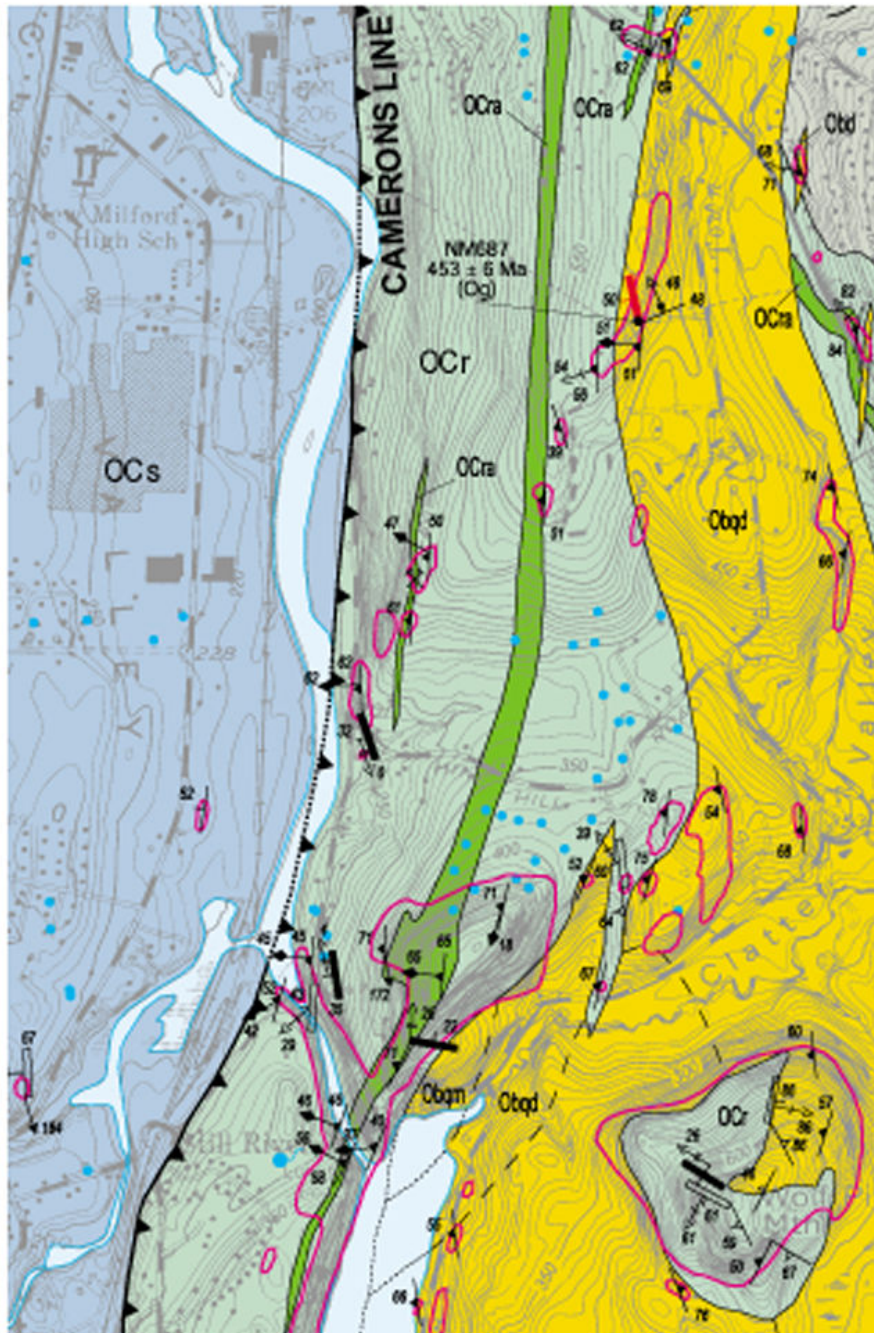


The Geology of Cameron's Line, the Housatonic River, and the Still River by Kayak

Steve Kluge, Fox Lane High School, Bedford, NY (retired)
 steve.kluge@gmail.com



Autochthonous Meta-sedimentary Rock West of Camerons Line Stockbridge Formation (Ordovician and Cambrian)

OCs Dolomite Marble

Allochthonous Meta-sedimentary & Metavolcanic Rocks East of Camerons Line Ratlum Mountain Schist (Ordovician and Cambrian)

OCr Schist

OCra Amphibolite

OCk Coarse Kyanite Schist

Ordovician Intrusive Rocks

Obd Brookfield Gneiss

Obqd - quartz diorite
 Obgq - granodiorite
 Obqm - quartz monzonite

Map Section from
 Bedrock Geologic Map
 of New Milford Quad.
 by Gregory J. Walsh, USGS, 2003

Acknowledgment: The field work and preparation of the map on the cover of this pamphlet was done by Gregory Walsh out of the USGS office in Montpelier, VT. I met Greg at a meeting of the Geological Society of America where his map was showcased, and Greg spent significant time with me discussing various aspects of the geology of the New Milford quadrangle. Later he sent me the entire report (available for download at <http://pubs.usgs.gov/of/2003/of03-487>). I was already familiar with the stretch of the Housatonic covered by this guide, and have been back over it since then, map in hand, to develop this guide.

General Information: The Housatonic in this area is really part of Lake Lillinonah, held up by the Shepaug Dam 12 miles SSE of here. The nominal water level is 198 feet above sea level, though releases at the dam can result in rapid drops of several feet. The discharge of the river is relatively small for the cross section of the Lake, so the current velocity is small - during the low discharge months of July and August, the water actually stagnates in the broad opening south of the gorge. During peak flow, particularly after extended heavy rains, the current can move quickly in the Gorge. Unless you are an experienced and strong paddler, you should probably postpone your trip until the waters subside some. Keep an eye out for floating logs and other debris, and watch for rocks, tree stumps, and sand bars when you're away from the center of the channel.

Preparation: As with any kayak outing, you must be properly prepared. During the spring months the water is dangerously cold, and cold weather paddling precautions must be taken. Any time you venture out, follow safe boating rules, regulations, and common sense. Bring your normal safety and 'rescue gear', wear your PFD, bring along some water, make sure you have sunglasses, sunscreen and a hat.

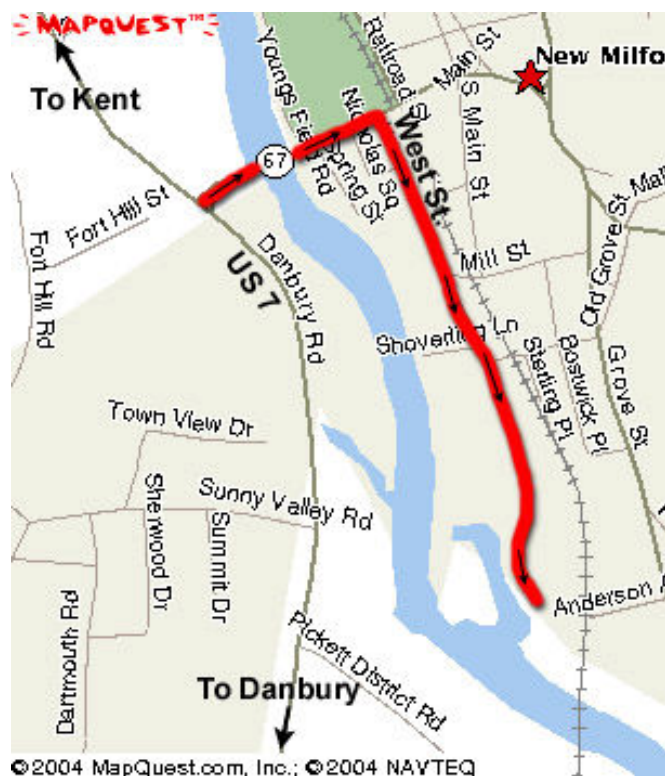
Kayak Rentals: The Trading Post (314 Kent Road, Route 7 New Milford, CT 06776 860-354-3276) is just north of the village of New Milford on US 7. They rent kayaks at reasonable rates, and have supported trips like this with group rental rates in the past.

The "Put In": The village of New Milford is just off US Route 7, about 11 miles north of Exit 7 of I-84 in Danbury, CT. To get to the put in, turn off US 7 onto route 67 (east), crossing the Housatonic River. Take the 3rd right (at the light, before crossing the tracks) onto West Street. Follow West St. to its end in a small corporate park. Continue south through the park to the boat ramp at the extreme south end of the parking lot. This is where you'll put in.

An alternate put-in is at the ramp at Addis Park, about 1.12 km (0.7 miles) south of the West Street put in on Grove Street. In this area, Grove Street runs right along Cameron's Line, and Addis Park is developed on a stable point bar along the Housatonic here. Adjust your itinerary appropriately.

A Google Earth file covering this field trip is available here:

<http://stevekluge.com/geoscience/ges/cameronslinefieldtrip.kmz>



ITINERARY

*From the ramp at West Street, turn right (away from the railroad trestle) and paddle north to the small dam just upstream. **STAY BACK A GOOD DISTANCE FROM THE DAM** to avoid the dangerous turbulence at the spillway.*



Figure 1 - The view south from the Bleachery Dam. The foot of the hill on the horizon marks Cameron's Line.

Stop 1 The Bleachery Dam. Less than a mile north of this little dam, the Housatonic is characterized by gentle rapids and mild white water (though there are dams and steep rapids punctuating the flow farther upriver). But from here south to the Long Island Sound, the Housatonic is really a series of long, narrow lakes held up by a series of dams. At this point, you are at the extreme northern end of Lake Lillinonah, formed in 1955 behind the newly constructed Shepaug Dam about 12 miles south-southeast of here. The

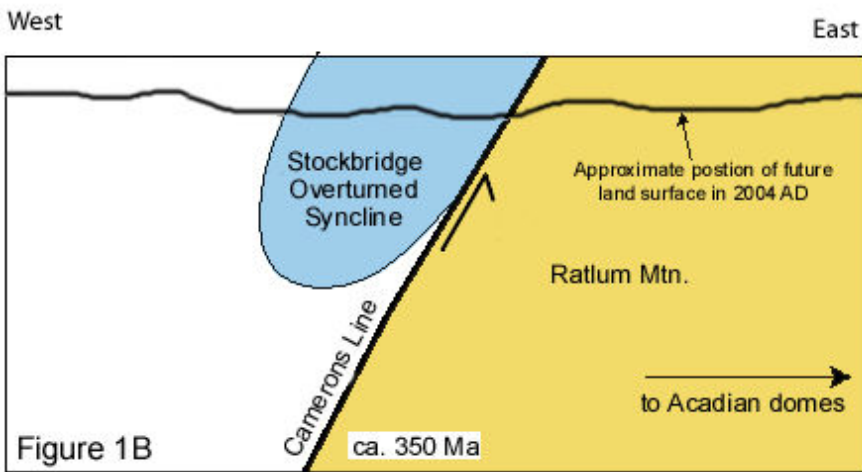
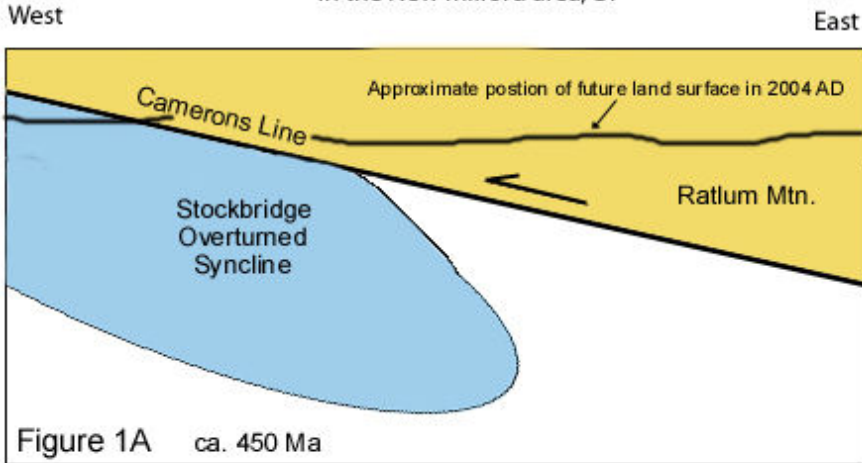
old brick building on the east shore is what remains of the Bleachery and dyeworks that in the past caused the river to run with what ever color dye was currently being used. You can paddle over to the ruins of the old Bleachery on the east shore.

From here, paddle south and pass under the railroad trestle. Continue south to the bend in the river.

Stop 2 Cameron's Line. As you round the apex of the meander, you are crossing Cameron's Line, a major Ordovician thrust fault. Cameron's Line marks the suture between the continental rocks of ancestral North America, behind you, and oceanic rocks metamorphosed as they were thrust eastward during the closing of the Iapetus Ocean during the Taconic Orogeny. Here, the allochthonous Ratlum Mountain Schist ahead of you is sutured to the dolomite marble of the Stockbridge Fm. behind you. The schists of the Ratlum Mt. Schist on the eastern bank of the river are more resistant to weathering than the marble of the Stockbridge Fm. to the west, and that explains the height of land to the east. The trace of the fault follows the base of the hill quite closely. As you round the bend, you're crossing Camerons Line again, this time back onto the Stockbridge Fm. A half mile farther down the river (at the next right hand bend), you once again cross the fault, and from here down to the gorge at Lover's Leap, the river runs right on top of the fault, as if it's rubbing up against the Ratlum Mountain Schist, looking for a place to break through. (See "Notes on Stop 2" at the end of this guide for more on the Cameron's Line fault.)

Note too the point bar deposits on the inside of the meander, and the deep water at the cut bank on the eastern shore.

Cartoon Cross Sections of Camerons Line
in the New Milford area, CT



Stop 2 **Cameron's Line** (continued)

The Ratlum Mt. Schist was thrust westward during the Taconic Orogeny along (and over) a low angle thrust fault that dipped gently to the east. That would lead to the assumption that the fault today strikes N along the river here (it does) and dips gently to the east away from the river (it does not). Rather, field work indicates that the fault in this area was rotated during the subsequent Acadian Orogeny into its present orientation. In the New Milford area, it is overturned and now dips steeply to the west, under the river and the Stockbridge Fm. to the west.

Figure 1A. During the Taconic Orogeny the newly formed Camerons Line fault was a low angle thrust fault.

Figure 1B. During the Acadian Orogeny, Camerons Line was rotated into its present day orientation, overturned and dipping steeply to the west. (diagrams after Gregory Walsh, 2004)

Look for a narrow tributary entering on your right before you enter the gorge. Paddle up that tributary, passing under another railroad trestle.

Stop 3 The Still River. Paddle under the trestle and up the tributary, and cross the pond beyond. Keep to the right (west) side, paddling upstream. You'll pass under 2 roadway bridges, and finally a white pedestrian bridge at Harrybrooke Park. Just beyond here are the gentle falls that mark the northern end of the Still River. In its last 10 miles (significantly longer if meanders are considered), the river drops only about 80 feet as it winds its way northward through the wide valley formed in the Stockbridge marble. The falls mark its final descent into Lake Lillinonah, and the end of navigability for us. Notice the shallow, muddy bottom of the stream here where sediments are dropped as the gradient (and hence the velocity) of the river approach zero.

Paddle back out to the Housatonic and turn south (downstream).

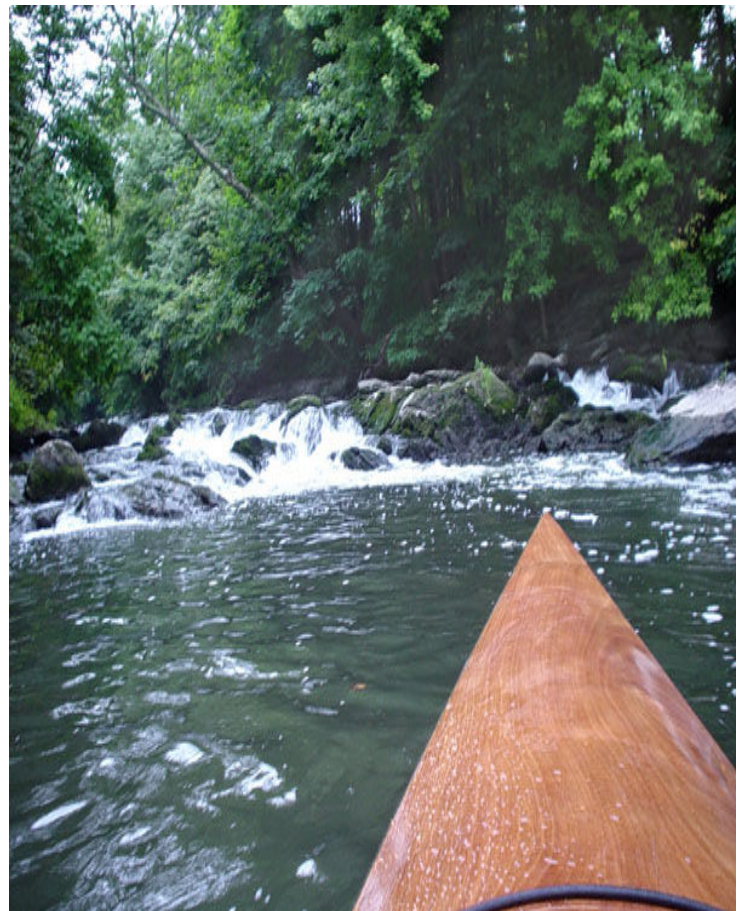


Figure 2 Final falls near the mouth of the Still River.



Figure 3 The gauge at the top of Lover's Leap Gorge

Stop 4: The Gorge at Lover's Leap. The Housatonic crosses Camerons Line for the last time before it enters the gorge in front of you. Prior to the damming of the Housatonic in 1955, the river roared through the gorge here, dropping more than 20 feet in less than a quarter of a mile in the narrow valley. Notice the old stream gauge on the western shore as you enter the gorge. The bottom of the gauge is at 200 feet above sea level. As you paddle through the gorge, you are crossing the continuation of the ridge of resistant Ratlum Mt. Schist that formed the east bank of the river upstream from here. As you pass under the steel and concrete bridge stay to your left. Notice how the Ratlum Mt. Schist has weathered - leaving broad, flat foliation planes dipping towards you into the water. The intersection of the water and the foliation plane (the shoreline!) is the strike of the foliation, and not surprisingly it is pretty much parallel to Camerons Line 100 feet northwest of here. Splash some water on the rock - it flows down dip into the river. If you have your Brunton (and are careful not to drop it!), you can measure both the dip and strike of the foliation easily

Stop 4: **The Gorge at Lover's Leap** (continued)

right from your boat. Joints have formed perpendicular to the foliation, and where slabs of rock have fallen away, the true dip can be measured directly on the joint surface. It's worth a paddle to the other side of the gorge to observe the 'scarp face'. In particular, note the steepness and instability of the slope developed on that structure.



Figure 4 The Berlin Iron Bridge Company's lenticular truss bridge over the gorge at "Lover's Leap"

Stop 5: Lenticular Truss Bridge. The delicate red suspension bridge ahead of you was built in 1885, and carried vehicle traffic until 1977, when it was replaced by the modern steel and concrete bridge behind you. As of April, 2004, the bridge was scheduled for restoration by the town of New Milford. It is one of only 3 remaining examples in Connecticut of the "lenticular truss" bridges built by the Berlin Iron Bridge Company in the late 1800's. Another spans the Housatonic just north of New Milford at Boardman Bridge (near the Trading Post!), making New Milford the "the mecca of lenticular trusses in Connecticut."

Stop 6: Amphibolite Outcrop. As you paddle farther into the gorge, notice how traffic noise is muffled, and listen for the croaky call of ravens from the hills above.

Continue south along the east bank, noticing the sparkly, mica rich foliation of the schist. Notice on the map that there's a thin band of amphibolite (green, labeled OCra) running across the gorge. Where the rocks are weathered it is a little difficult to see exactly where it starts, but the southern contact is obvious - just look for the change from the fine grained gray/black rock back to the mica foliation of the Ratlum Mt. Schist. When you find the contact, cross the river and find the contact on the west bank.

Stop 7: Lover's Leap. The high outcrop on the east bank at the southern mouth of the gorge (best seen from the west bank of the river) is known as "Lover's Leap", where, according to the Connecticut Guide of 1935, "tradition has it that Chief Waramaug's only daughter Lilinonah and her white lover plunged to a watery grave." Today, the rocks at Lover's Leap are accessible via a short hike along an old road that head south up the hill from the west end of the Lover's Leap Bridge. There is room to park your car there.

As you leave the gorge, head for Goodyear Island directly ahead of you and west of the middle of the channel.

Stop 8: **Goodyear Island.** Paddle around the island, watching for rocks as you round the north and south ends. Notice that there is no bedrock, but rather the island consists of thousands of small boulders bound by a clayey mix of sediments and tree roots - typical glacial till. The island supports a variety of plants, including shadbush and mountain laurel. Goodyear Island is likely part of a moraine or the top of a small drumlin that was drowned as Lake Lillinonah flooded the valley.

From Goodyear Island, paddle straight across the lake to the east bank, and turn north along the eastern shore.

Stop 9 **The Brookfield Gneiss.** As you left the south end of the gorge earlier, you also left the Ratlum Mt. Schist and crossed onto the Brookfield Gneiss, the metamorphosed intrusions into the Ratlum rocks that occurred during the Ordovician. As you paddle north along the shore here, look for the 'black with white speckles' appearance of the Brookfield Diorite Gneiss. One particularly nice outcrop occurs on a private waterfront that stands prominently out into the river. There's a 0.6m diameter tan quartzite erratic boulder lodged there as well.

Continue to paddle north along the eastern shore of the river

Outcrops are few as you paddle north along the shore, but there is another huge (2m diameter!) quartzite erratic along the shore.

Stop 10 **Clatter Valley creek.** Explore the cove to the east of Lover's Leap (where the Clatter Valley creek enters the lake), noting especially the sand bar at the culvert where the Clatter Valley creek dumps into the lake, and the weathered rocks of the Ratlum on the western side of the cove.

At this point, head back to the gorge and upstream back to the put in. If time allows,