

# A Proposal for Water Quality Monitoring Sites

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## INTRODUCTION

The purpose of the project is to propose water quality testing sites for the Great Hollow Nature Preserve and Ecological Research Center in New Fairfield, Connecticut.

Great Hollow Nature Preserve is located on the Connecticut and New York border in New Fairfield and Sherman, Connecticut. Following Pembroke Road (Route 37), a large freshwater stream runs through the preserve. Two additional first order streams join Quaker Brook which flows south towards Haviland Hollow Road.

Great Hollow is anticipating adding water quality monitoring to their assessment of the health of their preserve. Of special concern is the proximity of Route 37 to the streams. Large roads can increase the temperature of the water (USGS) and bring in pollutants from runoff such as heavy metals, hydrocarbons, and trash (NRC). Another main concern is the effect of road salts on aquatic life and water quality (Corsi 2010). The purpose of the project is to identify suitable testing locations for Quaker Brook and additional sites away from the roadways that could be used for comparison. A secondary consideration for finding testing locations is including ease of access for students to take part in the water monitoring program.

## METHODS

Prior to visiting the sites, topographical maps and a trail map provided by Great Hollow Nature Preserve were used to identify water flow into Quaker Brook. Possible test sites were evaluated for accessibility and identified with GPS coordinates and elevation using an iPhone Compass. Photos were taken to show location and access points. Proposed sites were visited during the winter while ground cover was low.

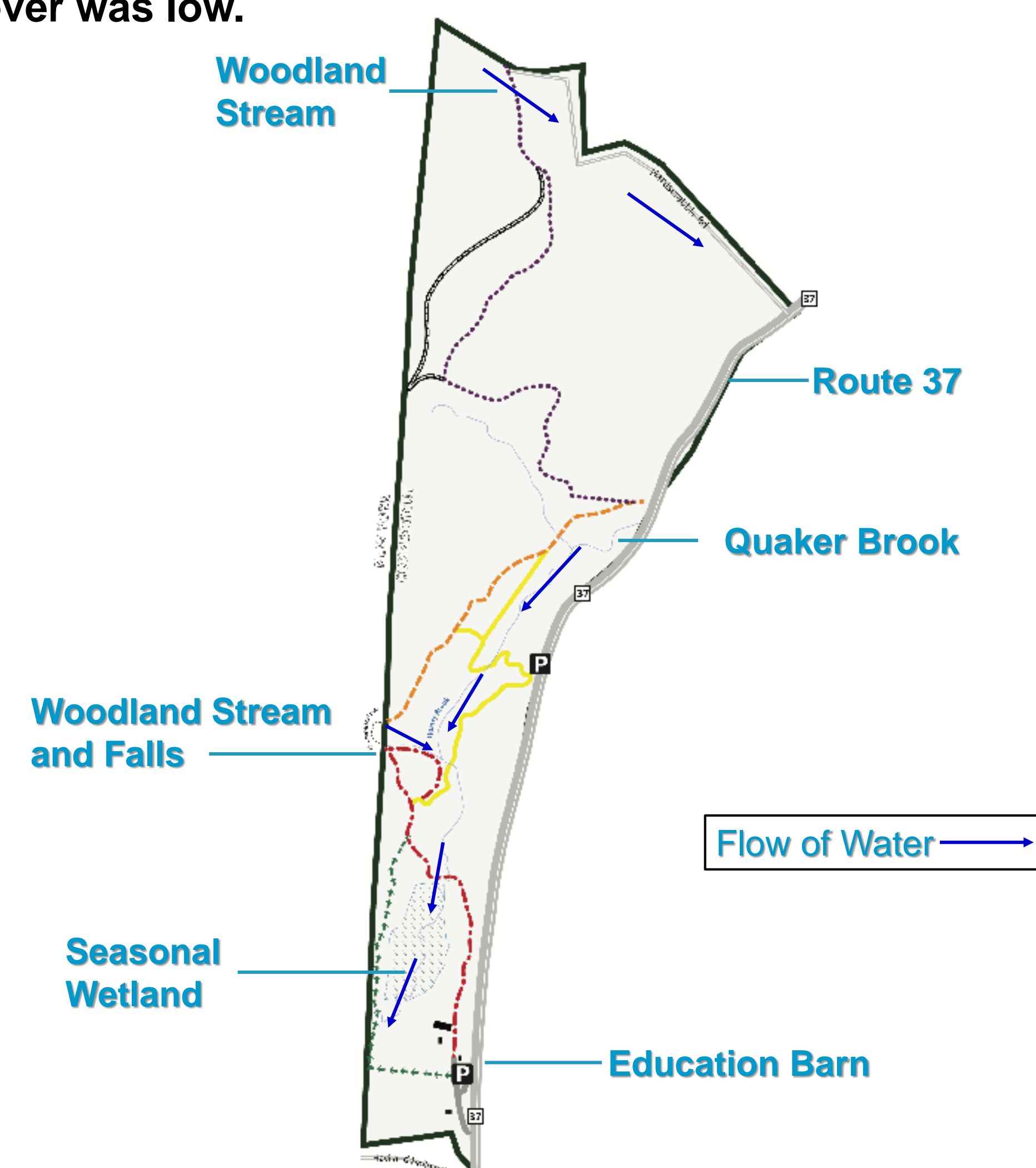


Fig. 1 – Trail Map of Great Hollow Nature Preserve and Flow of Streams (modified from Greathollow.org)

## FINAL PROPOSAL

Five water quality testing sites are proposed, three on Quaker Brook and one on each first order stream. (Fig. 2) Since Quaker Brook follows roadways, there is a greater chance of pollution compared to the first order streams which originate in the forest. Therefore testing both the first order streams and Quaker Brook, will allow comparison to determine how roads affect water quality.

Proposed Test Sites:

### First Order Streams

- Location 1 - *Hardscrabble Road First Order Stream*
- Location 3 – *West Woodland First Order Stream*

### Quaker Brook Locations

- Location 2 - *Quaker Brook at Pembroke Road*
- Location 4 – *Quaker Brook Merge*
- Location 5 - *Southern end of Quaker Brook*

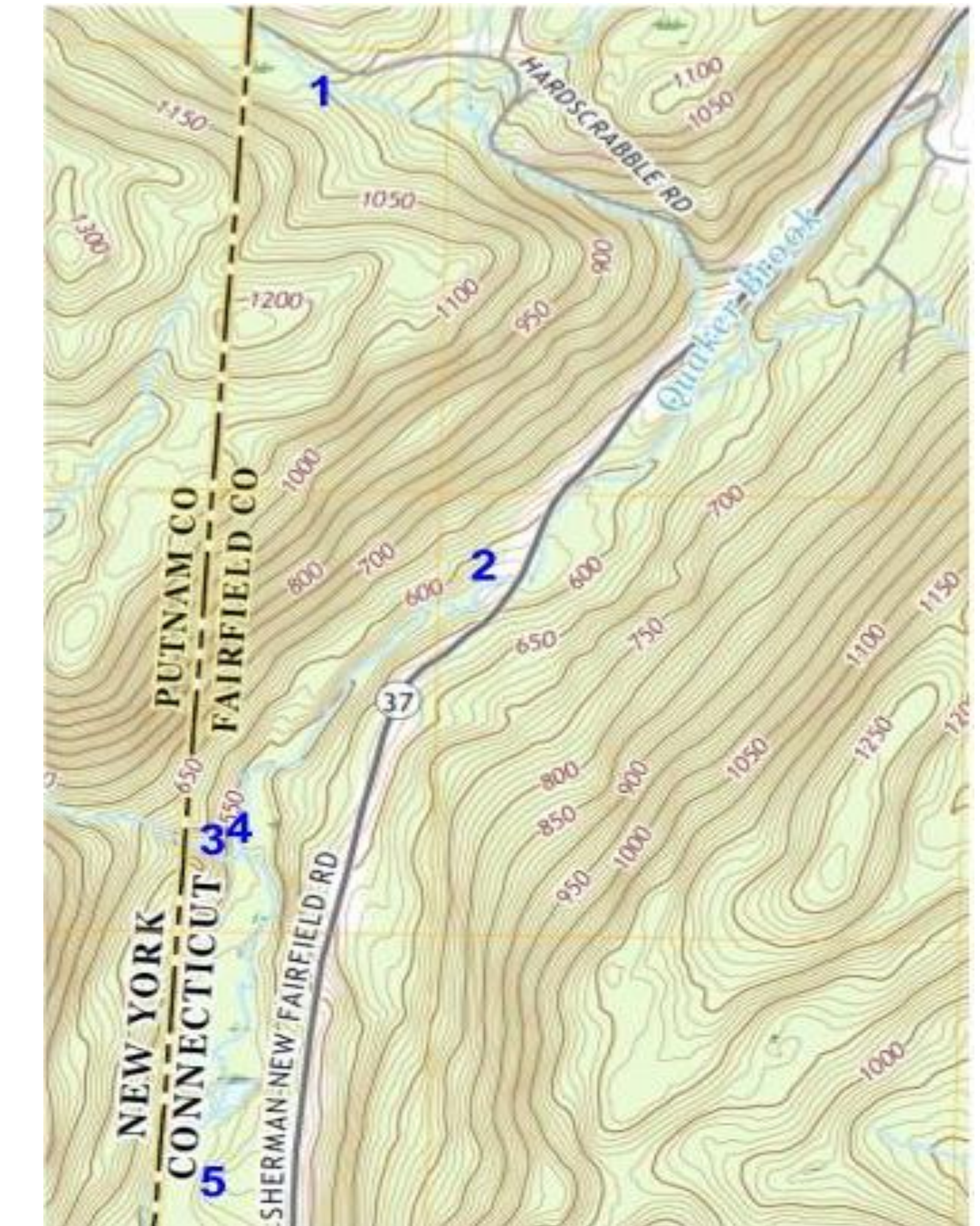


Fig 2. Proposed Sites 1-5 (USGS Topographical Map)



Fig 3. Proposed Site 1- Hardscrabble Road First Order Stream This first order stream is easily accessed by the parking area or the Purple Trail and will provide a control site for comparison to the larger Quaker Brook. This stream follows Hardscrabble Road but additional access points are limited by the steep terrain.



Fig 4. Proposed Site 2 - Quaker Brook at Pembroke Road Quaker Brook (A) flows south from Sherman along the east side of Pembroke Road. This proposed site is just after Quaker Brook and passes under the road to the east. This is also after the Hardscrabble Road stream has merged with Quaker Brook. Access recommendation: Removal of invasive vegetation (B) would be needed to access the site. Winged burning bush (*Euonymus alatus*) and multiflora rose (*Rosa multiflora*) were blocking a clear path to the brook. See third photo.



Fig. 5 Proposed Sites 3 and 4- Quaker Brook Merge Site 3 is the first order stream draining the elevated forest to the west in New York. Site 4 is just past where the western stream joins Quaker Brook. Differences in water quality and temperature would be expected between these two waterways.



Fig. 6 Proposed Site 5- Southern end of Quaker Brook In between sites 4 and 5 is a large seasonal wetland which may alter the water quality. Therefore, this site will be monitored for the effects of the wetlands on the water quality of Quaker Brook. This site is also near the Education Barn and would be an ideal site for student participation.

## CONCLUSION

Great Hollow Preserve and Ecological Research Center is interested in adding water quality testing to their data collection efforts and is concerned about the proximity of Route 37 to the waterways. In order to identify if the roadway contributes to water quality issues in Quaker Brook, five testing sites have been proposed which will compare forested first order streams to Quaker Brook. Consideration was also made for ease of access to the sites for staff and volunteers.

### Next Steps

If the five sites are approved by Great Hollow staff, access to Site 2 needs to be improved by removing the invasive vegetation. Then, Great Hollow staff can create protocols for each type of test they would like performed. Once protocols are established, then volunteers or students can take part in the testing program, furthering their mission of ecological education.

## REFERENCES

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