

Supporting Information

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The following reports and anecdotes provide information useful in evaluating the relative abundances of some mammals, namely raccoons and rabbits, in Everglades National Park (ENP) both before and after the proliferation of pythons in the 2000s.

Wildlife incident reports document interactions between wildlife and humans in ENP. Most commonly, incident reports involve raccoons. R.W.S., National Park Service Biologist, provides the following summary regarding frequency of incident reports involving raccoons: No raccoon case incident has been submitted from the Flamingo and Pine Island Ranger Districts (an area encompassing the entire Main Park Road corridor, adjacent roads, and developments) since January 2005. From 2000 to the present only nine raccoon-related case incidents have been submitted from these ranger districts. In January 2005 there is some mention of a “recent [raccoon] population explosion” in the Flamingo Campground and comments on “an increase in aggressive behavior in the raccoon population.” After this mention, the record is silent on raccoons through to the present.

Wildlife observation cards allow visitors to ENP to provide documentation of animal sightings. The following are quotations from some of the cards before python proliferation in the park.

20 August 1951 – “. . .counted 13 marsh rabbits seen alive on the Ingraham Hwy. in driving up to Homestead from Coot Bay Ranger Station.”

31 August 1952 – “Driving down the Ingraham Hwy [Main Park Road] between Paradise Key and Flamingo. . . We saw marsh rabbits run out on the road at least 10 times.”

4 October 1952 – “Between Krome Road and Coopertown on the Tamiami Trail I counted the remains of forty-four marsh rabbit and one opossum highway casualties. As long as there was fur identifiable by color as marsh rabbit, I counted it.”

Scott Pfaff, Curator of Herpetology, Riverbanks Zoo, Columbia, SC:

“Between the years 1973 and 2005 I drove the Main Park Road looking for snakes approximately 50 times and would typically see between 5 and 10 raccoons on each trip. On 16 October 1973, I observed approximately 50 raccoons and 12 bobcats on the way to Flamingo and 12 bobcats on the return trip to the main park gate.”

R.W.S. queried eight photographers/naturalists who have worked frequently in the park for many years regarding observations of marsh rabbits in ENP. They reported a combined total of 157 y of visiting ENP, with the minimum being 4 y and the maximum 42 y. Only two respondents reported visiting for less than 10 y (4 and 7 y, respectively). All are repeat and frequent visitors, including some who worked seasonally or as volunteers. On July 14, 2011, R.W.S. asked, “When was the last time you saw and/or photographed a marsh rabbit in Everglades National Park?” Responses are below:

“It has been quite a while, certainly five or six years. When I worked as a tour guide at Shark Valley ten years ago, they were a common sight at the observation tower. My wife [who works at Shark Valley] called me a few minutes ago after querying the tour guides and manager at Shark Valley. The

manager thinks he might have seen one about a year and a half ago. Everyone else said they had not seen one for at least two years, perhaps longer. I’ve been bicycling out there regularly, and I’ve seen more otters (3) than marsh hares (0) the last six months or so.”

“VERY interesting question!! I have been frequently coming to the park since the mid to early 70’s mostly fishing at Flamingo. I have also been involved in photography for close to 5 years in the park, and why I say very interesting is that I have noticed that, while we use to frequently see them along the roadside years ago that, in the past 4 plus years I may have seen only one!!”

“Wow. . . it has been years. I’m guessing the last time I may have seen one was between 2005 and 2007. Photography wise, I got my first digital camera in 2005, and I don’t believe I have any digital shots of marsh rabbits in Everglades since 2005. I have been very concerned about not seeing any marsh rabbits in ENP for so long and figured it was due to the invasive pythons. Very sad. Within the past month or so, I have seen marsh rabbits further north on the Tamiami Trail, mostly in the area between SR 29 and the Big Cypress Bend Boardwalk Trail on the south side of the road. I have seen them feeding in the grass next to 41. Have also been seeing them on Janes Scenic Drive leading into the Fakahatchee Strand. Hope this info is helpful. If you are ever going to look for marsh rabbits in ENP, I would love to tag along and photographically document your search/capture efforts and write an article for nature mags of their decline within the park.”

“I can’t recall the last time I saw a marsh rabbit in ENP, but it’s been over ten years, maybe more. Back in the day (1970s-80s) I remember seeing many dozens on the drive to Flamingo, and when I was traveling in the predawn hours I’d see one to several bobcats too, especially in that last stretch 2 or 3 miles before Flamingo. They were always there, presumably hunting the marsh rabbits. There were melanistic marsh rabbits too.”

“I haven’t seen or photographed a marsh rabbit since Wilma hit [2005]. I have been looking but have not seen any. I wish I had better news for you.”

“It has been years since I saw one, never even photographed. Did the pythons eat them all?”

“Wish I had a photo of a Marsh Rabbit, but am afraid I deleted all mine as I felt they were not that good. The word around Shark Valley is that one has not been seen for about two years, one person said a year and a half, but everyone else said at least two years. I have not seen one since I started working there a year ago. Hope that helps.”

“Years ago when I biked in Shark Valley I used to see many Marsh Rabbits on the road, also many at the tower. Since I had been working there almost 6 years ago I have never seen a Marsh Rabbit. Once about 3 1/2 to 4 years ago I saw a raccoon, never seen an opossum.”

Table S1. Mammal observations during historical and recent road surveys in South Florida

Sightings (effort corrected sighting rates: observations/100 km)

Year	Location	Nights	Km	<i>Odocoileus virginianus</i> (white-tailed deer)	<i>Procyon lotor</i> (raccoon)	<i>Didelphis virginiana</i> (Virginia opossum)	Rabbits*	<i>Lynx rufus</i> (bobcat)	<i>Puma concolor</i> (Florida panther)	<i>Canis latrans</i> (coyote)	Foxes [†]	Squirrels [‡]	Small rodents [§]
ENP roadkill surveys													
1993	MPR	NR	NR	3	22	6	1	3	0	0	0	0	0
1994	MPR	NR	NR	4	48	21	1	2	0	0	2	1	1
1995	MPR	NR	NR	19	60	23	13	1	0	0	2	2	2
1996	MPR	NR	NR	14	30	12	2	1	0	0	0	2	0
1997	MPR	NR	NR	11	44	18	13	0	0	0	1	1	1
1998	MPR	NR	NR	4	23	14	3	1	0	0	0	1	0
1999	MPR	NR	NR	9	39	9	5	1	0	0	0	2	1
ENP systematic road surveys													
1996–1997	MPR	51	6,599	45 (0.68)	184 (2.79)	59 (0.89)	6 (0.09)	5 (0.08)	0	0	12 (0.18)	2 (0.03)	3 (0.05)
2003	MPR	12	2,104	0	0	0	0	0	0	0	0	0	0
2004	MPR	20	2,996	0	3 (0.10)	0	0	0	0	0	0	0	1 (0.03)
2005	MPR	13	2,204	0	2 (0.09)	0	0	0	0	0	0	0	0
2006	MPR	18	3,068	3 (0.10)	1 (0.03)	0	0	0	0	0	0	0	2 (0.07)
2007	MPR	7	1,564	0	0	0	0	0	0	0	0	0	0
2008	MPR	41	6,993	0	0	0	0	0	1 (0.01)	1 (0.01)	0	0	1 (0.01)
2009	MPR	78	14,090	11 (0.08)	0	2 (0.01)	0	2 (0.01)	2 (0.01)	0	0	0	6 (0.04)
2010	MPR	112	21,367	10 (0.05)	0	3 (0.01)	0	2 (0.01)	1 (<0.01)	0	0	1 (<0.01)	39 (0.18)
2011	MPR	12	2,586	0	3 (0.12)	0	0	0	0	1 (0.04)	0	1 (0.04)	1 (0.04)
Peripheral locations													
2006,	Chekika	6	560	0	0	2 (0.36)	0	0	0	0	0	0	0
2009,2010													
2010, 2011	BCNP	8	1,632	1 (0.06)	5 (0.31)	9 (0.55)	0	1 (0.06)	0	0	0	1 (0.06)	2 (0.12)
2010	Key Largo	5	959	0	4 (0.42)	3 (0.31)	0	0	0	0	0	0	2 (0.21)
2010, 2011	CSSP	7	1,643	0	9 (0.55)	13 (0.79)	4 (0.24)	0	0	3 (0.18)	2 (0.12)	0	0
Extralimital Locations													
2011	Immokalee	1	278	0	5 (1.80)	3 (1.08)	0	0	0	0	0	0	0
2009	CWMA	9	539	1 (0.19)	21 (3.90)	12 (2.23)	0	0	0	0	1 (0.19)	0	2 (0.37)
Totals													
ENP roadkill (1993–1999)		NR	NR	64	266	103	38	9	0	0	5	9	5
ENP (1996–1997)		51	6,599	45 (0.68)	184 (2.79)	59 (0.89)	6 (0.09)	5 (0.08)	0 (0)	0 (0)	12 (0.18)	2 (0.03)	3 (0.05)
ENP (2003–2011)		313	56,971	24 (0.04)	9 (0.02)	5 (0.01)	0 (0)	4 (0.01)	4 (0.01)	2 (<0.01)	0 (0)	2 (<0.01)	50 (0.09)
Peripheral (mean of four sites)		26 [¶]	4,794 [¶]	0.3 (0.02)	4.5 (0.32)	6.8 (0.50)	1 (0.06)	0.3 (0.02)	0 (0)	0.8 (0.05)	0.5 (0.03)	0.3 (0.02)	1 (0.08)
Extralimital (mean of two sites)		10 [¶]	817 [¶]	0.5 (0.09)	13 (2.85)	7.5 (1.65)	0 (0)	0 (0)	0 (0)	0 (0)	0.5 (0.09)	0 (0)	1 (0.19)

Data sources include historical road kill surveys (1993–1999) conducted by National Park Service personnel in Everglades National Park (effort not recorded); mammal observations (live and dead) from historical (1996–1997) and recent (2003–2011) systematic road surveys within Everglades National Park; and mammal observations (live and dead) from recent surveys in four areas recently invaded by pythons (peripheral locations) and two locations where pythons are not yet thought to be established (extralimital locations). Data from CWMA are from Holbrook and Chernes (1). BCNP, Big Cypress National Preserve; CSSP, Collier-Seminole State Park; CWMA, Corbett Wildlife Management Area; ENP, Everglades National Park; MPR, Main Park Road in ENP; NR, data not recorded.

**Sylvilagus palustris* and *S. floridanus*, most observations were *S. palustris*.
[†]*Urocyon cinereoargenteus* and *Vulpes vulpes*. Most observations were *U. cinereoargenteus*.
[‡]Predominantly *Sciurus carolinensis*, with few observations of *Sciurus niger* and *Glaucomys volans*.
[§]Predominantly *Rattus* spp. and *Sigmodon hispidus*. Also includes some smaller rodents which were not identifiable to species.
[¶]Number of nights and survey distance are listed as totals for peripheral and extralimital locations.

1. Holbrook J, Chernes T (2011) An effect of Burmese pythons (*Python molurus bivittatus*) on mammal populations in southern Florida. *Fla Sci* 74:17–24.