**Media Summary**

The globally distributed scalloped hammerhead was the first shark species afforded protection under the U.S. Endangered Species Act. The recently discovered Carolina hammerhead, only known to occur in the western Atlantic, looks identical to scalloped hammerheads and is likely also of conservation concern. Although they are visually indistinguishable and co-exist in the western Atlantic, strong genetic differentiation exists between the species. In this study, hybrid juveniles were identified in nursery habitat used by both scalloped and Carolina hammerheads along the U.S. East Coast. Backcrossed individuals (offspring of a hybrid and scalloped or Carolina hammerhead) were also detected, demonstrating that hybrids are reproductively viable, and all backcrosses but one involved a scalloped hammerhead. Repeated hybridization and backcrossing with scalloped hammerheads could lead to the loss of Carolina hammerheads.