ASTOTIN CREEK RESILIENCY STUDY

Community Session

November 2021

About the Project

Astotin Creek and its tributaries have experienced three major flooding events in the past ten years. These events have caused flooded farmland, damaged county roads and threatened homes and industrial infrastructure within the Astotin Creek watershed. To help manage current and future water issues, Strathcona County is undertaking a detailed study to understand historical changes and current conditions for the Astotin Creek watershed.

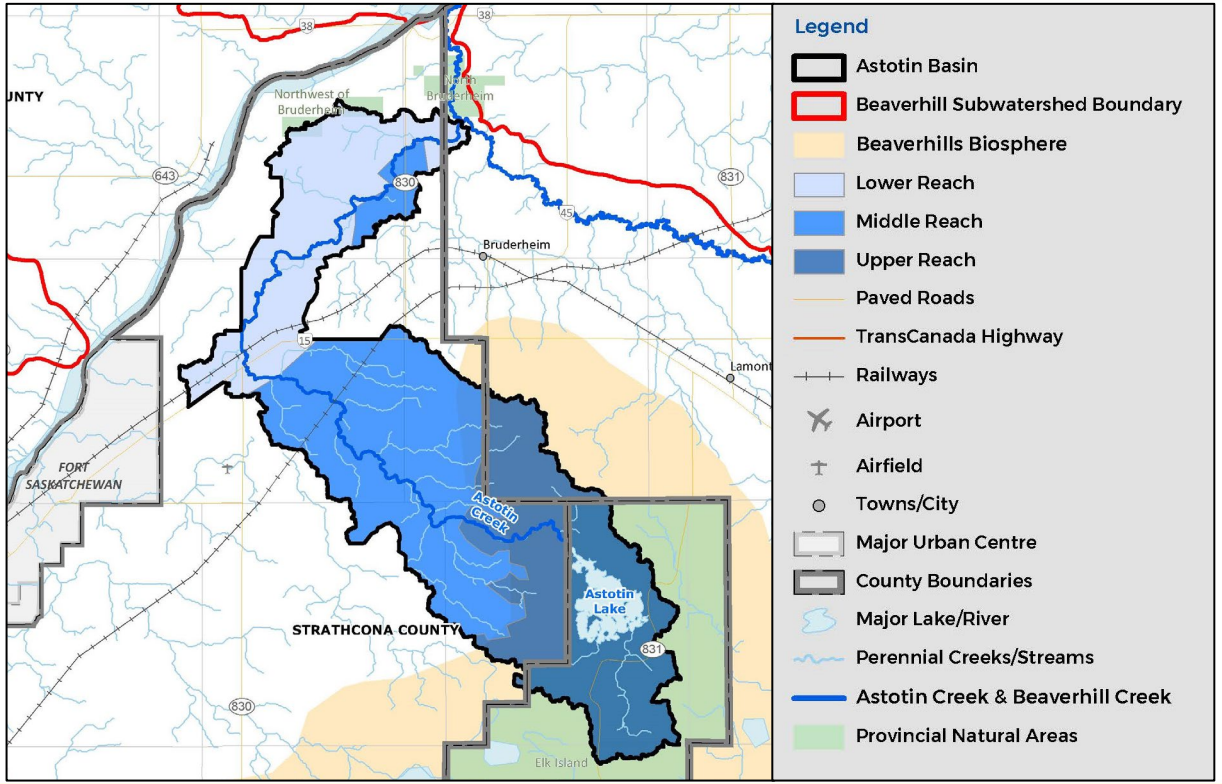
The key goals of the study are to:

- Create an action plan that will address flood, drought, and water quality issues in priority areas within the Astotin Creek watershed,
- Restore and enhance ecological connectivity and function in critical areas of the Astotin Creek watershed, and
- Increase capacity, knowledge, awareness and participation by industrial landowners, private landowners, and agricultural producers in activities that can restore and maintain critical areas and functions of Astotin Creek watershed.

The study includes technical assessments, analyses, planning and development of a Resiliency Action Plan. The technical work will be accompanied by Indigenous, stakeholder, and community engagement.

This presentation will review key findings of the study, and solicit comments on the Action Plan

Astotin Creek Watershed



The Three E's

Astotin Creek Resiliency Study

Environment, Engagement, and Engineering

These three elements must be balanced when making decisions about Astotin Creek Watershed. The actions in the resiliency plan will reflect community and stakeholder input, sound engineering practices, and the need for a sustainable creek environment.

WATERSHED ANALYSIS

- Fieldwork
- Climate analysis
- Public GIS Data Atlas
- Astotin Creek State of the Watershed Assessment
- Astotin Creek Watershed Master Drainage Plan

ONGOING ENGAGEMENT

- Project Introduction Letter and emails
- Road Signs – 4 locations along major rural routes in the north
- Newsletters: Public Engagement, Project, & County Living
- Postcards (about 700 basin area residents & businesses)
- Public Engagement Calendar & Social Media
- Stakeholder Engagement Invite Letters, Emails, & Packages)
- Online engagement sessions (Stakeholder & Community)
- Virtual Open House, Survey , & Scoop survey (mixed topic survey)

RESILIENCY ACTION PLAN

- Draft Resiliency Action Plan
  - *November 2021*
- Presentation to Priorities Committee
  - January 2022
- Resiliency Action Plan
  - *January 2022*
- Presentation to Council
  - *Q1 2022*

Key Findings: Ecological Assessment

Stream-side Vegetation and Creek Health

Vegetated buffer zones support healthy creeks:

- 30m creek buffer zone is the minimum for protecting water quality
- 100m creek buffer zone supports wildlife and plant biodiversity

Results:

- Vegetated creek buffers in the upper watershed were largely intact
  - Both 30m and 100m buffer zones had more than 95% of vegetation intact
- Vegetated creek buffers in the lower watershed were mostly intact
  - Both 30m and 100m buffer zones had more than 73% of vegetation intact
- Vegetated creek buffers in the middle watershed were least intact
  - 32% of vegetation intact at 30m; 22% of vegetation intact at 100m

Benefits of intact vegetation buffers:

- Biodiversity
- Ecological connectivity
- Erosion & sediment control
- Bank stability
- Water quality
- Water availability

Key Findings: Hydrological & Hydraulic Analysis

Hydraulic Modelling

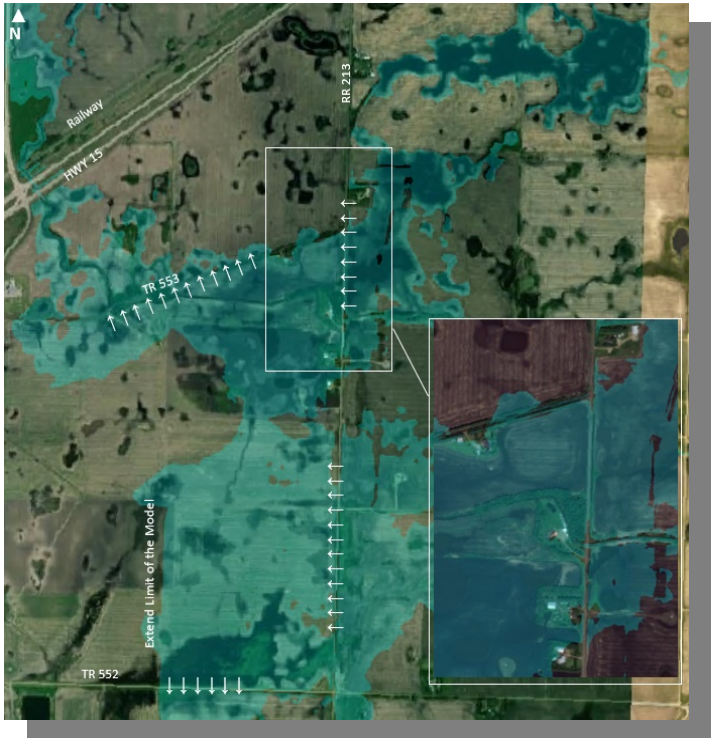
"Hydraulic modelling" is a mathematic model of a fluid flow system.

Our approach:

- We simulated future major flood events on Astotin Creek and studied the impact of climate change on flood flows. The simulated major floods were compared with the 2018 flood events to confirm location of flood-prone areas.
- Flood inundation maps were produced for each simulated flood event, which shows the inundated areas along the creek.

Key Findings:

- The simulations revealed that several bridges/culverts along Astotin Creek are too small to convey flood flows, leading to higher flood levels upstream of the roads.
- These higher flood levels exceed road surface elevation at several locations, causing flooding and potential road closure.
- Land adjacent to Astotin Creek downstream of Range Road 212 is very flat, leading to larger flooded areas. Impacted lands generally consist of agricultural lands and wetlands.



Key Findings: Stormwater Drainage Planning

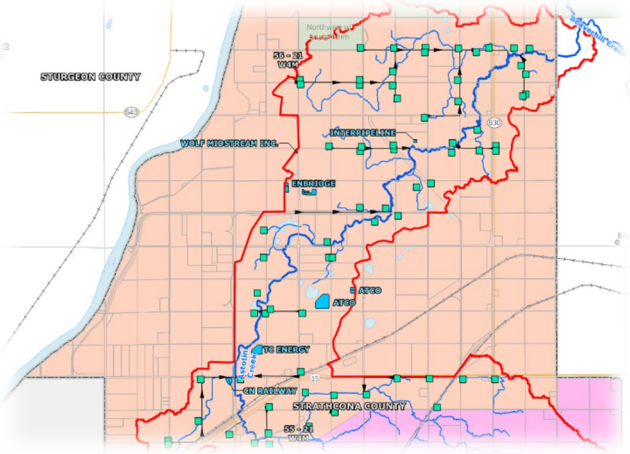
Our approach:

- We reviewed background information to understand what elements constitute the existing drainage system and what are the natural drainage patterns.
- We developed a concept to provide stormwater service for future developments in the Alberta Industrial Heartland.

Key findings:

- A complete drainage infrastructure inventory was not available.
- Some drainage infrastructure is primarily within private property.
- The watershed includes lands from Lamont County and Elk Island National Park.

Our recommendation is to develop an inventory of private, provincial and municipal, infrastructure, and natural drainage features. This will support collaborative infrastructure planning to meet current and future drainage needs in the watershed.



What is the "Resiliency Action Plan?"

The Resiliency Action Plan is a **set of recommended actions** that the County, landowners, the public, and other stakeholders can use to build and restore flood and drought resilience in the Astotin Creek watershed.

Six visions have been identified which contribute to resilience for Astotin Creek Watershed. Supporting actions will be developed for each vision.

Vision 1: Healthy Ecosystem

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Healthy Ecosystem

Vision Statement

Astotin Creek has a healthy watershed with rich vegetation and aquatic habitat, which supports biodiversity, maintains water quality, and provides flood and drought resilience.

Supported actions being considered for this vision area:

- Conserve/restore vegetated buffer
- Conserve/restore natural water retention features
- Erosion and sediment control measures
- Co-existence with wildlife
- Ensure aquatic connectivity through culverts
- Prevent livestock from accessing creek

Vision 2: Integrated Watershed Management

Astotin Creek Resiliency Study

Integrated Watershed Management

Vision Statement	Supported actions being considered for this vision area:
Sustainable land management within Astotin Creek watershed reduces flood risk and protects ecosystems.	• Wetland conservation • Land buy-back program • Compensation program • Limit new development in upper watershed • Protect and enhance drainage ways

Vision 3: Resilient Infrastructure

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Resilient Infrastructure

Vision Statement

Infrastructure in the Astotin Creek watershed is designed to reduce flood risk and enable adaption to climate change.

Supported actions being considered for this vision area:

- Replace undersized infrastructure, considering future climate
- Elevate roads along with crossing upgrades
- Update the allowable stormwater discharge rate for new developments
- Incorporate flood construction level requirements in land-use bylaw
- Monitor and adapt to climate change trends in standards/policy related to infrastructure development

Vision 4: Proactive Management

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Proactive Management

Vision Statement	Supported actions being considered for this vision area:
Strathcona County's programs and operations reduce flood risk in the Astotin Creek watershed.	• Debris management program • Asset management program • Proactive creek inspections • Landowner education and partnership for private property clean up

Vision 5: Flood Preparedness

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Flood Preparedness

Vision Statement

Strathcona County will invest in flood response planning to ensure staff and residents can deal with flood events.

Supported actions being considered for this vision area:

- Flood response plans and training
- Flood forecast and warning
- Support residents to build understanding of risk/response plans
- Property level flood protection
- Flood insurance

Vision 6: Educated, Engaged, & Empowered Public

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Educated, Engaged and Empowered Public

Vision Statement	Supported actions being considered for this vision area:
Strathcona County residents will have a shared understanding of flood and drought risks and feel empowered to participate in programs to manage risks.	• Public outreach programs • Pilot programs to showcase nature-based solutions

Project Contact Information

Astotin Creek Resiliency Study

Learn more and share your thoughts!

E-Newsletter Sign Up
Visit the project webpage to view the Data Atlas and sign up for the newsletter:
https:// www.strathcona.ca/astotin

Environmental Planning
Contact the Environmental Planning team for more information or to provide input into the study.

Phone: 780.464.8047
Email: astotincreek@strathcona.ca

Survey links
Share your thoughts on this session and the technical questions:

Engagement evaluation
Project questions