Cariboo Adaptation Strategies Update

BC Agriculture & Climate Change
Regional Adaptation Strategies
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other project partners
BCAC/ ARDCorp

Opinions expressed in this publication are not necessarily those of the Governments of British Columbia and Canada or the BC Agriculture Council.

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The Regional Adaptation Enhancement Program is a part of the BC Ministry of Agriculture’s ongoing commitment to climate change adaptation in the agricultural sector while enhancing sustainability, growth and competitiveness.

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www.BCagClimateAction.ca
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Introduction

The Cariboo Adaptation Strategies plan was completed in 2014 and project implementation began in the summer of 2014 and concluded by the spring of 2018. Over the fall and winter of 2017/2018, the BC Agriculture and Food Climate Action Initiative (CAI) undertook a process to re-visit the strategies and actions that were identified as high priorities in the original plan, to assess progress in plan delivery and to determine areas of focus for the future. The intent of this process was not to repeat the original (and still relatively recent) comprehensive planning process, but rather to undertake an efficient and targeted update that reflects progress, and captures changes in context and priorities.

This document outlines the Strategies Update process objectives and methodology, describes implementation progress, and defines key actions and implementation priorities moving forward. The Strategies Update process had three overarching objectives:

- To review and reflect on progress in addressing priority actions from the Cariboo Adaptation Strategies;
- To identify highest priority areas in the plan that have not been addressed or require additional support; and
- To identify new or emerging adaptation priorities/projects.

Overview of Cariboo Adaptation Strategies

The original planning process took place in the Cariboo from the fall of 2013 to the spring of 2014, bringing together agricultural producers and specialists, along with local and provincial government representatives. Approximately 80 participants took part over the course of two paired workshops (four workshops in total). A local advisory committee that included representatives from the Cariboo Cattlemen’s Association, the Quesnel Cattlemen’s Association, the District H Farmers’ Institute, the Cariboo Regional District, the Cariboo Growers and the BC Ministry of Agriculture, provided guidance and input throughout the process.

The resulting Cariboo Adaptation Strategies plan outlines the anticipated changes in climate and the associated agricultural impacts. It also provides clear actions, suited to the specifics of the local context, both with respect to projected changes in climate and local capacity and resources. The plan includes 12 strategies and 32 actions for agriculture to adapt to five priority impact areas:

1) Increasing wildfire risk;
2) Changing hydrology;
3) Increasing variability;
4) Changing pests, diseases and invasive species; and
5) Changes to wildlife and ecological systems.

Upon completion of the planning process, $300,000 of Growing Forward 2 funding was made available to implement collaborative projects identified in the plan. The advisory committee that was formed to guide the planning process transitioned into an oversight “working group” for development and delivery of projects. By the spring of 2018, nine regional projects had been completed and funding had been fully committed.

\[^{1}\text{The climate change projections and four impact areas are described in more detail in the Cariboo Adaptation Strategies available at: https://www.bcagclimateaction.ca/wp/wp-content/media/RegionalStrategies-Cariboo.pdf}\]
Methodology

The process to review and update the Cariboo Adaptation Strategies included the following four steps:

1) Undertaking analysis of progress on strategies and actions;
2) Conducting meetings with local partners from the working group and beyond;
3) Holding an information gathering and prioritization workshop; and
4) Developing a draft document and circulating it for working group review prior to finalization.

Each of these steps is described in more detail below:

1) Progress analysis: CAI undertook a review of projects implemented to determine which strategies and actions from the Cariboo Adaptation Strategies plan have been completed (wholly or partially). This analysis also included a review of any recommendations for next steps or additional activities from completed projects to support further actions in priority areas.

2) Local partner meetings: Preliminary meetings were held with staff from the Cariboo Regional District and the Ministry of Agriculture and with producers from the Kersley Farmers’ Institute and the Cariboo Cattlemen’s Association. These meetings helped to identify any changes in local context or organizational priorities.

These preliminary consultations confirmed that undertaking a formal process to update the Cariboo Adaptation Strategies plan was both valuable and timely.

3) Prioritization workshop: A workshop was conducted to assess progress on the prioritized strategies and actions within the Cariboo Adaptation Strategies plan and to discuss preferred areas of focus for near-term implementation. The workshop was held on Wednesday March 21st 2018 at the Pioneer Complex in Williams Lake.

Workshop participation was by invitation and there were 17 participants including Cariboo producers and other key partner groups/agencies with active knowledge of implementation activities in the region.

The workshop began with an overview of the Cariboo adaptation projects completed to date, as they relate to the climate change impacts and strategies within each of the five Impact Areas in the plan. After discussion of the strategies and work accomplished to date, workshop participants then voted on the most important strategies within each Impact Area (see Appendix 1: voting card). When selecting priorities, participants were asked to take into consideration the following:

- The potential to build on momentum, activities or results of earlier work with next steps;
- The degree of urgency of the strategy;
- Areas within the original Strategies that had not yet been addressed; and
- The potential for linkage to related local initiatives and/or synergistic opportunities.

The results of the voting activity were tallied and workshop participants were divided into small groups to discuss the strategies that received the most votes. Participants discussed the actions associated with the top strategies, brainstormed possible additional actions, prioritized the actions and identified necessary steps for implementing the actions. A workshop summary was provided back to all workshop participants.

4) Draft development and completion: Utilizing the workshop summary, the CAI team developed a draft Strategies Update document. This document was then shared back with the local working group for feedback. Final adjustments and edits were completed, and the final Update was distributed back to workshop participants and project/program partners.
Summary of Progress to Date

This table provides a visual summary of progress made towards addressing the strategies in the Cariboo Adaptation Strategies plan. Additional details about projects can be found in the introductions to each strategy in the Cariboo Adaptation Strategies Update section (beginning on page 5). A table listing all strategies and actions, along with projects completed, is located in Appendix II.

**Graphic representation of progress (2014 - 2018) within each strategy in the Cariboo Adaptation Strategies.**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>not started</th>
<th>partially addressed</th>
<th>fully addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1.1</td>
<td>Collaborative approaches to fuel management &amp; wildfire mitigation</td>
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<tr>
<td>Strategy 1.2</td>
<td>Farm-level wildfire damage mitigation planning</td>
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<td></td>
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<tr>
<td>Strategy 2.1</td>
<td>Restore &amp; enhance natural water storage capacities in local watersheds</td>
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<td></td>
<td></td>
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<tr>
<td>Strategy 2.2</td>
<td>Maintain &amp; enhance agriculturally significant dams</td>
<td></td>
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<tr>
<td>Strategy 2.3</td>
<td>Maximize agricultural water use conservation &amp; efficiency</td>
<td></td>
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<td></td>
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<tr>
<td>Strategy 2.4</td>
<td>Identify flood &amp; runoff prone agricultural areas &amp; implement mitigation measures</td>
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<td></td>
<td></td>
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<tr>
<td>Strategy 3.1</td>
<td>Conduct local research to increase resilience</td>
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<tr>
<td>Strategy 3.2</td>
<td>Support and enhance holistic and adaptive grazing management systems</td>
<td></td>
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<td></td>
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<tr>
<td>Strategy 4.1</td>
<td>Increase regional monitoring for pests, diseases and invasive species</td>
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<td></td>
<td></td>
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<tr>
<td>Strategy 4.2</td>
<td>Implement best management practices for pest, disease and invasive species issues</td>
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<tr>
<td>Strategy 5.1</td>
<td>Maintain rangeland productivity in a changing climate</td>
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<td></td>
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<tr>
<td>Strategy 5.2</td>
<td>Collaborative management of changing wildlife impacts</td>
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**Investment in Cariboo Adaptation Projects: 2014 – 2018**

The Cariboo Adaptation Strategies plan identifies 12 strategies and 32 actions to support agricultural adaptation to climate change through the development of (regionally relevant) tools and resources that enhance adaptive capacity.

Over a four-year period nine regional projects (and three farm adaptation innovator projects (FAIP)2) were undertaken to address the highest priorities identified in the Cariboo Adaptation Strategies plan. The

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2 The Farm Adaptation Innovator Program supports farm level projects that seek to demonstrate, and evaluate practices and technologies that may reduce weather related production risks and/or increase new production opportunities.
The Cariboo Adaptation Strategies plan identifies 12 strategies and 32 actions to support agricultural adaptation to climate change through the development of (regionally relevant) tools and resources that enhance adaptive capacity.

Over a four-year period nine regional projects (and three farm adaptation innovator projects (FAIP) were undertaken to address the highest priorities identified in the Cariboo Adaptation Strategies plan. The $470,395 TOTAL FARM ADAPTATION INNOVATOR PROJECT FUNDING to date.

$887,184 INVESTED IN CARIBOO ADAPTATION PROJECTS

Regulatory Adaptation Funding Partners

<table>
<thead>
<tr>
<th>Program and Project Partners</th>
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<tbody>
<tr>
<td>Ducks Unlimited</td>
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<tr>
<td>Beef Cattle Industry Development Fund</td>
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<tr>
<td>Cariboo Chilcotin Beetle Action Coalition</td>
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Investment in Cariboo Farm Adaptation Innovator Projects: 2014 – 2018

$470,395 TOTAL FARM ADAPTATION INNOVATOR PROJECT FUNDING

FAIP Funding Partners

<table>
<thead>
<tr>
<th>FAIP Project Leads</th>
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<tbody>
<tr>
<td>Thompson Rivers University</td>
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<td>University of British Columbia</td>
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FAIP Project Partners

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<tr>
<th>FAIP Project Partners</th>
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</thead>
<tbody>
<tr>
<td>Osborne Seed Company</td>
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<tr>
<td>Ministry of Forests, Lands, Natural Resources Operations and Rural Development</td>
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<tr>
<td>Tranquille Livestock Association</td>
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<tr>
<td>Cariboo region ranchers</td>
</tr>
<tr>
<td>AT Films Inc</td>
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<tr>
<td>Cropthorne Farm Ltd</td>
</tr>
<tr>
<td>Dubois Agrinovation</td>
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<td>Mackin Creek Farm</td>
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Regional Adaptation Funding Partners

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<th>Regional Adaptation Funding Partners</th>
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<tr>
<td>BC Cattlemen’s Association</td>
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<tr>
<td>Cariboo Cattlemen’s Association</td>
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<tr>
<td>BC Ministry of Agriculture</td>
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<tr>
<td>Ministry of Forests, Lands, Natural Resource Operations and Rural Development</td>
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<tr>
<td>Cariboo Regional District</td>
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<tr>
<td>BC Wildfire Service</td>
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<tr>
<td>Kersley Farmers’ Institute</td>
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<tr>
<td>FARMED: North Cariboo</td>
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<tr>
<td>District H Farmers institute</td>
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</tbody>
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Growing Forward 2 Regional Adaptation Enhancement Program
Growing Forward 2 Agri-Innovation
Partner Funds

(74%) $307,680
(20%) $83,500
(6%) $25,609

Investment in Cariboo Regional Adaptation Projects: 2014 – 2018

$416,789 TOTAL REGIONAL ADAPTATION PROJECT FUNDING

Growing Forward 2 Regional Adaptation Enhancement Program
Growing Forward 2 Agri-Innovation
Partner Funds

(74%) $307,680
(20%) $83,500
(6%) $25,609
Cariboo Adaptation Strategies Update

The Strategies that have been identified as highest priority for near term implementation (through the process outlined in the Methodology) are highlighted in green text boxes. The eight prioritized actions (along with eight possible projects) developed and fleshed out through the workshop – and subsequent input received from the Cariboo Adaptation Working Group – are described under the relevant Strategy and highlighted in light blue text boxes.

Impact Area 1:
Increasing Wildfire Risk

**Strategy 1.1 [Prioritized] - Collaborative approaches to fuel management & wildfire mitigation**

**Progress to Date**

Preliminary steps have been undertaken to address this strategy (as well as Strategy 1.2) through one project. The *Cariboo Wildfire Preparedness & Mitigation Planning & Resources* project included seven ranch visits to assess risks, hazards and defensibility of each operation and to pilot a ranch-level wildfire preparedness planning tool. Three workshops (in Williams Lake, Tatla Lake and Nimpo Lake) were held to gather information about wildfire risks and issues beyond the ranch scale (requiring collective solutions). Costs, issues and challenges around implementation of mitigation measures (including fuel management) were identified through the final project report.

**Priority Action #1**

*Assessing and piloting collaborative fuel management strategies for high-risk agricultural interface areas*

Many agricultural operations in the Cariboo are bordered or surrounded by areas with high wildfire risk. These operations are also usually located outside of the Wildland Urban Interface, and therefore there are limited opportunities for fuel management support. While there are policy and economic challenges to undertaking fuel management in these areas, possible solutions have been identified that could be implemented through partnerships between producers, government agencies, First Nations and the private sector.
Many agricultural operations in the Cariboo are bordered or surrounded by areas with high wildfire risk. These operations are also usually located outside of the Wildland Urban Interface, and therefore there are limited opportunities for fuel management support. While there are policy and economic challenges to undertaking fuel management in these areas, possible solutions have been identified that could be implemented through partnerships between producers, government agencies, First Nations and the private sector.

### Activities

I. Identify key partners, collaborators and existing initiatives with points of intersection.

II. Convene partners and collaborators to discuss options for management of forest fuels near agricultural operations (e.g. fuel thinning, fuel chipping, fuel shredding).

III. Evaluate possible opportunities and challenges related to piloting identified options including:

- utilizing chipper/shredded fuels for bedding or as bale grazing pods
- linkages to biofuel tenures and biofuel industry
- linkages to agroforestry (e.g. silvopasture)
- the possibility for direct communication channels between agriculture producers and timber licensees
- the role of the timber appraisal system in identified possible opportunities such as removal of non-merchantable fuels
- the process for supporting/enabling prescribed burns

IV. Use results of (above) evaluation to determine the scope and focus of one or more pilot projects.

V. Implement pilot projects and monitor results to inform broader fuel management strategies.

### Implementation Details

- Utilize opportunities identified in the Opportunities and Barriers to Wildfire Risk Mitigation report and well as in any other relevant reports.

- There may be synergy between this action and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) Ecosystem Restoration Program as well as the Cariboo Chilcotin Ecosystem Restoration Steering Committee.

- Utilize this project as an opportunity to enhance communications between the Province and producers related to fuel management plans and activities in the region.

- Include economic analysis in the evaluation of the pilot project(s).

- FLNRORD Land Based Investment funding and the Integrated Investment opportunity group should be investigated as potential funding sources.

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1 *A strong interest in silvopasture was reflected at the 2018 Annual General Meeting of the BC Cattlemen’s Association (Nicole Pressey, personal communication)*
Implementation Details continued...

**Possible Partners**

Agricultural organizations including (but not limited to):
- Cariboo Cattlemen’s Association
- BC Cattlemen’s Association
- BC Forage Council

BC FLNRORD
- BC Wildfire Service
- Range Branch
- Ecosystem Restoration Districts
- Forest District Land Use Planners

BC Ministry of Agriculture
Cariboo Chilcotin Ecosystem Restoration Committee
Cariboo Regional District (CRD)
First Nations
Forest Enhancement Society

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Medium term (2-5 years)</td>
<td>High ($100,000 +)</td>
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**Strategy 1.2 [Not Prioritized] - Farm-level wildfire damage mitigation planning**

**Progress to Date**

As noted above, ranch visits and a pilot preparedness/planning tool were part of the previously completed project. The materials developed through the Cariboo project were then integrated into additional projects in the Cowichan and Okanagan – resulting in a comprehensive *Agriculture Wildfire Preparedness and Mitigation Planning Guide and Workbook* to assist producers with planning and preparing for wildfire. These resources have since been used by the BC Cattlemen’s Association in a series twelve wildfire preparedness workshops for producers across BC (during the spring of 2018).
Impact Area 2:
Changing Hydrology

**Strategy 2.1 [Prioritized] -** Restore & enhance natural water storage capacities in local watersheds

**Progress to Date**
This strategy has been partially addressed by two projects. To inform water management and water development decisions, a project was completed that created and tested a surface water risk assessment and planning tool. Using existing data, the planning process was applied to three range units as case studies. The tool evaluates how future evaporation and climatic moisture deficit will impact water resources within a range unit, combines this with information about the forage resource and considers options for sustainable range/water use. This approach can inform range planning and water development decisions.

Another multi-year research and demonstration project evaluated the potential for Management-Intensive Grazing as a tool to strengthen the resilience of rangelands to climate change related impacts, including how the practice may increase water storage within the soil profile. Intensively managed pastures were observed and compared to more extensively (traditionally) managed pastures on the ranches of six cattle producers in the BC Interior. The project used field-based data and remote sensing to measure and monitor range health, specifically by evaluating soil carbon and soil moisture, to strengthen understanding of their relationship to grazing practices.

**Priority Action #2**
Complete surface water risk assessment process for additional Cariboo range units and pilot and demonstrate water developments in priority areas.

Shifts in climate conditions and hydrology are likely to significantly impact surface water sources in some areas of the Cariboo, which will, in turn, impact the availability of water for livestock. Testing and demonstrating water development approaches, with a focus on sustainable water resource management in the context of a changing climate, will have growing importance to the cattle (and other grazing livestock) industries.

This action will: i) use the surface water assessment and planning tool on selected range units to identify potential water development or restoration needs; ii) pilot implementation of water development projects and monitor and evaluate over multiple production seasons; and, iii) develop knowledge transfer events and materials based on the pilot projects.

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4 Field evaluations and surface water monitoring are required to verify the equations utilized in the tool and to further ground truth the process.
Activities

I. Identify key partners, collaborators and existing initiatives with points of intersection.
II. Determine how many and which additional range units to focus on.
III. Identify potential pilot areas and develop criteria for site selection, such as:
   - Potential for co-funding;
   - Level of current and future risk; and
   - Interested producer co-operators.

IV. Identify the most suitable water development improvements, installations and/or practices to pilot on each site.
V. Develop demonstration projects.
VI. Track and monitor results of piloted options.
VII. Establish a long-term monitoring plan for sites.
VII. Share results through:
   - Field days or tours
   - Detailed written summaries of data collected
   - Short case studies/articles/factsheets.

Implementation Details

- Water development projects may include innovative technologies/practices, but will also assess adaptive potential of factors such as: changes to the depth or siting of the intake, changes to when and how the water source is used as part of a broader management plan, and upgrades to existing developments.
- Monitoring is critical to evaluate effectiveness in changing conditions.
- FLNRORD Land Based Investment funding may be appropriate for developments on Crown range.
- Environmental Farm Plan (EFP)/ Beneficial Management Practices (BMP) programs should be investigated for water development cost-sharing opportunities on private land.
- There is potential for monitoring over a few seasons to be accomplished by summer students from partner organizations.
- It is important to establish carrying capacity of water resources - to ensure supply for all users of vulnerable water supply sources.

Possible Partners

<table>
<thead>
<tr>
<th>Agricultural organizations including (but not limited to):</th>
<th>Timeframe</th>
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<tbody>
<tr>
<td>o BC Sheep Federation</td>
<td>Long-term (5+ years)</td>
</tr>
<tr>
<td>o BC Cattlemen’s Association</td>
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<tr>
<td>o BC Forage Council</td>
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<tr>
<td>o Cariboo Cattlemen’s Association</td>
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<td>o Cariboo Growers</td>
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<tr>
<td>o Kersley Farmers’ Institute</td>
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<td>BC Ministry of Agriculture</td>
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<tr>
<td>First Nations</td>
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<tr>
<td>FLNRORD – Range Branch and Cariboo Chilcotin District Range Staff</td>
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Cost

- Medium ($50,000 -$100,000)
- to High ($100,000+)
Strategy 2.2 [Prioritized] - Maintain & enhance agriculturally significant dams

Progress to Date
This strategy has been partially addressed by three projects. The first project inventoried the region’s agricultural dams and assessed key issues surrounding the dam safety regulations as well as broader agricultural water storage considerations. The resulting report provided a broad evaluation of the status of agricultural dams and explored possible solutions to a number of challenges – particularly options for sharing the responsibilities and costs associated with agricultural dams.

Following the completion of the agricultural dams inventory/report, a workshop was held in Williams Lake in November 2015 to share and discuss the report with agricultural dam owners. In addition to sharing the report findings, the workshop brought agency representatives together with dam owners with a focus on determining how to move forward effectively with preferred solutions.

One of the highest shared priorities emerging from the agricultural dams workshop resulted in a third project. To better support agricultural dam owners with navigating the regulatory requirements pertaining to dams, the Knowledge Transfer Resources project developed a Dam Safety Management Binder, and delivered five workshops for agricultural dam owners. The binder is now being maintained by FLNRORD, which has also committed to delivering additional workshops to agricultural dam owners in early 2018 and beyond.

Priority Action #3
Undertake an in-depth analysis of shared benefits and collaborative maintenance models for Cariboo agricultural dams

While the projects completed to date did strengthen information flow and resources for agricultural dam owners, they did not address the identified challenge of the cost burden associated with agricultural dam maintenance and upgrades. A report completed for the BC Cattlemen’s Association, Study of the Costs and Benefits Associated with Dams and Reservoirs on BC Cattle Ranches, provides a high level overview of costs and benefits. Through this study, and the previous work initiated by CAI, general cost estimates have been developed but there is still the need to more thoroughly evaluate (and quantify) the shared benefits associated with agricultural dams and to undertake a finer level quantitative and qualitative assessment of individual dams. This level of specificity is required to identify models for sharing of costs associated with dam maintenance and upgrades. Shared benefits of individual dams may include: tourism, recreation, wildlife habitat, flood/runoff control and protection of infrastructure (e.g. highways) and use of reservoirs for fighting wildfire.

Activities
I. Convene potential partners, select preferred approach for analysis.
II. If a case study approach is confirmed, determine case study examples.
III. Identify which benefits will be evaluated and document and gather associated data.

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5 The study provides a small number of case studies and includes high-level quantitative (dollar) values where possible to illustrate these cases.
Activities continued...

IV. Review dam maintenance/upgrade costs.
V. Develop suitable cost-share models based on shared benefits and cost analysis.
VI. Following completion of the analysis, implement a communications/outreach plan to communicate the value of agricultural dams to the public (regionally and provincially).

Implementation Details

• As part of the analysis, a sub-set of agricultural dams could be evaluated as case studies with respect to specific benefits and strategies for sharing costs.
• A broader scan approach pertaining specifically to co-benefits may also be useful.

Possible Partners

BC Cattlemen’s Association
BC Ministry of Agriculture
Cariboo Cattlemen’s Association
Cariboo Regional District
Ducks Unlimited
FLNRORD

Timeframe | Cost
--- | ---
Short-term (less than 2 years) | Medium ($50,000-$100,000)

Strategy 2.3 [Not Prioritized] - Maximize agricultural water use conservation & efficiency

Progress to Date
No actions were undertaken by the CAI between 2014 and 2018 to accomplish this Strategy.

Strategy 2.4 [Prioritized] - Identify flood & run-off prone agricultural areas & implement mitigation measures

Progress to Date
No actions were undertaken by the CAI between 2014 and 2018 to accomplish this Strategy.
**Priority Action #4**

*Assess and/or pilot run-off and erosion control practices and monitor impacts on the agriculture sector*

Run-off and erosion are likely to increase in areas of the Cariboo affected by recent wildfires. Identifying agricultural sub-areas within the Cariboo region that are vulnerable to run-off and erosion impacts (associated with flooding) is the first step, along with conducting a scan of management options utilized in the Cariboo and in other jurisdictions to determine best practices for piloting.

Two approaches could then be used to strengthen understanding of effective practices including (i.) the selection of an area (or areas) to monitor and evaluate run-off and erosion issues, as well as the results of any existing practices for control, and (ii.) piloting and evaluating a selection of promising (uncommon or innovative) methods for erosion and run-off control practices and documentation of their costs and benefits.

**Activities**

**Part A – Inventory and Practices Analysis**

I. Consult with producers and local experts to identify an agricultural area impacted (and/or likely to be impacted in the future) by flooding and run-off. This could focus on, or include, areas recently affected by wildfires.

II. Inventory and detail the run-off/erosion impacts in this sub area and evaluate risks to agriculture and to the soil resource.

III. Consolidate relevant studies/information pertaining to erosion control to analyze the options and determine best practices for the Cariboo (e.g. post-wildfire seeding, riparian rehabilitation etc.).

**Part B – Monitoring and Pilot**

IV. Monitor outcomes of practices that are already being used over multiple years (from an agricultural productivity perspective) including effects on soil quality and retention.

V. Identify innovative erosion and run-off control/ emergency management practices and partners for piloting.

VI. Initiate pilot project.

**Implementation Details**

- Ensure that both farm-level and broader collaborative practices are included in initial scan and for future pilots.
- This action should be focused on enabling more proactive erosion and flood control in preparation for future events.
- A next step to Part B could be the development of a post wildfire treatment /management decision tool for the agriculture sector.
- Monitoring and assessment of effects on soil quality should include soil biology as well as soil nutrients.
- Improving the natural water retention capacity of soils and riparian areas will assist in reducing run-off and flooding, but will require collaborative approaches to management and infrastructure.
- In addition to working cooperatively, individual producers may need to implement practices or invest in infrastructure that will help to minimize negative impacts to production areas and farm assets.
Implementation details continued...

Possible Partners

Agricultural organizations (see organizations listed on page 9)
BC Ministry of Agriculture
BC Ministry of Forests Lands Natural Resources Operations and Rural Development
Cariboo Regional District
Emergency Management BC
Fraser Basin Council
Union of BC Municipalities

Timeframe

**Part A Inventory and Practices Analysis:**
Short-term (less than 2 years)

**Part B Monitoring and Pilot Identification:**
Medium-term (2-5 years)

Cost

Part A: Low (less than $50,000)
Part B: Medium ($50,000-$100,000)

Impact Area 3: Increasing Variability

Strategy 3.1 [Prioritized] - Conduct local research to increase resilience

Progress to Date

This strategy has been partially addressed through two regional projects and three FAIP projects also contribute toward elements of this Strategy.

To set the stage for a more coordinated and strategic approach to agricultural research in the Cariboo, the first regional project developed a model for a regional research alliance that could house/track local research, identify shared research priorities, support distribution of research results to producers and provide research project coordination. The project engaged participants from 32 local organizations in creating the foundation for a coordinated approach and summarized the results in a report and summary document. Building on this project, the second phase solidified the partnerships, established the “soft infrastructure” for the Cariboo Agricultural Research Alliance (CARA) to achieve its mandate and provided producers with new knowledge transfer resources.

The three FAIP projects covered specific applied research topics and included research relevant to the Cariboo. One project evaluated the effectiveness of plastic film mulches and low tunnels in modifying soil and horticultural crop environments to support adaptation (with one set of experiments conducted at a farm in Soda Creek). A second project - the Pond Risk Assessment Tool project – developed a prototype for an on-line tool for that could ultimately enable producers to identify potential for risk of reduction in water availability/supply in ponds important to their grazing management. A summary of the third project (related to Management Intensive Grazing) may be found under Strategy 2.1.
**Priority Action #5**  
**Strengthen CARA partnerships and inclusiveness through strategic research planning and diverse knowledge sharing mechanisms**

The development of a regional adaptation research strategic plan would identify and leverage opportunities between research institutions and producer associations and would streamline dialogue between producers and researchers. The activities to develop this strategy would also serve to engage new groups within the agricultural sector who may be under serviced due to a lack of sector association connections or other barriers to information. Simultaneously, new knowledge sharing mechanisms will be piloted to more effectively engage the range of producers and operations within the region. This will allow adaptation researchers to share recent research outcomes in a way that is useful to producers and will promote and facilitate knowledge sharing between producers.

**Activities**

**Regional Strategy for Adaptation Research:**  
Facilitate and coordinate a cross-commodity, regional adaptation research strategic plan

I. Engage with community for plan input (in-person meetings/interviews, open house sessions, survey)  
   - Utilize engagement sessions.  
   - Document needs and priorities.

II. Target regional agricultural sub-sectors with information barriers and/or a high degree of vulnerability to climate change risk. These targeted groups may include:  
   - Cariboo Growers  
   - Southern part of the region  
   - First Nations  
   - New farmers

III. The research strategic plan could include:  
   - A coordinated and cross-region approach to trials,  
   - A list of research priorities,  
   - Priorities/protocols for data collection and monitoring, and  
   - A set of high level research project proposals.

**Pilot and expand knowledge sharing mechanisms for adaptation research, including:**  
- Producer to producer sharing (coordinating producers already doing new things),  
- Mechanisms to assist producer groups, partners and producers to share/distribute information across the region (e.g. joint Google calendar, webinars, WhatsApp, distinct website) researcher presentations and workshops,  
- Researcher and producer dialogue,  
- Field days, and  
- Fact sheets.
Implementation Details

- Activities pertaining to research strategic planning and expanding knowledge sharing mechanisms should be linked for efficiency and for increased engagement of both producers and researchers.
- The strategic plan should be a partnership between CAI and CARA to include all agricultural research in the scope, rather than just adaptation research,
- The completed strategic plan could be shared with the BC-ACARN at the annual meeting.

Possible Partners

Agricultural organizations (listed on page 9)
- BC-Agriculture and Climate Adaptation Research Network (BC-ACARN)
- BC Ministry of Agriculture
- Cariboo Agricultural Research Alliance (CARA)
- Cariboo Regional District (Cariboo Strong Program)
- Quesnel Agriculture Working Group

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term (less than 2 years)</td>
<td>Medium ($50,000 - $100,000)</td>
</tr>
</tbody>
</table>

Strategy 3.2 [Not Prioritized] - Support and enhance holistic and adaptive grazing management systems

Progress to Date

This strategy has been partly addressed through the FAIP project: Using Management-Intensive Grazing for Adapting to and Mitigating Climate Change. A summary of this project may be found under Strategy 2.1.

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6 CARA Steering Committee member organizations as of May 2018 include: District H Farmers’ Institute, Cariboo Cattlemen’s Association, Kersley Farmers’ Institute, FARMED North Cariboo, Central Interior Poultry Producers Association, BC Sheep Federation, BC Forage Council, BC Agriculture and Food Climate Action Initiative, BC Ministry of Agriculture, Cariboo Regional District, Thompson Rivers University, University of Northern BC and the College of New Caledonia.
Impact Area 4: Changing pests, diseases and invasive species

**Strategy 4.1 [Prioritized] - Increase regional monitoring for pests, diseases and invasive species**

**Progress to Date**
A scan was undertaken to determine priorities and identify potential actions to address emerging pest threats. This project also identified existing resources and gaps pertaining to awareness, education and monitoring. Consultation was undertaken with producers and relevant organizations to prioritize and rank plant, insect and disease pests based on current and potential distribution, scale and severity of pest impacts on local production systems and the existing levels of support for addressing the pest. Collaborative opportunities for monitoring were identified and findings are summarized through an “action plan” that highlights gaps, opportunities and areas for next steps.

**Priority Action #6**  
*Establishing a regional weather monitoring network and increasing sub-regional agricultural weather stations*

Insect and disease populations are strongly linked to annual and seasonal weather patterns. The large geographic area of the Cariboo-Chilcotin currently has a relatively sparse network of climate stations. There is a need for reliable local or sub-regional climate information to enable forecasting for pest distribution and emergence (and to support management decisions). Developing and implementing a collaborative strategy to fill this baseline data gap is a logical first step to strengthen information and decision support tools for agricultural pest management in the region. An improved weather station network would also assist with forecasting agricultural water needs (and adjusting water/irrigation management), assessing local wildfire conditions and evaluating changing crop suitability over time.

**Activities**

I. Review status of current weather monitoring and identify specific geographic and data gaps.

II. Identify and convene key partners for implementation of plan for improving agricultural weather data.

III. Determine which (if/any) decision support tools for pest management could be made available in the region with improved climate data.

IV. Plan for consistent collection and quality control of data.

V. Establish a long-term outreach and extension plan to communicate availability of improved weather/climate data to producers.

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**Implementation Details**

- The Climate Action Initiative has partnered on related work in both the Peace and Okanagan regions, which the Cariboo can learn from.
- This initiative may connect with the multi-agency provincial Climate Related Monitoring Program (CRMP).
- Utilize the BC-ACARN Gap Analysis of Weather Station Data and Application in BC Agricultural Regions.
- Ensure that weather monitoring data collected at each site meets criteria for climatic models, pest and disease models etc.
- Ensure that stations collect the types of data needed for future pest management decision support tools.
- In recent years, eligible individual agricultural producers (with completed and current EFP) could access cost-share funding for weather stations.
- Once station network is in place, develop a strategic plan for pest monitoring.
- Outcomes from a Thompson Rivers University spring 2017 research conference on invasive species could inform future pest monitoring.

**Possible Partners**

<table>
<thead>
<tr>
<th>Financial Information</th>
<th>Stakeholders</th>
</tr>
</thead>
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<tr>
<td><strong>Cost</strong></td>
<td>High ($100,000+)</td>
</tr>
<tr>
<td><strong>Timeframe</strong></td>
<td>Long-term (5+ years)</td>
</tr>
</tbody>
</table>

**Agricultural organizations (listed on page 9)**
- BC-ACARN
- BC Ministry of Agriculture
- CARA
- Climate Related Monitoring Program
- College of New Caledonia (horticulture program)
- Farmwest
- Pacific Climate Impacts Consortium
- Thompson Rivers University
- University of Northern BC

**Strategy 4.2 [Prioritized] - Implement best management practices for pest, disease and invasive species issues**

**Progress to Date**

This Strategy has been partially addressed through the Cariboo Priority Pests: Consultation, Scan and Action Plan (described under 4.1). This project developed a multi-variable ranking system and then used a literature review, consultation, mapping and a ranking/scoring system to identify the pests, diseases and invasive species of greatest concern for the Cariboo agriculture sector. The project also reviewed best management practices (local and transferable from other jurisdictions) and consolidated resources into a shared Cariboo database. The action plan component developed recommendations for collaboration with key agencies and partners for management of pests, diseases and invasive species.
**Priority Action #7**

**Enhance producer knowledge of and access to pest management information**

With the anticipated changes to pest populations (and associated impacts to production) there is a need to bolster producer knowledge of pest issues and management options. The findings of the completed project indicate that the ability of agricultural producers to effectively address existing and emerging pest threats hinges on improving information dissemination in the areas of: Integrated Pest Management (IPM) concepts and planning; identification of priority agricultural pests and their damage patterns; scouting and monitoring protocols, particularly for insects and pathogens; and the full range of control options (cultural, biological, mechanical and chemical) suited to individual pest problems.8

This project will build on the existing cost-free or low cost programs and tools within the Cariboo region. Information pertaining to the themes listed above will be shared through a number of tools and training approaches (some specific options are outlined in the Activities below).

**Activities**

I. Promote existing tools and programs of key groups working across sectors and with the public, including:

- Cariboo Chilcotin Invasive Plant Committee (CCIPC) education resources for weed identification and management options
- The Environmental Farm Plan (EFP) and Beneficial Management Practices (BMP) programs for IPM education and planning support9
- Invasive Species Council of BC (ISCBC) for education and training resources
- BC Ministry of Agriculture - Plant and Animal Health Laboratories10

II. Develop new tools and training to fill gaps, such as:

- Basic training on low cost and simple monitoring techniques,
- Add insects and pathogens to ISCBC invasive plant monitoring tool, and
- Create a small booklet on key invasive insects and diseases modeled after existing booklet on invasive plants.

III. Programs and tools could be shared through one or more of the following:

- A communications campaign,
- A series of presentations at regular industry association meetings,
- A dedicated workshop/speakers series on pest management,
- A dedicated session at another regular event in the region (i.e. 2019 CARA workshop, education events connected to regional academic institutions).

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9 In the last 8 years no Cariboo producers have accessed support cost-share funding for IPM planning or activities (Powell, G. W., 2018)

10 The plant diagnostic lab in Abbotsford notes that they receive very few samples for identification from the Cariboo-Central Interior which limits their ability to prepare support responses (Powell, G.W., 2018).
**Implementation Details**

- Currently, the scope of the ISCBC monitoring tool is limited to regulated pests. To make the tool more proactive it would need to be expanded to include emergent pests.
- Once priority Action #6 is completed, future pest monitoring sites could be located at weather station sites in order to connect pest and weather data to inform pest management.
- Potential experts and presenters for workshops could be identified via the proceedings from the TRU 2017 invasive species conference proceedings.

**Possible Partners**

Agricultural organizations (listed on page 9)
BC Ministry of Agriculture
Cariboo Chilcotin Invasive Plant Committee
Cariboo Regional District
Invasive Species Council of BC

**Timeframe**

Short-term (less than 2 years)

<table>
<thead>
<tr>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>This project could be scaled to whatever size is desired</td>
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<tr>
<td>Low (less than $50,000)</td>
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<tr>
<td>Medium ($50,000 - $100,000)</td>
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**Impact Area 5:**
Changes to wildlife and ecological systems

**Strategy 5.1 [Not Prioritized] - Maintain rangeland productivity in a changing climate**

**Progress to Date**

No actions were undertaken by the CAI between 2014 and 2018 to accomplish this Strategy.

**Strategy 5.2 [Prioritized] - Collaborative management of changing wildlife impacts**

**Progress to Date**

No actions were undertaken by the CAI between 2014 and 2018 to accomplish this Strategy.
**Priority Action #8**

*Consolidate and summarize information on damage and losses to agriculture from wildlife with a focus on post-wildfire impacts*

The damage and/or loss of crops and livestock associated with wildlife interactions has been an on-going challenge for producers in the Cariboo region. Shifts in the distribution and prevalence of wildlife populations are likely to be associated with a number of climate impacts including the increasing frequency and intensity of wildfires. Producers are concerned that wildlife impacts on production may worsen in the aftermath of the 2017 wildfire season.

There are existing data sources related to crop or livestock damage and losses to agriculture (AgriStability and Agriculture Wildlife Programs); however, enrollment in these programs is limited so the information available for the Cariboo is not comprehensive. A scan and summary of damage and losses, which ties together existing information and data, would serve as a valuable tool to raise awareness and to provide key information in an accessible and concise format. This project would summarize the effects of wildlife on all Cariboo production systems and explore the potential influence of climate change on these dynamics, including the effects of recent wildfires (which represent the kind of large-scale landscape changes that are likely to continue into the future).

**Activities**

I. Gather existing information and gather input on losses and damages, possibly including:
   - data from AgriStability
   - data from Agriculture Wildlife programs
   - other data sources
   - interviews

II. Complete a summary of existing information

III. Share summary/briefing with interested parties and potential future implementation partners.

IV. Include recommendations for a collaborative and strategic response in the report.

**Implementation Details**

- This area of work will need to be connected to forage supply/rangeland productivity information, as this information may also affect wildlife movement.
- Methodology for scan will depend on breadth and quality of information that can be gathered from existing data sources.

**Possible Partners**

Agricultural Organizations (listed on page 9)
BC Ministry of Agriculture
BC Ministry of Environment
First Nations
Habitat Conservation Trust
Regional Agriculture and Wildlife Committee

**Timeframe**

Short-term (less than 2 years)

**Cost**

Low (less than $50,000)
## Impact Area 1: Increasing wildfire risk

**A:** Impact Area 1: Increasing wildfire risk

<table>
<thead>
<tr>
<th>Strategy 1.1</th>
<th>Collaborative approaches to fuel management and wildfire mitigation</th>
</tr>
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<tbody>
<tr>
<td>Strategy 1.2</td>
<td>Farm-level wildfire damage mitigation planning</td>
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</tbody>
</table>

## Impact Area 2: Changing hydrology

**B:** Impact Area 2: Changing hydrology

<table>
<thead>
<tr>
<th>Strategy 2.1</th>
<th>Restore &amp; enhance natural water storage capacities in local watersheds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 2.2</td>
<td>Maintain &amp; enhance agriculturally significant dams</td>
</tr>
<tr>
<td>Strategy 2.3</td>
<td>Maximize agricultural water use conservation &amp; efficiency</td>
</tr>
<tr>
<td>Strategy 2.4</td>
<td>Identify flood &amp; runoff prone agricultural areas &amp; implement mitigation measures</td>
</tr>
</tbody>
</table>

## Impact Area 3: Increasing variability

**C:** Impact Area 3: Increasing variability

<table>
<thead>
<tr>
<th>Strategy 3.1</th>
<th>Conduct local research to increase resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 3.2</td>
<td>Support &amp; enhance holistic and adaptive grazing management systems</td>
</tr>
</tbody>
</table>

## Impact Area 4: Changes to pests, diseases & invasive species

**D:** Impact Area 4: Changes to pests, diseases & invasive species

<table>
<thead>
<tr>
<th>Strategy 4.1</th>
<th>Increase regional monitoring for pests, diseases and invasive species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 4.2</td>
<td>Implement best management practices for pest, disease and invasive species issues</td>
</tr>
</tbody>
</table>

## Impact Area 5: Changes to wildlife and ecological systems

**E:** Impact Area 5: Changes to wildlife and ecological systems

<table>
<thead>
<tr>
<th>Strategy 5.1</th>
<th>Maintain rangeland productivity in a changing climate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 5.2</td>
<td>Collaborative management of changing wildfire impacts</td>
</tr>
</tbody>
</table>
## Appendix II

### Summary of strategies, actions and implementation to date

#### Impact Area 1

##### Increasing wildfire risk

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actions</th>
<th>Implementation Details</th>
</tr>
</thead>
</table>
| **Strategy 1.1**  
Collaborative approaches to fuel management & wildfire mitigation | Action 1.1A  
Develop collaborative agriculture wildfire plans | partially addressed by Wildfire Preparedness & Mitigation Planning & Resources |
|  | Action 1.1B  
Develop collaborative fuel-management strategies for high-risk agricultural interface areas |  |
| **Strategy 1.2**  
Farm-level wildfire damage mitigation planning | Action 1.2A  
Develop agriculture specific wildfire preparedness and mitigation resources |  |
|  | Action 1.2B  
Develop individual farm/ranch-level wildfire plans (fuel management/asset protection etc.) | partially addressed by Wildfire Preparedness & Mitigation Planning & Resources and through Okanagan Project Agriculture Wildfire Preparedness Planning Workbook and Guide |
|  | Action 1.2C  
Increase access to basic fire education and training for producers | not yet addressed |

#### Impact Area 2

##### Changing hydrology

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actions</th>
<th>Implementation Details</th>
</tr>
</thead>
</table>
| **Strategy 2.1**  
Restore & enhance natural water storage capacities in local watersheds | Action 2.1A  
Establish local watershed restoration projects to evaluate and demonstrate restoration and enhancement options | partially addressed by scoping of Livestock Surface Water Assessment project |
|  | Action 2.1B  
Evaluate, demonstrate and share soil management and cropping options for improved water retention | partially addressed by FAIP project Using Management-Intensive Grazing for Adapting to and Mitigating Climate Change |
| **Strategy 2.2**  
Maintain & enhance agriculturally significant dams | Action 2.2A  
Inventory and prioritize existing dams/water storage | partially addressed by 3 projects: Cooperative Maintenance & Enhancement of Agriculturally Significant Dams, Workshop on Maintaining & Enhancing Agricultural Dams and Agricultural Dams Knowledge Transfer Resource |
|  | Action 2.2B  
Develop cooperative approaches to dam assessments, upgrades, maintenance and management |  |
| **Strategy 2.3**  
Maximize agricultural water use conservation & efficiency | Action 2.3A  
Promote irrigation assessments and disseminate existing irrigation and water management tools through locally effective means | not yet addressed |
|  | Action 2.3B  
Demonstrate and evaluate innovative irrigation technologies and water management practices within the Cariboo’s agricultural context |  |
### Impact Area 2 (continued)
**Changing hydrology**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actions</th>
<th>Implementation Details</th>
</tr>
</thead>
</table>
| **Strategy 2.4**  
Identify flood & runoff prone agricultural areas & implement mitigation measures |  
**Action 2.4A**  
Inventory agricultural areas vulnerable to flooding and significant run-off/erosion impacts | not yet addressed |
|  
**Action 2.4B**  
Identify, pilot and evaluate low-cost flood mitigation infrastructure options (e.g. spillways into storage, riparian management, berms, embankments etc.) |  |
|  
**Action 2.4C**  
Pilot joint management projects for enhancing natural water retention capacity across the region to minimize run-off (e.g. build soil organic matter, restore riparian areas) | partially addressed by FAIP project *Using Management-Intensive Grazing for Adapting to and Mitigating Climate Change* |

### Impact Area 3  
**Increasing variability**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actions</th>
<th>Implementation Details</th>
</tr>
</thead>
</table>
| **Strategy 3.1**  
Conduct local research to increase resilience |  
**Action 3.1A**  
Strengthen the capacity for a coordinate regional approach to agricultural research | partially addressed by *Regional Research Alliance/Organization Model and CARA: Launch and Extension Resources* |
|  
**Action 3.1B**  
Undertake applied research of management practices to enhance resilience in variable and changing conditions | partially addressed by FAIP projects *Adapting BC Horticulture through Protected-Crop Research and Demonstration and Climate Change Impact Risk Assessment Tool for Ponds used as Livestock Water Sources and Using Management-Intensive Grazing for Adapting to and Mitigating Climate Change* |
|  
**Action 3.1C**  
Undertake local variety/new crop trials to assess suitability for variable and changing conditions | not yet addressed |
|  
**Action 3.1D**  
Increase availability of local education and tools to support producers in managing variable conditions | partially addressed by *Wildfire Preparedness & Mitigation Planning & Resources, Agricultural Dams Knowledge Transfer Resource and CARA Launch and Extension Resources* |
| **Strategy 3.2**  
Support and enhance holistic and adaptive grazing management systems |  
**Action 3.2A**  
Monitor and evaluate how different grazing and management regimes affect: soils development, nutrient cycling and profitability | partially addressed by FAIP project *Using Management-Intensive Grazing for Adapting to and Mitigating Climate Change* |
|  
**Action 3.2B**  
Expand producer opportunities for education, knowledge acquisition and mentorship for adaptive grazing management |  |
## Impact Area 4
### Changing pests, diseases and invasive species

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actions</th>
<th>Implementation Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 4.1&lt;br&gt; Increase regional monitoring for pests, diseases and invasive species</td>
<td><strong>Action 4.1A</strong>&lt;br&gt; Pilot a community education and monitoring program</td>
<td>partially addressed by <em>Cariboo Priority Pests: Consultation, Scan and Action Plan</em></td>
</tr>
<tr>
<td></td>
<td><strong>Action 4.1B</strong>&lt;br&gt; Partner with interested agencies to increase local monitoring</td>
<td></td>
</tr>
<tr>
<td>Strategy 4.2&lt;br&gt; Implement best management practices for pest, disease and invasive species issues</td>
<td><strong>Action 4.2A</strong>&lt;br&gt; Develop and distribute best practices resources for management of pests, diseases and invasive species</td>
<td>partially addressed by <em>Cariboo Priority Pests: Consultation, Scan and Action Plan</em></td>
</tr>
<tr>
<td></td>
<td><strong>Action 4.2B</strong>&lt;br&gt; Conduct pilot projects for effective farm-level management of pests, diseases and invasive species (particularly for emerging issues)</td>
<td>not yet addressed</td>
</tr>
<tr>
<td></td>
<td><strong>Action 4.2C</strong>&lt;br&gt; Collaborate with key agencies and partners for management of pests, diseases and invasive species</td>
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</tbody>
</table>

## Impact Area 5
### Changes to wildlife and ecological systems

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actions</th>
<th>Implementation Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 5.1&lt;br&gt; Maintain rangeland productivity in a changing climate</td>
<td><strong>Action 5.1A</strong>&lt;br&gt; Research, pilot and demonstrate practices and technologies for maintaining and enhancing range productivity</td>
<td>partially addressed by <em>Regional Research Alliance/Organization Model</em> and CARA: <em>Launch and Extension Resources</em></td>
</tr>
<tr>
<td></td>
<td><strong>Action 5.1B</strong>&lt;br&gt; Seek partners interested in collaborative monitoring of local rangeland to track changes</td>
<td>not yet addressed</td>
</tr>
<tr>
<td></td>
<td><strong>Action 5.1C</strong>&lt;br&gt; Pilot alternative livestock watering options</td>
<td>partially addressed by <em>Livestock Surface Water Assessment and Options</em></td>
</tr>
<tr>
<td></td>
<td><strong>Action 5.1D</strong>&lt;br&gt; Enhance flexibility of range use plans and communicate options and opportunities to producers</td>
<td>not yet addressed</td>
</tr>
<tr>
<td>Strategy 5.2&lt;br&gt; Collaborative management of changing wildlife impacts</td>
<td><strong>Action 5.2A</strong>&lt;br&gt; Enhance collaboration with key partners to implement management strategies</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action 5.2B</strong>&lt;br&gt; Improve collaborative mechanisms for tracking and monitoring changes in the wildlife/agriculture interface</td>
<td>not yet addressed</td>
</tr>
<tr>
<td></td>
<td><strong>Action 5.2C</strong>&lt;br&gt; Pilot farm-level approaches to reduce losses from wildlife to feed and livestock</td>
<td></td>
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</tbody>
</table>