

Nesting Activities of an Eastern Spiny Softshell Turtle, *Apalone spinifera*

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Une tortue-molle à épines a été suivie étroitement durant la période de ponte de 1998. Cette tortue a démontré un patron quotidien d'activité régulier avant la ponte. Elle consacrait ses matinées à s'exposer au soleil et à se déplacer dans un secteur restreint, ses après-midi à se déplacer sur des distances de 2 à 3 km, pour finalement s'arrêter en fin d'après-midi alors que durant la soirée, elle semblait être à la recherche d'un endroit propice pour déposer ses œufs. Cette tortue-molle à épines a démontré la capacité de se déplacer à contre courant sur une distance de plus de 7 km, en trois jours, pour aller pondre.

An Eastern Spiny Softshell Turtle was closely followed during the 1998 nesting season. It showed a rather consistent daily pattern of activity. The morning was spent basking and moving around in a small area, large movements (2-3 km) were made during the afternoon and the turtle would stop for the evening, acting like it was searching for a suitable nesting site. This softshell turtle moved 7 km upstream in three days for nesting.

Key Words : Eastern Spiny Softshell Turtle, *Apalone spinifera*, nesting, movement, activity, Québec, Canada.

The information reported here was collected in the course of a larger study designed to help the conservation of a unique Québec population of Eastern Spiny Softshell Turtle (*Apalone spinifera*) (Galois, 1999*). Attempts were made to follow three females to their nesting sites, but we were successful with only one. This adult female (535) was captured 18 June 1997 in Rivière aux Brochets (Figure 1), a tributary of Lake Champlain (73°13'W, 45°04'N) and equipped with a radio transmitter (frequency 155.535; Holohil System Ltd, Ottawa, Canada) provided with a mortality option that produces a double bip when the turtle remains still for more than four hours. The softshell spent the winter of 1998 in the Missisquoi River near Swanton, Vermont, U.S.A. (73°13'W, 44°58'N), moved north across Lake Champlain during the first half of May, and up in the Rivière aux Brochets, where it spent the following three weeks in the vicinity of a small island, more than 25 km away from its wintering area. We followed 535 for most of the daylight hours during the few days before nesting and the day after nesting in June 1998. Although nesting activities had been described before (Eigenman 1896; Newman 1906; Evermann and Clark 1920; Minton 1972; Ernst et al. 1994), few individuals were involved in those observations, and daily activities shortly before and after ovoposition has not been reported previously.

9 June, mostly sunny, 26°C

At our arrival (10:15), 535 was basking on the sunny side of the river, approximately 20 cm from water, with two other softshell females basking a few meters away. They started moving at around 11:30, going in and out of the water. By 13:30, 535 had left the area and moved upstream throughout the afternoon. At 18:00, after swimming about 2 km, it stopped and remained in the area until we left at 20:00.

10 June, sunny, 22°C

When we arrived at 5:30, 535 was in the same area as the previous evening. The signal became double at 9:30, indicating that the turtle had not moved for the last 4 hours. At 9:30, we spotted 535 basking on a stone in the river, approximately 5 m from the shore. It entered the water at 10:30 but remained in the area. By noon, it had started moving upstream. The river was about 30 cm deep and 30 m wide, and steep banks allowed us to often have a good look in the water. On many occasions we could see 535 passing by. It swam vigorously, its neck fully extended, pointing its nose out of the water every 5 to 10 m and sometimes stopping in this position for a few seconds. The softshell kept this pace for the whole afternoon. At 17:00, it stopped next to a gravel bar 5 m long but only 10 to 20 cm above the

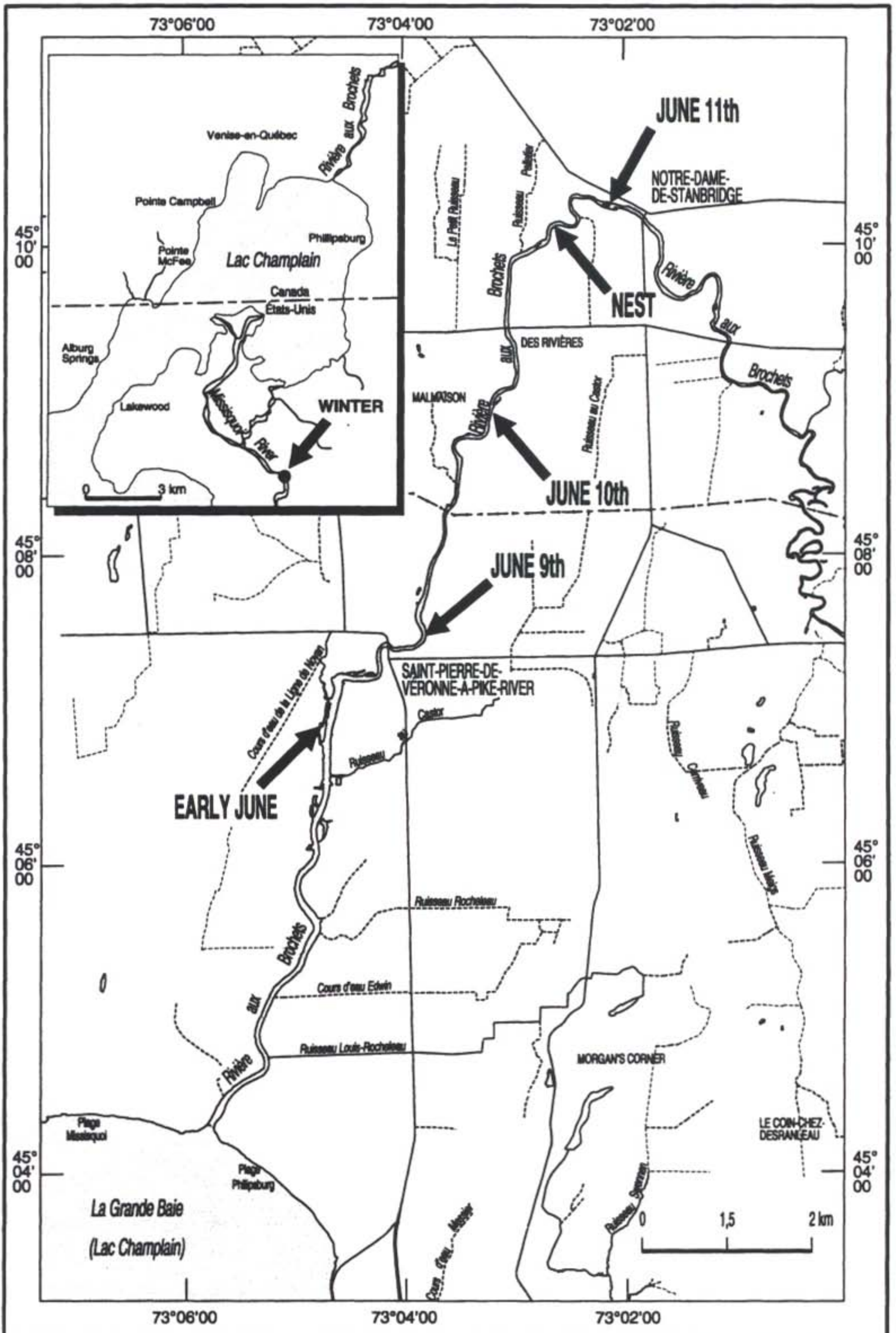


FIGURE 1. Movements of a female Eastern Spiny Softshell Turtle during the nesting season.

water level, almost 3 km from its point of departure at noon. The softshell came out of the water at 17:30, moving around on the gravel bar and rubbing its chin on the substrate every now and then. It re-entered the water 10 minutes later, but climbed back on it at 19:50, departing about 20 seconds later when disturbed by a man passing on the road 10 m away. At 20:10, it climbed once more on the gravel bar, but was disturbed a second time by human activities. The softshell was still in the area when we left at 21:00.

11 June, mostly sunny, 22°C

We returned to the area at 6:00. Although not visible, 535 was still around. At 8:30, the signal became double and remained so until 10:15. For the next hour, the turtle seemed to be moving around, but staying in the area. At 11:15, 535 walked on the gravel bar in spite of the presence of six ducks. Again, the softshell seemed to be rubbing its chin on the ground. By 11:30, it was back in the water and swam intensively upstream throughout the afternoon. It climbed on the sunny shoreline of the river at 15:50, approximately 2.5 km away from its daily departure point. It moved in and out of the water on a 30 m stretch of the river, next to a sharp curve. At 16:05, 535 walked on land for the sixth time, at the other end of the curve, about a hundred meters upstream from where it had first gone on land, but only 20–30 m in straight line through forest. The softshell started the excavation at 16:15 at the edge of the vegetation, into gravel and flat pebbles ranging in size from 1 to 10 cm long. The first part of the digging motion was slow, but it ended vigorously and pebbles were thrown up to 2 m away. The excavation stopped at 16:35. After a few minutes without moving (probably laying), the turtle started filling the hole at 16:45. The softshell ran back into the water at 16:49, 44 minutes after coming out of the water. The nest was excavated 2 m from the water and approximately 1 m above the water level, in full late afternoon sunshine (northwestern slope). Numerous other signs of nesting activity were present in the vicinity. The softshell immediately started swimming upstream. We observed 535 at 20:00, 1 km upstream from where it nested, about 100 m below a dam in a small village. We left the area for the night.

12 June, partially sunny, 24°C

When we arrived at 6:40, the turtle had moved downstream about 0.5 km from where we last saw it the night before. The signal was double but became single 10 minutes later, indicating that the turtle just started to move after a stop of at least four hours. The radio indicated that the softshell was moving downstream. It swam by its nest at 7:00. A large Snapping Turtle (*Chelydra serpentina*) was digging a few meters from where 535 had excavated its nest the night before. We saw the softshell at 8:40, and

then again at 10:15. It was swimming vigorously, in the same way it had been during the few days it spent moving up the river. We stopped tracking the turtle around 11:00 to check the softshell's nest to confirm that it had really laid eggs. We found eggs exactly where the turtle dug the night before. In order to avoid any disturbance in the incubation process, eggs were covered, without counting them, as soon as we discovered the first egg. We tracked the turtle during the whole afternoon and by 17:30, 535 was back in the area it left 9 June. Travelling downstream, it took the turtle one day to cover the same distance that had required three days moving upstream. Swimming time summed up to 11 hours travelling downstream and 17 hours moving upstream.

Discussion

Most events observed while tracking this softshell turtle are comparable to what other authors have described about *A. spinifera* nesting habits. We were impressed by the last part of the digging strokes, but Minton (1972) also reported that softshells were vigorously throwing the sand several meters away. Newman (1906) reported that nesting process usually lasts about one hour and 535 completed the entire process in 44 minutes. Breckenridge (1960) reports almost exactly the same nesting observations from Minnesota as ours, in terms of date, time, duration and behaviour. According to Newman (1906) nesting can also occur at midday.

What was most notable about our observations was the daily pattern of activity preceding nesting. The day seemed divided into 3 parts. Morning would be spent basking and moving around in one area. Around noon, the turtle would leave the area and spend the whole afternoon swimming vigorously. By the end of the afternoon, the turtle would stop and then seem to be looking around for a suitable nesting spot.

Our observations raised the following questions: Did the turtle choose this specific nesting site because it did not find any other suitable site while travelling or was it going for this exact spot because it knew it from past nesting experiences or because she had hatched there? We know that 535 was in this part of the river during the 1997 nesting season but it was not observed in nesting behaviour. What was the influence of the area's other nests in 535 choice? Smell seemed to have played a significant role in her search. We believe that this is what brought her out of the water the day it nested. She first moved on land at the beginning of a sharp curve probably smelling the nests at the other end of this curve, only a few meters away through forest. As reported by Fletcher (1996*), our observations indicated that *Apalone spinifera* can move considerable distance in a short period of time, exploring different potential nesting sites. This would suggest that confirmation

of the nesting site of any specific turtle can only be achieved through direct observation of the laying process.

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