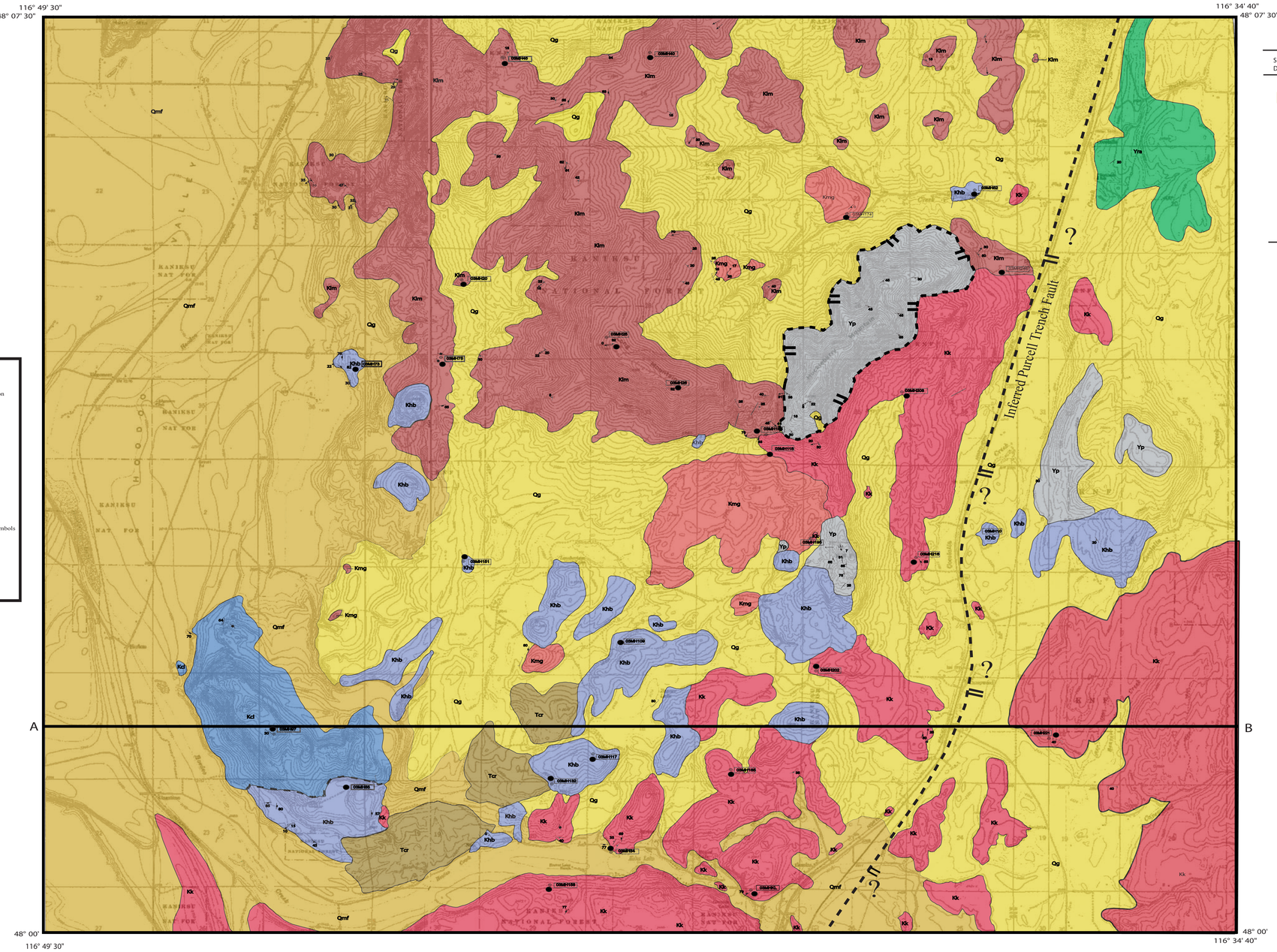
Geologic Map of the Careywood Quadrangle and Surrounding Area, Bonner County, Idaho

Matthew R. Hoffer

2005

Matthew R. Hoffer, 2005, Petrology and Geochemistry of Cretaceous Plutons in the Careywood Quadrangle, Northern Idaho [M.Sc. thesis]: University of Idaho, 83 p. 1 plate, scale 1:24,000.



Map Symbols

- Strike of folded beds
- Bearing and plunge of lineation
- Mineral lineation
- Mylonitic lineation
- Strike and dip of bedding
- Horizontal bedding
- Strike and dip of joint plane
- Vertical joint
- Strike and dip of cleavage
- Vertical cleavage
- Strike and dip of folliation
- Vertical folliation
- 45 Angle, in degrees of above symbols
- Geochemical sample sites
- Inferred fault
- Inferred contact
- Contact

CORRELATION OF MAP UNITS

Surficial Deposits	Columbia River Basalt Group	Pre-Basalt Bedrock Geology	Belt Supergroup		
Qmf			Pleistocene	Quaternary	cenozoic
Qg			Miocene	Tertiary	cenozoic
	Tcr				
		Klm, Kmg, Kk, Khb, Kcl		Cretaceous	Mesozoic
			Yra	Proterozoic	Precambrian
			Yp	Proterozoic	Precambrian

SURFICIAL DEPOSITS

Qmf Missoula flood deposits charcterized by graded beds and localized cross bedding. Grain sizes range from boulder to sand within the map area.

Qg Till from continental glaciation characterized by poorly sorted, round to sub rounded clasts of igneous, metamorphic, and sedimentary parent rocks

COLUMBIA RIVER BASALT GROUP

Tcr ***Columbia River Basalt Group (Miocene)*** Fine grained tholeitic basalt.

PRE-BASALT BEDROCK GEOLOGY

Klm ***Porphyritic two-mica granodiorite of Long Mountain (Cretaceous)***-Medium- grained porphyritic granodiorite with the assemblage quartz, potassium feldspar, plagioclase, muscovite, biotite, and trace amounts of magnetite, zircon and apatite. Large 1-3 cm phenocrysts of muscovite and 1-cm long euhedral orthoclase phenocrysts characterize the unit. Chemically the rocks are calc-alkalic to alkali-calcic and range from metaluminous to strongly peraluminous. The unit forms a large body west and southwest of Cocolalla Lake and is strongly foliated and slightly mylonitic in the northwest and weakly folliated in the south and southeast. Abundant aplite and pegmatite dikes cut the unit in all locales. The unit intrudes the older two-mica granodiorite (Kmg). Miller et. al. (1999) noted 0-20 percent of the rock volume is composed of feldspar megacrysts. Age considered Cretaceous based on lithologic similarity to nearby Cretaceous rocks such as the monzogranite of Blanchard Road

Kmg ***Two-mica granodiorite (Cretaceous)***-Fine-grained to medium-grained, subequigranular two-mica granodiorite with the assemblage quartz, potassium feldspar, plagioclase, muscovite, biotite, sphene and trace amounts of magnetite, zircon, and apatite. Chemically the rocks are calc-alkalic and range from peraluminous to strongly peraluminous. The unit forms localized intrusions north and south of Long Mountain and grades into and is cut by dikes of the phenocrystic Long Mountain (Klm). Locally has subhedral, 1-2 cm, potassium feldspar phenocrysts and is weakly foliated. Aplite and pegmatite intrudes along joints. Miller et. al. (1999) recognized a gradational transition between the unit and the porphyritic two-mica of Long Mountain (Klm) and the age is considered Cretaceous based on lithologic similarity to nearby Cretaceous two-mica rocks (Miller et. al. 1999).

Granodiorite of Kelso Lake

Kk ***Biotite granodiorite (Cretaceous)*** -Medium-grained to coarse-grained (1-4 mm) equigranular biotite granodiorite with euhedral to subhedral grain contacts and the mineral assemblage quartz, plagioclase, potassium feldspar, biotite, sphene, apatite, and zircon. Magmatic epidote occurs locally with euhedral biotite contacts and wormy plagioclase contacts. Locally, sparse amounts of magnetite, muscovite, and hornblende are present. Chemically the rocks are calc-alkalic and range from metaluminous to peraluminous. The unit forms a large body south and east of Long and Huckleberry Mountains and is overlain at lower elevations by Quaternary flood and glacial deposits. The unit is moderately foliated in the south and heavily fractured in the southeast with steeply dipping joints trending SW-NE. Locally these joints acted as conduits for basalt intrusion. To the west and east the unit grades into more mafic hornblende biotite granodiorite (Khb). Zircon gives uranium-lead age of 88 +/- 9 Ma, sphene gives 88 +/ 0.5 Ma (J.L Wooden, written commun., cited in Miller et. al 1999)

Granodiorite of Kelso Lake

Khb ***Hornblende-biotite granodiorite (Cretaceous)***-Medium-grained to coarse-grained (1-5mm) equigranular hornblende-biotite granodiorite, with euhedral to subhedral grain contacts and the mineral assemblage quartz, plagioclase, biotite, hornblende, potassium feldspar, epidote, and sphene, with trace amounts of apatite and zircon. The epidote, like in Kkl, illustrates magmatic textures. Chemically the rocks are calc-alkalic and metaluminous. The unit occurs east of the Tonalite of Clagstone and grades eastward into the biotite granodiorite phase of the Kelso Lake pluton (Kkl). It crops out again on the southeastern margin of the Kelso Lake pluton and is overlain, at lower elevations, by Quaternary flood and glacial deposits. The unit is weakly foliated in the south and contains aplite and pegmatite veins throughout.

Kcl ***Tonalite of Clagstone (Cretaceous)***-Medium-grained (1-3 mm) equigranular tonalite with subhedral grain contacts and the assemblage quartz, plagioclase, biotite, hornblende, microcline, epidote, and sphene. The epidote is ~2-3% of the rock and is magmatic with euhedral contacts with hornblende and biotite. The unit consists of a single pluton near Clagstone, Idaho (Miller et. al, 1979), within the Edgemere 7.5' quadrangle. Chemically the rocks are metaluminous and calcic with ~30-40% mafic materials. The unit is very weakly foliated and is locally intruded by pegmatite dikes. To the north the tonalite is bordered by a two mica granite pegmatite and aplite zone which illustrates graphic textures. To the east of the unit is the hornblende-biotite phase of the Kelso Lake pluton (Khb). Zircon gives uranium-lead age of 90-100 Ma and sphene gives age of 94 +/- .5 Ma (J.L Wooden, written communication, 1994, cited in Miller et. al 1999).

BELT SUPERGROUP

Yra ***Ravalli Group (Middle Proterozoic)***-Fine to medium grained siltite, quartzite, and argillite. Moderately metamorphosed close to plutons (Miller et. al 1999). The unit crops just east of Cocallala Lake.

Yp ***Prichard Formation (Middle Proterozoic)***-Interbedded quartzite, siltite, and argillite; color ranges from white and pale gray for quartzite, pale to medium-gray for siltite, and medium to dark-gray for argillite. Entire formation contains pyrite, causing all rock surfaces to be iron stained (Miller et. al. 1999). The unit makes up Huckleberry Mountain and a small ridge to the south. Crops out to the east of Huckleberry Mountain where it the rock shares contacts with glacial till *(Qt)* and hornblende-biotite granodiorite of Kelso Lake *(Kkb)*.

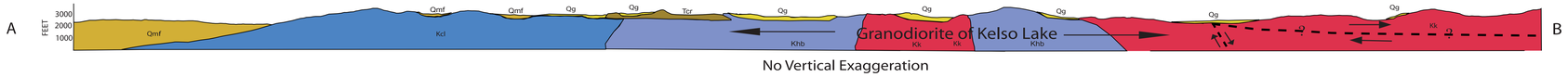
Base map from USGS digital raster graphic 1996.
Topography by photogrammetric methods from aerial photographs taken 1966. Updated from aerial photographs taken 1992 and field checked. Map edited 1996. Conflicts may exist between some updated features and previously mapped contours.
Polyconic projection. 1927 North American Datum.
10,000-foot grid ticks based on Idaho coordinate system, west zone.
1000-meter Universal Transverse Mercator grid ticks, zone 11.

UTM Grid and 1971 Magnetic North Declination at Center of Map

SCALE 1:24,000
1 0.5 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0.5 0 1 KILOMETER

QUADRANGLE LOCATION

Fieldwork conducted 2003
Support provided by the U.S. Geological Survey, National Cooperative Geologic Mapping Program
Map Version 2-1-2006



No Vertical Exaggeration

Published and sold by the Idaho Geological Survey
University of Idaho, Moscow, Idaho, 83844-3014