



2011 Alligator Management Report



**Prepared by Kelly J. Irwin
Herpetologist
Alligator Management Team Co-chair**

26 June 2012

Basking adult female American Alligator at Grassy Lake, Hempstead County, Arkansas, July 2003. Photograph by K. J. Irwin

EXECUTIVE SUMMARY

This report presents information on the status of the Arkansas Game and Fish Commission's Alligator Management Program for 2011, 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.

A total of 23 CITES tags were issued to successful Alligator hunters in 2011. No CITES tags were issued for Alligator farming applications. The number of nuisance complaints decreased by approximately 9% from 2010 with a total of 75 reports. Alligator Management Zones (AMZs) 1 and 3 accounted for 93% of all nuisance complaints. A total of 23 Alligators were harvested in AMZs 1 and 3 in 2011. AMZs 1 and 3 are the only management zones open to the Alligator sport hunt. This represents a 48% hunter success rate and is a significant decrease from the 2010 harvest with an 81% success rate. The harvest sex ratio was 1.9:1 (M:F), a modest decrease from the 2010 harvest ratio of 2.1:1. Only two (2) subadults (4-≤6 ft size class) were harvested in 2011, a decrease from 10 subadults in 2010. Males continued to be harvested in greater numbers, comprising 65% of the harvest. The mean total length of harvested males (for all harvest years) have consistently been larger in AMZ 1 (9.7 ft) than those from AMZ 3 (8.4 ft). AMZ 1 produced a new maximum size record with a 13.1 ft male, which ties the size maximum established in AMZ 3 in 2010.

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 from April – June 2012. Approximately 75% of all 2012 surveys exhibited an increase in the APM metric. The pooled mean APM value for the 2012 post-harvest surveys was 9.5, an increase of 3.4 APM from 2011 (6.0 APM). This compared favorably to the 2010 pooled mean of 9.4 APM. The pooled APM values of long-term survey sites from 2008 – 2012 range from 6.0 to 9.5, with the greatest difference observed between the 2011 and 2012 surveys. Arkansas has experienced wide climatic extremes from severe drought to major flooding over the past several 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 climatic extremes. The Alligator Management Team proposes issuance of 47 Alligator sport hunt permits for 2012 and future population survey data will continue to 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 2011 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 AMZs 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, given its similar latitude as AMZs 1 and 3.

CITES Tags Use – A total of 23 CITES tags were issued in 2011 (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 2011, 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 75 nuisance Alligator occurrences were recorded from 18 counties within AMZs 1–3 (Table 2). The number of nuisance complaints in 2011 decreased by 9% from 2010. AMZs 1 and 3 accounted for 93% 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 overall mean annual number of nuisance Alligator reports increased in 2011 to 65.2 (Table 3).

AMZ 1: Hempstead County had the greatest number ($n = 13$) of nuisance reports among all AMZs and counties; and five (5) Alligators were harvested in this county (Tables 2 and 4). Miller County had the second greatest number ($n = 9$) yet only one (1) animal was harvested in this county.

AMZ 3: Arkansas County had the greatest number ($n = 10$) of nuisance reports in AMZ 3, and produced the highest number ($n = 6$) of harvested alligators in the state. Jefferson County

had the second greatest number ($n = 7$) of nuisance reports and no Alligators were harvested in this county.

Alligator Harvest – Arkansas’ fifth Alligator sport hunt was held during the last two weekends in September 2011 in AMZ’s 1 and 3. A total of 23 Alligators were harvested out of a possible 48 permits, yielding a 48% hunter success rate. AMZ 1 produced the majority of Alligators in 2011, with a harvest of 14 Alligators; and Hempstead and Little River counties the majority of those taken (Table 4). In AMZ 3 Arkansas County consistently produces the greatest number of harvested Alligators ($n = 6$), 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 any other area within AMZ 3.

Harvest Demographics – The 2011 harvest sex ratio was 1.9:1 (M:F) (Table 5). Only two (2) subadults [4–≤6 ft total length (TL)], were harvested in 2011, both from AMZ 1 (Table 4). This is a significant decrease from the 2010 harvest of 10 subadults. The mean TL of all males ($n = 15$) was 0.2 ft greater than in 2010, though harvest of males was significantly higher in 2010 ($n = 25$) (Table 5). As in 2010, harvested males from AMZ 1 had a higher mean TL than AMZ 3 (Table 6). AMZ 1 also produced a male that tied the record sized (13.1 ft) sport harvested Alligator taken in AMZ 3 in 2010. The mean TL of all females ($n = 8$) was 1.9 ft longer than in 2010. Males comprised 65% of the harvest in 2011 (67% in 2010, 58% in 2009, 89% in 2008, 57% in 2007). Harvested males in AMZ 1 continue to be consistently larger than those in AMZ 3. Comparison of mean TL from 2007 – 2011: AMZ 1 (9.7 ft) and AMZ 3 (8.4 ft).

2012 Post-Harvest Population Survey –Spotlight survey routes were completed from April - June 2012 (survey methods are described in the 2007–2008 annual reports). The 2012 post-harvest survey routes ($n = 16$; Table 7) with historic data allow for long-term population trend assessment. Eight (8) of these localities had harvests in 2011. 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 calculation of the APM metric. These areas consistently produce harvested Alligators.

In spite of major flooding during the spring and significant drought conditions in the summer of 2011 75% of all 2012 surveys (Table 7) exhibited an increase in the APM metric. This is in contrast to the 2011 post-harvest surveys where approximately 62% of survey routes exhibited decreased APMs. However, it should be noted that extreme flooding prevented post-harvest surveys in the Arkansas River Wetland Complex in the spring of 2011. Given these climatic extremes an *a priori* expectation of population metrics might have been an observed decrease in the 2012 APM. The assumption being that drought conditions would have concentrated more animals into shrinking available habitat resulting in increased cannibalism rates in smaller size classes. Additionally, the continued droughty conditions during the spring 2012 surveys may have somehow played a role in increasing the number of observed animals. However, there are no data to support either of these assumptions. Therefore, extreme shifts in the APM metric between years could be attributed to recent stochastic events (flooding, drought) and the number of juveniles encountered on specific survey routes.

The most significant increase in the APM ($\Delta +27.2$) was at Grassy Lake and could be attributed to the influence of drought conditions. This 3000 acre natural wetland experienced a significant contraction in areal extent in 2011. During the 2011 drought the submergent aquatic vegetation dried up forming a compacted layer of organic matter that became solid floating mats when the wetland refilled in the spring of 2012. These dense floating organic mats completely covered extensive areas (estimated at several hundred acres) that are normally open water, thus greatly reducing available habitat which concentrated Alligators ($n = 283$) in available open water during the survey. It should be noted that only one survey was completed at Grassy Lake during the 2012 survey period. Grassy Lake continues to serve as a survey control population 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 Alligator population density in Arkansas, and importantly, the largest native stock population. Significant increases in the APM metric were observed at all survey locations in AMZ 3 (Table 7). However, these increases were not the result of higher numbers of any particular size class.

The pooled mean APM value for all 2012 post-harvest surveys was 9.5, an increase of 3.5 APM from 2011 (6.0 APM). The 2012 pooled mean compared closely that of the 2010 value 9.4 APM. The pooled mean APM (2008 – 2012) ranges from 6.0 to 9.5 with the greatest difference observed between the 2011 and 2012 surveys.

Harvest Estimation and Proposed 2012 Harvest – The recommendations for the proposed 2012 Alligator harvest are based on the data generated from the post-harvest population survey. The following parameters were used in determining the 2012 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 2012 will be a maximum of 47 permits. The Alligator Management Team recommends that 24 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 eight (8) tags will be issued directly to private landowners with surveyed populations. A total of 23 harvest tags will be issued in AMZ 3: seventeen (17) tags will be issued to the public through computer drawing, nine (9) for specific public lands harvest and eight (8) for private land-at-large harvest; and six (6) 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 2011. “Harvested” applies to Alligators taken during the sport hunt. There were no active Alligator farmers in 2011.

Application	<i>N</i>
Harvested	23
Farmed	0
Total	23

Table 2. Number of nuisance occurrences by Alligator Management Zone (AMZ) and county in 2011.

AMZ 1		AMZ 2		AMZ 3	
County	<i>N</i>	County	<i>N</i>	County	<i>N</i>
Hempstead	13	Clark	1	Arkansas	10
Howard	2	Columbia	2	Ashley	2
Lafayette	7	Union	2	Chicot	4
Little River	4			Desha	3
Miller	9			Drew	3
Nevada	1			Jefferson	7
Pike	1			Lincoln	1
Sevier	3				
Total	40		5		30

Table 3. Number of nuisance Alligator complaints by year. Note: data for 2000 and 2001 are incomplete as data collection was not coordinated at that time.

Year	<i>N</i>	Mean (\bar{x})
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

Table 4. Data for 2011 Alligator harvest. (TAPT = Temporary Alligator Possession Tag)

TAPT #	CITES #	AMZ	County	Capture method	Dispatch method	Sex	TL (ft)
110-2	0122785	1	Hempstead	Snare	Shotgun	M	12.2
101-1	0122791	1	Hempstead	Harpoon	Shotgun	M	11.3
112-1	0122784	1	Hempstead	Harpoon	Shotgun	M	11.6
102-9	0122781	1	Hempstead	Snare	Shotgun	F	8.5
110-1	0122788	1	Hempstead	Harpoon	Shotgun	M	10.3
102-4	0122779	1	Howard	Snare	Shotgun	M	9.1
114-1	0122783	1	Lafayette	Snare	Shotgun	F	8.3
305-1	0122789	1	Lafayette	Snare	Shotgun	M	13.1
106-2	0122787	1	Little River	Harpoon	Shotgun	F	5.1
106-1	0122786	1	Little River	Snare	Shotgun	M	5.7
115-1	0122790	1	Little River	Harpoon	Shotgun	M	10.4
102-5	0122778	1	Little River	Harpoon	Shotgun	M	7.1
111-1	0122782	1	Miller	Snare	Bang Stick	M	10.9
102-3	0122780	1	Sevier	Snare	Shotgun	F	7.0
304-7	0122811	3	Arkansas	Harpoon	Shotgun	M	6.8
304-4	0122802	3	Arkansas	Harpoon	Shotgun	F	7.5
304-2	0122803	3	Arkansas	Snare	Shotgun	F	7.3
304-3	0122813	3	Arkansas	Harpoon	Shotgun	F	6.1
303-5	0122801	3	Arkansas	Harpoon	Shotgun	M	7.0
302-1	0122820	3	Arkansas	Harpoon	Shotgun	M	12.7
303-1	0122800	3	Chicot	Harpoon	Shotgun	M	7.0
303-3	0122812	3	Desha	Harpoon	Shotgun	M	10.1
300-1	0122819	3	Drew	Harpoon	Shotgun	F	8.5

Table 5. Comparison of total length (feet) by sex for all sport harvested Alligators in 2011.

Sex	<i>N</i>	Range	Mean (\bar{x})
Male	15	5.7 – 12.7	9.7
Female	8	5.1 – 8.5	7.6

Table 6. Comparison of total length (feet) by AMZ and sex for sport harvested Alligators in 2011.

AMZ 1				AMZ 3			
Sex	<i>N</i>	Range	Mean (\bar{x})	Sex	<i>N</i>	Range	Mean (\bar{x})
Male	10	5.7 – 13.1	10.2	Male	5	6.8 – 12.7	8.7
Female	4	5.1 – 8.5	7.2	Female	4	6.1 – 7.5	7.9

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 2011 and 2012 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	2011 Harvest	Pre-Hvst APM*	2008 APM	2009 APM	2010 APM	2011 APM	2012 APM	Δ APM
	Holly Mound	No	n/a	1.6	2.5	3.3	1.2	2.0	+0.8
	Bois d' Arc Lake	Yes	1.8	4.0	1.8	23.6	5.8	3.6	-2.2
	Lake Erling	Yes	1.4	0.4	0.2	1.5	1.3	1.0	-0.3
	Lost Lakes	Yes	n/a	15.4	3.9	8.7	6.7 ¹	12.2	+5.5
1	Yellow Crk/Cypress Byu	Yes	1.3	2.8	1.5	5.4	3.5	5.0	+1.5
	Grassy Lake	No	30.8	43.5	42.4	51.3 ¹	35.7 ¹	62.9	+27.2
	Mercer Bayou	No	0.6	0.1	0.1	1.2	1.2	1.8	+0.6
	Millwood Lake	Yes	0.6	2.7	1.6	4.8	2.3	4.5	+2.2
	Beard's Lake	No	1.7	2.7	2.3	4.4	4.8	4.9	+0.1
	Long Lake	No	0.4	0.5	1.2	1.4	3.7	3.3	-0.4
2	Bragg Lake	No	1.0	0.9	0.4	0.6	1.1	1.1	0.0
	White Oak Lake	No	0.2	0.1	0.05	0.0	0.1	0.6	+0.5
	Arkansas River Complex ²	Yes	4.0	11.0	11.7	13.2	1.7 ³	9.1	+7.4
3	Tillar Duck Club	No	5.0	6.6	8.8	11.1	9.0	15.0	+6.0
	McClendon Farm	Yes	3.1	9.4	9.7	13.8	12.1	16.3	+4.2
	Hampton Farm	Yes	5.6	3.3	11.8 ¹	6.4	6.4	8.2	+1.8

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.

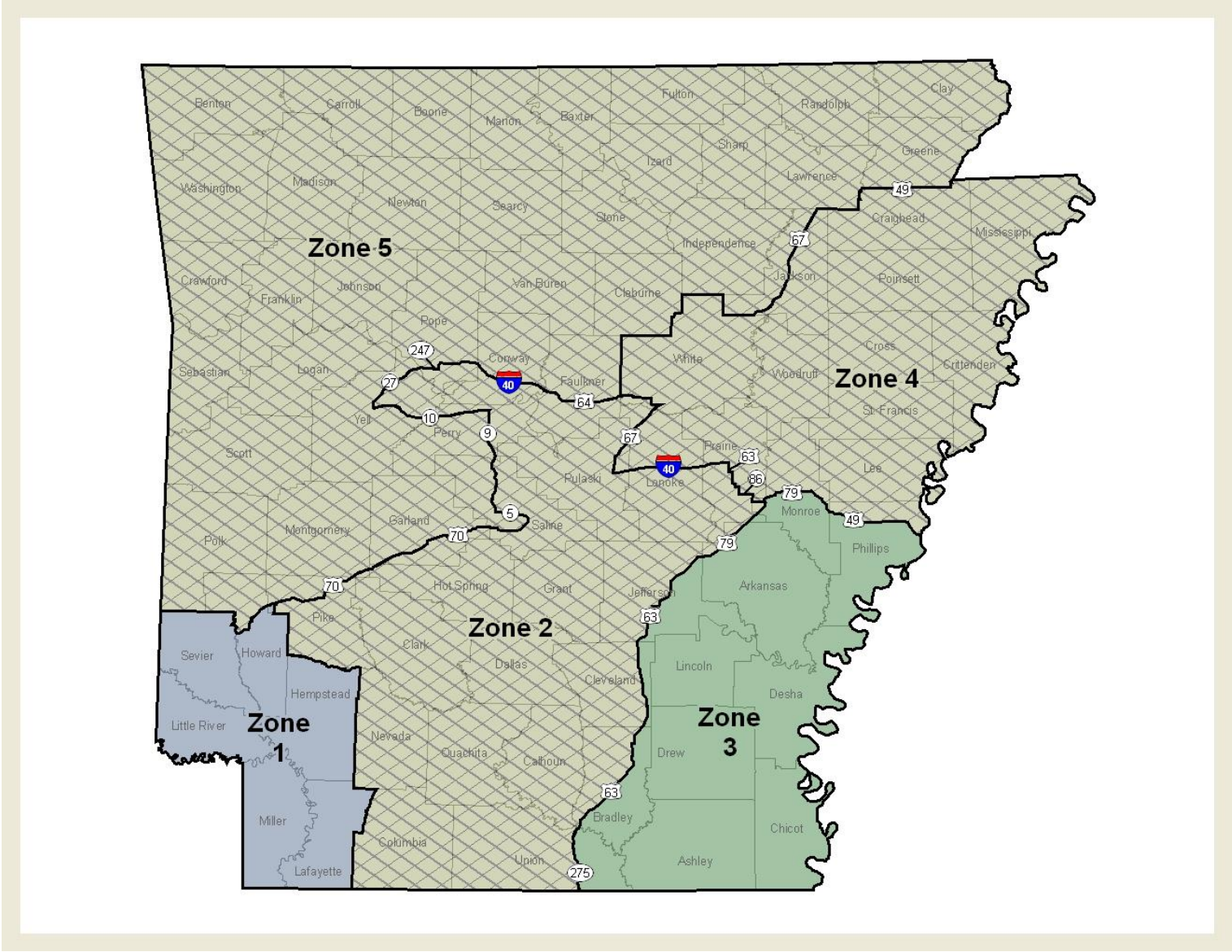


Fig. 1. Current Alligator Management Zones (AMZs); the Alligator sport hunt is permitted in highlighted zones 1 and 3.