

Biological Information

1. Results of the Key deer abundance indices, including the calculation of the average number of deer seen.

For January 1, 2015 to December 31, 2015

Average count for full year = 52

The Key deer road-count index value is the average count from multiple road count surveys throughout the year on Big Pine Key and No Name Key. It has also been referred to as the Key deer “census”, road count, and count index; these labels are often used interchangeably. The road counts are conducted on the USFWS Survey Route, monthly in most years. Recent changes to protocols require a complete road count surveys once every two months, or 6 times annually. The 2015 road-count index value was derived from 5 standardized count surveys (one each from February, April, May, July, September, and November). Total deer counted during this period were 262, with 68 (26%) identified as males, 155 (59%) as females, and the remaining 39 (15%) were unidentified. For the period January through December, 2015, the value (mean of those 5 counts) was 52. Summaries of the count index for 2015 and values from previous years for comparison can be found in Tables 1 and 2 of the report.

Year	Total Deer Recorded	Number of Surveys	Average Count
2010	571	10	57
2011	674	11	61
2012	590	10	59
2013	338	5	68
2014	401	6	67
2015	262	5	52

Table 1: Summary of Key Deer recorded during road surveys and averages for 2010-2015.

	2010	2011	2012	2013	2014	2015
January	60	57	43	75		
February	36	88			59	73
March	77	77				
April	78	61	55	77	58	74
May		68	69		93	
June	55		57	52	61	
July	41	55	56			49
August	54	72	69			
September	62	30	39			31
October	42	46	59			
November	66	46	76	67	62	35
December		74	67	67	68	

Table 2: Monthly totals for Key deer road surveys on Big Pine and No Name Keys. Maximum and minimum values for the period covered are in displayed in bold.

2. A summary of Key deer mortality information, including the calculation of the number of human-related deaths.

The other index of key deer abundance is the mortality index (deer deaths documented on Big Pine and No Name Keys [core]). In 2015, the total mortality count (all known mortalities from all causes) on Big Pine Key and No Name Key was 104. Mortalities caused by deer-vehicle collisions (DVCs) were 75, or 72% of total reported mortalities. Forty two (42) or 56% of DVCs occurred on US-1. Additional human involved (anthropogenic) deer mortalities such as poaching, drowning, entanglement, and domestic dog attacks account for 9 additional mortalities, raising the number to 84 (81%) of mortalities on Big Pine and No-Name Keys. The remaining 20 mortalities are attributed to various causes such as combat inflicted injuries, natural disease, or undetermined causes. Tables of total mortalities and causes from 2015 and previous years for comparison can be found in Tables 3 and 4 of this report.

Year	Cause of Mortality									Total
	Combat	Disease	Dog	Drowning	Entanglement	HumanCauseMisc	Poaching	DVC	Undet	
2010	1	7		7	3			103	20	141
2011	2	12	6	3	3	2		131	16	175
2012	4	17	2	3	5			151	15	197
2013		8		5	2			109	27	151
2014		3	3	5	1		1	121	13	147
2015	1	6	1	2	2		4	75*	13	104

Table 3: Detailed mortality information from 2010-2015. DVC is deer-vehicle collision or road mortality. *Variation in reported deer-vehicle collisions may be due to reporting error.

Year	Total	DVC	Anthropogenic	%DVC (of total)	%Anthropogenic (of total)
2010	141	103	113	73	80
2011	175	131	145	75	83
2012	197	151	161	77	82
2013	151	109	116	72	77
2014	147	121	131	82	89
2015	104*	75*	80*	72	77

Table 4: Percent of mortalities for 2010-2015 attributed to DVC (deer-vehicle collision or road mortality) and anthropogenic causes. Anthropogenic causes include DVC, entanglement, drowning, poaching, dog attack, and miscellaneous values. *Variation in reported deer-vehicle collisions may be due to reporting error.

3. *An assessment of the ratio of the number of anthropogenic (human-related) deaths to average deer seen*

In 2015, the ratio of human-related deaths (mortality index, 84) to average number of deer seen (count index, 52) was 1.6, which is greater than the upper boundary of the 95% confidence interval (1.53) defined in the HCP.

Year	Anthropogenic Deaths	Average Deer Seen	Ratio
2010	113	57	2.0
2011	145	61	2.4
2012	161	59	2.7
2013	116	68	1.7
2014	131	67	2.0
2015	84	52	1.6

Table 5: Ratio of anthropogenic (human-related) deaths to average deer seen during an annual census from 2010-2015.

4. *A discussion and interpretation of census and mortality data*

In 2015, the average number of deer seen during standardized road census was 52. This number is lower than the previous five years, and represents a 22% reduction in the average number of observed deer. While this appears as a significant reduction, it is not unprecedented in the census history. In 2001 and 2002, we observed respective census averages of 44 and 48. The number of total deer counted was similarly down 35%, from counts of 401 in 2014 to 262 in 2015. Speculatively, this variation in detections may due to a combination of low availability of fresh water during the unusually dry summer months of 2015, disease prevalence, and observer bias. Monthly totals in the last 5 years have ranged from 30 to 93, with no apparent correlation with seasonality.

In 2015, there were 104 mortalities of all causes recorded for Big Pine and No Name Keys. The total mortalities, DVC mortalities, and overall anthropogenic mortalities were substantially lower than previous years. This dramatic reduction in mortalities may not be representative of an actual reduction in Key deer mortalities, but rather a result of inconsistencies in reporting throughout 2015. Refuge staff was dramatically reduced by scheduled staff transitions during the beginning of 2015, and the introduction of replacement staff was gradual throughout the year. In addition, a cooperative agreement with both county and state law enforcement officials to augment and improve the response to calls regarding deer injury and mortality was being developed.

5. *A summary of reported Lower Keys marsh rabbit road mortality.*

There were no reported road mortalities of Lower Keys Marsh Rabbits within the HCP area. One mortality due to predation by a free-roaming cat was documented on Big Pine Key by trail camera on January 20, 2015. These observations indicate, as per the literature on Lower Keys marsh rabbits (Forys 1995, Forys and Humphrey 1999), that cats continue to represent a threat to marsh rabbit populations.

Literature Cited

- Forys, E.A. 1995. Metapopulations of marsh rabbits: a population viability analysis for the Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*). Ph.D. Dissertation, University of Florida, Gainesville, Florida.
- Forys, E.A., and S.R. Humphrey. 1999. Use of population viability analysis to evaluate management options for the endangered Lower Keys marsh rabbit. *Journal of Wildlife Management* 63:251-260.