2012 Western Gulf Coast Mottled Duck Survey

USFWS Division of Migratory Bird Management, Branch of Population and Habitat Assessment

This report summarizes the 2012 status of the breeding mottled duck population along the Gulf Coast in Louisiana and Texas. These results are based on an aerial survey conducted April 2–6, 2012 as a joint effort of USFWS Division of Migratory Bird Management, Texas Department of Parks and Wildlife, and Louisiana Department of Wildlife and Fisheries. This experimental visibility-corrected survey has been conducted since 2008 using airplanes and helicopters to count mottled ducks along transects within their breeding range in both states. During this 5-year period the survey design has been modified in order to achieve better precision in the visibility correction factor (VCF) and the resulting population estimates. We report here the population estimates for 2012, and compare these to those from 2009–2011.

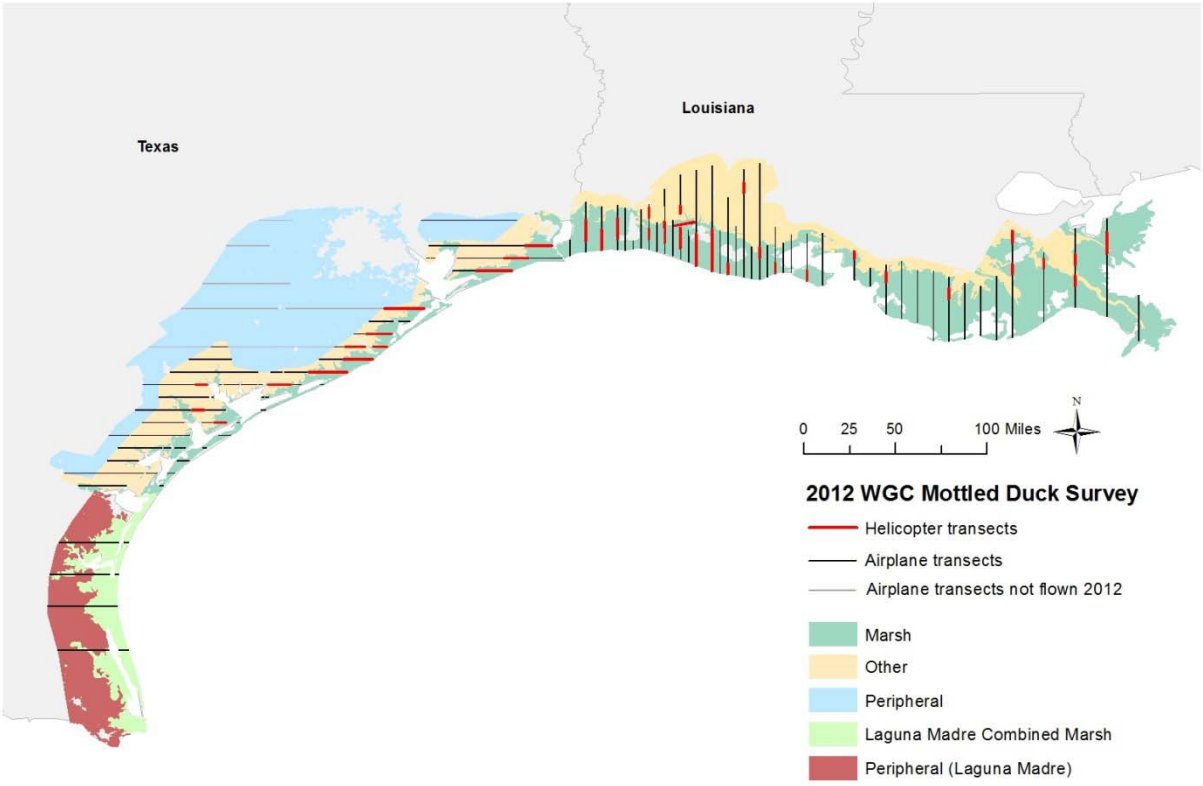

Figure 1. 2012 western Gulf Coast mottled duck survey design.

Methods

The survey area covers 10,111 sq mi in Louisiana and 16,550 sq mi in Texas (Figure 1). Survey transects are flown by airplane crews in each state, with a subsample of transects reflown by helicopter crews. Total transect area surveyed by airplanes in 2012 was 268 sq mi in Louisiana and 214 sq mi in Texas (due to weather delays, 62 sq mi was not flown by the airplane in the

peripheral stratum of Texas). Airplanes flew each transect at approximately 100 mph at 30–50 m altitude. Two observers, one in the front right seat and one behind the pilot, recorded all mottled ducks seen within 200 m of the transect. Helicopters containing a pilot and two observers surveyed a subsample of transects after the airplane, using a "beat out" pattern of flying tight curves low to the ground. In 2012, 52 sq mi was surveyed by helicopter in Louisiana and 37 sq mi was surveyed in Texas (due to weather 8 sq mi was not flown by the helicopter in Texas). Observers on either side of the helicopter recorded all ducks seen within the same transect strip width. The helicopter observations were used to calculate a visibility-correction factor (VCF), to account for birds missed by the airplane observers.

2012 Habitat Conditions

Texas: Habitat conditions in the Texas Chenier Plain were excellent as the area received 20 or more inches of rain since Jan 1. No drought conditions were observed, and marsh conditions appeared to have recovered from last year's drought. Water was ponding in rice fields, abandoned rice fields and depressions. Habitat conditions west of Galveston Bay in Galveston, Brazoria and Matagorda Counties were good with rainfall amounts varying between 10 to 20 in since Jan 1. Conditions ranged from no drought to moderate drought. Marsh conditions in Galveston and Brazoria Counties have improved relative to last year. Surface water was observed during the survey in depressions and wetland impoundments. Habitat conditions were fair to poor for areas west of Lavaca and Matagorda Bays as these areas received less precipitation (10 in or less) and are still experiencing severe drought conditions. Many seasonal wetlands there remain dry and estuarine marsh habitat has not recovered to any noticeable extent relative to last year. Habitat on Matagorda Island, in and around Aransas NWR, and around Rockport was likely not favorable as this area received less rainfall and is currently under extreme and exceptional drought conditions.

Louisiana: Flooding was observed in the coastal marshes of western Louisiana during the survey, while water levels in the marshes east of the Atchafalaya River were more average. There was higher than average shallow flooding in agricultural fields north of the marsh, located mostly in the western part of the state.

Calculation of Population Estimates

Mottled duck population estimates and variances were calculated following Smith (1995). The visibility correction factor (VCF) was calculated as the ratio of the total number of ducks counted by helicopter observers to the total number counted by airplane observers in those segments surveyed by both helicopter and airplane. The total indicated birds (TIBs)/area surveyed was calculated from the raw airplane count data [TIBs = (2 x singles) + (2 x pairs) + (1 x groups)], and multiplied by the VCF to give a visibility-corrected density. Due to substantial differences in bird density between marsh and upland (agriculture) habitats, densities were calculated separately for each habitat type, and scaled to the total area of that habitat within the survey area. In Louisiana, densities were calculated within two habitat strata: marsh,

consisting of both freshwater–intermediate and salt–brackish marsh, and "other," consisting mostly of agriculture. In Texas, five habitat strata were used: core marsh, consisting of the two

Table 1. Population estimates (in thousands), visibility-correction factors (VCF), and area estimates from the 2012 WGC mottled duck survey.

Texas	Population (SE) (1000s)	VCF (SE)	TIBs	Sampled Area	Stratum Area
Core Marsh	28.4 (10.7)	4.92 (1.60)	183	54	1,714
Core Other	10.3 (4.9)	4.92 (1.60)	68	105	3,255
Peripheral	10.2 (7.7)	4.92 (1.60)	6	23	7,699
Laguna Madre Combined Marsh	3.9 (3.3)	4.92 (1.60)	8	14	1,398
Laguna Madre Peripheral	13.0 (7.6)	4.92 (1.60)	18	17	2,485
Texas Subtotal	65.8 (24.4)		283	213	16,551
Louisiana					
Marsh	58.3 (12.7)	4.45 (0.7)	404	201	6,535
Other	40.6 (10.7)	4.45 (0.7)	170	67	3,576
Louisiana Subtotal	98.9 (21.1)		574	268	10,111
Survey Total	164.7 (32.2)		857	481	26,662

marsh types; core "other," consisting mostly of agriculture; peripheral, consisting mostly of agriculture but located farther from the coast than the core strata; and in the Laguna Madre region, a marsh stratum (Laguna Madre combined marsh) and a peripheral stratum (Figure 1). Urban areas were excluded from the analysis in both states. The total population estimate for each state was the sum of the populations in each habitat type.

Results

The 2012 total mottled duck population estimate was 164,745 ± 32,227 (SE) birds (coefficient of variation (CV) = 20%; Table 1). In Louisiana the total estimate was 98,915 ± 21,074 (CV = 21%) and in Texas the estimate was 65,830 ± 24,382 (CV = 37%; this includes the Laguna Madre region which was not surveyed in 2009–2010). The 2012 VCF was 4.45 ± 0.70 (CV = 16%) in Louisiana, and 4.92 ± 1.60 (CV = 33%) in Texas.

Comparison of 2012 estimates with 2009-2011

Several changes have been made to the survey design in the five years in which this experimental survey has been conducted. In particular, the 2008 survey design and visibility-

correction methodology differed substantially from subsequent years. The survey design in 2012 was similar to that of 2011, with the exception that, due to weather conditions, 5 airplane transects (234 mi) and 9 helicopter segments (33 mi) could not be flown. The 2012 western Gulf Coast estimate was similar to the 2011 estimate of 171,684 ± 25,922 birds (P = 0.433). For the 2009–2012 time series (Figure 2), we calculated the 2012 estimate without the Laguna Madre birds because this region was not surveyed in 2009–2010. The 2012 western Gulf Coast estimate without Laguna Madre (147,882 ± 32,227) was similar to the 2011 estimate without Laguna Madre (147,769 ± 21,038; P = 0.498).

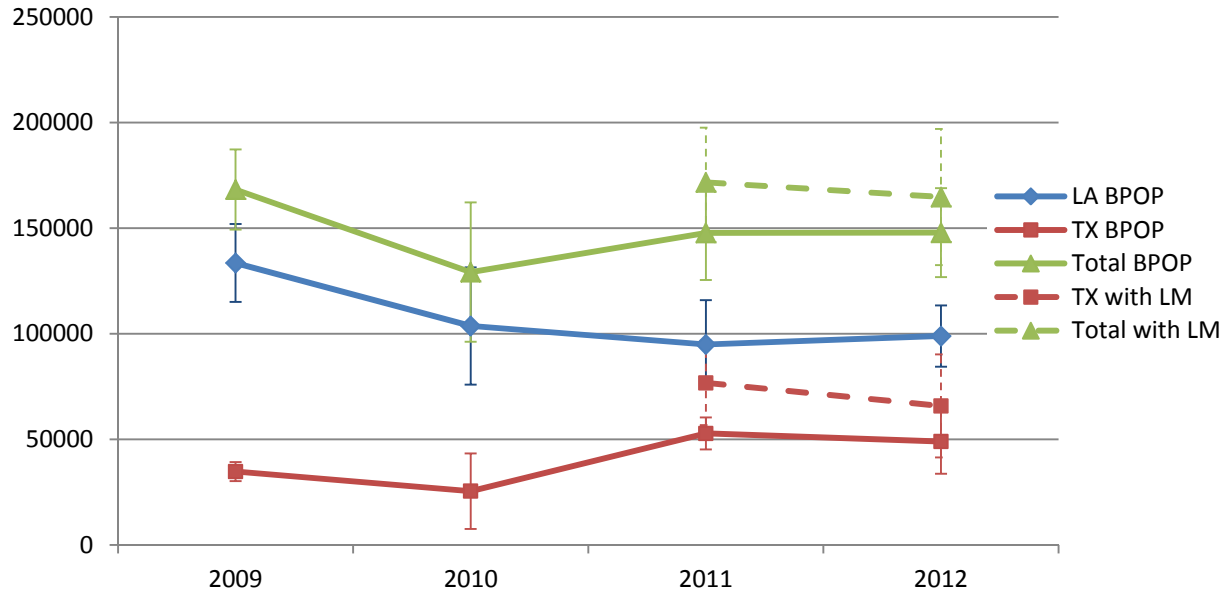

Figure 2. 2009–2012 mottled duck population estimates and associated standard errors, including the Laguna Madre region of Texas (dashed lines) and without the Laguna Madre (solid lines). The 2008 estimates were not included due to substantial differences in survey design and methodology.

Literature Cited

Smith, G. W. 1995. A critical review of the aerial and ground surveys of breeding waterfowl in North America. U.S. Department of Interior Biological Science Report 5, Washington, D.C.