How Large Is a Vernal Pool?

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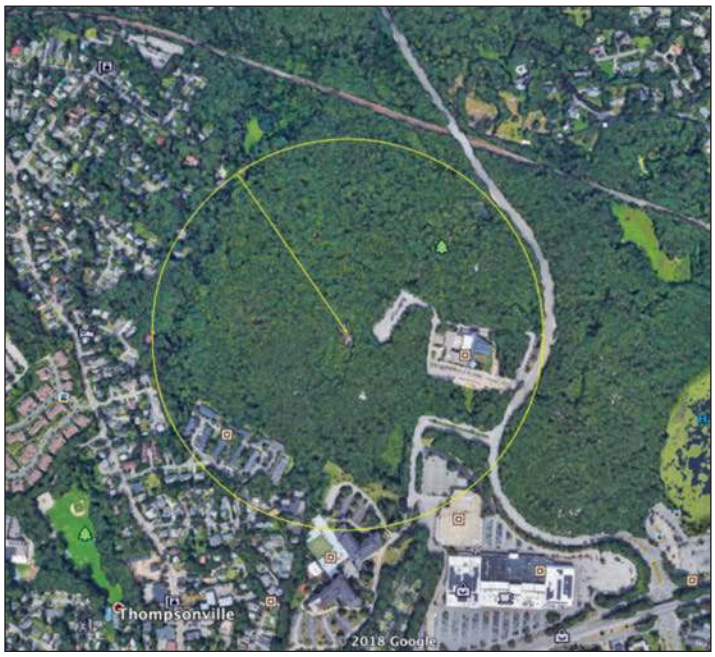
How large is a vernal pool? Mention this habitat to ecologists, and they will not think of water so much as *animals in water* — salamanders, frogs, gliding fairy shrimp, and other species that appear abruptly and fleetingly in these special places each spring. The various amphibians that arrive at vernal pools in March or April will reside in and near a pool only long enough to mate and lay eggs; all the rest of the year they are forest dwellers. When we ask about a vernal pool's size, we need to see in our mind's eye a vital halo around it, encompassing shady forest understory with rich loose soil, fallen trunks and limbs to hide under, and plenty of worms and bugs to eat. "How large" becomes "how far?" as in, "how far will the frogs and salamanders that gather in the spring disperse during early summer?"

Here I illustrate what I have learned so far, using imagery for Bare Pond in Webster Woods.

Vital Area for Spotted Salamanders



McDonough and Paton (2007) used radiotelemetry to track both male and female spotted salamanders dispersing from a vernal pool in Connecticut. They found that females tended to be the longer distance travelers, and estimated that a forested circle of radius 370 meters would be needed to protect 95% of them. The resulting life zone surrounding Bare Pond, shown above, encompasses 106 acres. Using the polygon tool in Google Earth Pro I found that 20 acres of the life zone has already been paved over or otherwise developed, or approx. 1/5th of the total. Fortunately, most of this developed area is on the periphery of the zone. Animals dispersing north, west, or south from the pond have a good chance of finding suitable habitat.

Vernal Pond Spotted Salamander

The vital area for wood frogs is only slightly smaller than the area needed by spotted salamanders. Studies of the adults of this species by Baldwin, Calhoun, and deMaynadier (2006) and Vasconcelos and Calhoun (2004) both found maximum dispersal distances of 300 to 340 meters.

References

Baldwin, R. F., A. J. K. Calhoun, and P. G. deMaynadier. 2006. Conservation planning for amphibian species with complex habitat requirements: a case study using movements and habitat selection of the wood frog *Rana sylvatica*. *Journal of Herpetology* 40:442–453.

McDonough, C. and Paton, P. 2007. Salamander dispersal across a forested landscape fragmented by a golf course. *The Journal of Wildlife Management* 71: 1163-1169.

Vasconcelos, D., and A. J. K. Calhoun. 2004. Movement patterns of adult and juvenile *Rana sylvatica* (Le-Conte) and *Ambystoma maculatum* (Shaw) in three restored seasonal pools in Maine. *Journal of Herpetology* 38:551–561. ◆