

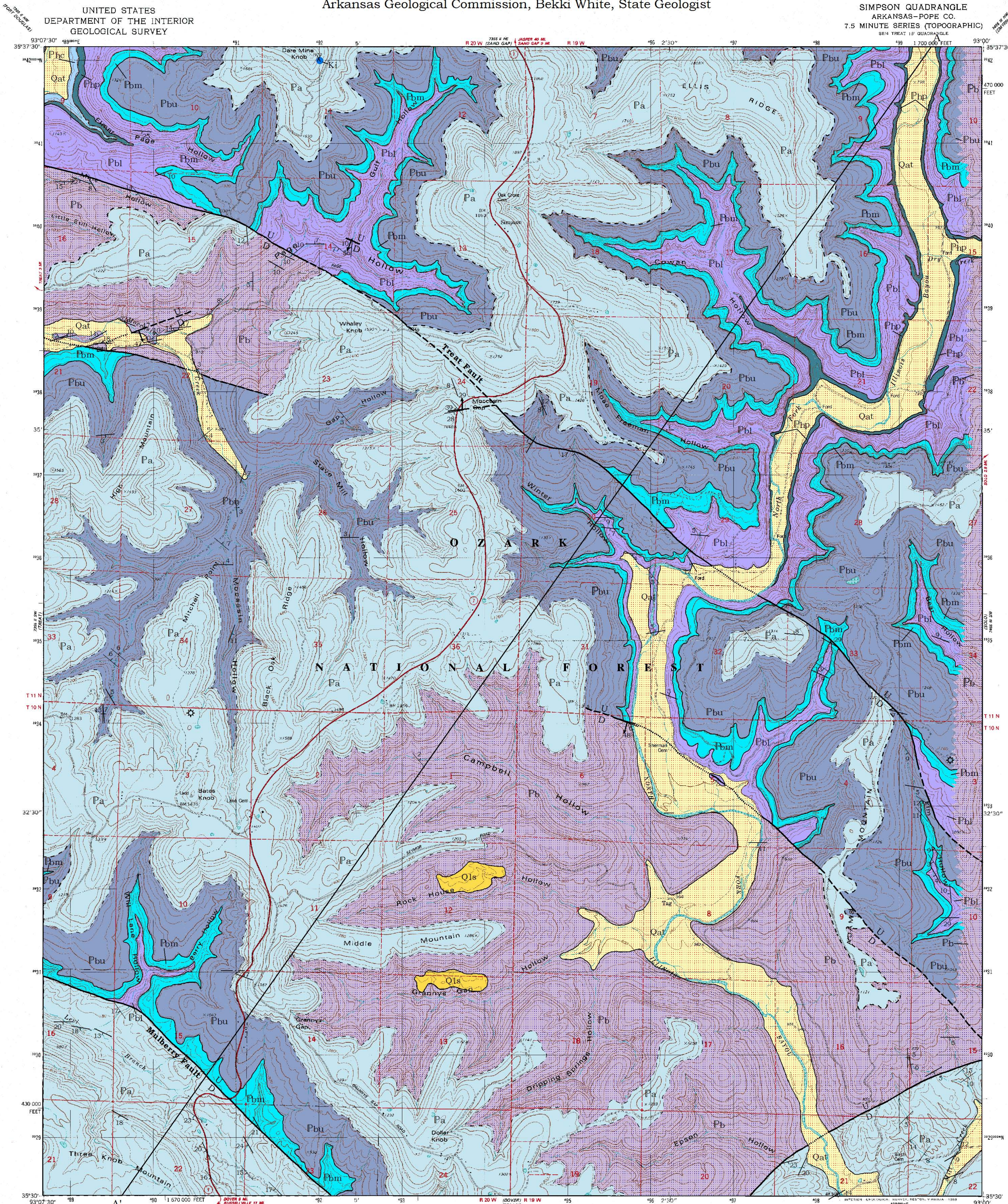
GEOLOGIC MAP OF THE SIMPSON QUADRANGLE, POPE COUNTY, ARKANSAS

DIGITAL GEOLOGIC QUADRANGLE MAP
SIMPSON QUADRANGLE, ARKANSAS
DGM-AR-00784

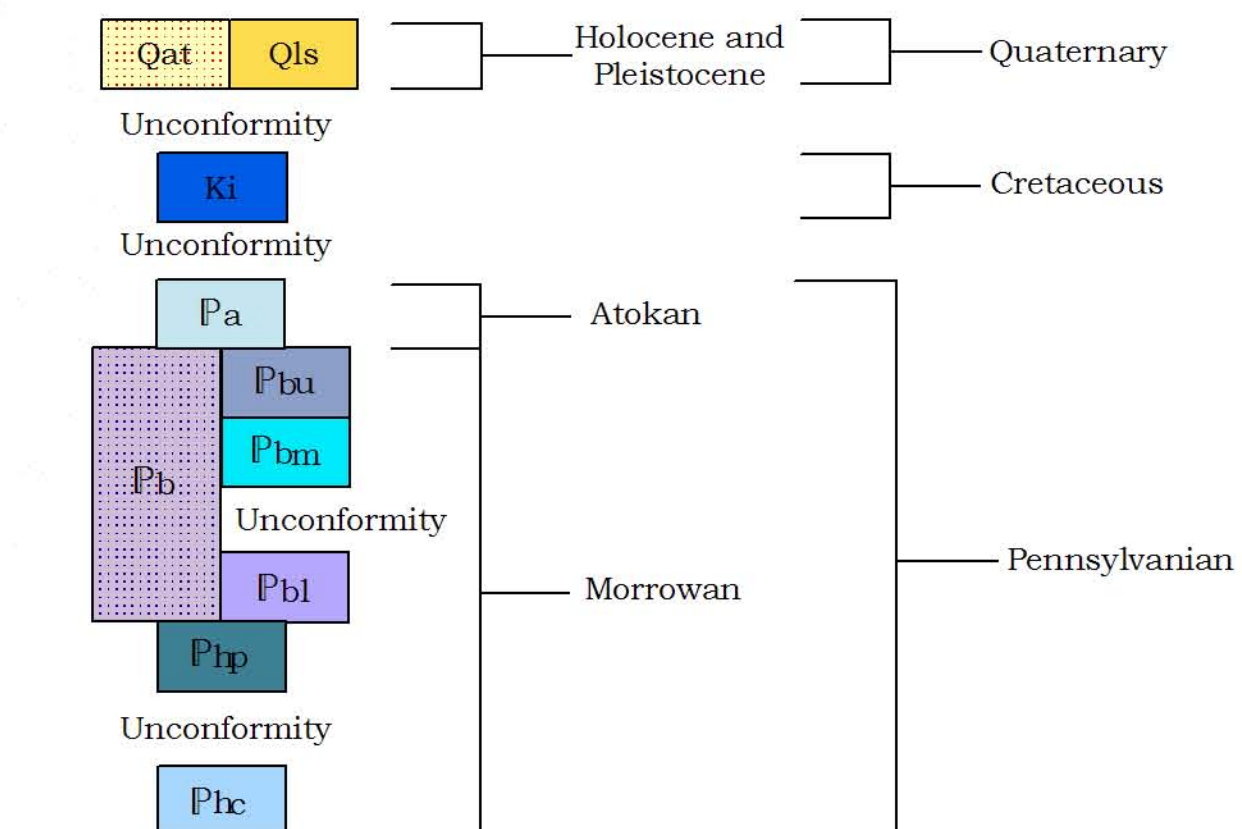
Geology by Angela K. Chandler and Richard S. Hutto
Digital compilation by Walter K. Mayfield
2006

Arkansas Geological Commission, Bekki White, State Geologist

SIMPSON QUADRANGLE
ARKANSAS-POPE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SERIES TREAT IS QUADRANGLE
SERIES TREAT IS QUADRANGLE
SERIES TREAT IS QUADRANGLE



Correlation of Map Units



Description of Map Units

- Qls** **Landslide deposits (Quaternary)** - Mostly blocks of sandstone and covered shale slumps derived from the Bloyd Formation.
- Qat** **Alluvium and terrace deposits (Quaternary)** - Unconsolidated clay, silt, sand and gravel including deposits on one or more terrace levels of local streams.
- Ki** **Igneous (Cretaceous)** - An igneous lamprophyric intrusion is located on Dare Mine Knob on the northern border of the quadrangle. The intrusion has been dated by Denison using the K/Ar mica concentrate method at 83 ± 8 mybp (1976, open file data, AGC). E.M. Morris (1988) named the intrusion rock aolite. The intrusion is poorly exposed and only weathered pieces of the lamprophyre and metamorphosed country rock such as hornfels and metagranite can be found in this locality.
- Pa** **Atoka Formation (Middle Pennsylvanian, Atokan)** - Consists of black to tan shales interbedded with very thin to thin ripple-bedded micaceous siltstones and thin to medium bedded, fine to very fine-grained sandstones with sub-angular to sub-rounded quartz grains. The sandstones are tan to buff colored on fresh and weathered surface and occasionally contains clay pebbles, lenticular bands, horizontal trace fossils, and cross-beds. Occasionally the sandstones contain pebble conglomerate zones with external nodules of fossils. The sandstones vary from 10 - 20 ft. (3 - 6 m) thick. The upper Atoka is exposed in the southwestern corner of the map due to a displacement of approximately 2500-3000 ft. along the Mulberry fault near this area (Haley, 1982). A 3' coal seam is present in the upper Atoka along Hwy 7 south of the Mulberry Fault. The base of the Atoka Formation is placed at the base of a thin-bedded sandstone unit approximately 15-20 ft. thick. This contact is tentative and will be resolved with future mapping. Approximately 120-480 ft. (37-146 m) thick.
- Pbu** **Bloyd Formation (Lower Pennsylvanian, Morrowan)** - In this quadrangle the individual members within the Bloyd Formation cannot be recognized because its limestone units (Brentwood and Kensler Limestones) are either missing or have become shaly and sandy. There are no other "marker zones" to divide the section into the recognizable members known from the type section in northwest Arkansas. Therefore the Bloyd Formation is divided informally into lower and upper parts (Hudson et al., 2001) separated by the "middle Bloyd sandstone" (Zachry and Haley, 1975) where divisible. In some areas on this quadrangle the "middle Bloyd sandstone" cannot be recognized making the Bloyd Formation indivisible into lower and upper parts. For that reason a zigzag line is drawn in the region where the "middle Bloyd sandstone" begins to be unrecognizable. Approximately 320-760 ft. (98-232 m) thick.
 - Upper part** - Consists of thin ripple-bedded to thick micaceous sandstones interbedded with clay to silty shales. The sandstones consist of fine to coarse grained sub-angular to sub-rounded quartz. They are light-brown to gray on fresh surface but weather dark-gray. The shales are dark-gray to black on fresh and weathered surfaces. This interval contains many trace fossils and load features. A calcareous fossiliferous sandstone is present at a few localities just above the "middle Bloyd sandstone". It is fine to medium grained and contains some conglomerate pebbles consisting of siltstone, hematite and limonite. The sandstone is gray to reddish-gray on a fresh surface but weathers brown to reddish-brown. Approximately 200-320 ft. (61-98 m) thick.
 - Lower part** - Consists of sections of thin to thick ripple to planar-bedded sandstone interbedded with very thin to thin ripple-bedded siltstones and clay to silty shale. The sandstones are fine to medium-grained, gray, dark gray to tan, may contain quartz pebbles, clay drapes, lenticular bands, trace fossils and siltstones and are sometimes calcareous and cross-bedded. The shales and siltstones are charcoal gray to black, sometimes weather reddish and occasionally contain siltstone concretions and Asterozonia trace fossils. Calcareous fossiliferous conglomerate beds occur throughout the Bloyd Formation. Sandy cross-bedded limestones occur in the lower portion of the formation. They are gray to dark gray on fresh surface but weather reddish or light gray to white and contain abundant fossils such as crinoids, brachiopods, blastoids and occasionally oolites. Approximately 320-560 ft. (98-171 m) thick.
- Pbl** **Undifferentiated** - Consists of sections of thin to thick ripple to planar-bedded sandstone interbedded with very thin to thin ripple-bedded siltstones and clay to silty shale. The sandstones are fine to medium-grained, gray, dark gray to tan, may contain quartz pebbles, clay drapes, lenticular bands, trace fossils and siltstones and are sometimes calcareous and cross-bedded. The shales and siltstones are charcoal gray to black, sometimes weather reddish and occasionally contain siltstone concretions and Asterozonia trace fossils. Calcareous fossiliferous conglomerate beds occur throughout the Bloyd Formation. Sandy cross-bedded limestones occur in the lower portion of the formation. They are gray to dark gray on fresh surface but weather reddish or light gray to white and contain abundant fossils such as crinoids, brachiopods, blastoids and occasionally oolites. Approximately 320-560 ft. (98-171 m) thick.
- Pbc** **Cane Hill Member** - A gray to black fissile clay to silty shale in the lower portion that contains iron nodules and small limonitic box work fragments. The upper portion consists of thin bedded ripple marked micaceous siltstones and sandstones. Varies from black to dark-gray on fresh surface to light-gray and light-orange-brown on weathered surface. Trace fossils and tyrogon fragments are abundant. The base of the Cane Hill Member is not exposed in this quadrangle. Approximately 60 ft. (18 m) exposed in the extreme northwestern corner of the map.

"middle Bloyd sandstone" - A thin to massive, medium to coarse-grained, cross-bedded quartz or iron-cemented sandstone with sub-angular to sub-rounded quartz grains. Reddish, gray or light tan on fresh surface but weathers brown to orange-brown due to iron content. Contains tabular cross-bedded packages that can be up to three feet thick and sometimes herringbone cross-beds. Contains abundant tyrogon fossils and rounded quartz pebbles. A pebble class conglomerate is present at some localities at the base of this sandstone that contains marble size sandstone concretions. The "middle Bloyd sandstone" is unconformable with the lower part of the Bloyd Formation. Approximately 60-160 ft. (18 - 49 m) thick.

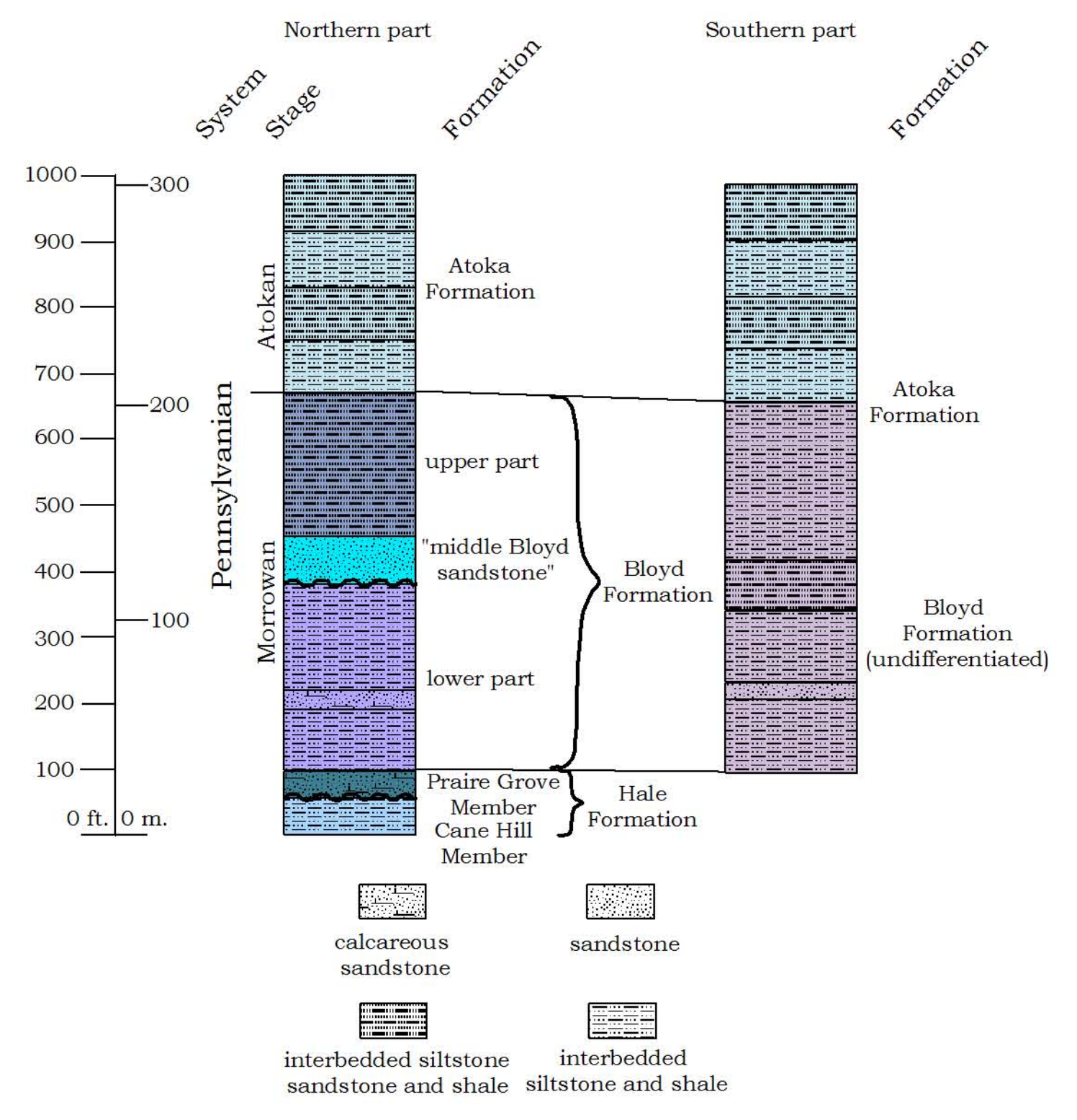
Pbl - Consists of interbedded very thin to thin ripple-bedded micaceous siltstones and sandstones that are fine to medium-grained interbedded with black clay to silty shales. Throughout the lower portion is black fissile clay shales to silty shales interbedded with thin to thick-bedded fossiliferous calcareous sandstone to sandy limestone beds. The carbonate beds vary from red to gray on fresh and weathered surface and can be mottled and cross-bedded. Sometimes the fossiliferous sandy layers look "rotten" due to decalcification. The quartz grains are medium grained and sub-angular to sub-rounded. This unit contains abundant trace fossils. The contact between the lower part of the Bloyd Formation and the Prairie Grove is placed below a shaly layer conformable with the underlying massive calcareous sand of the Prairie Grove Member of the Hale Formation. Approximately 240-360 ft. (73-110 m) thick.

Hale Formation (Lower Pennsylvanian, Morrowan) - The Hale Formation consists of two Members; the Prairie Grove Member and the Cane Hill Member. Approximately 80-120 ft. (24-37 m) thick.

Prairie Grove Member - A fine to coarse-grained quartz sandstone with varying amounts of carbonate, crinoid fragments and quartz pebbles. Reddish-gray to brown or mottled on fresh surfaces but weathers dark reddish-brown. Bedding varies from thin to massive and exhibits a rounded weathering profile. This unit often contains cross-beds, lenticular bands, and a pitted surface that is referred to as honeycomb weathering. The base of the Prairie Grove Member contains a fossiliferous quartz pebble conglomerate that contains clay drapes, limonite pebbles and clasts of shale, siltstone, and sandstone. Throughout this quadrangle it is difficult to differentiate the Prairie Grove Member due to additional sandstone packages in the Hale Formation and the lower part of the Bloyd Formation. The Prairie Grove Member is unconformable with the Cane Hill Member. Approximately 20-60 ft. (6-18 m) thick.

Cane Hill Member - A gray to black fissile clay to silty shale in the lower portion that contains iron nodules and small limonitic box work fragments. The upper portion consists of thin bedded ripple marked micaceous siltstones and sandstones. Varies from black to dark-gray on fresh surface to light-gray and light-orange-brown on weathered surface. Trace fossils and tyrogon fragments are abundant. The base of the Cane Hill Member is not exposed in this quadrangle. Approximately 60 ft. (18 m) exposed in the extreme northwestern corner of the map.

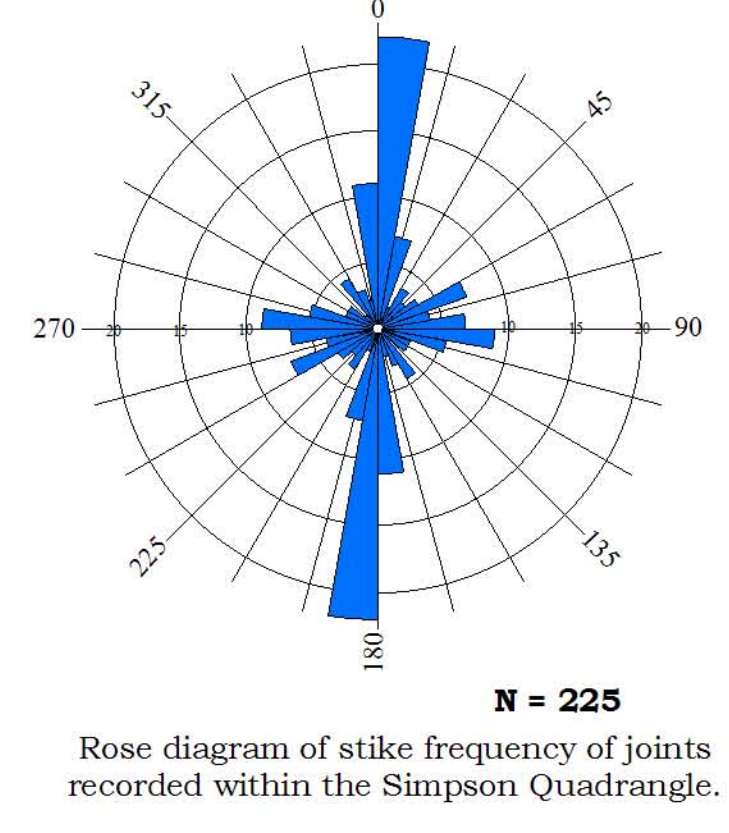
Stratigraphic Column



Symbols

- Contact
- Contact - inferred
- Fault - arrow showing dip of the fault plane
- U - upthrown
- D - downthrown
- Fault - inferred
- Fault - concealed
- Strike and dip of inclined bedding
- Gas well
- Prospect pit

Joint Frequency



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Control by USGS and NOS/NOAA
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Projection and 10,000-foot grid ticks. Arkansas coordinate system, north zone (Lambert conformal conic)
1:000-meter Universal Transverse Mercator grid, zone 15
1927 North American Datum
To place on the predicted North American Datum 1983
move the projection lines 6 meters south and
16 meters east as shown by dashed corner ticks
There may be private landowners within the boundaries of the National or State reservations shown on this map.
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is un-checked.

ROAD CLASSIFICATION
Primary highway, light-duty road, hard or hard surface
Secondary highway, hard surface
Unimproved road
Interstate Route
U.S. Route
State Route

SCALE 1:24,000
CONTOUR INTERVAL 40 FEET
NATIONAL GEODESIC VERICAL DATUM OF 1929

SIMPSON, ARK.
7.5 MINUTE SERIES
1980
DMA 1355 II 8E-SERIES 7084

