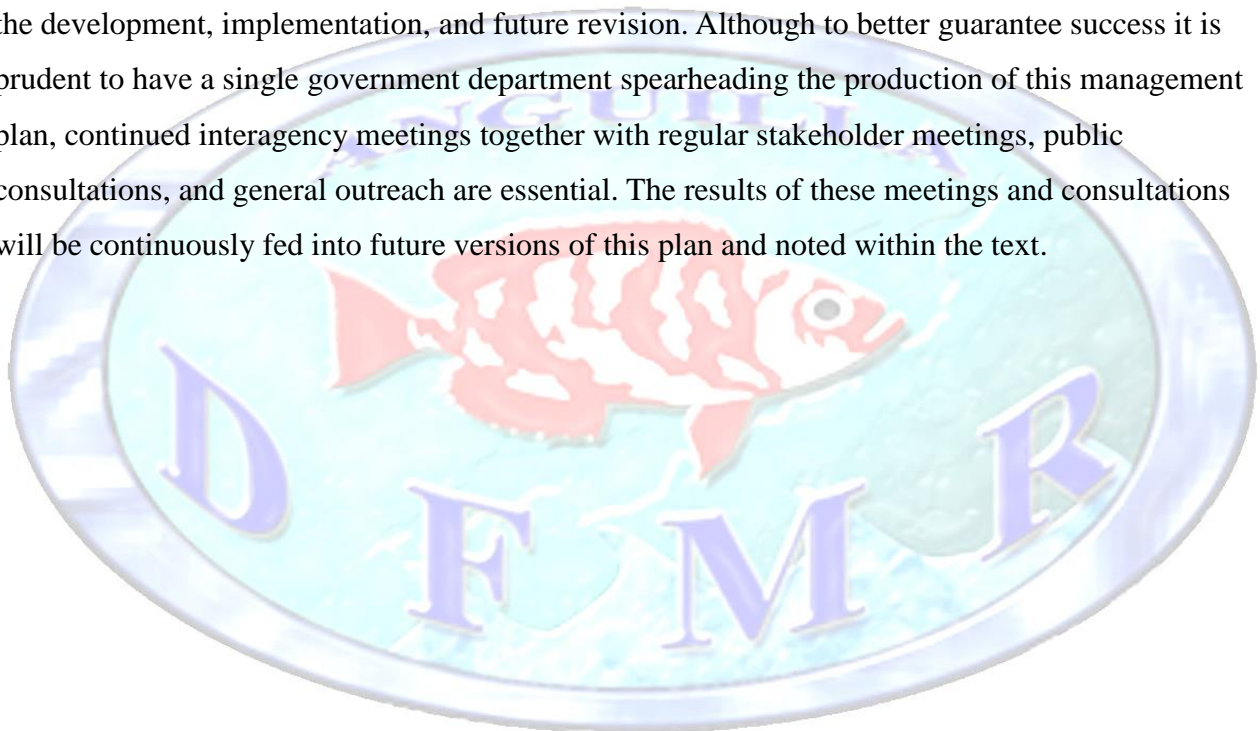
Scope and Successful Implementation of this Management Plan

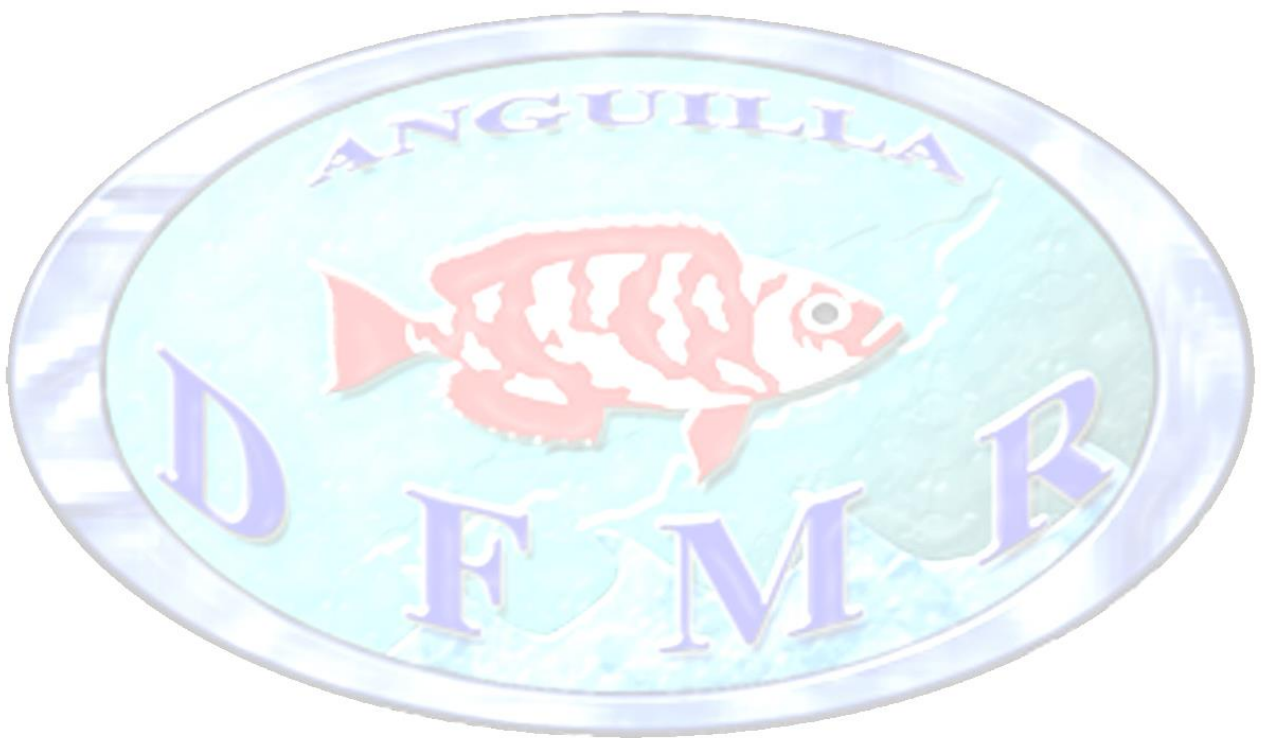
This current plan sets out to be a comprehensive management breakdown not just for Anguilla's marine parks, but also for nearshore shallow water habitats and associated fisheries. These latter facets will serve to link the marine parks together into a true network with an all-encompassing nature that will hopefully aid the management plans official adoption. As mentioned earlier areas that are not included within this plan are more distant deeper offshore regions and the pelagic fisheries that they may contain. These areas will be covered by the AFDP although additional studies may be required to clarify pelagic stocks and include fishing grounds not yet surveyed (for example: Old England, that lays 20 km northeast of mainland Anguilla; and Tuna Bank, that lays a similar distance to the West). Pelagic fisheries that cross-over into the Marine Park System (or the proposed Anguilla Marine Management Area – AMMA) will be mentioned in this plan, but again be more relevant to the AFDP. Examples of such include sport fishing and trolling for pelagic species in nearshore areas. As mentioned above, one of the over-arching purposes of this management plan to compliment the AFDP and help steer the Anguillian fishing industry towards offshore fisheries resources in order to help mitigate known degradation of nearshore reefs and other fishery resources (Wynne, 2016; Chapter 2). Due to the wide ranging nature of this report legislation governing its success falls under the Fisheries Protection Act as well as the Marine Parks Act (or BHCA once it's regulations are produced. Efforts have been made throughout this report to clearly identify which legislative amendments fall under which Act in order to clearly steer its developmental progress.

This plan uses baseline data for the marine parks collected and reported in Wynne (2007), and current up-to-date monitoring data that were collected as part of the AMMP (2007-2010). AMMP has continued beyond 2010, but these data will only be used for subsequent revisions to this plan as

they have yet to be fully organised and analysed. These revisions will allow adaptive management to be undertaken, which is characterised by a flexible approach to management, where both environmental and socio-economic conditions change over time. As stated by Hoggarth (2001, page 7) 'What is appropriate today may not be appropriate tomorrow or in ten years time. An adaptive approach is thus recommended, that recognises the complexity of natural resource management and develops management strategies based on learning and feedback'. This feedback system is illustrated in Chapter 4 (Wynne, 2016), which is the framework this plan will follow.

Finally, to ensure the successful adoption of this plan it is essential that it is based on an integrated and multi-disciplinary approach, and one that is fully participatory in terms of those involved with the development, implementation, and future revision. Although to better guarantee success it is prudent to have a single government department spearheading the production of this management plan, continued interagency meetings together with regular stakeholder meetings, public consultations, and general outreach are essential. The results of these meetings and consultations will be continuously fed into future versions of this plan and noted within the text.





Section 2: Legislative & Managerial Structure

In order to facilitate the adoption of this management plan, the aim is to create a framework that relies on, where possible, existing legislation or minor amendments to existing legislation. Although ultimate managerial goals may be more wide reaching, a primary aim is for other measures to be introduced, at least in the initial stages, via public awareness initiatives/education. This will encourage a community based approach and aid public acceptance and future support.

Complementing this approach, much of the legislative backbone needed for this plan has either already been enacted (although in some cases not enforced), drafted but yet to be enacted, or proposed but not yet added as amendments. The main pieces of legislation as they relate to this plan have been listed below:

- **Beach Protection:** The Beach Control Act (2000). Earliest known version is the Beach Control Ordinance 1961. This Act makes provision for the control of beach usage and the need for a license to build on a beach or the sea floor. It states that the Act will not be used to affect fishing rights. The Beach Protection Act (2000) is a spate Act which makes provision for the Governor to declare a particular beach as protected. Under this, the Beach Protection Orders name eighteen beaches as protected. It also prohibits against sand mining. The Access to Beaches Act (2000) aims to ensure that all beaches remain public, but also affords protection in terms of (for example): littering; damaging plants; driving on the beach (unless it is an established custom).
- **Cruising Permits Act (2000):** Earliest known version is the Cruising Permits Ordinance 1980. This Act falls under the jurisdiction of Customs and provides provisions for cruising permit fees and no anchoring zones in Little Bay, Sandy Island, Prickly Pear Cays and Seal Island Reef, Dog Island and Rendezvous Bay.
- **Fisheries Protection Act (2000):** Earliest known version is the Fisheries Protection Ordinance 1986, with amendments in 1990 and 1995. This Act was due to be updated in 2008 together with a newly drafted set of 2010 Regulations. To date, this has not yet happened. The current 2000 Act legislates all current legal fishing practices and licensing, including (but not limited to): legal size of lobster and conch; molestation of lobsters exhibiting reproductive activity; marking of fish trap buoys with fishing licence number;

molestation of other fishers traps; minimum mesh size for fish trap mesh; prohibition of taking or being in possession of a turtle (to remain in force until 15-12-2020), either whole or a portion of the meat; and prohibition of using gillnets. The Act also makes provisions for: closed seasons (schedule 3); closed areas (schedule 4); minimum size of marine products (schedule 6); minimum mesh size of nets (schedule 7); and designated fish aggregating devices (schedule 8).

- Marine Parks Act (2000): Earliest version is the Marine Parks Ordinance 1974 (revised 1982). Amendments to the regulations under this act were made in 2008 and 2010. No controlling agency has been appointed but DFMR act in this capacity by default. In Section 15 of this Act however, Customs Officers are included as having powers to arrest persons and seize vessels. Regulations include restrictions on (but not limited to): Fishing by non-belongers; diving by unauthorised dive operators; camping; damaging flora and fauna; water skiing; discharging sewage; building fires; and installation of moorings. Provisions are also made so that the Governor in Council may designate any portions of the marine areas of Anguilla as a marine park where it is considered that special steps are necessary for: the protection of fish, the flora and fauna and wrecks found in such areas; preserving and enhancing the natural beauty of such areas; the promotion of the enjoyment by the public of such areas; the promotion of scientific study and research in respect of such areas. Currently Rendezvous Bay is not listed under this act although it is demarked as a no anchoring zone under the Cruising Permits Act.
- Land Development (Control) Act (2010): Earliest version is unknown. This Act is relevant in situations where marine parks include privately owned land within their boundaries, or if future beach set-back regulations may be required. For example, Dog Island is privately owned and therefore any form of development on the island must be approved by the Land Development Control Committee. Set-back recommendations are made when developments are proposed but no legally-binding set-back legislation currently exists above the vegetation line.
- Trade in Endangered Species Act (2010): This Act is relevant in terms of certain endangered species, for example the Hawksbill Turtle (*Eretmochelys imbricate*), although the Act does not have direct implications within this management plan. The Department of Environment

are the management authority, with the Act's primary purpose to compliment the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulations and Appendices.

- Biodiversity and Heritage Conservation Act (2010): This new Act is poised to become one of the most relevant pieces of legislation to this management plan (in combination with the Fisheries Protection Act), although as its governing regulations have yet to be produced the full implications remain unclear. As described earlier both the Minister of Fisheries and the Minister of Environment have joint authority under this Act, as delegated by their competency. Once the regulations are produced this Act will likely replace the Marine Parks Act, and so it is fundamental that the regulations contain all that is already in the Marine Parks Act, together with the relevant amendments suggested within this plan. The BHCA also provides provision for buffer zones, and so compliments the proposed creation of the Coastal Zone Fisheries Management Area (CZFMA). As these regulations have yet to be produced, for the purpose of this management plan, the Marine Parks Act will be cited as the current governing legislation unless stated otherwise.



Management and Managerial Structure

Currently management of the Marine Park System, although limited, is conducted by the Department of Fisheries and Marine Resources by default. DFMR is ideal for the role of management agency as it has: over twenty years experience managing Anguillian waters; a sea going vessel; seven dive certified staff, five of which are competent in underwater survey work and can identify at least 95% of Anguilla's marine species; complete sets of equipment including those needed for diving, all in-water survey work, and mooring buoy installation/maintenance.

Notwithstanding this, because the management of the marine parks involves an integrated approach across many sectors and also encompasses certain terrestrial habitats, DFMR will rely on input from other agencies and, at times, likely seek support from owners of land that falls within park boundaries.

DFMR will assume the lead role in implementing this management plan until it is named officially as lead agency within the Marine Parks Act. In the initial stages of management plan development

DFMR will hold public consultations to gauge acceptance of proposed management. Once completed a final draft management plan will be produced and circulated within the relevant areas of Government. Aside from high level approval of the document, it will be important to get feedback from both the ANT and Department of Environment (DoE) due to their expertise in the management of the terrestrial habitats falling within the marine park boundaries. Following this the management plan will be circulated more widely to other agencies/stakeholders for their comment. These will include:

- Department of Lands and Surveys
- Department of Physical Planning
- Department of Environmental Health
- Anguilla Hotel and Tourism Association
- Anguilla Tourist Board
- Anguilla Fisherman's Association(s)
- Anguilla Sea Turtle Conservation Group
- Owners of land within/bordering the marine parks
- Charter Boat Operators
- Dive Operators

Through public consultations and private meetings with fishers and other stakeholders, the roots of this management plan will be founded within the local community. This community based approach will continue throughout the development process and be essential when revising this document as necessitated under the adaptive management approach. An overall goal is to produce this updated document on an annual basis at the end of each year, based on progress made and information gained over the previous twelve months. Stakeholders are welcomed to participate in the process by visiting the DFMR office on Crocus Hill to discuss any aspects of it.

Section 3: Management Plan

The following management plan will put forward mitigation measures, mainly through legislative amendments (Section 4), for all of the impacts and threats identified (Wynne, 2016). It is recognised that in many marine management areas, complex zoning plans are often proposed to allow effective use of multiple purpose regions. Indeed, such a plan was proposed by Jackson (1981), prior to the establishment of the marine parks. Zoning offers an effective way of achieving the multiple objectives required of protected areas by defining discrete areas for specific uses and/or purposes as described by Kelleher (1999). Examples of these purposes include (but are not limited to): providing protection for critical species and/or representative habitats; separating out and directly managing detrimental and/or conflicting human activities; preserving and directly managing areas for particular human uses; protecting areas from as many anthropogenic stress sources as possible; and allowing for scientific research and/or education.

Today however, the now established marine parks can themselves act as zones without the need for creating a complex system. The current management plan has been based on a simplified concept, but one that goes beyond the Marine Park System to amalgamate Jackson's original idea. Thus the present plan is not just a management plan for Anguilla's Marine Park System, but also for other shallow water habitats and associated fisheries. This creates one large area that encompasses much of the island shelf that is referred to as the Anguilla Marine Management Area (AMMA) within this document. The Marine Parks will form the backbone of this management area, and be afforded the highest level of protection under both the Marine Parks Act and the Fisheries Protection Act. These parks will be linked together with a corridor or buffer zone known as the Coastal Zone Fisheries Management Area (CZFMA). This will be the area where surveillance and enforcement efforts are initially focused due to its proximity to mainland Anguilla. An ultimate goal is to continue such efforts out in to AMMA and beyond, but this will be very much influenced by financial and logistical limitations.

Producing a simple zoning plan such as this overcomes danger posed when over-complication occurs and reduces the risk of associated user confusion: it is problematic to effectively mark the boundaries of the marine parks as a whole, let alone complex zonation within them. Figure 3 illustrates the proposed simple zonation scheme. As mentioned later however, it may be necessary to assess and introduce other small demarked areas for water sports. To further help simplify

zonation, boundaries have been placed in areas that loosely follow habitat gradients and the proposed activities closely follow the usage that has already naturally evolved in different areas. It is hoped that this approach will allow acceptance of the management plan by all stakeholders and/or resource users, while offering an effective way of managing and/or keeping control of these uses.

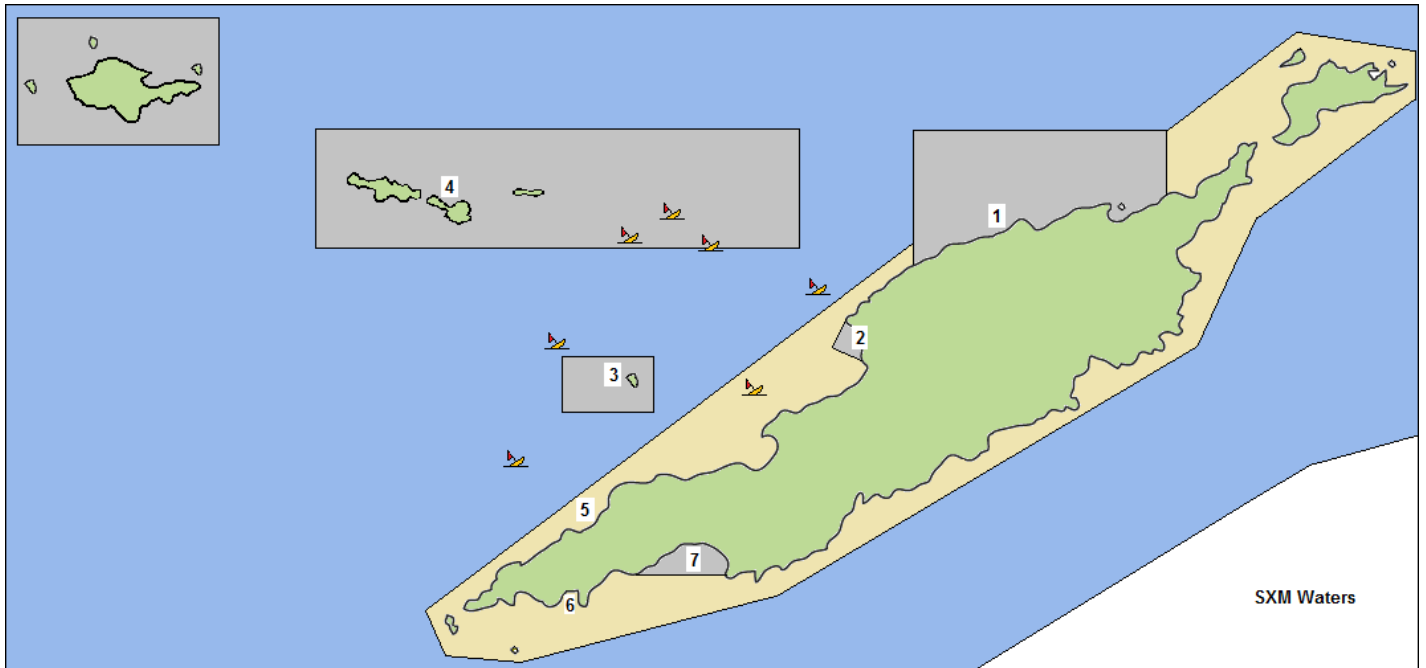


Figure 3: Map (not to scale) depicting the Anguilla Marine Management Area (AMMA - blue) that contains, the Coastal Zone Fisheries Management Area (CZFMA - yellow), and the Anguilla Marine Park System (Grey). Also shown are wreck dive sites (wreck symbol) and potential swimming/snorkelling areas (numbers): (1) Shoal Bay East; (2) Little Bay; (3) Sandy Island; (4) Prickly Pear; (5) Meads Bay; (6) Maundays Bay; (7) Rendezvous Bay. These numbered areas will need further zoning or restrictions if water sports and swimming activities are to not conflict. Although the AMMA and the CZFMA are governed under the same legislation (Fisheries Protection Act) they have been differentiated as zones because, being close to land, it will be possible to patrol the CZFMA regularly and thus enforce regulations effectively. It is proposed that this is the area, outside of the marine parks, that management efforts are initially focused on. The AMMA on the other hand, although still possible to be under active management will only realistically be patrolled on a weekly basis, so regular enforcement would become less viable.

Marine Park Descriptions and Breakdown of Goals for Each Area³

Junks Hole Marine Park: Surrounding the area within a radius of 500 yards (457 m) from GPS coordinates marking the location of the wreck of the Spanish Galleon El Buen Consejo. This area (c. 0.65 km²) is not of ecological significance, being protected instead as an important heritage site. For this reason it is not considered part of Anguilla's Marine Park System. The overall area of this park should also be given. **Park goal**: heritage conservation. Restrictions to the use of the area are concluded as sufficient to preserve site from damage and/or looting. The area is shallow and sea conditions generally rough, which naturally restricts access to the park.

Dog Island Marine Park: The second most distant park from mainland Anguilla, lying approximately 15 km north-west of mainland Anguilla, Dog Island Marine Park, which includes three smaller cays and other scattered rocky outcrops has an overall area of c.10 km² (c.4.5 km x 2 km). The island itself comprises 207 ha of limestone and is recognised as an Important Bird Area (IBA) by Birdlife International (since 1999). Much of the marine habitat consists of sand patches and flat pavement, low complexity, hard bottom communities. The most ecologically diverse area exists between Dog Island and West Cay, where topologically complex subsurface rocks are encrusted with a large variety of sponges, soft corals and hard corals. There is a wide diversity of fish species in the area, with pelagic and reef species coexisting throughout the area. This leads to favourable fishing in the area, although again, its distance from mainland Anguilla serves to restrict this activity somewhat. Sharks are relatively common and turtles are often sighted making this an attractive area for recreational diving. Great Bay is also an important sea turtle nesting site. Sea conditions and strong currents mean survey work can be problematic to conduct here, thus only three baseline 2007 sites could be surveyed and despite a number of efforts it is not included within current AMMP monitoring. Lobster, snapper and conch fishing occur in the area as well as trap fishing for reef fish species, spearfishing, and seasonal 'rounding of the jacks'. **Park goal**: fisheries and habitat conservation. The island is privately owned and is important for sea birds and nesting sea turtles. Restrictions on anchoring exist under the Cruising Permits Act that helps preserve rocky reef habitat integrity and other benthic life. Anchoring is permitted in Great Bay (although a typographical error in the Cruising Permits Act labels it incorrectly). The area is not heavily visited by tourist charters and so a mooring buoy field is not deemed necessary. There are no developments of the island, although it has been put up for sale a number of times in the past. Diving takes place

³ Table 1 gives a visual synopsis of these managerial goals

at some locations in the park, mostly close to West Cay. It is proposed that the area becomes a pelagic fish and reef species reserve, including conch and lobster. A lot of fishing takes place in the area, but following public consultations it appears that most occurs outside of park boundaries: more discussions with fishers will be needed to confirm this, but the amount of suitable habitat outside the park should mean livelihoods are not significantly affected. Spearfishing and trap fishing should be prohibited in the park.

Prickly Pear and Seal Island Reefs Marine Park: This park, the largest within the Marine Park System, lies approximately 9 km north-west of mainland Anguilla and consists of three main cays with an overall park area of c.33 km² (c.12.5 km x 2.5 km). Prickly Pear East, with an area of 31 ha of dense scrub, with Hoggarth (2001) recognising it as an IBA due to 180 pairs of nesting Bridled Terns (*Onychoprion anaethetus*). Up-to-date bird counts are presented in Lloyd & Mukhida (2014). Extensive sand and rubble patches are present around the cays, with a number of small rocky outcrops and a chain of barrier reefs stretching c.10 km eastwards. This barrier reef has extensive hard and soft coral communities together with a wide variety of reef fish species. Juvenile turtles frequent the area, both Green (*Chelonia mydas*) and Hawksbill (*Eretmochelys imbricata*) Turtles, with a small amount of nesting known to occur on certain beaches. Although little data exists to corroborate as such, it is believed that this reef system has degraded markedly over recent decades due to fishing impacts, coral diseases, and hurricane damage. One sign of this is that the area, although still important for fishing, is not visited by fishers in the numbers once reported (Wynne, pers. obs.). No recreational diving regularly occurs in the vicinity although the cays are a very popular snorkelling spot with dozens of tourists descending on the reefs closest to shore on a daily basis. Eight sites were surveyed for baseline data collection in 2007, and one AMMP site is located towards the more pristine eastern end of the barrier reef system. Trap fishing for local 'crayfish' (*Panulirus guttatus*) occurs extensively along the barrier reef system as well as spearfishing and trap fishing for reef fish species. **Park goal:** fisheries and habitat conservation; recreational enhancement. The main islands are privately owned and important for sea birds and nesting sea turtles. The land owners have spoken of an interest in integrated management, which will be pursued together with the ANT. Restrictions on anchoring exist under the Cruising Permits Act that help preserve rocky reef habitat integrity and other benthic life. Anchoring is permitted in two sandy areas around Prickly Pear East where DFMR also maintain small mooring fields. The area is heavily visited by tourist charters and popular with snorkelers. Two restaurants operate here also. Diving takes place at three wreck sites located close to the border of the eastern end of the park. It is

proposed that the area becomes a pelagic fish and reef species reserve, including conch and lobster, but fishing for Crayfish (*P. guttatus*) be permitted: a lot of fishing takes place along the main Seal Island reef system, but following public consultations it appears that most of this is for Crayfish only. As virtually all trap fishing for Crayfish occurs within the Marine Park System some concessions will be needed to accommodate this. Spearfishing should be prohibited in the park.

Sandy Island Marine Park: One of the smallest offshore cays within the marine park system, situated only a few km north-west from mainland Anguilla. The cay is made entirely of sand and coral fragments/rubble, with the park itself having an overall area of c.5 km² (c.3 km x 1.5 km). The habitats around Sandy Island are varied, with sand/rubble areas, seagrass beds, patch reefs and fairly extensive deep reefs. Dowling Shoal is one such example which has variable hard and soft coral communities and a wide variety of reef fish species. It is an important juvenile turtle habitat for both Green (*Chelonia mydas*) and Hawksbill (*Eretmochelys imbricata*) Turtles, with a small amount of nesting known to occur on the cay. Relatively high levels of fishing occur in the area (mainly trap fishing with some spearfishing also) and it is popular with snorkelers visiting by boat. Two or more recreational dive sites exist within park boundaries. Four study sites were surveyed for baseline data collection in 2007. The eastern most of these sites became a long term monitoring site as part of AMMP. **Park goal**: fisheries and habitat conservation; recreational enhancement. The main island is privately owned and relatively important for nesting sea turtles. Turtles also forage in the surrounding waters. Restrictions on anchoring exist under the Cruising Permits Act that help preserve rocky reef habitat integrity, seagrass areas, and other benthic life. Anchoring is permitted in two sandy areas in front of the western side of the island where DFMR maintain a relatively large mooring field. The area is heavily visited by tourist charters and popular with snorkelers. One restaurant operates here also. Diving takes place on a number of the reefs within the park. It is proposed that the area becomes a pelagic fish and reef species reserve, including conch and lobster. A lot of fishing takes place in the area, but following public consultations it appears that most of this is for Snapper using hook and line and so would still be permitted in the park: discussions with fishers are needed to confirm this. Spearfishing and trap fishing should be prohibited in the park.

Little Bay Marine Park: This triangular shaped coastal protected area is the smallest within the marine park system (<1 km², c.1 km x 1 km x 1 km triangle), extending from Pelican Point (southern tip) to Flat Cap Point (northern tip). The bay has extensive seagrass and is considered to be an important nursery area for reef fish species and spawning ground for Yellowtail Snapper

(Hoggarth, 2001). The small size of this park, combined with the fact that it attracts a lot of visitors, mean user conflicts are reportedly high. It is a very important juvenile turtle habitat for both Green (*Chelonia mydas*) and Hawksbill (*Eretmochelys imbricata*) Turtles, with occasional nesting activity on the beach. Some hard and soft corals are present in the submerged rocky coastal regions together with a variety of reef fish. Snorkelling is very popular here but no diving occurs aside from the occasional training course. A small number of fish traps can occasionally be found within the park area, but fishing is mainly hook and line from the sea rocks, spearfishing, or seasonal seine netting for species of Jacks (Carangidae). **Park goal:** fisheries and habitat conservation; recreational enhancement. The area is adjacent to privately owned areas of mainland Anguilla. Under the Cruising Permits Act anchoring is not permitted anywhere in the park in order to protect seagrass integrity. DFMR maintain a number of moorings in the area, some further away from the bay for vessels <55ft and others close to the bay for vessels <35ft. The area is heavily visited by tourist charters and popular with snorkelers. Some small developments can be found on the cliff tops overlooking the park. The area is one of those being put forward by DFMR for a tourist/fisheries enhancement project: sculpture garden; coral nursery; lobster casita; artificial reef; or a combination of these. Recreational diving does not take place in the park, aside from the occasional training session during rough sea conditions. The area is very important for foraging sea turtles. It is proposed that the area becomes a reef and seagrass species reserve, including conch and lobster. Hook and line fishing takes place from the sea rocks but this would still be permitted in the park. Following public consultations it became apparent that spearfishing is also popular within the park, although this, together with trap fishing, should be prohibited.

Shoal Bay and Island Harbour Reefs Marine Park: The largest of the marine parks bordering Anguilla's mainland coastline at c.19 km², this area flanks one of the longest stretches of white sand beaches in Anguilla. The northern limit of the park runs for c.7 km at approximately the same latitude as the southern end of Scrub Bay. This northern boundary lies 3.5 km offshore at the western end of the park past Lower Shoal Bay East and 1.75 km offshore at the eastern end of the park beyond the important fishing community of Island Harbour (that includes Scilly Cay). Habitats, and therefore resources in the area, are varied ranging from extensive patch reefs to fringing *Acropora palmata* reefs and mixed seagrass beds. The area is important for virtually all marine species including juvenile sea turtles that forage in the area, and adults that regularly nest on the beaches from March through November. It is a popular snorkelling spot although diving, which was once popular in the area, no longer regularly occurs due to reported degradation and travel

distances for dive operators. Fishing is common and ranges from spearfishing to lobster fishing for *Panulirus spp.* Twelve sites were surveyed for baseline data collection in 2007. One of the most westerly of these became a long term monitoring site as part of AMMP, with a second site eastwards close to Island Harbour. An important socio-economic study was conducted for this park in preparation for the development of a management plan which highlighted the challenges that this area will face (Mukhida & Gumbs, 2007). This report played an important role during the development of the current management plan. **Park goal:** fisheries and habitat conservation; recreational enhancement. The region is important for both foraging and nesting sea turtles. The area is adjacent to privately owned areas of mainland Anguilla with a number of hotel developments and small restaurants operating close to or on the beach. The area is one of those being put forward by DFMR for a tourist/fisheries enhancement project: sculpture garden; coral nursery; lobster casita; artificial reef; or a combination of these. The park is not listed under the Cruising Permits Act and so anchoring is currently permitted throughout the region. It is suggested that anchoring be prohibited in all areas to help preserve rocky reef habitat integrity, seagrass areas, and other benthic life. Two moorings were installed at the request of stakeholders in Shoal Bay and one in Island Harbour that are maintained by DFMR. Prior to anchoring being prohibited it will be necessary for DFMR to install more moorings in the area, pending research into stakeholder requirements. The shallow reefs mean that the area is not heavily visited by tourist charters (access is dangerous unless familiar with the waters), but the beach is busy almost year round with visiting tourists. Diving used to take at a number of sites within the park, but habitat degradation and distance needed to travel to the sites by dive operators mean it no longer commonly occurs. It is proposed that the area becomes a pelagic fish and reef species reserve, including conch and lobster, but fishing for Crayfish (*P. guttatus*) be permitted: a lot of fishing takes place along the outer Madeariman reef system of Shoal Bay and eastwards towards Island Harbour but, following public consultations, it appears that most of this is for Crayfish. As virtually all trap fishing for Crayfish occurs within the Marine Park System some concessions will be needed to accommodate this. Spearfishing should be prohibited in the park.

Sombrero Island: This park encompasses the land and sea areas within a 2000 yard (1.83 km) radius of GPS coordinates marking its central point, giving it a total size of 10.5 km². Historically, the island itself played an important role in Anguilla as it was the site of relatively extensive phosphate mining derived from bird guano that was exported as fertiliser. This mining was conducted first by the Americans in the mid 1850's and later by the English who took over operations in the mid

1860's. By 1870 the mining operation was yielding 3000 tonnes of phosphate each year, but by 1890 reserves were exhausted and operations ceased. There are still ruins on the Island that remain from this time and as such Sombrero Island is considered an important heritage site. The first lighthouse on the island was erected in 1868 which was replaced in 1962 after hurricane damage. The Lighthouse was manned until 2001 when an automated system was put in place. The Ministry of Infrastructure, which DFMR falls under, is still responsible for the maintenance of this navigational aid, and visits the island with the Marine Police sporadically. Today the island is visited only occasionally by fishers, biologists, divers and Government staff. The island has been identified as an IBA by Birdlife International due to a number of breeding seabird species, and is being nominated by the Government of Anguilla as a Ramsar site. One short report (Grueneberg, undated) is the only evidence of any past survey work being conducted there. One dive was undertaken by DFMR staff in the southern coastal area in 2009 that classified it as a rocky pavement reef habitat in some ways similar to that found at Dog Island, with an abundance of pelagic fish species. Quantitative data of the marine habitats around Sombrero were collected during four underwater video array transects in 2015 by DFMR (report in preparation). Further survey work is recommended before management measures can be proposed. **Park goal:** heritage and fisheries/habitat conservation. Management of the marine portion of the park is currently uncertain pending habitat survey reports and review of fisheries data. The coordinates listed in the Marine Parks Act need amending so that they include the whole of the land portion of the island. Sombrero's distance from mainland Anguilla (and therefore it lying outside of AMMA) mean surveillance and enforcement of any regulations would be problematic based on current logistical resources. The area however has great potential as a pelagic fish species, lobster and conch reserve. Spearfishing and trap fishing should be prohibited.

Rendezvous Bay: Although not yet officially a marine park, the area has extensive seagrass beds and as such listed as a no anchoring zone. Its boundary transects the bay from Shaddick Point to Cove Bay Point, and includes the smaller Merrywing Bay. As a seagrass habitat it is considered to be an important nursery area for reef fish species and Hoggarth (2001) notes that it is a spawning ground for Yellowtail Snapper (*Ocyurus chrysurus*). It is also important for juvenile foraging Green Turtles (*Chelonia mydas*) and as a nesting site for adult sea turtles. No diving occurs here and snorkelling is relatively uncommon due to the overall sand/seagrass benthic nature of the area. The beach is relatively busy in the tourist season due to surrounding coastal developments. A small number of fish traps can occasionally be found within the bay, but on the whole fishing does not

regularly take place here. The area includes one AMMP monitoring site at Merrywing Bay. **Park goal:** fisheries and habitat conservation; recreational enhancement. The area is not listed under the Marine Parks Act, but is demarked as a no anchoring zone under the Cruising Permits Act (although this law is currently not enforced). If anchoring were to be prohibited throughout the whole bay it would be necessary for DFMR to install and maintain a mooring field in the bay as it is very popular with visiting tourist vessels. Due to this popularity, and combined with both the moon splash festival that takes place here annually, and the bay's use as a safe harbour in times of adverse weather conditions, it is not recommended for it to remain officially a no anchoring area. Instead it is recommended that an anchoring zone be placed in the eastern end of the park. The bay is adjacent to privately owned areas of mainland Anguilla with a large hotel development come golf resort, two smaller hotels, and a number of small restaurants operating close to or on the beach. The area is one of those being put forward by DFMR for a tourist/fisheries enhancement project: sculpture garden; coral nursery; lobster casita; artificial reef; or a combination of these. It is proposed that the area becomes a reef and seagrass species reserve, including conch and lobster. Following public consultations few disagreed with the overall goal of the area, although anchoring restrictions were of some concern.

Other Managerial Units

CZFMA & AMMA: Area goal: fisheries surveillance and enforcement enhancement. Governed under the Fisheries Protection Act the CZFMA area will serve as a corridor or buffer zone between the marine park areas. This will be the region DFMR focuses its surveillance and enforcement efforts for the time being, although in combination with the Marine Police, DFMR will conduct weekly patrols around AMMA whenever possible.

Wreck dive sites: Area goal: fisheries conservation; recreational enhancement. Most of these seven wrecks were sunk in the 1990's as part of a Road Bay clean-up effort and artificial reef initiative. Today, in light of habitat degradation, they are the most visited dive sites in Anguillian waters and as such very important to conserve. Currently they are afforded no level of protection. Differing from reef dive sites as they were established originally for conservation and recreational purposes, these wrecks should be strictly protected as no take areas. It is suggested that a 50m circumference be used as a boundary from the published coordinates of these sites. Consideration should also be given to prohibiting spearfishing and trap fishing on all registered dive sites.

Table 1: Breakdown of the overall goals for the areas within the Marine Park System.

Marine Park Name	Junks Hole	Dog Island	Prickly Pear	Sandy Island	Little Bay	Shoal Bay Island Harb.	Sombrero Island	Rendezvous Bay
Anchoring Prohibited	X				X	X	X	
No Anchoring Areas		X	X	X				X
Spearfishing Prohibited	X	X	X	X	X	X	X	X
Conch Fishing Prohibited	X	X	X	X	X	X	X	X
Trap Fishing Prohibited	X	X	Crayfish Only	X	X	Crayfish Only	X	X
Hook and Line Allowed	X	X	X	X	X	X	X	X
Seine Netting Allowed	X	X	X	X	X	X	X	X
Enhancement Proposed					X	X		X

Section 4: Legislative Amendments

Proposed Amendments to the Marine Parks Act and/or the BHCA

- **Clarification of lead management agency:** Under the Marine Parks Act no administrative agency has been listed. Instead it states that “The Governor may appoint any person as Controlling Officer”. This role has been assumed by DFMR since the park’s creation, but a Controlling Officer has yet to be appointed. In the new BHCA, The Department of Fisheries and Marine Resources, through the Minister for Fisheries, have been indirectly named as lead management agency for the marine areas under the Act. Until the BHCA officially supersedes the Marine Parks Act DFMR will continue to assume the lead role and begin implementing this management plan. The Marine Parks Act will continue to be viewed as the guiding legislation for the marine parks until this time. As such, the Governor needs to officially state that the Director of Fisheries and Marine Resources (or Minister of Fisheries) is the Controlling Officer under the Act, or the Act needs to be amended to state that DFMR (or the Minister of Fisheries) is responsible for administering the Act.
- **Enforcement and ticketing:** In order for DFMR to be able to fulfil their managerial role under the Marine Parks Act, Fisheries Officers will need official enforcement capabilities. This should include the ability to issue on-the-spot fines (ticketing system) and confiscate fishing equipment infringing on legal fishing practices. Provision for this has been made under the BHCA, but as with the lead management body, until regulations are produced under the Act, the Marine Parks Act is still the governing legislation. No enforcement capabilities are listed under the Marine Parks Act. NB. Under the Fisheries Protection Act fisheries officers are given some limited enforcement powers, but these mainly relate to boarding and seizing vessels, and do not directly relate to enforcing legislation. It is currently prudent for Fisheries Officers to conduct patrols together with Police Officers for this purpose.
- **Official designation of marine parks:** All park areas within this management plan need to be correctly listed under the Marine Parks Act, together with their anchoring restrictions as detailed currently in the Cruising Permits Act. These restrictions can simply be transferred across, or remain in the Cruising Permits Act and simply be updated: one small alteration to

correct a typographical error stating that Great Bay (Dog Island) is a no anchoring area; Shoal Bay and Island Harbour is not listed in the Cruising Permits Act, and it is proposed to make it a no anchoring zone to protect its extensive reef and seagrass areas, as is already the case in Little Bay; Rendezvous Bay also needs to be listed in the Act as a marine park and its anchoring restrictions reviewed; the coordinates given for Sombrero Island in the 2010 revision of the Marine Parks Act appear incorrect as they fall quite a distance out to sea, rather than being placed centrally on the island as would be expected. DFMR owns, but has yet to install, fifty marine park boundary marker buoys that should be placed in appropriate locations along the demarcation boundaries.

- **Fishing restrictions in marine parks:** An overall aim for the marine parks is for them to house healthy populations of marine species that will migrate to other areas and be viable catch for fishers. To enable this, fishing restrictions within the parks will be needed. To gain community support it would not be wise to prohibit all types of fishing in the marine parks at this time. Instead it is suggested to allow all types of fishing that involves the use of a hook and line (rod and reel, trolling, vertical long-line etc) or seine nets. Hook and line methods do not remove herbivorous species, and can directly target certain species of certain sizes through gear choice. It is also arguably less damaging to the habitat, although nylon line entanglement can cause minor problems. Seine netting is also proposed as permitted in marine parks at this time as it, for the most part, targets pelagic species that migrate between areas rather than species that live 'permanently' in one place. However, an exception to this is trap fishing for Crayfish which will be permitted still in Shoal Bay-Island Harbour and Prickly Pear-Seal Island Marine Parks. The remaining marine parks, where Crayfish fishing will be prohibited, will be considered closed areas to this practice, and thus will be dealt with under the Fishery Protection Act amendments in the next subsection. Under the Marine Parks Act, as it makes better sense to keep regulations under this Act generic to all marine parks, only spearfishing and removal of conch will be prohibited. Sports fishing should also be prohibited in marine parks, although current sport fishing licences stipulate this as a regulation so in effect it is already in force.
- **Marine pollution fines:** A fining system should be developed where the dumping of grey water, black water and/or oil based substances be prohibited within the marine parks. These fines should be graded based on the severity of the pollution event. It may however be

prudent to include such a fining system for all marine areas and, if so, would be necessary to make the legislative amendment under the Fishery Protection Act rather than the Marine Parks Act. Notwithstanding this, the Merchants Shipping Act (2010) already makes provision for such regulations under section 66(1)(c). Thus this Act might better serve as the legislative origin for such a fining system.

- Fee for tourist enhancement features: The tourist enhancement features suggested for Little Bay, Rendezvous Bay and/or Shoal Bay will need moorings and maintenance to keep them running effectively (these features will be underwater and not affect the above water beauty of the areas they are in, being only visible via diving or snorkelling). In order to pay for this maintenance small visitor fees will be needed. Under the Marine Parks Act section 7 (1)(h), the Governor may make a regulation regarding to “the charging of fees for any of the services provided in marine parks”. All visitors to the underwater features (not the marine park as a whole) will be charged this fee (suggested as EC\$5.00 per person per day). As a method of implementing the collection of these fees it is proposed to make bracelets available for purchase at local outlets. Spot checks will be conducted by DFMR to check those snorkelling or diving around the feature are in possession of one. These spot checks will aid compliance although it is not proposed to have a fine in place for those without a bracelet: they will only be asked to leave the area.

Proposed Amendments to the Fisheries Protection Act

- Enforcement and ticketing: As mentioned under the amendments for the Marine Parks Act, Fisheries Officers need to be given greater powers when it comes to enforcing relevant legislation. Currently under the Fisheries Protection Act powers are generally limited to boarding and seizing vessels. This needs to be extended to, for example: seizing of fishing gear being used in a way that contravenes the Act; and spot fining of offenders.
- Fishing restrictions: *Trap Fishing* should be conducted with fish traps that are fitted with an easily erodible escape door; traps should only be placed on sand areas and not directly on the reef; netting of deep water pelagics (i.e. Coryphaenidae) and spawning aggregations of Snapper (Lutjanidae) or Grouper (Serranidae) should be prohibited; existing legislation should be enforced as it relates to marking fish trap buoys with licence numbers.

Spearfishing should be permitted by licence, not by default. *Seine net fishing* should only be permitted with minimum stretch mesh size of 3 inches. This can be provided for under schedule 7 of the existing legislation. *Hook and line fishing* should be permitted without restriction (recreationally) but with a licence (commercially). Minimum landing sizes should be imposed for certain species as detailed below (note: these regulations apply to all areas, not just the marine parks, hence their inclusion in the Fisheries Protection Act rather than only in the Marine Parks Act).

- Minimum landing sizes: To protect juveniles of certain fish species and encourage the recovery of their stocks. Under schedule 6 of the Fisheries Protection Act (thus relevant to all marine areas, not just the marine parks) key targeted fish species need to be legislated for in terms of a minimum landing size. Species to focus on primarily are those targeted by fishers that belong to the families Serranidae (seabass), Lutjanidae (snapper), Scaridae (parrotfish), Carangidae (jacks), and Acanthuridae (surgeonfish). Minimum size recommendations are presented in chapter 4 (Wynne, 2016) and also detailed within the AFDP. It is also recommended that while these changes are taking place public awareness posters be produced detailing the rationale behind these minimum size limits with some life size examples of key species. It would also be beneficial to produce a ruler like scale for fishers that depict recommended sizes for each species. This will facilitate compliance with the legislation once it comes into force.
- Conch legislative revision: Current Queen Conch (*S. gigas*) legislation is insufficient to protect immature individuals from harvest. Based on research over recent years it is recommended to update legislation to take into account the thickness of the flared lip, as detailed in Chapter 4 (Wynne, 2016). This will work in combination with the marine parks being closed areas to harvest conch and thus promote the sustainability of this important fishery.
- Lobster legislative revision: Insufficient legislation relates to *P. guttatus* (local name crayfish) as no minimum landing size exists for this species as it does for *P. argus*. Chapter 3 (Wynne, 2016) makes recommendations for a minimum size based on extensive local research. This is especially important to protect immature individuals, which cannot be readily captured by trap, from the expanding night-time hand capture fishery. Introduction of a closed season for both species, as closing certain marine parks to harvesting these

species may not be sufficient to allow stocks to remain economically sustainable. This is especially the case for *P. argus* where offshore grounds are reportedly much less productive than they were a decade or two ago (W.Harrigan, pers.comm.). It is suggested for this species to have a closed season between 1st June and 1st November each year. For *P. guttatus* a closed season between 1st Jan and 1st June each year is suggested. This will work in combination with the marine parks being closed areas to harvest both lobster species and thus promote the sustainability of these important fisheries. Closed seasons can be legislated under schedule 3 of the Fisheries Protection Act.

- Closed areas: All marine parks except Shoal Bay-Island Harbour and Prickly Pear-Seal Island are to be closed to all types of trap fishing. Schedule 4 of the Fishery Protection Act allows prohibited areas to be named in such a way. Dive wrecks should also be named under this schedule, but to all types of fishing entirely. These wrecks are extremely important with the diving/tourism industry. Acting as marine species aggregation structures, these wrecks house not just fish populations but also lobsters, turtles and many other marine species. These species are what many of the divers pay to observe. It is easy, especially for foreign vessels, to fish out the wrecks because a dive buoy advertises their locations and provides a mooring that can be used while fishing takes place. Reports have been made of these vessels stripping a wreck of its lobster inhabitants in a matter of minutes. Strict protection of these wrecks is therefore of utmost importance. It is suggested to prohibit fishing of any kind with 50m of the red buoy installed and maintained by DFMR to mark a wreck. As a long-term goal all dive sites marked with a red DFMR buoy should be completely protected, but until their locations are properly standardised this will not be possible.

Other and/or Non-Legislative Management Actions

- Coastal Zone Fishery Management Area (CZFMA) and other areas: The purpose of the CZFMA is to create a buffer zone that will link the marine parks with surrounding coastal regions and encourage sustainable fishing methods that will preserve fishery livelihoods for generations to come. This zone will be under the regulations governing all areas within the Anguilla Marine Management Area (AMMA), the Fisheries Protection Act, but will be designated as a buffer zone under the BHCA. DFMR will initially concentrate its surveillance and enforcement efforts within the CZFMA until more logistical and financial

resources become available to allow it to patrol AMMA more inclusively. The CZFMA is designed to be a specially managed area used to compliment the Marine Park System, and includes (but is not limited to) all coastal areas less than 10m in depth (see figure 2).

AMMA, despite its size, still forms an area that can (depending on resources) be realistically patrolled jointly by DFMR and the Marine Police, and therefore can be effectively managed. It is also encouraged that the aquaculture potential be fully explored within this area. A number of such projects have been proposed in the past, but to date none have been successfully established. DFMR will also encourage pelagic fishing in Anguillan waters in an effort to move away from more ecologically damaging reef fishing practices currently used. Some of these proposed activities will likely occur further offshore in Anguilla's EFZ and thus be more relevant for inclusion within the AFDP rather than this document.

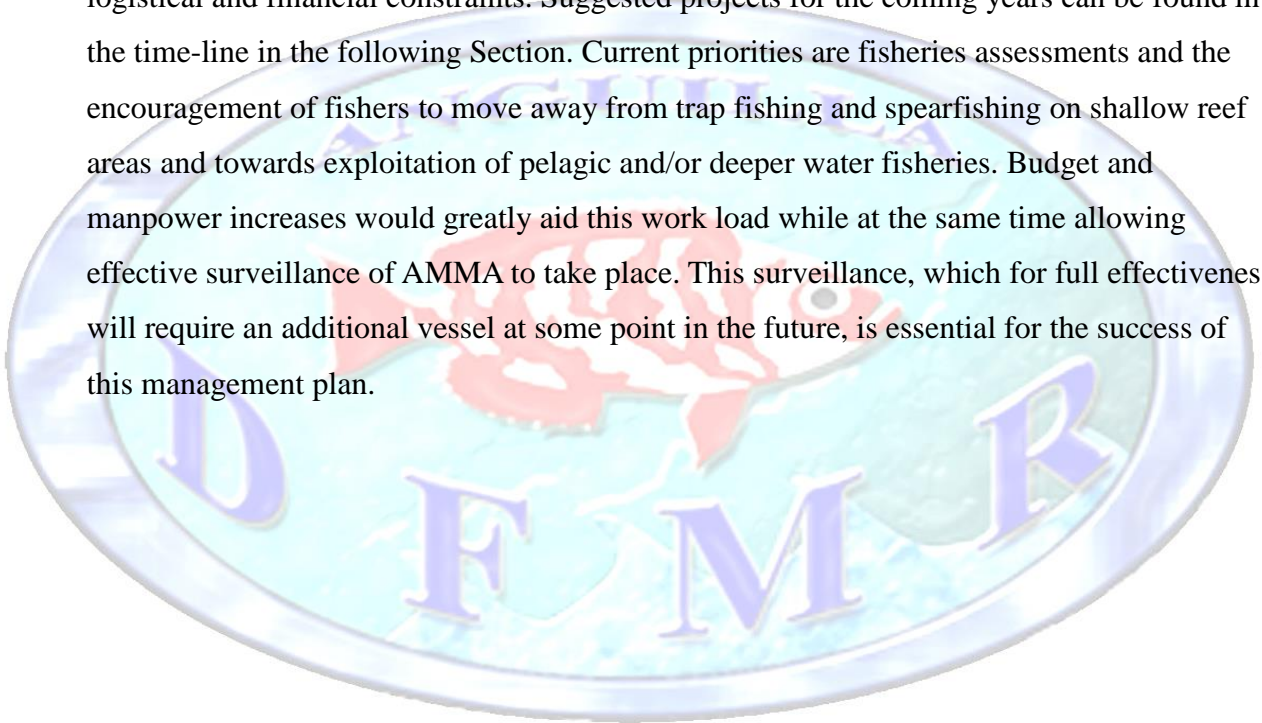
- Fee structure revisions: Some fees are included in the legislation, while others are not. Revision of the fee structure is suggested in order to provide revenue for the marine parks and relevant authorities. This is important for the longevity and successful management of the Marine Park System. Suggested fee structures that need review include (but are not limited to): *Dive Fee* - currently set at \$1US per person per dive. This fee has not changed since its introduction in the early 1990's and is based on an honour system where dive operators pay every three months. Previously, diver operators had agreed to change this fee to a one off \$10US fee per diver; *Marine Park Mooring Buoy User Fee* - currently collected when vessels check in at Customs and as such is not recorded as revenue created by the Marine Park System. This revenue needs to be recorded separately, and the fee structure increased for foreign vessels. These vessels are usually larger in size with a much higher number of visitors on board, therefore they put more pressure (wear and tear) on the moorings and the natural environment; *Sport Fishing Fee* - currently set at \$30US per person (not per vessel) for three months. It is known that many operators do not pay this, reportedly because it is seen as unfair to have to buy a three month licence for charter clients who only want to fish for one day. It would be fairer to increase the three month fee but for it to cover a maximum of three fishing charter passengers at any one time on the registered vessel. Most sport fishing occurs primarily in the deeper water parts of AMMA, although it is still known to sometimes take place within marine park boundaries.
- Tourism and fisheries enhancements: Enhancements should attract more paying visitors and help fund the Marine Park System, without harming the ecosystems the parks are designed

to protect. Snorkelling trails incorporating underwater fisheries enhancement features (lobster casitas, sculpture gardens etc) in Little Bay, Shoal Bay and/or Rendezvous would be educational and prove popular among visitors. Underwater sculptures, as well as being attractive to visitors, can be designed to encourage coral growth and attract fish and other marine species. Equally, a sunken wreck, if placed at a suitable depth (and therefore in a carefully selected location) can be visited by snorkelers and divers alike, while again attracting and sustaining fish populations. Lobster casitas too can be designed in an attractive manner and placed in large groups within park boundaries and form 'Lobster Sanctuary Villages' to enhance local and regional recruitment. Swimming areas will also need to be established in locations with high levels of boat activity to protect bathers from collisions. If conflicting user groups arise, agreements and/or buoyed swimming zones (or similar) will need to be created (potential areas where such conflicts may arise). Notwithstanding this, water-skiing is already banned in marine park areas, and it is recommended that this be mirrored by prohibiting any other 'collision-risk' water sports. This is especially relevant if the current ban on jet-ski's is lifted, as the majority of marine parks are popular swimming/snorkelling areas and so collision risk is heightened.

- Fishing methods outreach campaign: The campaign should encourage fishers to move away from the more laborious, environmentally damaging and economically limiting fishing methods. Sport fishing and long-lining/trolling fishing methods yield a catch more favourable to sell to the tourist industry, thus commanding higher prices. These practices also do less damage to the environment as they do not involve setting traps, negotiating shallow reef areas, or setting nets. Sport fishing can offer the greatest return for fishers as no catch is required to earn a living, only a paying client. Catch can either be returned to the ocean or sold to client/restaurant for extra earnings. An outreach campaign should also include materials on: the damage traps do when placed directly on the reef; why unregulated spearfishing is harmful to the marine ecosystem; and why juvenile fish do more good in the ocean than they do on someone's plate. Due to the restrictions to be placed on fishing within the marine parks these aspects will only be relevant to other areas within AMMA. It is also recommended that workshops be held and DFMR demonstrate the use of alternative fishing methods not widely practiced in Anguilla, such as floating fish aggregating devices for pelagic fishing and vertical long-line fishing rigs for deep water snapper species (etc).

- Terrestrial areas, coastal setbacks and pollution: The ridge-to-reef management approach adopts the principle that all habitat types are interlinked and so terrestrial area management is integral to the health of the marine habitats that surround them. Such an approach however involves cross agency cooperation and so is predominantly beyond the scope of this management plan, although recommendations for other agencies to follow can be made. The development of terrestrial areas is currently legislated under the Land Development (Control) Act (2000). Other legislation is relevant here also, with responsible agencies including, but not limited to, DoE, DoPP, and the ANT. All current policies should be adhered to, and the following is strongly recommended: development of official set-back legislation, especially within the marine parks and other sensitive coastal habitats; introduction of beaching lighting regulations to protect nesting sea turtles; working to ensure current legislation that protects natural beach flora and dunes is enforced; conducting regular septic tank inspections to ensure leeching into marine systems is limited; protection of mangroves and salt ponds important for sediment/nutrient entrapment; a full assessment of terrestrial pollution sources, especially the Corito Bay landfill site; and regulations that relate to connecting salt ponds to the ocean via subterranean pipes. Some of these factors/issues will need to be incorporated into new legislative revisions, and be the subject of separate management plans that should incorporate the goals laid out in the current document. Furthermore, the ANT and DoE will be encouraged by DFMR (in terms of help offered) to continue with any enhancement/rehabilitation programs within marine park terrestrial zones conducted in the past, for example: recent rat eradications on Dog Island (ANT, 2012); and bird/salt pond research island wide (Johnson *et al.*, 2014; Lloyd & Mukhida, 2014). If cooperation is possible with land owners a fully integrated management model is beneficial to be adopted
- The Cruising Permits Act: Although not under DFMR jurisdiction it will be necessary to make some minor amendments to the Cruising Permits Act in order for it to harmonise with the Marine Parks Act and the recommendations within this management plan. The typographical error naming Great Bay as a no anchoring zone needs to be updated, and it is suggested that, due to how circumstances have developed over the years, Rendezvous Bay no longer be classified as a no anchoring area, with anchoring merely restricted in the western end of the bay.

- Continuation of DFMR work: The importance of the work conducted by DFMR as it relates to this management plan cannot be overstated and as such all of their current programmes should continue. Aside from day-to-day Departmental duties these include, but are not limited to: annual seagrass and reef monitoring at fifteen sites; installation and maintenance of mooring fields within the marine parks; quarterly beach monitoring at over sixty sites; collection of fish catch data from landing sites around Anguilla; weekly in-water turtle population assessments; lionfish eradication from reported hot-spots; and at least one other independently conducted research project per year. These latter annual projects are chosen depending on perceived prioritisation by the Department with considerations given to logistical and financial constraints. Suggested projects for the coming years can be found in the time-line in the following Section. Current priorities are fisheries assessments and the encouragement of fishers to move away from trap fishing and spearfishing on shallow reef areas and towards exploitation of pelagic and/or deeper water fisheries. Budget and manpower increases would greatly aid this work load while at the same time allowing effective surveillance of AMMA to take place. This surveillance, which for full effectiveness will require an additional vessel at some point in the future, is essential for the success of this management plan.





Section 5: Implementation Time-line: 2015-2025

This time frame has been chosen as it ties in with the vision developed by DFMR for the fisheries sector in Anguilla 'Vision 2025': “a respected fisheries sector with informed fishers, fishing in a sustainable manner utilising improved fishing facilities and boats, supported by a Department of Fisheries and Marine Resources that impacts positively on all publics and manages the sector, in a participatory way, for the benefit of all stakeholders.” (from Fisheries Management Training Workshop 28th April 2008). It is believed the Marine Park System is an integral part of achieving this vision.

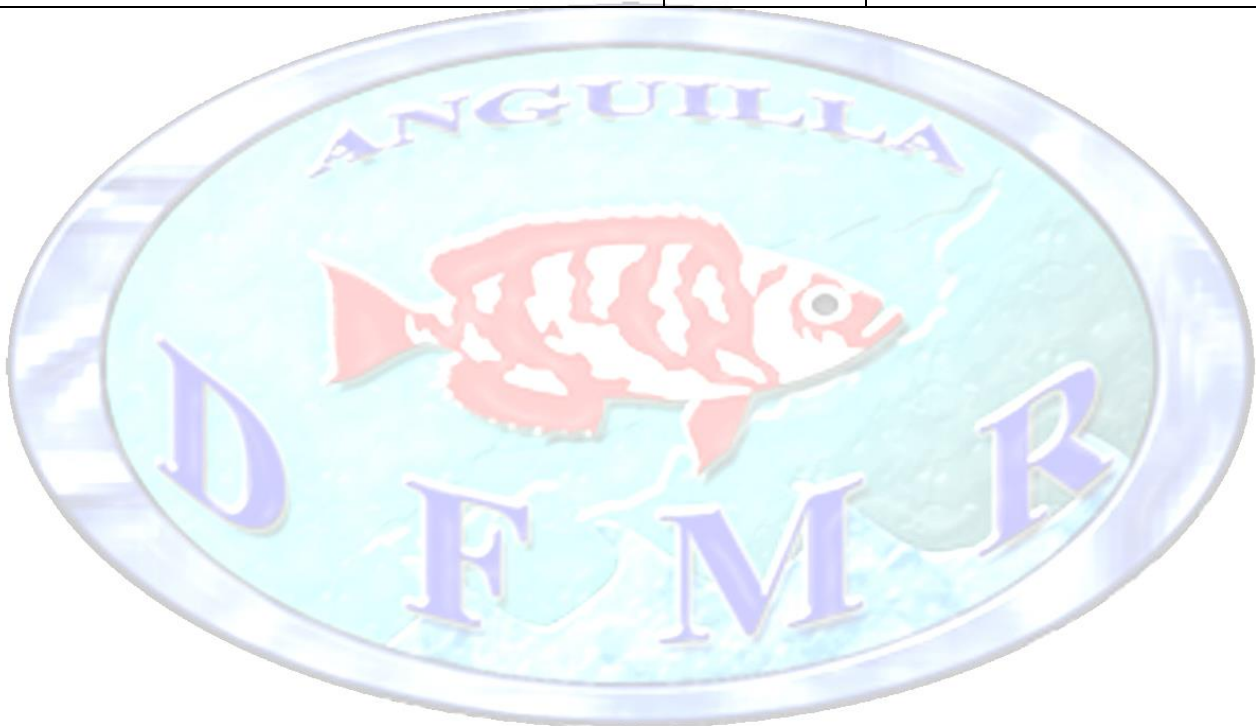
At the end of each year a review of the management plan progress will take place. Using new information gained over the past year, lessons learned, and stakeholder feedback, an updated version of the management plan document will be produced. Previous versions will be listed in the front matter for ease of reference. The time-line below will be similarly updated to represent the present situation. This will provide a documented chronology on the development of the management plan, its successes and/or failures, and pave the way for improved decisions making capacity in the future.

2015	Lead Agency	Outcome/Progress
Produce initial draft management plan for review by the Director of DFMR. Update management plan as necessary.	DFMR	Completed 2015
Draft and submit legislative amendments as they relate to marine parks and associated fisheries and shallow water habitats.	DFMR	Approved by ExCo May 2016. Due for drafting June 2017
Fish trap distribution study and collection of data via DFMR fish catch data through landing site patrols to establish general understanding of numbers of fishers who currently fish within marine park boundaries.	DFMR	Surveys began July 2015, ongoing through 2016, report due end 2017
Conduct island-wide Lionfish (<i>Pterois volitans</i>) population studies and reassess Lionfish Response Plan.	DFMR	Completed 2016. Report available at: www.gov.ai/documents/fisheries
Queen Conch (<i>Strombus gigas</i>) fishery assessment to be conducted by DFMR, including population assessments and collection of targeted landing data.	DFMR	Surveys conducted between July and December 2015. Report available at: www.gov.ai/documents/fisheries
Rapid assessment of Sombrero Island marine habitats and report produced with management recommendations.	DFMR	Surveys completed in September 2015. Report available at: www.gov.ai/documents/fisheries

Distribution of new draft of management plan to former Director of Fisheries, Mr James Gumbs.	Independent Consultant	Completed in October 2015
Presentation to Ministry & public consultations on MPA development strategies and legislative amendments. Feedback fed into final draft of management plan.	DFMR	Public consultations held around the island in November 2015
Studies and/or funding proposals for the development of underwater attractions for both tourism enhancement and fisheries enhancement within the marine parks, for example wrecks, lobster casitas, underwater sculptures etc.	DFMR	A number of proposals submitted. Other funding sources also currently being investigated. Ongoing 2017
First workshop to demonstrate fishing methods that do not rely of reef fish fisheries.	DFMR/FAO	FAD demonstration workshop conducted November 2015
Radio presentations and phone ins relating to legislative amendments.	DFMR	Three programmes conducted in December 2015 and early 2016
Production of public awareness materials to desensitise against new legislation: for example, posters depicting recommended minimum landing sizes for all relevant species and explanation how minimum landing sizes can help sustain fish populations for future generations.	DFMR	Recommended minimum fish size posters and Anguilla marine life posters designed, printed and distributed island wide December 2015.
Production of the Anguilla Fisheries Development Plan which will act as a sister document to this management plan.	DFMR	Completed 2016
Production of final draft of management plan ready for presentation to Ex-Co for approval (along with Marine Parks Act legislative amendments and AFDP) prior to distribution around other Government agencies/NGOs.	DFMR	Completed May 2016
2016	Lead Agency	Outcome/Progress
Finalise plan and present to ExCo. Distribution round DoE, ANT, DoPP etc.	DFMR	Completed June 2016
Research/demonstrations and outreach produced to publicise vertical long-line fishing method to develop deep water snapper fishery, plus other deep water/pelagic fisheries.	DFMR	Theme for Fishermans Day 2016 is 'Think Big, Fish Deep, Go Large – Explore our 200nm'
Installation of marine park boundary marker buoys, primarily around Prickly Pear, Sandy Island and Little Bay Marine Parks. These three areas have been identified as a priority due to high tourist boat traffic.	DFMR/ANT	Darwin Plus funding with ANT obtained to do this for Prickly Pear. Three year project began April 2017
New legislative amendments for Fishery Protection Act – minimum sizes, closed areas, closed seasons etc.	DFMR	Approved by ExCo May. Drafting due June 2017
Support other Departments as needed with regards to action plans for terrestrial areas (set-backs, septic tanks etc).	DFMR, DoE, ANT, DOPP	Communicated with Departments and recommendations made in reports 2016/2017

Spiny lobster (<i>Panulirus argus</i>) fishery assessment to be conducted by DFMR including population assessments; map of lobster grounds visited by fishers; and collection of targeted landing data (including CPUE). Include stakeholder opinion surveys on closed season and closed areas.	DFMR	Darwin Plus funding in partnership with CEFAS obtained. Three year project began April 2017
Meeting to discuss if there is the need for water activity zones within the marine parks (or elsewhere in AMMA). Initial zones to be discussed are swimming areas where bathers are safe from other water craft within the marine parks. The areas are not to be legislated, just buoyed. First to be considered is Shoal Bay East.	DFMR, DoE, ANT	Need for Shoal Bay East swimming area identified in 2016. Being set-up in 2017. Other areas also being considered. Discussions to continue
Production of public awareness materials to desensitise against new legislation: posters depicting Anguilla's Marine Park System and associated shallow water habitats, together for recommended practices to conserve these resources for future generations.	DFMR	New Marine Park brochure in 2016 (printed 2017), turtle poster printed in 2017. Other designs underway
2017	Lead Agency	Outcome/Progress
Undertake a ten year re-evaluation of the thirty baseline sites within the Marine Park System, if possible using original survey team (DFMR & ANT). Report produced and new management recommendations made.	DFMR	Prickly Pear assessment will be part of Darwin Plus project (2017-2020). Other parks to be expanded into after as separate DFMR work
Continue pushing for new legislation if the necessary changes still haven't been made.	DFMR, DoE, ANT	Due to be drafted June 2017
Training of Fisheries Officers and other officials to prepare them for surveillance and enforcement of new legislation.	DFMR	Underway and ongoing 2017
2018-2020	Lead Agency	Outcome/Progress
Begin increased surveillance & enforcement of new/existing legislation to begin within Marine Park System in combination with public awareness campaigns and stakeholder meetings.	DFMR	**Will need ocean going vessel**
Continued monitoring and assessments including the consideration of other areas being afforded increased protection: Suggested locations include Scrub Island, Limestone-Black Garden Bays and Anguillita-Blowing Rock.	DFMR	**Will need ocean going vessel**
Habitat mapping of offshore areas (for example Old England fishing grounds) to facilitate their potential inclusion within future adaptations of the AFDP.	DFMR, DoE	Being discussed with CEFAS, in potential conjunction with DoE

2021-2025	Lead Agency	Outcome/Progress
Assessment of compliance rates of new legislation and socio-economic monitoring of positive/negative effects and opinions.	DFMR	n/a
Establishment of new management areas within AMMA based on the results of area assessment conducted previously.	DFMR	n/a
Continued monitoring and assessment of all management plan facets with stakeholder meetings to discuss progress and suggestions.	DFMR	n/a
Development of a 2025-2035 AMMA management plan encompassing all the progress made over the last ten years and directions for future goals.	DFMR	n/a



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