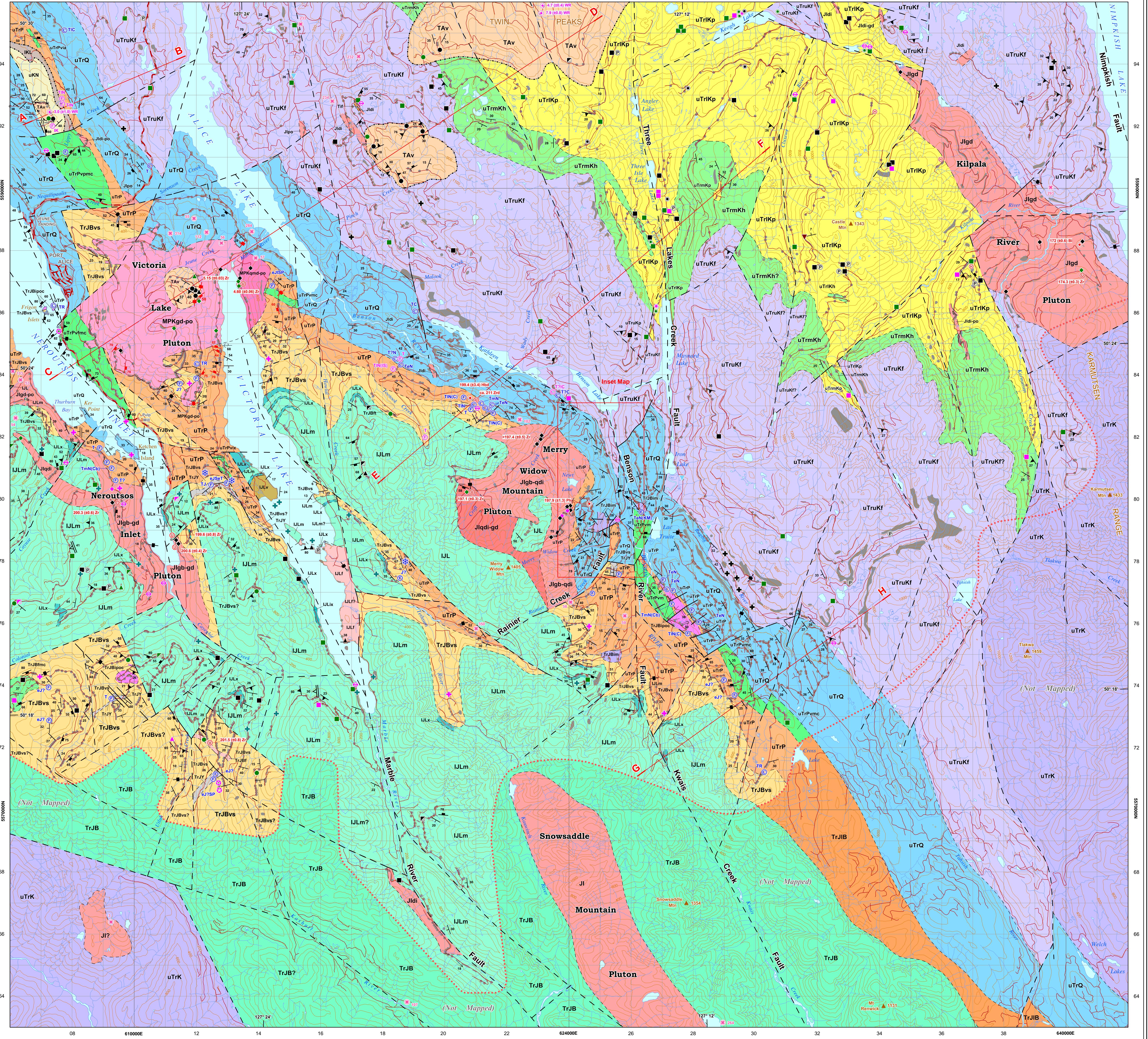




Geology, Geochronology, Lithogeochemistry and Metamorphism of the Alice Lake Area, Northern Vancouver Island

NTS 092L/06 and part of 092L/03

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D.A. ARCHIBALD (Queen's University)0 2 4
kilometres
Scale 1:50 000Ministry of
Energy
and Mines

LAYERED ROCKS

TERTIARY
Neogene
ALERT BAY VOLCANIC UNIT
TAV Dark grey to pale grey basaltic to mafic flows, flow domes and volcanic breccia; aphanitic to porphyritic, minor interbedded sedimentary rocks include volcanic conglomerate, sandstone, siltstone, and debris-flow deposits

UPPER CRETACEOUS
NANAIMO GROUP EQUIVALENTS (IN PART)
Companion to ?Maastrichtian
uKN Grey to greenish grey and brown, medium to coarse-grained arkosic to lithic wacke, pebble to cobble conglomerate, siltstone and minor coal; locally fossiliferous

LOWER CRETACEOUS
Upper Valanginian to Barremian
LONGARM FORMATION EQUIVALENTS
IKL Greenish to brownish grey, thickly bedded to massive sandstone, siltstone, mudstone, pebble conglomerate and minor coal; locally fossiliferous

UPPER TRIASSIC TO LOWER JURASSIC
BONANZA GROUP
TrJB Undifferentiated volcanic and sedimentary rocks of the Bonanza Group (outside the map area)

TrJBs Undifferentiated strata of the Parson Bay Formation (uTrP) and overlying volcanoclastic-sedimentary unit (TrJBs) in the lower part of the Bonanza Group (outside the map area)

Lower Jurassic (Hettangian to Upper Sinemurian)
LE MARE LAKE VOLCANIC UNIT
IJL Undifferentiated basic to acidic flows and pyroclastic rocks (mainly subaerial); includes ash-flow and rare airfall tuff and reworking equivalents, minor pillow lava, pillow breccia, hyaloclastite and rare pyroclastic cone deposits, locally intercalated with marine to non-marine volcanic/igneous, sandstone, siltstone, mudstone, impure limestone and debris-flow deposits

IULm Dark grey-green, basic to acidic flows with minor intercalated volcanoclastic and sedimentary intervals; may include minor pyroclastic rocks and pyroclastic flows

IULf Medium grey, rhythmic to dacitic flows, flow domes and/or pyroclastic rocks, including flow and pyroclastic breccias, welded to non-welded crystal-lithic lapilli tuff and rare tuffaceous rocks; may include interbedded sedimentary deposits and minor basaltic to andesitic flows

IULx Dark grey-green, plagioclase-megacrystic (0.8-2cm), variably amygdaloidal basaltic to andesitic flows, locally intercalated with aphanitic and plagioclase-phryic flows; thin lenses of pyroclastic rocks

IULx? Small outcrop of plagioclase-megacrystic basaltic to andesitic flows of unit IULx; likely similar to plagioclase-megacrystic Karmutsen basalts in unit uTrK

IULy Dark grey-green, basaltic to andesitic volcanic breccia of epiclastic and pyroclastic origin, and variably reworked lithic-crystal tuff; locally includes fine-grained sedimentary intervals

Upper Triassic (Carnian to possibly Lower Jurassic (Hettangian))
VOLCANOCLASTIC AND SEDIMENTARY STASS
TrJBvs Interbedded volcanoclastic and sedimentary stass (predominantly subaerial); light to grey-green, thin to very thickly bedded, calcareous to non-calcareous, volcanic breccia, lithic and felspathic wacke, siltstone and limestone, locally coralline; lithic and felspathic wacke, siltstone and limestone, locally coralline; lithic and felspathic wacke, siltstone, and volcaniclastic flow deposits; may include black carbonaceous shale, mudstone, siltstone and limestone (locally coralline) equivalent to unit TrJy

TrJy Yerka shale-limestone unit; black carbonaceous or graphic shale passing upward into black to medium grey, thin to medium-bedded, carbonaceous to rarely biogenic, lithic and felspathic wacke, siltstone and limestone, locally coralline; lithic and felspathic wacke, siltstone and limestone, locally coralline; lithic and felspathic wacke, siltstone, and volcaniclastic flow deposits; may be included in unit TrJBs, but not mapped separately (or pass laterally into coarser-grained clastic deposits)

TrJBmc Dark grey-green basaltic flows and minor volcanoclastic breccia and lapilli tuff; aphanitic to coarsely clinopyroxene-plagioclase-phryic

TrJBf Medium grey to reddish grey, rhythmic flows and minor flow and/or volcanoclastic breccia; aphanitic and flow-foliated

TrJBf? Pale pinkish grey, reworked, crystal-vitrific ryholitic tuff; weak internal laminations

Upper Triassic (Carnian to Rhacian)
PARSON BAY FORMATION
uTrP Medium grey to black, thinly bedded to medium bedded, impure limestone, calcareous to non-calcareous mudstone, siltstone and shale intercalated with variable proportions of grey-green to dark grey-green, thin to thickly bedded, carbonaceous to rarely biogenic, lithic and felspathic breccia and debris-flow deposits, and rare vitric tuff, pebbly sandstone and conglomerate; shale yields abundant thin-shelled bivalves (Halobia sp., Monotis sp.); limestone equivalent in part; see below for the type of the succession

Sutton limestone Sutton limestone (<1.0m) unit of pale to medium grey, massive limestone near the type of the Parson Bay Formation; contains silicified concretions and other fossils; likely equivalent in part to the Sutton limestone in the Cowichan Lake area, southern Vancouver Island

uTrPmc Dark grey-green, basaltic volcanoclastic breccia and lapilli tuff; aphanitic to sparsely plagioclase-clinopyroxene-phryic

uTrPvmc Dark grey-green, basaltic volcanoclastic breccia and lapilli tuff; aphanitic to coarsely clinopyroxene-plagioclase-phryic

uTrPvfm Dark grey-green, basaltic volcanoclastic breccia, lapilli tuff and minor flows; aphanitic to coarsely clinopyroxene-plagioclase-phryic; may include minor interbedded wacke, siltstone, mudstone and shale (locally fossiliferous)

uTrPvpmc Dark grey-green, basaltic volcanoclastic breccia, lapilli tuff and lesser plowed flows; aphanitic to clinopyroxene-plagioclase-phryic

uTrPvia Dark grey-green, andesitic volcanoclastic breccia and lapilli tuff; hornblende-clinopyroxene-plagioclase-phryic

uTrPvix Dark grey-green, andesitic volcanoclastic breccia and/or crystal-lithic lapilli tuff; plagioclase-rich; locally includes interbeds of dark grey, impure limestone

INTRUSIVE ROCKS

TERTIARY (EARLY PILOCENE: ca. 5.15 to 4.6 Ma)
KLASKISH PLUTONIC SUITE
MPKgd-po Medium to pale greenish grey, medium-grained, equigranular, hornblende-biotite granodiorite (gd) and plagioclase-hornblende porphyry (pd)

MPKgd-po Medium-grained, equigranular, hornblende-quartz monzonodiorite

Early to Middle Jurassic (ca. 20.6 to 17.4 Ma)
ISLAND PLUTONIC SUITE
Jl Dark green to pale pinkish grey, medium to coarse-grained, equigranular granitoid rocks and porphyry; includes gabbro (gb), hornblende-biotite-bearing dolite (dl), quartz diorite (qd), plagioclase-hornblende porphyry (ph), hornblende-biotite porphyry (hb), and plagioclase-hornblende porphyry (ph); combined codes indicate a range of common rock types (gb-dl, qd-ph)

Jlqd-gd Medium-grained, equigranular, hornblende-quartz monzonodiorite (qd-gd) phase of Merry Widow Pluton

Minor Intrusions

Tif Dark grey, sparsely plagioclase-phryic dacite dike

LATE TRIASSIC TO EARLY JURASSIC
uLlx Dark grey-green, plagioclase-megacrystic basalt-basaltic andesite intrusion or diabase; coeval with similar lavas of the Early Jurassic Le Mare Lake volcanic unit (uLlx)

uLlx? Thin dikelet of plagioclase-megacrystic basalt-basaltic andesite or diabase; coeval with similar lavas of the Early Jurassic Le Mare Lake volcanic unit (uLlx)

TrBim Dark-grey-green, basalt-andesite intrusion or diabase; coeval with Bonanza Group volcanism

TrBipoc Dark-grey-green, clinopyroxene-plagioclase-silicate porphyry; coeval with petrologically similar lavas in the lower part of the Bonanza Group (TrBim)

uTrBimc Small intrusion of dark grey-green, olivine-clinopyroxene-plagioclase porphyry, locally clinopyroxene-megacrystic; coeval with mineralogically similar lavas in the lower part of the Bonanza Group (units TrBimc/uTrPmc/uTrPvmc)

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