



REGIONAL  
DISTRICT  
OF NANAIMO

## Final Report for the Nanaimo River Flood Hazard Mapping Project

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### **RECOMMENDATION**

That the Board direct the 2023 Nanaimo River flood hazard mapping information be communicated to the public.

### **BACKGROUND**

Section 524 of the *Local Government Act* grants authority for local governments to designate floodplains, specify setbacks and flood construction levels for buildings and structures on land prone to flooding. The Regional District of Nanaimo (RDN) enacts these provisions through the Floodplain Management Bylaw No.1469, 2006. At present, the regulatory floodplains for the Little Qualicum River, Englishman River and Nanaimo River are based on mapping information provided by the provincial government in the 1980's and 1990's. These maps do not incorporate changes in the river systems over the last 40 years nor do they include allowances for climate change and sea level rise. To ensure land use decisions are based on the most up-to-date information available, a work program to acquire coastal floodplain mapping and to update river floodplain mapping was initiated in 2018.

On June 23, 2020, key findings from the coastal floodplain hazard mapping project were presented to the Board who supported steps to communicate the findings and proceed with implementation as follows:

- 20-222 *That the Board direct the coastal flood hazard maps be communicated to the public.*
- 20-223 *That the Board direct the applicable land use bylaw amendments be reviewed and updated to incorporate the findings of the Coastal Floodplain Mapping Project.*

July 26, 2022, the Board supported steps to implement the findings from the river flood hazard mapping projects by passing the following resolutions:

- 22-496 *That the Board direct the completed riverine mapping information be communicated to the public.*
- 22-497 *That the Board direct Regional District of Nanaimo Floodplain Management Bylaw No. 1469, 2006 be reviewed and updated to incorporate the findings of the riverine flood hazard mapping studies.*

The river and coastal flood hazard information is accessible by the following public web link: [www.rdn.bc.ca/flood-management-program](http://www.rdn.bc.ca/flood-management-program)

In April 2023, the Nanaimo River flood hazard mapping project was completed. This is the fourth successfully completed flood hazard/risk project lead by the RDN and is considered a significant milestone in understanding

present day and future flood hazards and the related risks to help inform local government policies, decision-making and to increase public awareness of natural hazards.

### ***Approach to Riverine Flood Hazard Study and Mapping***

The project approach includes three key elements summarized as analysing the flood hazard under present day and future conditions; representing the findings on a regulatory river floodplain map with Flood Construction Levels (FCLs)<sup>1</sup> and conducting a high-level risk assessment informed by participatory engagement to incorporate key flood concerns.

### ***Nanaimo River Regulatory Floodplain Map***

In accordance with provincial guidelines<sup>2</sup>, a flood analysis and mapping were completed for the Nanaimo River study area, downstream of Highway 1 bridge and the lower two kilometers of Haslam Creek. For the regulatory floodplain maps the design flow was adjusted to account for projected climate change to the year 2100 and the flood levels are based on model results for the 200-year return period flood. The flood level shown on the regulatory floodplain maps include a 0.6 meter freeboard allowance to account for uncertainties in the analysis when developing regulatory Flood Construction Levels (FCLs) intended for local bylaw development.

### ***Risk Assessment and Engagement***

The preliminary findings from the risk assessment were shared with workshop participants from provincial, local government, Snuneymuxw First Nation, the local water authority and community-based organizations. The participants had the opportunity to ask questions of subject experts and provide local insights to refine the evaluation of potential risks to existing buildings, infrastructure, people and the natural environment in the study area. Some areas adjacent to the Nanaimo River currently experience annual flooding and disruption (such as Alice Road, Raines Road, Riverside Road and Wilkinson Road) and this lived experience was evident throughout the discussion, along with these key themes:

- Knowledge of areas subject to flooding with concerns for future development in these areas as well as current impacts of flooding on existing culverts.
- Potential impacts of flooding on water quality due to agricultural or industrial run-off and access routes temporarily cut-off.
- Value of salmon as a food source; impact of flooding on salmon habitat and potentially the hatchery.
- Ideas for potential mitigation included creating opportunities to identify future land use mitigation options with co-benefits, such as connected recreational trails for secondary evacuation routes.

### ***Key Findings from Nanaimo River Flood Hazard Mapping Project***

The project's findings provide important insights about current and future community conditions, if unmitigated. Key findings include:

- Current land uses experiencing Nanaimo River flooding are primarily residential homes within Area A and Snuneymuxw First Nation Reserve Lands No.2 and No.3 and agricultural lands in Area A.

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<sup>1</sup> Flood Construction Level (FCL) is a calculated level of elevation for buildings used to protect people and property from flood impacts.

<sup>2</sup> Provincial Flood Hazard Area Land Use Management Guidelines requires 1-in-200-year flood level for floodplain mapping in BC. [www2.gov.bc.ca/assets/gov/environment/air-land-water/water/integrated-flood-hazard-mgmt/flood\\_hazard\\_area\\_land\\_use\\_guidelines\\_2017.pdf](http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/integrated-flood-hazard-mgmt/flood_hazard_area_land_use_guidelines_2017.pdf)

- Road flooding and transportation disruption is a significant, near-term risk. Now considered an annual occurrence resulting in disrupting access to residential property and services, property damage and costs of clean up and repair/replacement of road and drainage infrastructure.
- Operations at the Nanaimo River Hatchery may be impacted by flooding due to increasing water levels in the hatchery during extreme events.
- The above ground pipeline and wells in the Harmac water supply system are expected to be at risk of flooding under present-day and future climate conditions potentially causing disruption and costs to replacement infrastructure.

***Implementation – Advancing Community Resiliency***

The next stage is to incorporate the regulatory flood mapping information into the Flood Management Bylaw and prepare a new Development Permit Area (DPA). The proposed bylaw will clarify requirements for the construction of new buildings and structures within the designated floodplains for the existing rivers (Nanaimo, Little Qualicum and Englishman), Horne Lake and with the addition of a coastal floodplain for electoral areas A, E, G and H.

Unlike the river floodplain maps, the coastal floodplain maps do not provide established FCLs which can be applied at the property level as part of a flood hazard assessment. What this means is an additional tool, a DPA, is needed to engage a qualified professional to prepare a site-specific flood hazard assessment and provide a “safe use” certification including recommendations for new building construction.

The preparation of the draft bylaw and DPA are already underway. Given the current timelines the Board can expect to receive the draft documents along with an Engagement Plan in June or early July 2023.

**FINANCIAL IMPLICATIONS**

Preparing the Flood Hazard Management bylaw, DPA and proceeding with the approvals process will incur legal review and community engagement costs estimated to not exceed \$12,000. This cost is included in the current Long Range Planning Work Plan and budget in the 2023 - 2027 Financial Plan.

**STRATEGIC PLAN ALIGNMENT**

The Nanaimo River Flood Hazard Mapping project aligns with the Board strategic priority to be leaders in climate change adaptation by acquiring technical information required to better understand flood hazards under climate change and increases public awareness about preparing for and managing flood risks for present day and future citizens.

Climate Change - Be leaders in climate change adaptation and mitigation, and become net zero by 2032.

**REVIEWED BY:**

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**ATTACHMENTS**

1. Nanaimo River Flood Mapping Overview Report
2. Nanaimo River Regulatory Floodplain Map
3. Nanaimo River Power Point Presentation