

## In-Air and Underwater Hearing Abilities of Diving Ducks and Sea Ducks



- **The Challenge:** Most current mandates addressing climate change include the construction and expansion of alternative energy sources, such as off-shore wind farms. The construction and maintenance of wind turbines can increase local underwater noise levels through activities such as pile driving and shipping of materials, and continuous operational noise. Introduction of anthropogenic noise sources can mask communication, displace animals from preferred foraging or breeding habitat, disrupt predator-prey interactions, and cause hearing loss. Many sea ducks spend a significant portion of their lives under the water, and most likely have sensory adaptations to facilitate their aquatic lifestyles. However, without any measurements of in-air or underwater hearing abilities it is impossible to explore the role of acoustics in the lives of sea ducks.



- **The Science:** Hearing tests will be conducted on several species of diving ducks and sea ducks at Patuxent Wildlife Research Center. Hearing abilities will be measured both in air and underwater, using an electrophysiological method called the Auditory Brainstem Response, as well as a behavioral approach in which ducks are trained to respond to sounds that are varied in frequency and intensity.
- **The Future:** The results of this study will aid in interpreting effects of underwater noise on sea duck populations. If these results suggest that sea ducks have sensitive underwater hearing, then it will be important to monitor sea duck populations before, during and after underwater construction activities. If results instead show that sea ducks are relatively insensitive to sound underwater, it may be possible that these ducks have added protection from underwater noise and may be less affected.

