



District of Summerland Hazard, Risk, and Vulnerability Project Summary CCRA + HRVA

October 17, 2023



HRVA

Hazard, Risk, and Vulnerability Assessment

- All hazards risk assessment for social, environmental, and physical community priorities
- Guides emergency management and general hazard mitigation
- Online tool
- Provincial mandate
- Previously completed 2006

CCRA

Climate Change Risk Assessment

- Identifies risks from climate hazards to infrastructure assets
- Guides prioritization of assets and components for climate adaptation



HRVA Process and Worksheets

Step 1 - Getting started

Step 2 - Hazard identification

Step 3 - Understand community risk and resilience

Step 4 - Assess hazard likelihood

Step 5 - Assess consequences

Step 6 - Build a risk profile

Step 7 - Identify Risk Reduction Strategies

Step 8 - Generate report

Step 9 - Approval report



Risk Assessment Outline

1. Identify Hazards

- i. What hazards is Summerland exposed to now and in the future?
 - a. *Literature review and stakeholder interviews*

2. Explore Impacts

- i. What historic impacts has the District experienced, and what vulnerabilities exist?
 - a. *Stakeholder interviews*

3. Determine Likelihood

- i. How will the relevant hazards change over into the future (2050s)?
 - a. *Climate science – Stantec generated data*

4. Score Consequence

- i. Not all impacts are of equal consequence, how severe are these impacts? Financially, socially...etc.
 - a. *Stakeholder workshop*

5. Assess Risk and Plan to Adapt

- i. How does the District's risk profile change over time? What can the District do to adapt to these risks?
 - a. *Stakeholder workshop*

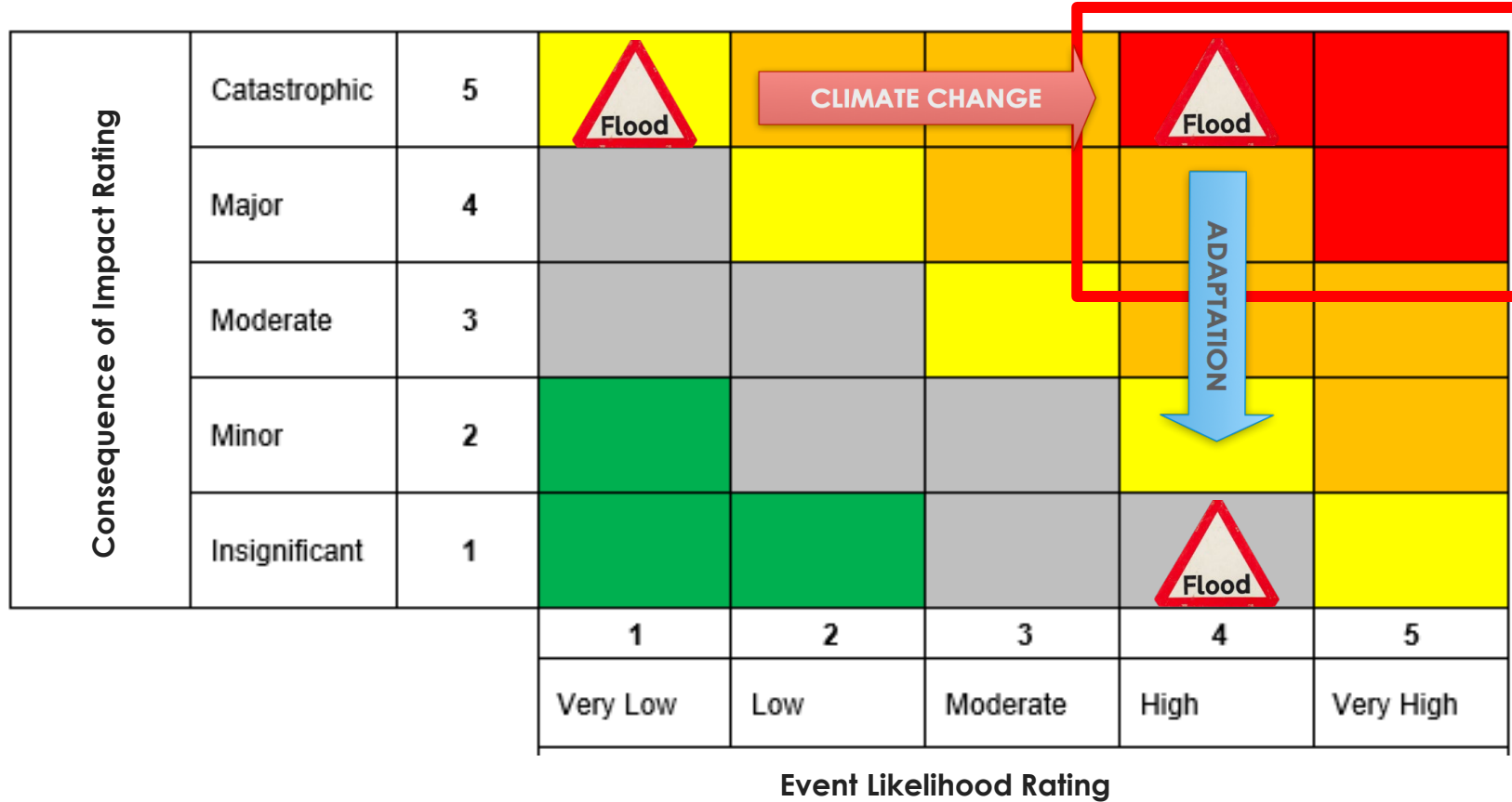


Risk





Risk Assessment - Example





Key Differences Between CCRA and HRVA

Level of detail
on assets

Consequence
considerations
/ severity of
impact

Visualisation of
risks



Summerland Risk Profile - CCRA

Assets	Air Quality				Extreme Heat				Extreme Cold				SDHI				Fog				Freezing Rain or Drizzle				Hail				High Wind Event							
	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s
Dams													8	12	16	16													0	0	0	0	0	0	0	0
Reservoirs					3	5	5	5					8	12	16	16					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Treatment Plant					6	10	10	10					6	9	12	12					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Supply Distribution Network									9	3	3	3	6	9	12	12													0	0	0	0	0	0	0	0
Pumphouses									0	0	0	0	4	6	8	8													0	0	0	0	0	0	0	0
Wastewater Treatment Plant					3	5	5	5					4	6	8	8													0	0	0	0	0	0	0	0
Wastewater Collection Network									3	1	1	1	4	6	8	8																				
Lift Stations									0	0	0	0	4	6	8	8													0	0	0	0	0	0	0	0
Stormwater Collection Network									3	1	1	1	6	9	12	12					6	6	8	10	3	3	4	4	2	2	3	3	2	2	3	3
Parks and Outdoor Recreation	9	9	12	12	0	0	0	0	3	1	1	1	2	3	4	4					6	6	8	10	0	0	0	0	4	4	6	6	4	4	6	6
Road Network	3	3	4	4	0	0	0	0	9	3	3	3	6	9	12	12	3	3	4	4	9	9	12	15	0	0	0	0	4	4	6	6	4	4	6	6
Municipal Facilities and Community Buildings	3	3	4	4	6	10	10	10					4	6	8	8					0	0	0	0	0	0	0	0	2	2	3	3	2	2	3	3
Waste Management Facilities					3	5	5	5	3	1	1	1	6	9	12	12	3	3	4	4	6	6	8	10					4	4	6	6	4	4	6	6
Utilities					3	5	5	5	3	1	1	1	4	6	8	8					12	12	16	20	3	3	4	4	6	6	9	9	6	6	9	9

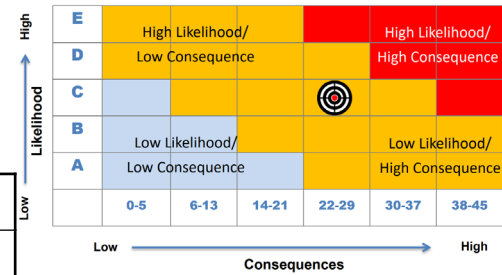


Summerland Risk Profile - CCRA

Assets	Lightning				Snowstorms and Blizzards				Wildfire				Landslide/ Debris Flow				Drought				Seiche				Lake/ River/ Stream Flooding				Flash Flooding			
	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s	Present	2030s	2050s	2080s
	Dams																									8	12	12	12	8	12	16
Reservoirs					0	0	0	0					16	16	16	16	9	12	12	15					8	12	12	12	8	12	16	16
Water Treatment Plant	0	0	0	0					20	20	20	20					9	12	12	15					8	12	12	12	6	9	12	12
Water Supply Distribution Network									0	0	0	0	8	8	8	8									6	9	9	9	8	12	16	16
Pumphouses	5	5	5	5					10	10	10	10	4	4	4	4									6	9	9	9				
Wastewater Treatment Plant	0	0	0	0					0	0	0	0													2	3	3	3	8	12	16	16
Wastewater Collection Network									0	0	0	0	8	8	8	8									6	9	9	9	4	6	8	8
Lift Stations	5	5	5	5					10	10	10	10	4	4	4	4									6	9	9	9	4	6	8	8
Stormwater Collection Network					3	3	4	4	0	0	0	0	4	4	4	4	6	8	8	10					8	12	12	12	4	6	8	8
Parks and Outdoor Recreation	5	5	5	5	0	0	0	0	5	5	5	5	12	12	12	12	6	8	8	10	3	3	3	3	8	12	12	12	4	6	8	8
Road Network					6	6	8	8	10	10	10	10	8	8	8	8					6	6	6	6	8	12	12	12	6	9	12	12
Municipal Facilities and Community Buildings	5	5	5	5	3	3	4	4	10	10	10	10	4	4	4	4	3	4	4	5					2	3	3	3	4	6	8	8
Waste Management Facilities	0	0	0	0	3	3	4	4	10	10	10	10	0	0	0	0									2	3	3	3	8	12	16	16
Utilities	20	20	20	20	3	3	4	4	20	20	20	20	12	12	12	12									6	9	9	9	4	6	8	8



Summerland Risk Profile - HRVA



Hazards		
Climate, Natural Hazards	Disease, Hazardous, Security	Infrastructure and Service Disruption
High Wind Event	Animal Disease	Structure Fire
Lake, River, and Stream Flooding	Human Disease	Structure Failure
Flash Flooding	Plant Disease and Pest Infestation	Dam and Spillway Failure
Storm Water Flooding (urban, local, pluvial)	Public Health Crisis	Dike Failure
Landslide/Debris Flow	Explosions	Water Service Interruption (Includes shortage and contamination)
Seiche	Hazardous Materials Spill	Electrical Outage
Extreme Heat	Oil or Gas Pipeline Spill	Food Source Interruption
Air Quality	Cyber Security Threat	Telecommunications Interruption
Drought	National Security Threat	Transportation Route Interruption
Lightning	Public Disturbance	Wastewater Interruption
Wildfire	Major Planned Event	Fuel Source Interruption
Extreme Cold		Aircraft Incident
Fog		Rail Incident
Freezing Rain or Drizzle		Marine Vehicle Incident
Hail		Motor Vehicle Incident
Snowstorms and Blizzards		



Summary of Workshop 2 – Risk Reduction

Climate, Natural Hazards

Hazards	Existing Actions	New Actions
High Wind Event	Increased budget for tree brushing	Low Firearm put out public info and advice Transition to underground utilities
Lake, River, and Stream Flooding	Water Utility Emergency Response Plan (ERP) Watershed Mester Plan Turbidity sensor on WTP SCADA system	
Flash Flooding	Water Utility Emergency Response Plan (ERP)	

Disease, Hazardous, Security

Hazards	Existing Actions	New Actions
Animal Disease	Quarantine individual farms Communicating to all residents to avoid interactions with wild birds Vaccination awareness and uptake Disease transmission tracing Provincial monitoring of COVID-19 (family) deaths reviews to invest in	Continues public education re handling, animal handling
Human Disease	Municipal met and together re: walk-in Pharmacies and out of office post-sourcing Vaccination awareness campaigns, clinics (IH) Disease transmission tracing (IH, Province) Animal Contact process (rabies)	
Plant Disease and Pest Infestation	Research from the Canadian government Municipal Agriculture Research Centre focuses on urban areas, insects, orchards	
Public Health Crisis	Business continuity measures, e.g. Remote work During COVID District established work from home Guidance communication from BC & IH Ministry PHN 410 460 200	

Infrastructure and Service Disruption

Hazards	Existing Actions	New Actions
Structure Fire	Full service department - On-call person at all times Access to external capacity/human resources, regional support ESS Emergency level services, e.g. Psychological support system Backup system available to restore data Pro for stock status, tracking updates, control for status, from assessment	Changes to building bylaws
Structure Failure	Full service department - On-call person at all times Access to external capacity/human resources, regional support ESS Emergency level services, e.g. Psychological support system Backup system available to restore data Pro for stock status, tracking updates, control for status, from assessment	on going courses with the Fire Dept. but lack knowledge for building over 2 stories
Dam and Spillway Failure	Regulatory monitoring and maintenance to maintain permits Possible use Table top planning / response exercises The district is leading early Water Utility Emergency Response Plan (ERP) Improvements	



Next Steps

Results can be used towards development of a climate adaptation plan for the District by:

- Identifying gaps and opportunities internally to support education and awareness in departments for risks and hazards in the District.
- Informing improvements in how the District responds to hazards and risks at a local and regional level.
- Informing future climate change planning by enhancing understanding of climate risk and informing actions and future implementation (adaptation and mitigation based low carbon resilience).



Next Steps – Recommendations

- Continue to promote a collaborative approach to adaptation planning that involves relevant stakeholders and knowledge holders, such as District government, First Nations, residents, business owners, and regional agencies (e.g., RDOS, IH, OASSIS).
- Continue to implement the District’s approved Asset Management Strategy by updating building condition assessments and Level I ASHRAE energy audits when necessary for critical facilities.
- Although “high” and “extreme” risks have been the focus of this analysis, there is value in developing risk reduction measures for medium and lower risk assets as well.