

Great Smoky Mountains National Park - 2007

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Introduction

Great Smoky Mountains National Park (GRSM) is a 2,080-km² area located on the border of western North Carolina and eastern Tennessee. GRSM is the most visited national park in the U.S. with more than 9 million recreational visits annually. Developed areas include 10 campgrounds, 11 picnic areas, 104 backcountry campsites and shelters, 384 miles of road and numerous scenic overlooks. The black bear (*Ursus americanus*) population in GRSM is estimated to be approximately 1,580 animals (F. VanManen, The University of Tennessee, personal communication). The combination of high human use and a large number of bears creates a situation where human/bear conflicts are likely. The objective for managing bears in GRSM is to manage visitors, concessionaires, and employees in a manner that allows bears to live naturally, and provide for safe visitor use (National Park Service, 2002).

Mortality Information

Hunting is prohibited within GRSM. We documented seven bear mortalities within GRSM (Table 1); four bears were struck and killed by vehicles, two were euthanized for management reasons and one died during handling.

Management Programs

The annual black bear management workshop was held in April and focused on managing roadside human/wildlife conflicts. We continued to use pyrotechnics for managing bears and other habituated wildlife (Dolson 2002). We also worked with officials from the Tennessee Wildlife Resources Agency (TWRA) and the City of Gatlinburg, Tennessee (City) to manage bears along the City/GRSM boundary. Numerous food storage cable systems were also repaired.

From February 27 to December 15, 2007 we received 257 bear management reports, 34 resulting in estimated property damages of \$5,373 (Table 1). While property damage is significantly higher compared to previous years, the estimate is still low due to the submission of incomplete bear management reports. Only 32.4% of incident reports with property damage included a monetary estimate. The low reporting rate may be due to the relatively low value of the damaged property (e.g., water bottles, food, etc.) and/or the reluctance of individuals to admit to illegal activities (e.g., illegal camping, improper food storage, etc.).

Bear activity in frontcountry areas included three campgrounds (Cades Cove, Cosby, and Elkmont), one horse camp (Cades Cove), and five picnic areas (Cades Cove, Chimneys, Collins Creek, Cosby, and Metcalf Bottoms) as well as Smoky Mountains Riding Stables and Twin Creeks. Bear activity was reported at nine backcountry shelters (60%) and 16 backcountry campsites (16.3%) (Figure 1) as well as Mt. LeConte lodge. Bear warning signs were posted at 21 locations. Seven backcountry campsites, one shelter and Little Brier Gap trail were temporarily closed due to bear activity.

We captured 15 individual bears (10 males and 5 females) within GRSM for management purposes (Table 1). Five captured bears were relocated; two within GRSM and three to the Cherokee National Forest, Tennessee. Five captured bears were known to die; two were euthanized for management reasons, one died during handling and two were later struck and killed by vehicles. Wildlife and Visitor Protection staff also used non-lethal aversive conditioning techniques 13 times on bears.

Monitoring Programs

Black bears in GRSM are monitored by bait-station surveys to determine changes in relative densities and distribution (Johnson 1982) and a hard mast survey (Whitehead 1969, Wentworth 1989, Greenberg and Warburton 2006) to determine the availability of important fall foods (e.g., acorns) and their influence on black bear population dynamics. The University of Tennessee (UTK) conducts long-term black bear monitoring using mark recapture and radio-telemetry.

The bait-station survey was conducted from July 5 to August 1. The overall bear visitation rate was 77.2%, slightly lower than 2006 (80.1%). The hard mast survey was completed from August 9 to August 29. The red oak and white oak mast ratings were 1.67 and

2.00, respectively and the overall oak mast rating was 1.91. Index values for white oak and red oaks suggested poor abundance for each, however, some white oaks, particularly chestnut oaks, produced well in higher elevations (above 3,000 feet). White oak mast was particularly abundant along Cherokee Orchard road and Little Brier Gap trail, resulting in numerous bears at both locations. Wildlife and Visitor Protection staff actively managed large concentrations of bears and people along Cherokee Orchard most of October and early November. Little Brier gap trail was closed most of November to minimize human bear conflicts.

Bear researchers from The University of Tennessee completed their 39th year of ongoing field studies on black bears. Ten female bears were visited during the 2007 winter season. Six females reproduced, with litter sizes from 1 to 3 cubs. One female was accompanied a yearling and three females had no cubs or yearlings. Hair sampling, using hair traps consisting of single-strand barbed wire corrals, was conducted at previous live-capture trapsites from June 4 to July 30, 2007. Fifty-one hair traps were operated for 10 trapnights each for a total of 510 trapnights. Hair samples were collected during 446 of those trapnights (79% trap success rate) resulting in a total of 1,811 samples. Given these sample sizes, the potential for this approach to serve as an effective population monitoring technique is high. Unfortunately, funding for analysis of the samples was not received; therefore, a mark-recapture based population estimate is currently not available for 2007.

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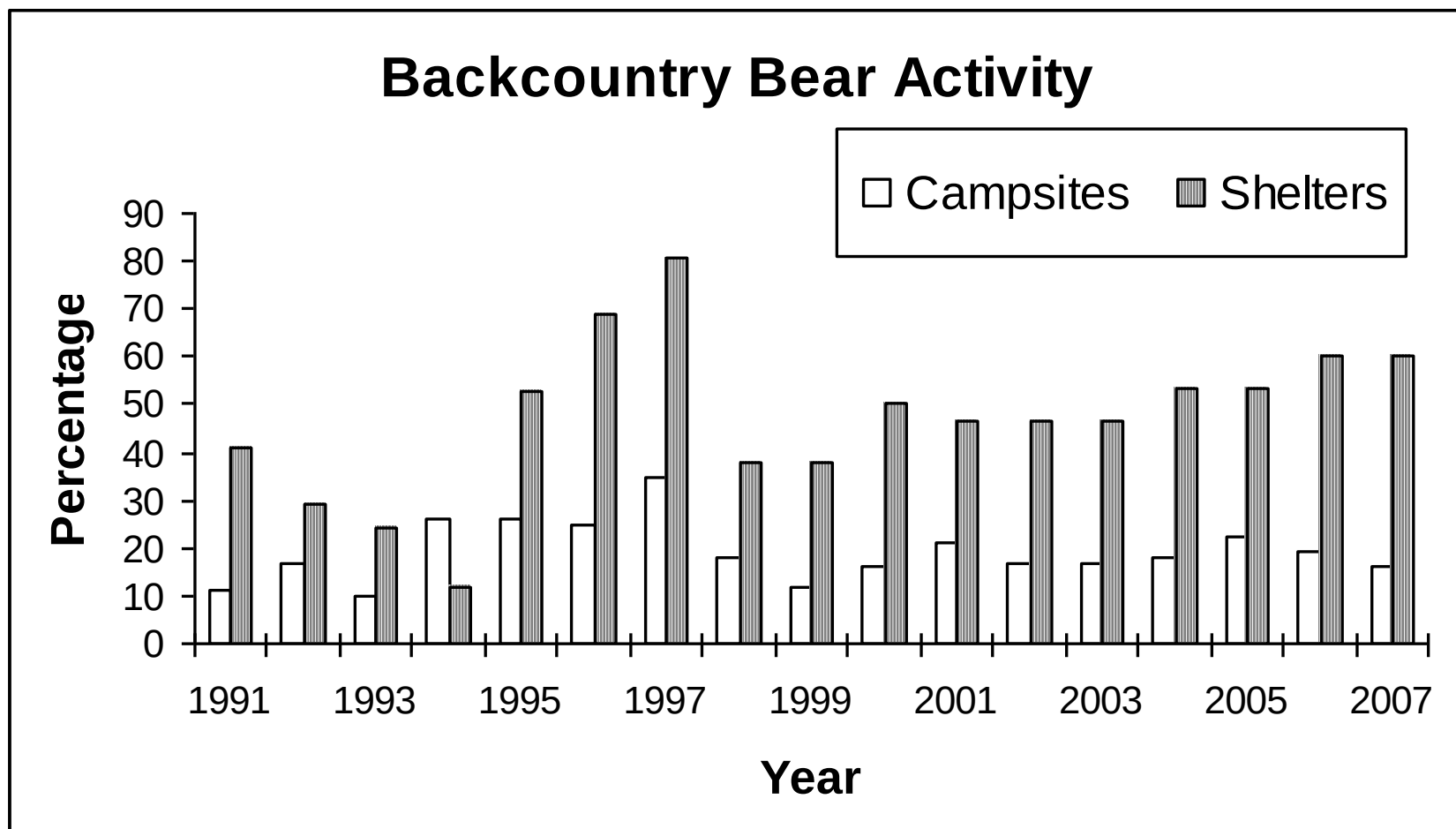


Figure 1. Percentage of backcountry campsites and shelters in Great Smoky Mountains National Park with bear activity, 1991-2007.

Table 1. Black bear management and monitoring statistics for Great Smoky Mountains National Park, 1998-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Management										
Bear Captures	19	24	19	17	24	17	22	21	13	20
Bears Relocated	5	10	6	8	15	8	6	6	6	5
Bears Released on Site	13	11	6	7	5	8	13	14	7	13
Individual Bears	18	16	18	16	19	16	21	19	13	15
Male	14 (78%)	14 (93%)	7 (39%)	10 (62%)	11 (58%)	9 (56.3%)	10 (55.6%)	13 (72.2%)	8 (61.5%)	10 (66.7%)
Female	4 (22%)	1 (7%)	11 (61%)	6 (38%)	8 (42%)	7 (43.7%)	8 (44.4%)	5 (27.8%)	5 (38.5%)	5 (33.3%)
Unknown	-	1	-	-	-	-	3	1	-	-
Bear Mortalities	6	16	15	6	8	5	4	6	3	7
Roadkill	3	6	3	4	3	2	2	4	2	4
Natural	-	1	1	-	-	-	1	1	-	-
Euthanized	1	5	6	2	4	-	1	1	-	2
Poached	1	-	1	-	1	-	-	-	1	-
Accidental	-	4	1	-	-	2	-	-	-	1
Unknown	1	-	3	-	-	1	-	-	-	-
Number of Incidents	110	116	147	170	176	112	163	165	249	257
Damage Incidents	28	46	27	32	23	11	29	26	35	34
Estimated Value	\$645	\$2,627	\$835	\$925	\$2,630	\$900	\$1,076	\$2,928	\$2770	\$5373
Human Injuries	1	1	2	2	1	0	0	0	1	0
Monitoring										
Population Estimate ¹	378	428	285	390	272	215	260	200	227	
95% Confidence Interval	<u>±</u> 96	<u>±</u> 95	<u>±</u> 75	<u>±</u> 152	<u>±</u> 82	<u>±</u> 58	<u>±</u> 116	<u>±</u> 72	<u>±</u> 72	
Bait-Station Survey	58.5%	53.7%	72.5%	58.6%	70.8%	67.6%	66.3%	72.8%	80.1%	77.2%
Oak Mast Survey	3.33	1.35	1.42	3.92	1.99	0.94	2.52	1.70	1.21	1.91
White Oak	1.73	1.23	0.78	1.05	0.97	0.99	2.62	0.48	0.80	2.00
Red Oak	3.77	1.29	1.61	5.10	2.38	0.80	2.25	2.24	1.33	1.67

¹Jolly-Seber population estimate determined by The University of Tennessee for the northwest portion of Great Smoky Mountains National Park.