

1636
CAHA**Sundar, Danielle**

From: Wetmore, Doug
Sent: Tuesday, April 21, 2009 11:10 AM
To: Sundar, Danielle
Cc: Fox, Lori
Subject: FW:
Follow Up Flag: Follow up
Flag Status: Blue
Attachments: Visitation Data.xls; CAHA Data Sources.doc

Danielle.

Please make sure these get in the Admin Record for CAHA. Thank you.

Doug Wetmore
Environmental Planner

Direct 303-985-6611
Mobile 303-905-6128
Fax 303-984-4942

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From: Van Dyke, Nancy
Sent: Monday, April 20, 2009 12:12 PM
To: Wetmore, Doug
Subject: FW:

Doug- I think that I did forward this to you- please make sure the attached docs are on the L drive and in the admin record. Thanks! Nancy

From: Loomis, Ross [<mailto:rloomis@rti.org>]
Sent: Tuesday, April 07, 2009 12:56 PM
To: Van Dyke, Nancy
Cc: Mansfield, Carol A.
Subject:

Nancy,

Here is a summary and discussion of the visitor data. Feel free to call or e-mail me if you have any questions.

Ross

Ross Loomis

4/22/2009

Research Associate, Economics
Technology, Energy and the Environment
RTI International
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Data Sources

Number of visitors

The park estimates monthly counts of recreation visits. This number is estimated from a combination of: a) the traffic count from an inductive loop traffic counter located at the park entrance; b) the number of registered hunters; c) the number of aircraft; d) number of vehicles arriving on Ocracoke Island by ferry; and e) the number of overnight boats.

Of these, the traffic count from the park entrance accounts for the largest share of the monthly estimate. In 2000, the last year in which the traffic counter had no days out, the traffic counter data accounted for between 92% and 97% of the monthly estimate. When the traffic counter is out, the park uses a daily traffic estimate in its stead. In 2008, this traffic counter was out all of January through May. Using these daily traffic estimates yield monthly totals between 2,000 and 56,000 lower than the counts seen in 2007.

Distribution of Visitation across Year

Based on monthly recreational visitor statistics from 2004-2008, 45% of all visits to Cape Hatteras take place from June through August, with 65% taking place May through September.

Housing Rental Data

Weekly visitor-occupied housing rental data for 2007-2008 was collected from rental agencies with rental homes in the villages of Cape Hatteras. This data shows a similar seasonal pattern to the official visitation data, however with even more weight on the summer months. An estimated 55% of the rentals take place from June through August and 80% taking place May through September.

This data ignores local users, day-trip visitors, and overnight visitors not staying in rental homes.

Fish License Sales

The North Carolina Wildlife Resources Commission (NC WRC) collects data on coastal recreational fish license sales by week and county of sale. This data shows that approximately 47% of license sales take place from June through August and 71% take place May through September. Some of these sales, however, are for annual or lifetime licenses, and

Number of ORVs

From 2007-2008, the park installed infrared (IR) counters at ORV ramps to determine the number of ORVs using CAHA as well as their distribution within the park. In addition to counting ORVs, the counters count anything that breaks the IR beam, including pedestrians, rain, and uncut plants. The counters also fail to register some counts, and they must be properly aligned to count.

In a pretest of the physical counting that will take place this year, actual counts of ORVs were compared to the ramp counter over a 1-2 hour period. The ramp counters overestimated the number of ORVs by 24% to 157%. In another physical count of ramp use at two pedestrian friendly ramps, Ramps 23 and 27, pedestrians accounted for 30% and 62.5% of the counts respectively. For these reasons, the data from the ramp counters are deemed to be not reliable to construct estimates of ORV use in CAHA.

On Memorial Day and July 4th, the park counts the number of ORVs on the beach by an aerial survey. This count is a snapshot of the ORVs on the beach, and is thus an underestimate of the total number of ORVs that are on the beach for the entire day.

To create a range of estimates for the total number of ORVs in a year, we first assume that the aerial holiday counts represent ORV use for a weekend day at that time of year. As mentioned above, the aerial holiday count is an underestimate of total ORV use on that day, but it is likely that Memorial Day and July 4th have higher ORV use than the average weekend day at that time of year. Based on personal communications and the ramp counter data, we assume that weekdays experience half the ORV traffic as a weekend day. We then assume that ORV use follows a similar distribution across the year as the rental housing data we have. This rental housing data is used to adjust the holiday ORV count to every other week in the year.

For instance, the average number of ORVs counted on July 4th is 2,033.7, assumed to be a representative weekend day at this time of year. To get the weekly total for this time of year, we use the following equation.

$$2*(\text{Aerial Count}) + 5*(\text{Aerial Count}/2) = 9,147$$

During this week, an estimated 94.26% of rental homes were renter occupied. The rental occupancy of each week is used to adjust this weekly total by the following equation.

$$9,147*(\% \text{ Renter Occupied}/\% \text{ Renter Occupied July 4}^{\text{th}})$$

Which equals 163 the first week in January, and 9,704 the second week in August. We then add all weekly estimates for the year to arrive at the total annual estimate. For each holiday's aerial count, we use the average (mean), minimum, and maximum value to arrive at an annual estimate, giving a range of 6 estimates from 110,000 to 395,000.

Distribution of ORVs within CAHA

The best data for how ORVs are distributed across Cape Hatteras come from the aerial counts, which provide counts for ORVs by the following locations:

- Ramp 4 – Includes Bodie Island Spit
- Ramp 23 to Ramp 27 – Approximately 4 mile area directly south of Salvo.
- Ramp 27 to Ramp 38 – Approximately 11 mile area including Avon.
- Ramp 43 to Ramp 49 – Includes Cape Point
- Ramp 55 – Includes Hatteras Spit

- Ocracoke – All of Ocracoke Island

The following pie charts show the distribution of ORVs across these areas on Memorial Day and July 4th in 2008. Over half of the ORVs in CAHA are located around Cape Point and the Bodie Island Spit.

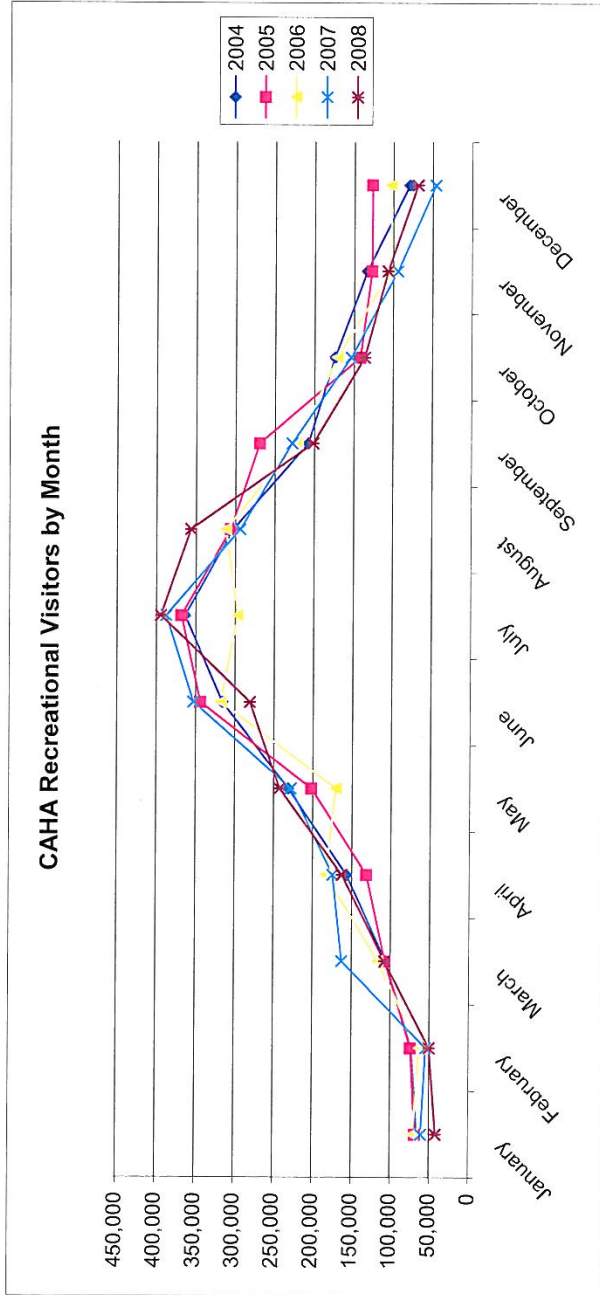
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Month	2004	2005	2006	2007	2008	Sum across % of Annual Total	Sum across Month	% of Maximum Month
January	65,934	67,552	70,523	60,662	41,423	306,094	306,094	16.91%
February	72,915	73,656	62,074	54,758	50,004	313,407	313,407	17.32%
March	106,007	106,562	115,742	162,967	107,383	598,661	598,661	33.08%
April	156,937	131,047	183,169	174,544	162,441	808,138	808,138	44.66%
May	231,086	201,363	170,394	228,045	242,423	1,073,311	1,073,311	59.31%
June	315,713	343,629	317,641	353,033	280,486	1,610,502	1,610,502	88.99%
July	363,617	367,888	296,407	387,676	394,111	1,809,699	1,809,699	100.00%
August	302,422	305,384	311,857	293,685	356,251	1,569,599	1,569,599	86.73%
September	207,274	268,768	221,469	227,894	201,077	1,126,482	1,126,482	62.25%
October	173,808	141,545	170,790	153,610	136,023	775,776	775,776	42.87%
November	133,253	126,846	102,818	94,268	106,329	563,514	563,514	31.14%
December	79,223	126,388	102,121	46,236	68,441	422,409	422,409	23.34%
Annual Total	2,208,189	2,260,628	2,125,005	2,237,378	2,146,392	10,977,592	Max Month 1,809,699	

CAHA Recreational Visitors by Month



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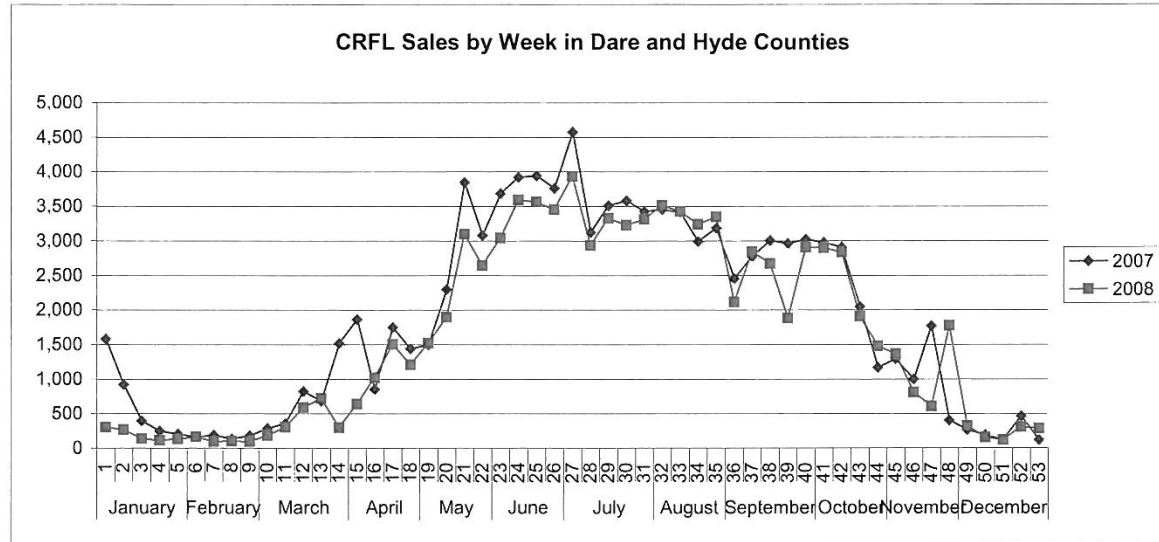
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CA #A

Location of Residence				
2008	North Carolina	Other states	Out of US	Week Total
Week	Nurr	Number	Percent	Number
1	165	132	0	297
2	160	107	0	267
3	71	64	0	135
4	53	57	0	110
5	77	52	0	129
6	96	64	1	161
7	42	51	0	93
8	55	42	1	98
9	50	41	0	91
10	72	106	2	180

Location of Residence				
2007	North Carolina	Other states	Out of US	Week Total
Week	Nurr	Number	Percent	Number
1	1179	396	1	1576
2	565	353	0	918
3	256	134	1	391
4	175	71	0	246
5	122	79	0	201
6	93	64	0	157
7	110	77	0	187
8	80	50	0	130
9	88	87	0	175
10	145	134	4	283
		192	3	353
		487	2	818
		421	1	677
		998	3	1511
		1377	6	1857
		579	11	847
		1209	13	1744
		908	5	1435
		1069	11	1491
		1719	15	2290
		2861	17	3841
		2200	9	3075
		2996	5	3683
		3053	4	3916
		3117	2	3937
		3063	14	3759
		3644	21	4569
		2586	19	3116
		3006	27	3504
		3023	16	3577
		2962	14	3421
		3030	8	3451
		2985	19	3408
		2691	9	2985
		2745	22	3179
		1988	3	2446
		2346	13	2768
		2540	17	2999
		2450	9	2956
		2461	8	3018
		2257	12	2972
		2178	6	2902
		1466	18	2041
		785	6	1161
		903	6	1286
		698	2	994
		1364	6	1763
		296	0	399
		171	0	263
		112	2	184
		66	0	117
		318	1	461
		84	0	113

2007 2008

Week	2007	2008
January 1	1,576	297
2	918	267
3	391	135
4	246	110
5	201	129
6	157	161
7	187	93
8	130	98
9	175	91
10	283	180
11	353	297
12	818	585
13	677	716
14	1,511	293
15	1,857	636
16	847	1,016
17	1,744	1,498
18	1,435	1,204
19	1,491	1,518
20	2,290	1,892
21	3,841	3,097
22	3,075	2,640
23	3,683	3,039
24	3,916	3,590
25	3,937	3,560
26	3,759	3,448
27	4,569	3,930
28	3,116	2,929
29	3,504	3,323
30	3,577	3,224
31	3,421	3,305
32	3,451	3,507
33	3,408	3,421
34	2,985	3,236
35	3,179	3,339
36	2,446	2,112
37	2,768	2,840
38	2,999	2,665
39	2,956	1,875
40	3,018	2,901
41	2,972	2,895
42	2,902	2,831
43	2,041	1,902
44	1,161	1,474
45	1,286	1,360
46	994	806
47	1,763	604
48	399	1,770
49	263	321
50	184	150
51	117	120
52	461	305
53	113	281
	4569	3930
	104120	88016
	46401	43152
	69806	63694
	0.445649	0.490274
	0.670438	0.723664
		192136
		89553
		133500
		0.466092
		0.69482



34	305	2850	25	3256	34	265
35	447	2861	31	3339	35	412
36	381	1720	11	2112	36	455
37	382	2443	15	2840	37	409
38	415	2244	6	2665	38	442
39	302	1567	6	1875	39	497
40	613	2279	9	2901	40	549
41	651	2223	21	2895	41	703
42	651	2174	6	2831	42	718
43	524	1370	8	1902	43	557
44	478	987	9	1474	44	370
45	413	940	7	1360	45	377
46	287	513	6	806	46	294
47	183	419	2	604	47	393
48	418	1352	0	1770	48	103
49	91	229	1	321	49	92
50	61	89	0	150	50	70
51	60	59	1	120	51	51
52	107	197	1	305	52	142
53	70	206	5	281	53	29

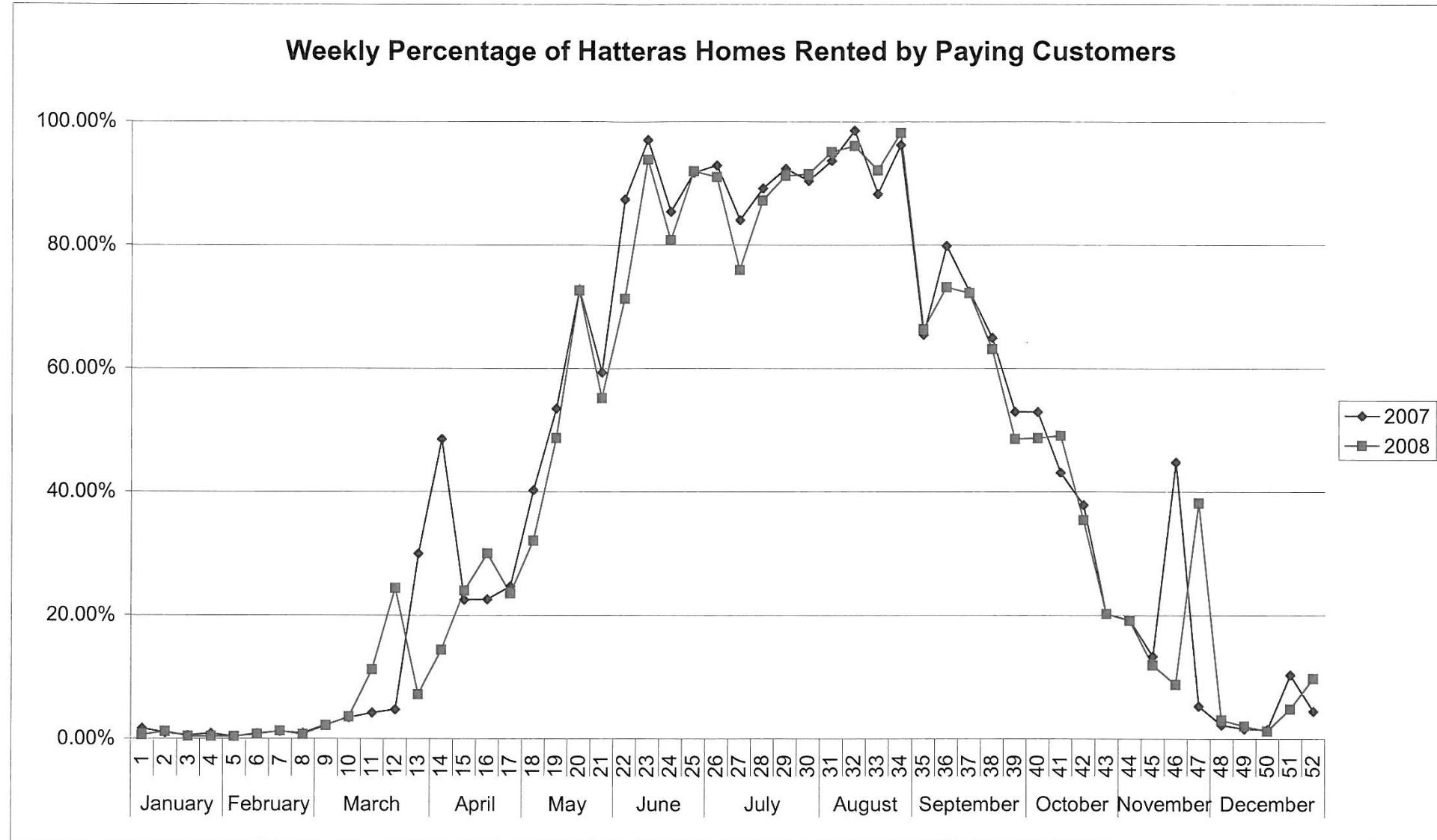
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 4879 6776
 -0.21868 -0.08817 0.306905 -0.11587

0.198055 0.214282

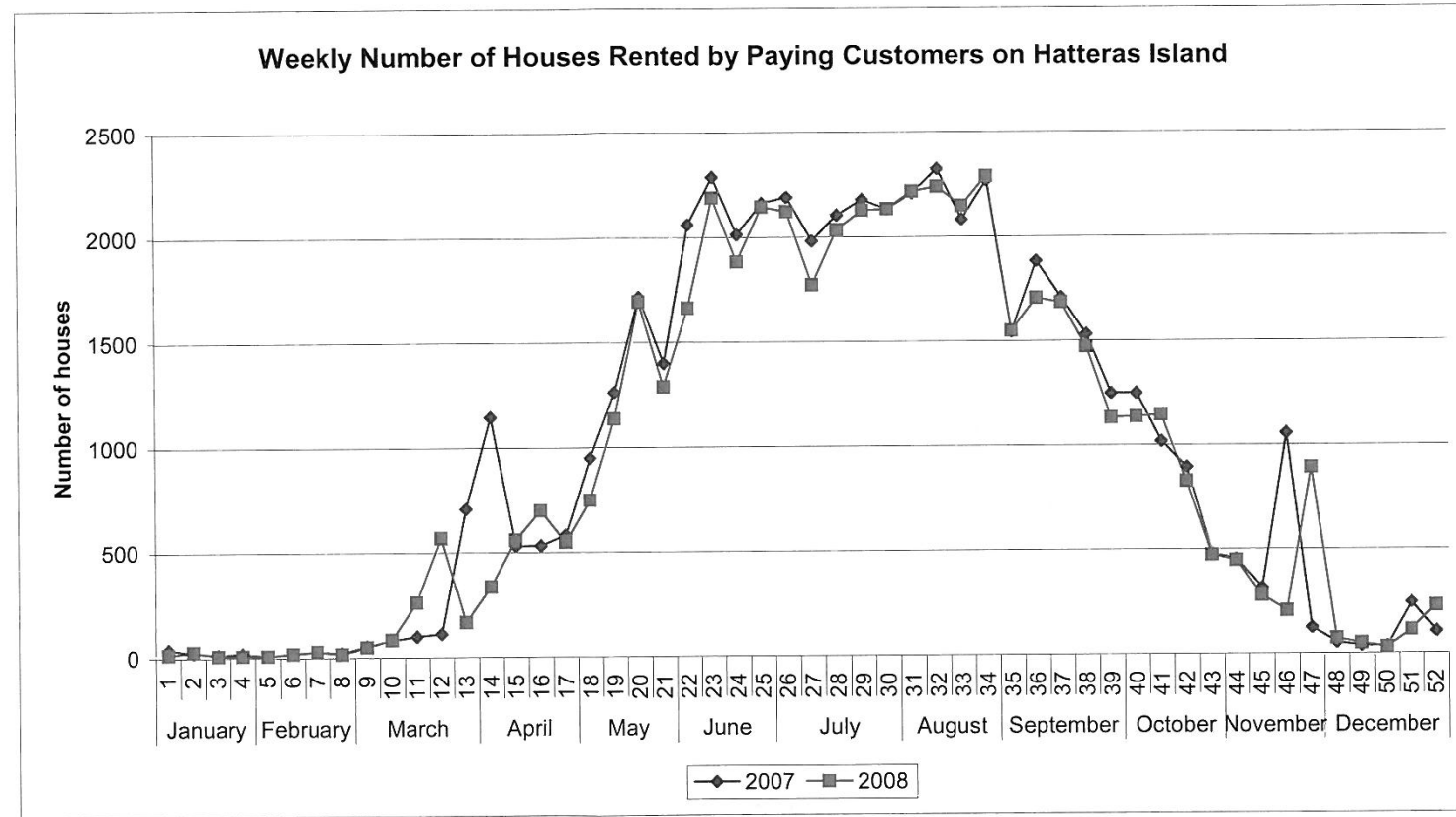
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Based on Max

	2007	2008	
	1	1.65%	0.61%
	2	0.94%	1.17%
	3	0.57%	0.38%
January	4	0.83%	0.38%
February	5	0.34%	0.38%
	6	0.87%	0.74%
	7	1.21%	1.27%
	8	0.93%	0.69%
March	9	2.29%	2.15%
	10	3.44%	3.57%
	11	4.21%	11.22%
	12	4.73%	24.36%
April	13	29.98%	7.16%
	14	48.52%	14.37%
	15	22.47%	23.97%
	16	22.55%	29.99%
May	17	24.67%	23.50%
	18	40.22%	32.05%
	19	53.46%	48.69%
	20	72.77%	72.61%
June	21	59.35%	55.19%
	22	87.41%	71.31%
	23	97.04%	93.87%
	24	85.35%	80.75%
July	25	91.69%	91.94%
	26	92.90%	90.99%
	27	84.01%	75.94%
	28	89.20%	87.22%
	29	92.35%	91.20%
August	30	90.37%	91.50%
	31	93.63%	95.07%
	32	98.56%	96.05%
	33	88.25%	92.07%
September	34	96.21%	98.15%
	35	65.44%	66.36%
	36	79.84%	73.15%
	37	72.42%	72.17%
October	38	64.94%	63.09%
	39	52.95%	48.52%
	40	52.90%	48.67%
	41	43.10%	49.05%
	42	37.85%	35.40%
November	43	20.27%	20.22%
	44	19.20%	19.11%
	45	13.33%	11.91%
	46	44.74%	8.77%
December	47	5.26%	38.16%
	48	2.22%	3.05%
	49	1.58%	2.05%
	50	1.48%	1.24%
	51	10.32%	4.79%
	52	4.44%	9.75%



	2007	2008
	1	39
	2	22
	3	13
January	4	20
February	5	8
	6	20
	7	29
	8	22
March	9	54
	10	81
	11	99
	12	111
	13	706
April	14	1144
	15	530
	16	531
	17	581
May	18	948
	19	1260
	20	1715
	21	1399
June	22	2060
	23	2287
	24	2012
	25	2161
July	26	2190
	27	1980
	28	2102
	29	2177
	30	2130
August	31	2207
	32	2323
	33	2080
	34	2268
September	35	1542
	36	1882
	37	1707
	38	1531
	39	1248
October	40	1247
	41	1016
	42	892
	43	478
November	44	453
	45	314
	46	1055
	47	124
December	48	52
	49	37
	50	35
	51	243
	52	112



52	105	227	
	51269	48606	99875
	27976	26938	54913
	41207	39330	80537
	0.545664	0.554204	0.54982
	0.803739	0.809157	0.806376

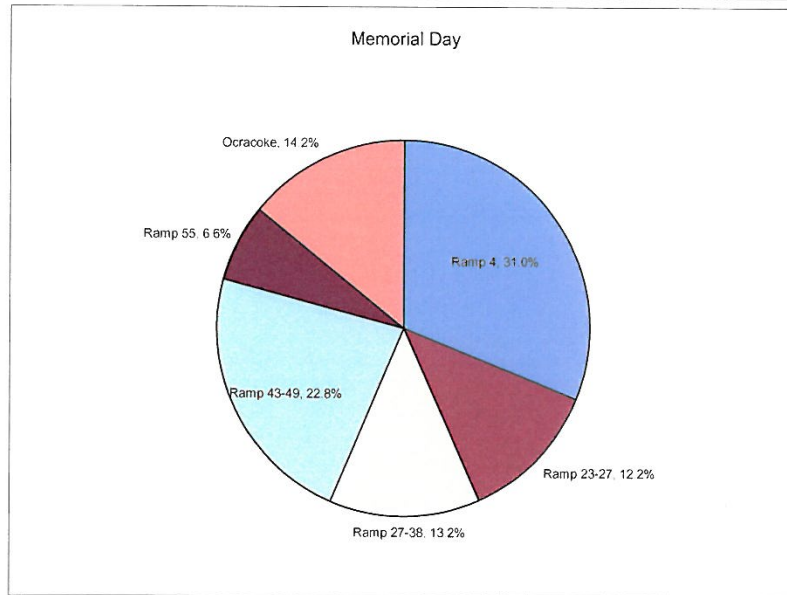
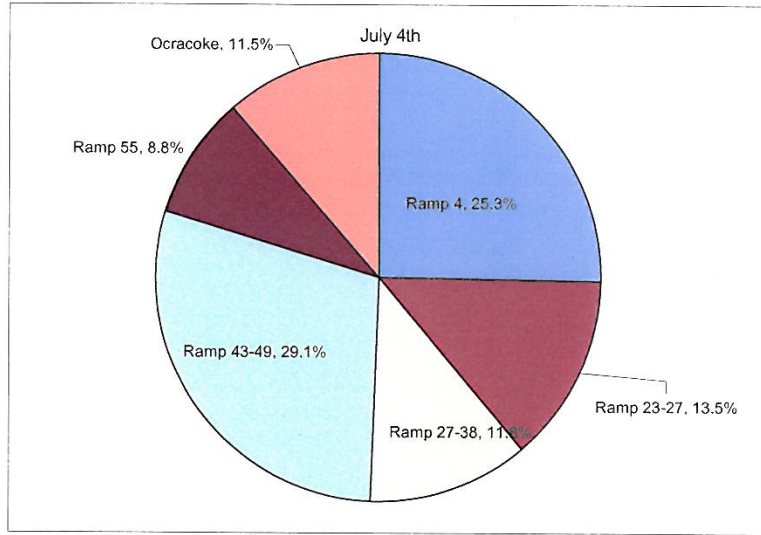
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CAWA

2008	
Ramp	July 4th
Ramp 4	25.3%
Ramp 23-2	13.5%
Ramp 27-2	11.8%
Ramp 43-4	29.1%
Ramp 55	8.8%
Ocracoke	11.5%

Ramp	Memorial Day
Ramp 4	31.0%
Ramp 23-2	12.2%
Ramp 27-2	13.2%
Ramp 43-4	22.8%
Ramp 55	6.6%
Ocracoke	14.2%



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C.A.B.

Ramp	Location	Counter?	Spits/Points	Village (first access in the direction)	Loomis Count	Count Date	Parking lot?	Easy to walk to beach		Lots of pedestrian use?	Lots of ORV use IF OPEN?
								on ramp if no boardwalk?	boardwalk?		
	2 Bodie Is	NO	NO	NO			YES	YES	YES	YES	YES
	4 Bodie Is	YES	YES	NO	856	Saturday, July 12, 2008	CARS PARK ALONG RAMP	NO	NO	NO	YES
	23 Hatteras Is	YES	NO	YES	694	Saturday, July 12, 2008	YES	YES	YES	YES	YES
	27 Hatteras Is	YES	NO	NO	315	Saturday, July 12, 2008	YES	YES	NO	NO	NO
	30 Hatteras Is	YES	NO	NO	499	Saturday, July 12, 2008	YES	YES	NO	NO	NO
	34 Hatteras Is	YES	NO	YES	291	Saturday, August 30, 2008	YES	YES	NO	NO	NO
	38 Hatteras Is	YES	NO	YES	212	Saturday, July 12, 2008	YES	YES	YES	NO	NO
	43 Hatteras Is	YES	YES	YES	413	Sunday, June 29, 2008	YES	YES	NO	NO	YES
	44 Hatteras Is	YES	YES	NO	377	Saturday, July 26, 2008	NO	NO	NO	NO	YES
	49 Hatteras Is	YES	NO	YES	416	Sunday, August 03, 2008	YES	NO	NO	NO	YES
	55 Hatteras Is	YES	YES	YES	638	Saturday, July 26, 2008	YES	YES	NO	NO	YES
	59 Ocracoke	YES	YES	NO	261	Saturday, July 12, 2008	NO, BUT CLOSE	YES	NO	NO	YES
	67 Ocracoke	YES	NO	NO	182	Saturday, July 12, 2008	NO	NO	NO	NO	NO
	68 Ocracoke	YES	NO	NO			YES				
	70 Ocracoke	YES	NO	YES	4	Saturday, July 12, 2008	(INBETWEEN CAMPGROUND AND RAMP)	NO	NO	NO	YES
	72 Ocracoke	YES	YES	YES	92	Saturday, July 12, 2008	YES	YES	YES	YES	YES
					249	Saturday, July 12, 2008	NO	NO	NO	NO	YES
					Average	TOTAL					
					431.2	2156	Percent Greater				
					300.5555556	2705	43.47%				
					375.625	3005	5.43%				
					356.2857143	2494					
					856	856					
					428.3333333	3855					
					157.6	788					

0.368421053
30.00%
62.50%

0.631578947

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Aerial Counts		7/4/2008 2579	May-08 2069	Memorial Day				July 4th				Memorial Day				July 4th																						
				MAX		AVG		MIN		MAX		AVG		MIN		MAX		AVG		MIN																		
				18 Low	106.14	68.30	40.64	89.22	60.80	29.63	53.07	34.15	20.32	44.61	30.40	14.81	17 Mid	1544.98	994.20	591.60	1298.70	885.02	431.25	772.49	497.10	295.80	649.35	442.51	215.63	17 High	3508.97	2258.02	1343.63	2949.61	2010.06	979.46	1754.48	1129.01
7/4/2007		2426	May-07	2938	Weekend ORVs																Weekday ORVs																	
7/4/2006		1100	May-06	1125																																		
7/4/2005		2587	May-05	1690																																		
7/4/2004		1047	May-03	1631																																		
7/4/2003		3153																																				
AVERAGE		2148.7		1890.6																																		
Minimum		1047.0		1125.0																																		
Maximum		3153.0		2938.0																																		

Maximum Rentals	Weekend Cars			
	2323 MAX	AVG	MIN	
	% Memorial Day Rentals	73.8%	3979.3	2560.7
% July 4 Rentals	94.3%	3345.0	2279.5	1110.8

Week Start	Week End	Week #	Houses R _e	Holiday	% Rented	Memorial Day			July 4th			Memorial Day			July 4th			Memorial Day			July 4th			Total for the Week	MAX	AVG	MIN
						MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN				
						Weekend ORVs									Weekday ORVs												
Saturday, January 06, 2007	Friday, January 12, 2007	1	Low	39	1.68%	66.79	42.98	25.58	56.15	38.26	18.64	33.40	21.49	12.79	28.07	19.13	9.32	300.57	193.42	115.09	252.66	172.18	83.90				
Saturday, January 13, 2007	Friday, January 19, 2007	2	Low	22	0.95%	37.86	24.36	14.50	31.82	21.69	10.57	18.93	12.18	7.25	15.91	10.84	5.28	170.36	109.62	65.23	143.20	97.59	47.55				
Saturday, January 20, 2007	Friday, January 26, 2007	3	Low	13	0.58%	23.08	14.85	8.84	19.40	13.22	6.44	11.54	7.42	4.42	9.70	6.61	3.22	103.84	66.82	39.76	87.29	59.48	28.99				
Saturday, January 27, 2007	Friday, February 02, 2007	4	Low	20	0.84%	33.55	21.59	12.85	28.20	19.22	9.36	16.77	10.79	6.42	14.10	9.61	4.68	150.96	97.15	57.81	126.90	86.48	42.14				
Saturday, February 03, 2007	Friday, February 09, 2007	5	Low	8	0.35%	13.85	8.92	5.31	11.65	7.94	3.87	6.93	4.46	2.65	5.82	3.97	1.93	62.34	40.12	23.87	52.41	35.71	17.40				
Saturday, February 10, 2007	Friday, February 16, 2007	6	Low	20	0.88%	35.10	22.59	13.44	29.50	20.11	9.80	17.55	11.29	6.72	14.75	10.05	4.90	157.95	101.64	60.48	132.77	90.48	44.09				
Saturday, February 17, 2007	Friday, February 23, 2007	7	Low	29	1.23%	48.93	31.49	18.74	41.13	28.03	13.66	24.47	15.74	9.37	20.57	14.01	6.83	220.19	141.69	84.31	185.09	126.13	61.46				
Saturday, February 24, 2007	Friday, March 02, 2007	8	Low	22	0.94%	37.56	24.17	14.38	31.57	21.51	10.48	18.78	12.08	7.19	15.78	10.76	5.24	169.00	108.75	64.71	142.06	96.81	47.17				
Saturday, March 03, 2007	Friday, March 09, 2007	9	Low	54	2.33%	92.65	59.62	35.48	77.88	53.07	25.86	46.32	29.81	17.74	38.94	26.54	12.93	416.92	268.29	159.65	350.46	238.83	116.38				
Saturday, March 10, 2007	Friday, March 16, 2007	10	Low	81	3.49%	138.82	89.33	53.16	116.69	79.52	38.75	69.41	44.67	26.58	58.35	39.76	19.37	624.71	402.00	239.21	525.12	357.85	174.37				
Saturday, March 17, 2007	Friday, March 23, 2007	11	Low	99	4.27%	169.91	109.34	65.06	142.83	97.33	47.43	84.96	54.67	32.53	71.41	48.67	23.71	764.62	492.03	292.78	642.73	438.00	213.43				
Saturday, March 24, 2007	Friday, March 30, 2007	12	Low	111	4.80%	190.84	122.80	73.07	160.42	109.32	53.27	95.42	61.40	36.54	80.21	54.66	26.63	858.76	552.61	328.83	721.87	491.93	239.71				
Saturday, March 31, 2007	Friday, April 06, 2007	13	Mid	706	30.41%	1210.28	778.82	463.43	1017.35	693.29	337.83	605.14	389.41	231.72	508.68	346.65	168.91	5446.27	3504.67	2085.45	4578.09	3119.82	1520.22				
Saturday, April 07, 2007	Friday, April 13, 2007	14	Mid	1144	49.23%	1959.19	1260.74	750.20	1646.88	1122.30	546.87	979.60	630.37	375.10	823.44	561.15	273.44	8816.36	5673.32	3375.90	7410.97	5050.33	2460.92				
Saturday, April 14, 2007	Friday, April 20, 2007	15	Mid	530	22.80%	907.40	583.91	347.46	762.76	519.79	253.28	453.70	291.96	173.73	381.38	259.90	126.64	4083.32	2627.61	1563.56	3432.41	2339.08	1139.78				
Saturday, April 21, 2007	Friday, April 27, 2007	16	Mid	531	22.88%	910.49	585.90	348.64	765.35	521.56	254.14	455.24	292.95	174.32	382.67	260.78	127.07	4097.18	2636.53	1568.87	3444.06	2347.02	1143.65				
Saturday, April 28, 2007	Friday, May 04, 2007	17	Mid	581	25.03%	996.07	640.97	381.41	837.29	570.58	278.03	498.03	320.48	190.70	418.64	285.29	139.02	4482.30	2884.36	1716.34	3767.79	2567.63	1251.15				
Saturday, May 05, 2007	Friday, May 11, 2007	18	Mid	948	40.81%	1623.97	1045.02	621.84	1365.10	930.27	453.30	811.99	522.51	310.92	682.55	465.14	226.65	7307.88	4702.61	2798.28	6142.95	4186.22	2039.86				
Saturday, May 12, 2007	Friday, May 18, 2007	19	Mid	1260	54.24%	2158.32	1388.88	826.45	1814.27	1236.37	602.46	1079.16	694.44	413.23	907.14	618.18	301.23	9712.45	6249.95	3719.03	8164.22	5563.65	2711.05				
Saturday, May 19, 2007	Friday, May 25, 2007	20	High	1715	73.83%	2938.00	1890.60	1125.00	2469.66	1682.99	820.09	1469.00	945.30	562.50	1234.83	841.50	410.04	13221.00	8507.70	5062.50	11113.48	7573.47	3690.39				
Saturday, May 26, 2007	Friday, June 01, 2007	21	Mid	1399	60.22%	2396.26	1541.99	917.56	2014.28	1372.67	668.87	1198.13	771.00	458.78	1007.14	686.33	334.44	10783.17	6938.96	4129.02	9064.25	6176.99	3009.92				
Saturday, June 02, 2007	Friday, June 08, 2007	22	High	2060	88.69%	3529.30	2271.10	1351.42	2966.70	2021.71	985.14	1764.65	1135.55	675.71	1483.35	1010.86	492.57	15881.84	10219.95	6081.37	13350.16	9097.70	4433.12				
Saturday, June 09, 2007	Friday, June 15, 2007	23	High	2287	98.46%	3918.06	2521.27	1500.28	3293.49	2244.41	1093.65	1959.03	1260.63	750.14	1646.75	1122.20	546.83	17631.26	11345.70	6751.25	14820.72	10099.84	4921.44				
Saturday, June 16, 2007	Friday, June 22, 2007	24	High	2012	86.60%	3446.19	2217.62	1319.59	2896.85	1974.11	961.94	1723.10	1108.81	659.80	1448.42	987.05	480.97	15507.87	9979.30	5938.17	13035.81	8883.48	4328.73				
Saturday, June 23, 2007	Friday, June 29, 2007	25	High	2161	93.03%	3701.97	2382.21	1417.53	3111.85	2120.62	1033.34	1850.99	1191.11	708.77	1555.93	1060.31	516.67	16658.87	10719.96	6378.91	14003.33	9542.81	4650.01				
Saturday, June 30, 2007	Friday, July 06, 2007	26	High	2190	94.26%	3750.92	2413.72	1436.28	3153.00	2148.67	1047.00	1875.46	1206.86	718.14	1576.50	1074.33	523.50	16879.16	10861.72	6463.26	14188.50	9669.00	4711.50				
Saturday, July 07, 2007	Friday, July 13, 2007	27	High	1980	85.24%	3392.03	2182.76	1298.85	2851.31	1943.08	946.82	1696.01	1091.38	649.43	1425.66	971.54	473.41	15264.11	9822.44	5844.84	12830.91	8743.85	4260.69				
Saturday, July 14, 2007	Friday, July 20, 2007	28	High	2102	90.50%	3601.33	2317.45	1379.00	3027.25	2062.97	1005.24	1800.66	1158.73	689.50	1513.63	1031.49	502.62	16205.97	10428.53	6205.49	13622.63	9283.38	4523.59				
Saturday, July 21, 2007	Friday, July 27, 2007	29	High	2177	93.70%	3728.75	2399.45	1427.79	3134.36	2135.97	1040.81	1864.38	1199.72	713.89	1567.18	1067.98	520.41	16779.38	10797.52	6425.05	14104.63	9611.85	4683.65				
Saturday, July 28, 2007	Friday, August 03, 2007	30	High	2130	91.69%	3648.73	2347.95	1397.15	3067.10	2090.13	1018.47	1824.36	1173.98	698.57	1533.55	1045.06	509.24	16419.28	10565.79	6287.16	13801.93	9405.57	4583.13				
Saturday, August 04, 2007	Friday, August 10, 2007	31	High	2207	95.00%	3780.16	2432.53	1447.48	3177.58	2165.42	1055.16	1890.08	1216.27	723.74	1588.79	1082.71	527.58	17010.73	10946.39	6513.64	14299.10	9744.37	4748.23				
Saturday, August 11, 2007	Friday, August 17, 2007	32	High	2323	100.00%	3979.32	2560.69	1523.73	3344.98	2279.50	1110.75	1989.66	1280.34	761.87	1672.49	1139.75	555.38	17906.92	11523.08	6856.80	15052.43	10257.74	4998.38				
Saturday, August 18, 2007	Friday, August 24, 2007	33	High	2080	89.54%	3563.15	2292.88	1364.38	2995.16	2041.10	994.59	1781.57	1146.44	682.19	1497.58	1020.55	497.29	16034.16	10317.97	6139.70	13478.20	9184.96	4475.64				
Saturday, August 25, 2007	Friday, August 31, 2007	34	High	2268	97.62%	3884.51	2499.68	1487.43	3265.29	2225.19	1084.29	1942.26	1249.84	743.72	1632.65	1112.60	542.14	17480.30	11248.55	6693.44	14693.82	10013.36	4879.30				
Saturday, September 01, 2007	Friday, September 07, 2007	35	High	1542	66.40%	2642.21	1700.26	1011.74	2221.02	1513.56	737.52	1321.11	850.13	505.87	1110.51	756.78	368.76	11889.95	7651.17	4552.82	9994.61	6811.00	3318.86				
Saturday, September 08, 2007	Friday, September 14, 2007	36	High	1882	81.01%	3223.64	2074.41	1234.38	2709.77	1846.62	899.82	1611.82	1037.20	617.19	1354.88	923.31	449.91	14506.38	9334.84	5554.69	12193.96	8309.79	4049.18				
Saturday, September 15, 2007	Friday, September 21, 2007	37	High	1707	73.48%	2924.15	1881.68																				

Page 1 of 1
CAHA # 1680
RTI 2009 A

April 7, 2009

Van Dyke, Nancy

From: Loomis, Ross [rloomis@rti.org]
Sent: Tuesday, April 07, 2009 12:56 PM
To: Van Dyke, Nancy
Cc: Mansfield, Carol A.
Attachments: Visitation Data.xls; CAHA Data Sources.doc

pic chart

Nancy,

Here is a summary and discussion of the visitor data. Feel free to call or e-mail me if you have any questions.

Ross

Ross Loomis
Research Associate, Economics
Technology, Energy and the Environment
RTI International
PO Box 12194, Research Triangle Park, NC 27709-2194
Phone: 919-541-6930
Fax: 919-541-6683



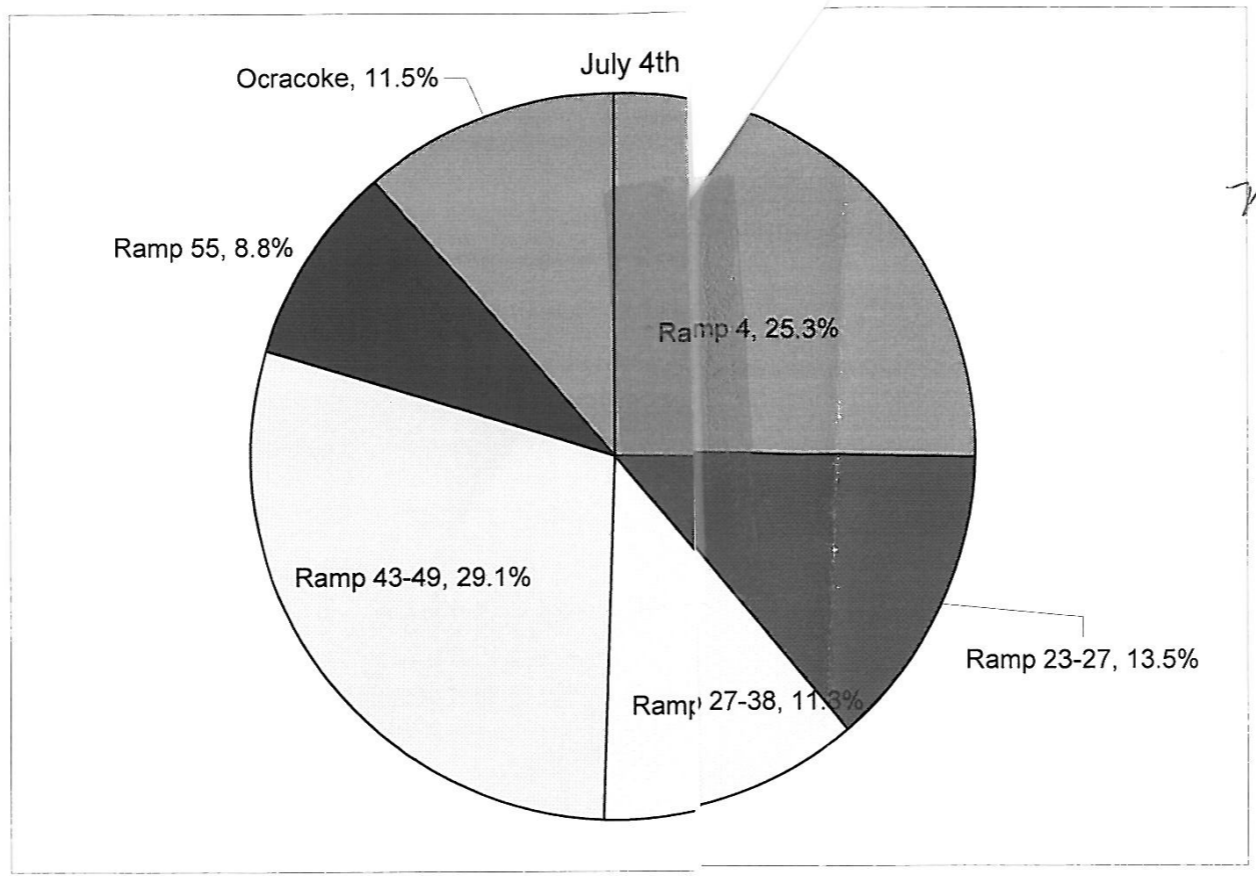
Ross Loomis.
Aerial Survey

75% / 72 -
on fire shrike
but mist on
spits.
DAY

2008
Ramp July 4th
Ramp 4 25.3% ✓ Bedic Is Spitt
Ramp 23-27 13.5% - S. of Salvo
Ramp 27-38 11.8% - New Moon.
Ramp 43-49 29.1% ✓ Cape Pt.
Ramp 55 8.8% ✓ - the other Spitt
Ocracoke 11.5% ✓ 2 white 1.

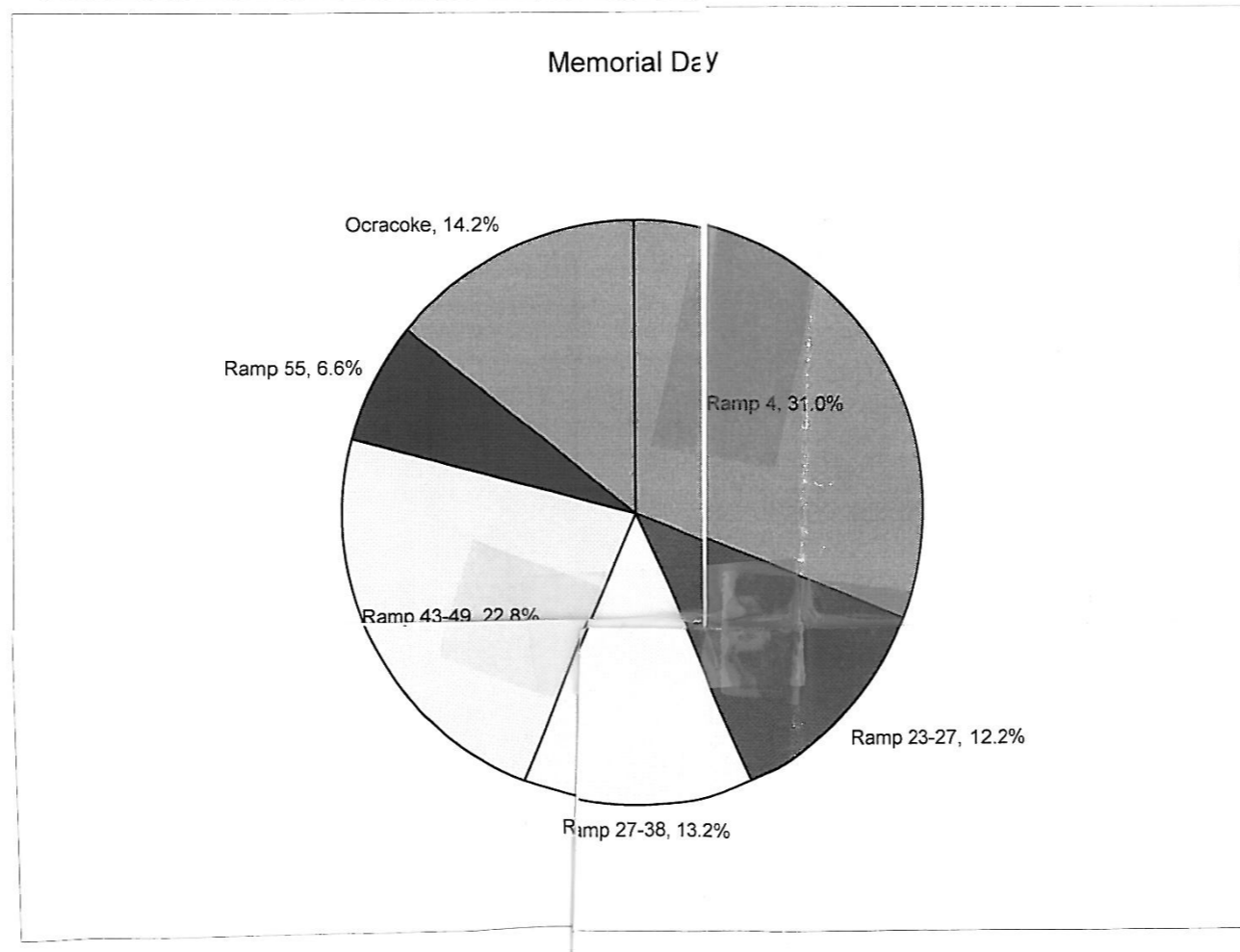
Ramp Memorial Day
Ramp 4 31.0%
Ramp 23-2 12.2%
Ramp 27-3 13.2%
Ramp 43-4 22.8%
Ramp 55 6.6%
Ocracoke 14.2%

counted on
1 day?



most people say!
74.7
~ 75% - pt + spits.
25.3
29.1 "over half"
54.4% - BI + CP

25% 31% at BI
25% 29% at CP



65% - May - Sept.
45% - J/J/A
Annual OKU use -
110,000 - 375,000

75% pts/spits

31.
22.8
53.8 "over half"
- BI + CP

Chris -> 1/3 left.
- 1/2 - Rock Dew

Data Sources



2006-8
 45% 6yr. No. rec'l visitors
 J ~~250,486~~ - 353,033
 J 296,467 - 354,111
 A 293,685 - ~~352,251~~
 ~ 300,000 + vis/mo

Number of visitors

The park estimates monthly counts of recreation visits. This number is estimated from a combination of: a) the traffic count from an inductive loop traffic counter located at the park entrance; b) the number of registered hunters; c) the number of aircraft; d) number of vehicles arriving on Ocracoke Island by ferry; and e) the number of overnight boats.

Annual Total 2,125,000 -
 2,227,378

Of these, the traffic count from the park entrance accounts for the largest share of the monthly estimate. In 2000, the last year in which the traffic counter had no days out, the traffic counter data accounted for between 92% and 97% of the monthly estimate. When the traffic counter is out, the park uses a daily traffic estimate in its stead. In 2008, this traffic counter was out all of January through May. Using these daily traffic estimates yield monthly totals between 2,000 and 56,000 lower than the counts seen in 2007.

~ 2 million
 Avg ~ 2.2 million
 2004-2006
 2,195,518

Distribution of Visitation across Year

Based on monthly recreational visitor statistics from 2004-2008, 45% of all visits to Cape Hatteras take place from June through August, with 65% taking place May through September.

Housing Rental Data

Weekly visitor-occupied housing rental data for 2007-2008 was collected from rental agencies with rental homes in the villages of Cape Hatteras. This data shows a similar seasonal pattern to the official visitation data, however with even more weight on the summer months. An estimated 55% of the rentals take place from June through August and 80% taking place May through September.

This data ignores local users, day-trip visitors, and overnight visitors not staying in rental homes.

Fish License Sales

The North Carolina Wildlife Resources Commission (NC WRC) collects data on coastal recreational fish license sales by week and county of sale. This data shows that approximately 47% of license sales take place from June through August and 71% take place May through September. Some of these sales, however, are for annual or lifetime licenses, and

Number of ORVs = ? visitors

* Cl. 3 - add in →
 remove
 slope?

From 2007-2008, the park installed infrared (IR) counters at ORV ramps to determine the number of ORVs using CAHA as well as their distribution within the park. In addition to counting ORVs, the counters count anything that breaks the IR beam, including pedestrians, rain, and uncut plants. The counters also fail to register some counts, and they must be properly aligned to count.

In a pretest of the physical counting that will take place this year, actual counts of ORVs were compared to the ramp counter over a 1-2 hour period. The ramp counters overestimated the number of ORVs by 24% to 157%. In another physical count of ramp use at two pedestrian friendly ramps, Ramps 23 and 27, pedestrians accounted for 30% and 62.5% of the counts respectively. For these reasons, the data from the ramp counters are deemed to be not reliable to construct estimates of ORV use in CAHA.

} =
ca. 3
=

On Memorial Day and July 4th, the park counts the number of ORVs on the beach by an aerial survey. This count is a snapshot of the ORVs on the beach, and is thus an underestimate of the total number of ORVs that are on the beach for the entire day.

To create a range of estimates for the total number of ORVs in a year, we first assume that the aerial holiday counts represent ORV use for a weekend day at that time of year. As mentioned above, the aerial holiday count is an underestimate of total ORV use on that day, but it is likely that Memorial Day and July 4th have higher ORV use than the average weekend day at that time of year. Based on personal communications and the ramp counter data, we assume that weekdays experience half the ORV traffic as a weekend day. We then assume that ORV use follows a similar distribution across the year as the rental housing data we have. This rental housing data is used to adjust the holiday ORV count to every other week in the year.

For instance, the average number of ORVs counted on July 4th is 2,033.7, assumed to be a representative weekend day at this time of year. To get the weekly total for this time of year, we use the following equation.

$$2*(Aerial\ Count) + 5*(Aerial\ Count/2) = 9,147$$

During this week, an estimated 94.26% of rental homes were renter occupied. The rental occupancy of each week is used to adjust this weekly total by the following equation.

$$9,147*(\% \text{ Renter Occupied} / \% \text{ Renter Occupied July 4th})$$

Which equals 163 the first week in January, and 9,704 the second week in August. We then add all weekly estimates for the year to arrive at the total annual estimate. For each holiday's aerial count, we use the average (mean), minimum, and maximum value to arrive at an annual estimate, giving a range of 6 estimates from 110,000 to 395,000.

2,033.7

Distribution of ORVs within CAHA

The best data for how ORVs are distributed across Cape Hatteras come from the aerial counts, which provide counts for ORVs by the following locations: — why there?

- Ramp 4 – Includes Bodie Island Spit
- || • Ramp 23 to Ramp 27 – Approximately 4 mile area directly south of Salvo.
- ||| • Ramp 27 to Ramp 38 – Approximately 11 mile area including Avon.
- |||| • Ramp 43 to Ramp 49 – Includes Cape Point
- | • Ramp 55 – Includes Hatteras Spit

(17)
X 2, (4)
23, 27, 30
34, 38, 41
43, 44, 49

57, 55
67, 68, 70, 72 — ORV count

57% of the
18% of the =



- Ocracoke – All of Ocracoke Island ?

The following pie charts show the distribution of ORVs across these areas on Memorial Day and July 4th in 2008. Over half of the ORVs in CAHA are located around Cape Point and the Bodie Island Spit.