

Cayman Brac and Grand Cayman Parrot Population Status Assessment

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Caymans

A. l. caymanensis
A. l. hesterna

Bahamas

A. l. abacoensis
A. l. inaguaensis

Cuba



The Amazon complex
comprises 28 extant
recognized full species
with 9 endemic to the
West Indies.

(Drawing from Raffaele et al. 1998)

Cayman Brac Parrot

(Amazona leucocephala hesternae)



IUCN Status:
“Near Threatened”
Not assessed at
subspecies level

Distinct conservation
unit and constitutes
the smallest range of
Amazon subspecies

After 1944 Hurricane,
no longer breeding in
Little Cayman

Photo by Stuart Mailer, Cayman Islands National Trust

Grand Cayman Parrot

(Amazona leucocephala caymanensis)



IUCN Status:

“Near Threatened”

Not assessed at
subspecies level but as
Cuban Parrot

Photo by Stuart Mailer, Cayman Islands National Trust

Main Objectives

- Assess abundance rate of change over time, accounting and correcting for changes in detection probability
- Before and after hurricanes in Grand Cayman (Ivan, Sep 2004) and Cayman Brac (Paloma, Nov 2008)
- During a period of habitat loss and degradation

To monitor population dynamics and establish population-based conservation objectives and assess conservation status

Rate of Change

$$\hat{r}_t = \ln(\hat{N}_{t+1} / \hat{N}_t)$$

- How much did population abundance change between time t and $t + 1$?
- Stability: persistence at target level
- Resilience: return time to target level

Target Level

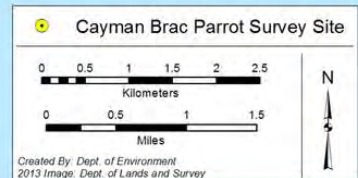
Population	Abundance (95% CI)
CBPA	$\hat{D} = 0.170 (0.142-0.227)$ $\hat{N} = 600 (500-800)$
GCPA	$\hat{D} = 0.386 (0.257-0.579)$ $\hat{N} = 6,000 (4,000-9,000)$

Baseline levels are established to determine if and when active management is needed

Survey Region: 3,527 ha

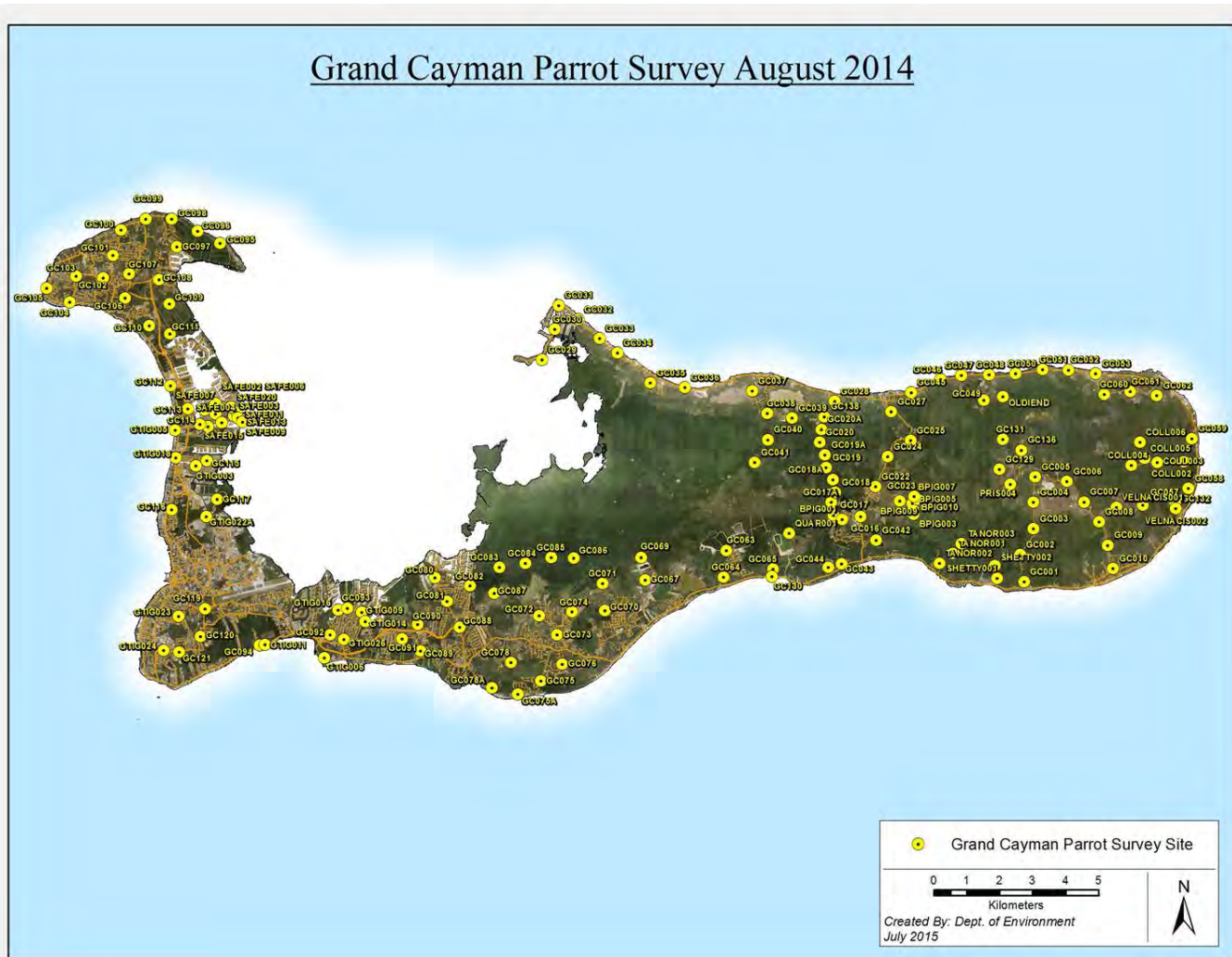
Survey Effort: 100 points

Cayman Brac Parrot Survey March 2015



Survey Region: 15,550 ha

Survey Effort: 165 points



Point-Count Survey Data

- Before (Feb–Mar) and After (Jul–Aug) reproduction
- Points at 400 m or 800 m
- 6-minute counts (detections per minute)
- 1–3 visits per point
- 2-observer teams
- Exact distances, or distance categories:
0-15, 16-30, 31-45, 46-60, 61-90, 91-120,
121-180, 181-240, 241-340, 341-440 m

Count Methods

Surveys were conducted in a way that allowed the combination of distance sampling with other count methods using hierarchical models

- Conventional distance sampling
- Multiple-covariate distance sampling
- Hierarchical distance sampling
- Repeated count (point visits)
- Removal count (time intervals)

Detection and Abundance Covariates

- Observer team
- Cluster size
- Detection distance
- Detection angle
- Detection time
- Detection form
- Point location
- Time of day
- Disturbance level
- Vegetation cover
- Land-cover category
- Food abundance
- Food diversity
- Habitat suitability

CBPA Abundance Estimates

Survey Date	\hat{N}	2.5%	97.5%
Jul 2008	565	409	782
Mar 2009	260	199	441
Jul 2009	291	188	451
Aug 2010	405	249	661
Aug 2012	573	389	790
Mar 2015	629	515	768
Jul 2015	772	603	989

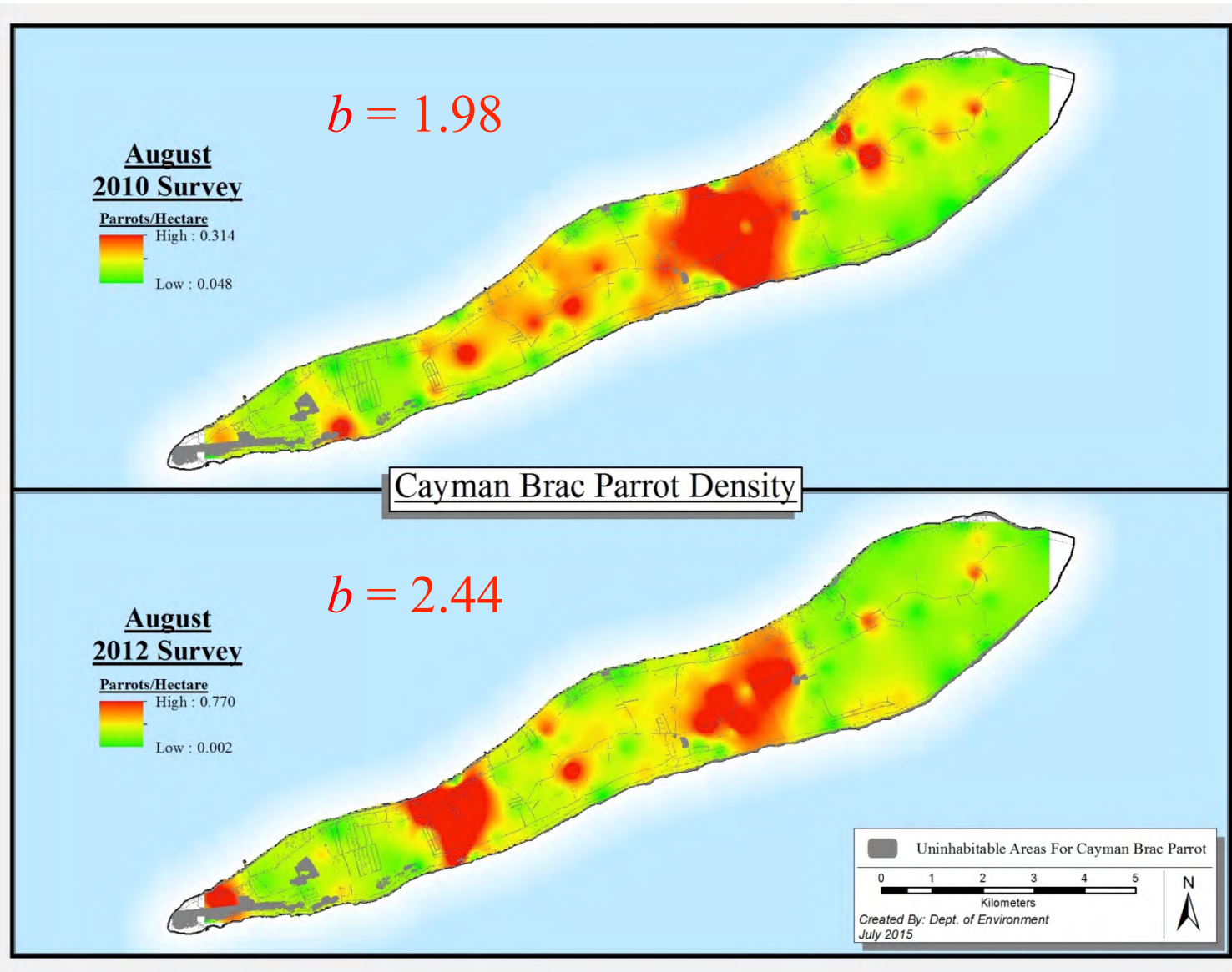
CBPA Abundance Rate of Change

Survey Date	\hat{N}
Jul 2008	565
Mar 2009	260
$\hat{r} = \ln(\hat{N}_{2009} / \hat{N}_{2008}) / t$	-0.776
$(\exp(\hat{r}_t) - 1) \times 100$	-54%

CBPA Abundance Rate of Change

Survey Date	\hat{N}
Mar 2009	260
Mar 2015	629
$\hat{r} = \ln(\hat{N}_{2015} / \hat{N}_{2009}) / t$	0.147
$(\exp(\hat{r}_t) - 1) \times 100$	16%

CBPA Point-Level Density



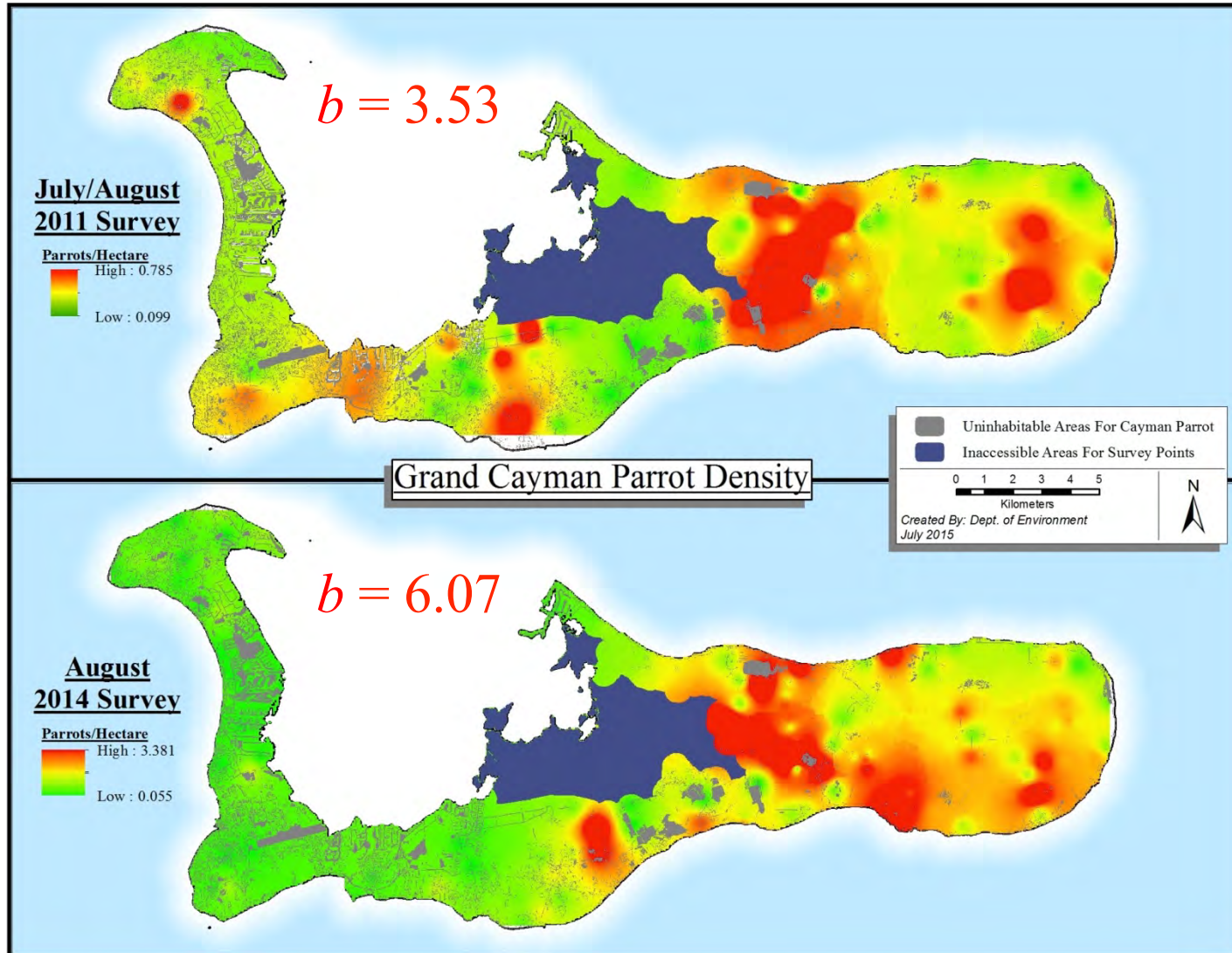
GCPA Abundance Estimates

Survey date	\hat{N}	2.5%	97.5%
Aug 2005	2,675	1,990	3,263
Mar 2006	2,962	2,009	4,367
Mar 2007	3,402	2,308	5,016
Jul 2011	4,308	2,879	6,190
Mar 2014	5,649	3,704	7,772
Aug 2014	6,395	4,340	8,987
Mar 2016	6,557	4,098	9,213

GCPA Abundance Rate of Change

Survey Date	\hat{N}
Aug 2005	2,675
Aug 2014	6,395
$\hat{r} = \ln(\hat{N}_{2014} / \hat{N}_{2005}) / t$	0.097
$(\exp(\hat{r}_t) - 1) \times 100$	10%

GCPA Point-Level Density



Recommendations

1. Conduct before-after reproduction surveys, and update density and habitat maps every other year for both subspecies
2. Identify management alternatives to mitigate the negative impacts of habitat loss and degradation, illegal hunting at farms, and poaching of nestlings
3. Integrate research and monitoring to inform decisions and evaluate management actions



THANK
YOU

