

TO: Carleton Montgomery and Theresa Lettman, Pinelands Preservation Alliance

FROM: Dr. Joanna Burger, Professor, Division of Life Sciences, Ecology, Evolution and Natural Resources, Rutgers University

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Re: Review of Ocean Acres 38-Acre Overlay Area/ 2005-2007 Pine Snake Survey Report from EcolSciences, Inc.

The following represents the results of our expert review of the Ocean Acres Overlay Area/2005-2007 Pine Snake Survey Report from EcolSciences, Inc. We have prepared this report in the expectation that the Pinelands Preservation Alliance will submit it to the Pinelands Commission as part of the Commission's deliberations on whether to continue or withdraw existing development restrictions on the Overlay Area.

We respectfully disagree with the finding of the Ecolsciences, Inc. report that the Ocean Acres Overlay Area is not critical habitat for the Northern Pine Snake. Here we discuss our four main concerns, which we believe nullify the finding in the report, that development of the Overlay Area will avoid irreversible adverse impacts on habitats that are critical to the survival of a local population of Northern Pine Snake.

- 1. The report admits that a mechanism for habitat value being degraded in the Overlay Area is the fragmentation impact or "domino effect" of nearby development that was previously permitted. If one accepts the finding (which we do not) that the Overlay Area is no longer habitat and the developer is rewarded for the habitat degradation that its consultant claims it has already caused, then the development of the Overlay Area, by extension of Ecolscience's own argument, will cause irreversible adverse impact on the remainder of the conservation zone.**

The report concludes that, based on Ecolscience's sampling, there is no longer evidence that the 38-acre Overlay Area is utilized by Northern Pine Snakes. We do not agree with this conclusion, but if one were to tentatively accept this hypothesis, the reported mechanism as to why the habitat has become degraded since the earlier study is the recent "nearby" development approved under the original Pinelands Commission conservation plan. Specifically, the Overlay Area habitat itself has not changed in any significant way, so there has been no activity or alteration within the Overlay Area to cause Pine Snakes to cease using it as they had in the recent past. The only habitat change has been the increased development of adjacent land – in particular the construction of Nautilus Drive and additional nearby housing. According to Ecolsciences, this habitat change has impacted the Overlay Area via forest fragmentation impacts – road traffic, off-road vehicle incursions, and removal of adjacent habitat areas which acted as buffers to fragmentation impacts. If one accepts the report's premise that off-site development has degraded the Overlay Area habitat value for Northern Pine Snake, then it is also an inescapable conclusion that by the exact same mechanism, the habitat value for Northern Pine Snake on the remainder of the Conservation Zone will be degraded by

development of the Overlay Area. The developer will not only be receiving a benefit from degrading rare species habitat by having developed the adjacent land, but by its own admission and application of their proposed mechanism via a fragmentation domino effect, will further degrade the remainder of the Conservation Zone by developing the Overlay Area.

2. The Overlay Area can be habitat critical to the survival of the local Northern Pine Snake populations because it buffers the remainder of the Conservation Zone from the impacts of the development, whether or not snakes are denning or hibernating in the Overlay Zone in any given year.

The Pinelands CMP provides that “No development shall be carried out unless it is designed to avoid irreversible adverse impacts on habitats that are critical to the survival of any local populations” of listed threatened or endangered species. (N.J.A.C. 7:50-6.33) This provision wisely does not apply only to parcels that are themselves, at any given point in time, being used by a protected species for breeding, foraging or other activities. This provision regulates any habitat critical to the survival of a local population. If a buffer zone between development and a population’s active range is critical to the survival of the population, then that buffer zone may not be developed in a manner that creates any irreversible adverse impacts. The Ecolsciences report appears to assume that the Overlay Zone can only represent habitat critical to the local population’s survival if it is currently in use for foraging, nesting or hibernating. This assumption – that habitat buffers are unnecessary to the survival of local wildlife populations – has no scientific basis. Indeed, the Ecolsciences argues that the local population has been eliminated from the Overlay Zone because of the adjacent development. If the Pinelands Commission accepted the erroneous premise that buffer habitat is never critical to the survival of a local population, the CMP could not protect any rare species that is adversely affected by habitat fragmentation, roads and other forms of development at the edge of its range, as developers could simply encroach upon and eliminate habitats through sequential development of the habitat’s diminishing edges.

3. The consultants’ sampling methodology does not support the conclusion that the Overlay Area is no longer utilized by Northern Pine Snakes.

The time period of the study may not be appropriate, both in terms of 1) the sampling (it would have been better to continue to the end of July, and to mid-November, and 2) the number of years. In our experience with hibernation sites, for example, there is movement between them in different years. One hibernation site may not be used for several years, and then the Pine Snakes return to use it. Thus encircling a hibernation site in one year does not insure that it is not used the following year, or two or three years later.

The May through July period is appropriate for counting nesting Pine Snakes, although in some years, Pine Snakes can nest later in July. The September through October is appropriate for snakes searching for hibernation sites. We would have conducted the survey from mid-April through July, since this would have also included movement from hibernation sites in the spring. Similarly, depending upon the year, some Pine Snakes do not enter hibernation sites until November, and even when they do, they sometimes come up to bask near hibernation sites in early November when it is warm.

In addition, Ecolsciences made no attempt to track Pine Snakes from outside the Overlay Area to once again determine whether such snakes came onto the Overlay Area now and then to hunt or hibernate. Because the drift fence methodology used in this case was not, by itself, reliable in determining whether Pine Snakes are still using the Overlay Zone, the tracking approach would have provided data that is essential to verifying the consultant's conclusions. Given that the local population is known to use the adjoining Conservation Area, and the study is ostensibly aimed at determining whether any members of this local population are using the Overlay Zone, the failure to consider the Overlay Zone as a part of the overall range of this local population is a serious deficiency.

It is also unclear whether Ecolsciences used one-way doors at the opening of the traps, which is essential to obtain adequate data. At the least, this point needs to be discussed.

Finally, it is not apparent that Ecolsciences checked the previously used winter den during the 2005-2007 study. Since a den could be used in one year, and then not used again until two to several years later, any known sites should have been checked during the study. Regarding the EcolSciences letter of 30 November 2004, apparently the traps around the hibernation site were set from April 19 in 2004. In some warm years, snakes would already have left by this date. To ensure that no Pine Snakes are missed, the traps should have been opened in late March. In the years that we (Burger & Zappalorti) checked our hibernation sites in very early April, we lost some snakes (that is, the hibernation site did not contain the number it had the previous year or the next year). Therefore, checking hibernation sites after 19 April would not be persuasive that no snakes used this site.

4. Zeroes in the data set and the inability to capture common and observable snake species negate the conclusions reached in the Ecolsciences report

The results of the sampling reported by Ecolsciences are highly variable and show that the failure to catch a snake in the trap system used by Ecolsciences gives virtually no indication of the species' presence or absence on the site. Key points about the data recorded in the report are:

- No snake species was recorded every year; 2 species were recorded in two years and 4 species were recorded in only one year.
- For the 6 snake species recorded on the Overlay Area, all of which occur at higher densities than Northern Pine Snake, 11 of the 18 of the trap-years they were not detected at all. In other words, 61% of the time, snakes known to be present were not caught using the sampling method.

Thus, based on the three year success rate of the Ecolsciences trap system, one would predict that the chance of not capturing a common but present species would be 23% (.61 x .61 x .61). Thus, the failure to capture a Northern Pine Snake is not statistically significant, and the study does not support the conclusion that Pine Snakes are no longer present on the site.

Three species were recorded that are common and typically occur at densities far greater than Northern Pine Snake, yet for each of these only one individual was caught in the entire 3 years. This is statistically indistinguishable from catching zero Northern Pine Snakes, and it is not possible to conclude that Pine Snakes are not present. There is no biological theory that can allow one to make

inferences about critical habitat value using this protocol, which is barely able to detect common species.

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