



Environmental Consulting & Restoration, LLC



POTENTIAL VERNAL POOL REVIEW MEMO

TO: McKenzie Engineering Group
FROM: Brad Holmes, Professional Wetland Scientist
DATE: May 7, 2026
RE: Off Ward Street & Viking Lane, Hingham

Per your request, Environmental Consulting & Restoration, LLC (ECR) has performed several reviews of the potential vernal pool (PVP) area off Viking Lane/Ward Street in Hingham (the site) over the past month. This PVP is located within an Isolated Vegetated Wetland delineated by ECR in January as the A series wetland. The purpose of the review was to evaluate if the potential vernal pool area contains the physical and biological criteria necessary to meet NHESP's vernal pool certification requirements. ECR performed reviews on April 13, 17, 29, and May 5, 2026. Below is a summary of ECR's observations:

- 4/13/26 – PVP holding water to a depth of approximately 1 foot. No observations of vernal pool species.
- 4/17/26 – PVP holding water to a depth of approximately 1 foot. Fairy shrimp (juvenile) observed within the water column.
- 4/29/26 – PVP consists of a small puddle with approximately 4 inches of water. Fairy shrimp (juvenile) observed within the water column.
- 5/5/26 – PVP completely dry.

For more information, please refer to the Photograph Pages attached.

PHYSICAL CRITERIA

For a potential vernal pool to meet the physical requirements, standing water must be contained for more than two months in the spring and summer seasons. The vernal pool season in the southeast region area started around the second week of March, which was after the heavy winter snow melt. Based on our observations, this PVP does not hold water for at least two months, which is understandable due to its shallowness.

BIOLOGICAL CRITERIA

For a potential vernal pool to meet the biological requirements, the area has to contain obligate or facultative vernal pool species. The only species that ECR observed during the site review was juvenile Fairy Shrimp (*Anostraca: Eubbranchipu*). Adult Fairy Shrimp are listed by NHESP as an obligate vernal pool species. Fairy Shrimp are documented to reach adult stage at varying times depending on site conditions. Some literature suggests adult stage at 1 to 3 weeks. Based on our review, it may be that the juvenile Fairy Shrimp reached adult stage prior to May 5th. ECR was unable to observe adult Fairy Shrimp within the PVP.

SUMMARY

For a PVP to meet certification by NHESP, the PVP must meet the biological AND physical criteria. Based on ECR's review, the PVP does not meet the physical criteria. Based on ECR's review, the PVP may meet the biological criteria. ECR did not observe adult Fairy Shrimp but can not confirm that the juvenile Fairy Shrimp observed in the PVP did not meet adult stage.

ECR

Environmental Consulting & Restoration, LLC



Since the PVP does not contain both biological AND physical requirements, this area should only be considered an Isolated Vegetated Wetland.

Attachments:

1. Photograph Pages
2. Fairy Shrimp profile data

**Isolated Wetland Photographs Spring 2026
Viking Lane/Ward Street, Hingham**



Photograph #1- View across the isolated wetland on April 13, 2026. The wetland is holding approximately 12 inches of water in the interior basin.



Photograph #2- View across the isolated wetland on April 17, 2026.

Isolated Wetland Photographs Spring 2026
Viking Lane/Ward Street, Hingham



Photograph #3- Example of juvenile Fairy Shrimp found within the isolated wetland.



Photograph #4- View of the remaining puddle on April 29, 2026.

**Isolated Wetland Photographs Spring 2026
Viking Lane/Ward Street, Hingham**



Photograph #5- View across the interior of the isolated wetland completely dry on May 5, 2026.

FAIRY SHRIMP

ONE SPECIES IS A MASSACHUSETTS
SPECIES OF SPECIAL CONCERN

C: BRANCHIOPODA O: ANOSTRACA

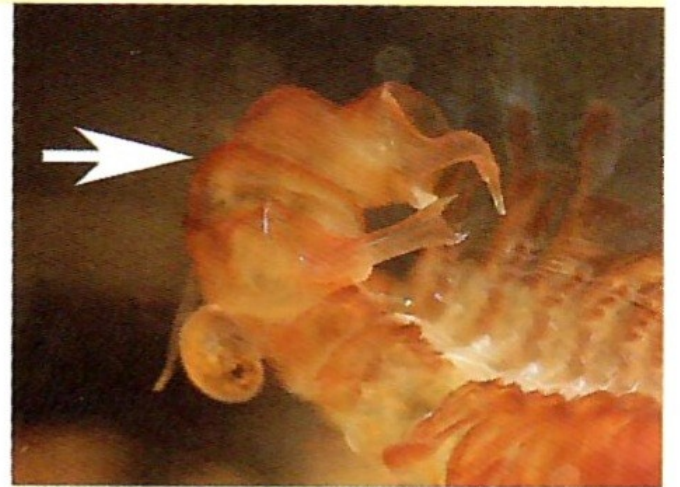
Fairy shrimp are small (.5-1.5"), orange to green, delicate-bodied crustaceans that live only in vernal pools. They swim "upside down" through the water, rhythmically beating their abdominal appendages which also serve as respiratory structures. When viewed from above, their sometimes white forked tail may make them noticeable. They may move slowly, dart quickly, or even remain stationary as they filter bacteria, phytoplankton, protozoans and detritus. Mature females have a brood pouch evident at the base of the abdomen, while males appear to have an enlarged head due to claspers used in mating.

Two species of fairy shrimp are confirmed from MA. *Eubbranchipus vernalis* is common and widespread, while the intricate fairy shrimp, *E. intricatus*, is a state-listed rare species known from only a few sites. They can be differentiated by examining the heads of mature males under a hand lens. *E. intricatus* has a pair of long, often curled, antennal appendages which reach to the end of the claspers. The antennal appendages of *E. vernalis* are quite small and inconspicuous (see diagram).

Female fairy shrimp produce several broods of encysted eggs which must dry and be re-submerged before they will hatch. Hatched larvae develop quickly into mature adults which reproduce several times. The drought and cold resistant cysts withstand ingestion by animals, may be blown by wind from a dry pool, or carried along with mud or plant matter. The rapid development and reproduction of fairy shrimp places their activity period in a vernal pool at a time (winter and early spring) when there are few predators present.



Adult male fairy shrimp, *E. vernalis*, with claspers used in mating evident.



E. intricatus has much longer antennal appendages than *E. vernalis*.



Maturing female. Encysted eggs are developing in the brood pouch, and the head is much smaller than a male's.



Fairy shrimp are camouflaged by the surrounding leaves. The white forked tail gives this female away.