

SURVIVAL AMONG TRANSLOCATED EASTERN BOX TURTLES

Annual box turtle mortality in natural populations may range from 0-20% (Yahner, 1974; Williams & Parker, 1987). It can be much higher among translocated box turtles (Cook, 1996). The early years of our T.c.c. repatriation effort in NW PA (Belzer, 1996) indicate (perhaps not surprisingly) that mortality among translocated turtles can be reduced by intensive monitoring and intervention.

Each of our box turtles carries a radiotransmitter. We regularly monitor each turtle's activity and intervene to keep it well. When a dispersal* trek (*see terminology in my Home Range article in this issue) takes it beyond our preserve's boundaries, or brings it near the danger of highways, farms or residential areas, we return it to the relative safety of the preserve's interior. Injured or diseased individuals receive veterinary or infirmary care till recovery. We quarantine each new individual to assure health before release into the preserve. Nasal washes from our 1995 population were given PCR screens (and found negative) for Mycoplasma agassizii by Dr. Dan Brown (U of Fla, Gainesville). After 1993 we began to supplement each turtle's forage with vit-A-rich foods (yams & cantaloupe) dusted with calcium powder in hopes of improving immunity and egg development. As winter cold increases, we add insulating layers of leaves to each animal's hibernaculum.

Dispersal can dominate a turtle's activity during its first years after translocation (cf. my Home Range article in this issue, and Doroff & Keith, 1990), wasting energy and increasing disease/injury risks. Translocated animals are further disadvantaged by unfamiliarity with good sites for forage, water, sun, soft soil for hibernacula, etc. During their early years, at least, it appears to me that our translocated turtles' choices of hibernation sites can be incidental; some get stranded in soil too rocky or root-riddled for adequate excavation. Such circumstances may have contributed to the mortality seen by Cook.

Our beginning years of data suggest that we may expect that sooner or later most translocated box turtles (that can be kept alive, and inside a preserve) will gain sufficient familiarity with a new habitat to develop favored areas that they return to, to hibernate (see my Home Range article in this issue), sun, soak, rest, or look for mates - i.e. they will eventually establish genuine home ranges. Mortality risk, I expect, will diminish thereafter. Our "shepherding" keeps mortality low even before home ranges are established. To date, only five of our adults have died (three in 1997, two in 1998). These five fatalities span 103 "turtle-seasons" (our population numbered four in 1993; six in 1994; 10 in 1995; 21 in 1996; 29 adults in 1997; 33 in Aug 1998). Mortality was zero in 1993 through 1996; 10% in 1997; 6% in 1998.

An ancient male (all annuli polished smooth) died April 7, 1997 shortly after emerging from hibernation. I found him near his hibernaculum with his feet chewed off but his head intact. I don't know whether he died by an attack during his immediate post-hibernation lethargy or whether he died of nutrient depletion after emerging (thus, the chewing representing carrion scavenging). Two males died (one in 1997; one in 1998) several weeks after emerging from hibernation unusually early. Each had returned under ground

and emerged several times, then died, before sustained spring warmth enabled foraging/digestion. They may have died of nutrient depletion. A fourth male died of a predator bite to the head the night of August 31, 1997; its feet had been gnawed off, but the head remained. This turtle had, like many in our population, previously lived in captivity, but was notably slow in recovering the typical behavior of finding cover for its head at night. I often found him sleeping at night in the open. His head and legs, lolling out and uncovered, presented an easy target for a nocturnal predator (perhaps a feral cat). Without the presumed advantage of being awakened by a predator's rummaging through leaf litter to get to his head, he probably was unable to retract and close in time to avoid the bite. The sixth fatality was a small female (about 13 yrs old) who was killed 24 July, 1998; all legs and head eaten by a predator. Others in our population would probably have died from disease and highway/farm traffic without retrieval from danger areas, augmentation of hibernaculum insulation, therapy for assorted infections and wounds, dietary supplements, etc.

It appears that mortality among translocated turtles may be lowered only by intensive surveillance and intervention. Our project (which aims at developing strategies for repatriation in relatively small habitats) carries what may be a commitment to the welfare of each donated turtle, and a financial & temporal burden, that is prohibitive for most situations.

As I increasingly discover the monumental (and complicated, if not impossible) task that repatriation is, I grow increasingly astonished at the shortsightedness of regulatory policies which wait till species are in obvious danger of disappearing and then react with "remedial" or "recovery" efforts. My State still allows non-commercial pet collection of box turtles; it allows snapping turtle harvests for soup. Petition for stronger protection is rejected because there are still "plenty of them" around (...so we'll wait till a crisis is obvious and then seek millions of dollars to try to undo the consequences of our complacency?). In the long term, conservation is much more inexpensive and effective than remediation.

LITERATURE CITATIONS

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