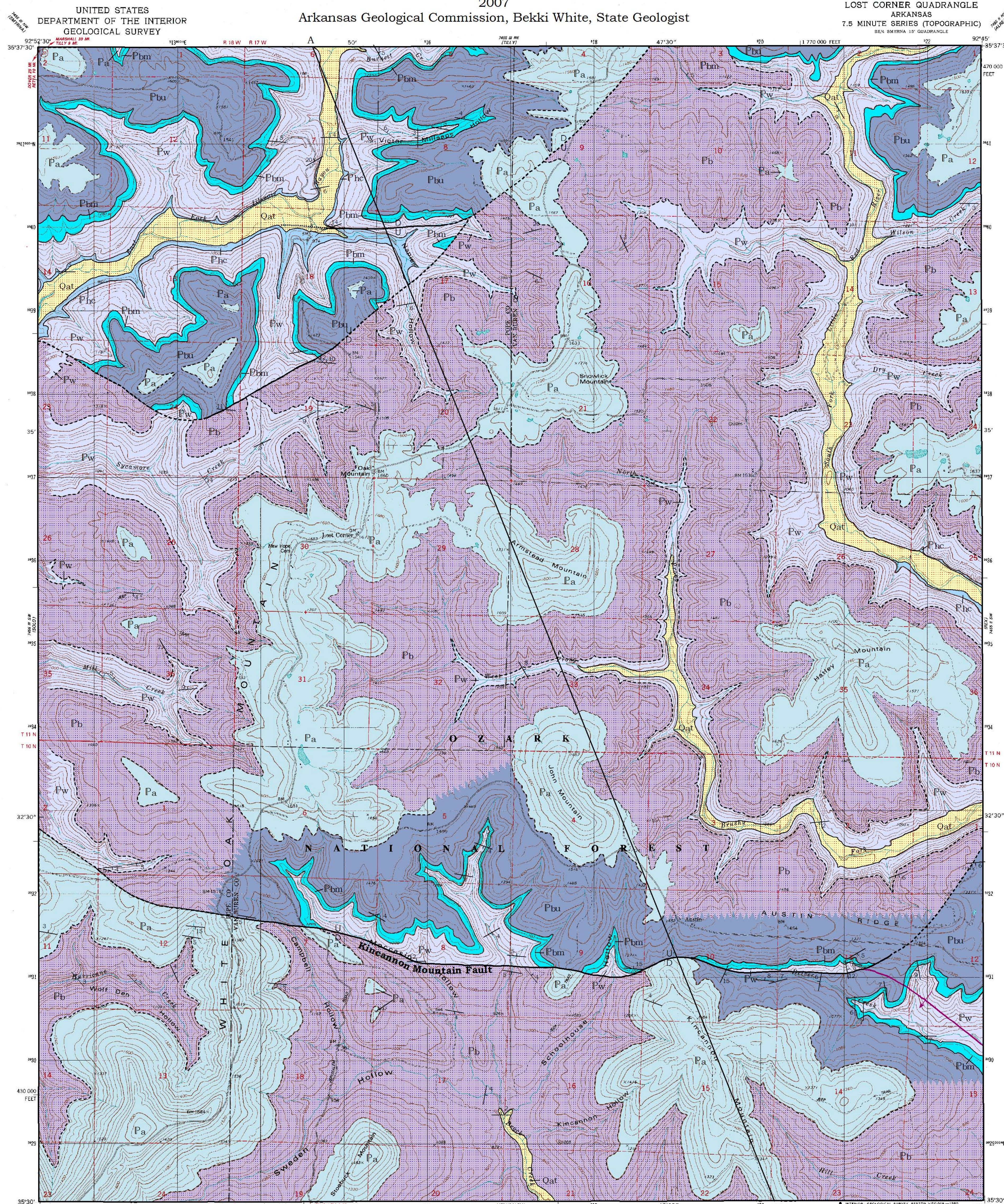


# GEOLOGIC MAP OF THE LOST CORNER QUADRANGLE, POPE, AND VAN BUREN COUNTIES, ARKANSAS

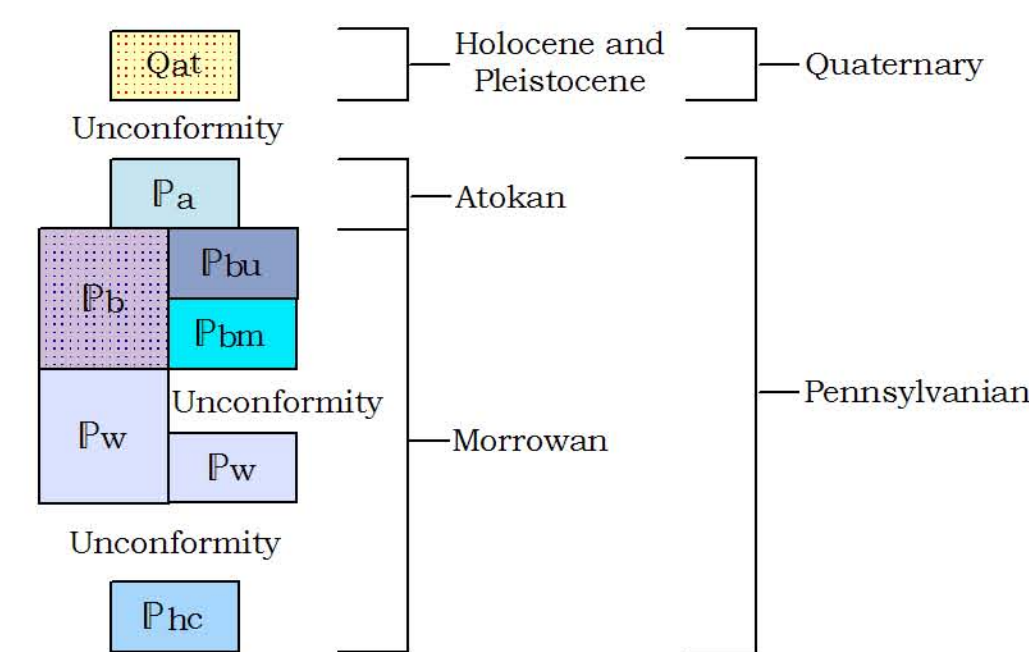
Geology by Richard S. Hutto and Daniel K. Smith  
Digital compilation by Brandy R. Rakes  
2007

Arkansas Geological Commission, Bekki White, State Geologist

LOST CORNER QUADRANGLE  
ARKANSAS  
7.5 MINUTE SERIES (TOPOGRAPHIC)  
SEA SURFACE 17' QUADRANGLE



## Correlation of Map Units



## Description of Map Units

**Qat** Alluvium and terrace deposits (Quaternary) - Unconsolidated clay, silt, sand and gravel including terrace deposits on one or more levels.

**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 and occasionally massive-bedded, fine to very fine-grained sandstones with sub-angular to sub-rounded grains. The sandstones are usually buff to tan on fresh surfaces, but can range to dark-orange, dark-red, and dark-brown. Weathered surfaces are typically light to dark-brown. Occasionally the sandstone exhibits trace fossils along bedding planes, pebble conglomerate zones, usually with external fossil molds, lense-shaped bands and cross-beds. The lower contact is tentative and will be resolved with future mapping. Over 600 feet (193 meters) of the Atoka is exposed on White Oak Mountain, and less elsewhere.

**Pbn** **Blond Formation (Lower Pennsylvanian, Morrowan)** - The individual members of the Blond formation (Brentwood and Kessler Limestones) cannot be differentiated on this quadrangle. These "marker zones" are used to divide the section into discernible units in the type section area in northwest Arkansas, and are either missing or have become unrecognizable on this quadrangle. Therefore, the Blond Formation is informally divided into upper, middle and lower parts on adjacent quadrangles (Chandler, et al., 2006) using the "middle Blond sandstone" (Zachry and Haley, 1975). On some of this map the "middle Blond sandstone" is used to separate the upper part of the Blond from the Witts Springs Formation. The Witts Springs contains rocks equivalent to the lower part of the Blond and the Prairie Grove Member of the Hale Formation (Braden, et al., 2003). In many places the "middle Blond sandstone" is no longer discernible, and therefore cannot be used to divide the formations. A zigzag pattern is drawn near the Kincannon Fault to indicate where the "middle Blond sandstone" is recognizable and used again to differentiate the formations in this area. The Blond Formation is approximately 200 - 400 feet (61 - 122 meters) thick on this quadrangle.

**Pbm** **Undifferentiated** - Consists of thin to massive-bedded, planar to ripple-bedded, micaceous sandstone interbedded with very thin to thin bedded siltstone and clay to silty shale. The sandstone consists of poorly sorted, sub-angular to rounded, very fine to fine-grained quartz with occasional calcareous or cross-bedded. The shale and siltstone is dark-gray to black, weather tan to reddish-brown and may contain siltstone concretions and trace fossils. Calcareous, fossiliferous conglomerate layers occur throughout the Blond Formation. A cross-bedded, sandy limestone occasionally manifests in the lower portion of the unit. It is gray to dark-gray on fresh surfaces, but weathers reddish-brown or light-gray to dark-gray and may contain abundant fossils such as crinoids and brachiopods, and occasionally oolites. Approximately 200 - 400 feet (61 - 122 meters) thick.

**Pbu** **Upper part** - Consists of thin, ripple-bedded to clay, thick-bedded, micaceous sandstone interbedded with clay to silty shale. The sandstone consists of poorly sorted, sub-angular to rounded, very fine to fine-grained quartz with occasional shale pebbles or shale partings. They are light to dark-gray on fresh surfaces and weather dark-brown to dark-gray. The shales are dark-gray to black on fresh surfaces, weather tan to reddish-brown and may contain ironstone concretions. This interval contains many trace fossils along bedding planes. The upper part ranges approximately 200 - 280 feet (61 - 85 meters) in thickness.

**Pbc** **"middle Blond sandstone"** - A thin to massive-bedded, often cross-bedded, poorly to moderately well-sorted, sub-angular to sub-rounded, fine to medium-grained, quartz or iron-cemented, micaceous sandstone. Fresh surfaces are buff to tan, light gray or yellowish to reddish-brown, whereas weathered surfaces are light to dark-gray or light to dark brown depending on iron content. Well-rounded, milky quartz pebbles measuring 0.08-0.12 inches (2-3 mm) are commonly present, and help to distinguish this sandstone from adjacent units. It is often micaceous and will sometimes contain rounded shale pebbles, lycopod prints or coalified wood fragments. It typically exhibits minor honeycomb weathering and lense-shaped banding, but this becomes much more pronounced near the Kincannon Fault. The "middle Blond sandstone" is unconformable with the Witts Springs Formation. Thickness ranges approximately 40 - 80 feet (12 - 24 meters).

**Pw** **Witts Springs Formation (Lower Pennsylvanian, Morrowan)** - Unconsolidated clay, silt, sand and gravel including terrace deposits on one or more levels.

**Pw** **Witts Springs Formation (Lower Pennsylvanian, Morrowan)** - Consists of black to tan shales, interbedded with very thin to thin, ripple-bedded, micaceous siltstones, and thin to medium and occasionally massive-bedded, fine to very fine-grained sandstones with sub-angular to sub-rounded grains. The sandstones are usually buff to tan on fresh surfaces, but can range to dark-orange, dark-red, and dark-brown. Weathered surfaces are typically light to dark-brown. Occasionally the sandstone exhibits trace fossils along bedding planes, pebble conglomerate zones, usually with external fossil molds, lense-shaped bands and cross-beds. The lower contact is tentative and will be resolved with future mapping. Over 600 feet (193 meters) of the Atoka is exposed on White Oak Mountain, and less elsewhere.

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**Pbc** **Upper part** - Consists of thin, ripple-bedded to clay, thick-bedded, micaceous sandstone interbedded with clay to silty shale. The sandstone consists of poorly sorted, sub-angular to rounded, very fine to fine-grained quartz with occasional shale pebbles or shale partings. They are light to dark-gray on fresh surfaces and weather dark-brown to dark-gray. The shales are dark-gray to black on fresh surfaces, weather tan to reddish-brown and may contain ironstone concretions. This interval contains many trace fossils along bedding planes. The upper part ranges approximately 200 - 280 feet (61 - 85 meters) in thickness.

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## Introduction

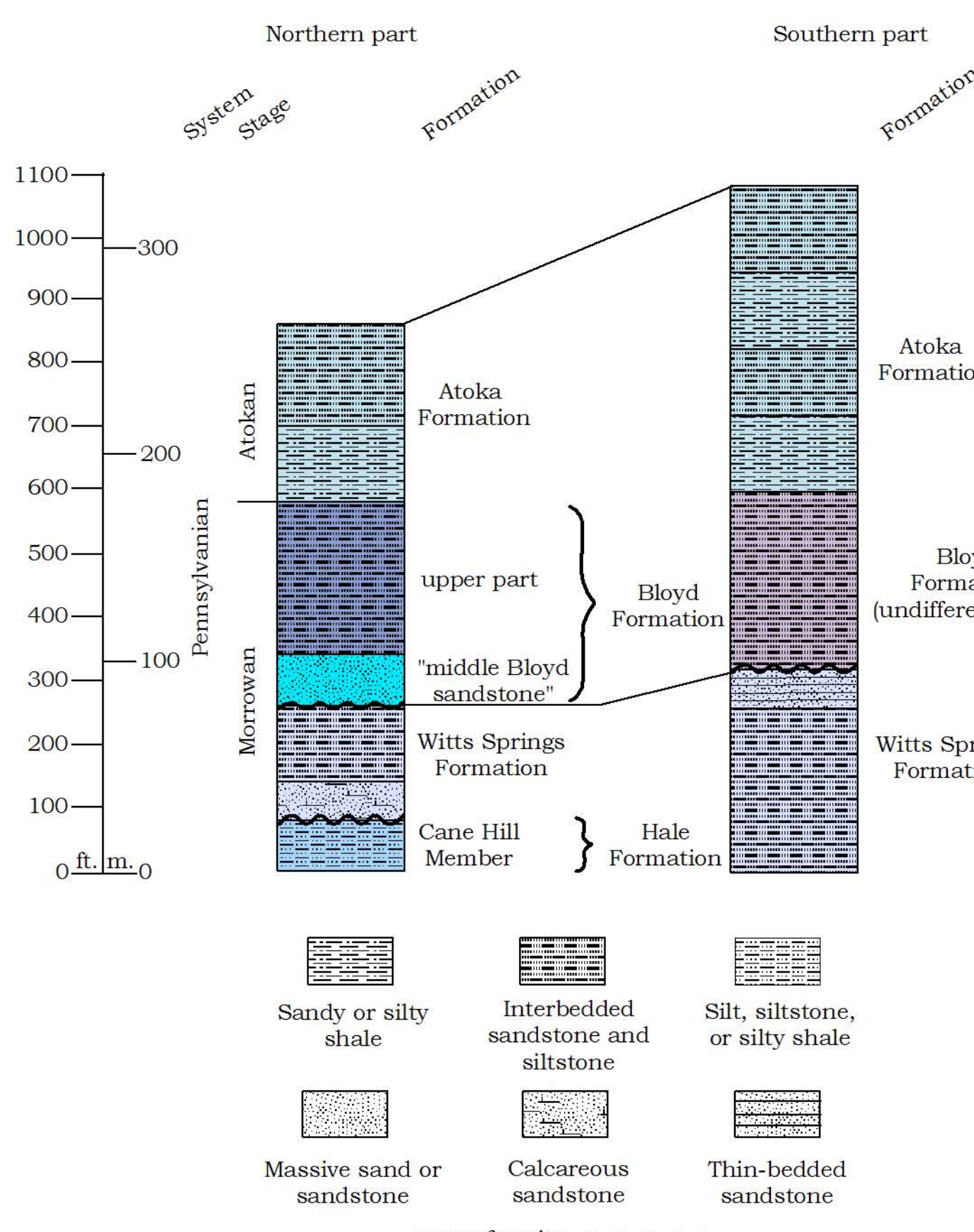
This map graphically summarizes the surface geology of the Lost Corner 7.5-minute quadrangle. In this area over 1040 feet of early Pennsylvanian clastic sedimentary rocks are exposed. The area lies on the Boston Mountains Plateau, the highest plateau on the southern flank of the Ozark Mountain dome which is centered in southeast Missouri. The Ozark National Forest covers most of the map area outside northwest quadrant. Several drainages flow through this area including the East Fork of the Illinois Bayou in the northwest corner, most of which is within a designated wilderness area of the national forest. The South and Brushy Forks of the Little Red River flow south then east, and Brock Creek drains the south central section.

The geology of this area was first mapped chiefly from aerial photography by Haley in 1972 as part of the Smyrna 15-minute quadrangle for the Geologic Map of Arkansas. The current map is the first to be mapped on the ground at the 1:24,000 scale and builds on the previous work while using a revised stratigraphy and adding certain stratigraphic refinements and structural details. The contacts and structural features on the map were derived from direct field observations at numerous sites. Site locations were generated with the aid of a global positioning satellite receiver. Bedrock dipping at less than 2° was considered horizontal.

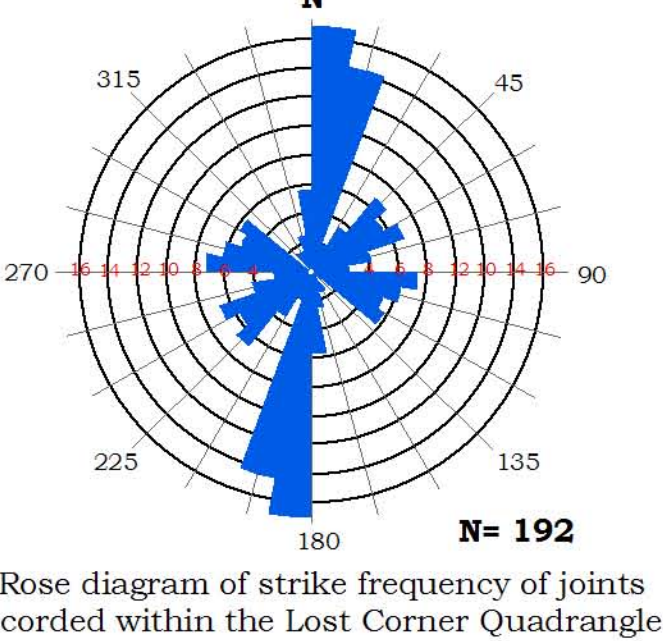
## Symbols

- Contact
- Contact - inferred
- Fault - certain  
U - upthrown  
D - downthrown
- Fault - inferred
- Fault - concealed
- Monocline
- Strike and dip of inclined bedding

## Stratigraphic Column



## Joint Frequency

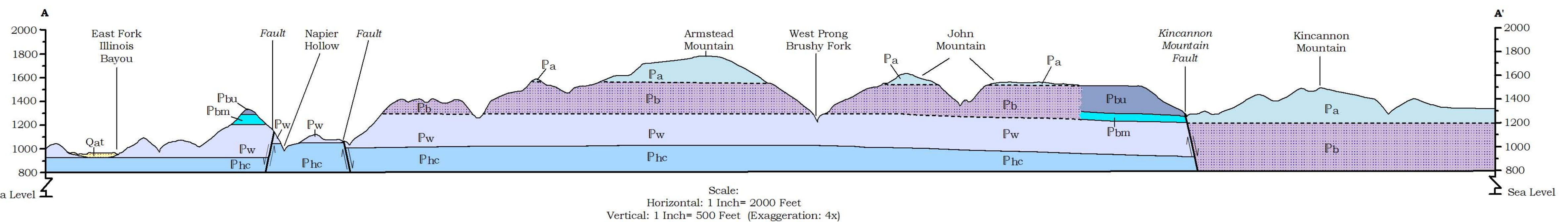


Mapped, edited, and published by the Geological Survey  
Control by USGS and NGS0404  
Topography by photogrammetric methods from aerial photographs taken 1975. Field checked 1976. Map edited 1980  
Projection and 10,000-foot grid ticks. Arkansas coordinate system, north zone (Lambert conformal conic)  
1000-meter Universal Transverse Mercator grid, zone 15  
1927 North American Datum  
To place on the projected North American Datum 1983  
move the projection lines 5 meters south and  
15 meters east as shown by dashed corner ticks  
There may be private inholdings 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 unchecked

SCALE 1:24,000  
CONTOUR INTERVAL 40 FEET  
NATIONAL GEOLOGIC VERTICAL DATUM OF 1929

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

LOST CORNER, ARK.  
SEA SURFACE 17' QUADRANGLE  
NSS50-W02457.5  
1980  
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U.S. GEOLOGICAL SURVEY, DOWNEY COLORADO 80225 OR RESTON VIRGINIA 22092  
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



**Acknowledgments:** This map was produced for The National Cooperative Geologic Mapping Program (STATEMAP), a matching-funds grant program administered by the U.S. Geological Survey, under Cooperative Agreement Award 06GQ00040. Special thanks to the U.S. Forest Service and to private landowners who graciously allowed access to their property. Very special thanks to William D. Hanson, Scott M. Aushrooks and Brandy R. Rakes for their invaluable assistance in the field, and to Angela K. Chandler for her tireless dedication to this mapping project.

**Disclaimer:** This map was prepared in a digital format using ArcGIS ArcView 9 software on computers at the Arkansas Geological Commission. The Arkansas Geological Commission does not guarantee the accuracy of this map especially when used on any other system or with any other software. As mapping continues and is refined, the data presented on this map may be updated. For the latest edition of this publication please contact our office.

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