Survival, habitat use, and movements of female gadwalls during winter along the Gulf Coast

Research Proposal
July 6, 2007

A Cooperative Research Effort

Ducks Unlimited, Inc.
Gulf Coast Joint Venture
Louisiana Cooperative Fish and Wildlife Research Unit
Louisiana Department of Wildlife and Fisheries
Louisiana State University
Texas Parks and Wildlife Department
US Fish and Wildlife Service

DUCKS UNLIMITED

INTRODUCTION

Greater than 75 percent of the North American gadwall population, along with substantial proportions of northern pintail, American wigeon, blue-winged teal, green-winged teal, and lesser scaup populations, may annually overwinter in the marshes and flooded agricultural fields along the Louisiana and Texas Gulf Coasts. Consequently, the North American Waterfowl Management Plan through the Gulf Coast Joint Venture (GCJV), and Ducks Unlimited through its International Conservation Plan, place top priority on conservation of winter and migration habitat in this region. Ducks Unlimited and the GCJV estimate foraging habitat needs using models that measure the energetic demand of waterfowl populations wintering along the Gulf Coast. Because of their great abundance in this area, gadwalls have a substantial impact on habitat conservation objectives derived from these models.

Gadwalls are one of the most abundant duck species along the Louisiana and Texas Gulf Coast during winter and have recently been the most frequently harvested duck species in each of these states (Figure 1). Gadwalls spend extensive time feeding during winter because their diet is dominated by submersed aquatic vegetation that is generally low in nutritional value. Their preference for submersed aquatic vegetation suggests a heavy reliance on coastal marsh habitats, but habitat use of wintering gadwalls has not been well studied.

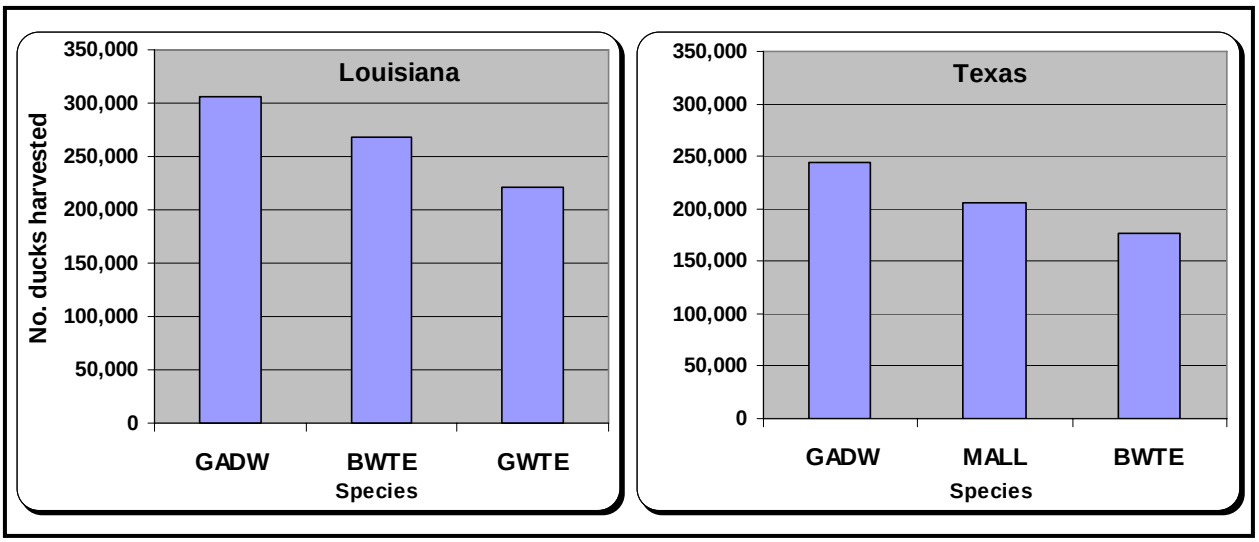


Figure 1. Average annual harvest, 1999 – 2004, of the top 3 most harvested duck species in Louisiana and Texas (GADW = gadwall, BWTE = blue-winged teal, GWTE = green-winged teal, MALL = mallard).

The extent, timing, and frequency of regional and long-range movements of gadwall are also unknown. Because gadwalls spend extensive time feeding, factors such as habitat quality, habitat quantity, and disturbance may influence their choice of wintering areas, local foraging habitats, regional movements, and winter survival rates. Wetland conservation strategies promoted by Ducks Unlimited and other conservation partners may directly affect each of these factors.

Anecdotal observations of waterfowl suggest that winter distributions of gadwall may have changed recently. Considerable speculation exists concerning movements of gadwall among such regions as the southern brushlands, rice prairies, and coastal marshes of Texas; rice prairies, major river deltas, and other marshes of Louisiana. Changes in habitat conditions or disturbance may play a role in inter-regional movements. Understanding of larger scale movements would be helpful to conservation planners, habitat managers, and waterfowl hunters. Strategic changes to conservation and management plans may be warranted if data suggest that plans are not properly aligned spatially and temporally with bird movements and/or patterns of habitat use.

Despite their significance to hunters and habitat managers in this region, waterfowl biologists have a relatively poor understanding of gadwall habitat use, regional and long-range movements, and survival rates during winter. Ducks Unlimited along with other partners of the GCJV including the Louisiana Cooperative Fish and Wildlife Research Unit, Louisiana Department of Wildlife and Fisheries, Louisiana State University, Texas Parks and Wildlife Department, and US Fish and Wildlife Service have initiated a cooperative research effort to better understand habitat use, movements, and survival of female gadwalls along the Louisiana and Texas coasts. This information will be used to evaluate and refine as needed wetland conservation strategies and priorities for gadwalls and other waterfowl during winter along the Louisiana and Texas Gulf Coast. The objectives of this study are to 1) estimate winter survival rates of female gadwalls in coastal Louisiana and Texas; 2) estimate habitat use during winter of female gadwalls in coastal Louisiana and Texas; and 3) quantify regional and long-range movements during winter of female gadwalls in coastal Louisiana and Texas.

STUDY AREAS

We will capture gadwalls at multiple sites in southwest Louisiana and southeast Texas. Sites in Louisiana will include White Lake Wetlands Conservation Area, Rockefeller State Wildlife Refuge, Cameron Prairie NWR, and Lacassine NWR; sites in Texas will include J.D. Murphree Wildlife Management Area and Anahuac NWR.

METHODS

Pilot Study

Because few previous studies of gadwall have been conducted during winter, research partners embarked on a pilot study during autumn – winter 2006 – 2007 to gain insight into logistical and financial needs of a larger, full-scale telemetry study of gadwall wintering ecology. Four primary objectives were identified for the pilot study: 1) determine if adequate numbers of gadwalls can be captured during autumn – winter for a full-scale study, 2) gain general insight into the extent and timing of regional and long-range movements of female gadwalls during winter, 3) determine whether satellite or conventional (i.e., VHF) telemetry methods are more

appropriate for a full-scale study, and 4) use information gained from this pilot study to more precisely estimate financial and logistical needs for a full-scale study.

During the pilot study we successfully captured and radiomarked 16 female gadwalls at Rockefeller State Wildlife Refuge. Although survival of these females was low (only 4 remain alive at the time of this proposal), we were able to collect valuable data for informing the design of the full-scale study. From this pilot study we determined that capturing a sufficient number of female gadwalls to enable a full-scale study is possible with adequate staffing, movements of female gadwalls during winter were more localized than expected, and satellite telemetry is suitable for the full-scale study. A complete report of this pilot study may be obtained from Mike Brasher at mbrasher@ducks.org.

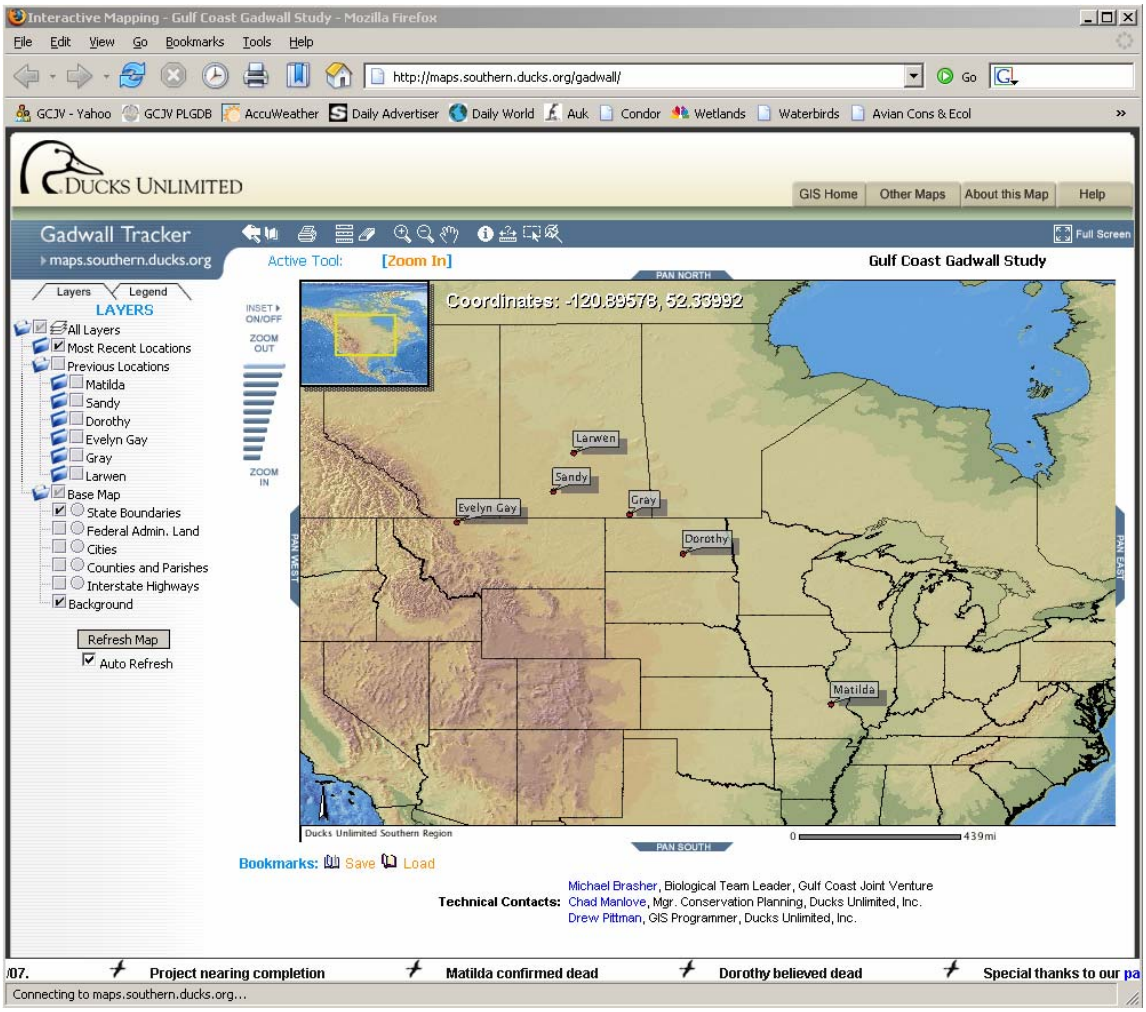
Full-scale Study

We propose to capture 60 adult female gadwalls and implant in each a 38-42g implantable satellite transmitter (i.e., platform transmitter terminals [PTT]) during October – November 2007 and 2008 on study sites in Louisiana and Texas. We will attempt to distribute satellite transmitters evenly among capture sites, but will modify these plans if necessitated by trapping success. We will capture gadwalls using rocket nets fired from portable platforms over pre-established bait sites. LeSchack et al. (1997) estimated mean body mass of adult female gadwalls during winter as 866g (range = 720 – 980g). We will mark only adult females whose body mass exceeds 800g, such that the transmitter weight will not exceed 5% of the female's body mass. This cutoff point will hopefully minimize potential bias introduced by transmitter effects on female survival, behavior, or movements.

Satellite transmitters will be configured to produce an effective battery life of approximately 210 days (7 months). Transmitters will operate in repeating cycles of 6 hours 'on' and 32 hours 'off.' This duty cycle represents a change from the pilot study. We chose a shorter 'off' period for the full-scale study to increase the number of transmissions per week and hopefully increase the frequency of high accuracy locations received during the winter study period. Radiomarked females will be monitored until they die or the transmitter battery expires; data will be received and processed weekly by project researchers. Dr. Alan Afton, Louisiana Cooperative Fish and Wildlife Research Unit at Louisiana State University, will hire and advise a Master of Science student to take primary responsibility for implementing the full-scale study.

WEB-BASED MAPPING & MONITORING

Project biologists at Ducks Unlimited's Southern Regional Office maintained during the pilot study an interactive, web-based mapping application that displayed the status and movements of female gadwalls radiomarked with satellite transmitters (www.ducks.org/gadwallstudy). Updates to the web site were performed at least weekly. We are uncertain of the extent to which the status and movements of radiomarked hens will be maintained and updated on this web site during the full-scale study. However, we will at minimum maintain this web site for those female gadwalls sponsored by private donors.



FUNDING NEEDS

We have estimated that this 3-year full-scale study will cost approximately $425,000. Ducks Unlimited, Inc., Ducks Unlimited private donors, and other research partners including the Gulf Coast Joint Venture, Louisiana Cooperative Fish and Wildlife Research Unit, Louisiana Department of Wildlife and Fisheries, Texas Parks and Wildlife Department, and US Fish and Wildlife Service have thus far contributed approximately $255,000 to fund the full-scale study. Research partners will continue efforts to procure the remaining funds needed to implement the full-scale study.

PROJECT TIMELINE

July 2007	Purchase 60 satellite transmitters
Aug 2007	Hire graduate student at LSU
Oct - Nov 2007	Capture and radiomark female gadwalls
Nov 2007 – May 2008	Data collection and processing, web-site maintenance
July 2008	Purchase 60 satellite transmitters
Oct – Nov 2008	Capture and radiomark female gadwalls
Nov 2008 – May 2009	Data collection and processing, web-site maintenance
May – Dec 2009	Data analysis, thesis, and publication writing

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