



UNIT EIGHT

A resource for
building climate
resilience in
Alberta

8

Action Plan, implement and review

What this unit will help you do

You have been directed to this unit because:

- ➔ You are looking to draft an Action Plan for your community, implement priority actions, and keep the Plan relevant over time.

This unit contains three sections to help you:

- Section 1:** Prepare a formal climate resilience action plan (“Action Plan”) for your community.
- Section 2:** Select and implement climate resilience actions within budgeting and planning cycles.
- Section 3:** Keep your community Action Plan relevant and up to date.

Section 1: Drafting a climate resilience Action Plan

Having completed the workshop, you are now ready to prepare a formal climate resilience action plan (“Action Plan”) for your community.

At Session 4 of the workshop, you generated a short-list of promising climate resilience actions for inclusion in the Action Plan. These actions were judged by participants to represent the most effective, most feasible, most acceptable, and most equitable means of managing a specific priority risk or opportunity. For each action you also collected basic information to support eventual implementation, including approximate total implementation costs, a timeframe for completing implementation, as well as staff, departments or other groups to lead implementation. This information forms “starter action plans” for specific risks or opportunities. They represent one simple way to organize and present actions for ensuing decision-making. An example of a starter action plan for wildfire from one of the pilot community workshops is shown in Table 1. These starter action plans form the basis of your community’s formal Action Plan.

Action	Cost	Timeframe	Lead
Hold additional table top exercises with all agencies to plan for large-scale wildfire	Low	Near-term	Municipalities
Update the Land Use Bylaw with FireSmart planning principles such as vegetation management and construction materials	Moderate	Ongoing	County
Improve vegetation management in high risk fire areas	Very high	Near-term	County, agriculture and forestry sectors
Purchase additional firefighting equipment specific to wildland firefighting	Very high	Short-term	Municipalities
Upgrade local airport runways to facilitate landing of larger fixed-wing aircraft for water bombing	Very high	Long-term	Municipalities, County, Government of Alberta
Enhance the Regional Municipal Emergency Plan to deal with increasing wildfire risk	Moderate	Ongoing	Municipalities

Table 1: Starter action plan for wildfire (example from Mackenzie County Action Plan)



Action Plan: A climate resilience action plan (“Action Plan”) documents the actions a community plans to implement in order to manage priority risks and opportunities posed by climate change. It also describes the process of arriving at the recommended actions, provides all materials used to support the decision-making process, and outlines how, when and by whom actions will be implemented.

An effective Action Plan not only documents the actions a community hopes to implement; it should also describe the process of arriving at the recommended actions, and provide all materials used to support decision-making throughout the process, including the workshop outcomes. A transparent process is an integral part of garnering internal and external support to implement the Action Plan.

A suggested table of contents for an Action Plan developed through the Climate Resilience Express pilot process is shown in the first panel of Figure 1. Note that the Plan describes the climate resilience planning process, with a separate section for each of the four workshop sessions. The other three panels in Figure 1 show screenshots of selected content from individual sections of the Action Plan.

Once you have prepared a draft of the Action Plan, we recommend you share it with workshop participants and senior staff in lead departments for comment and feedback prior to finalizing the document. You may also want to consider getting formal approval from Council before finalizing the Action Plan. Formal approval from Council indicates to staff and the wider community that Council supports the Action Plan and therefore endorses the allocation of resources to see it implemented.

You may want to add the following additional elements to your Action Plan:



- A Foreword from the Mayor or Council making a formal commitment to the climate resilience planning process to enable staff and other resources to be allocated to the Action Plan.
- A vision statement describing what the Action Plan is trying to accomplish and how this contributes to the overall future vision for your community.
- A glossary of key terms to assist readers.

You will find examples of these additional elements in the selection of community Action Plans from across Canada listed below.



Action Plans from the pilot communities are provided in Appendix N. These can be used as a template for drafting your community’s Action Plan.

A number of other communities across Canada have developed climate resilience action plans, which could also be used as a guide for your community's Action Plan; a selection are listed below:

- ✓ City of Leduc, AB, Weather and Climate Readiness Plan, 2014.
- ✓ City of Red Deer, AB, Climate Change Adaptation Plan, 2014.
- ✓ City of Thunder Bay, ON, Climate Adaptation Strategy, 2015.
- ✓ District of Saanich, BC, Climate Change Adaptation Plan, 2011.
- ✓ Community of Aklavik, NWT, Climate Change Adaptation Action Plan, 2011.
- ✓ District of Elkford, BC, Climate Change Adaptation Strategy, 2011.
- ✓ City of Windsor, ON, Climate Change Adaptation Plan, 2012.
- ✓ Town of Stratford, PEI, Climate Change Municipal Adaptation Plan, 2010.
- ✓ District of Barrington, ON, Municipal Climate Change Adaptation Plan, 2013.
- ✓ City of North Vancouver, BC, Climate Change Adaptation Plan, 2013.



If you want to learn more about preparing an Action Plan, look at:

- ✓ Bowron, B. and Davidson, G., 2011, Climate Change Adaptation Planning: A Handbook for Small Canadian Communities, Canadian Institute of Planners, Ottawa, Canada. [Page 31-40.]
- ✓ ICLEI, Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation ICLEI Canada, Toronto, ON. [Page 46-57 and Worksheet 13.]

➔ Complete action planning for priority risks and opportunities

At the workshop, there may not have been sufficient time to action plan around all identified priority risk and opportunity; action planning will have focused on a subset of priority risks and opportunities, chosen by workshop participants. At the earliest opportunity, starter action plans should be devised for all priority risks, and the Action Plan updated accordingly. This will entail organizing and facilitating another short action planning session with staff and other local stakeholders, following the guidance in Unit 7.

Mackenzie County – Climate Resilience Action Plan

Table of Contents

- 1. Introduction 2
- 2. Developing the Action Plan 3
 - Before the Workshop: Step 1 4
 - At the Workshop: Step 2 and Step 3 5
 - After the Workshop: Step 4 5
- 3. Observed Impacts, Climate Trends and Projections 6
 - Observed Local Weather and Climate Impacts 6
 - Local Climate Trends 7
 - Climate Projections for Area 10
 - Projected Environmental Changes 13
- 4. Climate Risks and Opportunities for Mackenzie County 18
 - Potential Climate Impacts 18
 - Priority Climate Risk and Opportunities 19
- 5. Climate Resilience Actions 25
 - Wildfire 27
 - Transport & access disruption 28
 - Crop & forage loss 28
 - Freezing rain / ice storm 29
- 6. Implementation and Next Steps 30
 - Acting 30
 - Mainstreaming 30
 - Review and Update 31
- 7. Appendices 32
- 8. Endnotes 37

11 | Page

Mackenzie County – Climate Resilience Action Plan

CLIMATE PROJECTIONS FOR AREA

Climate projections for Mackenzie County, for the 2050s, were derived using the Pacific Climate Impacts Consortium’s (PCIC) Regional Analysis Tool¹⁰. The projections are based on results from 15 different Global Climate Models (GCMs). Each model generates output for one high and one low GHG emission scenario. Projected climate change within the models is primarily driven by assumed increases in concentrations of GHGs in the atmosphere. The results from all 15 GCMs for both GHG emission scenarios are averaged.

Climate projections for the 2050s in Mackenzie County are summarized in Table 1. The mean annual temperature is anticipated to increase by +2.1°C above the 1961-1990 baseline, which will increase the absolute mean annual temperature in the 2050s to about +0.9°C. This projected increase in temperature is consistent with the rate of change in mean annual temperature that has been observed in Mackenzie County over the last 50 years. The projected increase in mean annual temperature is expected to be accompanied by an increase in mean annual precipitation of approximately +6%.

Table 1: Summary of climate projections for Mackenzie County by the 2050s

Climate Variable	Season	Baseline (1961-1990)	Projected Change	
			Mean	Range
Average temperature	Annual	-1.2°C	+2.1°C	(+1.5 to +3.0)
Average precipitation	Annual	484 mm	+6%	(0% to +17%)
Average temperature	Summer	15.1°C	+1.7°C	(+1.1 to +2.8)
Average precipitation	Summer	189 mm	+5%	(-6% to +16%)
Average temperature	Winter	-19.5°C	+3.1°C	(+0.9 to +4.2)
Average precipitation	Winter	78 mm	+12%	(-5% to +23%)
Average temperature	Spring	-0.3°C	+1.8°C	(+1.0 to +2.6)
Average precipitation	Spring	83 mm	+8%	(0% to +20%)
Average temperature	Fall	-0.2°C	+2.1°C	(+1.4 to +2.9)
Average precipitation	Fall	113 mm	+5%	(-1% to +20%)

Notes: The mean projected change is the average value over the 30-year period 2040-2069. The range is defined by the 10th and 90th percentile values. Summer includes Jun-Aug, fall includes Sep-Nov, winter includes Dec-Feb, and spring includes Mar-May.

18 | Page

"Since the mid-20th century human activities, including the burning of fossil fuels and changes in land use patterns have been the dominant cause of climate change... This trend is expected to continue through the present century and beyond, leading to rates of global warming that will exceed any experienced during the past several thousand years."

Mackenzie County – Climate Resilience Action Plan

Table 3: Climate change risks facing Mackenzie County by the 2050s

Label for risk map	Description	Key consequences for Mackenzie County
"Wildfire"	Increased interface wildfire risk caused by increased summer temperatures and heat waves, less precipitation in summer, and a longer fire season	<ul style="list-style-type: none"> Loss of fibre Health risks (smoke) Increased cost for reforestation Diversion of labour Cut-off of transportation routes Evacuations Expensive to fight, but positive for some local businesses Loss of wildlife More mushroom picking opportunities
"Reduced quality & supply of timber"	Reduced quality and supply of local timber due to regional ecosystem shifts towards deciduous forest and parkland	<ul style="list-style-type: none"> Increased haul distances and operation cost (must travel further to access timber) Coniferous timber will specifically decline in quality Increased opportunities for biofuel
"Transport & access disruption"	Warmer winters and shorter ice covered period on rivers will disrupt transportation and access to certain areas	<ul style="list-style-type: none"> Increased transportation time and cost for essential supplies such as bulk goods and fuel, and access to and from communities and medical facilities Increased isolation (e.g., Fox Lake)
"Overland flooding"	Increased frequency and intensity of local spring flooding from increased winter stream flow and earlier spring peak flow	<ul style="list-style-type: none"> Property damage Delayed planting of crops Road washouts and access disruption, with water on roads and airport runways Potential crop damage from increased fungi disease for plants More river sediment, with negative impact on fish
"Water supply shortage"	Inability to meet water demand for drinking, irrigation, livestock and transportation (ferries) due to decrease summer streamflow	<ul style="list-style-type: none"> Decreased water supply for rural fire operations, with increased fire risk Reduced water quality Economic impacts on crops (reduced plant growth) and farmers Potential loss or delays in transportation if ferries are affected Negative impact on wildlife and wetlands

20 | Page

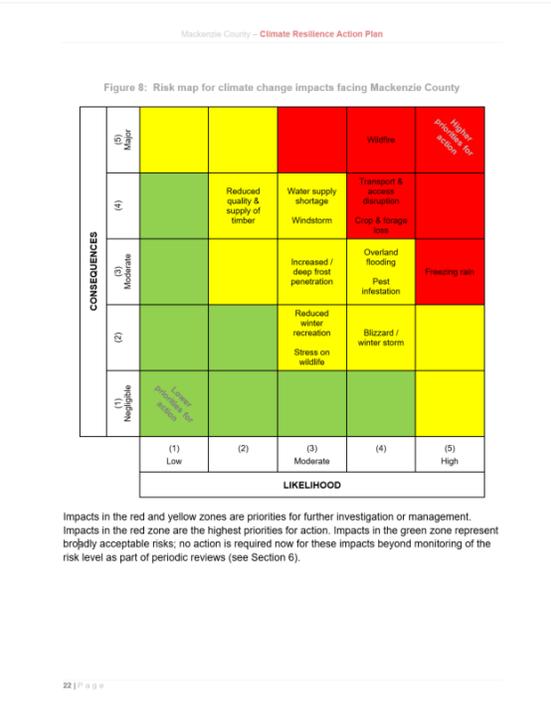


Figure 1: Screenshots from the Climate Resilience Action Plan for Mackenzie County

Section 2: Moving ahead with implementation

The starter action plans serve as a ‘shopping-list’ for communities. Staff can establish priorities for implementation from the listed actions on (say) an annual basis, to coincide with community budgeting and planning cycles.

In general, you will find that a number of actions in your Action Plan can be implemented quickly with minimal investment, whereas other actions will have longer-term timeframes, require a higher level of investment, and may require a more detailed implementation strategy with dedicated budgets and new funding sources, timelines and milestones for specific activities, and defined roles and responsibilities for specific stakeholders and groups.

Depending on the diversity of identified climate resilience actions, consideration could be given to forming a working group of municipal staff and external stakeholders, ideally from amongst workshop participants, to oversee implementation of the Action Plan. This group could coordinate the ongoing selection and implementation of actions.

It is not the intent of this Action Kit—with its focus on developing your community’s Action Plan—to provide detailed guidance on implementation. Nonetheless, three key considerations when moving ahead with implementation are highlighted:

- 1: Principles for prioritizing actions;
- 2: Mainstreaming actions; and
- 3: Communicating with stakeholders.

➔ Principles for prioritizing actions

Climate resilience actions included in the Action Plan represent the most effective, most feasible, most acceptable, and most equitable means of managing specific priority risks or opportunities, based on a qualitative assessment of options by workshop participants. A number of additional principles are typically taken into consideration by decision-makers when prioritizing actions to manage climate change impacts. Two of the most important principles that you should bear in mind when prioritizing actions are:

- ➔ **Prioritize flexible, adaptive actions.** An important strategy for dealing with uncertainties inherent in climate resilience planning is to prioritize actions that allow for easy adjustments and incremental implementation. The basic idea is to avoid taking actions with potential for high regrets. This may involve designing flexibility into an action from

the start, so that it can cope with a range of future climates (e.g., constructing a flood protection wall with larger foundations than currently needed, so the wall can be raised, rather than torn down and replaced, as improved information about the nature of projected climate change becomes available). It may also involve adopting a flexible planning process over time—sequencing actions so that ‘no-regrets’ measures (see below) are implemented earlier, and less flexible, large-scale, high-cost measures are delayed in anticipation of better information, with regular monitoring and review.

- ➔ **Look for ‘win-win’ and ‘no-regret’ actions.** Priority should be given to implementing ‘win-win’ and ‘no-regret’ actions, especially when resources are limited.
- ✓ Win-win actions refer to measures that manage the targeted climate change impact, while also generating other environmental, social or economic benefits, including climate mitigation benefits. They tend to have strong synergies with other community priorities and objectives, which provides sufficient motivation for their implementation, withstanding the need to increase resilience to climate change.
 - ✓ No-regret actions are measures that require minimal levels of investment, are justified now to manage *current* climate variability and extremes, and are therefore also justified under all plausible projections of climate change. One category of no-regret actions are measures that are cost neutral—involving a low initial investment but reducing overall cost in the longer-term due to improvements in resource (e.g., water, energy) efficiency.

One of the primary benefits of identifying win-win and no-regret actions is that it enables communities to implement short-term adaptation actions in the presence of limited budgets, and in doing so begin the adaptation process, rather than adopt a ‘wait and see approach’.

Although not a principle for selecting actions per se, departments should avoid taking decisions that will make it more difficult or costly for themselves or others to manage climate impacts in the future—i.e., avoid so-called “adaptation constraining decisions”. An example of an adaptation constraining decision is permitting new (re)development in a known flood-prone area of the community.

Win-win actions:

- ✓ Improve preparedness and emergency response planning to deal with flood and wildfire risks
- ✓ Use green roofs and walls to reduce building temperature, rainfall runoff, and cooling demand
- ✓ Re-establish flood plains or wetlands to manage flood risk and support biodiversity and habitat conservation

No-regret actions:

- ✓ Reduce leakage from water utility infrastructure to manage water supply shortages
- ✓ Develop a Water Conservation and Efficiency Plan to reduce water consumption and improve management of drought risk
- ✓ Develop an educational program to raise awareness of the adverse effects of storm run-off from private property, and how residents can effectively manage storm-water on their property

Table 2: Examples of win-win and no-regret climate resilience actions

➔ Mainstreaming actions

While the Action Plan is developed as a ‘stand-alone’ document, building climate resilience should not be separated from other sustainable development efforts, because climate change has the propensity to impact such a wide range of community objectives and priorities. Moreover, many climate resilience actions are likely to permeate multiple municipal functions. It is therefore important that climate resilience is integrated (or ‘mainstreamed’)—as a matter of routine, and as much as possible—into your community’s strategies, plans, policies, programs, projects, and administrative processes. For example:

- ➔ Climate resilience should be considered in all future land use and development decisions, including administrative processes such as bids, tenders and contracts for planning and development work;
- ➔ Strategic plans (e.g., the Municipal Development Plan and Parks, Open Spaces and Trails Master Plan) and neighborhood scale plans should consider potential future climate change impacts; and
- ➔ Decisions related to the design, maintenance, and upgrading of long-life infrastructural assets and facilities should likewise consider future climate changes and impacts.

The basic rationale behind mainstreaming is that the sustainability and impact of community plans, policies, etc. can be improved by integrating climate change considerations from the outset, thus ensuring initiatives are not at odds with projected climate impacts.

Identifying opportunities (e.g., when a policy is scheduled for review and updating) to mainstream climate considerations into municipal operations should be a priority. Most mainstreaming efforts require no or minimal investment costs and are thus a ‘no-regret’ strategy.



Mainstreaming: Mainstreaming climate resilience describes a process of considering—as a matter of routine—climate change impacts to community strategies, plans, policies, programs, projects, and administrative processes, and of incrementally adjusting these initiatives to better manage these impacts.

➔ Communicating with staff and other stakeholders

Effective communication with staff, residents and other stakeholders about climate change impacts facing the community can be valuable in helping them understand why certain actions are needed, and why resources are being allocated to these actions.

A range of approaches to community outreach can be used to both:

- ➔ Gather input from community members on the content of the Action Plan; and
- ➔ Promote and secure buy-in to the corporation’s efforts to make the community more resilient.

It is equally important that the Action Plan is effectively communicated to staff and elected officials. This is particularly important when actions involve the introduction of new technologies or practices, policy changes, amendments to existing plans, or modifications to current roles and responsibilities. In these cases, it may be necessary to offer staff formal training or education sessions; less formal sessions, such as noon hour “lunch & learns” may suffice for raising awareness of the Action Plan.

If you want to learn more about selecting and implementing actions from the Action Plan, look at:

- ✓ Black, R., et al, 2010, *Adapting to Climate Change: A Risk-based Guide for Local Governments*, Volume 1. [Pages 19-21.]
- ✓ Boyd, R., et al, 2012, *Economic Guidance for the Appraisal and Prioritization of Adaptation Actions*, All One Sky Foundation, Calgary, AB. [Pages 27-40.]
- ✓ Bowron, B. and Davidson, G., 2011, *Climate Change Adaptation Planning: A Handbook for Small Canadian Communities*, Canadian Institute of Planners, Ottawa, Canada. [Pages 38-43.]
- ✓ ICLEI, *Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation* ICLEI Canada, Toronto, ON. [Pages 60-62 and Worksheet 15.]

In you want to learn more about flexible, win-win and no-regret climate resilience actions, look at:

- ✓ Hallegatte, S., 2009, *Strategies to Adapt to an Uncertain Climate Change*, *Global Environmental Change*, 19, pp. 240–247.
- ✓ UKCIP, *Identifying Adaptation Options*, UK Climate Impacts Program, Oxford, UK. [Pages 15-18.]
- ✓ Martin, S., 2012, *Examples of 'No-regret', 'Low-regret' and 'Win-win' Adaptation Actions*, Climate-X-Change Secretariat, Edinburgh, UK.
- ✓ Ranger, N., et al, 2010, *Adaptation in the UK: A decision-making process*, Policy Brief September 2010, The Grantham Research Institute on Climate Change, London School of Economics and Political Science, London, UK. [Pages 18-20.]

In you want to learn more approaches to community engagement methods on climate topics, look at:

- ✓ AUMA and AAMDC, 2015, *Citizen Engagement Toolkit*, Alberta Urban Municipalities Association (AUMA) and the Alberta Association of Municipal District and Counties (AAMDC), Edmonton, AB.
- ✓ FCM, 2008, *Six Steps to a Sustainable Community: A Guide to Local Action Planning*, Federation of Canadian Municipalities (FCM), Ottawa, ON.
- ✓ AUMA and AAMDC, 2015, *Social Media: Resource Guide*, Alberta Urban Municipalities Association (AUMA) and the Alberta Association of Municipal District and Counties (AAMDC), Edmonton, AB.



Section 3: Keeping the Action Plan relevant

Building resilience to climate change is not a static process. The priority risks and opportunities identified in your Action Plan, along with the recommended actions to address them, should be viewed as the first step in the community's journey towards a climate resilient future.

The climate resilience action planning process is dynamic. For a start, the rapidly changing scientific knowledge about the physical impacts of climate change means that risk and opportunity assessments are not one-off activities, but rather need to be reviewed and updated regularly. An Action Plan should therefore be evaluated regularly—at least every 5 years—to ensure it remains effective and relevant. The evaluation should consider:

- ➔ Lessons learned from the implementation of actions, both in terms of:
 - Process**—to determine whether actions have been implemented as intended; and
 - Outcomes**—to assess the effectiveness of implemented actions in achieving the intended results.
- ➔ New scientific information on climate projections and corresponding impacts, which may affect the understanding of risks and opportunities facing the community.
- ➔ Changes to community goals, or changes to social, economic or environmental conditions, which likewise may affect the understanding of risks and opportunities facing the community.

Keeping the Action Plan relevant may only involve a few minor adjustments, or it may require revisiting some of the steps in the climate resilience planning process and preparing a new Action Plan.

Upon review, remember to communicate key achievements to staff, elected officials, residents and other stakeholders; this will spur support for the next iteration of the Action Plan.

If you want to learn more about how to monitor and review your community's Action Plan, look at:

- ✓ ICLEI, Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation ICLEI Canada, Toronto, ON. [Pages 66-70 and Worksheets 16 and 17.]

If you want to learn more about monitoring and review in a general disaster risk management context, look at:



- ✓ Australian Government Attorney-General's Department, 2015, Australian Emergency Management Handbook Series, National Emergency Risk Assessment Guidelines: Practice Guide, Canberra, AUS. [Pages 53-56.]

The Measuring Progress Working Group of Natural Resources Canada's Adaptation Platform references several recently completed studies that investigate lessons learned and best practice tools and methodologies for measuring progress on building resilience to climate change.

The Centre of Excellence for Evaluation (CEE) at the Treasury Board of Canada Secretariat also provides advice and guidance to conduct, use and promote monitoring, review and evaluation practices across government. The CEE hosts databases of evaluations covering every portfolio, and has information on evaluation policy, standards and tools.

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