MISSISSIPPI STATE UNIVERSITY

JAMES C. KENNEDY

endowed chair in waterfowl and wetlands conservation

2014 ANNUAL REPORT

College of Forest Resources | Forest and Wildlife Research Center

FROM THE CHAIR

As I peered from my office window and began writing this editorial on a dreary October day, I saw and felt, through the open window, the gray sky and falling temperature that accompanied the much awaited transition from summer to fall and winter in Mississippi. On the wings and tails of the blue-winged teal passage in September came initial pulses of other migratory ducks and geese, such as first sightings of gadwall, northern shoveler, mallard, white-fronted geese, and snow geese. Now, in early December, most leaves have fallen, the waterfowl hunting season is open, and mid-November aerial surveys by the Mississippi Department of Wildlife, Fisheries, and Parks estimated nearly 400,000 ducks were in the Delta—about twice more than in recent years at this time. This early abundance of ducks should bode well for the hunting season, especially after rains create wetlands and winter's cold cause birds still lingering northward to migrate southward.

On the wings and tails of the blue-winged teal passage in September came initial pulses of other migratory ducks and geese, such as first sightings of gadwall, northern shoveler, mallard, white-fronted geese, and snow geese.

We know waterfowl live amidst changing seasons and habitats, with most species being well adapted to "curves" thrown by Mother Earth. Like the Nearctic waterfowl species (or New World), which we are most familiar, the Palearctic species (Old World, Eurasian) are much like those in North America. Together, these two geographic eco-zones comprise the Holarctic region, and its waterfowl have evolved adaptations to cope with environmental dynamics of the Northern Hemisphere.

Nonetheless, both eco-zones and their eco-systems have been profoundly impacted by humans; yet, waterfowl are resilient and have adapted to living among us.

Our collective contributions in teaching, research, and service within the **James C. Kennedy Endowed Chair in Waterfowl and Wetlands Conservation** at Mississippi State University have historically focused on waterfowl and wetlands ecology and management in the Southeastern United States and in some other important eco-regions in North America. To capitalize on this foundation and further advance scientific knowledge for waterfowl and their habitats, we produced a unique publication that helps synthesize science and conservation of Holarctic waterfowl and their habitats during the 20th and 21st centuries. The publication, entitled *The Ecology and Conservation of Waterfowl in the Northern Hemisphere*, is a special issue of the United Kingdom's Wildfowl and Wetlands Trust's (WWT) journal, *Wildfowl*. This publication was released online in late November, and was the primary product of our international symposium, the "*Ecology and Conservation of North American Waterfowl*," which we convened in Memphis, Tennessee, January 2013. Moreover, this special issue represents the first journal publication in history to integrate classic and contemporary information on waterfowl ecology and conservation in the northern hemisphere. It's the largest special issue of *Wildfowl* ever published, comprised of some 20 multi-authored chapters and 500 pages. The publication is available online and in hard copy through the WWT (http://www.wwt.org.uk/).

Besides this seminal publication, "Team Duck" graduate students have been productive fulfilling their degree and research requirements and "fledging" from MSU. Five students have graduated in 2014. Pennsylvania native Jim Feaga received his M.S. degree in May 2014 and is a regional biologist for Ducks Unlimited Inc. in the Annapolis, Maryland office. We also congratulate Jim and his wife, Kristin, on the birth of their first child, Isiah. In August 2014, Tom Peterson graduated with his M.S. degree, following his study of wintering waterfowl use of wetlands in Delta National Forest in Mississippi, the only bottomland hardwood forest managed by the U.S. Forest Service. Tom recently was hired as a biologist for Ducks Unlimited Inc. and will be working from the Grand Island, Nebraska office. Amy Alford, a native of Ohio, successfully defended her doctoral dissertation on native crayfish production and other benefits, including water quality, of moist-soil wetlands and will receive her Ph.D. in December 2014. Amy is seeking employment from Knoxville, Tennessee, where her husband, Brian, is a fisheries professor at the University of Tennessee. Alabama native Kira Newcomb also successfully defended her M.S. thesis on wintering ecology of American black ducks in Tennessee in September, will graduate in December 2014, and has moved to Colorado where she plans to begin her professional career. Clay Shipes, a native of South Carolina, defended his M.S. thesis on mottled ducks in his home state, was married to Brittany in October, will receive his degree in December 2014, and has accepted a position as wildlife biologist with Texas Parks and Wildlife, working in coastal southeastern Texas. Please read

Kira's and Clay's feature articles on the "brown ducks" later in this annual report. Four "Team Duck" students are continuing their degree programs; they are Justyn Foth, Ph.D. student from Missouri; Molly Kneece, M.S. student from South Carolina; Joe Lancaster, Ph.D. student from Michigan; and Joe Marty, Ph.D. student from Wisconsin. You also can read about their research in this annual report.

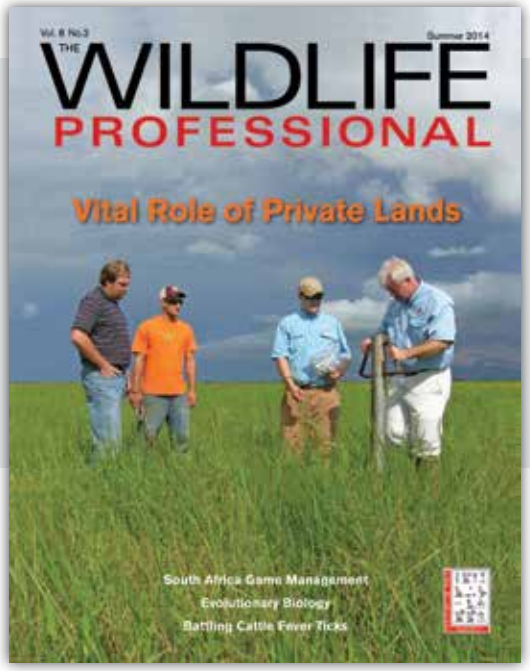
Besides celebrating graduation of several of our graduate students and their employment, students and faculty of the Kennedy Chair were honored by receiving awards or scholarships. Amy Alford was recipient of a Kennedy Chair doctoral fellowship for academic year 2013-2014. Amy also won first place for her presentation, "Crayfish harvesting: alternative opportunities for landowners practicing moist-soil management" at the Mississippi Water Resources and Research annual conference. The Ph.D. students, Joe Lancaster and Joe Marty, each received a James C. Kennedy Endowed Scholarship in Waterfowl and Wetlands Conservation to assist their academic and research programs. Joe Lancaster also received a Kennedy Research Fellowship to help support his field research on habitat ecology and survival of mallards in the Mississippi Delta. Finally, I was honored by the University of Wisconsin-Stevens Point as the university's College of Natural Resources Distinguished Alumnus of 2014. I received my B.S. degree from the University of Wisconsin-Stevens Point in 1972.

To close, the gray October sky has transformed to infinite blueness and sunshine on this December day. We can see clearly now and focus on our goals and objectives toward another productive year of science for waterfowl and wetlands conservation in 2015. We and MSU bestow a gigantic thank you to Mr. Jim Kennedy for ensuring this legacy Chair and program continue to contribute significantly to science guiding conservation of Holarctic waterfowl and their habitats.

Sincerely,

Richard M. Kaminski, Ph.D.

Professor of Wildlife Ecology and Management
James C. Kennedy Endowed Chair in Waterfowl and Wetlands Conservation
Fellow, The Wildlife Society



Mississippi State University researchers and Ducks Unlimited biologists are testing a core sampling device to estimate waterfowl food abundance in Gulf Coast ricelands. Left to right: Matt Kaminski, DU biologist and MSU alumnus; Joe Marty, MSU graduate student; James Callicutt, MDWFP and MSU alumnus; and Dr. Brian Davis, MSU assistant professor, wildlife ecology and management.

Cover Photo

Mr. James C. Kennedy, left, with wife Sarah and son Jamie.

TEAM DUCK

Clay Shipes
M.S. student

Molly Kneece
M.S. student

Amy Alford
Ph.D. student

Jim Feaga
M.S. student

Justyn Foth
Ph.D. student

Tom Peterson
M.S. student

Joe Lancaster
M.S. student

Joe Marty
Ph.D. student

Kira Newcomb
M.S. student

Winter and nesting ecology of mottled ducks in South Carolina

Clay Shipes, M.S. student

The mottled duck (*Anas fulvigula*) is endemic to Gulf coastal Louisiana and Texas, parts of Mexico, and inland Florida. Both males and females are "brown ducks" and similar in appearance to American black ducks, which also are featured in this annual report.

In the 1970s-1980s, about 1,200 mottled ducks were captured in Louisiana and Texas and translocated to the Ashepoo, Combahee, and Edisto Rivers Basin (ACE Basin) and the Santee River Basin in coastal South Carolina to establish a population that hopefully would provide harvest opportunity. Mottled ducks seem to have adapted well to the Low Country of South Carolina, given recent population estimates that approximate 20,000 birds. Additionally, mottled ducks are often considered a 'trophy' among waterfowl hunters, and the species is popular with birdwatchers and photographers alike.

Remnant rice fields in coastal South Carolina, dating back to the 1700s, best mimic wet prairie habitat used by mottled ducks throughout their endemic range. Despite apparent adaptations to coastal South Carolina by mottled ducks, knowledge of annual habitat ecology of the species there is limited. Piecing together interrelationships of waterfowl habitat use, survival, and ultimately reproductive success, in an environment where birds reside year-around, is a challenge but also is exciting. In Louisiana and Texas, research suggests that mottled ducks use a complex of agricultural and wetland habitats which often include coastal marshes, pastures, and native wet prairies; however, pastures and prairies are largely are absent in coastal South Carolina.

Given the limited knowledge of basic ecology of mottled ducks in South Carolina, Mississippi State University scientists teamed with the South Carolina Department of Natural Resources, Nemours Wildlife Foundation, and Ducks Unlimited to investigate winter and breeding ecology of mottled ducks in the ACE Basin of South Carolina.

In summer and fall 2010-2012, 116 female mottled ducks were captured and radio-marked. The captured ducks were mostly flightless molting birds that could be monitored during fall, winter, and breeding seasons. Based on over 1,200 locations of radio-marked birds, four different habitat and management types apparently important to mottled ducks in the ACE Basin were identified. These were habitat management, salinity, and hunting regimes plus type of vegetation coverage.

Interestingly and unlike habitat use by mottled ducks in Gulf coastal states and Florida, mottled ducks in South Carolina selected brackish over intermediate brackish-freshwater and saline wetlands year around.

For reasons not yet understood, mottled ducks selected wetlands with greater salinities than initial predictions based on studies outside South Carolina. Although some impoundments in South Carolina contained flooded corn fields during hunting seasons, and hence were dubbed 'agricultural' lands, mottled ducks did not select these over wetlands containing natural vegetation when both were available. The selection of wetlands over agricultural land may occur because corn fields generally were flooded only during the hunting season and then drained for spring planting. Moreover, flooded corn fields may attract large numbers of wild and game-farm released mallards. Furthermore, the promotion of habitat overlap between mallards and mottled ducks could lead to hybridization between the species and reduce the numbers of pure mottled ducks.

One of the most important findings in this study was the importance of managed wetland impoundments (historic rice fields) for wintering mottled ducks. Waterfowl research conducted decades ago substantiated the significance of managed impoundments for migrating and wintering waterfowl in South Carolina. Likewise, radio-marked mottled ducks in this study selected managed wetland impoundments much more than natural tidal marshes. Furthermore, managed impoundments seem important to nesting mottled ducks. Managed wetland impoundments may function as surrogate habitat for wet prairies in coastal Louisiana and Texas. Additionally, managed impoundments provide habitat for myriad shore- and wading birds.

As winter waned, many of the radio-marked females could not be detected. It is not clear if the transmitters failed, were shed, or birds dispersed from study areas. Thus, an intensive search for nests of female mottled ducks from the ground was conducted. Forty-five nests within wetland impoundments were found during spring-summer 2011-2012.

Average nest initiation date was April 12th, clutch size was 8.4 eggs, and nest success was 24 percent overall. A most revealing aspect of the nesting research was that the size of cord-grass or other vegetated islets on which birds nested had an important influence on nest survival. The probability of a nest surviving increased with islet area. Islets covering 15 square meters supported nests with greatest success of hatching ducklings.

This study is being continued, however, preliminary results have enhanced understanding of the annual ecology of mottled ducks in South Carolina.

Black ducks find winter habitat havens in Tennessee

Kira Newcomb, M.S. student

Cold mornings and leafless trees signal a much anticipated time of year for waterfowl hunters throughout the flyways. However, winter can be stressful for waterfowl, such as the American black duck (*Anas rubripes*). The black duck is another North American "brown duck" species, which is featured in this annual report. Indeed, male and female black ducks look strikingly alike, similar to mottled ducks (*A. fulvigula*), but a major difference between the species is that black ducks are migratory whereas mottled ducks live year around in southern coastal areas and do not migrate technically, although they disperse among coastal wetlands.

Black ducks and other waterfowl face predators such as hunters, harsh weather conditions, and fluctuations in food and water availability during winter. Nevertheless, winter survival is a necessary prerequisite for courtship, pair formation, and subsequent spring migration and breeding, and these life-cycle events may be impacted by hunting, weather, age, sex, body condition, and habitat resources.

Despite intensive research on declining populations of black ducks in North America, surprisingly limited information exists on factors affecting winter survival and habitat use of the species in the Mississippi Flyway. Researchers captured and attached radio transmitters to 113 female black ducks on the Tennessee National Wildlife Refuge (TNWR), a waterfowl sanctuary and historically important wintering area for black ducks in the Flyway during winters 2010–2012. By tracking these birds, scientists were able to monitor the ducks' survival, movements, and habitat use.

Waterfowl, like other birds, typically use a complex of habitats to meet their needs year around. Designated sanctuaries, like TNWR, are an important part of habitat complexes for waterfowl in the winter, especially during hunting seasons. Waterfowl using sanctuaries typically expend less energy because of less human disturbance from hunting, boating, ATVs, and bird watching.

Radio-marked black ducks in this study were more likely to use habitats on the TNWR, and this pattern persisted regardless of habitat type, hunting season, or time of day or night. These results emphasized that the importance of TNWR for wintering black ducks may extend beyond its function as a sanctuary. Fidelity to TNWR also may have been related to the refuge's habitat quality or landscape features such as wetland size, availability, and habitat arrangement.

Radio-marked black ducks also used other areas near TNWR, including private lands, but not to the extent of the refuge itself. Females used agricultural

lands, open water, and forested, moist-soil, and scrub-shrub wetlands on and off TNWR during the study. Nevertheless, the ducks had greater affinity for moist-soil and scrub-shrub wetlands than other habitats on or off the TNWR during both winters regardless of hunting season or time of day or night. Moreover, females used these wetlands especially at night likely for roosting, feeding, and thermal cover.

Black ducks in this study had high winter survival rates (83–85%). Researchers found that survival of females did not vary between hunting and post-hunting seasons, ducks of different ages, winters of the study, or weather conditions. However, body weight at time of capture, an index of physiological condition, ultimately did affect survival of black ducks. Ducks with greater body weight likely had more energy and other nutrient reserves to help them survive fluctuations in weather and food availability during winter. For example, a bird of average body mass had 18 percent lower winter survival than a bird 100 g (~4 oz.) heavier. So, a little extra fat and muscle may go a long way toward winter survival of black and other ducks.

Moreover, the scientists also found the effect of body weight on survival differed between winters of the study and also during and after the hunting season. Radio-marked black ducks with below average body mass had lower survival than those with above average body mass during a more severe winter. For example, winter 2010–2011 was harsh, which froze shallow wetlands and may have decreased food availability. That winter, a duck with body weight 100 g above average had 9 percent greater survival than an average-sized bird. In contrast, winter 2011–2012 was warmer and wetter, which may have allowed for less wetland freezing and increased birds' access to wetland foods. That winter, researchers observed fewer mortalities and lower survival for black

ducks with above average body mass; a duck 100 g heavier than average weight had 3 percent lower survival than an average-sized bird.

Black ducks with below average body masses had lower survival during post-hunting than hunting seasons, which may be related to within-winter changes in food availability and movements. Hunting pressure on surrounding lands may contribute to fewer movements of waterfowl off the TNWR during the hunting season, which increases demand for resources on the refuge. Consequently, food resources may have been depleted by birds foraging on the refuge and natural decomposition by the end of hunting season in late winter. A bird with below average body mass may not have had the energy reserves to search outside the TNWR or begin migration.

However, black ducks with below average body mass may be able to sustain themselves until hunting risks have passed after the season, as it is less energetically costly for a bird to remain heavy. In contrast, food resources on TNWR, possibly depleted by winter-long foraging by ducks, may have enabled ducks with above average body mass to search off refuge for food but also expose themselves to hunting-related risk. Most ducks and geese lose weight naturally during winter, called endogenous losses, even if they receive unlimited food in captivity. So, black ducks at TNWR may "weigh" all these risks and adaptations, when making decisions to stay or remain on the refuge during or after the hunting season.

To provide necessary resources for black ducks during winter, researchers recommend continued provision of complexes of habitats and active annual management in such areas, especially moist-soil wetlands. These wetlands provide waterfowl with more diverse vegetative structure and plant and animal foods than flooded croplands. Furthermore, investigations of functional uses of these habitats by black ducks (e.g., identification of feeding, roosting, and courtship micro-habitats) are needed to ensure these habitats are provided on other public and private lands in Tennessee and elsewhere in the Mississippi Flyway.

Ecosystem services of moist-soil wetlands: water quality benefits and crayfish harvest

By Amy Alford, Ph.D. Candidate

Because wetlands sequester nutrients and sediments from runoff, moist-soil wetlands managed for waterfowl and other wetland wildlife also provide services important for wetland restoration. Furthermore, these wetlands naturally support populations of crayfish that can be harvested for human consumption. To quantify these benefits, we compared nutrient and sediment concentrations and loads from moist-soil wetlands and nearest agriculture fields in Mississippi during winters 2010-2012. We also estimated yield, production costs, and evaluated consumer acceptability of crayfish harvested from moist-soil wetlands during springs 2009-2011.

Concentrations of total and particulate phosphorus, nitrate-nitrogen, and total suspended solids were 42, 52, 86, and 89 percent lower in runoff from moist-soil wetlands than row-crop agricultural fields, such as soybeans, corn, and rice. However, concentrations of soluble reactive phosphorus (which is biologically available and contributes to eutrophication) in runoff from moist-soil wetlands and adjoining croplands were highly variable and thus not detectably different. Nevertheless, loads of soluble reactive phosphorus from moist-soil wetlands were six times greater than

that from croplands. Whereas decaying vegetation is a primary source of phosphorus in wetlands, release of phosphorus-laden runoff from moist-soil wetlands can be controlled by simply adding stop-log boards to water control structures and retaining runoff in basins. Therefore, hydrologic management of moist-soil wetlands should be considered a simple technique to meet regional nutrient and sediment reduction goals.

Daily yield of crayfish from moist-soil wetlands was 2.1 lbs/acre. If a landowner wanted to harvest crayfish, they would incur costs of $163.89 to $287.13/acre over a 45-day harvest season and therefore the value of crayfish to the landowner would be approximately $1.70 to $2.99/lb. The current wholesale value of crayfish harvested from rice field-aquaculture systems in Louisiana is $1.25/lb but retail prices in north Mississippi for uncooked crawfish often exceed more than $5.00/lb. Therefore, landowners can realize the value of harvesting their own crayfish. Furthermore, we determined that consumer acceptability of crayfish harvested from wild populations in moist-soil wetlands did not differ from crayfish harvested from rice-crayfish culture fields in Louisiana. Opportunities to harvest crayfish and water quality benefits provided by managing moist-soil wetland hydrology further demonstrate the value of this conservation practice.

Waterbird use of catfish ponds managed through the Migratory Bird Habitat Initiative

By Jim Feaga, M.S. student

The conversion of natural wetlands in Mississippi in the 1970s to catfish production ponds provided alternate aquatic habitats for a variety of waterbirds. In response to the 2010 Deepwater Horizon oil spill, the National Resource Conservation Service (NRCS) enacted the Migratory Bird Habitat Initiative (MBHI). Through this initiative the NRCS partnered with landowners to develop managed wetlands and associated foraging habitat for migrating waterbirds in catfish ponds idled from production because of declining market conditions. During winters 2011-2013, diversity and abundance of waterbirds were estimated in active production and idled ponds in Mississippi. Wintering waterbirds exhibited similar densities on production ponds (~54 birds/acre) and idled ponds (~49 birds/acre) on MBHI sites. However, idled ponds, with varying water depths (mudflats to 8 inches) and diverse emergent vegetation—water interspersion—attracted over 30 species of waterbirds and, on average, had significantly more species of waterfowl and other waterbirds from fall through early spring than catfish production ponds. Common species on catfish production ponds were great blue heron, ruddy ducks, scaup, and northern shoveler; whereas, mallard, northern shoveler, gadwall, American coot, and shorebirds dominated use of idled ponds. Results suggest production and idled MBHI ponds provided suitable conditions for waterbirds but idled ponds supported a greater diversity of birds than did production ponds. Based on this research, it is recommended that future programs strive to enroll properties that promote an increased diversity of habitats in terms of vegetation structure, available forage, and varying water depth, with the aim of maximizing waterbird abundance and diversity.

Shorebird use of wetlands and aquaculture ponds in the Mississippi Alluvial Valley and Gulf Coast Region

By Justyn R. Foth, Ph.D. student

Historically, the Mississippi Alluvial Valley (MAV) was covered by forested wetlands. During the 20th century, most of the MAV was converted for agriculture, aquaculture, and other human uses, providing novel stop-over and wintering habitats for shorebirds. Prior to these landscape changes, shorebirds likely migrated over the MAV to wetlands along the Gulf Coast. In 2010, the Deepwater Horizon oil spill impacted coastal marshes of the northern Gulf of Mexico. In response, the USDA Natural Resources Conservation Service implemented the Migratory Bird Habitat Initiative (MBHI) to provide shorebirds with wetland habitats inland away from oil-impacted areas along the coast. The objective of this research was to estimate species composition and relative abundance of shorebirds on MBHI and associated wetlands in the MAV and Gulf Coast regions during fall migration. Surveys indicated that over seven times more shorebirds were observed on shallowly flooded MBHI wetlands (i.e., mudflat to 12 inches depth) created in idled catfish ponds in Mississippi than on production catfish ponds, state and federal conservation areas, and coastal wetlands in Alabama, Louisiana, and Mississippi combined. In 2011, mean relative abundance of shorebirds using MBHI-enrolled wetlands was over eight times greater than wetlands not enrolled in MBHI. Shorebird migration peaked in early September 2011. Similarly in 2012, abundance of shorebirds using MBHI-enrolled wetlands was over four times greater than on wetlands not enrolled in MBHI. Shorebird migration peaked in late August 2012, possibly related to effects of Hurricane Isaac in late August. Additionally, during peak migration in fall 2013, MBHI sites also had over seven times more birds than on state or federal managed or conserved coastal wetlands. MBHI-managed former catfish production ponds provided important habitat for migrating shorebirds and other waterbirds during summer through fall, especially in drought years when other wetlands may have been limited. Continued research on shorebirds in the MAV and Gulf Coast will incorporate stable isotope analysis of feather and blood to assess connectivity and possible oil signatures in shorebird tissues and invertebrate foods. This research will provide conservation planners with information to predict shorebird abundance, habitat connectivity, and management recommendations for environmentally-impacted wetlands.

Habitat use and survival of mottled duck broods in ACE Basin, South Carolina

By Molly Kneece, M.S. student

The mottled duck (*Anas fulvigula*) is endemic to the Gulf coastal states of Louisiana and Texas, parts of Mexico, and peninsular Florida. From the 1970s and 1980s, over 1,200 mottled ducks were transported mostly from Louisiana and Texas and released on coastal wetlands in South Carolina. Unpublished banding data indicate an expanded population of mottled ducks in South Carolina since initial release. Several studies of mottled ducks have been conducted in the birds' endemic range, but little research has been conducted in South Carolina. This study is the second of two consecutive projects that investigate aspects of the annual ecology of mottled ducks in South Carolina. The first study examined wintering and nesting ecology of mottled ducks in the Ashepoo, Combahee, and Edisto Rivers (ACE) Basin in South Carolina. The objective was to radio-mark nesting female mottled ducks to study movements, habitat use, and survival of mottled duck ducklings and broods on public and private lands in the ACE Basin. Several methods of marking were used, including instrumenting females with intra-abdominal transmitters during summer remige (wing) molt, ground searching for nests of unmarked females, and capturing females in late incubation to attach harness style radio-transmitters. Radio-marked females with broods were monitored daily to 30 days of age or until brood loss occurred. Sixteen nests were discovered and five radio-marked females with broods were followed for 62 days in 2013. Nest success was 27 percent and brood survival was 60 percent. In 2014, intra-abdominal transmitters were discontinued and 14 nests of unmarked females were located. However, all nests failed; three nests were abandoned by attending females and complete clutch removal by unknown predators occurred in the other 11 nests. This was the first year in four that complete clutch removal and this type of nest depredation occurred. Generally, estimating duckling and brood survival precisely for this species across its range continues to be a challenge, given the birds' rareness compared to other North American ducks, its reclusive behavior, and logistical impediments inherent in locating and marking adequate numbers of birds for study. Nonetheless, persistence is warranted to discover new ecological and technical knowledge to help sustain mottled ducks in coastal South Carolina.

Wintering ecology of mallards in the Mississippi Delta

By Joe Lancaster, Ph.D. student

The Mississippi Alluvial Valley (MAV) is an important wintering region for North American mallards, yet little is known about their habitat use and winter survival in Mississippi. To expand the study of habitat use and survival of mallards wintering in the south Delta during winters 2010-2012, 74 female mallards were captured and radio-marked during winter 2013-2014 in the north Delta at Coldwater River National Wildlife Refuge near Charleston and Crowder, Mississippi. During the day, moist-soil (40%) and forested (37%) wetlands were used most during the hunting season, while forested (38%), agricultural (30%), and moist-soil wetlands (21%) were used greatest after hunting season. At night, mallards used moist-soil (47%) and agricultural lands (39%) the most during hunting season. After the hunting season, moist-soil (33%), agricultural (34%), and forested (32%) habitats were used most. The daily survival estimate for radio-marked mallards was 99.7 percent, which was similar to the estimate from the south Delta during winters 2010-2012 (99.7 percent), and also estimates from Louisiana and Arkansas during winters 2004-2006 (99.7 percent) and Arkansas and Mississippi in the 1980s (99.7 percent). The final year of data collection will occur beginning in November 2014. Upon completion of the data collection, mallard habitat selection will be quantified. Habitat-specific survival will also be determined to deduce wetland and habitat complexes that increase probability of winter survival of mallards, thereby promoting potential for spring migration and subsequent return to the MAV by these mallards. These analyses are unique and will shape design of current and future habitat restoration, conservation, and acquisition for mallards and other ducks on public and private lands in the MAV.

Seed and waterbird abundances in ricelands in the Gulf Coast prairies of Louisiana and Texas

By Joe Marty, Ph.D. student

Rice not collected by harvesters and natural seeds occurring in rice fields are important foods for migrating and wintering waterfowl. Estimation of abundance of these seeds is necessary for calculating waterfowl habitat conservation needs in regions where rice is grown and waterfowl winter. The objectives of this study were to quantify the amount (lbs/ac) of rice and natural seeds and estimate waterfowl and other waterbird use of farmed and idled ricelands in the Chenier Plain of southwest Louisiana and southeast Texas (CP) and the Texas Mid-Coast (TMC) during fall-winter 2010-2013. Preliminary data analyses suggested that abundance of waste rice and natural seeds in the CP and the TMC was greater than any other rice growing region in North America. Waste rice abundance was greatest in CP farmed rice fields that were harvested in August (2010-2012; 469.9 lbs/acre). Natural seed abundance was greatest in TMC idle rice fields with standing vegetation in November (2010-2012; 317.2 lbs/acre). We observed a decline in waste rice from August-November. However, the practice of growing a second rice crop between late summer and fall (i.e., ratoon crop) likely lessened the severity of the loss because of seed deposited during the ratoon crop harvest in November. This trend contrasts with rice farming in the lower Mississippi Alluvial Valley where the fall growing season generally is too short to produce a ratoon crop. Greatest waterbird densities occurred in shallowly flooded disked ricelands which averaged 18.16 waterfowl or other waterbirds per acre. Ratoon, disked, and shallowly flooded ricelands are important habitat for these waterbirds but variable estimates of seed and waterbird abundances warrant continuation of this study through 2015.

Wintering waterfowl use of Delta National Forest, Mississippi

By Tom Peterson, M.S. student

Bottomland hardwood forests provide forage and other important resources for wintering and breeding waterfowl in the Southeastern United States. The objective of this study was to investigate possible influences of habitat features, flood events, and human disturbance on relative abundances of wintering ducks in the Delta National Forest in Mississippi. Sixty five wetlands were surveyed in the forest from November 2012 to March 2013. Occurrence and abundance data for wood ducks, mallards, gadwalls, and hooded mergansers were analyzed. These were the most frequently occurring waterfowl species in the Delta National Forest. Waterfowl abundance varied by species but generally increased during major flood events and on wetlands having an equal interspersion of scrub-shrub and open water consistent with the "hemi-marsh" concept (50:50 vegetation:water intersperson). Mallards used the forest in greatest abundance when the Big Sunflower River overflowed and the gage at Holly Bluff, Mississippi reached near 80 feet. This elevation flooded the forest extensively and likely increased availability of red oak acorns and aquatic invertebrates for ducks.

Because of this abundance, it is recommended that water from flood and rain events be captured in all existing greentree reservoirs to increase extent and duration of flooded bottomland hardwoods in the forest. However, greentree reservoirs should be drained in February before leaf-out by oaks and other deciduous trees. Partial removal of scrub-shrub from wetlands with dense shoreline coverage is recommended to create "hemi-marsh" conditions and promote moist-soil plant communities for increased duck forage. Finally, experimental evaluation of waterfowl responses to management of the wetlands and human disturbance during hunting seasons is needed.

AWARDS

Amy Alford

Kennedy Chair Doctoral Fellowship for academic year 2013-2014

Rick Kaminski

University of Wisconsin-Stevens Point College of Natural Resources Distinguished Alumnus of 2014

Joe Lancaster

James C. Kennedy Endowed Scholarship in Waterfowl and Wetlands Conservation

Kennedy Research Fellowship

Joe Marty

James C. Kennedy Endowed Scholarship in Waterfowl and Wetlands Conservation

PRESENTATIONS

Davis, J.B., J.C. Shipes, M.R. Kneece. 2014. Mottled ducks in South Carolina: Is it the good, the bad and the ugly? Southeastern Association of Fish and Wildlife Agencies, Destin, FL, October, 2014.

Davis, J.B., R.M. Kaminski, L. Webb, J. Tapp, M.W. Weegman. 2014. The Migratory Bird Habitat Initiative: Managing waterbird habitats after the 2010 Gulf oil spill. Mississippi Chapter of The Wildlife Society annual meeting, Ocean Springs, MS, September, 2014.

Davis, J., D. Godwin. 2014. Wildlife calls: A demonstration of the meaning of duck and turkey vocalizations. Conservation Camp, College of Forest Resources, Mississippi State University, June, 2014.

Davis, J., R.M. Kaminski, J.T. Callicut, H. Havens. 2014. Waterfowl life history. Mississippi Department of Wildlife, Fisheries & Parks Waterfowl Hunting and Education Camp, Gumbo Flats Hunting Club, Lambert, MS, January, 2014.

Foth, J., R.R. Robichaux, J. Davis, T. Jayroe. 2014. Water: Importance of, conservation of, and what's in it. Louisville Municipal School District, Dillard's Reading, Enrichment, Arts, Mathematics and Science (DREAMS) summer program, Louisville, MS, June, 2014.

Foth, J.R. 2014. Waterfowl identification and retriever training. Conservation Camp, College of Forest Resources, Mississippi State University, June, 2014.

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