Working with Beavers in Alberta, Canada: beneficial management practices for beaver coexistence

10th International Beaver Symposium – Scotland 2025

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miistakis institute
APPLIED CONSERVATION RESEARCH

The Miistakis Institute is a non-profit and registered charity that undertakes applied conservation research to enable responsible and sustainable decisions to support:

- **Biodiversity**,
- **Ecological connectivity**
- **Nature-based solutions**

WORKING WITH BEAVERS

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Core Team

miistakis institute
APPLIED CONSERVATION RESEARCH

COWS & FISH
RIPARIAN MANAGEMENT SOCIETY

Local Partners

Indigenous Communities

Urban and Rural local governments

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Calgary, AB, 2013 flood (Holly Kinas)

NW AB, 2025 (B.C. Wildfire Service, CBC News)

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Photo Credit: Beaver Our Watershed Partner, Cows and Fish

Photo credit: Glenbow Archives

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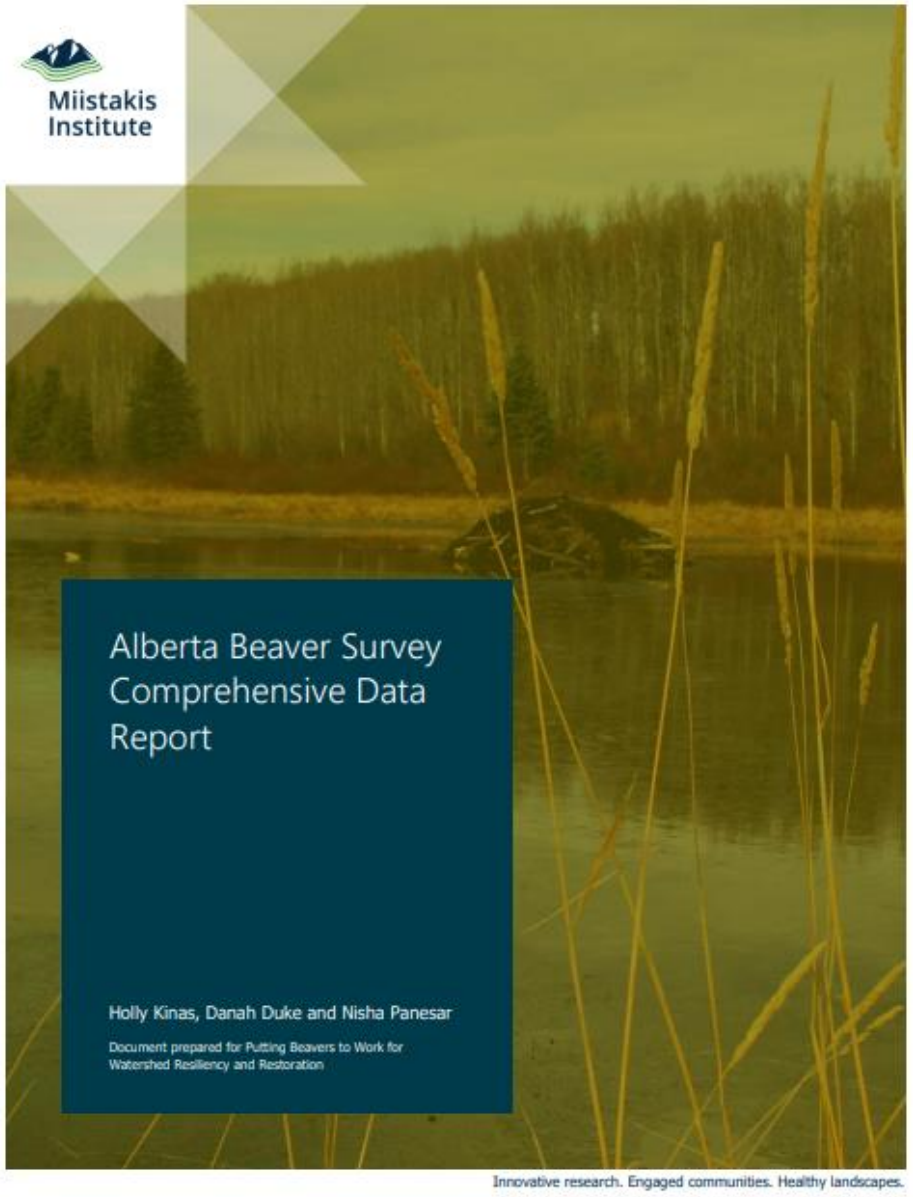

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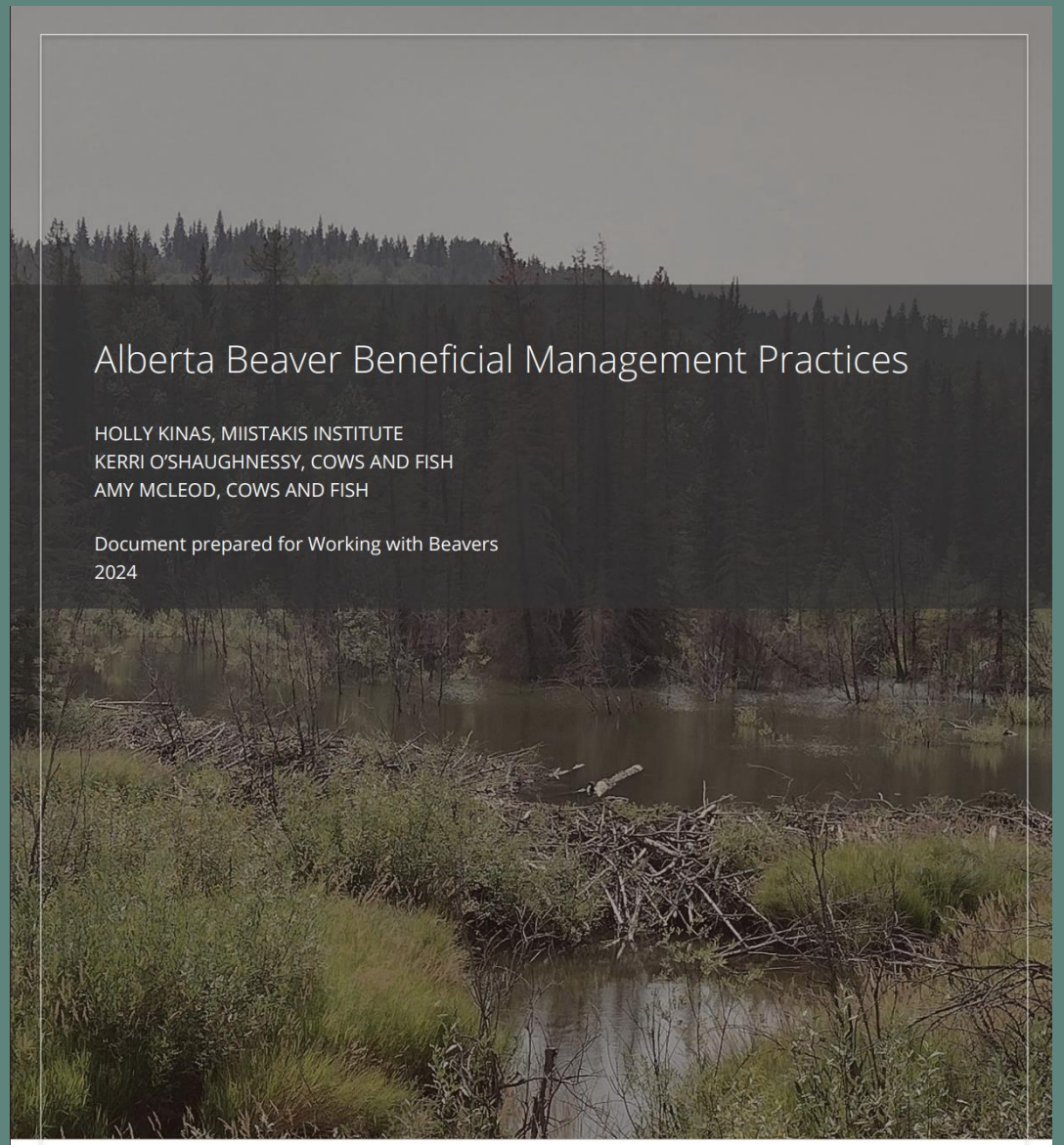

Alberta Beaver Beneficial Management Practices

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Document prepared for Working with Beavers
2024

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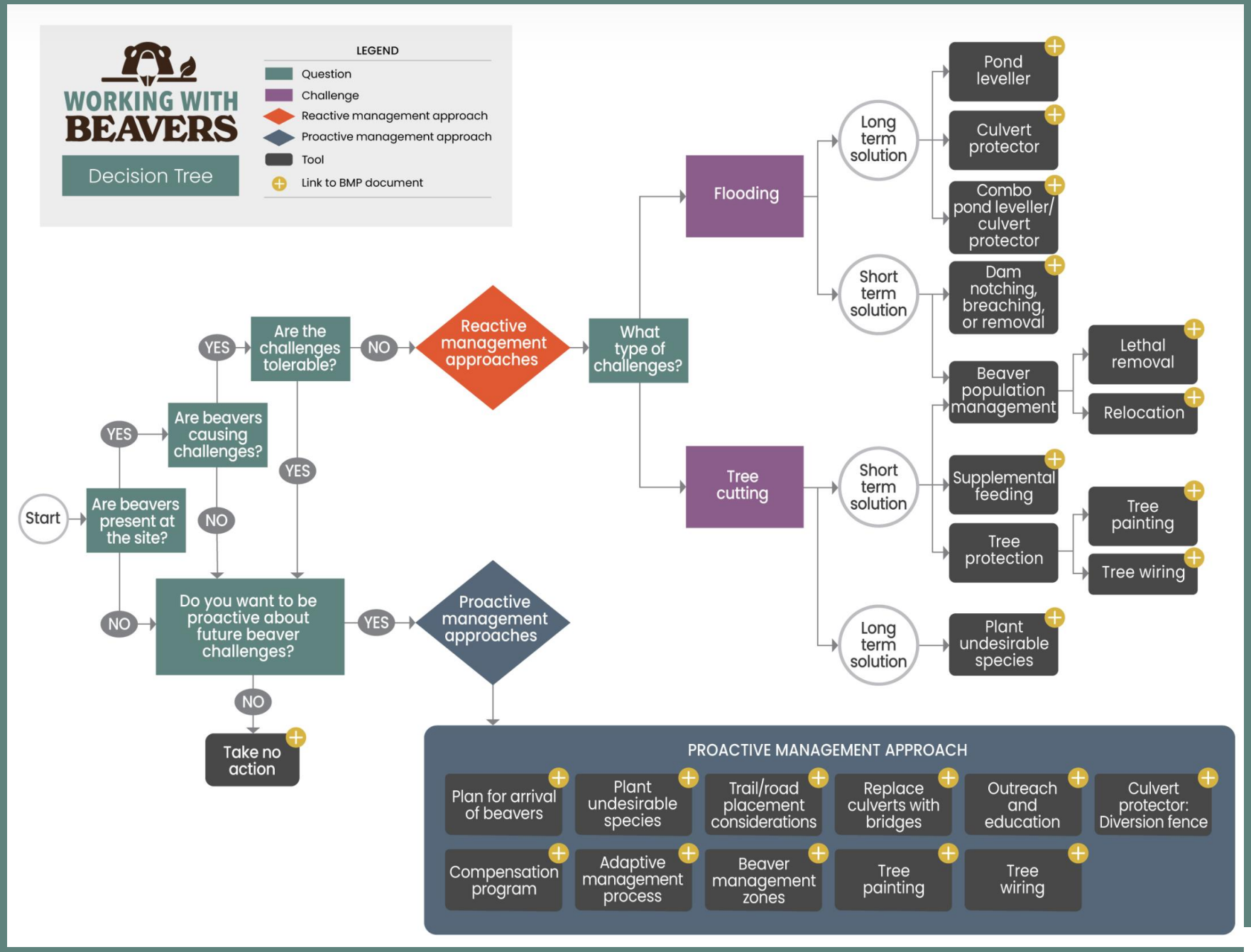
WORKING WITH BEAVERS
Decision Tree
LEGEND
Question
Challenge
Reactive management approach
Proactive management approach
Tool
Link to BMP document
Start
Are beavers present at the site?
YES
NO
Are beavers causing challenges?
YES
NO
Are the challenges tolerable?
YES
NO
Reactive management approaches
What type of challenges?
Flooding
Long term solution
Pond leveller
Culvert protector
Combo pond leveller/ culvert protector
Short term solution
Dam notching, breaching, or removal
Beaver population management
Lethal removal
Relocation
Tree cutting
Short term solution
Supplemental feeding
Tree protection
Tree painting
Tree wiring
Long term solution
Plant undesirable species
Do you want to be proactive about future beaver challenges?
NO
YES
Proactive management approaches
Take no action
PROACTIVE MANAGEMENT APPROACH
Plan for arrival of beavers
Plant undesirable species
Trail/road placement considerations
Replace culverts with bridges
Outreach and education
Culvert protector: Diversion fence
Compensation program
Adaptive management process
Beaver management zones
Tree painting
Tree wiring

Flow D

Figure 9: C

CULVERT

Culvert p
could hap
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- K
- B
- C
  p
- D

Reactive Management Approach: Flow Device: Culvert Protector

CULVERT PROTECTOR - ADVANTAGES

Environmental

- This tool creates a more stable situation becaus
  When a new beaver family moves into a site, the
  woody plants and repeat plugging of culverts as
- Beaver families grow and disperse to other part
  to a wider area.
- Strong materials are used in these designs and
- Design stays in place unless the culvert complet
- Wildlife passage can be added to culvert protect
  of wildlife species through the culvert while excl
  debris needed for them to plug the culvert. Adul
  when not carrying building materials.[27]

Social

- Maintains a clear culvert even though beavers m
- Continues flow downstream.
- Provides options for people or organizations wh
  culverts or do beaver population management.
- This low-tech, hand-built tool may have less hum
  management (e.g., dam removal with explosives
- With a trained/experienced project lead, installa
  effort once necessary approvals are in place, pot
  trapper is not needed, while also encouraging co
- Mitigation devices such as pond levellers and cu
  the cost of problem beaver management. Cost s
  road repairs and beaver population managemer
- A pond leveller or culvert protector is less costly
  control.[12]
- Being able to support land managers with cost-s
  helpful for those considering coexisting with bea
  this guide or who might be on the fence. There a
  to individuals and groups that could help provid

CULVERT PROTECTOR - DISADVANTAGES

Environmental

- Non-natural materials in waterway that could pc
  undesirable litter elsewhere or pose entangleme
- Beaver families grow and disperse to other part
  undesirable in some nearby areas.

Reactive Management Approach: Flow Device: Culvert Protector

- The height of the
  risk of beavers go
- Wildlife passage c
  the culvert while
  plug the culvert. T
- 4-6" x 4-8" wire m
  fences using the l
  and plug the culv
- Metal or steel gra
  if the culvert to be
  in place. If there i
  in place but they
  damming behavic

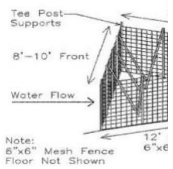


Figure 10: Keystone Fence™ tra

Design Considerations for th

The Beaver-Proof Add On
culverts of a wide variety c
extensions can be galvaniz

Reactive Management Approach: Flow Device: Culvert Protector

CULVERT PROTECTOR - SUMMARY OF ALBERTA REGULATORY CONSIDERATIONS

Regulations that may apply to this tool include:

- Provincial
  - Public Lands Act
  - Water Act
- Federal
  - Fisheries Act
  - Migratory Bird Act
  - Species at Risk Act
- Additional Regulations

For further regulatory details, please review the section on "Regulations Related to Beaver Management Tools."

CULVERT PROTECTOR - RESOURCES

Best Management Practices for Pond Levelers and Culvert Protection Systems: A guide for using flow devices to coexist with beavers, The Beaver Coalition

Beaver Proof Add On

Blocked Road Culverts and Drains, The Beaver Institute, Inc.

Self Help Information – Culverts, Drains, The Beaver Institute Inc.

Road Culvert Fence Instructions - YouTube

Code of Practice: Beaver dam breaching and removal, Fisheries and Oceans Canada

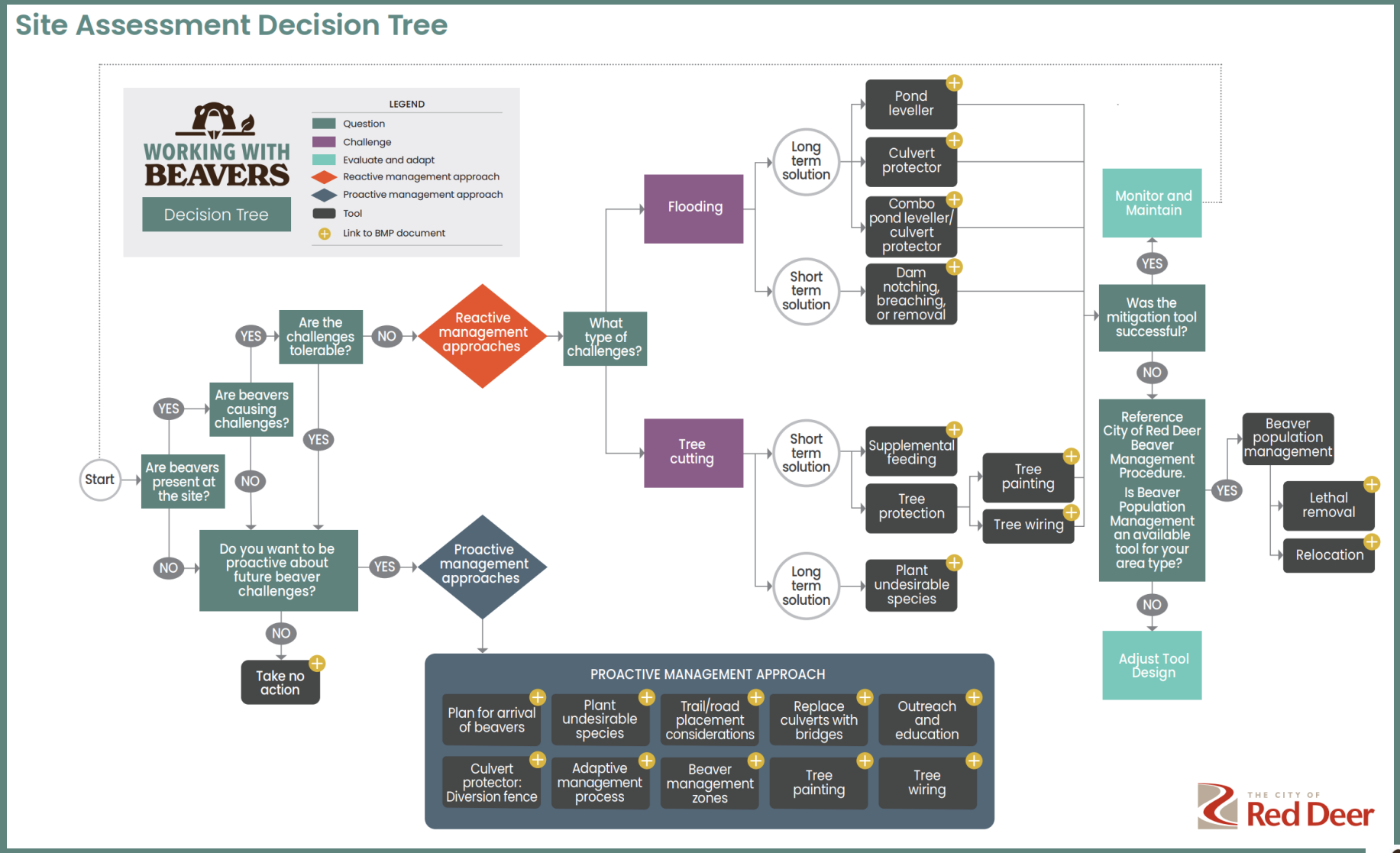
Working with Beavers - Culvert Protector

Beaver Coexistence Tools - Materials & Suppliers list

Cost-Benefit Analysis of Beaver Coexistence Tools fact sheet

WORKING WITH BEAVERS

Case Study – City of Red Deer, Alberta



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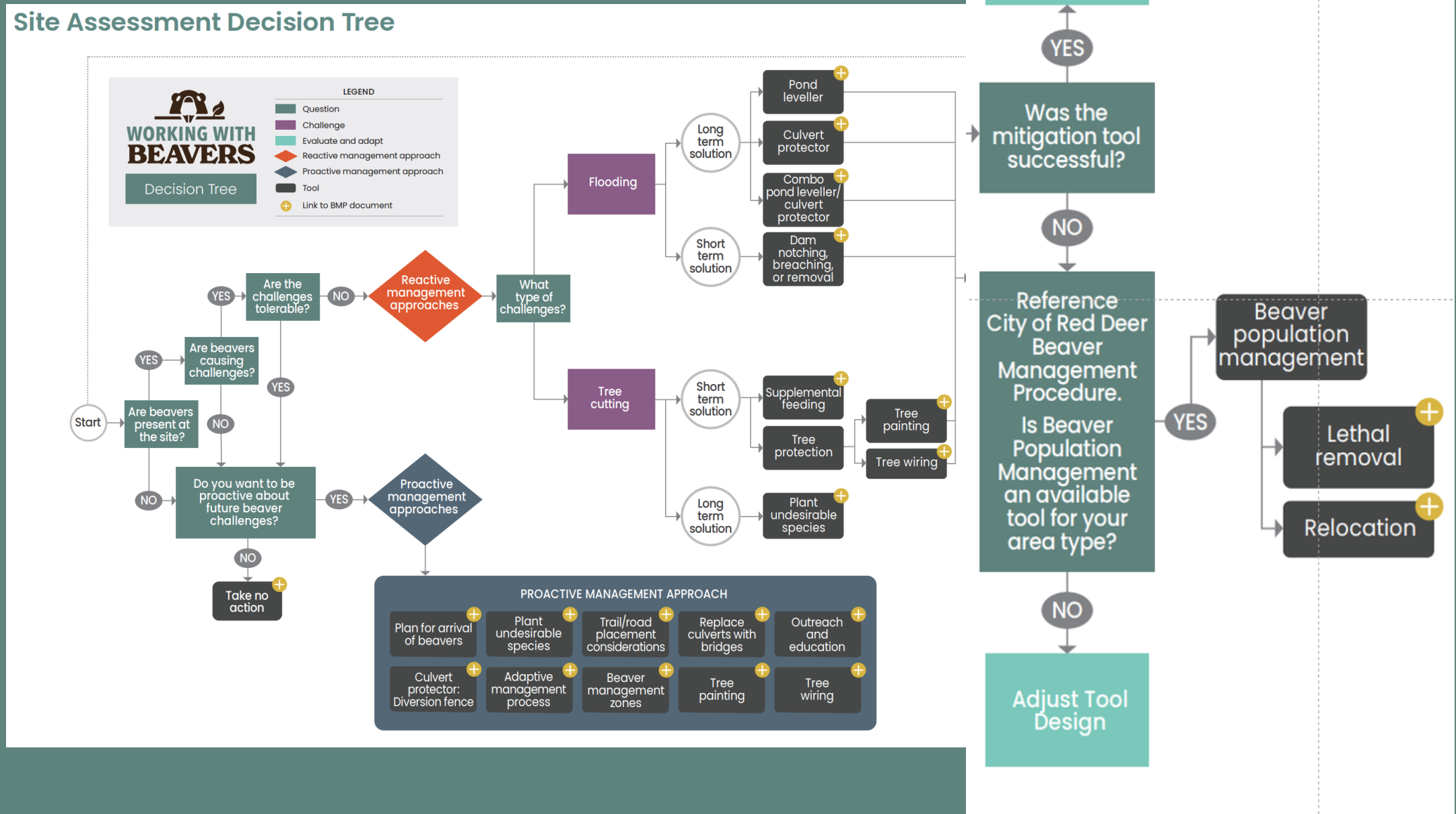
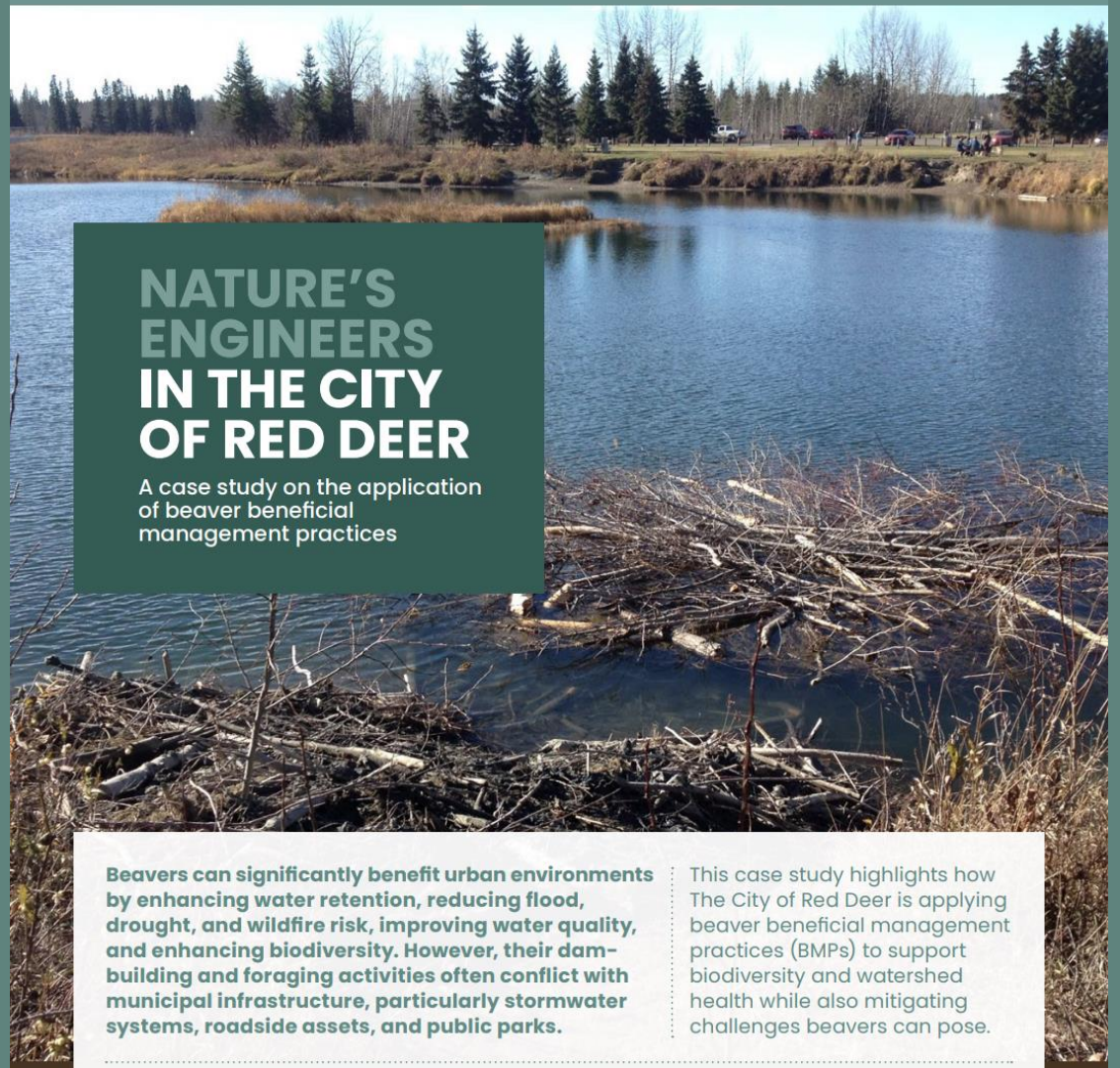
Case Study – City of Red Deer, Alberta





NATURE'S ENGINEERS IN THE CITY OF RED DEER

A case study on the application of beaver beneficial management practices

Beavers can significantly benefit urban environments by enhancing water retention, reducing flood, drought, and wildfire risk, improving water quality, and enhancing biodiversity. However, their dam-building and foraging activities often conflict with municipal infrastructure, particularly stormwater systems, roadside assets, and public parks.

This case study highlights how The City of Red Deer is applying beaver beneficial management practices (BMPs) to support biodiversity and watershed health while also mitigating challenges beavers can pose.

By taking this more naturalized approach, The City can support many of the goals outlined in their Climate Adaptation Strategy (2024), Environmental Master Plan (2019), and Urban Forest Management Plan (2017). This case study includes a decision support tree and outlines four practical coexistence tools that staff can implement to reduce maintenance costs, minimize flood risk, and support ecological function.

Building on the Alberta Beaver Beneficial Management Practices (2024), the City of Red Deer adapted the decision tree to better align with their Beaver Management Procedure (2025). This decision tree supports the decision-making process of City staff.

WORKING WITH BEAVERS

Case Study – City of Red Deer, Alberta

Coexistence tools

1 Culvert Protector

PROBLEM

Beavers are attracted to the s flow of water through culverts, leading to damming that can culvert failure and upstream f

DESIGN CONSIDERATIONS

- **Trapezoidal culvert fences** (K are preferred for their effectiv
  - Trapezoidal (not rectangula and potential damming ma
  - Use 6" galvanized steel mes extending 3-4 m from the c
  - Height should be 30-45 cm expected highest water.
  - Anchor with steel T-posts
  - A floor to prevent beavers fr
- **Pre-made Beaver-Proof culv** effective alternative to the Ke comes in a variety of sizes.

2 Pond Levellers

PROBLEM

Beaver dams can raise water levels and flood roads, trails, or private land.

SOLUTION

Install pon valves thro pond to be prevents flo to maintair

DESIGN CONSIDERATIONS

- **Double wall high density polyethylene (** reduces sounds of running water and th to dam. A wire mesh cage at the intake beaver interference.
- **Protective cage made with 6" galvaniz wire mesh** with a 30-60 cm gap betwe and the sides of the wire cage.
- **Pipe intake extended 9-12 m upstream c** to minimize detection by beavers.
- **The height of the bottom of the outlet end dictates the pond level** and can be adjus ensure pond is at least 1 m deep for beave
- **Pipe diameter** needs to be at least 30% nearest downstream conduit.

3 Tree Wiring

PROBLEM

Beavers fell desirable trees for food or building material, damaging urban forests and landscaped areas and causing a potential human safety hazard.

SOLUTION

Install tree wiring to protect from gnawing.

MAINTENANCE

Inspect annually; expand wiring as trees grow.

SPECIFICATIONS

- **Use wire mesh fencing around individual trees;** 14 gauge minimum, 2" x 4" maximum hole size, 1.2 m (4') minimum height.
- **Maintain 30 cm clearance** around the trunk to accommodate growth.
  - *NOTE*: Alternatively, in some scenarios where aesthetics is a factor, a tighter wire wrap is used.
- **Anchor bottom wire to the ground** using landscape staples or pins to prevent beavers from lifting wire.
- **Secure wire ends** with hog rings or durable zip ties.

Wire mesh fencing

Key Message

"Beaver BMP's have enhanced our decision making and support for beaver coexistence within the city. Ultimately this has helped to protect and enhance biodiversity and the health of the watershed."

Ken Lehman,
The City of Red Deer
Community & Program Facilitator – Parks

Holly Kinas

Miistakis Institute

holly@rockies.ca

www.workingwithbeavers.ca

Read the BMPs and Case Study Today!

Thank you to our current funders:

Environment and Climate Change Canada's Environmental Damages Fund

Alberta Ecotrust Foundation

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