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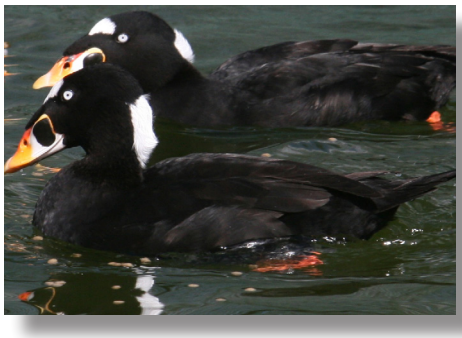
Patuxent Wildlife Research Center

Effects of Dorsally Mounted Solar-powered Cellular GPS Transmitters on diving and foraging in Surf Scoters and Red-throated Loons

The Challenge: Numerous proposals for construction of offshore wind farms have scientists racing to determine seabird migration routes and habitat use throughout coastal waters. Two common species of primary concern are red-throated loons (*Gavia stellata*) and surf scoters (*Melanitta perspicillata*). While much valuable data has been collected on these species through the use of implantable satellite transmitters, a solution is needed to address poor location estimates (>250 m) and large time gaps between location approximation (~3days). Additionally, mortality rates are above desired levels with implantation of satellite transmitters. In contrast, Solar-powered GPS transmitters allow for almost continuous location collection with location estimates within 18 m. However, to date, little success has been seen with the development of a long-term attachment method of external transmitters in sea birds.

The Science: This study will produce and investigate innovative methods of attaching solar-powered GPS transmitters for prolonged periods of time. Attachment of transmitter will be followed by intense behavioral quantification and understanding through time budget construction. These time budgets will be used to determine the attachment method with minimum behavioral impact across outfitted and non-outfitted birds. Once a suitable technique is developed and perfected, diving and foraging profiles of outfitted scoters and loons will be investigated to completely understand the costs associated with carrying an external transmitter. This will ensure low mortality, health risk, and behavioral interference due to transmitter attachment.



The Future: A perfected technique to attach external GPS transmitter will allow great advancements in understanding the migration routes and habitat use of tagged seabirds. Proposed offshore wind farm sites will be evaluated in light of the more precise data collected, resulting in the lowest impact placement through avoidance of high density feeding areas and heavy travel routes. In addition, migration data in the way of breeding and molting sites and site fidelity levels will be further revealed. This technique can be implemented across various other seabird species, such as northern gannets and long-tailed ducks.

Contact: Alicia Berlin at (301)497-5730 or aberlin@usgs.gov or Mark McBride at (301)497-5568