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EEB 4825 Telemetry

Home Range of *Procyon lotor* in Itasca State Park, MN

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Introduction: *Procyon lotor*, commonly known as raccoons, are native to North America.

Raccoons are omnivorous and nocturnal. They prefer to live in wooded areas with hollow trees serving as nests. In the winter they do not hibernate but are able to go the whole winter without eating and can stay in their den for long periods of time. Raccoons can cover extensive distances when they travel and also are able to swim.

Home range is the area used by an animal in the course of its usual movements, excluding migration. Raccoon home range varies by sex, age, and habitat. Females tend to have smaller ranges than males. Adults tend to have larger ranges than juveniles. If a habitat is abundant with resources the raccoon will have a smaller range compared to a raccoon with a resource poor habitat.

The purpose of this study was to find the home range of five raccoons in Itasca State Park, MN.

The raccoons were radio collared and tracked for ten days to obtain the home range data.

Methods: The raccoons were trapped using live traps with peanut butter and crackers placed around the cages as bait. The first sets of traps were set out on 5-27-2010 at 20:30. Four traps were placed north of the boat house by the lake shore and four traps were placed south of the boathouse close to the lake shore. By placing the traps close to the water the traps were less likely to trap skunks instead of raccoons. At 6:30 the next morning the traps were checked. Two raccoons were found in the traps south of the boat house. At 20:30 on 5-28-2010 the traps were set again and at 6:30 the next morning the traps were checked. Four raccoons were trapped; all were south of the boathouse. After each trapping both mornings we took the raccoons into the mammology building and fitted them with radio collars. Each raccoon was

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injected with 100 mg/ml of Telazol© to anesthetize them. The dosage of Telazol was determined by the weight of the animal; the ratio was .03 cc of Telazol per .45 kg of raccoon.

The first raccoon trapped (355) was a female. She weighed 6.12 kg and was therefore given 0.39 cc of Telazol. The dose of Telazol was given at 8:00 on 5-28-2010. The drug took 5 minutes to take effect. The total working time to put the collar on the raccoon was 7 minutes and 30 seconds. Observations included that she was not lactating and that she had some tooth wear which indicate older age. The attached radio collar had a frequency of 164.355 MHz. After the effects of the drug wore off, she was released at 18:30 on 5-28-2010 near the capture location.

The second raccoon (365) was also a female. She weighed 8.16 kg and was therefore given 0.54 cc of Telazol. The first dose of Telazol was given at 8:20 on 5-28-2010. The injection was believed to not have been thoroughly injected and at 8:30 a second dose of Telazol was given. This dose contained 0.27 cc of Telazol. It took 13 minutes and 30 seconds for the drug to take effect. The total working time to put the collar on the raccoon was 8 minutes. Observations included that she was not lactating. The attached radio collar had a frequency of 164.365 MHz. She was released at 18:30 on 5-28-2010 near the capture location.

The first raccoon trapped (386) on the second day was a male. He weighed 6.35 kg and was therefore given a 0.42 cc dose of Telazol. The first dose was given at 7:04 on 5-29-2010. The drug took 2 minutes and 15 seconds to take effect. The total time it took to put the collar on was 6 minutes. Observations included that he had good teeth, indicating young age. The attached radio collar had a frequency of 164.386 MHz. He was released at 16:30 near the capture location.

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The second raccoon (395) of the second day was also a male. He weighed 6.35 kg and was therefore given a 0.42 cc dose of Telazol. The first dose was given at 7:18 on 5-29-2010. The drug took 2 minutes and 15 seconds to take effect. The total time it took to put the collar on was 11 minutes and 30 seconds. Observations included that he was covered with ticks. The attached collar had a frequency of 164.395 MHz. He was released at 16:30 near the capture location.

The third raccoon (376) on the second day was a female. She weighed 6.35 kg and was therefore given 0.42 cc of Telazol. The first dose was given at 7:45 on 5-29-2010. The drug took 3 minutes and 30 seconds to take effect. The total time it took to put the collar on was 6 minutes and 2 seconds. Observations included that she wasn't lactating and had good teeth, indicating young age. The attached radio collar had a frequency of 164.376 MHz. She was released on 5-29-2010 at 16:30 near the capture location.

The fourth raccoon on the second day already had a collar attached to it from a previous year. The collar had become too tight on the animal and had embedded itself into the skin of the neck causing a disgusting, smelly sore. It was decided that putting a new collar on would not be beneficial to the animal. The corroded collar was removed and the raccoon was released on 5-29-2010 at 16:30 near the capture location.

In order to triangulate the signals from the raccoons, two radio antennae towers were set up around the area of capture. The towers had four element Yagi antennas with horizontal polarization. One was located near the large wood pile on the Biological Station campus (333848, 5232172). One was located near the entrance of the Bear Paw Campground (334757,

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5232167). Each day our group of five would split into a group of two and a group of three. Each group would take a bearing on each raccoon at one of the towers; this way the bearings on each tower would be taken simultaneously giving a more accurate point. This would be done twice a day to four times a day at around 12:30 and 18:30. For a 24-hour period the group went out every two hours to get bearings on all the raccoons. Every time a bearing was taken the activity of the animal was also recorded; an erratic signal indicated activity. Data was collected for ten days. After the data collection period, all the bearings were put into an excel spread sheet that calculated where the bearings crossed. Using the ArcMap program, the data points for each raccoon were placed on a map of Itasca State Park. The home range for each raccoon was analyzed using the kernel method and the minimum convex polygon method.

Results: At the end of the ten day data collection period, there were 36 data points for each raccoon. The standard deviation was 1.8 degrees. The standard deviation was calculated by our group of five people going out to the tower by the wood pile and picking a single raccoon for all of the group members to privately take the bearings on. Each group member took two readings from the same raccoon. Using these readings we calculated the standard deviation on excel. The home range area for each raccoon was determined using the minimum convex polygon method. The kernel method encloses the data points with concentration lines; the inner line encloses 50% of the data points, the second line encloses 90%, and the outer line encloses 95%. Raccoon 355 had eight valid data points with a home range of 24,138 \square^2 (Figure 1). Raccoon 365 had seven valid data points with a home range of 31,160 \square^2 (Figure 2). Raccoon 386 had nine valid data points with a home range of 746,269 \square^2 (Figure 3). Raccoon 395 had eight valid data points with a home range of 66,869 \square^2 (Figure 4).

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Raccoon 376 had seven valid data points with a home range of 62,631 \pm 2 (Figure 5). The raccoons were usually active during the night hour from around 19:00 to 7:00.

Discussion: On day eight of our data recording period it was made apparent that the angle our antenna was a different angle than what our needle pointed to. This made all of the data up to that point unusable; only the points made on day nine and ten could possibly be used. All of the raccoons we tracked stayed in the Bear Paw area with the exception of raccoon 386. Raccoon 386 is the younger male who also had the largest home range. This can be explained if he was searching for a female to copulate with. The females all had smaller home ranges than the males. This was expected. For each sex, the younger the raccoon was the larger its home range was compared to the older raccoons. This was not expected and can only be explained by if the habitat quality was much better for the older raccoons.

Conclusion: The home ranges of five raccoons in Itasca State Park were measured. All the raccoons stayed in the Bear Paw area where they were captured. The home ranges varied by sex, age, and quality of habitat. The males had larger home ranges than the females. It is speculated that the older raccoons have higher quality home ranges than the younger raccoons and therefore have smaller home ranges. In future studies the towers will be checked every day. This will allow for more accurate data points. Taking data points for a longer period of time will also help for a more accurate home range.

Figure 1:

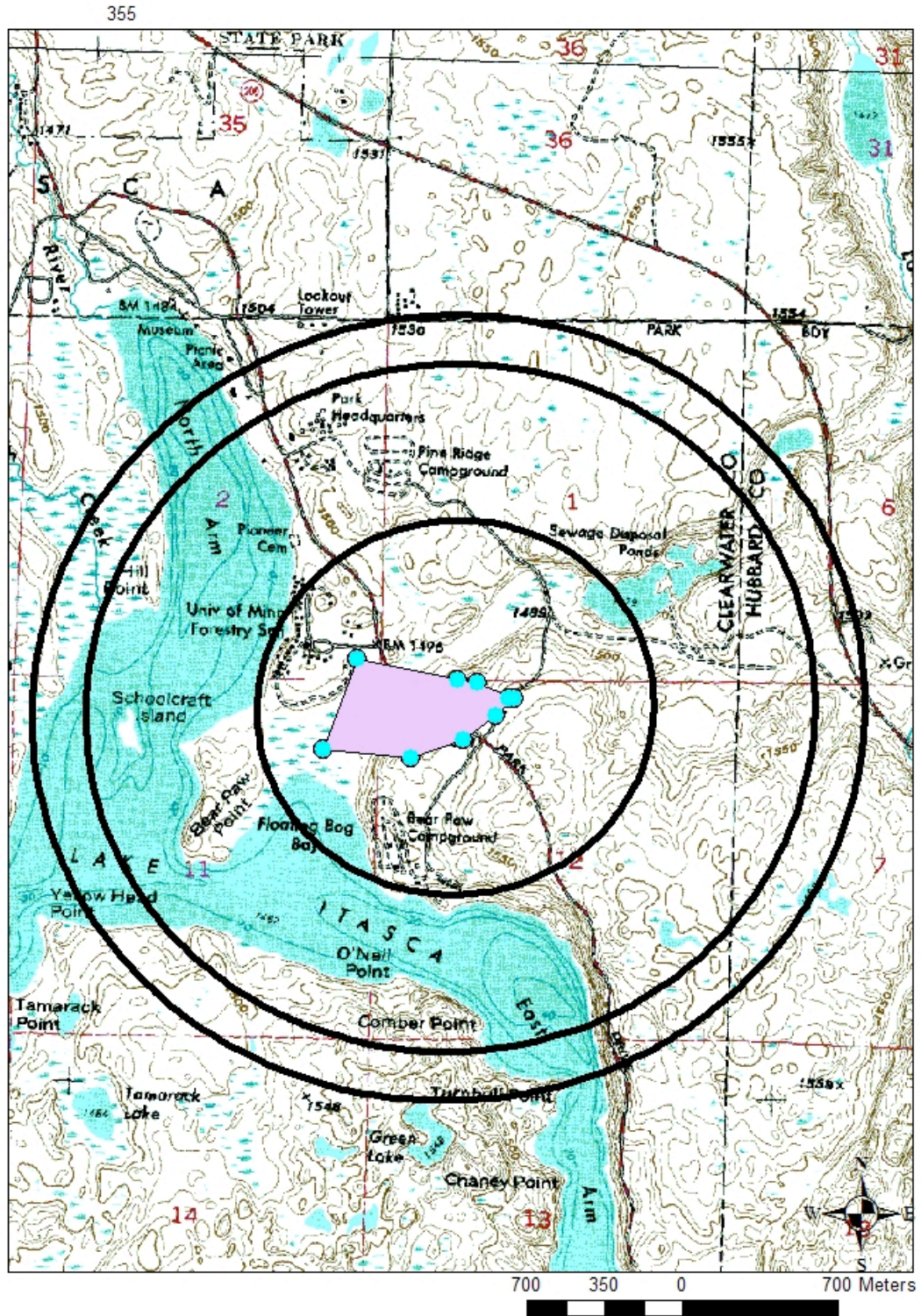


Figure 2:



Figure 3:

386

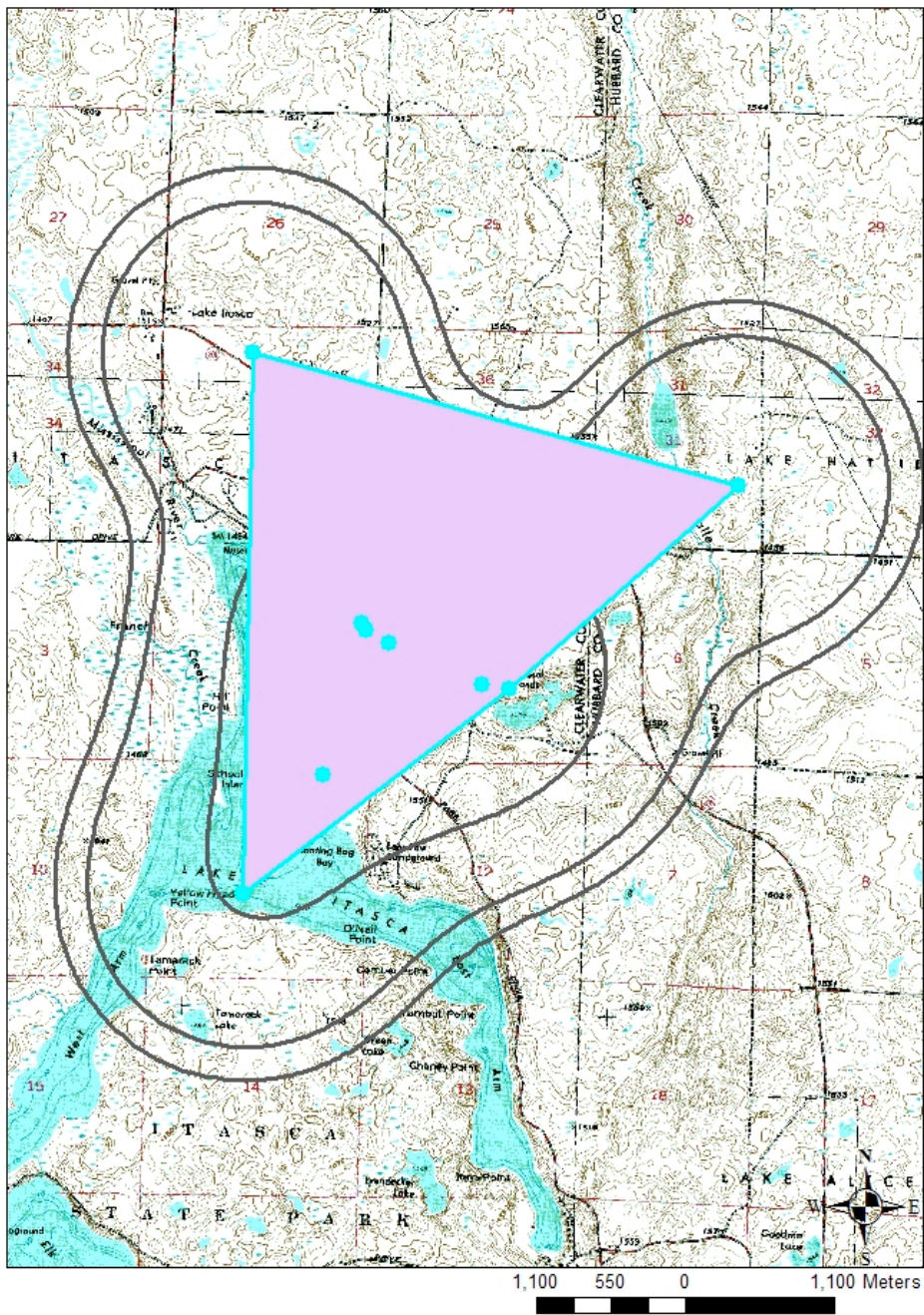


Figure 4:

395

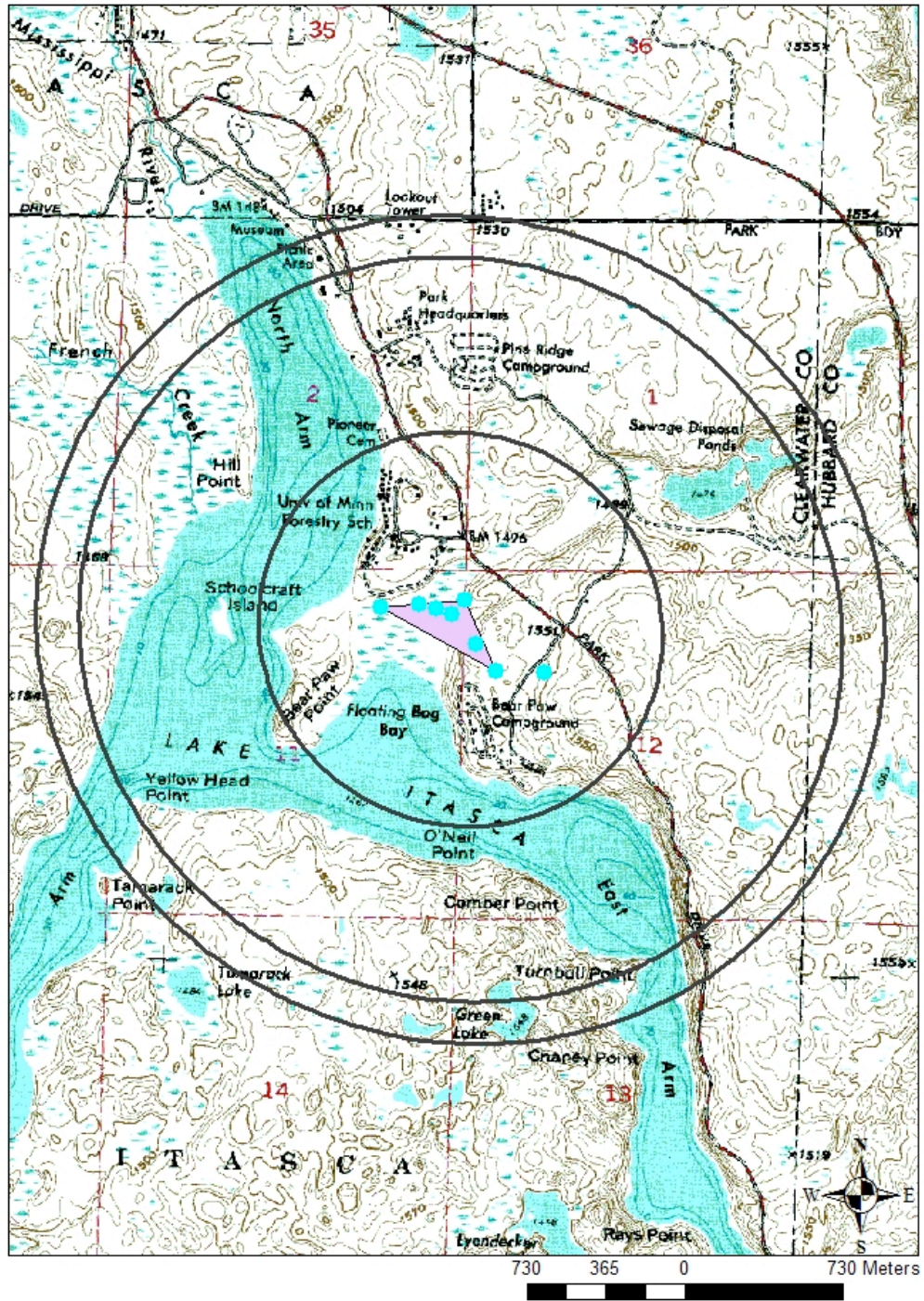


Figure 5:

376

