Future Direction Report
2020 to 2024

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Water Security Agency

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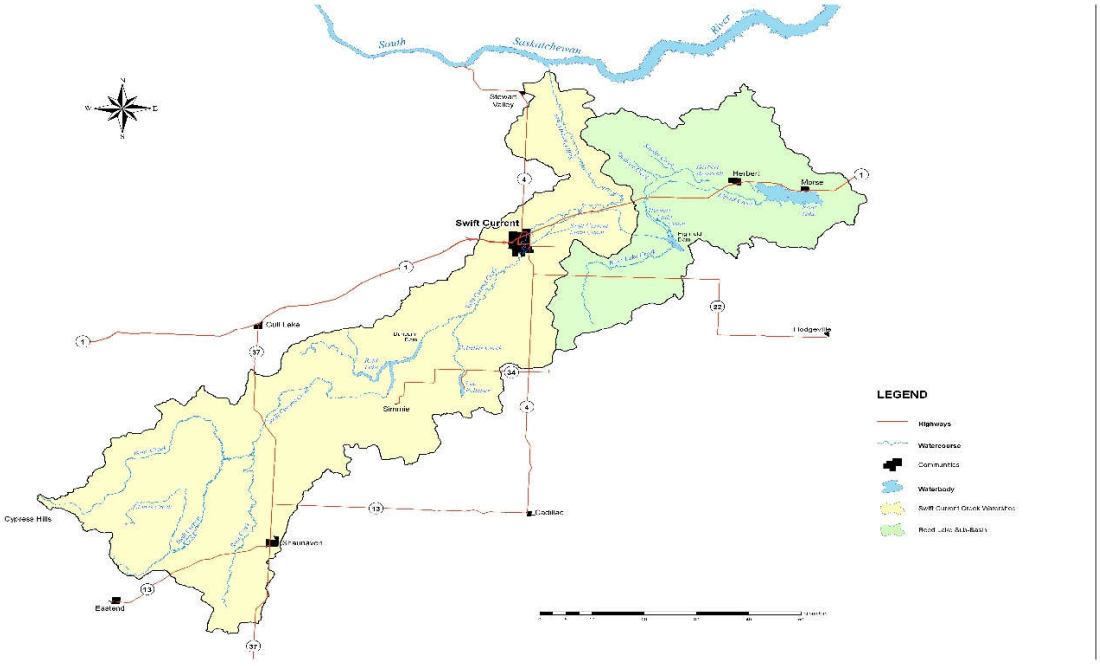

Figure 1. Map of Swift Current Creek and Rush Lake Creek Watersheds

Executive Summary

In 2009 the Swift Current Creek Watershed Stewards Inc. (SCCWS) with the assistance of Water Security Agency (WSA), then known as the Saskatchewan Watershed Authority (SWA) completed a Watershed Protection Plan (the Plan) for the Swift Current Creek and Rush Lake Creek basins collectively called the Swift Current Creek Watershed (the watershed). This plan had 62 Key Actions to improve water quality and watershed health. Since 2009 this Plan has helped shape the direction of the work of the SCCWS including its educational programming and the projects it undertakes.

Since the completion of the Plan, the watershed has seen many changes to the agriculture and oil and gas industries operating within the watershed, increased development along waterways and extremes in weather and precipitation. Many of the organizations given responsibilities to complete Key Actions in the Plan have had changes in mandates, capacity or funding that has not allowed them to complete these actions.

In December of 2018 the SCCWS board and staff members completed a strategic planning process and identified a need to re-engage with stakeholders to establish what they identify are the issues facing water quality and watershed health in the watershed today. Subsequently, the SCCWS invited stakeholders to meet and evaluate the completion of actions in the Plan and to discuss what they perceive are the current issues impacting water quality and watershed health.

Approximately 30 stakeholders representing municipalities, industry, government departments and non-governmental organizations met on October 29, 2019 to give their views and discuss issues within the watershed. From this group of stakeholders a Technical Committee was assembled to review the information provided by the stakeholders. This committee will assist the SCCWS to complete a report detailing actions that the SCCWS should undertake to improve water quality and watershed health in the watershed going forward.

1. Introduction to the Swift Current Creek Watershed

The Swift Current Creek watershed is the area of land that drains water into the Swift Current Creek. The creek is 302 kilometers long and begins northeast of Eastend at the foot of the Cypress Hills at an elevation of 1143 meters and empties into the South Saskatchewan River west of Beaver Flat Resort Village at an elevation of 553 meters. The watershed's total drainage area is 5,592 square kilometers. Major municipalities within the watershed include the City of Swift Current and the Town of Shaunavon.

The watershed includes tributaries Rock, Jones and Bone Creeks which confluence with the Swift Current Creek approximately twenty kilometers north of Shaunavon ten kilometers west of Highway 37. The watershed also has two lakes, Lac Pelletier and Duncairn Reservoir/Reid Lake which was formed when the creek was dammed by the Duncairn Dam. From the head waters the creek flows northeast to Duncairn Dam, flowing through the dam it meets the confluence of Pelletier Creek and Lac Pelletier Regional Park. From there it flows through the City of Swift Current, where it is contained by the Swift Current weir by the Water Treatment Plant. The creek then flows through the city, eastward to Waldeck and then north to the South Saskatchewan River.

The Swift Current Creek is formed by spring runoff and ground water springs and flows through agriculture land into urban municipalities and then back into agriculture land. Situated in the semi-arid region of Saskatchewan, water from the creek and its lakes and reservoirs is critical for drinking water supply, irrigation, livestock production and recreation.

Figure 2. Duncairn Dam and north end of reservoir

Duncairn Dam and the Reservoir it created is a multi-purpose project built by the Prairie Farm Rehabilitation Administration (PFRA) in 1943. Recently ownership and operation of the dam has been transferred from Agriculture and Agri-food Canada (AAFC) to provincial control through Water Security Agency (WSA). The reservoir is 19 meters deep at Full Supply Level and can hold 105,000 dams cubed of water. The reservoir was initially built to impound water for irrigation in the area and now provides a dependable supply of water and aids in flood protection for the City of Swift Current. The reservoir has seen increasing recreational uses such as fishing and boating over the last number of years. Lac Pelletier,

south of Swift Current is a spring-fed lake that was established as a regional park in 1964. The park includes a nine-hole grass greens golf course, boating, and fishing as the lake is stocked with perch, walleye and northern pike. Development along the shores and in close proximity to both Duncairn Reservoir and Lac Pelletier has increased over the last ten years.

Figure 3. Aerial View of North end of Lac Pelletier

For watershed planning purposes, the Rush Lake Creek basin has long been included with the Swift Current Creek Watershed. Although it is a part of the Old Wives Lake Watershed, the Rush Lake Creek basin has been included in Swift Current Creek watershed planning because water can be moved from the Swift Current Creek Watershed if there is not enough water for irrigation in the Rush Lake Basin or for the Town of Herbert to meet the water demands of its residents. This water is moved from the Swift Current Creek to Highfield Reservoir south of Rush Lake via the 30-kilometer-long Swift Current Main Canal. Highfield Reservoir holds 14,934 dam^3 of water. Highfield reservoir is on the Rush Lake Creek and runoff into the creek below the dam helps fill the reservoir. There is some irrigation out of Highfield Dam and some fishing along the shore. There is no official boat launch or dock. The Herbert Main Canal starts at the north end of Highfield Dam and runs 26 kilometers to the Herbert Reservoir. Water runs twice a year from Highfield Reservoir to replenish water levels at the Herbert Reservoir. The Herbert Reservoir is 2,700 dam^3 in size.

Water is pumped two or three times a year from the Herbert Reservoir to a dug-out north of Herbert to supply water to its Water Treatment Plant. There are 1,667 acres of irrigation that use water from the Herbert Reservoir. The Herbert Reservoir has been stocked with fish and there is some fishing available from the shore as there is no official boat launch or dock. The Herbert Main Canal also provides water to approximately 3,000 acres of border dyke irrigated land in the Rush Lake Irrigation project.

Figure 4. North end of Highfield Reservoir

At the north end of Highfield Reservoir is an outlet to release water into the Rush Lake Creek. This release provides water for approximately 2,000 acres of back flood irrigation in the Rush Lake Irrigation Project. The water is usually released in late March and held until the area to be irrigated is covered. The excess water is then released and flows through Lizard Creek to Reed Lake at Morse. Excess water from the border dyke irrigated land also flows to Reed Lake after the irrigation in late May and early June. Reed Lake is a terminal lake that has been designated as an Important Bird Area with many shorebird species stopping there during their migration. It has been dry many times in the past but not within the last ten years given the amount of rainfall and run-off in some years in the last decade.

2. History of the Swift Current Creek Watershed Stewards

The Swift Current Creek Watershed Stewards Incorporated (SCCWS) was formed in 2001. The SCCWS is a stakeholder driven non-profit organization whose mission is to "Enhance water quality and stream health of the Swift Current Creek Watershed by promoting awareness and understanding among water users." From its early beginnings in 2004 through to 2007, the SCCWS monitored the health of the creek and its watershed and educated stakeholders about the Swift Current Creek Watershed and the practices that improve watershed health. The SCCWS continues to fulfill this mission by working towards the following three goals:

1. Educate users of the Swift Current Creek Watershed on a continuous basis about issues and impacts that affect water quality.
2. Monitor water quality and riparian health to assist in co-operative solutions regarding water management.
3. Foster an attitude of individual responsibility toward watershed stewardship.

In 2007 the SCCWS in co-operation with Water Security Agency (WSA), formerly the Saskatchewan Watershed Authority (SWA), started consultations to complete the Swift Current Creek Watershed Water Protection Plan (the Plan). The plan was released in 2009 and contained 62 Key Actions to improve water quality and watershed health. This document continues to be the basis by which the SCCWS sets its yearly work plan as a condition of receiving funding from the WSA to see the actions in the plan completed.

Figure 5. Release of the Swift Current Creek Watershed Protection Plan October 23, 2009

Since 2007, the SCCWS has also been involved with the Agri-Environmental Group Plan (AEGP), which is now called the Canadian Agriculture Partnership Agri-Environmental Technical Services (CAP-AETS) to assist Saskatchewan Ministry of Agriculture (MOA) deliver Farm Stewardship Programming (FSP) and the Farm and Ranch Water Infrastructure Program (FRWIP). These programs are administered by the MOA and provide funding to agriculture producers to implement Beneficial Management Practices (BMPs) that mitigate or eliminate negative environmental impacts and enhance water quality and watershed health. Involvement with these programs has allowed the SCCWS to hire a staff member who assisted MOA to promote these programs and landowners with applications to receive funding to help implement these BMPS. The implementation of these BMPs have helped the SCCWS achieve many of the Key Actions in the 2009 Plan.

Figure 6. Water trough with solar power to pump water from creek into trough. One of many projects that producers have completed with assistance from the involvement of the SCCWS in Agri-Environmental Programming

Since its inception, the SCCWS has completed many projects that helped meet its mission statement and goals. Each project created awareness and educated the public, allowing the SCCWS to gain more insight into the watershed and its complexity, highlighting the dependence the southwest region has on its water as a valuable resource, and generating increased interest in maintaining a healthy watershed.

One of the SCCWS's most visible and enduring program is the student education program called Froghoppers. This program has been in existence since 2004 and over 7,000 students have participated in the program. Froghoppers spreads the message of watershed stewardship to students 6 to 12 years of age at schools, camps and park programs. Students are taught about the importance of maintaining riparian health, water conservation, the animals and plants that need the riparian area and water to survive. If possible students go to the creek or another waterbody to learn what fish, macroinvertebrates and plants live in there. Students may also complete a craft that they can take home with them to remind them about the message of watershed stewardship from that day that they can share with their families.

Figure 7. Students at Froghoppers program going out to do some creek dipping to see what they can find in the water.

3. Watershed Protection Plan Creation Process and Links to Source Water Protection

The Watershed Protection Plan was the first barrier in a multi-barrier approach to source water protection in the Swift Current Creek Watershed. Protecting source water in the creek is important because almost two thirds of watershed residents rely on water from the creek for their drinking water. It is also important to industry in the watershed especially livestock production, irrigation, recreation and oil and gas operations. Steps taken to protect source water will also work to improve watershed health, which in turn improves water quality creating a positive feedback loop to improve water quality and watershed health.

Figure 8. Swift Current Water Treatment Plant and weir on Swift Current Creek. Over two thirds of residents in the watershed rely on water from the creek for their drinking water. The outlet to the Swift Current Main Canal is to the left of the plant in this picture.

This multi-barrier approach (MBA) is defined by the Canadian Council of Ministers of Environment (CCME) as an "integrated system of procedures, processes and tools that collectively prevent or reduce the contamination of drinking water from source to tap in order to reduce risks to public health" (CCME 2002). Other barriers include effective treatment, maintenance of the water distribution system, monitoring and emergency response planning. As the first step in the multi-barrier approach, watershed protection planning is the essential component of any strategy to prevent or reduce contamination risks to a water system which reduces the need to rely on the other barriers to provide high quality water to users.

The Watershed Protection Plan process was modelled after a source water protection process designed by Dr. Robert Patrick of the University of Saskatchewan. This process includes the development of a steering committee, assessment of source water, development of land management action and implementation of the actions and review of the plan.

The 2009 Watershed Protection Plan process started with the formation of a Watershed Advisory Committee (WAC) made up of representatives from both the Swift Current Creek Watershed and Rush Lake Creek Sub-basin. These representatives were from stakeholder organizations such as Rural Municipalities (RMs), towns, the City of Swift Current and other organizations invested in water quality and quantity. Meetings were held to provide background information about the community based planning model and the role of the planner and stakeholders in creation of the plan. A Technical Advisory Committee (TAC) comprised of representatives of agencies involved in water resource management was created to work alongside the WAC. The TAC provided expertise about surface and ground water management, water quality monitoring, in stream flows, agriculture, climate change and environmental programming, and regulation of the energy industry. The SWA watershed planners working with the TAC prepared a background report to provide information on the watershed's physical and ecological characteristics, surface and ground water resources, state of the watershed report and current management characteristics.

After a tour of the watershed, the committees met to discuss issues impacting watershed health and then developed action items to address these issues. There were four meetings between December 2008 and April 2009 to develop the Plan. The report contained sixty-two key action items, each detailed under Specific Planning Objectives, Recommendations and Key Action. In the report each

recommendation and key action has information listed detailing context and background, time frame of implementation and lead agency and other agencies responsible for completion of the action.

The creation of the report and the work to complete these action items in the Plan are the basis of work plans created by the SCCWS. These work plans in turn are the basis from which WSA funds the SCCWS's core operational expenses.

The assessment completed by participants of the stakeholder meeting in October 2019 acted as the final stage of the process of the Watershed Protection Plan and marked the start of a new planning process to produce the Future Direction Report. However that does not mean that the Watershed Protection Plan will no longer be an important document for the SCCWS. In five years when the Future Direction Report is reviewed and a new report drafted, consideration will still be given to the Key Actions in the 2009 Plan.

4. Watershed Protection Plan Evaluation and Future Direction Report Methodology

In the fall of the 2018 the SCCWS board and staff met to work on a Strategic Plan. Resulting recommendations included bringing stakeholders together to:

- Determine what they see as the current issues of water quality and watershed health.
- Assess completeness of the action items in the Watershed Protection Plan.
- Identify actions that are still relevant to the SCCWS, and
- Add new actions, as needed.

To accomplish this the SCCWS invited stakeholders to a meeting which took place October 29th, 2019. Stakeholders included municipalities, government departments, non-governmental organizations and industries that have a vested interest in the watershed. The SCCWS also invited representatives from groups that had been involved with the completion of the 2009 Plan and those that the SCCWS has worked with or have provided funding to the SCCWS to complete projects in the past 3 years.

The SCCWS provided an updated background report to all meeting attendees to describe the physical environment, demographics and industries of the watershed. This report also included descriptions of the changes to the physical environment, demographics and industries in the SCCWS in the ten years since the release of the Plan. The SCCWS provided its evaluation of completion of Key Actions in the Plan. A report outlining the projects completed by the SCCWS in the past five years was also sent to attendees. These reports allowed meeting attendees to determine their own evaluation of completion of items in the Plan as well as the relevance of the items to the work of the SCCWS and the realities of water quality and watershed health today. Attendees were sent a survey to rank the issues that have emerged in the last ten years as to their impact on water quality and watershed health. This survey also

asked attendees to rank initiatives and projects of the SCCWS as to the importance of each to the attendee's organization.

At the stakeholder meeting, presentations were made about the history of the SCCWS, projects that it has undertaken, the history and evolution of the SCCWS's involvement in Agri-Environmental Programming and WSA's perspective on the history of watershed planning, the evaluation and direction setting process and what outcomes it expects from the process the SCCWS is undertaking.

After these presentations, there was a facilitated discussion about the progress and relevance of the 62 Key Actions in the Plan. The facilitator introduced each action, gave a brief description and the evaluation by the SCCWS. Once discussion was completed for an item, the process was repeated for the next action until all 62 actions were discussed. Once the evaluation of the Plan was completed, the results of the survey were released to attendees, who then discussed each of the questions in the survey in the same manner as the action items in the 2009 plan. From these discussions, meeting attendees agreed on three priority issues that the SCCWS should focus in as it sets its Future Direction. To assist the SCCWS as it sets its future direction a Technical Committee was assembled. This committee members possess a wide range of technical expertise in water and land management and represent various industries, government departments and the City of Swift Current.

5. Meeting Results

Following discussion about the Key Actions in the 2009 Plan and the current challenges facing the watershed, the meeting attendees identified 3 areas of concern that they believed the SCCWS should be focusing their work on. These are:

- **Impacts of agriculture** - including the potential effects of crop and livestock production on water quality and quantity, and watershed health and how the SCCWS can work with producers and industry to eliminate or mitigate these impacts.
- **Impacts of extreme climate events -** how they are managed to maximize water resources for all stakeholders, education about these events and the steps stakeholders can take to adapt to climate change and manage their own water resources.
- **Impact of Invasive species on water quality and watershed health** - this includes both aquatic species as well as invasive plants. The SCCWS will aim to educate and work with stakeholders and the public to stop or limit the spread of these species.

The Technical Committee reviewed each of the 62 Key Actions in the 2009 Plan to determine if the Action pertains to one or more of those areas of concern. This process also identified which of the action items could be set aside or parked as they are not relevant at this time or are not in the mandate of the SCCWS. In addition, several action items that did not pertain to these priority areas but were important to the work of the SCCWS were identified to be a part of the ongoing communications strategy of the SCCWS. Once this process was completed, the Technical Committee reviewed the remaining action items to create the Action Items that are in this Future Direction Report. Some of the items from the

original plan remain, some action items were amalgamated into one item, and new action items were added.

6. Watershed Planning Objectives

6.1 Watershed Risks and Stressors

During discussions for the 2009 Plan the Watershed Advisory Council (WAC) expressed concern about the long- term sustainability of both the quantity and quality of the water within the watershed. This concern was also shared by attendees of the 2019 stakeholder meeting. Risks such as climate variability and extremes, impact of agriculture, industry and development are risks and stressors that stakeholders indicated have the most impact on water quality and quantity in the watershed.

Water monitoring projects completed by the SCCWS show a wide range of water quality within the watershed. Water quality is generally good for all uses common in the watershed, however minor issues do exist. Further identification of these problems can help determine if issues are natural or human-caused and then identify solutions to address them.

Figure 9. Dallas Peters the SCCWS Agri-Environmental Technician testing water quality during one of the monitoring projects of the SCCWS.

In 2009, the threat of increased nutrient loading was identified as one of the most important stressors to water quality. Therefore, many of the action items developed in the Plan focused on reducing nutrient loading. In 2019 stakeholders identified that impacts of agricultural activities are one of the priority areas for the SCCWS to focus on in the next five years. As such, many of the actions in the Future Direction Report include this as a component of the action.

Identifying specific stressors in specific areas of the creek will require further monitoring. Stakeholders and the Technical Committee recommend that the SCCWS continue monitoring and investigate funding opportunities to undertake these projects and expand testing to include stressors.

6.2 Watershed Stewardship, Education and Communications

The SCCWS has had significant success in watershed education since the group was formed in 1998. The most visible and long-lasting program has been Froghoppers which takes the message of watershed stewardship to students throughout southwestern Saskatchewan and since 2003 over 7,000 students have participated in the program. The SCCWS has organized many workshops for agriculture producers through its work with the Agri-Environmental Technical Services promoting projects to improve riparian health, development of new water sources, conversion of saline and erodible crop land to forage production and identification and management of invasive plant species. The SCCWS has hosted workshops in urban areas to demonstrate how to build and use rain barrels and also discuss water conservation measures with attendees. The SCCWS has actively attended farmer's markets, fishing derbies and other events to promote awareness of invasive aquatic species and other topics of interest. The WAC in 2009 wanted this work to continue as did 2019 meeting attendees. The Technical Committee has put together a communication strategy that encompasses previous work and sets a direction for the communication activities of the SCCWS in the future.

Another topic of discussion during meetings in both 2009 and 2019 was the importance of ecological goods and services, also referred to as the natural capital provided by riparian areas and wetlands. These are the benefits gained from the ecological functions of healthy riparian areas and wetland ecosystems. Fully functioning riparian areas provide benefits such as improved flood control, improved water quality, wildlife habitat and recreational opportunities. Riparian areas control erosion by forming a physical barrier that slows surface flow of sediment and debris, stabilizes banks and promotes water infiltration. The width of the riparian buffer is determined by the type of vegetation present, the extent and impact of adjacent land use, and the functional value of the wetland. An effective riparian buffer will keep sediment in surface run-off from entering a waterbody. Buffer areas with woody, herbaceous vegetation and grasses remove nutrients such as nitrogen and phosphorous from surface water flow by the uptake of nitrate and phosphate by plant roots and anaerobic microbial denitrification in the saturated zone of the soil. These areas will reduce flow of fecal coliforms and the amount of pesticides entering the creek through run-off.

Riparian Health Assessments (RHAs) place a score on the ability of riparian areas to complete their functions. In 2017, the SCCWS as part of the monitoring project, completed RHAs on the sites where water samples were taken. Of the seven sites assessed, five were rated as healthy with problems, one rated as unhealthy and one as healthy. The problems that existed were the increased presence of shallow rooted grass species, increased presence of invasive weeds and increased human-caused damage to the banks and riparian areas. These assessments demonstrated that the value of the ecological goods and services of the creek is reduced and needs to be improved. Many of the action items in the Future Direction Report address these issues.

The increase of invasive plant species infestations in the watershed was identified as a major threat to riparian health by both the 2009 WAC and 2019 stakeholders. These species threaten the biodiversity of the watershed and affect the riparian areas along the creek as they can be spread in the water as it flows in the creek. Stakeholders at the 2019 meeting also indicated that work to stop the spread of

invasive aquatic species is required as they are also a significant threat to riparian health by altering the ecosystem and replacing native aquatic species.

Figure 10. Collecting Leafy Spurge Beetles to be released at areas in the watershed to control infestations of Leafy Spurge in environmentally sensitive areas

Due to the impacts on watershed health posed by both invasive plants and aquatic wildlife, stakeholders at the 2019 meeting indicated that invasive species prevention and management should be a priority for the SCCWS. Delivering Invasive Programming is one of the Actions Items in the Future Direction Report and will be a significant part of the communication strategy being developed as part of the Future Direction Report.

6.3 Watershed Management

The Swift Current Creek and Rush Lake Creek watersheds are located in the semi-arid Palliser Triangle and are susceptible to intermittent periods of drought followed by extreme rainfall events. Much of the surface run-off from spring melts and rainfall in the watershed are retained by dams especially Duncairn Dam. All of the drinking water for the City of Swift Current is supplied by the Swift Current Creek. The Town of Herbert relies on water from both the Swift Current Creek and Rush Lake Creek supplied by a network of reservoirs and canals to meet drinking water needs. Therefore, management of water resources within the watershed was identified as a priority by stakeholders at the 2019 meeting.

The Swift Current Creek and Rush Lake Creek basins have had a moratorium on new water allocations since 1981. WSA has completed a water supply study for these basins but has not put forward any recommendations that would change water allocations or lift the moratorium. An Action Item to approach WSA about finalizing the report has been included in the Future Direction Report as the water supply study should be an important piece in drafting water management plans in the future.

In both 2009 and 2019, development along the creek's flood plains was a concern. Since 2009, municipalities have worked to develop plans to ensure that no development takes place in the flood plain. The City of Swift Current is currently working with WSA to design and develop flood mitigation within the city where development has already taken place.

2009 Watershed Advisory Committee members identified a concern about storm water releases into the creek and the resulting impacts on water quality and watershed health. As part of the Technical Committee's prioritization process in 2019, urban impacts were identified as a concern requiring action

items in the Future Direction Report. Action items include education and working with municipalities to limit impacts and encourage municipalities to obtain resources or input from the SCCWS when planning new developments.

Figure 11. Completed Rain Garden. This feature will filter water from South Service Road in Swift Current before it hits the creek.

6.4 Water Conservation

A secure and high quality water supply is essential to human health and is also a key driver of economic expansion. Water conservation is important to ensure an adequate supply for current needs and to meet the needs of future development. Water conservation reduces water use by promoting efficient use of water and eliminating wasteful practices. This does not mean that total water withdrawals from the watershed will decline as economic activity and population growth creates new water demands. Successful water conservation programs will slow the demand for water during these periods of growth.

Water conservation increases economic efficiency by reducing costs to pump water which requires significant amounts of energy and creates significant emissions. This activity can be a major cost for irrigators, municipalities and other water users and wise use of water reduces these costs for users. Lowering water use reduces the need for new infrastructure and the costs of building and maintaining it. Reducing domestic water use in cities, towns and villages reduces the need to expand water treatment and waste water treatment systems as populations increase, reducing costs that get passed on to residents. Another benefit of water conservation is that water become available for other uses, increasing economic opportunities such as increased irrigation and the economic spin off that it could create.

Stream and lake ecosystems also benefit from water conservation as they become stressed when too much water is removed from them. As water levels decline, the natural processes that support fish and other wildlife are impacted. Water conservation helps to maintain healthy eco-systems, protects biodiversity and maintains an environment that contributes to our health and quality of life.

Water availability in Saskatchewan varies from large amounts available in the north part of the province to the Swift Current Creek and Rush Lake Creek basins in the southwest that have supply constraints which have led to the moratorium on new water allocations. As demand for water in these basins often can be greater than supply, conservation measures will produce a higher return than in northern areas.

However even in areas of sufficient water supply conservation measures provide benefits to the ecosystem, quality of life and the economics of the watershed.

There were no Action Items identified regarding water conservation. However water conservation education is a significant part of the Communication Strategy and work of the SCCWS going forward.

6.5 Aquifer and Ground Water Protection

Ground water is a significant source of drinking water for communities, Hutterite colonies, farms, ranches and rural residents within the watershed. Shaunavon is the largest community in the watershed that uses ground water only to supply drinking water to its residents. Given the importance of ground water to residents and their businesses within the watershed there is a need to protect both the quality and quantity of ground water within the watershed.

Ground water can be contaminated by numerous activities or sources, including improper gravel extraction, faulty septic systems and incorrect agriculture practices. Ground water quality in the watershed is variable, but is usually high in mineral content and because of that it often does not meet provincial government drinking water guidelines. Generally, the deeper the ground water source is, the less chance there is for water quality to be impacted by surface activities. Ground water found near the surface is more prone to drought and is more vulnerable to contamination from surface activities, but are less mineralized than from deeper aquifers. Aquifers can be recharged from or discharge into surface water bodies depending on local hydrogeology, creating a link between surface water and ground water quality and quantity.

In 2009 aquifer protection and awareness were considered a priority by the WAC. Recommendations included providing well owners with better information and education on issues of ground water quality and quantity through action items such as well decommissioning workshops. In 2019, stakeholder meeting attendees did not indicate ground water issues as a specific watershed management priority; however, it will be included as part of the other management issues. The proper decommissioning of abandoned water wells is a Beneficial Management Practice to improve ground water quality. The promotion and awareness of this practice is included in the SCCWS's involvement with Agri-Environmental Technical Services, which is an Action Item in the Future Direction Report.

7. Communication Strategy

The 2019 stakeholder meeting attendees and the Technical Committee recommended that the SCCWS develop a strategy to communicate the results of this process, the Future Direction Report and its Action Items, and the SCCWS's successes improving water quality and watershed health. The communication strategy will include the key messages to be transferred, the methods of communication and the events that the SCCWS will coordinate and attend to implement this strategy.

7.1 Specific Projects

To meet the objectives of the Communication Strategy, the following projects will be implemented.

Froghoppers

- This program has been very successful reaching over 7,000 students in 15 years of operation.
- The SCCWS will continue to educate students about watershed stewardship and look to add classrooms and other avenues to present to.
- The SCCWS will endeavor to make presentations to High Schools and to find classrooms and students to collaborate with on projects to further watershed stewardship.

Go Green

- Work with the City of Swift Current and organizers of Go Green to continue to implement projects that improve water quality and watershed stewardship in the city and raise the profile of the SCCWS.
- Promote projects and their successful completion in articles in electronic newsletter.
- Invite press to publish articles about the projects and their successful completions.

Aquatic Invasive Species Comprehensive Education

- Provide results of monitoring for zebra mussels and sampling for veligers to stakeholders.
- Develop educational and promotional materials.
- Continue to erect signage where required.
- Attend events such as fishing derbies, Market Square and others to promote Aquatic Invasive Species diligence.
- Promote events and provide continuing education in electronic newsletters.
- Invite press to publish articles about AIS monitoring and steps watercraft owners can take to reduce the spread of these species.

Invasive Weed Programming

- Host workshops for farmers, ranchers, oil and gas companies, environmental consultants, municipalities and land managers about identification of invasive weeds, mapping and management of infestations.
- Develop educational and promotional materials that highlight identification of invasive weeds, mapping and management of infestations.
- Promote events and distribute educational materials and promote programs in electronic newsletter.
- Invite press to publish articles that promote events and distribute educational materials and promote programs in electronic newsletter.

Agriculture Beneficial Management Practices Promotion

- In conjunction with the Ministry of Agriculture host workshops and field days that promote these practices.
- Promote the SCCWS's involvement in the Agri-Environmental Technical Service at workshops and in articles in the electronic newsletter.
- In partnership with the MOA publish newspapers that promote the programs available and the role that the SCCWS has in assisting producers to apply for funding under these programs.

7.2 Additional Education and Awareness Topics

Urban storm water run-off, storm sewer water discharge, and water conservation

- Educate urban residents about Beneficial Management Practices for urban areas including storm water run-off, storm sewer water discharge, and water conservation.
- Include as part of Froghoppers program and presentations to high schools.
- Include as part of materials for Go Green events.
- Provide information at events such as Market Square.
- Include educational articles in electronic newsletter.
- Provide articles on these topics to local newspapers to publish.

Future Direction Report

- Release the report at the 2020 Annual General Meeting of the SCCWS.
- Invite local press to publish article on the Report, its release and what it means for the SCCWS.
- Provide update of progress of action items in the Future Direction Report in electronic newsletter.

Results of Water Supply Study including discussion on climate variability, and adaptations to management water resources as a response to that variability.

- Host workshops with stakeholders to discuss possible scenarios of water availability and management, the results of each scenario and the impact of different water allocations.
- Discussion of workshops and results in electronic newsletter.
- Invite press to publish articles on this subject in local newspapers.

Other possible topics for discussion at events, electronic newsletters and local newspaper articles.

- Climate impacts and adaptation measures.
- Resources available from the SCCWS.
- The interactions of the SCCWS with industry, government and other NGO's.
- Results of monitoring projects.
- Voluntary land protection options available to land owners and managers.

8. Action Items

The following summarizes the key action items identified for the SCCWS through the 2019 planning process and will provide direction for the SCCWS work plans for the next five years.

1. Identify likely impacts of climate variability on water quality and quantity in the watershed and adaptation measures to mitigate these impacts.
    a. Use historical events and modelling to understand watershed specific results.
    b. Identify adaptions to climate variability by managing extremes/cyclical variations.
    c. Identify actions that will assist the City of Swift Current to manage water supplies during times of water deficits and assist the city with implementation of these actions.

2. Promote Agriculture Best Management Practices (BMPs) for improving water quality and watershed health through participation in Canadian Agriculture Partnership Agri-Environmental Technical Services and any subsequent Agri-Environmental Programming that may be in place. BMPs will include but are not limited to the following:
    a. Wetland retention.
    b. Well decommissioning.
    c. Off-site cattle watering.
    d. Riparian buffer retention.
    e. Invasive plant species management and control.
    f. All other new programs and agriculture BMPs identified to improve water quality and watershed health.

3. Deliver Invasive Species Programming to improve watershed health.
    a. Prioritize the invasive species with potential to negatively impact the watershed and develop programming to monitor and apply control methods.
    b. Organize invasive species field days and develop extension materials.
    c. Work with Rural and Urban Municipalities to apply Integrated Weed and Pest Management Plans.

4. Identify and develop Best Management Practices for urban municipalities and communicate to stakeholders
    a. Provide this information to schools and students, including high schools, continue to work with volunteers on Go Green Friday to clean up the creek within the City of Swift Current and implement projects that improve water quality and watershed health.
    b. Work with municipalities to help promote and host Hazardous Waste Days.
    c. Educate residents about the impacts of storm water run-off and storm sewer discharge into the creek on water quality and watershed health and promote Best Management Practices to limit these impacts.

d. Engage municipalities to access resources or input from the SCCWS when undertaking planning activities.
e. Identify actions that will assist the City of Swift Current to manage water supplies during times of water deficits and assist the city to communicate this information to residents.

5. Work with oil and gas industries to promote source water protection.
   a. Discuss with members of the industry about the best measures to promote source water protection.
   b. Network with industry members to learn more about industry to learn what practices that industry are already using and the practices that the SCCWS can help the industry to adopt to improve water quality and watershed health.
   c. Look for industry events that the SCCWS can attend and publications the SCCWS can publish articles in to improve communications to members of these industries.

6. Approach Water Security Agency to complete a report detailing the results of the completed Water Supply Study for the Swift Current Creek Watershed and Rush Lake Creek Sub-basin.
   a. As part of this request, the SCCWS and WSA will consult about scenarios that could impact water availability in the watershed and they are to be inputted into the model to determine their impact on water availability throughout all parts of the watershed.
   b. The report should include how climate variability (especially long term drought) could impact water supply.
   c. After completion of the report promote the sharing of information regarding water allocations to all stakeholders in the watershed.

7. Promote sharing of information regarding water supply study.
   a. Collaborate with Water Security Agency to find best method to share this information.
   b. Implement measures to share information to stakeholders.

8. The SCCWS needs to continue with monitoring projects that quantify water quality and riparian health
   a. Monitoring should be periodic to allow for comparison to previous projects and act as a baseline for future projects.
   b. Monitoring will identify significant stressors to water quality and watershed health and the activities that eliminate or mitigate these stressors.
   c. Use the results of riparian health monitoring to identify, develop and implement activities that can improve riparian functioning.
   d. Seek funding for these monitoring projects especially to include testing for pesticide residues, nutrient loading and other pollutants that may impact water quality and watershed health that have not been tested for in prior projects.

9. Share all monitoring results on the SCCWS web-site by developing a portal that stakeholders can access to view results of all monitoring that the SCCWS has completed.

10. Develop business and operating plans to identify potential services and long term funding sources.
    a. The SCCWS Board and Staff with the assistance of the Technical Committee will expand upon the Strategic Plan completed in the fall of 2018 to develop a long term business and operating plan.
    b. Extend the opportunity to municipalities to be paid members and identify the services that could be provided for in return for membership fees paid.
    c. Engage businesses, government agencies and other non-governmental organizations to determine the partnerships that can be formed to complete projects that possibly provide sources of income.
    d. Engage businesses, government agencies and other non-governmental organizations to determine projects that the SCCWS can implement under contracts that possibly provide sources of income.
    e. Identify and communicate opportunities to develop the completed Future Direction Plan.

11. Implement Communication Strategy outlined in Section 7 of the Future Direction Report to share information with stakeholders.

Appendix A: October 29, 2019 Stakeholder Meeting Attendees

Participant Name	Organization Represented
Alanna Howell	Water Security Agency
Austin Baron	Ministry of Agriculture - Swift Current Office
Bernie Lemire	RM of Carmichael
Bob Stennick	RM of Lac Pelletier
Bridget Andrews	Saskatchewan Association of Watersheds
Bruce Deg	City Of Swift Current Council
Curt Chickoski	RM of Saskatchewan Landing
Dallas Peters	Swift Current Creek Watershed Stewards
Dan Runcie	Swift Current Creek Watershed Stewards
Danny Spenst	RM of Excelsior
Darren Fiddler	RM of Webb
Darren Steinley	Rush Lake Irrigation District
Don Hornung	Lac Pelletier Regional Park
Frank Glenn	RM of Swift Current
Gary Neil	Water Security Agency
Harold Martens	South Sask River Watershed Stewards
James Wright	Duncairn Dam Cabin Owners Association
Janna Foster Wilfong	WSP
Jenna Furseth	Water Security Agency
Jolene Peters	Swift Current Infrastructure and Operations
Karen Richmound	Swift Current Chamber of Commerce
Kevin Steinley	Swift Current Creek Watershed Stewards
Lloyd Cowan	Waldeck Irrigation Project
Martin Cooling	Swift Current Parks and Rec
Megan Carlson	Ministry of Energy and Resources
Raymond Pare	RM of Arlington
Sandra Bathgate	Saskatchewan Irrigation Projects Association
Stacy Wiens	Matrix Environmental Solutions
Thomas Moore	Plains Midstream
Tom Harrison	South of the Divide Conservation Action Program
Brittany Hesjedal	Old Wives Watershed Association

Appendix B: Technical Committee Members

Committee Member	Group Represented
Alanna Howell	Water Security Agency
Austin Baron	Ministry of Agriculture - Swift Current Office
Dallas Peters	Swift Current Creek Watershed Stewards
Dan Runcie	Swift Current Creek Watershed Stewards
Janna Foster Wilfong	WSP Canada Ltd.
Kevin Steinley	Swift Current Creek Watershed Stewards
Martin Cooling	Swift Current Parks and Rec
Stacy Wiens	Matrix Environmental Solutions