



## Research Brief for Resource Managers

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### Fire and Wildlife: Eastern hognose snakes prefer managed habitat

Akresh ME, King DI, Timm BC, Brooks RT (2017)  
*Fuels Management and Habitat Restoration Activities Benefit Eastern Hognose Snakes (Heterodon platirhinos) in a Disturbance-Dependent Ecosystem* *Journal of Herpetology* 51(4):468–476.

[Click here](#) for original paper.

Why do some animals prefer regularly-disturbed sites and some do not? Does the habitat they use for hunting and breeding change depending on the type or quality of forest cover around them? These questions are critical to determining how much and where to conduct prescribed burns or mechanical thinning that benefit species of concern that occur in the fire-adapted pitch pine-scrub oak ecosystem of our region.

Dr. Michael Akresh and fellow researchers at the University of Massachusetts and USDA Forest Service Northern Research Station wanted to understand how managed areas were being utilized by Eastern hognose snakes in the 1,600-acre Montague Plains Wildlife Management Area, a unique inland pitch-pine scrub oak ecosystem located in western Massachusetts. The area has been undergoing selective thinning and prescribed fire treatments since 2000, overseen by the Massachusetts Division of Fisheries and Wildlife. The researchers looked at five different types of habitat: open canopy types such as treated (or managed) pitch pine, scrub oak, power line cuts, and closed-canopy types such as pitch pine and deciduous forest. They used PIT tags that can be scanned via a barcode to distinguish unique individuals among 46 snakes. Of those 46, 12 were fitted with radio transmitters to

#### Management Implications

- The Eastern hognose snake is listed as a species of greatest conservation need (SGCN) in five northeastern states (MA, NH, NJ, NY and RI) where habitat loss due to fire exclusion is a major factor in its decline.
- Areas managed for public safety using mechanical fuel reduction treatments can help create open habitat needed by species of concern, conditions similar to what may occur after a high-severity fire.
- Studies investigating the home range and preferences of species of concern can guide how much and how often to manage habitat without severely impacting species populations.

determine home range and distances traveled per day. They determined home ranges using the minimum convex polygon, essentially ‘connecting the dots’ of the detected locations to show the area used (see Figure 2 from the paper, next page). They also used other computations to obtain additional estimates of home range size, and to determine the core areas utilized by the snakes, based on their detected locations.

Results showed that Eastern hognose snakes have smaller home ranges when they are in open canopy areas (average of 20 acres). They travel farther and have larger home ranges when they inhabit closed canopy systems (average of 61 meters per day for closed-canopy versus average of 25 meters per day for open-canopy). There was no significant difference in survivorship between the two habitat uses. However, the researchers did establish that the snakes preferred open-

canopy habitat types. This was shown using a habitat selection model that considers potential movements towards all available habitat at any given time and determines which habitat is utilized more. Interestingly, open canopy scrub-oak and treated pitch pine areas were preferred, but power line cuts were not. The authors surmised that soil compaction, shorter vegetation, and less leaf litter could have made power line cuts less attractive for Eastern hognose snakes. The authors also noted that the higher body temperature of the Eastern hognose snake compared to other snake species may explain its preference for more open-canopy habitat types.

Other explanations for this habitat selection preference include nesting site use, prey availability, hibernacula (shelter) availability, and suitable cover from predators.

Overall, this study takes a solid statistical look at the movements and habitat preferences of Eastern hognose snakes in an area that has undergone extensive fuels management. From this study, it is clear that Eastern hognose snakes have smaller home ranges and travel less in managed pitch pine-scrub oak habitat and generally prefer it to closed canopy areas.

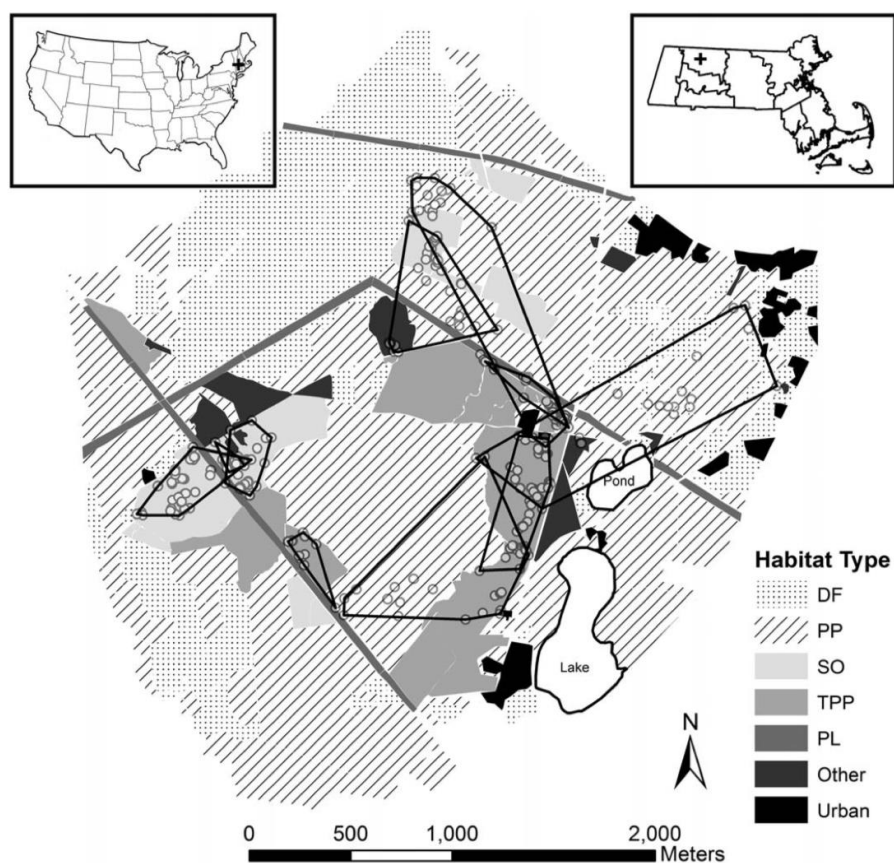


FIG. 2. The 600-ha Montague Plains study site (inset maps of location in Massachusetts, USA) with habitat type classifications (see Fig. 1 legend), telemetry fixes of 12 radio-tagged Eastern Hognose Snakes, and 100% minimum convex polygons for 10 individuals.

Legend acronyms are: DF = deciduous forest, PP = pitch pine forest, SO = scrub oak, TPP = treated pitch pine, PL = power line corridors, Other = other early successional or sand pit habitat.