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EDITORIAL: Living Tag, Living Reputation

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Those who undertake research that is unlikely to yield answers in their own lifetime surely deserve some mention, especially if the results are revealing. Such is the case with the work of the Hendricksons in the 1980s on the development of the living tag method for green turtles (Hendrickson & Hendrickson 1981). The procedure is to take a sliver of tissue from the white underside (plastron) of the turtle and implant it into one of the darker scutes on the carapace on the top; the particular scute selected codes for year of release. As this is an autograft, there is no immune response. Conventional tags on hatchlings are ineffective because either they corrode away or they slough off or are incorporated as the animal grows from a carapace length of a few cm to over 100 cm in the case of green turtles. Internal transponder tags migrate from the site of injection, making it hard to pick them up years later with a scanner.

Living tags have been applied to several species of sea turtles, in several locations (Hendrickson & Hendrickson 1981). But those for green turtles released by the Cayman Farm have provided the exciting new data because turtles bearing those tags have now returned to nest on nearby beaches (Bell & Parsons 2002). Sadly, John Hendrickson died this year before the report of these findings appeared.

These events are notable not simply as a validation of the living tag method; they also provide insights on turtle demography. An important variable is age at maturity (Crouse et al. 1987). This has featured prominently in debates about the degree to which sea turtles should be considered threatened, and to what extent conservation should be focused on hatchlings or sub-adults.

Because hatchling sea turtles disappear into pelagic habitats and are not regularly seen until they have re-entered inshore habitats as juveniles, growth curves are almost exclusively based on mark-recapture investigations with juveniles and sub-adults. Until now, the estimated age at maturity has depended on extrapolations beyond the range of values for which growth data exist, and is therefore tentative (Frazer & Ladner 1986; Zug & Glor 1998).

The data from the turtles with living tags, however, include information on all life stages. One of the turtles released as a hatchling with a living tag in 1985 has been seen nesting in 2002, giving a maximum maturation period for this individual of only 17 years. No models or estimates were involved: the tag and the turtle were seen and were photographed (Bell & Parsons 2002). Also, an adult male, released as a hatchling in 1983, was captured while mating in 2002, that is 19 years later. In addition, 5 adult turtles with living tags were seen 14 years after release as yearlings. Adding one year for the time before release, and then arbitrarily but probably generously another 4 years to allow for faster growth in captivity during the first year than might have occurred in the wild, gives 19 years to mature for these 5 individuals.

Of course, larger samples are required, and various questions remain to be resolved. Is the appropriate measure the minimum maturation time or that of average sized turtles on a nesting beach? Any growth of turtles after first nesting will introduce errors into the use of average size of nesting turtles. Turtles nesting unobserved in years previous to when they were recorded could introduce errors into use of the minimum sizes.

Nevertheless, it would now appear that, in round figures, maturation in less than 20 years may not be uncommon for green turtles and that is faster than has been supposed. Although the range of past estimates for Florida and Caribbean

green turtles has included values below 20 years, it has been thought that longer values were more likely, for example, 27 years (Frazer & Ehrhart 1985) or 34 years (Zug & Glor 1998). Whatever the final mean values for age at maturity turn out to be, hard data from living tags experiments should replace estimates from partial growth curves.

The data from the animals released as yearlings show that green turtles head-started in captivity can return to nest in the area where they were released. It does not prove that head-starting is superior to other conservation measures (Mrosovsky 1983) but it does provide a method with which comparisons could be made - if anyone wished to initiate such a long-term endeavour. Nevertheless, because turtles nesting on the Cayman Islands have been almost wiped out in the past, any augmentation there is to be welcomed.

The research contributions and conservation potentials of the Cayman Farm have been frequently discounted (Fosdick & Fosdick 1994; Mrosovsky 1983). The new data from the living tags may perhaps cause this too to be re-evaluated, as well as providing a tribute to John Hendrickson, who published his classic paper on green turtles more than forty years ago (Hendrickson 1958).

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