

OVERLAP ASSEMBLAGES

LAYERED ROCKS LOWER TO MIDDLE TRIASSIC Black slate and phyllonite; limy metasandstone and pebble conglomerate; minor dark grey limestone

PERMIAN OR OLDER KLINKIT GROUP

Upper clastic member: Brown-weathering indurated metasiltstone and sandstone,

interbedded chloritic meta-tuff, quartzose grit and light grey marble

Beige-weathering marble, locally silicified; rare chloritic interbeds

Volcanic fragmental member: Undifferentiated meta-tuff and volcanic breccia of intermediate composition; minor chloritic meta-sandstone and meta-siltstone MIDDLE MISSISSIPPIAN TO LOWER PENNSYLVANIAN Screw Creek Limestone: Thin- to thick-bedded light grey weathering commonly

bioclastic limestone and dolomitic marble; minor maroon and green phyllite and green YUKON-TANANA TERRANE

BIG SALMON COMPLEX Cabin Lake unit: fine-layered, plagioclase-phyric meta-tuff (intermediate composition) with bands of quartz-rich phyllite and meta-grit; minor carbonate

Hazel Pluton: granitoid gneiss, alaskite to meta-diorite (U-Pb zircon ages: 336 \pm 4 and 362.3 ± 7 Ma; Mihalynuk et al., 1998, 2000)

DCBc Buff-weathering limestone and marble

LOWER CARBONIFEROUS AND OLDER

Mount Hazel Metachert: Laminated quartzite, locally rich in pink peidmontite and hematite (Crinkle chert of Mihalynuk et al., 1998; 2000)

composition; minor volcanic meta-sandstone fault, sense of motion unclear

Ram Stock: Coarse-grained monzonite, granodiorite (U-Pb zircon 258 \pm 2 Ma; J.K. Mortensen, pers. comm., 2002) (intrudes Dorsey Complex)

Smart River Greenstone: Chloritic metabasalt and meta-tuff of intermediate to mafic

LOWER CARBONIFEROUS AND OLDER **SWIFT RIVER GROUP** Dark-coloured quartz-plagioclase grit, meta-sandstone; minor phyllitic argillite,

PSR quartzite, conglomerate, limestone and chloritic meta-tuff (U-Pb detrital zircons as young as 422 Ma; Gleeson et al., 2001), carbonaceous siltstone, grey chert and volcanic breccia (intermediate composition)

Light grey to beige limestone and marble lenses, not stratigraphic Chloritic andesitic intrusions, breccia and tuff; green siliceous argillite

CARBONIFEROUS AND OLDER DORSEY COMPLEX Upper Dorsey unit: Red-brown weathering phyllite, grey pelite and quartzite, grey metachert and quartz-sericite schist (U-Pb zircon: 355.6 ± 2.7 Ma Roots and Heaman, 2001), highly foliated meta-plutonic rocks

Beige weathering marble and limestone, brown calc-silicate

Biotite ± garnet schist, metagrit, minor marble

Lower Dorsey unit: Hornblende schist and gneiss, locally contains felsic leucosome (U-Pb zircon date: 373 ± 14 Ma Roots and al., 2003); amphibolite

SYN- AND POST-OROGENIC

INTRUSIVE ROCKS PALEOCENE

Logtung stock: Hornblende granodiorite, monzogranite (U-Pb zircon - $58.6\pm~1.5$ Ma

LEGEND

EARLY CRETACEOUS Biotite granite, granodiorite, leuco-quartz monzonite, alaskite

Non-foliated, K-feldspar porphyritic granodiorite, monzonite; minor diorite, gabbro

Mihalynuk and Heaman, 2003)

Hornblende diorite and quartz diorite; minor biotite hornblende quartz monzonite

Ultramafite: Gabbro, serpentinite and dunite

Overturned folds: antiform, synform Cross-section line . Yukon MINFILE (105B) occurrence

NOTES

The southwest corner of Dorsey Lake map area lies 10 km east of Morley River Lodge on the Alaska Highway (km 1246), the nearest permanent settlement. An un-maintained road extends from the Alaska Highway at km 1210, about 20 km to the decommissioned portal at the Logtung occurrence (Yukon Minfile #039), and a track continues a further 6 km to the campsite below the Logjam adits (#038). Most other trails shown on this and topographic maps were made

PHYSIOGRAPHY The west half of the map area is part of the Nisutlin Plateau (Mathews, 1986). Extensive tundra and meadows cover the rolling Hazel Ridge. Broad, U-shaped valleys of boreal forest are dominated by white spruce. To the east, angular peaks and narrow arêtes of the Dorsey Range constitute the northern limit of the Cassiar Mountains. There cliffs and slopes of steep talus are common, particularly where underlain by vertically jointed granitic rocks. Pleistocene

PREVIOUS WORK Reconnaissance by Poole et al. (1960) and more detailed studies (Abbott, 1981; Stevens and Harms, 1995; 2000) preceded this revision mapping. The current map is part of a regional initiative to assess the mineral potential of Yukon-Tanana Terrane (cf. Roots et al., 2000; Colpron and the Yukon-Tanana Working Group, 2001).

REGIONAL GEOLOGY The layered rocks in this area originated as continental shelf sediments overlain by volcanic arc successions. Now

called Yukon-Tanana Terrane, they tectonically over-rode the western edge of ancient North America beginning in

Yukon-Tanana Terrane Three elements are present in the map area. The west half comprises the Big Salmon Complex; the east half is a

separate, in part contemporaneous succession composed of the Dorsey Complex and Swift River Group. Unconformably overlying both these elements are less metamorphosed Klinkit Group and Triassic sediments that are here interpreted as overlap assemblages. The unexposed contact between Big Salmon Complex and Swift River Group is inferred to be an east-side-down normal fault. Big Salmon Complex (Mulligan, 1963) consists of foliated plutonic and siliclastic rocks, and includes late Devonian(?) to mid-Mississippian stratigraphy described in adjacent BC (Mihalynuk et al., 1998; 2000). REE

concentrations in metavolcanic flows (Smart River greenstone) reveal an arc composition (Mihalynuk et al., in prep.). Isolated outcrops in the valley east of Morley River reveal the northern extent of the Hazel meta-pluton, a foliated tonalite-alaskite body ('Hazel orthogneiss'; Mihalynuk et al., 1998). Disparate U-Pb zircon dates suggest multiple intrusive phases (M. Mihalynuk, pers. comm., 2002). The Mount Hazel meta-chert has elevated Mn and Ba, suggesting a hydrothermal origin (Mihalynuk et al. 1998). It and the flanking marble have been traced in broad west-verging recumbent folds across the map area to the south (Mihalynuk et al., 2001a). A rugose coral fragment was collected from the mid-section of Hazel Ridge (Poulton et al., 1999) and the same unit contains crinoid ossicles south of the map area (Alaska Highway at Logjam Creek) but neither provides definitive age information. The Cabin Lake unit may be equivalent to the ca. 325 Ma Mount Francis metadacite (18 km southeast of the map area; Mihalynuk et al., 2000) but did not yield dateable zircons.

Dorsey Complex and Swift River Group: The northeast corner of the map area is underlain by mafic schist and gneiss, phyllite and boudinaged marble of the Dorsey Complex. Its mineral assemblages reflect a medium-to high pressure and temperature episode (Stevens, 1996) prior to intrusion by the Permian Ram stock. Swift River Group

layering): inclined, vertical, (2nd stage) inclined, (2nd stage) vertical Igneous layering Compositional layering Crenulation lineation Elongation or mineral lineation Intersection lineation, with vergence: M fold Folds, with vergence: M fold U/Pb zircon date, age in Ma Geological contact: defined, approximate, assumed Limit of outcrop . Normal fault: defined, approximate, inferred solid circle on downthrown side . Thrust fault: defined, approximate, inferred teeth on upthrust side . Upright folds: antiform, synform . . — 11 — 44 ._____

SYMBOLS

Dominant foliation (transposition foliation; commonly parallel to compositional

Bedding: inclined, upright, overturned

Consists of metamorphosed grit, decimeter-bedded siltstone-sandstone couplets with rare carbonate and intermediate metavolcanic layers. It contrasts with the black chert-quartzite succession exposed east of the map area. At least locally it appears to overlie Dorsey Complex (Roots et al., 2003).

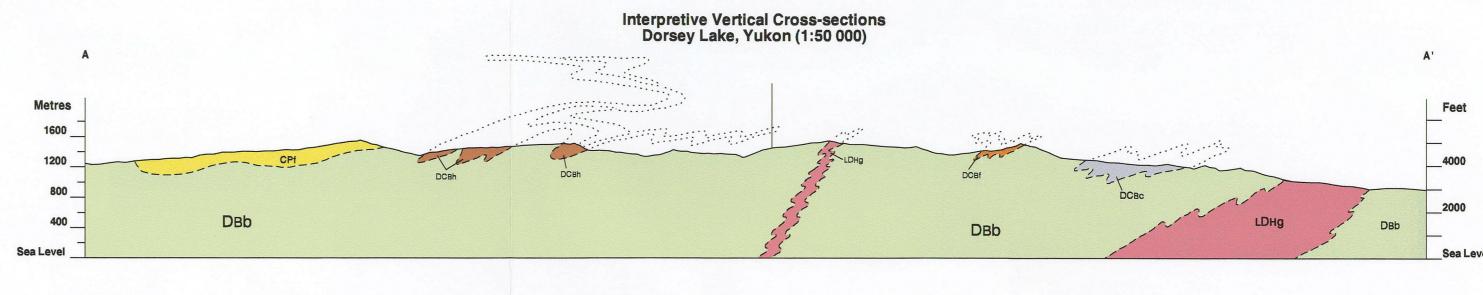
The Klinkit Group (Simard et al, 2003) is a carbonate-volcaniclastic succession. Hill-capping limestone northwest of Morley River contains abundant corál, brachiopod and crinoid fragments typical of Screw Čreek Limestone whose type area is immediately east of the map area. The meta-greywacke unit at the south end of Hazel Ridge ('upper immature clastics' of Big Salmon Complex; Mihalynuk et al., 1998) unconformably overlies the Smart River eenstone and is here correlated with the Klinkit Group. Andesitic meta-tuff, breccia and volcanic-derived siltstone and sandstone on ridges northeast of Dorsey Lake Include a light grey to pink-weathering marble 35 m thick as a useful stratigraphic marker. The cross-section depicts recumbent folds but does not portray the pervasive layer-parallel deformation. In the same area underlying crenulated rusty schist and tectonite exposed at the base of north-facing cirques is here correlated with Swift River The black argillite capping these hills is considered Triassic, based upon its similarity that unit north of Logtung and in northern BC (Roots et al., 2002).

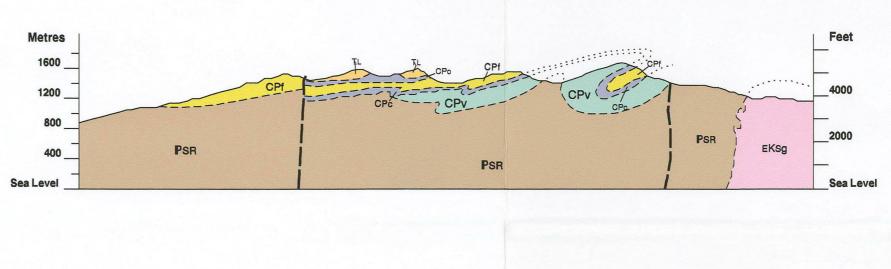
Unfoliated plutonic rocks A series of Early Jurassic (and possibly older) intrusions trend northwest from northern BC (Simpson Peak and Nome Lake batholiths; Gabrielse, 1969; Mihalynuk et al., 1998) to the Teslin River (Stevens et al. 1993; Gordey et al., 1998). In Dorsey Lake map area the oldest representative is a composite olivine clinopyroxenite, dunite and serpentinite body the head of Logiam Creek. Of intermediate age are massive hornblende diorite plutons, intruded locally by tonalite to monzonite stocks and veinlets. Youngest is the felsic pluton at the head of Logjam Creek which appears to have split the ultramafic body (Poole, 1956; Abbott, 1981). The southern lobe contains a coarse trachyitic phase. The Cretaceous Seaguil batholith has a coarse-grained, seriate-textured core and a fine-grained margin that iis is approximately 101 Ma (Mato et al., 1983; Wanless, 1972; Mortensen, 1999).

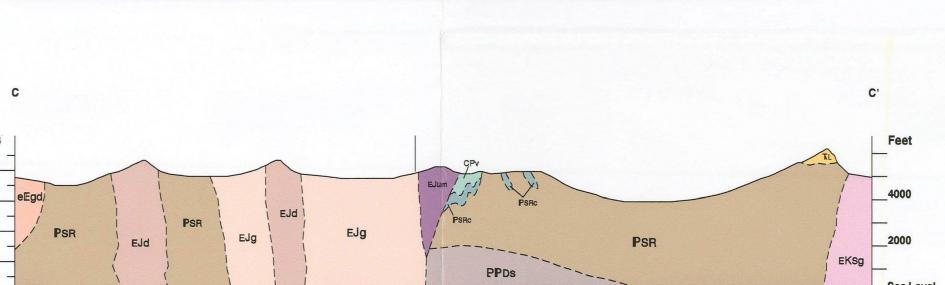
Felsic porphyritic monzo-granite at the head of West Logjam Creek is 118 ± 2 Ma by Rb-Sr (Stewart, 1983; Stewart and Evansen, 1983) but includes granite that is Early Tertiary (58.6 Ma by zircon with hydrothermal characteristics; MINERAL OCCURRENCES The map area contains many skarn and vein occurrences. The principal occurrences are Logtung, Logjam, JC. These and surrounding sites were intensely explored between 1978 and 1983.

Mineralization at <u>JC</u> was interpreted as magmatic by Layne and Spooner (1991) and the nearby Smith occurrence reported as skarn. The lead lead isotopes of some samples from these were non-radiogenic, suggesting sedimentary rigin (Mortensen and Gabites, 2002). ourmaline orbicules and scheelite greisen are present wherever carbonate is within 100 m of the contact with Seagull granite. The <u>Logtung</u> W-Mo porphyry deposit (Christopher, 1978) lies within a vertical granitic dyke whose blond sericitic alteration envelope was dated at 109 ± 2 Ma by K-Ar (Hunt and Roddick, 1987, p. 183) Minor scheelite in discontinuous skarn flanks the granitic stock (Noble et al., 1983; 1984). A pyrite-chalcopyrite showing in siliceous sericite schist, 4.5 km southwest of Cabin Lake Minfile occurrence #144) and its Devonian-Mississippian model age (Mortensen and Gabites, 2002), points toward a volcanogenic origin.

Manganiferous metachert is exposed in the nearby creek (W. Jakubowski, pers. comm., 2000) and extracted as ornamental stone near the Alaska Highway south of the map area (H. Hibbing, pers. comm., 2003).









Ancient Pacific Margin NATMAP



Yukon Geological Survey Energy, Mines and Resources Yukon Government

Open File 2004-2 Bedrock geology, Dorsey Lake (NTS 105B/4) Yukon Territory (1:50,000 scale)

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C. Roots, J. Nelson, M. Mihalynuk, T. Harms, M. de Keijzer and R-L. Simard This map has been reprinted from a scanned version of the original map

carte sur papier

Recommended citation: Roots, C., Nelson, J., Mihalynuk, M., Harms, T., de Keijzer, M., and 2004: Bedrock Geology, Dorsey Lake, Yukon Territory; Geological Survey of Canada, Open File 4630; Yukon Geological Survey, Reproduction par numérisation d'une Open File 2004-2, scale 1:50 000.