Geologic Map Compilation of the Hamilton 30 x 60 Minute Quadrangle, Idaho

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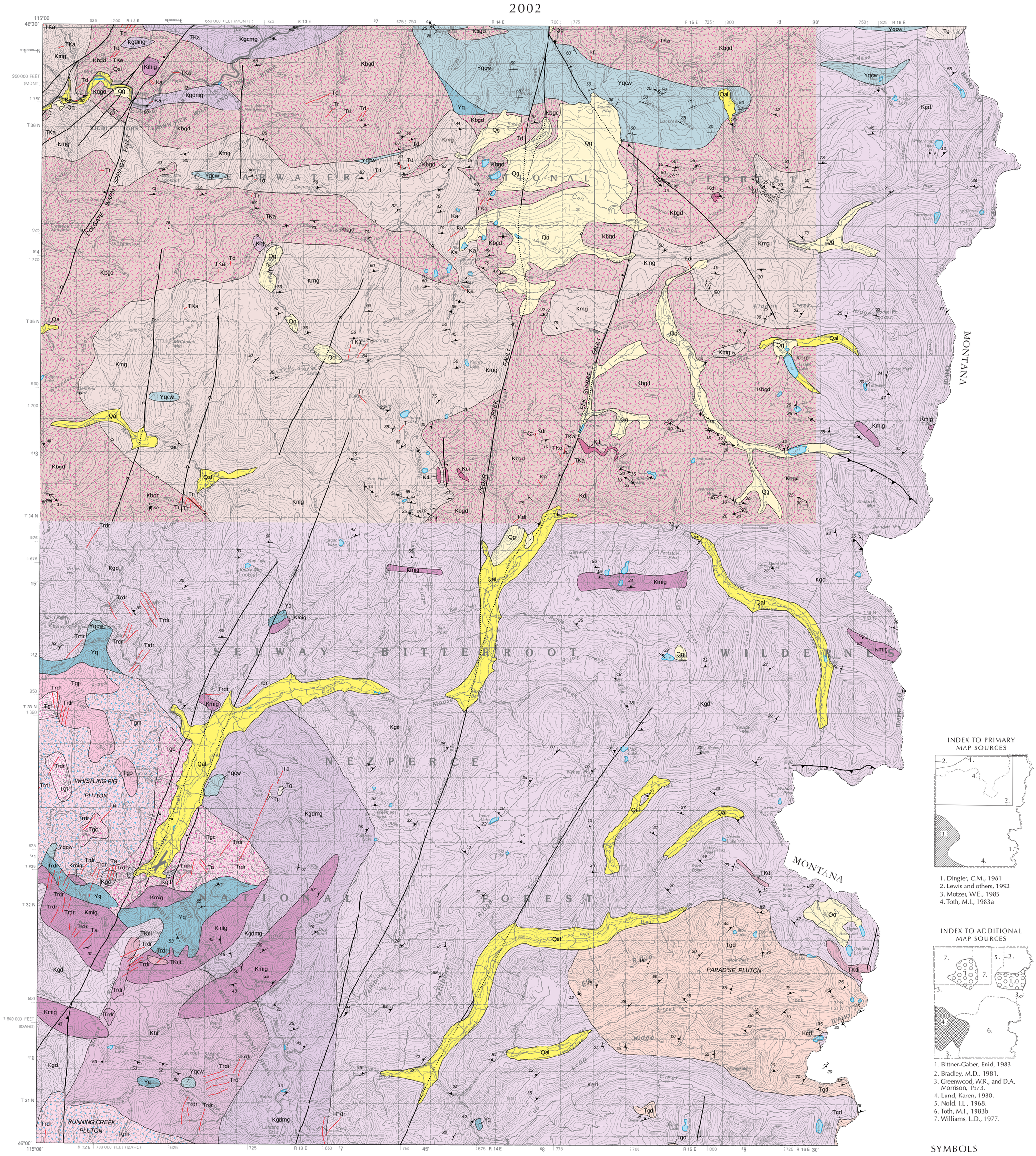
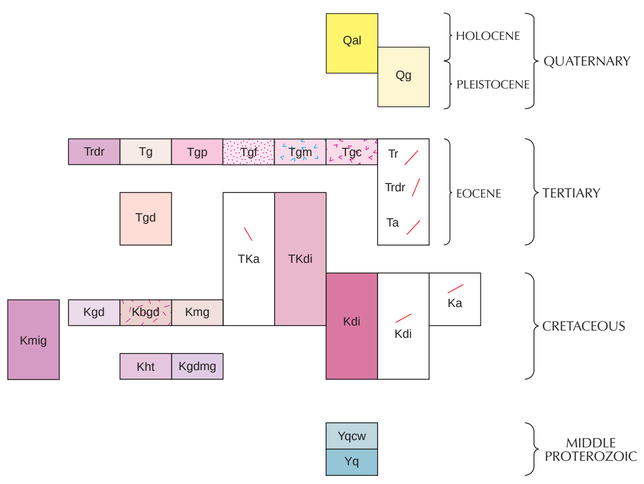


Introduction

The map was compiled primarily from four sources: Lewis and others 1992, Toth 1980, Motzer 1985, and Dingler 1981. Geologic edge-match discrepancies between sources were reconciled where possible in the compilation; the field work necessary to resolve remaining problems was beyond the funded scope of this project. Intrusive rocks are classified according to IUGS nomenclature using normalized values of modal quartz (Q), alkali feldspar (A), and plagioclase (P) on a ternary diagram (Streckeisen, 1976).

Correlation of Map Units



Description of Map Units

Qal **Alluvium (Quaternary)**—Stream deposits in modern drainages; gravel, silt, and sand.

Qg **Glacial deposits (Quaternary)**—Poorly sorted and poorly stratified, unconsolidated deposits principally of glacial origin. Includes till in lateral and ground moraines as well as outwash and modern stream alluvium.

Tr **Rhyolite dikes (Eocene)**—Tan-weathering, aphanitic to very fine-grained phaneritic rock that contains less than 10 percent phenocrysts of potassium feldspar and quartz.

Trdr **Rhyodacite and rhyolite dikes and plugs (Eocene)**—Rhyodacite and subordinate rhyolite, typically porphyritic, with phenocrysts of orthoclase or sanidine, plagioclase, quartz, biotite, and hornblende.

Ta **Andesite dikes (Eocene)**—Dark gray nonfoliated dikes characterized by sparse hornblende and plagioclase phenocrysts in an aphanitic matrix.

Tg **Granite (Eocene)**—Biotite granite. Stock in northeast corner is light gray, fine grained, and muscovite-bearing. It lacks perthitic feldspar typical of Eocene granite in the region, but is similar chemically ($K_2O > Na_2O$; $SiO_2 > 72\%$).

Tgp **Porphyritic granite (Eocene)**—Gray to pinkish gray, fine- to medium-grained porphyritic hornblende-biotite granite. Phenocrysts are orthoclase feldspar. Mapped as a chill zone capping the Whistling Pig pluton (Lund, 1980; Motzer, 1985).

Tgf **Fine-grained granite (Eocene)**—Cream colored biotite leucogranite. Commonly contains miarolitic cavities. Graphic and myrmekitic textures are abundant. Mapped as a textural phase of the Whistling Pig pluton (Lund, 1980; Motzer, 1985).

Tgm **Medium-grained granite (Eocene)**—Pink, medium-grained, biotite-hornblende granite to quartz syenite. Miarolitic cavities are common. Mapped as a textural phase of the Whistling Pig pluton (Lund, 1980; Motzer, 1985).

Tgc **Coarse-grained granite (Eocene)**—Pink, coarse-grained, biotite-hornblende granite to quartz syenite. Grain size averages greater than 5 mm. Sparse to no miarolitic cavities. Mapped as a textural phase of the Whistling Pig pluton (Lund, 1980; Motzer, 1985).

Tgd **Hornblende-biotite granodiorite (Eocene)**—Medium-grained equigranular to porphyritic monzogranite and granodiorite. Porphyritic rocks have light pink potassium feldspar phenocrysts 6 mm long in a medium-grained groundmass. Mapped as the Paradise pluton by Toth (1983a, 1983b).

TKa **Andesite dikes (Cretaceous and Eocene?)**—Dark gray, sparsely porphyritic to equigranular fine-grained dikes of uncertain age. Equivalent to either Ta or Ka units.

TKdi **Biotite-hornblende diorite, quartz diorite, and tonalite (Cretaceous and Eocene?)**—Abundant narrow dikes and composite bodies of gray to black diorite, quartz diorite, and tonalite. Fine- to medium-grained equigranular rocks are dominant over porphyritic varieties.

Ka **Andesite dikes (Cretaceous)**—Dark gray, weakly porphyritic to equigranular fine-grained dikes that consist primarily of plagioclase, biotite, quartz, and hornblende.

Kdi **Hornblende diorite (Cretaceous)**—Dikes and small bodies of fine- to medium-grained equigranular (pyroxene-) biotite-hornblende diorite and quartz diorite.

Kgd **Biotite and muscovite-biotite granodiorite and granite (Cretaceous)**—Slightly porphyritic to equigranular granodiorite and granite containing 2-5 percent biotite and varied amounts of muscovite. Weakly developed primary flow foliation present. Local development of a mylonitic foliation, particularly at higher elevations. Includes the Bear Creek pluton of Toth (1983b).

Kmg **Muscovite-biotite granite (Cretaceous)**—Medium-grained, equigranular muscovite-biotite granite and granodiorite. Muscovite is in books that locally coarsen to 1 cm in diameter.

Kbgd **Biotite granodiorite (Cretaceous)**—Medium- to fine-grained, equigranular to slightly porphyritic biotite granodiorite. Hornblende-bearing and tonalitic near some contacts with metasedimentary rocks. Associated pegmatite and aplite dikes and sills are common.

Kht **Tonalite (Cretaceous)**—Medium-grained hornblende-biotite tonalite and quartz diorite. Strongly developed flow foliation and a down-dip flow lineation defined by biotite and hornblende.

Kgdmg **Megacrystic granodiorite (Cretaceous)**—Granodiorite, granite, and tonalite containing poikilitic potassium feldspar megacrysts 3 to 8 cm long. Muscovite-bearing in southwest part of quadrangle (Toth, 1983), and hornblende-bearing and foliated in northwest part (Lewis and others, 1992).

Kmig **Migmatite (Cretaceous)**—Migmatite consisting of 20-95 percent granitic rocks intruded into quartzofeldspathic schist and gneiss, amphibolite, biotite quartzite, and calc-silicate gneiss. Studied in detail by Bittner-Gaber (1987).

Yqcw **Calc-silicate gneiss and quartzite of Wallace Formation (Middle Proterozoic)**—Includes centimeter-scale, layered, hornblende-diopside-quartz plagioclase gneiss, garnet-diopside quartzite, amphibolite, and minor amounts of garnet-biotite schist and gneiss.

Yq **Quartzite (Middle Proterozoic)**—White quartzite and micaceous granofelsic quartzite, commonly interlayered with pelitic schist. Quartz (31-97 percent) is found as granoblastic grains 2-4 mm across and in elongate platy grains parallel to the schistosity.

Index to Primary Map Sources

1. Dingler, C.M., 1981
2. Lewis and others, 1992
3. Motzer, W.E., 1985
4. Toth, M.I., 1983a

Index to Additional Map Sources

1. Bittner-Gaber, Enid, 1983.
2. Bradley, M.D., 1981.
3. Greenwood, W.R., and D.A. Morrison, 1973.
4. Lund, Karen, 1980.
5. Nold, J.L., 1968.
6. Toth, M.I., 1983b
7. Williams, L.D., 1977.

Symbols

- Contact: approximately located.
- Normal fault: approximately located; dotted where concealed; ball and bar on downthrown side.
- Thrust fault: approximately located; teeth on upper plate
- 50 — Strike and dip of bedding.
- 25 — Strike and dip of foliation.
- Strike of vertical foliation.
- 20 — Strike and dip of mylonitic foliation.
- 10 — Bearing and plunge of lineation.
- Mylonite.
- 25 — Bearing and plunge of small fold axis.
- 20 — Bearing and plunge of asymmetrical small fold showing counterclockwise rotation viewed down plunge.

References

Bittner-Gaber, Enid, 1983, Geology of selected migmatite zones within the Bitterroot lobe of the Idaho batholith, Idaho and Montana: University of Idaho Ph.D. dissertation, 173 p.

Bradley, M.D., 1981, Geology of northeastern Selway-Bitterroot Wilderness area, Idaho and Montana: University of Idaho M.S. thesis, 51 p.

Dingler, C.M., 1981, Reconnaissance glacial geology of the Selway-Bitterroot Wilderness and surrounding lower elevations, Idaho and Montana: University of Idaho M.S. thesis, 184 p.

Greenwood, W.R., and D.A. Morrison, 1973, Reconnaissance geology of the Selway-Bitterroot Wilderness area: Idaho Bureau of Mines and Geology Pamphlet 154, 30 p.

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Nold, J.L., 1968, Geology of the northeastern border zone of the Idaho batholith, Montana and Idaho: University of Montana Ph.D. dissertation, 159 p.

Streckeisen, A.L., 1976, To each plutonic rock its proper name: Earth-Science Reviews, v. 12, p. 1-33.

Toth, M.I., 1983a, Reconnaissance geologic map of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-B, scale 1:125,000.

Toth, M.I., 1983b, Structure, petrochemistry, and origin of the Bear Creek and Paradise plutons, Bitterroot lobe of the Idaho batholith: University of Colorado Ph.D. dissertation, 337 p.

Williams, L.D., 1977, Petrology and petrography of a section across the Bitterroot lobe of the Idaho batholith: University of Montana Ph.D. dissertation, 219 p.

Base map scanned from USGS 1:100,000-scale metric topographic map.
Base map prepared by the U.S. Geological Survey. Compiled from USGS 1:24,000-scale topographic maps dated 1964-1967. Planimetry revised from aerial photographs taken 1974, 1979, and other source data. Revised information not field checked. Map edited 1980.
Projection and 10,000-meter grid, zone 11, Universal Transverse Mercator.
25,000-foot grid ticks based on Idaho coordinate system, west zone.
1927 North American datum.
National geodetic datum of 1929.

UTM grid (GN) and Magnetic declination (MN). Diagram is approximate.

SCALE 1:100,000

1 0 1 2 3 4 5 KILOMETERS
1 0 1 2 3 MILES

Contour interval 50 meters
Supplementary contour interval 10 meters

IDAHO
QUADRANGLE LOCATION

Funded in part by the Mineral Resource Program of the U.S. Geological Survey
Digital cartography by Jane S. Freed, Loudon R. Stanford, and Tim Funderburg at the Idaho Geological Survey's Digital Mapping and GIS Lab.
Technical review by Karen Lund is gratefully acknowledged.
Map edited by Roger C. Stewart.
Note on printing: The map is reproduced at a high resolution of 600 dots per inch. The inks are resistant to run but not to the fading caused by long-term exposure to light.
Map version 5-31-02.

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