

# Identifying Important Areas for Bald Eagles Using Satellite Telemetry



Libby Mojica recently received her Master's degree from the Warnell School of Forestry and Natural Resources at the University of Georgia. She is currently working as a raptor biologist at the Center for Conservation Biology at the College of William and Mary in Virginia. Her research interests include using satellite telemetry to investigate bird migration, communal roosting, and contaminant exposure.

I was lucky enough to land a job working with satellite telemetry after graduating from Trinity University with an undergraduate degree in biology. As an avian biologist for the Florida Fish and Wildlife Conservation Commission (FWC), I worked with several raptor species using radio and satellite telemetry. One of our research projects involved attaching 95g PTT-100s to nestling Bald Eagles in Florida with a backpack harness. From 1997-2001, our team tagged 70 eagles with PTTs we hoped would last until the eagles sexually matured at age 5. The study focused initially on survival rates of these tagged nestlings but we

quickly realized the location data could answer other critical research questions.

After the Argos data collection was complete, I started my master's degree at the Warnell School of Forestry and Natural Resources at the University of Georgia with a graduate assistantship funded by FWC. With the large sample size of birds, I decided to group the data from all the eagles to look at broad movement trends. After the eagles dispersed from their natal area, they migrated north traveling along the Appalachian Mountains or the Atlantic Coast for distances ranging 300-4,000 km from Florida. I noticed that certain areas along the

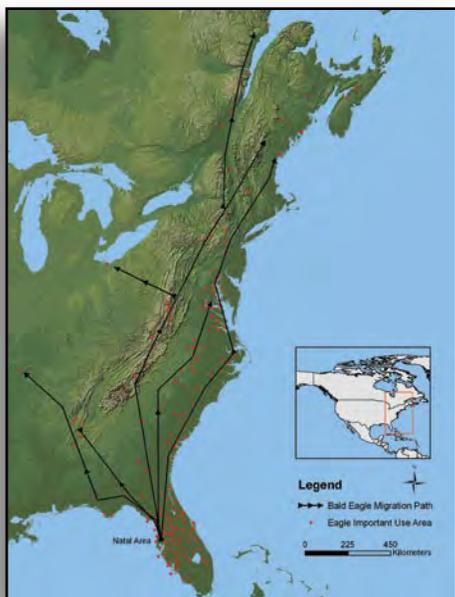
migration path seemed to be important hot spots where multiple birds congregated for weeks or months. Using a clustering program, I was able to identify and quantify the significance of 151 important use areas (IUA) for Bald Eagles.

Eagle management in the United States has historically focused on the breeders of the species mainly through nest protection and productivity monitoring. This management practice has proved highly successful; however, it doesn't address the

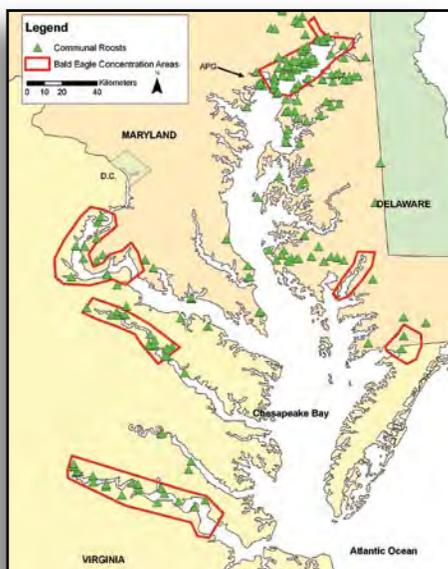
management needs of the non-breeding (immature) segment of the Bald Eagle population. Ensuring the fitness and survival of immature eagles to breeding age is key to the continued success of the species. Identification of these IUAs initiated state and local groups to begin conservation of shoreline habitat for non-breeding eagles. Locating IUAs for this long-distance migrant would not have been possible without the use of satellite telemetry.

In my post-graduation job at the Center for Conservation Biology, I'm continuing to refine these IUAs with more accurate data from GPS PTTs fitted on a new group of Bald Eagles. We are exploring the dynamics of IUAs (locally known as eagle concentration areas) with 70g GPS PTTs on 64 eagles using the waters of the Chesapeake Bay, USA. The Chesapeake Bay is strategically located midway along the Atlantic Coast and as such is a convergence zone for eagles from the southeast US population and the northeast US and eastern Canadian populations attracted to the Bay's abundant prey. The seasonal fluctuation of prey availability (fish spawning, migrating ducks, carrion) is reflected in the movement patterns of migrant eagles into the Bay as well as movement within the Bay by the resident eagle population.

Bald Eagles are a highly gregarious species, especially among the immature eagles and adults during non-breeding months. Eagles commonly congregate in communal roosts, a behavior thought to facilitate information exchange on the locations of variable prey resources. Roosts can be occupied for only a few weeks a year if prey is periodically available, or occupied year-round if prey resources are stable. Using the 2D GPS PTT software, we are collecting 16 GPS locations each day and 1 additional location at midnight. The midnight location has facilitated the identification of 175 communal roosts in the Chesapeake Bay. We are currently investigating this matrix of communal roosts and how fluctuations in roost occupancy will affect future management of eagle roosts.



Migration routes and important use areas used by Florida sub-adult Bald Eagles ( $n = 54$ ) in eastern North America, 1997-2004.



Bald Eagle communal roosts in the Chesapeake Bay identified using GPS locations, 2007-2008.



Libby holding an eagle fitted with a GPS PTT.

Photo by Bart Paxton



Photo by Libby Mojica

Fourth-year Bald Eagle fitted with 70g GPS PTT.