

GEOLOGIC ROAD LOG OF CEDAR BREAKS NATIONAL MONUMENT

*Stanley C. Hatfield¹, Peter D. Rowley¹, Edward G. Sable², David J. Maxwell¹,
Bryant V. Cox¹, Matthew D. McKell¹, and David E. Keil¹*

¹*Southern Utah University, Cedar City, Utah*

²*U.S. Geological Survey, Denver, CO*

Editors Note: A geologic map and stratigraphic section are included at the end of the road log. These illustrations are from a related article in Utah's Parks and Monuments, Utah Geological Association Publication 28, 2000.

INTRODUCTION

This road log starts at the top of Brian Head, the highest point in the Markagunt Plateau that is located just northeast of Cedar Breaks National Monument. Brian Head affords views of the Great Basin subprovince of the Basin and Range province to the west and provides opportunities to examine volcanic rocks not found in the Monument that are key to the geologic story of Cedar Breaks. From Brian Head, we will drive from the top of the mountain down the dirt road to the intersection with the main paved road (State Highway 143). From there we will turn south (left) onto Highway 143 into and through the monument via State Highways 143 and 148. Just south of the monument, we will take a detour by a dirt road to the right (west) to the top of Blowhard Mountain, where additional exposures also are key to the geologic story. We will return to the paved road and continue south along Highway 148 to State Highway 14, which cuts across the Markagunt Plateau. From this intersection, we will turn west (right) and proceed down Cedar Canyon, which will allow views of the general geology of the area. The road log will stop at the intersection with Main Street (State Highway 130), near the eastern outskirts to Cedar City.

MILEAGE

DESCRIPTION

INTERVAL/CUMULATIVE

INTERVAL	CUMULATIVE	DESCRIPTION
0	0	BEGIN. To arrive at the beginning point of the log, drive about 0.4 miles north of the northern boundary of the Monument, along State Highway 143. Turn right at the Forest Service (sign says, "National Forest Vista Point, Brian Head Peak 3) road to Brian Head Overlook. From the turnoff at the paved road, a 2.5 mile dirt road winds up the east side of Brian Head peak. STOP 1 - BRIAN HEAD PEAK, Elevation

11,307 feet. From the parking lot, walk about 100 m west to the edge of the scarp of Brian Head for views from the crest of the Markagunt Plateau westward into the Great Basin. We are standing on a mesa held up by the Leach Canyon Formation, an ash-flow tuff of about 24 Ma derived from the Great Basin. Brian Head ski resort is just northwest of us and, if we look 4 km east-northeast, Sidney Peaks are the low hills rising above our mesa. These hills consist of the Markagunt Megabreccia, a gravity slide mass that will be a main focus of this trip. Look west at the north-south ranges and intervening basins of the Great Basin, which extends into Nevada. Not far beyond the Nevada border due west of us is the Caliente caldera complex. This may be the source of the Leach Canyon Formation. Beneath the Leach Canyon is another ash-flow tuff, the Isom Formation derived at about 26 Ma from the Indian Peak caldera complex at the Nevada-Utah border due west-northwest of us. Closer to us, the small ranges just west of Cedar Valley contain the Iron Springs mining district. Several large open-pit mines in the district may be seen from Brian Head. **DRIVE BACK** the way you came, toward Highway 143.

- 2.1 2.1 Look north at the slope leading to the crest of Brian Head. The poorly exposed sedimentary rocks, extending up to the Isom Formation, consist of the Brian Head Formation, an incompetent unit prone to landsliding. Most of the thin white ledges are limestone beds, between which is mostly tuffaceous sandstone.

- 0.4 2.5 INTERSECTION of the dirt road with the main north-south paved road to Cedar Breaks National Monument. Red soil here consists of soft Brian Head Formation. **TURN LEFT** (south) on paved road (Highway 143).

- 0.4 2.9 North boundary of Cedar Breaks National Monument. Rattlesnake Creek trail starts just north of the boundary and heads west, then south to Ashdown Creek.

- 0.4 3.3 **PULL OFF** for parking area of North View overlook, to right (west). **PARK. STOP 2 - VIEWS OF BRIAN HEAD AND CLARON FORMATIONS.** Walk west to overlook, where good views of Cedar Breaks National Monument and the Great Basin are found. The rim here consists of Brian Head Formation; its subhorizontal contact with the white Claron is just below the rim. Several hundred meters north of the overlook, dunes cap the rim; they are due to westerly winds bringing silt and fine sand up the gulches cut into the rim (Laird Naylor, verbal communication, 1999). **CONTINUE SOUTH.**

- 0.5 3.8 INTERSECTION with paved road (State Highway 143) from the east (from Panguitch and Panguitch Lake). **CONTINUE SOUTH** on State Highway 148.

- 0.9 4.7 Service road enters from the east.

- 0.1 4.8 Parking-area pulloff for Alpine Pond, to west. **PARK. STOP 3 - ALPINE POND HIKE.** Round trip of about a mile hike to see hummocky topography created by a

Holocene landslide just below the scarp of Cedar Breaks, in the Brian Head Formation (not exposed). At the fork in the trail, go right (west) along the lower trail. Pass below a landslide scarp about 15 m high, cut in blocks as long as 5 m of the Isom Formation. This self-guiding trail contains numbered posts keyed to a brochure; an Isom block at the post marked #4 is internally brecciated and rehealed, forming a resistant angular boulder. This internally brecciated block indicates that this is a deposit of the Miocene Markagunt Megabreccia and only later failed as a landslide. Whether the Megabreccia makes up the full thickness of the scarp cannot be determined; more likely it does not, and the lower Isom blocks have tumbled off the top of the scarp as talus. The Alpine Pond is in the lowest part of the hummocky slide mass. Return to the vehicles by way of the upper trail that starts at the far side of the pond. **CONTINUE SOUTH.**

- 0.5 5.3 Service road enters from the east.
- 0.6 5.9 Parking-area pulloff for Chessman overlook, to west.
- 0.5 6.4 Service road enters from east, on the top of the upper white limestone bed at the top of the white Claron Formation.
- 0.5 6.9 Parking-area pulloff for Sunset View overlook, to west.
- 0.6 7.5 Road to campground, to east.
- 0.2 7.7 Service road enters from the east.
- 0.1 7.8 **TURN RIGHT** into northern entrance to parking lot for Monument visitor center, to west. **PARK. STOP 4 - POINT SUPREME OVERLOOK.** Tour the visitor center on the way to the overlook to the west, in white Claron. View from the rim of north-striking basin-range faults that cut the Claron and underlying rocks. Look south to see a conglomerate channel (basal Brian Head Formation) cut into the white Claron. The Ramparts trail starts at the parking lot and heads south along the rim. **CONTINUE SOUTH**
- 0.2 8.0 Service road enters from the east.
- 0.5 8.5 Service road enters from the west.
- 0.2 8.7 Large angular block of Isom Formation, to west.
- 0.2 8.9 South boundary of Cedar Breaks National Monument.
- 0.3 9.2 **TURN RIGHT** (west) onto dirt road to Blowhard Mountain. Drive up a slope developed on unexposed Brian Head Formation, which rests unconformably on the red

Claron Formation. The subhorizontal contact with poorly exposed overlying Markagunt Megabreccia is above us but its location is uncertain.

- 0.9 10.1 Road bends sharply right (south). On the west side of the road, a log fence surrounds Lundale Spring, perhaps developed on the gravity-slide shear plane separating the Markagunt Megabreccia and Brian Head Formation. Here and below us, float blocks of the Baldhills Member of the Isom Formation and of chalcedony from the Brian Head Formation have been let down to lower levels.
- 0.5 10.6 On right and left, buildings and antennas of the communication site on Blowhard Mountain. **TAKE LEFT FORK, THEN TAKE RIGHT FORK.**
- 0.1 10.7 **STOP** at small green and tan building at the base of a dish antenna. **STOP 5 - PINK OUTCROPS OF BRIAN HEAD(?) FORMATION.** Examine pink sandstone just north of the building, on the west flank of Blowhard Mountain, possibly belonging to the Brian Head Formation. In some places above this unit is a white conglomerate that clearly correlates with the Brian Head Formation. Then, above these rocks, look at blocks of Isom (Markagunt Megabreccia) that cap the mountain; some of these blocks are internally brecciated and rehealed. **RETURN TO MAIN HIGHWAY**
- 1.5 12.2 **TURN RIGHT** (south) onto main highway.
- 0.3 12.5 Dirt road enters from east. Peat bogs found in some drainages to the east. Isom blocks abundant on left and right.
- 0.4 12.9 Sinkhole on right, one of many in this area.
- 0.3 13.2 Isom block, about 4 m long, on the right.
- 1.1 14.3 **STOP** at junction with State Highway 14. Isom blocks in the meadow south of us. **TURN RIGHT** (west) onto Highway 14.
- 1.3 15.6 Cliffs of red Claron on the right. View to the left of the Kolob Plateau below.
- 0.8 16.4 New landslides and earth flows on the right in light-gray Upper Cretaceous rocks.
- 1.0 17.4 Paved Webster Flat road enters from the south (left).
- 1.0 18.4 New landslides in Upper Cretaceous rocks on right.
- 1.1 19.5 Dirt road enters from the left. Upper Cretaceous sandstone below.
- 0.4 19.9 Entrance to U.S. Forest Service campground on right.

- 0.7 20.6 Woods Ranch on left.
- 0.6 21.2 Southern Utah University Mountain Center on left.
- 0.3 21.5 Paved road enters from the south. Spectacular cliffs of lower Straight Cliffs Formation to the west. These are mostly shoreline sandstones, with interbedded thin oyster coquina beds and coal units.
- 2.9 24.4 Huge landslide mass on the left. This slide came down about 5 years ago, blocking Highway 14 for a couple months until a new road could be built.
- 0.6 25.0 Spectacular fault in roadcut on the left.
- 1.9 26.9 Milts Stage Stop, a popular restaurant, on the left. Subhorizontal Cretaceous rocks to the south, with the lower member of the Straight Cliffs Formation (Upper Cretaceous) on the horizon.
- 0.1 27.0 Paved Kolob Reservoir road enters from the south (left). Gray rocks at and just above road level for the next couple miles belong to the Carmel Formation (Jurassic).
- 0.9 27.9 Faulted and intricately folded Jurassic Carmel Formation well exposed on the right (Averitt and Threet, 1973). This thick buff-colored limestone member forms the basal Carmel.
- 0.3 28.2 Dirt road enters on the right. Carmel Formation continues, containing some red beds with white gypsum in roadcuts.
- 1.0 29.2 Faults and folds in the Carmel Formation to the west.
- 0.6 29.8 Bridge. Faulted Carmel. From here and continuing west, beds dip steeply east.
- 0.3 30.1 Rusty's Steak House on right, behind which is a large red hill of Navajo Sandstone (Jurassic).
- 0.2 30.3 Pullout for nature trail on left. On right, a strike valley is underlain by the red Kayenta Formation (Triassic). Coal piles on right remain from a former power plant.
- 0.3 30.6 Massive outcrops of Red Hill on the right, made up of interbedded Kayenta and Navajo (Averitt and Threet, 1973). The Moenave Formation (Triassic) makes up the west side of Red Hill. Pink water tank on left.
- 0.2 30.8 Resistant bed of Shinarump Member of the Chinle Formation (Triassic) on the right. Good red shale roadcuts of the overlying Petrified Forest Member of the Moenkopi Formation (Triassic) below it to the west.

- 0.2 31.0 Fault-repeated Shinarump Member on right.
- 0.3 31.3 Enter Cedar City. Moenkopi Formation on right.
- 0.5 31.8 Intersection with Main Street (State Highway 130). **END LOG**

REFERENCES

Averitt, Paul, and Threet, R.L. 1973, Geologic map of the Cedar City quadrangle, Iron County, Utah: U.S. Geological Survey Geologic Quadrangle Map GQ-1120, scale 1:24,000.

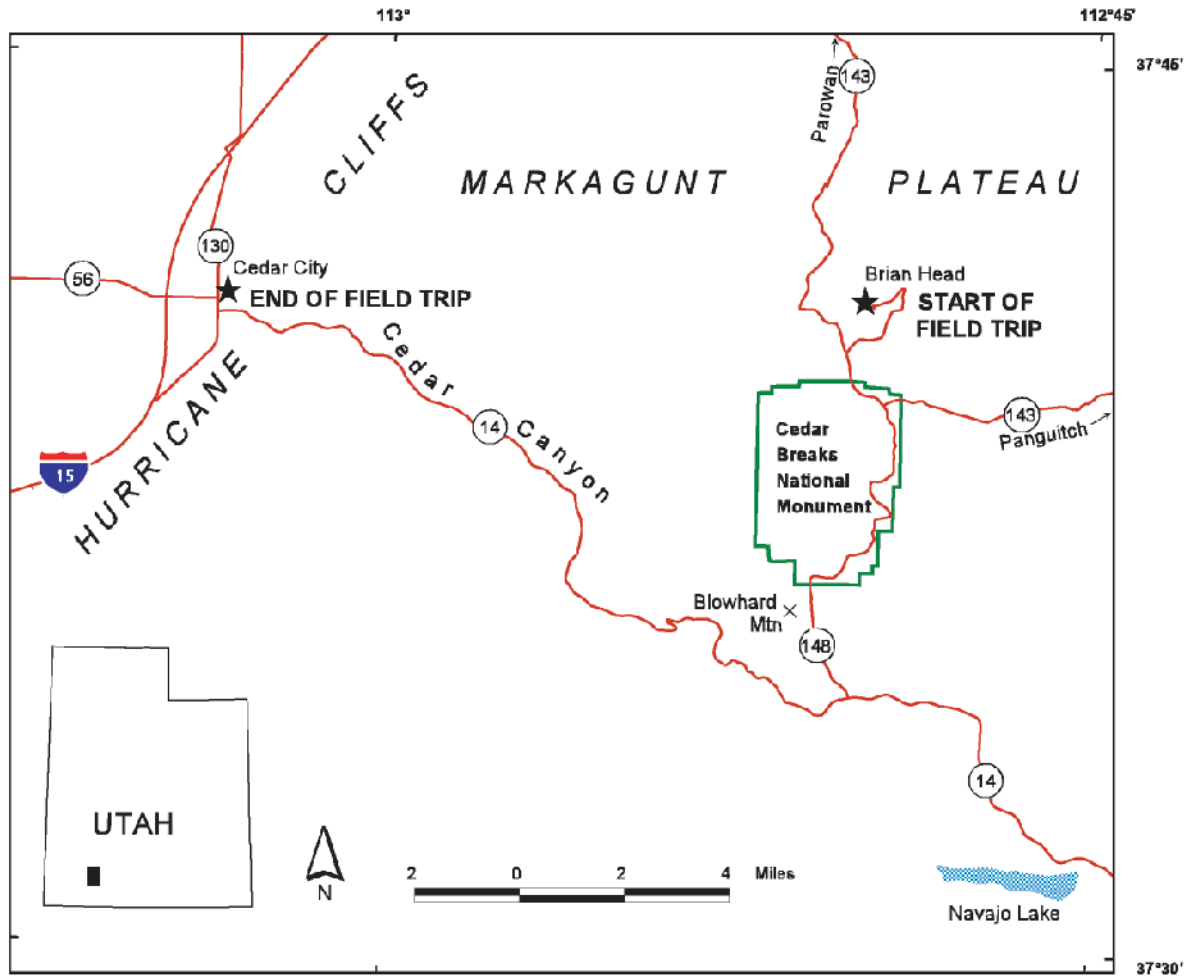


Figure 1. Index map showing the geologic guide route to Cedar Breaks National Monument and surrounding area.

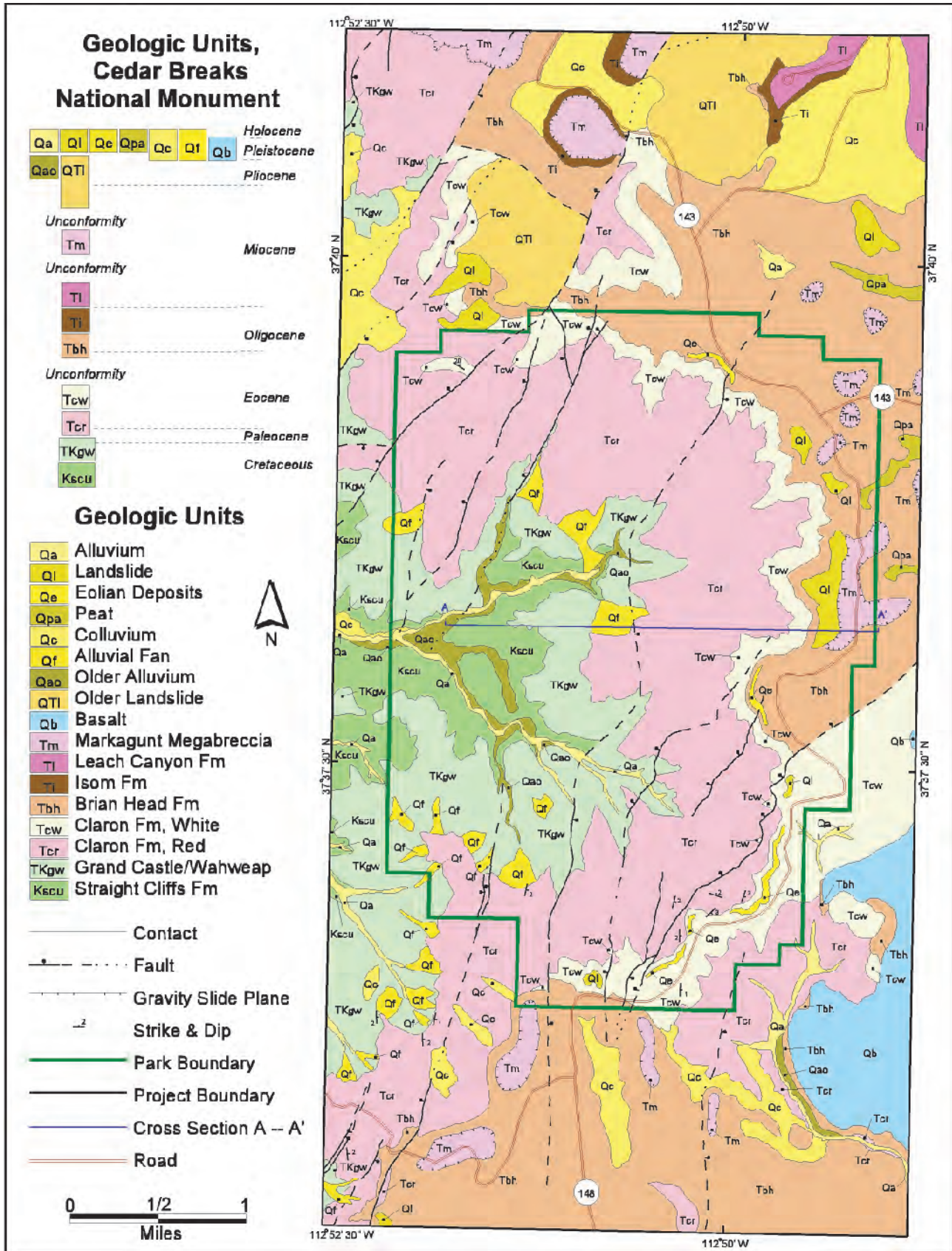


Figure 2. Geologic map of Cedar Breaks National Monument.

