DRAFT 2 – 2021-10-19 (incorporating thoughts from Brian Emmett)

Mapping Working Group Recommendation to the Resilient Saanich Technical Committee (RSTC) for Detailed Marine Shoreline Ecosystem Mapping

The RSTC recommends that Saanich undertake marine shoreline ecosystem mapping as soon as possible. This would be a valuable supplement to the recommended updates to the terrestrial mapping and similarly would provide a ground-based methodology for analyzing and conserving sensitive ecosystems in the District of Saanich. Mapping scale would depend on objectives. If land use planning at a public/private lot-by-lot scale is desired, then finer grained mapping would be required than if the objective was to simply survey for conservation and biodiversity.

If Saanich agrees and decides that the mapping needs to be updated and changed, this is how we recommend doing it. Methods to achieve either larger or smaller scale outputs are provided separately.

Large scale methods suitable for lot-by-lot land use decisions

While there are no provincial standards for large scale shoreline or marine mapping, a number of informal methods have been developed. At this level, mapping should to focus on coastal riparian (backshore) features and the upper intertidal area. Clear resolution of the present natural boundary (PNB) is also important as it is often differs from the surveyed lot boundary. A clearly delineated PNB would allow Saanich to more accurately define a marine ESA that could be used in land use decisions and regulations such as a new EDPA.

The Harbours Ecological Inventory Rating (HEIR) system[1] is a locally developed mapping system that was initiated in 1997 and has been applied to the Victoria and Esquimalt Harbours. The system was based on the BC Physical and Biological Shore-zone classification systems[2,3] with a number of enhancements including:

- being done at a larger scale (i.e. 1:5,000) to allow for identification of smaller subunits;
- ground truthing to identify and confirm features not readily identifiable via aerial imagery, potentially at a lot-by-lot scale;
- finer classification of shoreline anthropogenic structures and land use;
- additional codes for wildlife features; and

[1] VEHEAP. 2000. Victoria and Esquimalt Harbours Ecological Inventory and Rating Phase 1: Intertidal and Backshore. Prepared by Westland Resource Group and Archipelago Marine Research. 42pp. https://www.crd.bc.ca/docs/default-source/initiatives-pdf/veheap-pdf/heir-report-intertidal-and-backshore.pdf

[2] Howes, D., J. Harper and E. Owens. 1995. British Columbia Physical Shore-zone Mapping System. Prepared for BC Resources Inventory Committee. 96pp. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/bc_physical_shore-zone_mapping_system.pdf

[3] Searing, G.F. and H.R. Frith. 1995. British Columbia Biological Shore-zone Mapping System. Prepared for BC Resources Inventory Committee. 60pp. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/bc_biological_shore-zone_mapping_system.pdf

- a rating system incorporating species diversity, habitat diversity, natural habitat value, presence of "key life cycle" areas, ecological value and vulnerability to development.

These enhancements make HEIR complementary to the proposed 1:5,000 scale terrestrial mapping recommendations. If applied fulsomely, this methodology would provide information sufficient to assess the state of nearshore marine biodiversity in Saanich and facilitate prioritization of biodiversity protection and habitat remediation efforts. However, there are potential challenges with clearly delineating a PNB with this method, unless ground truthing effort is high, as relying on orthophoto delineation is hampered by tree canopy shadow.

The HEIR mapping is currently being updated in Victoria and Esquimalt Harbours with output expected towards the end of 2021[4]. It is understood that Saanich staff plan to review updated harbour mapping to assess the value of expanding the spatial coverage to include the outer Saanich coastline (at an estimated cost of $70,000). The RSTC would be willing to help review the output and provide recommendations on a path forward with this tool.

Should HEIR mapping scope not be expanded, the Coastal Shoreline Inventory Methodology[5] (CSIM) would also be suitable to assess Saanich shorelines at a larger scale. This method was specifically developed for British Columbia and is also fundamentally based on shore-zone classifications[2,3], but at a larger mapping scale (like HEIR) and with explicit mapping of significant coastal features. This methodology also includes ground truthing and, as such, would likely be comparable in effort and cost to the HEIR method. The use of local people and groups to organize and complete the CSIM inventories could also be considered as this method was developed with non-professional assistance in mind.

Smaller scale methods suitable for conservation and biodiversity assessments

BC Physical and Biological Shore Shore-zone[2,3] mapping is the only formalized provincial standard, but it was developed for oil spill response at a medium mapping scale (typically 1:15,000 to 1:40,000). These standards, or the derivatives discussed below, would be suitable for smaller scale conservation and biodiversity mapping objectives. Without significant ground truthing, these methods would not be suitable for lot-by-lot land use decisions.

Assessments using the shore-zone standards have already been undertaken for the Saanich coastline, though most of this mapping is based on imagery from 2004 or earlier and ground truthing is largely non-existent. These imagery and videos[6] and subsequent biodiversity assessments[7] can be accessed via

[4] Archipelago Marine Research. 2020. CRD Pilot Harbours Ecological Inventory. Prepared for the Capital Regional District. 87pp. https://www.crd.bc.ca/docs/default-source/initiatives-pdf/veheap-pdf/harboursecologicalinventorypilot2019-finalreport.pdf

[5] Mason, B. And J. Booth. 2004. Coastal Shoreline Inventory and Mapping. Community Mapping Network, Vancouver, British Columbia. 75pp. http://cmnmaps.ca/cmn/files/pdfs/csim_june21_2004.pdf

[6] CORI produced BC Shore-zone imagery and video map. http://www.coastalandoceans.com/Shore-Zone-Photo-Gallery/thumbnails.asp https://mcori.maps.arcgis.com/apps/Viewer/index.html?appid=c76377500f814914ad90149f229d4d66

[7] Pacific Salmon Foundation Strait of Georgia Data Centre https://sogdatacentre.ca/interactive-map/shorezone_map/shorezone_map.html

Coastal and Ocean Resources and the Pacific Salmon Foundation (PSF). However, the PSF is updating these assessments for the east coast of Vancouver Island, including Saanich. This update involves high resolution GPS-enabled video surveys of the coastline from which they will identify the following three shoreline categories: a) overhanging vegetation; b) altered shorelines; c) forage fish beaches. The PSF will then put the call out to local groups to ground truth and undertake more detailed surveys of the forage fish beaches to confirm how functional they are. While not lot-by-lot, this work will identify some marine sensitive ecosystems. Saanich could support this work if desired.

Islands Trust has also developed a mapping method derived from shore-zone standards[8]. This method has proven useful for broader planning decisions and public outreach, and involved adapting the shore-zone data into a series of three maps (i.e., physical features, shoreline processes, shoreline values & vulnerability)[9].

[8]de Greeff, P., B. Emmett, J. Harper and A. Mewett. 2011. Islands Trust Shoreline Mapping Project Methodology. Prepared for Islands Trust. 19 pp. https://islandstrust.bc.ca/wp-content/uploads/2020/05/11.09.27-IT-Shoreline-Methodology-Report.pdf

[9] Islands Trust Keats Island shoreline mapping example https://islandstrust.bc.ca/document/keats-island-shoreline-mapping/