

EVALUATION OF BLACK BEAR SURVEY DATA IN ARKANSAS, 1976 - 1980

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Abstract: Arkansas residents and personnel of the U.S. Forest Service, U.S. Fish and Wildlife Service and the Arkansas Game and Fish Commission reported 1,253 observations of black bear (*Ursus americanus*) and signs of their activity from 1976 through 1980. Cub:sow ratios ranged from 1.85 to 2.18 and averaged 2.06. Percent cubs observed ranged from 19.6 to 23.6 and averaged 22.4. Nuisance bear complaints increased during this period. Survey techniques and implications for present and future black bear management are discussed.

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Historically, the black bear was an important game animal to early pioneers and settlers of Arkansas. Demand for pelts and grease provided the commercial incentive that resulted in over-exploitation of this important resource. Indiscriminate killing and habitat loss reduced the number of bear in the state to a remnant population of 40 - 50 animals by 1950 (Holder 1951).

Between 1959 and 1968, efforts to reestablish black bear in Arkansas resulted in the translocation of 254 black bear from Minnesota and Manitoba, Canada to the Ozark and Ouachita National Forests in northern and western Arkansas. Releases were made on White Rock and Piney Creeks Wildlife Management Areas of the Ozark National Forest, and on the Muddy Creek Wildlife Management Area of the Ouachita National Forest. Released bear and their offspring were given complete protection from 1959 through 1980. Rogers (1973) reported the Muddy Creek and Piney Creeks releases as successful, and the White Rock release a failure. Conley (1978) reported subsequent data indicating the White Rock Area to also be a success.

Increasing numbers of bear sightings and complaints required the development of an economical means of monitoring the expanding bear population, determining range expansion, and reporting bear complaints. In 1976, District Biologists began soliciting reports of bear observations from Commission personnel, personnel of the U.S. Forest Service and Arkansas residents. Beginning in 1977, Conley (1978) refined the survey procedure as it was used through 1980.

I am grateful to the many Arkansas residents who reported observations of black bear, and to the personnel of the U.S. Forest Service and the U.S. Fish and Wildlife Service without whose cooperation the survey would not have been as successful. Mr. Bobby Conley, Mr. Mark Wright, Black Bear Committee members, and the personnel of the Arkansas Game and Fish Commission are acknowledged for their support of the survey. Mr. Raymond McMaster and the White River National Wildlife Refuge personnel receive our thanks for the information and assistance they provided. Mr. Steve N. Wilson and Dr. Robert C. Goetz are acknowledged for their review and critiques of the original manuscript.

METHODS

The survey procedure adopted utilized seven Arkansas Game and Fish Commission radio communication stations and district biologists. Radio operators and Commission personnel were supplied with instructions and report forms. Forms and instructions were supplied to the radio operators and regional supervisors of the Ozark and Ouachita National Forests. Public assistance in reporting observations was requested through news releases.

Data requested on report forms included: name and address of observer, county in which observation occurred, date, numbers and description of animals or sign, and specific location (township, range, and section) (Conley 1978). Data forms were forwarded to the survey coordinator and summarized monthly.

Duplications were eliminated by comparing date, location, and description of observation. Resulting data included indices of relative abundance pertaining to number of bear per county, number of cubs per sow, and percentage of cubs observed in the population.

Annual range distributions maps were plotted to monitor population changes and range expansion. Monthly observations were averaged for the period of the survey to determine annual activity information.

RESULTS

The following numbers of bears were reported for 1976, 1977, 1978, 1979, and 1980, respectively: 272, 455, 274, 232, and 296. Twenty-three of Arkansas' 75 counties reported no bear observations from 1976 to 1980. Twenty-four counties averaging less than 1 bear observation per year were classified as incidental occurrences resulting from movements away from known bear population centers. Fourteen counties averaging from 1 - 5 bear observations per year were classified as areas where population establishment and range expansion were probably occurring. Six counties averaging 6 - 10 observations annually were classified as having established bear populations. Three counties with a mean of 11 - 20 bear sightings annually were classed as having expanding established black bear populations. The 5 counties within which the original release sites were located exceeded an annual average of 21 observations (Fig. 1).

Cub:sow ratios ranged from 1.85 to 2.18 and averaged 2.06. The percentage of cubs within the observed population ranged from 19.6% to 23.6% and averaged 22.4% from 1976 to 1980. Both of these indices indicate Arkansas' black bear population is expanding (Jonkel and Cowan 1971).

The 1978 cub:sow ratio was the lowest recorded (1.85); whereas in 1977, the year in which the most observations were recorded, the lowest percentage of cubs was observed (Table 1). Conversely, the cub:sow ratio and the percentage of cubs observed during 1980, a year of extreme drought, were the highest recorded. Climatological data from 1976 through 1980 did not show any clear correlation with either cub:sow ratios or the percentage of cubs in the observed population.

Black bear were observed in Arkansas during every month of the year (Fig. 2). Observations were lowest during December through March. A denning black bear was checked weekly during the winter of 1979 - 80, and had left the den permanently by the week of March 15, 1980. Observations were highest during

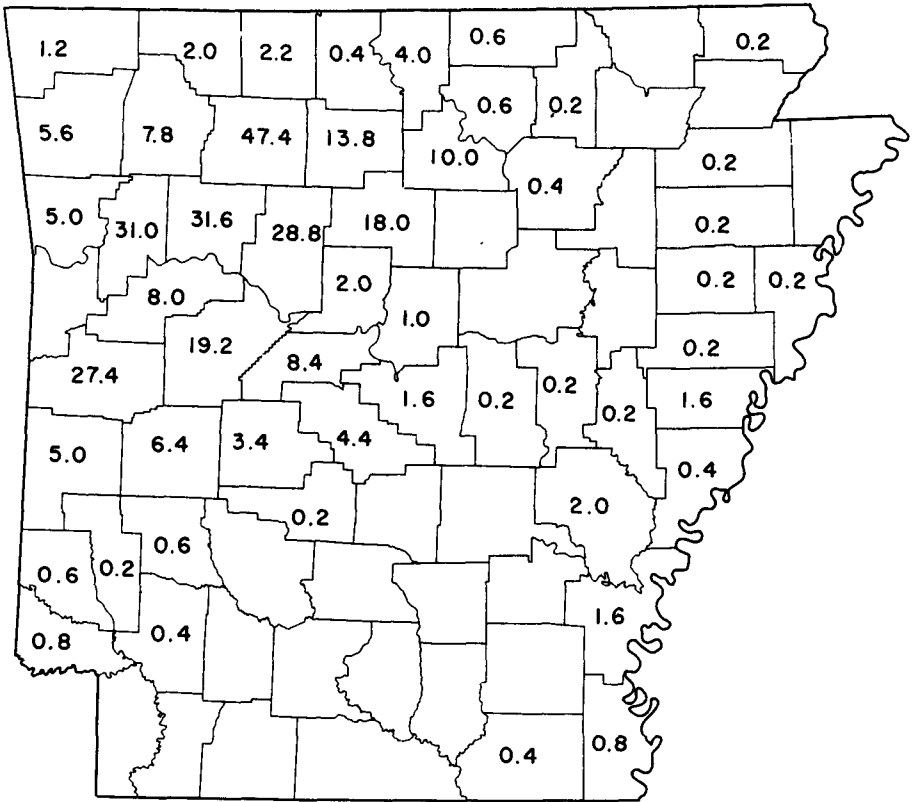


Fig. 1. Average number of bear observed in counties outside the White River National Wildlife Refuge from 1976 through 1980. No number listed indicates no bear were observed in that county.

Table 1. Summary of Black Bear Observations, 1976 - 1980.

Year	# Bear	# Observations	Cub:Sow	% Cubs
1976	272	269	2.10	23.2
1977	455	304	2.17	19.6
1978	274	220	1.85	23.0
1979	232	201	2.00	22.4
1980	296	259	2.18	23.6

April through June and were probably due to extensive activity associated with scarcity of food at this time of year. As natural foods became more available, observations decreased during July through September. Observations peaked again in October and coincided with annual mast drop and the fall squirrel and wild turkey seasons.

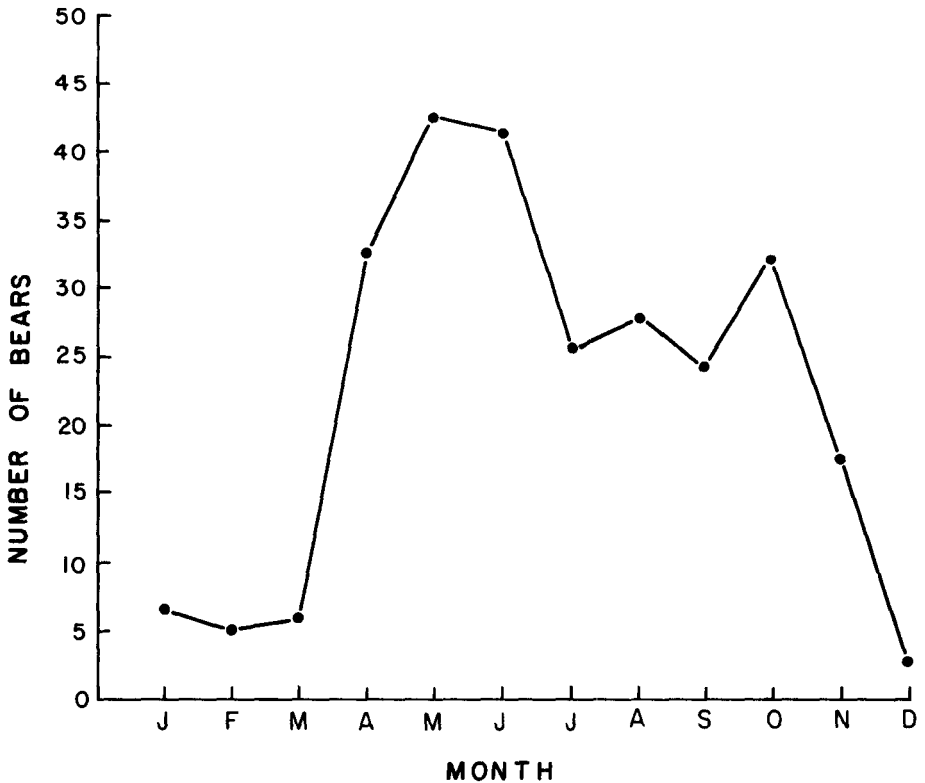


Fig. 2. Average number of black bear observations per month, 1976 - 1980.

DISCUSSION

The survey used to monitor Arkansas' black bear population has provided indices of relative abundance, cub:sow ratios, and the percentage of cubs observed that indicate an expanding population. Comparable data obtained by a similar survey technique are not readily available in the literature. Spencer (1955) reported a cub:sow ratio, obtained by soliciting reports of bear observations from conservation officers, of 2.4 in Maine. The cub component of the hunter harvest in Maine was 22.4%, and the population was described as increasing. Wilson and Gipson (1975), reporting on the status of the black bear in the western Ozarks, indicated 12 of 30 sightings included sows with cubs or immature bears alone. Cub:sow ratios and percentage of cubs in the observed population obtained by the survey are comparable to those documented elsewhere in the literature (Troyer and Hensel 1964, Jonkel and Cowan 1971, Kemp 1976). Pelton and Beeman (1975) stated the low proportion (14%) of cubs and yearlings in the black bear population of the Great Smoky Mountain National Park indicated a low reproductive rate.

Management of black bear in Arkansas has centered around protection of the resource and reducing problems caused by nuisance bear. Nuisance bear complaints have increased over the last decade, and as expected in an expanding population a majority of the bears relocated were sub-adult males. Bear survey data and the increase in nuisance bear complaints resulted in Arkansas' 1st legal bear season in December, 1980.

The 1980 black bear season, December 1 - 6, was conservative, experimental and the 1st in 53 years. Use of dogs and bait were prohibited, and hunters were permitted to hunt on Buffalo River, Gulf Mountain, White Rock and Piney Creeks Wildlife Management Areas. Approximately 1,000 sportsmen of the 1,338 who purchased permits participated in the hunt. Five black bear were harvested; 4 females and 1 male. Hunter success was low (0.5%).

Information from the bear survey was used in recommendations for the 1980 and 1981 black bear seasons. The 1981 season will be during the last week of October, and coincides with the fall peak of bear activity. The survey data aided in the designation of wildlife management zones open to black bear hunting.

At present the black bear survey is a continuing and important part of black bear management in Arkansas. The survey was recently modified to document actual sightings of black bear in counties with established and expanding populations. In counties classified as absent or incidental, observations of black bear sign are reported to determine if range expansion is continuing.

LITERATURE CITED

- Conley, B. W. 1978. Black bear status report of Arkansas. Pages 1-4 in R. Hugie, ed., Fourth Eastern Black Bear Workshop. Maine Dep. Inland Fish. and Wildl. Holder, T. H., ed. 1951. A survey of Arkansas game. Ark. Game and Fish Comm., Little Rock. 155pp.
- Jonkel, C. J., and I. M. Cowan. 1971. The black bear in the spruce-fir forest. Wildl. Mono. No. 27. 57pp.
- Kemp, G. 1976. The dynamics and regulation of black bear, (*Ursus americanus*), populations in Northern Alberta. Pages 191-197 in M. Pelton, J. Lentfer, and E. Folks, eds., Third International Conference on Bear Research and Management. Morges, Switzerland: IUCN New Series 40. Binghamton, NY and Moscow, U.S.S.R.
- Pelton, M., and L. Beeman. 1975. A synopsis of population studies of black bear in the Great Smoky Mountain National Park. Paper presented at Southern Regional Zoo Workshop, Am. Assoc. Zoological Parks and Aquariums. Knoxville, Tenn. 10pp.
- Rogers, 1973. Movements and reproductive success of black bear introduced into Arkansas. Proc. Ann. Conf. S.E. Assoc. Game and Fish Comm. 27:307-308.
- Spencer, H. E., Jr. 1955. The black bear and its status in Maine. Dep. Inland Fisheries and Wildlife. Fed. Aid to Wildl. Restoration Proj. W-37-R. 55pp.
- Troyer, W., and R. Hensel. 1964. Structure and distribution of a Kodiak bear population. J. Wildl. Manage 28:769-772.
- Wilson, S., and P. Gipson. 1975. Status of black bear in the Western Ozarks. Ark. Game and Fish 8(1):10-11.