



BOOBY POND NATURE RESERVE

Management Plan

2012 – 2015

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INTRODUCTION

1.1 Date of Preparation

This **DRAFT** Management Plan was prepared for the National Trust for the Cayman Islands. Trust Council confirmed the Plan on **DATE**.

1.2 Vision Statement

Booby Pond Nature Reserve will serve as a sanctuary for breeding Red-footed Boobies and Magnificent Frigatebirds. Associate flora and fauna will also benefit from protection by extension. The Reserve will remain in a natural state which promotes the perpetuation of the two breeding colonies.

Visitors and bird watchers will be able to use the Visitor's Centre to view a variety of birds, as well as learn about Booby Pond's natural heritage and other conservation and environmental matters concerning Little Cayman.

1.3 Site Information

The Booby Pond Nature Reserve is located on the western side of Little Cayman (see Figure 1); an area which is predominantly rural. Nearby areas have been subjected to development, including resorts and private homes at the Reserve's boundary to the south, a subdivision to the east, government infrastructure to the west, and the site of the proposed airport to the north (see Figure 2).

The original footprint was founded on approximately 200 acres (81 hectares) consisting mainly of the open water pond and a mangrove fringe. The Booby Pond itself represents a landlocked coastal lagoon, used by resident and migratory waterfowl. The mangrove fringe to the north of the pond supports one of the region's largest breeding colonies of Red-footed Boobies, which have been in regional decline for a number of years. The Booby Pond Nature Reserve is also the only breeding site within the Cayman Islands for the Magnificent Frigatebird (*Fregata magnificens*).

The four properties comprising the Trust's Booby Pond Nature Reserve currently total 334 acres (see Table 1), or 135 hectares, and are situated in the Little Cayman West Registration Section. A covenant was placed on 83A 20REM2 pertaining to subdivisions; since the land is held by the Trust for conservation purposes, and since the covenant benefits another property owned by the Trust, there will be no conflict between the covenant's restrictions and the Trust's management activities. Another covenant placed on 80A 17 and 45 stipulates that these properties are to be "managed in accordance with the best conservation practice."

Booby Pond was designated an Animal Sanctuary by the Cayman Islands Government in 1982. The boundaries of the Sanctuary were properly delineated in 1993. The Animals Law (2003 Revision) affords Animal Sanctuaries protection from hunting, nest raiding, dogs, litter, and disturbance.

Booby Pond was designated as a Ramsar site on September 21st, 1994 (Ramsar Site No.: 702, Wetlands International Site Reference No.: 3UK169). Booby Pond meets three Ramsar criteria: containing a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region (1), supporting populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region (3), and supporting plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions (4).

The Booby Pond Nature Reserve was recognized as an Important Bird Area (IBA) in 2007 (IBA KY007), meeting four IBA criteria: known to regularly hold significant numbers of a globally threatened species (A1), known to harbour a significant component of a group of species whose distributions define an Endemic Bird Area (A2ii), known to regularly harbour >1% of the global population of a congregatory seabird species, and known to harbour >1% of the North American population of a congregatory seabird, or 5% over a season.

There are three properties adjacent to the Reserve which harbour portions of the Red-footed Booby (*Sula sula*) colony (see Figure 3). Acquisition of these parcels would serve to ensure full protection of the colony. In addition, portions of several adjacent, privately owned properties are included in the Ramsar designation (see Figure 3). While it may not be practical to attempt purchase of these properties, means by which they can be brought under Trust management should be investigated.

TABLE ONE: List of Trust-Owned Properties Comprising the Booby Pond Nature Reserve.

Registration Section	Property	Size (acres)	Declaration of Inalienability	Ramsar Site/Animal Sanctuary	Seabird Colony Present
Little Cayman West	80A 17	25	17 July, 1997	√	√
Little Cayman West	80A 45	110	17 July, 1997	√	
Little Cayman West	83A 154	63	15 December, 2010	√	√
Little Cayman West	83A 20REM2	136	15 December, 2010		
	4 Properties	334 acres (135 hectares)	4 Inalienable Properties	3 Properties	2 Properties

Driving directions: following Guy Banks Road east from Edward Bodden Airport, the National Trust Visitor's Centre (#953) can be found on the left after passing Spot Bay Road.

1.4 Acquisition

The National Trust for the Cayman Islands began purchasing land for the Booby Pond Nature Reserve in 1995 by securing the donation of two Crown parcels (80A 17 and 45). As the two parcels were donated for conservation purposes, a covenant was agreed upon:

- “1. To manage the land and to erect and maintain educational and information signs and displays on the land in accordance with the best accepted conservation practice consistent with (i) the designation of the land as a Ramsar site under the International Convention of Wetlands of International Importance and (ii) the duties of the Trust under section 4(i) of the Law to conserve land of environmental importance and to protect native flora and fauna, in particular the breeding colony of Red-footed boobies on the land.
2. Within one month of the date of this Agreement, to place the land on the Heritage Register maintained by the Trust and to declare the land inalienable under section 22(1) of the Law.” (1995)

Since then, nearly \$1 million KYD has been spent purchasing privately owned properties.

The most recent target footprint for the Booby Pond Nature Reserve totals 368.19 acres (144 hectares), of which the Trust owns ninety-one percent (see Figure 3). This makes it arguably the National Trust’s most complete protected area system, and in fact, the Reserve has been described as having “the greatest protection of any site in the Cayman Islands” (Bradley, 2009). The Reserve has been expanded primarily through acquisition of target parcels within the established footprint; however, it is likely that a total of 11.31 acres (4.58 hectares) of Ramsar/Animal Sanctuary designated portions of property will instead be managed via arrangement with landowners.

The Reserve takes its name from the Red-footed Booby rookery, which formerly accounted for up to 30% of the total Caribbean population of this species, the largest colony in the region (Bradley, 2009).

DESCRIPTION OF PROPERTY

2.1 Aerial Maps

Booby Pond Nature Reserve on the Island of Little Cayman



FIGURE ONE: Trust Owned Lands on the Island of Little Cayman.

The Situation of Booby Pond Nature Reserve in Western Little Cayman

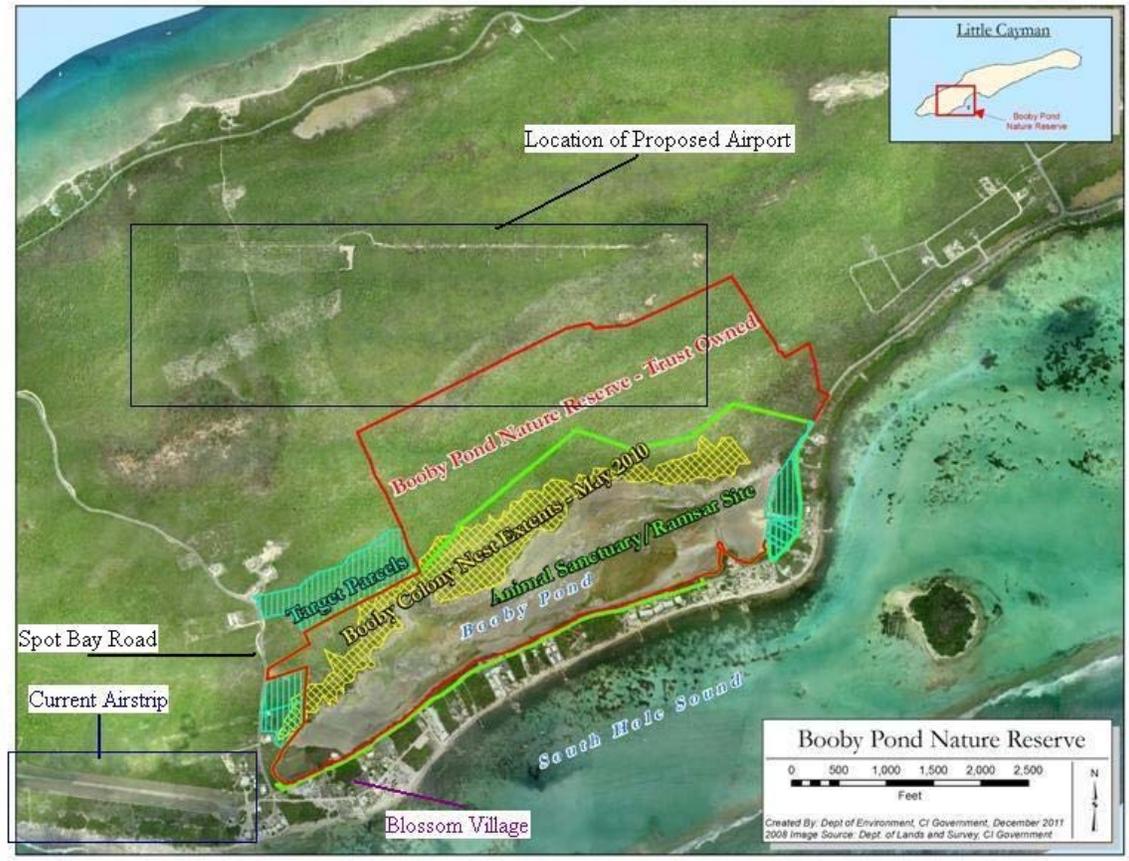


FIGURE TWO: Booby Pond Nature Reserve in Western Little Cayman.

Booby Pond Nature Reserve

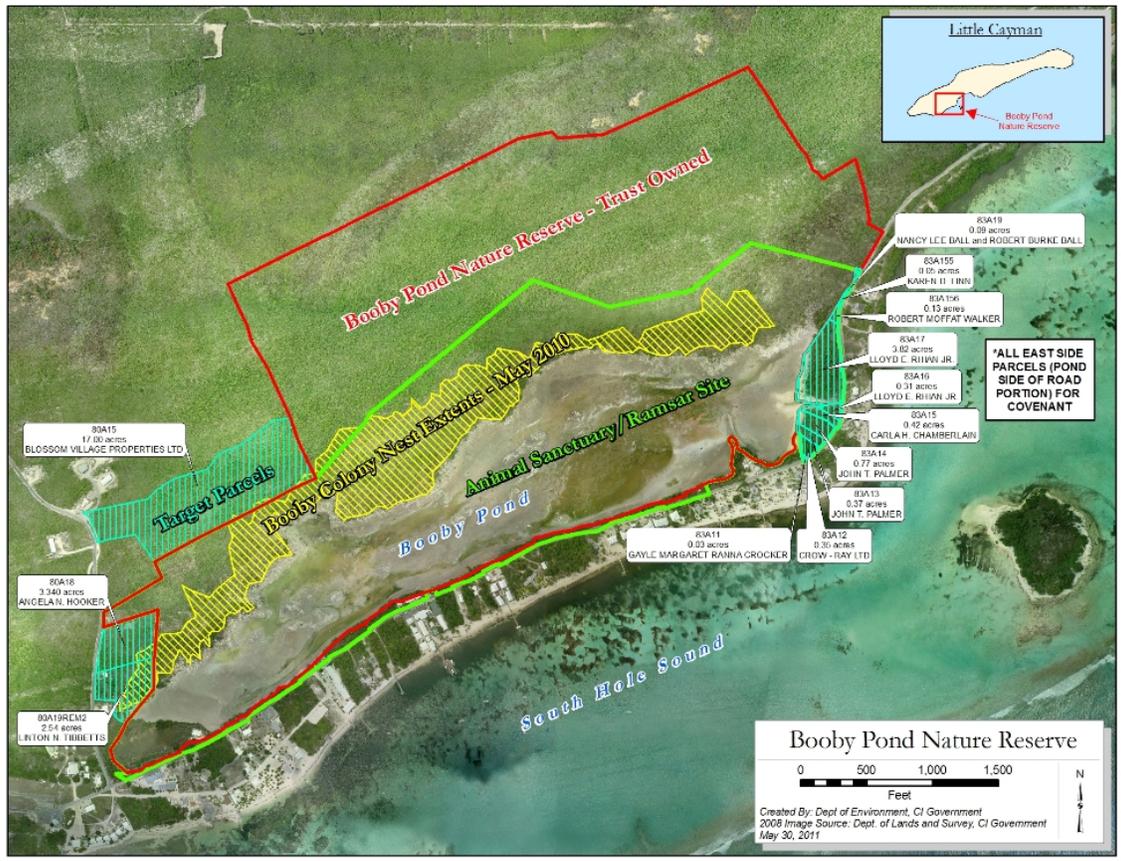


FIGURE THREE: Booby Pond Nature Reserve. The Animal Sanctuary and Ramsar Site are denoted by green; Trust Owned Property is coloured red; the May 2010 results of the Red-footed Booby Nest Survey are denoted by yellow; and important target parcels for purchase are coloured blue.

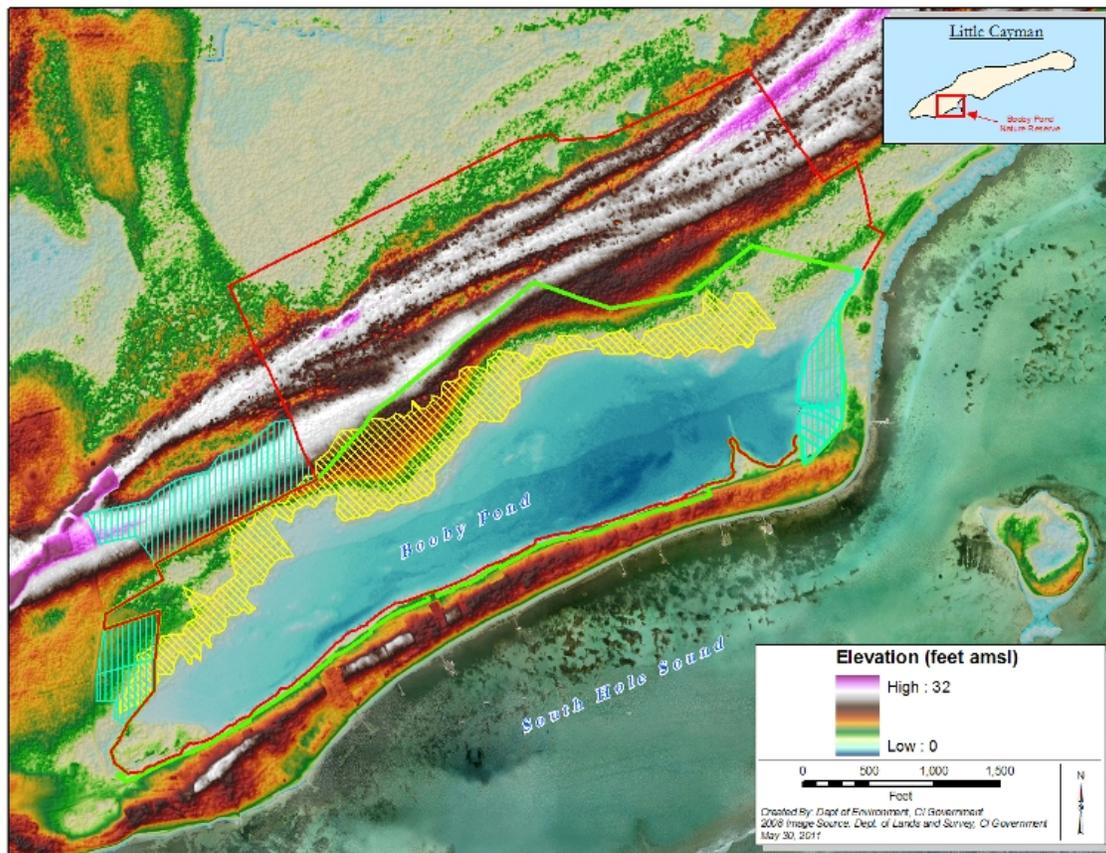
Topography

FIGURE FOUR: Topography of Booby Pond Nature Reserve.

Vegetation Community

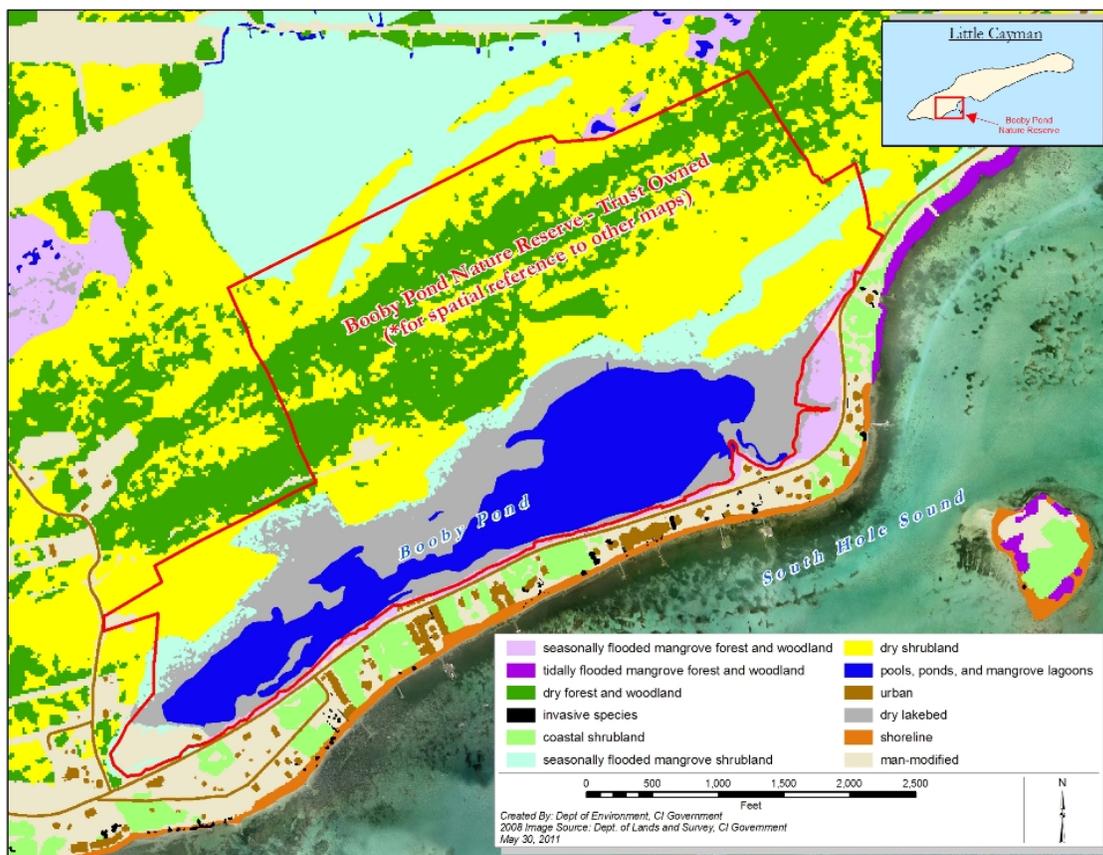


FIGURE FIVE: Vegetation Communities in the Vicinity of Booby Pond Nature Reserve.

2.2 Habitat Classification

The Booby Pond Nature Reserve was conceived as a means to protect Little Cayman’s Red-footed Booby rookery. The primary habitat targeted for conservation was the mangrove lagoon and associated wetlands. Other habitats have also been purchased in order to simultaneously serve as a buffer zone against development and to ensure that there is suitable space for the booby colony to expand or shift as events warrant.

Habitat classifications in this section are borrowed from the Cayman Islands Department of Environment’s *Cayman Islands National Biodiversity Action Plan* (2009), while vegetation classifications are borrowed from Burton’s *Vegetation Classification for the Cayman Islands* (2008), which follows the International Vegetation Classification System.

It is important to note that the habitats discussed below may as yet be recovering from the detrimental effects of Hurricanes Gustav and Paloma in 2008.

Mangrove Lagoon

The Cayman Islands Department of Environment states that “Mangrove lagoons are biologically productive, and attract large flocks of waders, shorebirds, herons, and egrets

– and most notably in Little Cayman, the Booby Pond provides security for the Caribbean’s largest breeding colony of Red-footed Boobies *Sula sula*” (2009). Booby Pond is in fact considered a key site for the conservation of mangrove lagoons according to the *National Biodiversity Action Plan*. The pond also supports Cayman’s only breeding colony of Magnificent Frigatebirds (*Fregata magnificens*). The pond is also seasonally important to resident and migratory waders and waterfowl (National Trust for the Cayman Islands)

Booby Pond is separated from South Hole Sound by a beach ridge to the south, but it was previously connected to the sea to the east (see Figure 4). The natural channel was filled in during the construction of Guy Banks Road.

A study in 1996 determined that the main factors determining Booby Pond’s water level is rainfall and evaporation. Groundwater does flow into the pond via multiple seeps from the higher land to the north (see Figure 4), which are generally brackish. Sea tides offer a slight, delayed tidal influence on the pond’s water level (Burton, personal communication).

Mangrove

Booby Pond is fringed by Mangrove habitat. Though the vegetative diversity of this habitat type is usually restricted to plants with a high salt tolerance, mangroves contribute immensely to terrestrial biodiversity – especially with respect to birds and various invertebrates. The northern banks of Booby Pond are considered a key site for the conservation of Mangrove according to the *National Biodiversity Action Plan* (Cayman Islands Department of Environment, 2009). This area is regarded as Seasonally flooded/saturated evergreen shrubland (Formation III.A.1.N.f.).

The eastern extent of the pond transitions to Seasonally flooded evergreen sclerophyllous forest (Formation I.A.5.N.c.), just a fragment between the banks of the pond and the main road. It is important to note that this particular patch of forest may be recovering from the effects Hurricanes Gustav and Paloma in 2008, and may exhibit the characteristics of Seasonally flooded/saturated sclerophyllous evergreen woodland in the meantime.

Dry Shrubland

The northern portion of the Booby Pond Nature Reserve transitions from Mangrove to Dry Shrubland. Dry Shrubland is one of the two key terrestrial habitats according to the *National Biodiversity Action Plan* (Cayman Islands Department of Environment, 2009). Dry Shrubland in the Cayman Islands is important for native and endemic biodiversity, harbouring endemic species of plants and reptiles, and providing sustenance for migratory warblers. This area is regarded as Mixed evergreen-drought deciduous shrubland with succulents (Formation III.C.1.N.a), and supports a small population of the endemic Sister Islands Rock Iguana (*Cyclura nubila caymanensis*) (Durrell Wildlife Conservation Trust, 2010).

Forest and Woodland

The Dry Shrubland to the north of Booby Pond is mixed with Forest and Woodland. This habitat exhibits the highest levels of biodiversity of all Cayman's terrestrial habitats and commonly provides havens for rare plant species. Forest and Woodland also provides habitat for a wealth of resident and migratory birds. These Forest and Woodland portions are regarded as Lowland semi-deciduous forest (Formation I.C.1.N.a), though it should be noted that this habitat may yet be recovering from the effects of Hurricanes Gustav and Paloma in 2008.

Flora

The Booby Pond Nature Reserve's flora is primarily composed of mangroves and associate salt-tolerant species, which are indicative of the seasonally high salinity experienced in Booby Pond and its immediate surroundings. Wetland species include Black Mangrove (*Avicennia germinans*), White Mangrove (*Laguncularia racemosa*), Red Mangrove (*Rhizophora mangle*), and Buttonwood (*Conocarpus erectus*).

The dry shrubland portion is more diverse, and Appendix One is an inventory of the plant species recorded within the Reserve.

Fauna

The main species of concern within the Booby Pond Nature Reserve are the Red-footed Booby (*Sula sula*) and the Magnificent Frigatebird (*Fregata magnificens*); however, Booby Pond also provides seasonally important habitat for migratory waterfowl.

In addition to seabirds, two species of Global Concern have been known to breed within the Reserve: the West Indian Whistling Duck (*Dendrocygna arborea*) and the Vitelline Warbler (*Dendroica vitellina*). The Vitelline Warbler is also considered a Species of Regional Concern and a Restricted Range Species.

As previously mentioned, the northern reaches of the Reserve are suitable habitat for Sister Island Rock Iguanas (*Cyclura nubila caymanensis*), which is endemic to Cayman Brac and Little Cayman. The Sister Islands Rock Iguana is listed as Critically Endangered by the IUCN Red List (Cayman Islands Department of Environment, 2009). A small number have been recorded on Trust property.

Red-footed Boobies

Regarded as pan tropical, the Red-footed Booby (*Sula sula*) is one of two Booby species breeding in the Cayman Islands, and the only breeding Booby from the island of Little Cayman. The Red-footed Booby is protected under the Animals Law (2003 Revision), and would receive protection under the National Conservation Law should it be passed. Named for its bright red feet, this Booby occurs in two plumages, a white phase and brown phase – note that this does not denote differences in gender or age.

Boobies forage at sea, diving from a height to plunge into the sea. Nests are typically built in trees and defended. The breeding season runs from September to June, with one egg laid.

Appendix Two is an inventory of the animals recorded within Booby Pond Nature Reserve.

Species of Concern

Appendix Three is a list of Species of Concern recorded within Booby Pond Nature Reserve.

2.3 Invasive Species

Cats

Of primary concern are reports of domestic cat (*Felis catus*) sightings within Booby Pond Nature Reserve. Most avian extinctions caused by predators are due to the impact of feral Cats. Little Cayman in fact has a population of feral cats, and the threat to native wildlife is exacerbated by having evolved in the absence of mammalian predators. With Blossom Village just south of the Reserve, the routine intrusion of cats (feral or domestic) is practically guaranteed; though it is unclear the extents to which cats prey on or otherwise disturb the breeding colonies.

The Cayman Islands Department of Environment, in conjunction with the UK's Food and Environment Research Agency (formerly Central Science Laboratory), conducted an island-wide attempt to control feral Cats in order to determine the feasibility of eradication and the most efficacious techniques to utilize. This project lowered the number of feral cats on Little Cayman, but the findings indicate that trapping in conjunction with the use of firearms or other projectile weapons are necessary in order to effectively cull feral cats.

These methods are internationally accepted means by which cat populations are controlled, and should be adopted as part of a control plan on Little Cayman. Trust Council has adamantly rejected plans to allow the DOE to employ firearms on Trust property, though the control or eradication of cats on Little Cayman has been identified as an important action item for the survival of Sister Islands Rock Iguanas (National Trust for the Cayman Islands, in press). Cats have been listed as a threat or liability for Booby Pond Nature Reserve in the two previous plans (National Trust for the Cayman Islands, 1993; National Trust for the Cayman Islands, 1997), so this issue should be addressed at the earliest convenient time.

Rats

Rats (*Rattus rattus*) are generally considered a threat to seabird colonies, but again, it is unclear to what extent they threaten the colonies at Booby Pond. Brown Rats (*Rattus norvegicus*) have been reported from Cayman Brac, though it is uncertain the extent to which they are present on Little Cayman.

2.4 Community Uses

History of the Red-footed Booby Colony

Diamond (1980) indicates that the Red-footed Booby Colony formerly occupied Owen Island, and that it subsequently moved onto Little Cayman, near the coast in the vicinity of what is now Blossom Village. Diamond goes on to explain that the colony was subsequently recorded *within* Booby Pond, at a time when mangroves afforded opportunities for nesting; he cites a hurricane in 1935 as the cause of the colony's shift to the northern fringe of the newly created lagoon. Diamond's 1980 count resulted in a minimum of 7,100 Red-footed Boobies.

Clapp's (1987) survey resulted in the estimation of 5,985 Red-footed Boobies. This should not be viewed as a decline, however; Clapp indicated that Diamond's methods likely resulted in an overestimation of the colony's numbers. He went on to describe the colony as "healthy with no evidence of a significant decline."

Burton, et. al. (1999) question Clapp's results in their 1999 work, and report a corrected figure of 3,155 *nesting pairs* from 1986. Burton, et. al. go on to report the results from their 1999 survey: approximately 4,839 nesting pairs. They further report an expansion of the area used by the breeding colony from 32.9 acres (13.3 hectares) to 40.8 acres (16.5 hectares) – a confirmed shift outside the area protected by the National Trust for the Cayman Islands

Bradley recorded a population decline in 2007 (Bradley, 2009), which led to a count in 2010 supported by funding from the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee. This most recent survey, performed by the Cayman Islands Department of Environment (2010) yielded an estimate of 2,493 *active nests* and goes on to indicate that "the colony may currently be subject to a significant decrease in nesting pairs." In recent years aerial imagery confirms that the western extent of the colony has maintained its shift outside of the Reserve's boundaries (refer to Figure 3).

History of Booby Pond

A hurricane in 1935 uprooted the mangroves in what is now Booby Pond. For many years an outlet to South Hole Sound afforded the exchange of water, but at some point this was filled in to allow Guy Banks Road to follow the coastline.

At one point the western end of Booby Pond was utilized as a dump. The dump was closed prior to 1997, and filled over.

Booby Pond was declared an Animal Sanctuary in 1982, and was recognized as a Ramsar site in 1994. The Crown transferred ownership of the two original properties to the National Trust for the Cayman Islands in 1995. The National Trust subsequently erected a Visitor's Centre in 1997 which is still in operation. Marobad Holdings Ltd. subdivided and sold 63 acres of its property to the north in 2000. In return, a covenant was placed on their remaining parcel in favour of the Trust which would ensure sound development of

the property. The Reserve was declared an Important Bird Area in 2007, and in the same year Marobad Holdings Ltd. sold their remaining 136 acre property to the Trust.

Two hurricanes struck in 2008, decimating the mangrove fringe on the northern bank of the pond. The mangroves on the very bank of the pond have not regenerated, and the Booby colony has shifted more toward the rear of the Reserve – closer to unprotected private property.

2.5 Management Review

A Review of Trust Management of Booby Pond Nature Reserve

The previous management plan was enacted in 1997 and expired in 2001. Chief among the proposed management activities was a hydrology study of Booby Pond (National Trust for the Cayman Islands, 1997). The goal was to discover the source of the odour that emanated from the pond, which has been a source of annoyance for nearby residents.

A study was conducted which determined that brackish groundwater seeps into the pond from higher land to the north. Simultaneously, underground systems allow sea tides to influence groundwater tables inland. The effects of sea tides on Booby Pond's water level are quite small, however, compared to the effects of rainfall and evaporation – the main controllers of the ponds water level (Burton, personal communication).

It was determined that restoring a connection between Booby Pond and South Hole Sound would not only reduce odour problems, but could also increase the pond's biodiversity. This strategy was never pursued owing to the possibility of negative effects on South Hole Sound and nearby reefs, and the possibility of other negative effects which cannot be anticipated.

The other major management activity was an investigation into the flight patterns of Red-footed Boobies leaving from and returning to the colony in 1998. The study concluded with recommendations to the Civil Aviation Department to minimize aircraft activity early or late in the daytime hours, when the Boobies were most likely to be in flight in the area (National Trust for the Cayman Islands, 1998). The report joined the previous management plan (National Trust for the Cayman Islands, 1997) in advising against a new or upgraded airport facility to the north of Booby Pond, owing to flight patterns taking Boobies in that direction, and Bradley (personal communication) added that Magnificent Frigatebirds tend to ride thermals just north of the colony – another danger to aircraft. All sources strongly advise against the use of jets on Little Cayman at all.

The previous management plan called for the purchase of a portion of 83A 20 (National Trust for the Cayman Islands, 1997). In fact, the National Trust first purchased a portion of the property in 2000, and went on to purchase the remainder in 2007. The Trust also constructed a Visitor's Centre in 1997 which offers educational information about natural history, affords an excellent vista of the pond and the breeding colonies, and generates revenue by selling keepsakes. The Visitor's Centre is operated by volunteers. Though it

is maintained by volunteers, the Little Cayman District Committee retains contractors for extensive projects as the need arises. The grounds of the Centre were replanted with native vegetation. Interpretive panels and telescopes were installed along the viewing area.

The previous management plan called for property signs to be placed in areas where the public had access to the Reserve's boundary (National Trust for the Cayman Islands, 1997), and in fact such signs were installed along the Reserve's boundary with the main road.

Surveys were performed of the breeding colonies, once in 1997 and again in 2010. Going forward, surveys ought to be performed more regularly.

Future Issues for Booby Pond Nature Reserve

A portion of Booby Pond Nature Reserve is composed of the northern extents of parcels of land that are traversed by Guy Banks Road (see Figure 3). Serious conflict was identified between landowners and the provisions in the Animals Law for protection of the Animal Sanctuary – specifically, property owners have littered or dumped refuse into the Sanctuary. The previous management plan called for the Trust to solicit the leasehold of the ends of these parcels for addition to the Reserve – this was deemed to be a more cost effective method of protection than either purchase or donation, as the costs for surveying in these situations would be quite high (National Trust for the Cayman Islands, 1997). Unfortunately, this plan was not carried forward, and the south margins of the pond remain unsecured. It bears mentioning that as leasehold property, these portions cannot be declared inalienable, and that regardless of ownership or management, the Trust will need to monitor the southern bank of Booby Pond to ensure compliance with the Animal Sanctuaries regulations. . The decision to move forward with securing leases should be examined in light of development in the years since the previous management plan was enacted. It may be worth the added expense to attempt the purchase of the larger portions, e. g. those greater than one acre (0.4 hectare). For a full list of potential additions to the Booby Pond Nature Reserve, see Appendix Four.

The management plan also called for the acquisition of 80A 15 and 80A 18 (National Trust for the Cayman Islands, 1997). This did not occur, and recent aerial images confirm that portions of the Red-footed Booby colony are found on these properties (see Figure 3). Another parcel, 80A 19REM2, harbours a portion of the Booby Colony. These properties should be protected by the Trust through purchase and declaration of inalienability. The two most recent acquisitions (83A 154 and 83A 20REM2) were declared inalienable by Trust Council in late 2010.

The management plan called for the replanting of the Visitor's Centre grounds to include a short interpretive trail (National Trust for the Cayman Islands, 1997). This did not occur, and in light of the need for restoration of the northern banks of the pond, ought to be deleted from the current plan.

BOOBY POND NATURE RESERVE MANAGEMENT PLAN

The overall management strategy will be formulated by the National Trust's Environmental Programmes Committee (Committee). The Little Cayman District Committee (LCDC) will be involved in the development of the plan, offering feedback and suggestions.

The Environmental Programmes Manager (EPM) will be responsible for writing and updating this management plan per the instructions of the Committee. The EPM will also have main responsibility for execution of the management strategies outlined in this document. The EPM will be required to keep the Committee and LCDC apprised of the progress being made. The Field Officer will not be wholly responsible for the labour involved in executing the management plan, based as they are on Grand Cayman. Instead, the LCDC is charged with the routine operations of the Booby Pond Nature Reserve. LCDC will also be expected to assist with organizing Trust membership or other volunteers to assist with planned projects.

3.1 Conservation Management

Property Acquisition

Additional properties should be purchased in order to complete the Booby Pond Nature Reserve footprint and meet the 368.19 acres (144 hectares) target. This goal will further the Trust's mission to preserve natural environments. Refer to Table 2 for a prioritized list of parcels which should be purchased in order to secure the Red-footed Booby breeding colony.

TABLE TWO: List of Properties to Purchase to Expand Booby Pond Nature Reserve

Property	Size (acres)	Booby Colony Present	Development Activity On Site
80A 15	17	√	
80A 18	3.34	√	
80A 19REM2	2.54	√	√

Although these sites were never included in the original Ramsar Site or Animal Sanctuary designation, The

Cayman Islands Department of Environment has confirmed that the Red-footed Booby colony has shifted onto portions of these properties (see Figure 3). The extent of the colony shared between these three properties totals 1.83 acres (0.74 hectares).

The purchase of these properties will depend on the level of funding available for the purchase of sensitive habitat and the other properties available for purchase at the time.

ACTION: EPM will establish contact with landowners as funding becomes available. EPM will coordinate with Trust Chair and GM to negotiate price (as necessary). ACTION: EPM will assemble necessary information for EPC. EPC will advise Trust Council how to proceed, Trust Council will decide whether to purchase property (as necessary).

Non-Purchase Management

The appropriation of additional lands for the Booby Pond Nature Reserve is made difficult by a number of factors. Chiefly, 50 of the target parcels located to the south and east of the Reserve have portions which are designated both Animal Sanctuary and Ramsar Site. Virtually all of these portions are adjacent to the Reserve, and extend toward Guy Banks Road (see Figure 3). However, in most if not all cases, the property as a whole continues past Guy Banks Road to the coast. In effect, this makes the purchase of these target parcels nigh impossible. Firstly, the cost of acquiring a whole parcel would be prohibitive, owing to the higher prices commanded by beachfront land. The fact that many of these parcels are developed would further increase the cost. Secondly, as noted in the previous management plan, the cost incurred by surveying, subdividing, and subsequently purchasing the portions between Booby Pond and Guy Banks Road would be uneconomical (National Trust for the Cayman Islands, 1997).

For this reason, most of the smaller parcels in the vicinity of Guy Banks Road should not be purchased; rather, the Trust should endeavour to enter into some sort of management agreement with the current owners.

ACTION: EPM, EPC, and LCDC to collaborate and determine best form of management agreement (June 1st 2012).

ACTION: EPM to approach landowners to secure non-purchase target parcels (January 2013).

Biodiversity Monitoring

Monitoring the Red-footed Booby and Magnificent Frigatebird colonies is necessary to ensure the health of both colonies, and to track changes over time. Censuses have been performed in the past, but due to the difficulties and costs inherent in monitoring these colonies, they have not been performed with any regularity. Going forward, a population census for both Red-footed Boobies and Magnificent Frigatebirds will be carried out once every five years. Health screening will be performed as part of this survey to gauge the fitness of individual birds. Censuses will be carried out by the EPM in conjunction with staff from the Cayman Islands Department of Environment, with assistance from trained volunteers. Veterinary professionals will have to be organized to run the necessary medical tests.

The Cayman Islands Department of Environment has examined cutting edge methods to census the Red-footed Booby population via aerial photography. While none of the methods investigated have been effective, refinements in the technique or equipment may make this feasible in the near future. The EPM and staff from the Department will be responsible for keeping abreast of current aerial survey techniques in case a tenable alternative arises.

The area occupied by the colony should be monitored in order to track changes in its position; especially the extent to which it lies outside the Reserve. The Cayman Islands Department of Environment has access to aerial imagery from the Cayman Islands Lands & Survey Department which has been used to determine the colony's position (see Figure

3). The Department of Environment will ensure that they have the most recent aerial imagery for use in this monitoring effort.

An opportunity has arisen for the National Trust for the Cayman Islands to work with the Royal Society for the Protection of Birds in identifying Marine Important Bird Areas. These areas will be identified by determining the sections of the sea which are foraged most often when Boobies are rearing their chicks. It is expected that this project will also glean information on the food supply available for seabirds in the area. The RSPB will be responsible for securing grant funding for the project, while the EPM will take charge of logistics. The RSPB will supply the necessary scientists, and this team will be augmented by the EPM and other Trust staff as required. The Cayman Islands Department of Environment will assist as events warrant.

The results of all surveys will be assembled by the EPM to be included in future management planning documents. The EPM will also ensure that reports are made available to EPC, and that the appropriate media releases are composed and distributed to the press.

ACTION: EPM, DOE, and volunteers to census seabird colonies every five years (2015). EPM will organize veterinary professionals for health screening of seabirds (2015).

ACTION: EPM and DOE to monitor advances in aerial censusing for seabirds (ongoing).

ACTION: DOE to ensure the most recent aerial imagery is sourced from Lands and Survey. Colony position to be determined from latest maps. (Ongoing)

ACTION: RSPB to write grant for Marine IBAs (January 30, 2012). EPM to provide logistical support and technical assistance to RSPB scientists (2012 - 2014). DOE to assist (as necessary).

ACTION: EPM to include survey results in future management plans (2015). EPM to provide reports for EPC and media releases (as necessary).

Introduced Species

As it stands, it is unclear the extent to which cats or rats are found within Booby Pond Nature Reserve, though it is common knowledge that both species are detrimental to seabird colonies. The EPM will solicit assistance from the Royal Society for the Protection of Birds to quantify the threat posed by introduced species to seabirds within the Reserve and carry out a monitoring project. EPM will then seek assistance from DOE in carrying out control or eradication measures.

ACTION: EPM to solicit assistance in survey design from RSPB (July 1, 2012). EPM to carry out survey (2013).

EPM and DOE to carry out feral species control project within Reserve (2014).

3.2 Security

Property Security

Access to Booby Pond Nature Reserve is completely unmonitored at this time. LCDC feels that security is not an issue due to the very small human population of Little Cayman and the difficult access to the seabird colonies. Bradley contends this viewpoint with reports that local resorts have advised their guests on the best means for accessing the seabird colonies and provided them with kayaks to paddle across Booby Pond (personal communication). Visitation to the interior of Booby Pond Nature Reserve will be restricted to authorized personnel. The Reserve's outlying boundaries will be inspected every two years by the EPM and/or the Field Officer. Careful attention will be paid to any evidence of littering, dumping, hunting, nest robbing, adjacent clearing, or any paths leading from the border into the interior. Patrols may by necessity be limited to the appropriate dry and cool season. The EPM will contact resorts on Little Cayman and inform them of this restriction and the sensitive nature of the seabird colonies. Resorts will be informed that the terrain is dangerous and that the Trust is not liable for injuries sustained by unauthorized visitors to the Reserve. LCDC will reinforce this message as necessary.

The previous management plan called for the placement of boundary signs on the borders of the Reserve. Since that time, two large properties totaling 160 acres have been added but not posted. EPC will determine the necessity for posting of newly purchased properties and the necessary distance between signs. The EPM and/or Field Officer will ensure that the boundaries are properly posted, and routine boundary patrols will enable Trust staff to check that signage is up to date and easily visible. Special attention will be paid to pedestrian access points in order to deter casual visitation.

The previous management plan indicated that fencing would be required in the event that the northern boundary was developed; though fencing the boundary along the southern fringes of the pond was deemed unnecessary. With the addition of the two aforementioned properties, a significant buffer has been established for the eastern portion of the seabird colonies (see Figure 3). The western portion of the Red-footed Booby colony is, by contrast, uncomfortably close to the boundaries of the Reserve, with portions extending past the boundaries onto properties accessed by Spot Bay Road, one of which has been developed. Consideration should be given to the requirement for fencing in light of these developments. In the event that the Trust is able to purchase property adjacent to Spot Bay Road, that boundary ought to be fenced as a matter of course. The EPM will contract the necessary installations. This need will be reviewed periodically.

ACTION: Access to Reserve restricted to authorized personnel (ongoing). EPM and/or FO will patrol boundaries of Reserve (February 2012, 2014). EPM will warn resorts against visitation by guests (January 31, 2012). LCDC will also discourage visitation by tourists (ongoing).

ACTION: EPC to determine necessity of posting undeveloped boundaries (March 2012). EPM and/or FO will post boundaries (June 2012).

ACTION: EPC to determine requirements for installation of fencing (March 2012). EPM to organize installation (as necessary). EPC to review fencing needs (as necessary).

Development

As mentioned previously, the National Trust owns 91% of the Booby Pond Nature Reserve target area. Serious development of adjacent properties would entail the developer notifying the National Trust of their intentions. Furthermore, owing to the close-knit community on Little Cayman, concerned members of the Trust would likely learn of such intentions very quickly. In the instance where an adjacent property is being cleared or developed, the EPM will be responsible for inspecting the relevant documents at the Development Control Board. The EPM, in accordance with the Committee, will then lodge appropriate objections or complaints on behalf of the National Trust. The lack of Trust staff headquartered on Little Cayman will necessitate local volunteers managing a share of monitoring in certain situations. If access to a border is deemed particularly difficult, the EPM and/or Field Officer will be dispatched to observe. In the event that a border is encroached by development, the issue will be addressed with workers, while the EPM will be responsible for contacting the landowner and/or developer.

There is no development plan for the sister islands. This is considered a serious liability for the Reserve, as there is no framework for the rejection of potentially damaging infrastructure. Trust Council will decide when to advocate for a development plan and pursue it accordingly.

ACTION: EPM will inspect documents at DCB and lodge objections (as necessary). EPM, LCDC, and/or FO will monitor Reserve boundaries as work progresses (as necessary). Workers will be instructed to cease development as it closes on Trust-owned property (as necessary). EPM will contact the landowner or company in charge (as necessary).

ACTION: Council to advocate for a development plan.

Planned Airport Construction

The many proposals for an upgraded airport on Little Cayman have not progressed. LCDC reports opposition toward the concept on the part of residents and tourists. It is common knowledge that the government does not have the funding to pursue such a project at this time. Because this facility has never left the planning stages, the extent to which it may disturb the seabird colonies cannot be forecast. Regardless, upgraded airport facilities are regarded as a liability and should not be discounted. Of particular note are unpublished reports of Magnificent Frigatebird activity over Little Cayman airspace: Bradley indicates (personal communication) that in certain seasons they are known for using thermal updrafts in the vicinity of Booby Pond to glide in the area. This

would be particularly dangerous if a new airport was constructed in the vicinity of Booby Pond, or if jets were allowed to fly into Little Cayman at all. A special effort will be made to alert the Cayman Islands Airports Authority of this information.

The EPM will contact the CIAA regarding plans for the improved airport. Trust Council will decide the best way to advocate against improved airport facilities on Little Cayman. Specifically, Trust Council may choose to have this item struck from the National Tourism Management Plan. Suggestions have also been made to have Little Cayman listed by the United Nations Educational, Scientific and Cultural Organization as a World Heritage Site, in order that the island gains more protection from such upgraded infrastructure. The EPM will assist as needed, and remain alert for any planning notices regarding nearby developments as well as media releases concerning improved facilities on Little Cayman.

ACTION: EPM to contact CIAA regarding airport plans and disseminate Frigatebird flight information (December 31, 2012). Trust Council to lodge objections and/or advocate from removal from NTMP or addition as UNESCO World Heritage Site (as necessary). EPM will assist (as necessary). EPM to remain alert for notifications regarding new facilities on Little Cayman (ongoing).

3.3 Access and Amenities

Visitor's Centre

The Visitor's Centre is currently staffed by volunteers; in most cases during regular business hours. A volunteer is also present in instances when the Centre is being utilized as a meeting place after regular business hours. In this way, visitation is monitored, and the Trust ensures that the visitor experience is rewarding.

The exterior of the Visitor's Centre is open to the public at all hours, with access unmonitored. The public makes use of the porch and deck for viewing the seabird colonies and other native biodiversity. Mounted telescopes are free for use on the porch and viewing deck which allow visitors to scan across Booby Pond. Interpretive signage is provided which allows for the identification of birds by the casual observer.

The structure is serviced by adequate parking and restroom facilities.

3.4 Publicity and Outreach

The ongoing protection of this natural area will attract the interest and garner the support of both residents and tourists.

Raising awareness and public education opportunities were mentioned by LCDC as an area which should be enhanced. To that end, a special Sister Islands section of the upgraded Trust website can serve to allow the LCDC to develop their own content and showcase events at the Visitor's Centre.

Participation by resorts can be solicited, with the Trust offering activities for guests and developing sponsorship opportunities for local businesses.

The EPM can also utilize press releases and the Trust's publications to raise awareness about conservation issues as the need arises or the opportunity becomes available. In particular, outreach efforts regarding the detrimental effects of feral cats and rats can be combined with action items identified in the species management plan recently written for the Sister Islands Rock Iguana (National Trust for the Cayman Islands, in press). These efforts call for articles released to the local media that detail the effects of these animals on native wildlife, and explain the necessity for control of their populations in order to manage local biodiversity.

ACTION: MC2 to ensure website has Little Cayman content featured (February 2012). LCDC to ensure content is prepared (January 2012). EPM to liaise (as necessary). LCDC will be responsible for updating webpage content (as necessary). ACTION: EPC and LCDC to prepare sponsorship opportunities for local businesses and activities for guests at resorts (January 2013). EPM and DMO to assist (as necessary). ACTION: EPM will prepare media releases concerning Booby Pond Nature Reserve (as necessary). ACTION: EPM to prepare media releases for the local press (as necessary). EPM to ensure releases regarding invasive species are prepared per Sister Islands Rock Iguana species management plan, and that sections pertaining to Booby Pond Nature Reserve are highlighted.

3.5 Expenditure and Maintenance

Resources

LCDC has proven particularly capable at fundraising and at present quite a lot of their activities are centered on the Sister Islands Rock Iguana project. At the time of writing, the funds at the disposal of LCDC total \$35,000.00KYD. Donations will continue to be solicited, and the National Trust can use its status as a charity in order to benefit from in-kind donations, discounts, or volunteer services.

Forecast Expenditures

Note that the costs outlined in this section are estimates based on the previous year's operating costs. Please refer to Table 3 for a breakdown of the previous two years' operating costs, as well as a forecast for the coming three years.

Repairs & Maintenance.— Repairs and Maintenance for 2011 ran to more than \$17,000.00KYD, whereas in the two years previous it averaged approximately \$4,800.00KYD. The added expenses for 2011 were due to major repairs of the Visitor's Centre, which are not anticipated to recur in the coming three years. Repairs and Maintenance is expected to run to \$15,000.00KYD.

Utilities.— Utilities ran to more than \$4,000.00KYD in 2010, and with the rise in the cost of fuel, Utilities for the next three years are estimated to cost \$15,000.00KYD.

Office Expenses.— Office expenses are projected to cost \$550.00KYD per year, and are forecast to run to \$1,650.00KYD over three years.

Property Insurance.— Property insurance typically costs \$7,987.00KYD in a given year, and as such is projected to run to \$23,961.00KYD over three years.

Landscaping.— Landscaping is projected to cost \$900.00KYD over the next three years. It is important to note that while LCDC typically arranges for volunteers to perform such labour, the seasonal nature of residency on Little Cayman can make it difficult to organize volunteers all year round. This necessitates hiring a firm to perform the necessary work roughly half the year.

Salaries.— While it is difficult to determine the extent of staff time spent on management of Booby Pond Nature Reserve, a figure can be devised by estimating the time devoted to the Reserve in comparison to other Trust properties and taking into account the salaries paid to Environmental Programmes personnel.

The share of the EPM's salary dedicated to activities involving Booby Pond Nature Reserve is estimated to run to \$18,600.00KYD over three years.

Repairs and Maintenance for 2011:

- Raising the sagging back porch
 - Hydraulic jack
 - Reinforced with hurricane straps
- Gutters replaced
 - Continuous seamless gutters
 - Work to be concluded
- Sewage and drain pipes repaired or replaced
 - Large tree roots removed
 - Rejoined pipes
 - Lowered pipe angle to facilitate proper drainage
 - Straps to support pipes
 - More pipes placed
- Observation deck improved
 - Wood facings replaced
 - Nails replaced with screws
 - All bolts tightened
 - Main pillar post braced
 - Sanding and painting to be concluded
- Wheelchair ramp improved
- Walls to be concluded
 - Require caulking
 - Require painting
- Painting to be concluded
 - Porch
 - Interior
- Wiring to be concluded

*TABLE THREE: Forecast Expenditures for the Coming Three Years. All prices are in Cayman Islands Dollars. †Note that these figures are higher than normal due to major projects carried out in these years. *Note this figure is lower than normal due to deficient data.*

Year	2010	2011	2012	2013	2014
Repairs/Maintenance	\$4,872.18	\$17,627.40†	\$5,000.00	\$5,000.00	\$5,000.00
Utilities	\$4,772.90	\$820.00*	\$5,000.00	\$5,000.00	\$5,000.00
Office Expenses	\$1,100.56	\$405.27	\$550.00	\$550.00	\$550.00
Property Insurance	\$7,987.00	\$7,987.00	\$7,987.00	\$7,987.00	\$7,987.00
Landscaping	\$117.88	\$144.00	\$300.00	\$300.00	\$300.00
Salaries					
<i>Staff Costs</i>	\$8,333.33	\$8,333.33	\$8,333.33	\$8,333.33	\$8,333.33
<i>In Kind</i>	\$2,333.33	\$2,333.33	\$2,333.33	\$2,333.33	\$2,333.33
Population Census	\$27,437.25†	\$0.00	\$0.00	\$0.00	\$0.00
Total Cost	\$56,954.43	\$37,650.33	\$29,503.66	\$29,503.66	\$29,503.66

The share of the Field Officer's salary dedicated to activities involving Booby Pond Nature Reserve is estimated to run to \$6,900.00KYD over three years. It should be noted that the Field Officer position is based in Grand Cayman. As such, they are not typically capable of performing their function on either sister island. This has been reflected when totaling the time which the Field Officer would spend on Booby Pond Nature Reserve.

SUBTOTAL: \$25,000.00KYD.

It should also be mentioned that the contribution of volunteers on Trust Council, Executive Committee, EPC, and LCDC amounts to an in-kind donation. Again, it is difficult to determine the extent of volunteer time spent on decisions concerning Booby Pond Nature Reserve – indeed, it is difficult to value such contributions to begin with. However, the figures are estimated forthwith.

The in-kind donation made by Trust Council in the course of three years is estimated to be worth \$3,400.00KYD.

The in-kind donation made by the Executive Committee in the course of three years is estimated to be worth \$300.00KYD.

The in-kind donation made by the EPC in the course of three years is estimated to be worth \$2,300.00KYD.

The in-kind donation made by the LCDC in the course of three years is estimated to be worth \$1,000.00KYD.

Note that as in-kind donations, these costs are not tallied in the final estimate.

SUBTOTAL: \$7,000.00KYD.

Introduced Species.— The cost of controlling feral cats within Booby Pond Nature Reserve is not considered in this management plan. The Cayman Islands Department of Environment has been seeking the means to eradicate feral cats from the entire island of Little Cayman, and in the event this effort moves forward the Trust would almost certainly be included as a partner. The funding required to participate would either need to be sourced from a grant or levied from the Trust's Environmental Programmes, and likely regarded as a separate project or treated as a split between management of the Reserve and Sister Islands Rock Iguana species management.

Property Acquisition.—The cost of purchasing the remaining parcels in the Booby Pond footprint is not considered in this management plan, in part due to the complexities inherent in the real estate market. Rather, the acquisition of further parcels will be carried out as the opportunity arises and as funding allows. A rough estimate of the cost of fulfilling the footprint of Booby Pond Nature Reserve indicates that the price will likely exceed \$150,000.00KYD.

Total Cost Estimate

Over the next three years, management of Booby Pond Nature Reserve is projected to cost **\$82,011.00KYD**.

3.6 Time Charts

A series of time charts outline the yearly objectives for this three-year plan. Refer to Appendix Five.

3.7 Management Review

EPC will ensure the three-year plan is carried out as the means and circumstances allow.

This management plan is regarded as a working document, and will be redrafted as deemed necessary, with an update planned by January 2015 at the latest. Upon redrafting, a review will be carried out to rate the effectiveness of this three-year plan.

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