

The South Florida nesting subpopulation was the largest contributor at almost all sampling sites. For example, samples from an estuarine area in North Carolina indicated that about 64 percent of the individuals were from the South Florida subpopulation, 30 percent from the Northern subpopulation, and 5 percent from Mexico (Bass et al., 2000). This information demonstrates mixing of the immatures from the Northern and South Florida nesting assemblages in these foraging areas. The information also indicates that loggerheads from the Northern and South Florida subpopulations are not distributed randomly, i.e., not in proportion to the relative abundance of the subpopulations. Along the Atlantic seaboard and off the west coast of Florida, the Northern nesting subpopulation was represented disproportionately to its level of nesting. Specifically, although the Northern subpopulation accounts for only 8.5 percent of the total U.S. loggerhead nesting in the western North Atlantic, 25 to 59 percent of the loggerheads found foraging from the northeast United States to Georgia come from the Northern subpopulation and approximately 20 percent of those found off both Florida coasts come from the Northern nesting subpopulation (TEWG, 2000).

The study of epibiont colonization on turtle carapaces may provide clues as to where turtles are foraging because a number of long-lived sessile organisms within the epibiont community are likely unaffected by short term migrations. Carapace epibionts have been studied on female loggerhead turtles nesting along a portion of the east coast of the U.S., including parts of the Northern and South Florida nesting assemblages (from Pritchard's Island, South Carolina, south to Hutchinson Island, Florida) (Caine, 1986). The results provide an indirect indication that adult females are more strongly segregated on the foraging grounds than immature loggerheads. Caine found that differences in the epibiont communities began to appear on nesting females in the area between Flagler Beach and Cape Canaveral National Seashore in northeast Florida, indicating some separation in foraging areas used by nesting females from the Northern and South Florida nesting subpopulations. Certain epibionts of the turtles from the South Florida nesting areas were of Caribbean origin, whereas some of the epibionts of turtles from the Northern nesting assemblage were indicative of the Sargasso Sea, in the central North

Atlantic. The amount of overlap in the epibiont communities is relatively low, 4.2 to 7.5 percent, which is an indirect indication that nesting turtles from northern versus southern nesting areas were inhabiting different foraging environments.

Satellite telemetry and tagging data also suggest that adult females from the Northern and South Florida nesting assemblages are not using the same foraging areas. Based on satellite telemetry studies and analyses of flipper tag return data, non-nesting adult females from the South Florida subpopulation are distributed throughout the Bahamas, Greater Antilles, Cuba, Yucatan, eastern and western Gulf of Mexico, and southern Florida (Meylan, 1982; Meylan et al., 1983; Barbara Schroeder, NMFS, pers. comm., 2003), whereas non-nesting adult females from the Northern subpopulation appear to occur almost exclusively along the east coast of the United States (Plotkin and Spotila, 2002; Griffin and Murphy, 2003; Sally Murphy, South Carolina Department of Natural Resources, pers. comm., 2003). Only one Northern subpopulation mature female has been reported to enter the Gulf of Mexico (Bell and Richardson, 1978). Limited tagging data suggest that adult females from the Florida Panhandle subpopulation remain in the Gulf of Mexico (Barbara Schroeder, NMFS, pers. comm., 2003) and overlap in foraging areas exist between adult females from the Florida panhandle and south Florida nesting subpopulations (Meylan, 1982; Barbara Schroeder, NMFS, pers. comm., 2003).

### Conclusion

The petitioners cited a number of points in support of their assertion that the Northern and Florida Panhandle subpopulations meet the discreteness criteria of our DPS policy. These included mtDNA distinctions, physical and ecological separations based on the behavioral attribute of females returning to their natal beaches to nest, differences in nesting chronology between "northern" and "southern" turtles, and post-nesting movement to foraging areas by turtles in the Northern subpopulation as compared to those in the Southern subpopulation. We have reviewed information presented in the petition and other available information pertaining to the discreteness as defined by DPS policy.

On the question of the discreteness of the petitioned Northern and Florida Panhandle nesting subpopulations, while numerous lines of evidence indicate the identified nesting assemblages are discrete to some degree,

the separation is not highly rigid and the subpopulations are not markedly separated from each other based on the criteria for discreteness in our DPS policy. Although our DPS policy does not require an absolute separation or reproductive isolation for a population to satisfy the discreteness requirement, several factors within the overall loggerhead population structure indicate that the subpopulations are not markedly separated, and thus are not discrete under our DPS policy.

Marked separation on the basis of genetic discontinuity is not definitive for the subpopulations. Natal homing behavior and nest site fidelity of females apparently are the mechanisms that result in being able to distinguish nesting subpopulations on the basis of maternally inherited mtDNA. However, recent genetic studies indicate that mtDNA distinctions between and among subpopulations are complex. Further subdivisions of some of the nesting assemblages, including the Northern subpopulation, may exist (e.g., the data for Volusia County) and some widely separated populations, including Amelia Island (in the Northern nesting assemblage) and Eglin Air Force Base (in the Florida Panhandle nesting assemblage) have no statistically significant differences in the mtDNA analysis. In addition, the recently available nDNA information suggests that males likely interbreed with females across subpopulations, and thus the subpopulations are not separable on this basis. From the standpoint of our DPS policy criteria, the evidence of marked separation based on genetic discontinuity at the nDNA level is inconclusive for the petitioned subpopulations.

There is a high correlation of the annual variation in nesting activity across beaches within subpopulations. However, there also are statistically significant correlations in nesting activity between the Northern and South Florida subpopulations, and between the Florida Panhandle and South Florida subpopulations. Therefore, the comparison of annual variation in nesting activity does not indicate marked separation of the subpopulations.

The Northern and South Florida subpopulations differ considerably in the percentage of male hatchlings produced, as a result of environmental differences in nest incubation temperatures. The percentage of males produced from the Florida Panhandle population is not known, but is estimated to be higher than that of the South Florida subpopulation. Because of its much larger size, however, the