



2016 Alligator Management Report



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Adult American Alligator in slough off of Arkansas River, Desha County, Arkansas, April 25, 2017.
Photograph by Mark Barbee.

EXECUTIVE SUMMARY

This report presents information on the status of the Arkansas Game and Fish Commission's Alligator Management Program for 2016, in fulfillment of U.S. Fish and Wildlife Service requirements for CITES compliance. This report contains data and/or information on: (1) the number of CITES tags issued and their application; (2) nuisance Alligator occurrences; (3) Alligator harvest data; (4) methods used in determining harvest levels; and (5) post-harvest population survey data.

Sixty six (66) CITES tags were issued to successful Alligator hunters in 2016. The number of nuisance complaints decreased by approximately 10% from 2015 with a total of 74 reports, of which 91% occurred in Alligator Management Zones (AMZs) 1 and 3. AMZs 1 and 3 are the only management zones open to the Alligator sport hunt and a total of 66 Alligators were harvested. Although 116 tags were available for 2016 only 110 permits were issued to qualifying hunters. These hunters in 2016 had a 59% hunter success rate and a slight increase from the 2015 harvest with a 58% success rate. The harvest sex ratio was 2.3:1 (M:F), a decrease from the 2015 harvest ratio of 5.4:1. There were nine (9) sub-adults (4-6 ft. size class) harvested in 2016 as opposed to one for the 2015 season. Males continued to be harvested in greater numbers, comprising 70% of the harvest. Harvested males (for all harvest years) had consistently been larger in AMZ 1 than those from AMZ 3. The 2016 season harvest resulted in a mean TL of 9.7 ft. (AMZ 1) and 8.8 ft. (AMZ 3). The maximum size harvest record of 13'10" was harvested in AMZ 3 during the 2015 season and continues to be the largest alligator harvested to date.

Harvest quotas are based on population density values, which are generated using the standard metric "number of Alligators observed per mile of survey route" (APM) and the data for this calculation are obtained using replicated spotlight surveys. Post-harvest spotlight survey routes were sampled in April - June 2017. Approximately 75% of all 2017 surveys exhibited an increase in the APM metric. The pooled mean APM value for the 2017 post-harvest surveys was 8.9 APM, an increase of 1.2 APM from 2016 (7.7 APM). The pooled APM values of long-term survey sites from 2008-2016 range from 5.7 – 11.0, with the greatest difference still observed between the 2011 and 2012 surveys. Arkansas continues to experience wide climatic extremes from severe drought to major flooding over the past few years, which has a direct impact on: (1) the Alligator population, e.g., potential reduction of smaller size classes due to increased

predation/cannibalism during drought conditions; and (2) survey results i.e., major flooding prevents conducting surveys and/or disperses animals thereby decreasing observability rates resulting in reduced APM values. The Alligator population is considered stable at present, with the caveat that significant population fluctuations are occurring as a result of climate extremes. The Alligator Management Team proposes issuance of 152 Alligator sport hunt permits for 2017. Post-harvest population survey data will be closely monitored in the future to ensure that the number of harvest permits is not negatively impacting core populations.

The following is a summary of relevant Alligator management information and data for the 2015 calendar year. This is presented to the U. S. Fish and Wildlife Service to fulfill CITES compliance requirements by providing evidence that management activities have not been detrimental to Arkansas' wild Alligator population.

Alligator Management Zones – The Arkansas Game and Fish Commission (AGFC) established a network of Alligator population management zones (AMZs) in 2007 and has retained these zones to date without any changes (Fig. 1). AMZs 1 and 3 remain open to the Alligator sport hunt, while AMZ 2, 4 and 5 are closed to hunting. AMZ 2 is used as a control for comparing trends in the number of nuisance occurrences and population density variation among AMZ's.

CITES Tags Use – A total of 66 CITES tags were issued in 2016 (Table 1). These tags were issued to successful Alligator sport hunters at the time that their Alligator was verified by AGFC personnel. There were no active Alligator Farmer Permittees in 2016, hence no issuance of CITES tags for farmed Alligators. The AGFC does not allow the collection of wild Alligator eggs or hatchlings for commercial purposes, and all farmed Alligator stocks have historically been obtained as juveniles from legally permitted Alligator farmers in Florida or Louisiana.

Nuisance Occurrences – A total of 74 nuisance Alligator occurrences were recorded from 15 counties within AMZs 1–3 (Table 2). The number of nuisance occurrences in 2016 decreased by approximately 10% from 2015. AMZs 1 and 3 accounted for 91% of all nuisance occurrences. The ranked distribution in terms of number of occurrences remained constant

among AMZs in descending order AMZ 1, 3, and 2. The mean annual number of nuisance Alligator reports increased in 2016 to 66.6 (Table 3).

AMZ 1: Hempstead County had the greatest number (n = 13) of nuisance reports among AMZs and counties; eleven (11) Alligators were harvested in this county (Tables 2 and 4). Miller County had the second greatest number (n = 11) and five (5) Alligators were harvested in Miller County.

AMZ 3: Chicot County had the greatest number (n = 8) of nuisance reports, and two (2) Alligators were harvested from this county. Ashley, Desha and Drew Counties had the next greatest number (n = 5) of nuisance reports per county. There were eleven (11) alligators harvested in Desha, two (2) Alligators were harvested in Ashley and two (2) Alligator in Drew County.

Alligator Harvest – Arkansas’ tenth Alligator sport hunt was held during the last two full weekends in September 2016 in AMZ’s 1 and 3. A total of 66 Alligators were harvested out of a possible 110 qualifying permit holders, yielding a 59% hunter success rate. AMZ 1 produced the second highest harvest of Alligators in 2016, with a harvest of 24 Alligators; Miller County comprised the majority of those taken (Table 4). AMZ 3 produced the highest harvest of Alligators in 2016, with a harvest of 42 Alligators; Arkansas County produced the majority of Alligators in 2016 with a harvest of twenty three (23) Alligators. Arkansas County consistently produces the greatest number of harvested Alligators (n=23), this is due to the fact that Arkansas County contains more optimal habitat, in terms of areal extent, within the Arkansas River wetland complex than other areas within AMZ 3. Alligators were collectively harvested from eleven (11) counties in both AMZ 1 and AMZ 3 (Table 4).

Harvest Demographics – The 2016 harvest sex ratio was 2.3:1 (M: F) (Table 5). Nine (9) sub-adults [4–≤6 ft. total length (TL)], were harvested in 2016 (Table 4). This is an increase from the 2015 harvest of 1 sub-adult. The mean TL of all males (n = 46) was 0.2 ft. less than in 2015. Harvested males from AMZ 1 had a slight higher mean TL (Table 6). The mean TL of all females (n = 20) was 0.6 ft. less than in 2015. Males comprised 70% of the harvest in 2016 (82% 2015, 69% 2014, 68 % 2013, 77% 2012, 65% 2011, 67% 2010, 58% 2009, 89% 2008 and 57% 2007).

2017 Post-Harvest Population Survey – Spotlight survey routes were conducted during April – June 2017 (survey methods are described in the 2007–2008 annual reports). The 2017 post-harvest survey routes (n = 16; Table 7) when combined with historic data allow for long-term trend assessment. Nine (9) of these localities had harvests in 2016. The Arkansas River Complex and Hampton Farm listed in Table 7 consist of multiple survey routes in close proximity and are pooled as metapopulations for calculations of the APM metric. These areas consistently produce harvested Alligators.

Approximately 75% of all 2016 surveys (Table 7) exhibited an increase in the APM metric. While the remaining 25% reflected decreased APM's it is an improvement over the 2016 post-harvest survey data where approximately 80% of survey routes exhibited decreased APMs. The difference between years can again be attributed to fluctuating water events, which increased dispersion and decreased observability due to increased aquatic vegetation.

The decrease in APM ($\Delta -1.5$) at Grassy Lake is in contrast to the increase in the APM ($\Delta 30.4$) between 2014 and 2015 surveys. This population fluctuation is likely an effect of two unusual early year flood events that potentially dispersed the population prior to survey. Only one survey was completed, with no replicate, during the 2016 survey period. This site serves as a control site in AMZ 1 as no hunting has occurred on this site since the initiation of the sport hunt. Grassy Lake continues to harbor the highest density population in the entire state (48.9 APM). The increase in APM ($\Delta +1.3$) within the Arkansas River Complex was likely influenced by the encroachment of aquatic vegetation and sedimentation that may have forced alligators out of remote areas into the available open water.

In 2017 only one survey was conducted for each route (table 7). Historically each route had two surveys completed and an average calculated. This new methodology allowed for optimal conditions (weather, water levels and aquatic vegetation growth) to be capitalized.

The pooled mean APM value for all 2017 post-harvest surveys was 8.9, an increase of 1.2 APM from 2016 (7.7 APM). The 2015 pooled mean still remains the highest to date. The pooled mean APM (2008 – 2015) ranges from 5.9 to 11.0 with the greatest difference observed between the 2011 and 2012 surveys.

Harvest Estimation and Proposed 2017 Harvest – The recommendations for the proposed 2016 Alligator harvest are based on the data generated from the post-harvest population survey.

The following parameters were used in determining the 2016 harvest rate: (1) only observations of Alligators ≥ 4 ft. TL were used in calculating the harvest rate and (2) a harvest goal of 4% of the estimated Alligator population was applied for all surveyed private land and public land localities.

The proposed harvest rate for 2017 will be a maximum of 152 permits. The Alligator Management Team will recommend that no more than 69 harvest tags be issued in AMZ 1: fifty one (51) tags will be issued to the public through a randomized computer drawing, twenty one (21) for specific public lands and thirty (30) for private land-at-large; and eighteen (18) tags will be issued directly to private landowners with surveyed populations. A maximum of 83 harvest tags will be issued in AMZ 3: fifty (50) tags will be issued to the public through a randomized computer drawing, twenty (20) for specific public lands and thirty (30) for private land-at-large; and no more than thirty three (33) tags will be issued directly to private landowners with surveyed populations. All other AMZs will remain closed to the harvest of Alligators.

Future Harvest Rate Recommendations – The recommendations for the 2018 Alligator harvest will be based on the 2017 post-harvest population survey data. A maximum of 150 tags may be issued for private land-at-large and public land hunts. The number of private land tags issued may vary based upon 2017 post-harvest survey results. Only Alligators ≥ 4 ft. TL will be used in calculating harvest rates. The harvest rate for all zones will not exceed a maximum of 4% for both private and public land. A variable harvest rate of 2-4% will be applied to future harvest rates if biological or environmental factors (i.e., excessive winter kill die off, drought conditions, etc.) warrant adjustment of the harvest rate.

Table 1. Number of CITES tags issued in 2016. “Harvested” applies to Alligators taken during the sport hunt. There were no active Alligator farmers in 2016.

Application	<i>N</i>
Harvested	66
Farmed	0
Total	66

Table 2. Number of nuisance occurrences by Alligator Management Zone (AMZ) and county in 2016.

AMZ 1		AMZ 2		AMZ 3	
County	<i>N</i>	County	<i>N</i>	County	<i>N</i>
Hempstead	13	Calhoun	1	Arkansas	1
Lafayette	5	Columbia	1	Ashley	5
Little River	9	Hot Springs	1	Chicot	8
Miller	11	Ouachita	1	Desha	5
Sevier	3	Union	2	Drew	5
		Nevada	1	Jefferson	3
Total	41		6		27

Table 3. Number of nuisance Alligator complaints statewide by year, includes data from AMZs 4 and 5 for some years. Note: data for 2000 and 2001 are incomplete as data collection was not coordinated at that time.

Year	<i>N</i>	Mean
2000	11	----
2001	32	----
2002	64	64.0
2003	58	61.0
2004	50	57.3
2005	47	54.8
2006	36	51.0
2007	71	54.3
2008	61	55.3
2009	108	61.9
2010	82	64.4
2011	75	65.2
2012	52	64.0
2013	78	65.2
2014	60	64.8
2015	83	66.1
2016	74	66.6

Table 4. Data for 2016 Alligator harvest. (TAPT = Temporary Alligator Possession Tag)

TAPT#	CITES#	AMZ	County	Capture method	Dispatch method	Sex	TL (ft.)
101-2	1600022	1	Hempstead	Harpoon	Shotgun	F	8'3"
101-1	1600011	1	Hempstead	Harpoon	Shotgun	M	10'6"
112-4	1600007	1	Hempstead	Harpoon	Shotgun	M	7'5"
112-5	1600004	1	Hempstead	Harpoon	Shotgun	M	8'8.75"
115-1	1600024	1	Hempstead	Harpoon	Shotgun	M	9'8"
101-4	1600015	1	Hempstead	Harpoon	Shotgun	M	12'4"
110-2	1600023	1	Hempstead	Snare	Shotgun	M	10'6"
102-18	1600013	1	Hempstead	Harpoon	Shotgun	M	7'
102-15	1600014	1	Hempstead	Harpoon	Shotgun	M	7'2"
102-19	1600009	1	Hempstead	Harpoon	Shotgun	M	5'2"
102-16	1600104	1	Howard	Harpoon	Shotgun	M	9'7"
102-3	1600016	1	Lafayette	Snare	Shotgun	M	11'10.5"
102-2	1600005	1	Little River	Harpoon	Shotgun	F	8'2"
102-6	1600017	1	Little River	Harpoon	Shotgun	F	7'7"
115-2	1600006	1	Little River	Harpoon	Shotgun	M	12'
106-3	1600002	1	Little River	Harpoon	Shotgun	M	11'4"
102-20	1600012	1	Little River	Snare	Shotgun	M	8'
106-2	1600020	1	Little River	Harpoon	Shotgun	M	12'5"
116-1	1600001	1	Miller	Snare	Shotgun	F	8'3"
113-1	1600003	1	Miller	Harpoon	Bang Stick	M	8'9"
102-11	1600019	1	Miller	Snare	Shotgun	M	7'
102-9	1600021	1	Miller	Harpoon	Shotgun	M	11'3"
111-2	1600018	1	Miller	Harpoon	Shotgun	M	12'3"
112-3	1600008	1	Hempstead	Harpoon	Shotgun	M	10'4"
303-13	1600092	3	Arkansas	Harpoon	Shotgun	F	8'4"
304-13	1600102	3	Arkansas	Harpoon	Shotgun	F	8'9"
304-5	1600108	3	Arkansas	Snare	Shotgun	F	4'5"
303-20	1600084	3	Arkansas	Harpoon	Shotgun	F	6'7"
303-2	1600074	3	Arkansas	Harpoon	Shotgun	F	5'.375"
303-9	1600075	3	Arkansas	Harpoon	Shotgun	F	7'1"
304-15	1600076	3	Arkansas	Harpoon	Shotgun	F	5'7"
303-3	1600099	3	Arkansas	Snare	Shotgun	M	11'2.5"
303-4	1600098	3	Arkansas	Harpoon	Shotgun	M	8'9"
302-5	1600097	3	Arkansas	Harpoon	Shotgun	M	8'7"
308-1	1600090	3	Arkansas	Harpoon	Shotgun	M	6'
302-7	1600093	3	Arkansas	Harpoon	Shotgun	M	8'1"
302-6	1600094	3	Arkansas	Harpoon	Shotgun	M	8'9"
304-20	1600101	3	Arkansas	Snare	Shotgun	M	5'4"
30-310	1600077	3	Arkansas	Harpoon	Shotgun	M	10'

303-5	1600073	3	Arkansas	Harpoon	Shotgun	M	9'8"
303-1	1600069	3	Arkansas	Snare	Shotgun	M	9'4"
303-19	1600083	3	Arkansas	Harpoon	Shotgun	M	9
305-1	1600068	3	Arkansas	Harpoon	Shotgun	M	6'4"
305-5	1600078	3	Arkansas	Snare	Shotgun	M	6'
304-3	1600089	3	Arkansas	Harpoon	Shotgun	M	11'11"
304-16	1600087	3	Arkansas	Harpoon	Shotgun	M	8'6.5"
304-4	1600082	3	Arkansas	Harpoon	Shotgun	M	12'4"
301-2	1600103	3	Ashley	Snare	Shotgun	F	6'4"
301-1	1600105	3	Ashley	Harpoon	Shotgun	F	8'9"
303-17	1600066	3	Chicot	Harpoon	Shotgun	F	9'1"
310-1	1600070	3	Chicot	Harpoon	Shotgun	F	9'
304-7	1600072	3	Desha	Harpoon	Shotgun	F	6'11"
303-8	1600107	3	Desha	Snare	Shotgun	M	6'3"
304-6	1600106	3	Desha	Harpoon	Shotgun	M	10'
304-19	1600095	3	Desha	Harpoon	Shotgun	M	9'6.75"
304-17	1600100	3	Desha	Snare	Shotgun	M	10'1"
309-1	1600079	3	Desha	Harpoon	Shotgun	M	8'3"
304-1	1600086	3	Desha	Harpoon	Shotgun	M	11'5"
304-10	1600085	3	Desha	Harpoon	Shotgun	M	7'1"
304-18	1600080	3	Desha	Harpoon	Shotgun	M	8'10"
306-2	1600091	3	Drew	Harpoon	Shotgun	F	7'10"
300-2	1600067	3	Drew	Harpoon	Shotgun	F	8'1"
311-1	1600088	3	Lincoln	Harpoon	Shotgun	M	8'7"
303-12	1600096	3	Phillips	Harpoon	Shotgun	M	12'10.5"
309-2	1600081	3	Desha	Harpoon	Shotgun	F	5'5"
309-4	1600071	3	Desha	Snare	Shotgun	F	5'8.5"

Table 5. Comparison of total length (feet) by sex for all sport harvested Alligators in 2016.

Sex	<i>N</i>	Range	Mean (\bar{x})
Male	46	5.2 – 12.3	9.7
Female	20	4.4 – 9.1	7.3

Table 6. Comparison of total length (feet) by AMZ and sex for sport harvested Alligators in 2016.

AMZ 1				AMZ 3			
Sex	<i>N</i>	Range	Mean (\bar{x})	Sex	<i>N</i>	Range	Mean (\bar{x})
Male	20	5.2 – 12.3	9.7	Male	26	5.4 – 12.8	8.8
Female	4	7.6 – 8.2	8.1	Female	16	4.4 – 9.0	7.1

Table 7. Pre- and post-harvest comparison of Alligator density, based on the metric Alligators observed per survey mile (APM). Δ APM is the change in density between the 2015 and 2016 surveys. *= Pre-harvest data cited in: Irwin, K. 2006. Alligator population survey 2003-2004: Final Report. Arkansas Game and Fish Commission, Little Rock. 47 pp. n/a = data not available.

AMZ	Location	2014 Harvest	Pre-harvest APM*	2009 APM	2010 APM	2011 APM	2012 APM	2013 APM	2014 APM	2015 APM	2016 APM	2017 APM	Δ APM
	Holly Mound	Yes	n/a	2.5	3.3	1.2	2.0	3.0	1.8	3.0	3.2	2.0	-1.2
	Bois d'Arc Lake	Yes	1.8	1.8	23.6	5.8	3.6	10.5	5.4	6.0	3.1	3.3	0.2
	Lake Erling	Yes	1.4	0.2	1.5	1.3	1.0	0.9	3.4	- ⁴	0.0	0.9	0.9
	Lost Lakes	Yes	n/a	3.9	8.7	6.7	12.2	13.6	9.3	21.6	19.8	18.2	-1.6
1	Yellow Creek/Cypress Bayou	Yes	1.3	1.5	5.4	3.5	5.0	4.1	7.6	1.9	6.2	5.1	-1.1
	Grassy Lake	No	30.8	42.4	51.3 ¹	35.7 ¹	62.9 ¹	67.8 ¹	59.1 ¹	89.6 ¹	50.4 ¹	48.9	-1.5
	Mercer Bayou	No	0.6	0.1	1.2	1.2	1.8	1.8	1.4	1.6	0.3	2.2	1.9
	Millwood Lake	Yes	0.6	1.6	4.8	2.3	4.5	2.0	2.7 ¹	1.5 ¹	1.4	4.9	3.5
	Beard's Lake	No	1.7	2.3	4.4	4.8	4.9	3.9	4.2	2.8	3.4	4.7	1.3
	Long Lake	No	0.4	1.2	1.4	3.7	3.3	0.7	0.4	1.1	0.0	0.0	0.0
2	Bragg Lake	No	1.0	0.4	0.6	1.1	1.1	1.5	1.5	1.7	1.1	3.0	1.9
	White Oak Lake	No	0.2	0.1	0.0	0.1	0.6	0.3	0.4	0.5	0.3	0.5	0.2
	Arkansas River Complex ²	Yes	4.0	11.7	13.2	1.7 ³	9.1	8.1	12.7	9.2	5.9	7.3	1.4
3	Tillar Duck Club	Yes	5.0	8.8	11.1	9.0	15.0	12.6	15.2	9.9	8.3	19.6	11.3
	McClendon Farm	Yes	3.1	9.7	13.8	12.1	16.3	14.7	10.6	8.8	6.8	13.1	6.3
	Hampton Farm	Yes	5.6	11.8 ¹	6.4	6.4	8.2	6.3	6.3	6.3	5.7	8.9	3.2

1 = One survey was completed, i.e., no replicate survey conducted.

2 = The Arkansas River wetland complex consists of four survey routes in close proximity: Moore's Bayou, Merisach Lake, Arkansas River Ship Canal, and Arkansas Post Lake.

3 = Data based on one survey route with no replicate, all other routes for this location were not surveyable due to major flooding.

4= Lake Erling was not surveyed due to a change of ownership

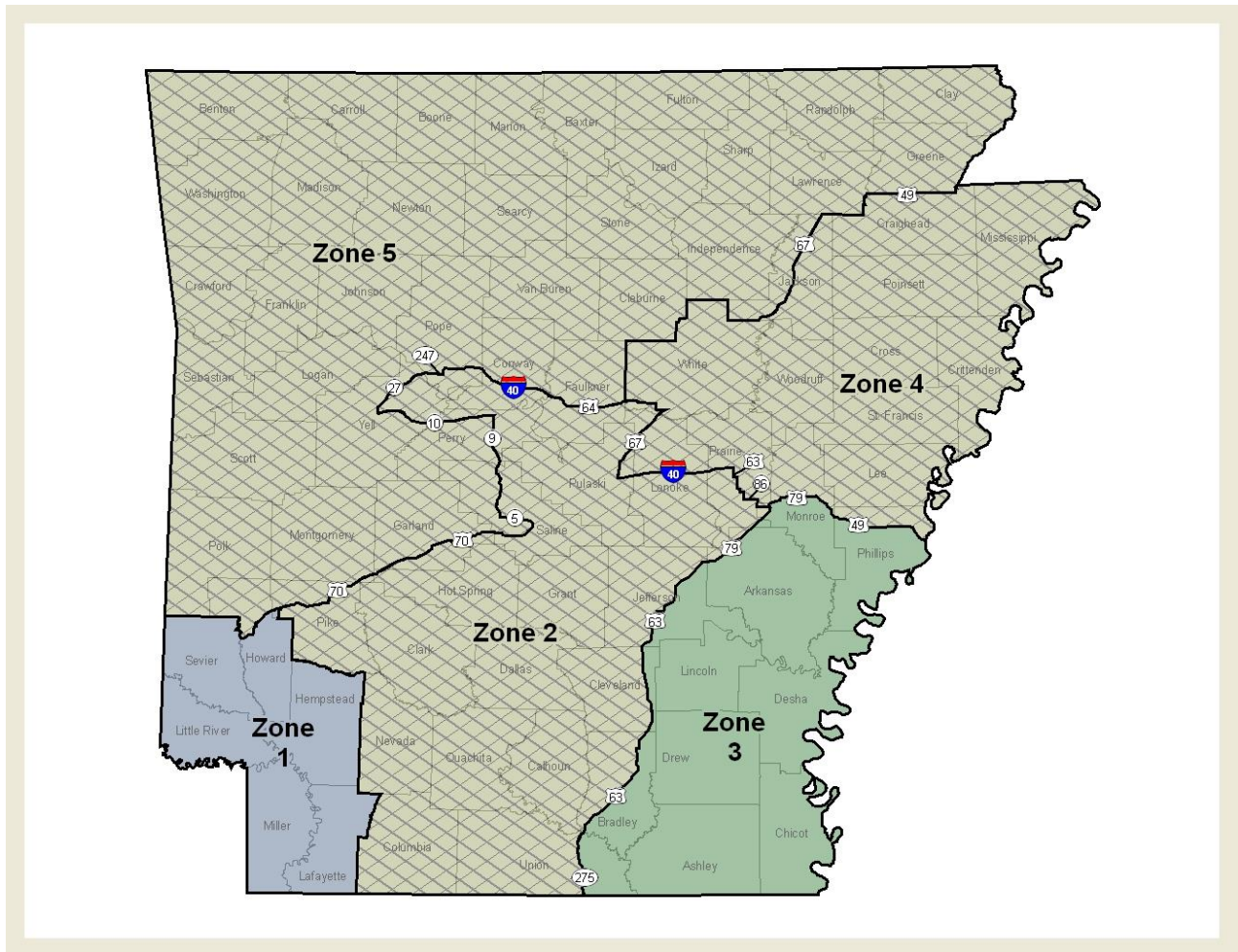


Fig. 1. Current Alligator Management Zones (AMZs); the Alligator sport hunt is permitted in highlighted zones 1 and 3.