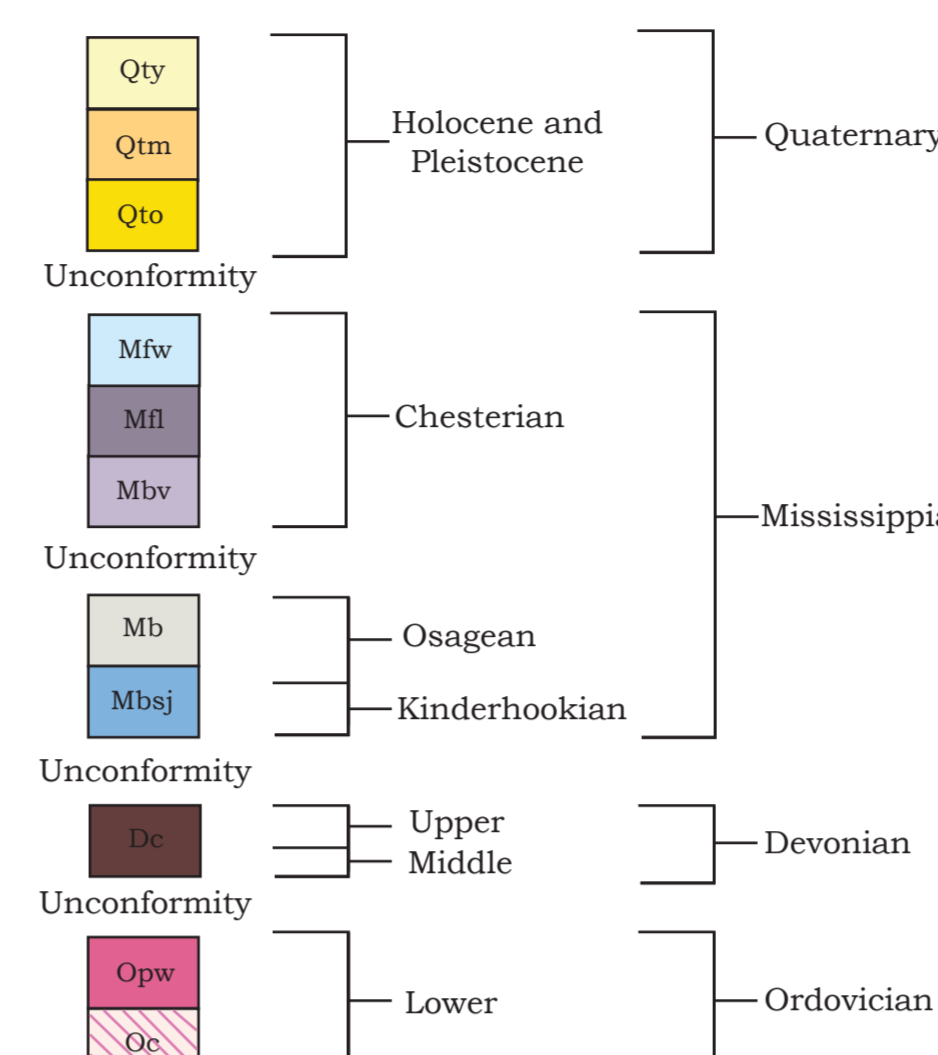


Geologic Map of Hobbs State Park-Conservation Area

Angela Chandler, Corbin Cannon II, and Lea Tipton
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Correlation of Map Units



Description of Map Units

Qtq **Young terrace and active channel deposits (Quaternary)** - Unconsolidated clay, silt, sand, and gravel in gravel bars and sandy point bar deposits along War Eagle Creek. Primarily clay, silt, and sand. Approximately 20-30 ft. (6-9 m) thick.

Qtm **Medial terrace and alluvial deposits (Quaternary)** - Unconsolidated clay, silt, sand, gravel, and cobbles terrace located approximately 30-50 ft. (9-15 m) above the creek.

Qto **Old terrace and alluvial deposits (Quaternary)** - Unconsolidated gravel deposits located approximately 60-100 ft. (18-30 m) above War Eagle Creek. Deposits consist of coarse sand to cobble-sized sub-angular to rounded chert and sandstone. Thickness unknown.

Mfw **Fayetteville Shale (Upper Mississippian, Chesterian)** - The Fayetteville Shale can be divided into a lower part and an upper part separated by the Wedington Sandstone Member. Only the lower part and the Wedington Sandstone are present in this area. The Fayetteville Shale is conformable with the underlying Batesville Sandstone.

Mf **Lower part** - A black clay shale that contains ironstone concretions at a few localities. Conformable with the underlying Batesville Sandstone. Approximately 40 feet (12 m) thick.

Mbsj **Batesville Sandstone (Upper Mississippian, Chesterian)** - Consists of very fine grained thin-bedded micaceous sandstone. The sandstone is light brown to gray on fresh surfaces but weathers orange. The sandstone is conformable with the Hindsville Limestone Member. Ranges from 5-15 feet (1-5 m).

Mbsj **Hindsville Limestone Member** - A thin-bedded, fine to coarsely crystalline limestone. The limestone is light- to dark-gray on fresh surfaces, but generally weathers to a light gray or brown. Usually has a strong petroliferous odor on freshly broken surfaces. The limestone is fossiliferous and/or oolitic, contains pyrite and at various localities is interbedded with thin layers of clay shale and thin beds of siltstone to fine-grained sandstone. Approximately 60-80 feet (18-24 m) thick.

Mb **Boone Formation (Lower Mississippian, Osagean and Kinderhookian)** - Coarse-grained fossiliferous and fine-grained limestones interbedded with anastomosing and bedded chert. Light to medium gray on fresh surfaces but usually weathers dark gray. The chert varies in color from white to light gray in the upper portion to dark gray or blue gray in the lower portion. Fairly cherty free sections are petroliferous and contain brachiopods, corals, and crinoids. The trace fossil *Zoophycus* and productid brachiopods are present in the bedded chert locally. Springs, caves, and sinkholes are common. Approximately 260 feet (79 m) is exposed in this area.

Mbsj **St. Joe Limestone Member (Lower Mississippian, Kinderhookian, Osagean)** - Consists of medium to coarsely crystalline or fine-grained thin-bedded limestone and shale. Individual units are recognized as Formations in Missouri as follows: Bachelor, Compton, Northview and Pierson, respectively from oldest to youngest. These same units are recognized in the St. Joe Limestone Member in northwest Arkansas. This limestone contains numerous caves, sinkholes, and springs. Ranges from 20-40 feet (6-12 m) thick.

Pierson - Fine to coarsely-crystalline, thin- to thick-planar bedded crinoidal limestone. Red chert is present locally. Gray to white on weathered surfaces and gray to reddish-gray on fresh surfaces. Forms the upper 10-15 feet (3-5 m) of the St. Joe bluff above the Northview.

Northview - Fine grained argillaceous limestone. Red to gray green on fresh and weathered surfaces. Forms 2-3 feet (0.6 m) re-entrant between the Compton and Pierson Limestones.

Compton - Fine to medium grained crinoidal limestone; thin-bedded with wavy or nodular bedding. Gray to reddish gray on fresh surfaces but weathers light gray to white. Contains weathered pyrite blebs. The basal two feet of this unit contain black shale chert at one location where the Bachelor is absent. Ranges from 12-15 feet (3-5 m) thick.

Bachelor - A gray-green clay shale. Contact with underlying Chattanooga Shale is sharp and unconformable. At one location a finely crystalline gray limestone is present just beneath the contact within the Chattanooga black shale. Ranges from 0-2 feet (0-0.6 m) thick.

Chattanooga Shale (Upper Devonian) - A clay shale that is black on fresh and weathered surfaces. It contains very small iron concretions or pyrite or marcasite concretions that vary in size from one inch to three inches (25-76 mm) in diameter. Ranges from 10-40 feet (3-12 m) thick.

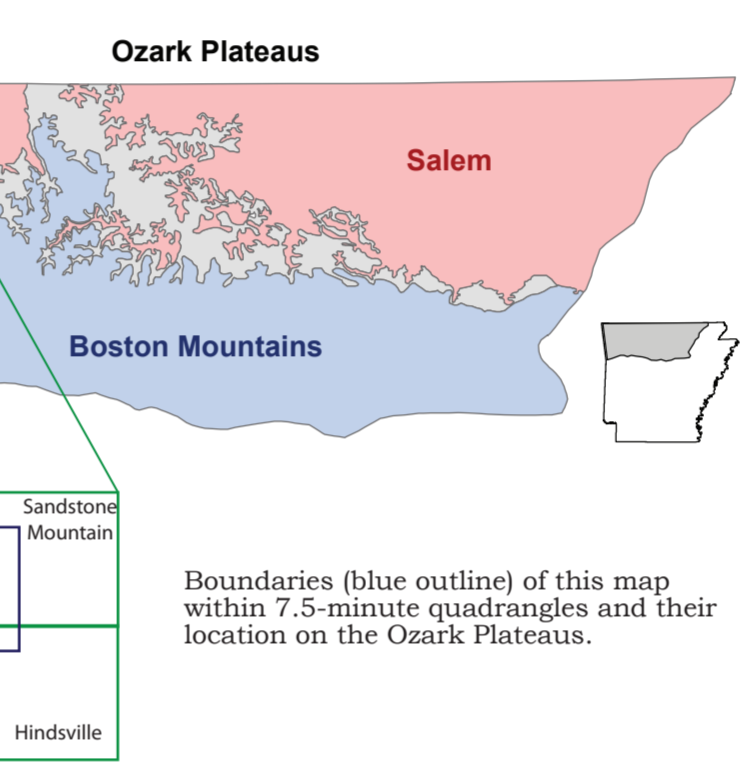
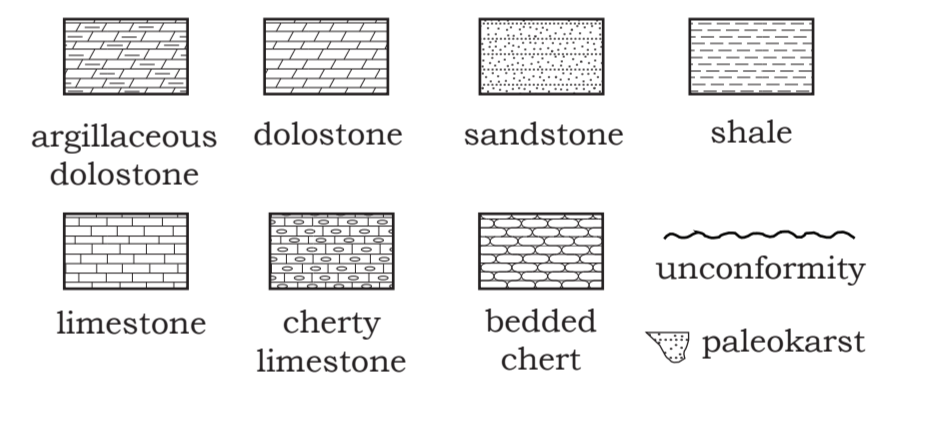
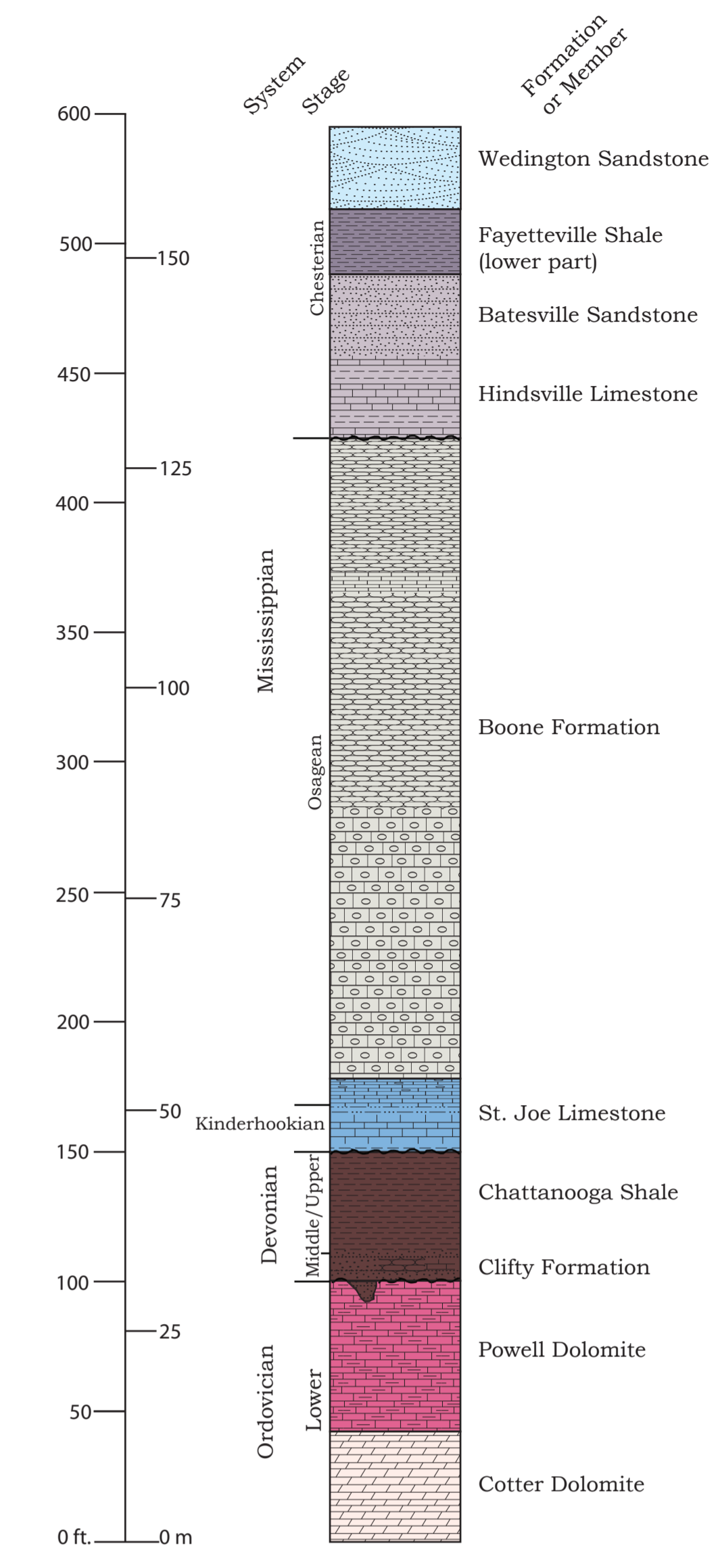
Sylamore Sandstone Member - A medium-grained, well-sorted, sub-angular to sub-rounded, friable iron-cemented sandstone. Weathers light tan but has a salt and pepper appearance on fresh surfaces. Very thin to thin bedded. Contains angular chert fragments and trace fossils. Thickness is unknown until differentiated from underlying Clifty Formation.

Clifty Formation (Middle Devonian) - The Clifty is mapped with the Chattanooga Shale because it is too thin to map separately at most locations and it is difficult to distinguish from the Sylamore Sandstone. The Clifty was originally described as a limestone with the type section located in the upper reaches of Rambo Creek. In 1979, Wise and Caplan concluded the limestone is a lens within a sandstone and both units contain a Clifty fauna. Subsequently, the Clifty has been referred to as a sandstone. At the type section, light gray micritic limestone is present within a sandstone sequence. In this same area and within this interval, a petroliferous sandy limestone bed is also present. Elsewhere, this interval consists only of sandstone that is fine-grained and thin- to thick-bedded, usually forming a bench or ledge. Quartz grains are rounded to sub-angular. It is white on fresh surfaces and gray to orange on weathered surfaces. Usually only two sandstone beds can be distinguished within the sandstone ledge; however at a few localities several can be differentiated. Vertical and horizontal trace fossils are abundant. The sandstone contains chert fragments and pebble clasts/molds on the basal portion of bedding planes. Locally, a massive chert breccia is present between sandstone beds. The chert is tan to gray, contains spicules, calcite- and quartz-filled vugs, and fractures filled with the overlying sandstone. In the southeastern portion of the quadrangle, the sandstone interval is thicker and may include Ordovician sandstone at its base. The Clifty is unconformable (locally angular) with the underlying Powell Dolomite. Ranges from 2-15 feet (0.5-4.5 m) thick.

Opw **Powell Dolomite (Lower Ordovician)** - A very fine- to fine-grained thin- to medium-bedded argillaceous and mottled dolostone. White to light-gray on fresh and weathered surfaces. Contains calcite vugs and stromatolites. Very thin-bedded gray-green shale is interbedded with the dolostone at a few localities. Numerous sandstone masses are present within the upper portion of the Powell. These features are most likely paleokarst consisting of sand that has filled a karsted surface at the top of the Powell. The paleokarst is Devonian and possibly Ordovician in age. The basal contact of the Powell is placed at the appearance of banded chert nodules and/or chert breccia in the upper portion of the Cotter Dolomite. Approximately 60 feet (18 m) thick.

Oc **Cotter Dolomite (Lower Ordovician)** - A fine- to medium-grained dolostone, commonly bioturbated. Light gray on fresh surfaces but weathers dark gray. Contains angular bedded chert fragments at the upper contact with the Powell Dolomite. Contains stromatolites, oolitic chert fragments, and drusy quartz. At a few localities, greenish clay shale is present as well as white coarse-grained sandstone in the upper portion. Approximately 20-60 feet (6-18 m) of section is exposed around Beaver Lake in the north-west portion of this map.

Stratigraphic Column



Introduction

This map illustrates the surface geology of Hobbs State Park. This area was previously mapped by Glick circa 1971 for the Geologic Map of Arkansas. Portions of this area have also been mapped by students at the University of Arkansas: Staley in 1962 during construction of Beaver Lake, Sullivan in 1999 through the EDMAP Program, a part of the National Cooperative Geologic Mapping Program, and Hutchinson and Dowell in 2004 as mapping theses. The War Eagle quadrangle was mapped by Chandler and others in 2017.

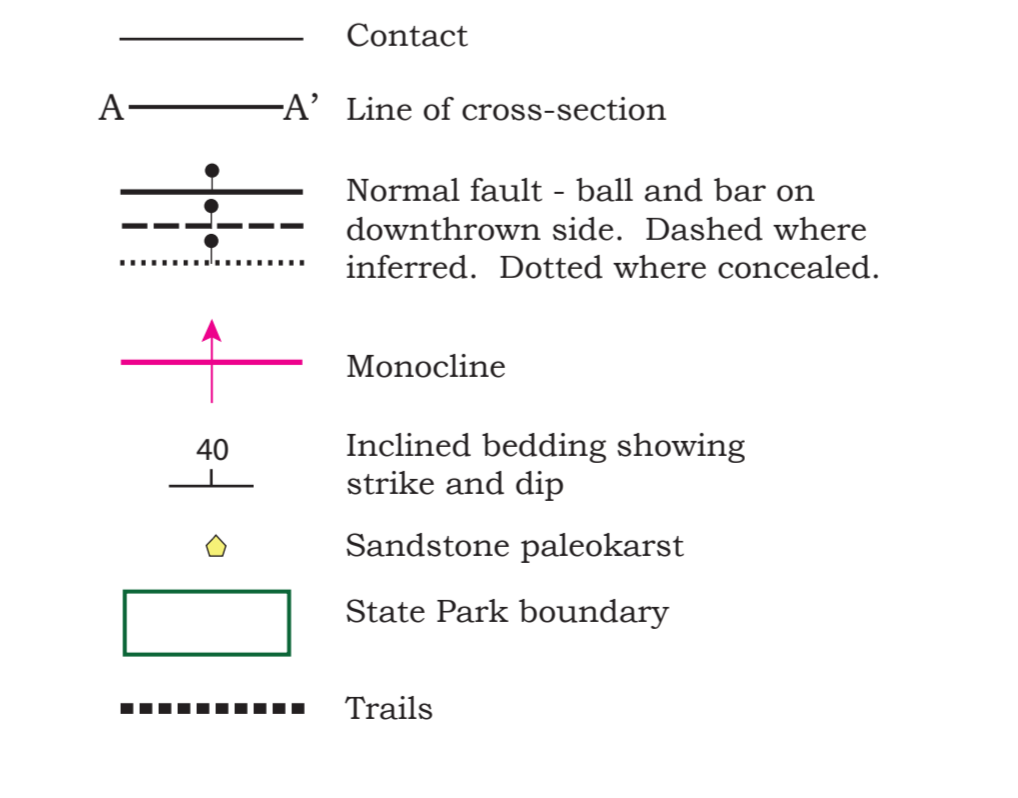
Approximately 530 feet (163 meters) of Lower Ordovician to Upper Mississippian strata crop out in this area. The lower part of the Boone Formation is present only in the northwestern part of the area where it is upthrown by the Fayetteville Fault. The Lower Ordovician Powell is also thickest on the upthrown side of the fault. The Devonian Chattanooga Shale and Clifty Formation are thickest on the downthrown side of the fault in the east-central part of the quadrangle. The lowest sandstone bed(s) included in the Clifty Formation could be Ordovician in age. The Lower Mississippian cherty Boone Formation covers most of the quadrangle forming the Springfield Plateau. The St. Joe Limestone, at the base of the Boone, is a small bluff former throughout the area. The Chesterian Batesville Sandstone crops out in only two locations: downthrown by the Fayetteville Fault in the southwestern portion of the quadrangle and south of the Devil's Gap Fault along the east-central border of the quadrangle. The lower part and Wedington Sandstone Member of the Fayetteville Shale are present on Kenars Mountain in the east-central portion of the map.

Quaternary terrace and alluvial deposits are present in the valley of War Eagle Creek. Two terrace levels are developed along the river: a younger and a medial. Older terraces are preserved 60-100 feet (18-30 meters) above the river locally.

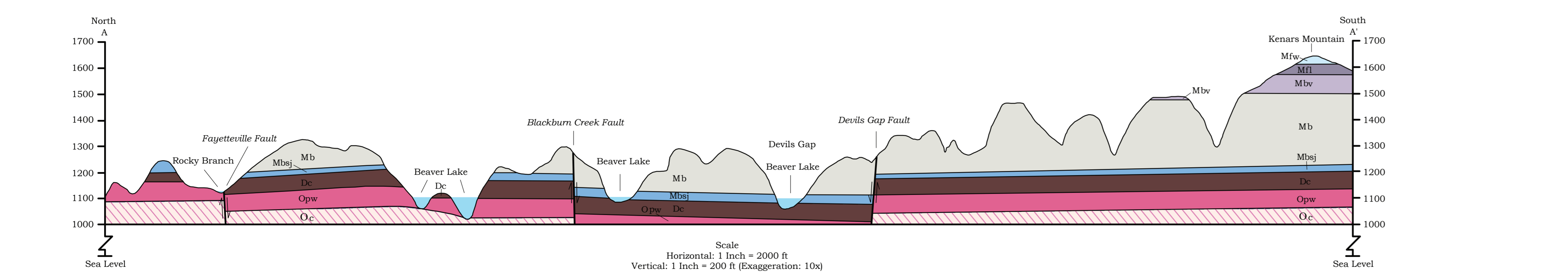
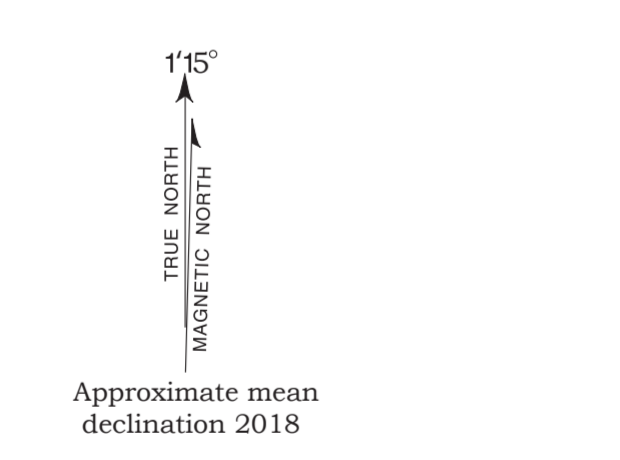
Two normal faults are present. The Fayetteville Fault strikes southwest to northeast across the quadrangle and is downthrown on the southeast side. The Blackburn Creek Fault (Dowell, 2004) strikes east to west across the quadrangle and is downthrown on the north side until it reaches the Fayetteville Fault. East of the Fayetteville Fault, it is downthrown on the south side. Displacement along the Fayetteville Fault varies from 60-100 feet (18-30 meters) and offset along the Blackburn Creek Fault is approximately 60 feet (18 meters). The Devils Gap Fault is a normal fault downthrown on the north side with displacement of approximately 40 feet (12 meters). It changes to a monocline just west of Devils Gap.

Approximately 14 square miles of Hobbs State Park-Conservation Area is located in this area. Major features in this park are karst landforms. The park contains a large number of caves, springs, and sinkholes. The geology of the area is best seen from the various multi-use trails that are present in the area. This area also contains a portion of Beaver Lake, a U.S. Army Corps of Engineers Lake completed in 1966 for flood control of the White River Basin and other purposes.

Symbols



The topographic base is a colorless Digital Raster Graphic (DRG). The DRG is a scanned image of a U.S. Geological Survey standard series topographic maps published in 1957 and 1958. The area was photo-revised from aerial photographs taken in 1976 to include Beaver Lake. Planimetric elements were updated on the Sonora quadrangle using imagery from 1994.



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Limitations: This map, like all geologic maps, is based on interpretations that were made from the data available at the time it was created. As work continues and new data is collected, the contacts and structures depicted on this map may change.

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Digital compilation of map and cross-section by Brian Kelnner. Trails and geology updated in August 2019.