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**TO:** Electoral Area Services Committee      **MEETING:** February 11, 2020  
**FROM:** Catherine Morrison  
          Manager, Emergency Services      **FILE:** 7130-01 HRVA  
**SUBJECT:** Regional District of Nanaimo Hazard, Risk and Vulnerability Analysis

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### RECOMMENDATION

1. That the Regional District of Nanaimo Hazard, Risk and Vulnerability Analysis and Flood Risk Assessment reports, be endorsed.
2. That an interdepartmental review of the Full Hazard Assessment Scores be conducted to assign priority rankings and identify current and new risk reduction strategies for prioritized hazards.

### SUMMARY

In June 2018, the Regional District of Nanaimo (RDN), City of Parksville and Town of Qualicum Beach partnered to update the 2009 Hazard Risk and Vulnerability Analysis (HRVA) for the region with the goal of enhancing a cooperative approach to emergency management and inform the next steps to disaster risk reduction activities while increasing the capacity and resiliency of the region as a whole. Critical Continuity and Emergency Management Strategies (CCEM) was selected to conduct the RDN Hazard, Risk and Vulnerability Analysis 2019 (Attachment 1) in parallel to the National Disaster Mitigation Program (NDMP) RDN Flood Risk Assessment 2019 (Attachment 2). The HRVA is an all hazards risk assessment that helps guide decisions to mitigate, prepare, respond and recover from hazards that pose a risk to the region. The Flood Risk Assessment is a hazard specific assessment and forms part of the full HRVA.

The Local Authority Emergency Management Regulation (LAEMR) mandates that the Local Authority Emergency Plan be based on relative risk of occurrence and potential impact on people and property of emergencies that could affect their jurisdiction. It was essential to update the 2009 HRVA to improve the information available of potential hazards and associated impacts to the region as we revise the Emergency Plan. The results from the HRVA are the cornerstones of the planning process and will be used to develop planning priorities and help make risk-based choices to address vulnerabilities, mitigate hazards, and prepare for response and recovery from disasters<sup>1</sup>. The new HRVA will be incorporated into the RDN Emergency Plan revision currently underway and hazard specific plans will be prioritized and updated to address emergency response to hazards that pose the greatest risk to the region.

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<sup>1</sup> EMBC, 2004

## BACKGROUND

The Regional HRVA was developed using the new standard practices set out in Emergency Management British Columbia's (EMBC) HRVA Toolkit scheduled to be released in 2020. The toolkit promotes the exploration and incorporation of both scientific data and local knowledge during the hazard assessment process. This project engaged over 70 stakeholders from across the region with sessions held in October 2018, February 2019 and June 2019. Stakeholders represented First Nation communities, local government departments, industry, technical specialists as well as scientists and other subject matter experts. These stakeholder engagement sessions were conducted to discuss and gather traditional knowledge, personal perceptions and local understanding of hazards, risks and vulnerabilities within the region including their frequency and severity. These sessions created a networking opportunity which strengthened relationships and built a community risk consensus as a method to contribute to long-term resiliency.

Using historical data, previous HRVAs, provincial (Emergency Management British Columbia), federal (Public Safety Canada) and international hazard lists, a comprehensive list of 53 natural and human-caused hazards was created. Following the completion of the hazard list, the next step was to determine the relative risk posed by each hazard by calculating a risk score. The risk score is calculated by multiplying the likelihood score by the total consequence score. The likelihood is the probability of an event occurring and is commonly expressed as an expected rate of occurrence for example once every 15 years. The severity was determined using a consequence assessment that defined 11 consequence categories divided into "Human and Social Impacts" and "Physical and Economic Impacts" and associated 5-point scales to rate the severity and potential impacts. The risk score assessment considered historical records and relevant data collected for the region, wider province and country, influencing factors such as climate change, subject matter experts, mitigation efforts as well as critical information gathered from stakeholder consultation sessions.

To fully understand how a hazard might impact a community, the degree of vulnerability to the hazard was assessed. Vulnerability defines the susceptibility of the people, property, industry, resources, and the environment to harm should a hazard event occur.<sup>2</sup> The report outlines social, economic, environmental and physical vulnerabilities that could adversely be impacted by a hazard event. Social vulnerabilities include factors such as demographics, homelessness, income and tourists. Economic vulnerabilities can include the diversity in the economic base for industry and resources. Environmental vulnerabilities consider sensitive ecosystems and the services these systems provide to humans. Physical vulnerabilities can include critical infrastructure and local government owned critical assets. Considering how these factors increase a community's susceptibility to the impact of hazards will ultimately permit the prioritization of risks based on where communities are most vulnerable.

Results of the full hazard assessment scores can be found in Appendix 3 of the HRVA (Attachment 3). Using risk scores as a guide, the prioritization of hazards can begin. The EMBC companion guide to the HRVA recommends using the fillable risk reduction worksheet included in the guide to review hazard rankings, and set priorities to better reflect a community's unique

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<sup>2</sup> CCEM Strategies. (2019). *Hazard, Risk and Vulnerability Analysis*. Prepared for Regional District of Nanaimo, Town of Qualicum Beach, and City of Parksville

values and to align with current strategic plans or funding opportunities.<sup>3</sup> Changing a hazard's priority does not alter that hazard's score, it simply moves the selected hazard up and down the summary list. The risk reduction worksheet guides the process for identification of current risk reduction measures and then the analysis to determine if the measures in place are current, adequate, or must be enhanced or upgraded. An interdepartmental review can capture current and planned initiatives, review strategies and plans and document findings to set priorities that meet the particular needs of the region.

Significant efforts have been taken, or are underway, to enhance resiliency in the region and to reduce the adverse effects of hazards. Of the 53 hazards identified, over half are actively being mitigated. While not an exhaustive list, examples of efforts currently underway and planned include:

#### Flooding (Overland, Lakes, Streams, Rivers, Coastal)

- Sea Level Rise Adaptation project, the Flood Risk Assessment and HRVA. The next phase planned to commence in 2020 will cover overland flood mapping. Future initiatives include the accompanying coastal and river risk assessments. The results will provide a mitigation and management framework.
- The Floodplain Bylaw was updated in 2018 and anticipated to be updated again with results of flood mapping projects.
- Development Permit Areas (DPAs) in Area A, Marine Coast and Freshwater DPAs
- Monitoring river levels in Nanoose Creek, Haslam Creek and French Creek through the Drinking Water and Watershed Protection Program (DWWP)
- Monitoring River Forecast Centre for proactive notifications to residents in flood prone areas including flood preparedness public outreach on social media and RDN website

#### Wildfire, Structure Fires and Air Quality

- FireSmart landscape guide that is aligned with the WaterSmart landscape guide to promote fire and drought resistant landscape.
- FireSmart grant which provided training for 33 new Local FireSmart Representatives in our region and is aimed to provide information, support and encourage households and neighbourhoods to undertake mitigation efforts on their own properties reducing the risk of Wildland Urban Interface fires.
- Policies in Official Community Plans, building codes, select area outdoor burning bylaws.
- Woodstove Exchange Rebates
- Plans for next year will look for Fall 2020 grant opportunities to update the current Community Wildfire Protection Plans (CWPP) with the new provincial Community Wildfire Resiliency Planning Framework which is expected to be implemented by Spring 2020. The new framework will guide activities in 2021 and moving forward to reduce the risk and impacts of Wildland Urban Interface fires.

#### Saltwater intrusion

- WellSmart educational Workshops, region-wide water conservation education.

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<sup>3</sup> [https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/local-government/hrva/guides/companion\\_guide\\_to\\_the\\_hrva.pdf](https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/local-government/hrva/guides/companion_guide_to_the_hrva.pdf)

- Groundwater monitoring in RDN Production Wells and Volunteer Observation Wells

#### Drought and Portable Water Supply Interruption, Wastewater Interruption

- Area A DPA (Rainwater harvesting required)
- Region-wide watering restrictions framework
- Water Conservation rebates and education
- Water budget modelling, Nanoose water budget phase 3 near completion
- Policy B1.21 ground water requirements
- Water Services Emergency Plans
- Liquid Waste Management Plan & Wastewater Emergency Plans

#### Weather Events, Communication and Supply Interruptions, Earthquakes

- Resiliency planning is underway with Reception Centre sites, group lodging supplies, evacuation planning, emergency communications, and post-disaster logistics coordination for the distribution of essential services and staging for critical infrastructure operators.
- Building Codes and Seismic Designs
- Climate monitoring at Mt Arrowsmith and Upper Nanoose Creek
- Departmental Emergency Response Plans

#### Landslides, Erosion & Sedimentation,

- DPAs
- Geo-hazard assessments in known geotechnical areas, site specific erosion studies
- Monitoring rainfall intensity and water quality at 62 sites, stewardship seed funding

#### Insect Infestation & Plant Disease

- Sensitive Ecosystem DPA, designated conservation areas
- Regional and Community Parks
- Stewardship seed funding,
- Promotion of native plants via FireSmart, WaterSmart

#### Dam Failure

- Partnerships with City of Parksville and City of Nanaimo for information sharing (inundation maps, technical studies, maintenance checks)

The Emergency Plan takes an all hazards approach and is intended to guide the response to all emergencies and disasters. Preparedness for all hazards is addressed at a community level through household emergency preparedness workshops and Neighbourhood Emergency Preparedness Programs. RDN Emergency Services works closely with many neighbourhood groups to provide workshops, materials and guidance to help communities become more disaster resilient.

The results of the HRVA and partnerships formed through the development of the document will guide and support the shift in emergency management approach from response to managing and reducing risks. The United Nations Framework for Disaster Risk Reduction identifies the

number one priority as “understanding disaster risk”. Future planning activities will include recovery and business continuity planning based on the understanding of disaster risk in our region.

## **ALTERNATIVES**

1. That the Regional District of Nanaimo Hazard, Risk and Vulnerability Analysis and Flood Risk Assessment reports, be endorsed.
2. That an interdepartmental review of the Full Hazard Assessment Scores be conducted to assign priority rankings and identify current and new risk reduction strategies for prioritized hazards.
3. That alternate direction be provided.

## **FINANCIAL IMPLICATIONS**

The HRVA was funded by the RDN, City of Parksville and Town of Qualicum as an addition to the National Disaster Mitigation Program (NDMP) grant funded project and budgeted for in the 5-year financial plan. A review of the HRVA, in particular hazards expected to increase in severity with climate change and urbanization will be accounted for in the 10-year financial plan.

## **STRATEGIC PLAN IMPLICATIONS**

Growth Management - Provide effective regional land use planning and responsible asset management for both physical infrastructure and natural assets.



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Catherine Morrison  
Manager, Emergency Services  
January 23, 2020

Reviewed by:

- D. Pearce, General Manager, Transportation and Emergency Services
- P. Carlyle, Chief Administrative Officer

Attachments

1. RDN Hazard, Risk and Vulnerability Analysis 2019
2. RDN Flood Risk Assessment Report 2019
3. Appendix 3 Full Hazard Assessment Scores