Garry Oak and Associated Ecosystem Patches on Southern Vancouver Island Mapping Methodology

The three primary data sources used to develop the preliminary map (the BC the Sensitive Ecosystem Inventory (SEI), Ted Lea's 2002 Garry oak ecosystems map, and Patrick Lilley's (2007) remnant oak savanna map) were compiled and processed using QGIS 3.4. All polygons that overlapped between Lea's dataset and the SEI were included in the final map with corrections made for recent development. Additional SEI polygons were included to capture associated ecosystems, such as coastal bluffs and herbaceous rocky outcrops, that may not have Garry oak trees present but support meadow communities. Seven primary ecosystem types from the SEI dataset that support Garry oak ecosystems (GOEs) were included in the map (see Table 1). All polygons that listed Garry oaks (*Quercus garryana*) as a dominant or co-dominant species were included if they fell within one of the seven primary ecosystem types. Some polygons did not have a dominant/co-dominant species recorded in the SEI dataset but were included in the final map due to visual similarity to nearby polygons that recorded QG (*Quercus garryana*) as a dominant or co-dominant species.

Table 1. SEI primary ecosystem types included in the preliminary map.

SEI Primary Ecosystem Code	Definition
CB	Coastal bluff
CB:cl	Coastal cliff
HT	Terrestrial herbaceous
HT:ro	Terrestrial herbaceous: rocky outcrop
HT:ro:sh	Terrestrial herbaceous: rocky outcrop: >20% shrub cover
HT:sh	Terrestrial herbaceous: >20% shrub cover
WD	Woodland

All of Patrick Lilley's polygons were included in the final map and when overlapping with SEI or Lea's polygons, Lilley's polygons were used to delineate the patch as they reflected a more recent, ground-truthed reflection of patch boundaries.

Additional polygons were delineated based on indicator species occurrences and visually estimated locations that were field checked. The indicator species occurrences were downloaded from the Global Biodiversity Information Facility (GBIF.org). The indicator species selected were chosen based on information gathered from the Garry Oak Ecosystems Recovery Team (GOERT) and E-FLORA BC. Some species that were initially selected were not included in the analysis due to their scattered distribution and are indicated as such in the list of indicator species (see Table 2). Where > 3 different indicator species were observed within a visually similar ecosystem patch, a new polygon was delineated. It is important to note the limitations associated with GBIF occurrence location accuracy. Many occurrences are iNaturalist observations acquired on devices with poor GPS accuracy and some observations have a 'masked location' causing the point on the map to fall within the general area of the species identified but not the exact location. In addition, GBIF occurrences are not evenly distributed throughout the area of interest and many areas supporting GOE indicator species may have no occurrences present.

Table 2. Garry oak ecosystem indicator species used to delineate polygons.

Species	Used in Analysis
Allium acuminatum	Yes
Allium cernuum	No
Camassia leichtlinii	Yes
Camassia quamash	Yes
Carex inops	No
Collinsia parviflora	No
Dodecatheon hendersonii	No
Eriophyllum lanatum	Yes
Fritillaria affinis	Yes
Lomatium nudicaule	Yes
Lomatium utriculatum	Yes
Olsynium douglasii	Yes
Triteleia hyacinthina	Yes