National Conservation Council

Minutes of the General Meeting held at the Main (ground floor) Conference Room, Government Administration Building, Elgin Avenue, George Town, Grand Cayman
24 February 2015, 2pm.

1. Call to Order

   Notice having been duly given the meeting was called to order at 2:04pm. A quorum was present (see Attendance Appendix, below) and no interests were declared.

2. Confirmation of Minutes

   There being no amendments raised approval of the minutes of the meeting held on 24 November 2015 was moved by Patricia Bradley, seconded by Davy Ebanks and passed unanimously.

3. Matters Arising from the Minutes.

   a. Council Remuneration. The Ministry had advised that Cabinet had approved per meeting rates of CI$100 per member and CI$125 for the Chair. DoE was arranging the issuance of cheques. Davy Ebanks requested clarification of the allowance for sub-committees.

   b. Legal Advisor. Mrs Marilyn Brandt had been assigned to the Council by the Attorney General's Chambers.

   c. Project Future (EY Report Recommendations) – Letter re Sale of Non-Operational Land. The letter was delivered to the Hon. Premier, Deputy Governor and Minister of Financial Services, Commerce and the Environment on 24 November 2015. The Chair thanked the Deputy Governor for redirecting it to the Ministry of Planning, Land, Agriculture, Housing and Infrastructure. As a result the Council delivered an assessment on 10 December 2015 recommending that 13 of the 69 parcels identified by caucus be reserved for their environmental value. No further response had been received.

4. Committees

   a. Invasive Species. Fred Burton, chair of the committee, presented the Iguana Removal Plan, dated 7 January 2016 (WP01) which had been prepared on behalf of the committee by the Department of Environment Terrestrial Unit and Frank Rivera-Milan of the US Fish and Wildlife Service. The Committee Chair noted that the Plan had received preliminary Council approval on 13 January 2016 to enable certain preparations in the Plant to commence and proposed that the Council now ratify the Plan. The motion to ratify was proposed by Wallace Platts and seconded by Davy Ebanks. The Committee Chair reported that the Phase 1 of the Plan had been completed and repeat counts of green iguana in the removal areas were being undertaken; hiring of cullers had met with certain bureaucratic hurdles but it was expected that these issues would soon be resolved and culling in the designated areas would begin in March; DoE would be undertaking public outreach in advance of the cull.

It was resolved that Iguana Removal Plan dated 7 January 2015 be ratified and confirmed.

b. Section 35 Imports Committee. The chair of the committee had no updates to report.

a. Climate Change Committee. Lisa Hurlston-McKenzie, the chair of the committee, reported that policy advancement was awaiting word on the commencement of government's reviews of the National Climate Change Policy and National Energy Policy. No response had been received to the offer made to the Ministry. The committee would consider how to advance the Addendum to the Environmental Charter which had been proposed for the Joint Ministerial Meeting in December. The chair of the committee had been invited to attend a technical workshop in Brussels hosted by the Association of Overseas Countries and Territories of the European Union (OCTA) at a meeting which followed-up on the 13th EU-OCT Forum held in February 2015. The workshop focused on methodology for accessing the 11th European Development Fund (EDF) over the next four years. Ms Hurlston had briefed the Cabinet Office, the U.K. representative elect, Eric Bush, and the Department of Environment. The theme for EDF 11 funding opportunities was integrated and sustainable land, coastal and marine management. Ms. Hurlston had succeeded in having storm water management included within the category of water management and security.

5. New Matters

Marine Protected Areas. Report of the consultation, including recommended amendments to the nomination arising out of the public consultation (WP02)

The Chair introduced the Report:

I) A nomination under section 9(1) of the National Conservation Law for protected status for an enhanced marine protected area system for the Cayman Islands was accepted by the National Conservation Council at its meeting on the 26th of May 2015.

ii) At the same meeting the Council delegated the carrying out of notifications and consultations required under sections 9(6) and 9(7) of the National Conservation Law to the Director, Department of Environment.

iii) The proposal reviewed by the public in 2015 took into consideration the views of the public received during a previous period of consultation in 2012 and further input from elected officials and key stakeholders between 2012 and 2015.

iv) The proposal reviewed by the public in 2015 included changes in the status of existing protected areas (section 12 of the National Conservation Law).

v) The proposal reviewed by the public included outline management regulations for the protected areas which will be incorporated into a management plan (section 10 of the National Conservation Law).

vi) The Director had submitted a report of the consultation and recommended amendments to the nomination arising out of the public consultation. The Council had received and reviewed all the written responses submitted by the public during the consultation, as extended.

Motion 1. That the report of the Director to the Council be received for consideration was proposed by the Chair, seconded by Davy Ebanks and approved.

The Director gave a PowerPoint presentation describing the results of the consultation and illustrating with maps and text the proposed amendments to the original nomination for the consideration of Council. The Director noted: a firm view that a greater area of the marine coastal waters with less complex regulations was required; calls for increased enforcement was partly met by the new powers in the NCL and DoE were requesting a budget for an additional officer for Little Cayman , though this might not meet the demands of the public in full; revisions to of the West Bay and East End marine reserves and line fishing zones could still meet the levels of environmental benefit and provide spill over while accommodating the concerns in those communities; in making those adjustment the addition of a reserved on the South Coast between Beach Bay and Manse Road was justified to maintain the same overall level of no take, though decreased slightly from the original nomination of 45.2% to 44.2%, as amended.; Cayman Brac was the least protected under the current Marine Parks System and the data showed the effect of that deficit.

In response to the presentation and the report Mr Ebanks requested and received clarification that (a) since it would be permitted to continue to take sprats and fries by cast net from shore that otherwise protected species such as goggle eyes would be classed as permitted by-catch, (b) the Salt Rock Dock on Little Cayman remained an open area. He thanked the DoE for "the patient and amicable way" in which the issues had been handled and observed that every single concern that had been taken at the public meetings or had been brought had been addressed.

Mr Burton noted that the level of public consultation and time devoted had been unprecedented. Mrs Bradley said that it was critical that the proposals be passed by Cabinet.

On conclusion of the discussion the Chair read the remaining draft motions which were proposed as follows:

Motion 2. That the amendments to the nomination recommended by the Director be accepted as the amendments of the Council as provided for by section 9(9): proposed by Davy Ebanks and seconded by Fred Burton.

Motion 3. That the amendments, not being substantial, the original proposal so amended, together with copies of all written objections and representations made during the consultation period be submitted to Cabinet in accordance with section 9(9) (c) for designation as a protected area by Order of Cabinet under section 7 of the Law: proposed by Christine Rose-Smyth and seconded by Patricia Bradley.

Motion 4. That the proposal to remove protected area status from the certain zones identified in the nomination, as amended, are justified in the context of the enhancements to be made within the entire Marine Protected Areas System and may be recommended to Cabinet in accordance with section 12, together with the written objections and representations made during the consultation period: proposed by Christine Rose-Smyth and seconded by Fred Burton. On discussion it was

proposed by Fred Burton and seconded by MacFarlane Conolly that Motion 4. be amended by the deletion of the word "may" in relation to the recommendation to be made to Cabinet.

It was noted that the Council, having reviewed the amended nomination carefully, considered and taken into account all written objections and representations received during the public consultation period which ran from 26th August to 18th December 2015, as well as, inter alia, the views of the public expressed at public meetings held in each of the Districts of the Cayman Islands, had determined that:

a. pursuant to section 9 (9) (c) of the law that the proposed amendments to the original proposal are not substantial;

b. the recently concluded notification to the public and the public consultations fulfilled the requirements of section 12(3) of the National Conservation Law in respect of the removal of the protected status of the certain existing Marine protected areas identified in the proposal as amended;

IT WAS RESOLVED that

the amendments to the nomination recommended by the Director be accepted, approved and adopted as the amendments of the Council as provided for by section 9(9);

the amendments, not being substantial, the original proposal so amended, together with copies of all written objections and representations made during the consultation period be submitted to Cabinet in accordance with section 9(9)(c) for designation as a protected area by Order of Cabinet under section 7 of the Law;

the proposal to remove protected area status from the certain zones identified in the nomination, as amended, are justified in the context of the enhancements to be made within the entire Marine Protected Areas System and be recommended to Cabinet in accordance with section 12.

Mr Ebanks concluded the remarks by noting the importance of properly marking the new protected areas, once approved by Cabinet, to avoid confusion.

Adjournment

There being no other business, the meeting was adjourned at 15:34.

Chair: Christine Rose-Smyth	Secretary: John Bothwell
Date: 2 Oct 2016	Date: 7 Sep 2016

Attendance Appendix

Council Member	**24 February 2016**	**Representation**
Christine Rose-Smyth	present	Chairperson; Bodden Town, Plants, Terrestrial & Marine Biodiversity
Davy Ebanks	present	West Bay and Marine Conservation
Lisa Hurlston-McKenzie	present	George Town and Sustainable Development & Climate Change
McFarlane Conolly	present	East End and Sustainable Development
		North Side
Wallace Platts	present	Sister Islands and Terrestrial Biodiversity
Christina Pineda	absent	National Trust for the Cayman Islands
Patricia Bradley	present	Avifauna & Biodiversity
Fred Burton	apologies	Terrestrial Biodiversity
Adrian Estwick	absent	Director of Agriculture
Haroon Pandohie	apologies	Director of Planning
Colleen Stoetzel	present	Planning Officer, representing the Director of Planning
Gina Ebanks-Petrie	present	Director of Environment
Timothy Austin	present	DoE Deputy, Research
John Bothwell	present	Secretary

National Conservation Council

General Meeting

GAB Rm 1038, 2pm, 24 February 2016

AGENDA

1. Call to Order
   a. Attendees, Apologies, Quorum
   b. Declaration of Interests

2. Confirmation of Minutes of 24 November 2015

3. Matters Arising from the Minutes

   a. Council Remuneration

4. Committees

   a. Invasive Species Committee
      i. WP-01 Green Iguana Culling Plan
   b. Section 35 Imports Committee
   c. Climate Change Conference Committee

5. Matters Arising at this Meting

   a. Marine Parks Enhancement Proposal
      i. WP-02 Consultation Report

6. Next Meeting
   a. 18 May 2016, 2pm, GAB 1038

7. Any Other Business

8. Adjournment

GRAND CAYMAN GREEN IGUANA REMOVAL PLAN

JANE EBERT HAAKONSSON and **JESSICA HARVEY**, Department of Environment, 580 North Sound Road, Grand Cayman KY1-1002, Cayman Islands. **FRANK F. RIVERA-MILÁN**, United States Fish and Wildlife Service, Division of Migratory Bird Management, 11510 American Holly Drive, Maryland 20708 USA.

INTRODUCTION

The control of green iguana (*Iguana iguana*) overabundance on Grand Cayman is a management priority. In this document, we propose a pilot study aiming to remove and decrease green iguana abundance on Grand Cayman. The pilot study was designed on the basis of island-wide surveys conducted in August 2014 and 2015, and the application of harvest theory (e.g., standard logistic model) and decision analysis (e.g., expected value of decision outcome). Although the green iguana is exposed to human-induced mortality (e.g., hunting at private property, depredation by cats and dogs, and road kills), between August 2014 and August 2015 the population increased at a rate of 59.8% (95% CI = 27.1% to 101.8%). At this rate of increase, based on a simple exponential model, abundance is expected to be 300,061 subadult and adult green iguanas in August 2016 (95% CI = 156,315 to 448,462). The objectives of this pilot study are: (1) estimate green iguana abundance before and after removal efforts in February−June 2016; (2) monitor changes in population abundance (rate of increase) in response to removal effort; (3) determine logistic details for sustained removal effort after 2016; and (4) quantify the effectiveness of control measures (e.g., air rifles, pellet guns, and nooses) in high to medium iguana density habitats (e.g., golf courses, quarries, and residential areas).

METHODS

Removal Effort and Surveys

We will conduct a pilot study focusing on high-medium density areas (see Figure 1), which will be surveyed before and after removing subadult and adult green iguanas in February−June 2016. The long-term management goal is to decrease abundance to less than 50,000 subadult and adult green iguanas on Grand Cayman in 5−10 years (see Figures 2 and 3). Given the rate at which the population increased between August 2014 and 2015, and under the assumptions of the standard logistic model with constant removal effort (h = $0.6N_t$.), 60% of the estimated population will have to be removed in 2016; this means over 120,000 subadult and adult iguanas. This effort will then need to be sustained with a decade-long removal effort of about 60% per year of the estimated population to meet this long-term goal of 50,000 iguanas or less (see Figures 2 and 3).

A sampling frame of a medium-high density removal area has been defined after initial contacts with potential hunters, and before and after removal surveys will be conducted to estimate rate of change in the abundance of subadult and adult green iguanas in the removal area. As in August 2014−2015, we will combine distance sampling and repeated count methods to estimate detection probability (availability and perceptibility components) density (number of subadult and adult iguanas per hectare), and population size (number of subadult and adult iguanas in the removal area and island-wide). We propose the following survey dates:

- February 1-11, 2016 (removal areas only)
- June 21−30, 2016 (removal areas only)
- August 1−14, 2016 (island-wide, including removal areas)
- February 1−11, 2017 (removal areas only)

Hunters and Removal Effort

Fifty hunters will be paired in teams of 2 per removal effort. Each hunter will have a quota of 100 or more subadult and adult green iguanas per day for 30 days between February and June 2016. Because the hunters will not be working full time most hunting will occur on weekends, spread out over the five months. This provides 'continuous' control effort in the target areas instead of a 'one off' cull. Our removal target is 120,000 or more subadult and adult green iguanas for 2016. A planning assumption is that approximately 20% of the 'removed' animals will be shot but not bagged (i.e., crippling loss, dead or dying animal remains *in situ*). This means that the Department of Environmental Health will have to be prepared to receive over 120,000 carcases over five months.

Focus will be on subadult and adult iguanas, because the annual mortality of hatchlings is high and their detection is low (though any size iguana will be taken, targeting hatchlings and juveniles would require even more effort for a lower rate of return, thus making the target goal of 120,000 iguanas killed even harder to achieve). Statistics will be computed from the quantification of removal effort per area (e.g., number of subadult and adult green iguanas bagged per hunter per day; see Appendix 3). A representative sample of iguanas will be examined from each cull each weekend (see below) to monitor changes in age class (subadult, adult), sex (male, female), size (snout-vent and vent-tail in cm), and gravidity (females with and without eggs) during the removal period. Blood samples will be taken for disease screening and for genetic work with established international partners to determine origin and spread of green iguanas in the Cayman Islands.

Details will be discussed with hunters at meetings between December 2015 and February 2016. Removal efforts (air or pellet guns and nooses) will be conducted on weekends, covering 30 days in February-June 2016. A removal day will include the morning (09:00−11:00 hr) and afternoon (13:00−15:00 hr) when green iguanas are active and available for detection.

Removal Dates

We propose to conduct 30 removal efforts during the following dates (2−4 days per weekend):

- February 20−21 and 27−28
- March 5−6, 12−13, 19−20 and 26−27
- April 2−3, 9−10, 16−17, 23−24 and 30−1
- May 7−8, 14−15, 21−22, and 28−29
- June 4−5, 11−12 and 18−19

Definition of Removal Areas and Hunters, Hunter Management and Payment

We conducted initial meetings with hunters in December 2015 to discuss details of the removal strategy, including standard operational procedure for removal efforts using air riffles, pellet guns, and nooses, quantification and monitoring of removal effort, supplementary data about bagged iguanas, removal dates, and removal areas, as well as disposal methods.

1) **Cull Area**

   At this moment, we have the culling area defined as Grand Cayman, west of approximately Grand Harbour / Red Bay, as this narrow area of land, provides a natural 'choke point' for limiting green iguana movement in and out of the test area. The removal area will be explored and delineated for before and after removal surveys, including golf courses, residential areas, water channels, dumpsites, and quarries (see Figure 1). While before and after surveys of the entire test area will occur subsampling may also occur based upon hunter reporting of their most regularly or most heavily culled locations.

2) **Hunters and Liability**

   We are contacting potential hunters to obtain information about previous removal effort and to determine the feasibility of their participation in the project.

a. Hunters will be 'independent contractors' responsible for their own site selection (within the defined cull area) and authorization – allowing those with existing contracts to continue to work 'their' areas unimpeded. Hunters will also be responsible for following any and all laws themselves, e.g., firearms law, trespass, etc.
b. DoE will draft a Participation Waiver which will include ensuring that hunters using a firearm have a valid Firearms License and a clear Police Record (more details to be included in the Participation Waiver). DoE will not be responsible nor will be providing indemnity or other insurance coverage for anyone participating in the cull programme.
c. DoE will provide 'official hunter' letters of introduction along with other Public Education and Outreach materials for hunters to use when requesting permission to enter new properties to conduct culling activities.
d. Hunters will be responsible for basic data collection (i.e., location, time, etc.) for each hunting activity through standardized data forms provided by DoE staff. Submission of incomplete datasheets, or non-submission of data, will be reason to invalidate any carcasses submitted.

3) Contract Style and Payment

a. $2,000 for thirty hunting days during the hunting season, within the hunting area west of Grand Harbour, with at least one hunting day weekly, returning at least 2,400 iguana carcasses. (Payments will be periodic through the cull period, for the proportional expected iguana returns per period.)
b. Bonuses will be paid to top-producing hunters (e.g., top five hunters will be paid no more than $4,500 in total; first bonus = $2,000, second bonus = $1,000, third, fourth and fifth bonuses = $500). Payment will be pro-rated for those underperforming either in number of iguanas killed or number of days hunted.
c. Amount paid per hunter and base number of iguanas per hunter may vary based on the number of hunters. Both will need to increase if fewer than 50 hunters are recruited, with the goal of 120,000 or more dead iguanas in five months.

d. Payment schedule currently being considered is six 3-week pay-periods over the 18 weeks as outlined in 'Removal Dates' (page 3). (A proportional number of iguanas will still be expected to be culled for each pay period.) Alternatively payment can be scheduled in three 6-week payments and will be around 134 iguanas at $111 each hunter each week.

Outcome

Data analysis will be completed through consultation with Dr. Frank Rivera-Milán (see Appendix 2) and a full report will be delivered by the end of the second week of October 2016. The report will include a recommended plan of action for culling in 2017, recognizing the importance to continue culling in order to achieve a meaningful reduction of iguanas in 5-10 years, and assuming that the test cull suggests that such a reduction can in fact be achieved in a reasonable time for a reasonable cost.

Budget

The pilot project budget (see Appendix 1) contains 8 items and come to a total of $164,900. It is broken down into: 50 hunters, bonus payments, 4 volunteers, USFWS consultancy, PEO, DoE administrative costs and materials, disposal contingency and general contingency.

Action Plan – DoE Staff

1. Protocol agreed with DEH for delivery of 120,000 or more carcases over five months, on weekends. – 1st week December, 2015
2. Hunters advertised, contacted, 1st – 2nd week December 2015 – in progress
3. Initial Hunter Consultation, December 10th 2015 - completed
4. Draft Payment & contract requirements determined, January 2015
5. Invasive Species Committee review, amend & approve action plan, January 2016
6. Conservation Council authorizes action plan, 13 January 2016
7. Hunter payment method & contract (performance) terms agreed, January 2016
8. Hunter contracts signed, including data collection and carcass disposal protocols - January 2016
9. Public Education & Outreach designed, January 2016
10. Data collection & carcass validation volunteers recruited, January 2016
    a. Remuneration of volunteers determined (e.g. $125 per 4 SMU students), January 2016
11. Public Education & Outreach conducted, Feb 1 – 12 2016, ongoing Feb – Aug 2016
12. Culling, Feb 20 – June 19, 2016
13. Surveys: February 1-11, 2016 (removal areas only), June 21-30, 2016 (removal areas only), August 1-14, 2016 (island-wide, including removal areas), February 1-11, 2017 (removal areas only)

Appendix 1:

Iguana Cull Budget, Jan - Jun 2016

Line	Description	Values	Amount
1	Hunters	Fifty hunters, $111 each, 18 weeks, 134 iguanas per week	$99,900
2	Bonus	Incentive for hunters to over perform; divided among top 5 hunters	$4,500
3	Volunteers	Four St. Mathew's Students (or similar), $125 each	$500
4	Frank	Research consultant, field assistance, reporting	$8,000
5	PEO	Media Releases, Advertisements, Flyers	$2,000
6	DoE Work	Administrative costs and training, materials & consumables	$10,000
7	Disposal Contingency	Fuel for incinerator, carcass containers, refrigerated storage	$20,000
8	Contingency	Unforeseen Additional Costs, e.g., carcass collection point	$20,000
9	Line Intentionally Left Blank		
10	Total	Total Projected Budget	$164,900

Appendix 2:

Monitoring and Modeling of Green Iguana Population Before and After Removal on Grand Cayman

Project Duration

February-October 2016

Project Cost

$14,000.00

Project Consultant

Dr. Frank F. Rivera-Milán, Population Ecologist

Background

Effective wildlife management is limited by our understanding of population dynamics. Monitoring and modeling are essential components of wildlife management. Wildlife management requires regular monitoring to conduct quantitative population assessments and inform decision making. Monitoring and modeling provide information about population dynamics, which is needed for state-dependent decision making. Wildlife populations are managed for three basic purposes: conservation (e.g., reversing a population decline), control (e.g., causing a population decline), or sustained harvesting (e.g., maintaining a population stable when individuals are removed for recreational or commercial purposes).

DOE-TRU is responsible for the management of wildlife populations, including species considered problematic, such as the green iguana on Grand Cayman. Monitoring and modeling are needed to establish abundance-based management objectives, determine population status and trend, and evaluate the results of objective-oriented management actions.

Dr. Frank F. Rivera-Milán is a population ecologist with 30 years of experience working in the Caribbean region. Dr. Rivera-Milán is mostly involved in the design and conduct of wildlife surveys and the application of quantitative methods for parameter estimation and modeling of population dynamics (e.g., see Rivera-Milán et al., 2014, Journal of Wildlife Management 78:513−221). Since 2005, Dr. Rivera-Milán has been providing technical assistance to TRU (e.g., landbird population assessments before and after hurricanes, and the development of a green iguana removal strategy).

Objective

In February-October 2016, Dr. Rivera-Milán will serve as a consultant, providing technical assistance (data collection, preparation, and analysis; PowerPoint presentations; interim and final reports), and completing the following:

1. Activity and Cost

Survey (Removal Area) and Removal Data	Days	$US/Day	Cost
Analysis, interim report, and presentation (Feb 2016)	5	$400.00	$2,000.00
Analysis, interim report, and presentation (Feb-Jun 2016)	10	$400.00	$4,000.00
Analysis, interim report, and presentation (Jun 2016)	5	$400.00	$2,000.00
Total	**20**		**$8,000.00**

2. Activity and Cost

Survey (Island-wide) and Removal Data	**Days**	**$US/Day**	**Cost**
Analysis, interim report, and presentation (Aug 2016)	5	$400.00	$2,000.00
Analysis, final report, and presentation (Oct 2016)	10	$400.00	$4,000.00
Total	**15**		**$6,000.00**

Appendix 3:

Example of hunting statistics for removal effort in February−June 2016.

		NUMBER OF GREEN IGUANAS BAGGED PER DAY											
HUNTER NAME	HUNTER_ID	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	....	DAY 30
	1												
	2												
	3												
	...												
	50												
	SUM												
	MEAN												
	SD												
	SE												
	LO 95% CI												
	HI 95% CI												

		NUMBER OF GREEN IGUANAS SHOT BUT NOT BAGGED PER DAY											
HUNTER NANE	HUNTER_ID	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	....	DAY 30
	1												
	2												
	3												
	...												
	50												
	SUM												
	MEAN												
	SD												
	SE												
	LO 95% CI												
	HI 95% CI												

HUNTING STATS	TOTAL
(1) NO. BAGGED/DAY	
(2) NO. SHOT BUT NOT BAGGED/DAY	
(3) NO. REMOVED IN 30 DAYS	

IGUANA_ID	HUNTER_ID	DAY HUNTED	AGE	SEX	SIZE	GRAVID	EGGS	BLOOD
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

COMMENTS
(1) DAY HUNTED FORMAT AS DAY/MO/YR
(2) AGE 1 = HATCHLING, 2 = SUBADULT, 3 = ADULT
(3) SEX 1 = MALE, 2 = FEMALE
(4) SIZE IN CM (FROM TIP OF SNOUT TO BASE OF TAIL)
(5) GRAVID FEMALE WITH EGGS OR DEVELOPED OVARIES
(6) NUMBER OF EGGS IN GRAVID FEMALE
(7) BLOOD 0 = SAMPLE NOT TAKEN, SAMPLE TAKEN = 1
(8) SAMPLE OF 25 HUNTERS

Figure 1:

Green iguana density gradient based on distance sampling and repeated counts conducted on Grand Cayman in August 2015.

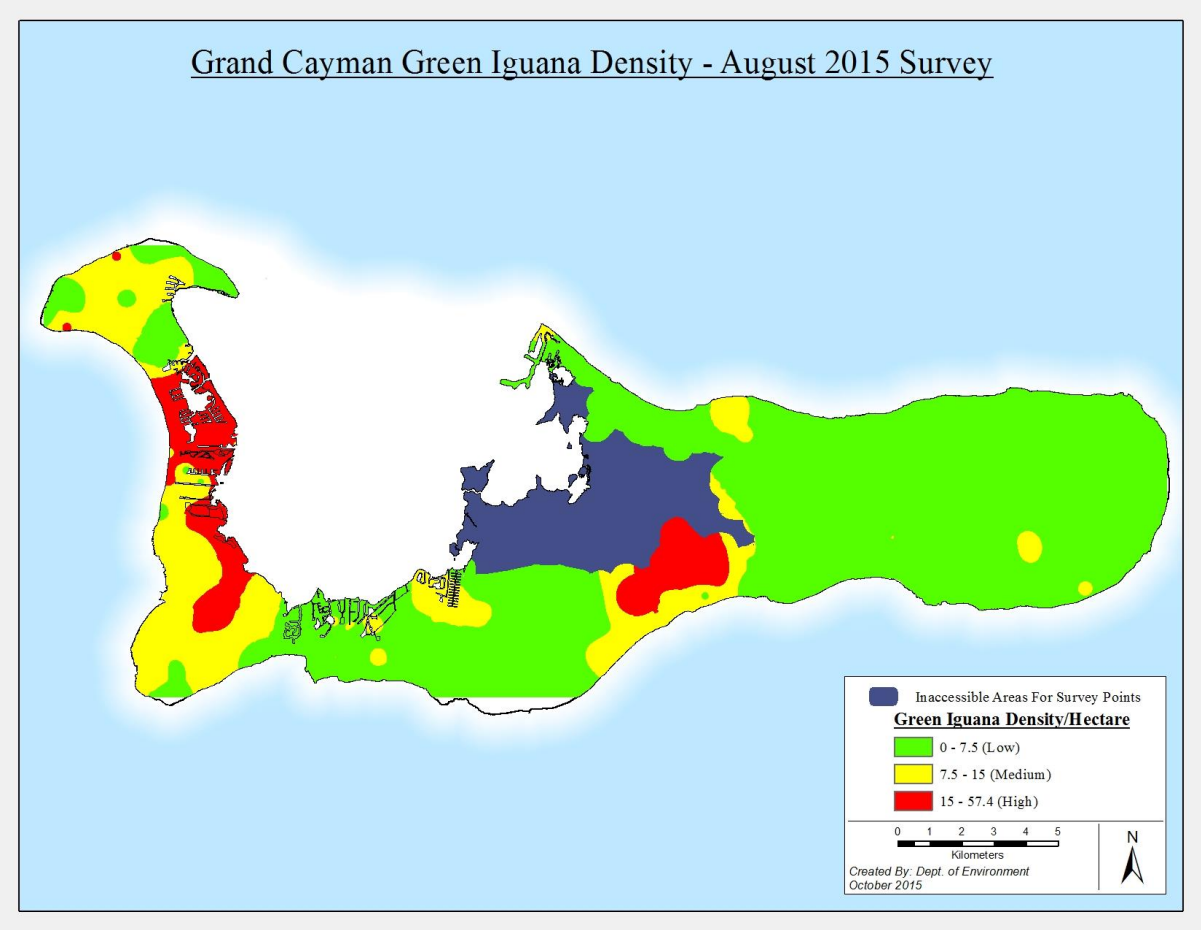


Figure 2:

Standard logistic model (runs = 1−10 in blue, with average in red for 500 runs) for the green iguana population with subadult and adult removal during 20 years. Carrying capacity (K) was defined as $U \sim$ (500,000, 1,000,000), intrinsic rate of increase (r) as $U \sim$ (0.241, 0.702), initial abundance (N_0) as $U \sim$ (103,140, 403,400), and annual harvest rate (h) constant at $0.6N_t$.

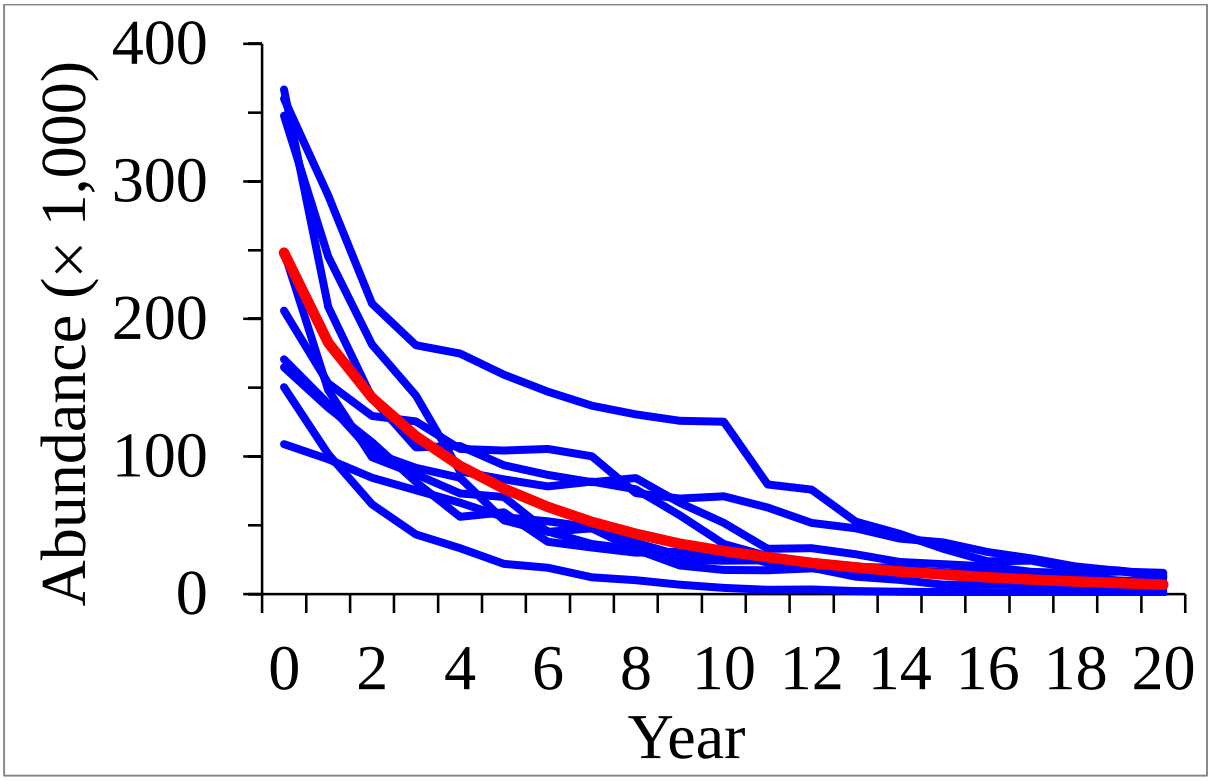
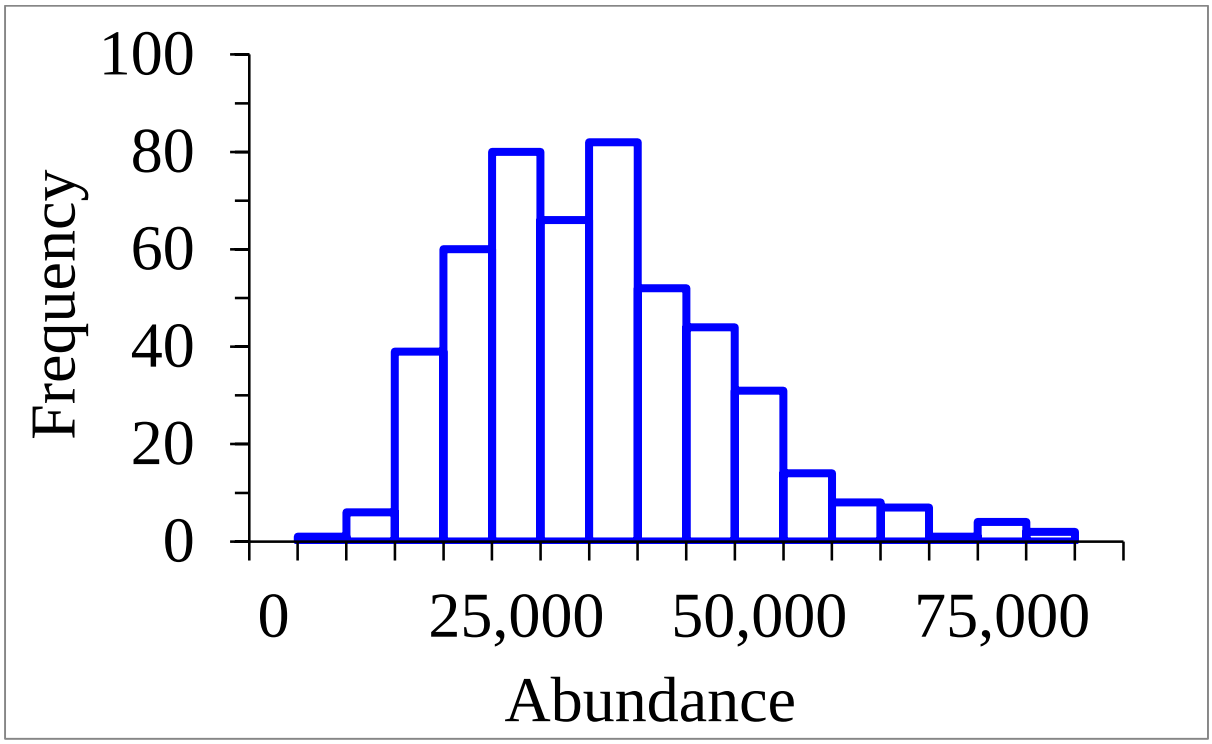


Figure 3:

Predicted abundance (time horizon t = 10 years) for subadult and adult green iguanas on Grand Cayman based on the standard logistic model (runs = 500). Mean abundance was 31,280 (95% CI = 14,230−59,232) after 10 years of constant removal effort ($h = 0.6N_t$).



Enhanced Marine Parks Proposals
2015 Consultation Report

Prepared by Department of Environment for National Conservation Council

Table of Contents

Background 2

Summary of Proposals 3

Table of Proposed Changes 5

Public Consultation Feedback - Key Considerations 7

Specific Areas 10

Grand Cayman 10

Little Cayman 16

Cayman Brac 19

General Issues *(Amendments or Clarifications to Nomination)* 21

Conclusion 23

Appendixes 25

Amended Nomination 25

Maps showing proposed changes 28

Area of Shelf Nominated for Protected Area Status 31

Background

Following the award of a Darwin Initiative Grant in 2010 for a project to comprehensively review the Cayman Islands Marine Parks to ensure that 25 years since their establishment in 1986 they continue to be optimally configured to protect the marine habitats and resources of the Cayman Islands for future generations, the Department of Environment (DoE) initiated a national conversation on the current state of the Cayman Islands' Marine Parks. The public was consulted on the condition in which they wished to see their marine environment in the future. Generally people desired a healthier, more productive, marine environment and were willing to accept enhanced conservation measures to achieve that goal.

Building on that first round of discussions in 2011 and years of research and local knowledge as well as international findings - while taking into account the growing local, regional and global challenges to the marine environment - the Department of Environment proposed an enhanced system of Marine Parks to try to meet the goal of a healthier and more productive future marine environment for the Cayman Islands. These proposals were presented to the public in 2012. Public input was reviewed and the proposals refined by the Department in 2013 and 2014. In 2015 the updated enhanced Marine Parks proposal was presented to the National Conservation Council (NCC) and approved for public consultation under the Protected Areas nomination mechanism of the National Conservation Law. The NCC delegated conduct of the public consultations to the DoE

In September 2015, the Department of Environment held public meetings in each of the five districts on Grand Cayman, and one on each of the Sister Islands in November 2015. Additionally, the department presented at a public meeting organised by Members of the Legislative Assembly in West Bay, as well as to the Watersports Committee of the Cayman Islands Tourism Association. The Department also discussed the proposals with other interested parties, including members of the Angling Club, and individual members of the public. Through local media (including notices in a newspaper on August 28th and September 4th) the public was made aware of the proposals and how to get more information, including that the 90-day written submission period would run to 4 December 2015, later extended by the Council to 18 December 2015. All feedback is available to the Council as an appendix to this report.

This report provides the NCC with an analysis of the feedback received via the public consultation process including follow-up consultations continuing up to early February 2016. Based on the feedback from the public, local scientific and anecdotal observations, and international best practice guidance the Department of Environment proposes the following revisions and clarifications to the 2015 Enhanced Marine Parks system for consideration (*Amendments to Nomination*).

Benefit Goals

Proposed enhancements to the Marine Parks meet internationally agreed marine resource conservation goals as follows:

- Increasing no-take protection from around 14% to 40-50% of the narrow coastal shelf;
- Distribution of optimally sized and located no-take Marine Reserves around the coastline of all Islands, including a few fully protected Reserves where No-Diving Zones are overlaid;
- Protecting healthy and productive habitats and ensuring a degree of connectivity between adjacent ecosystems;
- Creating concession slots for fishing alongside Marine Reserves such that persons wishing to fish may benefit from direct 'spillover' from the Reserve along its boundary.

Additionally, the following management objectives were considered:

a. **Economic Efficiency** – No-take protected areas are easier and less expensive to patrol and enforce than a wide variety of species or activity specific regulations. Licencing regulations in particular are expensive to manage for large numbers of persons.
b. **Standardisation and Simplicity** of zoning - Extending zones from shore to drop-off and building upon existing protected areas means fewer area changes to learn and a simpler system to use than with rotating zones (which also reduces the overall effectiveness of the zones in the long term) or where zones stop and start at various points inside and outside reefs, as currently occurs.

Summary of Proposals

In response to current and emerging threats to our fragile marine resources and based on public feedback, biological data indicating reef health and resilience, together with international best practice for marine protected area network design, the following changes are being recommended to Cabinet:

1. Expansion of current protected areas to cover 40-50% of Cayman's marine habitats (see **Error! Reference source not found.**).
    a. Such a significant expansion is necessary to have the best chance of conserving Cayman's marine resources for fishing, diving and other recreational uses now and in the future and is in line with international best practise recommendations.

2. Modification of Marine Parks to true no-take Marine Reserves, including no fishing from shore and to the 150 ft depth contour.
    a. Fishing from shore and on the upper part of the reef wall (within 150 ft depth) targets reef and other fish within the Parks, reducing their effectiveness, particularly given Cayman's narrow shelf area;
    b. Allowance made for catch-and-release fishing of tarpon, bonefish and permit within Marine Reserves;
    c. taking fry and sprat with a fry or cast net is permitted so long as (1) a cast net only is used while standing on the shore and (2) no more than 2.5 gallons per person per day of fry or sprats, inclusive of bycatch, are taken;
    d. Licenced lionfish cullers will be allowed to remove lionfish from Marine Reserves with methods approved by the DOE, as previously permitted within Marine Parks.
3. Larger Park sizes to increase effectiveness through broader ecosystem protection and through inclusion of all adjoining habitats from shore to 150 ft depth.
4. Increased number of No Diving Zones for the purpose of (a) dedicating areas for line fishing and (b) creating areas of greater protection for reef and other marine resources from diver impact.
5. Renaming of zones:
    a. Marine Reserves – no take zones from shoreline to 150 ft depth. (Marine Reserves will replace Marine Parks).
    b. Line Fishing – areas reserved for line fishing, often within or alongside Marine Reserves and adjacent to key community access points, to allow members of the public who fish to benefit from the 'spillover' effect from Marine Reserves. Cast net fishing for sprats permitted. (Line Fishing zones will replace Replenishment Zones.)
    c. Environmental Zone – unchanged.
    d. No Diving Zones – no SCUBA diving without permission. (No Diving Zones will replace No SCUBA Diving / Restricted SCUBA Diving Zones).
        i. Currently lionfish culling licences allow certain exemptions from the rules and regulations of the Marine Conservation Law, such as allowing cullers to take lionfish while SCUBA diving. This will continue. Generally, licenced lionfish cullers will be able to SCUBA dive in No Diving Zones in order to cull lionfish, except, the Sandbar and North Side No Dive Zones, the Environmental Zone and the SPAG Zones.
        ii. When overlaid on Line Fishing Only zones create reserved area for line fishing.
        iii. When overlaid on marine reserves create a higher level of protection, particularly for coral reefs.
    e. Wildlife Interaction Zones (unchanged).

f. Spawning Aggregation (SPAG) Zones – mirror recommendations made under Grouper Spawning Zone review – no fishing, diving or anchoring during the closed season (December through April) to provide fuller protection of aggregations from interference. (Spawning Aggregation (SPAG) Zones will replace Grouper Spawning Zones.)

Table of Proposed Changes

These changes are outlined in the Table below and illustrated in the maps attached.

Current Marine Park zones	**Proposed Marine Park zones**
MARINE PARK ZONE • No taking of any marine life alive or dead, except: - line fishing from shore is permitted; - line fishing at depths of 80 ft or greater is permitted; - taking fry and sprat with a fry or cast net is permitted. NOTE: fish traps, spear guns, pole spears and other nets are totally prohibited; - licenced Lionfish cullers are permitted to kill and remove lionfish with methods approved by the DOE. • No anchoring - use of fixed moorings only, except: - boats of 60 ft or less may anchor in sand, so long as no grappling hook is used, and neither the anchor nor the rope or chain will impact coral; - anchoring permitted in designated Port anchorage areas—contact Port Security VHF Channel 16; - anchoring prohibitions suspended during emergencies and by permission of Port Director. • Bloody Bay, Little Cayman - Special restrictions have been placed on the use of the Bloody Bay Marine Park, no commercial operations may use the park without a licence from the Marine Conservation Board.	MARINE RESERVE • No taking of any marine life alive or dead, except: - line fishing from shore NO LONGER permitted; - line fishing at depths of 150 ft or greater is permitted; - taking fry and sprat with a fry or cast net is permitted so long as (1) a cast net only is used while standing on the shore and (2) no more than 2.5 gallons per person per day of fry or sprats, inclusive of bycatch, are taken; - NOTE: fish traps, spear guns, pole spears and other nets are totally prohibited; - licenced Lionfish cullers are permitted to kill and remove lionfish with methods approved by the DOE; - catch-and-release fishing of select species permitted. • No anchoring - use of fixed moorings only, except: - boats of 60 ft or less may anchor in sand, so long as no grappling hook is used, and neither the anchor nor the rope or chain will impact coral; - anchoring permitted in designated Port anchorage areas—contact Port Security VHF Channel 16; - anchoring prohibitions suspended during emergencies and by permission of Port Director. • Bloody Bay, Little Cayman - Special restrictions have been placed on the use of the Bloody Bay Marine Park, no commercial operations may use the park without a licence from the Marine Conservation Board.

<table>
<tr>
<td>REPLENISHMENT ZONE

• No taking of conch or lobster by any means;
• Line fishing and anchoring permitted;
• Anchor, chain or line must not touch coral;
• Spear guns, pole spears, fish traps and nets prohibited, except:
- fry and sprat may be taken with a fry or cast net;
- licenced Lionfish cullers are permitted to kill and remove lionfish with methods approved by the DOE.
NOTE: These zones include the outside edge of the reef to a depth of 20 ft.</td>
<td>LINE FISHING ONLY ZONE

• No taking of conch or lobster by any means;
• Line fishing and anchoring permitted;
• Anchor, chain or line must not touch coral;
• Spear guns, pole spears, fish traps and nets prohibited, except:
- taking fry and sprat with a fry or cast net is permitted so long as (1) a cast net only is used while standing on the shore and (2) no more than 2.5 gallons per person per day of fry or sprats, inclusive of bycatch, are taken
- licenced Lionfish cullers are permitted to kill and remove lionfish with methods approved by the DOE.
NOTE: These zones extend from shore to the reef drop off at a depth of 150 ft.</td>
</tr>
<tr>
<td>NO DIVING ZONE

• No SCUBA diving.

PROHIBITED DIVING ZONE

• No SCUBA diving within this zone unless licenced to do so by the Marine Conservation Board.</td>
<td>NO DIVING ZONE

• No SCUBA diving without permission.</td>
</tr>
<tr>
<td>ENVIRONMENTAL ZONE

• No taking of any marine life, alive or dead with no exceptions;
• No in-water activities;
• Public may access only at speeds of 5 m.p.h. or less;
• No anchoring of any boat.

NOTE: Line fishing, fish traps, nets, spear guns and strikers are totally prohibited.</td>
<td>ENVIRONMENTAL ZONE

• No taking of any marine life, alive or dead with no exceptions;
• No in-water activities;
• Public may access only at speeds of 5 m.p.h. or less;
• No anchoring of any boat.

NOTE: Line fishing, fish traps, nets, spear guns and strikers are totally prohibited.</td>
</tr>
</table>

WILDLIFE INTERACTION ZONES • No taking any marine life by any means; • No selling of fish from boats; • No removing of any marine life from the water; • No anchoring in water shallower than three feet or so that the anchor or boat is within 20 ft of any reef structure; • No feeding any marine life with food of any kind or amount other than that approved by the Marine Conservation Board; • Fish feeding is prohibited anywhere in Cayman waters outside of a designated WIZ unless licensed by the Marine Conservation Board; • No wearing any footwear in water shallower than 4 ft; • Special conditions apply to commercial boats whom must have a licence issued by the Marine Conservation Board and clearly displayed on the boat to enter this area.	WILDLIFE INTERACTION ZONES • No taking any marine life by any means; • No selling of fish from boats; • No removing of any marine life from the water; • No anchoring in water shallower than three feet or so that the anchor or boat is within 20 ft of any reef structure; • No feeding any marine life with food of any kind or amount other than that approved by the Marine Conservation Board; • Fish feeding is prohibited anywhere in Cayman waters outside of a designated WIZ unless licensed by the Marine Conservation Board; • No wearing any footwear in water shallower than 4 ft; • Special conditions apply to commercial boats whom must have a licence issued by the Marine Conservation Board and clearly displayed on the boat to enter this area.
DESIGNATED GROUPER SPAWNING AREAS • East and West End of: Cayman Brac, Little Cayman and Twelve Mile Bank. Coxswain Bank and South West Point, Grand Cayman; • No fishing for Nassau groupers 1 November through 31 March; • No fish pots or spear fishing within one-mile radius of Designated Grouper Spawning Area from 1 November through 31 March.	SPAWNING AGGREGATION (SPAG) ZONES • (Regulations to mirror recommendations made under Grouper Spawning Zone review).

Public Consultation Feedback - Key Considerations

A variety of comments were received showing strong support for marine conservation, many raising specific issues regarding enhancing Cayman's Marine Parks system. A number of issues stood out and formed key considerations in preparing a revised enhanced Marine Parks proposal.

1) Demand for no or little change to areal extent of the existing Parks – **preference for some other form of conservation instead** (usually some form or combination of general or specific bag limits, licences and closed seasons was offered).

a. The Department, in all of its presentations pointed out that Marine Protected Areas are not a panacea. While they are the most ecologically sound and environmentally effective way to manage natural resources, species-specific controls such as exist for conch and lobster will continue to be necessary for commonly targeted and socio-economically important species. However, to attempt to manage all those species that are required to maintain a vibrant and healthy marine ecosystem by utilising this option would require a dizzying array of species controls, size limits and seasonal closures. This regime would be complicated for the public to follow, and expensive to enforce, requiring constant checks of all fishermen around all three Islands. Marine Reserves are the most effective and efficient tool available for protection of fisheries and their associated marine habitats. They have the additional advantage over traditional fisheries management methods of providing broad species protection and habitat protection resulting in more holistic ecosystem conservation.
b. Fishing Licences, especially for non-Caymanians were often cited as a preferred option to more protected areas, the assumption being that these licences would result in Caymanians only being allowed to fish. The previous attempt restricted the requirement for fishing licenses to non-Caymanian work-permit holders fishing from shore. Experience has shown that this restriction is easily worked around by access to even the leakiest canoe, kayak or raft. In addition, fishing licences, rather than being a source of income for conservation purposes, are a resource drain, costing more to administer and enforce than they bring in.
c. Heavy fishing pressure has been identified as the largest directly manageable impact on our marine resources (with climate change being today's most significant driver of environmental change). A truly conservation-oriented licensing system will therefore require restricting not only non-Caymanian fishers but also Caymanians. Given this, and the vast body of scientific evidence showing that the protection of whole ecosystems in no-take areas affords a greater range of fisheries benefits than other fisheries management techniques such as licensing, the Department of Environment has opted for an increase in the percentage of no-take areas as its primary fisheries management strategy. To attempt to control the numbers of people currently fishing though a licensing system only would require a major expansion in enforcement capability and therefore cost.

2) **Increased Enforcement**, before, in addition to, or instead of, increased conservation controls. DoE's Conservation Officers currently patrol and have responsibility for enforcing marine conservation laws in all Cayman waters so changing rules for some areas will not increase or make the job of Conservation Officers any harder. In fact, by streamlining the proposed rules, enforcement will become easier. Additionally, the

recent passage of the National Conservation Law has provided DoE's Conservation Officers with previously missing powers and authorities and has enhanced the enforcement capabilities of the department.

It is also likely that the number of DoE Conservation Officers will not significantly increase in the near future, and so neither will the person-hours spent on marine enforcement. While there is an identified need for additional conservation officers this will be to replace or bolster existing resources, e.g., Sister Islands, for dedicated tasks, e.g., WIZ Patrol, or as terrestrial conservation enforcement activities under the National Conservation Law increase, and will likely not meet the expectations of persons who feel that increased enforcement of current regulations could balance an increase in protected areas.

3) There were a number of requests for **Area-Specific Changes**. These were accommodated as much as possible, where they did not run counter to the stated conservation goals, or against other public input in this or previous rounds of consultation. In most areas it was possible to shift management zone boundaries around to try to balance local and conservation interests. The proposed amendments to the nomination which follow reflect these changes wherever possible.
4) **Shore fishing** did not emerge as significant an issue as expected. Indeed most issues related to restrictions on fishing from shore in specific areas. Wherever possible this was addressed by the inclusion of Line Fishing Zones or shifting Marine Reserves and Open Zones to preserve fishing access in current common-use locations. Some Marine Reserves were also shifted to avoid public property on the shore in an attempt to preserve fishing access ahead of population growth and resulting access demands. Unfortunately many common-use areas are not public property and this may lead to difficulties later on when public access over private property becomes less available.
5) **Sprats and Fries** were a point of some difficulty given their highly transitory nature and the initially restricted area proposed for allowable take. The DoE believes that the most effective way to manage these species, while permitting traditional levels of take, is to allow the take of these species from the shore with a cast or fry net within the proposed Marine Reserves and Line Fishing Zones (as is currently the case for these species within Marine Park and Replenishment Zones) and to further regulate their take through a catch limit of half a five gallon bucket. These catch limits would be extended to the open zones through Species Conservation Plans under the National Conservation Law at a later (but hopefully not too distant) date.
    a. *Amendment to Nomination:* To reduce confusion 'Line Fishing Only' zones to be called 'Line Fishing' zones.

6) It bears repeating that **catch and release fishing** for select species, i.e., bonefish, tarpon and permit, will be allowed within Marine Reserves, e.g., Barkers, South Hole Sound, etc., as will taking lion fish in Marine Reserves and (select) No Diving Zones.
7) It is also worth repeating that the **permitted uses of the existing recreational public moorings** will continue to include line fishing in open areas, Line Fishing Zones and wherever conditions allow 'tailing off' from moorings within Marine Reserves and fishing beyond the edge of the reserve, which is proposed at 150 ft depth.
8) **Demarcation of zones** will continue to be an issue. The public are concerned that they are able to identify zones, on the water, with relative accuracy. The increased use of range markers and possibly range-marking boundary buoys in deeper water may be required. For ease of reference where possible zone boundaries now run north-south or east-west, or to obvious visible landmarks, e.g., channels. In addition the Department is producing an app so that persons with GPS enabled smart phones will be able to know their location relative to the zones.

Specific Areas

The following explains the changes to zones in the proposed enhanced Park system, compared with the existing Marine Parks and particularly where amendments to the nomination are proposed as a result of the 2015 round of public consultation including follow-up consultations continuing up to early February 2016.

Grand Cayman

1) Barkers
    a. The existing Replenishment Zone would become a Marine Reserve in order to protect a part of this important North Sound back reef lagoon, vital for fish habitat and for beneficial fish 'spillover' to culturally and recreationally important fishing areas on either side of it. The boundaries would be extended to the South to include important mangrove coastlines and eastwards to encompass the existing Spanish Bay Marine Park. Additionally boundaries would extend to the 150 ft contour (drop off) consistent with other protected areas and to provide protection to larger reef fish in this important mangrove shore to deep reef continuum.
    b. This protected area would complement the proposed Barkers National Park (dedicated in 2003) giving a total-ecosystem conservation approach coupled with appropriate public use of the area.
    c. *Amendment to Nomination:* In recognition of the strong community desire for the culturally important line fishing practices that occur in this area, particularly during the Easter camping season, a Line Fishing Zone is proposed for part of the

nominated Marine Reserve in order to permit these activities to continue while maintaining the almost 30 years of conch and lobster protection. Replacing some of the previously proposed Marine Reserve with a Line Fishing Zone is less complicated and more consistent than attempts to allow shore or other fishing within the proposed Marine Reserve area. The area encompasses the Spanish Bay Reef Marine Park, which was considered too small to be effective on its own.

2) Northwest Point
    a. A marine reserve has not been proposed for this area despite suggestions based on maintaining and enhancing the value of the diving activities in the area. The area is widely recognised as an active, geographically and culturally important and productive fishing area.
3) Seven Mile Beach Marine Reserve
    a. Currently the Seven Mile Beach Marine Park extends from Northwest Point to north of Sand Cay Condominiums and includes two Replenishment Zones. The same area is proposed to be designated Marine Reserve with minor adjustments to the boundaries and locations of the Line Fishing Zones. This effectively continues the almost thirty years of Marine Park protection this area has enjoyed. Because of its size it is one of Cayman's best functioning marine protected areas with relatively high levels of fish biomass compared to smaller Marine Parks. The associated fish 'spillover' from these large protected areas supports the productive open fishing areas adjacent and to the north.
    b. The proposed West Bay Bight Line Fishing Zone replaces the existing Replenishment Zone in this area and continues the existing access for fishers. Boundaries have been located south of the Kittiwake wreck dive sites to avoid conflicts with diving activity in the area. A No Diving Zone overlay has been incorporated into the Line Fishing Zone to reduce diving and fishing conflicts. The No Diving Zone will make four existing public moorings off limits to diving at existing named dive sites, however the moorings maybe utilised for fishing and other boating activities requiring a mooring, thereby reducing potential anchoring impacts.
        i. *Amendment to Nomination*: The northern boundary of the Line Fishing Zone has been moved north to encompass more of the sand bottom in this area which is used as an anchorage for yachts too large to be accommodated on the Department of Environment's public moorings. Vessels over 60 ft in length will not be allowed to anchor in the Marine Reserves. The No Diving Zone overlay also moves north but does not involve the loss of any additional public moorings on named dive sites.
    c. A Line Fishing Zone at Jackson's Point is proposed to accommodate the George Town fishing community. This zone is located in an area where traditionally

more shore fishing seems to occur and also compensates for the loss of the existing Replenishment Zone from between Treasure Island and the Wreck of the Gamma (Pageant Beach).

4) South Sound No Diving Zone and SPAG
    a. *Amendment to Nomination:* Remove these nominated zones and replace with the SPAG zone which will be closed to diving and fishing during the grouper spawning season. (See SPAG Zones below.) This simplifies the zoning of this area for little loss of effective protection.
5) South Sound Marine Reserve
    a. The nomination proposes to enhance the current Replenishment Zone designation by upgrading the protection status of the area to a Marine Reserve, and expanding the area to include the coastal shelf outside the reef to the 150 ft contour ('drop off').
    b. A Line Fishing Zone with an additional No Diving Zone overlay is proposed for the area centred on the South Sound community dock and South Sound Channel. The zones extend from shore to the 150 ft contour ('drop off') and have been positioned on the public property at the dock to facilitate access and existing fishing activities in the South Sound area to continue. The No Diving Zone will make two existing public moorings off limits to diving at existing named dive sites, however the moorings maybe utilised for fishing and other boating activities requiring a mooring, thereby reducing potential anchoring impacts.
    c. Additionally the South Sound Marine Reserve designation is proposed to expand eastwards to provide continuous coverage along the south coast to the Spotts area, where the existing small Replenishment Zone would be removed. Research has shown that small zones are less environmentally effective than larger zones so one continuous Marine Reserve is preferred. (No Take Marine Reserves are also more environmentally effective than the limited protections of the Replenishment Zones.)
    d. In order that the Marine Reserve be within socially acceptable and scientifically justifiable limits the boundaries were not nominated to extend through the Spotts Beach and lagoon areas. Not upgrading the existing Replenishment Zone in this area allows the popular Spotts Dock area to remain open to the fishing public as long as that area remains open to public access. The existing Replenishment Zone status of the area would be removed. Additionally the Spotts area remains a significant anchorage area for vessels in excess of 60 ft. during inclement weather. Under a new Marine Reserve designation, anchoring of vessels over 60 ft. in length would not be allowed.
    e. *Amendment to Nomination:* In order to facilitate the existing large yacht anchorage usage of the area the Department of Environment has proposed that

the eastern end of the nominated South Sound Marine Reserve is amended by relocating it westerly from the west of Prospect Reef Resort to the start of the reef at Spotts.

6) Grand Cayman South Coast
    a. The initial proposal for Grand Cayman had left a gap along the south coast lacking a protected area to keep fish biomass high. This was because the initial plans had focused upon enhancing the existing zones and not going over the 50% coverage goal in order to respect fisheries users' interests.
    b. However the new *Amendments to Nomination*, reflecting reductions requested by the public around Grand Cayman, would result in only about 42% of coastal habitat under no take protection. Therefore a Marine Reserve could acceptably and usefully be placed on the south coast of Grand Cayman in order to promote sustainable fishing and healthy marine environments along this coast.
    c. The lack of a Marine Reserve on the central south coast was noticed and questioned during the consultations both as a matter of fairness to other areas of the Island as well as to provide a fully connected system of marine protected areas. The addition of a Marine Reserve on the south coast would therefore address both of these points.
    d. *Amendment to the Nomination:* The addition of a Marine Reserve on the south coast of Grand Cayman from 940 ft east of the Beach Bay groyne to the Manse Road / Bodden Town Road intersection, protecting cliff and lagoonal coastline as well as the associated offshore reef structures.
    e. This is still a minor change as the amount of area on Grand Cayman as a Marine Reserve in particular or a No Take Zone in general in the *Amended Nomination* has been reduced slightly (about 1%) from the original nomination. (See table: *Area of Shelf Nominated for Protected Area Status*.) Like other proposed changes this amended nomination is in response to public feedback.
7) Frank Sound Marine Reserve
    a. The nomination upgraded this area from a Replenishment Zone to a Marine Reserve and increased its area by extending offshore to the 150 ft contour ('drop off'). In addition it is extended east in response to the community request for enhanced protection and to replace the proposed removal of the very small Dive Lodge Replenishment Zone in the south of East End Sound.
8) East End Zones
    a. The existing conservation zones in East End are a Replenishment Zone north of Gun Bluff, as well as the aforementioned Dive Lodge Replenishment Zone opposite the Health Centre.

b. The nomination was for a Line Fishing Zone from Ocean Frontier's dock to just east of the South Channel, and a Marine Reserve with No Diving Zone from Ocean Frontier's dock to just south of Collier's Wilderness Drive.
    i. The Marine Reserve and No Diving Zone would provide a well-protected area within and without the reef protecting a variety of species, size classes and habitats. With the adjoining Line Fishing Zone to provide continued conch and lobster protection, analogous to the existing Replenishment Zone.
c. The East End Dive Lodge Replenishment Zone is to be removed as part of the nominated changes as it is too small to function effectively. It will be replaced by the larger Marine Reserve in East End, and the extended Marine Reserve in Frank Sound.
d. East End No Diving Zone and SPAG
    i. *Amendment to Nomination:* Remove these nominated zones and replace with the SPAG zone which will be closed to diving and fishing during the grouper spawning season. (See SPAG Zones below.) This simplifies the zoning of this area for little loss of effective protection.
e. *Amendment to the Nomination*
    i. The suggested amendments to the nomination result from requests in the currently concluded and previous consultations to revise the placement of the zones to keep the southern portion of the Sound as fully open as possible.
    ii. The nominated Line Fishing Zone would be removed.
    iii. The Marine Reserve would be moved north from the Ocean Frontier's dock to begin at Gun Bluff (the boundary of the present Replenishment Zone) but extend north to the southern edge of the SPAG Zone, at about 1562 Austin Conolly Drive.
    iv. A Line Fishing Zone would then begin and proceed north to Spotter's Bay. This provides extended conch and lobster protection close to the developing tourist area, addressing previous complaints of take of these species by visitors.
    v. The Marine Reserve would be overlaid with a No Diving Zone to provide maximum protection and therefore maximum spillover benefit to the adjoining line fishing and open zones. The No Diving restriction is only for SCUBA divers, so snorkelling from shore or at the reef would still be allowed for recreational or commercial purposes. By moving the No Diving Zone north of its previously proposed location it should reduce impact on the shallow water SCUBA dive sites within the Sound. This is in recognition of the importance of these sites to the dive industry in East

End. There will still need to be the removal of one publicly moored dive site.

vi. It is important that Marine Reserves (and Line Fishing Zones) be carried offshore to the drop-off to protect fish and other species in these depths. This includes fishing at the drop-off, which is why the zones were nominated (and no amendment is suggested) to continue to 150 ft depth, a depth worked out in previous consultations as providing a compromise between conservation, the fishing of non-demersal species, and the practical inability to visually judge depths once at the drop-off.

9) North-East Zones
   a. The North-East of Grand Cayman's existing marine protection is provided by a narrow shore to reef Replenishment Zone between Spotter's Bay and Anchor Point. This is nominated to be converted to a Marine Reserve and extended to the drop off (150ft deep).
   b. The nomination of a Marine Reserve from Anchor's Point to Spotter's Bay, with a Line Fishing Zone continuing eastward from Spotter's Bay is intended as a balance between conservation and the various resource uses of the area. The establishment of a significant and more effective protected area is intended to promote sustainable fishing in the north and east of Grand Cayman in the long term, much as the Marine Park on the western coast has done for fishing in the Northwest Point area.
10) Old Robin Point / Rosebud Drive Marine Reserve
   a. The nomination of this reserve area was in response to a community request taking into account potential dive tourism expansion. It should also allow sustainable fishing to continue to the east and west of the proposed Reserve as population grows in the North and East of the Island.
11) North Side No Diving Zones
   a. The current No Diving Zones are based on the legally gazetted boundaries and the nomination did not propose any alteration to these zones.
   b. Requests were received to shift the No Diving Zones eastward, suggesting that their boundaries were not accurately transcribed at the time of designation. These shifts would either reduce the size of the western No Diving Zone or require the removal of several important dive sites in the Babylon dive area (eastern No Diving Zone), developed over the years based on the gazetted end of the No Diving Zone. For this reason the Department only recommends one change.
   c. *Amendment of Nomination*: To move the eastern boundary of the western zone from west of Chisholm's Supermarket to east of Chisholm's Supermarket.

12) North Sound Marine Reserve

a. In addition to the upgrade of the Replenishment Zone to Marine Reserve status, including extending to the drop-off (150 ft depth) the nomination retracts the Western boundary to line up with the WIZ boundary for simplicity.
b. *Amendment to the Nomination:* To further retreat both boundaries east, to the start of the horseshoe bar, freeing up additional fishing area inside the reef in the North Sound. This is a movement of over 0.2 miles from the nominated boundary, opening up over 824 acres to fishing, lobstering and conching.
c. The nomination of a Rum Point No Diving Zone, requiring the removal of two dive sites, was in response to public requests for a strongly protected area on the north coast to enhance fishery recruitment from the Marine Reserve to the open zones. Given the heavy diving and fishing pressure on these reefs this area was all that could be found to balance competing user interests.
d. The nomination that the existing Rum Point Marine Park (from Rum Point to Bowse Bluff) be changed to a Marine Reserve but remain within the reef originated during the previous round of consultation based on public input. The Marine Reserve remains inside the reef in Rum Point as there was strong public desire to maintain the fishing grounds outside the reef balanced with strong public interest in continuing the existing Marine Park protection which has been afforded to Rum Point for almost 30 years. While one of the goals of the proposals was to simplify and enhance the Parks by having all boundaries run from the shore to the drop-off the strong competing public interests in this area outweighed the goal of simplicity which has been adhered to in most other areas.

13) Environmental Zone – No changes proposed in the nominations process.

Little Cayman

14) Amount of Protection

a. In the first pubic consultations in 2011 there was a strong push from the public for all of Little Cayman to be protected. The Department did not propose total protection in 2012 and, as expected, once the impact of such a dramatic change was visualised there was objection to even what was proposed. However, balancing those initial public desires with subsequent requests for areas opened for the taking of fish and shellfish, including shore fishing access, has resulted in a proposal well above the internationally recommended standard of 40% - 50% no-take protection.
b. By pursuing the current proposal for Little Cayman, including its large No Diving Zone, we should be able to provide continuing good fishing for residents utilising the open and Line Fishing areas of the coast.

c. The current proposal for enhancing Little Cayman's Marine Parks has the further advantage that the Island should continue to act as a breeding refuge for the entire Cayman Islands with spawn from Little Cayman fish, and possibly conch, lobster and coral distributed through larval planktonic transport sporadically to the other two islands, helping to keep the marine resources of the Cayman Islands abundant at a national level.

15) West End No Diving Zone and SPAG

a. *Amendment to Nomination:* Remove these nominated zones and replace with the SPAG zone which will be closed to diving and fishing during the grouper spawning season. (See SPAG Zones below.) This simplifies the zoning of this area for little loss of effective protection.

16) South Hole Sound West

a. The nomination was to replace the Marine Park Zone presently running outside the reef from Preston Bay to the Main Channel in South Hole Sound with a Marine Reserve, from shore to drop off (150 ft), from the lighthouse on the western end of the island to the South Hole Sound main channel.

b. *Amendment to Nomination:* The section of Marine Reserve in the western part of South Hole Sound is now proposed to be a Line Fishing Zone. This would still provide increased conch and lobster protection to the Sound while respecting public requests for shore fishing access, especially around the public dock where fishing currently occurs. The eastern boundary line has been realigned to allow access to the area just inshore of the channel for taking conch and lobster.

c. It is proposed that Preston Bay inside and outside the reef, up to the beginning of the South Hole Sound reef will be a Marine Reserve. This provides a solid conservation core allowing fish and lobster numbers to increase and then spill over in to the adjoining open zone (west) and fishing zone (east). This builds upon the existing Marine Park in this area but extends it in to the sound providing important protection for younger fish as well as conch and lobster within the sound.

17) South Hole Sound, Owen Island, South Coast

a. Currently the South Hole Sound Replenishment Zone extends from Owen Island to Thornton's Flats, inside the reef. It was proposed to upgrade the Replenishment Zone to a Marine Reserve, extend the Reserve from the shore to the drop off (150 ft contour), but shorten the zone to run from Owen Island to 350 ft West of the Christoffer's.

b. Amendment of Nomination: The western boundary of this zone to be realigned to clearly take in all of Owen Island. Due to mapping improvements over time the emergent rocks at the south-west corner of the island appeared to be out of

the Marine Reserve. As the boundary was always recognised as 'west of Owen Island' this has been continued in the new maps.

18) Eastern Zones
    a. The nomination proposed a Line Fishing Zone at Charles Bight in recognition of the current use of the area. The No Diving Zone overlaying it reserves the area for fishing in the face of potential future dive industry expansion.
    b. The nomination proposed a Marine Reserve, with overlying No Diving Zone around the eastern end of the island providing a strong core of protection for all marine life, which should provide an effective source of marine life spilling over in to the down-current fishing areas on either side of it. It will require the removal of one public mooring at a named dive site. This dual designation should also help to preserve the snorkelling within the popular Point O' Sand recreation area, at least until it is developed.

19) Point O' Sand SPAG
    a. *Amendment to Nomination:* Remove the nominated zone and replace with a SPAG zone which will be closed to diving and fishing during the grouper spawning season. (See SPAG Zones below.) This simplifies the zoning of this area for little loss of effective protection.

20) Mary's Bay
    a. The nomination proposed that the existing Replenishment Zone be replaced with a Marine Reserve, from the shore to the drop off (150 ft contour), as part of the Marine Reserve around the eastern end of the Island, with a No Diving Zone overlaying most of it.
    b. *Amendment of Nomination:* Move the western end of the Marine Reserve (and the No Diving Zone) east to the Mary's Bay Channel (the edge of the current Replenishment Zone). This would simplify the changes in this area and leave more area for fishing as requested by the public, including around the new public dock on that coast.
    c. While there were requests for a fishing zone in the eastern corner of the Sound, e.g., around the wrecked barge, this is not public property, as people thought, so the Department has suggested making the open fishing zone in the area of the new dock (as outlined above) where the public should have continued access in the future.

21) Bloody Bay
    a. The current Bloody Bay Marine Park runs from Jackson Point to Spot Bay from the shore to the drop off (80 ft depth contour). The nomination proposed to expand the Bloody Bay Marine Park, which will become a Marine Reserve under the proposed system, to the east (across from Little Island Drive) and west (1/2 mile east of Grape Tree Bay). This will increase protection for this important

diving tourism area while building upon the decades of protection it currently enjoys, allowing it to continue producing spillover for sustainable fishing in the adjoining open zones, hopefully for decades to come.

Cayman Brac

1) No Diving Zone, Cayman Brac West
    a. *Amendment to Nomination*: Remove this nominated zone and replace it with the SPAG zone which will be closed to diving and fishing during the grouper spawning season. (See SPAG Zones below.) This simplifies the zoning of this area for little loss of effective protection.
2) South-West Marine Reserve
    a. A Marine Reserve was nominated from the West End Point to west of Brac Reef Resort.
    b. *Amendment of Nomination:* Extended west to the Main Channel, based on public feedback.
3) South Coast Marine Reserve
    a. Presently a Marine Park extends, outside the reef, from Dennis Point to east of Cedar Point, with a replenishment zone inside the reef at Saltwater Pond and inside the reef along the South Side West road. It was nominated that these Parks be upgraded to a Marine Reserve to run, from shore to drop off (150 ft depth) from Dennis Point to 650 ft east of Cedar Point.
    b. This zone remains as proposed in order to protect at least a portion of the biologically valuable sound. As Cayman Brac has few such areas (relative to the other two islands) protecting sound habitat within the fringing reef carries extra importance for the biodiversity and marine productivity of Cayman Brac as well as, potentially, the recreational attractiveness of the sound in the long term.
4) Goat Bay Marine Reserve and No Diving Zone
    a. The present Marine Park (from shore to drop off, 80 ft depth) runs from Jennifer Bay to Deep Well. An extended Marine Reserve, from shore to 150 ft depth, from east of Brac Haven Villas to west of Southern Reach residence was nominated, including a No Diving Zone overlay from west of Bay Winds residence to the Southern Reach boundary of the Marine Reserve. This will provide a core protected area to supply the adjoining open zones with fish spillover. The No Diving Zone increases the conservation of the area while not affecting any public moorings at named dive sites.
5) No Diving Zone, Cayman Brac East
    a. *Amendment to Nomination*: Remove this nominated zone and replace it with the SPAG zone which will be closed to diving and fishing during the grouper

spawning season. (See SPAG Zones below.) This simplifies the zoning of this area for little loss of effective protection.

6) Spot Bay
    a. Currently there is a Replenishment Zone only inside the reef from Mr. Taylor Foster's residence to Spot Bay School. The Nomination proposed a Marine Reserve extended to the drop-off (150 ft depth) from Brac Heights Realty to the Scott Bay School, with a Fishing Zone from the school to Booby Point. This balances conservation of fish, current fishing access both from shore and at the drop-off, with additional protection for lobster and conch.
7) North Coast Zones
    a. A Line Fishing and No Diving Zone was nominated from Tibbetts Turn to Frigate Drive to recognise and preserve fishing access in the area. A Marine Reserve was nominated from Juniper Bay road to Hideaway link to provide a core Marine Reserve refuge for fish, lobster and conch to spill over in to the surrounding areas.
    b. This area has elicited various, sometimes competing, public opinions and recommendations over the years and again in 2015.
    c. *Amendment to Nomination:*
        i. That the Line Fishing /No Diving zone be removed. The community requested a shift in the Marine Reserves (below) and the removal of the No Diving Zone to support Cayman Brac's attractiveness as a shore diving tourist destination. This simplifies the overall proposal for Cayman Brac.
        ii. A Marine Reserve from Frigate Drive to Coastal Way.
        iii. A Marine Reserve from Suncave Close to Ryan's Drive.
8) Buccaneer's Inn Marine Reserves and Fishing Zone
    a. Presently there is only a Marine Park from White Bay to Buccaneer's Inn.
    b. The nominated zones are a Marine Reserve from West End Primary School to Scott's Dock, a Fishing Zone from Scott's Dock to Buccaneer's Inn, and a Marine Reserve from Buccaneer's Inn to West End Point. This is intended to provide a core refuge for fish, conch and lobster to spill over into the adjoining open areas. The Line Fishing Zone recognises the public's desire for fishing, including shore fishing, in this area, and is anchored by the public launching ramp to ensure continuity of access while segregating fishing from the active industrial port for safety.
    c. The area is currently a Marine Park, which limits anchoring to vessels 60 ft or less in sand. While Marine Reserves will also restrict anchoring to vessels 60 ft or less, and then only in sand, desire to moor larger vessels in this area should be addressed through the creation of a 'Port anchorage area', not the removal of

protected area status. Permanent moorings should also be strongly considered if the intention is to make this an anchorage area for large vessels in the future.

General Issues *(Amendments or Clarifications to Nomination)*

9) SPAG Zones
    a. The original nomination was for SPAG Zones extending to 650ft to protect deep-water spawning aggregations, closed year-round to fishing to protect the variety of species which use these areas at different months of the year and overlaid with a No Diving Zone.
    b. The nomination and consultation proceeded on the basis that these zones on all islands will be managed through seasonal closures, adjusted to match the grouper fishing closed seasons proposed for the management of Nassau grouper(December through April), and restrict all diving and all fishing in the zones (from 50 ft deep to 200 ft deep) during the closed season. This standardises and simplifies the proposal's shallow boundaries as some overlapped shore fishing and shallow diving interests that did not compete directly with the desire to protect the spawning aggregation areas. The deeper (than the 150 ft limit of all other zones) outer boundary is in recognition of the use of the deeper shelf edge by the spawning species, while limiting impact on pelagic fishing interests. Unfortunately this compromise still means that some spawning or aggregating grouper, which use water beyond the 200 ft depth contour, will be outside the SPAG boundary.

10) Lionfish
    a. The taking of lionfish without a licence while abiding by all National Conservation Law regulations will continue.
    b. There will continue to be licences (now permits under the Law) to allow the take of lionfish outside the normal Conservation Law rules:
        i. While diving; wearing gloves while diving; taking fish under 8";
        ii. Permitting the use of spears and nets to persons not normally eligible for such permission; and
        iii. Taking lionfish within protected areas, including SCUBA diving in No Diving Zones.
    c. The following protected areas will generally remain off-limits to lionfishing, even with a Permit, outside of direct DoE research and control activities.
        i. Environmental Zone
        ii. SPAGs (during closed season)
        iii. North Side No Diving Zones; Sandbar No Diving Zone

11) Research Permissions
    a. Proposals to conduct extractive research, i.e., 'take', or other actions requiring special permission under the Law will continue to generally only be approved by the National Conservation Council (acting through the Department of Environment) for areas outside of the Marine Parks system.
    b. Requests to conduct research inside the Marine Parks System may be approved if it is demonstrated that the research goals cannot be achieved in any other way.
    c. Proposals for activities within the Environmental Zone, SPAGs (during closed season), North Side and Sandbar No Diving Zones, will normally not be approved.
12) Fry & Sprat
    a. The taking of fry and sprat from shore with a fry or cast net will be permitted within Marine Reserves and Line Fishing Zones (as they are now for Marine Park and Replenishment Zones) to a maximum of 2.5 gallons per net per day.
13) Catch & Release Fishing
    a. Catch & Release Fishing will be permitted within Marine Reserves for the following species: Tarpon, Bonefish, Permit. This will include both from shore and by boat. This will alleviate the administrative costs of managing a licencing system for residents, tour guides and visitors.

Conclusion

Throughout the course of this Marine Parks Review several things have become clear:

1. Research shows that the implementation of our existing Marine Parks almost 30 years ago and their continued support have been effective in protecting the marine environment and coasts of Cayman, but that they now require enhancement to halt or even reverse evident declines in our marine resources. Our coral reefs are in poor health, the physical structure of the reef is degraded and our fish stocks are declining critically;

2. Fishing pressure is higher than previously believed;

3. Climate change, national population growth, development trajectories and economic growth will continue to apply pressures on our marine environment;

4. If action is not taken now, declines in reef health and fish diversity, abundance and size will continue and soon reach a point where they can no longer be corrected;

5. A thriving and healthy marine environment is important to the people of the Cayman Islands, both socially and economically;

6. Food security is a socio-economic concern. Without sustainable management of our fisheries resources through enhanced Marine Parks these resources will not be available for current and future users;

7. The people of the Cayman Islands want proactive conservation through active management of their natural resources; and feedback received during public consultation indicated that the majority of people see the need for enhancement of their Marine Parks, as outlined in this report;

Given that they have a variety of biological, fishing, economic and management benefits, the DoE believes that an enhanced system of Marine Parks (combined with species specific fisheries management as needed) is the optimal management tool to ensure the Cayman Islands marine resources are better able to resist or recover from existing and emerging threats. Further, the required infrastructure and management capacity, both legislative and institutional, are already in place.

A large body of international research has shown the effectiveness of no-take marine parks as a fisheries management tool, with overall significantly higher levels of density, biomass, species diversity and size of organisms within reserves compared to outside. Measures, such as the general fishing and diving restrictions proposed by opponents of enhancing the Marine Parks, are much less effective at an ecosystem level, less acceptable to the general community and much less efficient from an enforcement perspective.

Having consulted widely with the public, and based on the scientific and technical information available, we believe the proposed changes to the current Marine Parks are balanced and effective. We also believe that, should these proposals for enhanced Marine Parks which have been widely discussed for the last several years not be implemented, we risk ecosystem collapse, local fishery extinctions, coastal infrastructure exposure, and negative impacts on tourism and economic growth. We therefore strongly recommend these Marine Park enhancements to the Minister of the Environment for immediate approval by the Cabinet of the Cayman Islands.

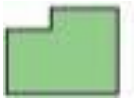
Appendixes

- Amended nomination
- Maps of the Cayman Islands showing current marine protected areas, nominated protected areas and amendments to the nomination
- Area of shelf nominated for protected status

Amended Nomination

The Department of Environment's nomination to the National Conservation Council of marine areas for protected status under section 9(1) of the National Conservation Law. Including amendments proposed on 24 February 2016 to the Nomination accepted for consultation on 26 May 2015.

The areas nominated for protected status, as shown in the maps overleaf, will be under various specific management regimes.



MARINE RESERVE ZONE

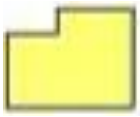
- No taking of any marine life alive or dead, including and extending from the shoreline to a depth of 150 ft unless otherwise demarcated, except:
  - catch-and-release fishing of select species
    - tarpon (*Megalops atlanticus*)
    - bonefish (*Albula vulpes*)
    - permit (*Trachinotus falcatus*)
  - taking fry and sprat with a fry or cast net is permitted so long as (1) a cast net only is used while standing on the shore and (2) no more than 2.5 gallons per person per day of fry or sprats, inclusive of bycatch, are taken
  - licenced Lionfish cullers are permitted to kill and remove lionfish with approved methods
- No anchoring - use of fixed moorings only, except:
  - boats of 60 ft or less may anchor in sand, so long as no grappling hook is used, and neither the anchor nor the rope or chain will impact coral;
  - anchoring permitted in designated Port anchorage areas—contact Port Security VHF Channel 16;
  - anchoring prohibitions suspended during emergencies and by permission of Port Director.
  - Bloody Bay, Little Cayman - No tourist boat shall enter the protected area without authorisation of the National Conservation Council and at a time, or in circumstances, where such entry is not permitted by the conditions of such a permit.

ENVIRONMENTAL ZONE

- No taking of any marine life, alive or dead with no exceptions;
- No in-water activities;
- Speed limit of 5 m.p.h. or less;
- No anchoring or tying to mangroves.

WILDLIFE INTERACTION ZONE

- No taking of any marine life, alive or dead
- No removing any marine life from the water
- No selling fish food from a boat
- No anchoring in water shallower than three feet or so that the anchor or boat is within 20 feet of any reef structure
- No feeding any marine life with food of any kind or of an amount or in a manner other than permitted
- Fish feeding is prohibited anywhere in Cayman waters outside a Wildlife Interaction Zone unless specially permitted
- No wearing any footwear in water shallower than four feet (which does not prohibit wearing of flippers while snorkelling in water deeper than four feet)
- No tourist boat shall enter the zone without authorisation of the National Conservation Council and at a time, or in circumstances, where such entry is not permitted by the conditions of such authorisation.



LINE FISHING ZONE

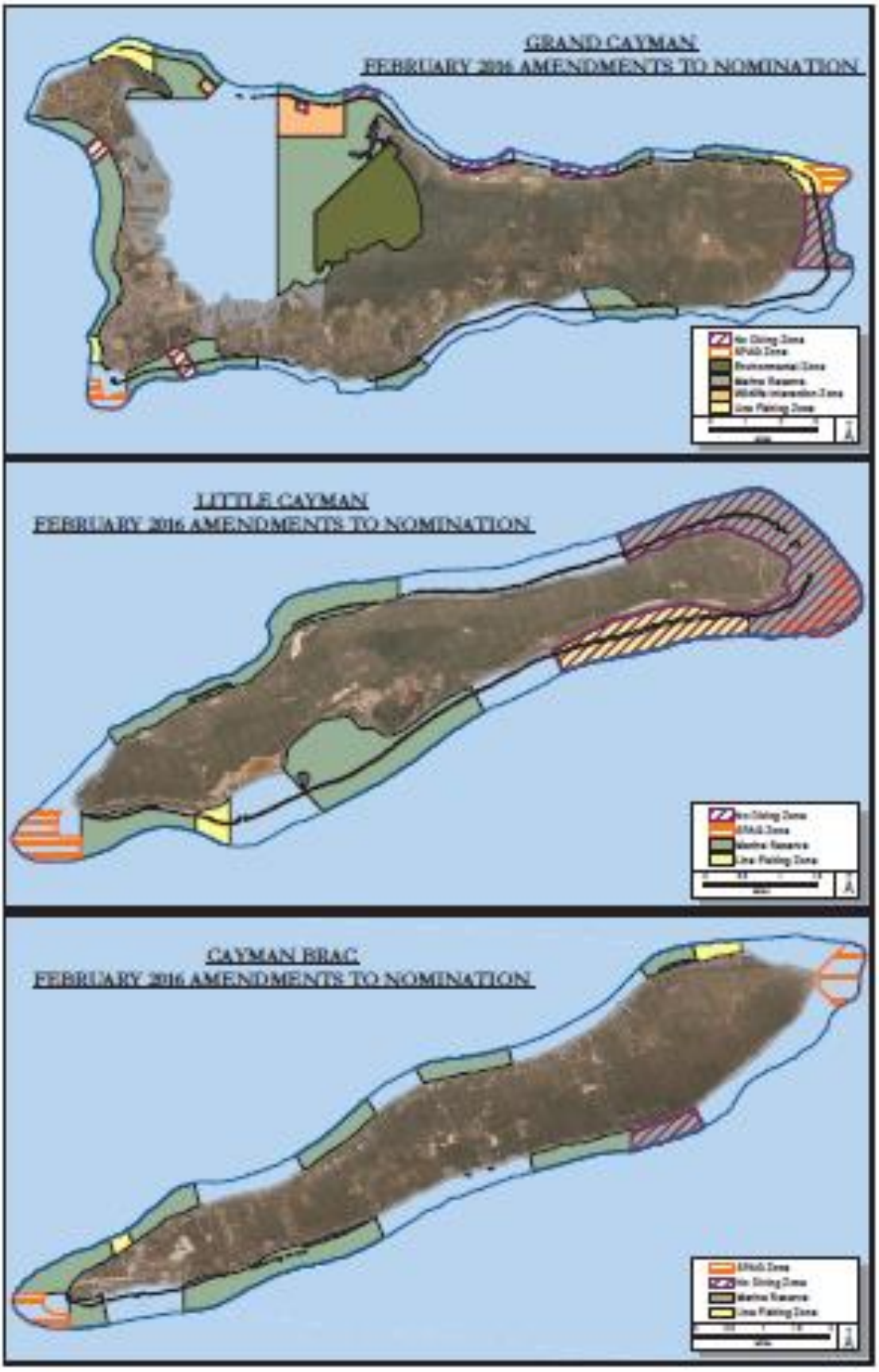
- No take of any marine life, alive or dead, from shore to 150 ft depth, except
  - Line fishing is permitted
  - taking fry and sprat with a fry or cast net is permitted so long as (1) a cast net only is used while standing on the shore and (2) no more than 2.5 gallons per person per day of fry or sprats, inclusive of bycatch, are taken
  - licenced Lionfish cullers are permitted to kill and remove lionfish with approved methods
- Anchoring permitted;
  - Anchor, chain or line must not touch coral.

NO DIVING ZONE

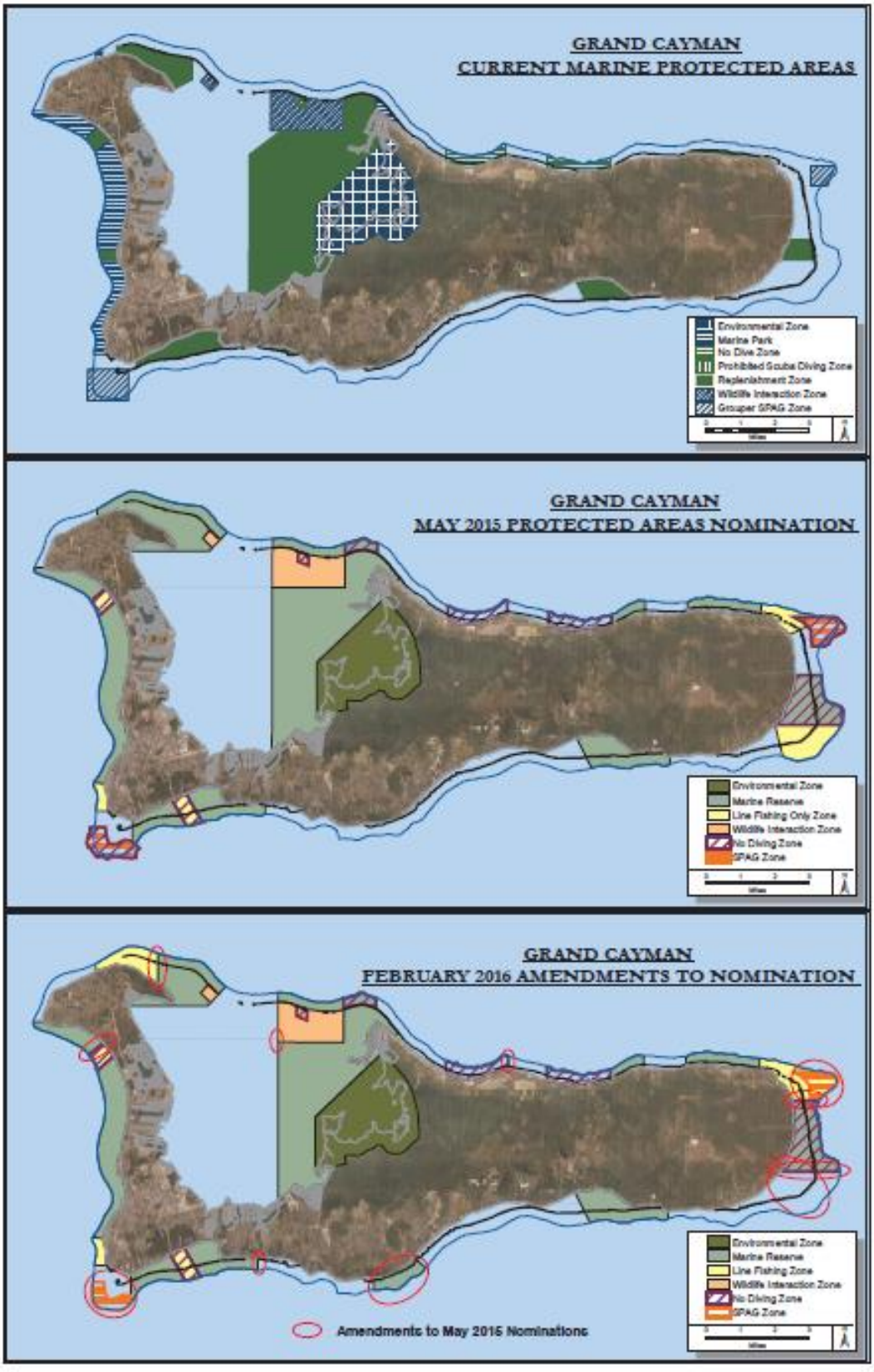
- No SCUBA diving without permission

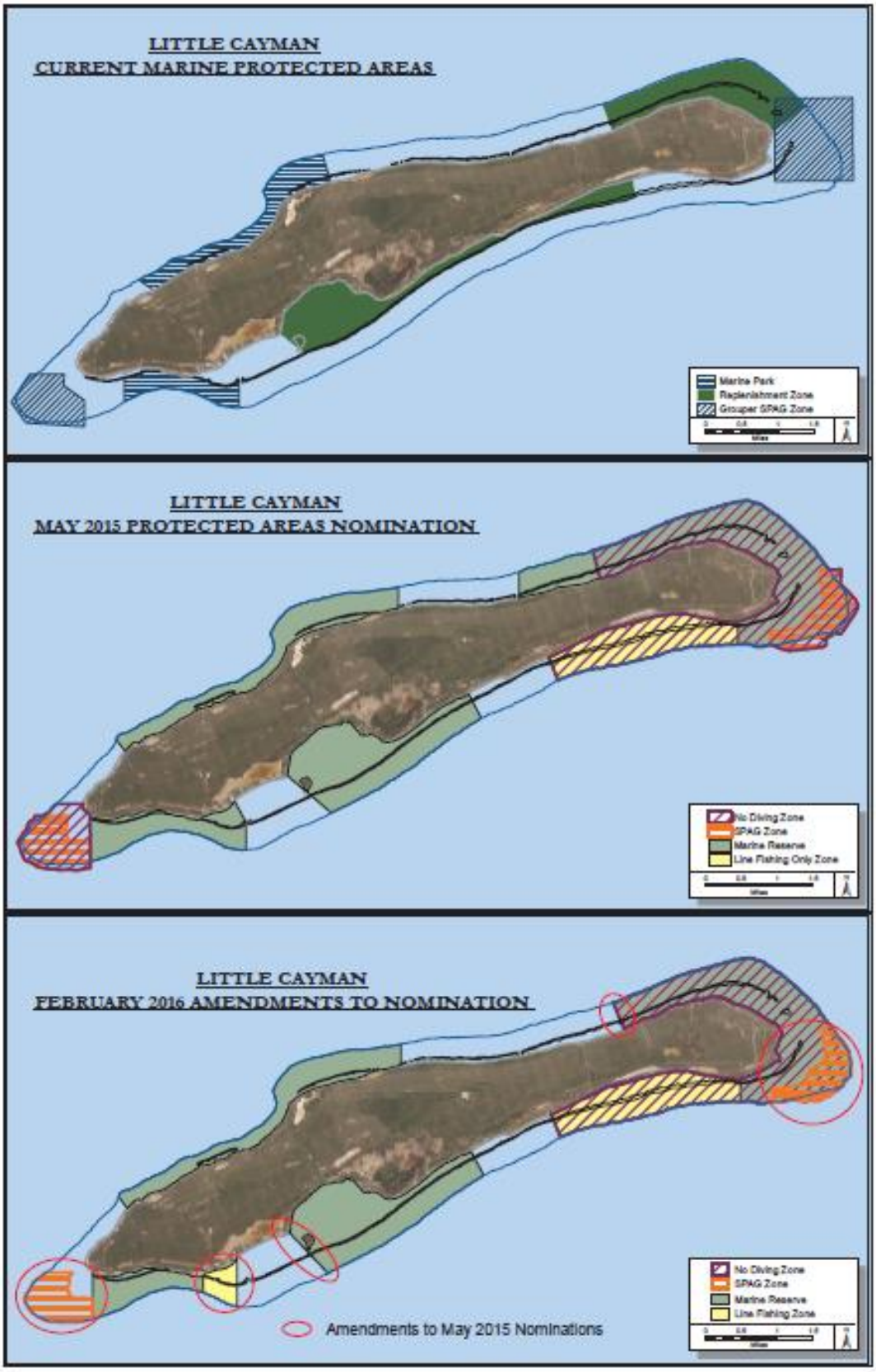
SPAG ZONE

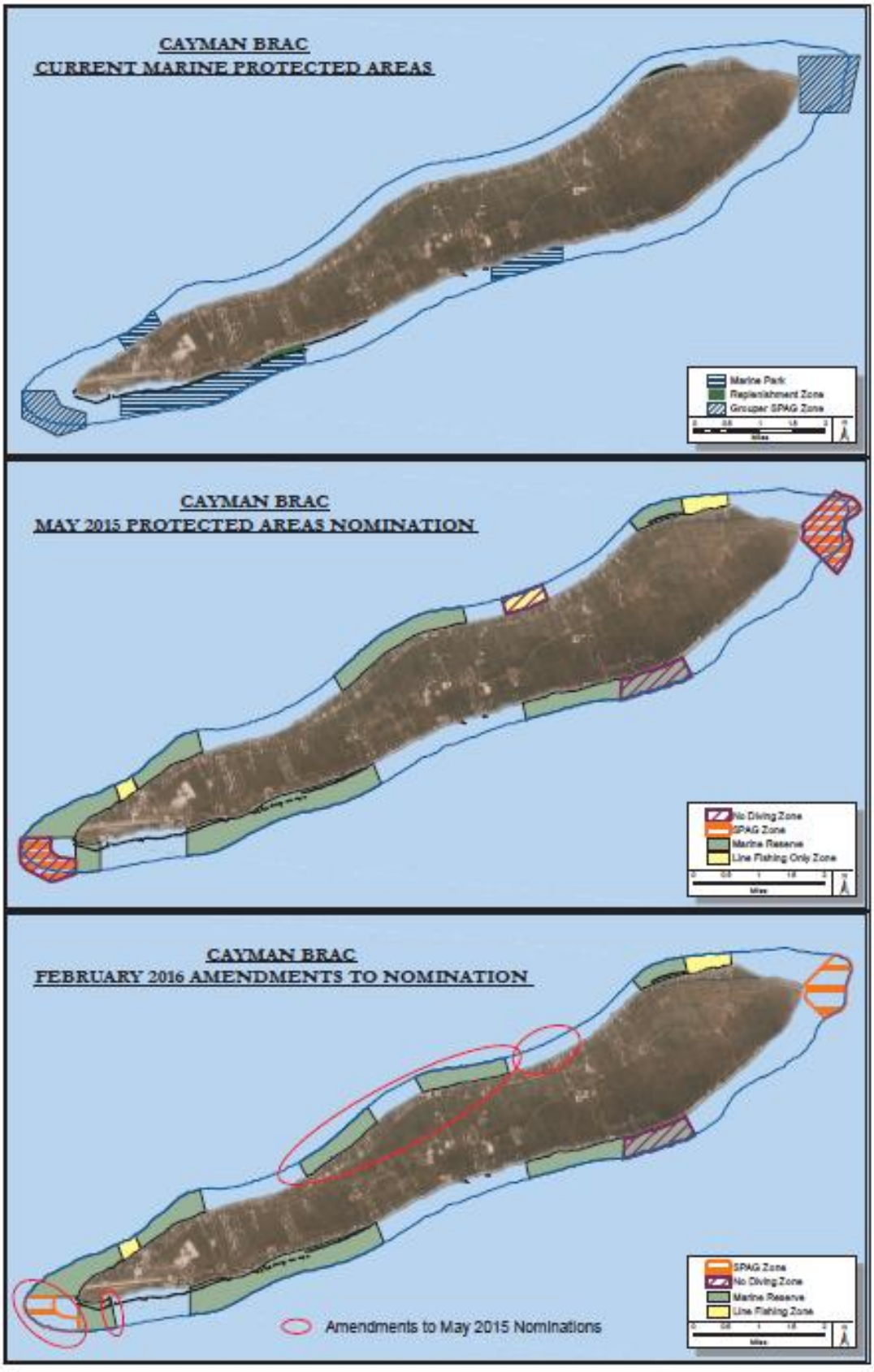
- No fishing, no diving, no anchoring, December through April inclusive, between the 50 ft and 200 ft depth contours inclusive.


GRAND CAYMAN
FEBRUARY 2016 AMENDMENTS TO NOMINATION
LITTLE CAYMAN
FEBRUARY 2016 AMENDMENTS TO NOMINATION
CAYMAN BRAC
FEBRUARY 2016 AMENDMENTS TO NOMINATION

Maps showing proposed changes




LITTLE CAYMAN
CURRENT MARINE PROTECTED AREAS
Marine Park
Replenishment Zone
Grouper SPAG Zone
LITTLE CAYMAN
MAY 2015 PROTECTED AREAS NOMINATION
No Diving Zone
SPAG Zone
Marine Reserve
Line Fishing Only Zone
LITTLE CAYMAN
FEBRUARY 2016 AMENDMENTS TO NOMINATION
No Diving Zone
SPAG Zone
Marine Reserve
Line Fishing Zone
Amendments to May 2015 Nominations


CAYMAN BRAC
CURRENT MARINE PROTECTED AREAS
Marine Park
Replenishment Zone
Grouper SPAG Zone
CAYMAN BRAC
MAY 2015 PROTECTED AREAS NOMINATION
No Diving Zone
SPAG Zone
Marine Reserve
Line Fishing Only Zone
CAYMAN BRAC
FEBRUARY 2016 AMENDMENTS TO NOMINATION
Amendments to May 2015 Nominations
SPAG Zone
No Diving Zone
Marine Reserve
Line Fishing Zone

Area of Shelf Nominated for Protected Area Status

CAYMAN BRAC	**Amended Nomination**		
	Area (acres)	**Percentage**	**2015**
Shore to Drop-Off	5,598.4		
SPAG Zones	441.1	7.9%	7.7%
No Diving Zones	203.8	3.6%	13.1%
Marine Reserves (**No Take**)	2,239.2	**40.0%**	**40.7%**
Line Fishing Only Zones	146.8	2.6%	4.4%
ALL ZONES WITH OVERLAPS	3,012.6	53.8%	52.8%

LITTLE CAYMAN	**Amended Nomination**		
	Area (acres)	**Percentage**	**2015**
Shore to Drop-Off	6,821.0		
SPAG Zones	557.0	8.2%	8.0%
No Diving Zones	2,336.4	34.3%	40.6%
Marine Reserves (**No Take**)	3,887.6	**57.0%**	**63.4%**
Line Fishing Only Zones	860.1	12.6%	10.6%
ALL ZONES WITH OVERLAPS	5,032.5	73.8%	79.8%

GRAND CAYMAN			
NO-TAKE ZONES	**Amended Nomination**		
	Area (acres)	**Percentage**	**2015**
Shore to Drop-Off	40,460.1		
Marine Reserves	14,092.4	34.8%	35.7%
Environmental Zone	2,501.4	6.2%	6.0%
WIZ Zones	1,296.0	3.2%	3.5%
ALL NO-TAKE ZONES	17,889.8	**44.2%**	**45.2%**

GRAND CAYMAN			
OTHER ZONES	**Amended Nomination**		
	Area (acres)	**Percentage**	**2015**
Shore to Drop-Off	40,460.1		
SPAG Zones	696.7	1.7%	1.7%
No Diving Zones	2,679.8	6.6%	7.8%
Line Fishing Only Zones	2,178.4	5.4%	4.8%
ALL 'OTHER' ZONES	5,554.9	13.7%	14.3%
GRAND CAYMAN ALL ZONES WITH OVERLAPS	21,104.6	53.3%	53.2%

"All zones with overlaps" are the entire shelf area under some form of management.