



Our Stories

Southwest Science Applications

Getting Strategic to Protect Prime Gulf Coast Habitat

Mottled Duck Signals the Health of a Naturally Abundant Region

A Productive Place

Why the mottled duck evolved to become a bird that no longer migrates – an attribute that is rare in the waterfowl world – will likely remain one of Mother Nature’s mysteries. But scientific advancements are helping wildlife managers gain a better understanding of the mottled duck’s needs and refine their approach for ensuring the long-term health of this Gulf Coast resident.

One of only a few duck species adapted to breeding in southern marshes, a major component of the mottled duck population spends its entire life cycle within a relatively small coastal area in eastern Texas and western Louisiana, roughly between Houston and New Orleans. Other than its “sitting duck” status, the mottled duck has no other particularly unusual attributes that distinguish it from other duck species. But that one characteristic alone accounts for its special vulnerability to disruptions in the ecological balance.

Historically, the temperate climate along the western Gulf Coast provided plenty of optimal habitat for mottled ducks and scores of other waterfowl migrating from their breeding grounds in central Canada and the Dakotas. The western Gulf Coast is a thriving part of the Mississippi



Photo Credit: Ruth Elsey/Louisiana Department of Wildlife and Fisheries. The non-migratory mottled duck is a relative of the mallard and looks like a cross between the female mallard and black duck. A new geospatial model, funded by the Gulf Coast Prairie Landscape Conservation Cooperative, will help ensure the long-term health of the mottled duck population that resides along the western coast of the Gulf of Mexico in Texas and Louisiana.

and Central Flyways, two of four major waterfowl migration routes in North America.

In more recent years, however, the mottled duck’s habitat and surrounding areas have been compromised by urbanization, agricultural development, and changes to the area’s hydrology that affect the characteristics of historically verdant wetlands along the coast. The latter threat includes the ramifications of climate change, such as sea level rise and atypically variable precipitation patterns. Survey data suggest the mottled duck population has experienced a long-term decline in Texas and is stable-to-declining across the rest of its range.

The Power of Partnership

The Gulf Coast Prairie Landscape Conservation Cooperative, like 21 other similar public-private partnerships across the country, is marshaling the science needed to effectively deal with the complexities of conservation in today’s world. In many cases, LCCs are helping to improve longstanding conservation

efforts, such as those for the mottled duck, by providing cutting-edge science and technical expertise for conservation at broader landscape scales – beyond the reach or resources of any one organization.

“Over the years, there has been lots of good conservation work on behalf of the mottled duck in this region, especially by Gulf Coast Joint Venture partners,” said Bill Bartush, Coordinator of the Gulf Coast Prairie LCC, referring to a nearly 30-year-old public-private partnership focused on migratory bird conservation. The Gulf Coast Joint Venture includes more than a dozen formal partners and scores of other collaborators, from government land and water management agencies to non-profit organizations to private landowners. In addition to the Joint Venture’s interest in the mottled duck, it’s also a U.S. Fish and Wildlife Service Focal Species and Bird of Management Concern, as well as a priority species for both the Texas and Louisiana Comprehensive Wildlife Conservation Plans.

A Renewed Approach

Because the mottled duck is more sensitive to environmental changes, it serves to signal the health of ecosystems in a more direct way than other species. Partners' efforts on behalf of the mottled duck are actually proactive investments that safeguard scores of other coastal grassland- and wetland-dependent species, including the seaside sparrow, black-necked stilt, long-billed curlew, least sandpiper, marbled godwit, Attwaters prairie-chicken, northern bobwhite, and American alligator, to name a few.

Today's wildlife managers are taking this approach more and more often – focusing their efforts on conserving species that can serve as “surrogates” for others that depend on the same habitats or environmental conditions. It's simply a way to get more “bang for the buck” when making priorities about where to invest conservation resources. And it's a way of getting out in front of a challenge since surrogate species are harbingers of potentially bigger environmental problems in the future if left unaddressed.

Targeting conservation toward certain representative species is just one tactic that has evolved over time and has become more prominent in recent years as partners in the conservation community deal with more complex issues such as climate change. The U.S. Fish and Wildlife Service, for example, has made the identification and focus on surrogate species a major element of its modernized approach to conservation called “Strategic Habitat Conservation.” This approach generally entails:

- Setting measurable biological objectives for surrogate species, such as self-sustaining population levels, based on the best available science;
- Developing tools to evaluate habitat areas to determine their capacity to achieve those biological objectives;
- Prioritizing the best actions to take to accomplish the objectives; and
- Continually evaluating efforts to refine actions along the way, taking new information and scientific knowledge into account as well.

Others in the conservation community use the same general approach, if not always by the same name. The Gulf Coast Joint Venture, for example, uses similar tactics in its renewed strategies to conserve species such as the mottled duck.

“More recently, Joint Venture partners identified the need for a habitat conservation framework and geospatial model that will help combine their efforts in a more consistent and complementary way,” Bartush explained. “They knew that better bridging of effort in Texas and Louisiana would be more effective overall, and that's why we've funded a project that will help them do just that.”

Bringing in Better Science

According to Daniel P. Collins, Ph.D., Migratory Game Bird Coordinator for the U.S. Fish and Wildlife Service's Southwest Region, the progress of partners working to save the mottled duck comes down to the fundamentals of breeding success, or survival through the stages of nesting and fledging. If partners can ensure enough high quality breeding habitat, they can improve mottled duck breeding success and the population will grow. Though the concept is simple, getting it done is another story given the range of threats to Gulf Coast habitats.

In recent years, Gulf Coast Joint Venture partners developed specific conservation objectives across the landscape that indicate the desired status of mottled duck populations. Then, they examined how to meet those objectives in the face of all the environmental changes taking place in

and around mottled duck habitat areas.

With project funding from the Gulf Coast Prairie LCC, partners began developing a new computerized geospatial model, based on Geographic Information System (GIS) and remote sensing technologies, to determine habitat conservation priorities. Expected to be complete later this year, the model is being developed by Texas A&M University-Kingsville, with technical support from several state, federal, and non-profit partners that are part of the Gulf Coast Joint Venture and the Gulf Coast Prairie LCC.

The model takes into account information about mottled duck population objectives and combines that with a host of biological data input related to typical breeding habitats. The model then provides various configurations and analyses to come up with the information partners most need: which specific breeding habitat areas to focus on at any given time to make progress toward the desired self-sustaining population objectives and the most effective set of actions to take to do so.

Collins put it this way: “We know ‘x’ number of high quality breeding habitat acres produces ‘y’ number of ducks per year; so the better the breeding habitat, the better you can influence the population. The new model helps identify the best habitat that's going to support those population outcomes.”

Photo Credit: Ruth Elsey/Louisiana Department of Wildlife and Fisheries. Partners making up the Gulf Coast Joint Venture—a public-private partnership dedicated to conserving waterfowl and other birds—have in recent years refined strategies to protect mottled duck breeding habitat. The new geospatial model will help partners prioritize habitat conservation and identify the best actions to take in specific areas.





Photo Credit: Ruth Elsey/Louisiana Department of Wildlife and Fisheries. Ultimately, wildlife managers' progress in protecting the mottled duck will benefit people who live in this wildlife-rich region, too. Major economic drivers along the coast of the Gulf of Mexico include tourism and outdoor recreation, commercial fishing, and shipping and transportation. Lush wetlands and grasslands are not only scenic icons of the Gulf Coast, they also help buffer erosion and the impact of storms, control flooding, and provide groundwater supplies for a fast-growing population.

With that information in hand, partners generally carry out three different habitat treatments: 1) protection of currently valuable wetland/grassland complexes, 2) improvement of grasslands, and 3) improvement of wetlands.

Fortunately, there are a host of programs for advancing wetland and grassland conservation, such as the U.S. Department of Agriculture's Wildlife Habitat Incentive Program, Environmental Quality Incentive Program, Conservation Reserve Enhancement Program, and others; North American Wetlands Conservation Act grant programs; private land conservation programs; and public land conservation activities.

Improving Over Time

Using the new model, and the above programs to carry out the conservation work, partners will have an even more precise and sustainable path for growing the mottled duck population.

A key benefit of the model is it's dynamic. Collins pointed out that one of the best things about it is it will become more effective over time, since better inputs lead to better outputs. As GIS and related mapping capabilities progress, partners will be able to feed the model with better geospatial data. And because they're doing more intensive evaluation of their efforts, they continue to get better biological information from their monitoring as well. "It all feeds back

into your data-hungry model; and the more information you gather, the better you get at predicting outcomes," Collins explained.

Collins also emphasized that the model's outputs change as new areas are put into conservation. "It's not static," he said. "It's always changing so that the best habitats are always identified, and that helps you stay strategic."

And that's conservation in the 21st century. ♦ *By the Southwest Region Science Applications Team, with contributions from Daniel P. Collins, Migratory Game Bird Coordinator; and Barry Wilson, Gulf Coast Joint Venture Coordinator.*

U.S. Department of the Interior
U.S. Fish & Wildlife Service
Southwest Region
Science Applications
500 Gold Ave SW
Albuquerque, NM 87102
<http://www.fws.gov/southwest/science/stories.html>

Dana Roth
Assistant Regional Director for Science Applications
505/248-6928
Or
505/248-6277

April 2014