

2005 Camera Trap Survey at Guthrie-Bancroft Parcel, Colby Hill, Lincoln, Vermont

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Summary

In 2005 camera trapping efforts continued after the promising start in 2004. This year we used a second digital camera and monitoring lasted from 18 July to 14 December 2005 recording five mammal and one bird species. Three of the mammal species (fisher, red fox and white-tailed deer) were recorded for the first time by camera traps, as was human hunter presence on the Guthrie-Bancroft parcel.

Introduction

Camera traps are increasingly being used to monitor secretive and rare species in a less invasive manner. In Vermont, as early as 1994/1995, the success of reintroduction of 115 martens (*Martes americana*) was checked with 40 camera traps of two types, recording 10 mammal and one bird species (Moruzzi et al. 2003). Cutler and Swann (1999) reviewed 107 papers reporting the use of remote photography in wildlife monitoring, 42% of which used light-triggered system like the two types of camera we are using. Swann et al. (2004) evaluated six infrared-triggered camera systems, including the CamTrakker model used by us. The CamTrakker showed the highest percentage of detections (78%) but, like most models in the test, it showed reduced sensitivity in higher ambient temperatures and was better at detecting smaller targets aimed at lower heights (20 cm) than at upper heights (120 cm). I have not yet come across a test of available digital camera models.

Materials and Methods

In addition to the film-based (analog) CamTrakker camera, we employed a second digital camera for the first time this year (Cuddeback; <http://www.cuddebackdigital.com/>), which also records short video sequences. The digital camera uses standard CF cards that can be checked with a laptop and a small card reader at the camera site to allow for immediate decisions on relocation or re-orientation of the camera. Two cards were used for swapping. Cameras were checked every 6 to 10 days. As bait we used fisher scent as in 2004 and also tried wild cat (lynx) scent this year. Camera-trapping concentrated on Ecosystem 14, ES 12, ES 20 (beaver pond) and ES 23 (old field edge).

For the first time GPS waypoints were downloaded from the Garmin 12 receiver and plotted using the program Mac GPS Pro 6.4.0 on a scanned and geo-referenced digital USGS topographic map (<http://www.macgpspro.com/>).

Results and Discussion

The film-based camera (Camtrakker) recorded useful results only at the beginning of the survey period (18 July 2005, moose calf), all other pictures were recorded by the digital camera (Cuddeback). Newly added to the list of camera-trapped species this year were: Fisher (*Martes pennanti*), Red Fox (*Vulpes vulpes*), and White-tailed Deer (*Odocoileus americanus*). There

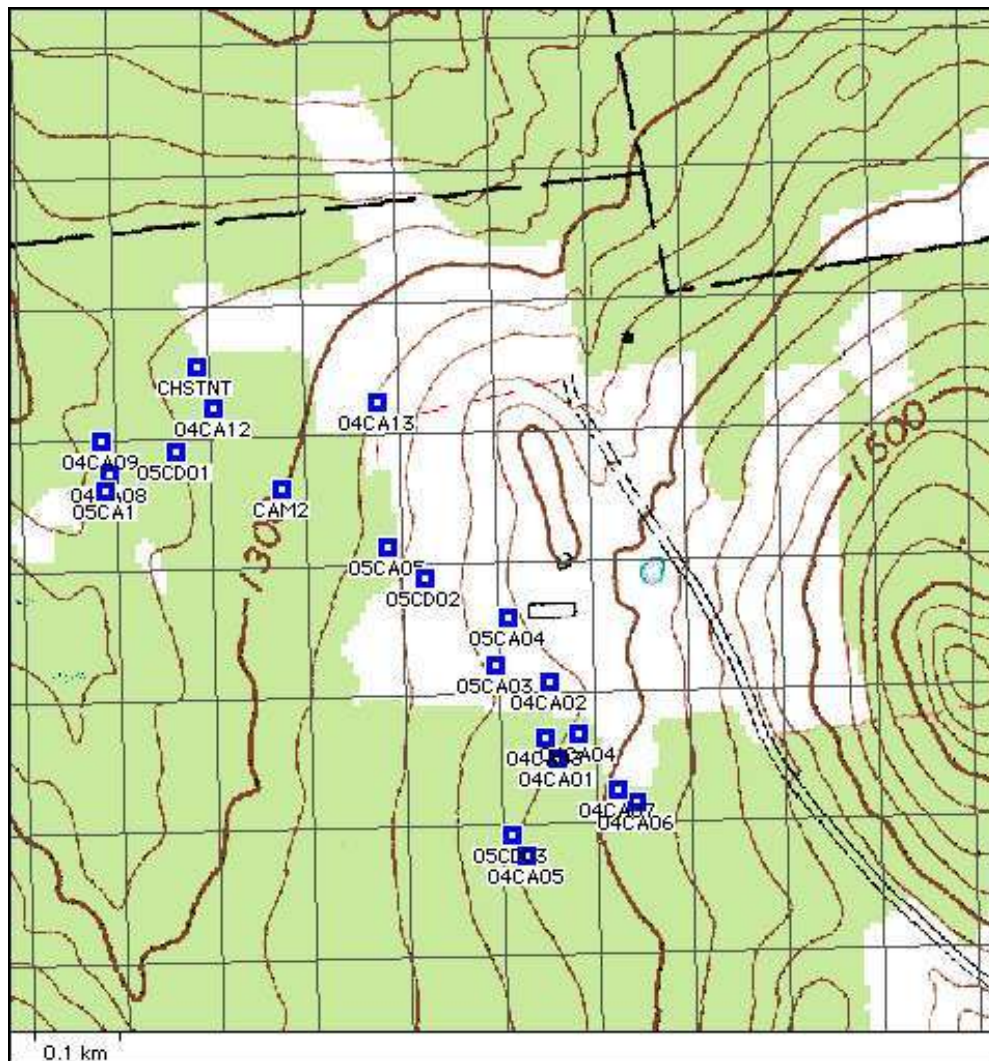


Fig. 1 - Plotted Garmin 12 GPS Reading of 2004 and 2005 camera trap localities on scanned georeferences USGS Map (www.MacGPSPro.com). Waypoint CHSTNT is the location of large American Chestnut (*Castanea dentata*) tree.

were no pictures of bears in 2005 (Table 1). There was more activity at the trap sites in fall than in the summer. Snowfall began early with a 5-inch layer of very wet snow on 26 October 2005 causing much snowbreak along the Guthrie access road and in the woods. Hunters were recorded twice on the digital camera. A hunter with two dogs was also observed during camera check on the Guthrie-Bancroft Land on 21 October 2005.

Waypoints plotted on the digital topographic map (Fig. 1) appear to be approximately in the right locations, judged by map designations such as forest/meadow edge and ponds and streams etc. Deviations from previously used hand-drawn maps may stem from the age of the topographic source map (Bristol, VT NE/4 Middlebury 15' Quadrangle N4407.5–W7300/7.5 1963 Sheet), showing outdated forest-meadow boundaries but possibly also from inaccuracies of GPS readings under the canopy. This map still shows a building near the old fields at Guthrie (near GPS waypoint 04CA04). Plotting on more recent geo-referenced aerial or satellite images would be desirable.

Table 1: 2005 Wildlife recorded by two camera traps at Guthrie–Bancroft parcel, Colby Hill, Lincoln, between 18 July and 14 December.

Common Name	Scientific Name	Order, Family	Number of Photographs
M a m m a l s			
Raccoon	<i>Procyon lotor</i>	Carnivora, Procyonidae	1
Fisher	<i>Martes pennanti</i>	Carnivora, Mustelidae	4
Red Fox	<i>Vulpes vulpes</i>	Carnivora, Canidae	3
Moose	<i>Alces alces</i>	Artiodactyla, Cervidae	4
White-tailed Deer	<i>Odocoileus virginianus</i>	Artiodactyla, Cervidae	2
B i r d s			
Ruffed Grouse	<i>Bonasa umbellus</i>	Galliformes, Phasianidae	1

Table 2 summarizes all GPS Codes for camera sites tried, coordinates and their recording dates, and all mammals and birds species recorded in 2004 and 2005. Interesting details are the recording of white-tailed deer (Fig. 5; 5 Nov 2005) and one of the hunters (Fig. 16; 13 Nov. 2005) at the same locality in ES 14, or the number of fisher and fox observations from the same

rock outcrop in the ES 14/22 transition (low, deciduous forest with old apple trees). As in 2004 moose were encountered at the edge of the old beaver pond (ES 20).

Table 2: 2004 and 2005 Camera trap GPS localities that yielded useful results.

GPS Code	Date & Time of Reading	Latitude	Longitude	Mammals										Birds				
				Bear	Fisher	W.-T. Deer	Moose	Raccoon	Coyote	Red Fox	East. Cottontail	Peromyscus	Turkey	Ruffed Grouse	Wh.-br. Nuthatch	Hunters		
04CA01	19/05/04 13:03	44°08'57.4"	73°01'05.3"															
04CA03	09/06/04 13:09	44°08'57.5"	73°01'08.1"	•														
04CA04	12/06/04 15:07	44°08'58.3"	73°01'04.2"	•														
04CA07	06/07/04 14:28	44°08'56.1"	73°01'02.1"					•	•									
04CA08	11/08/04 13:07	44°09'08.6"	73°01'28.7"	•			•									•		
04CA09	11/08/04 13:35	44°09'09.9"	73°01'28.9"	•							•							
04CA13	22/10/04 14:28	44°09'11.2"	73°01'14.4"								•					•		
05CA01	07/19/05 13:59	44°09'08.0"	73°01'28.8"				•											
05CA04*	28/09/05 14:00	44°09'02.8"	73°01'07.7"		•	•		•		•						•		
05CD01	05/10/05 14:18	44°09'09.4"	73°01'25.1"				•											
05CD02	05/10/05 15:06	44°09'04.4"	73°01'12.1"															•
05CD03	02/11/05 15:30	44°08'55.5"	73°01'07.8"			•												•

*Digital camera used on analog camera location (05CA04)

Finally, Table 3 shows a comparison of our efforts in 2004 and 2005 with one other temperate zone study (Séquin et al. 2001) and two tropical studies using camera traps.

Table 3: Comparison of 2004 and 2005 Colby Hill study with three other published studies.

Study	habitat	No. of cameras	camera days	total wildlife photos	No. of species	photos/100 trap days	species/100 trap days	Comments/cameras used
Séquin et al 2001	CA grassland and blue oak woodland	?	9702	106	1	1.1	n/a	photos of coyotes reported only
Kawinishi 2001	tropical primary forest	?	4192	1519	27	36.2	0.6	TrailMaster & CamTrakker
Mohd 2006	tropical secondary forest	24	5872	2121	33	36.1	0.6	CamTrakker
Decher 2004	temperate sec. forest	1	176	21	9	11.9	5.1	CamTrakker
Decher 2005	temperate sec. Forest	2	306	15	6	4.9	2.0	CamTrakker & Cuddeback

The tropical studies (Kawanishi 2001, Mohd 2006) yielded more than three times the number of photos per 100 trap days than our study but our initial efforts yielded a higher number of species per 100 trap days even though only 2 cameras were used.

Camera trapping will continue in 2006 in additional areas o the Guthrie Bancroft land.

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Appendix: Photographs

1. Mammals

1.1 Artiodactyls



Fig. 1. *Alces alces* (Moose calf) Date: 18 July 2005 Location Code: 05CA01
GPS: 44°09'08.0"N, 73°01'28.8"W Habitat: Edge of Beaver Pond, ES 20



Fig. 2. *Alces alces* (Moose Calf) Date: 18 July 2005. Same location code. Notice legs of adult animal in background in both pictures.



Fig. 3. *Alces alces* (Moose Calf) Date: 18 July 2005; same Location.



Fig. 4. *Alces alces* (Moose Calf) retreating. Date: 18 July 2005; same Location



Fig. 5 *Odocoileus virginianus* (Whitetail Buck) retreating. Date: 5 Nov 2005
Location Code: 05CD03 GPS: 44°08'55.5"N, 73°01'07.8"W Habitat: ES14



Fig. 6 *Odocoileus virginianus* (Whitetail Deer tail) Date: 27 October 2005 Location Code:
05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)
First heavy and wet snowfall.

5.2 Carnivores



Fig. 7 *Martes pennanti* (Fisher) Date: 11 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)



Fig. 8 *Martes pennanti* (Fisher) Date: 21 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)



Fig. 9 *Martes pennanti* (Fisher; on top of rock) Date: 28 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)



Fig. 10 *Martes pennanti* (Fisher) Date: 1 November 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)



Fig. 11 *Vulpes vulpes* (Red Fox) Date: 21 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)

Fig. 12 *Vulpes vulpes* (Red Fox)

Date: 21 October 2005

Same location as Fig 11.

This picture (part) was taken 2 minutes earlier and just barely shows a red fox dragging the baited stick out of the camera's viewing angle.





Fig. 13 *Vulpes vulpes* (Red Fox) Date: 28 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)



Fig. 14 *Procyon lotor* (Raccoon) Date: 12 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)

2. Birds



Fig. 15 *Bonasus umbellus* (female Ruffed Grouse) Date: 31 October 2005 Location Code: 05CA04 GPS: 44°09'02.8"N, 73°00'07.7"W Habitat: Rock outcrop near old fields (ES14/22)

3. Hunters



Fig. 16 Hunters Date: 7 October 2005 Location Code: 05CD02
GPS: 44°09'04.4"N, 73°01'12.1"W Habitat: ES14 near lower junk car
(This was the first picture taken with the new digital camera.)



Fig. 17 Hunter (same location as Whitetail deer in Fig. 5) Date: 13 Nov 2005
Location Code: 05CD03 GPS: 44°08'55.5"N, 73°01'07.8"W Habitat: ES14