Update on Box Turtle Conservation Research initiated at the McKeever Center
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In 1993, the McKeever Environmental Learning Center allowed us to begin a seminal study to discover whether Eastern Box Turtles, who had lost their homes due to development, injury, pet collection etc., could be used to build a self-sustaining population within a nature sanctuary.

It was known that turtles which are moved from their native homes and released into new habitat rarely remain there. Many turtles get displaced when people remove them from their homes to use as pets and then release them somewhere else; or injured turtles are taken to veterinarians but the site from which the injured turtle was collected is not clearly recalled. In a new habitat, such displaced turtles seem to realize it is not their home and so they disperse. But our idea was that if we affixed a radiotransmitter to each displaced turtle, released it into a protected sanctuary, and kept track of its movements, then we could retrieve any animal that moved well beyond sanctuary boundaries and return it to the center of the sanctuary. We hoped that a wandering turtle might eventually become accustomed to its new environment and cease the endless search for its original home. To encourage that end, we also provided returned turtles with favored foods and access to mates. The strategy proved to be a failure. After 7 years of work we learned that almost all the turtles that we released would eventually disperse beyond the 200 acre land holding at McKeever. No matter how many times they were returned, they seemed to have their own ideas about where they wanted to be.

In late 1999 we began to move such "incorrigible" turtles to a much larger, privately owned sanctuary where we could allow them to roam much farther before they reached any danger areas like roads, farms, and homes. We wanted to see whether, if left to wander far and wide, they might eventually settle into a new home range within the sanctuary if the expanse of protected habitat was very large. Besides those incorrigible "runners", we also had to evacuate from McKeever, and move to the new study site, a few of the rare individuals that had actually "settled" into home ranges within McKeever's 200 acres because their habitat-use often brought them into areas used by maintenance machinery. But there are still two turtles (Tina and Fran) at McKeever who had established home ranges in the safer edges of McKeever's land holdings. Each turtle uses some of the McKeever land, and some neighboring woods, during their seasonal wanderings. For almost 15 years, these two turtles have been very consistent in their habitat-use. Every year they return to hibernate in virtually the same place they used the year before. The female ranges up to a tilled field where she lays eggs each spring, and then returns to her usual home base among some windfalls on the edge of the McKeever boundary. The male ranges a half mile or so to the southwest in woods near a few rural residences and then, each Fall, he treks back to hibernate at his favored spot in the McKeever woods not far from a small "ironwood" tree. There may also be a few other turtles in the McKeever woods; their transmitters fell off many years ago and we lost track of their whereabouts. The few

turtles there now could never establish a new population, but at least they can live their remaining decades of life in a natural habitat.

Tina and Fran represent the rare "successes" from our early years of study at McKeever. At the larger study site, we have been able to learn much more about the feasibility of trying to re-establish a box turtle population once its numbers have declined or, as in the case of McKeever, completely disappeared. Short answer from this study: it's almost impossible. We now know that a project like this requires a minimum of 2000 acres (probably more like 3 or 4 thousand acres) so that most of the dispersing turtles can finally find a place within protected habitat that suits their individual likes. These turtles are highly individualistic and what proves to be favored habitat for one or a few turtles is rejected by other individuals and they move off to search for something more to their own liking. The large sanctuary for a project like this also needs to be uninterrupted by roads or trails that would provide access by mechanized vehicles.

During the last 8 years, at our larger study site, we have been able to track turtles as they disperse over distances that exceed a mile in various directions without disrupting their explorations. Some seem to keep moving ever farther "outward," year after year, evidently not yet finding a place to its liking. Others seem to have (eventually) discovered a place that they like and have settled down … but the sites are often very far apart. Moreover, some turtles that seem to have settled into a given part of habitat might pull up stakes after 4 or 5 years of "stability" and move off to a new distant area to explore. We wonder if they will ever choose a place for a permanent home (box turtles in native populations have been known to use the same small area of habitat for the duration of their long lives, which exceed 100 years). We have a lot of work ahead of us to learn whether that will ever happen for a re-located adult, or for a juvenile for whom the sanctuary is its first natural-habitat home. One juvenile that we have tracked for over 6 years has been gradually making a large circle with a diameter of about 3 miles. At least it is not going on a straight-line outbound course. We do not know if it will ever settle down. Its large circle of movement might eventually bring it back to where it was originally introduced. But then what will it do? This work takes many decades to answer even a basic question like this one.

Our studies have also taught us that very high densities of box turtles must be "settled" into a habitat for the population to become self-sustaining. Such a goal would probably require successfully getting tens of thousands of turtles to establish their home ranges within a large, protected habitat, not to mention a century of intensive field work and expenditure in excess of a million dollars. Males seem unable to find females at a distance. They need to SEE a female before they realize she is there, and can then pursue her to mate… hence the need for a high density population.

Our work has provided a hitherto unknown glimpse at the difficulties of trying to rebuild populations of this once common species. Despite the failure to achieve that goal at McKeever, if we had not conducted those early studies we would never have learned some of what we now know to be important. The issues are very complex and much remains unknown. For you who are interested in some of the details (plus beautiful photos) to flesh out our very general summary in this issue of Hemlock Pathways, you can access an informative overview of our work at http://herpetology.com/belzer/boxturtles.htm.

Also, a new web site for the Eastern Box Turtle Conservation Trust has been launched with the help of Penn State University Behrend campus seniors, Jarrod Bradbury and Matthew Ohler. It shares some of what we are learning. You can visit it at http://www.ebtct.org. Unfortunately, some of our reports on the site are in scientific journals that do not provide free on-line access; but what is freely available from links at ebtct.org should provide you with a greater insight into the difficulties of this conservation problem, and why the State recently (as of January 2007) made it illegal to remove virtually any reptile from native Pennsylvania woods. Our work has shown that once such populations are destabilized, it is almost impossible to bring them back.