



STATE OF CONNECTICUT

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By: Michael W. Klemens, PhD

Re: Managing Temporary Linear Impacts Associated with Transmission Line Upgrades as it Pertains to Wetland-Dependent Biodiversity.

I would like the following information to be considered by the CSC as we review activities that cross a variety of habitats in a linear transect.

Transmission-line rights of ways have long been identified as creating valuable edge habitats within more forested landscapes that are often exploited by a variety of amphibians and reptiles and other wildlife. Species that have directly benefited from these types of clearing include the eastern box turtle (*Terrapene carolina*), wood turtle (*Glyptemys insculpta*), hognose snake (*Heterodon platirhinos*), and ribbon snake (*Thamnophis sauritus*) which are all State-listed species, as well as spotted turtles (*Clemmys guttata*) which is a candidate for State listing. Edges of power line rights of way (ROWs) often contain large concentrations of various Ambystomid salamanders (especially juveniles) and various snakes. In my 1993 book on the amphibians and reptiles of Connecticut (Bulletin 112) I ranked the type of habitats found on many ROWs as very important (Category 2) because of the intermittent nature of the disturbances that created very valuable habitat. Intermittent disturbances, such as those that occur on ROWs are quite distinct from those that occur annually such as in agricultural fields, or continually, such as wildlife and road interactions.

None-the-less, the goal of management of ROWs should be minimize the loss of individual long-lived species such as turtles, and to allow free flow through the habitat for the myriad of smaller wildlife species that traverse the ROW. Some loss of individual turtles may be unavoidable when activities on the ROW are conducted using heavy motorized equipment during the activity season (March 1 –October 31). Box turtles are often killed during ROW clearing operations. This can be avoided by clearing in the later autumn and early winter, thereby avoiding turtles that are utilizing the ROWs for foraging and nesting. Another impact that is very hard to manage is the use of ROWs by ATV traffic, which also kills turtles and damages wetlands on the ROW. This type of trespass by the general public is very hard to effectively manage.

Longer term temporary impacts that occur as part of the ROW power line upgrade process can be managed effectively with some additional sensitivity to the needs of various species. Last week in the discussion of Petition 1140 there was discussion about swamp mats and silt fencing. Swamp mats, though preferable to building gravel roads through wetlands, are not without impacts. My goal in bringing these issues to the CSC is that I believe with increased awareness, these problems can be remedied. I had the opportunity to observe these impacts first-hand in a transmission line upgrade occurring in East Granby, which transected an area I was studying. The ROW upgrade process lasted over two activity seasons.

I have attached two photographs from the East Granby study to this report illustrating swamp mats *in situ*. These photographs clearly demonstrate that swamp mats have the potential to create a significant barrier to wildlife movement and cause incidental take of wildlife, especially when these mats are long (i.e., hundreds of feet). Wildlife either cannot move between habitats, or if they are able to get atop the swamp mat they risk

falling into the numerous crevices and gaps which function as death traps as the animals are unable to crawl up the 90 degree sides of these gaps. Other impacts to animals occur as illustrated by the spotted turtle that was found near death on its back, attempting to cross the swamp mat, and tipping over and are unable to right its self. Traversing swamp mats not only exposes animals to increase predatory threat, but also the threat of dying from exposure if trapped, even for a short period of time, atop or between a swamp mat on a sunny day.

Swamp mats and the heavy equipment that traverses them place a large amount of pressure on the wetland soils below these mats, killing plants and compacting soils. I would recommend that when the mats are removed that some attention be given to restoring this habitat below the mats to avoid the establishment of invasive species. I believe that swamp mats can be used effectively if the following considerations be employed.

1. Silt fence on each side of the swamp mat to stop wildlife from trying to cross the mat.
2. Bridges (box culverts) every 50 feet that will allow wildlife to pass under the swamp mat.
3. Closure (via silt fence) at each end of the swamp mat roadway to exclude animals entering the roadway.
4. A restoration and monitoring program of the area matted after work is completed to ensure that native vegetation is restored and to monitor (and remove) for invasive plants. Obviously, if the swamp mat is traversing a *Phragmites* marsh these provisions can be eliminated.
5. A protocol for cleaning swamp mats that are used in areas that are dominated by invasive plants so the mats do not become a vehicle for invasive plant establishment.

Silt fencing is an important aspect of S and E controls. As many of these ROW projects continue over a least one activity season, the silt fence impedes movement of animals. This can be easily remedied in one of two ways. Silt fence should be broken every 50 feet to allow wildlife passage. That gap can be addressed with a chip berm of several feet and then more silt fencing, or it can be addressed by syncopated silt fencing. Simply stated, syncopated silt fence is where the silt fence is installed in 50 foot lengths, and has a several foot gap. Another 20 foot array of silt fence is placed in front of the gap—at least a foot forward of the main array to allow animals to pass through and around the silt fence and to contain sediment. Data from the East Granby site showed that the silt fencing adjacent to Marsh Pond completely disrupted the breeding of four-toed salamanders (*Hemidactylium scutataum*) in the marsh down slope of the silt fence. Hundreds of salamanders, including many gravid females, were trapped on the upslope side of the silt fence unable to reach the wetland to breed.



