



Arkansas Game and Fish Commission Aerial Waterfowl Survey Report January 7-9, 2019

Arkansas Game and Fish Commission staff conducted the 2019 midwinter waterfowl survey Jan. 7-9 in the Mississippi Alluvial Valley (Delta), Arkansas River valley (ARV) and southwest Arkansas. Observers estimated just over 1 million ducks in the Delta, about half of which were mallards (Table 1). Duck population estimates in the ARV were about average for total ducks but low for mallards, with an estimated 39,620 ducks (18,237 mallards). Cruise surveys in southwest Arkansas indicated low mallard numbers; observers counted a total of 30,973 total ducks but only 3,507 mallards (Table 2). Observers in the Delta again estimated high numbers of arctic-nesting geese, including over a million light (lesser snow and Ross's) geese and nearly 270,000 greater white-fronted geese. Observers were J.J. Abernathy, Jason Carbaugh, Jason Jackson, Cameron Tatom and Alex Zachary.

The Delta total duck population estimate was above the 2009-2018 long-term midwinter average (Figure 1). However, the Delta mallard estimate was only about 64% of the long-term average. Mallards typically account for 71% of all ducks during the midwinter survey, but only made up 53% of all ducks in this year's survey. Ducks were spread widely across the Delta, presumably in response to widespread habitat made available by a relatively wet fall and early winter. The highest mallard estimate was in a survey zone – the Lower St. Francis – that is not typically a hot spot. More typical mallard strongholds accounted for a large portion of remaining mallards; these survey zones included the Bayou Meto-Lower Arkansas, Black-Upper White and Lower White (Table 1).

Estimates for all ducks in the Arkansas River valley increase substantially (over 75%) from December while mallard estimates only increased by about 3,000. Both estimates were lower than average midwinter counts since formal surveys began in 2013 (Figure 2). Like in December, roughly half the mallards observed in this survey were in the Point Remove-Plumerville survey zone, with fair numbers in the West Dardanelle Reservoir survey zone (Table 2). However, the highest concentration of ducks in the Point Remove-Plumerville zone was in the waterfowl rest area (not in huntable areas) at Ed Gordon Point Remove Wildlife Management Area. The mallard count in southwest Arkansas was noticeably low.

These surveys are much better for estimating duck numbers than goose numbers; nonetheless, indices of greater white-fronted goose (specklebelly) abundance continue to be high in the Delta (Figure 3).

Habitat conditions were good for ducks during this survey period. Key rivers such as the Black, Cache, St. Francis and White were flooded out of their banks in some locations, creating widespread habitat. Duck density maps reveal a wider distribution of relative "hot spots" during this survey (Figures 4 and 5). Added to the habitat found in these riparian corridors was habitat created by water pooling in flooded agricultural fields, and observers noted many ducks in these areas. Ducks appeared to be responding to hunting pressure by concentrating in habitat that appeared not to be hunted. In contrast, duck use seemingly declined some in managed public waterfowl rest areas, in all likelihood because ducks found refuge in an abundance of unmanaged habitats. Comments from hunters continue to suggest lackluster hunting success this season, surely impacted by relatively high habitat availability and weather conditions not conducive to duck movement and persistent hunting success in a single location. Ducks have lots of options, little need to move and quickly respond to hunting pressure by finding alternative habitats.

Table 2. Waterfowl abundance estimates in western Arkansas during the late November (Nov), mid-December (Dec), early-January Midwinter Survey (MWS) and late-January (Jan) aerial waterfowl survey periods, 2009-2019. Beginning in Jan. 2013, surveys in the Arkansas River Valley (ARV) were conducted using stratified random sampling of transects, while past ARV surveys and surveys in southwest Arkansas were conducted using “cruise” surveys.

		Survey Zone												
		Bigelow - Lake Conway	Cadron	East Dardanelle Reservoir	Fourche La Fave	Frog Bayou	Holla Bend	Petit Jean	Pt. Remove - Plumerville	West Dardanelle Reservoir	Arkansas River Valley Total	Southwest Arkansas Total		
Survey Period	Nov-09	Mallards											13,731	5,480
		Total Ducks											31,416	19,140
	Dec-09	Mallards											18,580	19,230
		Total Ducks											31,304	31,820
	MWS-10	Mallards											58,815	34,590
		Total Ducks											81,685	36,060
	Jan-10	Mallards											14,359	19,840
		Total Ducks											20,336	27,705
	Nov-10	Mallards											96	14,010
		Total Ducks											5,966	30,300
	Dec-10	Mallards											25,064	2,390
		Total Ducks											28,054	21,106
	MWS-11	Mallards											26,318	15,027
		Total Ducks											40,470	21,267
	Jan-11	Mallards											41,850	-
		Total Ducks											60,635	-
	Nov-11	Mallards											12,225	-
		Total Ducks											19,870	-
	Dec-11	Mallards											21,389	-
		Total Ducks											40,919	-
	MWS-12	Mallards											7,264	-
		Total Ducks											13,339	-
	Jan-12	Mallards											13,900	-
		Total Ducks											21,000	-
	Nov-12	Mallards											1,182	13,090
		Total Ducks											7,732	21,935
	Dec-12	Mallards											13,975	10,245
		Total Ducks											22,417	17,105
	MWS-13	Mallards											16,893	8,165
		Total Ducks											26,058	14,630
	Jan-13	Mallards	-	408	10,000	372	1,837	630	627	1,843	917		16,634	-
		Total Ducks	-	1,428	10,180	372	1,971	990	902	3,687	7,857		28,011	-
	Nov-13	Mallards	240	187	4,660	800	0	144	0	754	253		7,038	4,455
		Total Ducks	320	187	14,320	1,920	0	1,080	528	965	3,307		22,627	19,145
	Dec-13	Mallards	576	245	5,472	1,728	358	162	1,320	3,429	2,176		15,466	10,130
		Total Ducks	1,604	2,713	8,672	1,728	1,836	3,132	1,501	4,329	3,941		29,456	29,070
	MWS-14	Mallards	11,767	816	2,898	4,800	-	2,160	715	13,703	3,449		40,306	18,385
		Total Ducks	14,441	816	8,711	5,124	-	2,934	957	22,177	6,087		61,247	35,875
	Nov-14	Mallards	926	7,140	12,114	704	924	4,518	10,428	7,125	392		44,271	15,890
		Total Ducks	5,040	10,540	45,485	4,256	3,248	4,518	19,932	12,039	624		105,682	29,790
	Dec-14	Mallards	720	224	1,028	640	373	3,006	2,541	1,343	299		10,174	21,200
		Total Ducks	1,242	530	33,805	1,296	373	4,194	4,059	6,991	299		52,789	29,400
	MWS-15	Mallards	3,929	143	5,813	221	-	11,138	0	2,107	3,531		26,882	19,245
		Total Ducks	10,594	755	18,649	221	-	13,455	224	2,107	9,871		55,876	28,695
	Nov-15	Mallards	270	-	1,867	-	149	2,430	561	4,785	64		10,126	21,580
		Total Ducks	270	449	2,898	-	1,170	14,760	726	7,042	64		27,379	37,060
	Dec-15	Mallards	1,440	340	320	160	140	563	165	2,864	1,027		7,019	11,425
		Total Ducks	4,140	374	3,140	992	140	7,088	165	6,913	3,274		26,226	17,950
MWS-16	Mallards	411	775	352	496	14,000	3,042	726	2,544	6,070		28,416	10,310	
	Total Ducks	617	775	6,752	896	17,562	6,102	990	3,808	15,019		52,521	16,715	
Jan-16	Mallards	634	918	2,743	576	373	1,548	14,388	8,479	4,622		34,281	14,735	
	Total Ducks	634	918	3,817	1,536	1,966	2,088	18,777	11,815	5,478		47,029	19,565	
Nov-16	Mallards	-	-	818	-	0	-	-	-	99		917	5,165	
	Total Ducks	-	-	6,530	-	814	-	-	-	100		7,444	14,690	
Dec-16	Mallards	112	-	-	739	187	2,612	296	234	8,186		12,364	34,946	
	Total Ducks	333	-	3,165	1,016	988	3,248	550	1,788	10,192		21,278	39,360	
MWS-17	Mallards	24	1,538	180	831	242	448	5,050	1,808	2,333		12,454	19,386	
	Total Ducks	325	2,137	453	12,788	2,167	547	5,499	4,461	14,900		43,277	31,679	
Jan-17	Mallards	17	627	16,432	3,812	1,019	5,394	1,561	14,818	4,768		48,448	13,682	
	Total Ducks	17	1,647	17,810	11,308	2,595	5,638	1,825	14,836	4,917		60,593	26,594	
Dec-17	Mallards	-	-	821	-	0	1,184	-	-	2,129		4,134	15,487	
	Total Ducks	-	-	2,558	-	2,972	3,654	-	-	4,264		13,448	34,822	
MWS-18	Mallards	0	0	10,862	1,013	4,784	22,254	0	5,269	6,711		50,893	18,412	
	Total Ducks	510	0	13,785	2,114	5,880	36,695	0	13,843	7,553		80,380	38,114	
Jan-18	Mallards	2,080	3,144	11,881	135	1,115	141,074	845	3,361	5,214		168,849	10,849	
	Total Ducks	3,420	4,489	20,281	227	3,826	174,542	3,150	3,313	5,381		218,629	32,928	
Nov-18	Mallards	-	-	273	2,956	3,617	198	4,733	7,074	429		19,280	9,721	
	Total Ducks	-	-	5,878	3,319	3,895	253	8,867	9,956	502		32,670	26,969	
Dec-18	Mallards	235	326	2,440	73	179	3,292	462	7,426	605		15,038	9,241	
	Total Ducks	240	330	4,483	73	630	3,472	1,771	10,920	605		22,514	35,236	
MWS-19	Mallards	58	382	841	120	389	89	2,413	9,527	4,418		18,237	3,507	
	Total Ducks	58	748	4,417	192	2,446	100	3,875	23,206	4,582		39,620	30,973	

Figure 1. Duck abundance estimates in the Mississippi Alluvial Valley (Delta) of Arkansas during the late November (Nov), mid-December (Dec), early-January Midwinter Waterfowl Survey (MWS) and late-January (Jan) aerial waterfowl survey periods, 2009-2019.

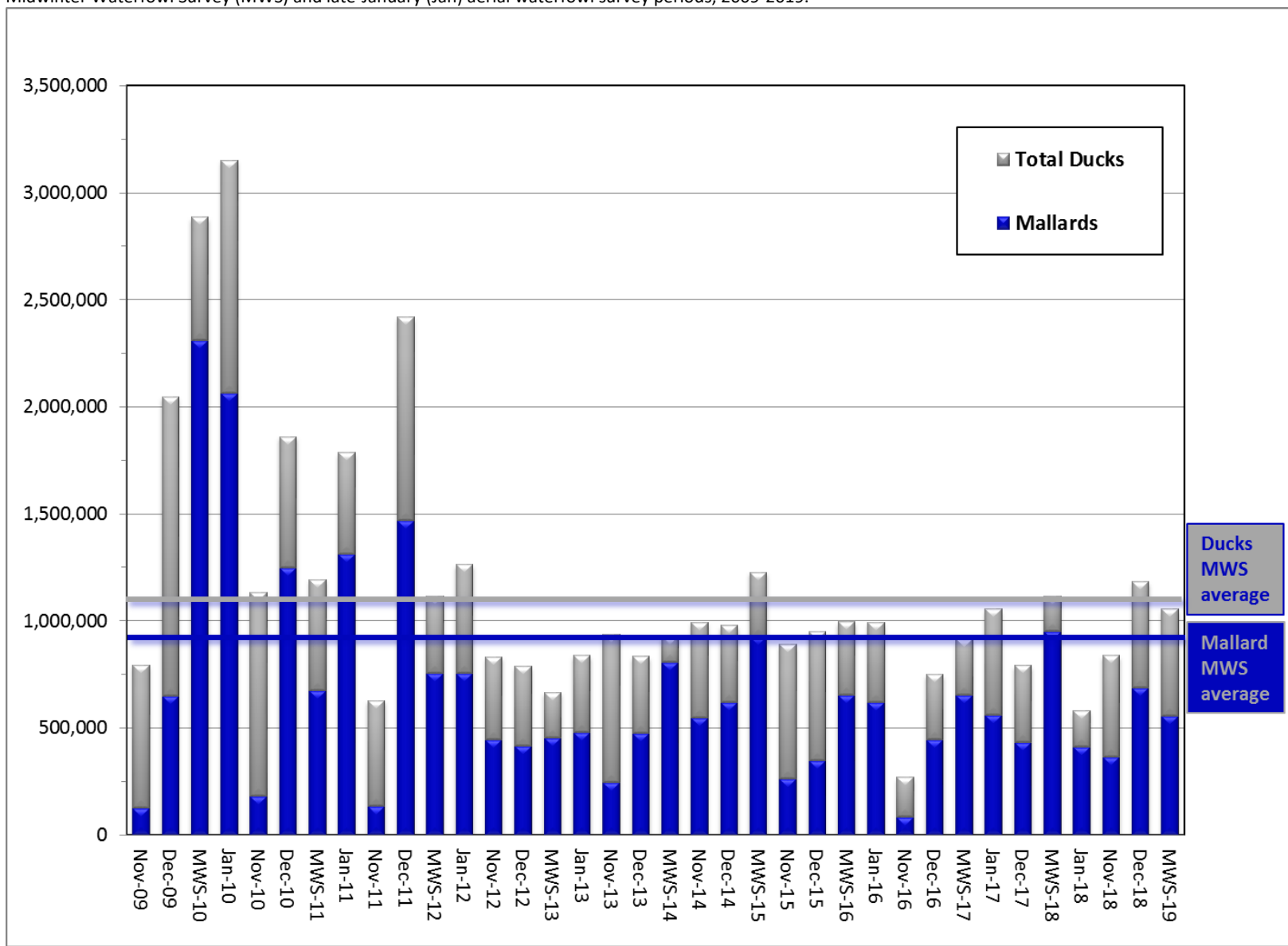


Figure 2. Duck abundance estimates in the Arkansas River valley of Arkansas during the late November (Nov), mid-December (Dec), early-January Midwinter Waterfowl Survey (MWS) and late-January (Jan) aerial waterfowl survey periods, 2009-2019.

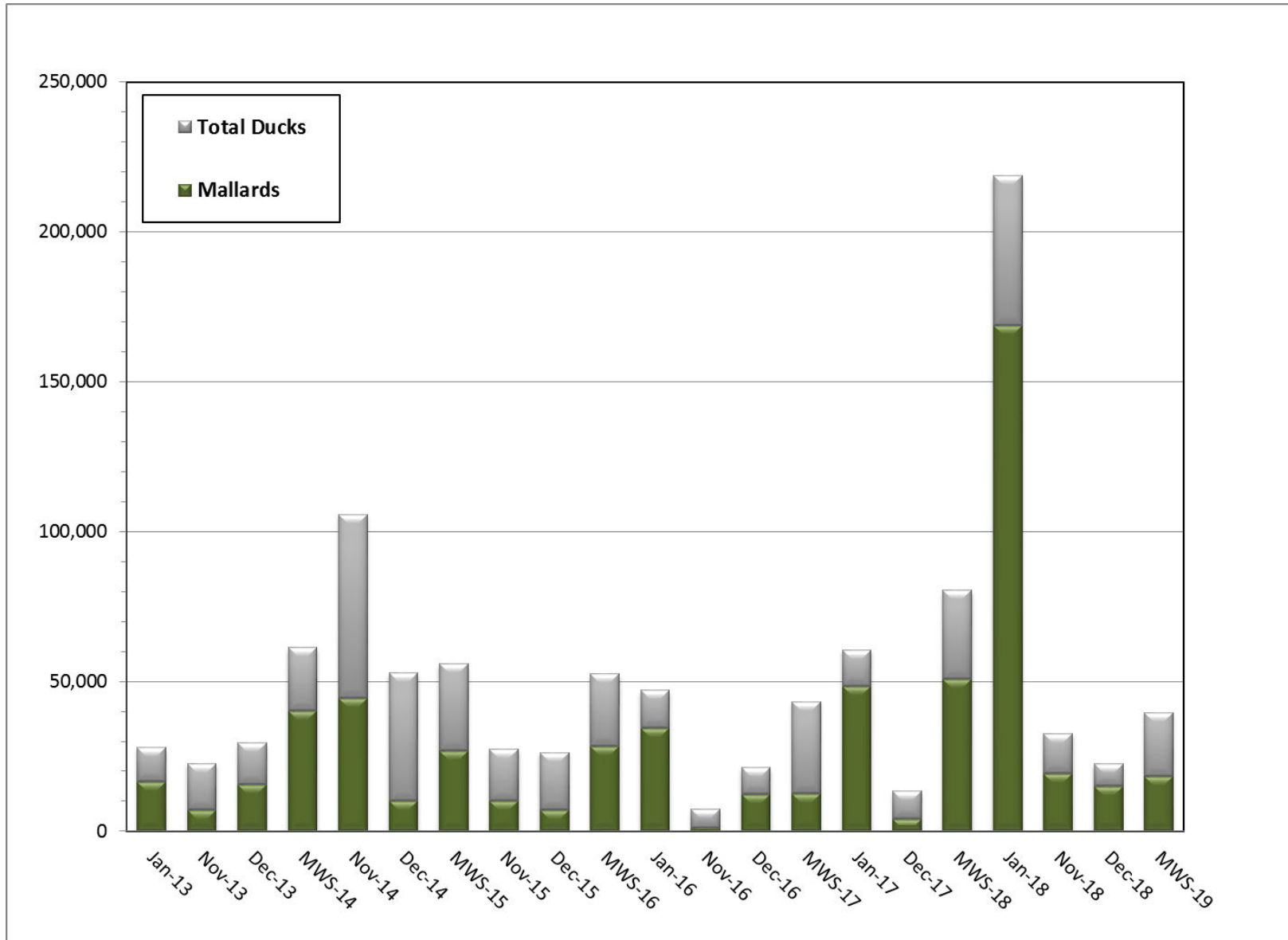


Figure 3. Greater white-fronted goose (GWFG) abundance estimates in the Mississippi Alluvial Valley (Delta) of Arkansas during the late November (Nov), mid-December (Dec), early-January Midwinter Waterfowl Survey (MWS) and late-January (Jan) aerial waterfowl survey periods, 2009-2019.

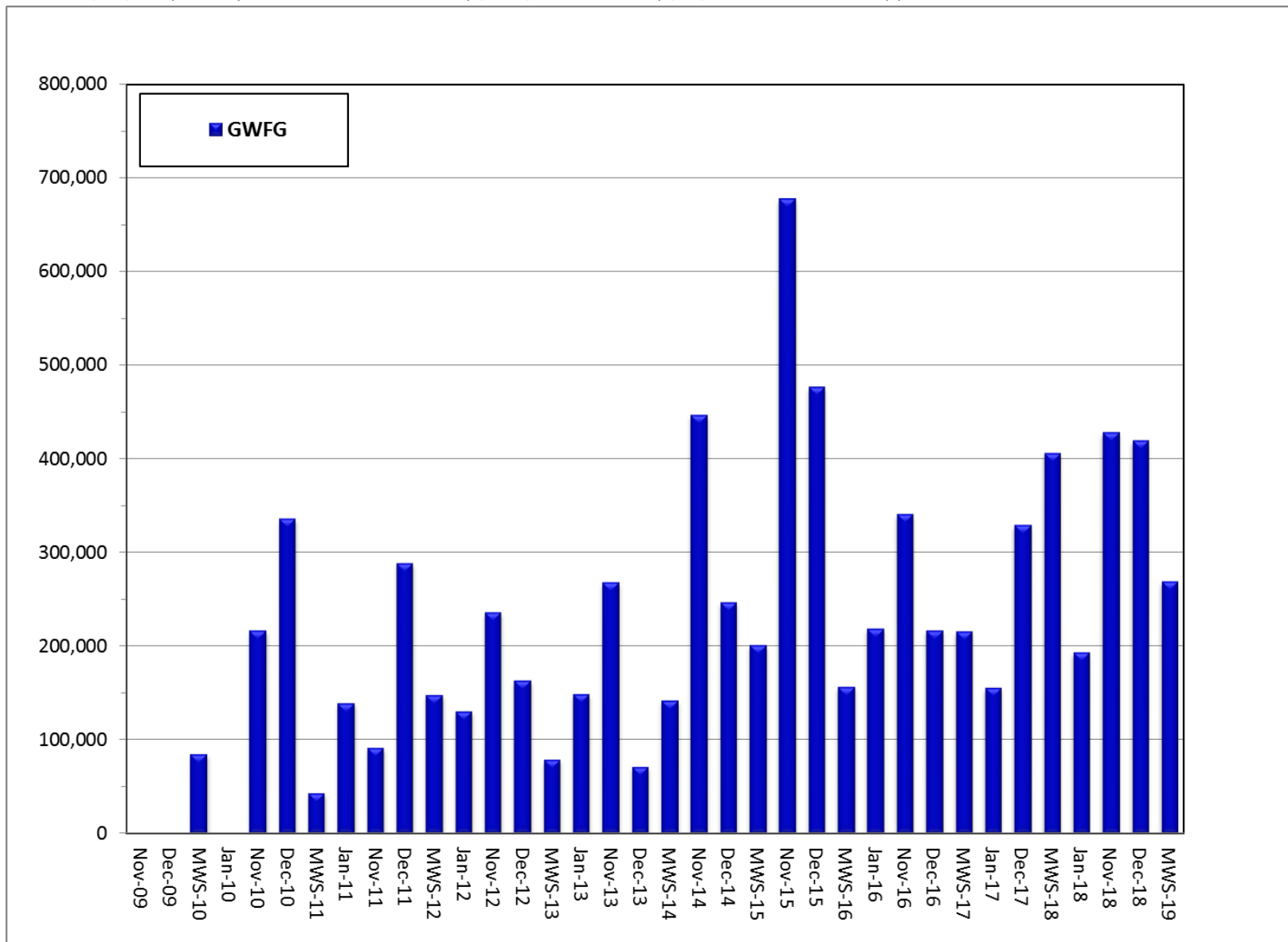


Figure 4. Duck distribution in the Mississippi Alluvial Valley of Arkansas during the 2019 Midwinter Waterfowl Survey.

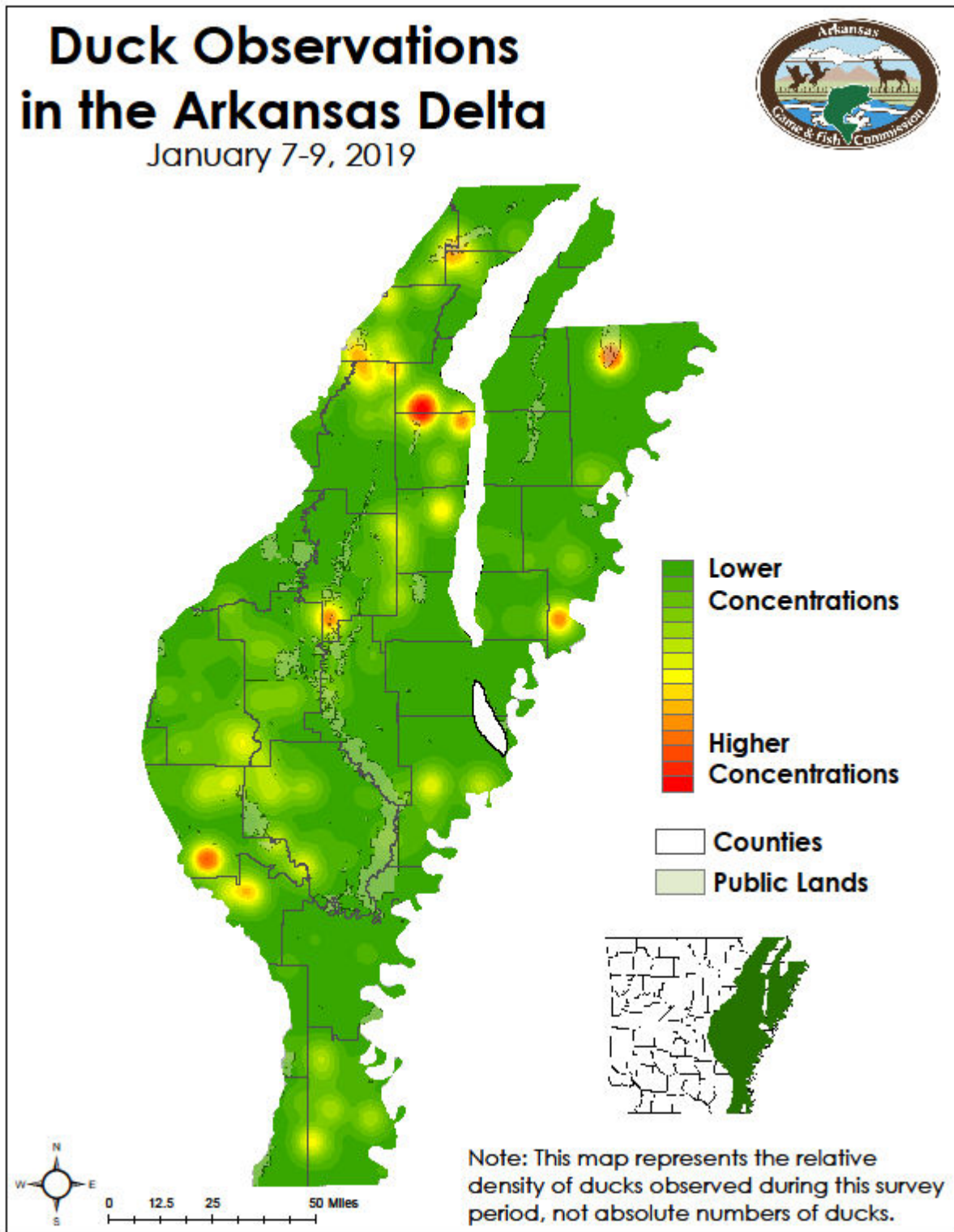


Figure 5. Mallard distribution in the Mississippi Alluvial Valley of Arkansas during the 2019 Midwinter Waterfowl Survey.

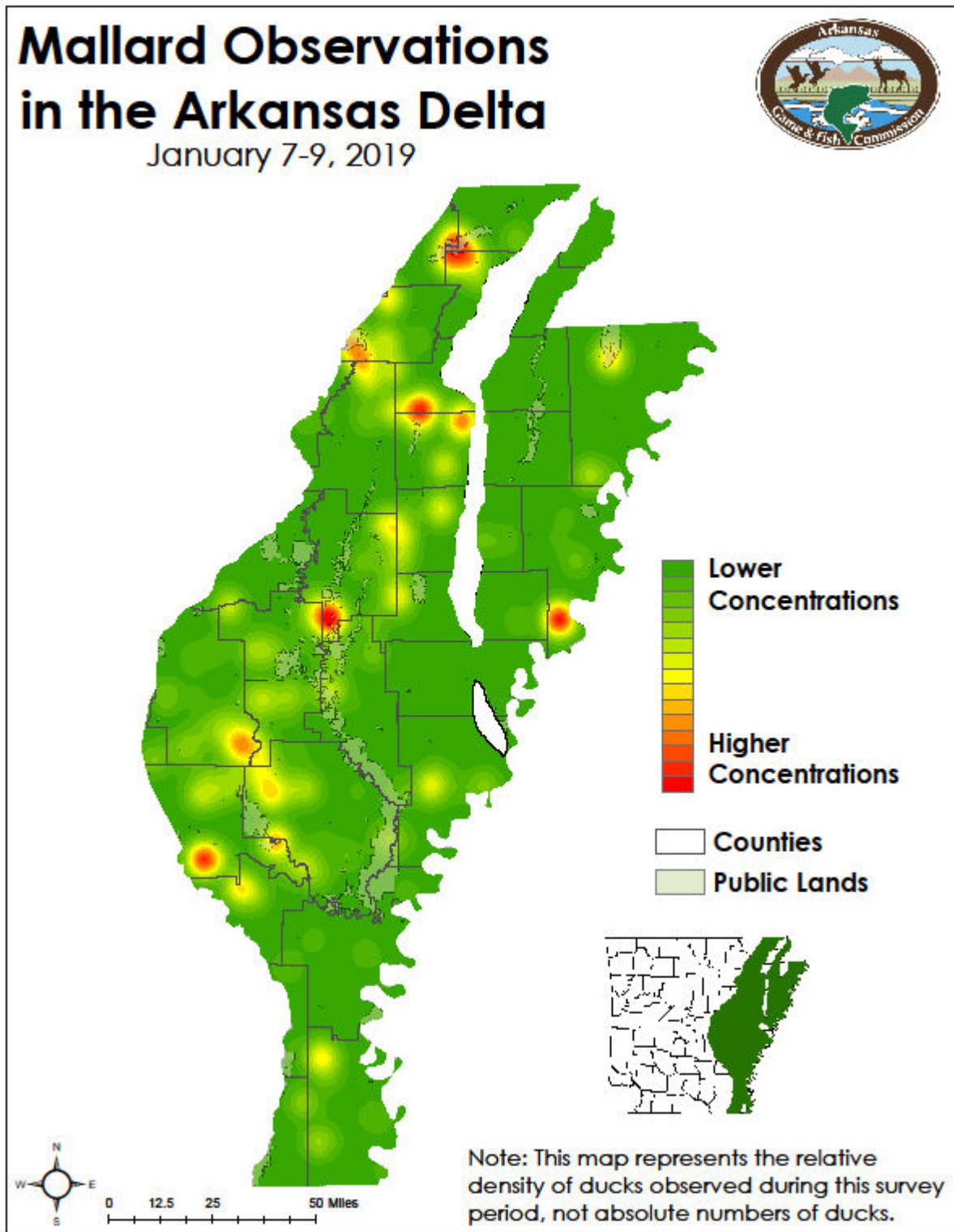


Figure 6. Duck distribution in the Arkansas River Valley of Arkansas during the 2019 Midwinter Waterfowl Survey.

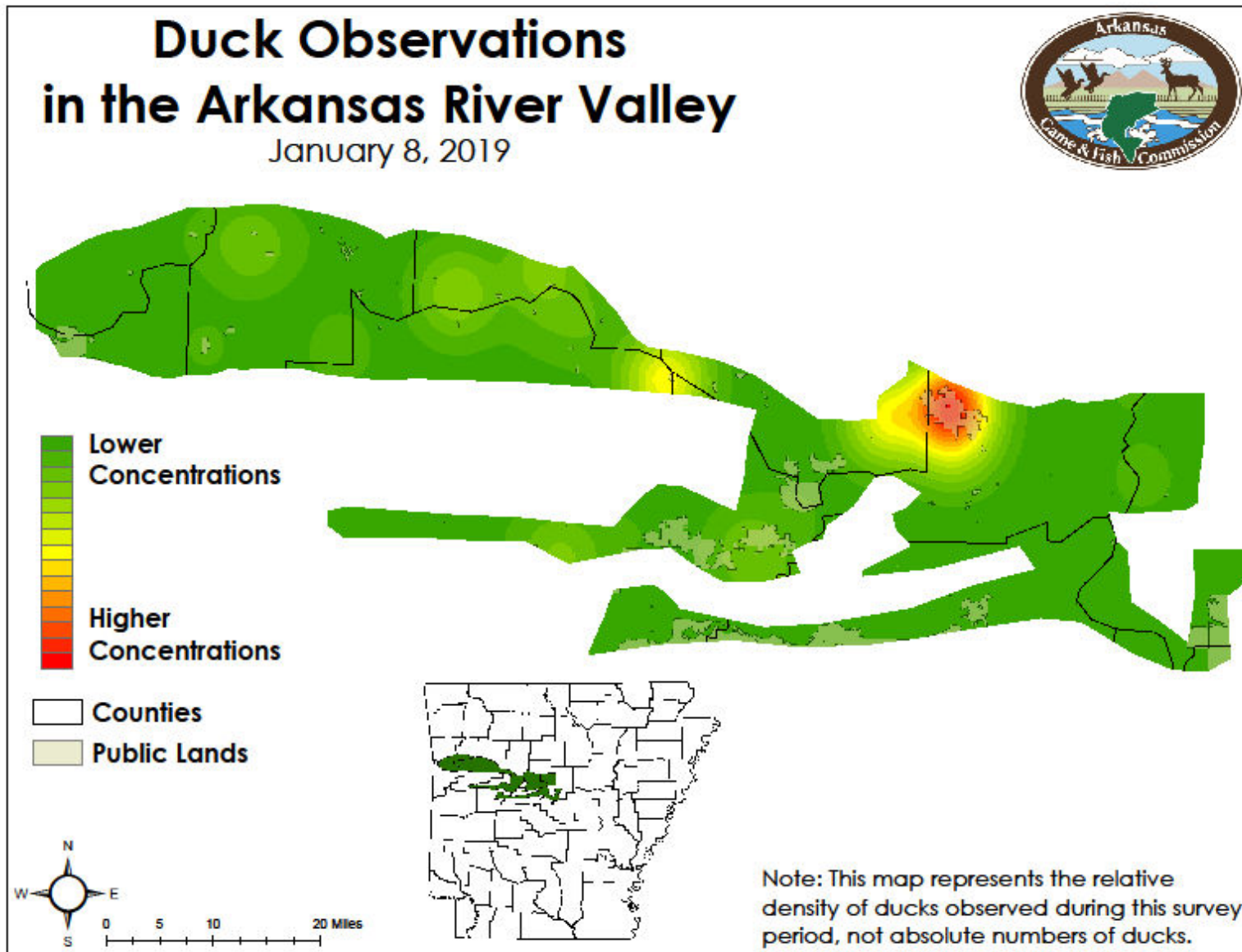
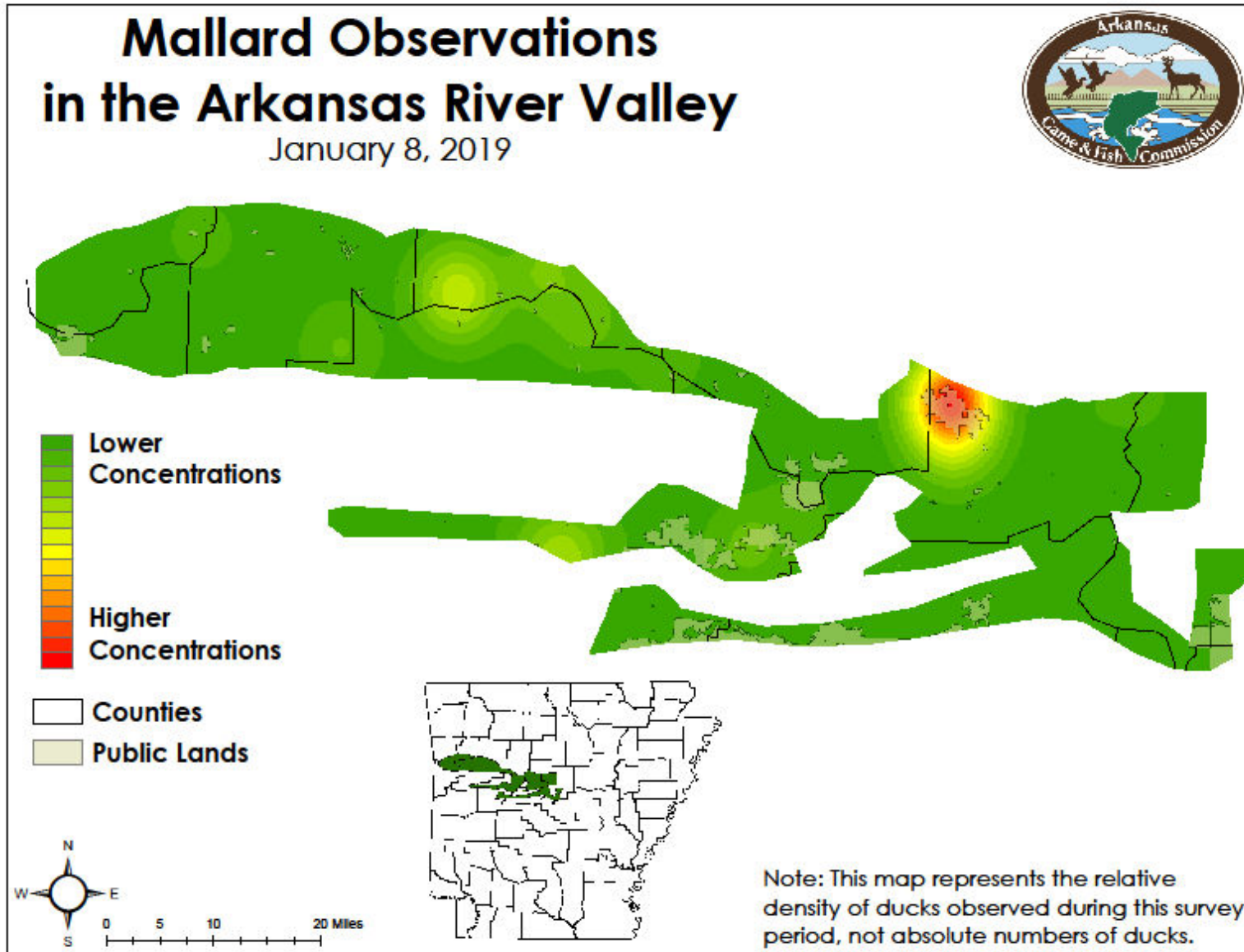


Figure 7. Mallard distribution in the Arkansas River Valley of Arkansas during the 2019 Midwinter Waterfowl Survey.



Survey Design Background

The Mississippi Alluvial Valley is an area of continental significance for migrating and wintering waterfowl, as outlined in the North American Waterfowl Management Plan, and the single most important region for wintering mallards. Habitats found in western Arkansas, including the Arkansas River Valley and southwest Arkansas, such as the Red and Sulphur River floodplains, provide additional critical habitat for migrating and wintering waterfowl. Biologists conduct regular waterfowl surveys in these regions by aircraft up to four times each wintering period.

Winter waterfowl surveys, including the Midwinter Waterfowl Survey, have been conducted across much of the United States since 1935. Many different counting techniques have been used, and recently AGFC and partners have conducted surveys in the MAV using stratified random sampling of aerial fixed width (250m) strips, or transects, that have the advantages of extensive coverage (i.e., no area is excluded from the sample), increased accuracy by counting on fixed strips rather than traditional “cruise” surveys only counting waterfowl on large concentration areas, and availability of measures of sampling error.

Beginning in 2011 in the MAV, survey strata – or sampling zones – follow watershed boundaries (Figure 8). A similar design was implemented in the Arkansas River Valley in 2013 (Figure 9). Watersheds in this case are simply land areas that are occupied by a drainage system consisting of a portion of a surface stream and all the tributary surface streams feeding it. For example, the Cache River strata includes lands surrounding and tributaries flowing into the Cache River from the Missouri border on the north to the Cache River’s junction with the White River on the south. At the root of this sampling design is the idea that habitat within these zones will share common weather and flooding patterns and, knowing that ducks are keyed in on such patterns, duck distribution will vary among watersheds. This is not a concept foreign to those who follow ducks, particularly duck hunters, as they frequently discuss habitat and duck numbers in terms of conditions in the “Cache River bottoms,” for instance. Systematically conducting aerial waterfowl surveys using this design will allow for more efficient allocation of sampling effort and provide precise estimates of waterfowl abundance in the MAV. Such a design offers an opportunity to track changes in abundance in response to changes in land use, flooding patterns or weather conditions, for example.

Before each survey period, transects to be flown are randomly selected within each strata. Biologists spend many hours in the air flying each of these transects – totaling over 3,500 miles each survey – recording all waterfowl observations using specialized computer software that collects location information in flight. Biologists also collect habitat information for each duck observation to track trends in habitat use. These data can then be used to generate population estimates for each strata and the entire MAV and develop visual representations of duck distribution (i.e., duck density maps).

Figure 8. Aerial waterfowl survey strata in the Mississippi Alluvial Valley (Delta) of Arkansas.

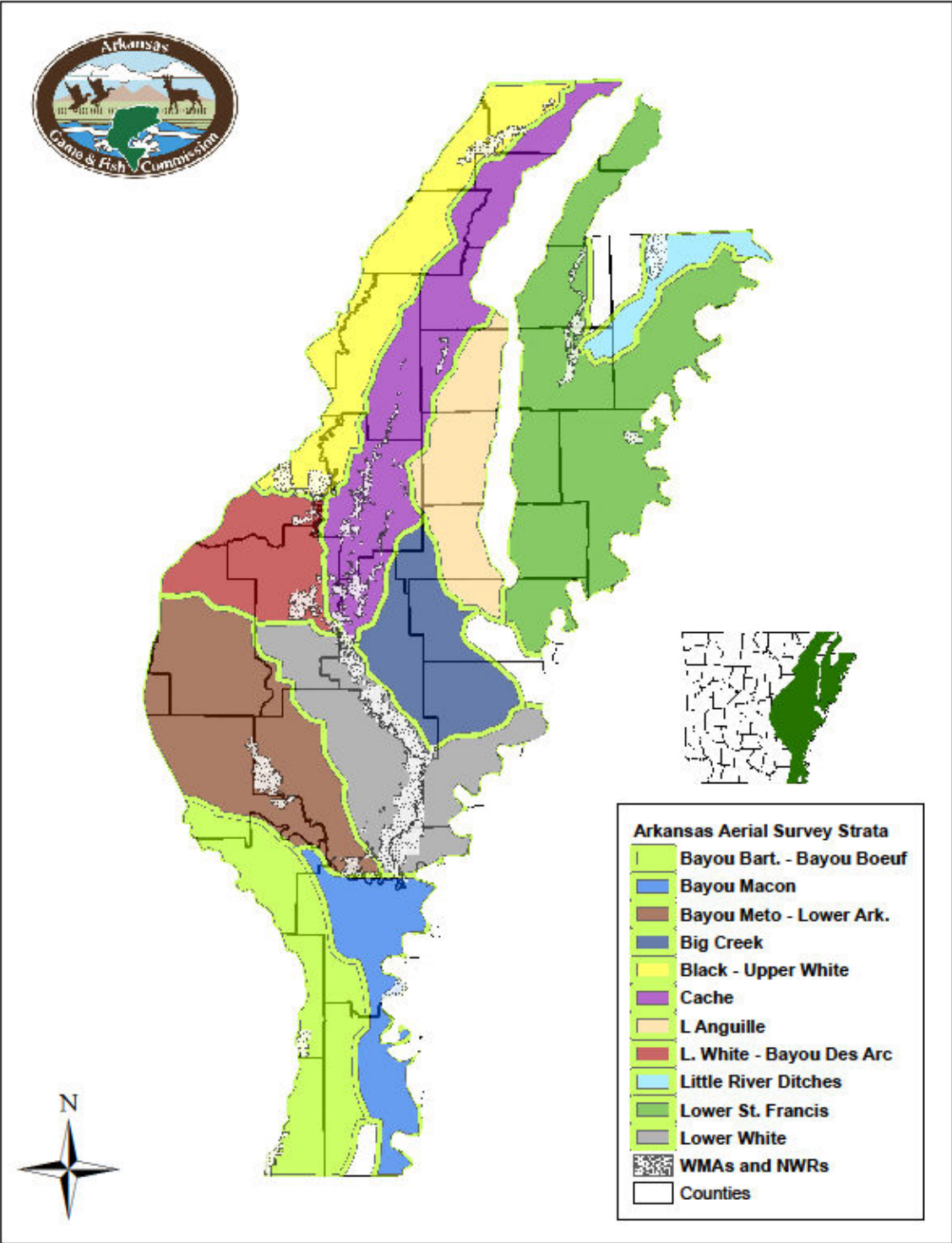


Figure 9. Aerial waterfowl survey strata in the Arkansas River valley (ARV) of western Arkansas.

