MISSISSIPPI STATE UNIVERSITY

JAMES C. KENNEDY

Endowed Chair in Waterfowl and Wetlands Conservation

COLLEGE OF FOREST RESOURCES • DEPARTMENT OF WILDLIFE, FISHERIES AND AQUACULTURE

ANNUAL REPORT 2011

FROM THE CHAIR

Dr. Richard M. Kaminski

In 2008, the James C. Kennedy Endowed Chair in Waterfowl and Wetlands Conservation was established at Mississippi State University by chairman of Atlanta, Ga.-based Cox Enterprises, Mr. James C. Kennedy. Since establishment, I have been privileged to serve as the Kennedy Chair and guide the program with Brian Davis, assistant professor of Wildlife Ecology and Management. This year has been another productive one for "Team Duck" (our local moniker). Dr. Davis and I have served as advisors to 10 graduate students who are working diligently on a variety of academic, research, and outreach projects related to waterfowl and wetlands. Highlights of our collective efforts are presented in this annual report and archived on the Kennedy Chair website. We hope you visit the website and monitor our progress in waterfowl and wetlands science and conservation (www.cfr.msstate.edu/kennedychair).

The primary impetus for creation of the Chair was the decline in waterfowl science and management programs in universities throughout North America. In 2000, a survey of 76 universities with natural resources or biology programs in the U.S. and Canada revealed a potential future decline in waterfowl expertise at North American universities. The results of the survey were published in the *Wildlife Society Bulletin* (2002, 30:616-6220). The survey found that, while over 60 percent of respondents employed one or more faculty with expertise in waterfowl and/or wetlands, the faculty members then averaged over 45 years of age. Furthermore, only half of the departments surveyed indicated they would seek another person with waterfowl expertise if their current faculty member(s) left his/her position. Thus, the research found cause for concern regarding potential waning of professionals with waterfowl expertise in North American universities.

With the results of the survey over a decade old, it seemed prudent to take another look at the trends in waterfowl and wetlands programs. A new investigation conducted in 2011 found that 52 percent of the universities surveyed in 2000 had lost their waterfowl/wetlands programs. To date, only 25 such programs persist in the U.S. and Canada. If the attrition rate of 52 percent continues, only a dozen or so waterfowl programs may exist in North America in the coming decade following looming retirements, unless current programs are sustained and new ones are established.

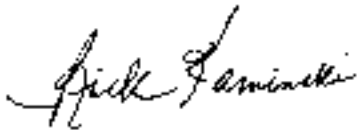
A vexing question remains, "Will a dozen or so professors and university programs in North America be adequate to educate and mentor the next generation of students needed to teach, conduct research, perform outreach, and implement waterfowl and wetlands conservation across the continent?" This will be a daunting task, especially

considering revision and expansion of the North American Waterfowl Management Plan which relies on the expertise of waterfowl and wetlands biologists and conservationists. I may be treading into "deep muck," but I predict there will be less than a dozen programs specializing in waterfowl and wetlands ecology and management continentally by the 2020s. I hope my prediction is wrong, and that waterfowl and wetlands programs in universities are again supported as they were in the 1980s concurrent with birth of the NAWMP.

Although the need for university waterfowl/wetlands programs may be challenging amid our current fiscal climate, we must recognize the ecologic, environmental, and economic values of waterfowl and wetlands worldwide. Endowed programs committed to waterfowl and wetlands must be established at key universities in the flyways to ensure graduation of people with expertise and passion for waterfowl and their habitats. How many programs are needed? As an initial goal, I suggest three per flyway in or near important Joint Venture regions of the NAWMP. If North America had three such programs strategically located in each of the four flyways, these 12 professors and students would be well positioned to teach, conduct research, and apply outreach with partners to fulfill the goals of the NAWMP as well as other conservation initiatives.

Clearly, Team Duck will continue its role to sustain waterfowl and wetlands in the Lower Mississippi Valley Joint Venture Region and elsewhere. Again, we thank Mr. Kennedy for believing there was a genuine need to establish the Kennedy Chair at MSU. For all who read this editorial and care for waterfowl and wetlands with deep passion, please do your part to help create a similar endowed program at your alma mater or another institution that can positively impact waterfowl and their habitats.

Best wishes to and yours for a health-filled and rewarding 2012. May you be inspired to spread the word and need for university programs of excellence in waterfowl and wetlands ecology and conservation.



Status of waterfowl programs at U.S. and Canadian universities in fall 2011:

- 52 of the 76 universities surveyed in 2000 had or retained a waterfowl-wetlands specialist on their faculty.
- 27 of the 52 universities have lost or not re-hired a waterfowl-wetlands specialist. In the Mississippi Flyway, Michigan State University, the University of Missouri, and the University of Wisconsin are notable examples of this situation. All three universities had prominent waterfowl programs for decades in the 20th century.
- 25 waterfowl/wetlands programs persist, only two are endowed and thus secured in perpetuity (MSU and University of California-Davis).
- Of the 25 programs still in existence; 50-60 percent of the professors in these positions now are 50-60+ years of age.
- If the observed attrition rate of 52% continues, only a dozen or so waterfowl programs may exist in North America in the coming decade following looming retirements, unless current programs are sustained and new ones are established. Regrettably, this potentially small "flock" of professors and programs is less than one-fourth of those present during the 20th century.

FACULTY AND STUDENTS

Jim and Sarah Kennedy

FACULTY

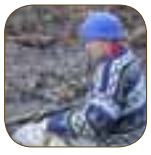
Dr. Richard M. Kaminski

James C. Kennedy Endowed Chair
Associate Dean, College of Forest Resources
Professor of Wildlife Ecology and Management, Department of Wildlife, Fisheries, and Aquaculture

Dr. J. Brian Davis

Assistant Professor of Wildlife Ecology and Management, Department of Wildlife, Fisheries and Aquaculture

DOCTORAL STUDENTS



Amy Alford (Ohio)

Ph.D. student, Department of Wildlife, Fisheries & Aquaculture Sciences

David Fishman (Quebec, Canada)

Ph.D. student, Department of Wildlife, Fisheries & Aquaculture

Justyn Foth (Missouri)

Ph.D. student, Department of Wildlife, Fisheries & Aquaculture

Jacob Straub (Wisconsin)

Ph.D. student, Department of Wildlife, Fisheries & Aquaculture Sciences

MASTERS STUDENTS

James Feaga (Pennsylvania)

M.S. student, Department of Wildlife, Fisheries & Aquaculture

Joseph Lancaster (Michigan)

M.S. student, Department of Wildlife, Fisheries & Aquaculture

Joseph Marty (Wisconsin)

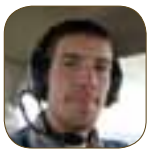
M.S. student, Department of Wildlife, Fisheries & Aquaculture

Kira Newcomb (Wisconsin)

M.S. student, Department of Wildlife, Fisheries & Aquaculture

James Shipes (South Carolina)

M.S. student, Department of Wildlife, Fisheries & Aquaculture

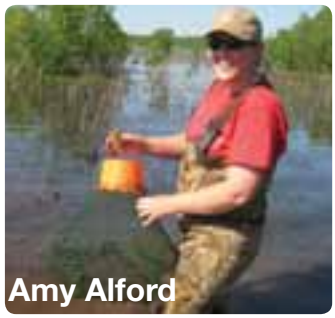


Matthew Weegman (Minnesota)

M.S. student, Department of Wildlife, Fisheries & Aquaculture

"DAWGS" FOR DUCKS AND "DADS" (DAT'S CRAWDADS)

by Amy Alford


Amy Alford

Crawfish—also known as crayfish, crawdads, and mud-bugs—are native invertebrate crustaceans, abundant in wetlands in the Mississippi Delta, Louisiana, and throughout the Southeast. One prime habitat where crawfish occur naturally is moist-soil wetlands. These grass-sedge areas, often managed for waterfowl and duck hunting, team with crawfish during spring and summer until the wetlands dry and the crawfish burrow deep into the soil to survive the drought.

Most commercial crawfish come from rice fields and the Atchafalaya Basin in Louisiana. Although Louisiana leads the nation in crawfish production for the market, moist-soil wetlands and swamps in Mississippi and other states in the Lower Mississippi Valley provide critical habitat for wintering waterfowl and other wetland wildlife and fish, including crawfish.

Scientists in the Department of Wildlife, Fisheries, and Aquaculture at Mississippi State University have known for years about native crawfish in Mississippi wetlands but little is known about crawfish ecology. While scientists have studied various aspects of culturing crawfish in rice fields, there has not been an attempt to quantify yield of crawfish from their natural habitats.

Commercial crawfish culturing in Louisiana begins with the capture of stocker crawfish from swamps which are then transported to rice fields where they reproduce, grow out, and are then caught in baited traps and marketed. Crawfish harvests in moist-soil duck holes rely only on native, naturally occurring invertebrates. These 'mud-bugs' burrow deep into the soil after duck holes are drained during spring-summer. When duck holes flood in winter, juvenile and adult crawfish emerge from their earthen environments, scavenging plant and animal foods from the bottom of duck holes.

MSU scientists decided to capitalize upon values of moist-soil wetlands for wintering waterfowl and water-quality improvement by initiating research to evaluate crawfish production from these natural wetlands and their economic values.

The MSU study mimics commercial crawfish harvest strategies as employed in Louisiana. Approximately 12 traps are deployed per acre, baited with crawfish bait made from fish meal, corn and soybeans. The traps and bait are the same commercially available

products used by crawfish farmers in Louisiana rice fields. Harvesting the crawfish takes place from April through June. Crawfish are most active and easier to catch when water temperatures reach about 65° F. Trapping before the hot summer months ensures the heat hasn't dried the wetland. The traps are set in about 18 inches of water.

After harvesting has ended, duck holes are drained, so they will produce wetland vegetation and again provide foraging habitat for wintering waterfowl and spring time crawfish. During the summer dry period, crawfish 'chimneys' pop up as the wetland dries. These 'chimneys' mark the underground burrow into which crawfish tunnel to survive the summer drought.

Crawfish harvest from duck holes will likely not compete with commercial production from rice fields in Louisiana. Costs associated with planting a forage (such as rice), machinery, transportation, and labor for commercial crawfish production can reach $450 to $700 per acre. To make a profit or break even, a farmer harvesting crawfish from Louisiana rice fields must produce a high yield of at least 10 pounds an acre per day. On average, daily production of 'duck hole crawdads' is about 2 pounds per acre per day.

However, the costs associated with crawfish harvests are reduced when a landowner wants to harvest 'duck hole crawdads' that live naturally in Delta wetlands. The vegetation forage base naturally grows in the wetland and less machinery is used to manage a wetland compared to a rice field. The big expense in harvesting crawfish from moist-soil wetlands comes mostly from the time it takes to set and run traps. The traps cost about $8 each or can be easily made by hand for around $5 each. The formulated bait is readily available at local feed and seed shops and typically costs $12 for a 50-pound bag. The research found that leftover chicken and fish parts have been used successfully as bait.

One question that is often asked is, "How do the duck hole crawdads compare in taste to Louisiana crawfish?" The misconception that the wetland habitat found in duck holes is 'mire-like', 'swampy', or 'dirty' has led some to think that naturally produced crawfish will taste dirty or muddy. Even in south Louisiana the taste of rice-field crawfish and swamp or naturally produced crawfish is debated.

To answer this question, a taste test analysis was conducted by Dr. Wes Schilling in the MSU's Department of Food Science, Nutrition, and Health Promotion. About 150 panelists rated duck-hole crawfish and the rice-field crawfish as equally liked.

The research found that creating duck holes provides habitat and food for wintering waterfowl and can create a harvest of crawfish after duck season for Delta landowners.

ACORNS FOR *ANAS* AND *AIX* IN THE MISSISSIPPI ALLUVIAL VALLEY

by Jake Straub

Anas platyrhynchos and *Aix sponsa* are the respective scientific names for mallards and wood ducks. Both species occur in abundance in the Lower Mississippi Alluvial Valley and depend heavily on food resources in MAV bottomland hardwood forests and other habitats during winter.

Late winter represents one of the most significant time periods in the annual cycle of these ducks and other waterfowl. During this time, the birds spend increasing amounts of time feeding to prepare for spring migration and breeding. This period is especially critical for female ducks because they are molting body plumage in preparation for nesting, need carbohydrates to build fat reserves to "fuel" their northward migration, and must begin assimilating protein for future egg production.

By late-winter, however, food resources in flooded croplands and moist-soil wetlands in the MAV may be largely depleted because of natural decomposition and consumption by ducks or other wildlife. In contrast, flooded hardwood bottomlands can provide a "flush" of available food resources, such as red oak acorns and aquatic invertebrates, for mallards and wood duck.

Acorns tend to be greater in fatty acids compared to other winter foods for mallards and wood ducks. Research has shown that waterfowl are adapted to respond quickly to food availability during late winter when rainfall and rivers often flood the landscape creating new foraging areas. Mallards appear to be especially keen at exploiting fresh resources as they have been found to increase their food consumption up to 5 times when newly flooded hardwood bottomlands and other wetlands become available.

This research has focused on the timing and abundance of red oak acorns in some of the few remaining large bottomland hardwood forests in the MAV. Red oak species composition varies among and within sites in the MAV but is primarily comprised of five species: cherrybark, Nuttall, pin, water, and willow oaks.

Results of the research indicate the timing of maximum acorn abundance varies from north to south in the MAV. In southeast Missouri, peak abundance occurs in late November to early December, while peak abundance occurs a month later in Mississippi and Louisiana.

There are also differences in timing of acorn drop among red oak species. Water, willow, and cherrybark oaks tend to drop acorns earliest, followed by pin and Nuttall oaks. Surprisingly, some Nuttall oaks observed in Mississippi retained most of their acorns until February.

The research also has revealed that acorns neither lost weight or energy after being exposed over 90 days in flooded or non-flooded areas in Mississippi forests. This finding suggests that acorns are highly adapted to resist decomposition. Indeed, an acorn that falls in October and is consumed by a duck in January actually loses less than 1 percent of its potential energy value.

The research team found astonishing levels of variation in acorn production among sites and years during the study. Among sites, there was over a 16-fold difference in acorn production within the same year and species. Furthermore, acorn production

increased over 15 times among years within sites. This tremendous level of variation is unique among the waterfowl food resources in the MAV and indicates how these foods naturally “pulse” within and among years and areas.

Ducks seemingly are uniquely adapted to locate pulses in available acorns. The research data suggest that, although there may be some years of little or no acorn production at some sites, waterfowl likely never experience a complete failure of acorn production in the MAV. During years of plenty, ducks can find pounds of acorns in bottomland hardwood forests that rival that of unharvested MAV croplands.

This research has provided the first landscape-scale estimates of acorn abundance in the MAV. These estimates will be used by conservationists to guide acquisition, restoration, and management of bottomland hardwood forests in the MAV for ducks and other wildlife that eat acorns. This work also has demonstrated that peak acorn abundance occurs at a critical time for mallards and wood ducks in the MAV, a time when food resources in other habitats have declined to low levels perhaps making foraging inefficient for ducks. Indeed, red oak acorns in hardwood bottomlands are critical for helping meet the energy needs of mallards, wood ducks, and other wildlife during winter and building fat reserves for migration and reproduction.

Jake Straub

WATERFOWL FOODS IN LOUISIANA AND TEXAS RICE FIELDS

by Joseph Marty

The rice growing regions in the Louisiana Chenier Plain and Texas Mid-Coast provide critical food resources for waterfowl and other waterbirds. From autumn through winter annually, millions of these birds migrate from breeding grounds to these historic winter and migration stopovers in south Louisiana and Texas. Once vast tall-grass prairies, the LCP and TMC were transformed by agriculture during the 20th century. Waste rice, not harvested by combines, and seeds of natural grasses and other vegetation provide important foods for waterfowl after migration and throughout winter. A common spectacle is large flocks of ducks, geese, and other birds foraging or loafing in muddy, shallowly flooded rice fields and natural wetlands.

Rice agriculture is an important main-stay of south Louisiana, Texas, and the Lower Mississippi Alluvial Valley in Arkansas, Mississippi, and Louisiana. Because of the significance of rice agriculture to waterfowl and other birds, researchers at Mississippi State University investigated dynamics of waste rice in the MAV in the 1990s and 2000s. They found an alarming decrease in waste rice during fall and after harvest, largely because of the typical early September harvest and subsequent deterioration of seeds amid warm, humid autumn temperatures. This information has proved vital for planning and implementing habitat conservation in the MAV, but similar studies have not conducted in south Louisiana and Texas. The need to study rice and other seed abundance and dynamics in the LCP and TMC is relevant because of the prevalence of ratoon rice (second rice crops harvested in late fall) in these regions and different agricultural practices, such as crawfish farming in idled and active rice fields. Given this lack of knowledge for Louisiana and Texas, the Gulf Coast Joint Venture of the North American Waterfowl Management Plan and Mississippi State University scientists are conducting this research for conservation planning and delivery.

Unlike in the MAV, rice fields generally remain idled in south Louisiana and Texas after a year of rice production. The timing of drainage of water from rice fields in late winter, and use of other techniques, such as disking or herbicide applications in spring or summer, can influence plant communities in idle fields during the subsequent growing season. The fallow fields may be rich with natural grass and sedge seeds and tubers used by waterfowl when fields flood. To estimate food abundance in active and idled fields, soil cores were obtained from 50 rice-production and 50 idled fields in areas important to planning by the Joint Venture across both states.

Joe Marty

The research has found an overall increase in rice and moist-soil seed abundance by 25 percent between the first harvest in August and the ratoon harvest in November. This is opposite the findings in the Mississippi Alluvial Valley where there was a decline in waste rice during fall. In the LCP, the greatest abundance of waste rice and natural seeds (988 lb/ac) was found in ratoon rice fields left un-harvested in November 2010; whereas, the greatest abundance of volunteer rice and natural seeds (533 lb/ac) in the TMC was found in idle fields with standing vegetation. On average, more than five times more rice in Louisiana and Texas were found during November than in the MAV at the same time. The ratoon crops in the LCP and TMC likely explain much of the difference between the Louisiana-Texas and MAV regions. In addition, there were no significant differences detected in seed abundances in either August or November samples between idled rice fields with standing vegetation and those that had been disked.

Preliminary results suggest that waste rice and natural seed abundances in autumn are significantly greater in south Louisiana and Texas than in the MAV. Ratoon rice production increases the abundance of waste rice during autumn because of the additional seed missed by combines. The results of this research will greatly facilitate conservation planning and development of models to estimate carrying capacity of these lands for migrating and wintering waterfowl.

James Callicutt and Dr. Brian Davis

ABSTRACTS

WATERBIRDS AND THEIR FOOD RESOURCES IN GULF COASTAL PRAIRIE RICELANDS

by David Fishman

Sometimes catastrophes are catalysts for conservation. This simile applies to the circumstances surrounding the Deepwater Horizon oil spill which occurred in the Gulf of Mexico in April 2010. Development and implementation of conservation programs geared toward creating and managing inland habitat for migratory waterbirds have been acknowledged as priorities for decades. The collapse of the Deepwater Horizon oil rig provided further justification to mobilize a gallant conservation initiative. Soon after the well was sealed, the USDA Natural Resource Conservation Service implemented the Migratory Bird Habitat Initiative with a primary goal to mitigate loss of habitat for migratory birds in the Gulf by providing inland wetlands. Similar to the Farm Bill conservation programs, NRCS's MBHI provided financial incentives to landowners to implement various management practices to create wetlands in eight states and make associated foods available in mainland habitats away from sites possibly impacted by the oil spill. Most practices involved flooding sites to various water depths at specified times during the migratory season, thus providing critical wetlands for countless shore- and other waterbirds.

Rice agriculture constitutes an important economy in the Gulf Coastal Prairies of Louisiana and Texas, also a continentally important region for migrating and wintering waterfowl and other birds. The pre-existing water-management infrastructures associated with rice fields makes these systems important potential habitats for conservation programs, such as the MBHI. For example, over 600,000 acres of ricelands were enrolled in MBHI in Louisiana alone. Furthermore, unlike rice agriculture in more northern rice-growing states (Arkansas, Mississippi, Missouri), producers in Louisiana and Texas often idle rice fields after a year of production to conserve soil and water. These fallow fields naturally produce diverse native grass-sedge communities (moist-soil plants) and thus provide important natural wetlands when flooded.

One component of this research is to link the MBHI management practices in Louisiana and Texas rice fields to bird use and associated potential foods. Based on current surveys, a major factor determining use of rice fields is the presence of water. For example, the mean number of birds observed in flooded fields was almost 17-fold that of dry fields. While no major differences in the numbers of birds using active and idle rice fields were detected, there is compelling evidence suggesting the two types of fields support different bird communities. Flooded rice-production fields tend to be used by ducks, geese, and waders; whereas, temporarily idled and flooded fields with sparse vegetation attract a variety of shorebirds, waders, and raptors.

While this research is in its preliminary stages, an important conclusion has already emerged. The MBHI is providing important inland habitat for

migratory waterbirds especially during times of catastrophes, such as the Gulf oil spill, and severe drought across the Gulf Coastal Prairies since 2010. Additionally, the research has demonstrated that waste rice and natural seeds in these systems are abundant and several times greater, on average, than amounts found in harvested rice fields in the Lower Mississippi Alluvial Valley. However, without ensuring proper water management, there is no guarantee these food resources are available to birds. When complete, it is anticipated this research will demonstrate the importance of conservation programs like MBHI and stimulate federal support for long-term provision of technical and managerial incentives for private landowners who provide habitat for migratory birds and other wildlife on working landscapes. Finally, this study will provide data on abundance of rice and natural seeds in managed rice and idled fields which will guide conservation planning and implementation in the Gulf Coastal Prairies of Louisiana and Texas.

SHOREBIRD AND WATERBIRD USE OF WETLANDS AND AQUACULTURE PONDS IN THE MISSISSIPPI ALLUVIAL VALLEY AND GULF COAST REGIONS

by Justyn Foth

Before the 20th century, most of the Mississippi Alluvial Valley was covered by bottomland hardwood forests. Most of it has been converted for agricultural, aquaculture, and other land uses which have provided new stop-over habitats for migrating shorebirds and other waterbirds. Historically, shorebirds likely by-passed the MAV for the Gulf Coast or remained within riverine wetlands on exposed mudflats and sandbars. Very little is currently known about shorebird use of new MAV habitats. The objectives of this research are to estimate species composition and relative abundance of migrating shorebirds and other waterbirds in aquaculture ponds and associated wetlands in the MAV and Gulf Coast regions from July-October, a primary migration period for shorebirds. This study will also estimate invertebrate food resources for migrating shorebirds in the MAV; use stable carbon and nitrogen analysis of shorebird tissues and soil to determine possible migratory connectivity among MAV and Gulf Coast habitats; and assess migratory connectivity and stopover wetland use from stable isotope analysis of biological material (feather tissue), soil, and invertebrates across the MAV. The data will allow scientists to evaluate accumulation of compound-specific material in shorebird tissue possibly derived from the Deep Water Horizon oil spill. Shorebird and other surveys began in summer-fall 2011 and will continue until 2013. Results from this study will provide the Natural Resources Conservation Service and other conservation agencies/organization with data and information to guide shorebird habitat conservation efforts in the MAV and along the Gulf Coast.

ABSTRACTS

HABITAT SELECTION AND SURVIVAL OF FEMALE AMERICAN BLACK DUCKS IN TENNESSEE

by Kira Newcomb

Surveys have revealed that American black duck (*Anas rubripes*) populations have declined throughout their range since the 1950s, especially the mid-continent population that uses the Mississippi Flyway. Loss of habitat and competition and hybridization with mallards (*A. platyrhynchos*) have been suggested as factors contributing to the duck's decline. The Tennessee and Cross Creeks National Wildlife Refuges in Tennessee and Kentucky are primary wintering areas for mid-continent black ducks. To understand habitat selection and habitat-related survival of black ducks at these refuges, 64 female black ducks were marked with radio transmitters on the Duck River Unit in winter 2010-2011. From December 2010-March 2011, radio-marked ducks were located 1,345 times in moist soil (44.7%), open water (33.5%), forested/scrub-shrub (14.0%), agriculture (6.5%), and other (1.2%) wetlands. Females were most frequently located during daylight hours in open water areas (41.7%) and in moist soil wetlands during night (59.2%). Nine mortalities were detected, with avian predation suspected as the primary cause of death. All surviving females departed study areas by mid-March. Scientists will continue and expand the existing project by studying radio-marked female mallards and black ducks at TNWR during winter 2011-2012. This study will provide information to guide conservation and management of wetland complexes for black ducks and mallards relative to where both species co-exist and survive winter.

WATERBIRD USE OF MISSISSIPPI ALLUVIAL VALLEY PRIVATE LANDS ENROLLED IN THE NATURAL RESOURCES CONSERVATION SERVICE'S MIGRATORY BIRD HABITAT INITIATIVE

by Matthew Weegman

The USDA's Natural Resources Conservation Service established the Migratory Bird Habitat Initiative in summer 2010 in response to the Deepwater Horizon oil spill in the Gulf of Mexico. The goal of MBHI was to create and restore wetlands inland away from the oil spill and thus provide habitat for migrating shorebirds, waterfowl, and other waterbirds. Aerial and/or ground surveys of waterbirds on MBHI lands in the Mississippi Alluvial Valley of Mississippi and Louisiana have been conducted. Soil core samples also have been obtained to estimate potential availability of waterbird food resources in wetlands. For aerial surveys, 54 MBHI wetlands enrolled in

conservation programs in western Mississippi were randomly selected. Twenty-six wetlands enrolled in the Wetland Reserve Program and 28 wetlands enrollled in either the Wetland Habitat Incentives Program or the Environmental Quality Incentives Program were surveyed. Preliminary results from winter 2010-2011 aerial surveys indicated that waterfowl use of MBHI wetlands was, on average, twice greater than that on passively managed WRP wetlands surveyed in winters 2007-2009. Ground surveys of waterbirds on actively and passively managed WRP wetlands in Mississippi and Louisiana also were began in August 2011. Preliminary data from these surveys reveal, on average, five times more birds and twice the number of species observed on MBHI than passively managed wetlands in Mississippi. The results are consistent with earlier research in the MAV and other regions, indicating greater abundances and species diversities of waterbirds using actively managed wetlands compared to those that are passively or not managed. This study will conclude in 2012 and will result in science-based management strategies for private and public wetlands in the MAV and southeastern United States.

ANNUAL ECOLOGY OF MOTTLED DUCKS IN COASTAL SOUTH CAROLINA

by James Shipes

Mottled ducks (*Anas fulvigula*) are native to Texas, Louisiana, Florida, and parts of Mexico but were introduced on few public and private lands in South Carolina in the late 1970s. Today, the species appears widespread in coastal South Carolina and is popular with waterfowl hunters. Twenty-five nests of female mottled ducks were found in managed impoundments along the southwest coast of South Carolina. Eighty-eight percent of the nests were initiated between April 8 and May 20, 2011, while a few nests also were initiated in March and June. Apparent nest success was 32%, and average clutch size was 7.8 eggs. During the second year of the study (August 2011), scientists surgically implanted transmitters in 36 female mottled ducks. Scientists will replicate the study again in 2011-2012. This study will provide important results on habitat use and survival to guide wetland management and conservation for mottled ducks in coastal South Carolina.

ABSTRACTS

WINTER WATERBIRD USE AND FOOD RESOURCES IN AQUACULTURE PONDS

by James Feaga

The Mississippi Alluvial Valley is a major wintering area for waterfowl and other waterbirds in North America. Ninety-seven percent of all commercial catfish production occurs within the MAV in western Mississippi. Catfish ponds are well known by farmers, biologists, and waterfowl hunters for their use by wintering ducks and waterbirds. Initial research of waterfowl use of Mississippi catfish ponds in the 1980s revealed that 50,000–150,000 ducks used these ponds, when over 120,000 acres of ponds were in production. Less than 60,000 acres of active catfish ponds remain in western Mississippi, and tens of thousands of acres of ponds have been idled for economic reasons. An unknown proportion of the idled ponds have been managed recently for waterfowl, shorebirds, and other waterbirds to provide waterfowl hunting opportunities and habitat for non-game waterbirds inland away from the tragic 2010 Gulf oil spill. The objectives of this research is to estimate waterbird abundance and diversity on active production and idled catfish ponds. Present use of aquaculture ponds will be compared with historical waterfowl use of ponds. An important component of this project will be to estimate moist-soil seed abundance on idled catfish ponds, as well as invertebrate abundances and diversity in production catfish ponds as they relate to water depth, pH, and soil types. Finally, this study will compare food densities between active production and idled catfish ponds. Results from this study will provide guidance for management of active and idled catfish ponds to increase waterfowl and waterbird abundance and diversity on these ponds.

HABITAT USE AND SURVIVAL OF RADIO-MARKED OF MALLARDS IN THE MISSISSIPPI DELTA

by Joseph Lancaster

The Mississippi Department of Wildlife, Fisheries, and Parks manage several Wildlife Management Areas for public waterfowl hunting. Understanding how mallards use the WMAs and surrounding lands spatially and temporally in relation to hunting and other factors is needed to guide management of habitat and hunting. Fifty-two female mallards were radio-marked on Howard Miller, Mahannah, and Muscadine WMAs and monitored from November 2010 to March 2011. From 1,781 diurnal locations, radio-marked mallards most often used forested wetlands (46.1%), followed by moist-soil (20.3%), flooded soybean (13.9%), rice (9.7%), permanent water (6.9%), corn/grain sorghum (2.6%), and other crop lands (0.5%). The presence or absence of radio-marked individuals at Muscadine WMA were

recorded using a centrally located remote receiver. Preliminary analyses revealed greatest presence by birds occurred during night time hours, regardless of hunted or non-hunted days. There were 18 mortalities of radio-marked ducks (35%) during the 2010-2011 field season, but 34 females survived winter and apparently migrated. The study will be continued with an attempt to radio-mark 100 female mallards during winter 2011-2012. This work will provide important information about habitat use, movements, and survival of wintering mallards in the Mississippi Delta, as this study represents the first of its kind in this region.

CONGRATULATIONS

CONGRATULATIONS TO THE GRADUATES OF THE FALL 2010 AND SPRING 2011 SEMESTERS!

Heath Hagy

Ph.D. (December 2010). In March 2012, Dr. Hagy assumes the position of Director, Frank C. Bellrose Waterfowl Research Laboratory, Illinois Natural History Survey and the University of Illinois (Champaign-Urbana).

Alan Leach

M.S. (May 2011). Currently a Ph.D. student at the University of Nevada (Reno) studying population ecology of black brant in Alaska.

Elizabeth St. James

M.S. (May 2011). Currently a Ph.D. student at the University of Illinois (Champagne, Urbana) studying attitudes of waterfowl hunters in the Mississippi Flyway.

PHOTO BY JOSH STAFFORD

AWARDS

Amy Alford

James C. Kennedy Ph.D Student Fellow (1 July 2011–30 June 2012).

John E. Skinner Memorial Travel Award to present at the 2011 American Fisheries Society annual meeting.

Richard M. Kaminski

Outstanding Peer-Review Publication, 2011 Mississippi Chapter of The Wildlife Society Annual Meeting for "Grado, S.C., K.M. Hunt, C.P. Hutt, X.T. Santos, and R.M. Kaminski. 2010 Economic impacts of waterfowl hunting in Mississippi derived from a state-based mail survey. Human Dimensions of Wildlife 16:100–113."

Kira Newcomb

2nd place, oral presentation winner for "Habitat Use and Survival of Female American Black Ducks," Southeastern Natural Resources Graduate Student Symposium.

Jacob Straub

1st Place, oral presentation winner for "Red Oak Acorn Dynamics in Bottomland Hardwood Forests in the Mississippi River Alluvial Valley," Southeastern Natural Resources Graduate Student Symposium.

Best Student Paper, 2011 Mississippi Chapter of The Wildlife Society Annual Meeting for "Red Oak Acorn Dynamics in Bottomland Hardwood Forests in the Lower Mississippi River Alluvial Valley."

Mitch Weegman

Travel Award, 12th North American Arctic Goose Conference.

PUBLICATIONS

Callicutt, J.T., H.M. Hagy, M.L. Schummer. 2011. The food preference paradigm: A review of fall-winter food use by North American dabbling ducks (1900-2009). Journal of Fish and Wildlife Management 2:29-40. 2011

Foster, M.A., M.J. Gray, C.A. Harper, R.M. Kaminski. 2011. Post-harvest fates of agricultural seeds in Tennessee croplands. Proceedings of the Annual Conference of Southeastern Association of Fish and Wildlife Agencies 64:81-87.

Foth, J. R. 2011. Aquatic invertebrate biomass and community composition in greentree reservoirs and naturally flooded forests in the Mississippi Alluvial Valley and Interior Flatwoods. Thesis, Mississippi State University.

Grado, S. C., K. M Hunt, C. P. Hutt, X. Santos, R. M. Kaminski. 2011. Economic impacts of waterfowl hunting in Mississippi derived from a state-based mail survey. Human Dimensions of Wildlife 16:100-113

Hagy, H. M., J. N. Straub, and R. M. Kaminski. 2011. Estimation and correction of seed recovery bias from moist-soil cores. Journal of Wildlife Management 75:959-966.

Leach, A. G. 2011. Red oak acorn production, mass, and gross energy dynamics in the Mississippi Alluvial Valley, Thesis, Mississippi State University.

Schummer, M. L., H. M. Hagy, K. S. Fleming, J. Cheshier, and J. T. Callicutt. In Press. A guide to moist-soil wetland plants of the Mississippi Alluvial Valley. University Press of Mississippi, Jackson, Mississippi.

Schummer, M. L., R. B. Allen, G. Wang. 2011. Sizes and long-term trends of ducks broods in Maine, 1955-2007. Northeastern Naturalist 18:73-86.

St. James, E. A. 2011. Effect of hunting frequency on duck abundance, harvest, and hunt quality in Mississippi. Thesis, Mississippi State University.

Wiseman, A.J., R.M. Kaminski, S.K. Riffell, K.J. Reinecke, E.J. Larson. 2011. Ratoon grain sorghum and other seeds for waterfowl in sorghum croplands. Proceedings of the Annual Conference of Southeastern Association of Fish and Wildlife Agencies 64:106-111.

PRESENTATIONS

Alford, A.B., R.M. Kaminski, R. Kroger. 2011. Water quality of effluent from managed wetlands in an agriculture landscape. Poster Presentation. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

Davis, J.B., J.R. Foth, R.M. Kaminski. 2011. Ecological assessment of the Natural Resources Conservation Service's Migratory Bird Habitat Initiative (MBHI). Poster presented at The Wildlife Society Annual Meeting, Hawaii.

Davis, J.B., R.M. Kaminski. 2011. A symposium: Ecology and conservation of North American waterfowl. Invited presentation to SEAFWA State Administrators, 2011 SEAFWA Annual Conference, Nashville, Tennessee.

Davis, J.B., R.M. Kaminski. 2011. Ecology and conservation of North American Waterfowl. Poster presented at The Wildlife Society Annual Meeting, Hawaii.

Feaga, J.S, M. Brittingham. 2010. Avian use of restored wetlands in the Ridge and Valley Region of Pennsylvania. Mississippi Chapter of The Wildlife Society Annual Meeting, Louisville, MS.

Foth, J.R., R.M. Kaminski, J.N. Straub, T. Leininger. 2011. Winter aquatic macroinvertebrate communities in Mississippi River Alluvial Valley forested wetlands. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

Kaminski, R.M., et al. 2011. Combating the Gulf oil spill with conservation: The Migratory Bird Habitat Initiative. Invited presentation, Soil and Water Conservation Society Annual Meeting, Washington, D.C. (18 July 2011).

Kaminski, R.M., J.B. Davis. 2011. Ecological assessment of the Migratory Bird Habitat Initiative. Invited presentation to joint meeting of Wildlife and Wetlands Subcommittee, 2011 SEAFWA Annual Conference, Nashville, Tennessee.

Kaminski, R.M., J.B. Davis. 2011. Ecology and conservation of North American Waterfowl. Poster presented at the Southeastern Association of Fish and Wildlife Agencies Conference, Nashville, TN.

Lancaster, J.D., J.B. Davis, R.M. Kaminski, A.D. Afton, E. Penny. 2011. Habitat selection and survival of radio-marked mallards on hunted and sanctuary wetlands in the Mississippi Alluvial Valley. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

Lancaster, J.D., J.B. Davis, R.M. Kaminski, A.D. Afton, E. Penny. 2011. WMA use, habitat use, and survival of radio-marked mallards in the Mississippi Delta. Mississippi Chapter of The Wildlife Society Annual Meeting, Louisville, MS.

Lancaster, J.D., J.B. Davis, R.M. Kaminski. 2011. Habitat selection, home range, and survival of mallards radio-marked on Wildlife Management Areas in the Mississippi Alluvial Valley. 2011 Research Summit, Mississippi Department of Wildlife, Fisheries and Parks and Department of Wildlife, Fisheries and Aquaculture, Mississippi State University.

Marty, J.M., J.B. Davis, R.M. Kaminski, M. Brasher, G. Wang, J. Callicut. 2011. Waste rice moist-soil seed, and waterbird abundances in rice production systems in Louisiana and Texas. Southeastern Natural Resources Graduate Symposium, Starkville, MS.

Marty, J.M., J.B. Davis, R.M., Kaminski, G. Wang, M.G. Brasher, J. Callicut. 2011. Waste rice, moist-soil seed, and waterbird abundances in rice production systems in Louisiana and Texas. Poster Presentation, SEAFWA Annual Conference, Nashville, TN.

Marty, J.M., J.B. Davis, R.M., Kaminski, G. Wang, M.G. Brasher, J. Callicut. 2011. Waste rice, moist-soil seed, and waterbird abundances in rice production systems in Louisiana and Texas. Poster Presentation, The Mississippi Chapter of The Wildlife Society Meeting, Louisville, MS.

Newcomb, K C., J.B. Davis, M J. Gray, R.M. Kaminski. 2011. Habitat selection and survival of female American black ducks. Poster presented at the Mississippi Chapter of the Wildlife Society Annual Meeting. Lake Tiak O'Khata, Louisville, MS.

Newcomb, K.C., J.B. Davis, M.J. Gray, R.M. Kaminski. 2011. Habitat selection and survival of female American black ducks. Poster presented at the Southeastern Association of Fish and Wildlife Agencies Conference, Nashville, TN.

Newcomb, K.C., J.B. Davis. 2011. Habitat use and survival of female American black ducks. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

St. James, E.A., M L. Schummer, R.M. Kaminski, E.J. Penny, L.W. Burger, K.M. Hunt. 2011. Effect of hunting frequency on duck abundance, harvest, and hunt quality in Mississippi. Midwest Fish and Wildlife Conference, Des Monies, Iowa.

Straub, J.N., R.M. Kaminski, A. Leach, A.W. Ezell, T. Leininger. 2011. Red oak acorn dynamics in bottomland hardwood forests in the Mississippi river alluvial valley. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

Straub, J.N., R.M. Kaminski, A.G. Leach, A.W. Ezell, T.D. Leininger and J. Tirpak. 2011. Red oak acorn dynamics in bottomland hardwood forests in the lower Mississippi River alluvial valley. Poster presented at Conserving the future: wildlife refuges and the next generation. Madison, WI.

Weegman, M.D., T. Fox, I. Francis, L. Griffin, C. Mitchell, H. Thomas, D. Stroud. 2011. Breeding ecology of Canada geese nesting in West Greenland. Poster Presentation. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

PRESENTATIONS

Weegman, M.D., T. Fox, I. Francis, L. Griffin, C. Mitchell, H. Thomas, D. Stroud. 2011. Breeding ecology of Canada geese nesting in West Greenland. 12th North American Arctic Goose Conference, Portland, OR.

Weegman, M.M., R.M. Kaminski, J.B. Davis, K. Nelms. 2011. Waterbird use of Mississippi Alluvial Valley private lands enrolled in the migratory bird habitat initiative. Southeastern Natural Resources Graduate Student Symposium, Starkville, MS.

Weegman, M.M., R.M. Kaminski, J.B. Davis, K. Nelms. 2011. Waterbird use of Mississippi Alluvial Valley private lands enrolled in the Migratory Bird Habitat Initiative. Mississippi Chapter of The Wildlife Society Annual Meeting, Louisville, MS.

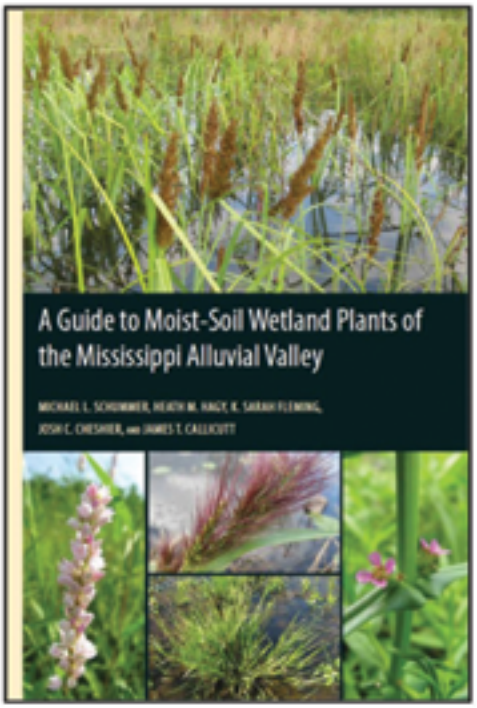
Weegman, M.M., R.M. Kaminski, J.B. Davis. 2011. Waterbird use of Mississippi Alluvial Valley private lands enrolled in the Migratory Bird Habitat Initiative. 2011 Research Summit, Mississippi Department of Wildlife, Fisheries and Parks and Department of Wildlife, Fisheries and Aquaculture, Mississippi State University.

TEAM DUCK PRESENTS

A Guide to Moist-soil Wetland Plants of the Mississippi Alluvial Valley

Michael L. Schummer, Heath M. Hagy, K. Sarah Fleming, Joshua C. Cheshier, and James T. Callicutt

An illustrated identification guide to 100+ moist-soil wetland plants that grow in the Mississippi Alluvial Valley.



Moist-soil wetlands are seasonally flooded areas that produce early-succession plant communities of grasses, sedges and other herbaceous plants. Moist-soil wetland plants provide food and cover for a diversity of wildlife species, including waterfowl and other waterbirds. Thus, conservation and management of moist-soil plants has become a major component of wildlife conservation efforts in the Mississippi Alluvial Valley and elsewhere in North America. The authors combined their extensive experience working in managed and unmanaged wetlands from southern Missouri to southern Louisiana to produce this beautifully-illustrated identification guide.

A detailed, yet user friendly field guide to identify moist-soil wetland plants of the Mississippi Alluvial Valley has not been available until now.

Michael L. Schummer of Allegany, New York, is a Scientist with Long Point Waterfowl, a nonprofit organization dedicated to the study and conservation of waterfowl and wetlands throughout the lower Great Lakes. **Heath M. Hagy of Frederick, Oklahoma,** is a postdoctoral Research Associate in the Department of Forestry, Wildlife and Fisheries, at the University of Tennessee-Knoxville. **K. Sarah Fleming of North Bay, Ontario** is a Regional Biologist with Ducks Unlimited, Inc. **Joshua C. Cheshier of Seattle, Washington,** is a Directional Driller with Halliburton, Sperry Drilling Services. **James T. Callicutt of New Albany, Mississippi,** is a Waterfowl Biologist with Mississippi Department of Wildlife, Fisheries, and Parks.

Management to encourage growth of moist-soil wetland plants is a common conservation strategy to increase food and cover for wildlife. Thus, managers must be able to identify moist-soil plants to meet their wildlife conservation goals.

Landowners, scientists, wildlife biologists, and students alike will welcome this useful resource which includes 600 detailed color photographs of plants, images of seeds and tubers, and other helpful information to aid in identification. The book includes subsections of major plant groups occurring in moist-soil wetlands including Aquatics, Grasses, Broadleaves, Sedges and Rushes, Trees and Shrubs, Vines, and Agricultural Crops.

Proceeds from sales of this book support wetlands research conducted through the James C. Kennedy Endowed Chair in Waterfowl and Wetlands Conservation at Mississippi State University.

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