

# Pioneering Box Turtle Conservation Strategies

## at McKeever

## Critical Background Issues

When the McKeever preserve was founded 24 years ago, no resident box turtle population remained. But octogenarians who grew up on our 200 acres early in the century report seeing box turtles wandering the woods, fields and hedgerows of their childhood. Disappearances of box turtle populations are recalled by "old timers" in most regions of North America. This impression of the species' decline, sometimes dismissed as unreliable anecdote, has been confirmed by many scientific studies that have followed specific box turtle population over long periods. The decline started generations ago as dirt, then paved, roads subdivided the turtles' ancestral habitats. Death along their habitual routes to food, nest and hibernation sites soared as habitat invasion by autos, ATVs and heavy machinery accelerated.

Few people realize that these remarkable, gentle creatures can live for more than 120 years in the wild (box turtles reach the longevity zenith of temperate North American wildlife!). They have high "site fidelity", meaning that they will live their long lives in a small parcel of the woods where they hatch, eating slugs, worms, insects, berries, mushrooms, and laying their eggs.

Unlike sea turtles, box turtles produce small clutches of only 3 or 4 eggs a year. Temperature & moisture extremes, fungus, and predators frequently destroy the eggs. Even when one does hatch, the baby has a slim chance of surviving weather, predator, and other hazards to attain relative safety from a stronger, protective adult shell and years of habitat savvy. But a female who survives her first 12 years, to reach reproductive maturity, can produce a few hundred eggs during her following 60-80 years. From her lifetime egg production, two or three hatchlings can actually reach adulthood and replace aged adults, sustaining the population.

The impact for a population, of losing that slow trickle of eggs from an adult, usually goes unrecognized during a human lifespan. Only recently, as box turtle populations are vanishing, have biologists begun to understand the delicate population dynamics of this species. One recent study concluded that loss (by pet collection, traffic, etc.) of just one adult box turtle from a population each year or two will doom that population to eradication in the distant future! Too few young are growing up among their elders to replace the losses.

We who ignorantly (if innocently) collected box turtles for "pets" were oblivious to the impact of our action: After we took our few pets, we could look around and see "LOTS" of adults still left in the woods the rest of our lives ... but since adults live so long, the population we saw was an increasingly "geriatric" one with too few young to sustain it in the distant future. This impact mushroomed by 1990 as escalating pet collecting removed tens of thousands each year for the international pet trade alone! Because of the serious decline through much of their former range, all types of Box Turtle received special protection in February, 1995 under provisions of the Convention on International Trade of Endangered Species, in an attempt to reduce the pet trade's contribution toward the Box Turtle's extinction. While international trafficking in box turtles now carries threat of \$20,000 fines plus imprisonment, environmental law enforcement (always very difficult) can not solve the problem alone. Public education and abandoning the traditional practice of collecting domestic pets from the wild are critically needed. YOU can help by sharing this information on box turtle natural history.

Pet collecting is a major cause of the eradication of the species in many areas, but releasing and moving turtles also contribute. Some turtles who have been relocated and released (sometimes by biologists and hobbyists wanting to move turtles to safer surroundings, sometimes by pet traders wanting to avoid veterinary or other maintenance costs for turtles that were diseased or not selling fast enough) harbored pathogens contracted from humans or other species, and passed them to wild populations where they were released. A released turtle has a homing instinct that causes it to search for its home; a box turtle moved much more than a quarter mile is not likely to find its way back home ... its subsequent fruitless searching (which can last for years) may not only bring the wandering turtle into harm's way and a fatal end, but can also carry any disease it harbors to other turtles it encounters. Many families wrongly assume that a turtle picked up in one place, and kept at home for a while, will simply "make a new home and live happily ever after" when released in the nice woods of a park or friendly farmer. More knowledgeable families, keeping one for the summer and then conscientiously releasing it where they collected it so it could find its usual hibernation site, still overlook the threats of disease and captivity's privation of the months of gradual adaptation to cooler weather, and the advanced cessation in eating, necessary to prepare the turtle for successful hibernation. (Moral: LEAVE THEM BE!)

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## McKeever's Effort to Help

The Box Turtles who inhabited the land that is now McKeever Center fell victim, like those in so many other locales, to the ravages of habitat loss, roads and pet collection. They disappeared by the 1950's after "Rocky Basin" (a former retreat on property that is now the McKeever Center) was opened to picnicking, camping and other human recreation in the 1930's. Long term studies in the midwest have clearly demonstrated that opening habitat to human recreation produces dramatic declines in resident turtle populations.

To help develop conservation strategies for this species, McKeever accepted the 1993 proposal by Bill Belzer (Clarion University biologist) to host a pioneering project to use perpetual radiotelemetric retrieval, monitoring and protection of individual turtles, nest & hibernation sites in an effort to rebuild our extirpated box turtle population. Belzer's protocol takes care to prevent the ecological mistakes of the past. The founders for rebuilding the lost McKeever Box Turtle population are not collected from the wild; they are displaced turtles (donated by Animal Rehab Centers, veterinarians, school classrooms, etc.) that have lost their homes through injury, habitat destruction and captivity. Qualified turtles can not originate beyond a 300 mile radius. To protect our accumulating "expatriate" population against disease that each new donated turtle could bring from its previous contact with humans or other species, new arrivals are first quarantined and their health assured. Disposable examination gloves, or phenol-free antiseptic hand spray, are used whenever a turtle is handled during clinical or field routines, to reduce risk of pathogen transfer.

Radiotransmitters attached to each released turtle permit us to monitor movements and the individual's welfare during the years it takes the turtle to settle in and gradually learn the best sites for forage, drink, hibernacula, nesting and sun. Their wounds and infections receive timely veterinary care; poorly chosen hibernation sites receive added leaf cover as winter's cold deepens; far ranging individuals are returned to the heart of McKeever woods when they approach roads or other human hazards. Happily, our intensive surveillance/care prevented the death of any of our 30 turtles during the project's first 5 years. Harsh weather and predators often kill 10% of the adults in an unattended population each year. One of our turtles (a female donated to the project after recovering from loss of a leg to auto traffic) was stolen (presumably for a pet). Information signs, planned for the hiking trails, we hope will discourage further poaching.

The cost to responsibly repatriate a turtle is so high that no other project in the country (let alone PA) is investing the human & financial resources needed to intensively guide dislocated turtles through the 5 or more years required for their adjustment to, learning of, and settling into new habitat in small (80 hectare) preserve's like McKeever's. Without such intercession, most of the box turtles that now get moved from their natal homes by casual pet collectors each year face premature death. While human hours in the field are donated, supply & equipment costs exceed \$1,000 for each turtle before it is finally repatriated. A one-time start-up grant from the Clarion University Foundation helped launch this project, but the \$10,000 - \$15,000 of funds now needed each year for supplies, transmitter and equipment replacement, and veterinary care all come from private donors. A Turtle Trust Fund has been established to build an endowment that will continue McKeever's box turtle conservation effort, in perpetuity, following the death of the project's originator. Donations can be made to Venango Area Community Foundation/Belzer Turtle Trust; 213 Seneca Street Oil City, PA 16301; (814) 677-5085.

In time, we hope refinements of strategies & methods we use now can lead to more affordable protocols that might be adopted & sustained by other preserves (but note the caution AGAINST adding displaced turtles to any preserve that already has an extant box turtle population). The magnitude of the displaced turtle problem can be mitigated if people learn to stop moving box turtles from native homes. When found crossing a road, they should be helped to the side toward which they are headed (and hope that they spend most of their time in the adjacent woods, away from that highway, thereafter). Moving them to a distant site simply dooms the animal to begin searching for its former home, multiplying its likelihood of encountering highways and other hazardous areas.

Thinned populations become "reproductively dead": too few meetings among mates occur to sustain the group. Not until we added, to our field routine, interventions to ensure male/female encounters did we get any eggs. Babies that have hatched out ON SITE hold the real promise for steadily rebuilding a resident population at McKeever. Such hatchlings, we believe, will regard McKeever woods as home and establish home ranges there, thereby requiring less intensive surveillance than "transplanted" adults. But some level of surveillance and intervention will always be needed, to augment mating, hatching and survival because of the unnatural drain on a population posed by highways, mechanical & canine threats inherent in a residential & agricultural periphery, and ignorant or malicious hikers who poach animals.

If you are lucky enough to see a box turtle wandering the woods, please leave it untouched; simply revel in the peaceful privilege/joy of beholding a life form that graced this earth before (and long after) the age of dinosaurs!... a sight that fewer and fewer humans now experience. Let's keep humanity from being an unfortunate accident that ends this remarkable creature's history on earth. Much of our damage stems from ignorance; Please "spread the word" to school classes, Scout groups, etc. Trying to return a lost species (to even a small area like McKeever's 200 acres) consumes monumental, unending expenditures of money and time - expenditures that, in the end, may not succeed. Any hope for preserving turtles (and other types of wild life) for our children depends on people learning about the delicacy of population dynamics, the need to not move or touch turtles, and the need to work to protect large tracts of land that are not carved up by access roads. Conservation is infinitely less expensive than remediation. Ignorant practices need to be abandoned.

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If you would like more information on the Eastern Box Turtle Conservation Project, please contact Dr. Bill Belzer in one of the following ways:

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