

Springbank Reservoir Reptiles At Risk:

Documentation and Study of Species At Risk Reptiles Along the former Springbank Dam Reservoir

Prepared by:

Scott Gillingwater

Species At Risk Biologist

Upper Thames River Conservation Authority

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For Public Distribution

This is a publicly available Executive Summary of research related to species at risk. The full report is confidential due to extraordinary pressures on these species. These species are often targeted by poachers. The report which contains location and population information must not be shared. The report has been provided to the Ministry of Natural Resources and Forestry to assist with their regulatory role in protecting species at risk.

Executive Summary

A reptiles-at-risk research and recovery program has been ongoing since 1994 throughout the Upper Thames River Watershed, providing monitoring and study of rare and declining turtle and snake species in this region. The West London area, from Harris Park to Springbank Dam, has been of particular interest with regard to changes experienced along the Thames River due to a non-functioning water control structure (Springbank Dam). In some cases, water control structures can cause unforeseen and often detrimental effects to wildlife, including changes to, or loss of, habitat necessary for various life processes. During two decades of reptile studies throughout the City of London, we have documented changes to the landscape and the effects on wildlife. The significant ecological changes to the river and adjacent floodplain habitat, since the dam has been inoperable, have been notably positive for some species found in this region, including at-risk turtles. The Spiny Softshell Turtle is designated as Threatened both Federally and Provincially due to low and declining populations, significant threats to both habitat and individuals, and increasing stressors on this species throughout its small Canadian range. The Thames River maintains the largest known concentration of Spiny Softshell Turtles in Canada. An estimated 1000 to 2500 adult softshell turtles are thought to remain in Canada, all of which are limited to a small number of river and lake sites in southern Ontario, and two locations in southern Quebec. One of the primary threats to this species is habitat loss.

Turtle surveys and research in West London have been ongoing since the mid-1990s, with significant ecological changes being observed in recent years. During the 2015 season, the largest single nesting aggregation of softshell turtles ever recorded in the City of London, and the fourth largest known along the entire Thames River was documented. The oviposition (nesting) site where these nests were located would not exist if Springbank Dam were in operation. Additionally, five other oviposition sites and numerous nursery, thermoregulation, and foraging sites were located in areas that previously, while Springbank Dam was in use, were not suitable for Spiny Softshell Turtles. Softshell turtles show fidelity to habitats necessary for survival; a number of such areas of habitat have become available since the operation of Springbank Dam halted, of which now appear vitally important to the recovery potential of these at-risk turtles.

In 2015, surveys were conducted from May to October within the former footprint of the Springbank Reservoir. A total of 50 Spiny Softshell Turtle nests were located within the target area, resulting in 468 hatchling turtles emerging from eggs and entering the river. Surveys in this area also resulted in observations of 87 additional Spiny Softshell Turtles (Threatened), 203 Northern Map Turtles (Species of Special Concern) and 34 Snapping Turtles (Species of Special Concern). The 2015 surveys have shown a dramatic and unparalleled increase in at-risk turtles to this area, since the dam has been out of

commission. In comparison, of records available from 1905 to 2006 (UTRCA, OMNRF Natural Heritage Information Centre), while the dam was in operation, only a small handful of observations were recorded in the same stretch of river, and only patchily distributed. Since the dam has not been in use, Spiny Softshell Turtle and Northern Map Turtle ranges throughout West London have expanded due to greatly improved habitat and resource opportunities. Without the influence of Springbank Dam, the substrate, shoreline contours, sediment dispersal and water depth, along this section of the Thames River, have become functional and important for at-risk reptiles. While the Springbank Dam was in operation, habitat conditions were disrupted by altered water depth and flow, and other changes caused by the creation of a reservoir. This resulted in the area being unsuitable for many activities of specialized wildlife species, such as the Spiny Softshell Turtle. An additional issue with the dam structure, when in use, was that it limited natural wildlife migration opportunities. Spiny Softshell Turtles are known to move distances of over 30 kilometres during seasonal migrations. Water control structures can negatively affect these movements. In 2015, an adult female softshell turtle, originally captured and micro-chipped 18km downstream, was recaptured upstream of Springbank Dam. This recapture is significant as it highlights the fact that without an impediment to aquatic movement, the turtles are able to travel freely along migration routes between habitats that best fit their needs.

Through recent and historic data collection, ortho-imagery over time, and relevant information available in peer reviewed literature, it is apparent that the absence of a functioning Springbank Dam has resulted in an increase of important habitat features necessary for Spiny Softshell Turtle reproduction, recruitment, cover, foraging and likely brumation (hibernation). Additionally, over time, at-risk species have adapted to and fully utilize these habitat features, which can now play a significant role in the recovery and long term viability of these species in this region. To restore the reservoir now, would likely result in direct mortality of individual turtles and other wildlife, displacement of wildlife to inadequate sites, loss of habitat critical to survival, and/or an overall decline in ecosystem health. The life-history strategies of Ontario turtles (low juvenile recruitment; late age of maturity; no density dependent reproductive strategies; and dependence on, and habitual use of, specific habitat features for survival) make them highly susceptible to population declines when subjected to increases in anthropogenic stressors, this is especially problematic for species already at risk.

Artificial compensation of habitat is not viewed as feasible with this species in this area, as a mosaic of interconnected habitat types are necessary for survival, some of which would be almost impossible to replicate in this area. Similarly, timing dam operations around critical activities, such as nesting, cannot be effectively accomplished since nesting, incubation and hatching times can extend from May to October. Current nesting sites would not be available if the dam were in operation, and any nests laid before the water levels increased would be lost due to flooding. Nesting sites that have been established since the dam has been non-operable, have taken years to reach their current successional stage in some cases; if the dam is again used, these will be lost due to water level changes. Additionally, the development and protection of animals at nursery sites can be disrupted by unnatural water fluctuations and long-term flooding. In such cases, turtles that currently use these habitats would be killed or displaced. Since brumation migrations can begin in August or September, areas affected by a functioning dam will likely not be appropriate due to unnatural water levels lasting well into the fall. If turtles were to locate an area to brumate/hibernate before water levels were reduced, they may not be able to survive the winter once water levels recede due to dam operations. These turtles show great fidelity to certain habitats, and changes to these areas could lead to mortality or decreased fitness/health. Overwintering physiology in Spiny Softshell Turtles requires very specific parameters, necessary to ensure survival during harsh Ontario winters. The available information suggests changes to water quality and prey availability during dam use could further limit the potential for robust and

viable populations of Spiny Softshell and Northern Map Turtles in this area, and could limit downstream expansion of the respective ranges. Turtle migration routes that include passing through the current dam, have had since 2006 to become established and are based on current river conditions. Blocking these migration routes could result in mortality or displacement if habitat features are no longer accessible, or are lost due to increases in water depth. Spiny Softshell Turtles are extremely shy animals, and areas used for nesting, basking, and cover are generally away from high human use. Such areas are already scarce, so ensuring the areas of habitat that currently exist are maintained and protected, and possibly increased, will assist in the recovery of this species.

The preceding summary was based on appropriate peer-reviewed scientific literature, results of over 20 years of turtle research in this region, and the decline currently facing Northern Map Turtles and Spiny Softshell Turtles in Canada. The wildlife habitats discussed in this overview would be difficult, if not impossible, to artificially recreate in this area, and thus careful consideration must be given to their protection. In order to avoid the risk of wildlife mortality, displacement and/or loss of essential habitat, it is the role of the Ontario Ministry of Natural Resources and Forestry (OMNRF) to provide appropriate feedback through the regulatory framework of the Provincial Endangered Species Act (ESA 2007). The OMNRF is the governing body that will be tasked with a decision based on the ESA, and thus will need to be provided with all relevant information to ensure an informed assessment.

Spiny Softshell Turtles at a Nursery Site after hatching in West London

