



# 2019 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 2019, 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.

Eighty four (84) CITES tags were issued to successful Alligator hunters in 2019. The number of nuisance complaints increased by approximately 40% from 2019 with a total of 90 reports, of which 87% occurred in Alligator Management Zones (AMZs) 1 and 3. AMZs 1, 2 and 3 are the only management zones open to the Alligator sport hunt and a total of 81 Alligators were harvested. Although 147 tags were available for 2019 only 118 permits were issued to qualifying hunters. These hunters in 2019 had a 71% hunter success rate and an increase from the 2018 harvest with a 55% success rate. The harvest sex ratio was 2.1:1 (M:F), an increase from the 2018 harvest ratio of 1.6:1. There were ten (10) sub-adults (4-6 ft. size class) harvested during the 2019 season. Males continued to be harvested in greater numbers, comprising 68% of the harvest. The 2019 season harvested males (for multiple harvest years) has been consistently larger in AMZ 1 than those from AMZ 3. The 2019 season harvest resulted in a mean TL of 8.8 ft. (AMZ 1) and 8.5 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 2019. Approximately 62% of all 2020 surveys exhibited an increase in the APM metric. The pooled mean APM value for the 2020 post-harvest surveys was 13.5 APM, an increase of 4.7 APM from 2019 (8.8 APM). The pooled APM values of long-term survey sites from 2008-2020 range from 5.7 – 13.5, with the greatest difference still observed between the 2019 and 2020 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 conditions for the 2020 post-harvest surveys were the best observed in many years. 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 147 Alligator sport hunt permits for 2019. 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 2019 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, 2 and 3 remain open to the Alligator sport hunt, while AMZ 4 and 5 are closed to hunting.

**CITES Tags Use** – A total of 84 CITES tags were issued in 2019 (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 2019, 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 90 nuisance Alligator occurrences were recorded from 17 counties within AMZs 1–5 (Table 2). The number of nuisance occurrences in 2019 increased by approximately 40% from 2018. AMZs 1 and 3 accounted for 87% 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 2019 to 67.7 (Table 3).

*AMZ 1:* Miller County had the greatest number (n = 13) of nuisance reports among AMZs and counties; ten (10) Alligators were harvested in Miller County (Tables 2 and 4). Little River County had the second greatest number (n = 12) and five (5) Alligators were harvested in Little River County.

*AMZ 3:* Chicot County had the greatest number (n = 11) of nuisance reports, two (2) Alligators were harvested from Chicot County. Desha County had the next greatest number (n = 5) of nuisance reports per county.

**Alligator Harvest** – Arkansas’ thirteenth Alligator sport hunt was held during the last two full weekends in September 2019 in AMZ’s 1, 2 and 3. A total of 84 Alligators were harvested out of a possible 118 qualifying permit holders, yielding a 71% hunter success rate. AMZ 3 produced the highest harvest of Alligators in 2019, with a harvest of 50 Alligators; Arkansas and Desha County comprised the majority of those taken (Table 4). Arkansas County consistently produces the greatest number of harvested Alligators (n=29), 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. AMZ 1 produced the second highest harvest of Alligators in 2019, with a harvest of 32 Alligators; Hempstead and Miller County produced the majority of Alligators in 2019 with a harvest of twenty (20) Alligators. Alligators were collectively harvested from fourteen (14) counties in AMZ 1, 2 and 3 (Table 4).

**Harvest Demographics** – The 2019 harvest sex ratio was 2.1:1 (M: F) (Table 5). Ten (10) sub-adults [4–≤6 ft. total length (TL)], were harvested in 2019 (Table 4). The mean TL of all males (n = 57) was the same as in 2018. Harvested males from AMZ 1 had a slight higher mean TL (Table 6). The mean TL of all females (n = 27) was 0.6 ft. greater than in 2018. Males comprised 67% of the harvest in 2019 (62% 2018, 64% 2017, 70% 2016, 82% 2015, 69% 2014, 68 % 2013, 77% 2012, 65% 2011, 67% 2010, 58% 2009, 89% 2008 and 57% 2007).

**2020 Post-Harvest Population Survey** – Spotlight survey routes were conducted during April – June 2019 (survey methods are described in the 2007–2008 annual reports). The 2020 post-harvest survey routes (n = 16; Table 7) when combined with historic data allow for long-term trend assessment. Ten (10) of these localities had harvests in 2019. 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 37.5% of all 2020 surveys (Table 7) exhibited a decrease in the APM metric. While the remaining 62.5% reflected increased APM's it is an increase from the 2019 post-harvest survey data where approximately 31.25% of survey routes exhibited increased APMs. The difference between years can be attributed to stable water levels, weather and more optimal survey conditions during the survey period.

The increase in APM ( $\Delta +44.8$ ) at Grassy Lake is in contrast to the decrease in the APM ( $\Delta 39.2$ ) between 2015 and 2016 surveys. This population fluctuation is likely an effect of a prolonged period of no harvest on this body of water. Only one survey was completed, with no replicate, during the 2020 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 (100.6 APM). The increase in APM ( $\Delta +5.6$ ) within the Arkansas River Complex was likely influenced by the lower water levels that resulted in increased detectability and optimal weather conditions.

In 2020 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 2020 post-harvest surveys was 13.5, an increase of 4.7 APM from 2019 (8.8 APM). The 2020 pooled mean is currently the highest to date. The pooled mean APM (2008 – 2020) ranges from 5.9 to 13.5 with the greatest difference observed between the 2019 and 2020 surveys.

*Harvest Estimation and Proposed 2020 Harvest* – The recommendations for the proposed 2020 Alligator harvest are based on the data generated from the post-harvest population survey. The following parameters were used in determining the 2020 harvest rate: (1) only observations of Alligators  $\geq 4$  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.

Arkansas has adopted and implemented an Alligator Management Zone (AMZ) quota system for the 2020 season. The proposed harvest rate for 2020 will be 164 permits. The Alligator

Management Team will recommend that 67 harvest tags be issued in AMZ 1: fifty two (52) tags will be available to private land hunters through an AMZ quota system, fifteen (15) for specific public lands will be awarded through a permit draw system. A maximum of 5 harvest tags will be issued in AMZ 2. Ninety two (92) harvest tags will be issued in AMZ 3: twenty three (23) tags will be issued to the public through a randomized computer drawing, sixty nine (69) tags will be available to private land hunters through an AMZ quota system. Allowances are considered for harvest exceeding the proposed quota and are within Arkansas's CITES tag allocation. All other AMZs will remain closed to the harvest of Alligators.

*Future Harvest Rate Recommendations* – The recommendations for the 2021 Alligator harvest will be based on the 2020 post-harvest population survey data. A maximum of 400 tags may be issued for public and private land hunts. The actual quota number of tags issued may vary based upon 2020 post-harvest survey results. Only Alligators  $\geq 4$  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 2019. “Harvested” applies to Alligators taken during the sport hunt. There were no active Alligator farmers in 2019.

Application	<i>N</i>
Harvested	84
Farmed	0
Total	84

Table 2. Number of nuisance occurrences by Alligator Management Zone (AMZ) and county in 2019.

AMZ 1		AMZ 2		AMZ 3		AMZ 4	
County	<i>N</i>	County	<i>N</i>	County	<i>N</i>	County	<i>N</i>
Hempstead	11	Calhoun	2	Arkansas	2	Prairie	1
Howard	4	Clark	2	Ashley	2		
Lafayette	8	Hot springs	1	Chicot	11		
Little River	12	Ouachita	2	Desha	5		
Miller	13	Union	4	Drew	3		
Sevier	2			Jefferson	3		
				Lincoln	2		
Total	50		11		28		1

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	Year	<i>N</i>	Mean
2000	11	–	2011	75	65.2
2001	32	–	2012	52	64
2002	64	64	2013	78	65.2
2003	58	61	2014	60	64.8
2004	50	57.3	2015	83	66.1
2005	47	54.8	2016	73	66.6
2006	36	51	2017	69	66.7
2007	71	54.3	2018	63	66.5
2008	61	55.3	2019	90	67.7
2009	108	61.9			
2010	82	64.4			

Table 4. Data for 2019 Alligator harvest.

CITES	AMZ	County	Capture	Dispatch	Sex	TL
19-0105	Zone 1	Hempstead	Snare	Shotgun	Female	8.5
19-0174	Zone 1	Little River	Harpoon	Shotgun	Female	7.5
19-0171	Zone 1	Little River	Harpoon	Shotgun	Female	10.2
19-0049	Zone 1	Howard	Harpoon	Shotgun	Female	5.7
19-0027	Zone 1	Miller	Harpoon	Shotgun	Female	6.0
19-0104	Zone 1	Miller	Harpoon	Shotgun	Female	7.9
19-0102	Zone 1	Miller	Harpoon	Shotgun	Female	5.0
19-0175	Zone 1	Hempstead	Harpoon	Shotgun	Male	10.9
19-0146	Zone 1	Lafayette	Harpoon	Shotgun	Male	10.5
19-0110	Zone 1	Lafayette	Harpoon	Shotgun	Male	9.8
19-0151	Zone 1	Miller	Harpoon	Shotgun	Male	12.1
19-0050	Zone 1	Howard	Harpoon	Shotgun	Male	6.2
19-0147	Zone 1	Hempstead	Harpoon	Shotgun	Male	6.0
19-0103	Zone 1	Miller	Harpoon	Shotgun	Male	6.3
19-0159	Zone 1	Hempstead	Harpoon	Bang Stick	Male	7.6
19-0152	Zone 1	Lafayette	Snare	Shotgun	Male	11.3
19-0026	Zone 1	Little River	Harpoon	Shotgun	Male	10.8
19-0172	Zone 1	Miller	Harpoon	Shotgun	Male	8.8
19-0032	Zone 1	Miller	Harpoon	Shotgun	Male	6.5
19-0036	Zone 1	Little River	Harpoon	Shotgun	Male	12.0
19-0010	Zone 1	Hempstead	Harpoon	Shotgun	Male	9.8
19-0059	Zone 1	Hempstead	Harpoon	Shotgun	Male	9.3
19-0101	Zone 1	Miller	Harpoon	Shotgun	Male	6.7
19-0177	Zone 1	Hempstead	Harpoon	Shotgun	Male	10.5
19-0157	Zone 1	Lafayette	Snare	Shotgun	Male	9.7
19-0173	Zone 1	Lafayette	Harpoon	Shotgun	Male	6.3
19-0178	Zone 1	Hempstead	Harpoon	Shotgun	Male	8.0
19-0150	Zone 1	Miller	Harpoon	Shotgun	Male	12.7
19-0053	Zone 1	Hempstead	Harpoon	Shotgun	Male	7.8
19-0143	Zone 1	Miller	Harpoon	Shotgun	Male	5.2
19-0156	Zone 1	Hempstead	Snare	Shotgun	Male	8.6
19-0106	Zone 1	Lafayette	Harpoon	Shotgun	Male	8.0
19-0061	Zone 2	Columbia	Harpoon	Shotgun	Female	8.0
19-0078	Zone 2	Calhoun	Snare	Shotgun	Female	7.6
19-0052	Zone 3	Arkansas	Harpoon	Shotgun	Female	6.6
19-0014	Zone 3	Arkansas	Harpoon	Shotgun	Female	8.9
19-0040	Zone 3	Drew	Harpoon	Shotgun	Female	6.4
19-0080	Zone 3	Arkansas	Harpoon	Shotgun	Female	7.5
19-0046	Zone 3	Arkansas	Harpoon	Shotgun	Female	9.0



19-0039	Zone 3	Desha	Harpoon	Shotgun	Female	7.2
19-0051	Zone 3	Desha	Harpoon	Shotgun	Female	8.5
19-0072	Zone 3	Lincoln	Harpoon	Shotgun	Female	8.2
19-0023	Zone 3	Arkansas	Harpoon	Shotgun	Female	6.3
19-0066	Zone 3	Arkansas	Harpoon	Shotgun	Female	7.5
19-0042	Zone 3	Chicot	Harpoon	Shotgun	Female	9.0
19-0073	Zone 3	Desha	Harpoon	Shotgun	Female	7.5
19-0054	Zone 3	Chicot	Harpoon	Shotgun	Female	6.1
19-056	Zone 3	Desha	Harpoon	Shotgun	Female	6.1
19-0011	Zone 3	Arkansas	Harpoon	Shotgun	Female	8.8
19-0074	Zone 3	Desha	Harpoon	Shotgun	Female	6.0
19-0022	Zone 3	Jefferson	Snare	Shotgun	Female	7.6
19-0064	Zone 3	Drew	Harpoon	Shotgun	Female	8.1
19-0015	Zone 3	Drew	Harpoon	Shotgun	Male	6.3
19-0005	Zone 3	Arkansas	Harpoon	Shotgun	Male	10.4
19-0068	Zone 3	Arkansas	Harpoon	Shotgun	Male	6.7
19-0028	Zone 3	Desha	Harpoon	Shotgun	Male	12.1
19-0044	Zone 3	Desha	Snare	Shotgun	Male	6.0
19-0063	Zone 3	Arkansas	Harpoon	Shotgun	Male	6.3
19-0033	Zone 3	Arkansas	Harpoon	Shotgun	Male	4.3
19-0038	Zone 3	Desha	Harpoon	Shotgun	Male	7.7
19-0041	Zone 3	Arkansas	Harpoon	Shotgun	Male	4.8
19-0004	Zone 3	Desha	Harpoon	Shotgun	Male	9.2
19-0003	Zone 3	Arkansas	Snare	Shotgun	Male	11.0
19-0012	Zone 3	Arkansas	Harpoon	Shotgun	Male	7.0
19-0067	Zone 3	Arkansas	Harpoon	Shotgun	Male	9.5
19-0007	Zone 3	Arkansas	Harpoon	Shotgun	Male	12.1
19-0077	Zone 3	Lincoln	Harpoon	Shotgun	Male	11.2
19-0001	Zone 3	Arkansas	Harpoon	Shotgun	Male	11.7
19-0071	Zone 3	Arkansas	Harpoon	Shotgun	Male	7.6
19-0070	Zone 3	Arkansas	Harpoon	Shotgun	Male	11.3
19-0069	Zone 3	Arkansas	Harpoon	Shotgun	Male	10.0
19-0030	Zone 3	Arkansas	Harpoon	Shotgun	Male	7.6
19-0034	Zone 3	Arkansas	Harpoon	Shotgun	Male	10.0
19-0058	Zone 3	Arkansas	Harpoon	Shotgun	Male	7.0
19-0031	Zone 3	Desha	Harpoon	Shotgun	Male	7.0
19-0066	Zone 3	Arkansas	Harpoon	Shotgun	Male	7.9
19-0006	Zone 3	Arkansas	Harpoon	Shotgun	Male	6.5
19-0045	Zone 3	Arkansas	Harpoon	Shotgun	Male	9.3
19-0062	Zone 3	Arkansas	Harpoon	Shotgun	Male	11.1
19-0075	Zone 3	Ashley	Snare	Shotgun	Male	11.3
19-0019	Zone 3	Jefferson	Harpoon	Shotgun	Male	6.8
19-0029	Zone 3	Arkansas	Harpoon	Shotgun	Male	6.0

19-0021	Zone 3	Drew	Harpoon	Shotgun	Male	9.3
19-0013	Zone 3	Arkansas	Harpoon	Shotgun	Male	7.3

Table 5. Comparison of total length (feet) by sex for all sport harvested Alligators in 2019.

Sex	<i>N</i>	Range	Mean ( $\bar{x}$ )
Male	57	4.3 – 12.7	8.7
Female	27	5.0 – 10.1	7.5

Table 6. Comparison of total length (feet) by AMZ and sex for sport harvested Alligators in 2019.

AMZ 1				AMZ 2			
Sex	<i>N</i>	Range	Mean ( $\bar{x}$ )	Sex	<i>N</i>	Range	Mean ( $\bar{x}$ )
Male	25	5.2 – 12.7	8.8	Male	0		
Female	7	5.0 – 10.1	7.3	Female	2	7.6 – 8.1	7.8

AMZ 3			
Sex	<i>N</i>	Range	Mean ( $\bar{x}$ )
Male	32	4.3 – 12.1	8.5
Female	11	6.0 – 9.0	7.5

Table 7. Pre- and post-harvest comparison of Alligator density, based on the metric Alligators observed per survey mile (APM).  $\Delta$  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	2019 Harvest	Pre-harvest APM*	2009 APM	2010 APM	2011 APM	2012 APM	2013 APM	2014 APM	2015 APM	2016 APM	2017 APM	2018 APM	2019 APM	2020 APM	$\Delta$ APM
	Holly Mound	Yes	n/a	2.5	3.3	1.2	2.0	3.0	1.8	3.0	3.2	2.0	2.8	2.3	1.2	-1.1
	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	3.4	6.6	6.2	-0.4
	Lake Erling	No	1.4	0.2	1.5	1.3	1.0	0.9	3.4	- <sup>4</sup>	0.0	0.9	1.0	1.0	0.8	-0.2
	Lost Lakes	Yes	n/a	3.9	8.7	6.7	12.2	13.6	9.3	21.6	19.8	18.2	17.0	12.0	15.7	3.7
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	5.5	5.1	5.0	-0.1
	Grassy Lake	No	30.8	42.4	51.3 <sup>1</sup>	35.7 <sup>1</sup>	62.9 <sup>1</sup>	67.8 <sup>1</sup>	59.1 <sup>1</sup>	89.6 <sup>1</sup>	50.4 <sup>1</sup>	48.9	68.0	55.8	100.6	44.8
	Mercer Bayou	Yes	0.6	0.1	1.2	1.2	1.8	1.8	1.4	1.6	0.3	2.2	4.8	1.9	0.8	-1.1
	Millwood Lake	Yes	0.6	1.6	4.8	2.3	4.5	2.0	2.7 <sup>1</sup>	1.5 <sup>1</sup>	1.4	4.9	5.3	2.3	4.2	1.9
	Beard's Lake	No	1.7	2.3	4.4	4.8	4.9	3.9	4.2	2.8	3.4	4.7	4.2	6.3	4.1	-2.2
	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	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	2.7	1.3	2.2	0.9
	White Oak Lake	No	0.2	0.1	0.0	0.1	0.6	0.3	0.4	0.5	0.3	0.5	1.7	0.0	0.5	0.5
	Arkansas River Complex <sup>2</sup>	Yes	4.0	11.7	13.2	1.7 <sup>3</sup>	9.1	8.1	12.7	9.2	5.9	7.3	10.8	8.3	13.9	5.6
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	26.4	21.2	24.9	3.7
	McClendon Farm	Yes	3.1	9.7	13.8	12.1	16.3	14.7	10.6	8.8	6.8	13.1	14.7	9.1	21.5	12.4
	Hampton Farm	Yes	5.6	11.8 <sup>1</sup>	6.4	6.4	8.2	6.3	6.3	6.3	5.7	8.9	11.0	7.2	13.9	6.7

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 = All 2019 survey routes conducted with excessive high water levels.

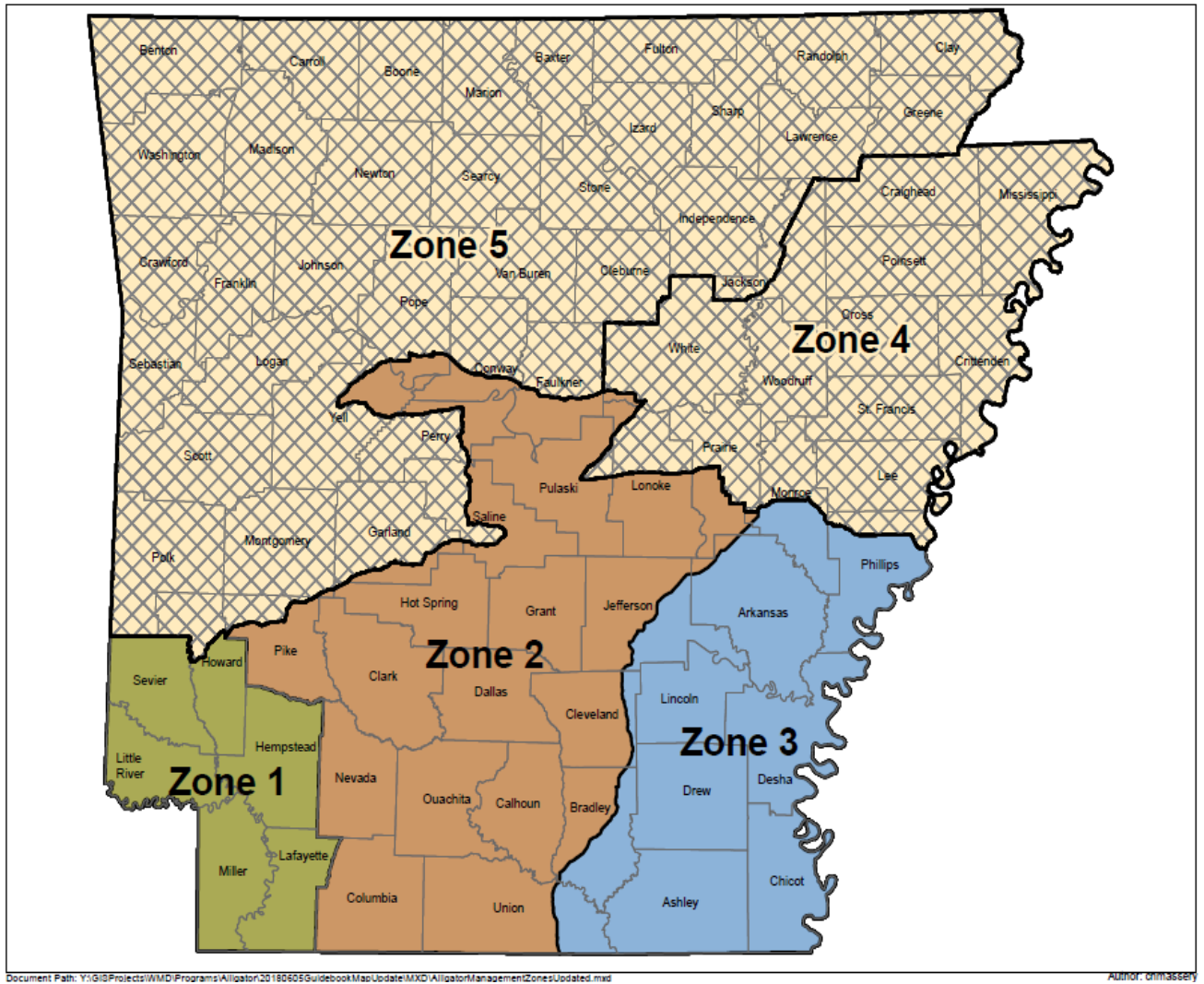


Fig. 1. Current Alligator Management Zones (AMZs); the Alligator sport hunt is permitted in highlighted zones 1, 2 and 3.