

Morrison Creek Lamprey (*Lampetra richardsoni*) trapping survey, June 2017.

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by

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ABSTRACT

Wade, J., Dealy, L., Hodes, V., and MacConnachie, S. 2019. Morrison Creek Lamprey (*Lampetra richardsoni*) trapping survey, June 2017. Can. Manuscr. Rep. Fish. Aquat. Sci. 3183: iv + 6 p.

Passive downstream traps were placed in the main stem and headwaters of Morrison Creek, Courtenay, BC as a part of ongoing monitoring of Morrison Creek Lamprey, a federally-listed endangered lamprey species found only in the Morrison Creek watershed. The total numbers of lamprey trapped were low; however, they are comparable to the results of other trapping studies since 2011. Although methods are the same, catches remain much lower than those reported in the late 1970s and 1980s when the population was discovered. The causes of this decline in catch are unknown. Recommendations are to continue monitoring the population both in the main stem and headwaters through trapping studies and, using our best knowledge, ensure the habitat is maintained in a manner which supports the functions of the population and mitigates the effects of harm.

RÉSUMÉ

Wade, J., Dealy, L., Hodes, V., and MacConnachie, S. 2019. Morrison Creek Lamprey (*Lampetra richardsoni*) trapping survey, June 2017. Can. Manuscr. Rep. Fish. Aquat. Sci. 3183: iv + 6 p.

Des pièges passifs en aval ont été disposés dans le cours principal et le cours supérieur du ruisseau Morrison, à Courtenay (C.-B.), dans le cadre de la surveillance en cours de la lamproie du ruisseau Morrison, une espèce de lamproie inscrite dans la liste fédérale des espèces en voie de disparition qui se trouve uniquement dans le bassin hydrographique du ruisseau Morrison. Le nombre total de lamproies piégées était faible; toutefois, il est comparable aux résultats d'autres études par piégeage réalisées depuis 2011. Même si les méthodes demeurent les mêmes, les prises restent très inférieures à celles qui étaient déclarées à la fin des années 1970 et au cours des années 1980, lorsque la population a été découverte. Les causes de cette baisse de prises sont inconnues. Il est recommandé de continuer à surveiller la population tant dans le cours principal que dans le cours supérieur au moyen d'études par piégeage et, en utilisant nos meilleures connaissances, de veiller à ce que l'habitat soit conservé de manière à appuyer les fonctions de la population et à atténuer les effets des dommages.

INTRODUCTION

The Western Brook Lamprey – Morrison Creek Population (*Lampetra richardsoni*), hereafter referred to as Morrison Creek Lamprey, are endemic to the Morrison Creek watershed in Courtenay, BC. There are two distinct forms of Morrison Creek Lamprey. The typical form lives entirely in freshwater, is non-parasitic and does not feed as an adult. The *marifuga* form following metamorphosis, become parasitic and capable of feeding as an adult, in addition to being silver in colour and larger in size (Wade et al 2015). Both forms are part of the Morrison Creek Lamprey Population, and genetic evidence supports they are part of a single population.

In 2000, Western Brook Lamprey, Morrison Creek Population was designated Endangered by COSEWIC, and listed under Schedule 1 of the *Species at Risk Act* (SARA) in 2003. Because it is not possible to distinguish between the parasitic and non-parasitic forms except at certain life history stages, in this document, when it is possible to distinguish the *marifuga* form (parasitic), the animal is referred to as “silver form”.

Very little information is known about the biology of Morrison Creek Lamprey population and even less is known about the parasitic form. Morrison Creek Lamprey are listed as Endangered by SARA and it is a requirement in legislation that an action plan be created based on the species’ Recovery Strategy. As a part of the Recovery Strategy, a long term monitoring program is to be developed and implemented to assess the abundance and distribution of this species. This work is a contribution to the monitoring program.

In the 1970s and 1980s, considerable efforts were made to study the Morrison Creek Lamprey within the main stem of Morrison Creek; these are summarized in Beamish (2013). No further field work was undertaken from the late 1980s until 2011. From 2011–2013, trapping studies were conducted in the main stem of Morrison Creek (summarized in Wade and MacConnachie 2014) in similar locations and with similar traps to those used in the 1970s and 1980s as described in Beamish (2013) although effort levels varied.

Given the apparent decline in the silver form, and lamprey overall, to reduce potential harm or impact to the species no trapping occurred in the main stem from 2014 to 2016. The cause of this decline in catch is unknown but one possible contributor may be habitat fragmentation caused by barriers to fish movement (Wade and Beamish 2014). In 2015, these barriers were remediated (Wade and MacConnachie 2016).

From 2014–2016, in cooperation with Hancock Forest Management, studies were undertaken to determine the extent of range of Morrison Creek Lamprey in the headwaters of Morrison Creek; specifically, within the property owned by Hancock Forest Management.

In 2017, live downstream traps were placed in the headwaters and main stem of Morrison Creek to determine if catch rates have improved since the habitat remediation in the main stem and to continue to monitor the population in the absence of a method to determine abundance.

METHODS

TRAPPING SURVEY

Trapping

Five live capture downstream traps were installed on June 6, 2017 (Table 1). Two traps were installed in the headwaters of Morrison Creek and the other three on the main stem in Courtenay (Figure 1). Traps 1 to 4 were removed on June 19. Trap 5 was removed on June 14 due to vandalism. The traps were the same as those used in previous years in the trapping studies within the city of Courtenay (Wade and MacConnachie 2014).

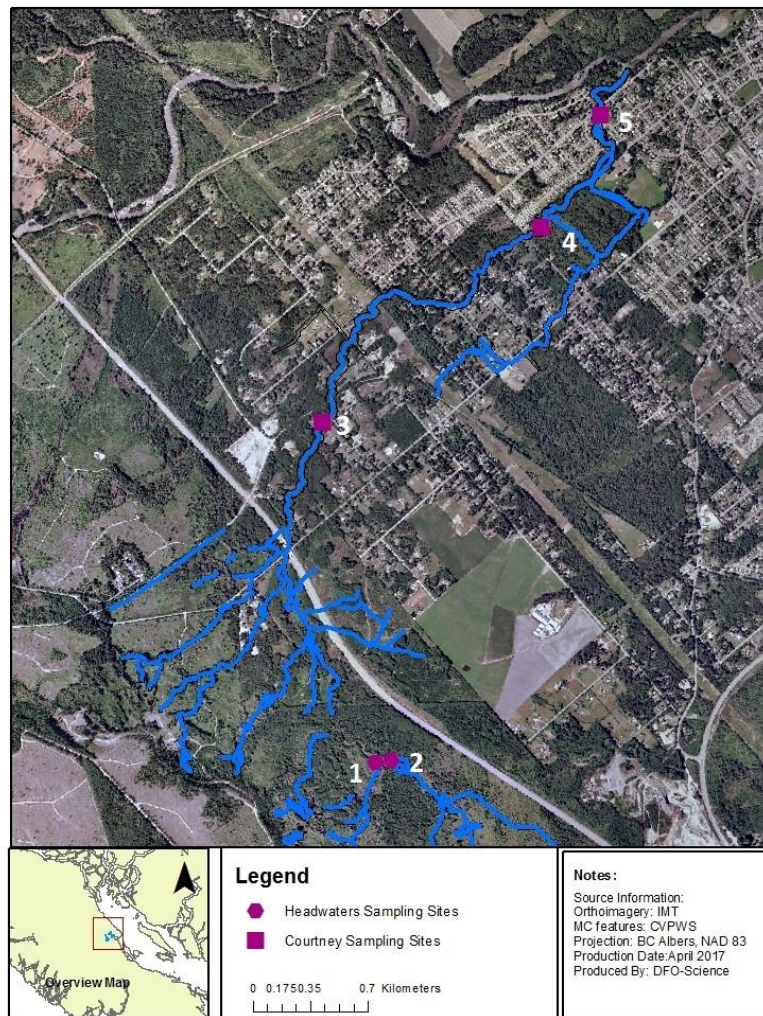


Figure 1: Location of traps 1–5 in the headwaters (traps 1, 2) and main stem (traps 3–5) Morrison Creek, 2017.

Table 1: Trapping locations in Morrison Creek, 2017.

Trap #	Location	Descriptive location	Date of installation	Date of Removal (2017)
Trap 1	Headwater	Downstream side of horse bridge	5 June	19 June
Trap 2	Headwater	Upstream side of horse bridge	5 June	19 June
Trap 3	Marsden Road bridge	Upstream side of bridge	5 June	19 June
Trap 4	Roy Morrison Park	Upstream of bridge	5 June	19 June
Trap 5	2nd Street and Willemar Road	Upstream of the bridge over Willemar Road	5 June	14 June

Sampling

Once installed, all traps were checked daily for fish. Using a small mesh aquarium dip-net, non-lamprey species were identified, enumerated, and released downstream of the traps. Lamprey were removed using a dip-net and placed in a large bucket filled with water taken directly from the creek. Each lamprey was anesthetized with TMS (100–125 ppm), measured for length, and identified to stage of development. Once the lamprey were sampled, they were placed in a second bucket filled with creek water and allowed to recover from anesthesia before being released downstream of the trap.

RESULTS

TRAPPING SURVEY

A total of 120 typical form lamprey, 63 ammocoetes (unidentifiable to typical or silver form), and 3 silver form lamprey were captured throughout the survey (Table 2). Trap 5 did not catch any lamprey at all. Due to rainfall events, some traps did not fish to expectations as they overflowed or became clogged. Other species were caught in the traps, including salmon fry (*spp.*), signal crayfish (*Pacifastacus leniusculus*), and sculpin (*spp.*). Except for Trap 5, most traps caught at least one species each day. Out of a maximum 14 possible fishing days, Trap 1 caught was successful 13/14 days, Trap 2 14/14 days, Trap 3 11/14 days, Trap 4 12/14 days and Trap 5 4/14 days.

Table 2: Lamprey catches from each trap installed in Morrison Creek in 2017.

	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Total
typical form	19	40	30	31	0	120
Silver form	1	1	0	1	0	3
Ammocoete	43	19	1	0	0	63

Of the 120 typical form lamprey caught, most (n=53) were in the 10.5–11.4 cm length range followed by 28 in each of 9.5–10.4 cm and 11.5–12.4 cm. Therefore, 91% of typical form lamprey were between 9.5 cm and 12.4 cm. Four of the 120 typical form lamprey were metamorphosing (average length 11.6 cm) and 90 typical form lamprey were either maturing, in spawning condition or spawned out. Ammocoetes varied in length from a minimum of 3.2 cm to a maximum of 12.9 cm. The three silver form lamprey measured 12.5, 14.0 and 13.6 cm long, two of which were caught on the last day of trapping.

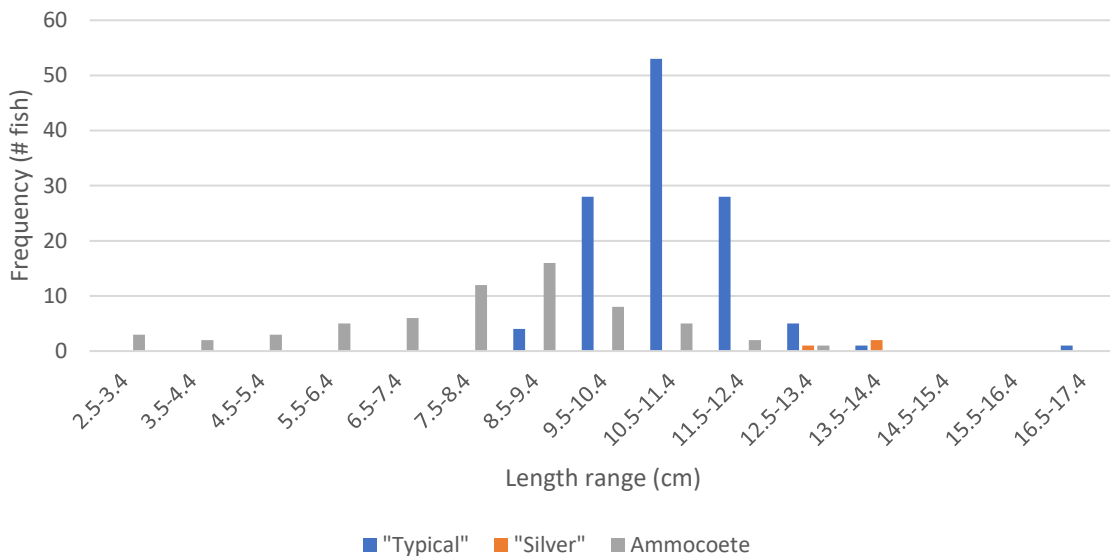


Figure 2: Length frequency of lamprey caught in Morrison Creek traps in 2017.

DISCUSSION

Catches of Morrison Creek Lamprey and the silver form do vary between years as does effort. There has been considerable variation in the amount of effort (i.e. trapping days) in recent years (2011–present), the total number of lamprey caught per day and total silver form caught per day were calculated for all years (Table 3). Daily catch rates of all lamprey vary from a low of 0.31 lamprey day⁻¹ (2013 main stem) to a high of 4.39 lamprey day⁻¹ (2017 headwaters). Total number of silver form caught per day has not been greater than 1 in recent years (2011–2017). In the mid to late 1980s, Beamish (2013) reported that an average of 1.5 silver form Morrison Creek Lamprey were caught each day in the location considered to have the maximum abundance.

Although there is concern that catch rates of the silver form have decreased over time, the cause or the implications are unknown. Daily catches do fluctuate between years (Table 3). Experience

trapping does indicate that environmental conditions which impact flow such as rain events also influence the effectiveness of traps and/or the timing of lamprey activity (e.g., spawning). Regardless, after six years of trapping studies, catch rates of lamprey and in particular the silver form, have decreased compared to those reported by Beamish (2013) in the 1970s and 1980s. It is recommended to continue conducting these trapping studies in Morrison Creek main stem and headwaters as a monitoring measure.

Table 3: Trapping summary in Morrison Creek 2011–2017 (*Wade and MacConnachie 2014; **MacConnachie et al 2016; ***Wade 2016).

Area	# traps	Trapping days	Ammocoete (#)	Adult/metamorphosing Typical form (#)	Silver form (#)	Total lamprey trapped	Total lamprey caught/day	Total silver caught/day
Mainstem								
2011*	4	101	41	179	17	260	2.57	0.17
2012*	3	165	11	61	4	77	0.47	0.024
2013*	3	99	4	15	12	31	0.31	0.12
2017	3	35	1	61	1	63	1.8	0.03
Headwaters								
2015**	3	69	5	156	15	176	2.55	0.22
2016***	3	45	38	74	10	122	2.71	0.22
2017	2	28	62	59	2	123	4.39	0.07

It is not possible to determine if the Morrison Creek Lamprey population is declining, maintaining, or increasing. Barriers to fish movement were identified (Wade and Beamish 2014) and have subsequently been repaired, but it is unknown what the impacts may have been on the population from these sources or any others. It is recommended that continued monitoring of the population is undertaken both in the main stem and headwaters through trapping studies. Further, ensure that habitat is maintained in a manner which supports the functions of the population and mitigates the effects of harm (Wade et al 2015). The latter can be achieved through continued communication with local governments, developers, industries, and the public.

ACKNOWLEDGEMENTS

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