

Report on the Implementation of the Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada (2007 – 2017)

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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 February 14, 2007, and a minor amendment was posted on the Species at Risk Public Registry on November 18, 2010. The recovery strategy and action plan included a goal and objectives for the species, a description of activities required to meet the goal and objectives, and timelines for implementation. 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 and in every subsequent five-year period, until its objectives have been achieved or the species' recovery is no longer feasible. This document reports on implementation of the Recovery Strategy and Action Plan for [the Banff Springs Snail (*Physella johnsoni*) in Canada from 2007 through 2017, the progress towards meeting its objectives, and its ecological and socio-economic impacts.

Implementation of the Recovery Strategy and Action Plan and Progress towards Meeting its Objectives

The Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada identified a goal to “*restore and maintain self-sustaining populations of the Banff Springs Snail within the species' historic range*”, and then identified objectives and approaches associated with achieving this goal. The goal has been achieved throughout the reporting period; however, research and monitoring programs are ongoing to help ensure this goal can continue to be realized into the future.

Data from the monitoring program shows that both restored and original populations are self-sustaining, while exhibiting a characteristic oscillating pattern of population increases and decreases both within and among years (Appendix 1). Overall, between 2007 and 2017, four populations (Cave, Lower Middle, Kidney and Upper Cave and Basin) were stable and three populations (Basin, Upper Middle, and Lower Cave and Basin) declined over this time period (Appendix 1). The Basin population has declined the most; however, declines of that magnitude were also observed in 1996 and 1999 and there are no known human-caused factors influencing the recent decline and therefore no mitigations to enact.

Parks Canada successfully reintroduced Banff Springs Snail to the Upper Middle and Kidney springs in 2003 and 2004, respectively. Since publication of the recovery strategy and action plan, the remaining three sites from which the species has been extirpated (Banff Springs Hotel, Upper Hot Springs and Gord's Pool) have been assessed as not feasible for reintroduction due to inadequate thermal flows. The creation of additional habitat where none existed previously (e.g., at the outflows at the Cave and Basin) was also assessed, and deemed as not appropriate nor viable as a recovery approach.

Initiatives to protect Banff Springs Snails and their habitat, and to manage for both the ecological and commemorative integrity values at the Cave and Basin National Historic Site (NHS), are ongoing. Electronic surveillance continues at the NHS, the Upper Middle Hot springs and the Kidney springs and has been very successful at reducing human impacts. A thermal waters touch feature was installed at the NHS in 2013 to reduce limb-dipping in the natural springs but this structure has experienced mechanical issues, and is therefore undergoing a re-design. Thermal habitat conservation messaging is also incorporated into regular programming at the NHS. The updating of boardwalk signage at the NHS has been deferred due to plans to relocate much of the boardwalk out of this sensitive and dynamic habitat to help avoid future conflicts. Additional training is also required for internal trades staff, e.g., towards ensuring protection of critical habitat while conducting plumbing maintenance. The habitat at each thermal spring is checked as a part of monthly population monitoring during the spring and summer. In addition, staff conduct daily habitat checks at the springs occurring within the NHS year-round. Mitigations and education have resulted in a reduction of human disturbance at the springs; however, complete elimination of human disturbance is likely not feasible given that some populations occur within the NHS.

Monitoring of thermal water volumes and stoppages is ongoing. Population trends in relation to environmental covariates such as spring discharge, temperature and conductivity have been analyzed, but need to be updated to incorporate regional climate data. A research project initiated in 2016 is using genomics to compare Banff Springs Snail to other *Physella* species such as Tadpole *Physa* (*Physella gyrina*), and to also determine the extent of genetic variation among thermal springs containing of Banff Springs Snail. This research will be vital for establishing appropriate emergency response plans in the event of future thermal pool drying incidents.

Protecting and Presenting both Natural & Cultural History

In 2013, the Cave and Basin National Historic Site reopened after a three-year major renovation. Protection and presentation of the Banff Springs Snail featured prominently in the designs of these renovations. These thermal 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. In addition to learning about the cultural importance of this National Historic Site as the birthplace of Canada's National Park system, visitors are exposed to one of Canada's most unique species at risk and can learn about the efforts undertaken to protect and restore the Banff Springs Snail.

In 2017, Parks Canada posted the final version of the Multi-species Action Plan for Banff National Park. 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. Lessons learned over the past 10 years of recovery efforts for Banff Springs Snail were incorporated into the planning, and the action plan identified a site-based population and distribution objective for the species to “*maintain self-sustaining populations and habitats by mitigating human-related threats*”. Results from research, monitoring and mitigation efforts outlined above will continue to be evaluated and incorporated into management and recovery efforts for the species.

Ecological Impacts

The Strategic Environmental Assessment (SEA) Statement provided in the Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada presented the potential positive and negative impacts on the environment in the implementation of that strategy and plan. This statement is provided in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan, and Program Proposals*. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making.

Species at risk recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that recovery strategies and action plans may also inadvertently lead to environmental effects beyond the intended benefits. Monitoring of habitat at the thermal springs has demonstrated that recovery activities are not resulting in substantive vegetation damage; therefore, alleviating concerns about unintended impacts to other rare species in the thermal springs (damselflies, mosses, liverworts, plants and amphibians). Concerns had also been identified with holding Banff Springs Snail captive in tanks during extreme low flow events; however, this action has not been implemented.

Socio-economic Impacts

The socio-economic evaluation provided in the Recovery Strategy and Action Plan for the Banff Springs Snail (*Physella johnsoni*) in Canada presented the forecasted costs and benefits as a result of implementation of the action plan. The following costs and benefits have been observed over the period of 2007-2017.

The total cost to implement the recovery strategy and action plan was borne by Parks Canada out of existing salaries and budgets. This includes incremental salary costs, materials, equipment and contracting of professional services. No significant socio-economic costs have been incurred by partners, stakeholders or Indigenous Peoples as a result of implementation of the recovery strategy and action plan. Many of the required actions to protect the thermal springs are associated with restrictions to visitor activities in the vicinity of the springs, for example, installation of fence pickets to prevent limb-dipping. The creation of a thermal waters touch feature at the NHS helped to mitigate this perceived impact by allowing visitors the experience of touching the thermal waters without impacting Banff Springs Snail and other

sensitive thermal spring species through the inadvertent introduction of sunscreen or bug spray or other substances that may affect aquatic life. It is hoped that a redesigned, and properly maintained, touch feature will continue to meet these objectives.

Protection of and recovery efforts for the Banff Spring Snail helps raise public awareness of species at risk by highlighting the importance of protecting small and less charismatic components of biodiversity. The fact that this has been done successfully at one of the most significant NHS in Canada (the birthplace of Canada's national park system) also provides a beneficial example of protecting both natural and cultural history in Canada.

Potential economic benefits of recovering species at risk found in the park cannot be easily quantified, as many of the values related to these species are non-market considerations that are difficult to evaluate in monetary terms. Biodiversity has intrinsic worth and may be valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historic, economic, medical, ecological and scientific reasons. The vast majority of people travelling to Alberta include a visit to the mountain national parks in their trip. Wildlife viewing is the most common visitor activity in the park and this helps support the economic health of the communities in the Bow Valley.

Appendix 1: Banff Springs Snail Population Trends

The figure below presents annual minimum counts of Banff Spring Snail population from individual thermal springs for the periods of 1996 to 2006 (red) and 2007 to 2017 (blue). Note that the Y axis (minimum annual snail counts) varies considerably relative to the overall abundance at each site.

