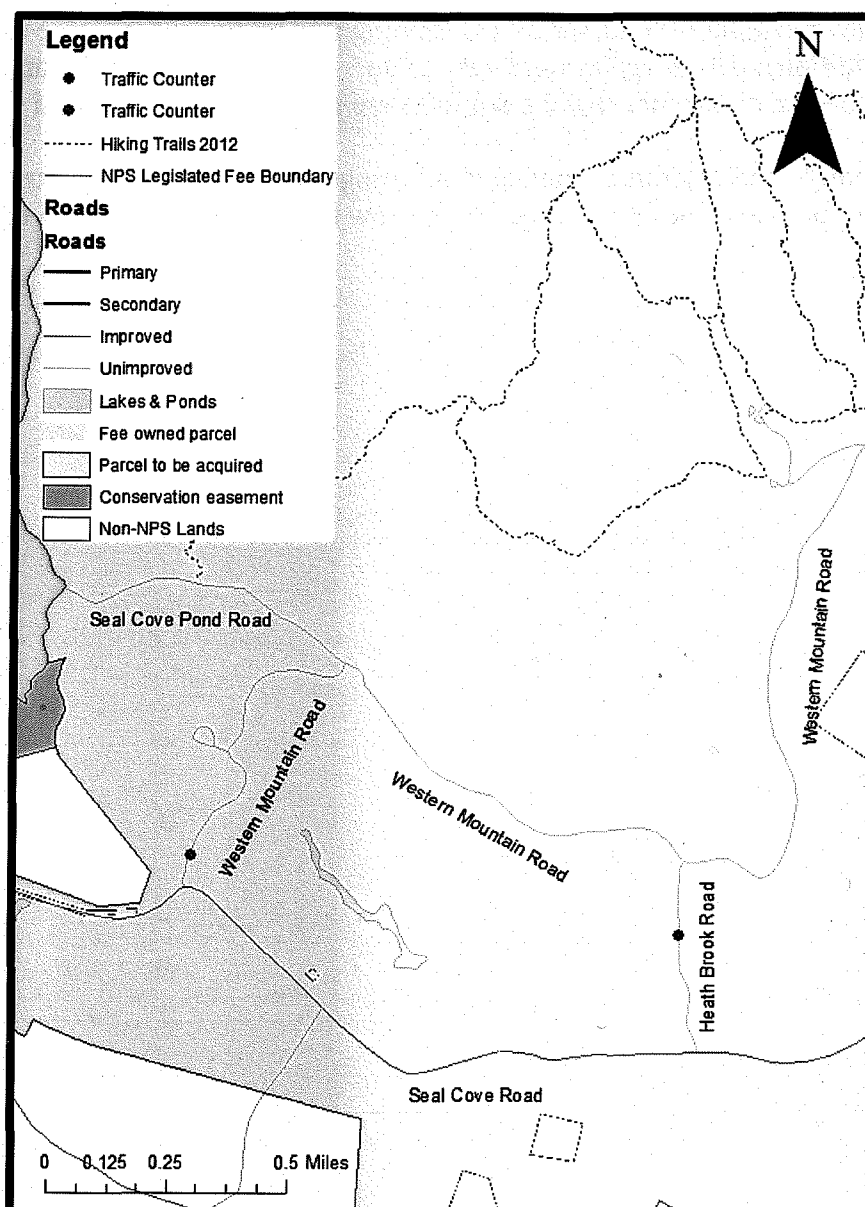




Vehicle Traffic on Western Mountain Road and Heath Brook Road, 2013



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Executive Summary

Vehicle traffic volume on the Heath Brook Road and Western Mountain Road was measured for twenty days in July and all of August 2013. For the combined roads, about 45 - 50 vehicles (nearly 150 visitors) *enter* this part of the park daily during these months, peaking at about 70 vehicles daily. On a monthly basis this is about 1300 – 1500 vehicles each month and 3,900 – 4,500 visitors.

The traffic counters on loan worked well and were easy to manage in the field. With Federal Highways staff downloading the data for us and sending it in an Excel file, some of the workload was reduced. Additional data analyses were easy to do. The accuracy of the counters was sufficient for us to have confidence that the numbers are representative of typical summer use.

We do not recommend making this an annual monitoring program, but the measurements can be repeated at longer intervals to detect changes in use now that a baseline has been established.

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ACKNOWLEDGEMENTS

We thank Leo Dario from the Department of Transportation and Rick Hody from Eastern Federal Lands Highway Division for the equipment loan and Friends of Acadia Ridgerunner Jared Garfield for help in the field.

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INTRODUCTION

In the fall of 2012, park managers decided to collect information on vehicular use of the Western Mountain Road system the following year. The park's ability to maintain these gravel roads is uncertain given today's funding realities. A section of the Western Mountain Road (between the Seal Cove Road and the Seal Cove Pond Road) and the Heath Brook Road provide access to hiking trails and a boat launch on Seal Cove Pond (Figure 1). All vehicles must enter and exit on one of these two roads and thus entry and exit traffic data provide complete information about vehicle use in this remote area.

METHODS

Thanks to Leo Dario of the U.S. Department of Transportation and Richard Hody of the Eastern Federal Lands Highway Division of the Federal Highway Administration, two Jamar Trax Apollyon automatic traffic recorders (ATR) with road tubes and protective mats were loaned for our use. These units were set up to record traffic volume only, not speed or size of vehicle.

We set the counters up on July 12, 2013 on the two roads as described above and shown in Figure 1. The road sections generally ran North - South and were relatively straight and level. We followed instructions provided by the manufacturer and Rick Hody. The ATR units were locked to trees on the West side of each road section and out of sight, the tubes were connected and enclosed in the mats, and the mats were laid out across the road and nailed to it to secure them. The "B" tube was the Northerly tube and the "A" tube was the Southerly tube at both sites. Unit 27132 was put on the Heath Brook Road and 27135 on the Western Mountain Road. We then tested the units with a vehicle at different speeds to see if they worked properly. We did note that not all traffic was recorded on every pass, but they seemed to work well enough. Patrol rangers periodically checked to see that the mats stayed in place, which they did. There was no way to easily download data during the summer to see how well the ATR and tubes were working. On September 5, we removed the equipment and mailed it back to Rick Hody who quickly downloaded the data and emailed it to us in several pdf and Excel files. Hody explained that the A and B tubes were reversed from how they should have been set up and that he transformed the data for us. We then compiled that data as shown in Appendix 1.

The accuracy of these units is limited because a divide-by-two count is used where every two hits on the tube is counted as one. According to the manufacturer, they are accurate within 10% unless traffic counts are validated through field observation to reduce that number. Field observation for these sites was not worth the effort due to the low volume of traffic expected. The following issues can affect accuracy: trailers or large vehicles such as RVs; traffic hitting the tubes at the same time in both directions; vehicles stopping on tubes; vehicles driving slowly over tubes; and motorcycle and bicycle traffic.

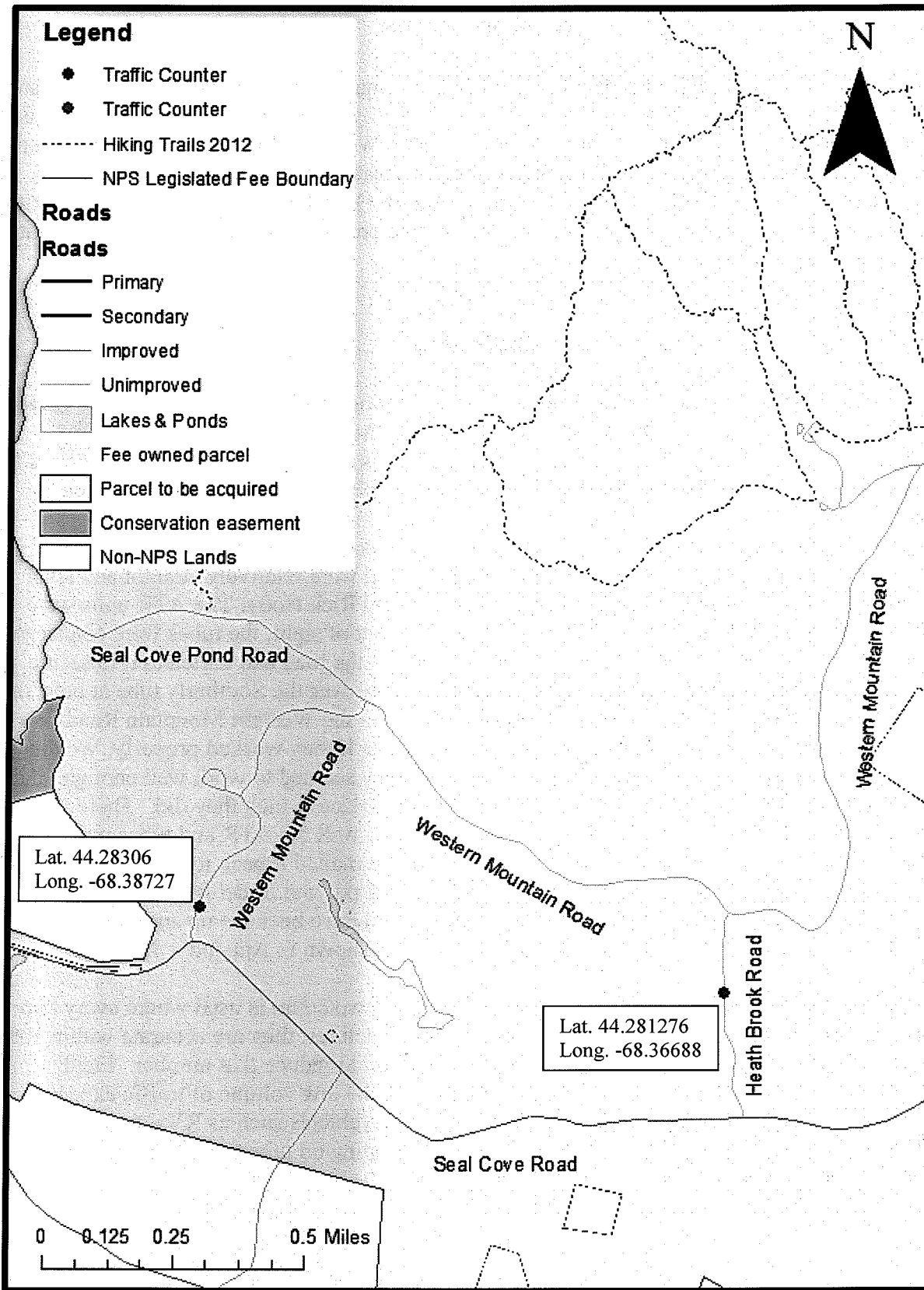


Figure 1: Heath Brook Road and Western Mountain Road Traffic Counter Locations, 2013.

RESULTS

Table 1 shows the total monthly traffic, the mean daily traffic, and the range of daily traffic for each road and for Northbound and Southbound traffic on both roads together, by month and direction of travel. The Northbound number is of particular interest because it represents all the vehicles entering this remote part of the park. In theory, the Southbound traffic should be nearly identical to the Northbound traffic but because of the counting issues noted in the Methods section there is variation. The variation was 1% in July (14 vehicles) and 5% in August (78 vehicles).

Table 1: Total Monthly Traffic, Mean Daily Traffic, and Range of Daily Traffic for the Heath Brook Road, the Western Mountain Road and Both Roads Together By Month and Direction of Travel

Month	Heath Brook Road			Western Mountain Road			Both Roads	
7/12-31/13	North (entry)	South (exit)	Total	North (entry)	South (exit)	Total	North (entry)	South (exit)
Total	383	464	847	600	505	1105	983	969
Mean	19.15	23.2	42.35	30.0	25.25	55.25	49.15	48.45
Range	8 - 30	4 - 36	12 - 66	13 - 51	9 - 39	25 - 90	21 - 69	20 - 70
8/1-31/13	North (entry)	South (exit)	Total	North (entry)	South (exit)	Total	North (entry)	South (exit)
Total	575	703	1278	865	659	1524	1440	1362
Mean	18.55	22.68	41.23	27.90	21.26	49.16	46.45	43.94
Range	1 - 34	1 - 40	3 - 74	13 - 47	9 - 37	23 - 79	14 - 70	16 - 66

We can glean the following from Table 1:

- With a little extrapolation for the first 11 days of July, each month had about 1,300 - 1,500 vehicles *enter* (North) this part of the park by *both roads together* (see North column for Both Roads);
- This number of vehicles represents 3,900 – 4,500 monthly visitors based on the three persons-per-vehicle multiplier used for the park's public use statistics in July and August;
- The mean number of daily *entries* (North) for *both roads together* in July was 49.15 +/- 5.95 and in August it was 46.45 +/- 5.97. This represents nearly 150 visitors per day. (Since the combined number of vehicle entries for *both roads together* was the main interest, we did not calculate any other confidence intervals);
- The mean number of daily *entries* (North) for the Heath Brook Road for July and August were 19.15 and 18.55, and for the Western Mountain Road for July and August daily entries were 30.0 and 27.9;
- The maximum number of daily vehicle *entries* (North) for *both roads together* in July was 69 vehicles and in August it was 70 vehicles;
- Heath Brook Road is less busy than Western Mountain Road;
- More vehicles exited by Heath Brook Road than entered; and
- More vehicles entered by Western Mountain Road than exited.

In general, these traffic volumes are in line with what we might expect. However, it is somewhat surprising Heath Brook Road is less busy than Western Mountain Road, and that *entries* via Heath Brook Road are less than *entries* via Western Mountain Road. We might expect most visitor traffic to this area to come from the east via Seal Cove Road (and Southwest Harbor and Bar Harbor), and the likely destination(s) for this traffic to be the Mill Field and Gilley Field trailheads reached most directly via Heath Brook Road. However, it may be that local traffic to the boat launch on Seal Cove Pond is sufficiently high to offset the general visitor traffic to the trailheads.

SUMMARY AND RECOMMENDATIONS

Vehicle traffic volume on the Heath Brook Road and Western Mountain Road was measured for twenty days in July and all of August 2013. For these combined roads, about 45 - 50 vehicles (nearly 150 visitors) *enter* this part of the park daily during these months, peaking at about 70 vehicles daily. On a monthly basis this is about 1300 – 1500 vehicles each month and 3,900 – 4,500 visitors.

The traffic counters on loan worked well and were easy to manage in the field. With Federal Highways staff downloading the data for us and sending it in an Excel file, some of the workload was reduced. Additional data analyses were easy to do. The accuracy of the counters was sufficient for us to have confidence that the numbers are representative of typical summer use.

We do not recommend making this an annual monitoring program, but the measurements can be repeated at longer intervals to detect changes in use now that a baseline has been established.

APPENDIX 1: HEATH BROOK ROAD AND WESTERN MOUNTAIN ROAD TRAFFIC COUNT DATA AND ANALYSIS*

	Heath Brook Road			Western Mountain Road			Totals by Direction		
	Northbound	Southbound	Total Traffic	Northbound	Southbound	Total	NB+NB	SB+SB	Difference
12-Jul-13	20	22	42	21	30	51	41	52	-11
13-Jul-13	18	18	36	33	38	71	51	56	-5
14-Jul-13	21	22	43	36	36	72	57	58	-1
15-Jul-13	20	28	48	43	32	75	63	60	3
16-Jul-13	18	34	52	42	26	68	60	60	0
17-Jul-13	21	32	53	33	22	55	54	54	0
18-Jul-13	22	22	44	26	23	49	48	45	3
19-Jul-13	27	20	47	30	27	57	57	47	10
20-Jul-13	23	27	50	37	31	68	60	58	2
21-Jul-13	18	31	49	51	39	90	69	70	-1
22-Jul-13	23	29	52	36	29	65	59	58	1
23-Jul-13	8	4	12	13	16	29	21	20	1
24-Jul-13	30	36	66	34	27	61	64	63	1
25-Jul-13	14	19	33	27	19	46	41	38	3
26-Jul-13	14	11	25	14	11	25	28	22	6
27-Jul-13	17	22	39	27	25	52	44	47	-3
28-Jul-13	17	27	44	24	9	33	41	36	5
29-Jul-13	15	17	32	18	18	36	33	35	-2
30-Jul-13	16	20	36	34	27	61	50	47	3
31-Jul-13	21	23	44	21	20	41	42	43	-1
Total	383	464	847	600	505	1105	983	969	14
Mean	19	23	42	30	25	55	49	48	0.01
	Heath Brook Road			Western Mountain Road			Totals by Direction		
	Northbound	Southbound	Total Traffic	Northbound	Southbound	Total	NB+NB	SB+SB	Difference
1-Aug-13	27	39	66	38	17	55	65	56	9
2-Aug-13	10	14	24	14	9	23	24	23	1
3-Aug-13	14	20	34	20	12	32	34	32	2
4-Aug-13	23	26	49	42	37	79	65	63	2
5-Aug-13	22	27	49	30	21	51	52	48	4
6-Aug-13	32	33	65	38	32	70	70	65	5
7-Aug-13	28	27	55	25	21	46	53	48	5
8-Aug-13	19	16	35	16	16	32	35	32	3
9-Aug-13	11	11	22	15	15	30	26	26	0
10-Aug-13	31	32	63	34	28	62	65	60	5
11-Aug-13	34	40	74	31	26	57	65	66	-1
12-Aug-13	20	28	48	37	28	65	57	56	1
13-Aug-13	23	27	50	32	20	52	55	47	8
14-Aug-13	23	29	52	25	20	45	48	49	-1
15-Aug-13	26	31	57	39	33	72	65	64	1
16-Aug-13	25	32	57	37	28	65	62	60	2
17-Aug-13	23	31	54	47	31	78	70	62	8
18-Aug-13	16	24	40	30	23	53	46	47	-1
19-Aug-13	17	24	41	23	14	37	40	38	2
20-Aug-13	15	16	31	22	17	39	37	33	4
21-Aug-13	11	18	29	37	29	66	48	47	1
22-Aug-13	17	16	33	32	29	61	49	45	4
23-Aug-13	24	35	59	36	26	62	60	61	-1
24-Aug-13	25	30	55	27	20	47	52	50	2
25-Aug-13	19	24	43	27	19	46	46	43	3
26-Aug-13	8	11	19	21	15	36	29	26	3
27-Aug-13	3	1	4	20	20	40	23	21	2
28-Aug-13	1	2	3	13	14	27	14	16	-2
29-Aug-13	2	7	9	17	10	27	19	17	2
30-Aug-13	8	15	23	21	10	31	29	25	4
31-Aug-13	18	17	35	19	19	38	37	36	1
Total	575	703	1278	865	659	1524	1440	1362	78
Mean	19	23	41	28	21	49	46	44	0.05
GrTotal	958	1167	2125	1465	1164	2629	2423	2331	92

* Compiled from Excel spreadsheets with daily use data for each site.

APPENDIX 1: HEATH BROOK ROAD AND WESTERN MOUNTAIN ROAD TRAFFIC COUNT DATA AND ANALYSIS (continued)

Heath Brook Road			Western Mountain Road			Totals by Direction			
7/12-31/17	Nbound	Sbound	Total Traffic	Nbound	Sbound	Total	NB+NB	SB+SB	Difference
Total	383	464	847	600	505	1105	983	969	14
Mean	19.15	23.2	42.35	30	25.25	55.25	49.15	48.45	
Range	8 - 30	4 - 36	12 - 66	13 - 51	9 - 39	25 - 90	21 - 69	20 - 70	
Heath Brook Road			Western Mountain Road			Totals by Direction			
8/1-31/21	Nbound	Sbound	Total Traffic	Nbound	Sbound	Total	NB+NB	SB+SB	Difference
Total	575	703	1278	865	659	1524	1440	1362	78
Mean	18.55	22.68	41.23	27.90	21.26	49.16	46.45	43.94	
Range	1 - 34	1 - 40	3 - 74	13 - 47	9 - 37	23 - 79	14 - 70	16 - 66	
July			August						
Southbound Both Roads			Northbound Both Roads						
Descriptive Stats									
Mean	49.15		Mean	46.4516129					
Standard Error	2.841677599		Standard Error	2.923703172					
Median	50.5		Median	48					
Mode	41		Mode	65					
Standard Deviation	12.70836856		Standard Deviation	16.27849033					
Sample Variance	161.5026316		Sample Variance	264.9892473					
Kurtosis	-0.21963189		Kurtosis	-1.020837862					
Skewness	-0.5629005		Skewness	-0.305116871					
Range	48		Range	56					
Minimum	21		Minimum	14					
Maximum	69		Maximum	70					
Sum	983		Sum	1440					
Count	20		Count	31					
Confidence Level	5.94769957		Confidence Level	5.970998458					