



2007 Alligator Management Report



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Alligator Management Team

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Photograph courtesy of Jonathan Gill. American Alligator eating a Cattle Egret at Grassy Lake, Hempstead County, Arkansas May, 2008.

EXECUTIVE SUMMARY

This report presents information on the status of the Alligator Management Program 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; (2) number of nuisance alligator occurrences in 2007; (3) 2007 harvest demographics; (4) the methods used in determining harvest levels; and (5) 2008 post-harvest population survey data. A total of 459 CITES tags were issued in 2007, 21 to alligator hunters. The majority of the 71 nuisance alligator complaints occurred in Alligator Management Zones (AMZs) 1 and 3, the only zones open to the alligator sport hunt. Out of 32 hunters, a total of 21 alligators were harvested during the 2007 alligator sport hunt, a 65.6% hunter success rate. Twelve alligators were harvested in AMZ 1, the largest alligators were taken in AMZ 1 and nine in AMZ 3. The sex ratio of harvested alligators was 1.3 M:1 F (n= 12 and n=9 respectively). Harvest quotas were based on alligator density, using the metric “number of alligators observed per mile of survey route” or APM, as determined via replicated spotlight surveys. A total of 40 post-harvest spotlight routes were conducted in May and June 2008. The 2008 APM densities were compared with data from the 2002-2004 surveys and suggested no decrease in alligator populations. The size class frequency distribution of pre- and post-harvest survey data suggests that populations are predominantly composed of juvenile and sub-adult size class individuals. This would suggest that prior to harvesting those size classes experienced high survivorship and recruitment rates indicative of healthy populations. However, decreases in these size class structures will not be detectable for several years. Regardless, no reductions in adult number were detected. Since the sample size is small and consists of only one year’s worth of data, findings for this analysis have no real significance until a multiple year data set is available.

Prior to 2001, management of wild populations of the American Alligator (*Alligator mississippiensis*) in Arkansas had historically been passive, with the exception of agency restocking efforts in 1972–1984. Since 2001 an active alligator management program has been implemented resulting in: (1) establishment of a nuisance alligator protocol and coordinator network; (2) the first systematic alligator population surveys; (3) creation of an Alligator Management Plan; and (4) realization of the first agency sanctioned alligator sport hunt in 2007. The information contained in this report is a direct result of these efforts and is presented here to fulfill the requirements of the U. S. Fish and Wildlife Service in providing evidence that the current harvest has not been detrimental to the wild alligator population, for compliance with the CITES agreement.

CITES Tags – A total of 459 CITES tags were issued in 2007 (Table 1). The majority of tags (n = 438) were issued to the sole alligator farmer in Arkansas, the remaining 21 were issued to successful alligator hunters. The Arkansas Game and Fish Commission (AGFC) does not allow the collection of eggs or hatchlings of wild alligators for commercial purposes. All farmed alligator stocks in Arkansas are obtained as juveniles from legally permitted alligator farmers in Florida or Louisiana.

Nuisance Occurrences – From March 2007 through May 2008, a total of 71 nuisance alligator occurrences were recorded in 20 counties within Alligator Management Zones (AMZs) 1–3 (Tables 2 and 3; Fig. 1). The greatest number of nuisance complaints occurred in AMZ 1 (n = 32) and AMZ 3 (n = 22). The fewest nuisance complaints occurred in AMZ 2 where alligator hunting is closed. AMZ 2 is used as a control for comparing the number of nuisance occurrences and population survey data with AMZs 1 and 3. No nuisance alligators were harvested/destroyed by agency personnel during 2007. Table 8 presents the total number of nuisance complaints by year from 2000 – 2007. The small number of nuisance occurrences in 2000 was due to the absence of a nuisance alligator protocol so data were not systematically collected at that time.

Miller County had the greatest number (n = 12) of nuisance incidents in AMZ 1, yet only one alligator was harvested in this county during the sport hunt. Hempstead County had the second greatest number (n = 8) of nuisance incidents in AMZ 1, and the greatest harvest rate of any

county in the state (Tables 3 and 6). In AMZ 3 Arkansas and Lincoln counties were tied with four nuisance occurrences per county and Arkansas County had the greatest number ($n = 5$) of harvested alligators (Tables 3 and 6).

Alligator Harvest – The 2007 alligator sport hunt was the first agency sanctioned hunt in the states' history. It was held during the last two weekends in September in AMZ's 1 and 3 (Fig. 2). A total of 21 alligators were harvested out of a possible 32 registered hunters (bag limit of one alligator per hunter), yielding a 65.6% hunter success rate. The hunter success rate was higher than expected. Alligators were harvested from five counties in AMZ 1 and from two counties in AMZ 3 (Fig. 2).

Harvest Demographics – The harvest sex ratio was 1.3 M: 1 F (12 and 9 respectively) (Table 4). The average total length (TL) of males was 1.65 ft greater than females, which is to be expected due to sexual dimorphism (Fig. 4). The number of harvested males was twice that of females in AMZ 1 (Table 5), with almost equal numbers of both sexes in AMZ 3. The mean TL for males varied only slightly (0.61 ft) between AMZs, while the mean TL for females varied by almost one foot (0.95 ft) between AMZs (Table 5). The average size of alligators was bigger in both sexes in AMZ 1. Since the sample size is small and consists of only one year's worth of data, findings for this analysis have no real significance until a multiple year data set is available.

Post-Harvest Population Survey – A total of 80 spotlight surveys ($n = 40$ routes) were completed in May and June of 2008 (Fig. 3). Replicate surveys were conducted with a 10-14 day interval between surveys, with 16 routes in AMZ 1, 14 routes in AMZ 2, and 10 routes in AMZ 3. Two parameters were used in determining alligator population density: (1) the mean (average) number of alligators observed for each replicated survey was used in calculating the density; and (2) a 25% observability rate was assumed when calculating total number of individuals at each locality. Surveys were conducted at every locality in AMZs 1 and 3 where an alligator was harvested in 2007. Some localities where alligators were harvested in 2007 were on private lands that had not been previously surveyed. Some new survey routes were added in 2008 based on potential surveyability and harvestability, i.e., large size of wetland and

observable population numbers. Surveys in AMZ 2 were used to compare harvested vs. non-harvested alligator populations.

Data collected from the 2002-2004 population surveys provided a baseline measure of alligator population density, using the metric “number of individual alligators observed per mile of survey route” or APM (Table 7). This is the current standard measure of alligator population density and is used in other states. Several factors must be considered when comparing the 2002-2004 survey data with 2008 data: the influence of an extended flooding event during early spring 2008; the addition of new survey routes; elimination of a few old survey routes; harvest of alligators on private lands (i.e., no pre- or post-harvest population survey data) in 2007; and aquatic vegetation growth (affects observation rates). As this annual review process continues into the future the survey data set should stabilize, providing better information for management considerations.

Table 7 provides a summary of APM density values at 20 localities, with pre-harvest data (2002-2004 survey) (n = 18) and two localities where harvest occurred without pre-harvest data. Of those localities, with pre- and post-harvest survey data, where an alligator was harvested (n = 7) 64% of those localities had increased APMs, a mean increase of 6.7 APM. The substantial APM increase (+27.3) at Red Lake is due to the large number of juveniles encountered during the survey. For those localities (n = 4) with harvest that showed a decreased APM value, the mean decrease was only 1.25 APM. The combined mean density value in 2008 for all surveys, excluding those without pre-harvest data, was 7.1 APM, compared to a mean of 4.0 APM (2002-2004 data). This is a significant increase in overall population density values.

The size class frequency distribution for the 2003-2004 population survey (Fig. 5) exhibits a normal distribution, whereas the size class frequency distribution for the 2008 population survey (Fig. 6) is dramatically skewed towards juveniles and sub-adults, indicating very good reproduction within the past two years. This is reflected in the increased APM values at Red Lakes, Arkansas River complex, and McClendon Farm (Table 7).

Harvest Estimation and Proposed Harvest – The recommendations for the proposed 2008 alligator harvest are based on the data generated from the post-harvest population survey. The following parameters were used in determining the 2008 harvest rate: (1) only observations of alligators ≥ 4 ft TL were used in calculating the harvest rate and (2) a conservative target harvest

goal of 2% of the estimated alligator population was applied for each locality. Due to the limited amount of quality habitat and a finite population, the AGFC does not anticipate any significant increase in the number of harvested alligators or expansion of harvest areas in the future.

The recommendation of the Alligator Management Team will be to issue the same number of alligator harvest tags (32) for the proposed 2008 alligator season, as were issued in 2007. A total of 15 harvest tags will be issued in AMZ 1: seven (7) will be issued to the public through a random computer draw process i.e., two (2) for public land harvest and five (5) for private land at-large harvest; and eight (8) tags will be issued directly to private landowners on property with surveyed populations. A total of 17 harvest tags will be issued in AMZ 3: 13 tags will be issued to the public through a random computer draw process i.e., nine (9) will be issued for public land harvest and four (4) for private land at-large harvest; and four (4) tags will be issued directly to private landowners on property with surveyed populations. All other AMZs will remain closed to the harvest of alligators. Two public land localities, Lake Erling and Sulphur River WMA (Mercer Bayou), in AMZ 1 will not be open for harvest in 2008, based on decreases in the density values in the 2008 population survey. Two new locations will be opened for harvest on private land in 2008, one each in AMZs 1 and 3.

Table 1. Number of CITES tags issued in 2007. Harvested alligators were those taken in the wild during the official alligator sport hunt. Farmed alligators originated from either captive propagated stocks or regulated wild egg harvest in other states.

Application	<i>N</i>
Harvested	21
Farmed	438
Total	459

Table 2. Number of nuisance occurrences by Alligator Management Zone (AMZ) in 2007. The 2007 alligator sport hunt was permitted only in AMZ's 1 and 3 (Fig. ??).

AMZ	<i>N</i>
1	32
2	17
3	22
Total	71

Table 3. Number of nuisance occurrences by AMZ and county in 2007.

AMZ 1		AMZ 2		AMZ 3	
County	<i>N</i>	County	<i>N</i>	County	<i>N</i>
Hempstead	8	Calhoun	1	Arkansas	4
Howard	3	Clark	7	Ashley	2
Miller	12	Grant	1	Bradley	3
Lafayette	5	Ouachita	4	Chicot	2
Little River	3	Pike	2	Desha	3
Sevier	1	Union	2	Drew	3
				Lincoln	4
				Phillips	1
Total	32		17		22

Table 4. Comparison of total length (ft) by sex in all harvested alligators.

Sex	<i>N</i>	Range	Mean (\bar{x})
Male	12	4.33 – 12.67	8.89
Female	9	4.75 – 8.42	7.24

Table 5. Comparison of total length (ft) by AMZ and sex for harvested alligators.

AMZ 1				AMZ 3			
Sex	<i>N</i>	Range	Mean (\bar{x})	Sex	<i>N</i>	Range	Mean (\bar{x})
Male	8	5.83 – 12.5	9.09	Male	4	4.33 – 12.67	8.48
Female	4	7.17 – 8.42	7.77	Female	5	4.75 – 8.42	6.82

Table 8. Comparison of nuisance alligator complaints by year.

Year	Complaints
2000	11
2001	32
2002	64
2003	58
2004	50
2005	47
2006	36
2007	71

Table 6. Data for 2007 alligator harvest. (TAPT = Temporary Alligator Possession Tag)

Date	TAPT #	CITES #	AMZ	County	Capture method	Harvest method	Sex	TL (in)	Mass (lbs)
9/23/2007	101-2	0700341	1	Hempstead	Snare	Shotgun	F	96	—
9/29/2007	103-1	0700361	1	Hempstead	Harpoon	Shotgun	F	86	—
10/1/2007	102-5	0700364	1	Hempstead	Harpoon	Shotgun	F	90	104
9/21/2007	102-1	0700336	1	Hempstead	Snare	Shotgun	M	121	180
9/22/2007	101-1	0700339	1	Hempstead	Snare	Shotgun	M	150	410
9/30/2007	102-3	0700362	1	Hempstead	Harpoon	Shotgun	M	103	—
9/22/2007	104-1	0700338	1	Lafayette	Harpoon	Shotgun	F	101	—
9/23/2007	102-4	0700340	1	Lafayette	Snare	Shotgun	M	129	—
9/22/2007	106-1	0700337	1	Little River	Snare	Shotgun	M	101	—
9/23/2007	106-2	0700342	1	Little River	Snare	Shotgun	M	120	—
9/28/2007	302-2	0700343	1	Miller	Harpoon	Bang Stick	M	70	—
9/30/2007	102-2	0700363	1	Sevier	Harpoon	Shotgun	M	79	—
9/21/2007	304-7	0700358	3	Arkansas	Snare	Shotgun	F	76	—
9/22/2007	304-8	0700359	3	Arkansas	Snare	Shotgun	F	80	—
10/1/2007	304-4	0700354	3	Arkansas	Snare	Shotgun	F	57	—
9/21/2007	304-3	0700355	3	Arkansas	Snare	Shotgun	M	113	—
9/23/2007	304-2	0700360	3	Arkansas	Harpoon	Shotgun	M	90	—
9/28/2007	303-2	0700348	3	Drew	Harpoon	Shotgun	F	101	—
9/29/2007	303-3	0700345	3	Drew	Harpoon	Shotgun	F	95	—
9/21/2007	301-1	0700346	3	Drew	Snare	Shotgun	M	152	550
9/29/2007	300-2	0700349	3	Drew	Snare	Shotgun	M	52	—

Table 7. Pre- and post-harvest comparison of alligator density, using the density metric alligators per mile (APM). *= Data from: 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	Harvest	02-04 APM*	2008 APM	APM Change
	Holly Mound	Yes	n/a	1.6	-
	Bois d' Arc Complex	Yes	1.8	4.0	+1.2
	Lake Erling	Yes	1.4	0.4	-1.0
	Lost Lakes	Yes	n/a	15.4	-
	Yellow Creek/Cypress Bayou	Yes	1.3	2.8	+1.5
1	Grassy Lake	No	30.8	43.5	+12.7
	Red Lake	Yes	6.7	34.0	+27.3
	Mercer Bayou	Yes	0.6	0.1	-0.5
	Millwood Lake	Yes	0.6	2.7	+2.1
	Three Lakes	Yes	7.2	6.0	-1.2
	Beard's Lake	No	1.7	2.7	+1.0
	Peckerwood/Hartz Lake	No	1.5	0.1	-1.4
	Long Lake	No	0.4	0.5	+0.1
2	Little Maumelle	No	0.05	0.0	-0.05
	Bragg Lake	No	1.0	0.9	-0.1
	White Oak Lake	No	0.2	0.1	-0.1
	Hampton Farms	Yes	5.6	3.3	-2.3
3	Arkansas River Complex	Yes	4.0	11.0	+7.0
	Tillar Duck Club	Yes	5.0	6.6	+1.6
	McClendon Farm	Yes	3.1	9.4	+6.3

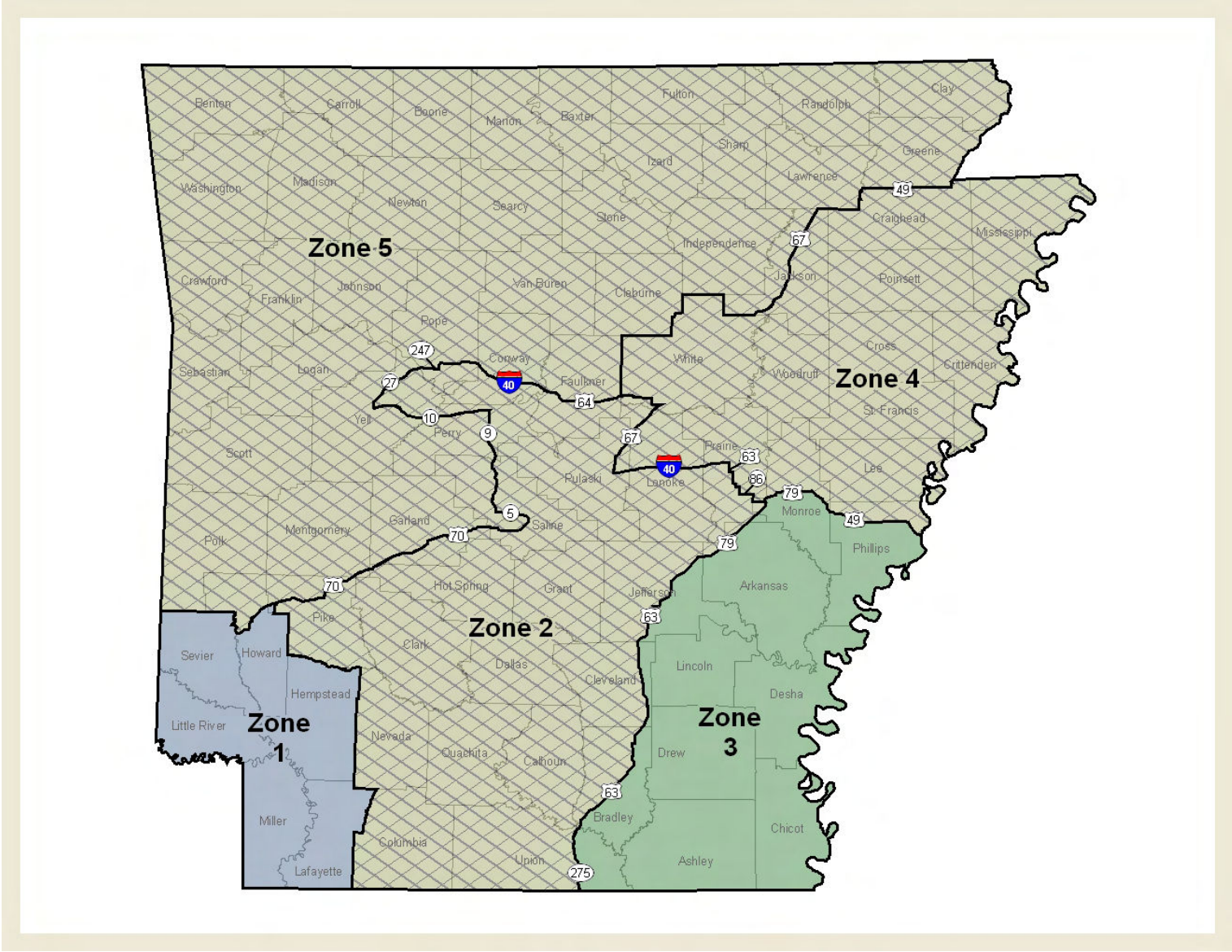


Fig. 1. Map of Alligator Management Zones (AMZs), showing highlighted zones 1 and 3 where the alligator sport hunt is permitted.

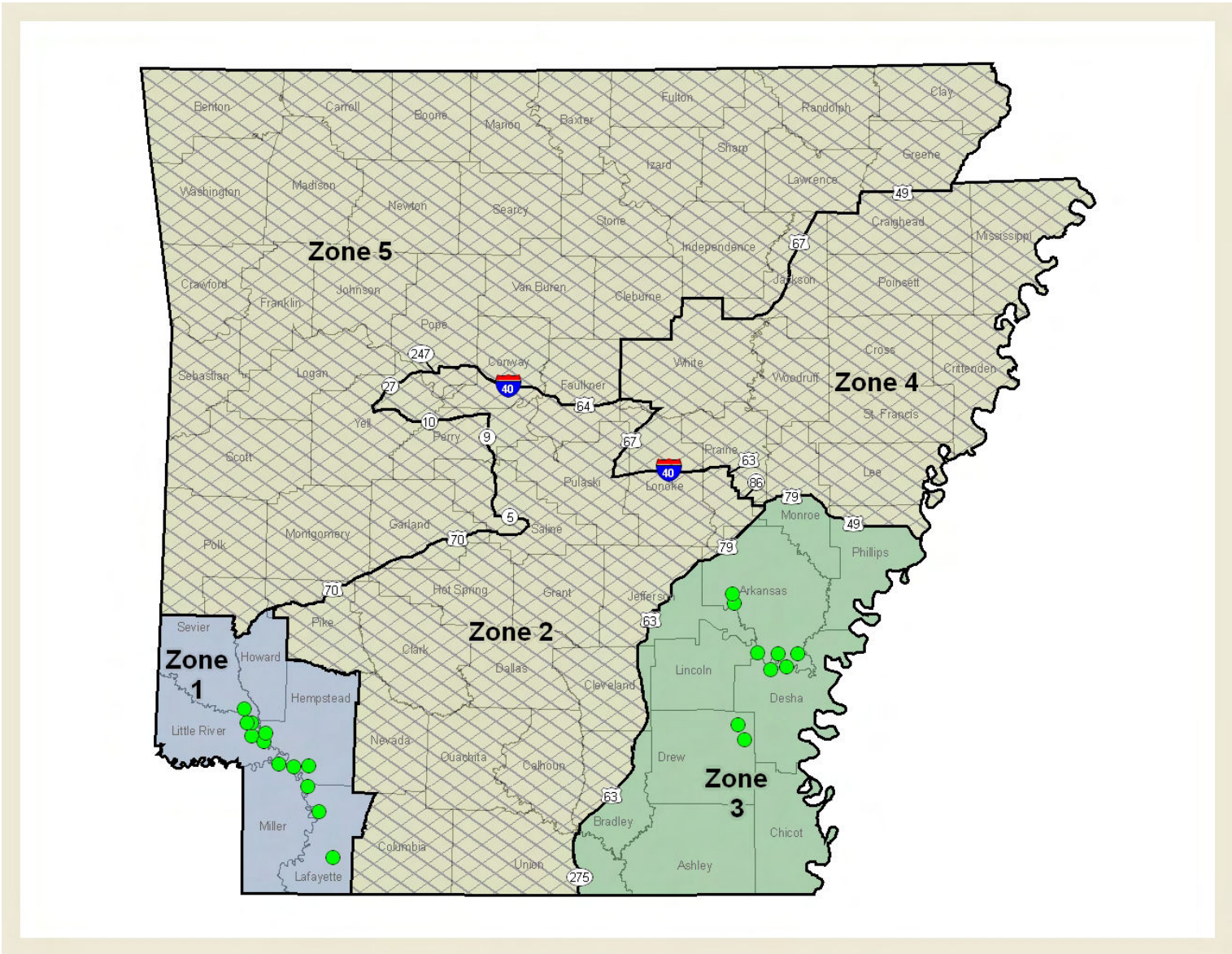


Fig. 2. Locations where alligators were harvested during the 2007 alligator sport hunt.

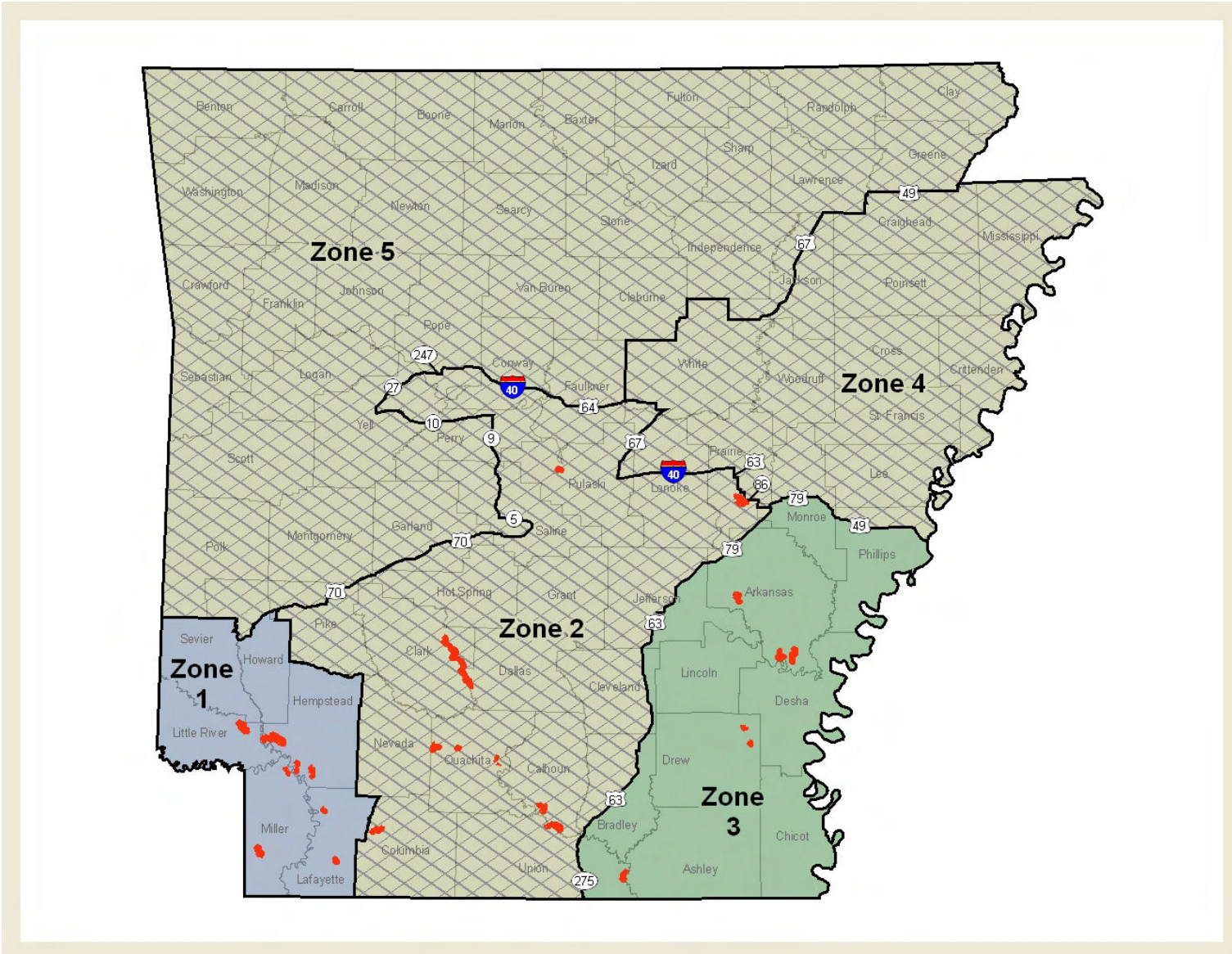


Fig. 3. Locations of the 2008 alligator population surveys conducted in AMZs 1-3.

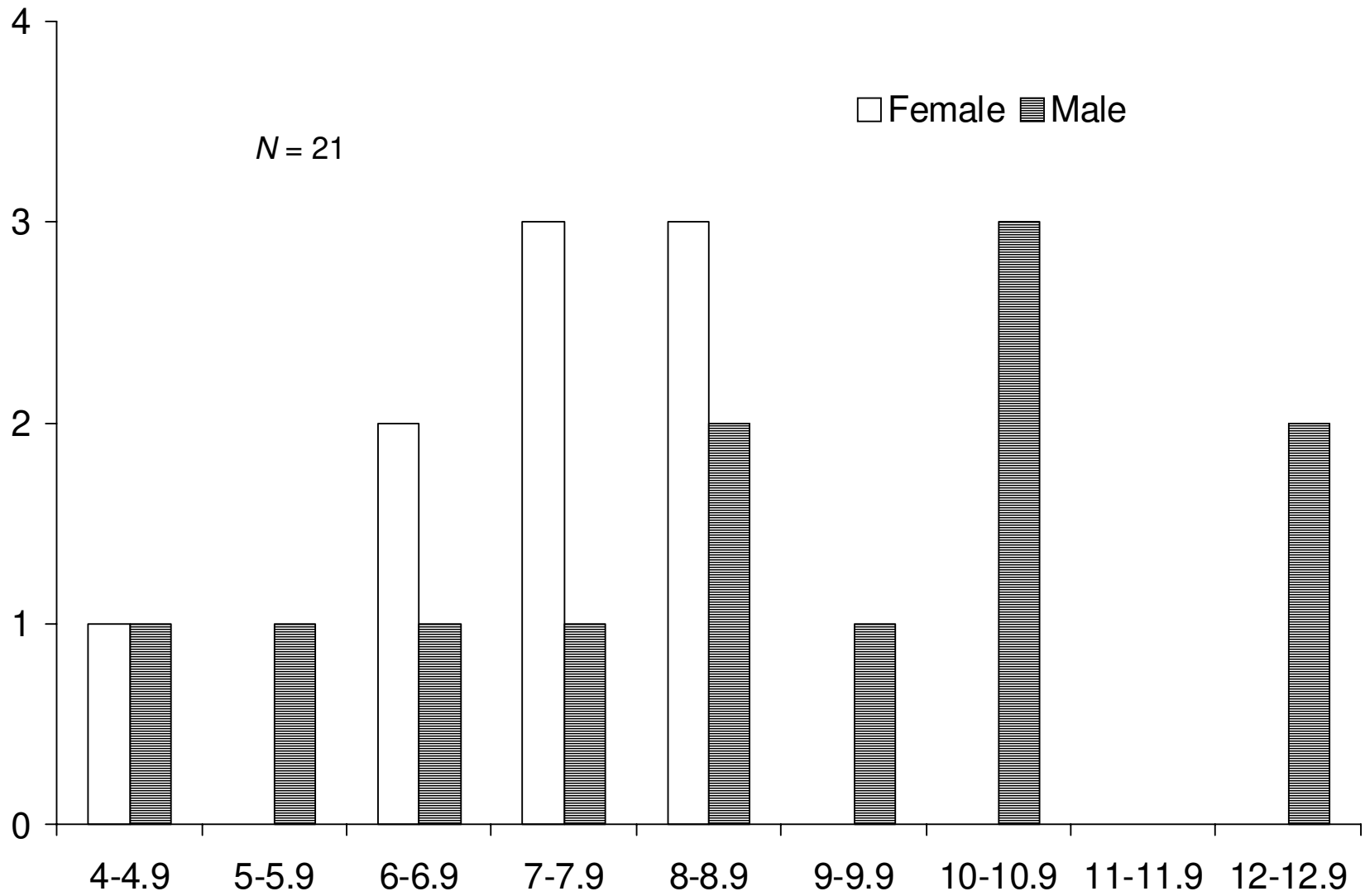


Fig. 4. Size class frequency distribution (ft) of male and female alligators harvested in 2007 sport hunt.

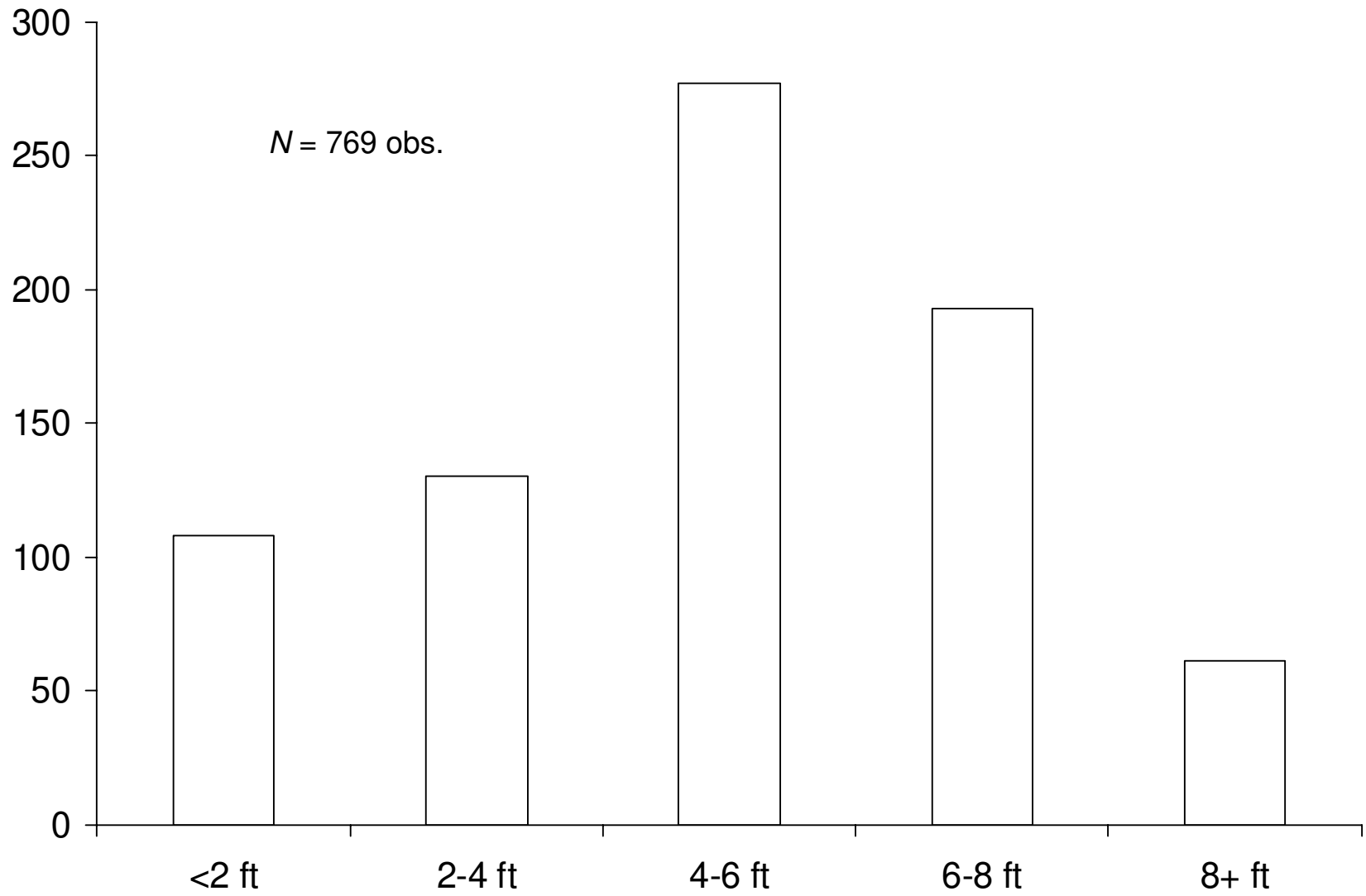


Fig. 5. Size class frequency distribution for all alligators in 2003-2004 population survey.

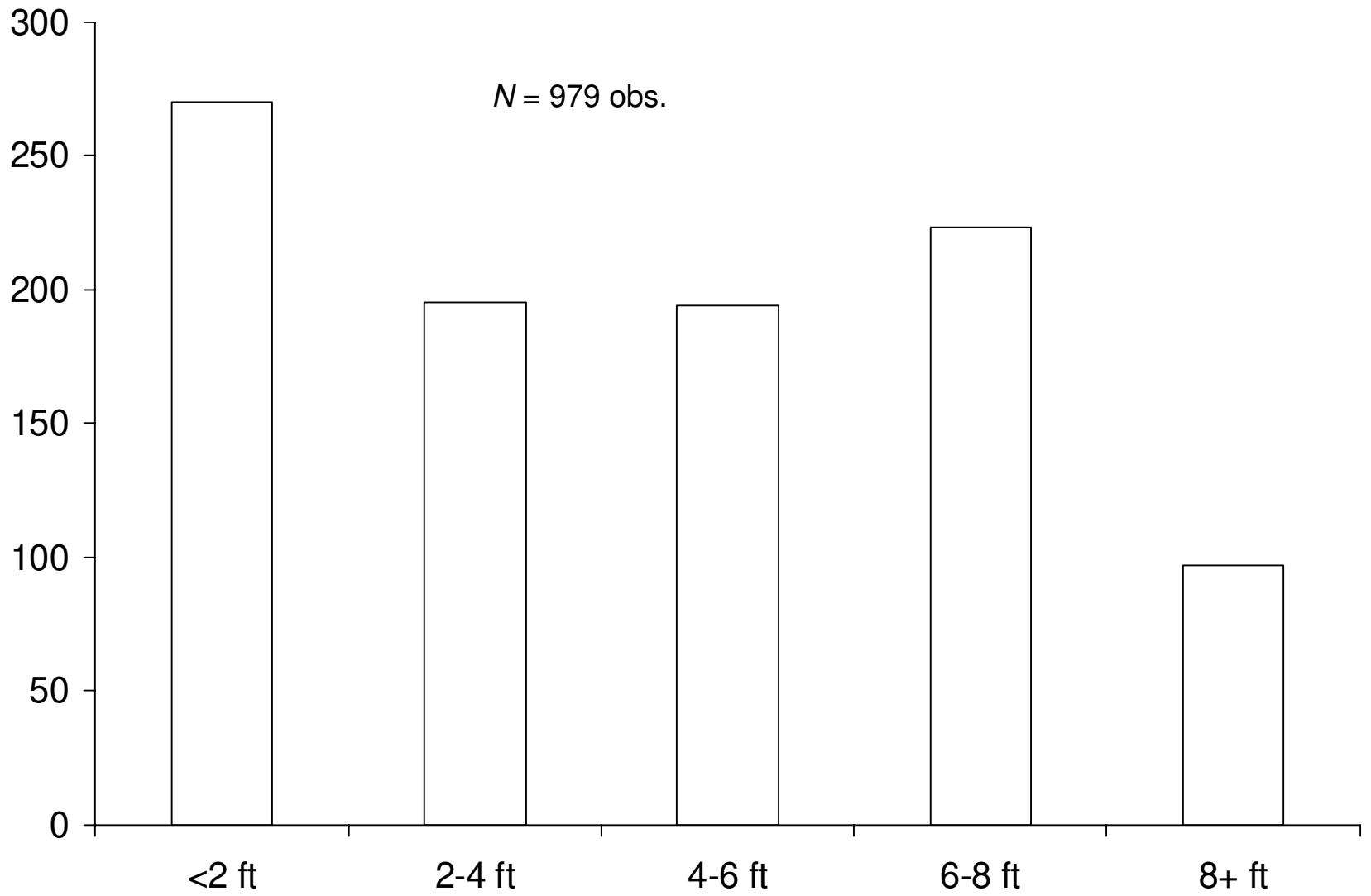


Fig. 6. Size class frequency distribution for all alligators in 2008 population survey.