



2010 Alligator Management Report



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Photograph courtesy of Lisa K. Irwin. Basking subadult American Alligator at Grassy Lake, Hempstead County, Arkansas August, 2009.

EXECUTIVE SUMMARY

This report presents information on the status of the Arkansas Game and Fish Commission's Alligator Management Program for 2010, 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.

Thirty-eight (38) CITES tags were issued to successful Alligator hunters in 2010. The number of nuisance complaints decreased by approximately 25% from 2009 with a total of 82 reports, of which 92% occurred in Alligator Management Zones (AMZs) 1 and 3, an increase from 87% in 2009. AMZs 1 and 3 are the only management zones open to the Alligator sport hunt and a total of 38 Alligators were harvested, out of 47 available permits. This represents an 81% hunter success rate and a significant increase from the 2009 harvest with a 40% success rate. The harvest sex ratio was 2.1:1 (M:F), an increase from the 2009 harvest ratio of 1.4:1. Ten (10) subadults (4-6 ft size class) were harvested, which was skewed towards females (n = 8). An increase in mean TL (+1.2 ft) was noted in males and mean TL decreased (-1.3 ft) in females. Males continued to be harvested in greater numbers, comprising 67% of the harvest. Harvested males (for all harvest years) have consistently been larger in AMZ 1 than those from AMZ 3, with a mean TL of 9.5 ft compared to 8.3 ft. However, a new maximum size record was established with the harvest of 13.1 ft male in AMZ 3.

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. A total of 33 post-harvest spotlight survey routes were sampled in May and June 2011. Approximately 62% of all 2011 surveys exhibited a decrease in the APM metric. The pooled mean APM value for the 2011 post-harvest surveys was 6.0, a decrease of 3.4 APM from 2010 (9.4 APM). This compared closely to the pooled mean of 6.6 and 6.2 for 2008 and 2009, respectively. This decrease in APM values could be interpreted as a decrease in overall population numbers. However, these numbers could still be within the range of normal population fluctuation cycles, given that from 2009 through 2011 the region has experienced climatic extremes of both flooding and drought, which directly impact the Alligator population i.e., increased predation/ cannibalism of juveniles during drought, and ability to conduct surveys i.e., major flooding prohibited conducting surveys and/or dispersed animals thereby decreasing observability and reducing APM values.

The Alligator Management Team proposes a maximum of 48 Alligator sport hunt permits for 2011. The 2012 post-harvest population survey data will be closely monitored 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 2010 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 being used as a control for comparing trends in the number of nuisance occurrences and population density.

CITES Tags Use – A total of 38 CITES tags were issued in 2010 (Table 1). These tags were issued to successful Alligator sport hunters at the time that their Alligator was checked by AGFC personnel. There were no active Alligator Farmer Permittees in 2010, 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 were previously obtained as juveniles from legally permitted Alligator farmers in Florida or Louisiana.

Nuisance Occurrences – A total of 80 nuisance Alligator occurrences were recorded from 16 counties within AMZs 1–3 (Table 2). The number of nuisance occurrences in 2010 fell by 25% from 2009. AMZs 1 and 3 accounted for 92% 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, excluding incomplete 2000–2001 data, decreased in 2010 from 108 to 82 (Table 3).

AMZ 1: Miller County had the greatest number ($n = 19$) of nuisance reports among AMZs and counties, yet only three (3) Alligators were harvested in this county (Tables 2 and 4). Hempstead County had the second greatest number ($n = 13$) and five (5) animals were harvested in this county.

AMZ 3: Drew County had the greatest number ($n = 7$) of nuisance reports, yet only two individuals were harvested from this county. Chicot County had the second greatest number ($n = 6$) of nuisance reports and no Alligators were harvested in this county.

Alligator Harvest – Arkansas’ fourth Alligator sport hunt was held during the last two weekends in September 2010 in AMZ’s 1 and 3. A total of 38 Alligators were harvested out of a possible 47 permits, yielding an 80% hunter success rate. An equal number (n = 19) of Alligators were harvested in both AMZs. Alligators were harvested from four (4) counties in AMZ 1 and two (2) counties in AMZ 3 (Table 4). Arkansas County in AMZ 3 had the greatest hunting pressure with a harvest of (n = 17). Little River County in AMZ 1 had the second greatest harvest (n = 6).

Harvest Demographics – The 2010 harvest sex ratio was 2.1:1 (M:F) (Table 5). A total of ten (10) subadults [4–≤6 ft total length (TL)], eight (8) in AMZ 3 and two (2) in AMZ 1, were harvested (Table 4). The subadult harvest sex ratio was strongly skewed towards females, eight (8) females and two (2) males. Individuals ≥6 ft TL are generally considered as sexually mature and this is the greatest subadult size class harvest to date. The mean TL of all males (n = 25) was 1.2 ft greater than in 2009, though the harvest was significantly less in 2009 (n = 12). The mean TL for males was 1.5 ft less in AMZ 3 than in AMZ 1 (Table 6). However, the record sized sport harvested Alligator to date was taken in AMZ 3 in 2010, measuring 13.1 ft. The mean TL of all females (n = 12) was 1.3 ft less than in 2009. Males comprised 67% of the harvest in 2010 (58% in 2009, 89% in 2008 and 57% in 2007). Harvested males in AMZ 1 have consistently been larger than those in AMZ 3; mean TL for 2007 – 2010: AMZ 1 (9.5 ft) and AMZ 3 (8.3 ft).

2011 Post-Harvest Population Survey – A total of 33 (AMZ 1, n=16; AMZ 2, n=10; and AMZ 3, n=7) spotlight survey routes were completed in May and June of 2011 (survey methods are described in the 2007–2008 annual reports). Two new survey routes were added to AMZ 1 in 2011, while the number of routes in AMZ 2 remained the same. Significant flooding during the survey period reduced the number of routes and replicates that could be run in AMZ 3, because as the flooding made conditions unsafe to survey at five (5) sites. The 2011 post-harvest survey routes (n = 16; Table 7) with historic data allow for long-term trend assessment. Eight (8) of these localities had harvests in 2010. As noted in Table 7 the Arkansas River Complex is composed of four wetlands in close proximity to each other and 16 out of the 19 Alligators harvested in AMZ 3 were taken from or near these localities. Water levels during this survey

period were at or above record flood levels within the Arkansas River Wetland Complex, which if these routes had been run would have greatly reduced observability due to dispersal of animals into inaccessible areas.

Approximately 62% of all 2011 surveys (Table 7) exhibited a decrease in the APM metric (range $-0.2 - 17.8$). This is in contrast to the 2010 post-harvest surveys where approximately 88% of survey routes exhibited increased APMs. These differences between years can be attributed to flooding, drought, and large numbers of juveniles encountered on specific survey routes.

The significant decrease in the APM ($\Delta -17.8$) at Bois d'Arc Lake was influenced by the absence of large numbers of juveniles (≤ 2 ft TL) that were observed during the 2010 survey. Severe drought conditions during the summer of 2010 may have resulted in the increased predation/ cannibalism of juveniles at this site. The significant decrease in APM ($\Delta -15.6$) at Grassy Lake could also be attributed to the influence of drought conditions and increased predation/ cannibalism at this locality. But only one survey was completed, with no replicate, during the 2011 survey period. This site acts as a control site in AMZ 1 as no hunting has occurred on this site since the initiation of the sport hunt. Grassy Lake also has the highest density population in the entire state. The decrease in APM ($\Delta -11.5$) within the Arkansas River Complex can be attributed to the influence of record flooding which prohibited surveys from being conducted. Only one survey route was completed and a replicate survey could not be completed at this site due to high water which prohibited access. The pooled mean APM value for all 2011 post-harvest surveys was 6.0, a decrease of 3.4 APM from 2010 (9.4 APM). This compared closely to the pooled mean of 6.6 and 6.2 for 2008 and 2009, respectively.

Harvest Estimation and Proposed 2011 Harvest – The recommendations for the proposed 2011 Alligator harvest are based on the data generated from the post-harvest population survey. The following parameters were used in determining the 2011 harvest rate: (1) only observations of Alligators ≥ 4 ft TL were used in calculating the harvest rate and (2) a harvest goal of 2% of the estimated Alligator population was applied for each locality.

The proposed harvest rate for 2011 will be a maximum of 48 permits. The Alligator Management Team recommends that no more than 21 harvest tags be issued in AMZ 1: sixteen (16) will be issued to the public through a randomized computer drawing, six (6) for specific

public lands harvest and ten (10) for private land-at-large harvest; and five (5) tags will be issued directly to private landowners with surveyed populations. A maximum of 27 harvest tags will be issued in AMZ 3: twenty (20) tags will be issued to the public through computer drawing, twelve (12) for specific public lands harvest and eight (8) for private land-at-large harvest; and no more than seven (7) tags will be issued directly to private landowners. All other AMZs will remain closed to the harvest of Alligators.

Table 1. Number of CITES tags issued in 2010. “Harvested” applies to Alligators taken during the sport hunt. There were no active Alligator farmers in 2010.

Application	<i>N</i>
Harvested	38
Farmed	0
Total	38

Table 2. Number of nuisance occurrences by Alligator Management Zone (AMZ) and county in 2010.

AMZ 1		AMZ 2		AMZ 3	
County	<i>N</i>	County	<i>N</i>	County	<i>N</i>
Hempstead	13	Calhoun	1	Arkansas	2
Howard	4	Columbia	1	Ashley	3
Lafayette	8	Lonoke	2	Chicot	6
Little River	4			Desha	5
Miller	19			Drew	7
Sevier	1			Jefferson	3
				Lincoln	1
Total	49		4		27

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

Year	Complaints
2000	11
2001	32
2002	64
2003	58
2004	50
2005	47
2006	36
2007	71
2008	61
2009	108
2010	82

Table 4. Data for 2010 Alligator harvest. (TAPT = Temporary Alligator Possession Tag)

TAPT #	CITES #	AMZ	County	Capture method	Dispatch method	Sex	TL (ft)
102-3	1000001	1	Miller	Snare	Shotgun	M	11.9
114-1	1000002	1	Lafayette	Harpoon	Shotgun	M	11.0
115-1	1000003	1	Little River	Harpoon	Shotgun	M	11.7
110-2	1000004	1	Hempstead	Harpoon	Shotgun	M	11.0
102-2	1000005	1	Lafayette	Harpoon	Shotgun	M	6.8
110-1	1000006	1	Hempstead	Harpoon	Shotgun	M	11.8
102-4	1000007	1	Hempstead	Snare	Shotgun	M	10.2
111-1	1000008	1	Miller	Snare	Shotgun	M	11.8
102-9	1000009	1	Little River	Snare	Shotgun	F	5.2
102-5	1000010	1	Little River	Snare	Shotgun	F	5.2
106-1	1000011	1	Little River	Harpoon	Shotgun	M	12.3
102-8	1000012	1	Lafayette	Harpoon	Shotgun	M	7.1
102-6	1000013	1	Lafayette	Harpoon	Shotgun	M	11.7
101-1	1000014	1	Hempstead	Harpoon	Shotgun	M	9.8
303-3	1000015	1	Lafayette	Snare	Shotgun	M	9.8
106-2	1000016	1	Little River	Harpoon	Shotgun	M	6.4
112-1	1000017	1	Little River	Snare	Shotgun	F	8.4
102-7	1000018	1	Miller	Snare	Shotgun	F	7.7
101-2	1000019	1	Hempstead	Snare	Shotgun	?	7.8
304-6	1000021	3	Arkansas	Harpoon	Shotgun	M	11.2
304-3	1000022	3	Arkansas	Harpoon	Shotgun	F	6.6
304-10	1000023	3	Arkansas	Snare	Shotgun	F	4.2
304-9	1000024	3	Arkansas	Harpoon	?	M	6.2
304-8	1000025	3	Arkansas	Harpoon	Shotgun	M	5.2
303-5	1000026	3	Arkansas	Harpoon	?	M	4.1
303-7	1000027	3	Arkansas	Harpoon	Shotgun	F	6.2
304-11	1000028	3	Arkansas	Snare	Shotgun	M	9.0
303-?	1000029	3	Drew	Snare	Shotgun	M	10.2
302-2	1000031	3	Arkansas	Harpoon	Shotgun	M	8.4
304-7	1000032	3	Arkansas	Snare	Shotgun	F	4.5
304-12	1000033	3	Arkansas	Snare	Shotgun	M	8.5
300-1	1000034	3	Drew	Harpoon	Shotgun	F	4.7
305-1	1000035	3	Arkansas	Harpoon	Shotgun	F	4.8
306-1	1000042	3	Arkansas	Harpoon	Shotgun	M	13.1
304-2	1000043	3	Arkansas	Snare	Shotgun	M	10.2
304-1	1000044	3	Arkansas	Snare	Shotgun	M	9.3
305-2	1000045	3	Arkansas	Harpoon	Shotgun	F	5.3
304-4	1000047	3	Arkansas	Snare	Shotgun	F	5.5

Table 5. Comparison of total length (feet) by sex for all sport harvested Alligators in 2010.

Sex	<i>N</i>	Range	Mean (\bar{x})
Male	25	4.1 – 13.1	9.5
Female	12	4.2 – 8.4	5.7

Table 6. Comparison of total length (feet) by AMZ and sex for sport harvested Alligators in 2010.

AMZ 1				AMZ 3			
Sex	<i>N</i>	Range	Mean (\bar{x})	Sex	<i>N</i>	Range	Mean (\bar{x})
Male	14	6.4 – 12.3	10.2	Male	11	4.1 – 13.1	8.7
Female	4	5.2 – 8.4	6.6	Female	8	4.2 – 5.5	6.4

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 2010 and 2011 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	2010 Harvest	Pre-harvest APM*	2008 APM	2009 APM	2010 APM	2011 APM	Δ APM
	Holly Mound	No	n/a	1.6	2.5	3.3	1.2	-2.1
	Bois d' Arc Lake	Yes	1.8	4.0	1.8	23.6	5.8	-17.8
	Lake Erling	Yes	1.4	0.4	0.2	1.5	1.3	-0.2
	Lost Lakes	Yes	n/a	15.4	3.9	8.7	6.7 ¹	-2.0
1	Yellow Creek/Cypress Bayou	Yes	1.3	2.8	1.5	5.4	3.5	-1.9
	Grassy Lake	No	30.8	43.5	42.4	51.3 ¹	35.7 ¹	-15.6
	Mercer Bayou	No	0.6	0.1	0.1	1.2	1.2	0.0
	Millwood Lake	Yes	0.6	2.7	1.6	4.8	2.3	-2.5
	Beard's Lake	No	1.7	2.7	2.3	4.4	4.8	+0.4
	Long Lake	No	0.4	0.5	1.2	1.4	3.7	+2.3
2	Bragg Lake	No	1.0	0.9	0.4	0.6	1.1	+0.5
	White Oak Lake	No	0.2	0.1	0.05	0.0	0.1	+0.1
	Arkansas River Complex ²	Yes	4.0	11.0	11.7	13.2	1.7 ³	-11.50
3	Tillar Duck Club	No	5.0	6.6	8.8	11.1	9.0	-2.1
	McClendon Farm	Yes	3.1	9.4	9.7	13.8	12.1	-1.7
	Hampton Farm	Yes	5.6	3.3	11.8 ¹	6.4	6.4	0.0

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

2 = The Arkansas River wetland complex consists of four survey routes in close proximity: Moores 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.

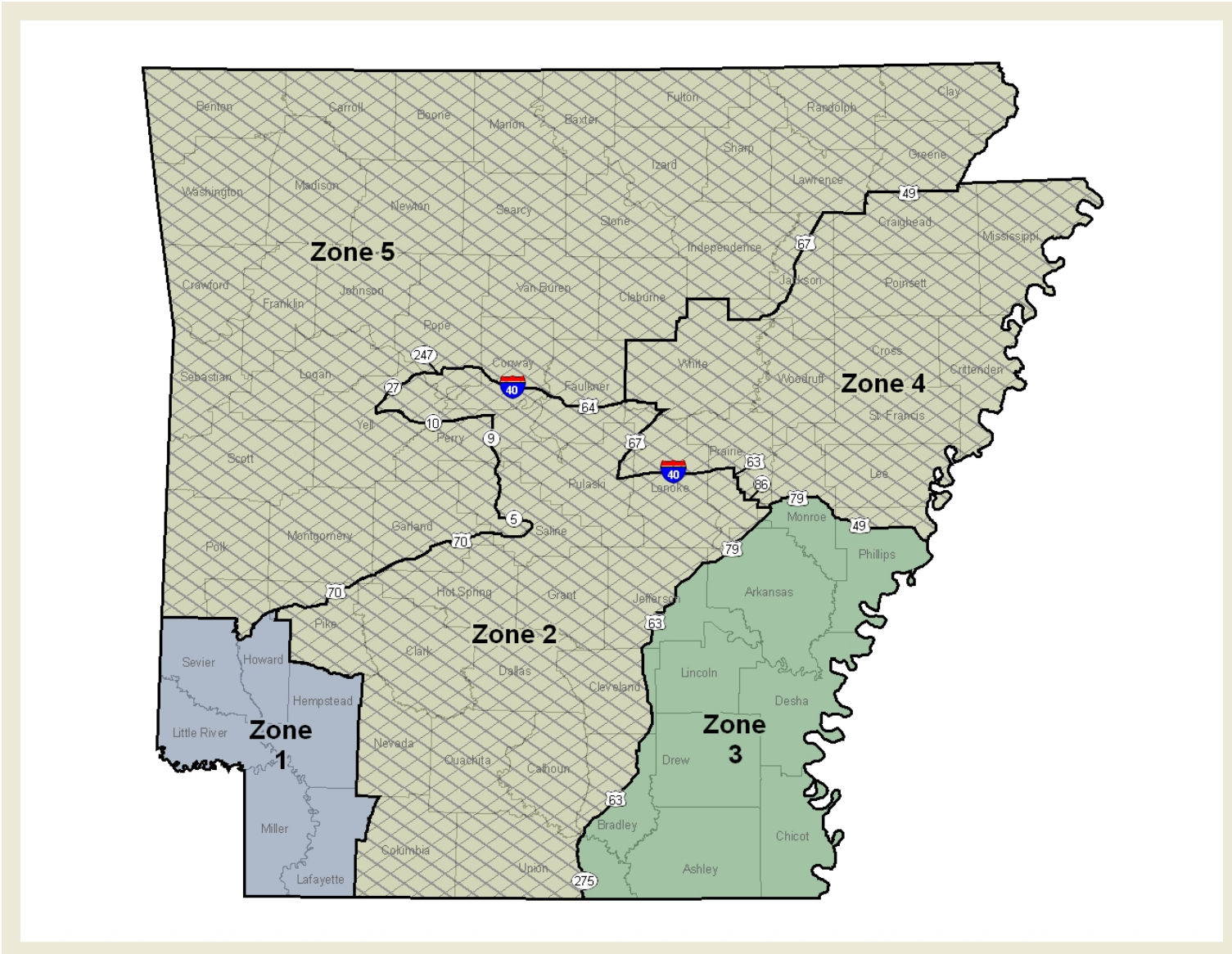


Fig. 1. Current Alligator Management Zones (AMZs); the Alligator sport hunt is permitted in highlighted zones 1 and 3.