

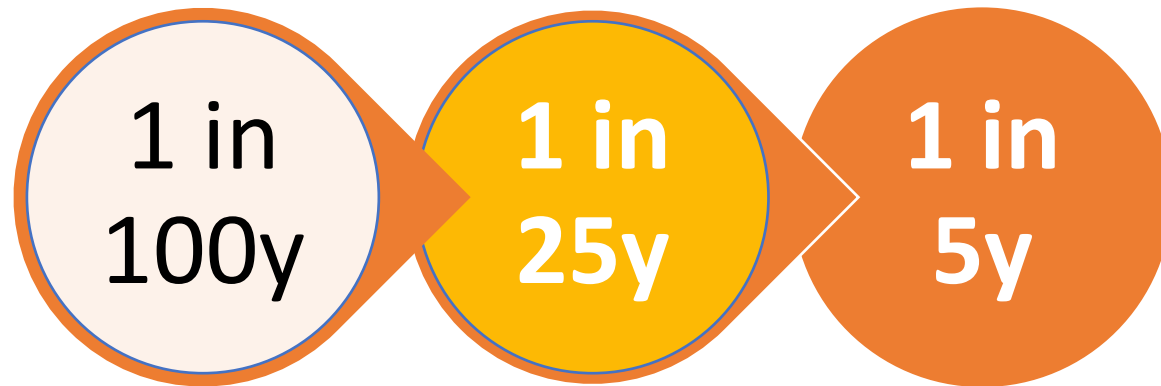


# Integration of Asset Management, Land Use Planning & Climate Action

Kim Fowler, Regional District of Nanaimo  
November 8, 2023

# Climate Change Trends

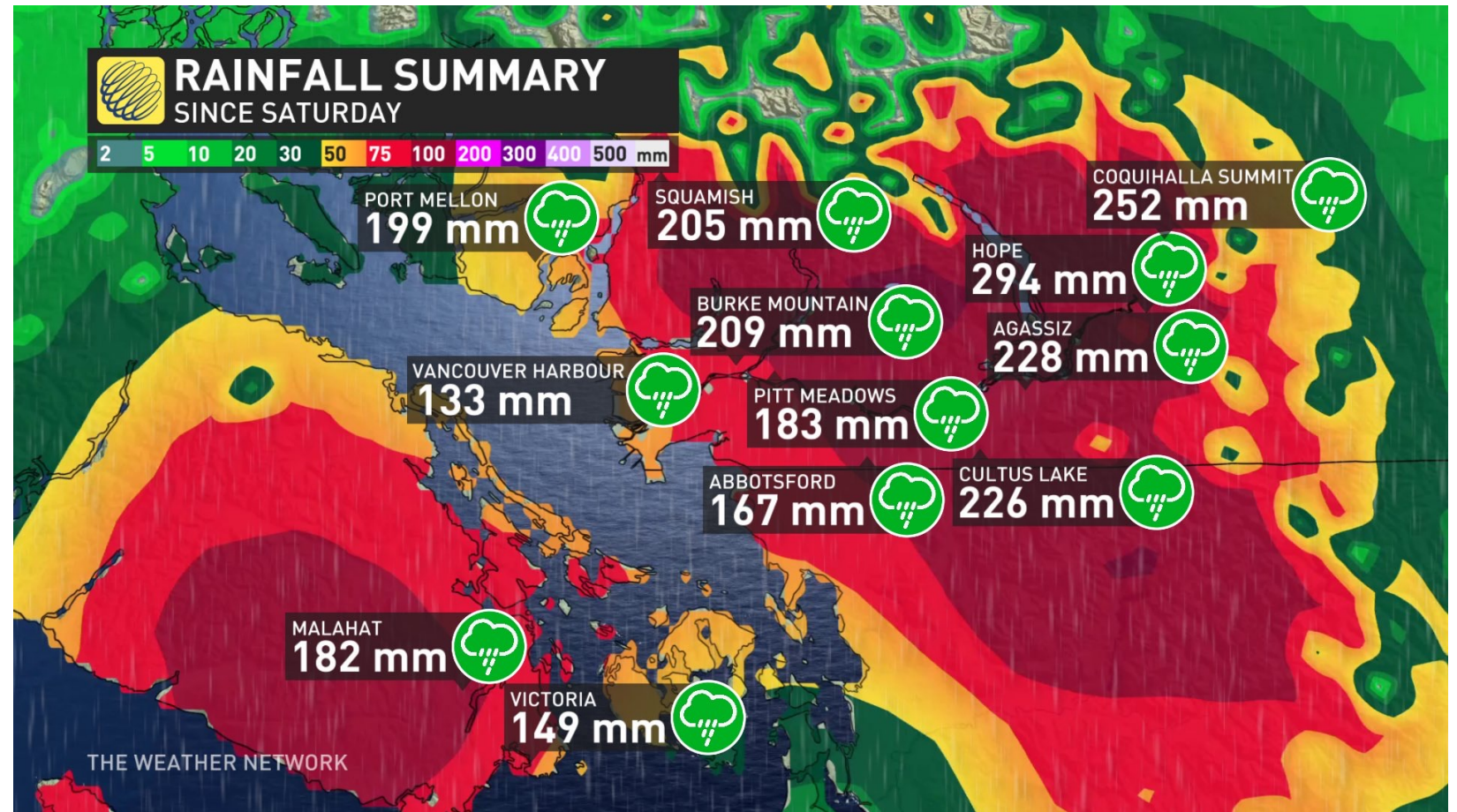
- Increasing frequency and intensity of extreme weather events creating more uncertainty
  - Extreme rainfall, prolonged drought and wildfire risk
  - Managing longer gradual changes (e.g. sea level rise)





# Surf's Up on the Malahat

## Nov 15, 2021









# Rising Risk – Adapt or Expensive Victim?

- The cost of climate change to road infrastructure will be \$1-2 billion/yr and \$1 billion/yr for electrical infrastructure in Canada. 50-90% of that damage can be avoided with modest infrastructure investments.\*
- Ballooning infrastructure funding gap.
- The time to adapt is now. Proactive adaptation can avoid most risk. Imperfect information must not be a barrier. Lack of political will can no longer be one of the biggest risks.\*

\* UNDER WATER: The Costs of Climate Change for Canada's Infrastructure  
Canadian Institute for Climate Choices , 2021



# Hwy 5 (Coquihalla) near Hope





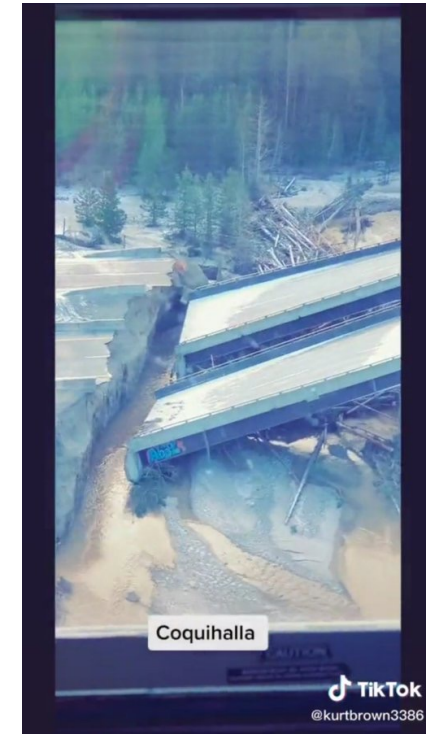
# Get Off the Disaster Hamster Wheel\*

- Floods, severe winds, wildfires, and other perils are costing Canada about \$6 billion annually; about \$2.2 billion is insured while the rest is uninsured (2022 data).
- Growing 9%/yr, which is 3x faster than GDP, 6x new construction, and 10x faster than the population.
- Shows we're creating new risk & something is wrong with what we are building, how we are building and where we are building.

\* McGillivray, Glenn & Keith Porter, **Opinion: We have to get off the disaster hamster wheel**, November 24, 2022, **Advert: Focus on Disaster Management**



# Hwy 5 near Othello tunnels



# November 15





# 2019 Canadian Infrastructure Report Card

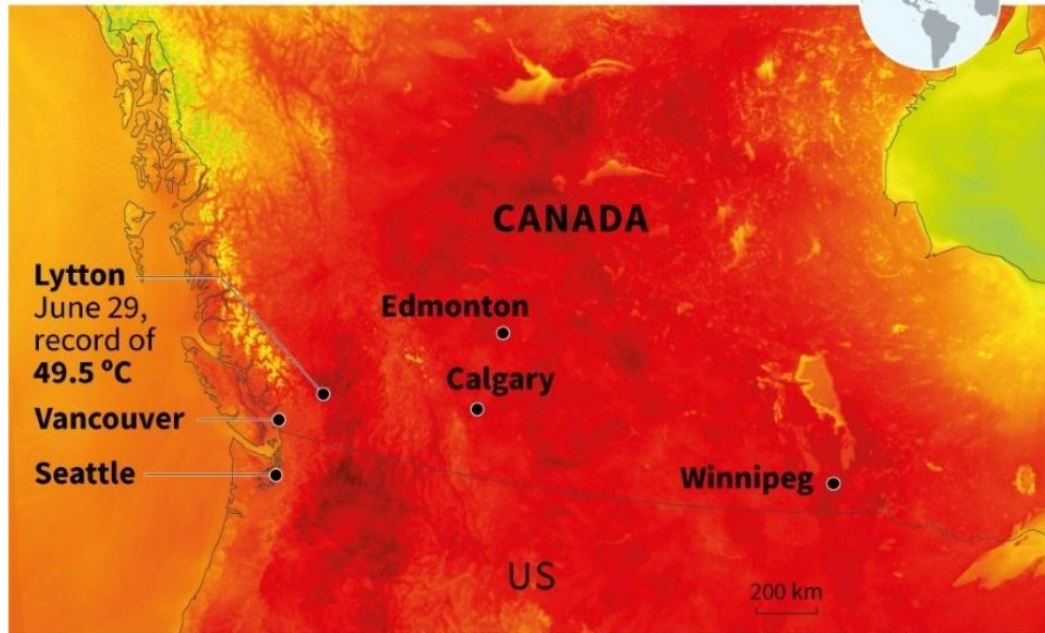
- 40% of roads & bridges are in fair, poor or very poor condition with roughly 80% more than 20 years old.
- 30-35% of recreational & cultural facilities are in fair, poor or very poor condition. In some categories (such as pools, libraries & community centres), more than 60% are at least 20 years old.
- 30% of water infrastructure (such as watermains & sewers) are in fair, poor or very poor condition.



# 595 People Died in BC Summer Heat Wave July 2021

## Extreme heat in Canada and the US

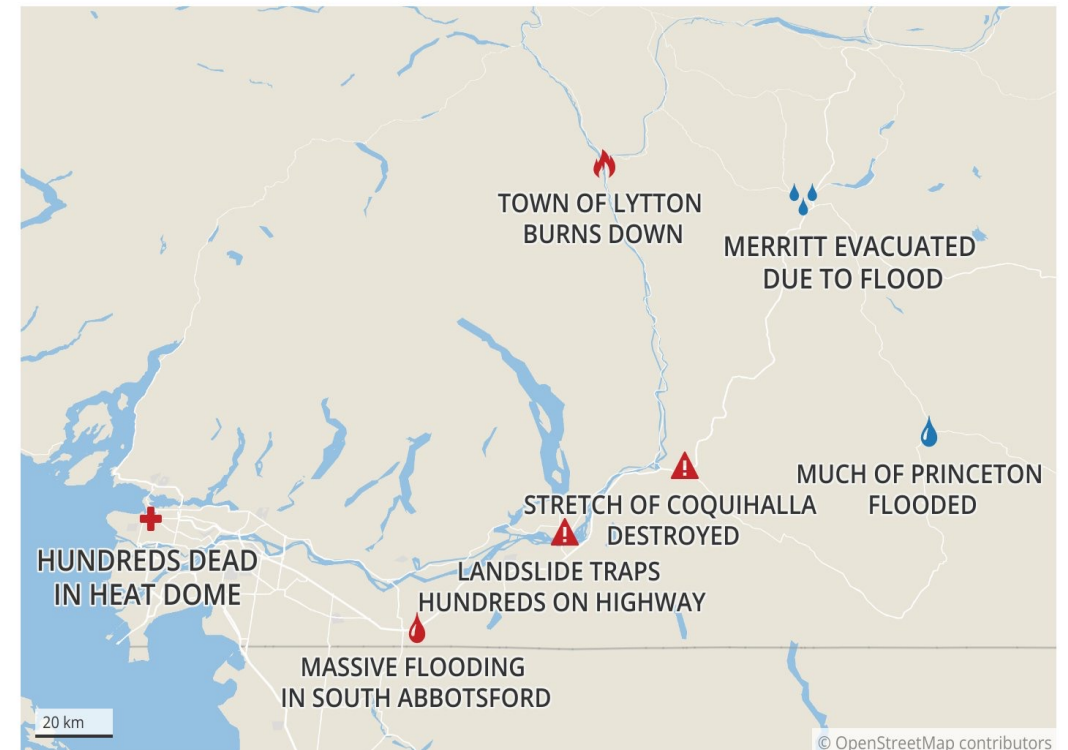
Forecast temperatures to July 1



Source: Canadian Meteorological Service



## Climate emergencies in southern British Columbia the last five months



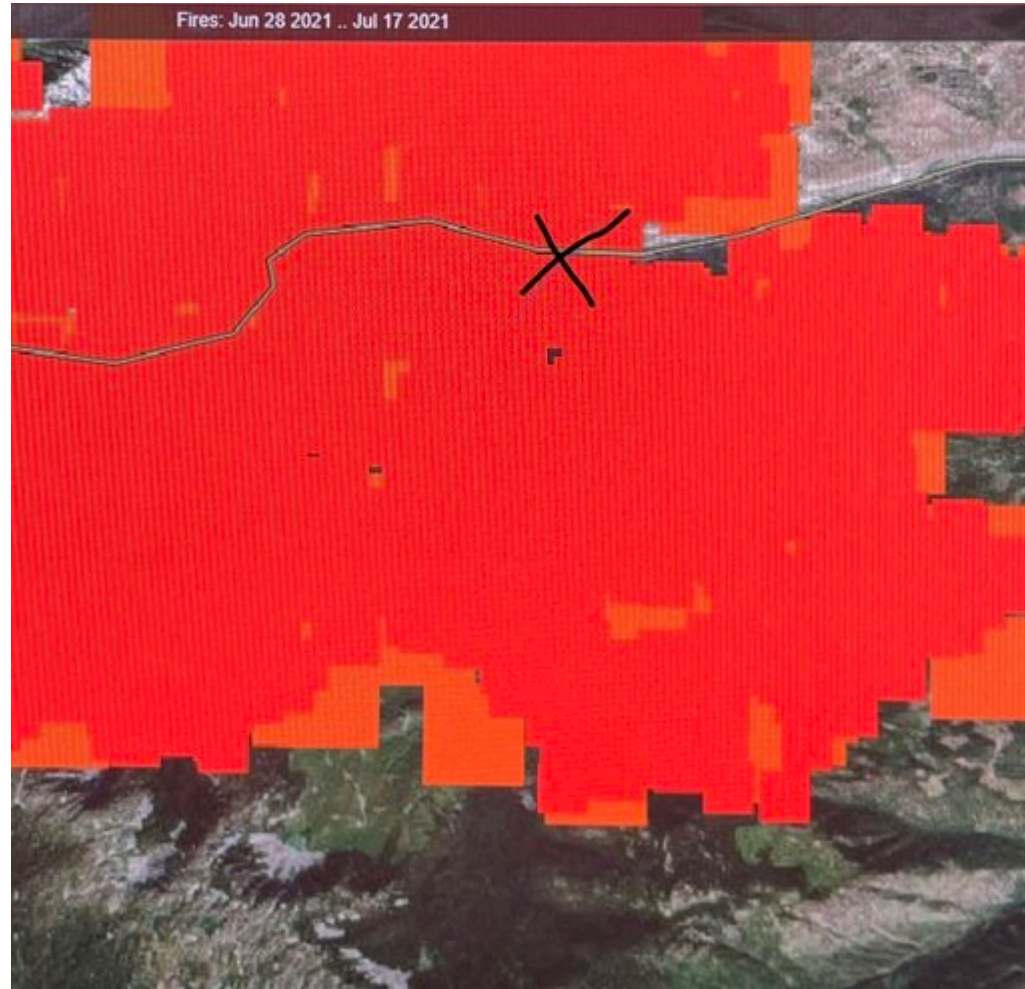
© OpenStreetMap contributors

CBC NEWS

Map: Justin McElroy



# Hwy 1 near Lytton



# Integrated Approach to Climate Adaptation



All municipalities  
Technical Advisors  
All RDN Departments  
Community Stakeholders  
Peer local governments  
Provincial and Federal Governments

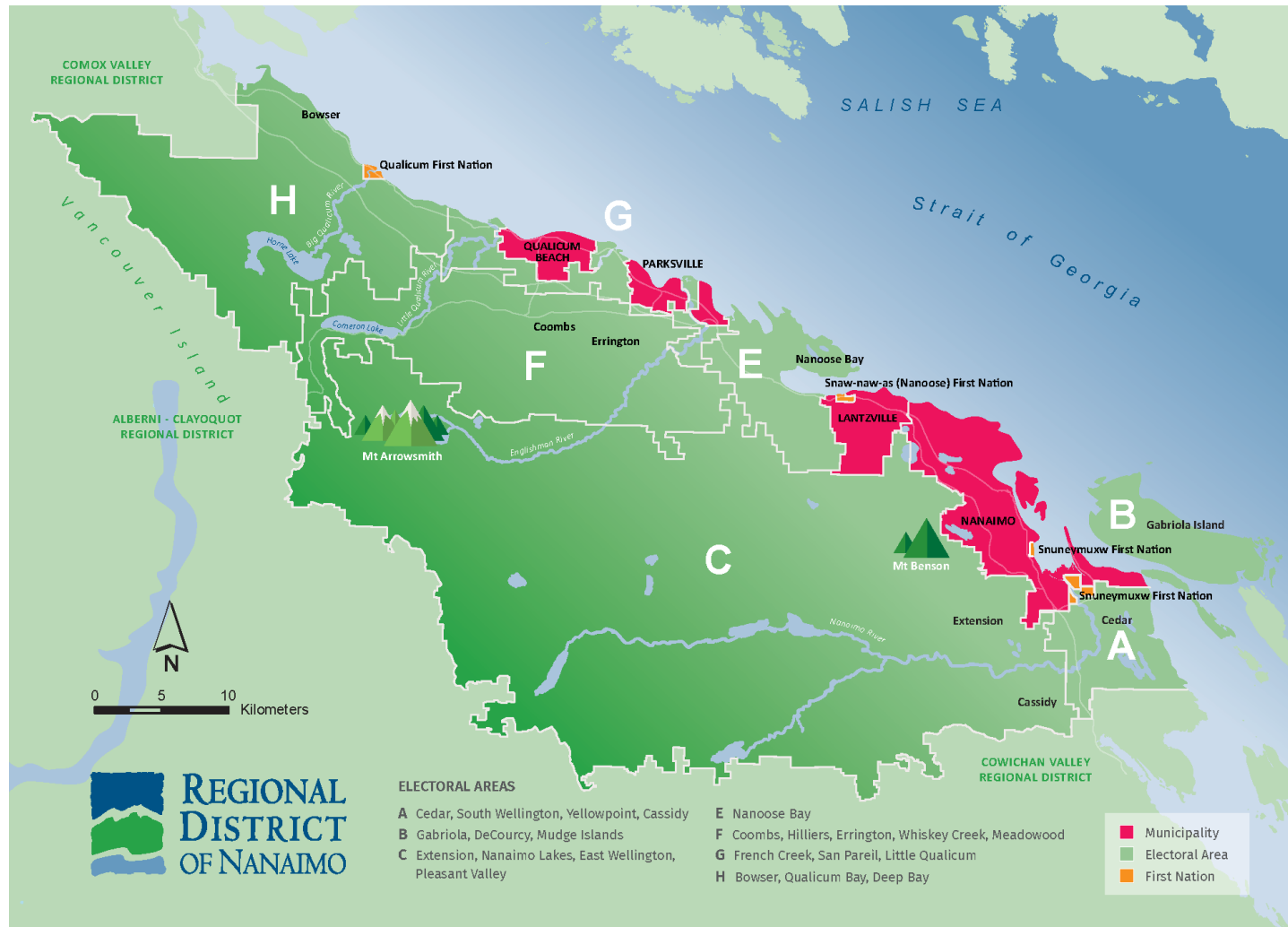


# Flood Management Project

- Mapping of 188 km of sea shoreline
- Updating floodplain maps for 3 rivers for which we have original Provincial mapping
- Risk assessments for significant assets
- Integrated into RDN asset design, including park services, pump stations and WWTP expansion



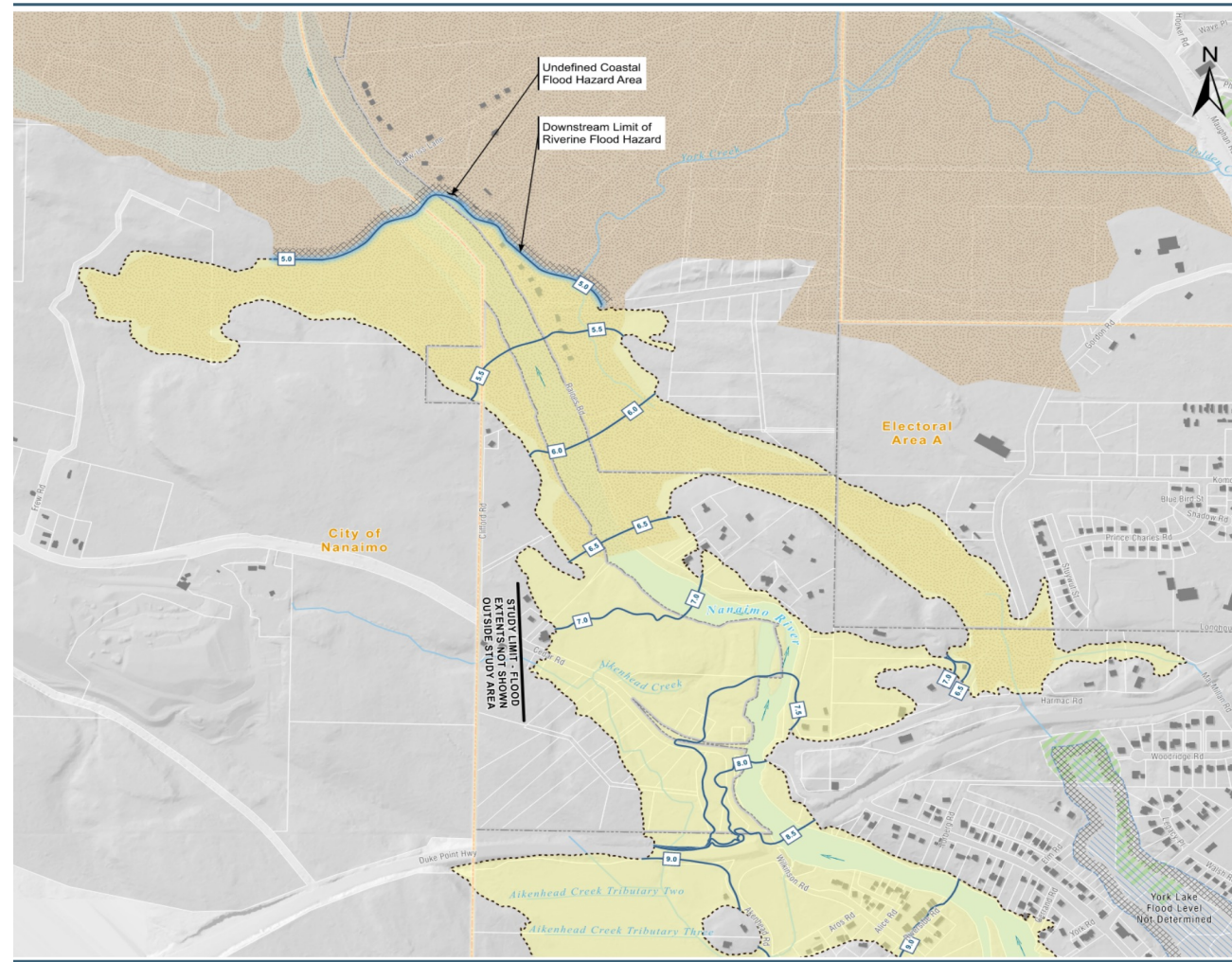
# Regional District of Nanaimo





# Regulatory Flood Mapping Approach

1. Topography & Bathymetry Data
  - channel and floodplain shape
2. Hydrologic Assessment
  - flood flow size and shape
  - climate change allowance
3. Hydraulic Modelling
  - translating flow to water level
  - sea level rise
4. Mapping
  - map background features
  - map floodplain limits & flood levels





# Prelim. Results (200-yr / YR 2100)

**EXTREME RIVER FLOOD** UNDER FUTURE CLIMATE CONDITIONS  
(Zoomed In)





# Rising Risk – Adapt or Expensive Victim?

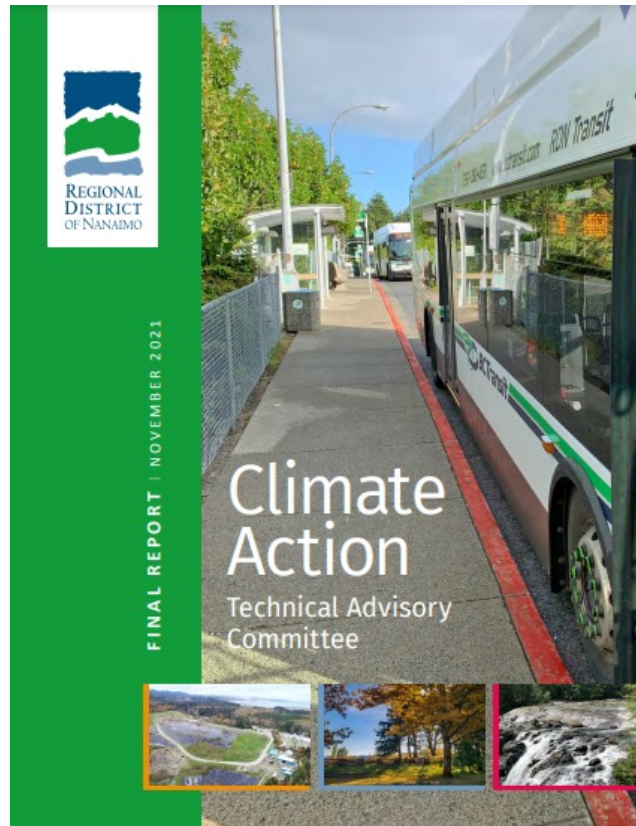
- MIABC sees evolving liability risk for local governments around climate change & advises local governments can be held liable for:
  - Development decisions – e.g., in areas of reasonably foreseeable hazards, such as flood plains or high-risk fire areas
  - Failure to properly design or maintain assets and infrastructure – e.g., not maintaining equipment, or failure to update infrastructure to meet expected conditions of operation.
- MIABC recommendations:
  1. Incorporate natural assets into AM plan.
  2. Consider how development decisions will impact drainage, flooding, slope stability, and wildfire risks.
  3. Have a written, preferably Board approved, policy establishing an inspection and maintenance plan for your engineered and natural assets.

# Hwy 1, Sumas Prairie, Abbotsford November 21, 2021

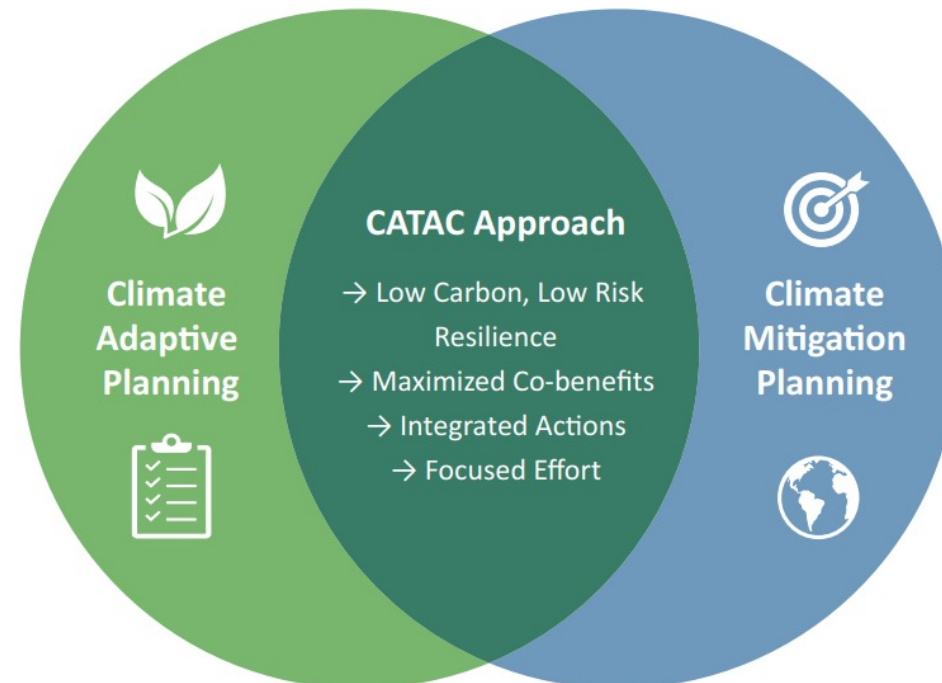




# Climate Action Technical Committee Final Report – December 2021



- Technical team, focused



# CATAC Recommended Priorities



**1** Ensure ongoing  
Water Supply  
Resiliency,  
supported by  
Natural Asset  
Management



**2** Review and update existing  
RDN policies and bylaws to  
remove barriers to climate  
mitigation and adaptation  
and ensure RDN policies  
support climate-appropriate  
development



**3** Increase support  
for home energy/  
adaptation retrofits

- Food security and local food systems
- Accelerated energy efficiency and decarbonization of new buildings



# Work Plans - 2022-2024



- Understanding and improving supply planning practices in region – DWWP and municipalities
- Natural asset inventory and pathway
- Future work – addressing gaps



- Development permit areas
- Net Zero Building and localized energy generation
- Opportunities in building bylaw review



- Identifying barriers to renovation uptake
- Redesigning supports to residents, industry, suppliers
- Aiming for focused, effective program 2023/2024

# Downscaled Climate Projections

## Heatwaves

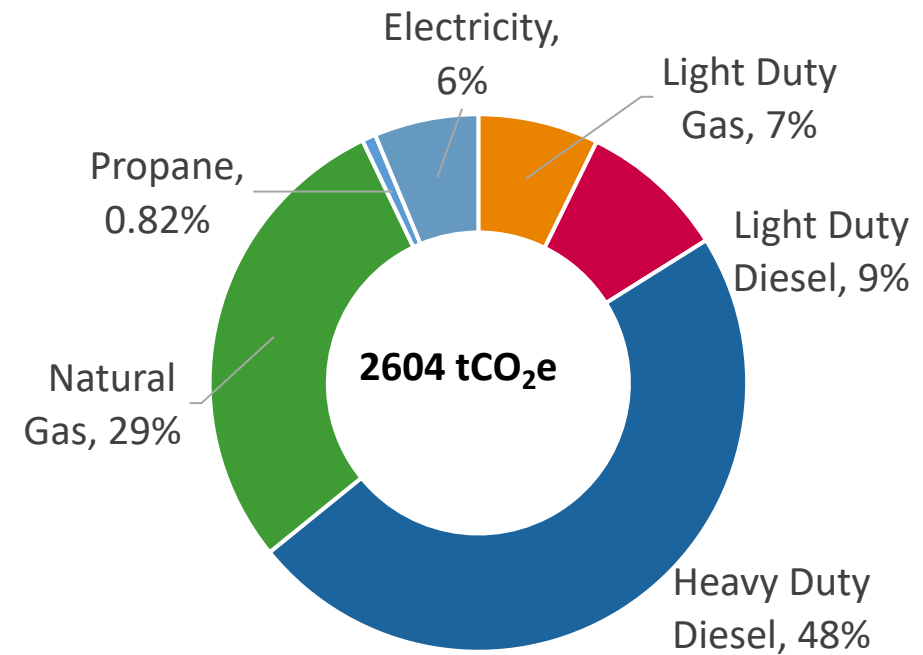
*Heatwave  
definition  
guided by  
ECCC/MSC Alert  
(BC HARS)  
regional  
thresholds*

Regional District of Nanaimo: Warm Days/Nights & Heatwave Indices (median model projection)					
Index	Description	Past	2030s	2050s	2080s
TXX	TX on hottest day of year (°C)	28	30	31	34
SU	Number of days reaching TX > 25°C	11	14	35	52
TR16C	Number of nights reaching TN > 16°C	0	4	12	40
HWD	Heatwave days (days)	0-1	3	8	19
HWXL	Heatwave maximum length (days)	3	4	4	8
HWN	Annual number of heatwaves	1	2	3	4



# Corporate Carbon Neutral 2032 Plan - *Implementation*

- Prioritize fuel switching, waste heat recovery & light duty fleet electrification
- Net Zero Pathways for each facility
- Policy Development - Buildings
- Shift from “sticker” to lifecycle cost thinking
- **Challenges** include focus on up front costs & market solutions for heavy duty fleet
- **Credits** – organics/landfill gas



# CCNP 2032 – *Opportunities*



## Savings over lifetime of infrastructure

Less exposure to energy price changes  
Avoided cost of retrofits  
Grant funding



## Sharing knowledge with the community

Low carbon building materials  
Design for deconstruction  
Sourcing from local suppliers



## Support for other RDN initiatives

Rainwater management  
FireSmart  
Zero Waste



# RDN Green Building Program



**Connecting** residents with resources needed to take next steps on more sustainable homes



**Outreach & Education** on sustainable building options



Small, stackable rebates for **RDN Electoral Area** residents.

# RDN's Growth Management Framework

## Key strategies:

- Land Use Designations
- Growth Containment Boundaries
- Supporting Policies

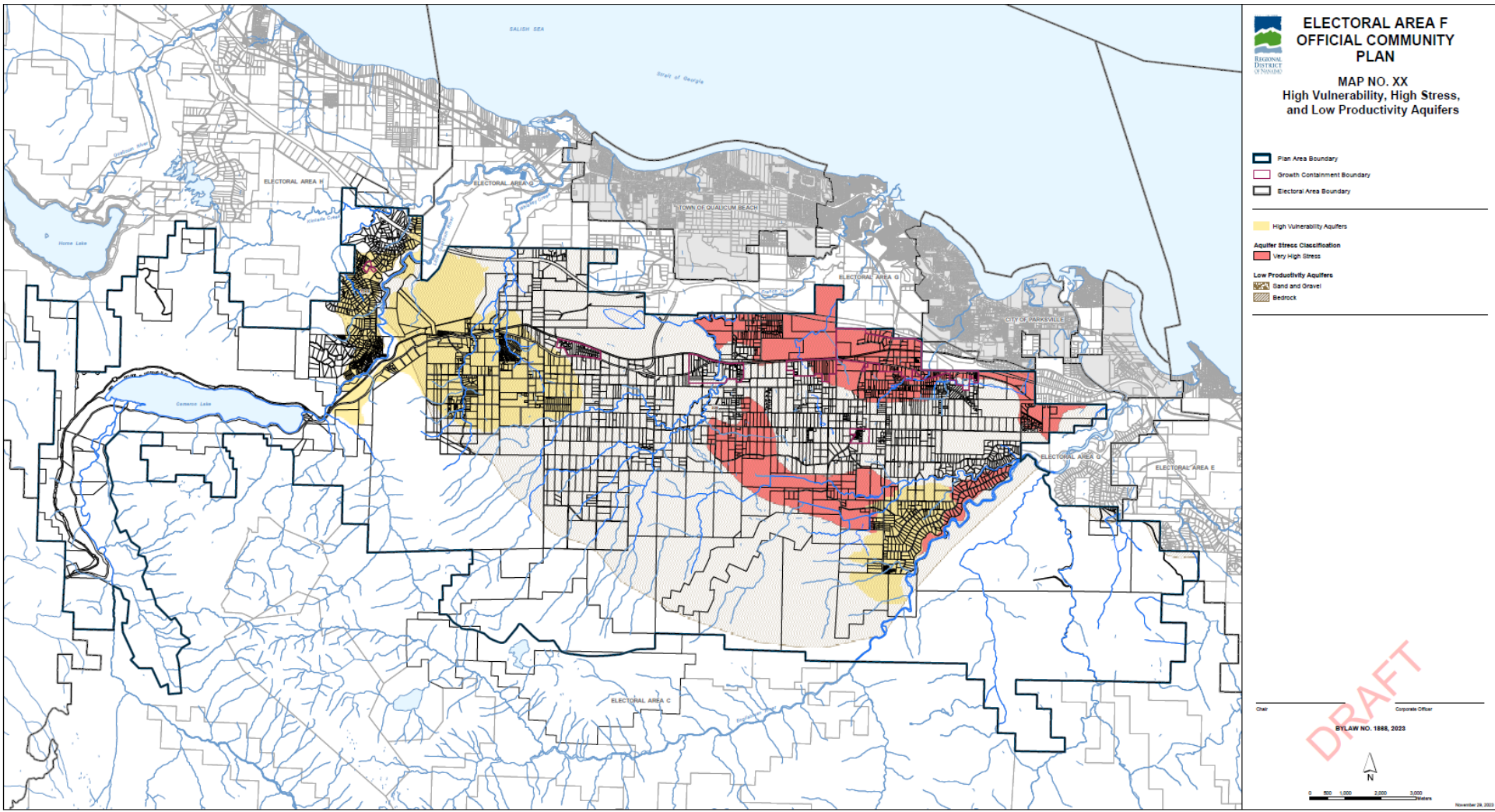
*Avoid sprawl.*

*Achieve Compact, Connected,  
Complete Communities.*





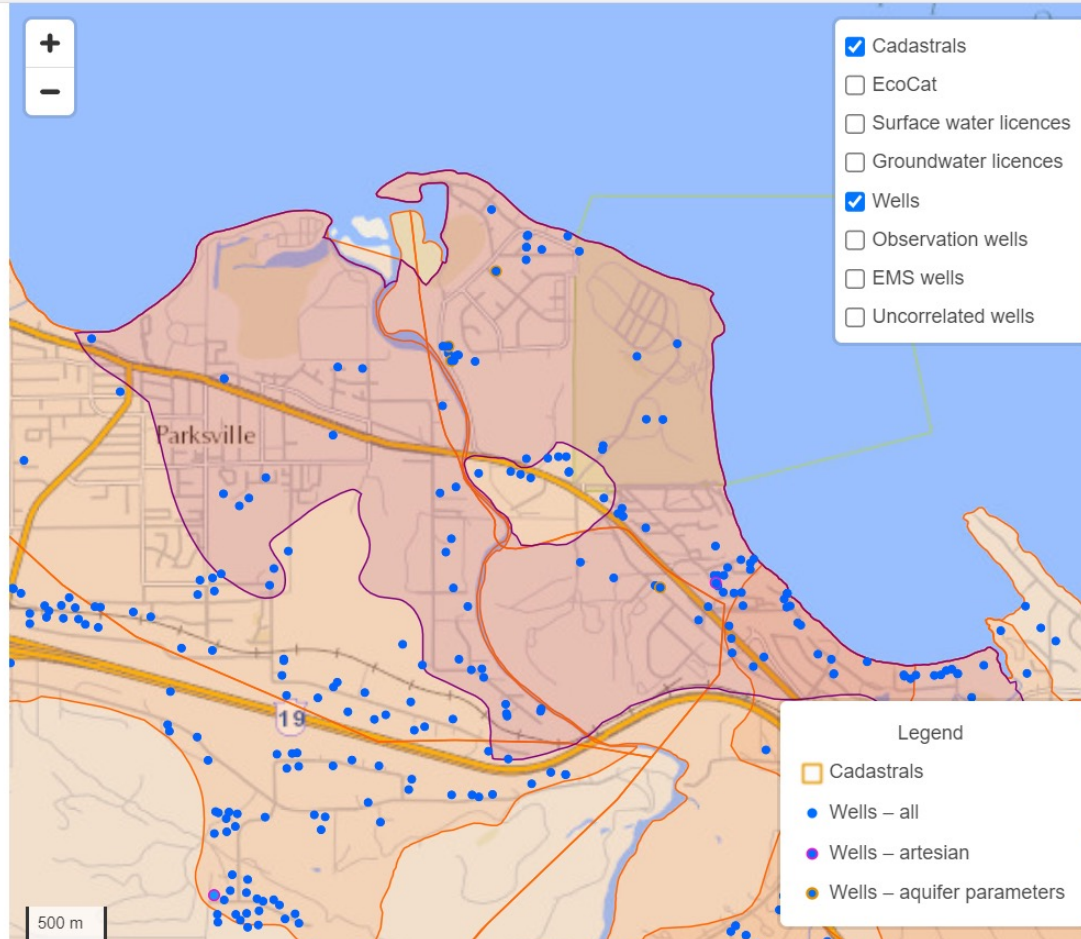
# Aquifer Protection DPA for EA F



# Newly Released Provincial Aquifer Maps

## Aquifer 221 Summary

Aquifer number	221
Year of mapping	2023
Aquifer name	
Litho stratigraphic unit	Salish Sediments
Descriptive location	Parksville
Vulnerability <a href="#">?</a>	High
Material type	Sand and Gravel
Subtype <a href="#">?</a>	Unconfined sand and gravel - deltaic
Quality concerns <a href="#">?</a>	
Productivity <a href="#">?</a>	High
Size (km <sup>2</sup> )	9.6
Calculated well density <a href="#">?</a>	Moderate

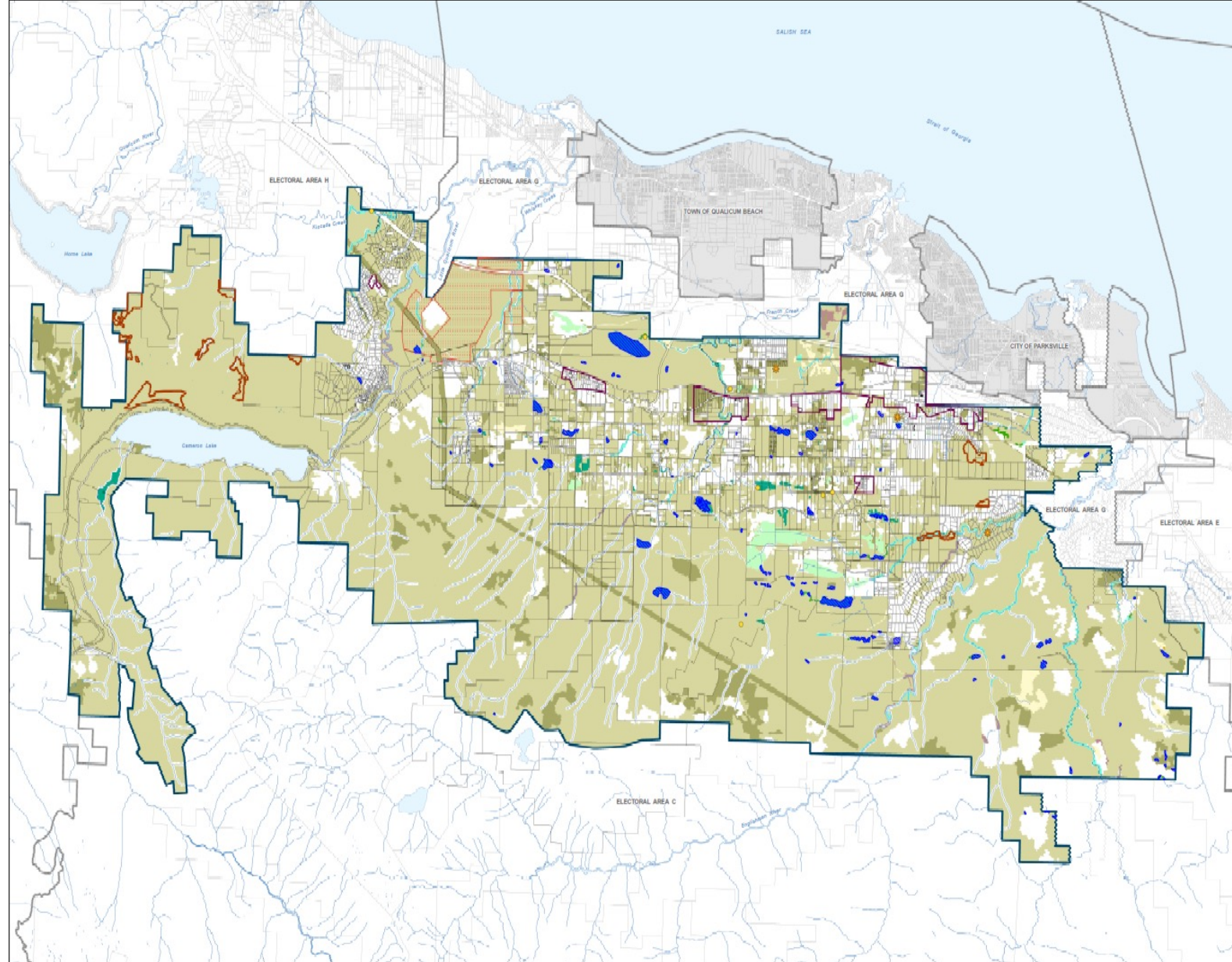






**ELECTORAL AREA F  
OFFICIAL COMMUNITY  
PLAN**

**MAP NO. 3  
ENVIRONMENTAL FEATURES**



- Plan Area Boundary
- Growth Containment Boundary
- Electoral Area Boundary

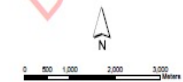
- Heron Nesting Trees\*
  - Eagle Nesting Trees\*
  - Wetlands, Fresh Water Atlas\*
  - Coastal Douglas Fir Landuse Order (Crown Land)\*
  - Old Growth Management Areas\*
- \*Source: Province of BC, 2022

- Natural Asset Inventory - Regional District of Nanaimo, 2022
- Forest
  - Shrubland
  - Wetland

- Sensitive Ecosystem Inventory - Province of BC, 2004
- Coastal Bluff
  - Seasonally Flooded Agricultural Land
  - Terrestrial Herbaceous
  - Older Forest
  - Riparian
  - Second Growth Forest
  - Sparsely Vegetated
  - Woodland
  - Wetland

Chair \_\_\_\_\_ Corporate Officer \_\_\_\_\_

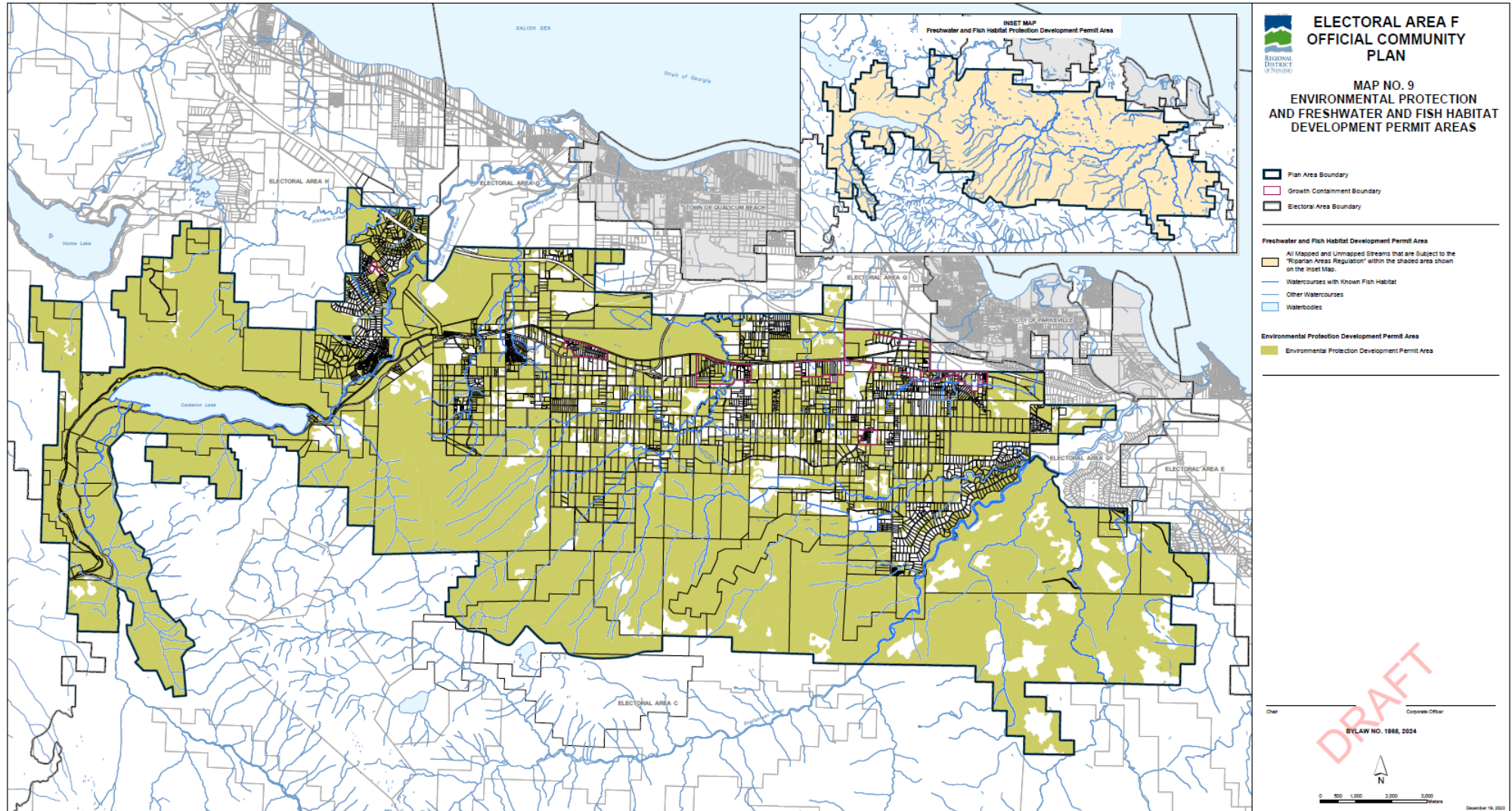
**BYLAW NO. 1889, 2023**



January 24, 2023



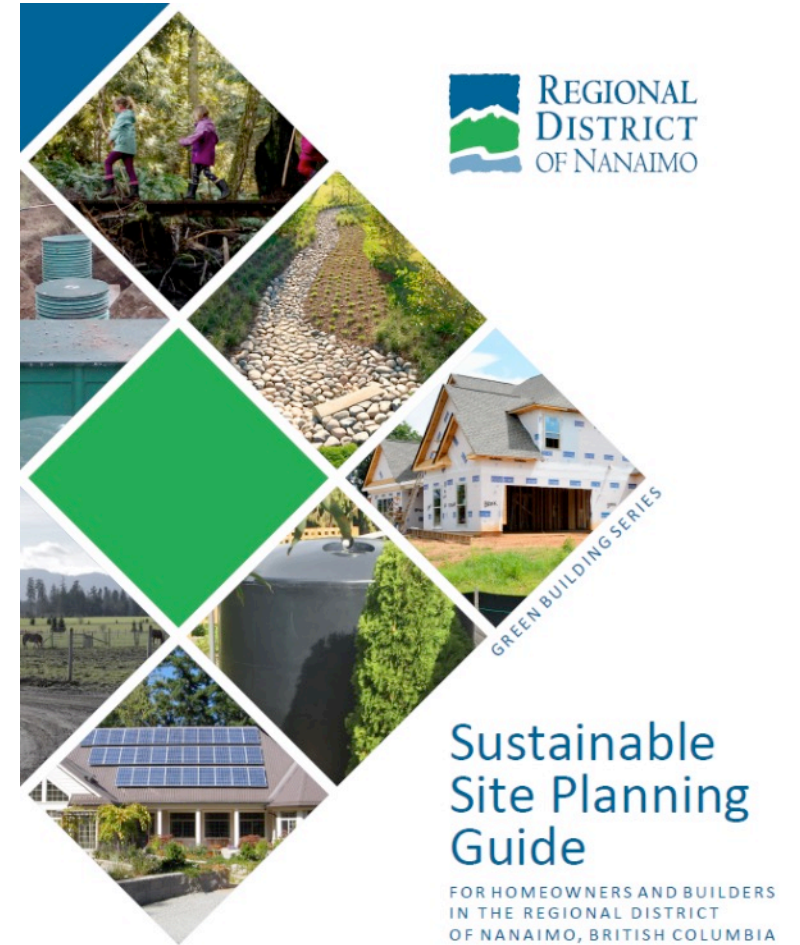
# Environmentally Sensitive Areas DPA





# Sustainable Site Planning Guide & Checklist

- Planning tool for homeowners and builders to minimize or restore natural environmental impacts of construction, landscaping, and major renovation projects.
- Site planning develops a thorough understanding of local area characteristics, such as its water, soil and climate before site design begins.
- Increase home comfort & reduce long-term O&M costs



# Board Policy on Climate Action (Key: It's all about water!)

- Will set climate action as a corporate priority, minimize risk, and set high level of service
  - Managed retreat from high-risk areas & focus on high-risk assets owned by local government
- Provide overall framework for land use adaptation, CATAC, CCNP 2032, DWWP, green building, utilities and waste management





# What working for local government often feels like...



Source: Best Photos from the Web 2008

# Questions?

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Regional District of Nanaimo  
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Tel: 250-714-6719

