



Town of Canmore

Flood Recovery Action Plan

January 2014



canmore stands strong canmore stands strong

Table of Contents

Executive Summary	3
The Perfect Ugly Storm	4
Emergency Response	5
Impacts	6
Vision, Goals, and Strategic Initiatives	7
Recovery	8
Short and Long Term Mitigations	10
Key Results	11
Conclusion	16



Executive Summary

This recovery action plan outlines how the Town of Canmore will recover from the June 2013 flood as we transition from immediate relief to long term community restoration and rehabilitation. It provides background information regarding weather conditions that led to the flooding, a summary of emergency response actions and event impacts, an overview of the recovery priorities, and key result areas and deliverable.

This document guides recovery efforts and helps target resources where they will be most valuable and impactful. It is a reference for future Town of Canmore Strategic and Business Plans. It provides detail as to how the Town of Canmore intends to fully recover from the floods of June 2013, decrease our vulnerability to future events, and aims to enable continued alignment of efforts while providing clarity for longer-term planning.

Just one month after the floods, Council approved a \$600,000 project to conduct a Mountain Creek Hazard Mitigation Plan.

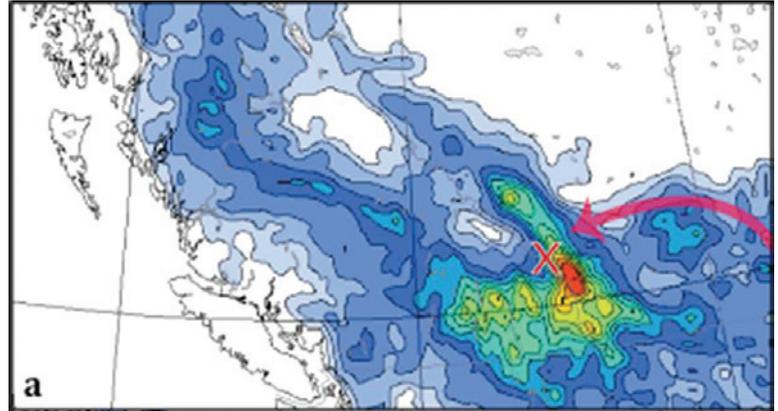


The Perfect Ugly Storm

An intensive rainstorm (three low pressure systems converged slightly south of Canmore) from June 19-21, 2013 combined with frozen ground and snow melt to initiate hundreds of debris flows and debris floods on tributaries of the Bow River including a number of creeks in Canmore: Cougar Creek, Echo Creek, Pigeon Creek, Three Sisters Creek, Stewart Creek, Stoneworks Creek, Stone Creek, and some unnamed creeks.

Significant flows of both water and debris like rock, trees and sediment occurred in all of Canmore's mountain creeks. In Cougar Creek, this flow caused the creek to migrate outside of its channel, eroding banks past property lines, undermining building foundations and supports for decks and balconies, as well as destroying roadways and infrastructure. When the water receded, 44 properties along Cougar Creek were deemed unsafe to occupy, some too damaged to repair. Similar flows occurred in all Canmore's mountain creeks, resulting in significant damage to private property, roadways, utilities, and municipal and provincial infrastructure. High groundwater in the valley bottom led to damage to private properties, businesses, and our hospital as well.

Some 9 million cubic metres of rain (220 mm) fell on the 43 square kilometre watershed of Cougar Creek over the course of 3 days.



Emergency Response

Impacts from the disaster could have been much worse. Approximately 1200 residents were evacuated from vulnerable areas as teams worked around the clock to preserve the culverts at Elk Run and Three Sisters Parkway. These transportation links were vital for the evacuation of residents, movement of essential goods and emergency services, and access for crews to reconstruct the Trans-Canada Highway and CP rail line. We were extremely fortunate to have no serious injuries or fatalities, thanks in large part to heroic efforts of emergency personnel, equipment operators, Town staff, and consultants who spent days working directly adjacent to and often in hazardous stream flows. Residents who chose not to evacuate or who observed the creeks from eroding banks were also fortunate to escape harm.

The Town's successful response to this event required not only mobilization of town staff, but also included consultants and contractors, members of the Canadian Forces, RCMP, volunteers, and numerous personnel from other municipalities and other levels of government. The Town's response was organized in an Emergency Operations Centre (EOC) with the following three goals:

1. Protect Life
2. Protect Infrastructure
3. Protect private property



We were extremely fortunate to have no serious injuries or fatalities, thanks in large part to heroic efforts of emergency personnel, equipment operators, Town staff, and consultants.



Impacts

The flood had a significant impact to the community and visitors. The Town became an island with the Trans-Canada Highway closed in both directions with travel restricted for seven days. There were prolonged power interruptions, natural gas services were cut off to many areas of town, extensive property loss, significant infrastructure damage, a lengthy boil water advisory, and sporadic disruptions to cellular and internet services. Some of the specific impacts include:

- Approximately 1200 evacuation orders
- Approximately \$16 million in initial damage to Town infrastructure
- 44 properties along Cougar Creek deemed unsafe to occupy immediately after the event estimated at \$6 million in damage (roughly \$150k/property)
- \$8 million in damage to properties along Stone creek
- 272 total DRP claims filed by property owners in Canmore
- \$4 million estimated impact on businesses
- Significant groundwater flooding at Canmore hospital
- More than 5,000 calls received at EOC call centre

- 310% increase in daily visits to Town website during state of local emergency
- 14 day boil water advisory
- Trans Canada closed for 7 days
- Benchlands Trail closed for two months
- Canadian Pacific Railway shut down for several days
- 30 business directly impacted with business loss/closure
- 3 businesses not fully operational at the time of this report

Transportation infrastructure was severely impacted as bridges on the Trans-Canada Highway, Highway 1A, and in town at Elk Run Boulevard and Three Sisters Parkway were compromised during the flood. Disruptions to cellular and internet services meant that at times, and temporarily, people could not access canmore.ca, Facebook, Twitter, or the call centre. Wet and heavily used radios and cell phones, whose batteries died, left staff in the field without contact. Local radio became a primary source of information for both town staff and residents.



Vision, Goals, and Strategic Initiatives

The following vision, goals and initiatives as set out in the town's 2014 strategic plan are consistent and applicable as it relates to flood recovery:

Vision:

Canmore is resilient and vibrant community socially, economically, and environmentally. Its strength is in its resourceful and engaged citizens, who thrive together on the strength of the community's heritage, long-term commitment to the diversity of its people, and the health of the mountain landscape.

Goals:

- **Service:**
 - ~ Canmore is a Safe Community
 - ~ The Town of Canmore delivers services in an effective, innovative, and fiscally responsible manner
- **Economy:**
 - ~ Canmore has a diverse economy that is resilient to change
- **Environment:**
 - ~ Canmore is a municipal leader in environmental stewardship
 - ~ Canmore's natural environment remains viable for wildlife while providing opportunity for human enjoyment
- **People:**
 - ~ Town of Canmore decisions are informed and deliberated in an open and transparent fashion
 - ~ We value and support "people" as the corporation's and community's strongest asset

Strategic Initiatives:

- Manage and mitigate known community hazards as identified through the Emergency Management Plan and operational experiences
- Develop and foster partnerships with community groups, regional neighbours, other levels of government and third part organizations for the provision of seamless service to the citizens of Canmore
- Define and commit to citizen engagement opportunities in advance of all major projects



Recovery

Clean up began almost immediately, with the Town focusing the majority of our efforts in Cougar Creek, due to the damage and remaining debris. Damaged infrastructure and utilities were repaired as quickly as possible. The creek bed was cleaned of debris and, in order to prepare for the possibility of additional summer storms, the creek channel was reestablished to its pre-flood condition as much as possible.

A flood recovery office was set up immediately after the event. This office is still operating. Several staff were seconded to this office and some additional workload was absorbed by existing departments. The impact on the Town to complete previous initiatives has been significant. The immediate goals were to coordinate recovery efforts, manage financial accounting, liaise with impacted residents and businesses, the Province, and key stakeholders, repair infrastructure, restore creeks and mitigate against possible future events, and to continue to communicate with impacted residents and community members.

On July 23, 2013, just one month after the floods, Canmore's Town Council approved a \$600,000 project to conduct a "Mountain Creek Hazard Mitigation Plan" which includes hazard analysis on all of Canmore's mountain creeks including understanding how the creeks behave, how they are expected to behave in the future, and to create steps to reduce future property loss and reduce the safety risk in the community.

BGC Engineering Inc. was hired to work with local and regional experts to create a plan for each creek. They have already begun their work to analyze each creek in Canmore and will make recommendations for appropriate mitigations. Key partners and stakeholders are working directly with us including the Province of Alberta, CP Rail, other mountain communities and neighbouring municipalities, private land owners, developers, and utility companies.



A flood recovery office was set up immediately after the event. This office is still operating. Several staff were seconded to this office and some additional workload was absorbed by existing departments.

Recovery

In 2014, the flood recovery office will have three main priorities:

- Disaster Recovery
- Emergency Planning
- Hazard Mitigation

Disaster Recovery is well underway and will be largely complete in 2014. The goals of this program are to restore infrastructure, support community restoration, focus on community wellness, obtain eligible funding, and ensure a well informed community.

Emergency Planning will receive increased attention by the entire Town organization in 2014. This will be led by our Manager of Protective Services. The whole organization will participate in training and practice. The goals are to have well identified hazards, emergency response planning, scenario exercises and training, appropriate state of readiness, and a well prepared community.

Hazard Mitigation requires a "Made in Alberta" solution. We are still determining the structure needed to support these efforts. Long term hazard mitigation will require staffing resources and significant capital investment. The goals of hazard mitigation are to complete detailed hazard and risk assessments, create new guidelines, policy and legislation to support prudent future development, secure funding for long-term mitigation and maintenance, and obtain approval and complete construction of state-of-the art infrastructure for hazard mitigation and community protection. We are also assessing current policy documents and processes for development in flood fringe areas, reviewing current overland flood hazard mapping, and evaluating the current state of the Bow River.



Short and Long Term Mitigations

The Mountain Creek Hazard Plans will take time to develop, and are substantially different from planning around typical inundation floods.

Based on the damage done in Cougar Creek and the amount of development in the alluvial fans of the creeks in Canmore, it is clear that work is needed to protect our community. The Mountain Creek Hazard Plans will take time to develop, and are substantially different from planning around typical inundation floods. These will provide long term mitigations for the mountain creeks in Canmore. However, something must be done before spring 2014 to ensure that people, infrastructure, and private property are protected as much as possible against a similar event. With the help of our consultant and contractors, and with funding secured through the Provincial DRP and Erosion Protection Programs, short term mitigations are currently underway in Cougar, Stoneworks, and Three Sisters creeks and will be complete before May of 2014.

Short term mitigations will do two things – reduce the amount of debris that travels from the upper creek into the developed fan, and reduce possible bank erosion in the creek channel. These measures will reduce our risk if we see another event the size of the 2013 flood. The Town will do as much as possible, within the reality of the short time frame, to establish temporary mitigation in creeks that have adjacent development. Long term mitigations will take more time to plan and construct, but will be more permanent and robust. They may include efforts to reduce disaster risk factors for even larger events.

Short term mitigation measures along with a detailed hazard assessment and a detailed risk assessment will occur on the following creeks in 2014: Cougar, Pigeon, Stone, Stoneworks, and Three Sisters. Long term mitigation will start in Cougar Creek in 2014 and continue through 2016. Long term mitigation will occur on other creeks as resources and time permits between 2014-2018.



Key partners and stakeholders meet to begin work on the Mountain Creek Hazard Mitigation Plan.



A debris net, which is used to capture debris before it goes into the creek channel, is an example of one possible short term mitigation strategy.



People

Provide support for residents who need assistance, ensuring Town staff have what they need to serve the community, and ensuring community needs are met.

Focus

- Focus on the needs of individuals and neighborhoods as they recover from the flood.
- Build resiliency including preparation for future disaster events.
- Ensure the right resources are in place to support the community's needs.

Objectives

- Support individual recovery and wellbeing for flood victims.
- Manage permitting and occupancy of flood damaged homes.
- Actively contribute to community wellbeing.
- Impacted residents are actively engaged, listened to, and heard.
- Keep the community well informed.
- Support Town employees in order to maintain productivity through the recovery period.

Deliverables

- Partner with Rotary Club of Canmore to distribute funds.
- Maintain regular contact with residents of Cougar Creek.
- Work with property owners until solutions to all impacted properties on Cougar Creek are obtained.
- Create email list for residents impacted by Three Sisters and Stoneworks creeks.
- Participate on the Bow Valley Community Wellness, Preparedness, and Recovery Committee.
- Provide staff with wellness resources and opportunities.
- Provide Town of Canmore staff with emergency preparedness training.



Governance and Policy

Provide local leadership by working in partnership to review existing legislation and identify needs for amendments and changes. The hazards associated with mountain creeks are substantially different from those related to inundation flooding, and will likely require new regulatory approaches at both the municipal and Provincial levels. The Town will use its experience in hazard and mitigation review and planning to work with the Province to cooperatively develop new regulatory tools to manage hazards around mountain creeks.

Focus

- Collaborate with different levels of government and external stakeholders to identify opportunities for legislative, regulatory, and policy amendments.
- Develop long-term risk reduction programs.

Objectives

- Collaborate with the Government of Alberta.
- Engage the Government of Alberta to align policies where appropriate.
- Review applicable policies, recommend updates, and implement appropriate changes to approved Town policies and statutory documents.
- Engage and inform stakeholders regarding key decisions that affect them.

Deliverables

- Land Use Bylaw and Municipal Development Plan Review and Update.
- Made in Alberta Solution for Mountain creeks.
- Long term funding and maintenance agreements.
- Produce updated Emergency Response Plan.



Infrastructure

Assess and rebuild local infrastructure and develop short and long term mitigation measures for mountain creeks that have development in the alluvial fans. This includes an evaluation of the current flood protection dike system in the community along the Bow River, as well as updated inundation mapping. The dikes performed well during the 2013 flood event, but there were concerns in particular locations, and the mapping dates from the 1980's and is in need of review. Once the evaluation has been completed, recommendations can be made to the Province about possible future changes and upgrades, as the dike system is owned by the Province.

Focus

- Ensure a coordinated and comprehensive effort to assess impacts to municipal infrastructure.
- Develop cost-benefit analysis on detailed hazard and risk assessments for new mitigation infrastructure.
- Provide a financial estimate for infrastructure costs.
- Follow the required processes to recover funds from available sources.
- Ensure Bow River structure has not changed significantly.
- Review existing overland flood hazard.

Objectives

- Complete all needed infrastructure repairs.
- Invite third party owners/maintainers of infrastructure to advise the Town of the status of this progress regarding flood repairs/improvements.
- Complete detailed hazard and risk assessments for 5 creeks.
- Create short and long term mitigation plans for creeks.

Deliverables

- Short term mitigation in place by May 2014.
- Long term mitigation construction, maintenance, and funding as resources and time permit, based on detailed hazard and risk assessments for each creek.
- Update existing overland flood hazard assessment.



Funding

Balance our flood recovery with Council priorities and financial means. This will require cooperation between the Town and the Province and the use of both Disaster Recovery Program (DRP) and the Flood Recovery Erosion Control Program (FREC) for accessing the required funding for recovery, restoration, hazard analysis and planning, and the construction of new mountain creek mitigation measures.

Focus

- Track expenditures.
- Report costs.
- Secure recovery and mountain creek mitigation funding.
- Adjust operating and capital budgets as required.

Objectives

- Identify funding sources.
- Communicate and manage the process and documentation for funding approval.
- Seek formal budget approval by council for capital projects.

Deliverables

- 2014 (and beyond) Business Plan and Budget.



Environment

As a recognized municipal sustainability leader in Alberta and Canada, the Town of Canmore is committed to caring for and preserving our beautiful natural environment. Considerations for sustainability and the environment will be included in all decision making during flood recovery.

Focus

- Preserve our beautiful natural environment.
- Consider sustainability and environmental impacts in all recovery and mitigation decision making.

Objectives

- Use local or regional materials whenever possible.
- Work to re-green Cougar Creek.
- Maintain natural processes as much as possible.
- Advocate for policies that minimize flood risk and climate instability.

Deliverables

- Local materials used and local production of articulated concrete mats for mitigation in Cougar Creek.

Conclusion

Recovery from the 2013 flood cannot be defined simply by Canmore's return to pre-disaster circumstances. Recovery is a success when it overcomes the impacts of disasters and re-establishes a community base that instills confidence in the local citizens and businesses, rebuilds the community to be more resilient from future disasters, and manages the risks and hazards in the community more effectively than in the past. Continued collaboration and support from all stakeholders will be a key enabler of success in the long-term recovery of the Town of Canmore.

The outreach of support in the community has been one of the biggest takeaways from this experience.

