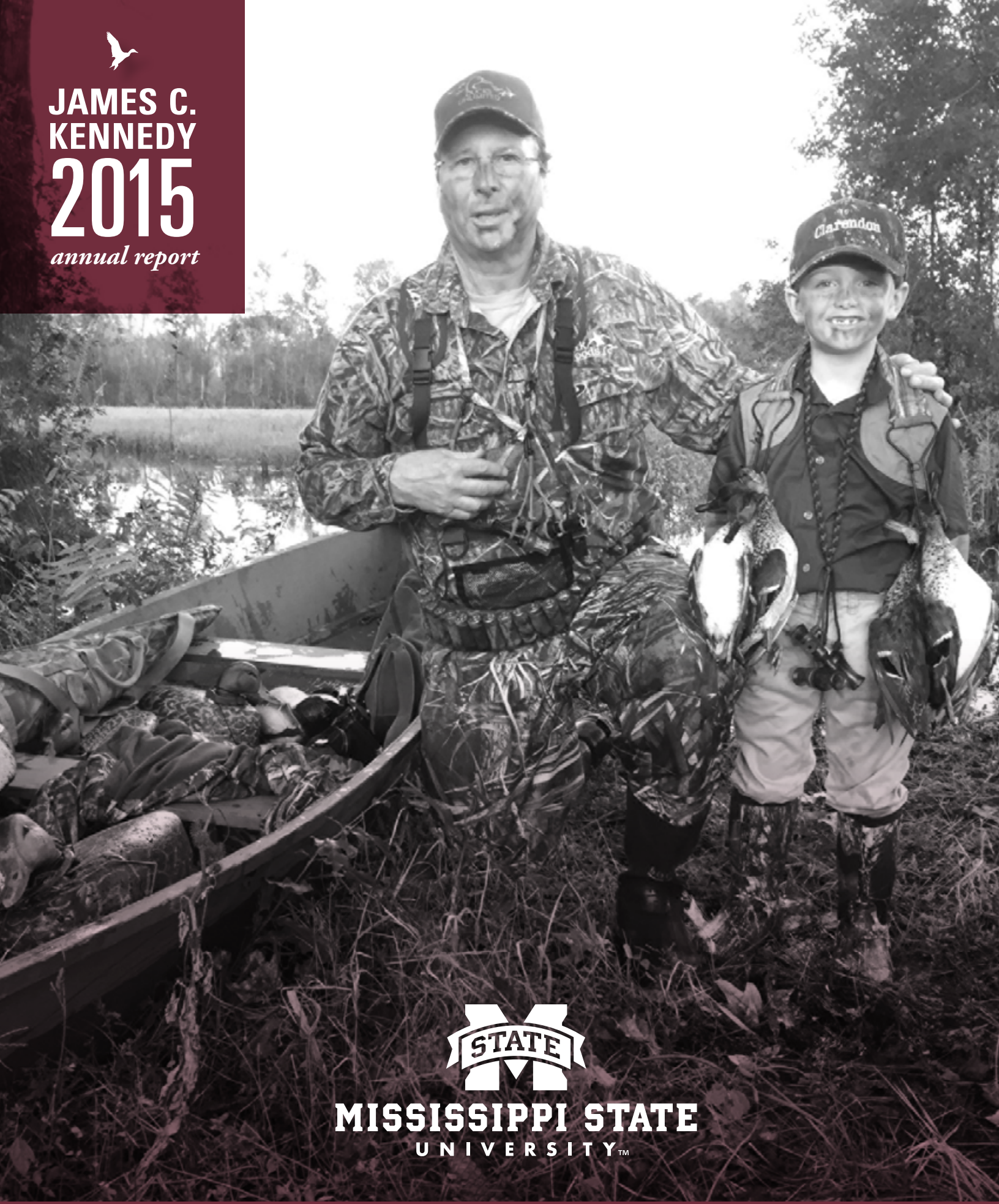
JAMES C. KENNEDY 2015

annual report



MISSISSIPPI STATE UNIVERSITY™

COLLEGE OF FOREST RESOURCES | FOREST AND WILDLIFE RESEARCH CENTER

TABLE *of* CONTENTS

MY MAROON *Memories*

I am titling this editorial, my maroon memories, because I retired in May 2015 from Mississippi State University (MSU) after a wonderful, 33-year career in the Department of Wildlife, Fisheries, Aquaculture and College of Forest Resources. My wife, Loretta, and I made the correct decision in 1982 to migrate with our young family from Manitoba, Canada to Mississippi and MSU. Who would have thought that journey would transform into awesome careers for both of us, working for the State of Mississippi and raising our children, Matt and Shannon, in Starkville. We will be forever grateful to Dr. Dale Arner, who believed in and hired me, and his wife of over seven decades, Julia, for creating a family environment for legions of faculty and students of the department. I am also indebted to Drs. Lyle Nauman, Charley White, Harold Prince, and Bruce Batt, who opened "waterfowl doors" and mentored me during my undergraduate and graduate student years at University of Wisconsin-Stevens Point and Michigan State University, respectively. They launched me professionally, and we continue to be colleagues and friends.

I am forever grateful and indebted to Mr. Jim Kennedy, whose conservation ethic, understanding of the recent decline in university-based waterfowl and wetlands programs in North America, and generosity created the James C. Kennedy Endowed Chair in Waterfowl and Wetlands Conservation at MSU. This gift perpetually sustains the waterfowl and wetlands program at MSU. The chair is the first in the College and one of the largest endowments at MSU. Mr. Kennedy's vision and generosity will continue to impact waterfowl and wetlands science and conservation in North America.

Drs. George Hopper and Bruce Leopold served as Dean of the College and Department Head, respectively, for nearly the last ten years of my tenure at MSU. I sincerely thank them for appointing me as Associate Dean of the College and Kennedy Chair and for their continuing professional and personal support and friendship. I learned a great deal from these gentleman and deeply appreciate the independence they allowed me in academic and administrative management of College and Chair affairs and our continuing friendship. Additionally, I thank my Department, College, and MSU colleagues for all their contributions and collegiality, making MSU a leading land-grant university in natural resources and for being great professionals in teaching, research, and service. The waterfowl and wetlands research and outreach program was enabled and productive owing to millions of dollars of support from public and private conservation sponsors and philanthropic individuals, too numerous to account here. I thank all of you for your fiscal and in-kind generosity which permitted student-faculty driven research and conservation for decades and into continuance.

I will never forget the more than 40 graduate students and hundreds of undergraduates who I had the privilege to teach, mentor, and befriend over the decades. I'm proud of them and deeply appreciate the leadership roles they have attained in science and conservation of waterfowl and other wildlife acros North America. Moreover, I thank my waterfowl and wildlife colleagues across North America and Europe. Together, we will increasingly continue to understand waterfowl and their dynamic ways in order to conserve these birds and their habitats globally.

The future of the Kennedy waterfowl and wetlands program is in most competent hands with Dr. Brian Davis. He understands waterfowl, MSU, being an alumnus, and our profession. Dr. Davis is a bright, tireless worker who is known and recognized internationally in the waterfowl community. I am most proud that one of my former students joined the faculty, is the Department's waterfowl and wetlands specialist, and that we will continue our collaboration.

Consistent with Mr. Kennedy's vision to establish endowed waterfowl and wetlands programs at major universities, we are indebted for his recent endowment of the James C. Kennedy Waterfowl and Wetlands Conservation Center at Clemson University's Belle W. Baruch Institute of Coastal Ecology and Forest Science near Georgetown, South Carolina. I began work as the Center's first Director in June 2015 and look forward to Loretta's and my new life in the Lowcountry of South Carolina.

I invite you to peruse the remainder of this annual report to learn of "Team Duck's" 2015 progress.

Richard M. Kaminski, Ph.D.
James C. Kennedy Chair of Waterfowl and Wetlands Conservation (2008-2015)

MSU

Evaluates Migratory Bird Habitat Initiative

Preliminary results of a Mississippi State University wildlife study show that a federal program to protect birds after the 2010 Gulf of Mexico oil spill has had widespread ecological, environmental, and economic benefits in the Southeast.

Researchers in the MSU Forest and Wildlife Research Center released a study evaluating the Migratory Bird Habitat Initiative, or MBHI. The program was created by the United States Department of Agriculture's Natural Resources Conservation Service, or NRCS, in response to the Deepwater Horizon oil spill to provide alternate wetlands for migratory and resident waterbirds inland away from the oil spill area. Certain phases of the study remain ongoing.

"When the oil spill occurred, no one knew what was going to happen to marshes along the coast," said Charles Rewa, a biologist with the NRCS Resource Assessment Division. "An ad hoc interagency working group of waterbird experts had been previously focusing on longstanding habitat issues emerging in the Mississippi Alluvial Valley, or MAV, and along the coasts of Louisiana and Texas."

The group included personnel from the U.S. Fish and Wildlife Service, the Lower Mississippi Valley and Gulf Coast Joint Ventures of the North American Waterfowl Management Plan, Ducks Unlimited, Inc., the National Fish and Wildlife Foundation, the NRCS, the U.S. Geological Survey (USGS), and state wildlife and natural resources agencies.

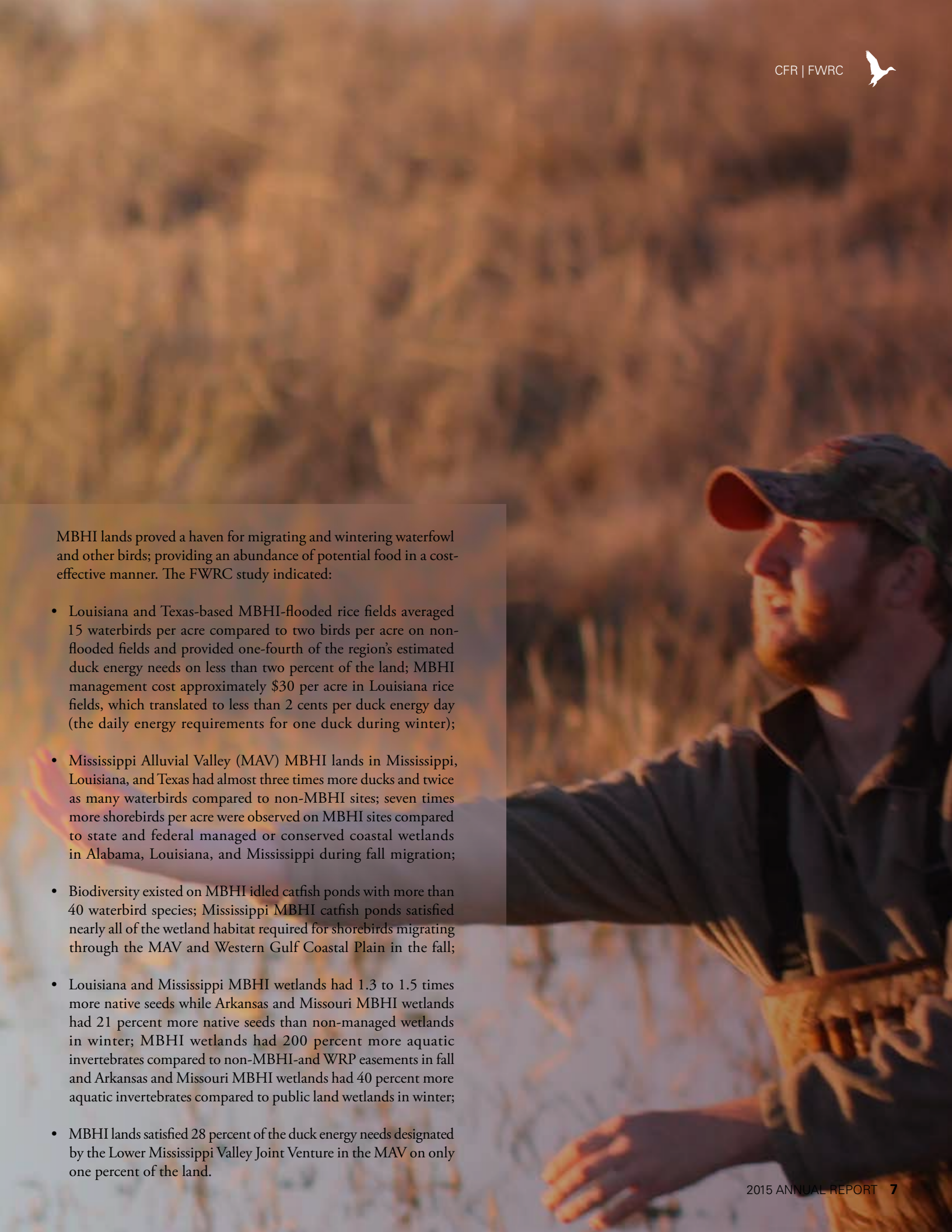
"The oil spill served as a catalyst to respond to some of these long-term habitat issues that had been occurring slowly over several decades while providing alternative habitats inland for millions of migrating and resident birds soon after the spill," Rewa said.

The NRCS allocated $40 million to landowners in eight states to manage 470,000 acres of habitat for one to three years. The NRCS commissioned the MSU Forest and Wildlife Research Center to lead an independent evaluation of MBHI. Richard Kaminski, former James C. Kennedy Endowed Chair in Waterfowl and Wetlands Conservation, served as the project's principal investigator, together with J. Brian Davis, Francisco Vilella, Guiming Wang, and Lisa Webb as co-investigators and seven graduate students from MSU, Arkansas Tech University, and the University of Missouri.

"Catastrophes like the oil spill can have lasting impacts on waterfowl and waterbird populations," Kaminski said. "The NRCS acted swiftly to implement MBHI to provide alternative habitats for waterbirds in hopes of reducing that impact."

The scientists studied waterbird species, populations, available food, and cost-effectiveness on MBHI land that included production and idled rice fields, idled catfish ponds, and natural wetlands enrolled in the Wetlands Reserve Program, or WRP.

Researchers estimated how many and which species of waterbirds were using the habitats, how much food was available for the birds, and cost-effectiveness of the program in terms of potential food energy available for maintaining birds during migration and wintering periods.



MBHI lands proved a haven for migrating and wintering waterfowl and other birds; providing an abundance of potential food in a cost-effective manner. The FWRC study indicated:

- Louisiana and Texas-based MBHI-flooded rice fields averaged 15 waterbirds per acre compared to two birds per acre on non-flooded fields and provided one-fourth of the region's estimated duck energy needs on less than two percent of the land; MBHI management cost approximately $30 per acre in Louisiana rice fields, which translated to less than 2 cents per duck energy day (the daily energy requirements for one duck during winter);

- Mississippi Alluvial Valley (MAV) MBHI lands in Mississippi, Louisiana, and Texas had almost three times more ducks and twice as many waterbirds compared to non-MBHI sites; seven times more shorebirds per acre were observed on MBHI sites compared to state and federal managed or conserved coastal wetlands in Alabama, Louisiana, and Mississippi during fall migration;

- Biodiversity existed on MBHI idled catfish ponds with more than 40 waterbird species; Mississippi MBHI catfish ponds satisfied nearly all of the wetland habitat required for shorebirds migrating through the MAV and Western Gulf Coastal Plain in the fall;

- Louisiana and Mississippi MBHI wetlands had 1.3 to 1.5 times more native seeds while Arkansas and Missouri MBHI wetlands had 21 percent more native seeds than non-managed wetlands in winter; MBHI wetlands had 200 percent more aquatic invertebrates compared to non-MBHI-and WRP easements in fall and Arkansas and Missouri MBHI wetlands had 40 percent more aquatic invertebrates compared to public land wetlands in winter;

- MBHI lands satisfied 28 percent of the duck energy needs designated by the Lower Mississippi Valley Joint Venture in the MAV on only one percent of the land.

Student

Abstracts

Nesting Ecology

of Mottled Ducks in Coastal South Carolina

by Molly Kneece & Clay Shipes

Mottled ducks are endemic to western Gulf Coastal (WGC) United States and Mexico, but a separate, genetically distinct subspecies lives in peninsular Florida. Mottled ducks from Texas, Louisiana, and Florida were released in coastal South Carolina from 1975-1983, with the goal of establishing a huntable population in the state. Surveys by the South Carolina Department of Natural Resources (SCDNR) and banding data suggest an expanding population of mottled ducks in South Carolina. Many partners, including SCDNR, the Nemours Wildlife Foundation, Ducks Unlimited (DU), the U.S. Fish and Wildlife Service, private landowners in the Lowcountry of South Carolina, and Drs. Brian Davis, Ernie Wiggers, and Rick Kaminski, have studied mottled ducks in the Ashepoo, Combahee, and Edisto (ACE) Rivers Basin of coastal South Carolina from 2010 to 2014, primarily to understand nesting ecology of the species. In our research, we vigorously beat-out marsh vegetation using long poles in attempts to flush nesting females, and in so doing, ultimately found 72 nests of mottled ducks from spring 2011-2014, all in managed tidal impoundments. We monitored nests approximately every seven days until the clutch of eggs hatched or failed, either being lost to a predator or being abandoned by the female. We combined data on nest survival across all years to maximize sample size and generalizations and examined survival in relation to vegetation height at the nest, whether nests were located on small islands (islets) or levees, how much cover surrounded the nest, salinity levels of wetlands, and whether or not these variables varied by year. What we found was somewhat perplexing. Nest survival was affected by the year of study and there was a negative relationship between nest survival and vegetation height. Overall, nest success across the four years of study was only 12%. Although this seems quite low, the survival rate is within the range for mottled duck nests in other parts of their range. However, mallards require nest success rates greater than15% to sustain populations. The greatest factor influencing low nest success was predation by unknown source(s). We often found eggs or entire clutches missing from the nest bowl, which remained intact with no visible sign of disturbance. We concluded that some type of bird or snake predator carried-off mottled duck eggs without otherwise disturbing the nest bowl. We believe the tall, robust vegetation may have provided perches for avian predators to locate and depredate mottled duck nests. Alternatively, black rat snakes are known to swim and ingest whole eggs, so these reptiles also may have been egg predators. Future research should identify major nest predators and management defenses should be implemented (e.g., over water hen houses near islets). We did not find other factors, including nest location (islets or levees), amount of cover surrounding the nest, or wetland salinity that influenced nest fates. Additionally, future research should investigate other important aspects related to mottled duck populations in South Carolina, including breeding season survival of females, ducklings, and brood survival. Nonetheless, we continue to advocate for protection and management of managed tidal impoundments that remain critical habitats for mottled ducks and other waterbirds in coastal South Carolina.

Survival Rates

of Mottled Ducks Banded in South Carolina

by Joe Lancaster & Molly Kneece

In addition to our studies of nesting mottled ducks in South Carolina, we recently investigated survival rates of leg-banded birds of this population. Leg-banded ducks provide vital information to biologists, particularly birds harvested by hunters. Important information includes breeding, migrating, and winter locations of birds, their age at death, and other valuable population data. Analysis of information from banded and harvested ducks also allows us to examine their harvest rates and overall survival. The South Carolina Department of Natural Resources initiated intensive fall banding of mottled ducks in the Santee Delta and ACE Basin in 2008. We acquired 3,471 banding and 442 harvest records of mottled ducks initially captured and banded during summer wing molt from 2008-2014. We used innovative statistical programs to estimate annual survival and birds' probability of being recovered (shot) by hunters. We examined these factors with respect to the birds' age, either a juvenile or adult (banded greater than one year after hatch), the birds' sex, year of banding, and other relevant factors associated with banding assumptions, such as a band reporting rate and type of leg band. We found that survival of mottled ducks varied by their age and sex, and their probability of being recovered by hunters also varied with these factors. The annual survival of these mottled ducks was greatest for adult males and adult females, with survival rates of about 60% for each sex. For juveniles, females and males had survival rates of 40% and 35%, respectively. The recovery and harvest rates of mottled ducks were greatest for juvenile males, 9% and 13%. These rates were 8% and 11% in adult males, respectively. Recovery and harvest rates for juvenile females was 5% and 7%; and 5% and 6% for adult females. We also found that aluminum bands that contained both a telephone number and web address had slightly greater recovery rates than stainless steel bands only containing the web address, but this difference was not strong. These annual survival results of adult mottled ducks in South Carolina were comparable to adult survival in other regions (47-58%), and exceeded that for mottled ducks in Georgia (35%). Survival of our juvenile females was similar to estimates from the birds' entire range (35-47%), but survival of our juvenile males appears similar to those in Georgia (35%). Recovery rates of South Carolina mottled ducks were similar (6-13%) to those in Florida and the western Gulf Coast, with juvenile males and adult females having greatest and least recovery rates, respectively. Finally, harvest rates of South Carolina mottled ducks are similar to Eastern mallards, which are about 14%. However, unlike mallards, annual survival may affect mottled duck populations beyond breeding season metrics (e.g., nest success) deemed critical for midcontinent mallards. Future research that estimates survival of females, ducklings, and broods will be needed to more fully understand population change in South Carolina mottled ducks.

"Florida Mottled Ducks" by http://www.birdphotos.com

Index of Spent Shot

in Louisiana and Texas Gulf Coast Prairie Riceland

by Joe Marty

Despite the long-term ban on lead-filled shotgun shells for waterfowl hunting, an estimated 2-3% of North American waterfowl die annually from lead poisoning. Lead also is deposited in waterfowl habitats when hunters use lead shot to pursue other game birds such as doves. The Chenier Plain (CP) of Louisiana and Texas and the Texas Mid-Coast (TMC) are popular hunting areas that winter millions of waterfowl and other birds annually. Production and idled ricelands in the CP and TMC provide high energy foods for waterfowl, such as waste rice, natural seeds, tubers, and aquatic invertebrates. Consequently, waterfowl may inadvertently ingest residual lead or non-toxic shot while foraging. We conducted a survey to estimate density of lead and non-toxic shot in ricelands in the CP and TMC. We randomly collected and x-rayed 1,000 soil cores, each core being approximately 10 cm in diameter and depth, that we collected from production (n = 760) and idled ricelands (n = 240) in the CP and TMC in November 2013. We washed soil cores through a series of meshed sieves to recover shot pellets. We imaged the remaining soil biomass using a 600 m A generator x-ray system and computed radiography imaging plates. Using these powerful x-ray images, we detected only a single lead shot pellet from a production rice field in the CP of Louisiana, but no non-toxic pellets were recovered. We believe that x-ray images were effective in detecting lead and non-toxic shot, because we imaged 20 soil cores containing known numbers of lead and non-toxic shot with 100% detection before imaging the 1,000 core samples. We speculate that regular soil tillage incorporates spent shot into the soil, likely rendering it unavailable to foraging waterfowl. Given that spent shot likely exhibits a clumped spatial distribution, our line-transect sampling may have been an imperfect design for estimating shot availability. Nevertheless, our results suggest that lead shot is not a widespread concern for waterfowl foraging in Gulf Coast ricelands.

Waste Rice & Natural Seed

Abundance in Rice Fields in the Gulf Coast Prairies of Louisiana and Texas

by Joe Marty

Commercial rice production and idled ricelands provide important habitats for waterfowl and waterbirds in the Chenier Plain (CP) of Louisiana and Texas and the Texas Mid-Coast (TMC). The spatial and temporal dynamics of waste rice and natural seeds have not been previously estimated in these regions as in other rice growing regions of North America, such as the Lower Mississippi Alluvial Valley (MAV). Additionally, rice culture in the MAV generally does not yield a second (ratoon) crop annually as occurs in the CP and TMC. Hence, abundance estimates of waste rice from the MAV could not be used to estimate the same in Louisiana and Texas.

Additionally, ricelands in the CP and TMC are assumed to provide approximately 42% of the estimated carrying capacity for wintering waterfowl in this region; therefore, precisely identifying the waste rice and natural seed densities are necessary for habitat conservation planning by the Gulf Coast Joint Venture. We developed a strategic sampling survey to estimate waste rice and natural seed densities in production and idled rice fields in the CP and TMC. We collected 8,750 soil cores from production and idled rice fields during August, October, and November 2010-2013. We washed cores through a series of mesh sieves to recover rice and natural seeds. We manually removed rice and natural seeds from samples and dried seeds to constant mass at 87°C before weighing to the nearest 0.0001 g. We used rigorous analytical methods to estimate mean waste rice and natural seed abundance among geographic regions, time-periods, and post-harvest treatments. Analyses of soil cores through 2012 indicated that abundance of waste rice in the CP declined 59% from 525 kilogram per hectare (kg/ha) in August following the first harvest to 215 kg/ha after a second crop was harvested in November. In fields without a second rice crop, abundance declined 87% to 66 kg/ha by November, similar to waste rice abundance in the Mississippi Alluvial Valley (78 kg/ha). In the TMC, waste rice abundance increased 120% from 221 kg/ha following the first harvest to 488 kg/ha after a second crop was harvested. Rice abundance was greatest in fields with a standing unharvested second crop in both the CP (366 kg/ha) and the TMC (1,137 kg/ha) regions. Natural seed abundance ranged from 142 kg/ha in disked idle fields in the CP to 355 kg/ha in standing idle fields in TMC. Overall, seasonal trends of waste rice in fields with a harvested second crop decreased in the CP and increased in the TMC, and, as anticipated, natural seed abundance was greatest in idled fields with standing vegetation. Growing and harvesting a second crop of rice in November likely mitigates rice loss due to decomposition, germination, and granivory that may occur between the first and second harvests. Our results will be critical metrics for future models to estimate foraging carrying capacity of ricelands in these regions.

Waterbird Use Of Wetlands

and Aquaculture Ponds in the Mississippi Alluvial Valley and Gulf Coast regions

by Justyn Foth

Historically, the Mississippi Alluvial Valley (MAV) landscapes contained extensive forested wetlands. During the 20th century, most of the MAV was transformed by agricultural, aquaculture, and other anthropogenic land uses. However, these land use changes created previously unavailable stop-over habitats for migrating shorebirds, waterfowl, and other waterbirds. Prior to modification, some species of waterbirds, such as shorebirds, likely migrated past or sparingly used the MAV before settling in wetlands along the Gulf Coast (GC). Shorebirds exhibit some of the longest annual migrations of any animal. During migration, they rely heavily on interior and coastal wetlands in the Atlantic and Mississippi Flyways for stopover sites. In 2010, the Deepwater Horizon Oil Spill impacted coastal marshes of the northern Gulf of Mexico. In response, USDA Natural Resources Conservation Service (NRCS) implemented the Migratory Bird Habitat Initiative (MBHI) to provide resident and migratory waterbirds with interior wetlands inland from possibly oil impacted areas. Our objective was to estimate species composition and relative abundance of migrating waterbirds on MBHI and associated wetlands in the MAV and GC regions during fall migration. We surveyed waterbird use of idled aquaculture ponds that were shallowly flooded to attract shore- and other waterbirds, national wildlife refuges, and conservation areas throughout the MAV and GC during August-October 2011-2013.

We followed protocols of the Integrated Waterbird Management and Monitoring Program's Monitoring Manual (2011) for conducting widespread bird counts. We conducted surveys on individual ponds or moist-soil units in the MAV, and also on national wildlife refuges in the north and south MAV. On coastal sites, we conducted surveys along tidally influenced mudflats and lagoons using a boat or by walking line transects when accessible by land. We recorded waterbird relative densities (birds/wetland ha surveyed) and species composition at all locations.

We examined variation in waterbird densities relative to year and month time period when surveys were conducted, wetland type, study site, and average rainfall five days prior to surveys. Preliminary results indicated that year and month, wetland type, and study site were all important in explaining bird abundances. We found the number of birds per hectare on MBHI wetlands were, on average, over six times greater than wetlands not enrolled in MBHI during peak migration 2011-2013. Ongoing research on shorebirds in the MAV and GC will incorporate stable isotope analysis to assess migratory connectivity between the two regions. Stable isotope analysis is a revolutionary technique used by plant and animal biologists to track animal movements. In our case, we may be able to detect presence of oil signatures in shorebird tissue and food sources along the GC. Our research will eventually provide conservation planners with tools to predict shorebird abundance and thereby improve wetlands management accordingly.

Daily Use of Conservation

Wetlands by Female Mallards in Mississippi

by Joe Lancaster

The Mississippi Alluvial Valley (MAV) is a continentally important region for migrating and wintering waterfowl, especially mallards. Historically, mallards exploited bottomland hardwood forests and associated emergent and riverine wetlands in the MAV. Flood abatement facilitated drainage and clearing of 7.5M ha of hardwood bottomlands primarily for agriculture by early 20th century. Today, habitat and resources available to wintering mallards in the Yazoo Basin of the MAV generally fall within three categories: PROG-USDA Natural Resources Conservation Service (NRCS) programs that incentivize landowners' retirement of farmland, wetland restoration, and inundation of restored wetlands and harvested croplands; PRIV–private croplands and seasonal wetlands that are deliberately flooded or receive temporary or backwater flooding after rainfall; and PUB–state or federal lands with wetland complexes. We have no contemporary information on individual mallards' use of these habitats in the Yazoo Basin. We used very high frequency telemetry techniques to monitor use of the aforementioned habitat categories by radio-marked female mallards in the north and south Yazoo Basin from December-March 2010-2012 and 2013-2015. Using compositional analysis, we divided proportional use of PROG and PUB by proportional use of PRIV and used natural log ratios of these as response variables in a split-plot multivariate analysis of variance to evaluate diurnal use of these lands by mallards. Specifically, we tested (a = 0.05) influences of individual females, north or south regions, hunting or post periods, and a period by region interaction. We located 268 individual radio-marked females on 7,441 occasions, including 3,080, 1,255, and 3,106 locations on PRIV, PROG, and PUB lands, respectively. Categorical use varied among females, regions, periods, and the period by region interaction. Female mallard use of PROG was 0.31-0.79 times less than PRIV among period by region combinations. Females used PUB 0.95 and 1.49 times more than PRIV during hunted periods in the north and south regions, respectively. After hunting season, mallards used PUB 0.73 times less than PRIV in the north region but used PUB and PRIV similarly in the south region. Mallards used federal lands closed to waterfowl hunting extensively during waterfowl hunting seasons. Use of PRIV and PROG lands increased after waterfowl hunting season in absence of disturbance. Our results suggest that public and private lands are extensively used and provide resources and sanctuary that promote survival during and after hunting seasons. Moreover, conservation programs increase resource availability by hydrological and other management otherwise unavailable without financial incentives for landowners. Our continuing research will explore how use of public lands and conservation program easements on private lands contribute to wintering mallard survival.

Linking Habitat Use

& Survival to Identify Habitat Complexes that Promote Female Mallard Survival in Mississippi

by Joe Lancaster

Flooded croplands and moist-soil wetlands have become critical contemporary habitats in the Mississippi Alluvial Valley (MAV) as bottomland hardwoods disappear. Research has revealed that greatest abundances of wintering mallards in the MAV occur on landscapes comprised of 50% flooded croplands, 20% moist-soil, 20% forested, and 10% permanent wetlands. Our study will advance previous research by combining daily habitat use and survival to identify habitat complexes that promote winter survival. We quantified use of flooded croplands (AG), moist-soil (MS), forested (FO), and permanent wetlands (PW) by 241 female mallards radio-marked in the Yazoo Basin of Mississippi, December-March 2010-2012 and 2013-2015. Using compositional analysis, we divided proportional use of MS, FO, and PW by proportional use of AG and used natural log ratios of these as response variables in a split-plot multivariate analysis of variance (MANOVA). We tested influences of individual female, north or south basin, hunting or post-hunting periods, and a period by region interaction. We are also using a multistate mark-recapture with dead recovery model in program MARK to estimate daily survival relative to diurnal habitat use, north or south basin, hunting or post periods, and a body-condition index. We will rank models using an information theoretic approach and use daily survival rates from the most parsimonious model to assess habitat-complex composition among three levels of winter survival rates (upper 25%, middle 50%, and lower 25%). We will incorporate proportional use of habitats by radio-marked females as the dependent variables in a MANOVA, then use individuals' level of winter survival as the independent variable to test the null hypothesis that habitat-complex composition does not differ among females with high, middle, or low winter survival. Habitat use varied among females, north or south basin, hunted and post-hunted periods, and the period by region interaction. Permanent wetlands were used 70-80% less than AG among all period by region combinations. Moist-soil wetlands were used 108% and 29% more than AG during hunting season in north and south basins, respectively. Post-hunting season, MS wetlands were used 38% less but 51% more than AG in north and south basins, respectively. Forested wetlands were used 88-154% more than AG among all period by region combinations, except post-hunting season in the north basin, where use of these habitats did not differ. Comparable to findings from Louisiana and Arkansas, forested wetlands were important habitats used by female mallards wintering in the Yazoo Basin. However, moist-soil wetlands were also important in the Yazoo Basin, despite low use in Louisiana and Arkansas. Our continued analyses will enhance understanding of mallard ecology and identify habitat complexes that promote their survival in the MAV.

Financials

Waterfowl and Wetland Expenditures

July 1, 2014-June 30, 2015

	Kennedy Endowed Chair	Mississippi State University	Contracts and Grants	Total
Kennedy Endowed Chair *(salary & fringe)*	$54,907.00	$140,596.00		$195,503.00
Graduate Research Students	$20,870.00	$5,743.00	$149,740.00	$176,353.00
Administrative Support		$20,000.00		$20,000.00
Contractual and Commodities	$1,304.00		$23,567.00	$24,871.00
Publications				
Travel	$3,825.00	$140.00	$5,581.00	$9,546.00
Total	**$80,906.00**	**$166,479.00**	**$178,888.00**	**$426,273.00**

Field Trips

blending academics with professional experience

Waterfowl Ecology & Management

South Louisiana (November 5-8)

Students commonly say, "I learn so much better in the field!" Although not a total substitute for the classroom, venturing afield to experience wetlands and waterfowl firsthand certainly bolsters interest and subsequent learning. In one of two primary field trips in fall 2015, Dr. Brian Davis led his Waterfowl Ecology and Management class to the historic Chenier Plain of southwest Louisiana in early November 2015. Approximately 12 undergraduate and Davis' three graduate students attended. The first stop was the National Wetlands Research Center, Lafayette, LA where scientists Dr. Mike Brasher, Science Coordinator (and WFA alum) for the Gulf Coast Joint Venture, and Mike Carloss, Manager of Conservation Programs for Ducks Unlimited in coastal Louisiana, lectured to the students. These men discussed science and management priorities for waterfowl and wetlands in coastal Louisiana, one of the most critical wetland regions of North America. Students also toured the Center and witnessed the diversity of professionals including wetland and soil scientists, engineers, hydrologists, GIS planners, and many others that work on diverse coastal needs. The evening in Lafayette was culminated with great culinary indulgence at the renowned Prejean's Restaurant.

Students were privileged to stay at Rockefeller Refuge, Grand Chenier, LA, which is owned and operated by the Louisiana Department of Wildlife and Fisheries. The refuge has hosted a plethora of students and biologists for many decades and is an epicenter for wildlife and wetlands research and management, and public use for birdwatching, fishing, and other activities. The Cameron Prairie National Wildlife Refuge was the first stop on Friday morning where the group was enthusiastically hosted by Glenn Harris of the USFWS. Harris overviewed the history and importance of refuge lands and other wetlands of the Chenier and how they help form a larger regional wetland complex. The group participated in classroom and field activities that morning before trekking back to Rockefeller for the afternoon. There, Dr. Will Selman, research wildlife biologist and host, provided a grand tour of Rockefeller and enlightened the students on wetland diversity, functions of water control structures, hydrological management, wildlife management and research, and other pertinent aspects. Dr. Selman concluded the field day with a late afternoon classroom presentation inside refuge headquarters.

On Saturday morning November 7, Davis led the students to the rice and crawfish country of southwestern Louisiana. Dr. Dustin Harrell, a research agronomist and extension rice specialist with the Louisiana State University Agricultural Center Rice Research Station in Rayne, LA served as host. In LSU's primary lecture auditorium, Dr. Harrell provided a thorough and enjoyable overview of rice and crawfish culture of the region. Unfortunately, a relentless downpour hindered a tour of local rice and crawfish fields, so the group retreated back to Rockefeller Saturday afternoon. The weather calmed Saturday evening which allowed for cleaning and grilling of fresh duck! Davis had hunted ducks with extended family in the area on Saturday morning, prior to visiting the rice research station. With harvested birds in tow, students participated in picking and cleaning a variety of ducks (and a coot!) for the evening meal. Several students had never pulled feathers nor had their hands in a duck cavity, but they eagerly joined the fray that evening, and the food and camaraderie were excellent during the evening grand finale at Rockefeller. On the return trip to Starkville on Sunday morning, the group detoured through rice country so that doctoral student Joe Marty could enlighten the students on the diverse agricultural management practices associated with rice and crawfish farming. This region was one primary study area for Joe's graduate research, and he was superb in explaining diverse agricultural management practices.

This trip allowed students to comprehend the network of coastal wetlands and associated agricultural lands so critical to millions of

waterbirds, and to experience its local people. Dr. Davis' family had the group over for gumbo supper on Friday night, a real and unique hit of the trip. Students also got to bird watch amid the tens-of-thousands of acres of Rockefeller wetlands, and their list swelled to dozens of observed species. The students had many impressionable experiences that will undoubtedly remain with them for years.

York Woods, Christian,MS (November 19, 2015)

In the second of two primary field trips, Dr. Davis led his Waterfowl class to York Woods on Thursday, November 19. York Woods is about 9,000 acres of prime wetland, forested, and agricultural lands owned by Mr. Jim Kennedy. The host, former WFA alum Cody Pugh, is a full time wildlife biologist at York Woods. Cody capably led the group around the property and discussed all aspects of the active management that occurs there. Students learned firsthand about the importance of and challenges in managing diverse habitats including seasonal wetlands, bottomland hardwood forest, and agricultural 'Hotcrops', such as "grassy corn," for waterfowl and other wildlife. Students experienced by boats a large and awe-inspiring cypress brake, which truly amazed them. The York Woods visit greatly complemented the Louisiana trip given the profound differences in geographies and natural resources between them. Students could experience and more fully appreciate the needs, challenges, and opportunities to managing resources in both of these critical regions for wetland-dependent birds and other wildlife.

Presentations

Davis, J. B. 2015. Evaluation of the NRCS's Migratory Bird Habitat Initiative. Oktibbeha Audubon Society.

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Accolades

Brian Davis, Conservation Education Award, The Wildlife Society.

Justyn Foth, Travel Assistance Grant, Office of the Graduate School, Mississippi State University.

Justyn Foth, Travel Award, The Waterbird Society.

Matthew Ivey, Scenic Homes Scholarship for Waterfowl and Wetlands, Mississippi State University.

Joe Marty, Scholarship, Mississippi Wildlife, Fisheries, and Parks Foundation.

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