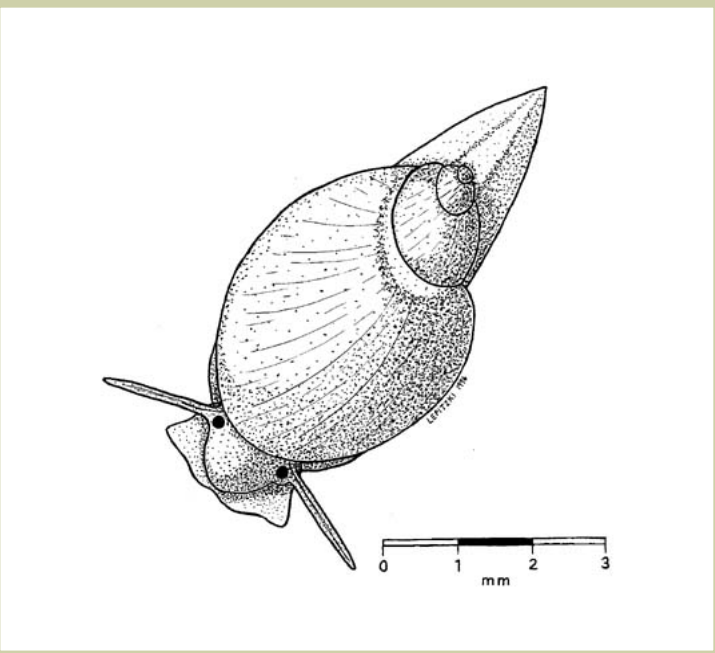
Species at Risk Act
Recovery Strategy Series

Report on the Progress of Recovery Strategy and Action Plan Implementation for the Banff Springs Snail (*Physella johnsoni*) in Canada (2018 – 2022)

Banff Springs Snail



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For copies of the progress report, or for additional information on species at risk, including Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, recovery strategies, residence descriptions, action plans, and other related recovery documents, please visit the Species at Risk Public Registry.

Cover illustration: Banff Springs Snail (*D.A.W. Lepitzki)*

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Introduction

The final Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada was posted on the Species at Risk Public Registry on 14 February 2007, and a minor amendment was posted on the Species at Risk Public Registry on 18 November 2010. A goal and objectives for the species, a description of activities required to meet the goal and objectives, and timelines for implementation were included in the recovery strategy and action plan document. Under section 46 and 55 of the Species at Risk Act (SARA), the competent minister must report on implementation of the recovery strategy and action plan, progress towards meeting its objectives, and its ecological and socio-economics impacts within five years after it is included in the public registry. In 2017, the *Report on the Implementation of the Recovery Strategy and Action Plan for the Banff Springs Snail (Physella johnsoni) in Canada (2007 – 2017)* was published on the SARA registry. Implementation of the recovery strategy is reported on in every subsequent five-year period, until its objectives have been achieved or the species' recovery is no longer feasible. This current document fulfills Section 46 of the SARA and reports on progress in implementing the recovery strategy portion of the Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) for the period 2018-2022. Section 55 of the SARA is reported on in the *Implementation Report: Multi-species Action Plan for Banff National Park of Canada (2017–2022).* Additionally, this multi-species action plan implementation report contains information regarding the actions implemented for *Physella johnsoni* as well as more general actions that benefit multiple species at risk.

Implementation of the Recovery Strategy and Progress towards Meeting its Objectives

The Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada identified the following Recovery Goal: "*to restore and maintain self-sustaining populations of the Banff Springs Snail within the species' historic range*". Supporting this goal were three broad recovery objectives. This goal has been achieved throughout this second reporting period; however, education, research and monitoring programs are ongoing to help ensure the continuing success of this goal.

Historical data from the monitoring program (1996-2017) show that both restored and original populations of *Physella johnsoni* (hereafter *P. johnsoni*) are self-sustaining, while exhibiting a characteristic oscillating pattern of population increases and decreases both within and among years. Surveys continued for the last five-year implementation period (2018-2022). *P. johnsoni* were counted monthly between April and September, and exhibit seasonal oscillations within the year (Lepitzki 2022). However, a prohibition on field work occurred during the start of the 2020 monitoring period because of COVID-19. The annual population minimum counts for three springs (Basin, Kidney and Lower Middle) was likely missed in 2020 because of the late start to the monitoring season.

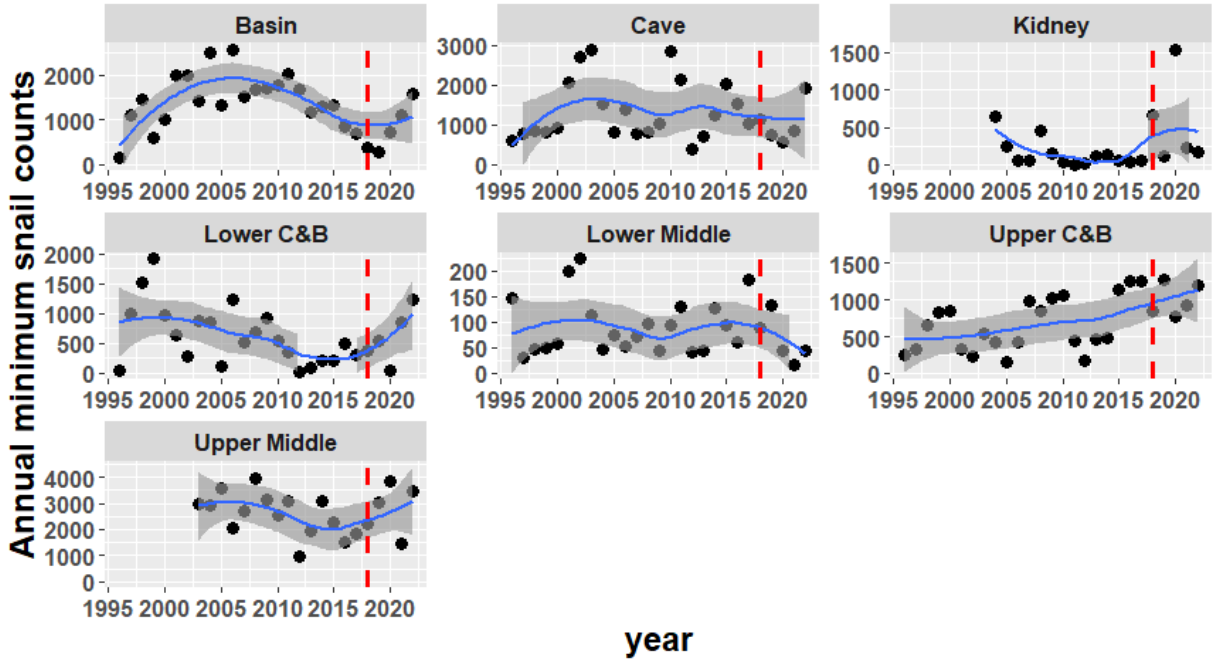

Figure 1. Annual minimum monthly snail counts from 1996 to 2022. The population minima occur during the spring/summer monitoring period. The exact month that the minima occurs differs depending on the individual population and year. The red dashed line represents the start of this implementation period (2018).

Figure 1 presents updated population trends for *P. johnsoni*, using a plot of the annual minimum monthly snail count (i.e. one value per year). The minimum count occurs during one of the monthly monitoring surveys, the exact timing of which depends on the population and year. These annual minimum counts demonstrate that the oscillating pattern observed seasonally (Lepitzki 2022) also occurs across years. Data collected during 2018 – 2022 indicate that the trend for this period was positive for most springs except for Lower Middle Spring and Kidney springs populations (Figure 1). Although populations fluctuate annually, they are persisting at all eight viable sites including the two reintroduction sites (Upper Middle and Kidney springs; Lepitzki 2022).

The following Recovery Objectives work to support the overarching Recovery Goal encompassing the following: Habitat Protection; Habitat Management, Restoration, Enhancement, and Snail Re-establishment; Scientific Research and Monitoring and; Communication and Education.

Recovery Objective One: Protect populations and habitats by mitigating human and natural threats.

P. johnsoni populations, individuals, and critical habitat are protected through a multi-faceted approach which includes area closures of select thermal pools, education, surveillance and enforcement. The ongoing challenge remains managing for both the ecological and commemorative integrity values at the Cave and Basin National Historic Site (NHS). Given the extensive history of these thermal springs, the commemorative historical stories are important to tell. These springs were used by Indigenous Peoples for thousands of years, and the Cave and Basin is still regarded as a sacred place of wellness, spirituality, and celebration. Popularity of the hot springs, and a dispute over ownership by railway workers, led to the creation of

Canada's first national park at the site in 1885. Since that time, the Cave and Basin has been managed for both ecological and commemorative integrity values.

Education is a fundamental aspect of *P. johnsoni* protection. Reductions of human disturbance are a result of ongoing mitigations and education programs. Public programs at the NHS include conservation messaging about these unique thermal water environments and *P. johnsoni* is a focus of many of these presentations. Additionally, signage for closures highlights conservation messages which explain that the reasons for closures is to protect snails and critical habitat. The educational component also includes supplementary training for internal trades staff, ensuring protection of critical habitat while conducting plumbing maintenance and snow removal. Since the last implementation report, the project to relocate the boardwalk was cancelled due to lack of funding and as a result there are no plans to update the existing boardwalk signage. Opportunities to make this a priority in the future will be pursued; however, complete elimination of human disturbance is likely not feasible given that some *P. johnsoni* populations occur within the NHS.

A thermal waters touch feature was installed at the NHS in 2013 to reduce limb-dipping in the natural springs. Unfortunately, this structure had problems with snails entering the pipes as well as algae mats clogging the pipes. Despite efforts at re-design, these problems were never solved and this feature has not been operational since the last implementation report in 2017.

Over the last five years, multiple communication approaches have been developed and delivered through cross-platform communication efforts aimed at raising awareness of *P. johnsoni*. This included social media posts on Banff National Park's Facebook and Twitter channels linking the Banff Springs Snail to the overall species at risk (SAR) program, and updated web content on Banff National Park's website. In addition, three media releases about the species were issued in 2018 that targeted local and regional audiences. More recently in 2021, Species at Risk Banners were developed and displayed in Banff Avenue Square where one featured *P. johnsoni*. Overall, these educational efforts have increased awareness of the linkages between the *P. johnsoni* and the comprehensive SAR program, as well as reduced incidents of disturbances to thermal water critical habitat.

Electronic surveillance continues at the NHS, the Upper Middle Hot springs and the Kidney springs, and has effectively reduced human disturbance. Habitat protection includes signage, enforcement, fences, and alarms. These measures have been very successful as there has only been one enforcement incident since 2018.

Recovery Objective Two: Restore self-sustaining snail populations and habitat within historic range, where and when possible.

Populations have been successfully restored to all viable sites within the species historic range (i.e., Kidney Spring & Upper Middle Spring). There is ongoing monitoring of the current distribution of *P. johnsoni*. Active management, including successful protection efforts and reintroduction programs, as well as natural dispersal have resulted in *P. johnsoni* occupying all viable habitats within its known range. Annual monitoring (Fig. 1) confirms that all suitable sites are occupied and currently no further active management is required. Continued annual monitoring will track changes over time at an annual scale.

Recovery Objective Three: Increase knowledge and understanding of snail ecology, thermal spring ecosystems and threats to them.

Monitoring of thermal water volumes and stoppages is ongoing. No thermal spring stoppages have occurred in *P. johnsoni* critical habitat during this implementation period. For example,

Kidney Springs and Gord's Spring, which have dried in the past, did not dry during this assessment period. Stoppages have occurred in the Upper Hot springs, but this site is unoccupied historic *P. johnsoni* habitat.

The habitat at each of the eight thermal springs is checked for disturbances monthly even though population monitoring occurs during the during the spring and summer. In addition, throughout the year, staff conduct daily habitat checks at the springs within the NHS. These checks ensure that potential threats to the snails are identified early and mitigations can be quickly put in place.

In 2018, Brenna Stanford published her thesis "Conservation genomics of the endangered Banff Springs Snail (*Physella johnsoni*) using Pool-Seq". This research compared *P. johnsoni* to other *Physella* species such as Tadpole Physa (*Physella gyrina*). This work also investigated the extent of Banff Spring Snail genetic variation among the seven thermal springs it inhabits. These results indicate that each spring represents a distinct genetic population of *P. johnsoni*. Conservation implications of this research suggest that mixing of these snail populations may not be appropriate, negating the potential for between pool translocations in the event of future thermal pool drying incidents. Mitigations for pool desiccation may include captive breeding/housing of snails from pools that have dried up.

Multi-Species Action Plan for Banff National Park of Canada

In 2017, Parks Canada posted a Multi-Species Action Plan for Banff National Park of Canada. The plan took a holistic approach, incorporating all species at risk in Banff National Park that required an action plan under s.49 of SARA. Actions that are beneficial to multiple species at risk were identified and prioritized, to maximize the effectiveness of species at risk recovery efforts in the park. Detailed results for five *P. johnsoni* specific actions as well as actions that benefit multiple SAR identified in the Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada, including research, monitoring and mitigations, are discussed in the *Implementation Report: Multi-Species Action Plan for Banff National Park of Canada (2017 – 2022).*

References

Literature Associated with Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada Since the Last Implementation Report.

Lepitzki, D. 2022. Compilation of selected data from the Banff Springs Snail (*Physella johnsoni*) and thermal spring habitat monitoring surveys, fiscal year 2021–2022. Aquatics Section, Banff National Park internal report.

Parks Canada Agency. 2022. Implementation Report: Multi-species Action Plan for Banff National Park of Canada (2017– 2022). Species at Risk Act Action Plan Report Series. Parks Canada Agency, Ottawa. v + 28 pp.

Stanford, B.C.M. 2018. Conservation genomics of the endangered Banff Springs Snail (*Physella johnsoni*) using Pool-Seq. Master of Science thesis, Biological Sciences, University of Calgary. 82 pps.