

Four Foot Farm

An Ecological Inventory

March 31st - June 6th, 2014



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College of the Atlantic

Wildlife Ecology SP-14



Legend

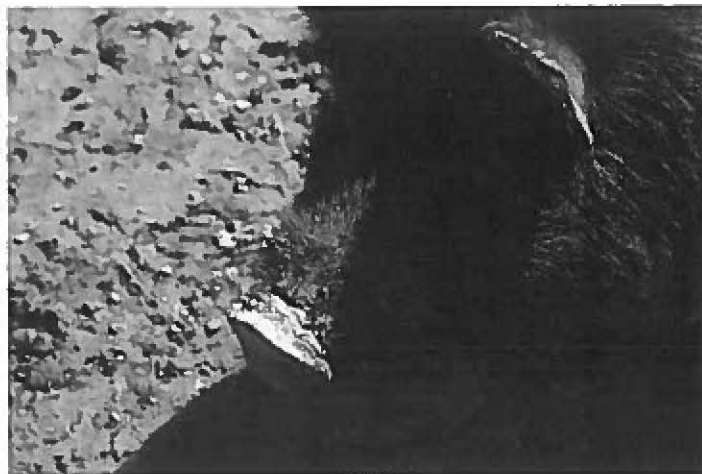
- human_disruption
- - - old_fencing
- - - trail_human
- Canoe stand
- bog
- fence
- clearings
- woodpile
- Vernal pool
- Acadia_national_park



Introduction

Four Foot Farm is a 40-acre property located in Bar Harbor near the head of Mount Desert Island, ME. It is most easily accessible by Maine Route 3, while runs along the east side of Mount Desert Island, though the property may also be accessed via Northeast Creek, which runs adjacent to the east side of the property. The farm is owned by Jay McNally, a College of the Atlantic alum and creator and former owner of Ibis Consulting. Jay's housing lot occupies about 4 acres on the north side of the property, while the farm itself, including farm buildings and fenced in pasture, occupies closer to 7 on the north and northwest parts of the property. He estimates that about 2 acres of the property are roads.

The farm is a working one, hosting pigs, laying hens, and domestic ducks. Adjacent to the main property is a therapeutic horse riding center called Willowind, where at least 6 horses graze on an enclosed pasture. There are currently 11 pigs being raised in a pen on the farm, though in the past the farm has raised 30 pigs at a time. 30 chickens and ducks roam freely around the premises of the farm, though the farm has had 150 chickens and ducks at one time in the past. Jay McNally also owns 3 domestic dogs that for the most part stay in the proximity of the farm buildings, though we caught them several times on our game cameras as they were out for a walk with a human. COA students also use the property for canoe access to Northeast Creek. It is worth noting that there is a trail to a clearing in the woods on the west side of the property, and on the opposite side of the clearing, there is a subdivision where many people reside, though this is a separate piece of property. In general, humans seem to be concentrated on the property at the farm buildings and on the trail to/from the subdivision and the park's field.



Besides those developments, however, the rest of the property (31 acres) is largely forested in the south and southwest parts of the property. From the northeast to the southeast corner of the property, a strip of woods parallels the river, and is a mixture of ericaceous shrubs, conifers, hardwoods, grasses, and mosses. Behind the enclosures just south of the house, a mowed field is interspersed with patches of spruce trees, some with accompanying birches, wildflowers, and shrubs. The line of spruce patches demarcates the boundary line between Four Foot Farm and Acadia National Park. The field continues on past the trees, and occupies about 20 acres in total. The field is mowed periodically by the Park, and lies adjacent to Northeast Creek, the coniferous forest, a vernal pool, and a wetland habitat. There are several trails accessible from two dirt roads running along the west side of the farm and behind Willowind, as well as from the park's field. For the most part the woods surrounding the property are largely unpenetrated by humans, though they are crisscrossed with deer trails.

This may not always have been the case. The southeast corner of the field managed by the Park has the remnants of an old stone wall, now covered with moss, peaking out from between cedars that have grown around it. Slightly north of the remains of the wall, an opening in the treeline extends from the field downhill into the woods. If one looks closely, they will see two shallow tire ruts, now covered with moss and fallen conifer needles. On the opposite side of the field (the west side) a stone wall extends for at least 100 meters, from the Vernal Pool Clearing all the way past the trail to the Trapping Clearing (see Locations of Interest). There are old lines of barbed wire lying among the stones and leaf litter, and on some trees one can see where the tree has grown around the wire and incorporated it into its trunk. Newer barbed wire

held up by green fiberglass poles pop up occasionally along the wall, and continue the wall past a large exposed rocky outcrop, where the stone wall ends. Furthermore, if one were to draw a straight line from the line of spruce patches in the field towards the treeline on the west side of the property, where that line meets the treeline is roughly the location of a raised berm and perhaps an old road that still remains relatively clear. All around the property there is evidence of previous farming use and partitioning of the parcel, and it is important to keep that in mind when thinking about how animals move across the landscape.

Madeline Motley (COA '16), Erickson Smith (COA '15), and Avery Lam (COA '15) conducted the first inventory of the property's fauna in the spring of 2014, from March 31st until June 6th.

Landmarks

There are certain landscape features and locations on the property that are important landmarks and hubs of animal activity. We would like to include them in this report so that future groups monitoring the property know where to start. The list below is roughly in the order one would encounter if they began close to the farm and moved away.

Canoe Launch

There is a canoe launch on the property east of the farm buildings that allows COA students and Jay's family to access Northeast Creek. In the surrounding area there is a strip of woods paralleling the creek, blueberry bushes, and exposed bedrock. We caught several deer on a game cam set up nearby.

Wood Pile

There is a woodpile next to the fence line that runs NW-SE to the east of the farm buildings, in between the fence line and the strip of woods that parallels the creek. If it remains on the property for a long time, it may be a good place to look for snakes, rodents, etc.

Hop Piles

There is a dirt road on the west side of the farm that runs from Route 3 up to the field at the lower end of the property. At the end of this road, there is a fence line that runs approximately E-W. Where the fence line and the road meet, there are two large piles of spent hops from a local brewery that Jay McNally keeps to feed his pigs. As these are outside of the fences, these piles may be good places to monitor scavenging.

Park Field and Spruce Patches

The park's field starts shortly after the fenceline farthest from the farm buildings. It is demarcated by posts that say "US Boundary." There is a line of spruce trees that have some lower brush and deciduous trees in their vicinity about 150 feet beyond the boundary. The third spruce from the right has a vernal pool surrounded by speckled alders next to it, and may be a good place to look for amphibians.



Campfire

There is another dirt road accessible if you turn right at the end of the dirt road perpendicular to Route 3. This dirt road goes behind Willowind and where it ends there is a trail that leads into the woods. Eventually this trail splits. If one takes the right-most trail, they will go downhill and come to a relatively flat forest floor. This trail continues and leads to a campfire,

which, when we encountered it, seemed to have been used recently. We were able to capture a coyote on camera in this location. Southwest of the campfire is a clearing which we did not adequately explore, but may be a good place to set up game cameras for large quadrupeds.

Old Berm

If one continues along the treeline on the west side of the field from the end of the dirt road, eventually on their right they will encounter a raised berm that has a large vernal pool to the right of it. This berm was wide enough to allow for an automobile to move across it. At the other end of the berm is a mound with sweetfern growing on it – a species known for growing in disturbed areas. Further back from the end of the berm is a relatively open part of the forest. In future explorations of land use, this may be a good place to start. The vernal pool is a good place to look for amphibians.

Clearing Trail and Trapping Clearing

Further along the treeline on the west side of the field is another trail that begins where the remains of an old stone wall become visible. This trail leads west into the woods towards a clearing. In the clearing is a large northern white pine. This is where the 2014 Wildlife Ecology class set up traplines for small mammals. Thus, the name of this clearing is Trapping Clearing. The game camera we set up here caught the most diverse array of animals: fox, coyote, deer, domestic dogs, humans, etc.



Vernal Pool and Vernal Pool Clearing

There is a vernal pool on the west side of the park's field. It is fairly visible, but if one walks along the treeline from the dirt road on the west side of the farm, they will go through a

wide corridor of trees to a clearing. This is the clearing we will refer to throughout this report as the Vernal Pool Clearing. From the clearing, if one turns left towards the field and walks downhill, they will come across the vernal pool, which is nearly circular in shape. In the clearing and at the pool we detected amphibians, deer, coyote, turkey, humans, and domestic animals.

Old Road and Wetland Crossing



Northeast Creek abuts the east side of field. The creek peels off from the field after a while, and after where that point the field is bounded by forest. If one walks along the treeline after where the field's border turns from creek to forest, they will eventually find a path downhill into the woods that is wider than a deer path, or even a human path. This is where the shallow tire ruts can be found, and where the Old Road is. If one follows the path down the grade towards the creek, it will turn right and parallel the creek. Eventually one will come across a place where there is an old beaver dam, and water flows across the trail, from a wetland area upstream into the creek, downstream. This is Wetland Crossing. Here we found otter feces, and were able to capture deer (including the only buck we saw on the property) and a raccoon on the game cameras. This is an excellent place to study the interactions between animals and the watershed.



Methods

Mapping

We used a Trimble Juno 3 GPS unit to map the features of Four Foot Farm and the surrounding landscape. The first structures we mapped were buildings, fence lines, human-made roads and trails, and the boundary line of the farm. These provide great reference points, and also show where the most human activity is likely to be. Evidence of previous human activity, such as an old stone wall and an old berm, were also mapped.

Areas that we thought were obviously different from each other we mapped as different “habitat” areas. These include areas like open fields, wetlands, and areas where the vegetation was largely dominated by a specific species such as red pine. Not only are these good reference points, but we were curious about any faunal species differences within these areas, and any change in the future.

We also mapped any obvious deer trails to show the network of deer movement across the farm. We may not have finished the entire network of deer trails, but it would be interesting to see any changes over the years once it is complete.

Points of interest were also taken and placed on the map as single points. These points include individual traps along our trap transects, game cameras, and fish traps. Other points of interest included evidence of animals, such as scat, egg shells, and bones.

Game Cameras

We used four motion-activated game cameras throughout our ten-week monitoring of the property to document animals – primarily large mammals – who were otherwise cryptic and disturbed by human presence. We used two different models of game cameras: the Moultrie 2013 M-880 Mini Game Camera and the Simmons Whitetail Trail Camera with Night Vision. We observed no significant difference between the two cameras in the quality of photos taken or ability of the camera in daytime or at night. The Simmons model was smaller, and had a more manageable attachment strap, so may be worth investing in when camera replacements are necessary.

Some camera locations were more successful than others: how consistently a camera captured photos of animals determined how long the camera would stay in that location. For example, in the first week of monitoring, we deployed all four cameras along the west shore of Northeast Creek. Only two of the four cameras captured photos of deer in their first week deployed. Over the course of the Spring, we found locations that were excellent camera traps, and rotated the remaining traps through new locations each week. In total, we placed cameras in 10 locations over the 10 weeks.

The most successful cameras were placed in corridors, like trails or in clearings: places that direct animal movement across the landscape. Cameras were attached by buckled strap or tied bands to trees, and on one occasion, a fencepost. The straighter and less knotty the trunk of the tree was, the better view the camera got. We aimed for the lens of the camera to be shooting parallel to the surface of the ground, for a maximum range of “vision”. The height on the trunk of the tree where the camera was placed varied depending on the tree’s foliage, the grade of the ground nearby, how dense the understory was, and the size of the animal we were targeting. For example, when we placed a camera nearby a burrow, we had the camera several inches above the ground, hoping to capture the animal at the burrow’s entrance. However, when targeting larger animals like deer and coyotes, cameras were placed a foot or more above the ground. In general, placing a camera higher up on a tree provided a wider field of vision where an area was clear, while by placing a camera lower down on a tree we were able to capture photos of a domestic cat and coyotes and animals that move relatively low to the ground.

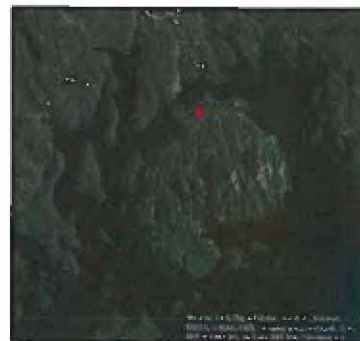
Cameras were checked at least once weekly, and the photos on their SD cards were downloaded in the field onto a laptop, and deleted from the card before it was returned to the camera body. Batteries were replaced when needed.

Traps and Game Camera Settings in Four Foot Farm



Legend

-  Acadia_national_park
-  bog
-  Vernal pool
-  clearings
-  woodpile
-  fence
-  Canoe stand



Trapping

Small Mammals

We used a total of 100 Sherman traps for the live capture of small mammals. Two 250 meter transects were set parallel to each other, one marked with yellow flags and the other with orange. Each transect had a total of 25 points that were 10 meters apart, with 2 traps at each point, one pointing northeast and the other southwest. Transects began in the Trapping Clearing and extended southeast into the forest. Each trap was baited with peanut butter mixed with raw oats and a small handful of cotton balls for bedding.

The traps were set at 1500 on May 8, 2014 and were officially closed at 0700 on May 13, 2014. A group of 2-3 students checked the traps every 6 hours at 0000, 0600, 1200, and 1800. Students walked along each transect, checking whether traps were open or closed. If they were open, we checked to see if they still had bait and bedding. Some traps were open and completely empty, having failed to trigger, and this was recorded. When we came across a closed trap, a student would put on gloves, tip the trap vertically, and check inside for an animal. On some occasions, traps were triggered without an animal inside. These were recorded. Those traps that either failed to trigger or were too sensitive were readjusted.

When a live animal was captured, we first measured the weight of the animal with the trap on a hanging spring scale. (Originally we attempted to measure the animal in a small bag, but upon some escapes we decided to measure them in the trap before they were released.) The trap was then partially opened and the animal was identified and released into a larger bag for easy handling. The animal was then sexed and marked with either weather resistant paint or nail polish. Each animal was marked with a different pattern and different colors, and recorded. Measurements of the nose to vent, head, and tail were then taken. The animal was then released and the trap was re-baited and set.

During bad weather, such as rain, traps were closed so that animals wouldn't get too cold within the traps during the 6 hour intervals.

Small Fish

We used a torpedo-shaped live minnow trap to see what small fish were in Northeast Creek. The trap was set at 2 different locations. The trap was tied to a rope and thrown out about

3 meters. At each trap site, the trap was checked once about half a day after it was set, and on another day at the same site about hour and a half after it was set. Tides were not taken into account. This was mainly because the traps were set to see what small fish species were in the creek, although a more systematic way of checking could be implemented if one wanted to study the populations more carefully. When checked, the fish were identified and sexed if the species was sexually dimorphic. After a few trap checks we began to measure the length of each fish.



Set minnow trap at location 2.

Animal Activity Survey

A systematic animal activity survey was conducted on the grassland and open field within the property in a sunny afternoon. We used a U-pattern search to look for signs of all animal activities (tracks, scats, fur, etc.) in the field . We walked along the field in a long straight line, turns 90 degrees and walked for a short length, and then walked another long length so to cover the whole open field. We recorded all signs of animal activity and plotted them in maps for evaluation. The density of signs of deer activity in the field was also examined (see Results

section). The survey gave us a better idea of where animals in the property are more active and survey observations contributed to the species list.

U-pattern search to survey the open field and grassland without the farm fence

Rabbit scats and deer scats look very similar, but rabbit scats can be distinguished from deer scats by looking at the texture and shape of the scat. Rabbit scats are more grainy and are oval-shaped, while deer scats are smoother and sometimes of a more irregular shape.



<--Deer scat

Rabbit scat -->

Incidental Observations

Incidental observations occurred mostly when we were en route to checking game cams, mapping landscape features, or on our way to the traplines. We either saw species live or saw evidence of them (e.g. fur, scat, etc.) while out on the farm. While we did actively look for new

species to augment the site's species list, we were often not looking systematically. We recorded the way in which we came across each of these species, seen in the Results section of this paper. In the end, incidental observations made up a large portion of our final species list.

Game Cameras

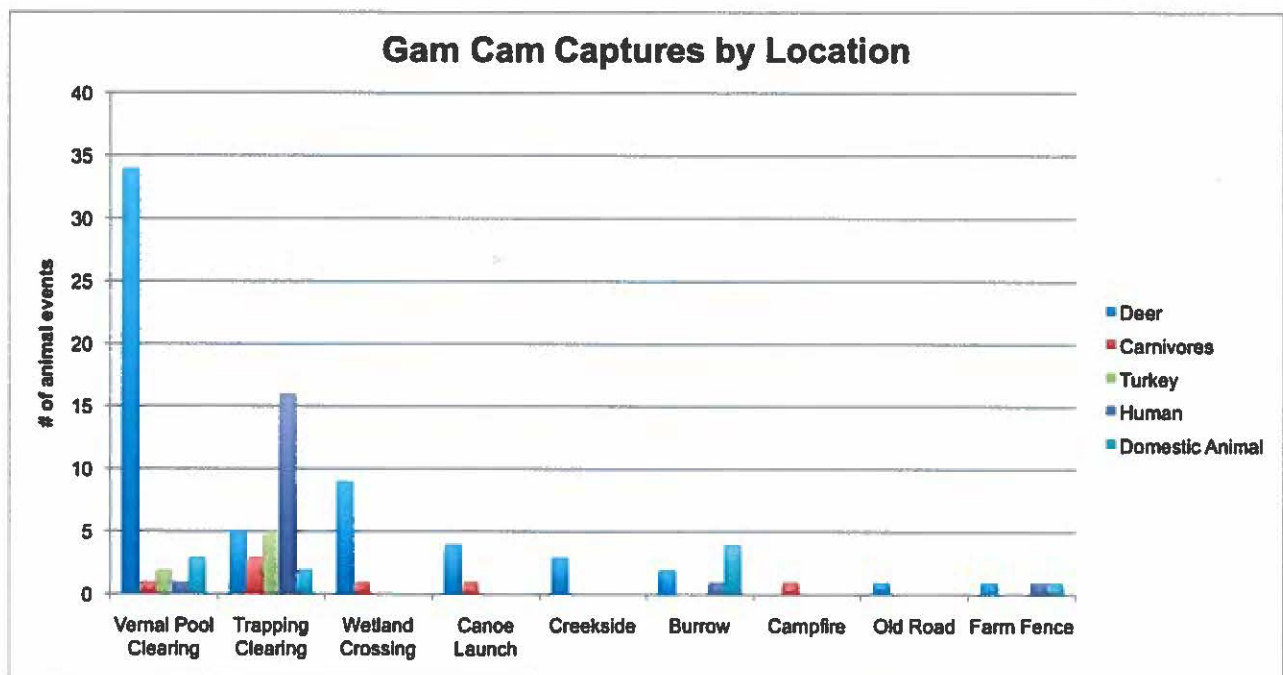
A total of 9 locations were monitored over the 10 week monitoring period, though no location was monitored for the whole 10 weeks. In reviewing the data from the cameras, we have decided to quantify our data in terms of “animal events”. 1 deer event means an individual deer was caught on camera at one time of the day. If there were 2 deer in one frame, that would count as two deer events. However, 1 deer being caught in 24 frames over a 5 minute period as it grazed in front of the camera only counted as 1 deer event.

Overall, there were 55 deer events, 7 carnivore events (4 coyote, 2 fox, 1 raccoon), 7 turkey events, 19 human events, and 8 domestic animal events (7 dogs and 1 cat) over the the course of the 10 week monitoring period. In total, there were 94 animal events, and 241 photos documenting those events. Minimum populations of fauna are as follow: 4 deer (based on Erickson’s observation on 4/21/14), 1 coyote, 2 turkey, 1 fox, and 1 raccoon.

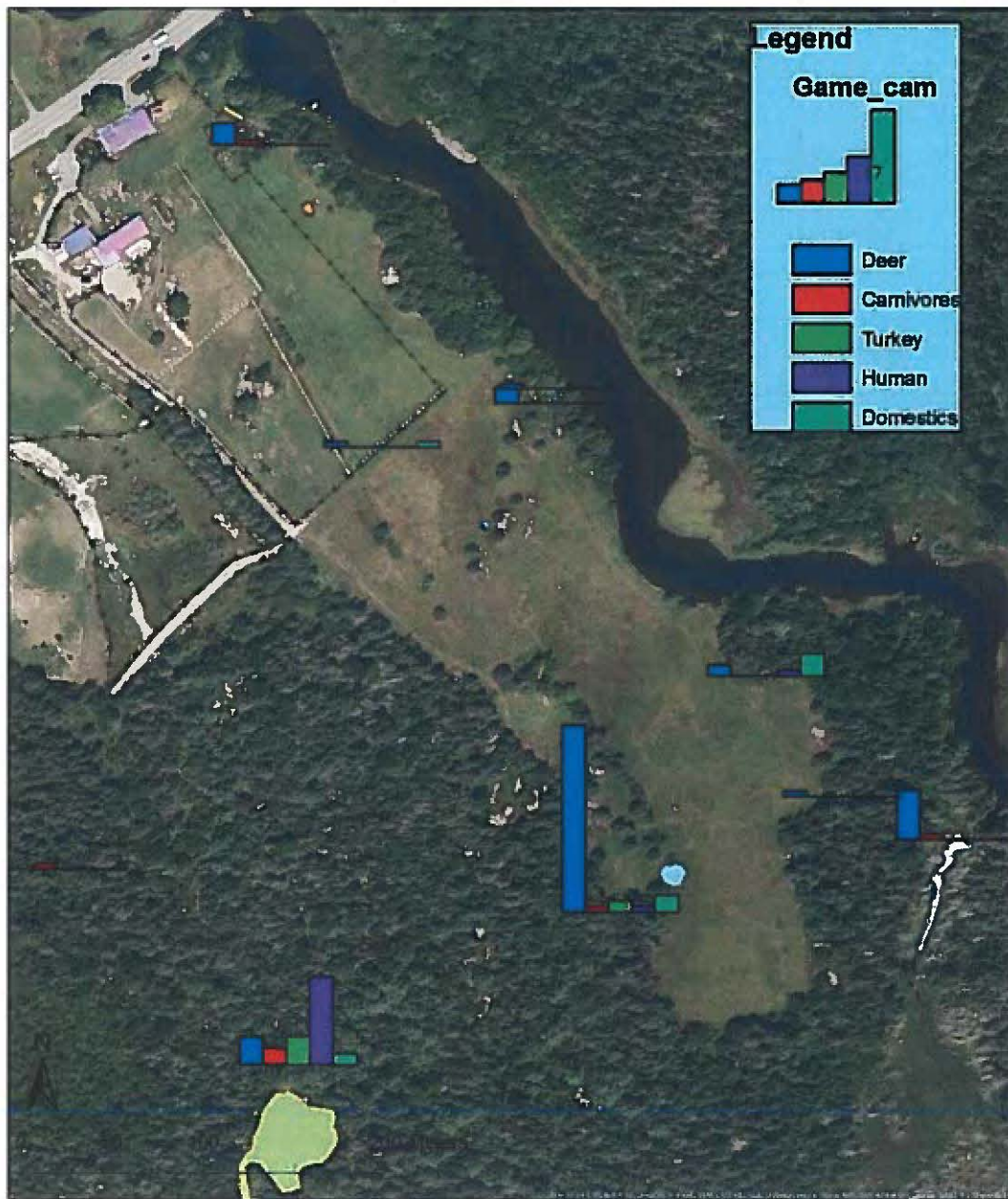
The table below shows the locations where cameras were placed, how long each location was monitored, and the number of animals captured on each camera.

Cam	Dates of Monitoring	Duration of Monitoring (in days)	Deer	Carnivore	Turkey	Human	Domestic Animal	Total ‘Wild’
Vernal Pool Clearing	April 29 – June 3	35	34	1 coyote	2	1	3 dog	37
Trapping Clearing	April 29 – June 3	35	5	2 coyotes, 1 fox	5	16	1 dog, 1 cat	12
Wetland Crossing	May 22 – June 3	12	9	1 raccoon	—	—	—	10
Canoe Launch	April 4 – May 8	34	4	1 fox	—	—	—	5
Creekside	April 4 – April 28	24	3	—	—	—	—	3

Burrow	May 12 – May 20	8	2	—	—	1	4 dog	2
Campfire	April 29 – May 8	9	—	1 coyote	—	—	—	1
Old Road	May 8 – May 22	14	1	—	—	—	—	1
Farm Fence	May 20 – June 3	14	1	—	—	1 truck	1 dog	1



Game Camera Results



While the Vernal Pool Clearing cam clearly captured the greatest number of animal events, the Trapping Clearing game cam was consistently more diverse, as we captured a wider variety of animals more often. Though there were turkeys and a coyote at the Vernal Pool Clearing, those were somewhat anomalous events. We can say with some certainty that coyotes and turkeys frequent the area around the Trapping Clearing. Because that was the location where we trapped, however, there was also the largest occurrence of humans in the area (though many of these were the Wildlife Ecology class checking traps). Walkers, presumably from the subdivision on the other side of the clearing, were also caught on camera several times.

The data demonstrate that clearings are the ideal places to capture wildlife by camera. This could be due to the fact that the sightlines are clear and the camera is simply able to distinguish the animals from the brush, but, in the case of deer, we believe the clearings also provide the edge habitats that deer thrive in and are attracted to for forage. In turn, coyotes may be present in these areas if they are tracking deer and their movements. However, the Trapping Clearing was also an excellent source of small mammals (see Trapping below), which may be why we saw coyotes the most in that clearing.

The fox photos were captured in two locations: at the canoe launch, and at the Trapping Clearing.

It was hard to predict where we would see turkeys. It is interesting that we only captured them on camera in the Southeast of the property. This may suggest that turkeys prefer the cover of the coniferous forest, and/or that the wooded strip abutting Northeast Creek was not wide enough for forage and/or for cover.

The raccoon photo was captured the night before we finished monitoring at the Wetland Crossing.

In the future, we recommend setting up cameras at the Wetland Crossing, at the Vernal Pool Clearing, and at the Trapping Clearing again, as these sites were excellent game camera traps. If future monitoring groups would like to try other sites, we recommend camera-trapping only trails and clearings, as other locations were far less fruitful.



A coyote caught on its way to the Trapping Clearing on May 16th at 0026.

Two deer graze at the Vernal Pool Clearing, May 14th at 1109.



A raccoon trundles past the cam on its way to Wetland Crossing on June 2nd at 2042.

A turkey poses for the camera as it sidles towards the Trapping clearing on May 4th at 1534.





Jay's domestic dogs, such as his German Shepherd, pictured here, occasionally appeared on the cameras that were monitoring the fields. This photo was taken at the Burrow Cam on May 14th at 1554.



With the exception of one other fleeting glimpse at the far end of the park's field, the only buck we saw the entire time we were monitoring the property was this young buck at Wetland Crossing, who seemed to frequent this area regularly. Photos were taken on June 1st at 0847 and June 3rd at 1830.

Trapping

Small Mammals

Out of the 17 animals caught, there were a total of 4 different species. The American red squirrel (*Tamiasciurus hudsonicus*) was caught on 9 occasions, the white-footed mouse

(*Peromyscus leucopus*) on 4 occasions, the northern flying squirrel (*Glaucomys sabrinus*) on 3 occasions, and the hairy-tailed mole (*Parascalops breweri*) was caught once. Due to weather, traps were closed May 9, at 18:00, and reopened on May 11, at 6:00. The traps were checked a total of 14 times in 6 hour intervals. The rate of capture per 6 hours is 1.21 mammals. The Shannon-Wiener diversity index is 0.4995.

No small mammal was recaptured.

There was one fatality on 5/12/14, of a red squirrel.

Date	Time	Trans ect	Flag	Species	Marking	Sex	Weight (g)	Nose- Vent (cm)	Tail (cm)	Head (cm)	Notes
5/8/14	0:28	O	9 right	red squirrel							jumped on Chris and Tallulah
5/9/14	6:15	O	25 left	northern flying squirrel	green right back left leg	M	110				
5/9/14	12:09	Y	19 left	red squirrel	red left thigh, purple right thigh	M	180		13.75		
5/11/14	7:26	Y	23 right	white-footed mouse			35				
5/11/14	7:35	Y	20 left	red squirrel	purple right thigh	M	140	15.664	14.442	4.419	
5/11/14	18:50	O	16 right	red squirrel	red right thigh						
5/11/14	19:03	Y	24 right	red squirrel	pink right thigh, purple left thigh	F		15.1	14.775		
5/12/14	6:00	O	11 east	hairy-tailed mole							
5/12/14	6:00	O	19 east	white-footed mouse							

5/12/14	6:00	Y	16 west	white-footed mouse							
5/12/14	18:00	Y	14 left	red squirrel	blue right thigh, blue left thigh	M	300 (w/ pillowcase)	17.5	10		
5/12/14	18:00	Y	25 right	red squirrel	green right, blue left	M	200	17.5			
5/12/14	18:00	Y	1 left	red squirrel	green right, green left	F					died, ribs crushed
5/12/14	18:00	O	6	northern flying squirrel							
5/12/14	18:00	O	8 right	red squirrel							
5/13/14	6:00	O	20 left	white-footed mouse			20				
5/13/14	7:00	Y	7 right	northern flying squirrel	purple right shoulder, purple left hip						

	<i>Number caught</i>	<i>Proportion</i>
<i>Hairy-tailed mole</i>	1	5.882%
<i>Northern flying squirrel</i>	3	17.647%
<i>Red squirrel</i>	9	52.941%
<i>White-footed mouse</i>	4	23.529%
Total	17	100%
Shannon-Wiener Index (H')	1.150	
Maximum diversity possible (H_s)	1.386	
Number of equally common species required to produce the same level of species diversity ($e^{H'}$)	3.158	

Species richness (S)	0.970	
Evenness (E)	0.830	

$$H' = - \sum_{i=1}^k p_i \ln p_i$$

The Shannon-Wiener Index represents the species diversity in the area sampled. It assumes that all individuals are randomly sampled, population is indefinitely large, or effectively infinite and all species in the community are represented. The index alone does not give the very useful information, but it is a good tool for comparing biodiversity in different habitats or changes in different years. It can also be used to calculate the evenness of species distribution in the area, the smaller E is, the more skewed the species distribution is.



A white-footed mouse is released (above).



A squirrel is marked with purple nail polish (left).



Small Fish

Mummichogs (*Fundulus heteroclitus*) was the only species caught in the traps. There were no fatalities. About 5.9 mummichogs were caught per hour the trap was left out. The tide was not taken into much consideration, but should be in the future.

Date Set	Time Set	Date Checked	Time Checked	Male	Female	Total
5/20/14	22:00	5/21/14	11:00	25	34	59
5/22/14	13:30	5/22/14	15:00	5	14	19
*5/23/14	21:00	5/24/14	8:00	37	32	69
*6/3/14	16:00	6/3/14	17:30	3	10	13

*Traps set at site 2.

Note at site 2: an abundance of fish were clearly visible from the shoreline.

Measurements taken of fish from 6/3/14

Female (cm)	5.2	n/a	5.0	4.2	5.1	4.3	n/a	4.4	4.2	4.1	4.1
Male (cm)	6.2	5.1	n/a								



Male *Fundulus heteroclitus*.



Mummichogs after first trap check.

Animal Activity Survey

Tracks and Scats

Multiple tracks of turkey and deer were observed in the open field. All the turkey tracks and most of the deer tracks were seen by the field between the farm fence and the creek. Tracks were not seen in other parts of the field, most likely because of the longer grasses in other area. Scats of geese, deer and rabbit were found across the field as well. Goose excrement was mainly found on the rocks by the creek. The scats of rabbit show that there were rabbits on the property, even though we had not seen one on game camera or in person. More comprehensive and multiple surveys should be conducted in the field and woods in the future to capture a better sense of animal activity in the property.

Density of signs of deer activity

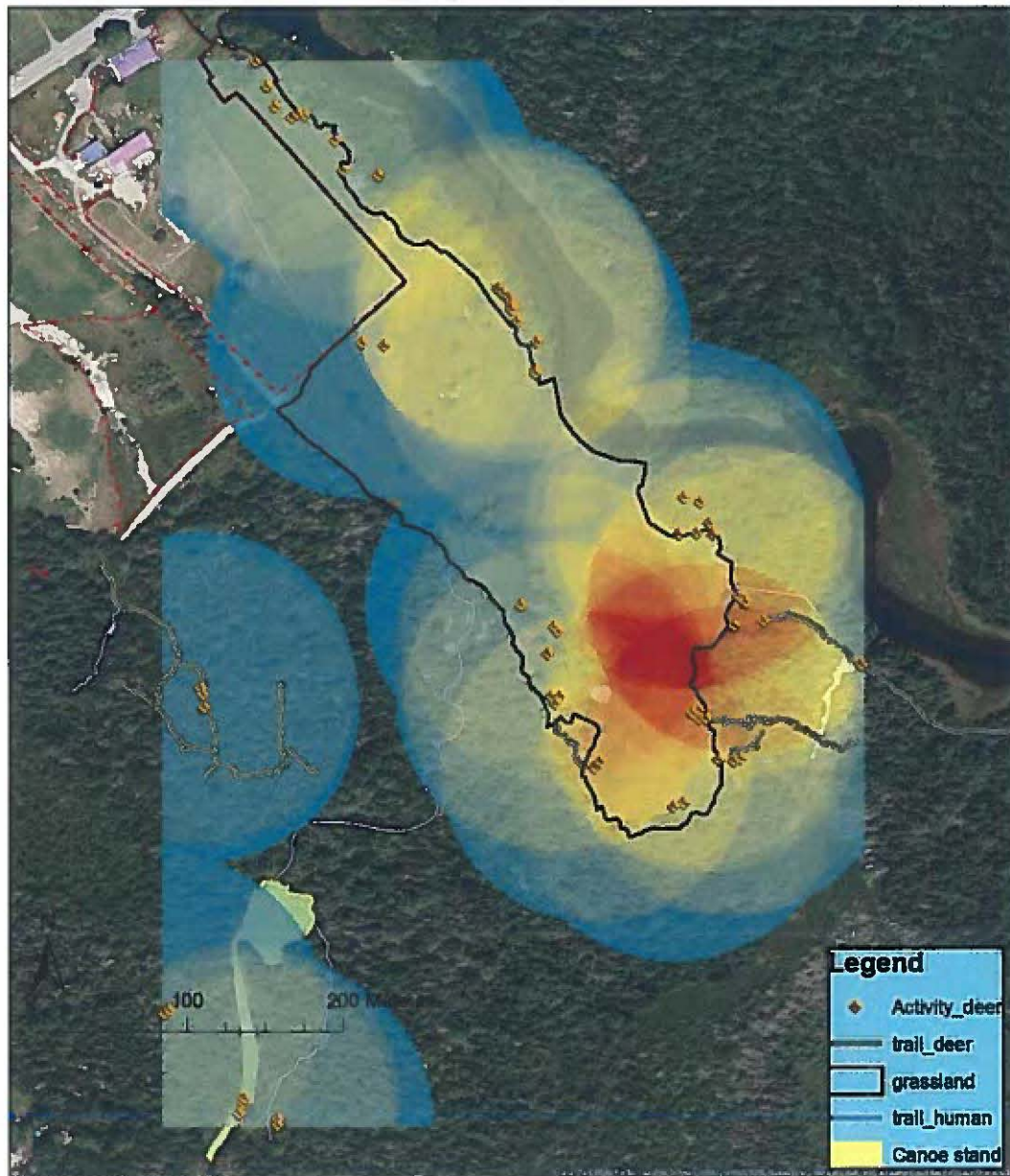
There were numerous signs of deer activity, including tracks, scats, game cam pictures and actual encounter, observed in the field. All signs of deer activity recorded during the survey were plotted on the map to demonstrate the density of the signs of deer activity in the openfield. There were also more signs of deer activity in areas close to the deer trails. The signs of activity were most intense by the SE edge of the grassland, and most signs were concentrated by the edge of the field. There was no sign of deer activity in the middle of the field. It seems that deer only occupy the periphery of the field as there were little signs of them walking across the field, except for right by the farm fence. The grasses of the middle of the field were significantly longer than at the periphery likely due to the lack of grazing by deer in the middle of the field. Note that even the density map (below) does not actually show the density of deer population on the property , it can give a brief picture of where the deers prefer to go. This will be helpful in predicting their activity patterns under different circumstances.

Animal Activities in Four Foot Farm



Legend	
●	otter
⊙	rabbit
⊕	geese
●	turkey
●	Deer
—	trail_deer
—	trail_human

Density of Signs of Deer Activity



Incidental Observations

Birds

Mallard duck *Anas platyrhynchos*

One adult mallard duck, along with at least 9 ducklings, were seen in the vernal pool. When they sensed our presence, they hunkered down underneath the brush at the edge of the pool. When approached, they quickly swam to the other side of the pool and hid in a bush. They all stuck closely together and were quiet when in hiding. Because of their fear of humans, we believe these to be wild ducks, and not apart of Four Foot Farm.

Two eggs, both cracked open, were found just beyond the fenceline, into the open field behind Four Foot Farm, about 2m apart. They were large, 6cm by 4cm, and purely white. (Pictures) We believe these to be duck eggs, but are likely from the farm.



American crow - *Corvus brachyrhynchos* Crows were often seen flying over the farm in clear areas. Additionally, crow feathers were often found in the forested areas.



Raven *Corvus corax*

One raven was spotted flying above the fenced area of Four Foot Farm on 5/20/14. It was identified by appearance, shape of the wings, and flight pattern.

Herring gull *Larus smithsonianus*

Ring-billed gull *Larus delawarensis*

About 150 gulls were seen at once, on the ground and within the horse fence line of Willow Wind. Additionally, there were about 20 in the sky, flying above.
O

Bald eagle *Haliaeetus leucocephalus*

Two bald eagles, on different occasions, were flying over Northeast Creek and the forest area that runs between

Pileated Woodpecker *Dryocopus pileatus*

Pileated woodpeckers appear to be on the property. Cedars along the southeast edge of the park's field bear the m

Canada Goose *Branta canadensis*

Canada geese were seen flying over the farm near Northeast Creek. We also found geese scat along the river trail. Students of Wildlife Ecology also reported hearing them

European starling *Sturnus vulgaris*

17 European starlings were identified in the clearing behind the farm by John Anderson on April 10, 2014

American robin *Turdus migratorius*

5 American robins were spotted on the farm by John Anderson on April 10, 2014. Additionally, we occasionally saw robins moving within the trees along the edge

Northern flicker *Colaptes auratus*

One Northern flicker was identified on the farm by John Anderson on April 10, 2014.

Owl unidentified species

Students of Wildlife Ecology reported hearing an owl at 6:14 on 5/12/14 while checking traplines, though were unable to identify the species.



Ring-billed gulls,



on 5/12/14.

Yellow Warbler *Dendroica petechia*

A yellow warbler was seen hopping through the branches of trees near the Wetland Crossing.

See Game Cameras (above) for Wild turkey; and Animal Activity Survey (above) for geese.

Mammals

North American river otter *Lontra canadensis*

Scat was found near the old beaver dam, just off of Northeast Creek, and filled with what was obviously some sort of crustacea. (picture) We believe this to be the scat of the North American River Otter. Jay McNelly has also confirmed that he has personally spotted River Otter on his property.



Eastern gray squirrel *Sciurus carolinensis*

Eastern gray squirrels were commonly seen throughout the farm. We saw them climbing in the trees along trails within the forest and along our trapline transects. However, no gray



squirrels were caught in the Sherman traps.

American red squirrel *Tamiasciurus hudsonicus*

Red squirrels were fairly ubiquitous on the property. We saw them in trees along the traplines, and also in trees above the old road leading to Wetland Crossing. Their chattering could be heard along the trail to the Trapping Clearing as well. Additionally, we caught 9



squirrels in the traplines (see photo below).

North American porcupine *Erethizon dorsatum*

Although members within our group did not personally see porcupines, Jay McNelly, owner of the property, reports that he has observed porcupines on the farm.

See Game Cameras (above) for White-tailed deer, coyote, American red fox, and raccoon; and Animal Activity Survey (above) for rabbit.

Herps

Garter snake *Thamnophis sirtalis*

Two garter snakes were spotted. One was found along the orange trapline transect and caught. A second was found in the Trapping Clearing.



American bull
catesbeianus
A bullfrog was h

frog *Lithobates*

Spring Peeper
Spring
heard in the

Pseudacris crucifer
Peepers were
wet area behind

Willowind Stables on 4/17/14. They were also reported by students of Wildlife Ecology while checking the trap

Wood frog – *Rana sylvatica*

Wood frogs were observed in the vernal pool directly next to the old berm on 5/20/14.

Yellow-spotted salamander – *Ambystoma maculatum*

Steve Ressel identified Yellow-spotted salamander tadpoles and/or eggs in the field vernal pool on 5/20/14.

Invertebrates

Blue mussel *Mytilus edulis*

Blue mussel shells were frequently found broken open on the ground, most often near the entrances of the driveway and along fence posts. These areas are near the river, giving us reason to believe that there are blue mussels in Northeast Creek.

American eel *Anguilla rostrata*

Elver nets were set up on Northeast Creek throughout spring downstream of Four Foot Farm.

Eastern tent caterpillar *Malacosoma americanum*

We first noticed eastern tent caterpillars in the foliage of the deciduous trees in the spruce patches in the field on May 22nd. In some trees the caterpillars were still within their tents, but



in others, the caterpillars had emerged and were crawling along the branches.

See **Small Fish Trapping** (above) for **Mummichog**.

Future Monitoring

Questions and suggestions for future classes

In this section, we've provided suggestions and possible questions for future studies that we would have liked to answer. These are things that we thought of as our project progressed, and with limited time were unable to answer with confidence.

Game Cameras

- Some animals are very elusive. Try baiting a game cam trap to attract animals. This may interfere with other studies, so this method should only be used if one simply wants to see what species are in the area.
- Set up a game camera in the clearing to the west of the Campfire. We were unable to explore that area and it looks like an excellent open space for camera trapping.

Animal survey

- More comprehensive deer activity survey in the woods
- Multiple activity surveys in the center of the property to get a better understanding of their habitat preference
- Bird surveys along the creek and by the wetland area

Mapping

- Continue mapping deer trails to complete the network, and monitor any change throughout the years.
- Conduct additional deer scat surveys.

Trapping

- Setup pit traps around the property to catch different species of herps.
- Set up traps in the grassland and open field in the middle of the property to capture and confirm the existence of snowshoe hare

Northeast Creek

- Use the canoe to explore the creek, wetland area, and bog.
- Continue minnow trappings on a consistent schedule and calculate the capture rate.
 - Look at sex ratios and sexual dimorphism
 - Measure each fish
- Use traps along several different points on the river- there appears to be a size difference.
- Pay attention to the tide.
 - Does it affect trapping success?
- Use larger nets (which may be available for use from COA) to catch a variety of species in the creek.

Vegetation

- Create a comprehensive vegetation map. It will help to predict animal activity, for example. Mapping of deer yards can help predict the activity pattern of deer during winter
- Measure the length of grasses at different points in the field to see if deer are impacting the edges more than the center of the field.

Species List

Birds

Mallard duck – *Anas platyrhynchos*

Canada goose – *Branta canadensis*

Herring gull – *Larus smithsonianus*

Ring-billed gull – *Larus delawarensis*

Wild turkey – *Meleagris gallopavo*

American crow – *Corvus brachyrhynchos*

Raven – *Corvus corax*

Common grackle – *Quiscalus quiscula*

American woodcock – *Scolopax minor*

Barn swallow – *Hirundo rustica*

American robin – *Turdus migratorius**

European starling – *Sturnus vulgaris**

Northern flicker – *Colaptes auratus**

Bald eagle – *Haliaeetus leucocephalus***

Pileated woodpecker – *Dryocopus pileatus*

Owl - Order Strigiformes

Mammals

American red squirrel – *Tamiasciurus hudsonicus*

Eastern gray squirrel – *Sciurus carolinensis*

Northern flying squirrel – *Glaucomys sabrinus*

White-footed mouse – *Peromyscus leucopus*

Hairy-tailed mole – *Parascalops breweri*

Eastern coyote – *Canis latrans*

American red fox – *Vulpes vulpes fulves*

Raccoon – *Procyon lotor*

North American river otter – *Lontra canadensis*

White-tailed deer – *Odocoileus virginianus*

North American porcupine – *Erethizon dorsatum*****

Snowshoe hare (tracks and feces)

Herps

Spring Peeper – *Pseudacris crucifer*

Wood frog – *Rana sylvatica*

American bull frog – *Lithobates catesbeianus*

Yellow-spotted salamander – *Ambystoma maculatum****

Garter snake – *Thamnophis sirtalis*

Fish

Mummichog – *Fundulus heteroclitus*

American eel – *Anguilla rostrata*

Invertebrates

Bumblebee – *Bombus* spp.

Eastern tent caterpillar – *Malacosoma americanum*

Blue mussel – *Mytilus edulis*

Grasshopper – Suborder Caelifera

Trees

Red maple – *Acer rubrum*

Northern white cedar – *Thuja occidentalis*

Paper birch – *Betula papyrifera*

Speckled/gray alder – *Alnus incana*

Balsam fir – *Abies balsamea*

White spruce – *Picea glauca*

Northern white pine – *Pinus strobus*

Larch/Tamarack – *Larix laricina*

Plants

Creeping wintergreen – *Gaultheria procumbens*

Sheep laurel/Lambkill – *Kalmia angustifolia*

Juniper – *Juniperus horizontalis*

Sweetfern – *Comptonia peregrina*

Cattails – *Typha* spp.

Large cranberry – *Vaccinium macrocarpon*

Lowbush blueberry – *Vaccinium angustifolium*

Wild raspberry – *Rubus* spp.

Flowers

Common dandelion – *Taraxacum officinale*

Violet – Family Violaceae

Bluet – *Houstonia caerulea*

Wild strawberry – *Fragaria* sp.

Pink Lady Slippers - *Cypripedium acaule*

*Observed – John Anderson

**Observed – Chloe Chen-Kraus

***Observed – Steve Ressel

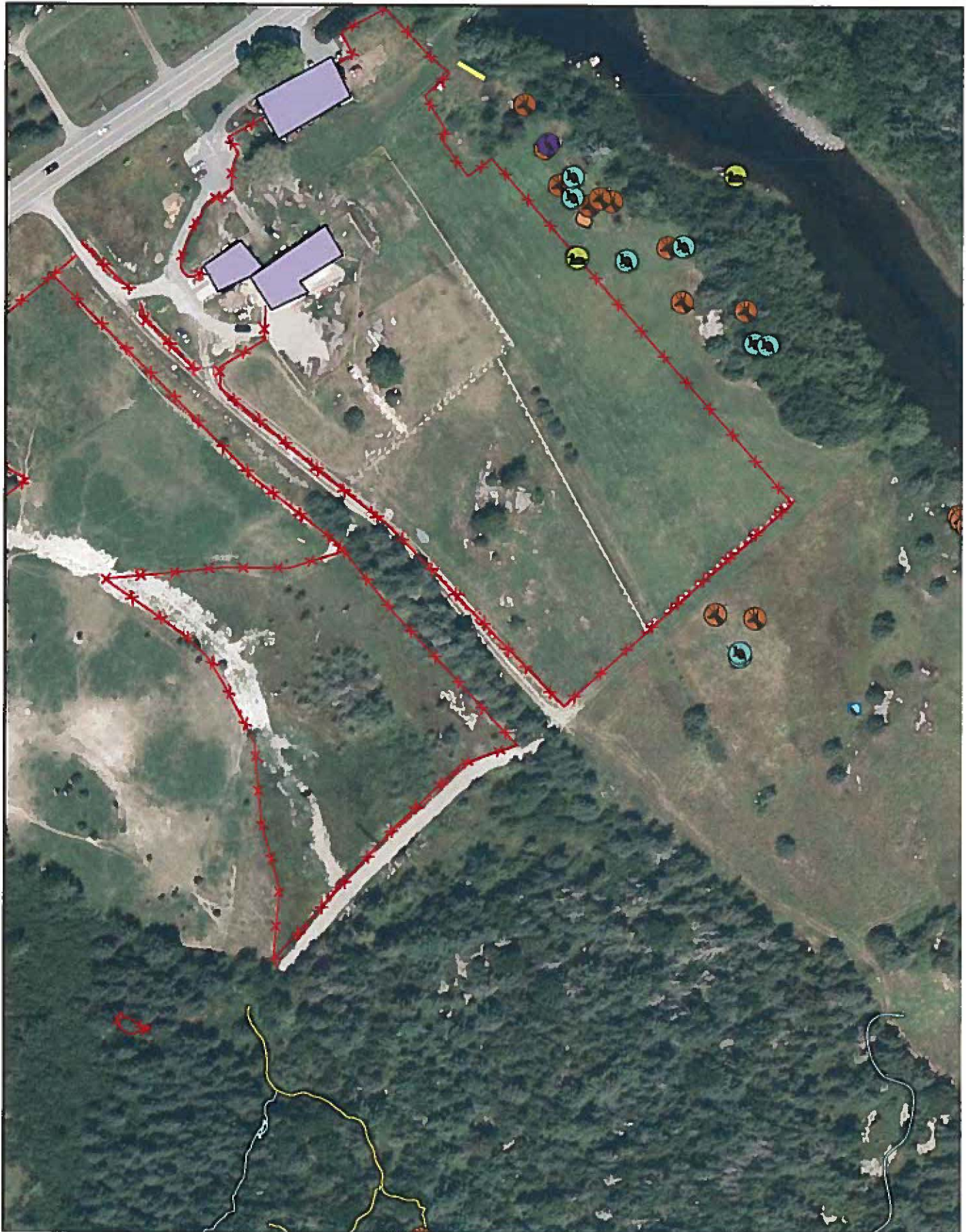
****Anecdotal – Jay McNally

Animal Activities in Four Foot Farm



Legend	
	otter
	rabbit
	geese
	turkey
	Deer
	trail_deer
	trail_human

Animal Activities

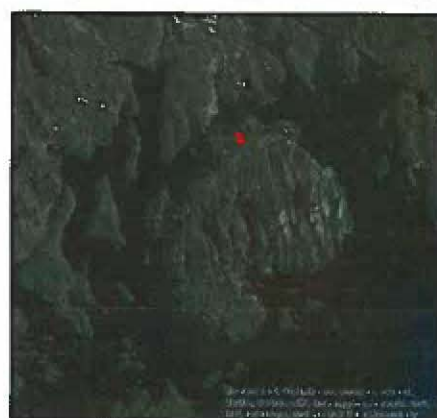


Trace of Human Activity in Four Foot Farm

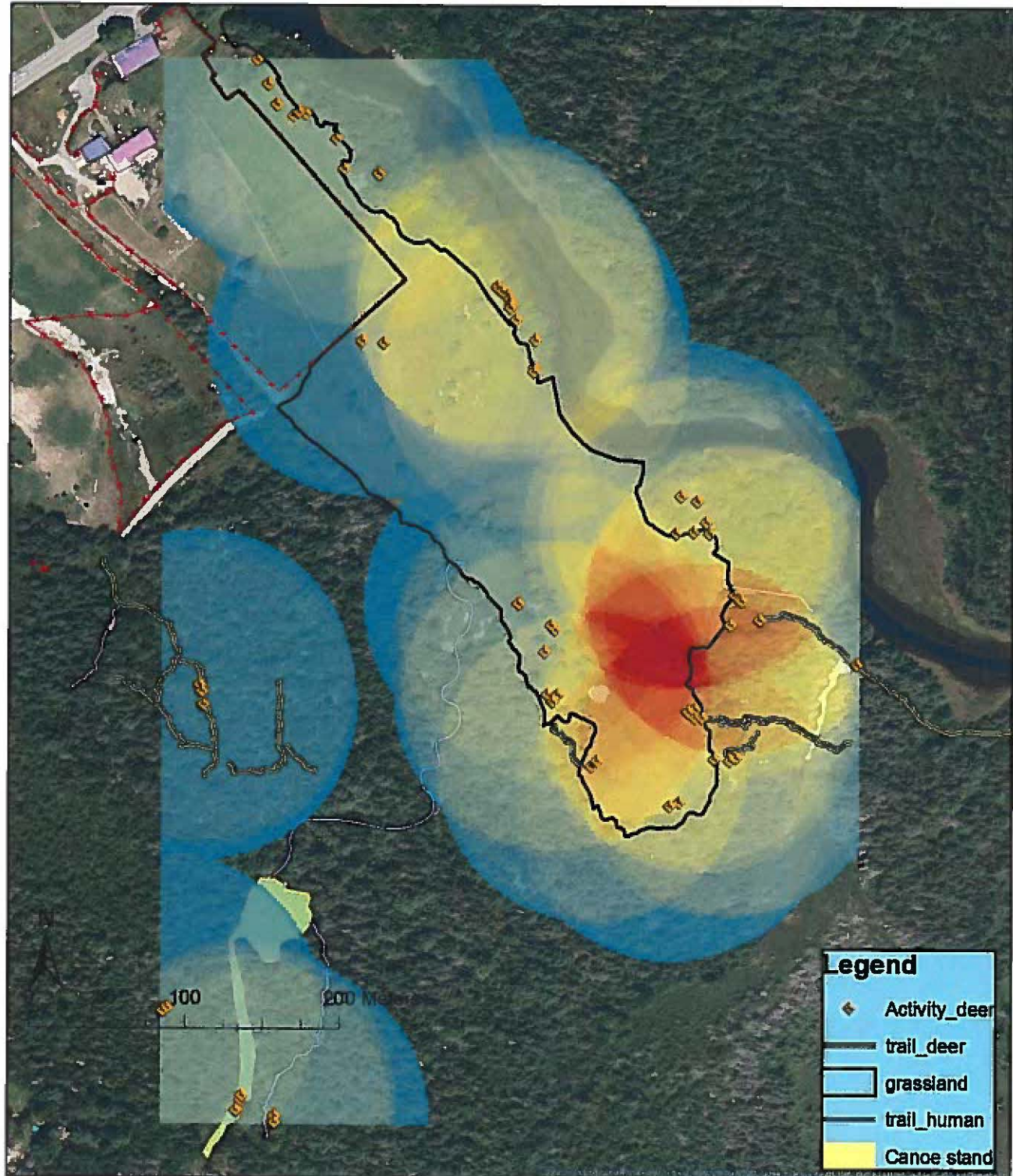


Legend

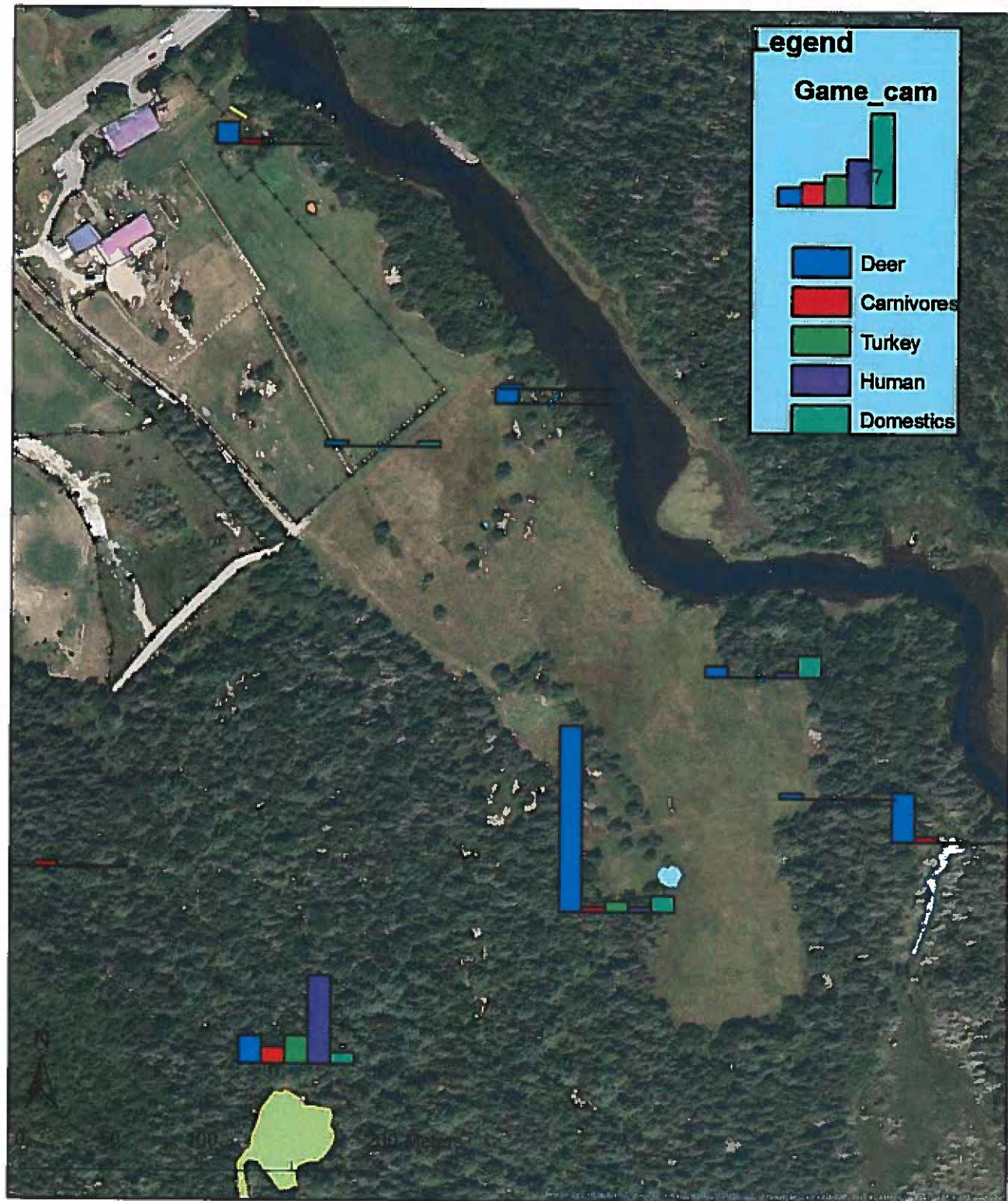
- human_disruption
- old_fencing
- trail_human
- Canoe stand
- bog
- fence
- clearings
- woodpile
- Vernal pool
- Acadia_national_park



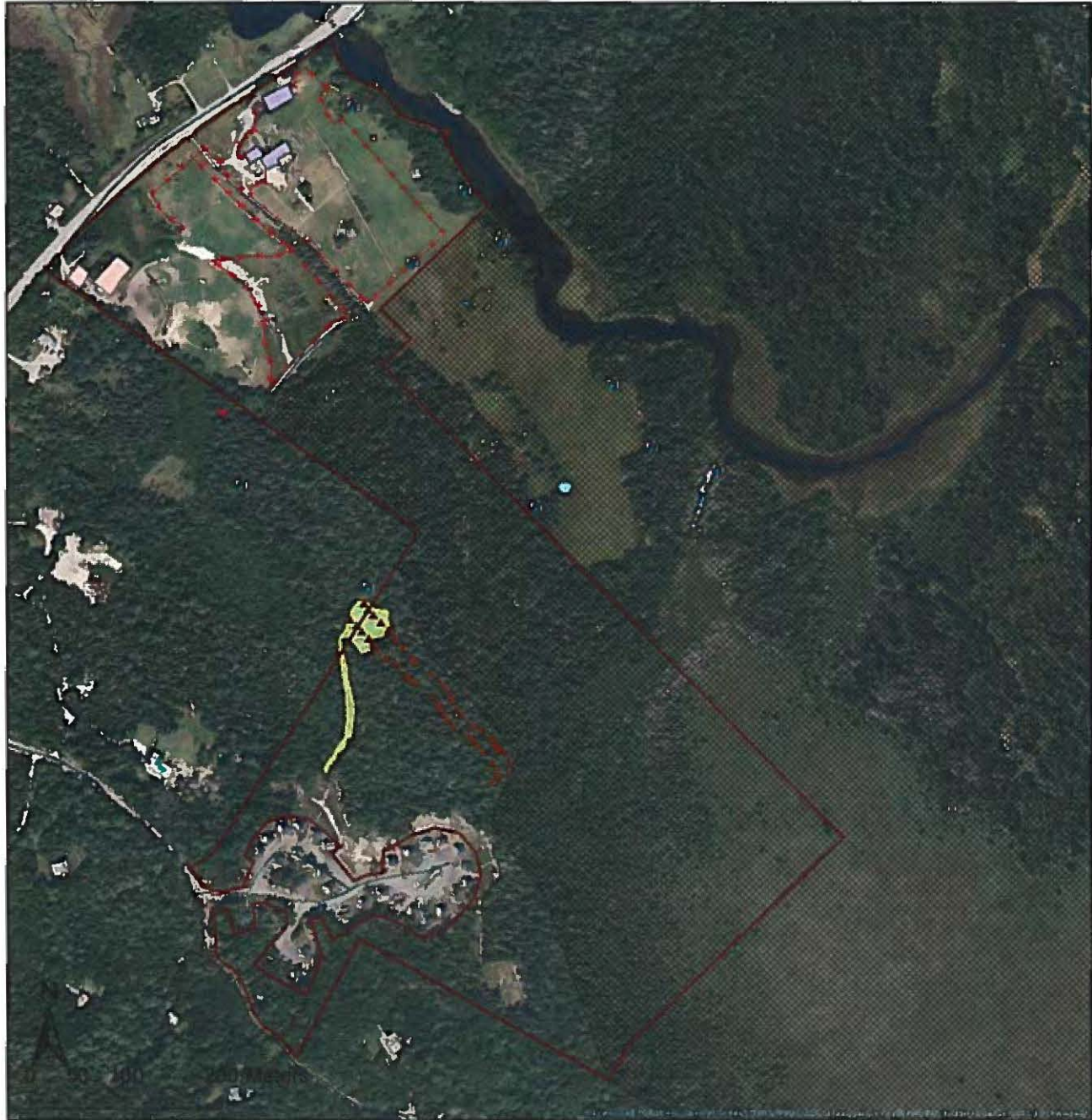
Density of Signs of Deer Activity



Game Camera Results



Traps and Game Camera Settings in Four Foot Farm



Legend

-  Acadia_national_park
-  bog
-  Vernal pool
-  clearings
-  woodpile
-  fence
-  Canoe stand

