

Preliminary observations on the geology of the Rackla belt, Mount Ferrell map area (NTS 106C/3), central Yukon

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ABSTRACT

The Mount Ferrell area straddles the Paleozoic platform-basin transition at the northern edge of Selwyn basin and the structural corridor of the Dawson thrust, a geological and metallogenic belt informally referred to as the Rackla belt. Main facies and structural domains are delimited by the Kathleen Lakes and Dawson faults. Paleozoic platformal rocks occur north of the Kathleen Lakes fault; their coeval slope deposits are bound by the Kathleen Lakes and Dawson thrust. Strata of Selwyn basin (Hyland Group) and overlying mid-Paleozoic Earn and Tsichu groups occur in the hanging wall of the Dawson thrust. Igneous rocks of probable Paleozoic age are restricted to the Dawson thrust zone. The Rackla belt is actively being explored for gold and silver occurrences, including possible Carlin-type gold mineralization, and has potential for base metal deposits.

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INTRODUCTION

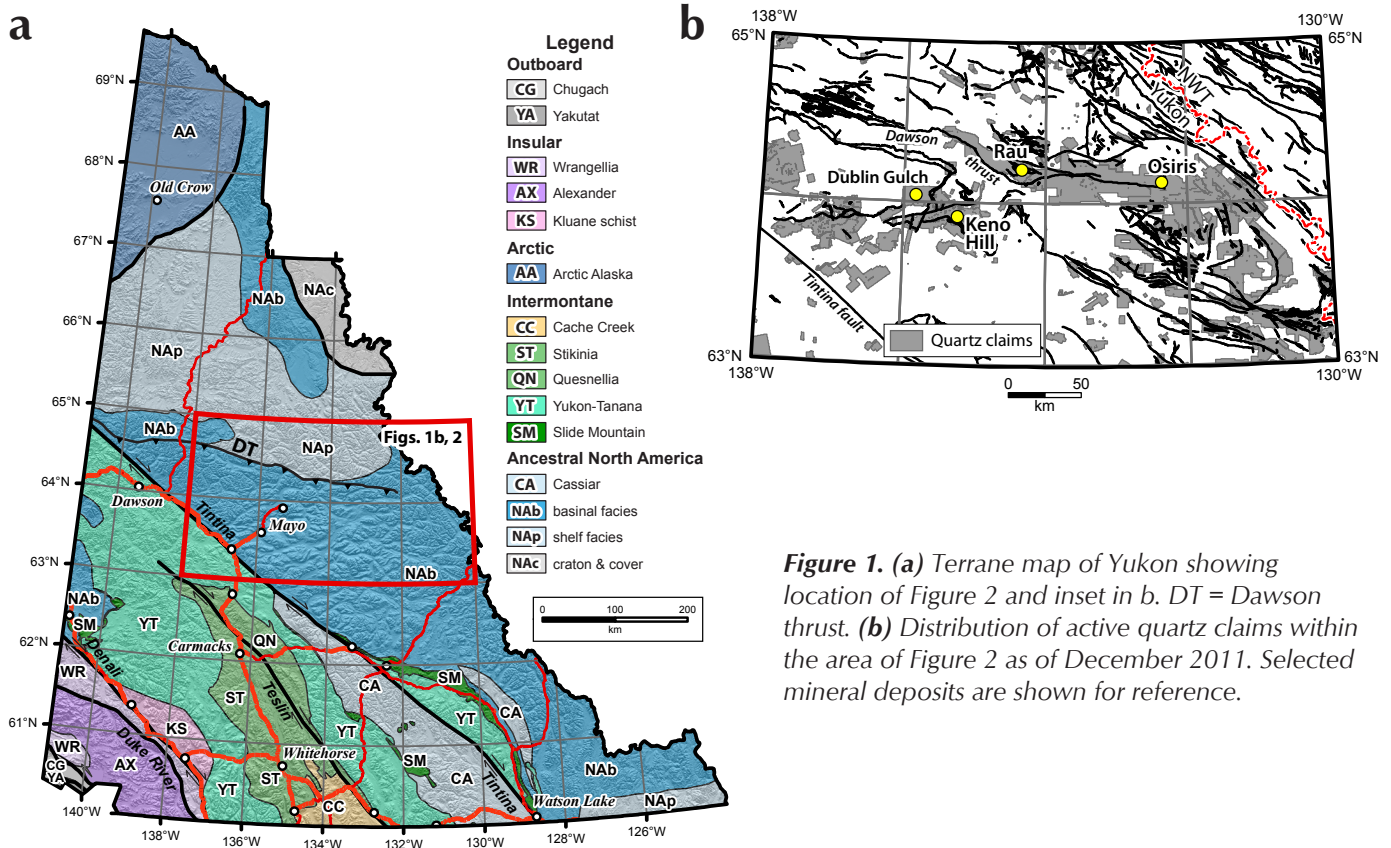
The 2008-2010 discoveries of gold mineralization, and particularly of potential Carlin-type carbonate replacement mineralization by ATAC Resources Ltd. in southern Nash Creek (106D) and Nadaleen River (106C) map areas has led to claim staking and intensive exploration activities in this part of central Yukon (Fig. 1). The new discoveries occur in carbonate rocks in the vicinity of the Dawson thrust, a WNW-striking structure that marks the northern edge of Selwyn basin (Abbott, 1997)(Fig. 2). The region is informally referred to as the Rackla belt.

Published bedrock maps for this region are primarily limited to 1:250 000 scale reconnaissance maps by Green (1972, for Nash Creek [106D]) and Blusson (1974, for Nadaleen River [106C]), with exception of the Mount Westman area (106D/1) which was mapped at 1:50 000 scale by Abbott (1990a; Fig. 2). In 2010, the Yukon Geological Survey initiated a regional mapping program of the Rackla belt in order to improve the geoscience knowledge of the area, and to provide the regional structural and stratigraphic context for mineralization along this belt. Results of mapping in the Mount Mervyn area (106C/4) in 2010 were presented

by Chakungal and Bennett (2011). The present report summarizes observations made in the adjacent Mount Ferrell area (106C/3) during the summer 2011; it is companion to a 1:50 000 scale Open File map (Colpron, 2012). The goal for 2012 is to complete mapping of the Rackla belt to the east into southwest Bonnet Plume Lake map area (106B; Fig. 2) and produce a compilation of all 1:50 000 scale maps along the belt.

GEOLOGICAL FRAMEWORK

The Mount Ferrell area straddles the platform to basin transition at the northern edge of Selwyn basin (Figs. 2 and 3). The main facies belt and stratigraphic successions in the area are bounded by the Kathleen Lakes fault and the Dawson thrust (Figs. 3 and 4). Paleozoic carbonate assigned to the Bouvette Formation (Gordey and Makepeace, 1999; Morrow, 1999) occupies the northern part of the map area and overlies local exposures of Hyland Group (Fig. 4). The carbonate rocks form part of the Mackenzie platform in the southern Wernecke Mountains. The Paleozoic platform rocks are bound to the south by the Kathleen Lakes fault (Figs. 3 and 4).



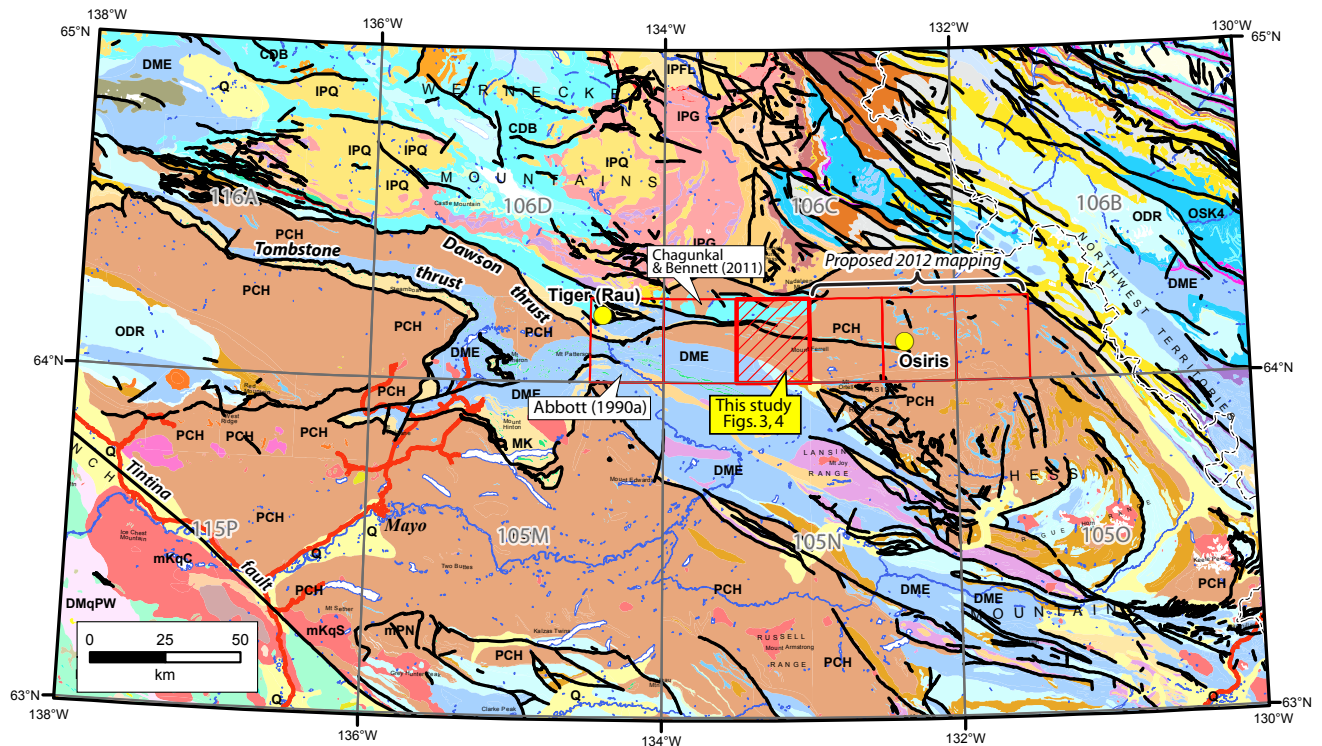


Figure 2. Regional geology of the northern part of Selwyn basin (after Gordey and Makepeace, 1999) showing location of major mineral occurrences and of existing and proposed detailed geological mapping along the Rackla belt. Major map units along the Rackla belt include: CDB – Bouvette Formation; DME – Earn Group; ODR – Road River Group; PCH – Hyland Group. For complete legend and unit information refer to Gordey and Makepeace (1999, 2000).

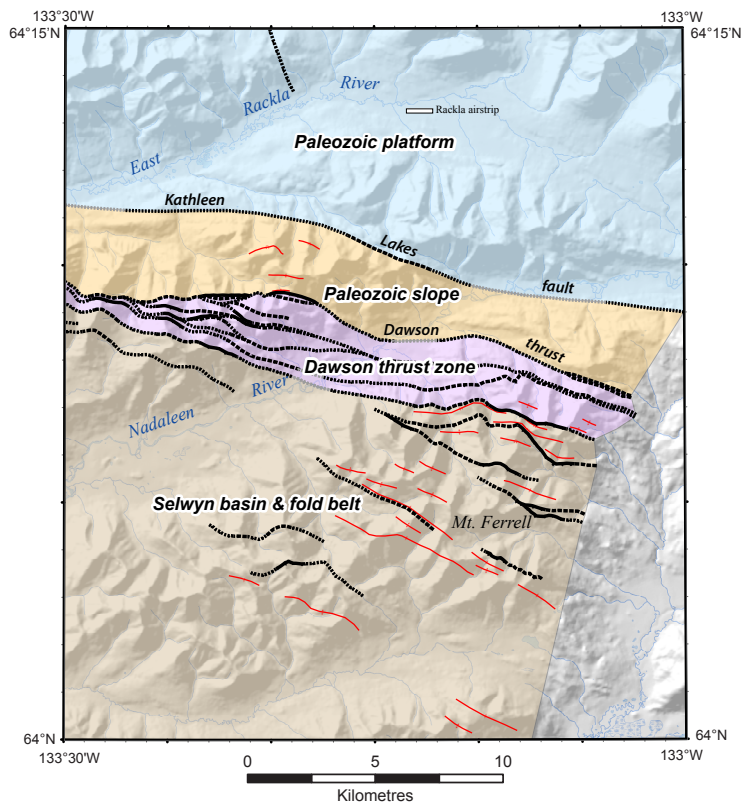


Figure 3. Geological framework of the Mount Ferrell area (106C/3).

South of the Kathleen Lakes fault, black shale with minor chert and carbonate debris-flow horizons represent Paleozoic slope to basinal clastic deposition and were assigned to the Road River Group by Blusson (1974)(Figs. 3 and 4). These rocks are bound to the south by the Dawson thrust.

Rocks in the hanging wall of the Dawson thrust to the south are primarily coarse sandstone, shale and carbonate rocks of the Neoproterozoic to Lower Cambrian Hyland Group, the oldest unit in Selwyn basin (Figs. 3 and 4). These are unconformably overlain to the south by Devonian and Mississippian rocks of the Earn and Tschu groups (Fig. 4). Igneous rocks of inferred Paleozoic age occur exclusively in the Dawson thrust zone.

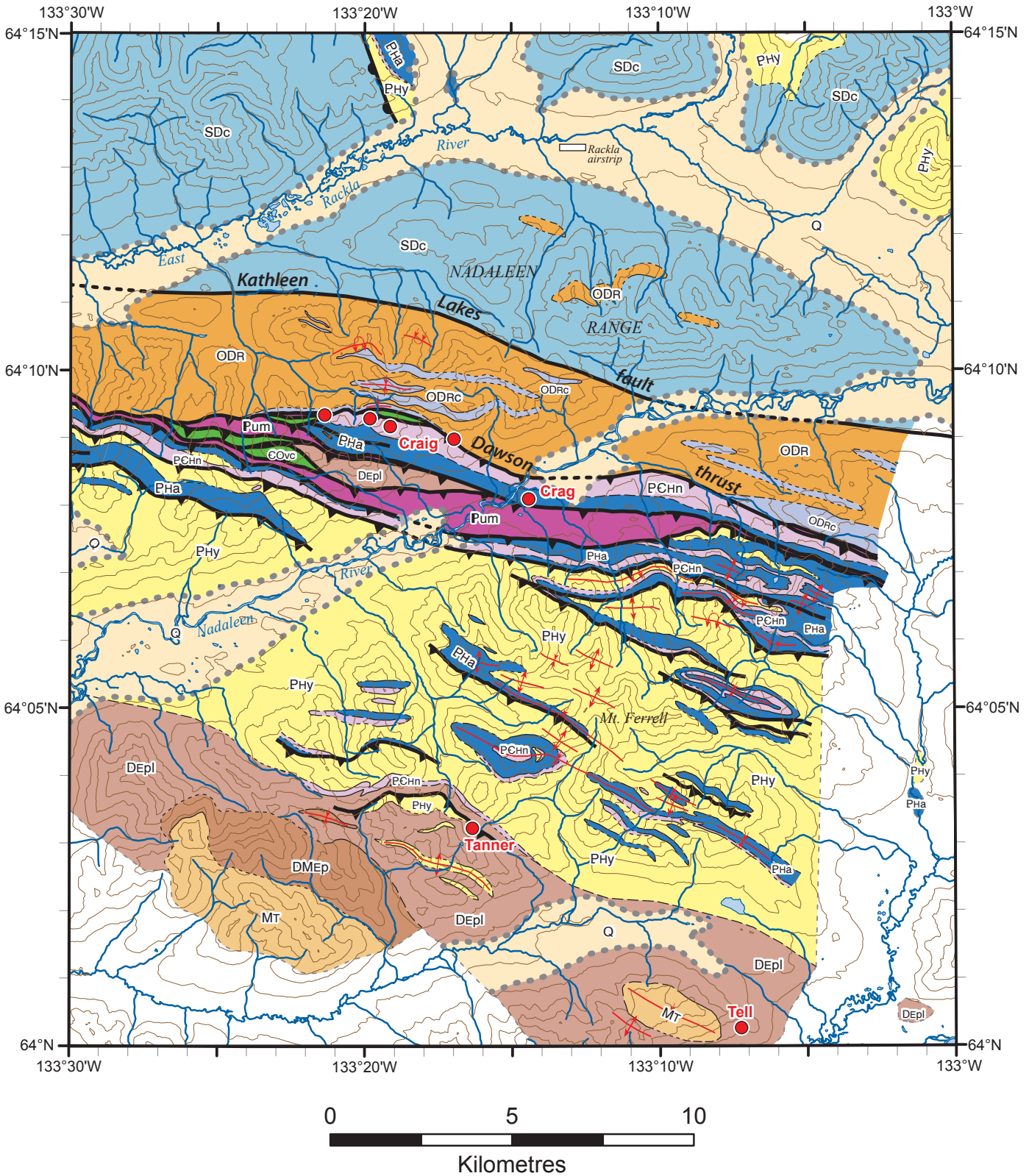


Figure 4. Simplified geological map of the Mount Ferrell area (106C/3)(after Colpron, 2012). Geology north of the East Rackla River is mostly after Blusson (1974).

LEGEND

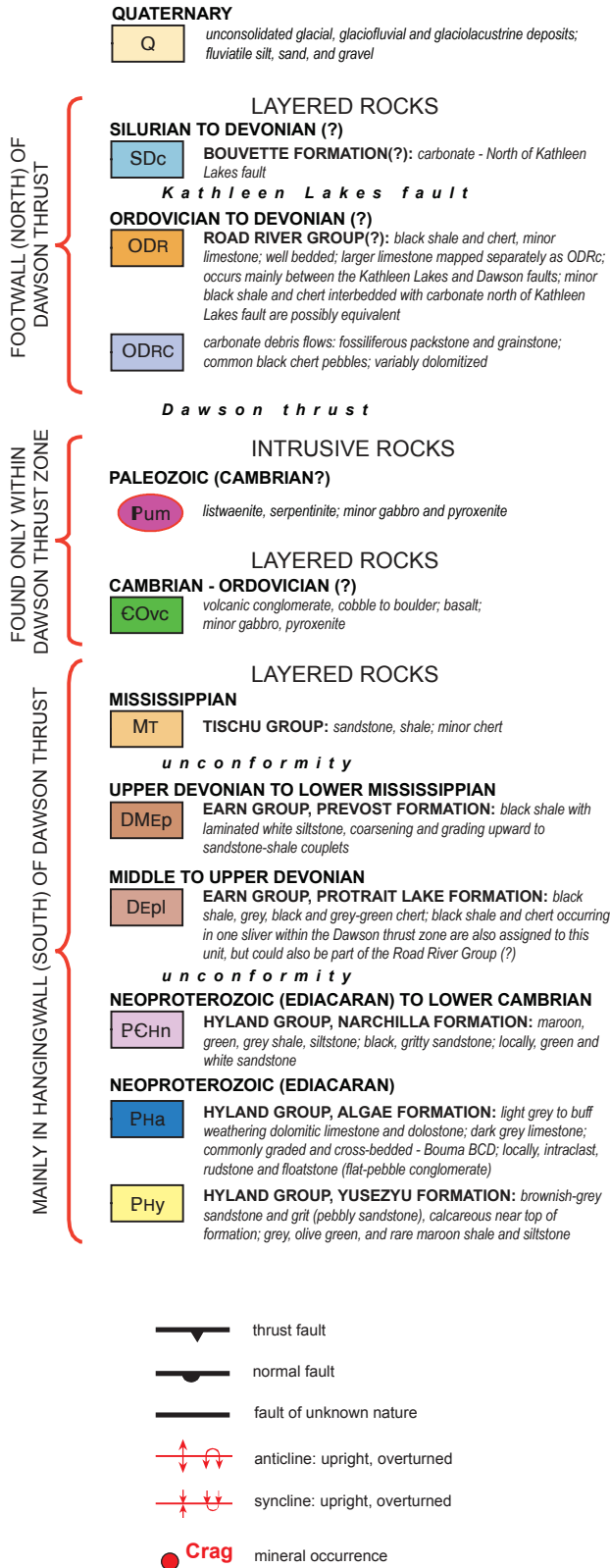


Figure 4 con'd

STRATIGRAPHY

PALEOZOIC PLATFORM

North of the Kathleen Lakes fault, the Mount Ferrell area is predominantly underlain by variably dolomitized carbonate rocks (Fig. 4). South of the East Rackla River these consist of light grey to yellowish-buff weathering dolostone and dolomitic limestone with common black chert nodules (Fig. 5a). The carbonate comprises mainly crudely bedded to massive fossiliferous wackestone to grainstone (Fig. 5b), with bed thickness ranging from 10-60 cm. Planar laminations are locally apparent. Fossil fragments include crinoids, echinoderms, colonial and solitary (rugose) corals. Local horizons of fossiliferous rudstone comprise a similar fossil assemblage but also contain black chert clasts up to 3 cm long. Coral bioherms are mainly developed at the crest of the Nadaleen Range, near the Kathleen Lakes fault, where they form cliffs (Fig. 5c,d). Chert locally make up beds up to 10-20 cm thick within dolostone, grading into intercalation of black argillite and chert, generally less than 5 m thick, but locally up to 75 m thick (labeled ODR in Fig. 4).

Limited observations north of the East Rackla River in 2011 indicate that much of the carbonate sequence in this region consist of generally finer grained, well-bedded micritic dolostone and dolomitic limestone capped by cliff-forming bioherms (Fig. 5e). Paleozoic carbonates unconformably overlie rocks of the Hyland Group in this region (Blusson, 1974; Fig. 4).

The carbonate rocks north of the Kathleen Lakes fault are assigned to the Cambrian-Devonian Bouvette Formation (Morrow, 1999; Gordey and Makepeace, 2000). Fossiliferous carbonates in the Mount Westman area to the west (106D/1) yielded Silurian and Devonian corals (Poulton *et al.*, 1999). Based on similar lithologies and fossils, carbonates in northern Mount Ferrell area (Fig. 4) are inferred to be Silurian-Devonian. However, occurrences of an Early Permian conodont fauna in carbonate from the intervening Mount Mervyn area (106C/4; Abbott and Orchard *in* Chakungal and Bennett, 2011) suggest that rocks in north Mount Ferrell could be this young as well.

Carbonate strata in the northern part of the Mount Ferrell area are generally gently folded north of the East Rackla River, with folds becoming tighter to the south near the Kathleen Lakes fault.

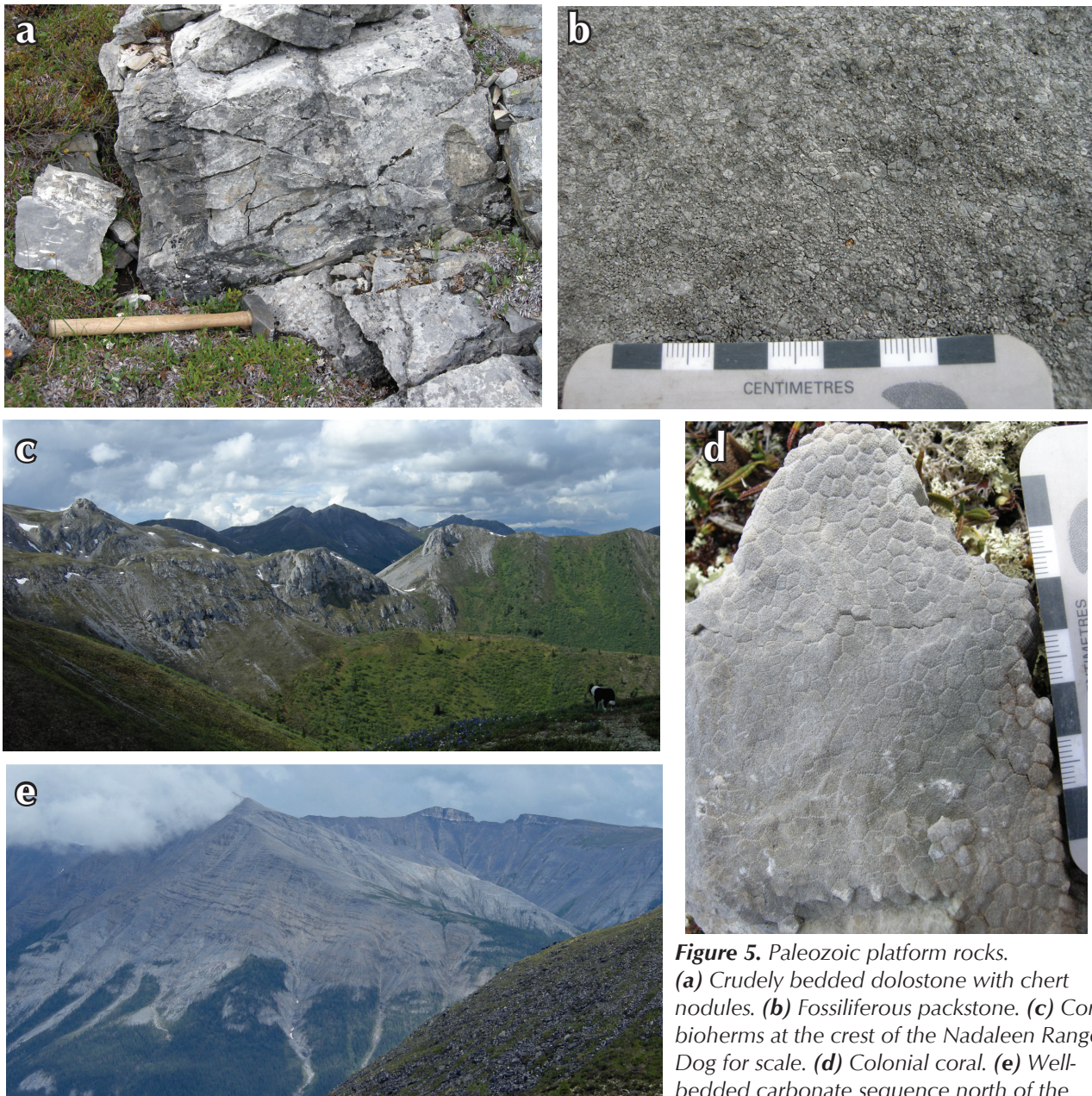


Figure 5. Paleozoic platform rocks. (a) Crudely bedded dolostone with chert nodules. (b) Fossiliferous packstone. (c) Coral bioherms at the crest of the Nadaleen Range. Dog for scale. (d) Colonial coral. (e) Well-bedded carbonate sequence north of the East Rackla River. The distinct cliff along the background ridge is a coral bioherm.

PALEOZOIC SLOPE DEPOSITS

The structural panel between the Kathleen Lakes fault and the Dawson thrust comprises a succession of tightly folded black shale and chert, with discontinuous light grey carbonate horizons (Fig. 6a). Chert occurs in beds up to 1 m thick and forms horizons up to 10-20 m within black shale (Fig. 6b). Chert represents approximately 20-30% of the black shale and chert unit.

Carbonate rocks occur as beds 5 cm to 1 m thick within the black shale (Fig. 6c). The carbonate rocks range from light grey weathering limestone and dolomitic limestone, to buff weathering, variably recrystallized dolostone. It is

commonly associated with irregular chert bands up to 10 cm thick. Sections with more than 80% carbonate are up to 20-30 m thick and laterally discontinuous; they commonly have greater apparent thickness due to tight folding and dip slope exposures (Fig. 6a,c). The carbonate is typically a skeletal grainstone to rudstone with coral and crinoid fragments, and pebbles of chert, limestone and shale (Fig. 6d,e). It is commonly normally graded and planar laminated (Fig. 6e). These rocks are interpreted as carbonate debris flows emplaced in a slope environment. The similarity in lithologic types and fossil assemblages suggests that these debris flows may be derived from

platform carbonates like those exposed north of the Kathleen Lakes fault (Fig. 4). Correspondingly, minor black shale and chert intercalated with platform carbonates to the north are likely interfingering of slope deposits at the platform margin.

Blusson (1974) assigned the black shale-dominated sequence to the Ordovician-Devonian Road River Group; a reasonable interpretation pending better biostratigraphic control based on 2011 collections (Fig. 4). This map unit was omitted in the compilation of Gordey and Makepeace (1999; Fig. 2).

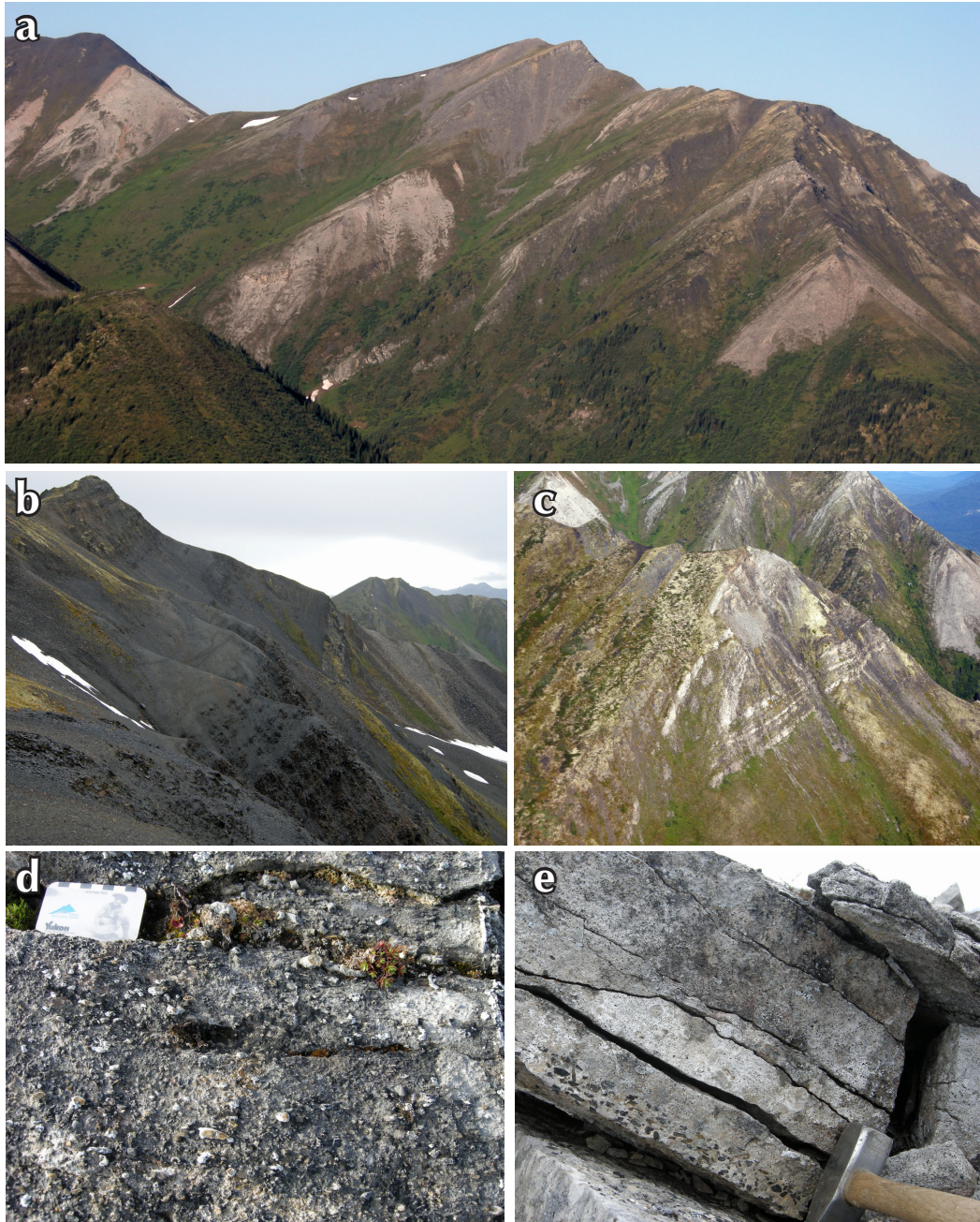


Figure 6. Paleozoic slope deposits. **(a)** Intercalated black shale and chert (ODR), and discontinuous carbonate (ODRc). **(b)** Black shale (recessive) and chert (more resistant, at break in slope) of the Road River Group. **(c)** Tightly folded carbonate beds up to 1 m thick interbedded with black shale. **(d)** Fossiliferous packstone typical of carbonate in the slope facies. **(e)** Base of carbonate bed outlined by black chert pebbles. Chert pebbles are particularly evident due to strong dolomitization of fossil fragments in this outcrop.

HYLAND GROUP

Rocks of the Hyland Group occur primarily in the central part of the Mount Ferrell area, in the hanging wall of the Dawson thrust, but also in valleys below the platform carbonate north of the East Rackla River (Figs. 2 and 4; Blusson, 1974). The Hyland Group is subdivided into three formations: 1) Neoproterozoic Yusezyu Formation, comprising mainly coarse clastic rocks; 2) carbonate of the Neoproterozoic Algae Formation; and 3) Neoproterozoic-Lower Cambrian Narchilla Formation, characterized by maroon shale (Gordey and Anderson, 1993; Cecile, 2000; Figs. 4 and 7a).

The Yusezyu Formation comprises mainly brown weathering sandstone and shale. The sandstone is brownish-grey, dark grey, or greenish-grey on fresh

surfaces. It is fine to coarse grained, commonly “gritty” (granules to pebbles in a medium to coarse sand matrix; Fig. 7b), and generally poorly sorted and immature. It is generally well-bedded, with bed thickness up to 0.5-2 m, and locally displays rhythmic and graded bedding, loads and flute casts, and slump folds; sedimentary structures consistent with deposition in a submarine fan environment (Gordey and Anderson, 1993). Quartz is the most important detrital mode clast in Yusezyu sandstones, but feldspar, muscovite (and locally biotite), shale chips and more rarely carbonate clasts are also common. Limonite clasts are also locally common (Fig. 7b). The sandstone is locally calcareous, most notably near the top of the formation where it grades into carbonate of the Algae Formation.

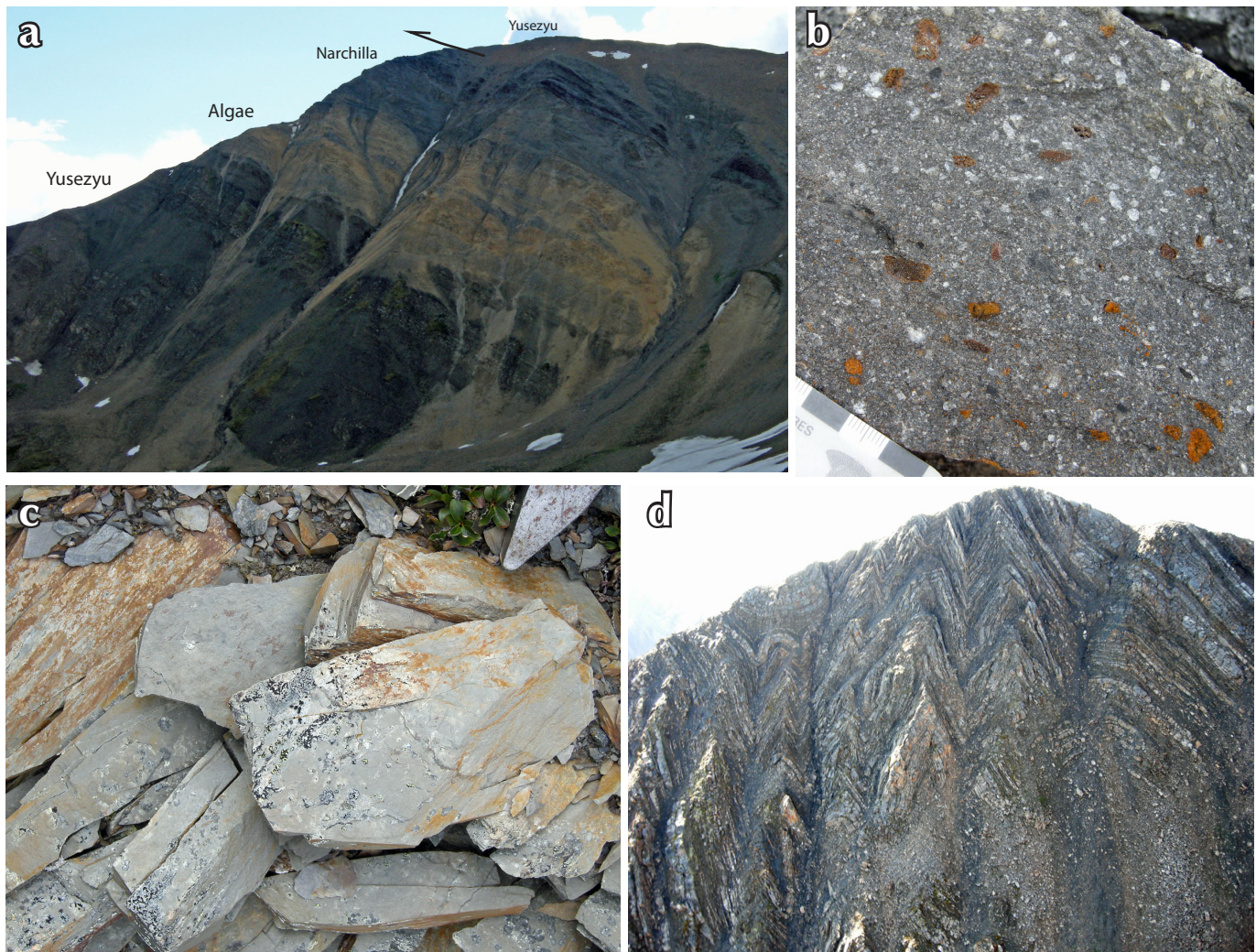


Figure 7. Hyland Group. (a) Section of Hyland Group north of Mount Ferrell displaying the three main units. The Yusezyu Formation is repeated by a thrust fault at the top of the ridge. (b) Typical gritty sandstone of the Yusezyu Formation. Note shale chips and limonite clasts. (c) Brown-weathering, greenish-grey shale of the Yusezyu Formation. (d) Tightly folded, intercalated shale and sandstone of the Yusezyu Formation.

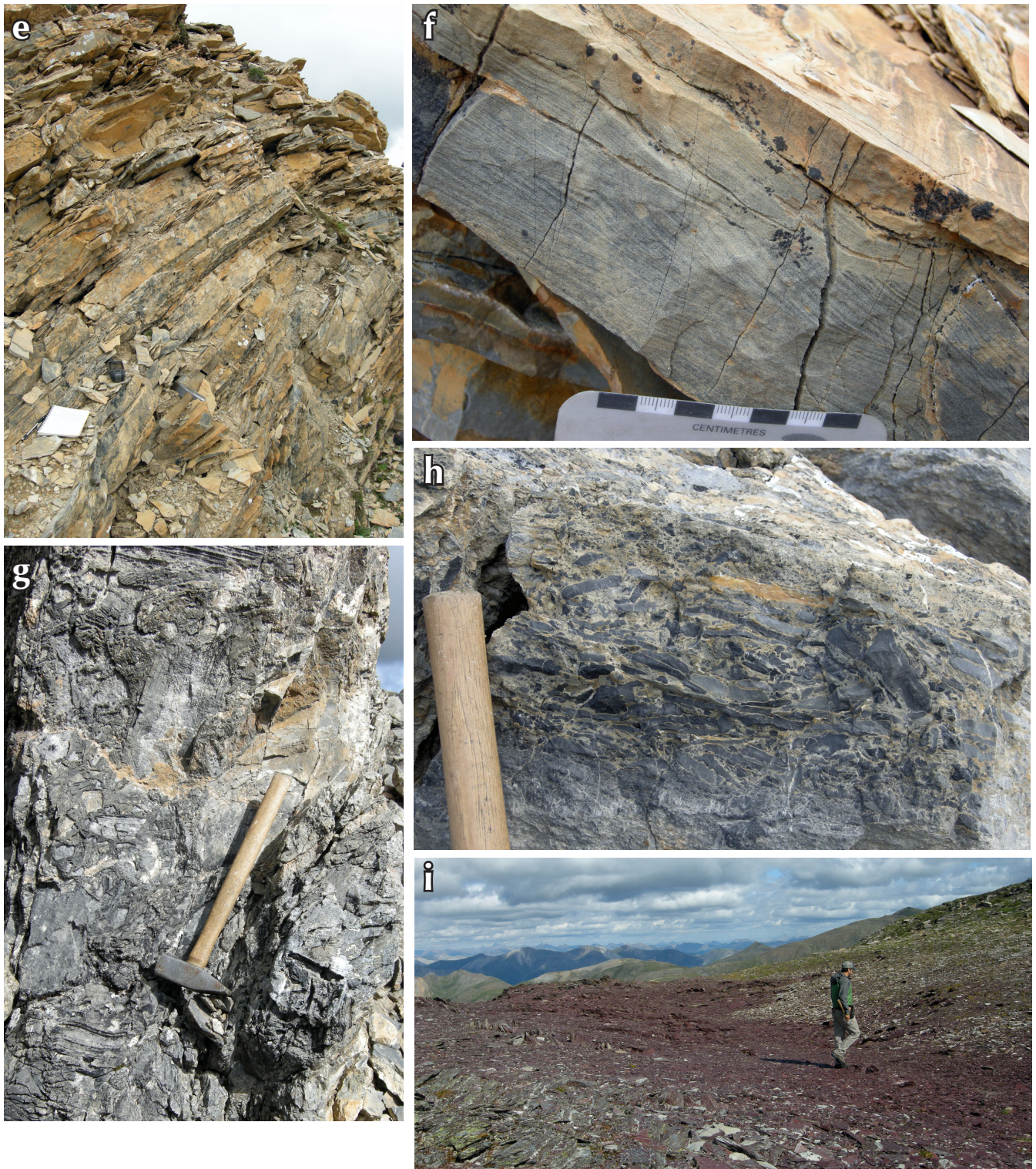


Figure 7 con'd. **(e)** Well-bedded, yellowish-buff weathering, dolomitic limestone of the Algae Formation. **(f)** Cross-bedding and planar laminations in dolomitic limestone of the Algae Formation. **(g)** Limestone breccia (floatstone), Algae Formation. **(h)** Flat-pebble, intraclast conglomerate (rudstone), Algae Formation. **(i)** Maroon shale of the Narchilla Formation.

The sandstone and grit of the Yusezyu Formation are intercalated with grey, brown, olive green and locally maroon shale (Fig. 7c,d). Shale interbeds in sandstone are typically less than 40 cm thick, although shale-dominated sections up to 50-70 m occur. Dolomitic limestone beds less than 40 cm thick are locally present within the grey shale.

Carbonate of the Algae Formation is typically a light grey to yellowish-buff weathering, medium to dark grey dolomitic limestone (Fig. 7a,e). Gordey and Anderson (1993) considered this limestone as the uppermost member of the Yusezyu Formation. Cecile (2000) separated it out and elevated it to formation status. The limestone is well-bedded, with bed thicknesses varying from 1-20 cm, and intercalated with grey and green shale horizons up to 3 cm thick (Fig. 7e). Locally, dark grey chert nodules are present in the limestone. The dolomitic limestone is typically sandy to locally gritty, and commonly displays planar laminations, cross-bedding, flute casts, and locally graded beds (Fig. 7f). Intraclast conglomerate and breccia (rudstone and locally floatstone; Fig. 7g), including flat-pebble conglomerate (Fig. 7h), are made up of limestone clasts 1-10 cm long and typically occur in horizons 20-40 cm thick, but locally several metres thick.

Carbonate in the northernmost thrust slice of the Dawson thrust zone comprises a black silty limestone intercalated with dark grey to black shale. It is assigned to the Algae Formation because it appears gradational with shale and sandstone of the Narchilla Formation to the north (Fig. 4). The black limestone is typically finely laminated and locally cross-bedded, and occurs in beds 1-10 cm thick. This limestone is associated with, and locally hosts, mineralization at the Craig/Crag occurrences; it is usually strongly dolomitized and/or silicified where associated with mineralization.

The Algae Formation passes gradationally upward into maroon, green, and lesser grey and black shale of the Narchilla Formation (Fig. 7i). Although the Narchilla Formation is typically dominated by shale, it also includes white, greenish-grey and black siltstone to fine and medium-grained sandstone. Millimetre to 3 cm-thick, graded horizons of light grey siltstone and fine sandstone typically outline bedding in the Narchilla Formation. Greenish-grey and black sandstone is usually coarser-grained, locally gritty, and locally forms beds 40 cm to 2 m thick. Regionally, the Narchilla Formation is assigned an upper Neoproterozoic to Lower Cambrian age based on occurrence of the trace fossil *Oldhamia* sp. (Gordey

and Anderson, 1993; Cecile, 2000); no trace fossils were observed in the Mount Ferrell area. It should also be noted that stratigraphic relationships between the Algae and Narchilla formations in the Mount Ferrell area are somewhat different than those described from their type sections (Cecile, 2000; Gordey and Anderson, 1993). In the Mount Ferrell area, maroon shale typical of the Narchilla Formation locally occurs stratigraphically below or within dolomitic limestone of the Algae Formation (Fig. 4); further stratigraphic studies are required to better characterize these relationships.

IGNEOUS ROCKS IN DAWSON THRUST ZONE

Occurrences of igneous rocks in the Mount Ferrell area are restricted to the Dawson thrust zone (Figs. 3 and 4). They are most prominently represented by altered ultramafic rocks (serpentinite and listwaenite; Fig. 8a), but also include gabbro sills and dikes (Fig. 8b), and fault-bounded slivers of mafic volcanic rocks (Fig. 8c,d).

Dikes and sills of gabbro (and lesser diorite) 1-3 m-wide intrude carbonate and shale in both footwall and hanging wall of the Dawson thrust. The gabbro is typically beige-weathering, black in fresh surface, and fine to medium-grained (Fig. 8b). It is locally pyroxene-phyric and weakly foliated. In the hanging wall of the Dawson thrust, gabbro dikes are spatially associated with serpentinite occurrences.

Ultramafic rocks were previously described by Tempelman-Kluit (1981) and Jutras (2003). They include serpentinite and more strongly altered listwaenite. The listwaenite is bright orange-weathering and the most distinctive rock unit in the Mount Ferrell area (Fig. 8a). It occurs within several fault-bounded panels in the Dawson thrust zone, the most prominent reaching up to ~1 km in width and extending laterally across the entire map area (Figs. 4, 8a). The listwaenite is a strongly carbonate and silica-altered ultramafic rock, locally containing traces of bright green chrome mica (fuschite). The rock is massive to strongly foliated and locally associated with serpentinite. The serpentinite is bottle green to black, composed mainly of antigorite and anthophyllite, strongly sheared, and occurs as pods within or along the margin of the more resistant listwaenite. Serpentinite is most common in the western part of the Mount Ferrell area, and the adjacent Mount Mervyn area (Chakungal and Bennett, 2011). Relict igneous textures in least altered exposures of ultramafic rocks suggest they may be derived from pyroxenite sills or dikes.

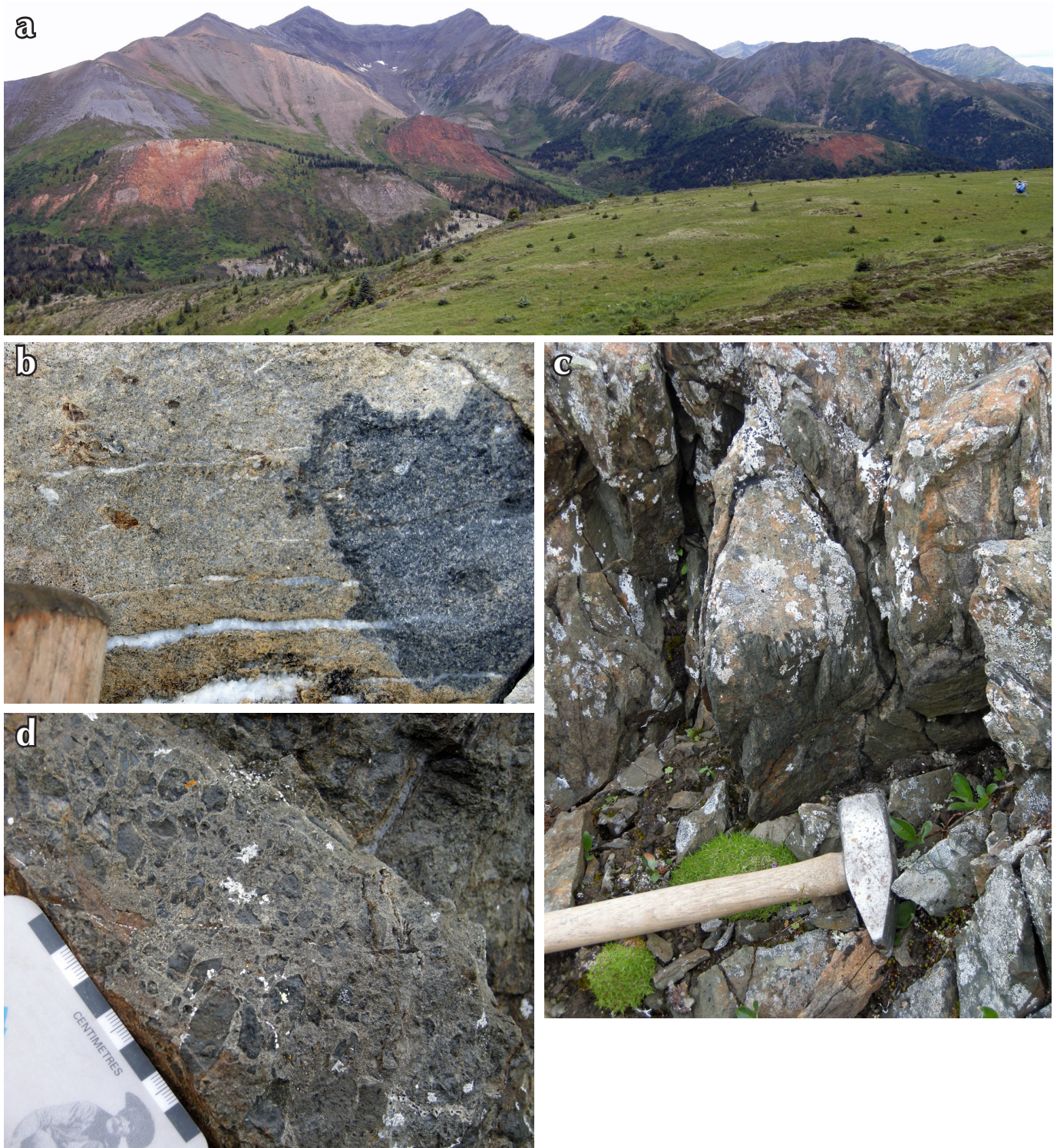


Figure 8. Igneous rocks associated with the Dawson thrust zone. **(a)** Looking southwest at orange-weathering listwaenite within the Dawson thrust zone. The foreground vegetated slope is underlain by Paleozoic carbonate debris flow deposits (unit ODRc in Fig. 4). Background peaks are underlain by carbonate, shale, and sandstone of the Neoproterozoic to Lower Cambrian Hyland Group. The trace of the Dawson thrust is located in the notch in front of the listwaenite body. **(b)** Close-up of fresh and weathered surface of medium-grained gabbro in the footwall of the Dawson thrust. Hammer handle for scale. **(c)** Pillow basalt in the hanging wall of the Dawson thrust. **(d)** Volcanic breccia.

Volcanic rocks include pillow basalt (Fig. 8c), and volcanic conglomerate and breccia (Fig. 8d). Pillow basalt is restricted to a single fault sliver in the immediate hanging wall of the Dawson thrust, near the Craig mineral occurrences (Fig. 4). It is a fine-grained, hornblende-phyric, vesicular basalt, with flattened pillows up to 30 cm long (Fig. 8c). Inter-pillow material includes hyaloclastite, green argillite, and local brown carbonate alteration. The volcanic conglomerate is brownish-green and composed mainly of pebbles and cobbles of mafic to intermediate volcanic rocks, locally plagioclase-phyric, but also including pebbles of brown-weathering dolostone and white quartz. The volcanic conglomerate is intercalated with brown-weathering, green shale with minor white quartz sandstone bands less than 1 cm thick.

The age of igneous rocks in the Mount Ferrell area is not precisely known. They are probably Paleozoic, but some dikes could also be Mesozoic. Abbott (1997) reports early (Cambrian?) and late Paleozoic ages (Permian?) from mafic and ultramafic dikes and sills in the vicinity of the Dawson thrust in the Upper Hart River area to the west (116A, Fig. 2). He also describes mafic volcanic rocks of Cambrian, Ordovician, and Silurian ages. Similarly, mafic volcanic rocks are intercalated with Silurian carbonate at the Tiger deposit, north of the Dawson thrust in the Mount Westman area (106D/1; Abbott, 1990a; M. Dumala, pers. comm., 2011). Triassic gabbro and diorite sills intrude mainly Earn Group strata to the south and west (Abbott, 1990a,b; 1997; Chakungal and Bennett, 2011; Roots, 1997; 2003). Finally, Cretaceous intrusions are widespread to the south in Selwyn basin (Gordey and Makepeace, 1999; 2000); some of the dikes in Mount Ferrell area could be related to Cretaceous magmatism as well. To date, Late Cretaceous magmatism has only been documented at one locality along the Rackla belt, in the vicinity of the Tiger deposit in southeast Nash Creek map area (106D, Fig. 2; Kingston *et al.*, 2010; V. Bennett, pers. comm., 2011).

EARN GROUP

Strata of the Earn Group unconformably overlie the Hyland Group south of Nadaleen River in the Mount Ferrell area (Fig. 4). The lower part of the Earn Group is dominated by medium to dark grey, greenish grey and black chert interbedded with lesser black shale and minor siltstone (Fig. 9a-c). The chert is well-bedded (Fig. 9a); beds are typically 2-5 cm but locally up to 50 cm thick. Chert is more dominant near the base of the Earn Group; shale becomes more predominant up-section. The dark grey

to black shale is typically rusty brown weathering; locally it forms silvery grey-weathering scree. Rare dark grey limestone intervals up to 10 m thick occur near the base of this succession. These rocks are correlated with the Middle to Upper Devonian Portrait Lake Formation of Gordey and Anderson (1993).

In the southwest part of the Mount Ferrell area, the dark grey shale contains tan weathering, white siltstone, and fine-grained sandstone beds (Fig. 9d,e). The siltstone is laminated and forms millimetre to 1-3 cm horizons (Fig. 9d). Sandstone occurs as graded beds 1-5 cm thick (Fig. 9e). Chert only occurs locally as isolated beds less than 5 cm thick within this more sandy part of the Earn Group. These rocks are assigned to the Upper Devonian to Lower Mississippian Prevost Formation of Gordey and Anderson (1993).

Black shale and chert also occurs within one fault sliver in the Dawson thrust zone (Fig. 4). These rocks are also provisionally assigned to the Portrait Lake Formation (DEpl on the map); but they could also be a sliver of the Road River Group within the fault zone.

TSICHU GROUP

Well-bedded orthoquartzite intercalated with bluish-black argillite that cap ridges along the southern edge of the Mount Ferrell area are correlated with the Tschu Group of Cecile (2000; Fig. 4). The quartz sandstone is light grey to white, fine to medium grained, and typically forms massive beds 10-40 cm thick, and locally up to 1-2 m thick (Fig. 10). Black shale interbeds are up to 10-20 cm thick. The sandstone is composed almost exclusively of well-rounded, moderately to well-sorted quartz grains in a silica cement. Rare beds of black chert sandstone and 3-4 mm-long shale chips are locally present.

STRUCTURE

Structures in the Mount Ferrell area are dominated by WNW-trending folds and thrust faults (Fig. 4). Paleozoic carbonates north of the Kathleen Lakes fault are generally gently folded (Fig. 5e) with folds becoming tighter towards the south. South of the Kathleen Lakes fault, shale, chert, and carbonate assigned to the Road River Group are tightly folded with folds overturned to the NNE (Fig. 6c). Folds are tight to isoclinal and overturned to the NNE in the hanging wall of the Dawson thrust; they become more opened and progressively more upright to the south (Fig. 7d). An axial plane cleavage is only well-developed



Figure 9. Earn Group. (a) Well-bedded chert of the Portrait Lake Formation. Thicker beds are approximately 20 cm in this outcrop. (b) Dark grey shale, Portrait Lake Formation. (c) Grey chert, Portrait Lake Formation. Hammer head for scale. (d) White siltstone to fine sandstone laminae in black shale, Prevost Formation. (e) Rhythmically bedded sandstone and shale, Prevost Formation.



Figure 10. Well-bedded orthoquartzite of the Tsichu Group.

in finer grained rocks in the hanging wall of the Dawson thrust (Fig. 9b,e). It is a pressure solution cleavage that generally dips moderately to steeply to the SSW.

Evidence for a younger generation of folds was only locally noted in the Mount Ferrell area. Both NW and NE-striking spaced cleavages were noted at a few localities, as well as broad warp folds with northerly trending axes and rare kink folds.

Thrust faults are generally identified by repetitions and/or truncations of marker units (mainly maroon shale of the Narchilla Formation or buff-weathering carbonate of the Algae Formation) in the hanging wall of the Dawson thrust (Fig. 4); they are also recognized locally in brown-weathering shale and sandstone of the Yusezyu Formation (Fig. 11). Thrust faults appear more closely spaced in the immediate hanging wall of the Dawson thrust and become more widely separated to the south (Fig. 4).

The Dawson thrust juxtaposed a thick succession of Neoproterozoic-Lower Cambrian Hyland Group in its hanging wall upon Paleozoic slope deposits in its footwall to the north (Fig. 12). The Dawson thrust zone comprises the zone of more pronounced deformation and close spacing of faults in the hanging wall of the main thrust; it is up to 3 km wide near the Nadaleen River and apparently narrows to the west (Figs. 3 and 4). Only limited occurrences of fault rocks were noted in 2011. West of the Nadaleen River, localized cataclastic breccia and brittle fault planes with step-fibres suggest reverse (top-to-the-N) dextral oblique displacement. To the east of the Nadaleen



Figure 11. Hanging wall ramp in sandstone and shale of the Yusezyu Formation. View to the west.

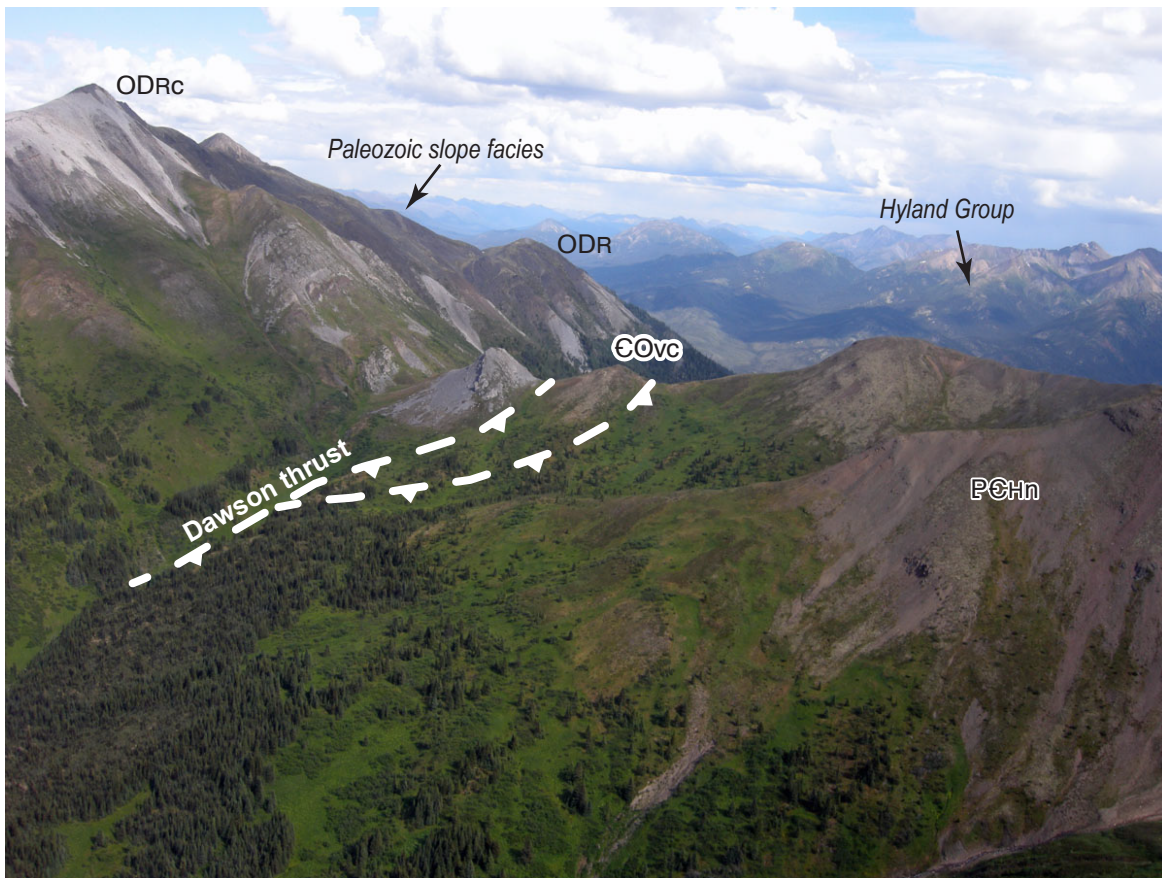


Figure 12. View to the east at the Dawson thrust.

River, shear bands in foliated fuschite-bearing listwaenite indicate an apparent top-to-the-N shear, although the lack of a pervasive lineation in this outcrop prevents definite interpretation.

The Kathleen Lakes fault in the Mount Ferrell area marks the boundary between Paleozoic carbonate platform strata to the north and Paleozoic clastic slope deposits to the south (Fig. 3). It has mainly been traced from mapping to the west (Abbott, 1990a; Chakungal and Bennett, 2011) and only has subtle expression in the Mount Ferrell area. Carbonate near the fault appears more fractured but does not provide information about the nature of the fault. The fault is traced at the sharp facies boundary and follows topographic lineaments.

It has been suggested that the Dawson and Kathleen Lakes faults are reactivated faults because of their apparent control on distribution of Middle Paleozoic and older sedimentary facies (Tempelman-Kluit, 1981; Abbott, 1990b; 1997). This may explain the local occurrences of Paleozoic mafic and ultramafic igneous rocks along the Dawson thrust zone in the Mount Ferrell area (Fig. 4).

MINERAL POTENTIAL

The Mount Ferrell area lies approximately half-way between ATAC Resources Ltd. two major gold discoveries along the Rackla belt: the Tiger deposit (indicated resources of 508,000 ounces averaging 2.21 g/t gold; www.atacresources.com, accessed January 3, 2012) to the west, and the Carlin-style gold occurrences at Osiris-Conrad and related zones to the east (Fig. 2). Both discoveries apparently lie in the footwall of the Dawson thrust. At Tiger, mineralization occurs as sulphide replacement in Silurian-Devonian carbonate and as oxidation zones along north-striking structures (Kingston *et al.*, 2010). Mineralization at Osiris-Conrad is more subtle, with varying concentrations of arsenic sulphide (realgar and orpiment) and very fine grained pyrite, and alteration comprising decalcification, clay alteration, and locally jasperoid. The mineralization is hosted in silty to sandy dolomitic limestone and carbonate debris flow. This latter style of mineralization is being compared to gold occurrences in the Carlin trend in Nevada.

Known occurrences in the Mount Ferrell area include a string of showings along the Dawson thrust zone (Craig; Yukon Occurrence 106C 073) and two potential sedimentary exhalative exploration targets in Earn Group strata to the south (Tell, Yukon Occurrence 106C 091; and Tanner, Yukon Occurrence 106C 098; Fig. 4). The Craig occurrences (recently renamed in part the Crag claims by Strategic Metals Ltd.) include 5 showings (over a strike length of 6.5 km) with galena and sphalerite mineralization, and minor pyrite, tetrahedrite and chalcopyrite; realgar and orpiment were reported from drillholes at the easternmost occurrence (Trent zone; labeled Crag on Fig. 4; Glifford, 1977). These occurrences were originally explored in the late 1970s for base metals and silver (Tempelman-Kluit, 1981). Jutras (2003) highlighted the potential of altered ultramafic rocks in the area for copper-nickel and gold mineralization. Drilling by Strategic Metals at the Crag (Trent zone) in 2011 confirmed occurrences of realgar and orpiment but only reported minor gold intersections (www.strategicmetalsltd.com, accessed December 21, 2011).

The Tell occurrence includes a number of gossan and kill zones with highly anomalous zinc and arsenic values in soils (Manson Creek Resources Ltd., www.manson.ca, accessed January 3, 2012). The Tanner occurrence also covers a gossanous spring underlain by Earn Group. The only mineralization reported from this occurrence consists of bedded barite and pyrite laminations.

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