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Headstarting as a Management Tool

Headstarting is the practice of growing hatchlings in captivity to a size that (theoretically) will protect them from the (presumably) high rates of natural predation that would have otherwise occurred in their early months. The rationale is that these turtles will continue to enjoy high rates of survival even after they are released to the wild. Headstarting has long been a subject of controversy among sea turtle biologists (note conflicting views expressed by Dodd, Ehrenfeld, Klima and McVey, and Reichart in this volume). Nevertheless, in virtually every country where sea turtles occur, people have repeatedly undertaken to headstart turtles. Donnelly (1994) reviews many of these cases and presents detailed evaluations of why three of the most prominent, well-funded and long-lived headstarting programs in the world—for green turtles in Florida (1959–1989), Kemp's ridleys in the United States (1978–1993), and hawksbills in Palau (1982–1991)—have all been terminated.

Critics argue that headstarting is not a proven management technique and may actually be harmful to turtles. They cite biological concerns that nutritional deficiencies and behavioral modifications associated with captivity (including insufficient exercise, lacking or inappropriate sensory stimuli, the unavailability of natural food, etc.) may interfere with the ability of headstarted turtles to survive in the open sea and with those imprinting mechanisms necessary to guide their breeding migrations (Mrosovsky 1983; Mortimer 1988; National Research Council 1990; Woody 1990, 1991; Taubes 1992; Donnelly 1994; Eckert et al. 1994). Disease is another problem, with some 27 sets of disease symptoms (many serious) common in captive turtles (Leong et al. 1989). In crowded conditions turtles bite each other causing injuries commonly invaded by secondary infections that can lead to loss of body parts (Mortimer 1988). Concern exists that captive-reared turtles might introduce or spread diseases among wild populations after their release (Woody 1981; Jacobson 1993; Donnelly 1994).

The most heavily subsidized headstarting programs, especially those at the Galveston Lab of NMFS and the Cayman Turtle Farm (both with multimillion dollar budgets), have produced useful information on sea turtle husbandry, behavior and physiology (Caillouet and Landry 1989; Caillouet 1993). Proponents claim that the emotional appeal commanded by headstarting enhances public concern for turtles (Allen 1990, 1992). Others argue that a few captive turtles would serve the same purpose and that the feel good appeal of headstarting siphons money from other programs which, though lacking popular appeal, are known to be effective (Mortimer 1988; Woody 1990, 1991; Donnelly 1994).

Ultimately, the success of headstarting as a management tool will be proven only by demonstrating that the proportion of nesting headstarted females has increased relative to the proportion of non-headstarted nesting females in the population (Mrosovsky 1983; Mortimer 1988; National Research Council 1990; Eckert et al. 1994). A critical point is that the headstarted turtles must nest at the appropriate beach in order to contribute effectively to the gene pool of the population (Bowen et al. 1994). Headstarting has always been considered experimental, but until recently, it has been an experiment lacking design and controls. In an effort to remedy this, based on recommendations by Wibbels et al. (1989) and Eckert et al. (1994), termination of the Kemp's ridley headstart program will be accompanied by intensive marking of wild hatchlings (as a control) and monitoring of those headstarted Kemp's turtles that have already been released (Byles 1993; Williams 1993; Donnelly 1994).

Modelling studies based on the analysis of reproductive value (Crouse et al. 1987) indicate that headstarting is unlikely to ever meet its goal of increased recruitment into the adult population without a simultaneous reduction in juvenile mortality in the wild (National Research Council 1990). Heppell and Crowder (1994) evaluated stage-based and age-based population models for Kemp's ridley and concluded that headstarting could not be a viable tool for species recovery because the addition of headstarted turtles is not sufficient to compensate for the annual loss of fecund adults. These models indicate that attempting to compensate for natural hatchling mortality without addressing the real causes of the decline of the species—i.e., overharvest, mortality in fishing gear, and habitat destruction—is not the best use of the limited resources available for conservation programs.

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