Update on the Mineral Deposit Potential of the Nootka Sound Region (NTS 092E), West Coast of Vancouver Island, British Columbia[1]

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KEYWORDS: Nootka Sound, ore deposits, metamorphism, Sicker, Westcoast Crystalline Complex, geochemistry, layered ultramafic

INTRODUCTION

The Nootka Sound region is host to a few small ore deposits. These are skarns (Ford and Silverado) and intrusion-related Au mineralization, such as the Privateer in the Zeballos camp. The area was mapped in the 1980s by Muller *et al.* (1981), a large portion being categorized as a metamorphic complex representative of mid-crustal level rocks. This oversimplification and misidentification of metamorphic grade in the area, combined with difficult access and terrain, have made exploration difficult. Preliminary work in the Nootka Sound region indicated that the rocks in the area were locally contact metamorphosed by the Jurassic Island and Tertiary Mount Washington intrusive suites, but had not been subjected to high-grade regional metamorphism and thus could be correlated with the rock units in the southern parts of Vancouver Island (cf. Massey, 1991; Massey, 1995; Yorath *et al.*, 1999; DeBari *et al.*, 1999;). Potential correlations of these rocks with the Sicker Group also makes these rocks prospective for volcanogenic massive sulphide (VMS) – type mineralization, such as at Myra Falls (Barrett and Sherlock, 1996).

The primary goals of this study are to promote exploration in the area through improved geological mapping, lithogeochemistry, metallogeny and mineral-deposit studies. This paper summarizes this summer's mapping and some preliminary lithogeochemistry, which are part of a Geoscience BC project focused on improving the bedrock mapping in the Nootka Sound area. Basic prospecting and sampling were undertaken during the mapping. Work continues on completion of a lithogeochemistry study of the various rock types and on a revised metallogenic interpretation of the area, based on new mapping, geochemistry and geochronology.

LOCATION, ACCESS AND PHYSIOGRAPHY

The Nootka Sound region (Fig. 1) occupies a large portion of the west-central half of Vancouver Island. The study region is mostly coastal in nature and comprises many islands, fjords, channels and inlets. The most notable of these are Bligh Island, Muchalat Inlet, Tlupana Inlet, Shelter Inlet, Sydney Inlet, Stewardson Inlet, Zuciarte Channel and Millar Channel. The region is relatively rugged and heavily vegetated with rain forest, with some portions of it having been logged.

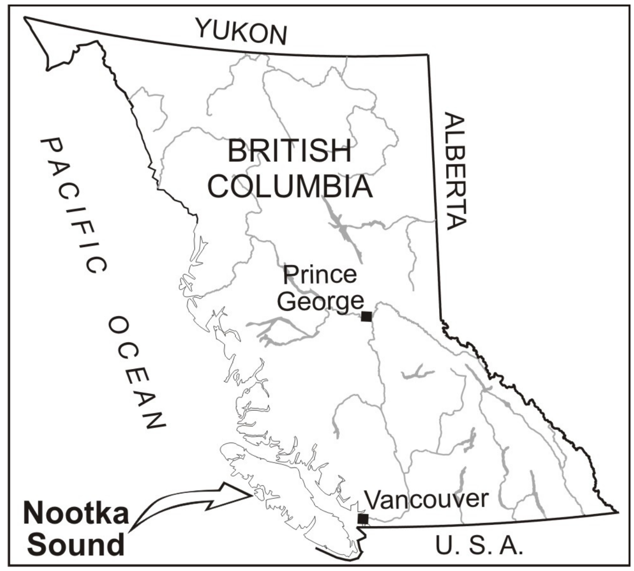

Figure 1. Location of the study area on the west coast of Vancouver Island.

Logging roads connected to the main road grid are accessed from the Gold River, Tofino, Zeballos and Tahsis roads. There are many additional logging roads not connected to the main road network, including the Conuma, Stewardson, Zuciarte, Escalante, Silverado and Houston main forestry roads (mainlines). Access to the field area this summer was by four-wheel-drive truck on logging roads connected to the main grid. Boats and fixed-wing aircraft were generally used to get to logging camps. A few weeks of coastal geological mapping were carried out using a variety of boats

PREVIOUS WORK

Previous work in the area has been carried out by a number of authors. Most notably, Muller *et al.* (1981). Two other important publications that describe similar rocks outside the study area are DeBari *et al.* (1999) and Yorath *et al.* (1999). Publications specific to mineralization in the area are Stevenson (1938, 1939, 1950), Muller *et al.* (1981), Sinclair and Hansen (1983), Hansen and Sinclair

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(1984) and Marshall *et al.* (2004) for the intrusion-related Au or 'Zeballos'-type mineralization. The other deposit types in the area, including vein, skarn and replacement types, are listed in Muller *et al.* (1981) and the interested reader is referred to that publication for additional references.

REGIONAL GEOLOGY

The study area is part of the Insular Belt of the Canadian Cordillera comprising a number of accreted volcanic terranes (Jones *et al.*, 1977; Wheeler *et al.*, 1991). Thus, the area consists mostly of metavolcanic rocks and their plutonic counterparts. Regional deformation is not pronounced. However, some rocks locally display minor tectonic foliation. Regional metamorphic grade in the area ranges up to middle greenschist facies. Local contact metamorphism around the intrusive rocks ranges from greenschist to migmatite, with many examples of partially melted inclusions of country rock. There are abundant brittle faults in the area, ranging from local to regional in scale. In most cases, the volcanic rocks are greenschist equivalents of Sicker, Bonanza and Karmutsen volcanic rocks. The volcanic rocks are, in most cases, impossible to distinguish in the field; it is virtually impossible to distinguish Sicker and Bonanza volcanic rocks in the study region even using geochemistry. The intrusive rocks are typical of the Jurassic Island and the Tertiary Mount Washington intrusive suites. Some of the more altered intrusive rocks may also be related to Sicker volcanism.

ROCK TYPES

A preliminary geology map (Fig. 2) and stratigraphic column (Fig. 3) for the rocks of the Muchalat Inlet area have been derived from field observations, airphotos and previously published reports and maps. Most of this year's mapping was concentrated in the areas surrounding and between Muchalat and Stewardson Inlets.

Older Basement Rocks

The older basement comprises fine-grained mafic rocks and more coarse grained intrusive rocks. The finer grained rocks appear to be mostly dikes or flows and exhibit no textures characteristic of extrusive volcanic rocks. Both fine-grained and coarser grained older basement rocks have been altered. Muller *et al.* (1981) mapped these rocks as Paleozoic and Mesozoic. Distinctive geochronological relationships with most of the rocks in the area are absent, but the higher degree of alteration observed in these rocks was not seen in either the Jurassic intrusive rocks or the Triassic extrusive rocks. Thus, it is inferred that these rocks are pre-Triassic. However, the altered coarse-grained rocks may be as young as early Jurassic and experienced a higher degree of alteration due to emplacement at depth. Geochronological work is underway to determine the exact age of the rocks.

FINE-GRAINED VOLCANIC AND HIGHER LEVEL INTRUSIVE FINE-GRAINED ROCKS (UNIT PMV)

These rocks are light to medium grey on fresh surfaces and dark brown/maroon on weathered surfaces. Grain size ranges from fine-grained (aphanitic to a few millimetres) basalt-dacite to a plagioclase-phyric basalt-dacite and locally even a plagioclase-hornblende-phyric basalt-dacite. Plagioclase and hornblende phenocrysts are up to 2 mm in diameter. The contacts between the different types of volcanic rocks are diffuse. There are varying amounts of alteration, with chlorite, yellow-green epidote-quartz veinlets up to 2 cm wide, and very small stringers (0.5 mm) of sulphide minerals. The volcanic rocks are intruded by dikes up to 3 m in width, veinlets of hornblende diorite and biotite-hornblende diorite, and rhyolite dikes. Within the volcanic rocks, there are dikes, patches and veinlets of equigranular coarser grained (2–3 mm) gabbro-like material resulting from partial remelting and recrystallization. The volcanic rocks are highly fractured and deformed within brittle faults and shear zones.

COARSE-GRAINED INTRUSIVE ROCKS (UNIT PMA_V)

These rocks, which are dark grey to whitish when fresh and white to tan brown when weathered, range from diorite to hornblende diorite (with abundant mafic minerals) to hornblende granodiorite. The intrusive rocks are equigranular and coarse grained, with grain size varying from 1 to 5 mm with generally finer grained mafic phases. There is epidote alteration and epidote-quartz veining along fractures. Abundant, fine-grained, rounded to angular volcanic inclusions generally range up to 30 cm in length, with some up to 3 m. There are abundant examples of local remelting and recrystallization of some of the volcanic clasts. Some basaltic inclusions have been completely recrystallized to fine-grained hornblende diorite. The intrusive rocks are themselves intruded by many basaltic dikes up to 1.5 m wide and striking generally 330–360° with steep dips.

Mooyah Formation (Unit PMm)

The Mooyah Formation comprises sedimentary and volcaniclastic rocks of various types. The rocks are best exposed in Mooyah Bay, on Anderson Point and along the northeastern parts of Zuciarte Channel. The rocks are interbedded cherty shale, sandstone-greywacke and conglomerate of turbidite sequences. Layers are generally up to 20 cm thick, although some of the more cohesive sandstone layers are up to 1 m and some pebble conglomerate layers are up to 2 m. Finely layered (1–2 cm) shaly beds are mostly found interbedded with coarser, more massive layers of sandstone and/or siltstone-sandstone. The sandy layers are pebble rich, with abundant (30%) white-weathering feldspar-rich clasts in a sandy matrix. The silty-sandy rocks have interlayered light and dark grey laminations up to 1 m thick. Some layers contain feldspar crystals and small pebbles (4 mm) of chert, and can locally be gossanous. There are also alternating sandy and silty crystal tuffs with very subtle layering. The crystal tuffs have 3–4 mm feldspar and hornblende crystals and smaller shaly clasts. The conglomeratic rocks have well-rounded fragments of volcanic rock up to 8 cm long, smaller fragments (2 cm) of a more felsic volcanic phase, quartz and feldspar fragments, and some hornblende crystals ranging up to 5 mm in a very fine grained volcanic matrix with no visible bedding. There are also minor beds of limestone and fine-grained diopside-garnet skarn at a few locations. The finer grained sedimentary rocks can be massive and have well-developed bedding with northeasterly strikes. They are light grey to black when fresh and a buff to rusty brown colour on the weath-

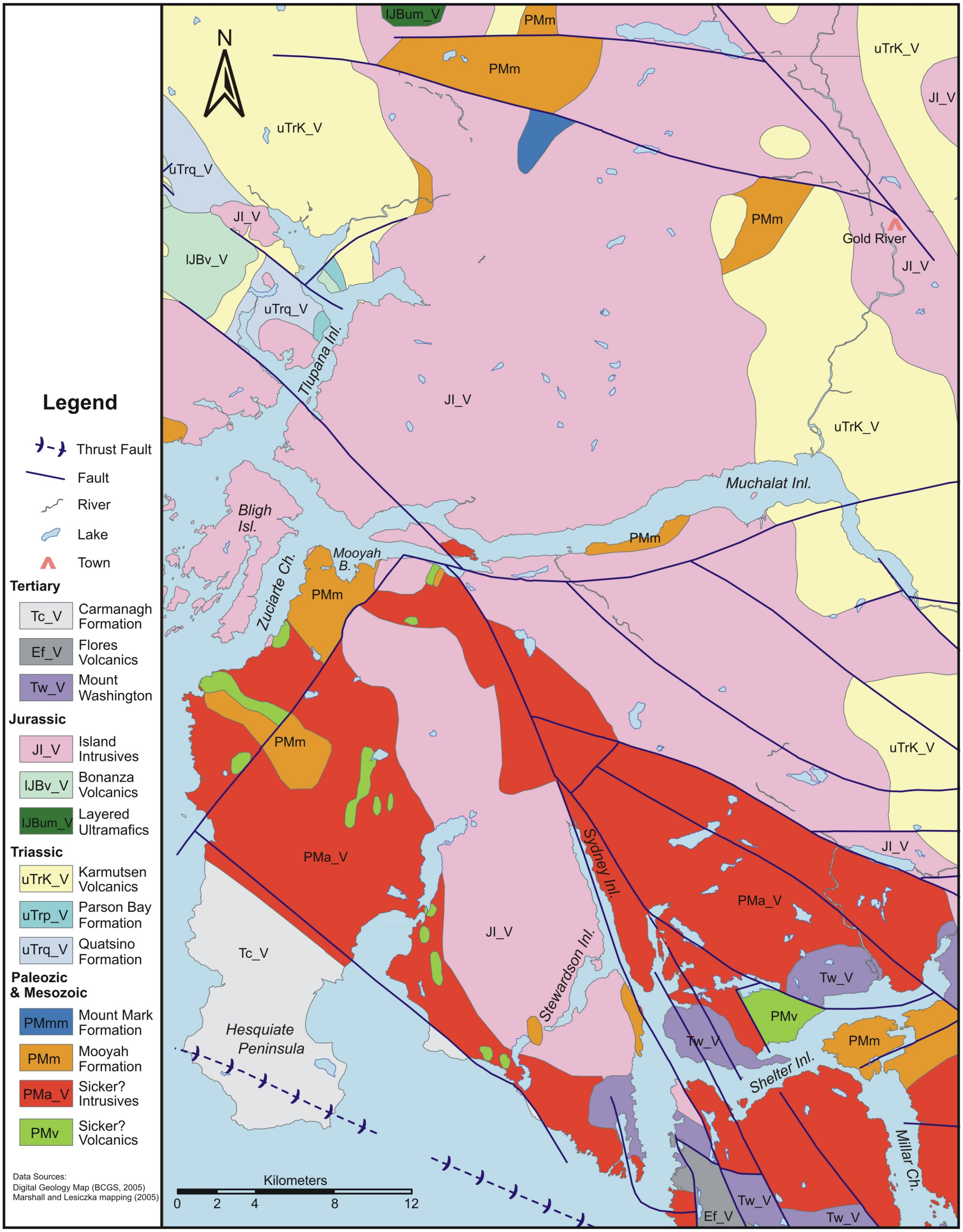

Figure 2. Preliminary geology of the study area, Nootka Sound region (after Muller *et al.*, 1981).

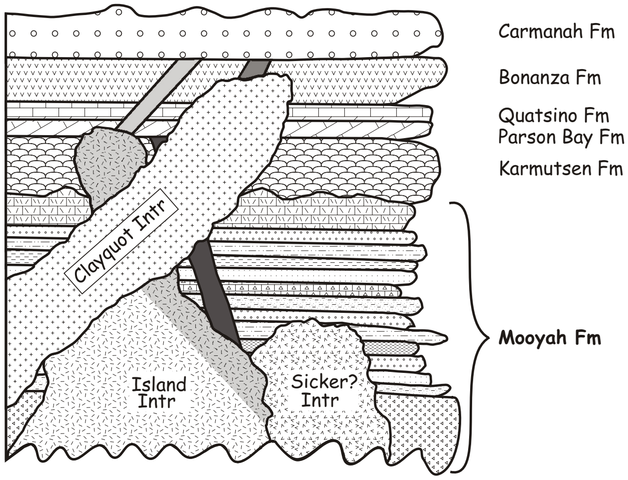

Figure 3. Idealized stratigraphic column. Unit thicknesses are not to scale. The base of the newly named Mooyah Formation is potentially equivalent to the McLaughlin Ridge Formation (Yorath *et al.*, 1999) and the lower parts of the Mooyah Formation are possibly correlative with the Fourth Lake Formation (Yorath *et al.*, 1999). The upper calcareous units of the Mooyah Formation may be possible correlatives with the Mount Mark Formation (Yorath *et al.*, 1999). Note that the intrusive rocks labelled as Sicker intrusive rocks are not dated and no contact relationships have been established in the field. Thus, these rocks may be an early generation of the Jurassic Island intrusive suite or as old as upper Paleozoic.

ered surface. Fining-upward sequences, ripple marks and rip-up clasts in number of locations indicate tops up in all locations displaying geopetal indicators.

The Mooyah Formation is intruded by diorite, rhyolite and mafic dikes (Fig. 4), and cut by quartz veins with minor epidote. There are some fine-grained epidote clasts (5 cm) and epidotized patches. The rocks are slightly deformed by fracturing and shearing, as well as by broad, low-amplitude folds that indicate antiformal closure to the north. The total thickness of the package is difficult to estimate due to possible apparent thickening from folding and fault repetition; however, the total package is estimated to be on the order of 1 km in thickness. Although the geochronology of the Mooyah Formation is not yet established, the authors have interpreted it as pre-Triassic. The volcaniclastic rocks of the lower Mooyah Formation may be correlative with the McLaughlin Ridge Formation, while the upper Mooyah Formation is probably correlative with the Fourth Lake Formation (Yorath *et al.*, 1999).

Mount Mark Formation (Unit PMmm)

The Mount Mark Formation (Yorath *et al.*, 1999) is exposed in the north-central portion of the study area (Fig. 2). The exposures here are several hundred metres thick and form highly visible light grey cliffs along the Conuma mainline. Layer thicknesses vary from a few centimetres to tens of metres. The layers are broadly to tightly folded and, in general, the Mount Mark Formation in this area is a tremolite marble, with minor occurrences of diopside marble. Marble formation is due to the intrusion of the nearby Jurassic Island intrusions.

Karmutsen Formation (Unit uTrK_V)

The Karmutsen rocks were not studied in detail. In general, the Karmutsen volcanic rocks (uTrK_V) are a relatively thick (~4 km) Triassic succession of dominantly pillow and massive basalt with comagmatic dikes and sills, and minor sedimentary and volcaniclastic rocks (Yorath *et al.*, 1999).

Quatsino and Parson Bay Formations (Units UTrq_V and UTrp_V)

The Triassic Parson Bay Formation is not well represented in the study area. The few outcrops observed were shaly limestone and were consistent with other descriptions of this rock type (cf. Muller *et al.*, 1969, 1981; Jeletzky, 1976; Yorath *et al.*, 1999). Likewise, outcrops of the Triassic Quatsino Formation are not abundant and the reader is directed to other publications for more detailed discussions of these rocks (cf. Muller *et al.*, 1974, 1981; Jeletzky, 1976; Yorath *et al.*, 1999).

Island Intrusive Suite (Unit JI_V) and Layered Ultramafic Rocks (Unit lJBum_V)

Rocks from the Jurassic Island intrusive suite vary from biotite-hornblende granodiorite to biotite-hornblende diorite (Fig. 5). The rocks are black and white on fresh surfaces and white on weathered surfaces. They are equigranular coarse grained (up to 8 mm) with occasional (1 cm) quartz veins. There are numerous volcanic inclusions that range from angular to rounded and are generally up to 30 cm in length, with few up to 1 m. The clasts can be fine-grained basalt to completely recrystallized finer grained mafic diorite. Clasts with partly recrystallized hornblende and plagioclase edges and remnant basalt cores are evidence of partial remelting and migmatization of the

Figure 4. Fine-grained felsic dike, approximately 2 m in width, cutting the flat-lying undisturbed sedimentary rocks of the Mooyah Formation at Anderson Point near Mooyah Bay, Muchalat Inlet.

clasts. Within the diorite, there are also very large screens (tens of metres) of layered Mooyah sedimentary rocks. The Island intrusive rocks are intruded by a number of different types of dikes, ranging from fine-grained granitic dikes (4 cm wide), mafic plagioclase-phyric dikes, aphanitic rhyolite/dacite dikes (1 m) and diorite dikes (40 cm wide) to mafic basalt-gabbro dikes up to 1.5 m in width. The rocks are locally fractured and sheared, but to a much lesser degree than the basement rocks. There is some vein-type mineralization along faults and shears, with minimal amounts of hydrothermal alteration comprising fine-grained chlorite, epidote and quartz along fractures.

The new ultramafic unit found on the upper reaches of the Conuma mainline consists of layered gabbro and pyroxenite (Fig. 6). The pyroxenite layers vary up to 60 cm in thickness and comprise relatively coarse grained (5 mm) equigranular pyroxene, phlogopite and plagioclase. The pyroxene constitutes 85% of the rock, with 10% phlogopite and 5% plagioclase making up the remainder. The gabbroic layers are generally thinner, ranging up to 30 cm, and comprise equal amounts of equigranular plagioclase and pyroxene, with grain sizes ranging up to 7 mm. This unit is arbitrarily assigned to the Jurassic. No contact relationships were observed with the surrounding Jurassic Island intrusive suite or the neighbouring Karmutsen rocks; thus, the layered ultramafic rocks might be Triassic.

Bonanza Group Rocks (Unit lJBv_V)

The Triassic Bonanza Group rocks are considered to be dominantly the extrusive equivalents and associated minor sedimentary rocks of the Island intrusive suite. These rocks outcrop in the northern portions of the study area and also to the west, on Nootka Island. The Bonanza rocks are calcalkaline pyroclastic rocks and associated hypabyssal rocks (Yorath *et al.*, 1999). The rocks tend to weather a slightly reddish colour and are generally dark grey on the fresh surface. The entire suite tends to be plagioclase phyric, with the plagioclase phenocrysts ranging up to several millimetres in length. These rocks were not studied in detail during this field season and no attempt has been made to subdivide the group into subunits, as in Jeletzky (1954), Muller *et al.* (1981) and Yorath *et al.* (1999).

Mount Washington Intrusive Rocks (Unit Tw_V)

Tertiary intrusive rocks are difficult to distinguish from the Jurassic Island intrusive suite. In the field, they have been distinguished by their large plagioclase phenocrysts in a finer grained matrix and fresher mafic minerals. The rocks range in composition from granodiorite to diorite, with matrix grain size varying up to 4 mm and porphyritic plagioclase ranging up to 1 cm. The mafic contents vary up to 15%, with amphibole generally the dominant mafic phase but usually accompanied by biotite. The fresh surface is generally white with black mafic minerals and aphanitic basalt to ghosted diorite clasts. Clasts are rare compared to the Island intrusive suite, but they can range in size up to 30 cm and, in some rare cases, constitute up to 10% of the rock. The weathered surface is generally a light tan to white colour.

MINERALIZATION POTENTIAL

The study region is host to a number of different deposit types. The largest of these are the Silverado mine and associated mineralization, such as the Baltic and Danzig. These are recorded as skarn and replacement-type deposits in limestone and Island intrusive rocks (MINFILE 082FSW323; MINFILE, 2005). The combined deposits

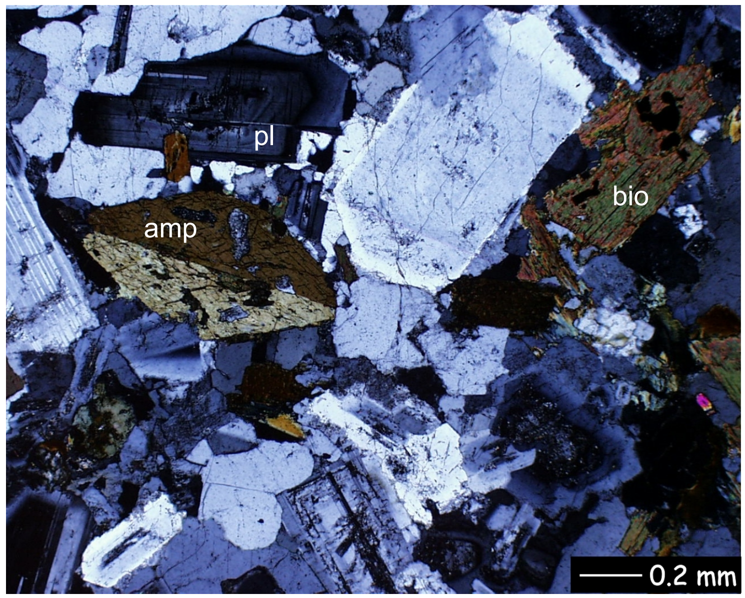

Figure 5. Thin-section photomicrograph of a slightly altered hornblende-biotite diorite from the Island intrusive suite (sample DM-05-182). Note the twinned poikiloblastic hornblende with typical amphibole (amp) cleavage intersection angles, zoned plagioclase (pl) and slightly altered biotite (bio). Photograph taken in plane-polarized light.

Figure 6. Gently eastward-dipping layered ultramafic rocks on the Conuma main forestry road. The layers consist of alternating bands of coarse-grained gabbro (gbo) and relatively finer grained peridotite (pdt). Hammer for scale.

produced 5567 g Au, 10 294 g Ag and 87 kg Cu. Other interesting mineralization types hosted within similar rocks adjacent to the study area include intrusion-related Au in the Zeballos camp, Fe-skarn mineralization (*e.g.*, the Ford mine), minor Au in pyrrhotite veins (*e.g.*, Beano on the Little Zeballos River) and VMS-type mineralization within the Sicker Group at Myra Falls.

Intrusion-Related Gold Mineralization

The study area has potential for Au mineralization similar to the intrusion-related deposits in the Zeballos camp. The Zeballos mineralization is related to the emplacement of the Tertiary Mount Washington intrusive rocks. This study has tentatively identified another large intrusion of this type in Shelter Inlet. The occurrence of the Mount Washington – type intrusive rocks in general proximity to volcanic rocks and Mooyah sedimentary rocks is prospective. Another earmark of Zeballos-type mineralization is the presence of carbonate rocks. No carbonate rocks or areas of mineralization were observed during this summer's fieldwork. However, there is still much unexplored ground in the area.

Sulphide Vein – Type Mineralization

The sulphide vein – type mineralization found on the H7000 spur north of the Stewardson mainline is similar to the mineralization at the Beano showing near the mouth of the Little Zeballos River. The mineralization at Beano consisted of three types (MINFILE): quartz-calcite-pyrrhotite stringers, disseminated pyrrhotite and lenses of massive pyrrhotite. The H7000 mineralization, which consists of a vein of massive pyrrhotite with blebs and veinlets of chalcopyrite and inclusions of altered hostrock, resembles the lenses of massive pyrrhotite from Beano. The inclusions consist of chlorite and constitute approximately 10% of the vein material. The chalcopyrite veinlets appear to cut the massive pyrrhotite within the main vein and make up as much as 2% of the rock. The vein, which strikes north-northeast and dips 80°W, is exposed at the edge of a small pond and disappears beneath the pond. The total length of the vein in outcrop is approximately 1.5 m. Preliminary geochemistry on a grab sample returned 0.5% Cu, elevated As and 0.005 ppm Au. The vein width varies from 10 to 30 cm in outcrop (Fig. 7). In polished thin section. chalcopyrite veins (Fig. 8) and blebs are abundant and appear to postdate the pyrrhotite. There is arsenopyrite associated with the chalcopyrite in thin section. Lack of exposure makes the vein hard to follow. However, a gossanous region can be seen on the other side of the valley directly along strike from the vein.

Figure 7. Gossanous zone containing a pyrrhotite vein cutting poorly bedded sedimentary rocks of the Mooyah Formation from the H7000 spur of the Stewardson main forestry road. The vein comprises predominantly massive pyrrhotite with minor veinlets and blebs of chalcopyrite visible in hand specimen. The vein-hostrock contacts vary from sharp to diffuse. Hammer for scale.

Skarn-Type Mineralization

Skarn mineralization has been reported at Silverado within the study area and nearby at a number of locations, most notably the Ford Fe-skarn north of Zeballos. The Silverado is hosted within limestone of uncertain age near the flanks of a large Jurassic Island intrusion. It is predominantly a Zn skarn with minor Ag, Au and Cu mineralization. The Ford skarn is hosted within Triassic carbonate rocks. It is magnetite skarn and is associated with the emplacement of Jurassic Island intrusions. There are two localities found this summer that have similar geological settings of calcareous rocks intruded by Jurassic Island intrusions. The exposed areas of carbonate were limited and, although there was abundant evidence of calcsilicate skarn minerals, there was little observed sulphide mineralization. Due to limited access and heavily vegetated terrane, however, there remains abundant unprospected terrain. The first of these areas is adjacent to the sulphide vein mineralization near the H7000 spur off the Stewardson mainline. There is some skarn exposed in a roadcut. Additionally, a small stock of Mount Washington intrusive (as mapped by Muller *et al.*, 1981) in Hisnit Inlet appears to be part of the Jurassic Island intrusive suite. The intrusion was emplaced into Quatsino and Parson Bay carbonate rocks, thus making it prospective for Silverado-type mineralization. A small marble quarry occurs in the marble near the intrusive contact and indicates that metamorphic conditions are probably appropriate for skarn-type mineralization.

VMS-Type Mineralization

Some metavolcanic rocks occur in the study area. Preliminary geochemistry and the presence of the overlying Mooyah Formation indicate that some of these volcanic rocks are most likely equivalent to Sicker Group volcanic rocks and correlative with the rocks hosting the Myra Falls mine, as described by Barrett and Sherlock (1996). The rocks on the upper portions of the H7000 spur are highly gossanous (Fig. 9) and contain abundant mineralized veins, up to 15 cm wide, that are comparable to typical VMS stockwork mineralization. The hostrocks are massive flows and volcaniclastic rocks with abundant chlorite-epidote alteration. The gossanous zones are up to 10 m in width. A grab sample from one of the highly weathered sulphide veins returned 2.5% Cu (Table 1).

Layered Ultramafic Rocks

Although not one of the targets of this project, layered ultramafic rocks (Fig. 5) were found on the Conuma mainline in the north-central portion of the study area (Fig. 2). As noted above, these rocks have been arbitrarily assigned to the Jurassic but could also be Triassic in age. Argon/argon dating is in progress. If these rocks are Triassic and thus related to the massive outpouring of mafic lavas forming oceanic plateaus during relatively short time intervals, then this rock type may be analogous to similar rocks that host such deposits as Noril'sk-Talnakh and the Thompson nickel belt. The presence of this rock type in the area certainly makes the region prospective for Ni and platinum group element – rich magmatic sulphide minerals (cf. Greene *et al.*, 2004).

MAPPING

Mapping from this summer (Fig. 2) has revealed some interesting features. Primarily, the Westcoast Crystalline Complex of Muller *et al.* (1981) is not a high-grade metamorphic complex as originally suggested and it can be subdivided into time-stratigraphic units correlative with other units on Vancouver Island. For example, the volcanic and volcaniclastic rocks found at the base of the Mooyah Formation (Fig. 3) may be correlative with the McLaughlin Ridge Formation, and the upper portions of the Mooyah Formation may be correlative with the Forth Lake Formation (Yorath *et al.*, 1999). Additionally, the Muller *et al.* (1981) map has inconsistencies relating to the identification of some intrusive rocks. This summer's efforts have identified a large stock of Mount Washington intrusive suite in Shelter Inlet; conversely a stock previously mapped as Tertiary Mount Washing Intrusive has been identified as part of the Jurassic Island intrusive suite. In both cases, these two igneous complexes can now be looked at as exploration targets for different types of mineralization.

CONCLUSIONS

Fieldwork is consistent with the rocks of the Westcoast Crystalline Complex having undergone a much lower grade of metamorphism than suggested by Muller *et al.* (1981). These preliminary results (Fig. 2) indicate that the rocks in the complex are probably correlative with other stratigraphic units on Vancouver Island, especially the sedimentary rocks of the Mooyah Formation. The basal and upper portions of the Mooyah Formation are probably correlative with the McLaughlin Ridge and Fourth Lake formations, respectively. Additionally, this summer's fieldwork has identified some exploration targets:

- at least one new occurrence of the Mount Washing intrusive suite, which is associated with Au mineralization in the neighbouring Zeballos Au camp
- a previously undocumented occurrence of layered mafic rocks near the contact between Jurassic and Triassic rocks that has potential for Ni and PGE-rich magmatic sulphide mineralization
- encouraging Cu values (2.5% Cu) from complex vein networks and possible stockwork mineralization in the altered volcanic rocks near Stewardson Inlet

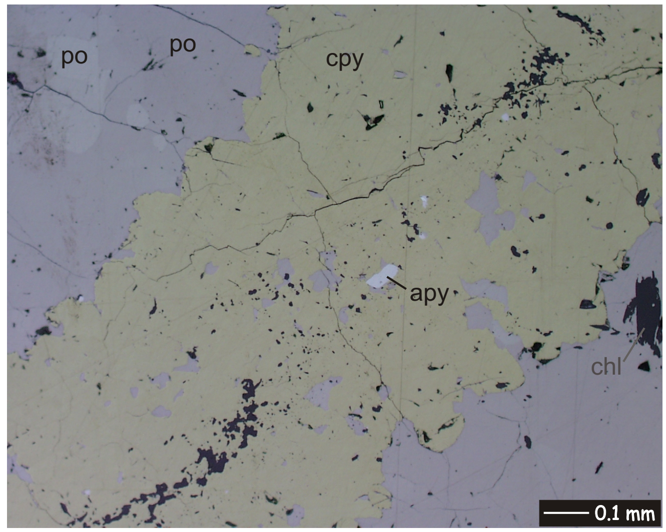

Figure 8. Polished thin-section photomicrograph of the pyrrhotite vein shown in Figure 7. A veinlet of chalcopyrite (cpy) cuts the generally massive pyrrhotite (po). Arsenopyrite (apy) is present in lesser quantities in the chalcopyrite veinlets. Inclusions of chlorite (chl) are present in both pyrrhotite and chalcopyrite. In some instances, the chlorite appears to be pseudomorphous after amphibole. Photograph taken under partly crossed polars.

Figure 9. Gossanous zone within altered mafic volcanic rocks, containing dispersed sulphide veins similar to a typical VMS stockwork zone. The vein on the extreme left (arrow) contains 2.5% Cu. The photograph is approximately 10 m in width.

TABLE 1. SELECTED GEOCHEMICAL RESULTS FOR THE GOSSANOUS VOLCANIC ROCK OCCURRENCE AND THE PYRRHOTITE VEIN (BOTH FROM THE H7000 SPUR OFF THE STEWARDSON MAIN FORESTRY ROAD)

Sample	Description	Au (ppm)	Cu (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	As (ppm)	S (wt.%)	Co (ppm)	Cr (ppm)
DM05-13	VMS	NA	24700	69	11	217	17.6	6	6.7	155	24
DM05-11	Po vein	0.005	4900	260	59	5	0.5	45	37.4	462	<1

Abbreviations: NA, not analyzed; Po: pyrrhotite; VMS, stockwork-like mineralization

potential for skarn mineralization similar to the neighbouring Silverado and Ford skarns

massive pyrrhotite veins with minor chalcopyrite mineralization that are similar to the veins described from the nearby Beano Au deposit on the Little Zeballos River

ACKNOWLEDGMENTS

The authors would like to thank Geoscience BC, Simon Fraser University, the Natural Sciences and Engineering Research Council of Canada (NSERC), Interfor Ltd., Spirit Lake Contracting, Western Forest Products Inc., Hesquiat First Nations and Peter Buckland for financial aid and/or assistance in the field and/or access to properties. Nick Massey from the BC Geological Survey is gratefully acknowledge for a very helpful field visit.

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