

Geologic Site of the Month
January, 2006

Some Geological Features at Moxie Falls



45 21' 49.63" N, 69 56' 12.59" W

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Introduction

With a single vertical drop of nearly 90 feet, Moxie Falls (Figure 1) in Moxie Gore near The Forks, is one of Maine's highest waterfalls and a spectacular sight in any season.



Photo by R. Marvinn

Figure 1. Moxie Falls.



Location

Several smaller falls and plunge pools make this section of Moxie Stream a scenic location well worth the short hike from the public parking area along Moxie Pond Road (Figure 2). For the more adventurous, the falls are a short hike upstream from exhilarating rafting on the Kennebec River. The land including Moxie Falls is maintained for public enjoyment by the Maine Department of Conservation, [Bureau of Parks and Lands](#).

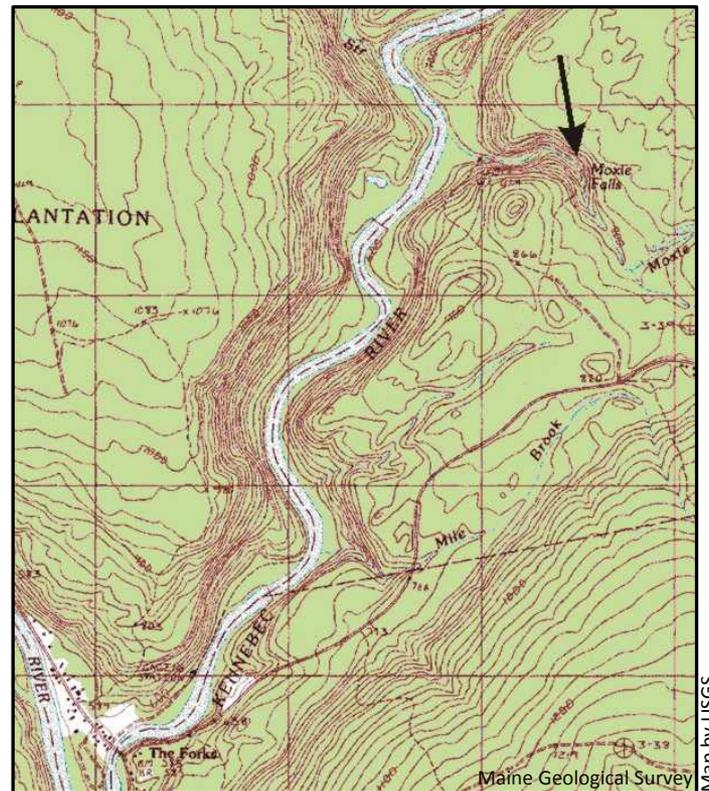


Figure 2. Topographic map showing location of Moxie Falls.



General geology of the Moxie Falls area

Mineral exploration and an opportunity to unravel interesting geological events were the main factors behind the drive to map the geology of the area during the 1960s and 1970s by the U.S. Geological Survey, the Maine Geological Survey, and various private mining companies. Figure 3 is a generalized bedrock geologic map of The Forks quadrangle which includes the boundary, interpreted as an [angular unconformity](#), between older rocks of Cambrian and Ordovician age, and younger rocks of Silurian and Devonian age (See the [USGS Geologic Time Scale](#)). The primary unit exposed at Moxie Falls is The Forks Formation of Silurian age. Rocks of the formation are exposed in a broad [anticline](#) which causes a unit of Devonian gray slate to be repeated on the west and east sides of the outcrop belt of The Forks Formation.

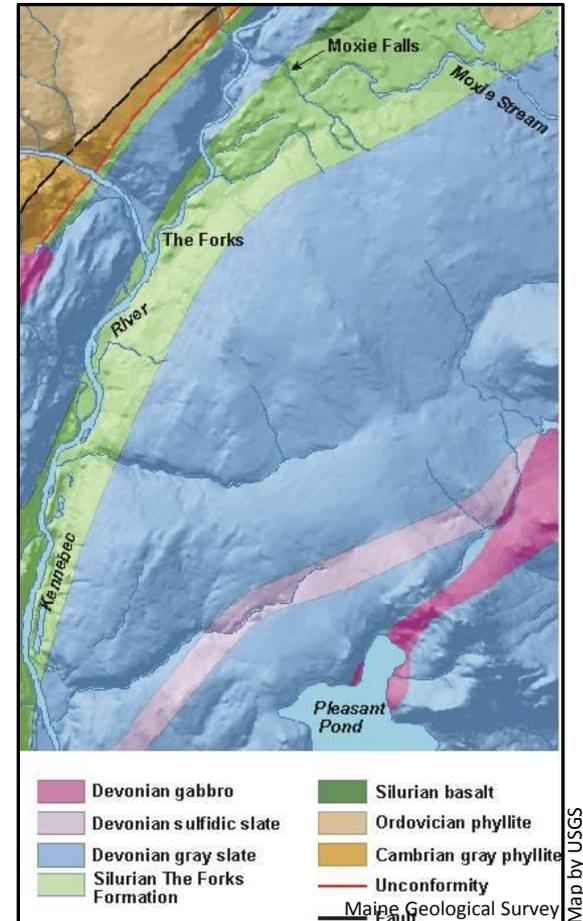


Figure 3. Generalized bedrock geologic map of The Forks quadrangle. The primary unit exposed at Moxie Falls is The Forks Formation of Silurian age in light green.



The Forks Formation

A number of closely related sedimentary and metamorphic rock types comprise The Forks Formation. These include thinly bedded silty limestone, calcareous (limy) siltstone, sandstone, and phyllites. The limier beds often contain abundant fossilized fragments of [crinoids](#), which help establish the Silurian age of the unit.

In this area of Maine, metamorphism is fairly weak such that many of the primary sedimentary features are still preserved in the rocks. A few thin granitic dikes intrude The Forks Formation at the falls and elsewhere along Moxie Stream.



The Forks Formation



Photo by R. Marwinney

Maine Geological Survey

Figure 4. Typical layering in The Forks Formation is turned up on edge in most places. This photo shows thinly bedded brown calcareous siltstone interlayered with light gray phyllite. These rocks are exposed a short way above the falls.



The Forks Formation

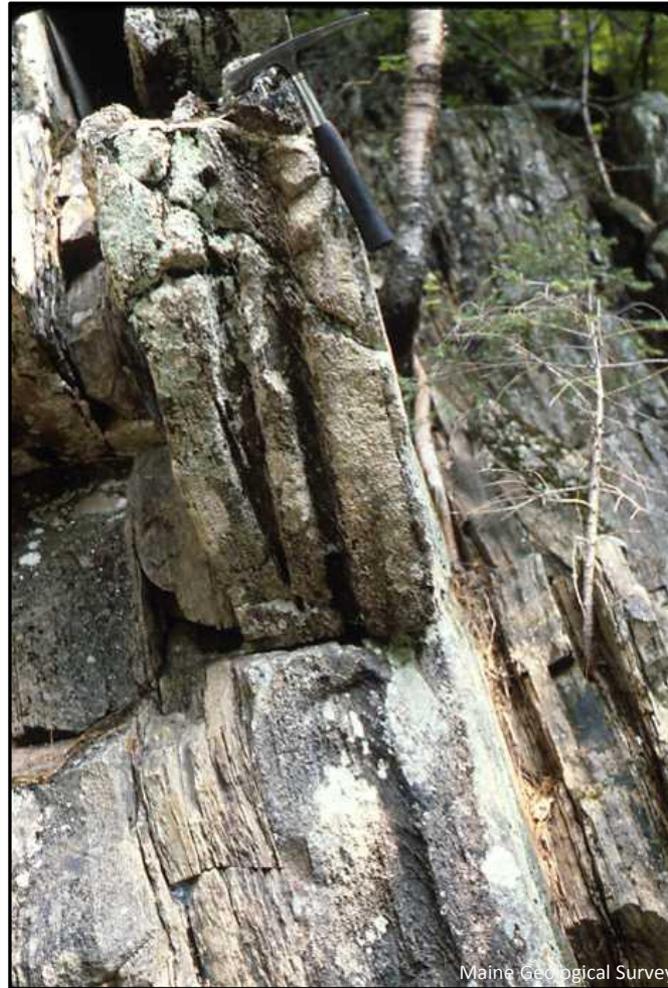


Photo by R. Marvinney

Maine Geological Survey

Figure 5. Layers of thick sandstone like these are more resistant to erosion and underlie the main falls. These beds are fairly coarse with quartz grains up to two millimeters in diameter.



The Forks Formation

Figure 6 shows the typical bedding style in The Forks Formation. The more calcareous layers weather more easily while the sandier/siltier layers are more resistant to weathering and erosion. This distinct ribbed characteristic of this outcrop is the result of these differences in weathering.



Figure 6. Two granitic dikes near the middle of the image cut across the bedding at a high angle. These are exposed along Moxie Stream about a half mile above the falls, but other dikes are exposed just below the main falls. These dikes are probably related to small granite intrusions in the area.

The Forks Formation



Photo by R. Marviny

Maine Geological Survey

Figure 7. A minor fault cuts bedding in The Forks formation at a low angle.



The Forks Formation

Figure 8. Typical folding in The Forks Formation. Thick calcareous sandstone beds sweep gently upward from lower left to middle right of the image. A strong cleavage has developed in the siltier layer at the bottom of the sequence, and cuts across bedding at a high angle from lower left to upper right. Fine sedimentary layering is visible near the base of the second layer up from the bottom of this sequence.

References and Additional Information

Burroughs, W.A., and Marvinney, R.G., 1981, Reconnaissance bedrock geology of The Forks quadrangle, Maine: Maine Geological Survey, Open-File Map 81-10, scale 1:62,500.

Marvinney, R.G., 1984, The Forks Formation of northwestern Maine: evidence for a Late Ordovician to Late Silurian angular unconformity: *Northeastern Geology*, v. 6, p. 151-160.

