

Replacement of Sections 2.3.1, 2.3.2, and 2.3.3 of the Recovery Strategy for Multi-Species at Risk in Woodlands associated with Garry Oak Ecosystems in Canada

Deltoid Balsamroot
Howell's Triteleia
Small-flowered Tonella
White-top Aster
Yellow Montane Violet *praemorsa* subspecies



2016

Replacement of Sections 2.3.1, 2.3.2, 2.3.3 of the following Recovery Strategy

Parks Canada Agency. 2006. Recovery Strategy for Multi-Species at Risk in Garry Oak Woodlands in Canada. In Species at Risk Act Recovery Strategy Series. Ottawa: Parks Canada Agency. 58 pp.

For copies of the recovery strategy, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the SAR Public Registry¹

Cover illustration: Deltoid Balsamroot (upper right), Yellow Montane Violet (lower right), and White-top Aster (centre), Matt Fairbarns; Howell's Tritoleia (center right), Chris Junck; and Small-flowered Tonella (left), Ryan Batten

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¹ www.registrelep.gc.ca

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Introduction

This document replaces the first five paragraphs of section 2.3 and sections 2.3.1, 2.3.2, and 2.3.3 of the “Recovery Strategy for Multi-Species at Risk in Woodlands associated with Garry Oak Ecosystems in Canada” (Parks Canada Agency 2006), which was posted on the Species at Risk Public Registry on August 11th 2006 ([registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=874](http://sararegistry.gc.ca/document/default_e.cfm?documentID=874)).

This document includes a partial identification of critical habitat for multiple species at risk in woodlands associated with Garry Oak ecosystems in British Columbia, Canada. The Government of Canada, in cooperation with the provinces and other partners, is continuing work that will lead to the identification of additional critical habitat in future recovery planning documents, in an effort to meet the population and distribution objectives for the recovery of multiple species at risk in woodlands associated with Garry Oak ecosystems in Canada.

2.3. Critical Habitat

Critical habitat is defined in the *Species at Risk Act* as “the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species” (Subsection 2(1)). Habitat for a terrestrial wildlife species is defined in the *Species at Risk Act* as “...the area or type of site where an individual or wildlife species naturally occurs or depends on directly or indirectly in order to carry out its life processes or formerly occurred and has the potential to be reintroduced” (Subsection 2(1)).

Critical habitat for Deltoid Balsamroot, Small-flowered Tonella, Howell’s Tritelleia, and Yellow Montane Violet *praemorsa* subspecies is identified to the extent possible, based on the best available information. Critical habitat is not identified for Special Concern species White-top Aster. It is recognized that the critical habitat identified below is necessary, but insufficient, to achieve the population and distribution objectives² (Section 2.5.1 of the recovery strategy; Parks Canada 2006) because additional critical habitat is required to create new populations for these five species. More precise boundaries may be mapped, and additional critical habitat may be added in the future if ongoing research supports the inclusion of areas beyond those currently identified. The schedule of studies (Section 2.3.4 of the recovery strategy; Parks Canada 2006) outlines the activities required to identify additional critical habitat necessary to support the population and distribution objectives of each of the species. While some studies remain to be completed, the schedule of studies is still expected to provide the required information.

Garry Oak woodlands on southeastern Vancouver Island and the adjacent Gulf Islands and islets express a variety of habitat types and may occur as oak parklands with rich, deep soil and a variable understory of shrubs and herbaceous vegetation, or as drier scrub oak woodlands with poorer, shallower soils and a sparser understory. The species addressed by this amendment

² The species-specific recovery objectives identified in Section 2.5.1 of the recovery strategy are considered to be the population and distribution objectives for the species.

typically occur in one of the above woodland types. These woodlands are naturally fragmented and are characterized by mild winters with frequent coastal fogs and warm, dry summers. To further characterize the specific habitat of each species, site and vegetation data were collected at extant locations.

2.3.1. Identification of the species' critical habitat

Geospatial location of areas containing critical habitat for species at risk in Woodlands

Geospatial areas containing critical habitat are depicted as bounding areas (Figures 5-32). These bounding areas are delineated based on the location of critical habitat attributes³. Note that several of the mapped areas shown contain critical habitat for more than one species. Biophysical attributes of critical habitat are described below and detailed location information is available on request.

Biophysical attributes of critical habitat for plant species at risk in Woodlands

Within the geospatial areas containing critical habitat, critical habitat for plant species of woodlands is identified based on the patch⁴ areas currently occupied by the species, and surrounding habitat which provides the biophysical attributes that maintain it. The specific attributes required for species' life history functions in occupied and surrounding habitat overlap biophysically, geospatially, seasonally, and across life history stages. Within the habitat surrounding patch areas, one habitat feature (high light conditions) is required, and comprises the biophysical attribute and identification of critical habitat for all species and sites. This feature is explained below and referred to where relevant, in the species-specific critical habitat sections.

These woodland plant species require high light conditions to germinate and grow. The area surrounding the seed bank must be clear of shading shrubs and trees: this area is the canopy opening required by the species. The minimum size of canopy openings can be determined based on the height of vegetation able to grow in the area and cast shade on the plants (e.g., Spittlehouse *et al.* 2004). An additional consideration with regards to canopy opening is that when tall vegetation falls, it will cover an area of ground equal to the distance of its height. In the habitats occupied by these species the maximum height of the coniferous vegetation able to grow in the area is approximately 20 metres. In addition, this area also allows for reproduction, growth and dispersal. Dispersal distances for all of these plants (Deltoid Balsamroot, Small-flowered Tonella, Howell's Triteleia, and Yellow Montane Violet *praemorsa* subspecies) will generally be within 20 metres (or much less) of the parent plants (Ryan and Douglas 1996; Douglas and Penny 2003 a&b; COSEWIC 2007). For the species in this amendment, a default minimum canopy opening of 20 metres radius, based on the maximum height of the vegetation able to grow in the area, was applied unless more specific data was available.

³ The bounding areas shown on maps represent minimum bounding geometry generated around all the minimum canopy openings of a population.

⁴ In the explanations below the term 'patch' refers to a group of several plants in close proximity or rarely a single plant. For the purposes of this amendment, the identification of 'patches' is based on survey work performed by a biologist familiar with the species. The term 'population' refers to groups of patches likely to interbreed with each other. This assessment is based on the 'Habitat-based Plant Element Occurrence Delimitation Guidance' and populations generally include patches within 1 km of each other unless otherwise specified (NatureServe 2011).

The presence of trees and shrubs create shade and as these species encroach into previously open sites shade will increase beyond survivable levels at which point the critical habitat would be destroyed. Garry Oak trees have a more open canopy structure which generally casts less shade than conifers and they are deciduous which significantly decreases shade in fall, winter, and spring. For the above reasons, compared to conifers, denser stands of oaks are possible without degrading or destroying critical habitat while any encroaching conifers and shrubs are assumed to be degrading critical habitat.

Critical habitat is each area currently occupied by the species and includes the surrounding habitat out to 20 metres distance. This area provides space for individual and population growth, seedbank sites, areas for dispersal, and the attributes of a woodland. Where existing roads and buildings are located within the critical habitat area they are not considered critical habitat.

The spatial delineation of the above habitat feature of high light conditions (comprising the biophysical attribute of critical habitat) has been completed for each population as indicated in Tables 1-4 based on the best available information. Detailed methods relating to habitat feature mapping (i.e., critical habitat identification) for each population are provided below. More detailed information on the spatial location of critical habitat to support protection of and its habitat may be requested, on a need-to-know basis, by contacting [Environment Canada's Recovery Planning section](#).

Critical Habitat Identification for Deltoid Balsamroot

All known extant populations for Deltoid Balsamroot are summarized in Table 1 which also indicates whether critical habitat is identified for each population. Critical habitat for Deltoid Balsamroot is identified in this amendment to the extent possible based on best available information. The schedule of studies in the recovery strategy outlines activities required to identify additional critical habitat necessary to support the population and distribution objectives (Section 2.3.4 of the recovery strategy, Parks Canada Agency 2006).

Critical habitat is identified in this strategy for seven of eight populations, based on the best existing available information. This is not a complete identification, as critical habitat has not been identified on First Nation reserves. The federal government will continue to work with First Nations to complete the identification of critical habitat on reserve land and will update this document as appropriate. In Canada, Deltoid Balsamroot is found in a range of Garry Oak woodland and/or rocky outcrops on southeastern Vancouver Island. It's habitat is typically very dry, exposed or partially shaded sites, with shallow soils (Ryan and Douglas 1996). Field investigations conducted in 2006-2008 helped to further characterize the habitat needs of Deltoid Balsamroot (Fairbarns 2008a and 2008b; GOERT 2008; GOERT 2009).

Table 1: Summary of critical habitat identification for extant populations of Deltoid Balsamroot (*Balsamorhiza deltoidea*).

Population (as referenced in recovery strategy)	Population (as referenced in amendment)	Figure #	Critical Habitat Identification
Fort Rodd Hill	Fort Rodd Hill	5	Yes
Mt. Tzuhalem	Mt. Tzuhalem	6	Yes
Mill Hill	Mill Hill	7	Yes
Thetis Lake	Thetis Lake	8	Yes
Beacon Hill	Beacon Hill	9	Yes
Francis King Park, SW of	Creed Road	10	Yes
Skirt Mountain	Skirt Mountain	11	Yes
Tyee Spit	Tyee Spit	33	No

Figure 1 shows typical habitat for Deltoid Balsamroot. Common attributes of habitat for Deltoid Balsamroot include:

- Elevations less than 250 metres above sea level.
- Open areas with short or sparse vegetation (tree canopy dominated by Garry Oaks and $\leq 50\%$ cover; conifers are rare and the cover of native shrubs is never substantial).
- Well drained soil that is moist early in the growing season (February and March) with water deficits by early summer.
- Soil depths ≥ 30 centimetres over bedrock with very small amounts of exposed mineral soil and fine litter.



Figure 1. Photo of typical habitat for Deltoid Balsamroot at Mount Tzuhalem (2009) (used with permission from S. Smith).

Within the geographical boundaries identified in Figure 5 (Fort Rodd Hill), Figure 6 (Mt Tzuhalem, BC Ecological Reserve portion), Figure 7 (Mill Hill), and Figure 8 (Thetis Lake) critical habitat is identified as the entire patch of Deltoid Balsamroot, plus the area surrounding the patch, where the canopy structure directly influences the amount of light reaching the plants. This area varies in size based on the height of vegetation able to grow nearby (up to a maximum of 20 m) and was mapped by Fairbarns (2008a and 2008b).

Within the geographical boundaries identified in Figure 6 (Mount Tzuhalem, private land portion), Figure 9 (Beacon Hill), Figure 10 (Creed Road), and Figure 11 (Skirt Mountain), critical habitat is identified as all areas within 20 metres of the recorded location of each patch of Deltoid Balsamroot (GOERT 2008; GOERT 2009). Surveys of these areas confirmed the continued existence of the species and its habitat at the sites and provided partial information on habitat and location. In addition, data from the BC Conservation Data Center (2012) is accepted as the best available information for the location of a newly discovered sub-population on Skirt Mountain.

As of December 2012, approximately 7.8 ha of critical habitat has been identified for Deltoid Balsamroot.

Critical Habitat Identification for Small-flowered Tonella

All known extant populations of Small-flowered Tonella are summarized in Table 2 which also indicates whether critical habitat is identified for each population. Since the publication of the recovery strategy, one new population at Mt. Erskine has been documented. Critical habitat for Small-flowered Tonella is identified in this amendment to the extent possible based on best available information. The schedule of studies outlines activities required to identify additional critical habitat necessary to support the population and distribution objectives (Section 2.3.4 of the recovery strategy, Parks Canada Agency 2006).

Table 2: Summary of critical habitat identification for extant populations of Small-flowered Tonella (*Tonella tenella*).

Population (as referenced in recovery strategy)	Population (as referenced in amendment)	Figure #	Critical Habitat Identification
Not recorded in recovery strategy	Mt. Erskine	12	Yes
Sansom Narrows, Saltspring Island	Sansom Narrows, Saltspring Island	n/a	No*

*Data required to identify critical habitat: location precision <100 m; confirmation of species or habitat presence

In Canada, Small-flowered Tonella occurs in Garry Oak woodlands, including transitional woodlands, on southeastern Vancouver Island. The habitat is relatively dry, steep, and is partly shaded (Parks Canada Agency 2006). Field investigations in 2009 helped to further characterize the habitat needs of Small-flowered Tonella (Maslovat 2009; Roemer 2010).

Wide population fluctuations are typical of many other annual species (Harper 1977; Bush and Lancaster 2004) and it is likely that populations of Small-flowered Tonella are similarly prone to large annual fluctuations. While some habitat may not be used every year, the presence of plants

in one year indicates that the habitat may be critical for storing seeds and boosting seed production in favourable years. For this reason all habitat used at any time by each patch of plants in each extant population is considered critical to achieve the population and distribution objectives and is critical habitat; however, due to population fluctuations this habitat cannot be completely identified based on data from any single year: a long term data set is required to ensure the full range of population fluctuation is captured.

Figure 2 shows typical habitat for Small-flowered Tonella. Common attributes of habitat for Small-flowered Tonella include:

- Extremely steep rocky slope (110% grade).
- Elevation of 340 metres above sea level and below 425 metres
- Open canopy areas with short or sparse understory vegetation within second growth forest (Arbutus, Bigleaf Maple, Douglas-fir, and/or Garry Oak).
- Well drained soil that is moist in the growing season (late winter/early spring) with water deficits by early summer.
- Soil depth up to 40 centimetres over bedrock with soil surface consisting of exposed mineral soil and fine litter with bedrock, coarse rock fragments, and coarse woody debris present.



Figure 2: Photo of typical Habitat of Small-flowered Tonella at Mount Erskine (2009) (photo used with permission from C. Maslovat) in Canada.

Within the geographical boundaries identified in Figure 12 (Mount Erskine), critical habitat is identified as the area around each patch of Small-flowered Tonella where the canopy structure directly influences the amount of light reaching the plants. Data from the BC Conservation Data

Center (2012) is accepted as the best available information for the location of the northernmost subpopulation and this data is supplemented with information from Maslovat (2009) regarding habitat and seepage tracks. The remaining three sub-populations were partially surveyed by (Roemer 2010); these surveys confirmed the continued existence of the species and its habitat at the sites and provided partial information on habitat and location.

As of December 2012, approximately 1.0 ha of critical habitat has been identified for Small-flowered Tonella.

Critical Habitat Identification for Howell's Triteleia

All known extant populations for Howell's Triteleia are summarized in Table 3 which also indicates whether critical habitat is identified for each population. Since the publication of the recovery strategy, two new populations at Brentwood Bay and Verdier Point have been documented and critical habitat remains to be described for these populations. Critical habitat for Howell's Triteleia is identified in this amendment to the extent possible based on best available information. The schedule of studies outlines activities required to identify additional critical habitat necessary to support the population and distribution objectives (Section 2.3.4 of the recovery strategy, Parks Canada Agency 2006).

Table 3: Summary of critical habitat identification for extant populations of Howell's Triteleia (*Triteleia howellii*)

Population (as referenced in recovery strategy)	Population (as referenced in amendment)	Figure #	Critical Habitat Identification
Beacon Hill	Beacon Hill	9	Yes
Albert Head	Albert Head Lagoon	13	Yes
Witty's Lagoon	Witty's Lagoon	14&15	Yes
Cowichan Garry Oak Preserve	Elkington Creek	16	Yes
Horth Hill	Horth Hill	17	Yes
Somenos Lake	Somenos Creek	18	Yes
Gordon Head	Gordon Head	19	Yes
William Head Rd.	Parker Bay	20	Yes
Mt. Tzuhalem, base of	Cowichan River Estuary	21	Yes
Cowichan River Estuary	Cowichan River Estuary	21	n/a ⁵
Island View Beach	Island View Beach	n/a	No*
Canoe Cove	Canoe Bay	n/a	No†
Thetis Lake	Thetis Lake	n/a	No†
Not recorded in recovery strategy	Brentwood Bay	n/a	No*
Not recorded in recovery strategy	Verdier Point	n/a	No*

*Data required to identify critical habitat: location precision <100 m; confirmation of species or habitat presence

†Data required to identify critical habitat: confirmation of species or habitat presence

In Canada, Howell's Triteleia is found in a range of Garry Oak woodland and rocky outcrops on southeastern Vancouver Island (Parks Canada Agency 2006). Field investigations conducted in

⁵ The "Cowichan River Estuary" and "Mt. Tzuhalem, base of" populations referenced in the recovery strategy have been determined to be the same population which is referenced as "Cowichan River Estuary" in this amendment.

2007-2009 helped to further characterize the habitat needs of Howell's *Triteleia* (Fairbarns 2008b; Costanzo *et al.* 2009a; GOERT 2009, GOERT 2012; Fleming 2010).

Figure 3 shows typical habitat for Howell's *Triteleia*. Common attributes of habitat for Howell's *Triteleia* include:

- Up to 250 metres above sea level.
- Terraces and low slopes (0- 20%), steeper slopes face south to southwest.
- Open areas with short or sparse vegetation. Garry Oak and *Arbutus* trees present, but conifers are rare and the cover of native shrubs is never substantial.
- Well drained soil that is moist early in the growing season (late winter/early spring) with water deficits by early summer.
- Soil consisting of loam (clay with soil) with 20 to 35 % coarse soil fragments, to 40 centimetres deep.



Figure 3: Photo of typical habitat of Howell's *Triteleia* at William Head (2008) (photo used with permission from C. Junck) in Canada.

Within the geographical boundaries identified in Figure 13 (Albert Head) and Figure 15 (Witty's Lagoon, eastern sub-population), critical habitat is identified as the area around each patch of Howell's *Triteleia* where the canopy structure directly influences the amount of light reaching the plants. This area varies in size based on the height of vegetation able to grow nearby (up to a maximum of 20 m) and was mapped by Fairbairns (2008b).

Within the geographical boundaries identified in Figure 9 (Beacon Hill), Figure 14 (Witty's Lagoon, western sub-population), Figure 16 (Elkington Creek), Figure 17 (Horth Hill), Figure 18 (Somenos Creek), Figure 19 (Gordon Head), Figure 20 (Parker Bay), and Figure 21 (Cowichan River Estuary) critical habitat is identified as all areas within 20 metres of the recorded location of each patch of Howell's *Triteleia* (Costanzo *et al.* 2009a; GOERT 2009; GOERT 2012; Fleming 2010). The following populations were partially surveyed: Beacon Hill, Horth Hill, Elkington Creek (eastern sub-populations) (Costanzo *et al.* 2009a), Elkington Creek (western sub-population), and Cowichan River Estuary (northern sub-population) (GOERT 2009), Somenos Creek (Fleming 2010), Gordon Head, Parker Bay (southern subpopulation) and Witty's Lagoon (western sub-population) (GOERT 2012). These partial surveys confirmed the continued existence of the species and its habitat at the sites and provided partial information on habitat and location. Data from the BC Conservation Data Center (2012) is accepted as the best available information for the location of the northern sub-population at Parker Bay and the populations at Cowichan River Estuary.

As of December 2012, approximately 6.1 ha of critical habitat is been identified for Howell's *Triteleia*.

*Critical Habitat Identification for Yellow Montane Violet *praemorsa* subspecies*

All known extant populations for Yellow Montane Violet *praemorsa* subspecies are summarized in Table 4 which also indicates whether critical habitat is identified for each population. Since the publication of the recovery strategy, one new population at Parry Bay (Devonian Park) has been documented. Critical habitat for Yellow Montane Violet *praemorsa* subspecies is identified in this amendment to the extent possible based on best available information. The schedule of studies outlines activities required to identify additional critical habitat necessary to support the population and distribution objectives (Section 2.3.4 of the recovery strategy, Parks Canada Agency 2006).

Table 4: Summary of critical habitat identification for extant populations of Yellow Montane Violet *praemorsa* subspecies (*Viola praemorsa* ssp. *praemorsa*)

Population (as referenced in recovery strategy)	Population (as referenced in amendment)	Figure #	Critical Habitat Identification
Mt. Tzuhalem	Mt. Tzuhalem	6	Yes
Beacon Hill	Beacon Hill	9	Yes
Cowichan Garry Oak Preserve	Elkington Creek	16	Yes
Somenos Lake	Somenos Creek	18	Yes
Little Saanich Mtn.	Little Saanich Mtn.	22	Yes
Bear Hill	Bear Hill	23	Yes
Uplands Park	Uplands Park/Cattle Point	24	Yes

Population (as referenced in recovery strategy)	Population (as referenced in amendment)	Figure #	Critical Habitat Identification
Mt. Maxwell	Mt. Maxwell	25	Yes
Mt. Tuam	Mt. Tuam	26	Yes
Christmas Hill	Christmas Hill	27	Yes
Playfair Park	Playfair Park	28	Yes
Falaise Park	Falaise Park	29	Yes
St. Peter's Church	Quamichan Creek	30	Yes
Smith Hill	Smith Hill	31	Yes
Not recorded in recovery strategy	Parry Bay (Devonian Park)	32	Yes

In Canada, Yellow Montane Violet *praemorsa* subspecies is found in a range of open Garry Oak woodlands and grass-dominated meadow openings on southeastern Vancouver Island and the Gulf Islands (Parks Canada Agency 2006). Field investigations conducted in 2007-2009 helped to further characterize the habitat needs of Yellow Montane Violet *praemorsa* subspecies (Costanzo *et al.* 2009b; Fleming 2010; Roemer and Annschild 2008; Fairbarns 2008a and 2008b; GOERT 2008; GOERT 2009; GOERT 2012; Maslovat 2009).

Figure 4 shows typical habitat for Yellow Montane Violet *praemorsa* subspecies. Common attributes of habitat for Yellow Montane Violet *praemorsa* subspecies include:

- Up to 604 metres above sea level.
- Open areas with short or sparse vegetation (Garry Oak trees present, but conifers are absent and the cover of native shrubs is never substantial).
- Low to moderate slopes (5 to 50% grade).
- Shallow soils (10 to 30 centimetres) over bedrock with very small amounts of exposed mineral soil and fine litter, with coarse woody debris often present.
- Well drained soil that is moist early in the growing season (January to March) with water deficits by early summer.



Figure 4. Photo of typical habitat of Yellow Montane Violet *praemorsa* subspecies in Canada (2006) (photo used with permission from M. Fairbarns).

Within the geographical boundaries identified in Figure 6 (Mt Tzuhalem) and Figure 23 (Bear Hill), critical habitat is the area around each patch of Yellow Montane Violet *praemorsa* subspecies where the canopy structure directly influences the amount of light reaching the plants. This area varies in size based on the height of vegetation able to grow nearby (up to a maximum of 20 metres) and was mapped by Fairbarns (2008a and 2008b).

Within the geographical boundaries identified in Figure 9 (Beacon Hill), Figure 16 (Elkington Creek), Figure 18 (Somenos Creek), Figure 22 (Little Saanich Mountain), Figure 24 (Uplands Park/Cattle Point), Figure 25 (Mt. Maxwell), Figure 26 (Mt. Tuam), Figure 27 (Christmas Hill), Figure 28 (Playfair Park), Figure 29 (Falaise Park), Figure 30 (Quamichan Creek), Figure 31 (Smith Hill), and Figure 32 (Parry Bay), critical habitat is identified as all areas within 20 m of the recorded location of each patch of Yellow Montane Violet *praemorsa* subspecies (Roemer and Annschild 2008; Costanzo *et al.* 2009b; GOERT 2008, 2009 and 2012; Maslovat 2009; Fleming 2010). The following populations were partially surveyed: Beacon Hill, Uplands/Cattle Point, Christmas Hill, Smith Hill (Costanzo *et al.* 2009b), Somenos Creek (Fleming 2010), Mount Tuam (Roemer and Annschild 2008), Mount Maxwell (Maslovat 2009), Quamichan Creek (GOERT 2008), Little Saanich Mountain, Falaise Park (GOERT 2009), Playfair Park and Parry Bay (GOERT 2012). These partial surveys confirmed the continued existence of the species and its habitat at the sites and provided partial information on habitat and location.

As of December 2012, approximately 16.3 ha of critical habitat is identified for Yellow Montane Violet *praemorsa* subspecies.

2.3.2. Critical Habitat Map Figures

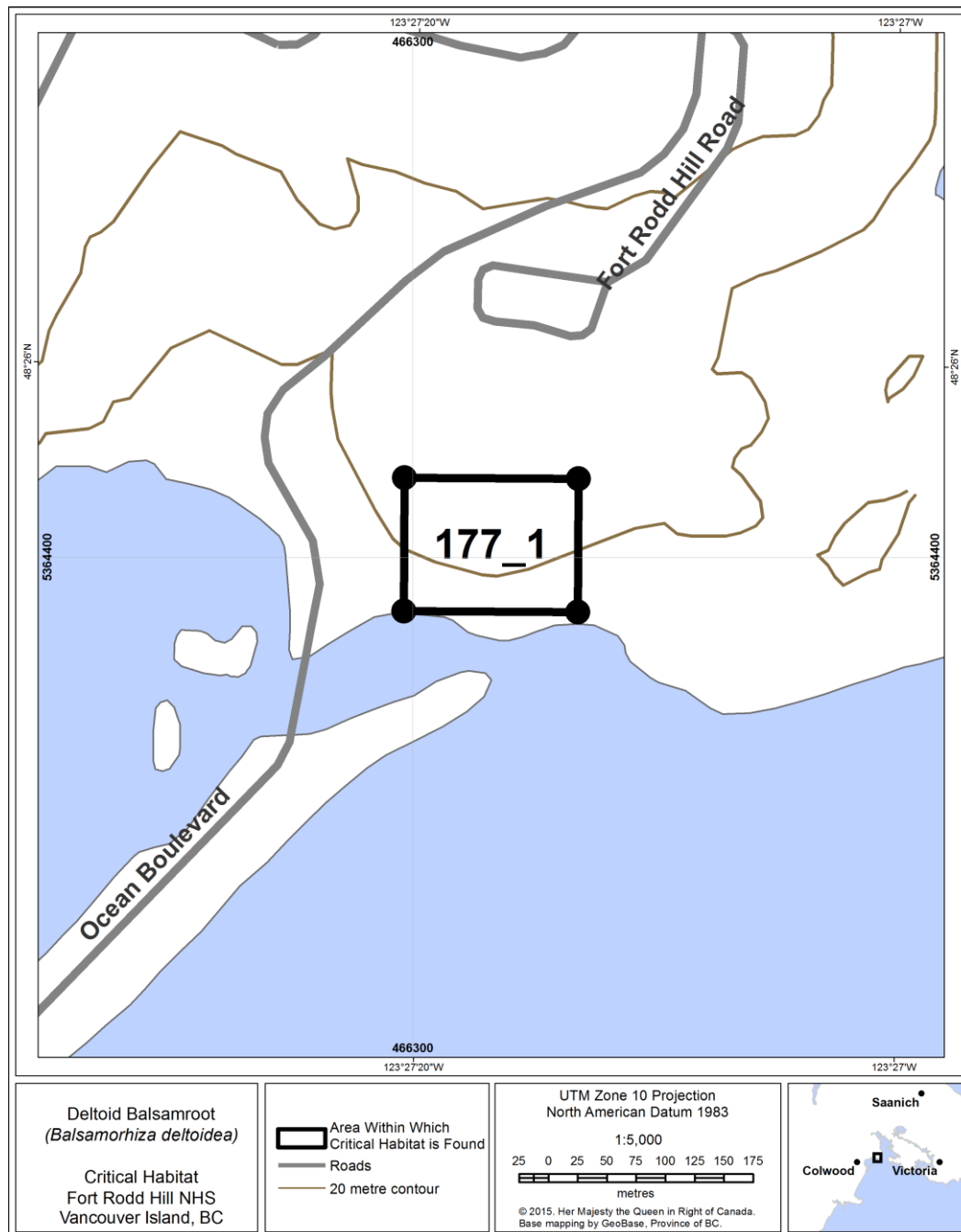


Figure 5. Area (~1.7 ha) within which critical habitat for Deltoid Balsamroot is found at Fort Rodd Hill National Historic Site, on federal lands. The area of critical habitat within this area is approximately 0.75 ha. The critical habitat parcel 177_1 is bounded by the following four corners: 466293, 5364468; 466442, 5364467; 466441, 5364353; 466292, 5364354 (UTM Zone10, NAD1983, North Azimuth).

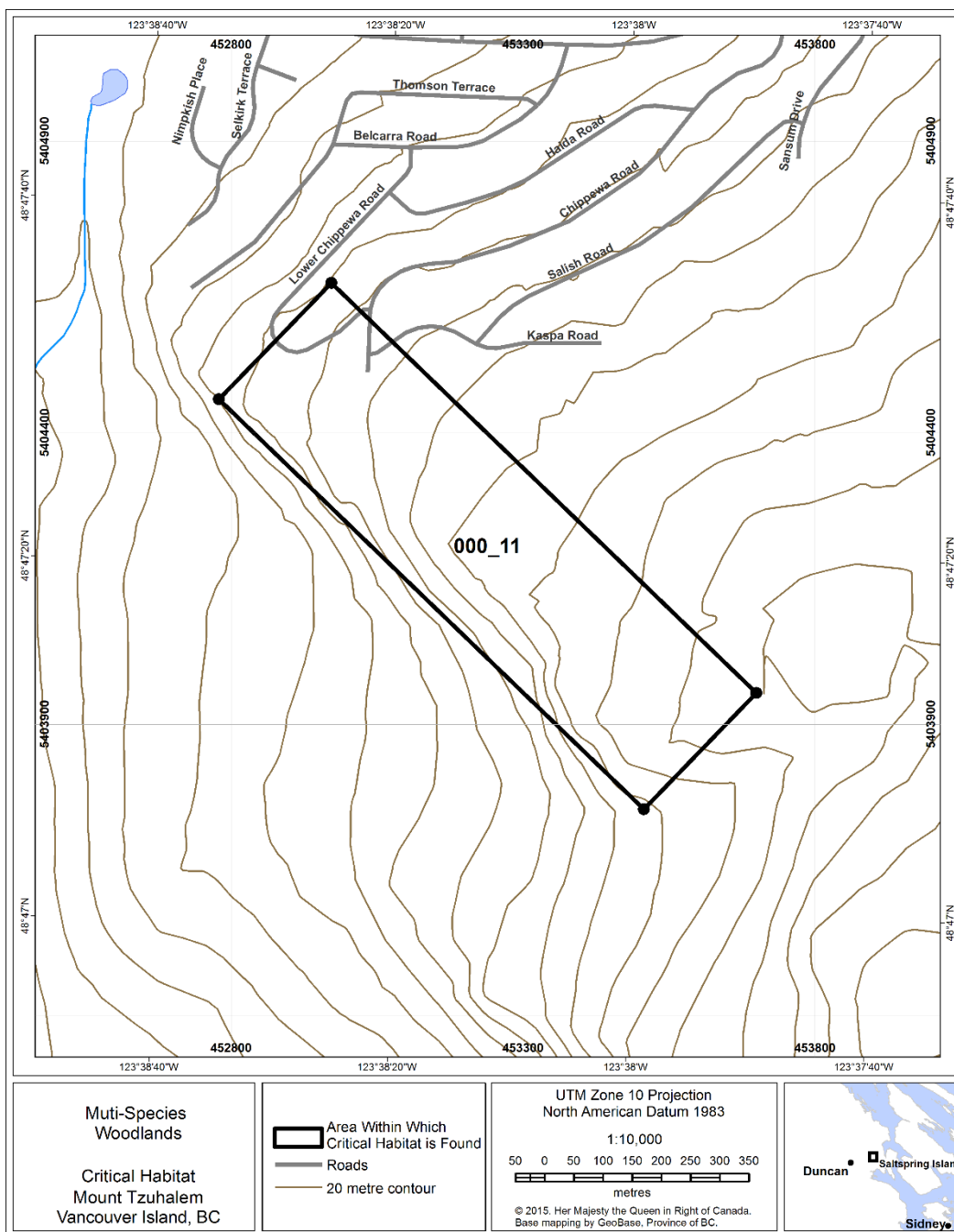


Figure 6. Area (~28.1 ha) within which critical habitat for Deltoid Balsamroot and Yellow Montane Violet *praemorsa* subspecies is found at Mount Tzuhalem, on non-federal lands. The area of critical habitat within this area is approximately 3.4 ha. The critical habitat parcel 000_11 is bounded by the following four corners: 452972 5404657; 453700 5403954; 453507 5403755; 452779 5404458 (UTM Zone10, NAD1983, North Azimuth).

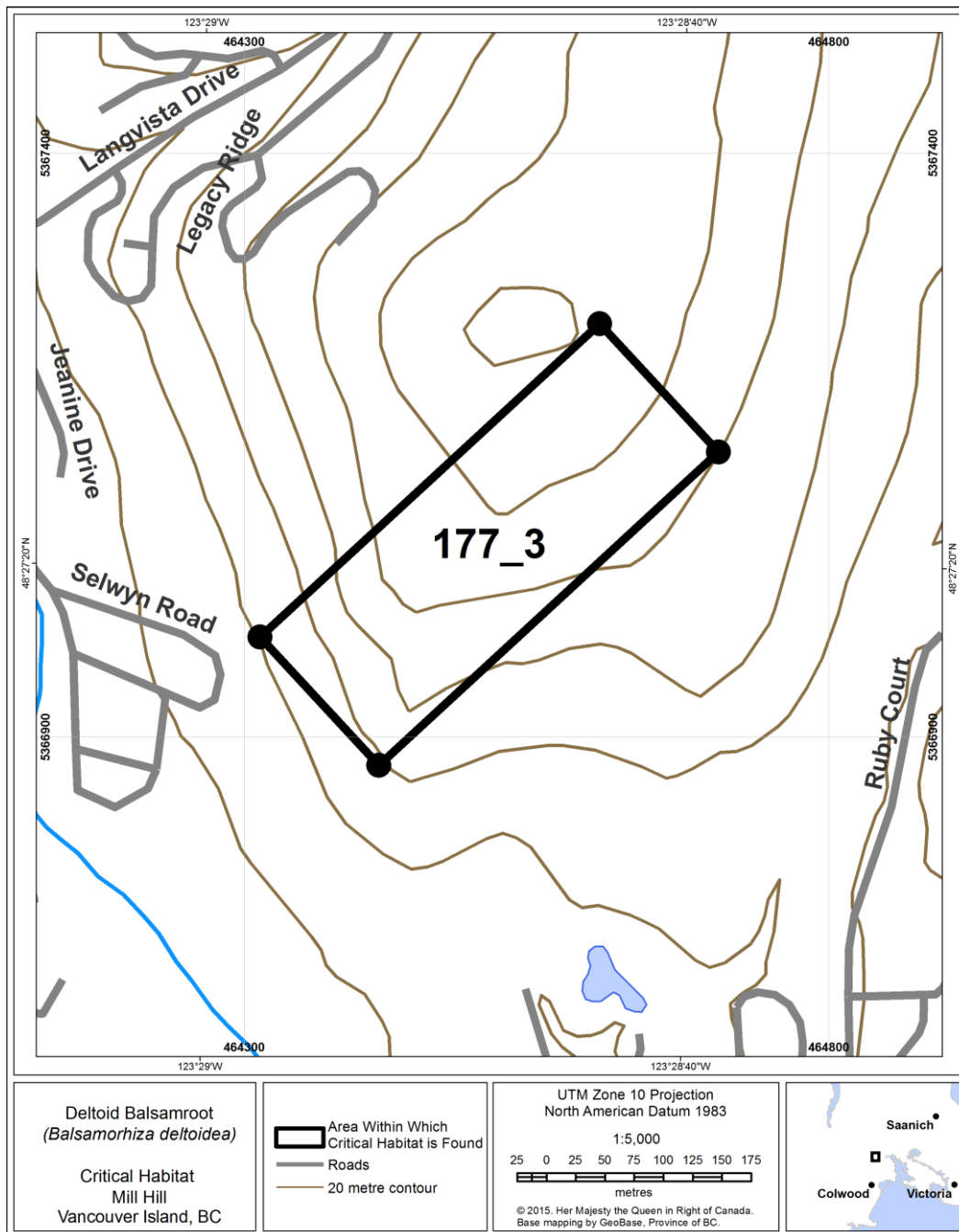


Figure 7: Area (~5.9 ha) within which critical habitat for Deltoid Balsamroot is found at Mill Hill Regional Park, on non-federal lands. The area of critical habitat within this area is approximately 0.2 ha. The critical habitat parcel 177_3 is bounded by the following four corners: 464314, 5366986; 464604, 5367254; 464706, 5367144; 464415, 5366876 (UTM Zone10, NAD1983, North Azimuth).

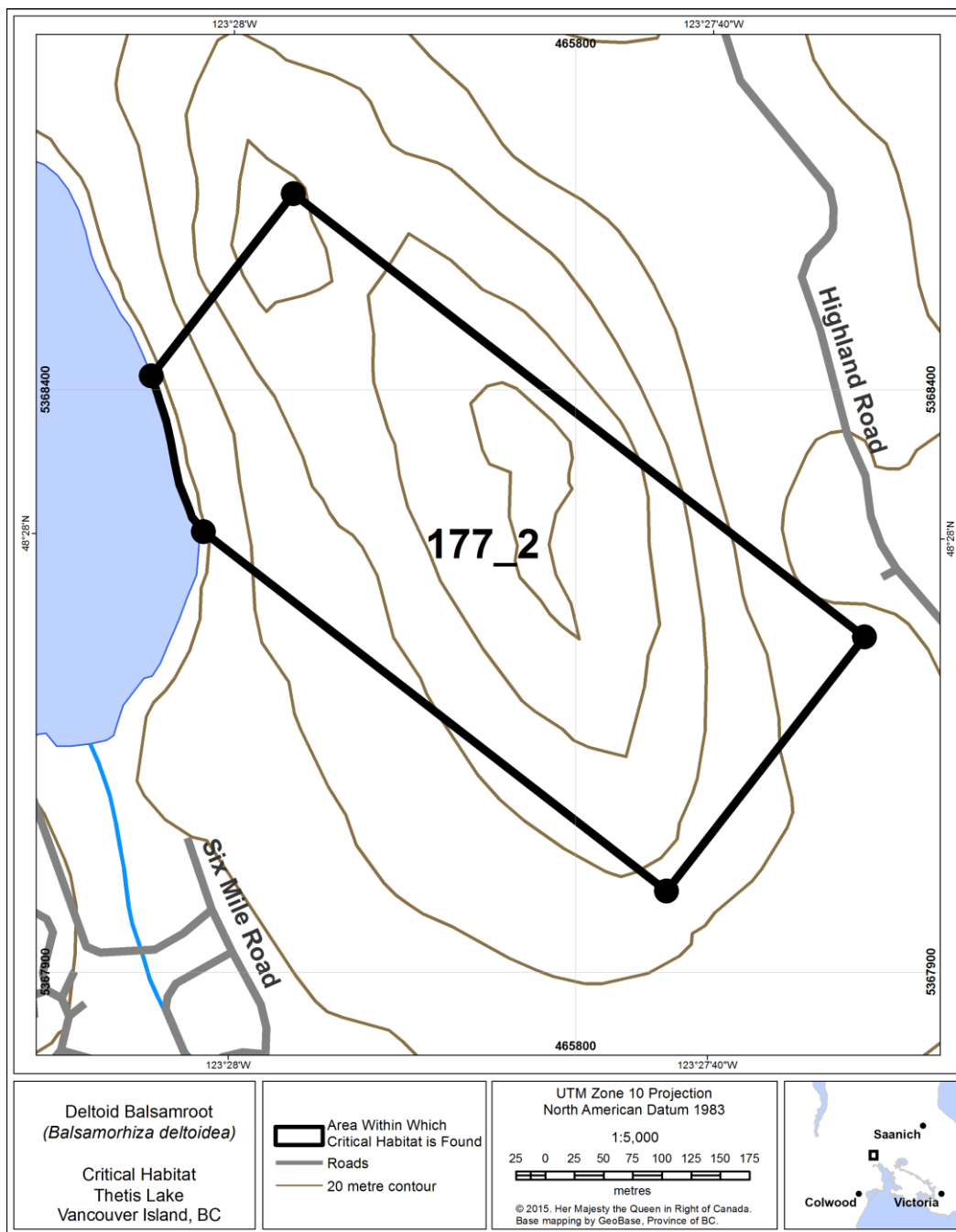


Figure 8. Area (~16.7 ha) within which critical habitat for Deltoid Balsamroot is found at Thetis Lake Regional Park, on non-federal lands. The area of critical habitat within this area is approximately 3.02 ha. The critical habitat parcel 177_2 commences at 465558, 5368568; thence 128° in a straight line to 466047, 5368187; thence 218° in a straight line to 465878, 5367970, thence 308° in a straight line to 465484, 5368280thence northwest along the lake's water edge to point 465438, 5368411; thence 38° in a straight line to the commencement point (UTM Zone 10, NAD 1983, North Azimuth).



Figure 9. Area (~63.4 ha) within which critical habitat for Deltoid Balsamroot, Howell's Tritelia and Yellow Montane Violet *praemorsa* subspecies are found at Beacon Hill Park, on non-federal lands. The area of critical habitat within this area is approximately 1.9 ha. The critical habitat parcel 000_12 is bounded by the following four corners: 472762, 5361845; 472949, 5362889; 473538, 5362784; 473352, 5361741 (UTM Zone 10, NAD 1983, North Azimuth).

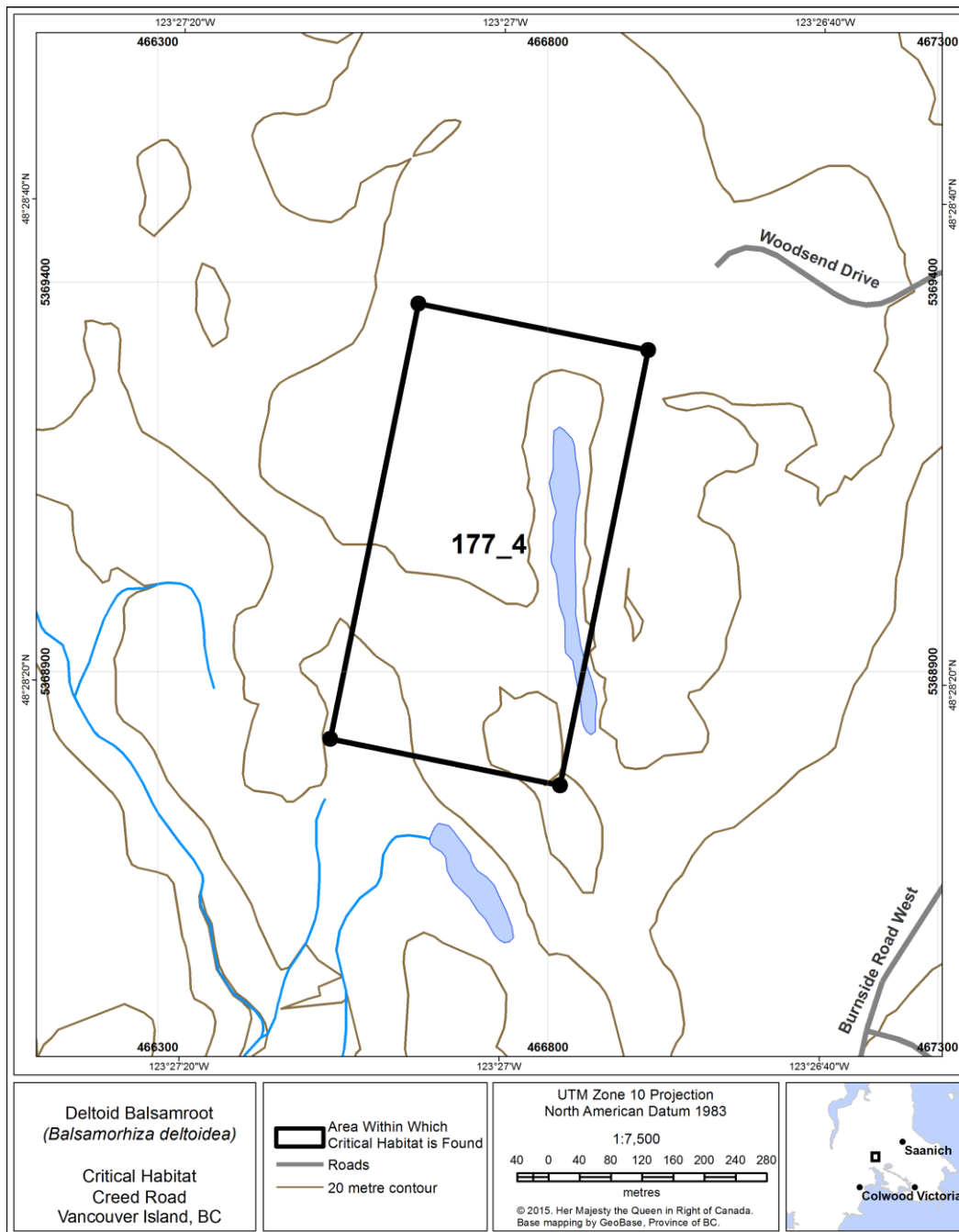


Figure 10: Area (~17.2 ha) within which critical habitat for Deltoid Balsamroot is found at Creed Road, on non-federal lands. The area of critical habitat within this area is approximately 0.5 ha. The critical habitat parcel 177_4 is bounded by the following four corners: 466634, 5369372; 466929, 5369313; 466816, 5368754; 466521, 5368813 (UTM Zone10, NAD1983, North Azimuth).

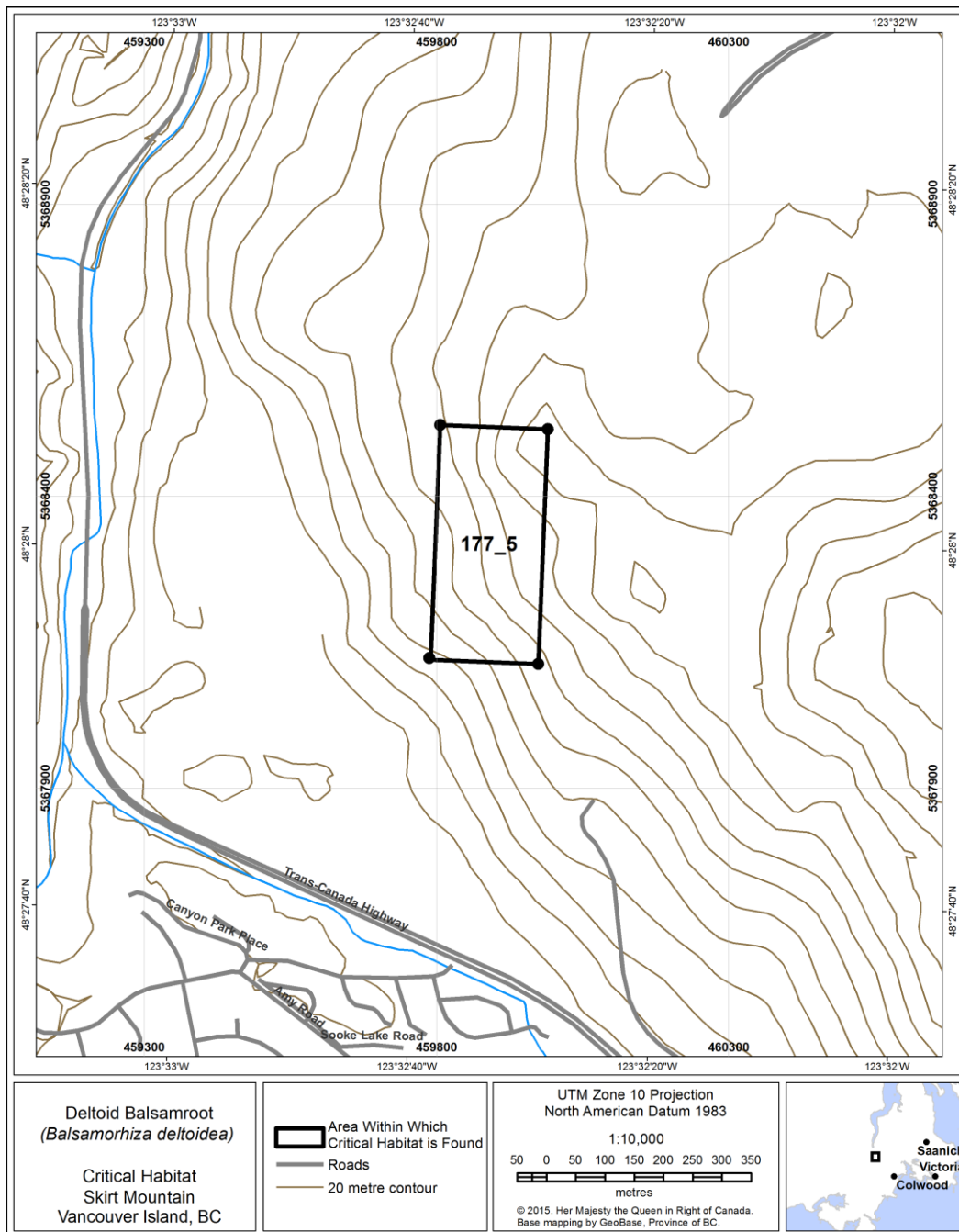


Figure 11. Area (~7.4 ha) within which critical habitat for Deltoid Balsamroot is found at Skirt Mountain, on non-federal lands. The area of critical habitat within this area is approximately 1.2 ha. The critical habitat parcel 177_5 is bounded by the following four corners: 459788, 5368123; 459806, 5368522; 459990, 5368515; 459974, 5368112 (UTM Zone10, NAD1983, North Azimuth).

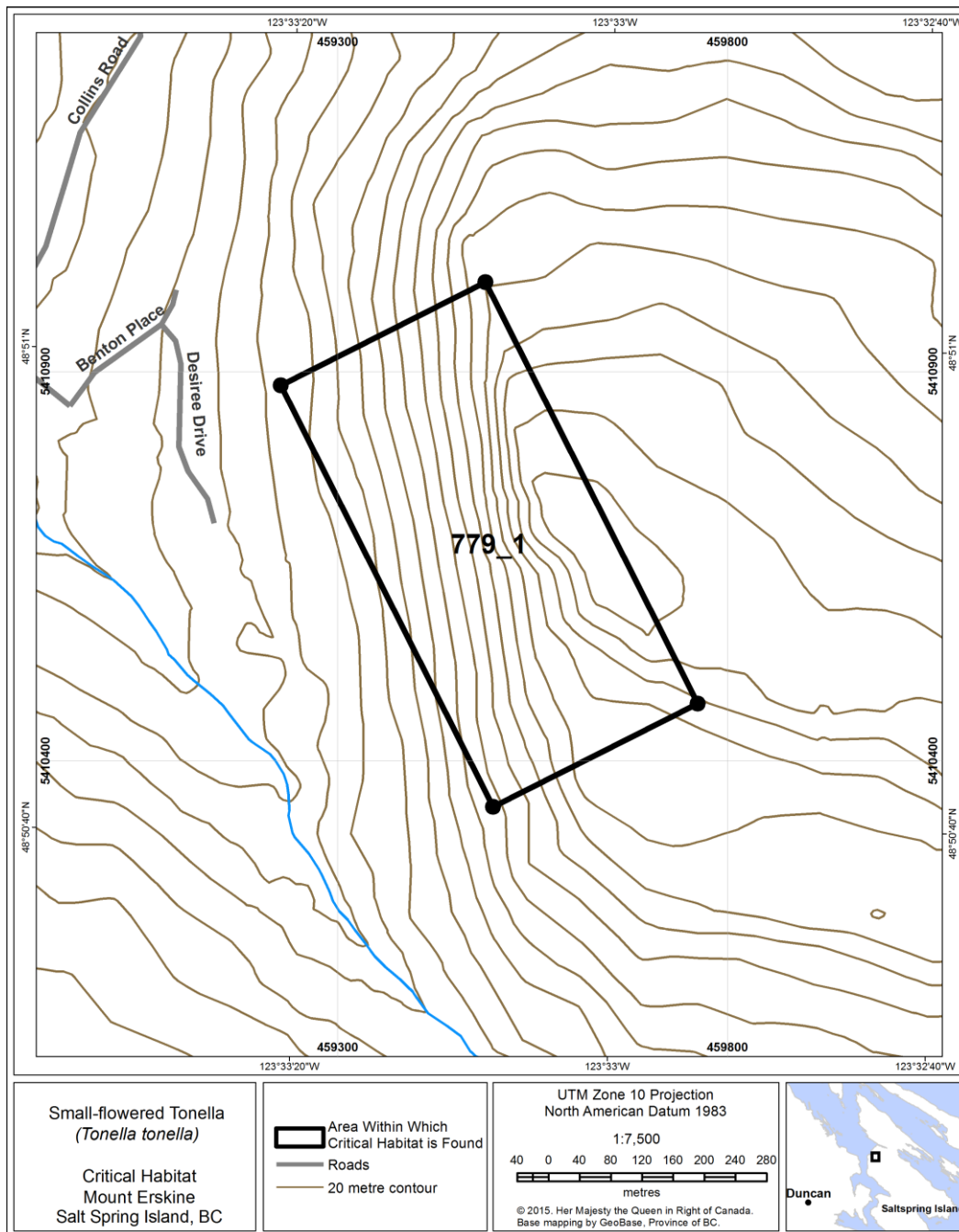


Figure 12. Area (~17.8 ha) within which critical habitat for Small-flowered Tonella is found on Mount Erskine, on non-federal lands. The area of critical habitat within this area is approximately 1.1 ha. The critical habitat parcel 779_1 is bounded by the following four corners: 459227, 5410882; 459490, 5411015; 459762, 5410473; 459499, 5410341 (UTM Zone10, NAD1983, North Azimuth).

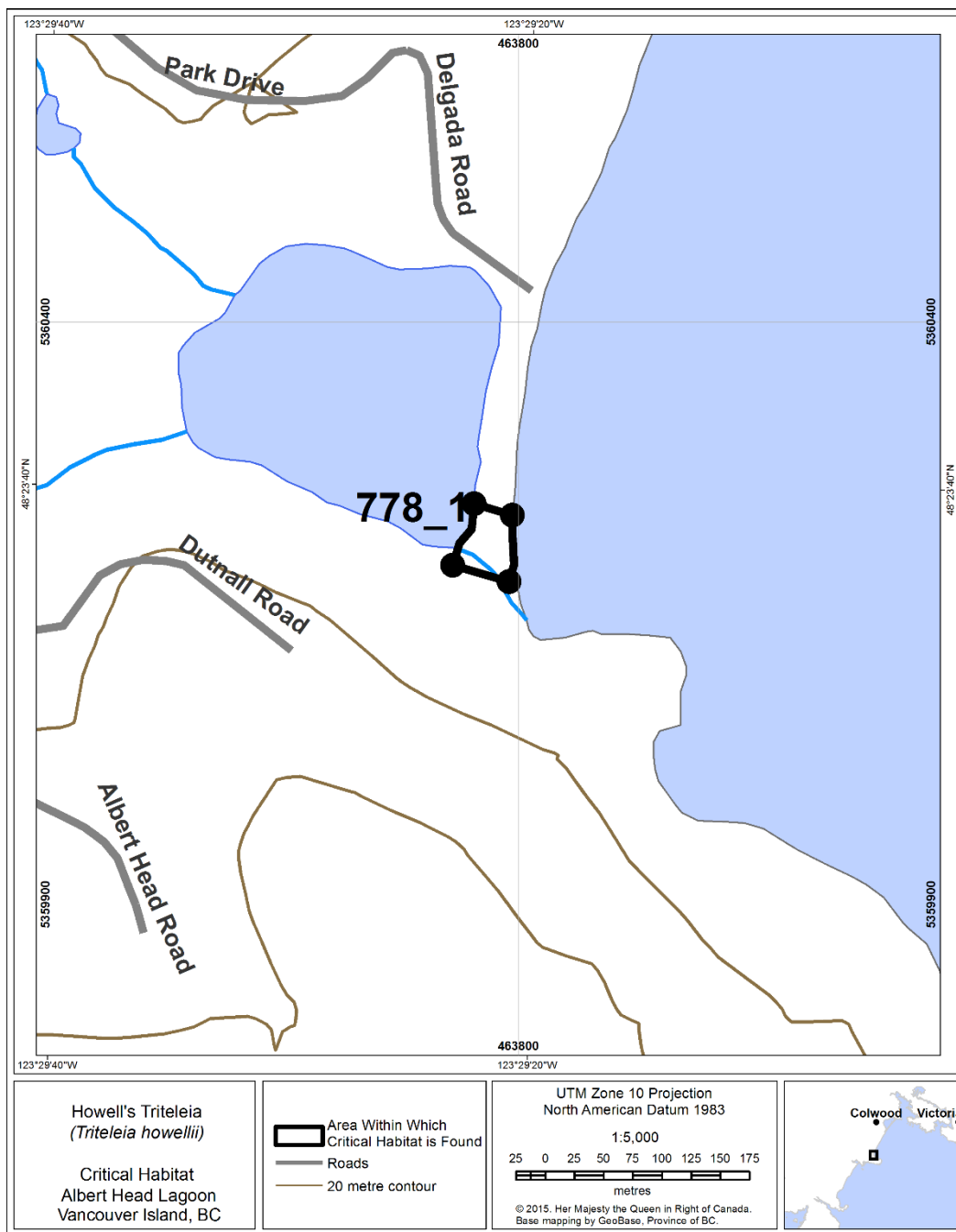


Figure 13: Area (~0.2 ha) within which critical habitat for Howell's Triteleia is found at Albert Head, on non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 778_1 commences at 463762, 5360244; thence 106° in a straight line to 463795, 5360234; thence along the Royal Bay shoreline to 463792, 5360177; thence 286° in a straight line to 463744, 5360191; thence along the Albert Head Lagoon shoreline to the commencement point (UTM Zone 10, NAD 1983, North Azimuth).

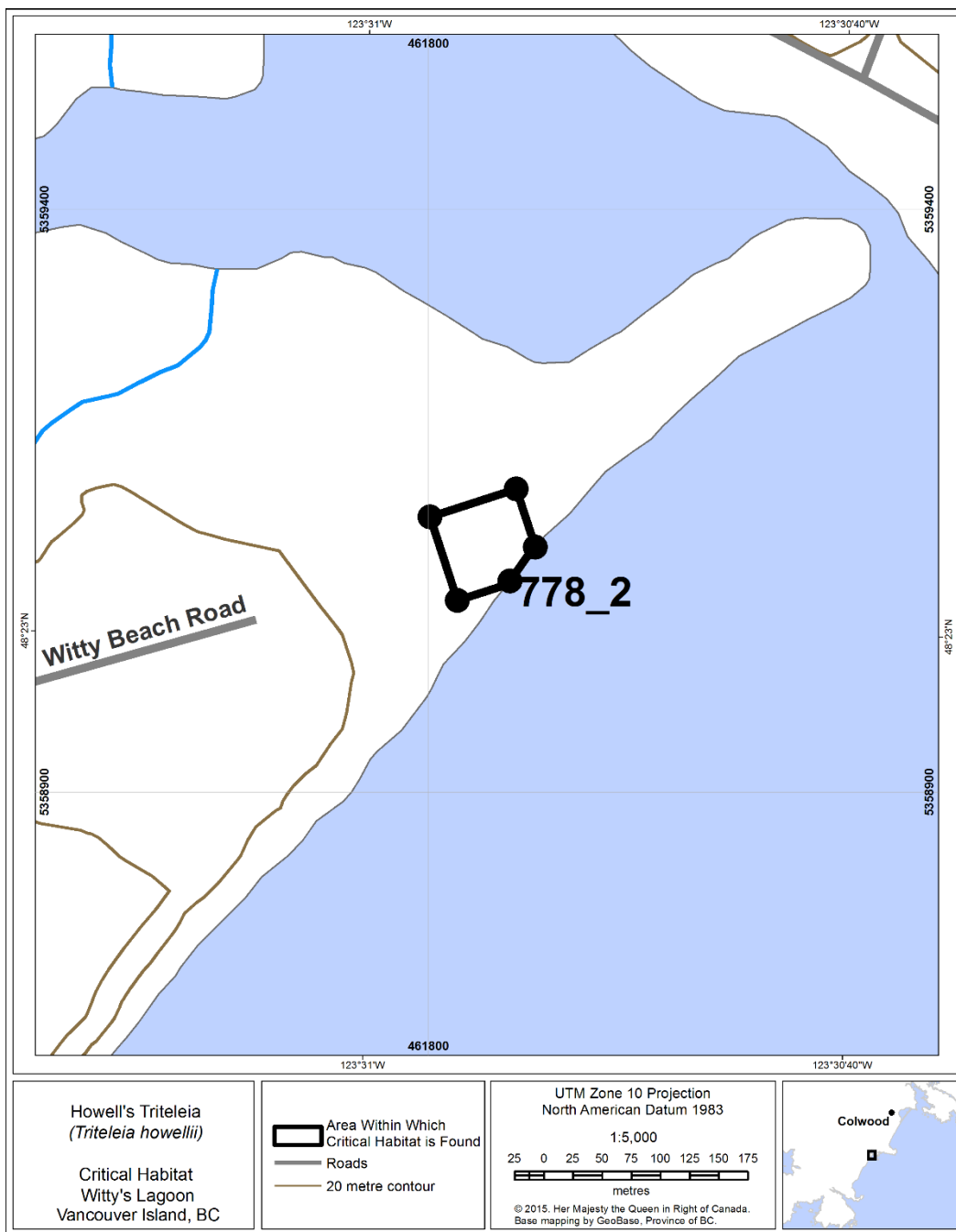


Figure 14: Area (~0.5 ha) within which critical habitat for Howell's Triteleia is found at Witty's Lagoon, on non-federal lands. The area of critical habitat within this area is approximately 0.3 ha. The critical habitat parcel 778_2 commences at 461802, 5359136; thence 72° in a straight line to 461875, 5359160; thence 108° in a straight line to 461892, 5359110; thence along the coastline to 461870, 5359081; then 250° in a straight line to 461825, 5359064; thence 342° in a straight line to the commencement point (UTM Zone10, NAD1983, North Azimuth).

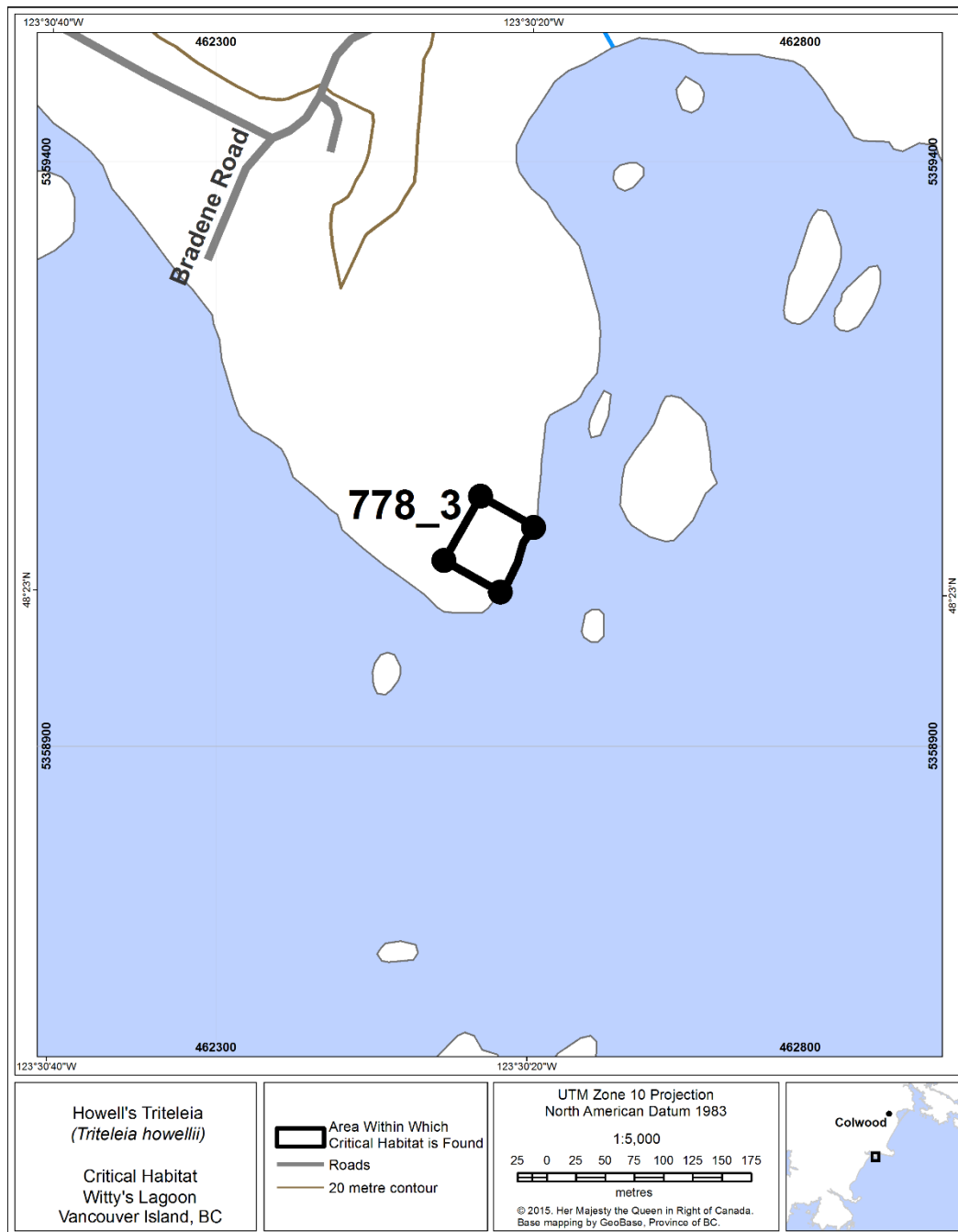


Figure 15: Area (~0.3 ha) within which critical habitat for Howell's Triteleia is found at Witty's Lagoon, on non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 778_3 commences at 462527, 5359080; thence 120° in a straight line to 462572, 5359052; thence along the coastline to 462544, 5359057; thence 299° in a straight line to 462495, 5359059; then 29° in a straight line to the commencement point (UTM Zone10, NAD1983, North Azimuth).

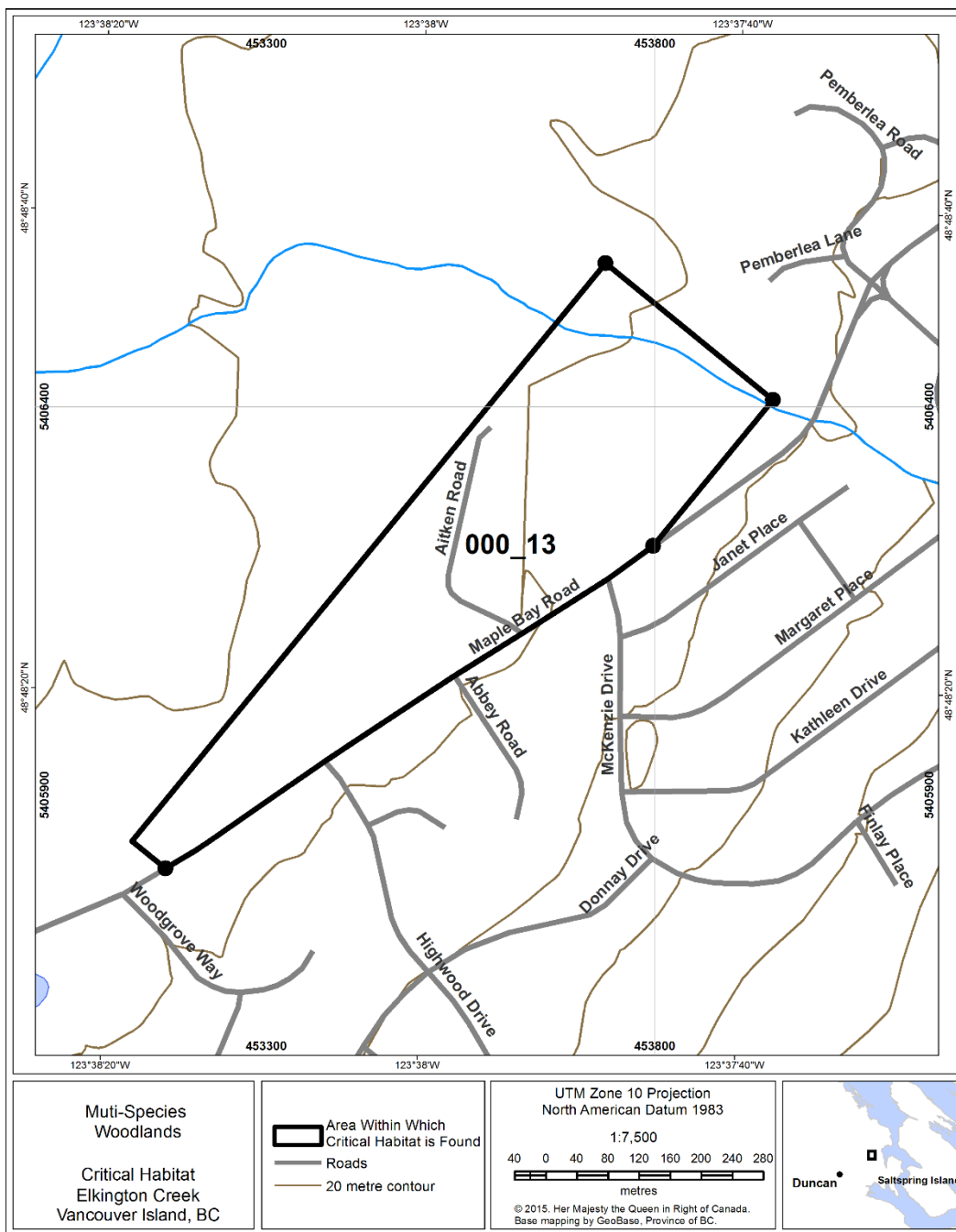


Figure 16: Area (~18.8 ha) within which critical habitat for Howell's *Triteleia* and Yellow Montane Violet *praemorsa* subspecies is found at Elkington Creek, on non-federal lands. The area of critical habitat within this area is approximately 5.8 ha. The critical habitat parcel 000_13 commences at 453736, 5406585; thence 129° in a straight line to 453952, 5406409; thence 219° in a straight line to 453798, 5406221; thence along the northern edge of Maple Bay Road to 453170, 5405805; thence 309° in a straight line to 4453127, 5405841; thence 39° in a straight line to the commencement point (UTM Zone 10, NAD 1983, North Azimuth).

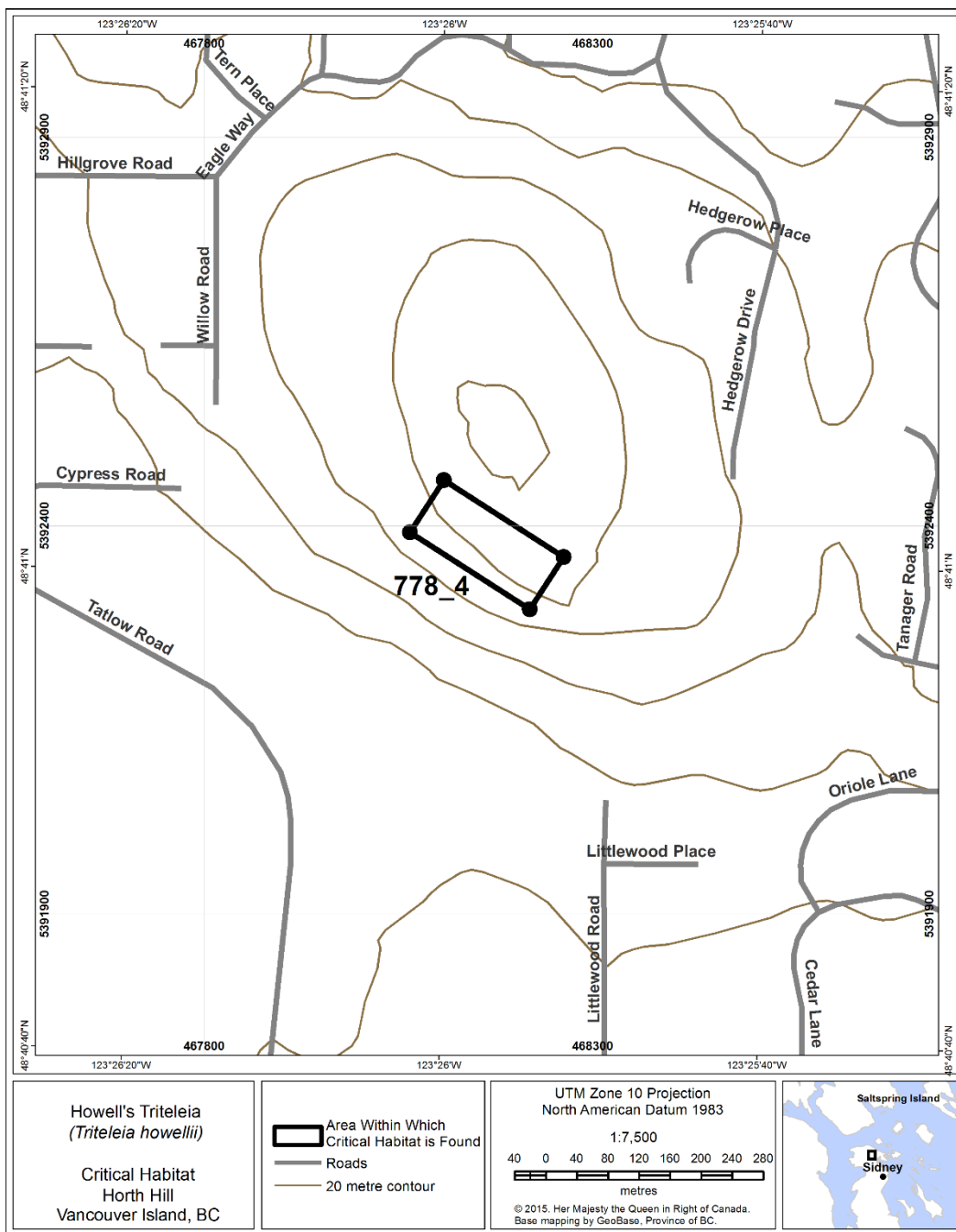


Figure 17: Area (~1.5 ha) within which critical habitat for Howell's Triteleia is found at Horth Hill Regional Park, on non-federal lands. The area of critical habitat within this area is approximately 0.3 ha. The critical habitat parcel 778_4 is bounded by a polygon with the following four corners: 468065, 5392392; 468109, 5392459; 468262, 5392359; 468219, 5392292 (UTM Zone 10, NAD 1983, North Azimuth).

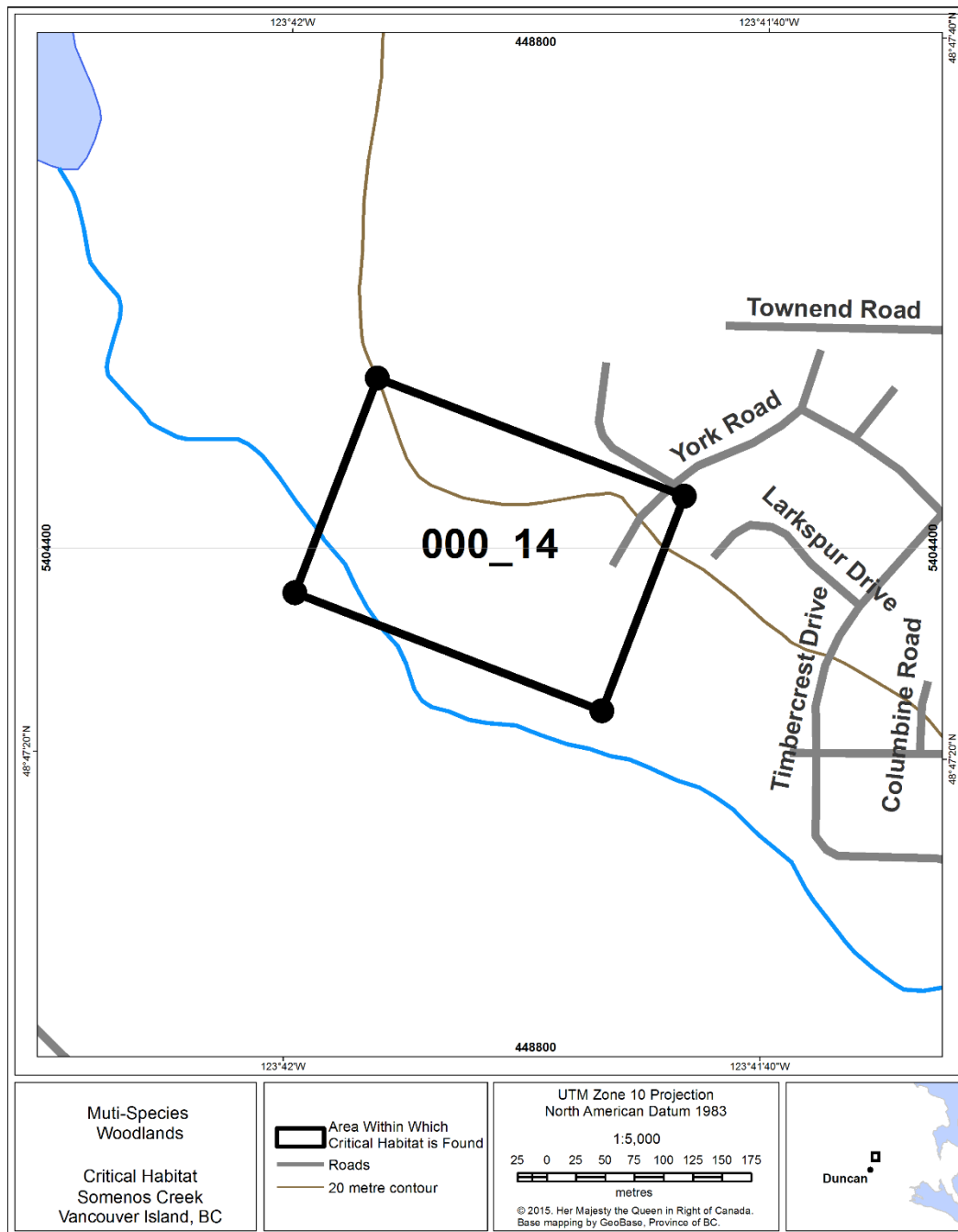


Figure 18: Area (~5.5 ha) within which critical habitat for Howell's *Triteleia* and Yellow Montane Violet *praemorsa* subspecies is found at Somenos Creek, on non-federal lands. The area of critical habitat within this area is approximately 2.4 ha. The critical habitat parcel 000_14 is bounded by a polygon with the following four corners: 448664, 5404545; 448927, 5404444; 448857, 5404261; 448594, 5404361 (UTM Zone 10, NAD 1983, North Azimuth).



Figure 19: Area (~0.3 ha) within which critical habitat for Howell's Triteleia is found at Gordon Head, on non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 778_5 commences at 477315, 5371454; thence along the shoreline to 477368, 5371418; thence 145° in a straight line to 477379, 5371402; thence 234° in a straight line to 477319, 5371359; thence 306° in a straight line to 477288, 5371401; thence along the shoreline to 477288, 5371434; thence 53° in a straight line to the commencement point (UTM Zone 10, NAD 1983, North Azimuth).

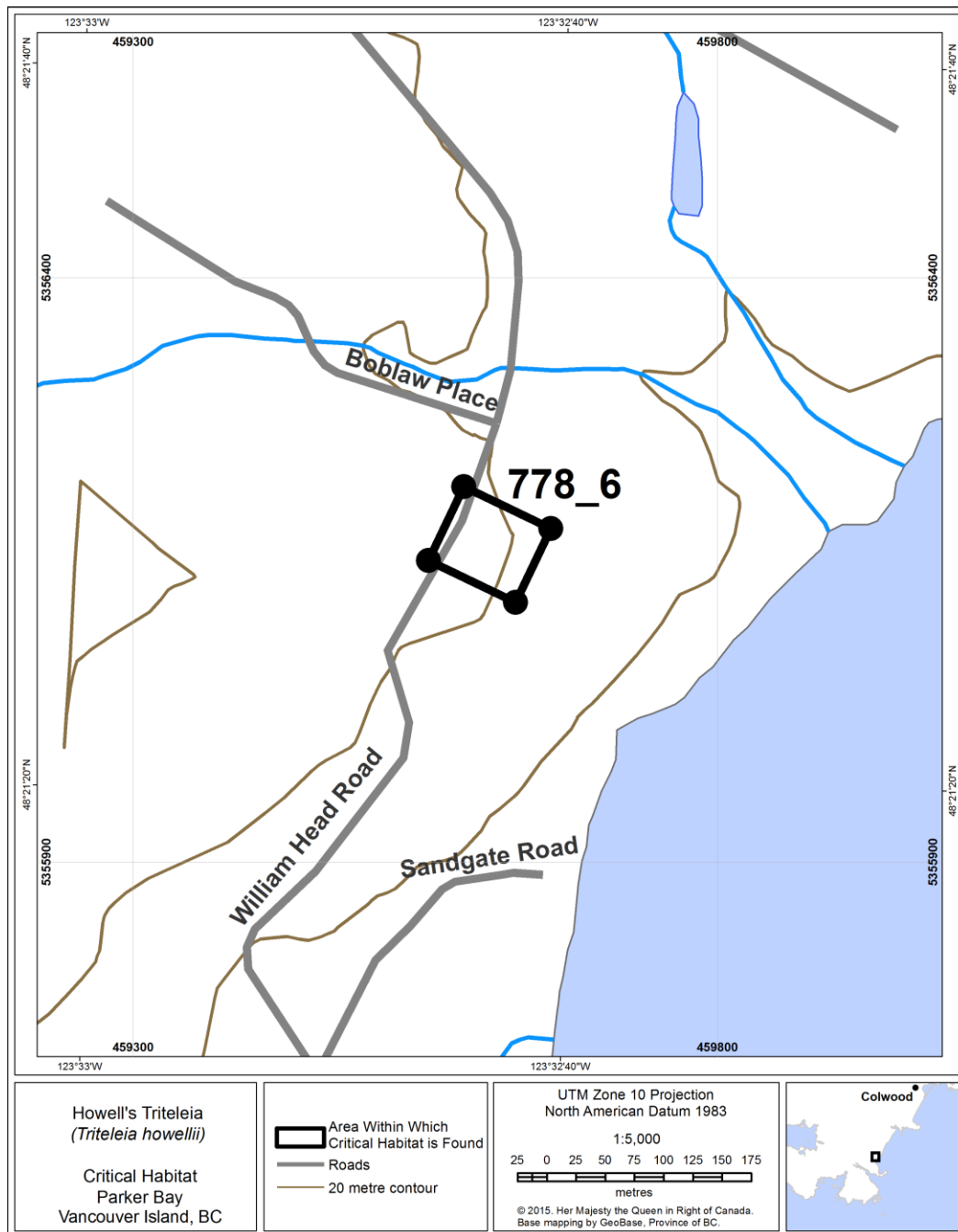


Figure 20 Area (~0.6 ha) within which critical habitat for Howell's Tritoleia is found at Parker Bay, on non-federal lands. The area of critical habitat within this area is approximately 0.2 ha. The critical habitat parcel 778_6 is bounded by a polygon with the following four corners: 459583, 5356221; 459658, 5356185; 459627, 5356122; 459553, 5356158 (UTM Zone 10, NAD 1983, North Azimuth).

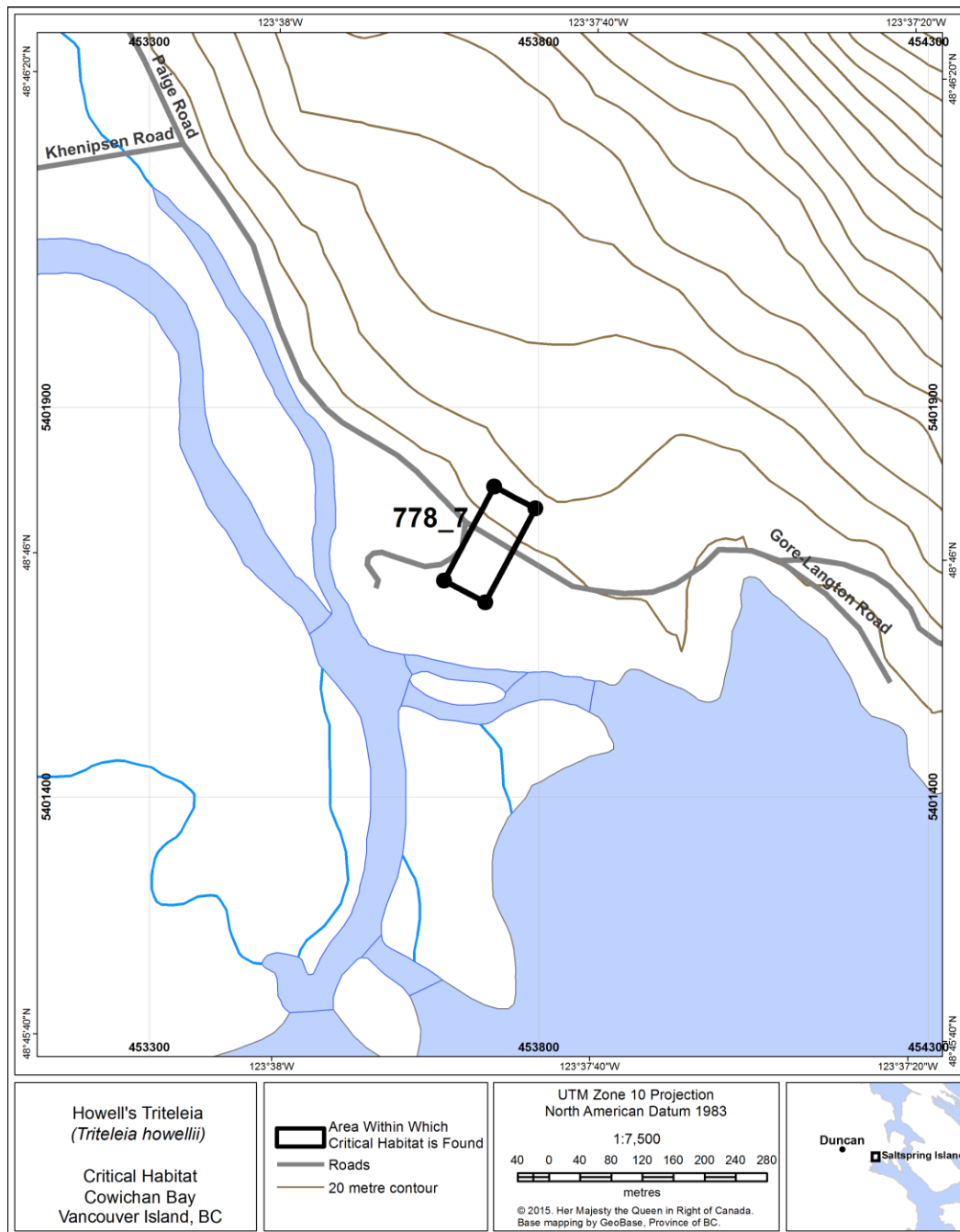


Figure 21. Area (~0.8 ha) within which critical habitat for Howell's Triteleia is found at Cowichan River Estuary, on non-federal lands. The area of critical habitat within this area is approximately 0.4 ha. The critical habitat parcel 778_7 is bounded by a polygon with the following four corners: 453796, 5401770; 453731, 5401650; 453678, 5401678; 453743, 5401799 (UTM Zone 10, NAD 1983, North Azimuth).

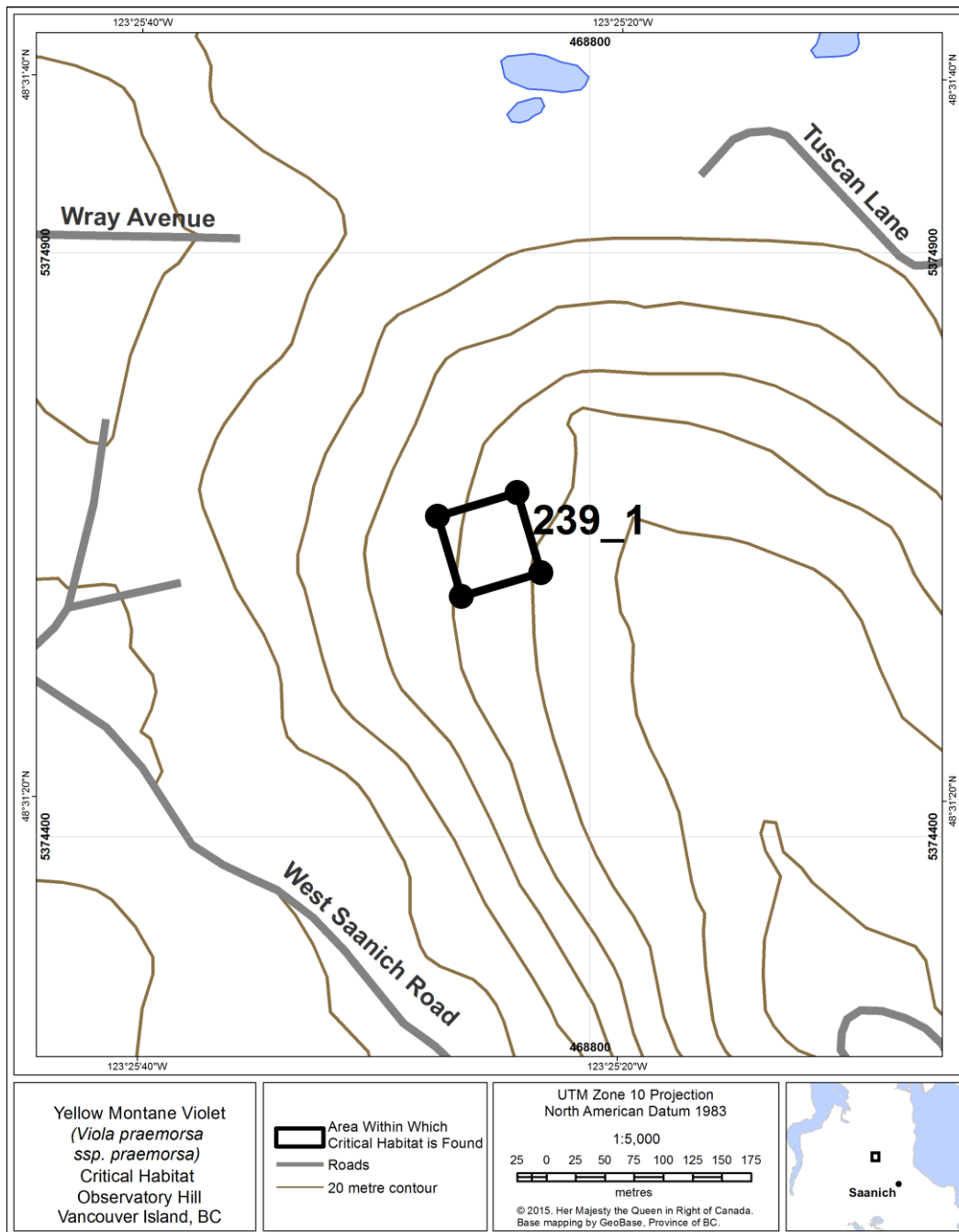


Figure 22. Area (~0.5 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Little Saanich Mountain, on federal and non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 239_1 is bounded by the following four corners: 468670, 5374674; 468738, 5374694; 468758 53746626; 468690, 5374606 (UTM Zone 10, NAD 1983, North Azimuth).

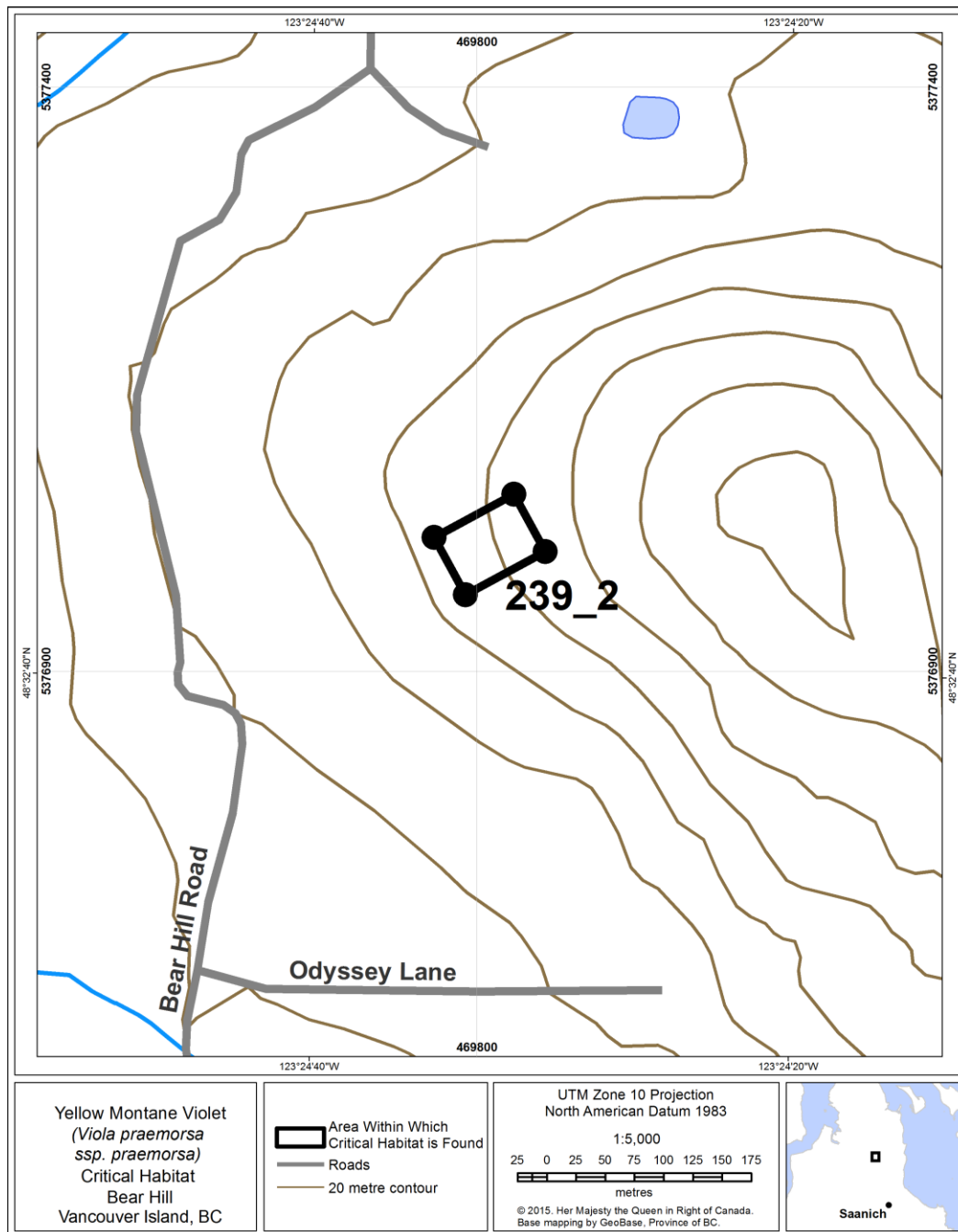


Figure 23. Area (~0.4 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Bear Hill, on non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 239_2 is bounded by the following four corners: 469763, 5377015; 469832, 5377052; 469858, 5377002; 469790, 5376966 (UTM Zone 10, NAD 1983, North Azimuth).

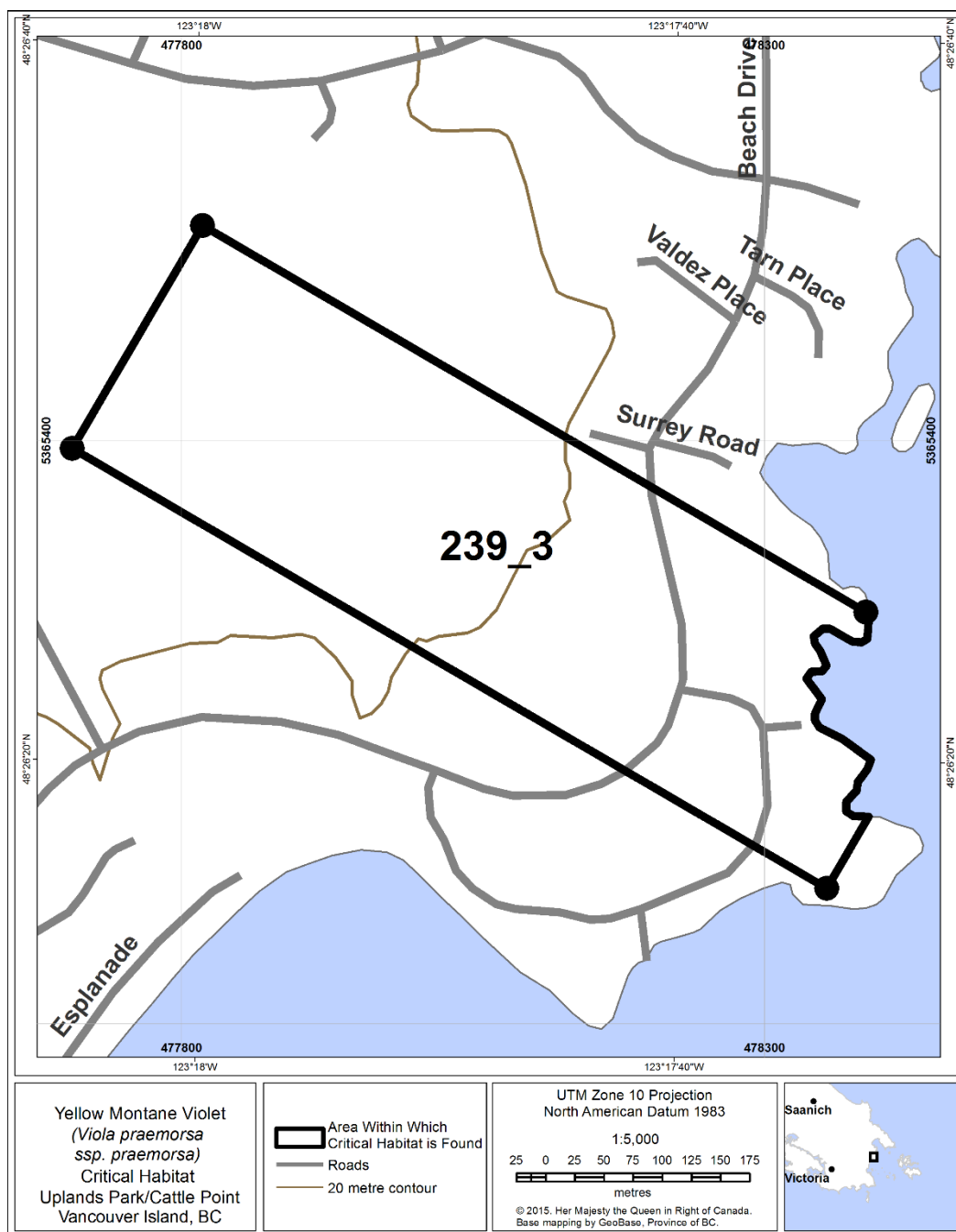


Figure 24. Area (~15.5 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Uplands Park/Cattle Point, on non-federal lands. The area of critical habitat within this area is approximately 1.0 ha. The critical habitat parcel 239_3 commences at 477706, 5365393; thence 30° in a straight line to 477817, 5365585; thence 120° in a straight line to 478387, 5365253; thence along the shoreline to 478353, 5365016; thence 300° in a straight line to the commencement point (UTM Zone 10, NAD 1983, North Azimuth).

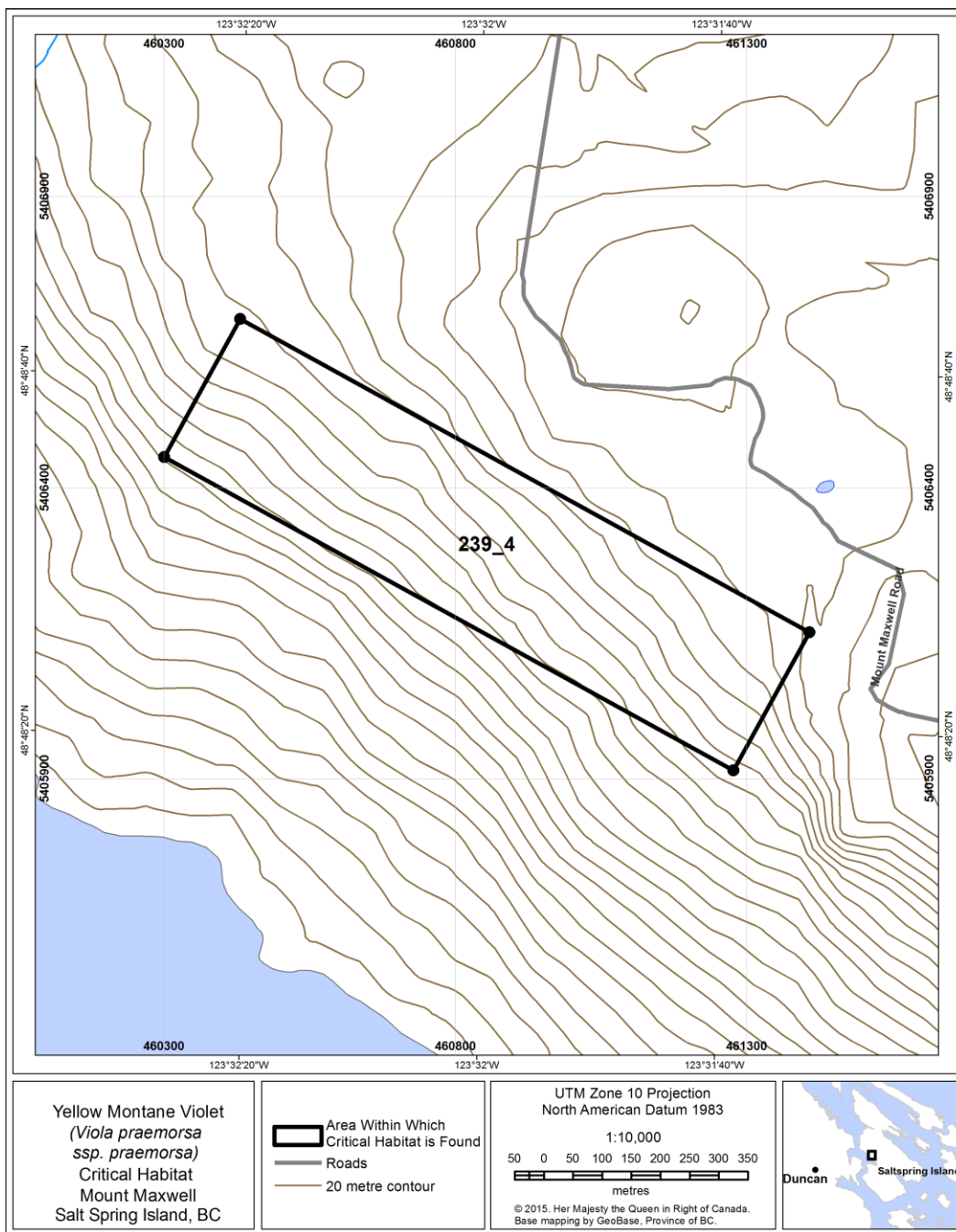


Figure 25. Area (~30.1 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Mount Maxwell, on non-federal lands. The area of critical habitat within this area is approximately 0.8 ha. The critical habitat parcel 239_4 is bounded by the following four corners: 460301, 5406452; 460431, 5406689; 461408, 5406151; 461277, 5405914 (UTM Zone10, NAD1983, North Azimuth).

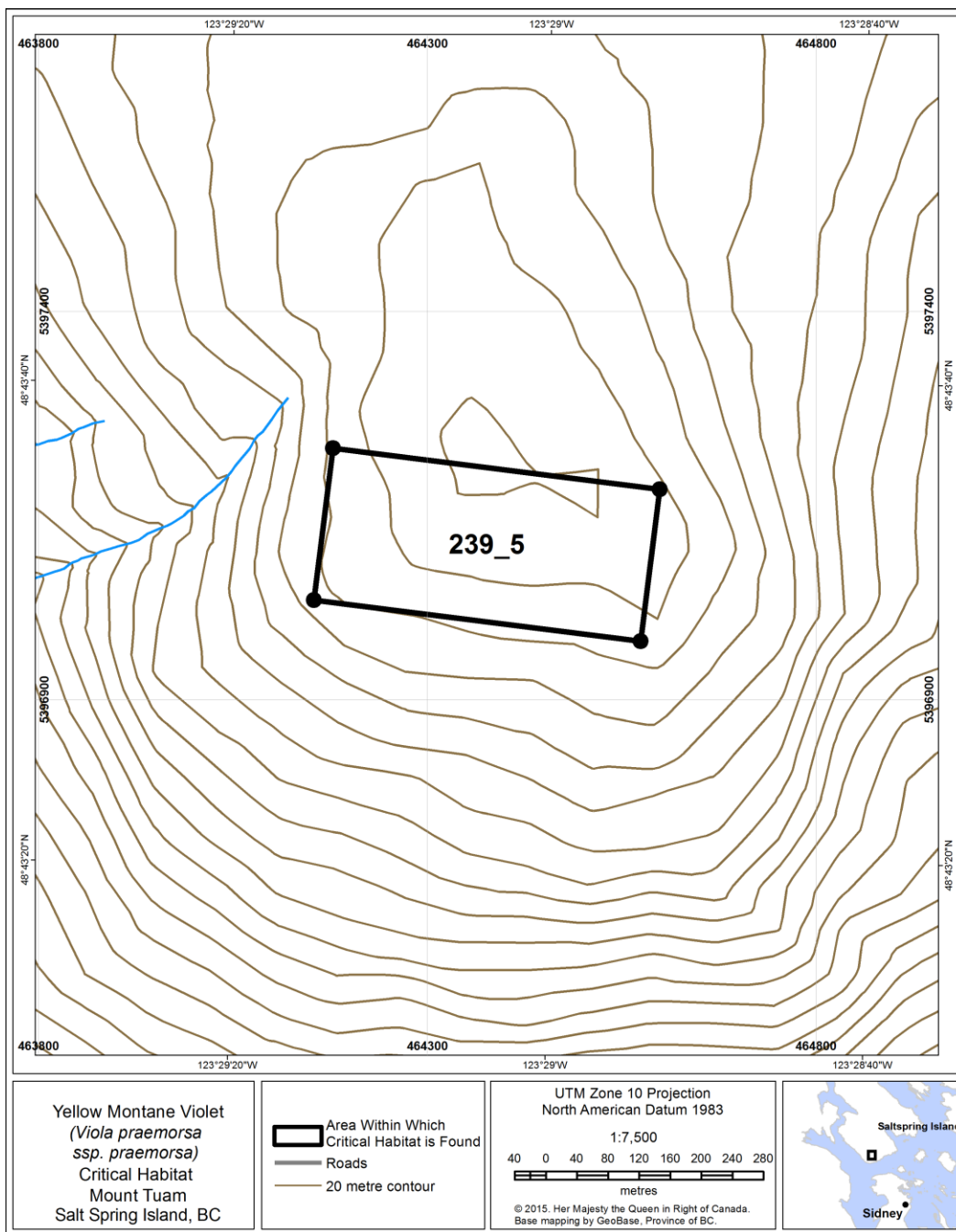


Figure 26. Area (~8.3 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Mount Tuam, on federal and non-federal lands. The area of critical habitat within this area is approximately 2.4 ha on federal land and approximately 0.9 ha on non-federal land. The critical habitat parcel 239_5 is bounded by the following four corners: 464179, 5397224; 464599, 5397171; 464574, 5396976; 464154, 5397028 (UTM Zone10, NAD1983, North Azimuth).

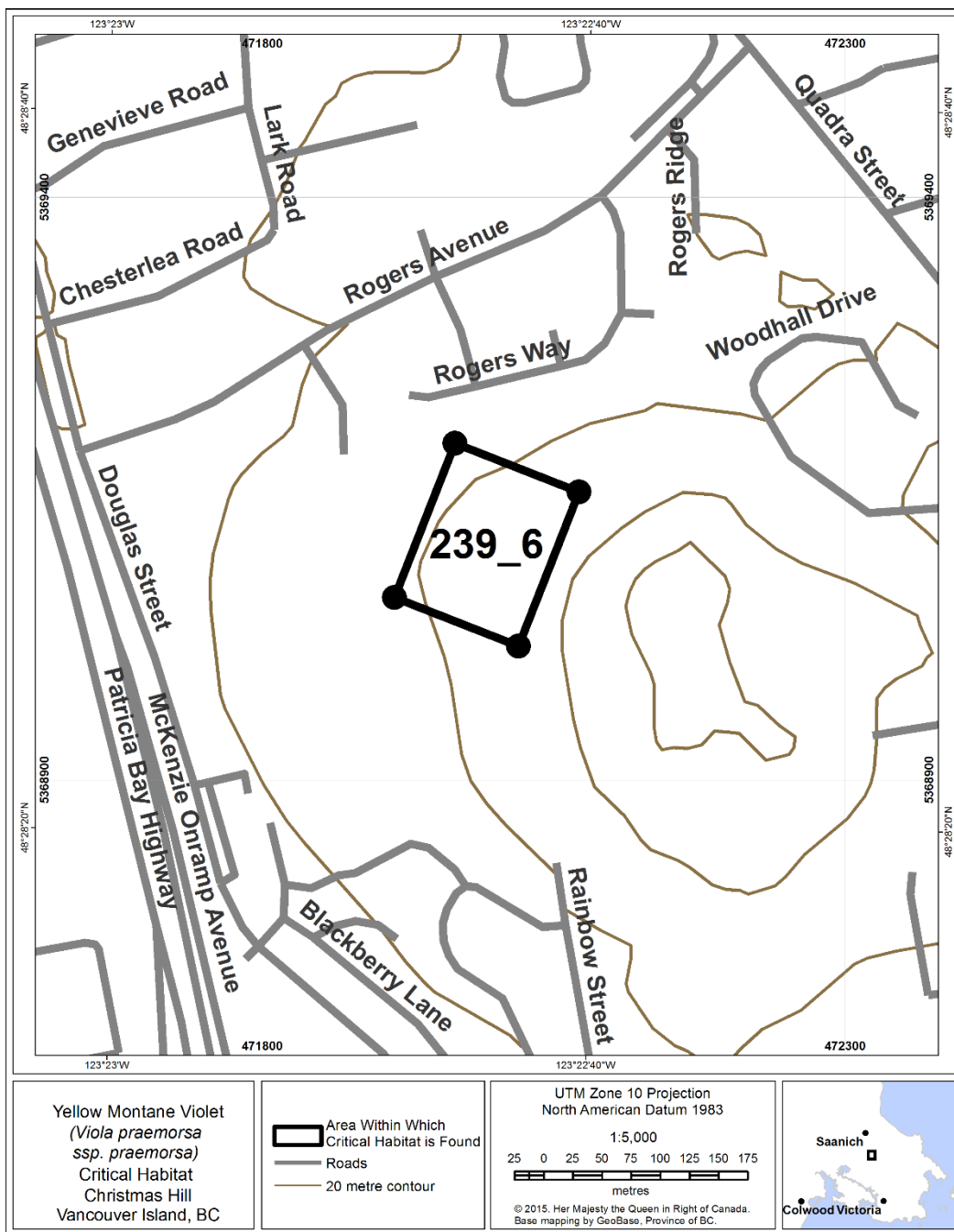


Figure 27. Area (~1.6 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Christmas Hill, on non-federal lands. The area of critical habitat within this area is approximately 0.6 ha. The critical habitat parcel 239_6 is bounded by the following four corners: 471965, 5369188; 472072, 5369147; 472019, 5369014; 471913, 5369057 (UTM Zone10, NAD1983, North Azimuth).

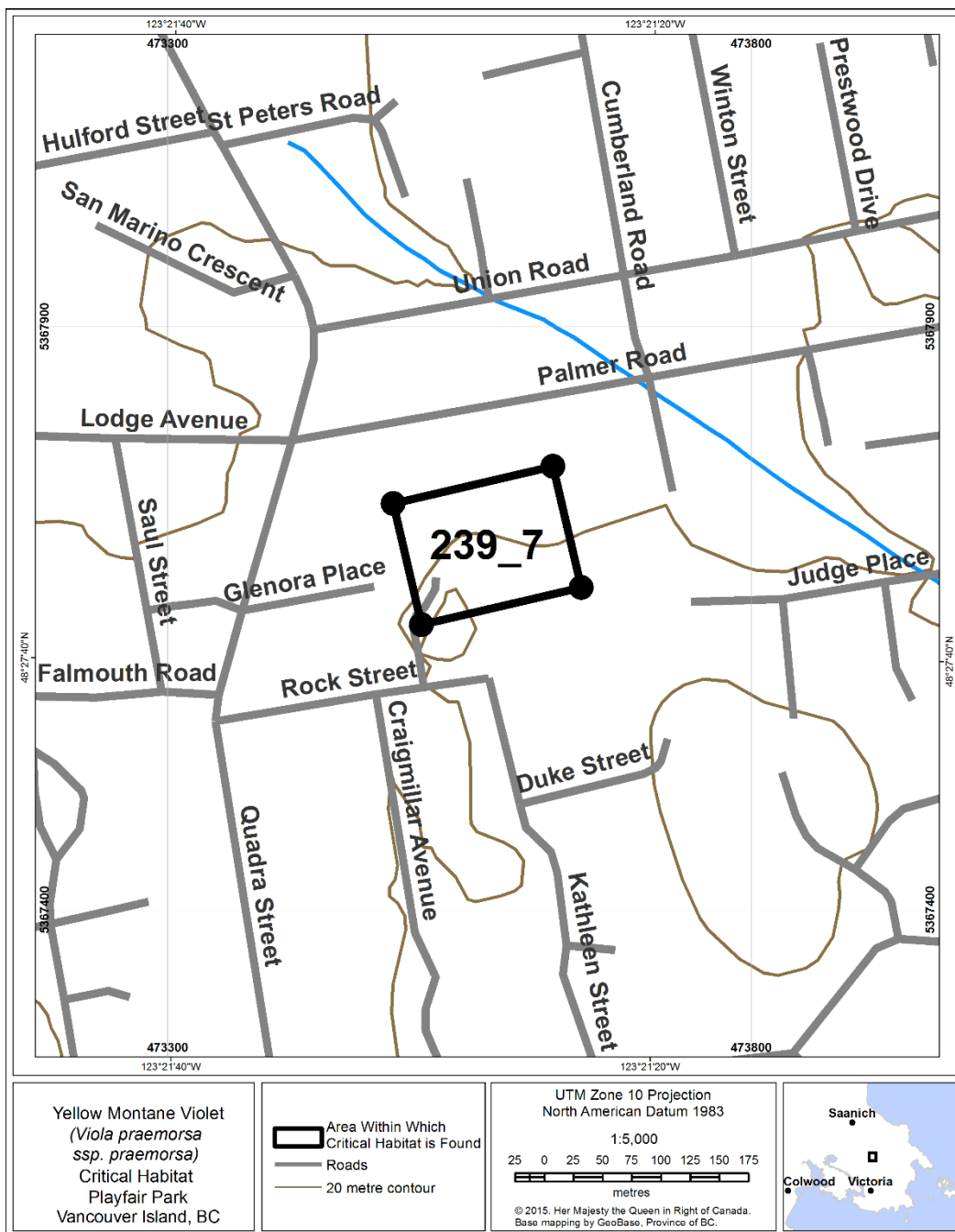


Figure 28. Area (~1.5 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Playfair Park, on non-federal lands. The area of critical habitat within this area is approximately 0.6 ha. The critical habitat parcel 239_7 is bounded by following four corners: 473493, 5367748; 473630, 5367780; 473654, 5367676; 473518, 5367644 (UTM Zone10, NAD1983, North Azimuth).

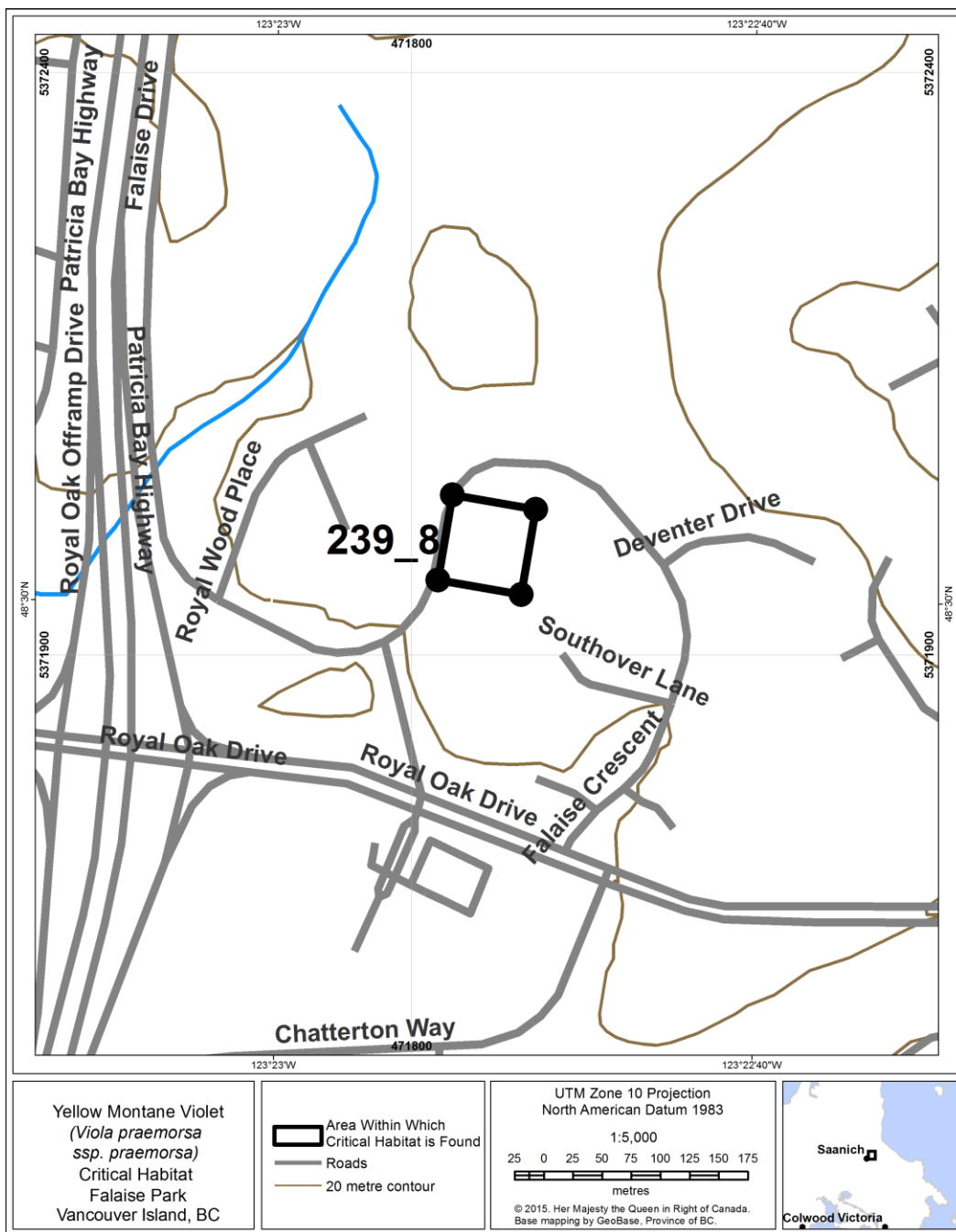


Figure 29. Area (~0.5 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Falaise Park, on non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 239_8 is bounded by the following coordinates: 471835, 5372037; 471906, 5372025; 471894, 5371952; 471822, 5371964 (UTM Zone10, NAD1983, North Azimuth).

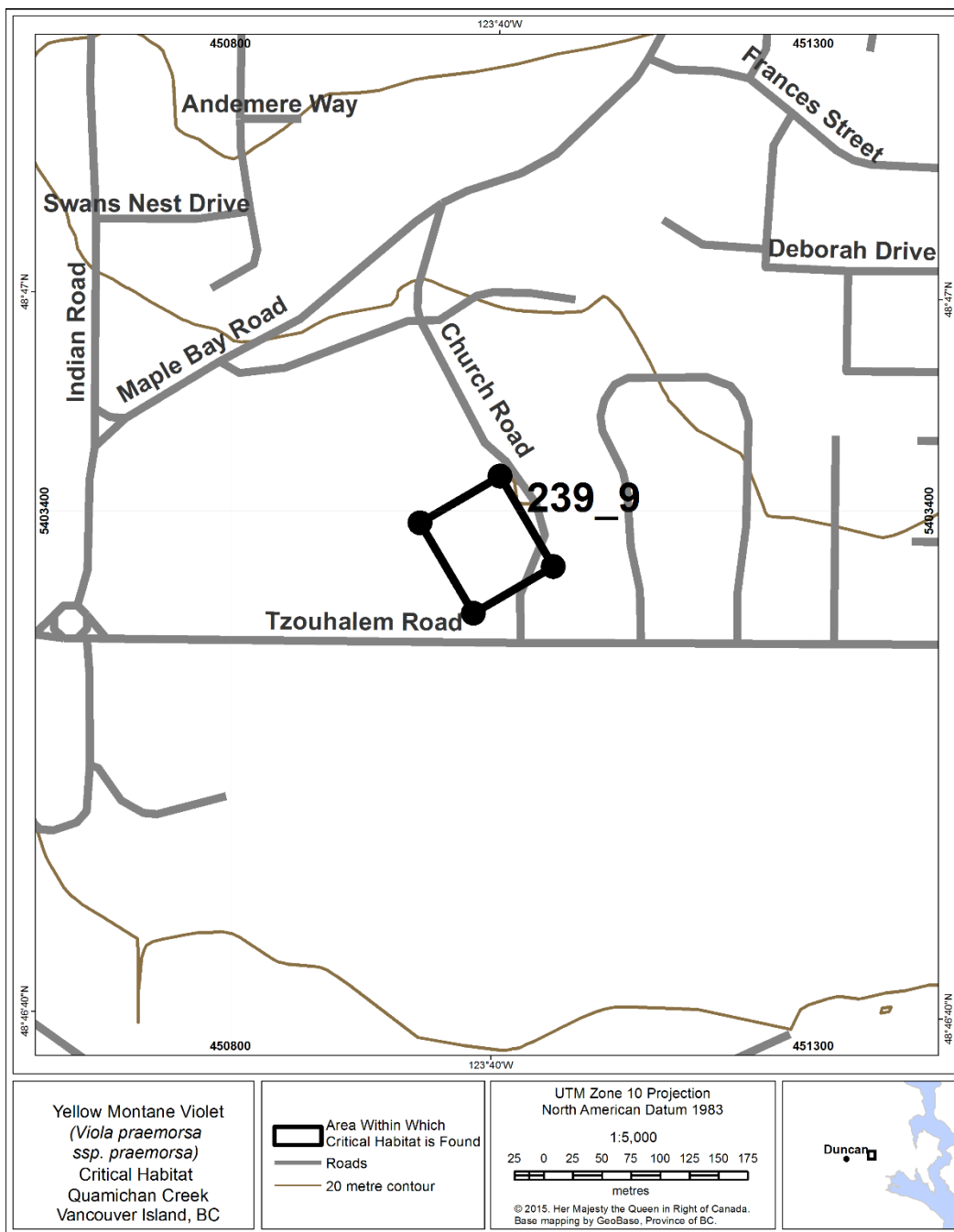


Figure 30. Area (~0.7 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Quamichan Creek, on non-federal lands. The area of critical habitat within this area is approximately 0.2 ha. The critical habitat parcel 239_9 is bounded by the following four corners: 450963, 5403390; 451031, 5403430; 451077, 5403352; 451008, 5403390 (UTM Zone10, NAD1983, North Azimuth).

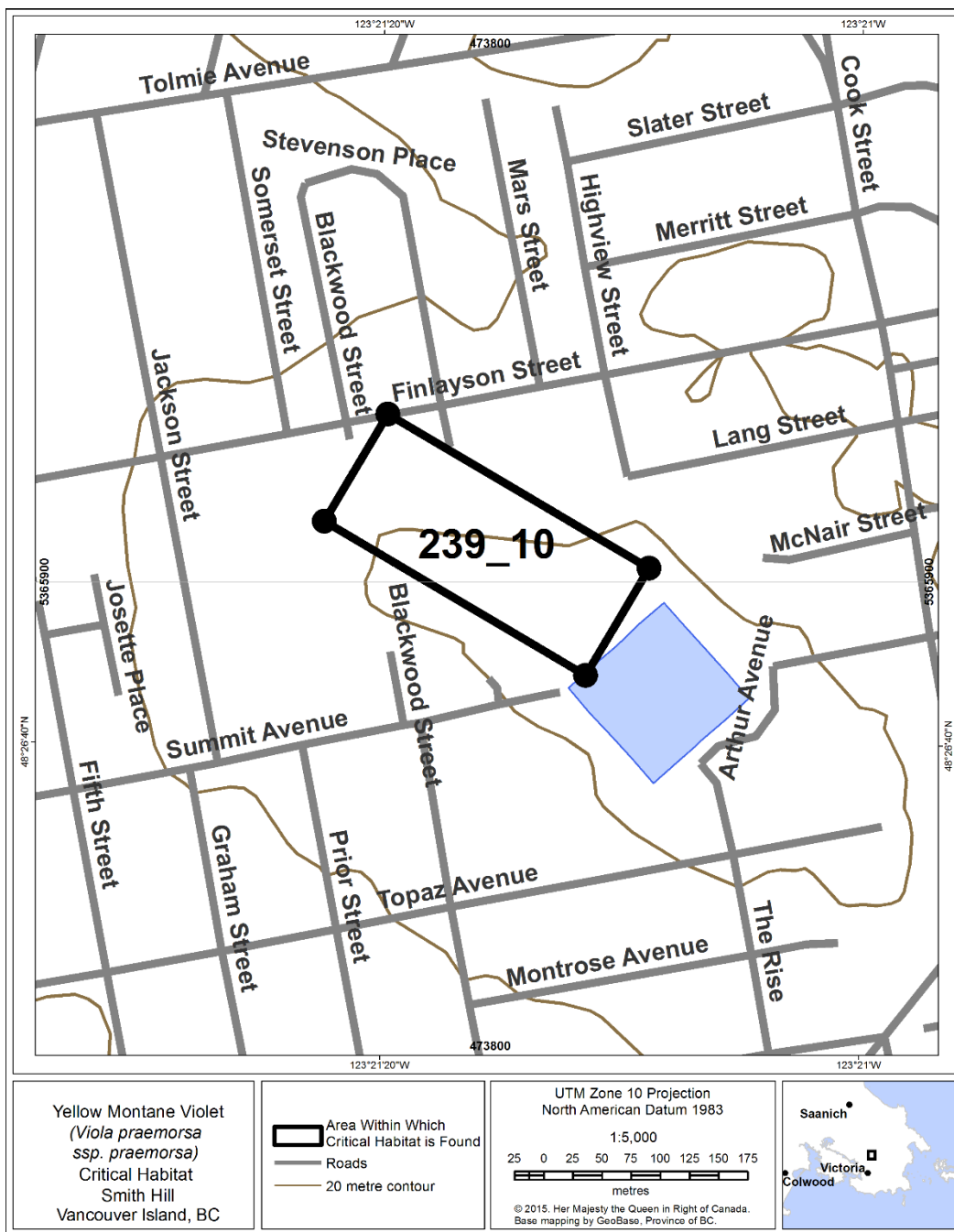


Figure 31. Area (~2.8 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Smith Hill, on non-federal lands. The area of critical habitat within this area is approximately 0.7 ha. The critical habitat parcel 239_10 is bounded by the following four corners: 473712, 5366044; 473936, 5365912; 473882, 5365820; 473658, 5365952 (UTM Zone10, NAD1983, North Azimuth).

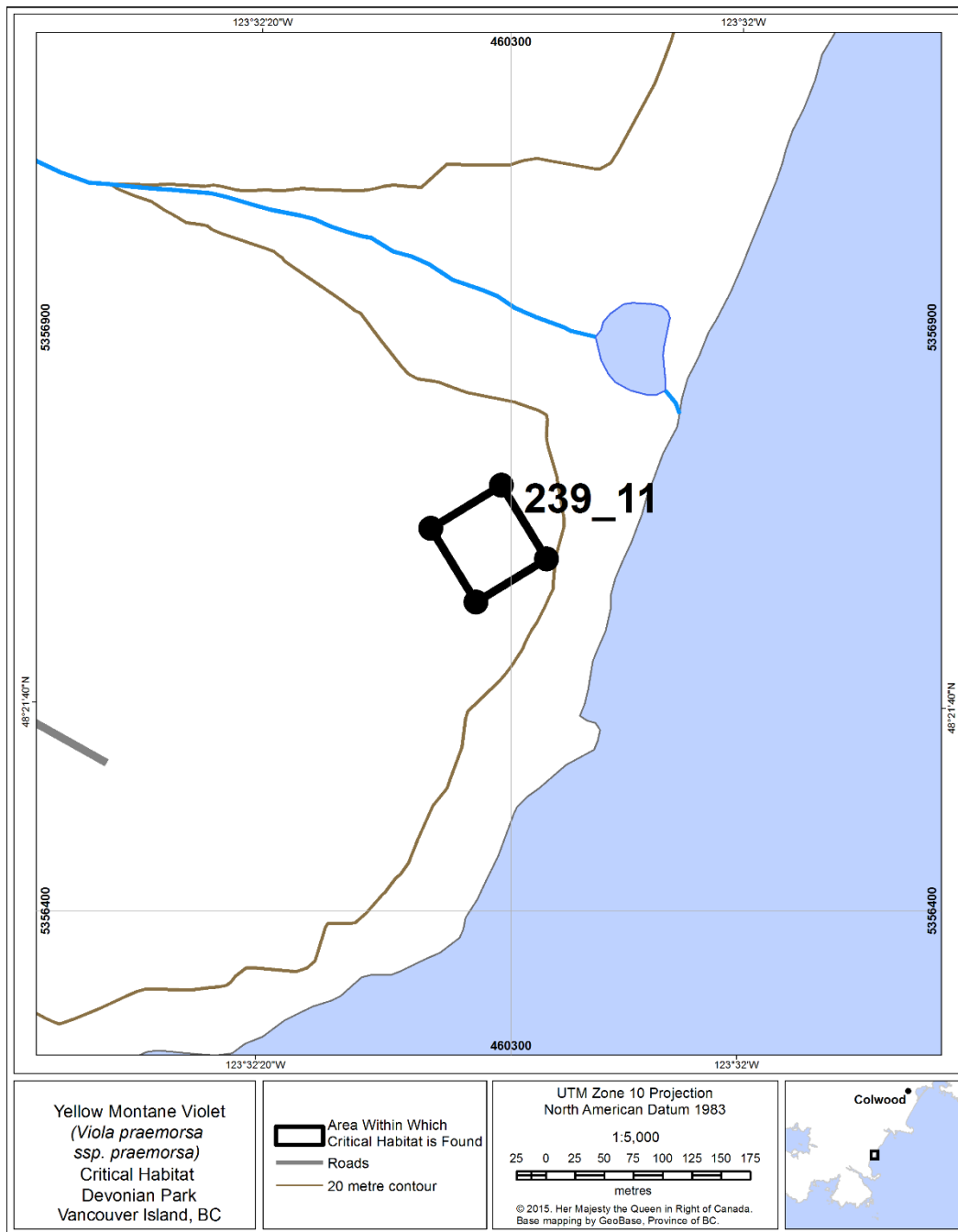


Figure 32. Area (~0.5 ha) within which critical habitat for Yellow Montane Violet *praemorsa* subspecies is found at Parry Bay, Devonian Park, on non-federal lands. The area of critical habitat within this area is approximately 0.1 ha. The critical habitat parcel 239_11 is bounded by the following four corners: 460231, 5356728; 460292, 5356765; 460330, 5356701; 460270, 5356664 (UTM Zone10, NAD1983, North Azimuth).

2.3.3. Examples of activities likely to result in destruction of critical habitat

Examples of activities likely to destroy critical habitat are provided below. Destruction of critical habitat will result if any part of the critical habitat is degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from single or multiple activities at one point in time or from the cumulative effects of one or more activities over time. It is important to note that some activities have the potential to destroy critical habitat from outside the critical habitat and also, that if carefully conducted the negative effects of some of these activities can be mitigated such that the activity will have no, or even a positive, effect on the habitat.

Table 5. Examples of activities likely to result in destruction of critical habitat.

Activity	Effect of activity on critical habitat	Potentially affected species*	Most likely site
Intensive recreational use (e.g., hiking, mountain biking, ATV traffic).	Soil compaction leading to altered habitat attributes, such as altered soil moisture or texture to the extent that it is no longer suitable for the species. In addition, this activity is likely to introduce or spread invasive alien plant species. Invasive alien plant species compete with Garry Oak woodland plant species and alter the availability of light, water, and nutrients in the habitat, such that the habitat would not provide the necessary habitat required conditions (see this standalone activity below for more details).	DB	Mt Tzuhalem Thetis Lake Mill Hill
		SFT	Mt. Erskine
		HT	Albert Head Tower Point Horth Hill Somenos
		YMV	Mount Tzuhalem Beacon Hill Somenos Bear Hill Uplands Park Christmas Hill Playfair Park Falaise Park
Direct land conversion by human development (e.g., development or modification of existing structures and roads).	Indirect effects of shading (e.g., by introduced plants or nearby structures), and altered moisture regime (e.g., impounded drainage, or reduced water flow to the plants through ditching or diversion of subsurface water by built structures) can alter the habitat of plant species. This disrupts life cycle processes, causes physiological stress and plants may die or be unable to germinate due to impaired ability of the habitat to provide suitable conditions.	DB	Mt Tzuhalem
		SFT	Salt Spring Island
		HT	Maple Bay Road Gordon Head William Head Cowichan Estuary
		YMV	Little Saanich Mountain Falaise Park St. Peter's Church

Activity	Effect of activity on critical habitat	Potentially affected species*	Most likely site
Deliberate or incidental introduction of invasive alien plants (e.g., landscaping plantings, seeds carried on unclean equipment, dumping plant waste).	This activity can cause increased competition from alien species and alter the availability of light, water, and nutrients in the habitat. Accidental introduction may be facilitated by contaminated machinery.	All species	All sites
Landscape maintenance activities (e.g., development and maintenance or modification of trails, stockpiling of materials, installation of park benches, picnic tables, fences, and signs).	These activities can cause direct land conversion, soil compaction and associated hydrological effects, altered moisture regime (e.g., impounded drainage, or reduced water flow to the plants through ditching, or diversion of subsurface water by built structures), and introduction of alien species (e.g., intentional plantings or accidental introductions such as facilitated by unclean machinery).	DB	Mt Tzuhalem Thetis Lake Mill Hill Beacon Hill Park
		HT	Albert Head Tower Point Horth Hill Maple Bay Road William Head
		YMV	Mt Tzuhalem Beacon Hill Park Bear Hill Uplands Park Mt Maxwell Christmas Hill Playfair Park Falaise Park St. Peter's Church

* DB=Deltoid Balsamroot, SFT=Small-flowered Tonella, HT=Howell's Tritelia, YMV=Yellow Montane Violet
praemorsa subspecies

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