



Monitoring Bicycle Use on the Schoodic Loop Road with a Camera, 2013



Schoodic Bike Camera Sample Picture

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Executive Summary

This camera gave us some bicycle use data but it was of limited value because of the 15-second reset time and loss of data in much of July and August.

TABLE 1: NUMBER OF BICYCLISTS USING THE SCHOODIC LOOP ROAD JUNE – OCTOBER 2013.					
Measure	June 13 - 30	July	August 19 - 31	September 1 - 30	October 1 - 22
Total Use	258	--	629	651	151
Mean Daily Use	14.33	--	48.38	21.7	6.86
Maximum Use	52	--	81	45	16
Number of Days	18	--	13	30	22

Counting bicycles and discriminating them from pedestrian and vehicle traffic is difficult. There are some very expensive solutions on the market. There are also cameras with a one to three second reset time, which would clearly be a better choice for this application. They cost from \$150 - \$500. Some faster bicyclists would still probably be able to traverse the camera's field of view along the roadway in this time, but we would capture a much higher percentage of bicyclists. We recommend such a camera, and also recommend validation of the camera through counts of bicyclists to compare with the camera. It will mean there are many more pictures to review for counting bicycles but the work load for this is estimated to be 8 – 12 hours.

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ACKNOWLEDGEMENTS

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INTRODUCTION

The Schoodic Loop Road is an easy bicycle ride with a few gentle hills and spectacular ocean scenery. Because it is a one way road, making a loop has always meant riding outside the park where the state roads have poor or nonexistent shoulders for biking. Bicycle use of the Schoodic Loop Road has never been monitored, though a traffic counter for vehicles at the entrance has been used for a long time to estimate park use. Given the new development expected at the Schoodic Woods property beginning in 2014, especially the proposed bike connector across the Schoodic Peninsula, we decided to begin monitoring bicycle use of the Schoodic Loop Road in 2013 with a camera.

METHODS

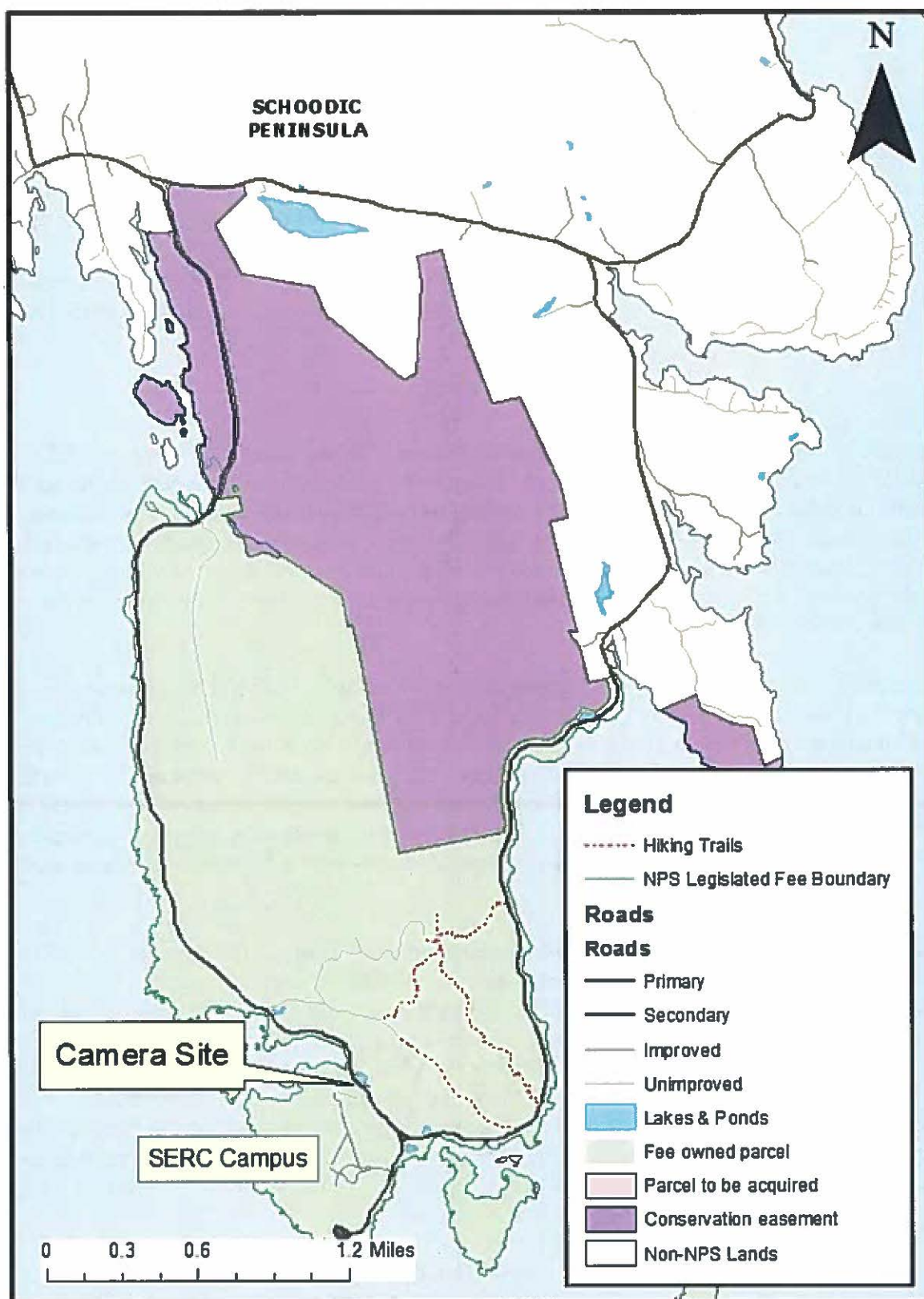
We selected a Wildgame Innovations Invisible Infrared Digital Scouting Camera Model L08 to monitor bicycles traffic along the Schoodic Loop Road. The camera has a passive infrared sensor that detects motion and heat up to 75 feet away to trigger the shutter of the camera. We set the camera resolution to 6 megapixels for still camera shots and the lens for wide angle pictures. Photographic infrared sensitivity was set to medium, and the camera was programmed to take pictures during daylight hours only, because we did not expect many bikers in the early or late hours when it was near dark.

The camera was set up on a tree on the east side of the entrance road a short distance from the Schoodic Point turnoff (Figure 1). Because the shutter had a fifteen second reset time, we positioned the camera to capture a long section of roadway to maximize the opportunity to capture bicyclists. If a car or another bicyclist or pedestrian tripped the camera, this gave us a chance to see bicyclists far down the road in case they were missed because of the fifteen second recycle time and 75-foot trigger distance. We concealed it further with debris. We swapped out disks twice in the summer to download pictures. Batteries were expected to last three months, but they worked for five months.

Images were downloaded and copied into folders named by date. All folders are located in the Acadia National Park server at Resource Management\Charlie\Digital Images\SchoodicBikeCounts. Then we clicked through each image one-by-one looking for and counting bicyclists, bicyclists going the wrong way on the one way road, pedestrians, recreational vehicles (RVs), and coach buses. Recreational vehicles were defined as vehicles designed to be an RV, or a travel trailer of any size. We did not count pick up campers or oversized vans as RVs. We counted only coach buses because they are prohibited from the road by the Commercial Services Plan (NPS 2000) and can only enter if they are serving the Schoodic Education and Research Center (SERC).

RESULTS

In retrospect, this camera was a poor choice. We thought it had a 5-second reset time for the next picture rather than fifteen seconds. Thus it is hard to know how many bicycles were missed as the camera was resetting. Many camera resets would have been triggered by vehicles, but no



matter how a picture was triggered, some bicyclists would have been able to easily travel from outside the 75-foot trigger distance and through the picture frame before the next reset. For the same reason many images showed no cars or bicycles at all, and we assume those were mostly cars going too fast for the camera to capture them.

Additionally, because of unfamiliarity with the equipment, we lost image data for most of the summer, from July 2, 2013 to August 18, 2013 inclusive. We reviewed the data we had: from June 13, 2013- July 1, 2013 and August 19, 2013 to October 22, 2013. A summary of this bicycle count data is shown in Table 1, and the details for all measures are in Appendix 1.

Table 1: Number of Bicyclists Using the Schoodic Loop Road June – October 2013.					
Measure	June 13 - 30	July	August 19 - 31	September 1 - 30	October 1 - 22
Total Use	258	--	629	651	151
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Despite these problems, the camera recorded many bicyclists along the road. Due to the camera choice, these counts are clearly underestimates. We did not see evidence of higher use on weekends in June, September, or October. Typically, activities throughout the park are relatively the same each day from mid-June to Labor Day, and weekend increases occur in the shoulder seasons. The weekend weather probably contributed to this lack of congruity.

We observed in a few images as many as 6 – 9 bicycles at once. It is impossible to know if these are organized or commercial groups. None of them wore the same “outfit.” It is very easy for any bicycling group to spread out far enough along the road that we would capture them in several images rather than one.

We did observe bicycles going the wrong way in June, August, September and October. During the government shut down, with Acadia National Park closed from October 1 -16, the number of bicycles going the wrong way increased from 4 – 8 per month to 22 in the 16-day closure. We counted bicycles going the wrong way separately, and they are not included in Table 1. We also sometimes observed the same bikes come and go in each direction, and counted them each time.

The number of pedestrians walking the road past the camera site was surprising. In June, it was 73, or about four per day. In August it was 66, or about five per day. In September, it was 171, or about six per day. In October, it was 89, or about four per day. Many did walk back and forth (and we counted them each time), even before the government shutdown. During the shutdown, quite a few folks walked all the way from the gate several miles one way to the site. It may be that many pedestrians are walking from SERC, and our on two biggest days for pedestrians, they were children’s groups from the Schoodic Education Adventure Program run by Acadia National Park and led by a ranger.

Recreational vehicles numbered about one per day in June and August. In September, we counted 43, or about 1.43 per day. There were only 2 in the 22 days we recorded data in October.

There were five coach buses observed in the images and we assume all were associated with SERC.

SUMMARY AND RECOMMENDATIONS

This camera gave us some bicycle use data but it was of limited value. Counting bicycles and discriminating them from pedestrian and vehicle traffic is difficult. There are some very expensive solutions on the market. There are also cameras with a one to three second reset time, which would clearly be a better choice for this application. They cost from \$150 - \$500. Some faster bicyclists would still probably be able to traverse the camera's field of view along the roadway in this time, but we would capture a much higher percentage of bicyclists. We recommend such a camera, and also recommend validation of the camera through counts of bicyclists to compare with the camera. It will mean there are many more pictures to review for counting bicycles but the work load for this is estimated to be 8 – 12 hours.

LITERATURE CITED

U.S. Department of the Interior, National Park Service
2000 Commercial Service Plan, Acadia National Park. April. 51pp.

**APPENDIX 1: BICYCLES, WRONG WAY BICYCLES, PEDESTRIANS,
RECREATIONAL VEHICLES, AND COACH BUSES
ON THE SCHOODIC LOOP ROAD, JUNE – OCTOBER 2014**

Date	DOW	Bikes	Bikes wrong way	Peds	RVs	Coach Buses	Notes
1-Jun	Saturday						
2-Jun	Sunday						
3-Jun	Monday						
4-Jun	Tuesday						
5-Jun	Wednesday						
6-Jun	Thursday						
7-Jun	Friday						
8-Jun	Saturday						
9-Jun	Sunday						
10-Jun	Monday						
11-Jun	Tuesday						
12-Jun	Wednesday						
13-Jun	Thursday	5	0	1	0	0	
14-Jun	Friday	4	2	0	1	0	
15-Jun	Saturday	28	0	2	0	0	
16-Jun	Sunday	10	0	3	2	0	
17-Jun	Monday	13	0	1	1	0	
18-Jun	Tuesday	6	0	3	0	1	
19-Jun	Wednesday	11	0	6	1	0	
20-Jun	Thursday	18	0	3	2	0	
21-Jun	Friday	8	0	2	1	0	
22-Jun	Saturday	52	0	3	2	0	
23-Jun	Sunday	10	2	3	5	0	
24-Jun	Monday	25	0	5	1	0	
25-Jun	Tuesday	32	0	13	0	0	
26-Jun	Wednesday	10	0	3	1	0	
27-Jun	Thursday	5	0	16	0	0	
28-Jun	Friday	0	0	1	0	0	
29-Jun	Saturday	4	0	5	0	0	
30-Jun	Sunday	17	0	3	2	0	
Total		258	4	73	19	1	
Mean		14.33	0.22	4.06	1.06	0.06	
Max		52.00	2.00	16.00	5.00	1.00	
Count		18	18	18	18	18	

**APPENDIX 2: BICYCLES, WRONG WAY BICYCLES, PEDESTRIANS,
RECREATIONAL VEHICLES, AND COACH BUSES
ON THE SCHOODIC LOOP ROAD, JUNE – OCTOBER 2014 (cont.)**

Date	DOW	Bikes	Bikes wrong way	Peds	RVs	Coach Buses	Notes
1-Jul	Monday	15	0	0	1	0	
2-Jul	Tuesday						
3-Jul	Wednesday						
4-Jul	Thursday						
5-Jul	Friday						
6-Jul	Saturday						
7-Jul	Sunday						
8-Jul	Monday						
9-Jul	Tuesday						
10-Jul	Wednesday						
11-Jul	Thursday						
12-Jul	Friday						
13-Jul	Saturday						
14-Jul	Sunday						
15-Jul	Monday						
16-Jul	Tuesday						
17-Jul	Wednesday						
18-Jul	Thursday						
19-Jul	Friday						
20-Jul	Saturday						
21-Jul	Sunday						
22-Jul	Monday						
23-Jul	Tuesday						
24-Jul	Wednesday						
25-Jul	Thursday						
26-Jul	Friday						
27-Jul	Saturday						
28-Jul	Sunday						
29-Jul	Monday						
30-Jul	Tuesday						
31-Jul	Wednesday						
Total		15	0	0	1	0	
Mean							
Max							
Count							

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Date	DOW	Bikes	Bikes wrong way	Peds	RVs	Coach Buses	Notes
1-Aug	Thursday						
2-Aug	Friday						
3-Aug	Saturday						
4-Aug	Sunday						
5-Aug	Monday						
6-Aug	Tuesday						
7-Aug	Wednesday						
8-Aug	Thursday						
9-Aug	Friday						
10-Aug	Saturday						
11-Aug	Sunday						
12-Aug	Monday						
13-Aug	Tuesday						
14-Aug	Wednesday						
15-Aug	Thursday						
16-Aug	Friday						
17-Aug	Saturday						
18-Aug	Sunday						
19-Aug	Monday	41	0	0	0	0	
20-Aug	Tuesday	58	0	0	0	0	
21-Aug	Wednesday	81	0	0	1	0	
22-Aug	Thursday	77	0	0	1	0	
23-Aug	Friday	57	0	0	2	0	
24-Aug	Saturday	44	0	11	1	0	
25-Aug	Sunday	57	2	6	1	0	
26-Aug	Monday	11	1	4	1	0	rain
27-Aug	Tuesday	48	0	2	2	0	
28-Aug	Wednesday	35	0	11	1	0	
29-Aug	Thursday	15	1	7	2	0	rain
30-Aug	Friday	45	0	3	1	0	
31-Aug	Saturday	60	0	22	1	0	
Total		629	4	66	14	0	
Mean		48.38	0.31	5.08	1.08	0.00	
Max		81	2	22	2	0	
Count		13	13	13	13	13	

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ON THE SCHOODIC LOOP ROAD, JUNE – OCTOBER 2014 (cont.)**

Date	DOW	Bikes	Bikes wrong way	Peds	RVs	Coach Buses	Notes
1-Sep	Sunday	24	1	7	0	0	
2-Sep	Monday	2	0	0	2	0	rain
3-Sep	Tuesday	15	0	7	0	0	
4-Sep	Wednesday	39	0	8	2	0	
5-Sep	Thursday	45	0	0	3	0	B9
6-Sep	Friday	33	0	6	1	0	
7-Sep	Saturday	43	1	8	0	0	
8-Sep	Sunday	9	0	11	1	0	rain
9-Sep	Monday	31	0	13	2	0	
10-Sep	Tuesday	6	0	0	4	0	rain
11-Sep	Wednesday	27	0	3	1	0	
12-Sep	Thursday	23	0	22	0	0	8B 16P-NPS
13-Sep	Friday	0	0	0	1	0	
14-Sep	Saturday	36	1	6	0	0	7B
15-Sep	Sunday	43	1	10	2	0	
16-Sep	Monday	5	0	2	2	0	
17-Sep	Tuesday	27	0	4	2	1	B6
18-Sep	Wednesday	30	1	0	2	0	
19-Sep	Thursday	45	0	0	1	0	B7, B6
20-Sep	Friday	41	0	7	3	0	
21-Sep	Saturday	11	0	1	0	1	
22-Sep	Sunday	1	0	0	3	0	Rain
23-Sep	Monday	12	0	8	0	0	
24-Sep	Tuesday	4	0	1	1	0	Rain
25-Sep	Wednesday	19	0	3	0	0	
26-Sep	Thursday	4	1	24	1	0	P18-NPS
27-Sep	Friday	18	0	7	3	1	
28-Sep	Saturday	26	0	7	0	0	
29-Sep	Sunday	24	0	2	4	0	
30-Sep	Monday	8	2	4	2	0	
Total		651	8	171	43	3	
Mean		21.70	0.27	5.70	1.43	0.10	
Max		45	2	24	4	1	
Count		30	30	30	30	30	

B7, P18—number of bikes or pedestrians in one image.

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ON THE SCHOODIC LOOP ROAD, JUNE – OCTOBER 2014 (cont.)**

DOW	Bikes	Bikes wrong way	Peds	RVs	Coach Buses	Notes
Tuesday	9	4	2	0	0	
Wednesday	5	2	2	0	0	
Thursday	7	1	0	0	0	
Friday	3	2	4	0	0	
Saturday	10	3	7	0	0	
Sunday	16	4	4	0	0	
Monday	1	0	4	0	0	
Tuesday	14	0	6	0	0	
Wednesday	15	0	0	0	0	
Thursday	5	2	7	0	0	
Friday	4	4	9	0	0	
Saturday	6	0	2	0	0	
Sunday	11	5	17	0	0	
Monday	12	10	0	0	0	
Tuesday	6	3	0	0	0	
Wednesday	4	4	1	0	0	
Thursday	1	0	5	0	0	
Friday	2	0	4	0	1	rain
Saturday	10	0	0	0	0	
Sunday	8	0	11	1	0	rain a.m.
Monday	1	0	4	1	0	
Tuesday	1	0	0	0	0	
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						
Monday						
Tuesday						
Wednesday						
Thursday						
	151	44	89	2	1	
	6.86	2.00	4.05	0.09	0.05	
	16	10	17	1	1	
	22	22	22	22	22	