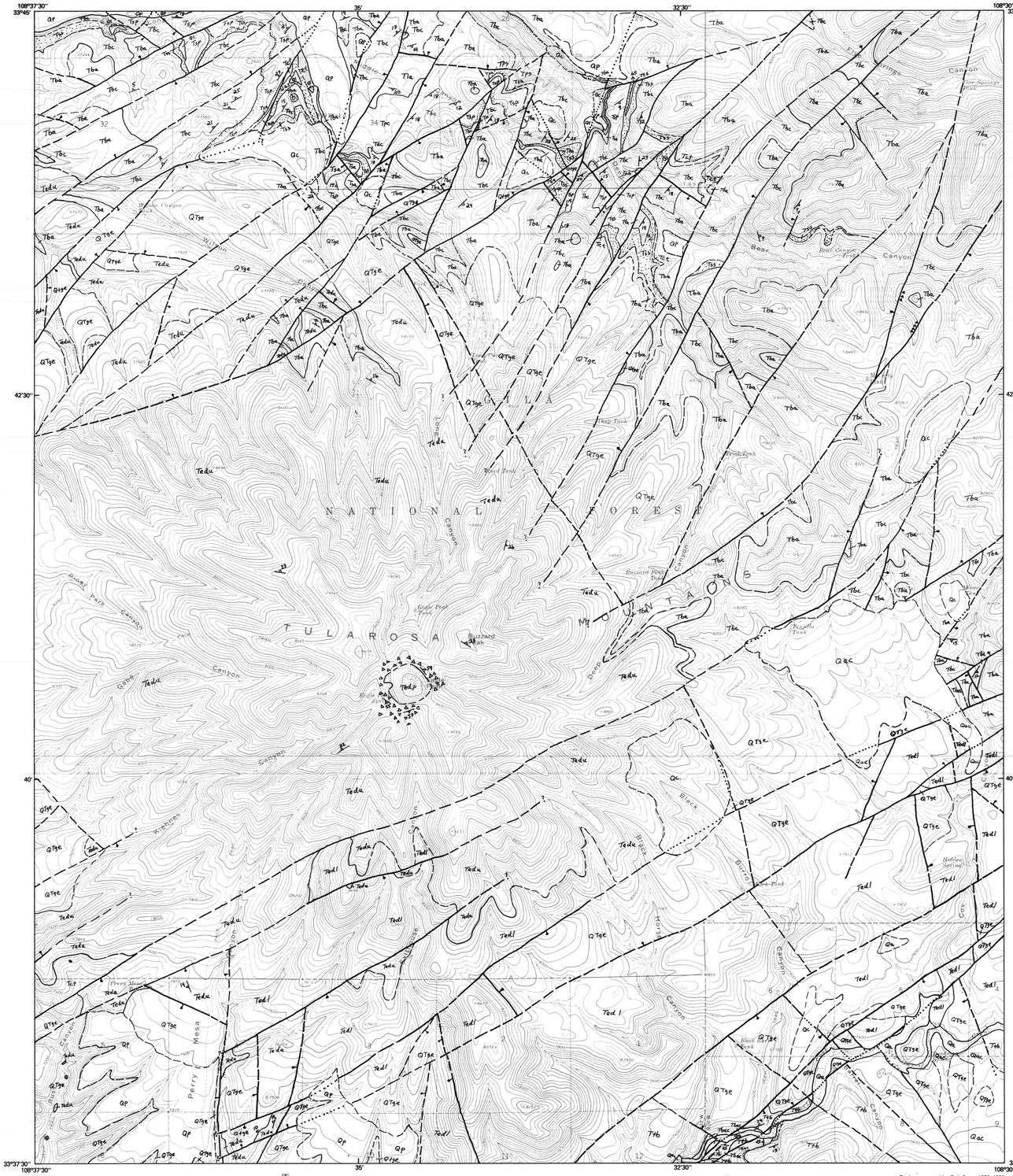
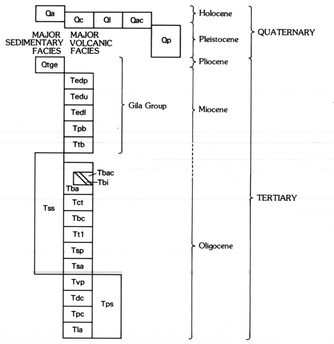
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN-FILE REPORT OF 90-0546
SHEET 1 OF 1



CORRELATION OF MAP UNITS



SYMBOLS

Contact--Dashed where approximately located or inferred; dotted where concealed; arrow indicates dip

Fault--Dashed where approximately located or inferred, dotted where concealed; ball and bar on downthrown side; arrow indicates dip; queried where continuation is uncertain; solid triangles indicate trace of fault marked by fault breccia

Strike and dip of bedded rocks

Horizontal or less than 5°

Strike and dip of flow structure in lava flows or compaction foliation in tuffs

Agglomerate vent breccia

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Qa **Alluvium (Holocene)**--Sand, gravel and boulder deposits along the North Fork of Negrito Creek. Locally includes torrential fan deposits at the mouths of tributary canyons. 0 m to about 10 m thick

Qc **Colluvium (Holocene and Pleistocene?)**--Poorly sorted silt- to boulder-sized deposits typically on or adjacent to moderately steep slopes. Locally includes talus and slope wash deposits. Thickness 0 m to about 10 m

Ql **Landslide deposits (Holocene and (or) Pleistocene?)**--Slumped and rotated bedrock and slumped talus; grades into colluvium. Headwall of landslide blocks commonly in well-sorted, eolian sandstone (unit Tss (see below)). May be tens of meters thick

Qac **Mixed alluvium and colluvium deposits (Holocene and (or) Pleistocene)**--Silt- to boulder-sized sheet and slope wash deposits. Includes alluvial sand, gravel, and boulders along drainages. Deposits south of the North Fork of Negrito Creek in the southeast corner of the quadrangle are mostly finer-silt-to-gravel-size sheet wash material that has surrounded isolated small outcrop islands. 0 m to a few tens of meters thick

Qp **Piedmont slope deposits (Pleistocene?)**--Silt- to boulder-sized deposits capping mesas. Deposits in the vicinity of Perry Mesa in southwest part of the quadrangle have morphological features of alluvial fans that were subsequently pedimented. 0 m to a few meters thick

GILA GROUP

Volcaniclastic conglomerate, sandstone and siltstone, and interlayered basaltic to dacitic lava flows and associated intrusive rocks

QTge **Eagle Peak beds of the Gila Formation (Miocene to Pliocene)**--Volcaniclastic sedimentary rocks locally derived from the Eagle Peak volcano. Nearer Eagle Peak, deposits typically consist of light- to medium-gray, coarse, poorly bedded, matrix-supported conglomerate. This coarse conglomerate contains 60 to 70 percent boulder- to pebble-sized clasts composed chiefly of Eagle Peak lithologies (units Tedu, Tedl (see below)). Clasts are subangular to subrounded, and moderately to poorly sorted. The matrix, which consists of medium-grained, muddy sand, is locally cemented by calcium carbonate. These deposits grade progressively into gray to reddish-brown, moderately well-bedded, clast-supported conglomerate, and well-bedded, locally crossbedded, conglomeratic sandstone with occasional lenses of conglomerate. Such a progression is well exposed in Russ Canyon, near the southwest corner of the quadrangle. Clasts within the finer sediments consist largely of locally derived volcanic rocks; the abundance of Eagle Peak lithologies decreases with distance from the volcanic center. With the exception of road cuts and canyons in the southwestern part of quadrangle, deposits are poorly exposed. These deposits represent an apron of debris flow and alluvial deposits with a coarser proximal facies and a finer, more reworked distal facies. Stratigraphically equivalent to the upper beds of the Gila Formation as mapped in the adjacent Milligan Mountain quadrangle (QTge of Ratté and Bove, 1990). Maximum thickness in quadrangle about 200 m

Dacite of Eagle Peak (Miocene)--Lava flows, vent-agglomerate breccias and central volcanic plug of andesite to dacite composition (60-66 percent SiO_2) erupted from the Eagle Peak volcano. Eagle Peak is a relatively low-angle-profile (about 8-12 degrees), central vent volcano with flanking flows extending up to 12 km from the vent area into the Milligan Mountain quadrangle (Ratté and Bove, 1990) to the west. Well-developed flow lobe masses, flow-folding, and flow layering characterize the Eagle Peak flows. Sheeting joints are developed parallel to flow layers and vertical shrinkage joints are also common. The basal portions of flows are commonly marked by flow breccia zones up to 15 meters thick, and the margins of flow lobes typically are encased in tractor-type breccias

Tedp **Dacite porphyry plug**--Light medium-gray porphyritic dacite (66 percent SiO_2) measures about 0.5 km in diameter. Contains 25-30 percent phenocrysts of plagioclase, orthopyroxene, clinopyroxene, and rare hornblende, including microphenocrysts of plagioclase, orthopyroxene, clinopyroxene and biotite. Magnetite and apatite occur as accessory minerals. The groundmass is finely granular. Forms the prominent, mostly treeless knob atop Eagle Peak

Tedu **Upper Eagle Peak flows**--Flows are seriate porphyritic, range from black (glassy) to dark-gray and have SiO_2 contents ranging from 63 to 65 percent. Contains 8-12 percent phenocrysts and microphenocrysts of plagioclase, orthopyroxene, and minor clinopyroxene. Accessory minerals include apatite, magnetite, and rare zircon. Volumetrically comprises about 75 percent of the Eagle Peak dacite. Upper flows fill paleotopography formed by flows of the lower, hornblende-bearing Eagle Peak unit (Tedl).

Flow breccias containing black subvitric blocks and smaller fragments in a fine-grained, red oxidized matrix are exclusive to the upper Eagle Peak flows and have been seen near basal flow boundaries. Zones up to several meters thick containing abundant spherulites 0.5-2 cm across also are found locally, and in places mark the horizon above basal vitrophyre zones.

Includes steeply dipping, monolithologic, vent-agglomerate breccias. Breccias contain up to 30 percent lapilli- to block-sized clasts and rare bombs of dark glassy dacite in a fine, locally oxidized matrix.

A whole-rock potassium-argon age of about 9.5 Ma has been reported for the upper Eagle Peak flows by Marvin and others (1987). 0 m to about 350 m thick

Tedl **Lower Eagle Peak flows**--Dark-gray to reddish-gray hornblende-bearing flows; contain finely vesicular upper zones. Contain 25-30 percent phenocrysts of plagioclase, hornblende, orthopyroxene and minor clinopyroxene and biotite. Accessory minerals include apatite, magnetite, and rare ilmenite and zircon. Flows are exposed beneath the upper Eagle Peak flows (Tedu) south of Eagle Peak; generally crop-out on the south and southeastern flanks of the volcano and apparently are absent on north and northeast flanks. The presence of a finely vesicular, frothy top preserved on the lower Eagle Peak flows may preclude a significant time gap between eruption of upper and lower units. 0 m to over 100 m thick

Tpb **Basalt of Pueblo Park (Miocene)**--Dark-gray, fine-grained porphyritic basalt. Characterized by sparse plagioclase phenocrysts ranging from 2 to 6 mm with iddingsitic olivine microphenocrysts and accessory opaque oxides set in a sparsely and finely vesicular aphanitic groundmass with sparse, small vesicles. Consists of a thin flow localized in section 36 above Deep Canyon. Overlies upper non-welded Bloodgood Canyon tuff (Ttc (see below)) and is bounded by northeast-trending fault. No correlative flow was observed to east of fault, possibly indicating post-faulting emplacement with termination of flow against a fault scarp barrier. Similar flows to the west in the Milligan Mountain quadrangle (Ratté and Bove, 1990) post-date Bearwallow andesite (Tba (see below)) and pre-date the dacite of Eagle Peak.

Flows of similar composition and texture and, presumably, similar age include basalt of Pueblo Park in the Saliz Park quadrangle, 19.2±2.5 Ma (Ratté, 1980); basalt flows interlayered with Gila Group conglomerate in Bull Basin quadrangle, 15.4±0.4 Ma (Ratté, 1989), and the basalt of Pueblo Park in the Milligan Mountain quadrangle (Ratté and Bove, 1990)

Ttb **Trachyandesite of Barrel Canyon (Oligocene and (or) Miocene)**--Thick sequence of dark-gray, sparse to moderately vesicular, finely porphyritic trachyandesite flows characterized by moderately abundant phenocrystic and glomerocrystic clinopyroxene up to about 0.8 cm and by microphenocrysts of iddingsitized olivine. Flows largely make up steep, wooded slopes south of North Fork of Negrito Creek in southeast corner of quadrangle. The source area is probably in the vicinity of Sheepherders Baseball Park, sec. 30, T. 8 S., R. 16 W., approximately 3 miles south in the adjacent Telephone Canyon quadrangle. Two thin flows (<10 m) of this unit have been observed in the adjacent Milligan Mountain quadrangle (Ratté and Bove, 1990) in the vicinities of Kinnes Canyon, sec. 36, T. 8 S., R. 18 W., and Jon S Mountain, sec. 28, T. 6 S., R. 18 W., at distances of about 15 and 22 km respectively from the Barrel Canyon locality. Flows in the vicinity of Barrel Canyon conformably overly local deposits of conglomeratic sandstone, which rest unconformably upon bedded, red, scoriaceous cinder deposits from an eroded Bearwallow Mountain-correlative cinder cone (Tbac (see below)). 0 m to about 200 m thick

Tss **Volcaniclastic sandstone (Oligocene and Miocene?)**--Tan to gray-brown, fine- to medium-grained, well-sorted volcaniclastic sandstone. Locally red where oxidized by overlying mafic lava flows. Characterized by steeply to moderately dipping large scale crossbeds. Sandstone may include Tuff of Triangle C Ranch on map, as on south side of Deep Canyon and elsewhere, or sandstone is included in other units, as indicated by local dot pattern within that unit. Ranges stratigraphically from above Davis Canyon Tuff (Tdc (see below)) to base of Trachyandesite of Barrel Canyon (Ttb). Deposits interpreted as eolian in origin. 0 m to about 40 m thick

Bearwallow Mountain Andesite (Oligocene and (or) Miocene)--Typically dark gray, iddingsitic andesite to trachyandesite flows or flow breccias erupted from numerous small to moderate sized shield volcanoes between 27 and 23 Ma (Ratté, 1989). The shield volcanoes are commonly aligned along regional northeast and northwest structural trends, and are widespread throughout the Mogollon-Datil volcanic field (Ratté, 1981). Includes voluminous flows (Tba), and an eroded andesitic cinder cone (Tbac) and dike? (Tbai) along the North Fork of Negrito Creek near the mouth of Black Burro Canyon

Tba **Andesite to trachyandesite lava flows**--Dark-gray to dark-brown, fine-grained vesicular to amygdaloidal andesitic to trachyandesitic flows and flow breccias. Characterized by abundant iddingsitic olivine phenocrysts averaging about 0.2-0.5 mm across. Mineralogy of flows varies; they may contain sparse phenocrysts and microphenocrysts of olivine, clinopyroxene, and orthopyroxene, and sparse glomerocrystic masses of clinopyroxene, olivine and (or) orthopyroxene. The groundmass is typically composed of plagioclase microlites and accessory opaques. Similar in appearance to the Trachyandesite of Barrel Canyon (Ttb), but without coarse-grained clinopyroxene phenocrysts. Maximum thickness of flows is about 250 m in the northeast part of the quadrangle; not present in the southwestern part where flows either pinched out or were eroded prior to deposition of the younger units. Extreme thickness in the northeastern part of quadrangle may indicate a local source in or adjacent to the northern part of the quadrangle. However, no vents or dikes were observed in that area

Tbi **Andesite dike or plug?**--Narrow, discontinuously outcropping intrusion about 50 feet in width. Contains abundant iddingsite after olivine averaging 1 to 2 mm set in an aphanitic, reddish-purple, oxidized and moderately altered groundmass. Stratigraphic equivalence to Bearwallow Mountain Andesite based upon major and trace element chemistry, with specific emphasis on Zr/Nb ratios

Tbac **Andesitic cinder cone**--Steeply dipping, bedded, red scoriaceous cinder deposits, with bombs up to about 60 cm. Unconformably overlain by crudely bedded conglomeratic sandstone, which fines upward into a moderately well-bedded sandstone. The sandstone is conformably overlain by flows of the Trachyandesite of Barrel Canyon (Ttb). The cinder deposits, which are offset by a northeast trending fault, have a maximum thickness of at least 60 m

Tct **Tuff of Triangle C Ranch (Oligocene)**--White to grayish-pink, nonwelded, rhyolitic ash-flow tuff; contains white glassy pumice blocks as much as 5 to 10 cm in diameter. Petrographically similar to underlying nonwelded, crystal-poor upper Bloodgood Canyon Tuff, from which it may be separated by zero to tens of meters of volcaniclastic sandstone and conglomerate. Dot pattern, locally superimposed on this map unit, indicates presence of volcaniclastic rocks. Where volcaniclastic rocks are absent between Tuff of Triangle C Ranch and Bloodgood Canyon Tuff, they are generally indistinguishable based on field characteristics. 0 m to about 25 m thick in northeast part of quadrangle and greater than 100 m thick in the vicinity of Russ Canyon near the southeast corner of quadrangle

Tbc **Bloodgood Canyon Tuff (Oligocene)**--Nearly white to light-gray rhyolitic ash-flow tuff. Where top is preserved, grades downward from nonwelded to densely welded tuff. Contains 10-20 percent phenocrysts including conspicuous, rounded bipyramidal quartz, cryptoperthitic sanidine (moonstone), sparse honey-yellow sphene, and minor to rare biotite in a compaction-foliated pumiceous matrix

The presently accepted $^{40}Ar/^{39}Ar$ age for Bloodgood Canyon Tuff is 28.1 Ma (McIntosh, Chapin, Ratté, and Sutter, in press). Tuff ranges from about 25 m in northwest part of quadrangle to more than 200 m in northeast part

Tt1 **Ash-flow tuff**--Thin (about 5 m), discontinuous, white to light-gray, poorly welded to non-welded ash flow tuff. Contains about 5 to 10 percent phenocrysts of sanidine, bronzy biotite, and plagioclase; contains block- to lapilli-sized lithics of the underlying Shelley Peak tuff (Tsp). Zeolitized and in part silicified. Lies conformably above and beneath beds of crossbedded eolian sandstone (unit Tss). Stratigraphic correlation unknown

Tsp **Shelley Peak Tuff (Oligocene)**--Typically red, densely welded, phenocryst-rich, rhyolitic ash-flow tuff with plagioclase, bronzy biotite, and clinopyroxene phenocrysts. Densely welded tuff typically grades upward into partially welded, pinkish-white tuff; black vitrophyre a meter or two thick commonly is present at the bottom of the densely welded zone. Thickness ranges from about 40 to 80 m

Tsa **Squirrel Springs Canyon Andesite (Oligocene)**--Dark-gray to reddish-brown, coarsely porphyritic basaltic andesite; flows characterized by flow aligned (trachytoid textured) plagioclase phenocrysts 1 to 2 cm long and clinopyroxene averaging 0.5 mm. Thickness averages about 5 to 10 m

Tps **Pre-Squirrel Springs Canyon andesite rocks undivided (Oligocene)**--Combines Vicks Peak Tuff (Tvp), Davis Canyon Tuff (Tdc) and Pueblo Creek Formation (Tpc), including andesite of Dry Leggett Canyon (Tla). These units were mapped together in sec. 35, T. 6 S., R. 17 W., where rock exposures are poor

Tvp **Vicks Peak Tuff (Oligocene)**--White to light-gray, phenocryst-poor, rhyolitic ash-flow tuff. Characterized by lack of crystals and pumice. $^{40}Ar/^{39}Ar$ age of Vicks Peak Tuff from northwest of Kimball Spring in the adjacent Milligan Mountain quadrangle is 30.89±0.11 Ma, compared with accepted $^{40}Ar/^{39}Ar$ age of 28.6 Ma. Sample northwest of Kimball Spring is considered to be contaminated with older sanidine crystals (McIntosh and others, in press, 1990). About 10 m thick in this quadrangle

Tdc **Davis Canyon Tuff (Oligocene)**--White to light-gray, poorly welded to densely welded, phenocryst-poor, rhyolitic ash-flow tuff. Matrix of vitroclastic ash shards commonly zeolitized. Partially welded tuff contains sparse, gray, flattened pumice lapilli; more densely welded tuff has wispy, gray to brown pumices as much as several cm long. Contains less than 5 percent, 1-2 mm phenocrysts, mainly sanidine and biotite, rare quartz, and accessory sphene, clinopyroxene and hornblende. Tuff is about 10 m thick in north-central part of quadrangle. $^{40}Ar/^{39}Ar$ age is 29.0 Ma (McIntosh and others, in press, 1990)

Pueblo Creek Formation (Oligocene)--Largely fluvial facies volcaniclastic rocks and interlayered andesitic lava flows. Virtually equivalent to the Spears Formation of the Datil Group (Osburn and Chapin, 1983), in the northeastern Mogollon-Datil volcanic field

Tpc **Pueblo Creek Conglomerate**--Red to reddish-brown volcaniclastic sedimentary rocks. Mainly debris flow breccias with andesitic to dacitic clasts, some hornblende-bearing. About 150 m thick in north-central part of quadrangle

Tla **Andesite of Dry Leggett Canyon**--Red to gray, typically oxidized, plagioclase and pyroxene porphyritic lava flows; minimum of about 70 m thick in north-central part of quadrangle

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This map is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards nor with the North American stratigraphic code.

PRELIMINARY GEOLOGIC MAP OF THE EAGLE PEAK QUADRANGLE, CATRON COUNTY, NEW MEXICO

By
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1990