North Carolina Black Bear Annual Report

Updated with 2018 Data

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Funding for the Black Bear Program was partially provided through a Pittman-Robertson Wildlife Restoration Grant. The Federal Aid in Wildlife Restoration Act, popularly known as the Pittman-Robertson Act, was approved by Congress on September 2, 1937, and began functioning July 1, 1938. The purpose of this Act was to provide funding for the selection, restoration, rehabilitation and improvement of wildlife habitat, wildlife management research, and the distribution of information produced by the projects. The Act was amended October 23, 1970, to include funding for hunter training programs and the development, operation and maintenance of public target ranges.

Funds are derived from an 11 percent Federal excise tax on sporting arms, ammunition, and archery equipment, and a 10 percent tax on handguns. These funds are collected from the manufacturers by the Department of the Treasury and are apportioned each year to the States and Territorial areas (except Puerto Rico) by the Department of the Interior on the basis of formulas set forth in the Act. Funds for hunter education and target ranges are derived from one-half of the tax on handguns and archery equipment.

Each state's apportionment is determined by a formula which considers the total area of the state and the number of licensed hunters in the state. The program is a cost-reimbursement program, where the state covers the full amount of an approved project then applies for reimbursement through Federal Aid for up to 75 percent of the project expenses. The state must provide at least 25 percent of the project costs from a non-federal source.

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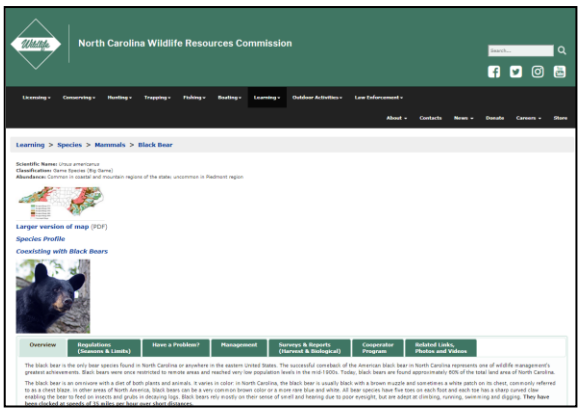
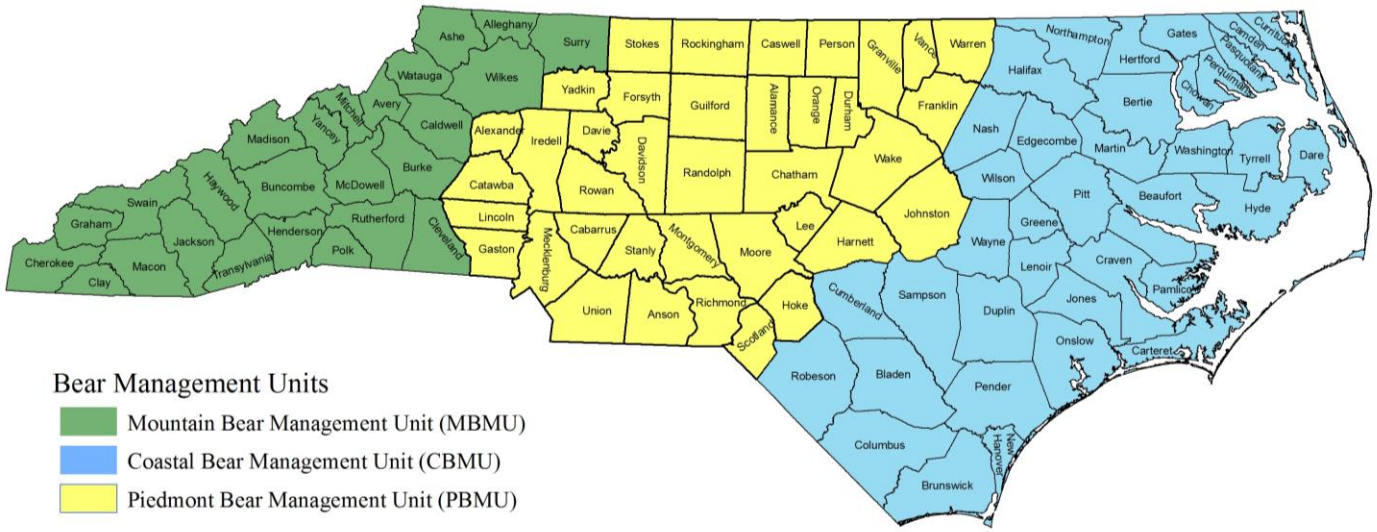
For more information on black bears in North Carolina, please visit our website at: www.ncwildlife.org/bear

There you will find information on:

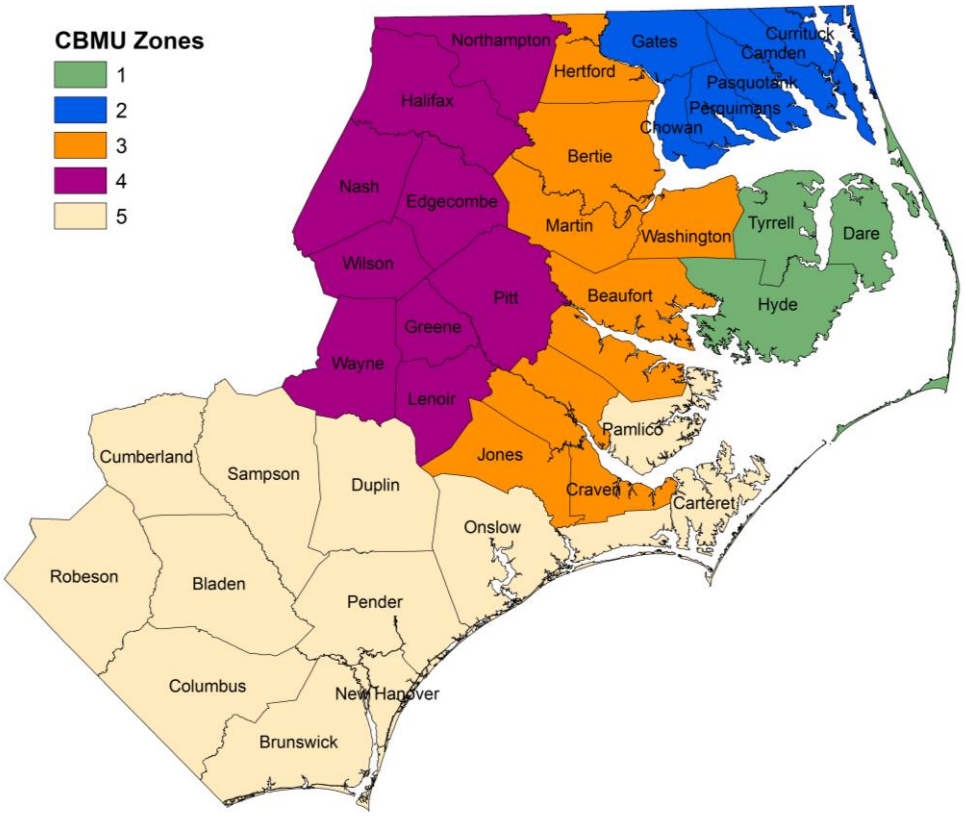
- NCWRC's 2012-2022 Black Bear Management Plan
- BearWise and how to prevent and resolve conflicts with bears.
- How to participate in the Black Bear Cooperator Program.
- Harvest Reports and Summaries
- And much more!



Black Bear Management Units



Coastal Bear Management Unit (CBMU) Zones



Statewide and Bear Management Unit Harvest

The statewide reported harvest for 2018 was a record harvest of 3,530 bears (Figure 1), a 2% increase from 2017 (N=3,454; Table 1). The statewide bear harvest has increased for eight of the ten past consecutive years from 2009 through 2018; the largest increase in harvest in those 10 years occurred in 2015 (24% increase; Table 1). Male harvest declined by 4% in 2018, while female harvest increased 13% (Table 1). Females comprised 41% of the reported harvest, an increase from 2017 when females comprised 37% of the harvest. The 2018 season was the 4th year in a row in which harvest exceeded 3,000 bears and the 4th year in a row in which North Carolina experienced a record harvest (Table 1).

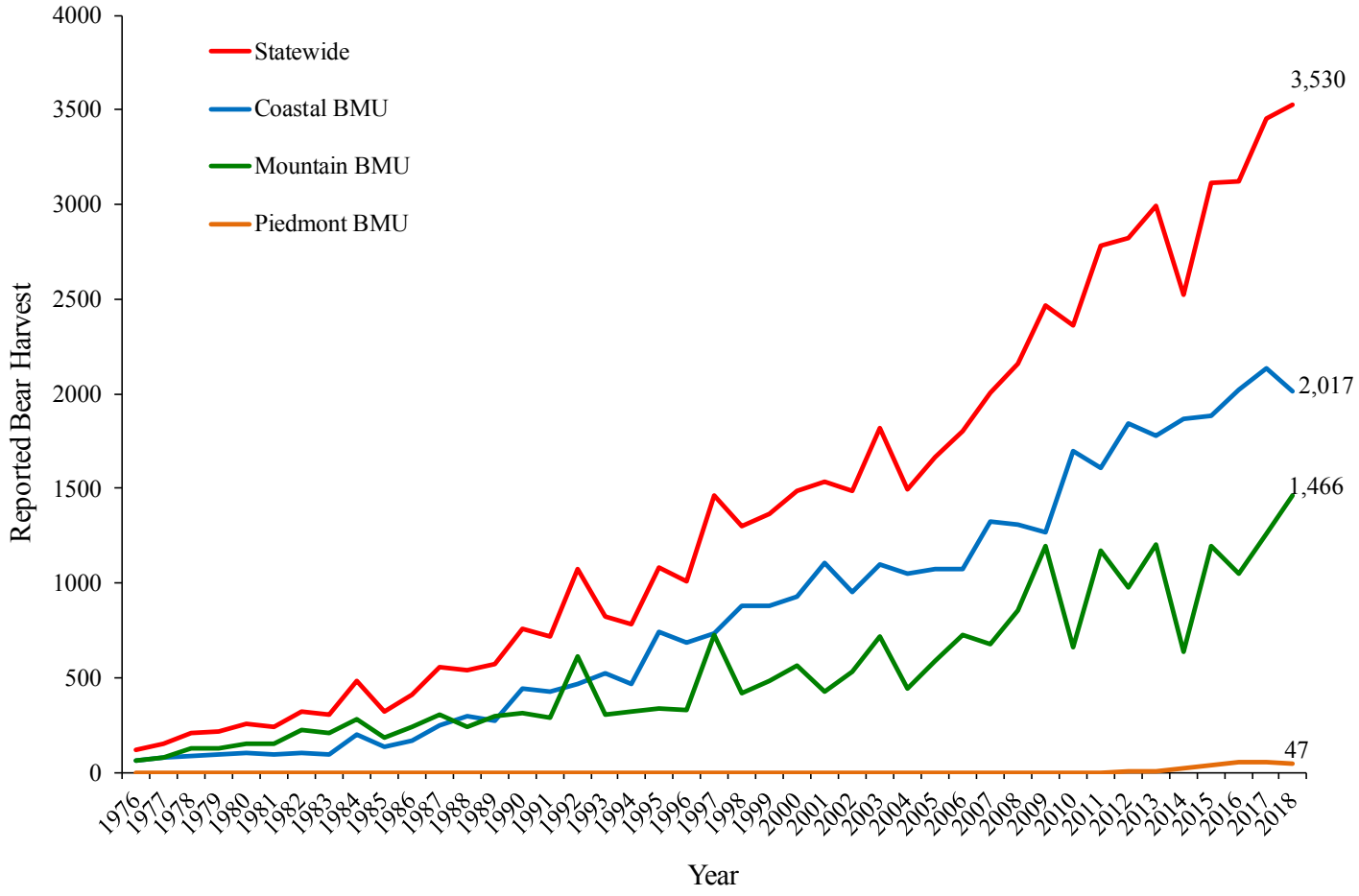


Figure 1. Statewide and regional harvest from 1976 through 2018.

Table 1. Statewide reported harvest of male and female bears from 1976 through 2018.

	Male		Female		All Bears	
Year	Harvest	Percent Change	Harvest	Percent Change	Total Harvest	Percent Change
1976	71	--	48	--	**121**	--
1977	84	18%	68	42%	**154**	**27%**
1978	144	71%	68	0.0%	**214**	**39%**
1979	124	-14%	93	37%	**219**	**3%**
1980	24	-81%	27	-71%	**254**	**16%**
1981	127	429%	79	193%	**250**	**-2%**
1982	178	40%	118	49%	**319**	**27%**
1983	189	6%	96	-19%	**305**	**-4%**
1984	323	71%	157	64%	**481**	**58%**
1985	198	-39%	124	-21%	**322**	**-33%**
1986	263	33%	144	16%	**409**	**27%**
1987	386	47%	167	16%	**554**	**35%**
1988	334	-14%	233	40%	**567**	**3%**
1989	310	-7%	237	2%	**547**	**-4%**
1990	455	47%	304	28%	**760**	**39%**
1991	416	-9%	294	-3%	**716**	**-6%**
1992	639	54%	420	43%	**1060**	**48%**
1993	505	-21%	316	-25%	**821**	**-23%**
1994	470	-7%	315	-0.3%	**785**	**-4%**
1995	657	40%	427	36%	**1,084**	**38%**
1996	593	-10%	417	-2%	**1,010**	**-7%**
1997	825	39%	638	53%	**1,464**	**45%**
1998	723	-12%	577	-10%	**1,300**	**-11%**
1999	820	13%	546	-5%	**1,366**	**5%**
2000	891	9%	599	10%	**1,490**	**9%**
2001	937	5%	596	-0.5%	**1,533**	**3%**
2002	939	0.2%	546	-8%	**1,485**	**-3%**
2003	1080	15%	732	34%	**1,812**	**22%**
2004	947	-12%	550	-25%	**1,497**	**-17%**
2005	1,024	8%	637	16%	**1,661**	**11%**
2006	1,142	12%	658	3%	**1,800**	**8%**
2007	1,198	5%	807	23%	**2,005**	**11%**
2008	1,323	10%	839	4%	**2,162**	**8%**
2009	1,537	16%	931	11%	**2,468**	**14%**
2010	1,481	-4%	882	-5%	**2,363**	**-4%**
2011	1,742	18%	1,033	17%	**2,779**	**18%**
2012	1,670	-4%	1,157	12%	**2,827**	**2%**
2013	1,788	7%	1,203	4%	**2,991**	**6%**
2014	1,490	-17%	1,030	-14%	**2,521**	**-16%**
2015	1,930	31%	1,185	15%	**3,118**	**24%**
2016	1,839	-5%	1,285	8%	**3,125**	**0.2%**
2017	2,159	17%	1,295	1%	**3,454**	**11%**
2018	2,069	-4%	1,461	13%	**3,530**	**2%**

Table 2. Percent (%) of total reported bear harvest that occurs in the CBMU, MBMU, and PBMU of North Carolina from 1987 through 2018.

Season	% of Total Harvest in CBMU Region	% of Total Harvest in MBMU Region	% of Total Harvest in PBMU Region
1987	44%	56%	NS
1988	53%	47%	NS
1989	50%	50%	NS
1990	58%	42%	NS
1991	60%	40%	NS
1992	44%	56%	NS
1993	64%	36%	NS
1994	59%	41%	NS
1995	69%	31%	NS
1996	68%	32%	NS
1997	50%	50%	NS
1998	68%	32%	NS
1999	64%	36%	NS
2000	62%	38%	NS
2001	72%	28%	NS
2002	64%	36%	NS
2003	60%	40%	NS
2004	70%	30%	NS
2005	65%	35%	0%
2006	60%	40%	0%
2007	66%	34%	0%
2008	60%	40%	0%
2009	51%	49%	0%
2010	72%	28%	0%
2011	58%	42%	0%
2012	65%	35%	0%
2013	60%	40%	0%
2014	74%	25%	1%
2015	60%	39%	1%
2016	65%	33%	2%
2017	62%	36%	2%
2018	57%	42%	1%

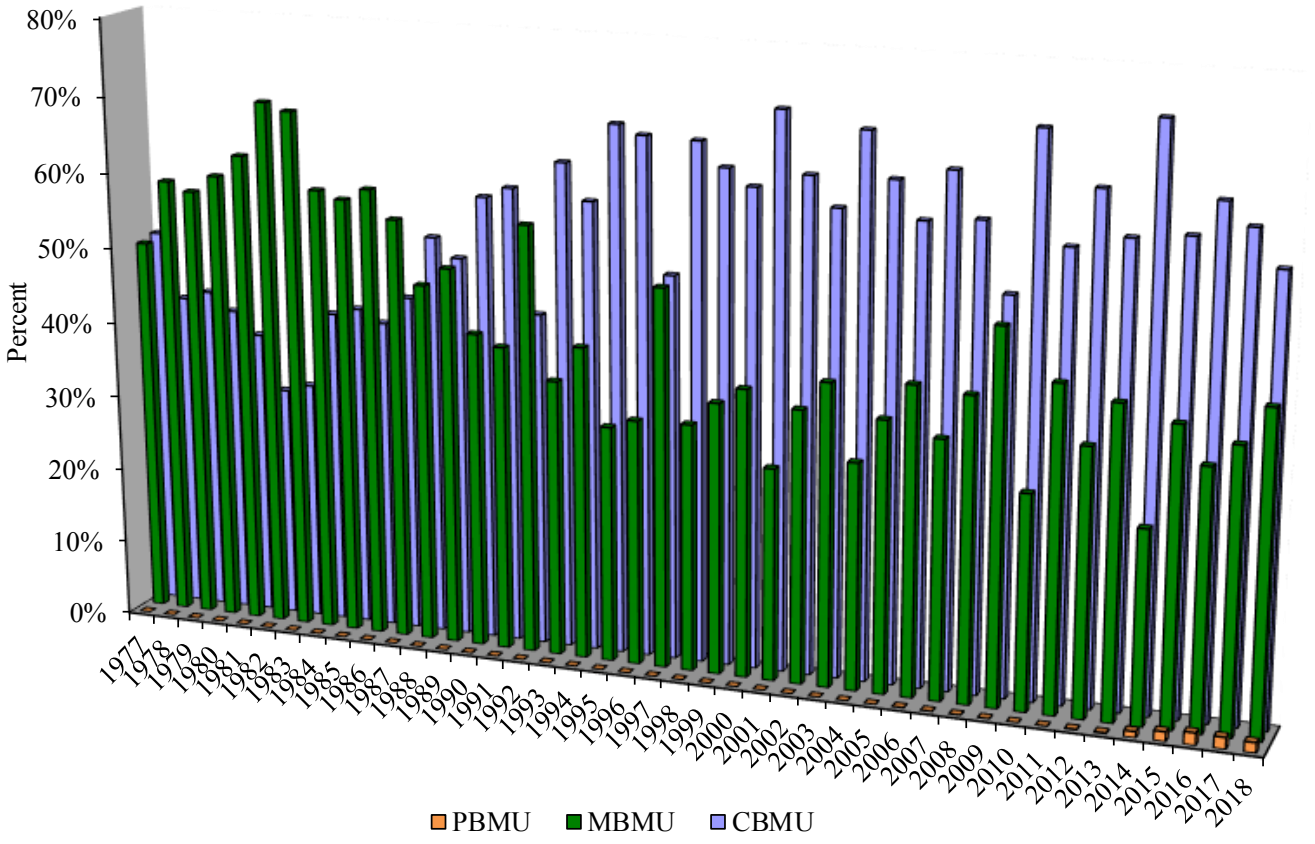


Figure 2. Percent of total reported bear harvest that occurs in the PBMU, MBMU and CBMU of North Carolina from 1977 through 2018.

Up until the late 1980's, the majority of bears harvested in North Carolina were in the Mountain Bear Management Unit (MBMU) versus the Coastal Bear Management Unit (CBMU), partly due to the closure of several coastal counties to bear hunting (Figure 2). As coastal bear populations increased and bear hunting seasons expanded in the coastal counties, bear harvest levels increased and started to exceed bear harvest levels in the MBMU. Since 1993, most bears harvested in North Carolina are from the CBMU (Table 2; Figure 2). During the 2018 season, 57% of bears harvested in North Carolina were from the CBMU, while 42% of bears were harvested in the MBMU, the highest percent since 2011. The composition of the statewide harvest that occurs in the mountains fluctuates annually, largely due to mast abundance and weather (Table 2 and 3). The increase in the percent of bears harvested from the MBMU during the 2018 season was largely due to the poor mast production, which makes bears more vulnerable to harvest due to both their increased movements searching for food and higher attraction to bait. While the sex ratio of the CBMU harvest is more biased towards females than in the MBMU, in low mast years females comprise a higher portion of the MBMU harvest, as was the case in 2018 (Table 4). Until 2005, there were no counties in the Piedmont Bear Management Unit (PBMU) with a bear hunting season. Starting in 2014, all 100 counties in North Carolina have a regulated bear hunting season, though harvest is still concentrated in the eastern and western fringes of the CBMU and MBMU (Figure 3).

Table 3. Harvest of registered black bears in the CBMU and MBMU and percent change in registered harvest from 1980-2018.

	CBMU						MBMU					
	Male		Female		Total[1]		Male		Female		Total[1]	
Year	Harvest	% change	Harvest	% change	Harvest	% change	Harvest	% change	Harvest	% change	Harvest	% change
1980	3	-94%	5	-88%	**104**	**11%**	21	-70%	22	-58%	**152**	**22%**
1981	42	1300%	26	420%	**92**	**-12%**	85	305%	53	141%	**152**	**0%**
1982	45	7%	46	77%	**97**	**5%**	133	56%	72	36%	**221**	**45%**
1983	55	22%	29	-37%	**96**	**-1%**	134	1%	67	-7%	**209**	**-5%**
1984	134	144%	65	124%	**199**	**107%**	189	41%	92	37%	**281**	**34%**
1985	80	-40%	57	-12%	**137**	**-31%**	118	-38%	67	-27%	**186**	**-34%**
1986	116	45%	51	-11%	**167**	**22%**	147	25%	93	39%	**242**	**30%**
1987	166	43%	80	57%	**246**	**47%**	220	50%	87	-6%	**307**	**27%**
1988	173	4%	126	58%	**299**	**22%**	161	-27%	107	23%	**268**	**-13%**
1989	147	-15%	128	2%	**275**	**-8%**	163	1%	109	2%	**272**	**1%**
1990	257	75%	187	46%	**444**	**61%**	198	21%	117	7%	**315**	**16%**
1991	242	-6%	187	0%	**429**	**-3%**	174	-12%	107	-9%	**287**	**-9%**
1992	281	16%	183	-2%	**464**	**8%**	358	106%	237	121%	**595**	**107%**
1993	304	8%	219	20%	**523**	**13%**	201	-44%	97	-59%	**298**	**-50%**
1994	286	-6%	177	-19%	**463**	**-11%**	184	-8%	138	42%	**322**	**8%**
1995	426	49%	319	80%	**745**	**61%**	231	26%	108	-22%	**339**	**5%**
1996	384	-10%	301	-6%	**685**	**-8%**	209	-10%	116	7%	**325**	**-4%**
1997	417	9%	320	6%	**737**	**8%**	408	95%	318	174%	**726**	**123%**
1998	457	10%	422	32%	**879**	**19%**	266	-35%	155	-51%	**421**	**-42%**

	CBMU						MBMU					
	Male		Female		Total[1]		Male		Female		Total[1]	
Year	Harvest	% change	Harvest	% change	Harvest	% change	Harvest	% change	Harvest	% change	Harvest	% change
1999	509	11%	372	-12%	**881**	**0%**	311	17%	174	12%	**485**	**15%**
2000	532	5%	397	7%	**929**	**5%**	359	15%	202	16%	**561**	**16%**
2001	667	25%	440	11%	**1,107**	**19%**	270	-25%	156	-23%	**426**	**-24%**
2002	594	-11%	361	-18%	**955**	**-14%**	345	28%	185	19%	**530**	**24%**
2003	656	10%	442	22%	**1,098**	**15%**	425	23%	292	58%	**717**	**35%**
2004	643	-2%	410	-7%	**1,053**	**-4%**	304	-28%	140	-52%	**444**	**-38%**
2005	655	2%	418	2%	**1,073**	**2%**	371	22%	219	56%	**590**	**33%**
2006	639	-2%	436	4%	**1,075**	**0%**	503	36%	222	1%	**725**	**23%**
2007	789	23%	538	23%	**1,327**	**23%**	409	-19%	269	21%	**678**	**-6%**
2008	757	-4%	548	2%	**1,305**	**-2%**	566	38%	291	8%	**857**	**26%**
2009	792	5%	478	-13%	**1,270**	**-3%**	745	32%	452	55%	**1,197**	**40%**
2010	1,060	34%	641	34%	**1,701**	**34%**	421	-43%	241	-47%	**662**	**-45%**
2011	987	-7%	620	-3%	**1,608**	**-5%**	755	79%	415	72%	**1,170**	**77%**
2012	1,082	10%	762	23%	**1,844**	**15%**	585	-23%	395	-5%	**980**	**-16%**
2013	1,089	1%	692	-9%	**1,781**	**-3%**	696	19%	510	29%	**1,206**	**23%**
2014	1,103	1%	764	10%	**1867**	**5%**	372	-47%	262	-49%	**634**	**-47%**
2015	1,115	1%	762	0%	**1880**	**1%**	784	111%	415	58%	**1199**	**89%**
2016	1,141	2%	882	16%	**2024**	**8%**	666	-15%	385	-7%	**1051**	**-12%**
2017	1,252	10%	885	0.3%	**2,137**	**6%**	872	31%	392	2%	**1,264**	**20%**
2018	1151	-8%	866	-2%	**2,017**	**-6%**	883	1%	583	49%	**1,466**	**16%**

[1] Total includes harvest of bears in which sex is unknown.

Table 4. Percentage of males and females that comprised the reported harvest in the three bear management units of North Carolina from 1976 through 2018.

	CBMU		MBMU		PBMU	
Year	% Female	% Male	% Female	% Male	% Female	% Male
1976	43%	57%	38%	62%	n/s	n/s
1977	47%	53%	42%	58%	n/s	n/s
1978	27%	73%	36%	64%	n/s	n/s
1979	44%	56%	42%	58%	n/s	n/s
1980	63%	38%	51%	49%	n/s	n/s
1981	38%	62%	38%	62%	n/s	n/s
1982	51%	49%	35%	65%	n/s	n/s
1983	35%	65%	33%	67%	n/s	n/s
1984	33%	67%	33%	67%	n/s	n/s
1985	42%	58%	36%	64%	n/s	n/s
1986	31%	69%	39%	61%	n/s	n/s
1987	33%	67%	28%	72%	n/s	n/s
1988	42%	58%	40%	60%	n/s	n/s
1989	47%	53%	40%	60%	n/s	n/s
1990	42%	58%	37%	63%	n/s	n/s
1991	44%	56%	38%	62%	n/s	n/s
1992	39%	61%	40%	60%	n/s	n/s
1993	42%	58%	33%	67%	n/s	n/s
1994	38%	62%	43%	57%	n/s	n/s
1995	43%	57%	32%	68%	n/s	n/s
1996	44%	56%	36%	64%	n/s	n/s
1997	43%	57%	44%	56%	n/s	n/s
1998	48%	52%	37%	63%	n/s	n/s
1999	42%	58%	36%	64%	n/s	n/s
2000	43%	57%	36%	64%	n/s	n/s
2001	40%	60%	37%	63%	n/s	n/s
2002	38%	62%	35%	65%	n/s	n/s
2003	40%	60%	41%	59%	n/s	n/s
2004	39%	61%	32%	68%	n/s	n/s
2005	39%	61%	37%	63%	0%	0%
2006	41%	59%	31%	69%	0%	100%
2007	41%	59%	40%	60%	100%	0%
2008	42%	58%	34%	66%	0%	100%
2009	38%	62%	38%	62%	100%	0%
2010	38%	62%	36%	64%	0%	0%
2011	39%	61%	35%	65%	0%	100%
2012	41%	59%	40%	60%	0%	100%
2013	39%	61%	42%	58%	25%	75%
2014	41%	59%	41%	59%	20%	80%
2015	41%	59%	35%	65%	21%	79%
2016	44%	56%	37%	63%	36%	64%
2017	41%	59%	31%	69%	37%	63%
2018	43%	57%	40%	60%	26%	74%

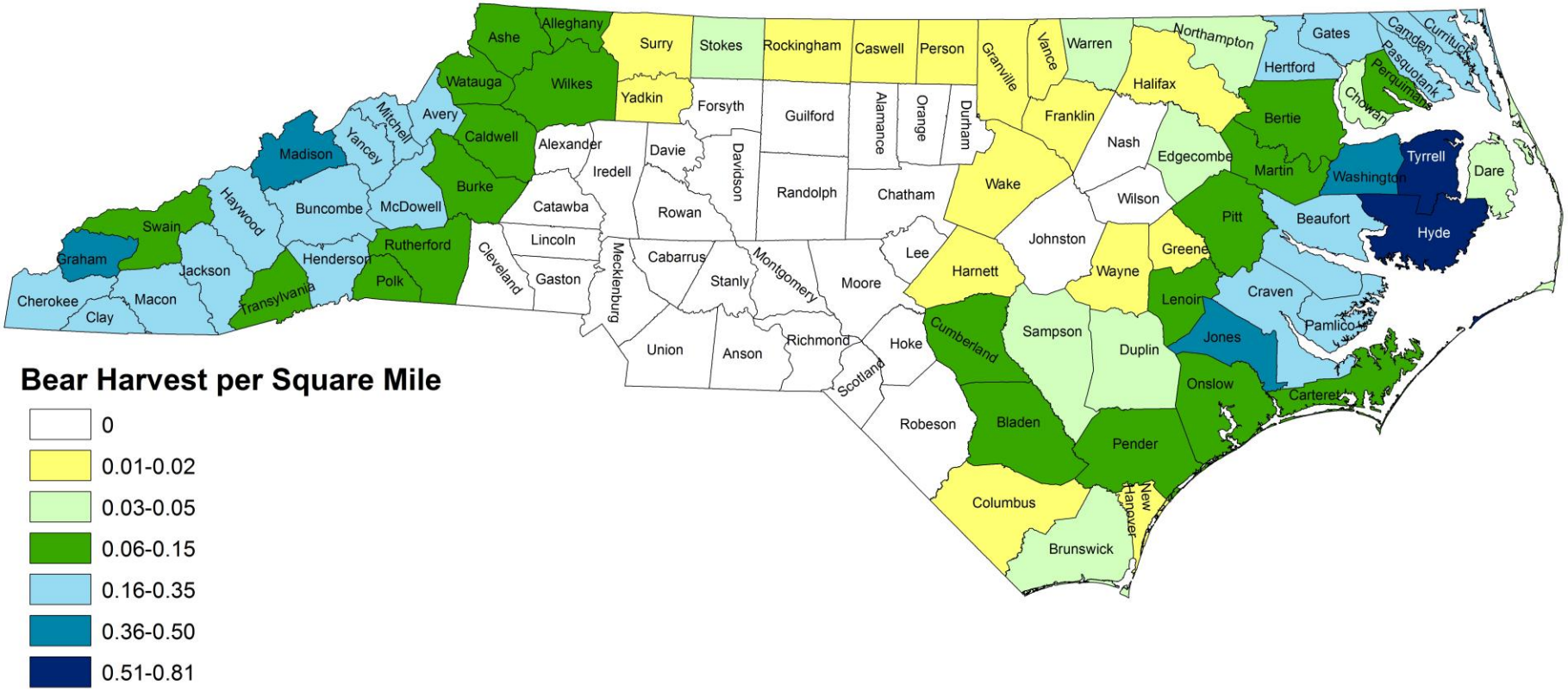
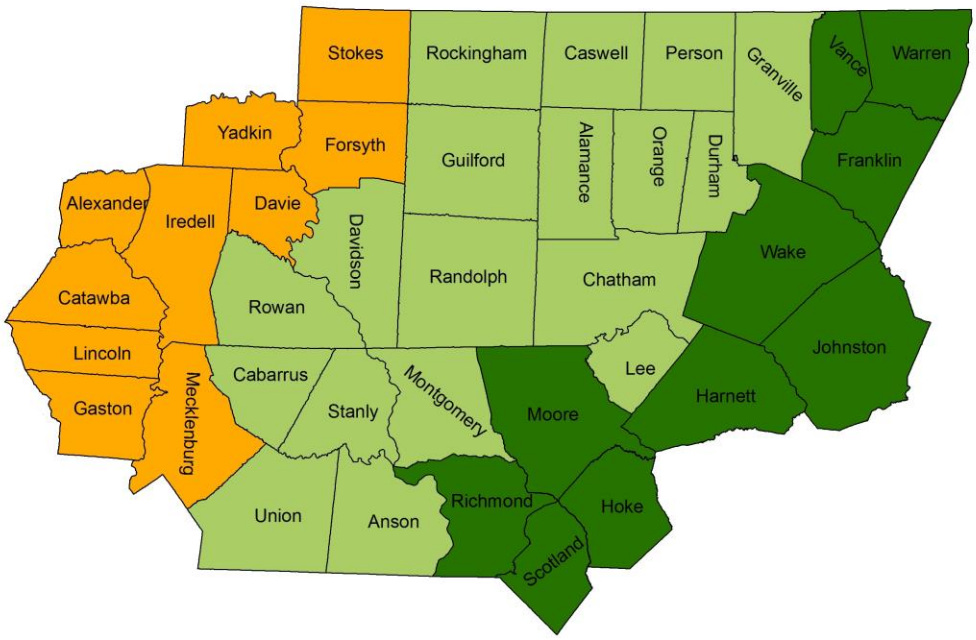


Figure 3. The 2018 reported harvest per square mile by county.

Piedmont Bear Management Unit (PBMU): In 2005, four counties in the PBMU were opened to bear hunting. In 2014, all 38 counties were opened for bear hunting opportunities in the PBMU in order to meet the 2012-2022 Black Bear Management Plan objective for this region, which is to limit the establishment of the bear population. There are 3 bear hunting seasons in the PBMU, which are open concurrent to the deer gun season for that county (Figure 4). While there are small, established bear populations in at least 9 counties of the PBMU that have a bear hunting season, harvest levels are low in comparisons to the CBMU and the MBMU, reflecting the lower number of bears. In 2018, 47 bears (35 males;12 females) were harvested from the PBMU; this was a 10% decline from 2017 (n=52 bears; Table 5).

The majority of the harvest occurred in the northern PBMU counties that border Virginia, with Warren County having the highest bear harvest, followed by Stokes County (Figure 5). This is likely due to these northern counties being less developed than other areas of the PBMU, as well as Virginia serving as a source population for black bear. Of note is a male bear was harvested in Wake County, the first bear harvested in the county in decades. The percent of females that comprised the 2018 reported harvest declined from 2017; females comprised 26% of the harvest and all female harvest occurred in the periphery of the PBMU, especially in the northern counties (Table 4; Figure 6). Most bears, including female bears, were harvested in the first half of the PBMU seasons, with only two females taken in the last half, specifically in late December (Figure 7 and 8).



Piedmont - Eastern	Piedmont - Central	Piedmont – Northwestern
Oct. 13, 2018-Jan. 1, 2019	Nov. 10, 2018-Jan. 1, 2019	Nov. 17, 2018-Jan. 1, 2019
10 counties	19 counties	9 counties

Figure 4. The 2018 PBMU bear hunting seasons, which are based on the deer gun seasons for these counties.

Table 5. Reported harvest results of black bears by county in the Piedmont region of North Carolina from 2005 through 2018 (n/s=no season).

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Alamance	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Alexander	0	0	0	0	0	0	1	0	0	1	1	0	2	0
Anson	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Cabarrus	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Caswell	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	3	7	5	4
Catawba	0	1	1	1	1	0	0	0	0	1	1	0	1	0
Chatham	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	1	0	0
Davidson	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Davie	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Durham	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	1	0	0	0
Forsyth	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Franklin	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	3	2	0	1
Gaston	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Granville	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	1	4	3	4	6
Guilford	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Harnett	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	1	0	0	1
Hoke	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Iredell	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Johnston	n/s	n/s	n/s	n/s	n/s	n/s	n/s	1	0	0	2	1	1	0
Lee	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Lincoln	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Mecklenburg	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Montgomery	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	1	0	0	0	0
Moore	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Orange	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Person	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	8	7	9	7	4
Randolph	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	1	0	0
Richmond	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Rockingham	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	2	3	5	4	5
Rowan	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Scotland	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Stanly	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Stokes	n/s	n/s	n/s	n/s	n/s	n/s	n/s	1	2	2	8	6	19	8
Union	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	0
Vance	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	1	1	3	2	1
Wake	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	0	1
Warren	n/s	n/s	n/s	n/s	n/s	n/s	n/s	1	2	2	4	12	7	15
Yadkin	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	**0**	**1**	**1**	**1**	**1**	**0**	**1**	**3**	**4**	**20**	**39**	**50**	**52**	**47**

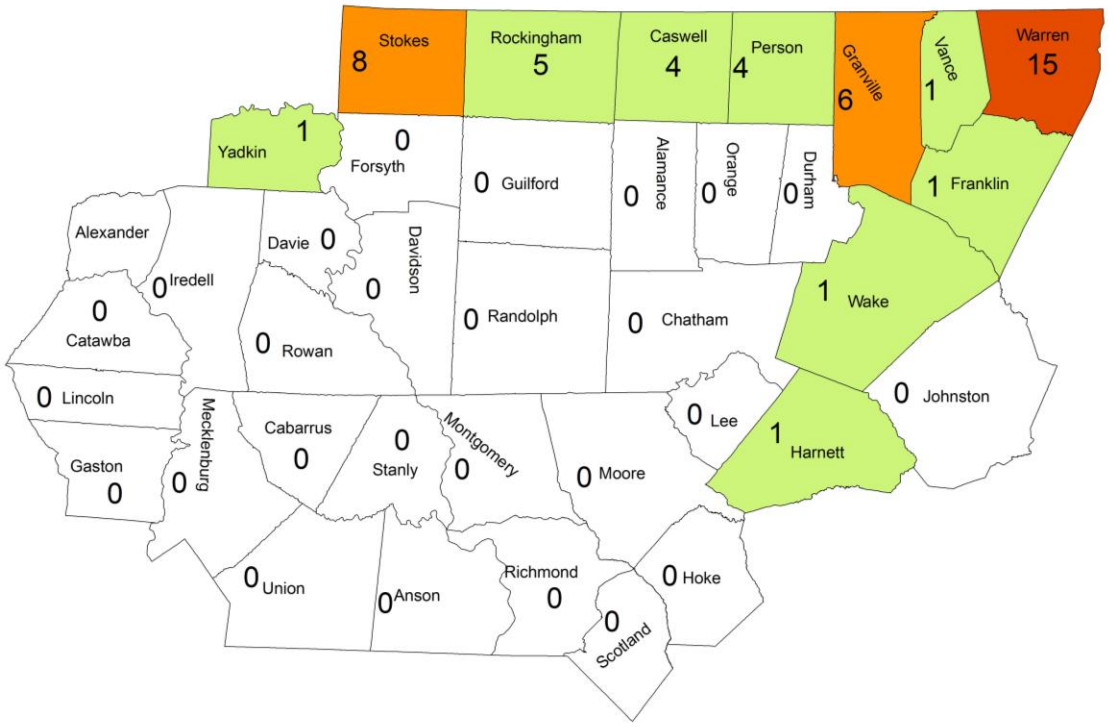


Figure 5. Reported harvest of black bears in the PBMU during the 2018 bear hunting season.

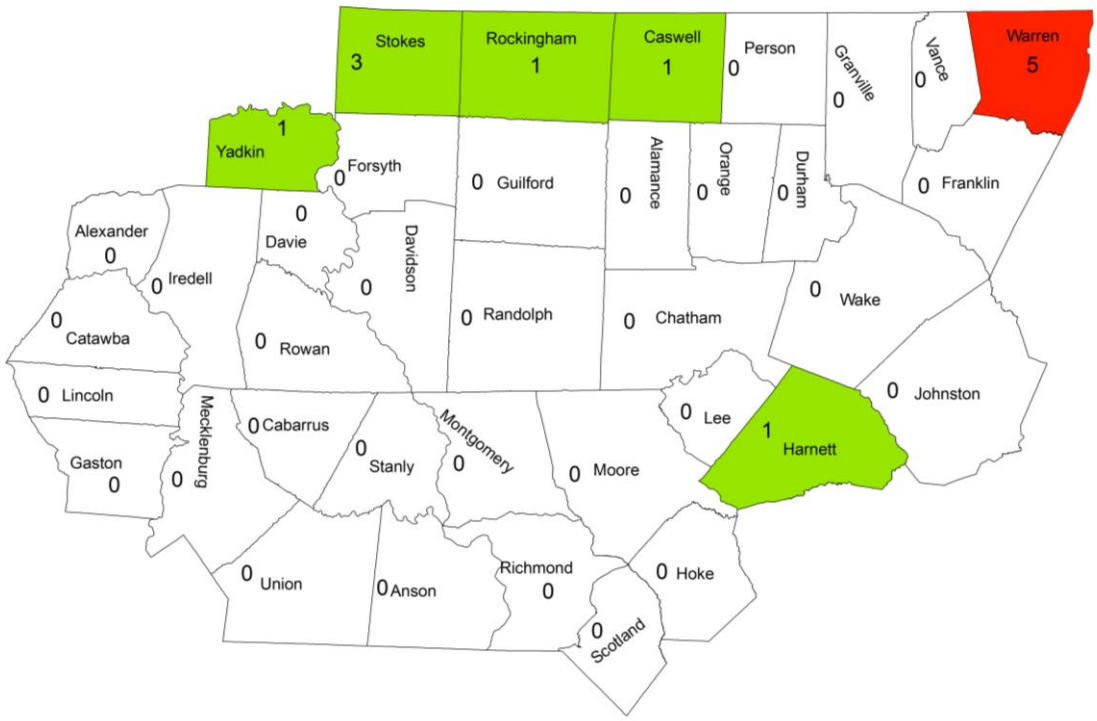


Figure 6. Reported harvest of female black bears in the PBMU during the 2018 black bear hunting season.

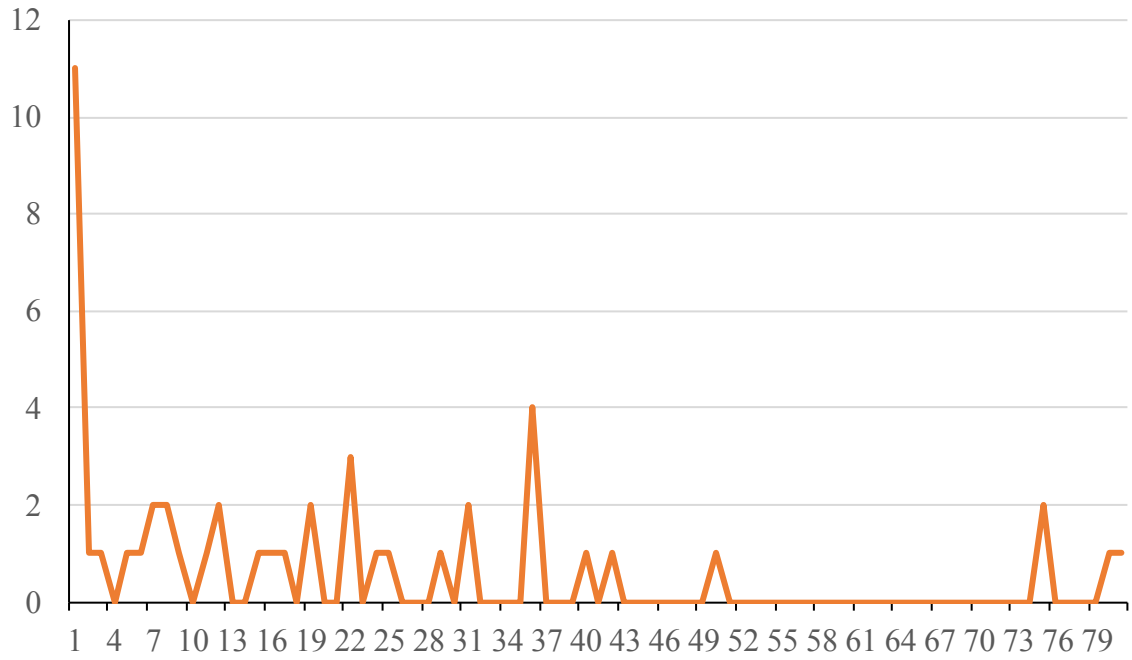


Figure 7. Number of bears harvested per day during the 2018 PBMU seasons.

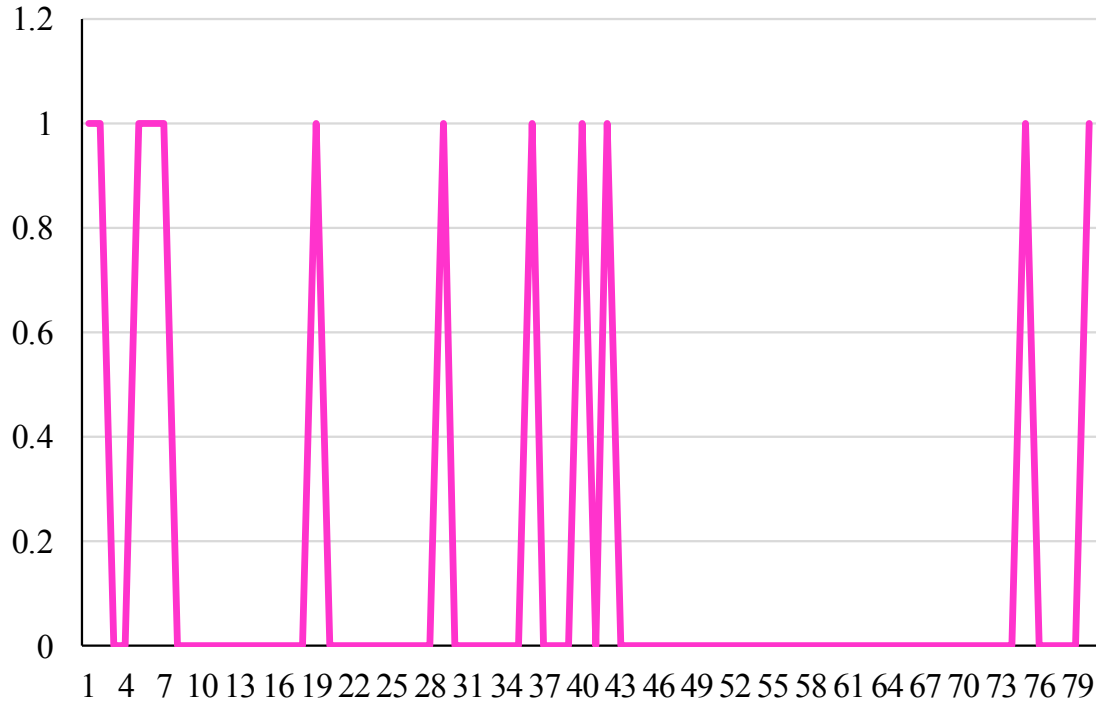


Figure 8. Number of female bears harvested per day during the 2018 PBMU seasons.

Coastal Bear Management Unit (CBMU): In 2018, the reported harvest declined 6% (n=2,018 bears; Table 3) from what occurred during the 2017 harvest (n=2,138 bears) and was the first time since 2014 that a harvest decline occurred. Prior to 2014, the CBMU would experience almost annual fluctuations in harvest and the CBMU had not experienced a 4-year trend of increasing harvest (2014-2017) since the 1970's (1977-1980). The 2018 harvest season was the 3rd highest on record and the third year in a row that the harvest exceeded 2,000 bears. Harvest in the CBMU varies based on weather and hunter access. For example, in 2016 harvest levels were slower during the first few days due to the effects of the Supermoon on bear activity patterns. In 2017, there were no weather events of note that occurred during the bear season. In 2018, many counties in the CBMU, especially in the southern portion, experienced high water due to the record rainfall from Hurricane Florence in September. Hurricane Florence not only caused tremendous property damage, which likely resulted in some hunters having limited time to hunt, but flooded portions of the landscape, which limited access to huntable lands.

The county with the highest reported harvest was Hyde County, followed by Tyrrell, Beaufort, Jones and Washington counties (Figure 9, Table 6). Record harvests occurred in 8 of 37 counties of the CBMU and include Craven, Hertford, Jones, Lenoir, Martin, Pasquotank, Tyrrell and Washington counties (Table 6). Pasquotank and Tyrrell counties experienced the largest increase in harvest, at 63% and 39% respectively, while Wilson and Greene counties experienced the largest decline, at 100% and 63% respectively (Table 6).

In 2018, there was an 8% decline in the reported male harvest (n=1,150) and a 2% decline in the reported female harvest (n=868; Table 3; Figure 10). This was the first decline in the female harvest since 2015 and the first decline in the male harvest since 2011 (Figure 10). The percentage of female black bears that comprise the reported harvest had increased over the past 5 seasons (average=42% from 2014 to 2018; Table 4), compared to the previous 5-year period from 2009 to 2013 (average=39%; Figure 11). In 2016, females comprised 44% of the black bears harvested in the CBMU, an increase from the previous 15 years. The 2016 female sex ratio of the reported harvest is the maximum before we expect population declines. In 2017, female bears comprised 41% of the CBMU reported harvest and in 2018, females comprised 43% of the harvest. The increase in the female sex ratio of the harvest may explain the slowing growth of the bear population in the CBMU; population growth has declined and is close to zero (Figure 50), which is in accordance with the objective ("stabilize the CBMU bear population") approved by the Commission in the 2012-2022 Black Bear Management Plan. The Commission will continue to closely monitor the harvest to determine how it is influencing the CBMU bear population. Tyrrell, Hyde, and Beaufort counties had the highest reported harvest of female bears, while New Hanover and Dare counties had the lowest reported harvest of females (Figure 12). The female sex ratio of the harvest was over 43% in several counties, with Chowan County have the most bias towards female harvest at 71%, though overall harvest is low in Chowan (n=12 bears) compared to other CBMU counties (Figure 13).

During the 2018 season, 45% of the reported CBMU harvest occurred in the first seven days of the season (Figure 14). This was a decline compared to previous seasons, likely due to high water that still existed in November, as well as a new longer November season in several counties that may have changed hunter effort and selectivity during the first seven days. Most of the reported harvest still occurred in November, while females comprised the reported harvest throughout the entirety of the season (Figures 15 and 16). In previous seasons, the bear harvest precipitately declined after the first 2-3 weeks; harvest in 2018 did drop after the first few days, but plateaued from weeks 2 through 5 (Figure 17). In 2018, females comprised a higher percentage of the harvest in the last half of the season vs previous years (Figure 18).

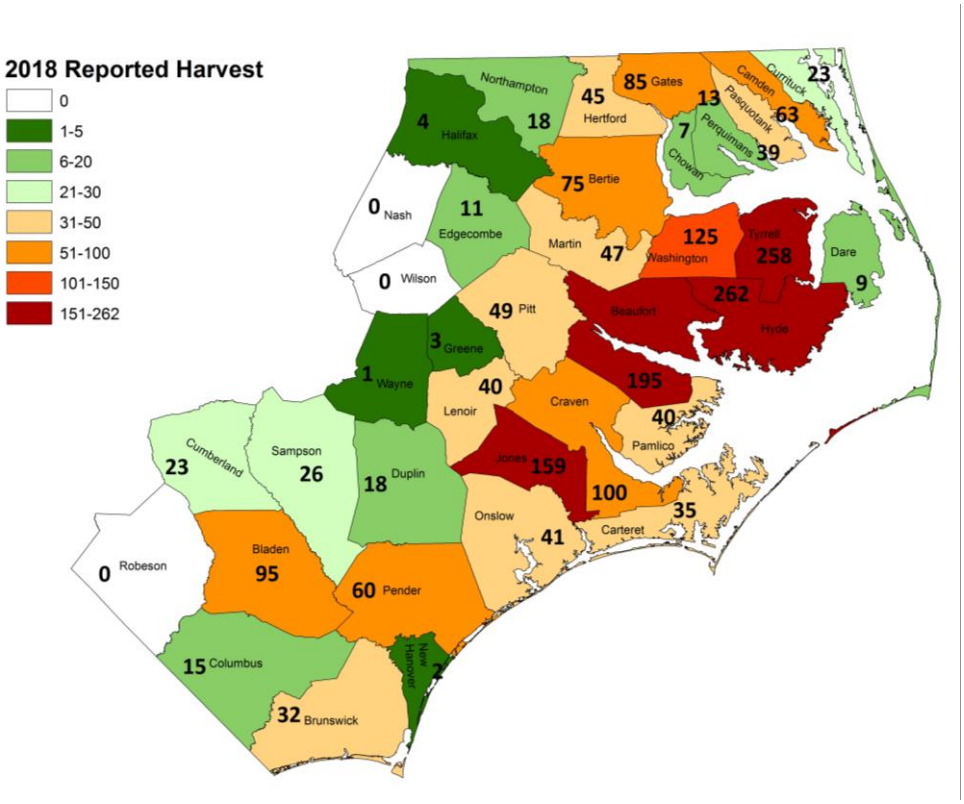


Figure 9. The 2018 reported harvest by county in the CBMU.

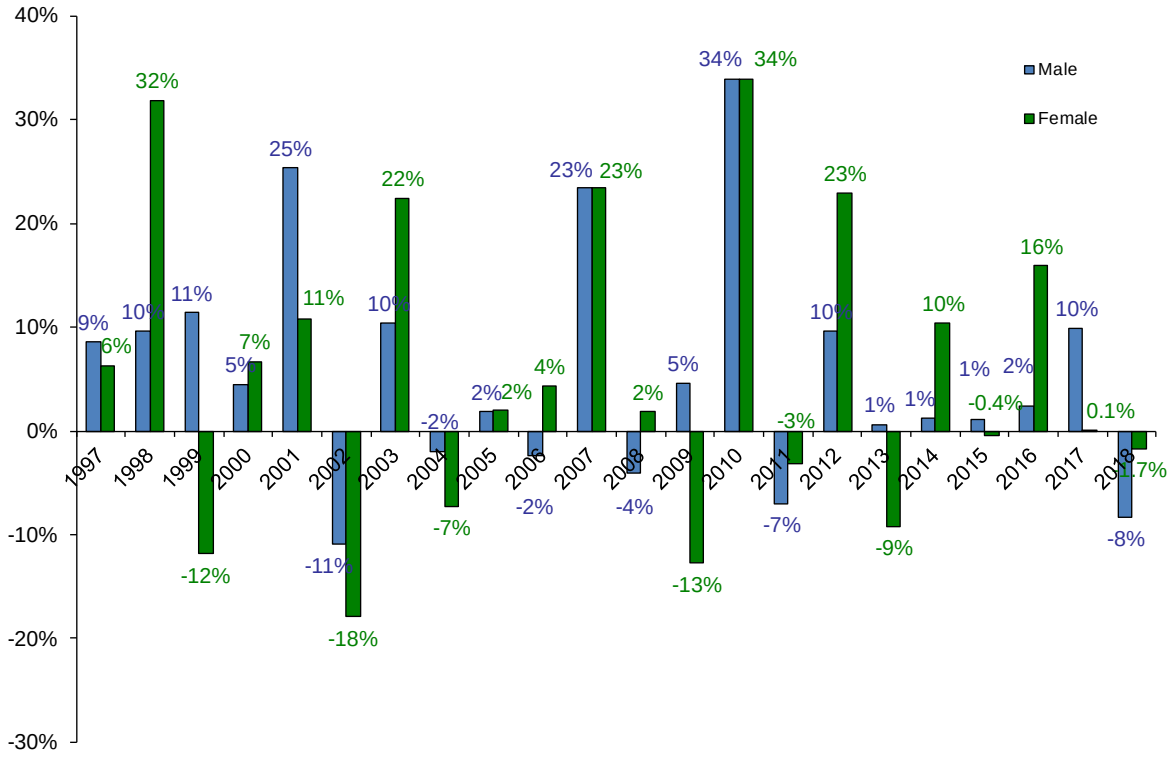


Figure 10. Annual percent change in male and female reported harvest in the CBMU from 1997 through 2018.

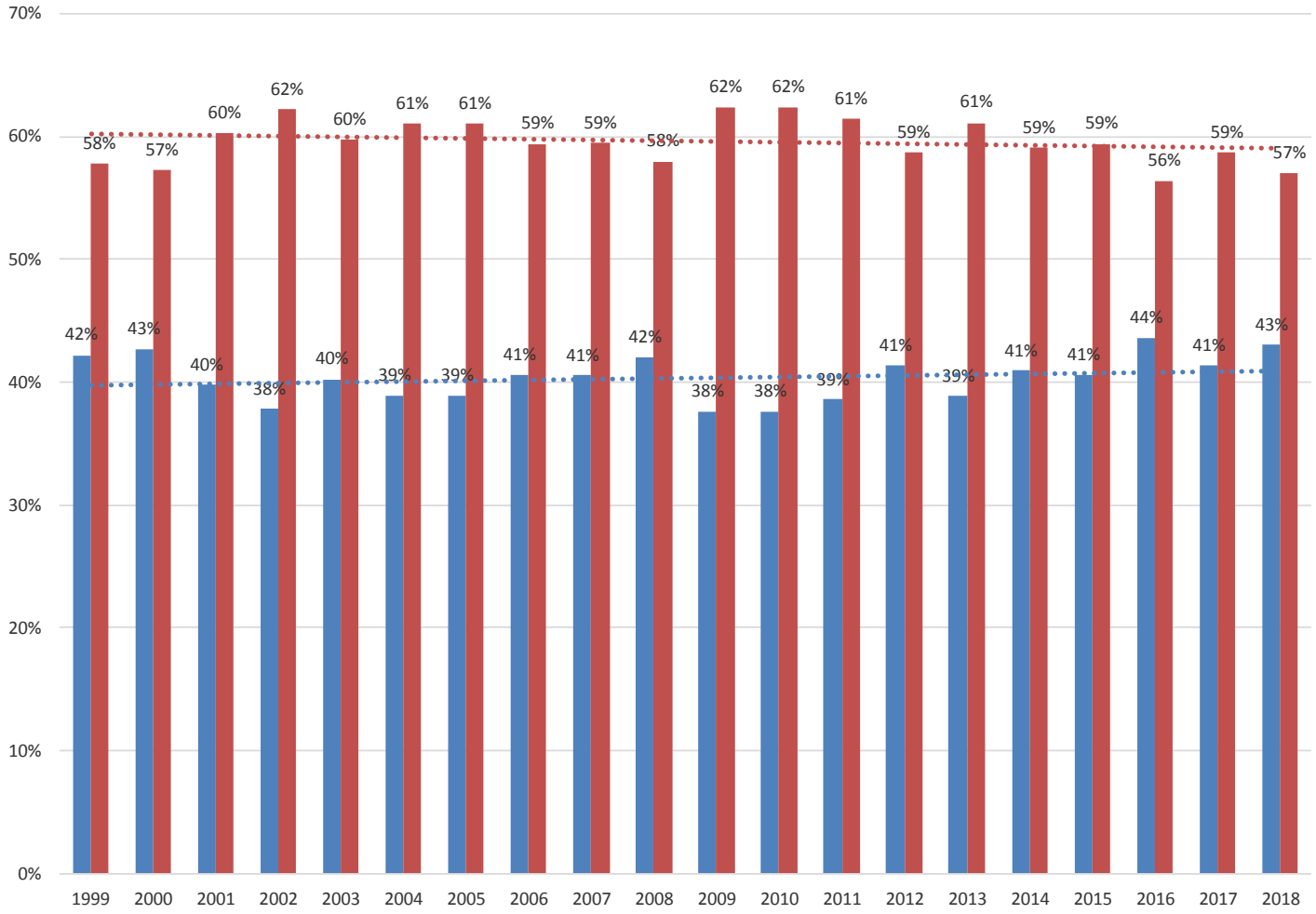


Figure 11. Percentage of male (red) and female (blue) bears in the reported CBMU harvest.

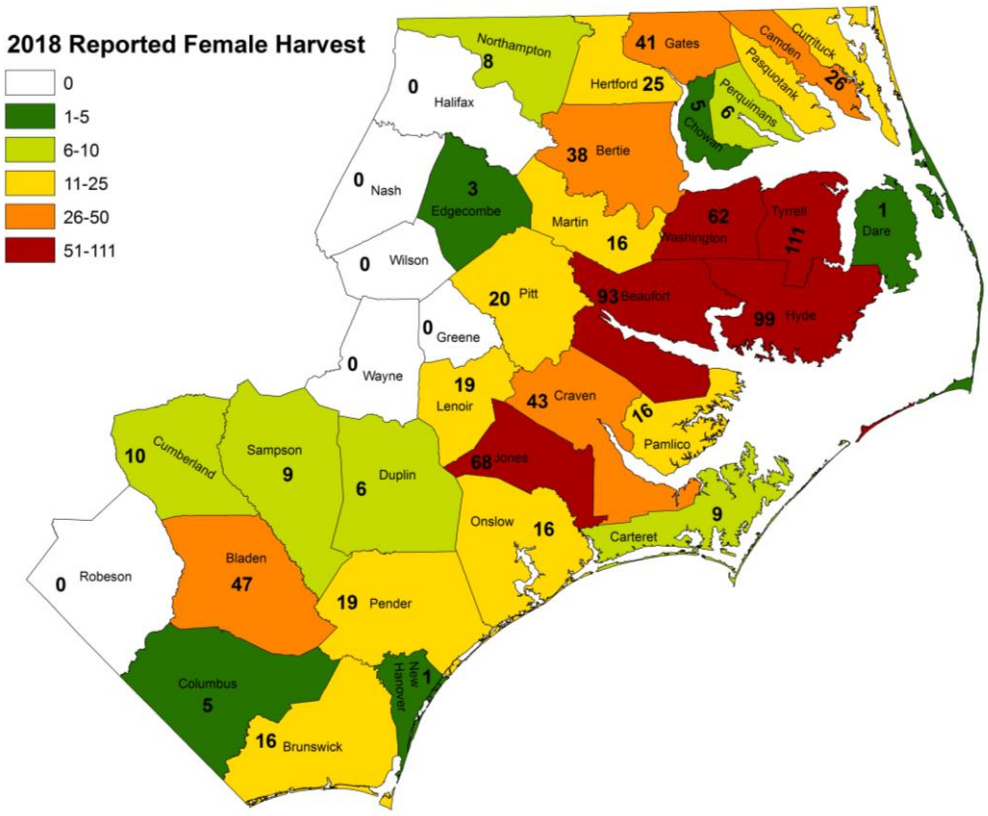


Figure 12. The 2018 reported female harvest by county in the CBMU.

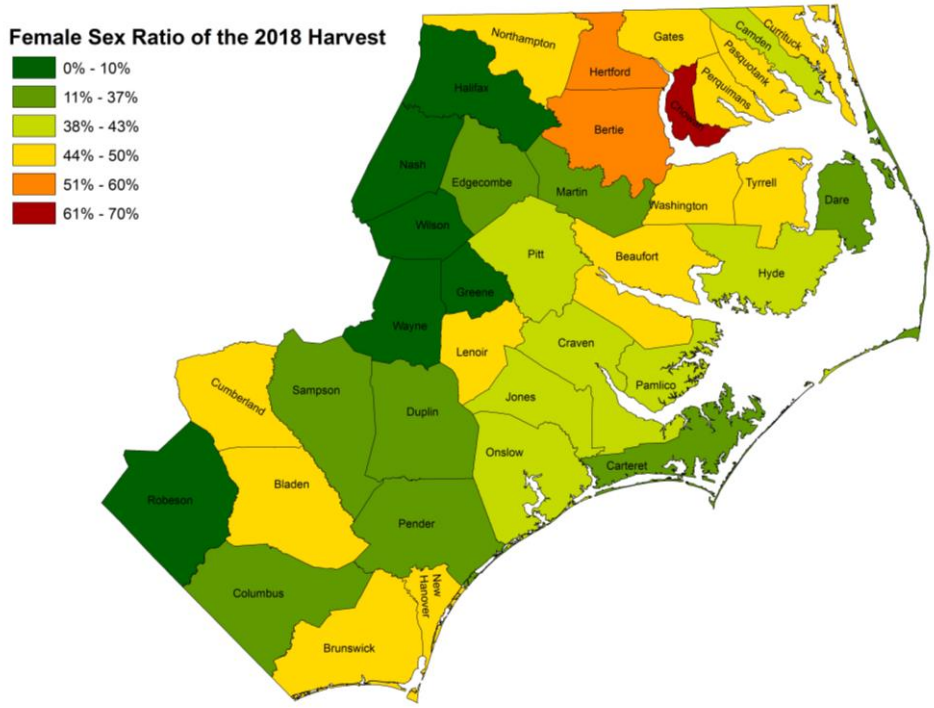


Figure 13. Percentage of the 2018 reported harvest comprised of female black bears in the CBMU.

Table 6. Reported harvest results of black bears by county in the Coastal Bear Management Unit (CBMU) of North Carolina from 2004 through 2018 (n/s=no season).

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	% change from 2017 to 2018
Beaufort	118	143	112	164	124	151	184	183	169	181	200	201	189	228	194	-15%
Bertie	40	38	53	73	44	50	61	90	112	99	68	81	79	100	75	-25%
Bladen	74	64	53	74	87	66	101	88	91	98	103	90	101	121	95	-21%
Brunswick	38	34	28	42	36	34	26	32	43	37	46	31	56	57	32	-44%
Camden	50	49	49	45	59	62	71	64	78	63	43	63	79	77	63	-18%
Carteret	24	31	32	40	23	23	25	31	32	15	28	36	29	45	35	-22%
Chowan	5	8	9	12	16	8	9	7	17	15	16	13	6	12	7	-42%
Columbus	22	23	23	19	30	17	25	21	32	25	14	9	25	23	15	-35%
Craven	69	41	46	67	66	77	84	79	87	65	76	67	79	90	100	11%
Cumberland	14	12	14	16	15	15	9	16	33	20	25	36	22	27	23	-15%
Currituck	20	14	18	49	39	26	34	39	27	26	35	40	31	30	23	-23%
Dare	3	1	3	10	3	7	4	5	3	3	10	2	11	18	9	-50%
Duplin	6	4	7	7	13	10	18	16	17	11	14	15	9	19	18	-5%
Edgecombe	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	12	10	7	9	8	13	11	-15%
Gates	51	47	53	52	53	55	75	52	75	70	82	77	75	85	85	0%
Greene	n/s	n/s	n/s	n/s	2	1	0	1	4	5	4	2	2	8	3	-63%
Halifax	4	2	1	2	2	1	3	6	4	7	4	0	2	9	4	-56%
Hertford	12	16	18	24	32	35	53	71	48	59	50	48	58	39	45	15%
Hyde	101	153	130	138	159	163	215	180	210	216	253	233	260	269	262	-3%
Jones	72	87	105	127	111	96	154	129	108	159	134	116	134	158	159	1%
Lenoir	n/s	n/s	n/s	n/s	19	13	13	22	32	29	18	26	30	39	40	3%
Martin	21	22	34	40	33	28	53	48	50	64	61	56	43	43	47	9%
Nash	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	0	1	0	0	0	0%
New Hanover	3	1	1	5	1	4	3	3	3	5	5	1	4	3	2	-33%
Northampton	9	13	6	4	7	8	14	8	15	15	25	16	19	31	17	-45%
Onslow	34	41	36	46	46	47	61	44	54	47	55	49	67	51	41	-20%
Pamlico	21	15	36	39	27	45	42	22	37	41	45	53	56	47	40	-15%
Pasquotank	8	8	14	10	6	7	10	8	11	8	25	14	12	24	39	63%

Pender	54	43	41	38	49	46	73	66	45	48	56	53	51	76	60	-21%
County	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**		**% change 2016 to 2017**
Perquimans	n/s	n/s	3	8	2	3	15	5	17	10	11	10	24	20	14	-30%
Pitt	n/s	n/s	n/s	n/s	12	20	36	40	51	77	61	38	60	57	49	-14%
Robeson	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	2	0	0	0	0%
Sampson	11	12	7	6	13	12	14	17	25	19	28	20	37	31	26	-16%
Tyrrell	84	85	72	102	113	90	150	137	216	151	156	264	231	185	258	39%
Washington	85	66	71	68	63	50	66	75	81	79	102	105	131	98	125	28%
Wayne	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	0	0	1	0	0	1	1	0%
Wilson	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	5	3	6	3	4	4	0	-100%
Total	**1,053**	**1,073**	**1,075**	**1,327**	**1,305**	**1,270**	**1,701**	**1,605**	**1,844**	**1,780**	**1,867**	**1,880**	**2,024**	**2,138**	**2,017**	-6%

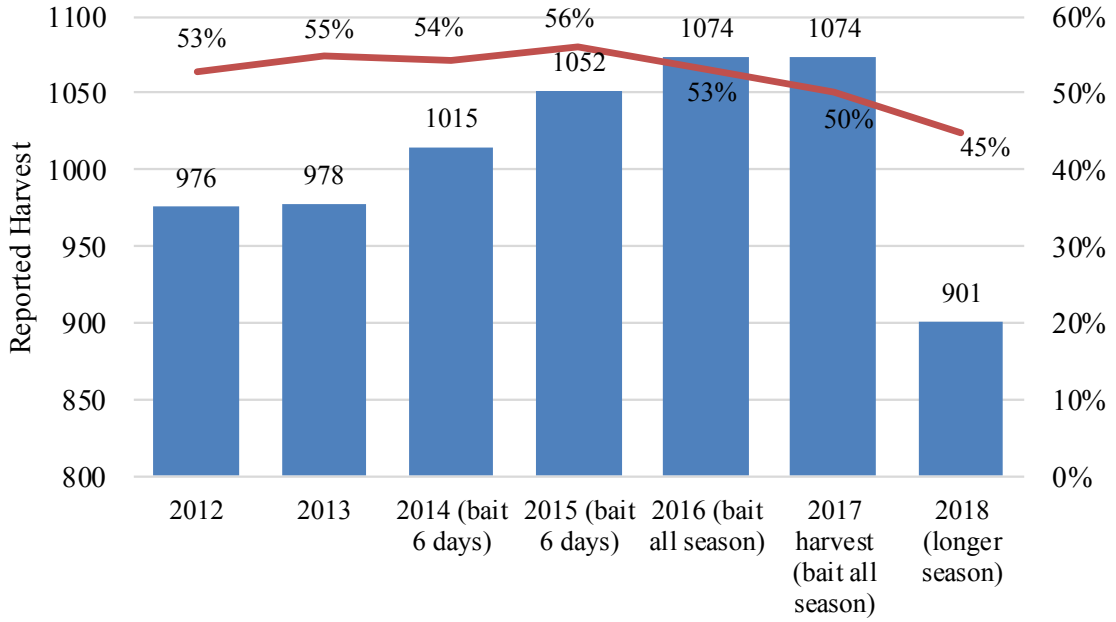


Figure 14. Reported harvest in first 7 days of CBMU season from 2012 through 2018.

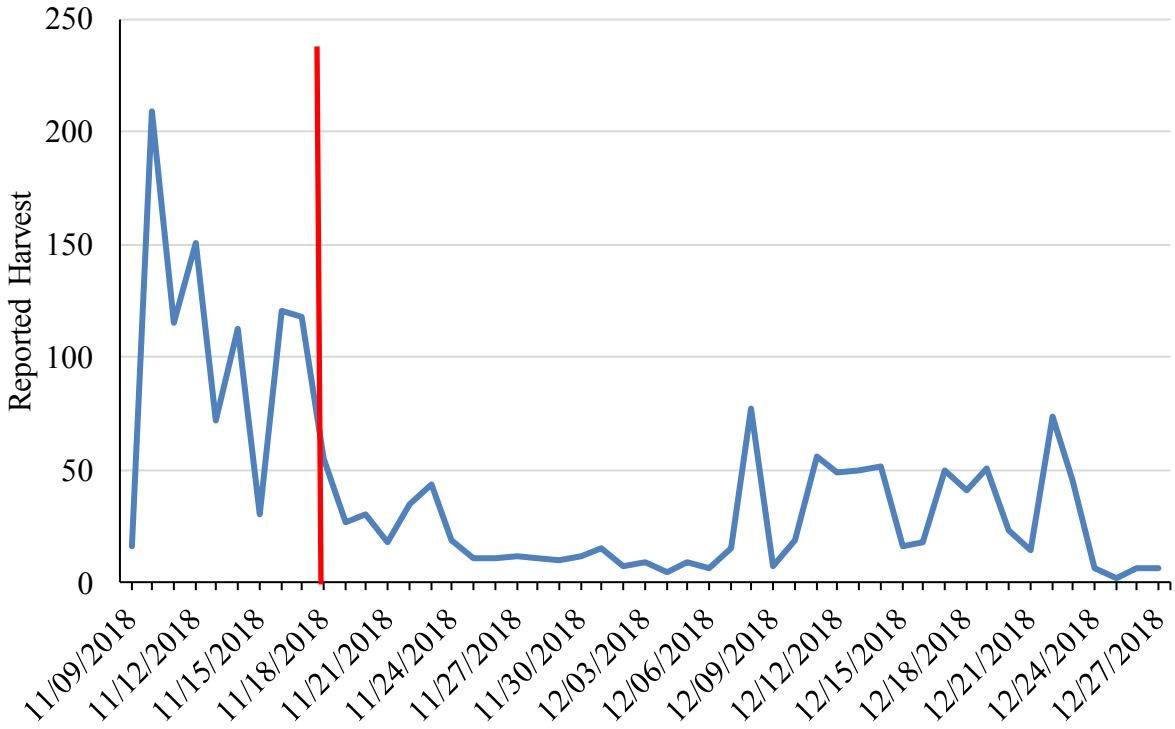


Figure 15. Number of reported bears harvested per date in the CBMU during the 2018 season. The red line indicates the split in the season for several counties.

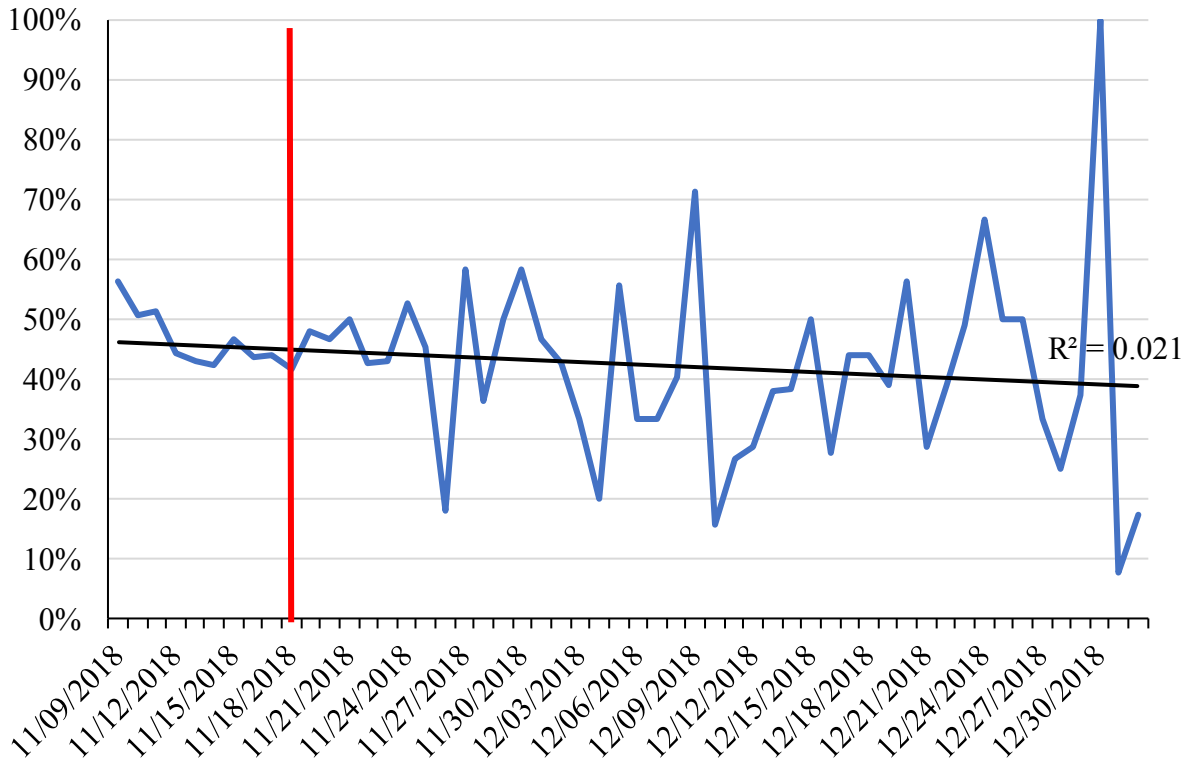


Figure 16. Percent of female bears that comprise the registered harvest during the 2018 season in the CBMU (trend indicated by black line). The red line indicates the split in the season for several counties.

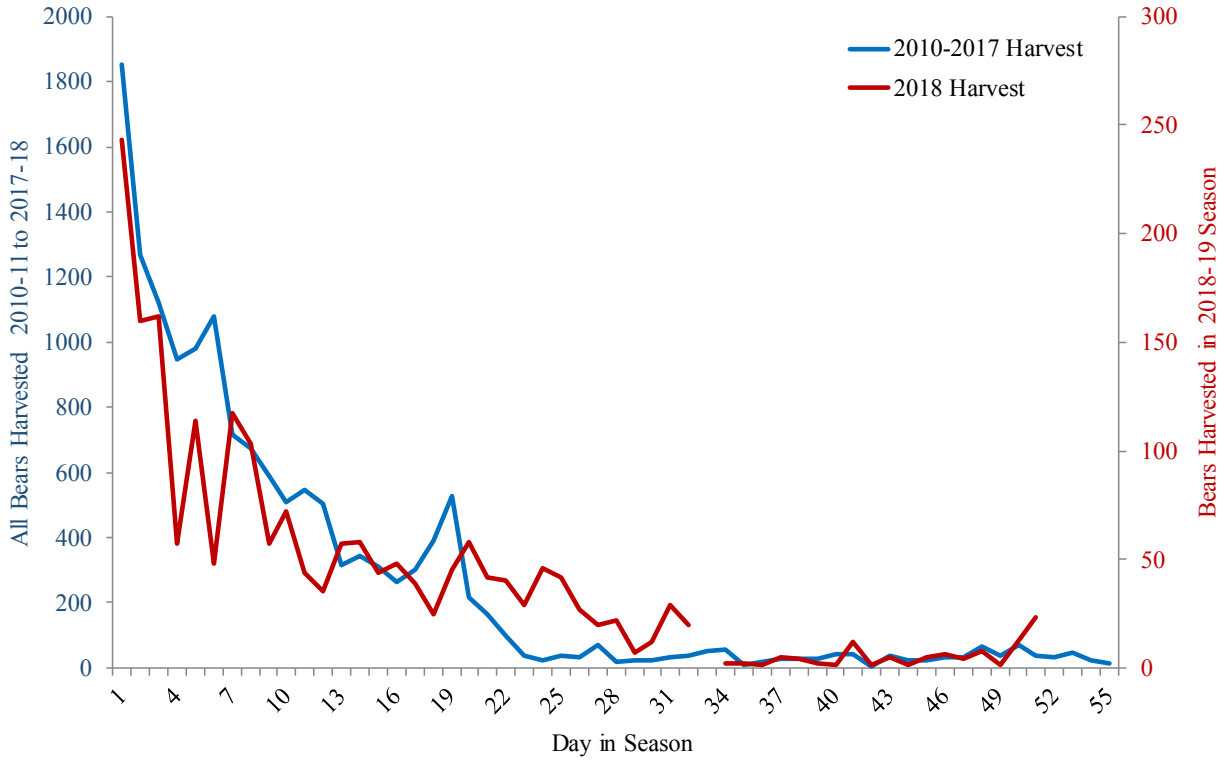


Figure 17. Comparison of 2018 CBMU reported bear harvest by day in season (red line) with harvest from previous seasons (2010-11 season through 2017-18 seasons; blue line)

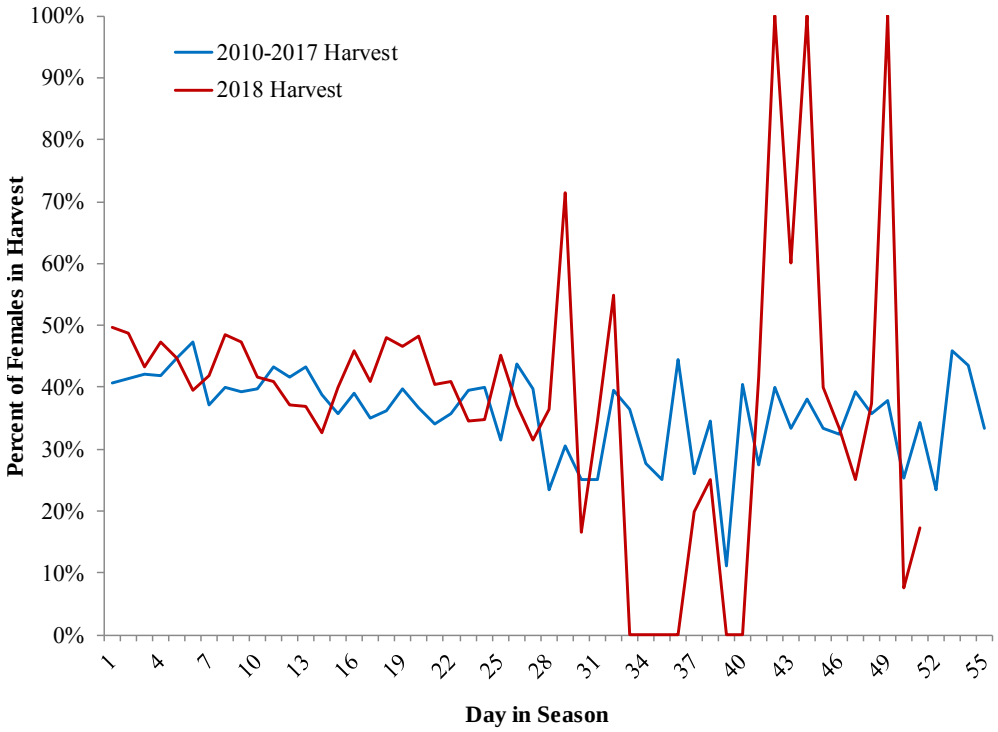
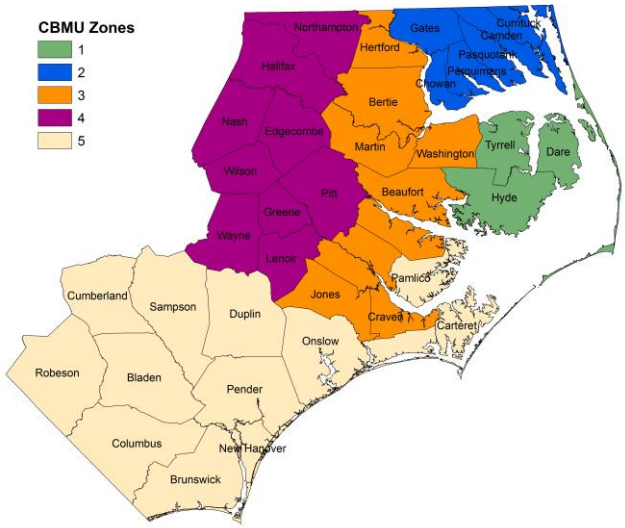


Figure 18. Comparison of the percentage of female bears in the 2018 CBMU reported harvest by day in season (red line) with harvest from previous seasons (2010-11 season through 2017-18 seasons; blue line).

CBMU Zone Harvest



In August 2016, the Commission engaged with constituents through 7 public bear management forums across the State. These forums were to engage with citizens on bear management issues and to gain feedback on the development of distinct biological zones for the CBMU. As a result, five zones (Figure 19) were created in the CBMU based on bear land cover, harvest per huntable acre, and percent of sanctuary in a county, as well as expert opinion provided by Commission biological staff and input from constituents. Seventy-six percent of attendees at the forums felt the zones were reasonable. There was less agreement about whether the Commission should create biological zones in the MBMU (50% support). Many hunters who did not support zones in the MBMU indicated concern that by creating zones, different seasons would be developed, resulting in greater hunting pressure on the bear population if these seasons were not concurrent.

In 2018, the Commission approved changes to bear hunting seasons in the CBMU that aligned the season to the zone, added Saturday openers for the November and December seasons in zones 1 through 4, changed the November season start date and end date in Zone 4, and extended the November season in Zone 1 from 6 days to 16 days, which also added 3 weekends.

While we cannot currently extrapolate population growth trends or absolute population estimate at the CBMU zone level, we can monitor harvest levels. In 2018, reported harvest was highest in Zone 3 (n=745 bears) followed by Zone 2 (n=529 bears), while lowest in Zone 4 (n=125 bears; Figure 20 and 21). Except for Zone 1, all other zones experienced declines in harvest during 2018; Zone 2 declined 7%, Zone 3 declined 1%, Zone 4 and Zone 5 declined 23% (Figure 20). The 2018 harvest in Zone 1 increased by 12%, likely reflective of the longer season created during November. When accounting for land area, harvest per square mile was highest in Zone 1, followed by Zone 3 (Figure 22). Harvest per square mile was lowest in Zone 4, which is expected, as this zone is at the peripery of occupied bear range in the CBMU (Figure 22). Hunters were more selective for male bears in Zones 1, 4, and 5, and less selective in Zones 2 and 3 (Figure 23).

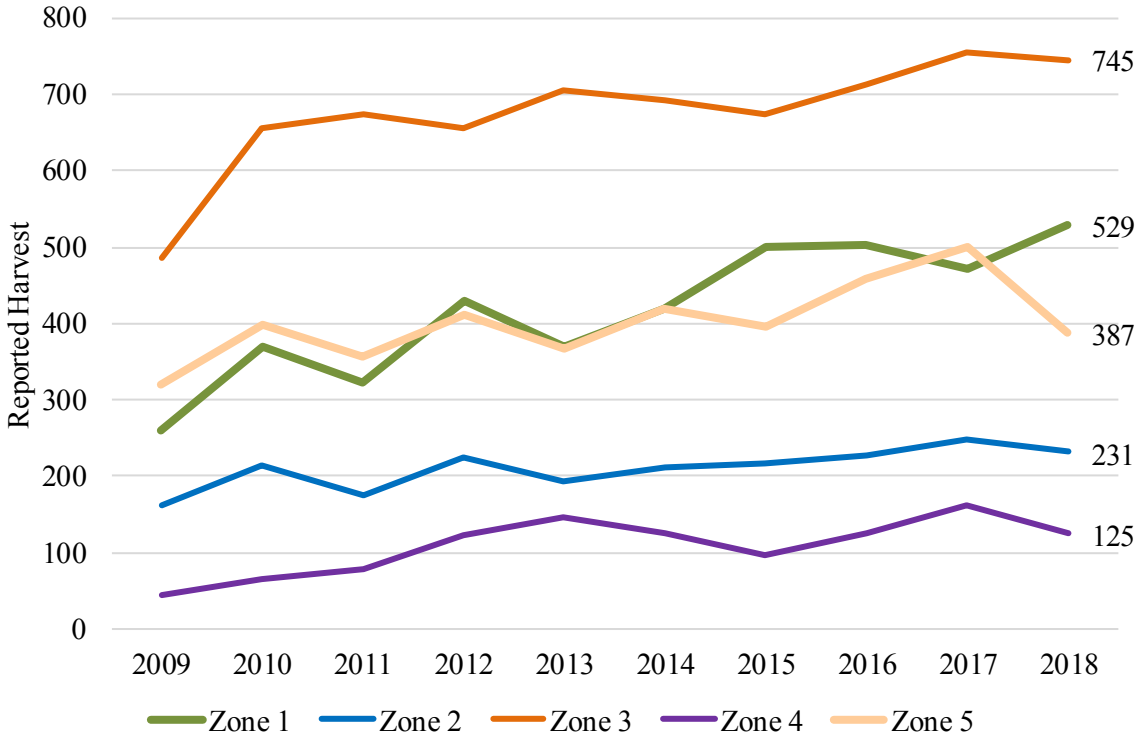


Figure 20. Reported harvest by CBMU zone from 2009 through 2018.

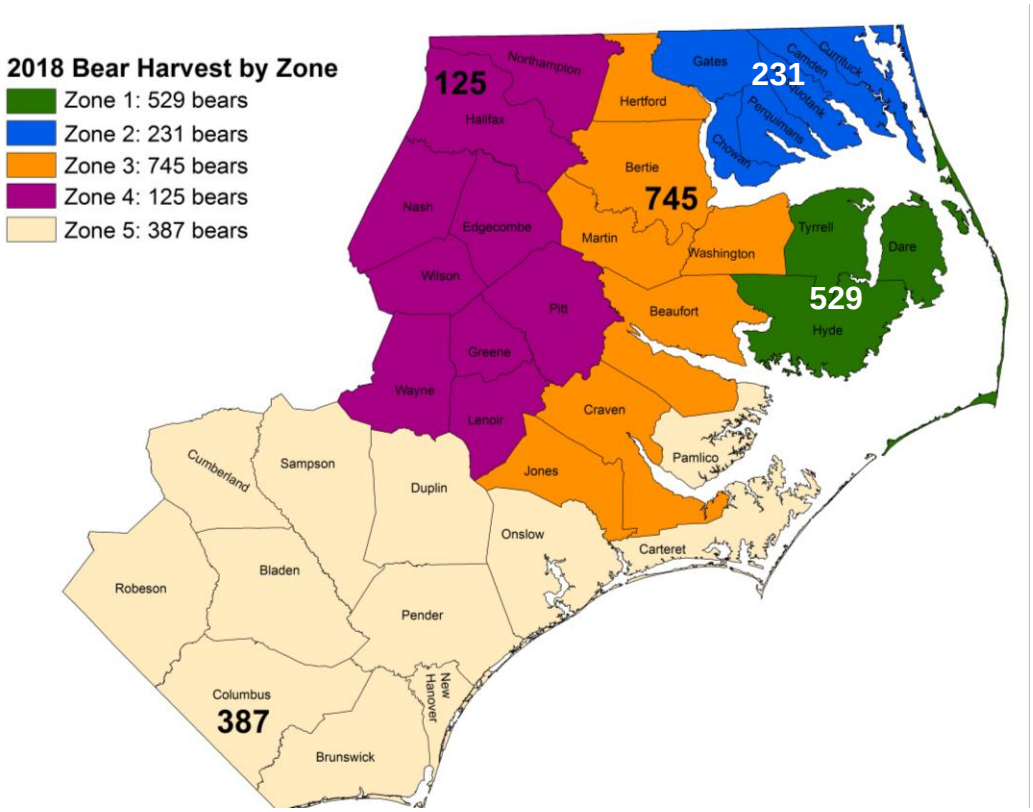


Figure 21. 2018 reported bear harvest by CBMU zone.

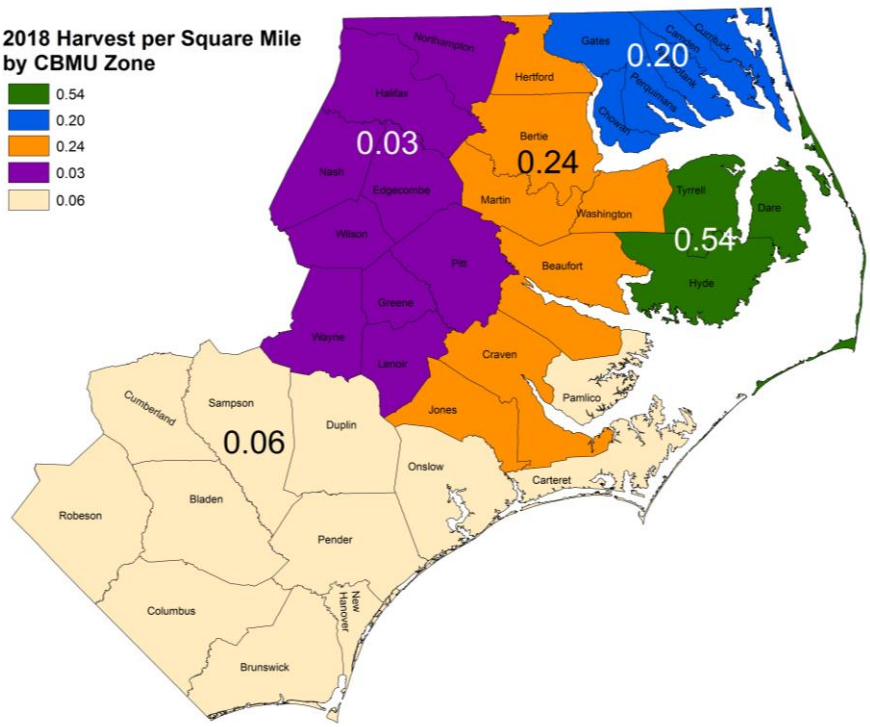


Figure 22. 2018 bear harvest per square mile by CBMU Zone.

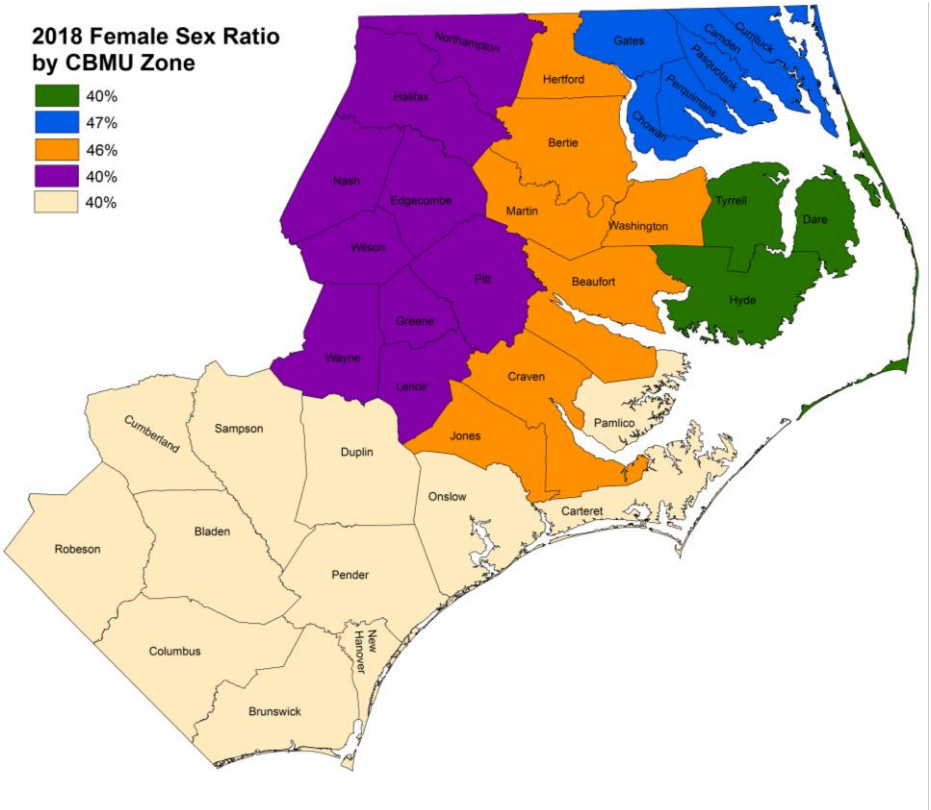


Figure 23. 2018 female sex ratio by CBMU zone.

Mountain Bear Management Unit (MBMU): The 2018 reported harvest (n=1,466 bears) in the MBMU increased by 16% compared to the 2017 season (n=1,264 bears; Table 3). The MBMU reported harvest was the highest on record and the fourth year in a row that harvest exceeded 1,000 bears. The MBMU harvest has exceeded 1,000 bears for 7 of the last 10 seasons. During the 2009 season, the reported bear harvest exceeded 1,000 bears for the first time since records were kept; the previous record reported harvest was 1,264 bears in the 2017 season (Table 3).

As with the CBMU, the MBMU bear harvest is also tied to bear population size, number of hunters, weather, and changes in bear hunting season structure and hunting methods. However, the MBMU bear harvest is also closely tied to the availability of hard and soft mast; harvest levels rise in years of poor natural food availability and drop in years of good natural food availability. When there is a lack of hard mast, bears are more attracted to unnatural food sources, such as bait piles, and look for food over larger unfamiliar areas, making them more accessible to hunters. During falls 2009, 2011 and 2013, the hard mast abundance was poor, which contributed to the record bear harvests that occurred in the MBMU in those years (Table 3; Figure 24). More recently, in 2016 the harvest declined 12% which corresponded with a fair hard mast crop and an improvement in hard mast production when compared to 2015 (Figure 24). However, the harvest in 2017 differed from the tradition pattern observed in the MBMU; despite an improvement in hard mast production from 2016, in 2017, there was a 20% harvest increase and a record harvest (Figure 24). While the fall hard mast index was higher in 2017 than in 2016, the 2017 hard mast production was uneven and extremely variable based on location, with some areas experiencing poor production while other areas experienced good to excellent production. For example, several areas experienced very poor production of white oaks. In addition, we suspect that hard mast productivity in 2016 was higher than what the index reflected. In 2018, hard mast abundance was poor, resulting in an increase in the reported harvest (+16%), as well as a record harvest (Figure 24).

The county with the highest reported harvest was Haywood County, followed by Madison, McDowell, and Buncombe counties; all reported >100 bears (Figure 25, Table 7). Record harvests occurred in 12 of 25 counties of the MBMU and include Alleghany, Avery, Buncombe, Haywood, Henderson, Jackson, Madison, McDowell, Mitchell, Polk, Swain, and Wilkes counties (Table 7). Polk (+114%), Henderson (+85%), Wilkes (+77%), Madison (+71%), Swain (+58%), and Rutherford (+50%) counties experienced the largest increase in harvest, while Surry (-67%), Ashe (-26%), and Yancey (-23%) experienced the largest declines in harvest (Table 7). Eight counties had declines in harvest, while 16 counties had increases in harvest; one county had no change in harvest (Cleveland County).

During the 2018 harvest season, the number of females and males harvested in the MBMU increased by 49% and 1%, respectively (Table 3; Figure 26). In the MBMU, the percentage of females that have comprised the total harvest has varied over the last 10 years (31% - 42%; Table 4; Figure 27). The 10-year average has been 38%; during the 2018 season females comprised 40% of the reported harvest. The overall trend in the MBMU shows less selectivity against females (Figure 27) Six counties exceeded a 44% female sex ratio (Figure 29); for sustainable bear harvests, the female sex ratio of the harvest should not exceed 44%. As expected, and observed in previous seasons, reported harvest of all bears and female bears, declined throughout the season, with increases occurring on the last day of the split and last day of the season (Figures 30 and 31). The percent of females in the harvest showed a slightly declining trend through the season (Figure 32).

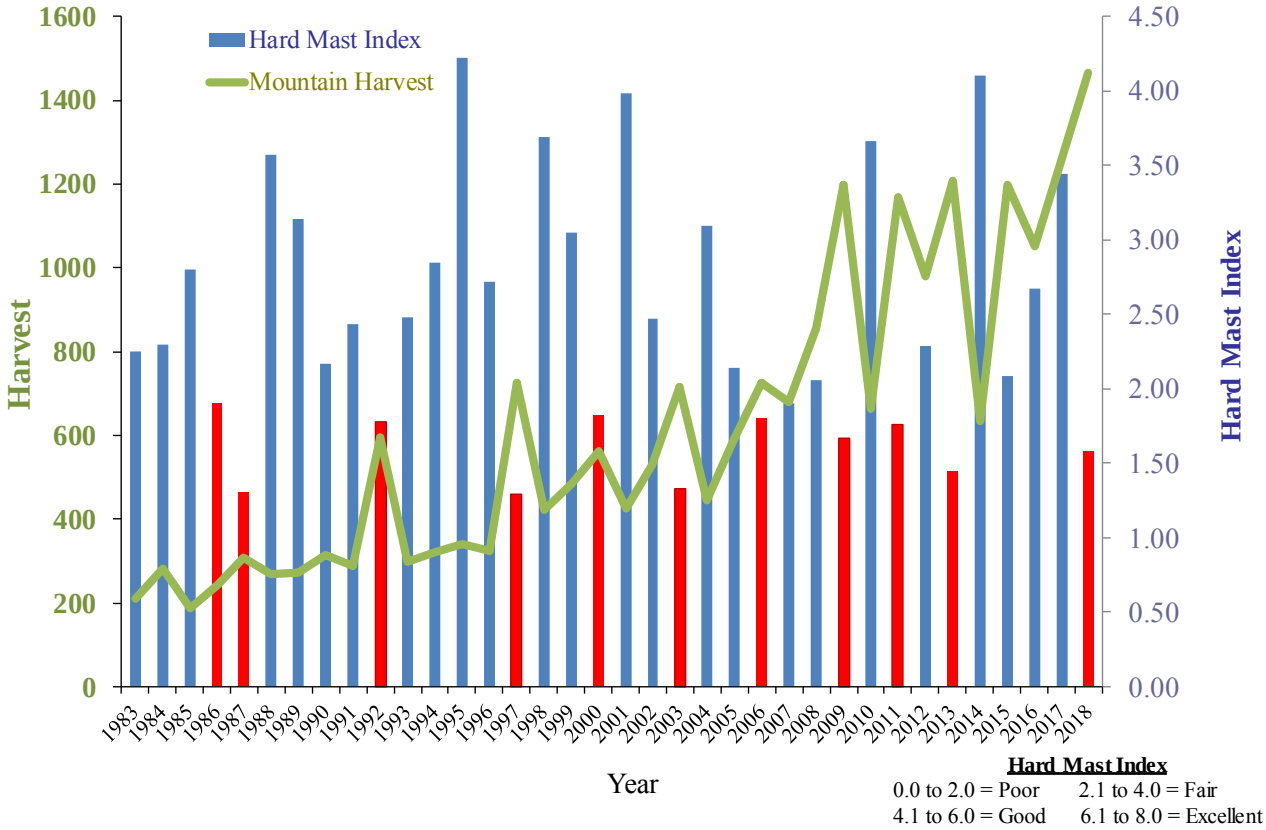


Figure 24. Registered bear harvest and hard mast index in the MBMU of North Carolina, 1983 through 2017, with increases in harvest corresponding with a poor hard mast index (indicated by the red bars).

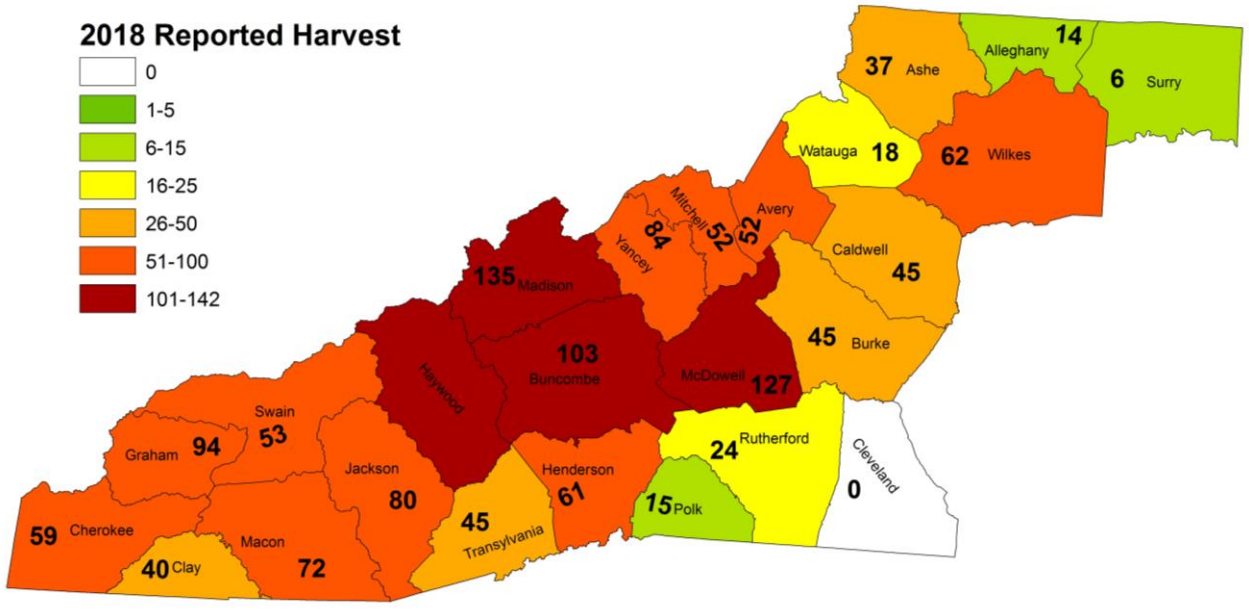


Figure 25. Reported harvest by county in the MBMU during the 2018 bear hunting season.

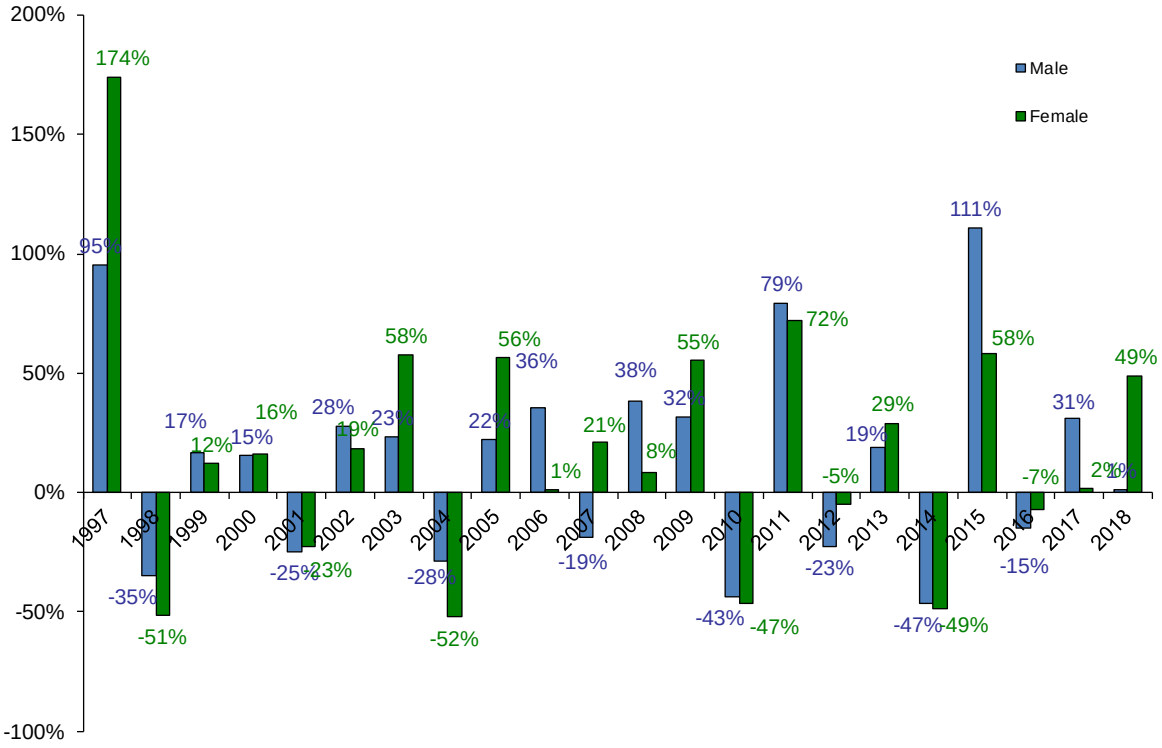


Figure 26. Annual percent change in male and female reported harvest in the MBMU from 1997 through 2018.

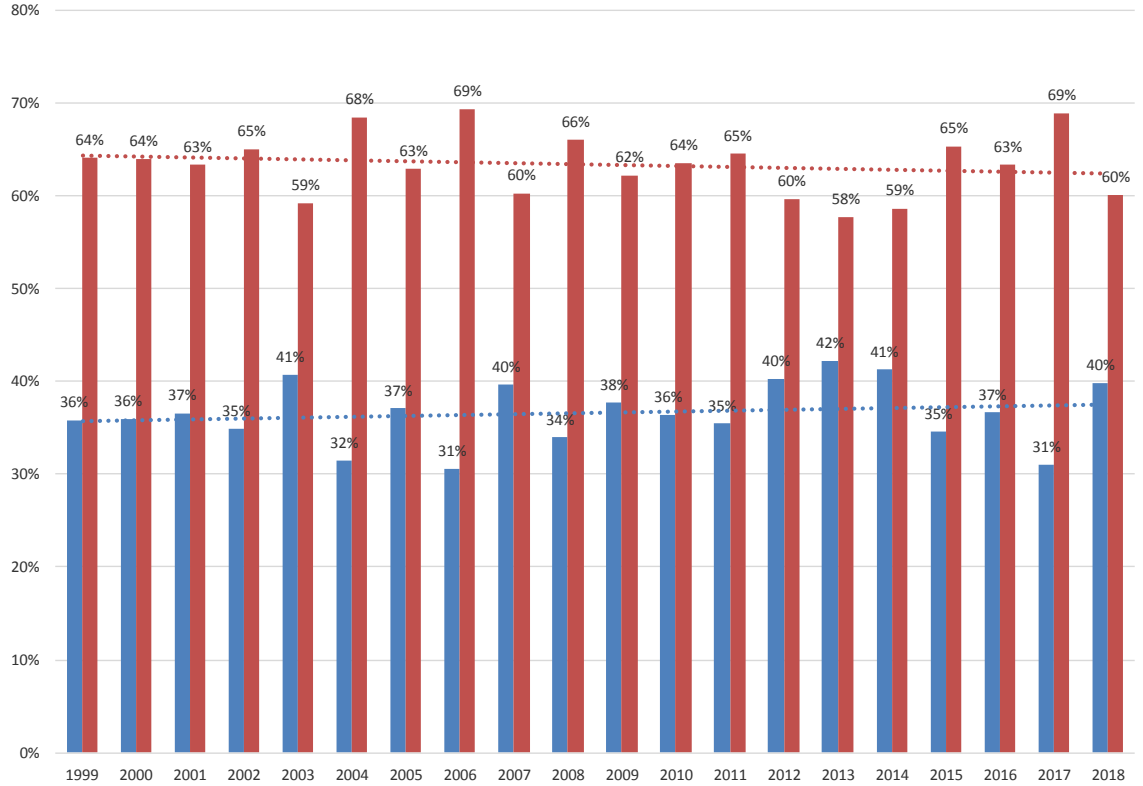


Figure 27. Percentage of male (red) and female (blue) bears in the reported MBMU harvest.

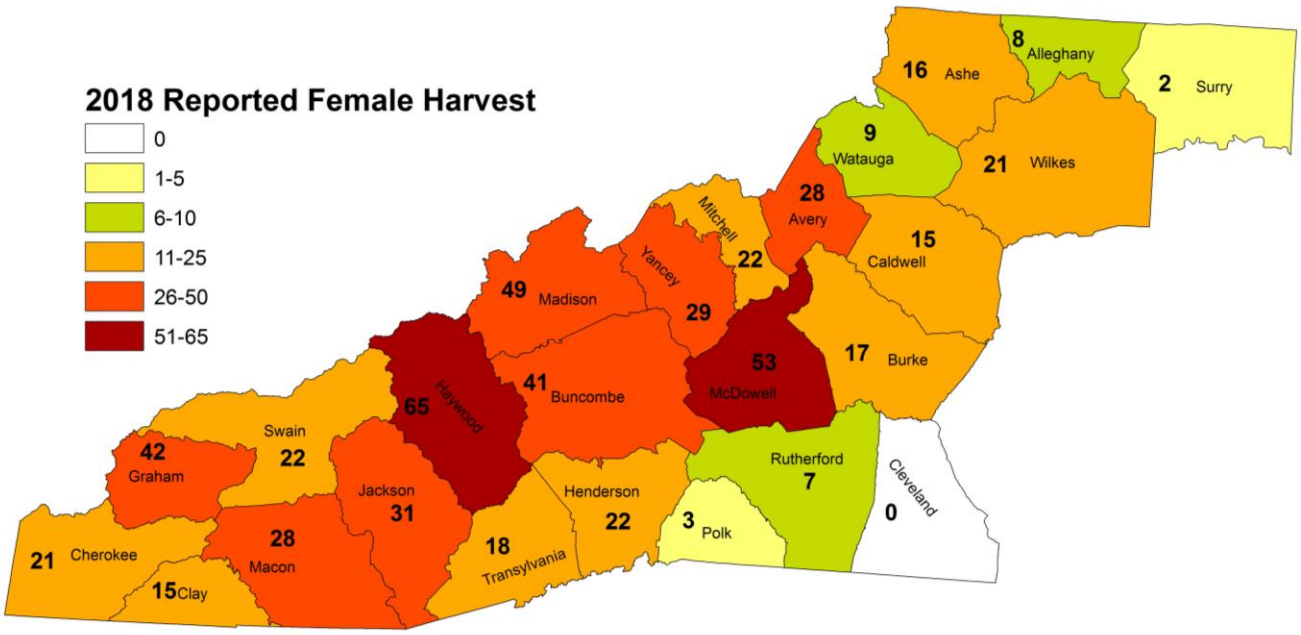


Figure 28. The 2018 reported female harvest by county in the MBMU.

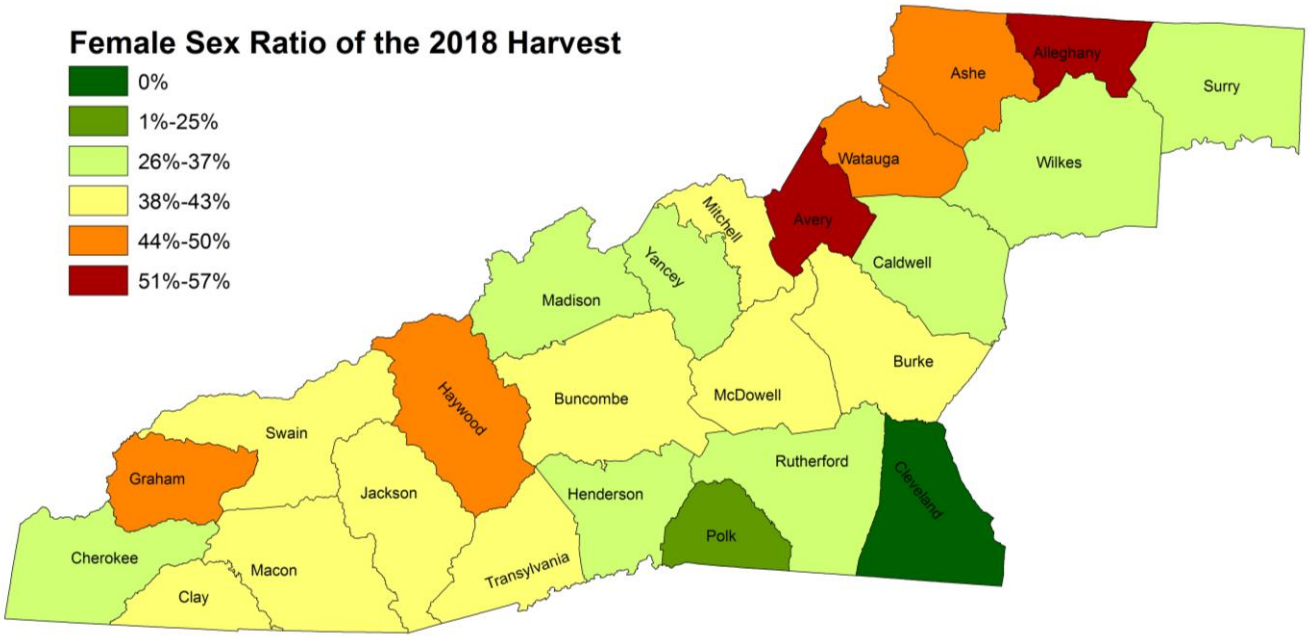


Figure 29. Percentage of the reported harvest comprised of female black bears in the MBMU during the 2018 bear hunting season.

Table 7. Reported harvest results of black bears by county in the Mountain Bear Management Unit (MBMU) of North Carolina from 2005 through 2018.

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	% change from 2017 to 2018
Alleghany	0	1	3	9	15	2	8	6	6	2	8	11	11	14	**27%**
Ashe	12	12	10	17	36	5	31	24	25	8	29	30	50	37	**-26%**
Avery	15	26	10	25	46	17	46	25	45	25	48	43	50	52	**4%**
Buncombe	18	19	17	39	47	18	49	47	74	30	61	68	69	103	**49%**
Burke	5	13	19	26	57	28	37	38	55	19	33	36	47	44	**-6%**
Caldwell	12	20	16	25	39	15	36	23	31	15	51	40	48	45	**-6%**
Cherokee	35	62	39	51	75	51	85	71	58	32	65	44	64	60	**-6%**
Clay	24	43	48	53	27	49	25	40	37	25	29	27	32	40	**25%**
Cleveland	0	0	1	0	1	0	0	3	3	1	0	0	0	0	**0%**
Graham	86	87	70	55	111	74	134	96	68	77	116	58	103	95	**-8%**
Haywood	46	72	60	76	96	41	127	75	102	54	117	92	99	142	**43%**
Henderson	14	13	22	23	35	10	37	25	38	7	28	26	33	61	**85%**
Jackson	21	31	38	23	47	28	37	59	71	26	63	54	64	80	**25%**
Macon	44	89	80	81	95	65	77	67	110	50	87	41	76	72	**-5%**
Madison	49	48	66	80	92	46	73	73	91	55	120	107	79	135	**71%**
McDowell	68	38	54	66	98	87	105	110	98	67	81	119	117	128	**9%**
Mitchell	14	24	16	47	64	19	40	29	42	22	37	36	45	52	**16%**
Polk	0	0	3	3	8	2	5	3	13	5	9	3	7	15	**114%**
Rutherford	8	15	5	15	29	8	6	10	25	7	14	13	16	24	**50%**
Surry	5	3	3	2	11	2	15	11	15	6	8	21	18	6	**-67%**
Swain	24	27	14	16	22	15	43	24	23	14	24	23	33	52	**58%**
Transylvania	34	12	30	20	36	26	43	42	52	18	33	25	42	45	**7%**
Watauga	5	8	5	9	17	3	9	10	20	8	26	10	17	18	**6%**
Wilkes	8	13	3	21	20	9	24	13	16	10	29	27	35	62	**77%**
Yancey	43	48	45	74	73	42	78	56	89	51	83	97	109	84	**-23%**
Totals	**590**	**724**	**677**	**856**	**1,197**	**662**	**1,170**	**980**	**1,207**	**634**	**1,199**	**1,051**	**1,264**	**1,466**	**16%**

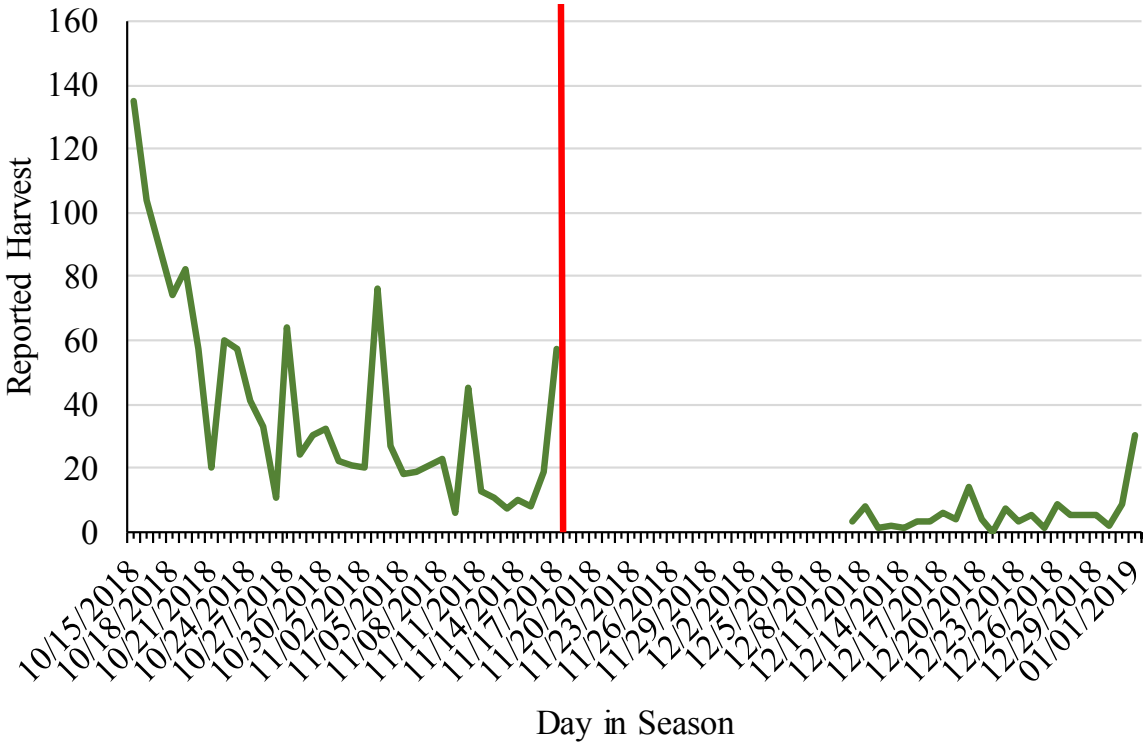


Figure 30. Reported bear harvest by day in the during the 2018 bears season in the MBMU season. Red line indicates the split in the season.

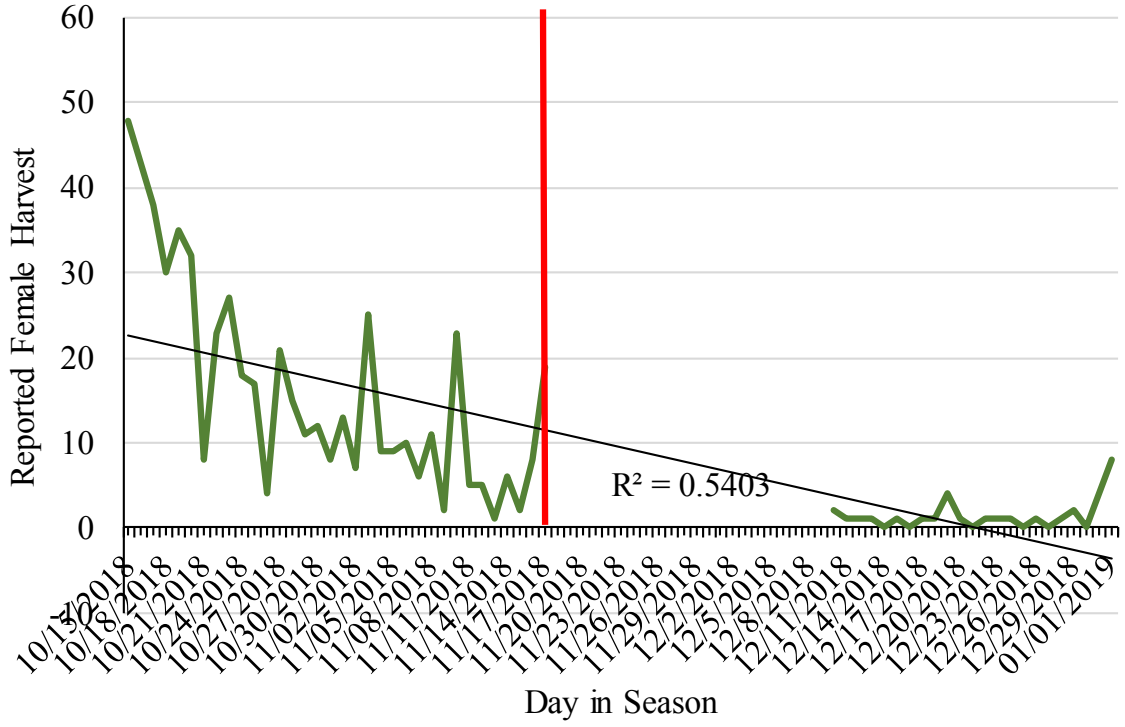


Figure 31. Reported harvest of female bears during the 2018 season in the MBMU (trend indicated by black line). The red line indicates the split in the season.

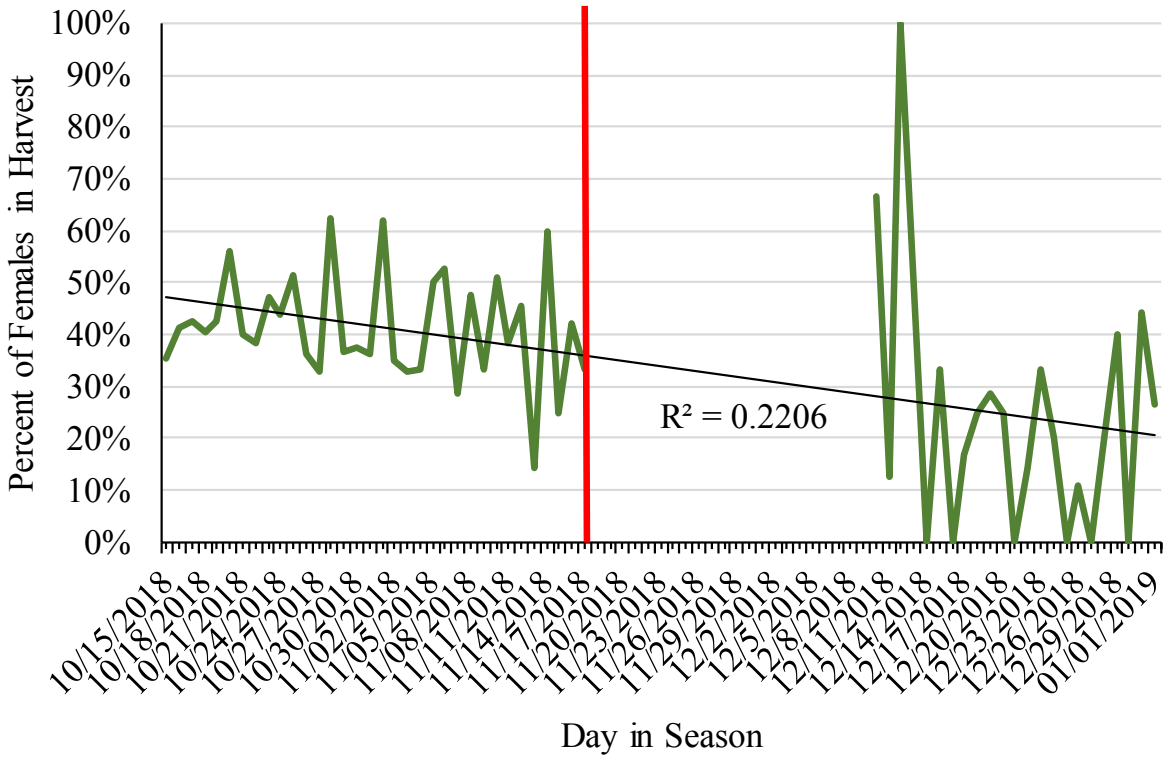


Figure 32. Percentage of female bears comprising the reported harvest during the 2018 season in the MBMU (trend indicated by black line). The red line indicates the split in the season.

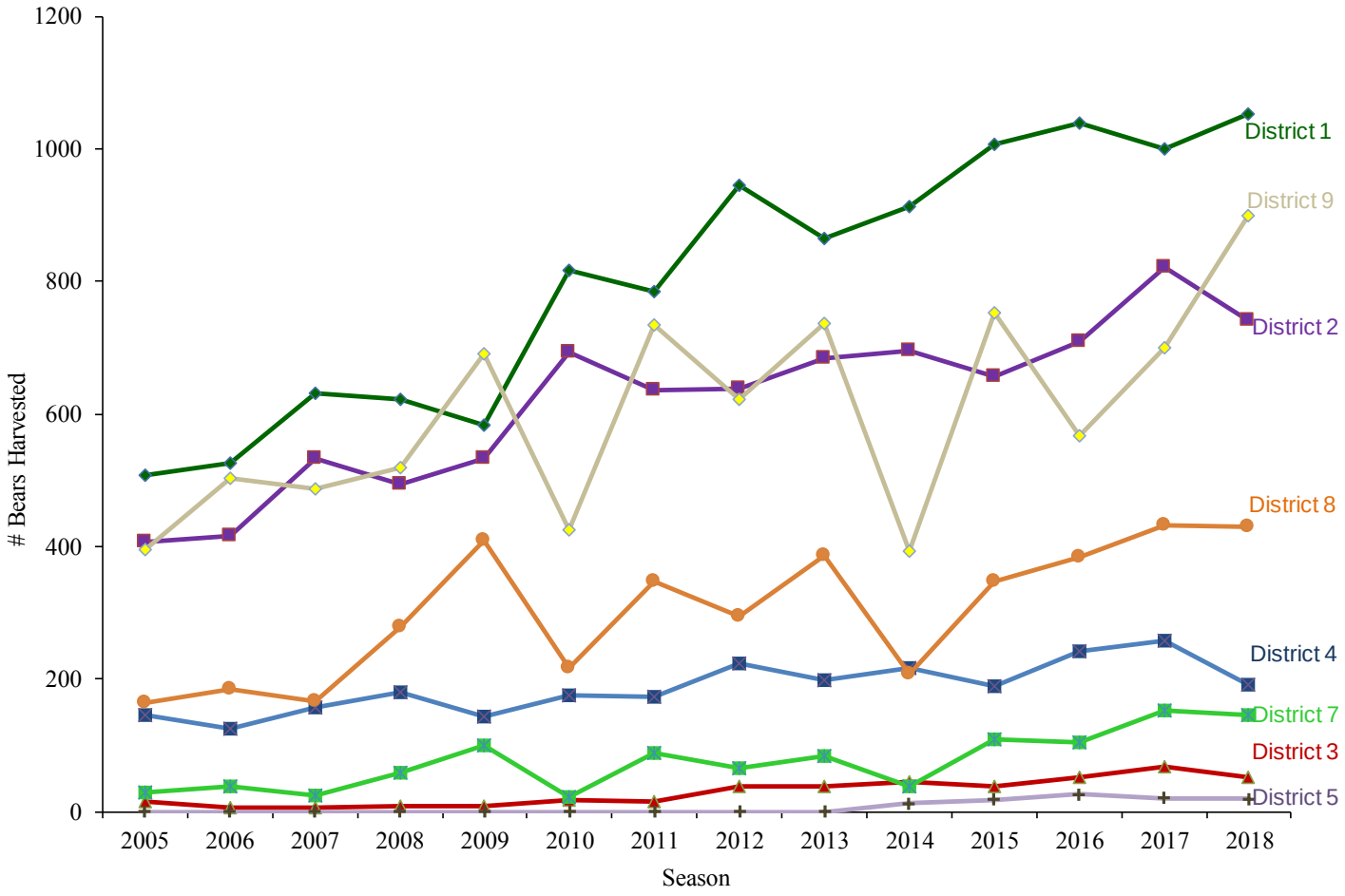


Figure 33. The reported harvest of black bears by district from 2005 through 2018.

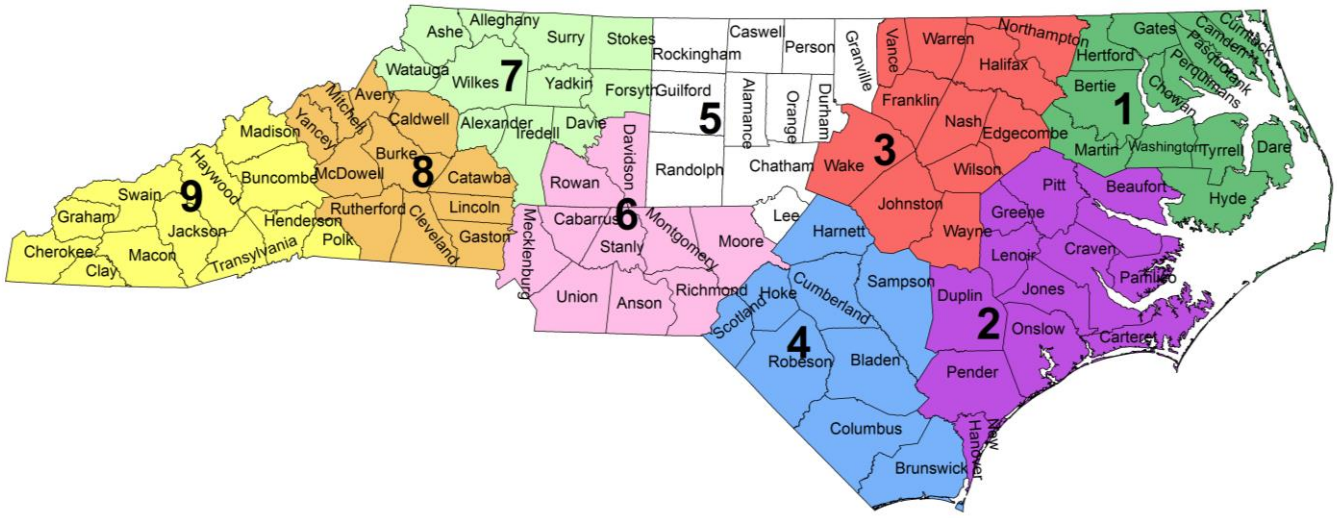


Figure 34. The nine wildlife districts of the North Carolina Wildlife Resources Commission.

Table 8. The reported harvest of black bears by district from 1977 through 2018.

	District								
Season	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1977	0	58	0	16	0	0	0	23	56
1978	0	57	0	28	0	0	1	45	78
1979	0	57	0	36	0	0	2	29	93
1980	0	74	0	30	0	0	2	49	101
1981	0	62	0	30	0	0	1	32	118
1982	0	73	0	26	0	0	0	56	168
1983	0	71	0	26	0	0	0	54	157
1984	0	120	0	81	0	0	2	45	234
1985	0	103	0	35	0	0	0	34	153
1986	48	86	0	33	0	0	1	76	163
1987	94	93	0	58	0	0	1	68	238
1988	98	136	0	62	0	0	0	53	187
1989	83	146	0	46	0	0	2	59	239
1990	194	192	0	58	0	0	4	81	231
1991	187	185	0	57	0	0	1	75	210
1992	222	186	0	56	0	0	2	130	478
1993	239	206	0	78	0	0	4	65	232
1994	194	192	0	77	0	0	5	102	215
1995	389	281	0	75	0	0	6	74	254
1996	392	204	0	89	0	0	3	91	231
1997	359	296	0	82	0	0	12	197	517
1998	467	336	15	61	0	0	9	119	293
1999	447	312	16	106	0	0	10	107	368
2000	461	355	9	104	0	0	20	139	402
2001	469	520	15	103	0	0	14	110	302
2002	429	410	16	100	0	0	30	170	330
2003	557	423	1	117	0	0	22	227	468
2004	480	401	13	159	0	0	15	99	330
2005	507	406	15	145	0	0	30	165	395
2006	527	416	7	125	0	0	37	185	503
2007	631	533	6	157	0	0	24	167	487
2008	622	493	9	181	0	0	58	279	520
2009	584	533	9	144	0	0	99	408	691
2010	816	693	17	175	0	0	21	216	425
2011	784	636	14	174	0	0	88	348	735
2012	945	639	38	224	0	0	65	294	622
2013	864	683	37	199	0	0	84	387	737
2014	912	696	46	216	12	1	38	207	393
2015	1,006	657	39	189	18	0	109	348	752
2016	1,040	710	51	241	26	0	105	384	568
2017	1,000	821	68	259	20	0	152	433	701
2018	1,052	741	51	192	19	0	146	429	900
Percent of 2018 Harvest by District	**30%**	**21%**	**1%**	**5%**	**1%**	**0%**	**4%**	**12%**	**25%**

Bear Permit Hunt Harvest

Prior to 2009, information on bear harvest that occurred on three of the bear permit hunts was obtained through the voluntary permit hunt surveys and voluntary tooth submission. However, hunter response to the permit surveys was low; in 2008, average response rate to the permit surveys was 10%. The exception to this is the Dare Bombing Range Bear Permit hunt, which is well monitored by NCWRC staff, due to the limited number of permit hunt days and the ability to have an established stationary check station; there is only one entrance and exit to the permit hunt. In order to improve our ability to monitor harvest on Mt. Mitchell and Daniel Boone Bear Sanctuaries, which are within Pisgah Game Land, questions were added to the big game registration system, enabling permit hunters to provide the sanctuaries as the location of their bear harvest.

In 2018, 11 bears were harvested during bear permit hunts (Table 9) and NCWRC received tooth submissions from 82% of these bears. The decline in reported harvest on permit hunts was largely due the Dare Bombing Range, followed by Mt. Mitchell Bear Sanctuary permit hunts, which experienced an 93% and 64% decline in the harvest, respectively, compared to 2017. Submission rates from bears taken on Mt. Mitchell Bear Sanctuary are the lowest of all permit hunts (50%). While harvest estimates for the Holly Shelter Bear Garden Tract are unknown, several permit houndsmen parties initiate the start of their bear hunt on the tract, with the remainder of the chase occurring off the tract within Holly Shelter Game Land.

Table 9. Reported bear harvest for bear permit hunts from 2007 through 2018.

Sanctuary	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Dare Bombing Range[1]	8	2	4	3	3	1	2	9	1	8	15	1
Daniel Boone Bear Sanctuary[2]	NS	NS	5	3	2	5	3	1	7	4	8	6
Holly Shelter Bear Garden Tract[4]	0	0	0	0	0	1	1	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]
Mt. Mitchell Bear Sanctuary[5]	3	5	2	3	3	16	3	7	16	13	11	4
Pond Mountain[2]	NS	NS	NS	NS	1	0	0	0	3	1	0	0
Texas Plantation[2]	NS	NS	NS	NS	NS	NS	NS	NS	0	0	0	0
Total Registered Harvest	**11**	**7**	**11**	**9**	**9**	**23**	**9**	**17**	**27**	**26**	**34**	**11**

[1]Harvest based on check station

[2]Harvest based on reported harvest to big game registration system

[3]Harvest based on permit surveys

[4]From 2007-2008, harvest based on permit surveys; after 2009, harvest based on big game registration system

[5]Harvest based on reported harvest to big game registration system

Mean weight and age of bears harvested on permit hunts can be seen in Table 10. Female bears harvested on the Dare Bombing Range permit hunt tend to be older and weight less than the 10-year average observed for females harvested in the CBMU (Table 10 and Table 35). Male bears taken on the Dare Bombing Range permit hunt were similar in age, but weigh much less (~167 lb. difference) than male bears harvested the CBMU (Table 10 and Table 35). Male and female bears harvested on Daniel Boone Bear Sanctuary (DBBS) were older and heavier than male bears harvested in the MBMU (Table 10 and Table 35). On Mt. Mitchell Bear Sanctuary, male bears were older and slightly heavier than male bears harvested in the remaining MBMU, while female bears on Mt. Mitchell were older, but weighed slightly less than female bears harvested in the MBMU (Table 10 and Table 35).

Table 10. Mean age (years), mean weight (lbs.) and samples sizes (n) of bears sampled on bear permit hunts (2006 through 2018).

	Age		**Weight**	
Permit Hunt	**Male**	**Female**	**Male**	**Female**
Dare Bombing Range	4.8 (n=15)	8.2 (n=26)	172 (n=15)	151 (n=26)
Daniel Boone	4.4 (n=19)	6.9 (n=8)	261 (n=19)	246 (n=8)
Mt. Mitchell	4.8 (n=27)	6.0 (n=24)	234 (n=27)	176 (n=24)
Pond Mountain	3.75 (n=3)	3.75 (n=2)	205 (n=3)	N/A

Harvest on Game Lands

The percent of the bear harvest that occurs on game lands has remained fairly stable from 1998 through 2012 (Table 11; Figure 24). Except for the 2014 bear season, the majority (54%-69%) of the MBMU bear harvest occurred on private lands (Table 11; Figure 24). In the CBMU, harvest by land type has been more stable and in the 2018 season, 97% of the CBMU bear harvest occurred on private lands. A majority of bears harvested in the PBMU were taken on private lands (94%), but three bears were harvested off three different game lands (Table 12). One reason for the regional difference is that in the MBMU there is a large amount of public lands (e.g. Pisgah National Forest, Nantahala National Forest), as well as private properties that are smaller than what is observed in the coast. In the CBMU, private properties tend to have a large amount of acreage (e.g. Weyerhaeuser, agricultural operations) that is more conductive to bear hunting with hounds. The declining percent of bears harvested off of game lands in the MBMU is likely due to the increase in the still hunted harvest aided by bait (Table 26). However, with human populations projected to increase in North Carolina and the increasing cost of leasing private lands, NCWRC game lands will become increasingly important in maintaining and providing bear hunting opportunities.

Table 11. Percentage of North Carolina's registered bear harvest occurring on game lands, 1998 through 2018.

	CBMU		MBMU		Statewide	
Year	**Game land**	**Other**	**Game land**	**Other**	**Game land**	**Other**
1998	3%	97%	67%	33%	24%	76%
1999	6%	94%	67%	33%	27%	73%
2000	3%	97%	50%	50%	21%	79%
2001	6%	94%	63%	37%	22%	78%
2002	5%	95%	54%	46%	22%	78%
2003	5%	95%	56%	44%	25%	75%
2004	5%	95%	67%	33%	24%	76%
2005	6%	94%	55%	45%	23%	77%
2006	6%	94%	52%	48%	25%	75%
2007	8%	92%	61%	39%	26%	74%
2008	6%	94%	50%	50%	24%	76%
2009	6%	94%	43%	57%	24%	76%
2010	6%	94%	65%	35%	23%	77%
2011	6%	94%	48%	52%	24%	76%
2012	6%	94%	53%	47%	22%	78%
2013	3%	97%	42%	58%	19%	81%
2014	5%	95%	56%	44%	18%	82%
2015	5%	95%	44%	56%	20%	80%
2016	4%	96%	43%	57%	17%	83%
2017	5%	95%	46%	54%	20%	80%
2018	3%	97%	31%	69%	15%	85%

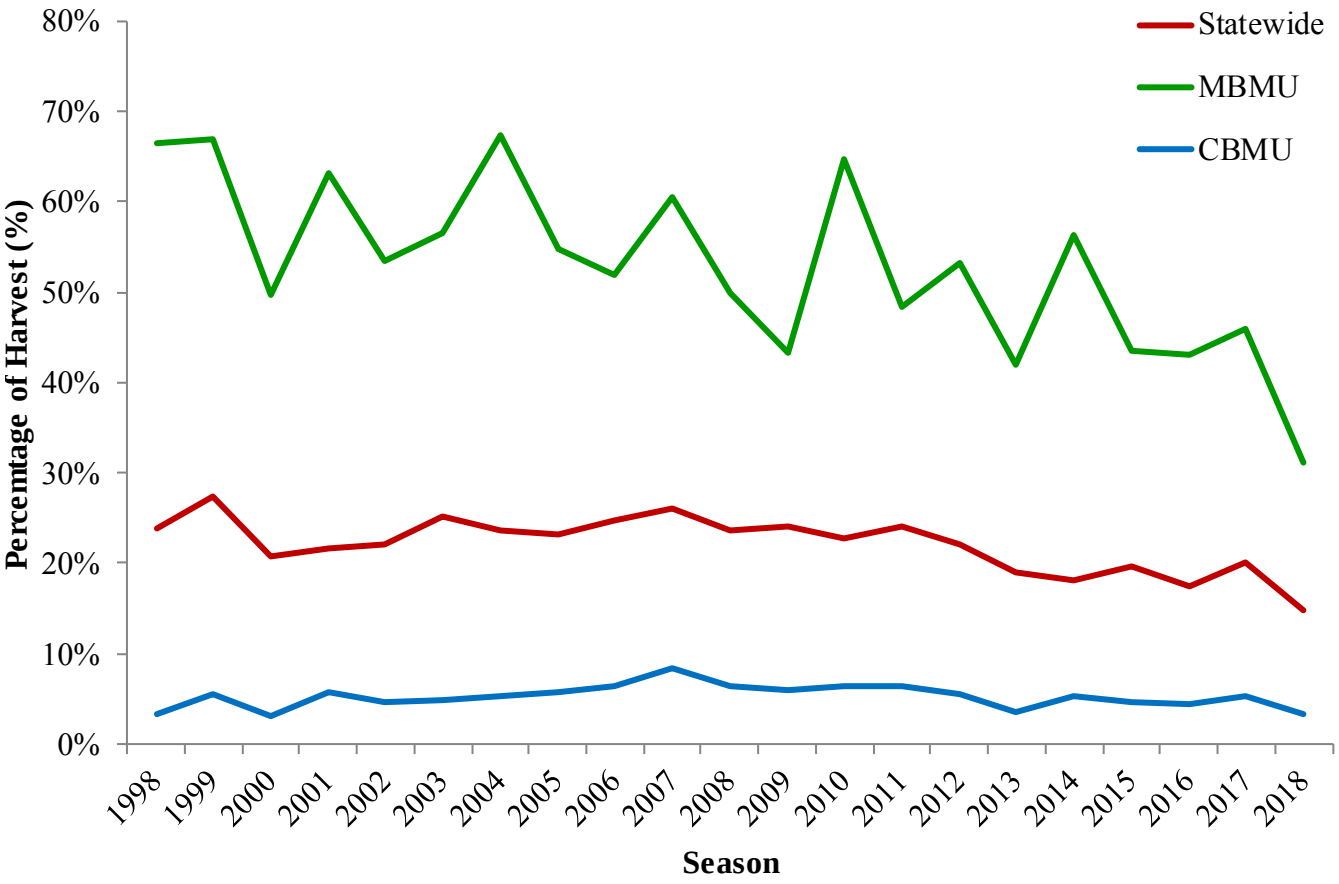


Figure 35. Percentage of registered bear harvest occurring on game lands, 1998 through 2018.

In the CBMU, a majority (57%) of the game land harvest occurs on four game lands: Croaton National Forest (22%), Buckridge (16%), Bladen Lakes State Forest (10%), and Alligator River (9%; Table 12). During the 2018 bear season, 10 bears were harvested on Lantern Acres Game Lan, followed by Croatan National Forest (n=8), Buckridge Game Land (n=19), Van Swamp (n=7), and Angola Bay (n=7). In the MBMU, 93% of the game land harvest occurs on Nantahala National Forest (53%) and Pisgah National Forest (40%; Table 12). These two national forest comprise just over one million acres total and are the largest public lands in the mountain region in which bear hunting is allowed. Nantahala National Forest (n=239), followed by Pisgah (n=184) had the highest bear harvest on game lands, followed by Needmore (n=8) and Daniel Boone Bear Sanctuary (n=8). In the PBMU, three bears were harvested on game lands during the 2018 bear season (Table 12). Harris, Sandy Creek, and R. Wayne Bailey-Caswell game lands each had one bear harvested (Table 12).

Table 12. Registered harvest on game lands in the MBMU and CBMU of North Carolina, 2011 through 2018. Note: The total column reflects total harvest from 2008-2018.

BMU	Game Land	2011	2012	2013	2014	2015	2016	2017	2018	Total	Percent
CBMU	Alligator River	6	9	8	11	14	10	4	3	89	9%
	Angola Bay	6	3	4	2	3	1	8	7	44	5%
	Bachelor Bay	0	0	0	0	0	0	0	0	1	0.1%
	Bertie County[1]	1	1	0	1	0	1	1	1	8	1%
	Bladen Lakes State Forest	9	7	5	9	16	6	10	4	92	10%
	Buckridge	19	22	12	12	18	11	19	4	151	16%
	Cape Fear River Wetlands	0	0	0	0	0	0	0	0	2	0.2%
	Carteret County[1]	1	2	1	0	1	1	0	1	11	1%
	Chowan Swamp	6	10	4	4	3	2	5	4	49	5%
	Columbus County	0	0	0	2	0	1	0	1	7	1%
	Croatan	26	27	14	23	11	23	26	8	213	22%
	Dare	3	1	2	9	2	8	15	1	50	5%
	Dover Bay	1	0	0	1	0	0	0	0	2	0.2%
	Goose Creek	0	0	1	2	0	0	4	1	12	1%
	Green Swamp	0	1	0	0	1	0	1	0	3	0.3%
	Gull Rock	5	1	0	3	3	5	2	3	28	3%
	Holly Shelter	7	2	0	5	6	4	1	2	35	4%
	Juniper Creek	3	7	3	5	1	1	2	5	30	3%
	Lantern Acres	3	4	4	3	6	6	7	10	58	6%
	Light Ground Pocosin	0	1	0	0	0	0	0	0	1	0.1%
	New Lake	0	0	0	0	1	2	0	3	6	1%
	Neuse River	0	0	1	0	0	0	0	0	2	0.2%
	North River	0	0	0	0	0	3	1	0	4	0.4%
	Pungo River	0	0	0	0	1	0	0	0	2	0.2%
	Stones Creek	0	0	0	0	0	0	0	0	1	0.1%
	Van Swamp	7	4	2	5	1	3	8	7	53	6%
	White Oak River	0	1	0	0	0	0	0	0	3	0.3%
MBMU	Buffalo Cove	0	1	3	0	2	3	2	3	15	0.3%
	Cold Mountain	7	5	11	7	10	4	14	4	82	2%
	Daniel Boone Bear Sanctuary	2	5	3	1	7	4	8	6	44	1%
	Green River	2	0	1	2	3	1	0	4	15	0.3%
	Headwaters	0	0	0	0	0	0	0	1	1	0.0%
	Mitchell River	0	0	0	1	0	0	0	0	2	0.0%
	Mt. Mitchell Bear Sanctuary	3	16	3	7	16	13	11	4	78	2%
	Nantahala	318	287	271	187	298	206	287	239	2,736	53%
	Needmore	4	5	4	3	2	1	7	6	49	1%
	Pisgah	224	202	205	143	179	216	241	184	2,096	40%
	Pond Mountain	1	0	0	0	2	1	2	0	6	0.1%
	Sandy Mush	2	0	1	2	2	1	1	0	11	0.2%
	South Mountains	2	0	2	1	1	1	2	2	19	0.4%
	Three Top Mountain	0	1	1	1	1	1	2	0	8	0.2%
	Toxaway	1	1	1	2	0	0	3	2	20	0.4%

BMU	Game Land	2011	2012	2013	2014	2015	2016	2017	2018	Total	Percent
PBMU	Harris		No Season			0	0	0	1	1	11%
	Mayo		No Season			2	2	0	0	4	44%
	R.Wayne Bailey-Caswell		No Season			1	1	0	1	3	33%
	Sandy Creek		No Season			0	0	0	1	1	11%

[1] Possibly an error in reporting from hunters equating game land to county of harvest.

Harvest by Weapon Type

Since 1981, the requirement to report the weapon used for taking bears has changed throughout the years (Table 13). As of 2010, when a hunter registers a bear, s/he must indicate if a gun, bow, muzzleloader or crossbow was used. A majority of bears are harvested by use of gun, followed by bow, muzzleloaders, then crossbow.

Table 13. Composition of registered bear harvest by weapon from 1983 through 2018.

Year	Statewide Harvest	Gun	Muzzleloader	Bow	Crossbow	Unknown
1983	308	97%	N/A	N/A	N/A	3%
1984	482	95%	N/A	N/A	N/A	5%
1985	325	90%	N/A	N/A	N/A	10%
1986	407	100%	N/A	N/A	N/A	0%
1987	552	99%	N/A	N/A	N/A	1%
1988	536	100%	N/A	N/A	N/A	0%
1989	575	98%	N/A	N/A	N/A	2%
1990	760	99%	N/A	1%	N/A	0%
1991	715	95%	N/A	1%	N/A	4%
1992[1]	1,074	96%	0.1%	2%	N/A	3%
1993[2]	824	55%	0.0%	0%	N/A	45%
1994	785	60%	0.1%	1%	N/A	39%
1995	1,079	55%	0.0%	0%	N/A	45%
1996	1,010	57%	0.1%	0%	N/A	42%
1997	1,463	51%	0.0%	1%	N/A	48%
1998	1,300	52%	0.0%	0.1%	N/A	48%
1999	1,366	46%	0.3%	0.1%	N/A	53%
2000	1,490	41%	0.1%	0.3%	N/A	58%
2001	1,533	44%	0.1%	0.2%	N/A	56%
2002	1,485	43%	0.0%	1%	N/A	56%
2003	1,812	47%	0.1%	0.3%	N/A	52%
2004	1,497	43%	0.1%	0.3%	N/A	56%
2005	1,661	37%	0.2%	0.2%	N/A	62%
2006	1,800	41%	0.1%	0.1%	N/A	59%
2007	2,006	44%	0.1%	0.2%	N/A	56%
2008	2,162	58%	1%	3%	N/A	38%
2009[3]	2,468	93%	1%	5%	N/A	1%
2010	2,363	96%	1%	2%	0.30%	0.30%
2011	2,779	95%	1%	4%	0.54%	0.04%
2012	2,827	95%	1%	3%	0.81%	0%
2013	2,521	97%	1%	2%	0.40%	10%
2014	3,118	95%	1%	3%	0.61%	0.1%
2015	2,521	97%	1%	2%	0.40%	10%
2016	3,125	94%	2%	3%	0.74%	0.1%
2017	3,454	94%	2%	3%	1%	0%
2018	3,530	92%	2%	4%	2%	0%
5- yr. Average		**94%**	**2%**	**3%**	**1%**	**0.1%**

[1]From 1981-1992, weapon reported when hunters registered their bear.

[2] Weapon used based on sampled harvest.

[3] Type of weapon required when registering by all registration methods (i.e. big game harvest sheet, on-line and phone).

Non-Resident (NR) Bear Harvest

Until Oct. 1, 2011, determining the annual number of NR bear hunters was difficult. Prior to Oct. 1, 2011, non-residents (NRs) were required to obtain a NR bear/wild boar license prior to hunting bear. Because the NR bear license was combined with wild boar, not all NRs who purchased the NR bear/wild boar license were hunting bear. Another difficulty in determining the number of NR bear hunters was that NRs who purchased a NR lifetime sportsman license prior to May 24th, 1994 are exempt from purchasing a NR bear license. In 2011, these exempt lifetime NRs comprised 7% of the non-resident registered bear harvest. Lastly, during 2011, 26% of successful NR bear hunters who registered their harvested bear did not purchase the NR bear license. Some of these successful NRs may have been exempt from having to purchase the separate bear license, while other NRs were illegally hunting without the required NR bear license.

After Oct. 1, 2011, wild boars were reclassified as feral hogs and non-resident hog hunters were no longer required to purchase the separate license. This improved our efforts to estimate the number of NR bear hunters. However, due to NR lifetime license exemptions, other exemptions, and illegal activity, we continued to underestimate the number of NR bear hunters in North Carolina.

In July 1, 2014 the bear e-stamp was created and is required for all hunters before taking any bear within North Carolina. For NR hunters, they must have the bear e-stamp if they hunt bears, even if they are exempt from purchasing the NR bear license. The bear e-stamp will provide a more accurate estimate of NR hunters who hunt bears in North Carolina. In addition, the NC General Assembly increased the NR bear license from $125 to $225 in 2015. The number of bear e-stamps issued to NR bear hunters barely increased (0.4%) from 2017 to 2018, but the number of NR bear licenses ($225) purchased increased by 10% (Table 14). In 2018, 45% of NRs were required to purchase the bear e-stamp; 55% of NRs were exempt from purchasing the bear e-stamp due to their lifetime license and received it free upon request (Table 14).

During 2018, a majority of NR bear hunters were from Tennessee (15%), Virginia (13%), South Carolina (9%), Georgia (9%) and Pennsylvania (6%). NR bear hunters came from 46 of 50 states and 3 different countries (Canada, Czech Republic, and Mexico). It is estimated that successful NR bear hunters comprised 13% of the registered bear harvest (Table 14; Figure 36). A majority of successful NR bear hunters hunted with the assistance of hounds in both the CBMU and MBMU (Table 15). Sixty-four percent and 58% of bears harvested by NR bear hunters in the CBMU and MBMU, respectively, were male during the 2018 season (Table 15). This sex ratio of female bears harvested by NR bear hunters in the MBMU is highest since 2002 and higher than the overall reported harvest (Table 4).

During the 2018 season, 17% and 8% of the reported harvest in the CBMU and MBMU, respectively, was by non-residents (Table 16). While the percent of residents that comprise the reported MBMU bear harvest has remained stable since 2010 (91-93%), there is a decreasing trend in resident hunters that comprise the reported CBMU bear harvest (89% to 83%; Table 16). In the CBMU, Pasquotank (54%), New Hanover (50%), Camden (32%), Hyde (32%) and Tyrrell (31%) counties had the highest percentage of non-residents in the reported harvest (Table 17). In the MBMU, Surry (17%), Madison (16%), Transylvania (16%), and Henderson (15%) counties had the highest percentage of non-residents in the reported harvest (Table 17). Of the non-residents reporting a harvest in North Carolina, a majority (74%) occurred in the CBMU (Table 17). Hyde (n=83, 32%) and Tyrrell (n=81, 31%) counties were the top two counties for non-resident bear harvest in the CBMU. The 3rd highest NR harvest in the CBMU occurred in Beaufort County (n=23, 12%). In the MBMU, non-residents harvested the highest number of bears from Madison (n=22, 16%), Macon (n=10, 14%) and Haywood counties (n=10, 7%; Table 17).

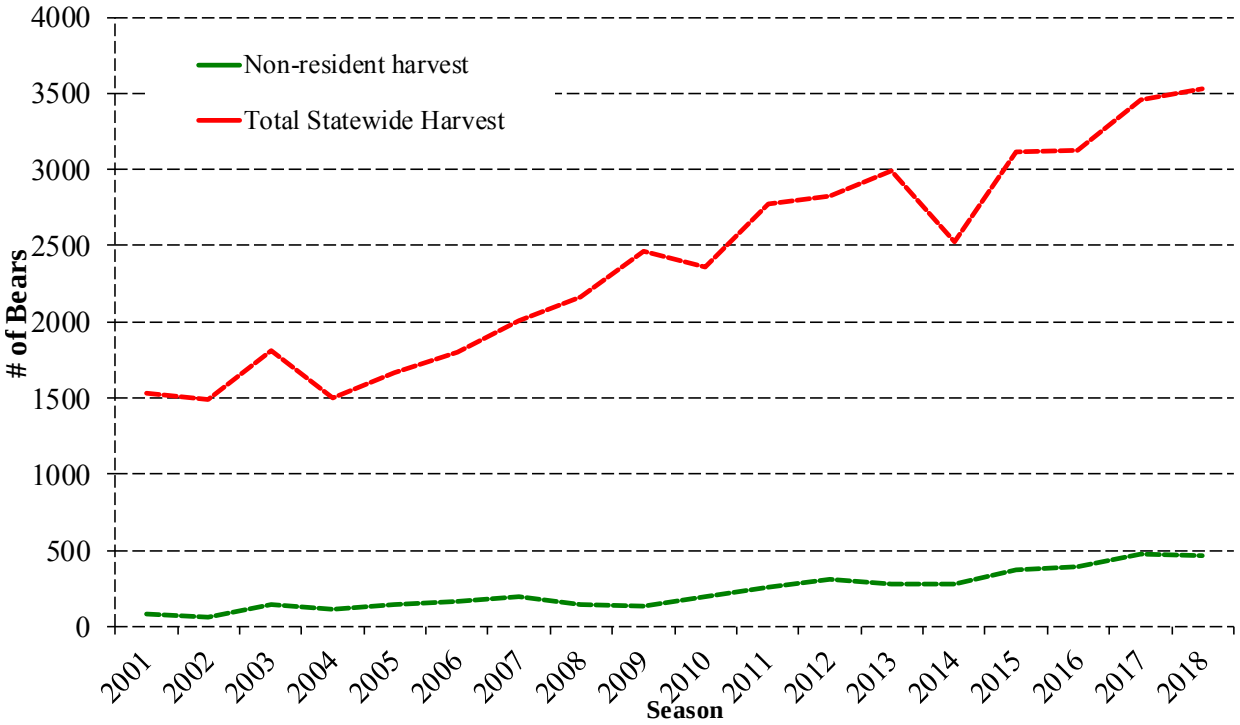


Figure 36. Number of bears harvested by non-residents and total number of bears harvested statewide from 2001 through 2018.

Table 14. Non-resident (NR) bear license sales, NR bear e-stamps, and harvest from 2001 through 2018.

Year	NR Bear Licenses Issued	NR Bear E-Stamps Issued	NRs paid for Bear E-stamp[1]	NR[2] Male Harvest	NR Female Harvest	Total NR Harvest	NR Composition of Statewide Harvest
2001	698	NA	NA	45	37	82	5%
2002	1,075	NA	NA	39	17	56	4%
2003	1,126	NA	NA	91	51	142	8%
2004	1,123	NA	NA	73	36	109	7%
2005	695	NA	NA	93	49	142	9%
2006	1,124	NA	NA	90	71	161	9%
2007	1,201	NA	NA	115	79	194	10%
2008	1,107	NA	NA	81	59	140	6%
2009	1,080	NA	NA	93	39	132	5%
2010	1,071	NA	NA	123	67	190	8%
2011[3]	1,127	NA	NA	150	106	256	9%
2012	1,194	NA	NA	179	126	305	11%
2013	1,216	NA	NA	159	114	273	9%
2014	1,149	2,490	974	175	107	282	11%
2015	991	2,702	1,041	239	134	373	12%
2016	1,224	2,723	1,122	207	184	391	13%
2017	1,430	3,033	1,339	310	169	479	14%
2018	1,577	3,045	1,359	287	175	462	13%
Total	**20,208**	**13,993**	**5,835**	**2,549**	**1,620**	**4,169**	

[1]All NRs are required to have bear e-stamp, but NRs with lifetime licenses prior to July 1, 2014 receive it free upon request.
[2] Male and female reported harvest includes NRs who were exempt from purchasing a NR bear license.
[3] In October 2011, license changed to non-resident bear license, as wild boar was reclassified to feral hog.

Table 15. Sex ratio and method of harvest of successful non-resident bear hunters who registered a bear, 2002 through 2018.

	CBMU		MBMU		CBMU		MBMU	
Year	Male	Female	Male	Female	Still	Dog	Still	Dog
2002	68%	32%	72%	28%	N/A	N/A	N/A	N/A
2003	65%	35%	61%	39%	N/A	N/A	N/A	N/A
2004	64%	36%	74%	26%	N/A	N/A	N/A	N/A
2005	61%	39%	78%	23%	N/A	N/A	N/A	N/A
2006	53%	47%	61%	39%	N/A	N/A	N/A	N/A
2007	60%	40%	57%	43%	N/A	N/A	N/A	N/A
2008	57%	43%	58%	42%	N/A	N/A	N/A	N/A
2009	67%	33%	77%	23%	47%	53%	5%	95%
2010	64%	36%	67%	33%	31%	69%	6%	94%
2011	56%	44%	63%	37%	22%	78%	14%	86%
2012	58%	42%	60%	40%	38%	62%	8%	92%
2013	58%	42%	59%	41%	36%	64%	16%	84%
2014	62%	38%	62%	38%	38%	62%	14%	86%
2015	62%	38%	70%	30%	43%	58%	10%	90%
2016	52%	48%	59%	41%	44%	56%	11%	89%
2017	64%	36%	68%	32%	47%	53%	20%	80%
2018	64%	36%	58%	42%	47%	53%	35%	65%

Table 16. Percent of reported harvest in the CBMU and MBMU that is comprised of resident and non-resident hunters from 2010 through 2018.

	CBMU		MBMU	
Year	Resident	Non-resident	Resident	Non-resident
2010	89%	11%	92%	8%
2011	89%	11%	93%	7%
2012	87%	13%	93%	7%
2013	89%	11%	93%	7%
2014	88%	12%	91%	9%
2015	88%	12%	92%	8%
2016	84%	16%	93%	7%
2017	83%	17%	91%	9%
2018	83%	17%	92%	8%

Table 17. Non-resident reported harvest by bear management unit and county for 2018 hunting season.

Region	County	NR Harvest	% of the NR Harvest	Total Harvest	% of Harvest by NR for County
CBMU	Beaufort	23	6%	194	12%
	Bertie	7	2%	75	9%
	Bladen	4	1%	95	4%
	Brunswick	1	0%	32	3%
	Camden	20	5%	63	32%
	Carteret	2	1%	35	6%
	Chowan	0	0%	7	0%
	Columbus	2	1%	15	13%
	Craven	12	3%	100	12%
	Cumberland	0	0%	23	0%
	Currituck	4	1%	23	17%
	Dare	0	0%	9	0%
	Duplin	2	1%	18	11%
	Edgecombe	0	0%	11	0%
	Gates	12	3%	85	14%
	Greene	0	0%	3	0%
	Halifax	0	0%	4	0%
	Hertford	6	2%	45	13%
	Hyde	83	22%	262	32%
	Jones	12	3%	159	8%
	Lenoir	1	0%	40	3%
	Martin	7	2%	47	15%
	New Hanover	1	0%	2	50%
	Northampton	4	1%	17	24%
	Onslow	1	0%	41	2%
	Pamlico	6	2%	40	15%
	Pasquotank	21	6%	39	54%
	Pender	6	2%	60	10%
	Perquimans	0	0%	14	0%
	Pitt	6	2%	49	12%
	Sampson	0	0%	26	0%
	Tyrrell	81	22%	258	31%
	Washington	14	4%	125	11%
	Wayne	0	0%	1	0%
	Wilson	0	0%	0	0%
	CBMU Total	**338**	**74%**	**2,017**	**17%**

Region	County	NR Harvest	% of the NR Harvest	Total Harvest	% of Harvest by NR for County
MBMU	Alleghany	0	0%	14	0%
	Ashe	2	2%	37	5%
	Avery	2	2%	52	4%
	Buncombe	6	6%	103	6%
	Burke	1	1%	44	2%
	Caldwell	2	2%	45	4%
	Cherokee	8	8%	60	13%
	Clay	4	4%	40	10%
	Graham	6	6%	95	6%
	Haywood	10	10%	142	7%
	Henderson	9	9%	61	15%
	Jackson	8	8%	80	10%
	Macon	10	10%	72	14%
	Madison	22	21%	135	16%
	McDowell	5	5%	128	4%
	Mitchell	3	3%	52	6%
	Polk	1	1%	15	7%
	Rutherford	3	3%	24	13%
	Surry	1	1%	6	17%
	Swain	5	5%	52	10%
	Transylvania	7	7%	45	16%
	Watauga	2	2%	18	11%
	Wilkes	2	2%	62	3%
	Yancey	2	2%	84	2%
	MBMU Total	**121**	**26%**	**1199**	**10%**

Bear e-stamp holder survey

In July 1, 2014, the bear e-stamp became a requirement for both residents and non-residents who hunted bears during the regulated bear hunting season in North Carolina. The implementation of the bear e-stamp allowed the NCWRC to identify potential bear hunters for the first time. In January 2015, the NCWRC initiated a survey of all holders of the bear e-stamp from the 2014 bear hunting season. This survey will be conducted annually in order to monitor changes in the number of active bear hunters and bear hunter success rates. In addition, biological staff can gain information on specific harvest statistics (e.g., hunter effort and success by method). This data will aid in evaluating future regulatory proposals, as well as help biological staff demonstrate cause-effect relationships of several factors that influence harvest levels, such as regulatory and statutory changes, number of bear hunters, changes in hunting methods, and changes in bear population levels.

Results from each question of the 2018 bear e-stamp holder survey can be seen in Appendix A. During the 2018 bear hunting season, 84,662 hunters had a valid bear e-stamp, of which 61% (n=51,266) received for free due to exemptions (e.g., lifetime license holder prior to July 1, 2014, land owner who hunts on their land; Table 19). We sent the survey to 83,163 bear e-stamp holders with valid addresses and received 30,188 responses (36% response rate). Sixty-one percent of respondents (n=18,270) had not hunted black blacks prior to the 2018 bear hunting season. Based on survey results, it is estimated there were 12,088 active bear hunters during the 2018 regulated bear hunting season (Table 19). Hound hunting was the method used most often in the MBMU (59%), while still/stand hunting was the more common method in the CBMU (52%) and PBMU (87%; Table 20).

Table 19. Results of bear e-stamp holder survey for the 2014-15 through 2018-19 survey years.

Survey Year	# Bear E-stamp holders	# Paid Bear E-stamp holders	# of Survey Respondents	Response Rate	# Identifying as Bear Hunters	% Hunted Specifically for Bear	Estimated # Active Bear Hunters	% Respondents Harvested Bear
2014-15	70,391	24,205 (34%)	31,292	44%	N/A	15%	10,758	7.1%
2015-16	79,743	28,185 (36%)	28,273	36%	N/A	14%	11,434	6.8%
2016-17	79,718	29,379 (37%)	31,292	39%	21,129	14%	10,855	5.6%
2017-18	83,151	31,608 (38%)	29,489	36%	22,513	15%	12,302	6.8%
2018-19	84,662	33,396 (39%)	30,188	36%	22,050	14%	12,088	6.1%

Table 20. Method of hunting by bear management unit during the 2018 bear hunting season.

Region	Method	% of Method[1]	Primarily used Bait
Statewide	Dog	50%	41%
	Still / Stand	50%	55%
Coastal BMU	Dog	48%	49%
	Still / Stand	52%	60%
Mountain BMU	Dog	59%	28%
	Still / Stand	41%	45%
Piedmont BMU	Dog	13%	26%
	Still / Stand	87%	41%

[1]Includes hunters who used both methods and/or hunted in greater than one bear management unit.

Bear Cooperator Program Participation

The Black Bear Cooperator Program lets hunters directly participate with the NCWRC in monitoring the bear population when they voluntarily submit biological information from their harvested bear to the NCWRC. Age and sex information gathered from biological samples are used for analyzing the age structure of the harvested population and for population reconstruction modeling. Hunter submissions are critical to the program's success. Participating hunters receive an age report on their harvested bear, as well as a blaze orange black bear cooperator hat. For information on how to participate and instructions on removing the upper pre-molars from a bear, please visit: ncwildlife.org/bearcooperator

Participation: In order to meet the assumptions of population reconstruction (see page 80), remove biases due to the under-sampling of younger bears and female bears, accurately determine age structures of the bear populations, and calculate population growth rates at a smaller scale (i.e., CBMU zones 1-5), we would need ~80 to 90% submission rate. This has not yet been accomplished through the voluntary Bear Cooperator Program. Despite intensive efforts expended by NCWRC staff during the bear hunting seasons, the number of bear teeth submitted by hunters statewide has declined since the 1990's (Table 21, Figure 37). These efforts involve the following:

1. The Bear Cooperator Hat;
2. The Bear Cooperator Packet, sent to all Bear e-stamp holders, that contains a self-addressed postage-paid bear tooth envelope and instructions on how to remove the upper pre-molars.
3. Meeting with party leaders to provide tooth collection supplies;
4. Meeting with party leaders to pick up teeth at the end of the season;
5. Calling bear hunters who registered their bear to request a tooth;
6. Roving check stations, in which staff drive around counties to weigh bears and pull premolars from harvested bears;
7. Responding to phone calls from hunters that would like their bear weighed.
8. An ad that appears with the hunter's authorization number when s/he registers a bear on-line.
9. An ad that appears on the big game report card for those hunters that receive a bear e-stamp.

In order to increase submission rates, the NCWRC in 2014 started mailing bear cooperator envelopes to all holders of the Bear E-stamp prior to and during the regulated bear hunting season. These are self-addressed, postage-paid envelopes that allow the hunter to place both upper pre-molar teeth in the envelope, fill out information on the envelope, then place the envelope in a mailbox. There was an increase in submission rates in 2014 (60%), but submission rates have declined in all bear management units since 2014 (Figure 37, Table 21). For the first time, all three BMUs had under 50% participation. For the forth year in a row, tooth submission rates in the CBMU (48% submission rate) exceeded that in the MBMU (42% submission rate). Since the cooperator program was initiated in 1976, the MBMU had higher submission rates than the CBMU; however, submission rates from the CBMU started to exceed that of the MBMU in 2013. The MBMU had the lowest submission rate during the 2018 season (42%, Table 21).

The higher submission rates in the CBMU is likely due to a combination of outreach efforts to assist hunters in participating in the Black Bear Cooperator Program and an increase in roving check stations during the first week of the CBMU seasons. The decline in submission rates in the MBMU may be partly due hunter disapproval of enforcement activities and regulatory changes that have occurred over the past 5 years.

Table 21. Percent of registered black bears in each bear management region that are sampled by NCWRC from 1976 through 2018 (ns=no season).

Year	CBMU	MBMU	PBMU
1976	31%	97%	ns
1977	23%	75%	ns
1978	51%	90%	ns
1979	48%	69%	ns
1980	36%	69%	ns
1981	58%	74%	ns
1982	38%	58%	ns
1983	44%	88%	ns
1984	29%	77%	ns
1985	32%	80%	ns
1986	24%	74%	ns
1987	42%	77%	ns
1988	38%	61%	ns
1989	36%	55%	ns
1990	34%	57%	ns
1991	30%	61%	ns
1992	50%	54%	ns
1993	52%	65%	ns
1994	58%	74%	ns
1995	50%	73%	ns
1996	51%	73%	ns
1997	47%	61%	ns
1998	45%	72%	ns
1999	46%	60%	ns
2000	42%	52%	ns
2001	42%	57%	ns
2002	43%	54%	ns
2003	47%	54%	ns
2004	42%	55%	ns
2005	35%	42%	N/A[1]
2006	36%	49%	0%
2007	40%	51%	0%
2008	41%	54%	0%
2009	47%	49%	0%
2010	46%	55%	N/A
2011	48%	52%	0%
2012	48%	48%	33%
2013	53%	43%	25%
2014	60%	61%	65%
2015	57%	53%	41%
2016	52%	51%	52%
2017	56%	51%	48%
2018	48%	42%	45%

[1] N/A: Submission rates not available because no bears were harvested in that region.

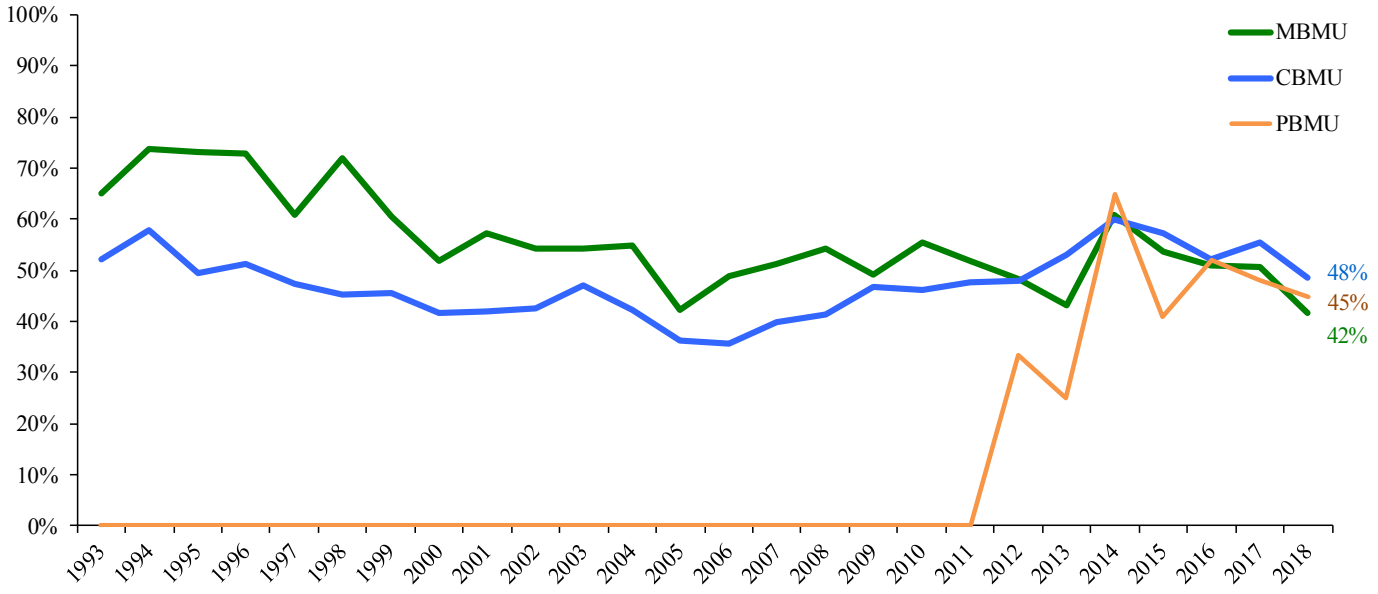


Figure 37. Percentage of registered bears that are sampled by NCWRC for aging from 1976 through 2018.

County Participation: Participation in the bear cooperator program varied widely by county during 2018 (0%-100%; Table 22). Granville (83%), Hyde (68%), Craven (68%), Macon (67%), and Cumberland (61%) counties had the highest participation rates in the state while hunters in seven counties (Franklin, Harnett, New Hanover, Vance, Wake, Wayne and Yadkin) submitted no teeth. Hunters in Duplin (6%), Dare (11%), Martin (13%), Polk (13%) and Henderson (18%) counties had the lowest participation rates.

Table 22. Percent of registered black bears in each county that are sampled by NCWRC (2011-2018; ns=no season).

County	2011	2012	2013	2014	2015	2016	2017	2018	5-year average
ALAMANCE	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
ALEXANDER	0%	N/A	N/A	100%	0%	N/A	N/A	N/A	50%
ALLEGHANY	50%	33%	0%	50%	0%	45%	18%	21%	23%
ANSON	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
ASHE	29%	42%	32%	75%	52%	37%	30%	32%	43%
AVERY	13%	28%	31%	48%	54%	51%	50%	27%	44%
BEAUFORT	48%	59%	52%	59%	57%	67%	58%	57%	58%
BERTIE	52%	53%	38%	40%	40%	43%	49%	27%	39%
BLADEN	44%	44%	41%	55%	63%	42%	55%	40%	49%
BRUNSWICK	25%	28%	27%	46%	39%	32%	39%	47%	38%
BUNCOMBE	16%	55%	36%	37%	34%	51%	30%	21%	35%
BURKE	57%	45%	53%	79%	85%	72%	62%	59%	68%
CABARRUS	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
CALDWELL	42%	48%	35%	27%	49%	43%	44%	49%	41%
CAMDEN	52%	44%	51%	53%	65%	28%	34%	49%	47%
CARTERET	26%	34%	53%	50%	39%	24%	42%	57%	44%
CASWELL	ns	ns	ns	0%	33%	71%	40%	50%	39%
CATAWBA	N/A	N/A	N/A	N/A	N/A	N/A	0%	N/A	0%
CHATHAM	ns	ns	ns	N/A	N/A	0%	N/A	N/A	0%
CHEROKEE	74%	72%	90%	69%	66%	66%	59%	50%	67%

County	2011	2012	2013	2014	2015	2016	2017	2018	5-year average
CHOWAN	71%	41%	67%	81%	38%	67%	42%	43%	56%
CLAY	56%	58%	62%	72%	55%	96%	56%	45%	64%
CLEVELAND	N/A	33%	0%	100%	N/A	N/A	N/A	N/A	50%
COLUMBUS	29%	34%	64%	43%	44%	28%	39%	20%	40%
CRAVEN	61%	67%	75%	88%	73%	75%	77%	68%	76%
CUMBERLAND	50%	24%	35%	56%	28%	23%	52%	61%	42%
CURRITUCK	38%	59%	46%	74%	60%	45%	57%	43%	54%
DARE	100%	33%	67%	90%	50%	73%	83%	11%	62%
DAVIDSON	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
DAVIE	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
DUPLIN	38%	6%	55%	36%	73%	44%	47%	6%	43%
DURHAM	ns	ns	ns	N/A	0%	N/A	N/A	N/A	0%
EDGECOMBE	ns	33%	0%	14%	44%	13%	38%	27%	23%
FORSYTH	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
FRANKLIN	ns	ns	ns	N/A	33%	0%	N/A	0%	11%
GASTON	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
GATES	37%	67%	64%	59%	73%	56%	68%	45%	61%
GRAHAM	59%	67%	94%	64%	53%	64%	62%	56%	65%
GRANVILLE	ns	ns	ns	100%	25%	33%	75%	83%	63%
GREENE	0%	25%	20%	0%	50%	0%	38%	33%	23%
GUILFORD	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
HALIFAX	67%	25%	29%	50%	N/A	0%	33%	25%	27%
HARNETT	ns	ns	ns	N/A	0%	N/A	N/A	0%	0%
HAYWOOD	62%	32%	24%	37%	35%	49%	43%	42%	38%
HENDERSON	14%	24%	5%	57%	25%	19%	24%	18%	25%
HERTFORD	73%	73%	64%	72%	77%	66%	69%	58%	68%
HOKE	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
HYDE	57%	57%	59%	63%	64%	65%	68%	68%	64%
IREDELL	N/A	N/A	N/A	0%	N/A	N/A	N/A	N/A	0%
JACKSON	62%	15%	10%	46%	52%	37%	45%	46%	39%
JOHNSTON	ns	0%	N/A	N/A	50%	0%	100%	N/A	50%
JONES	51%	50%	73%	78%	70%	59%	61%	50%	65%
LEE	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
LENOIR	55%	38%	52%	72%	46%	37%	59%	30%	49%
LINCOLN	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
MACON	57%	54%	33%	90%	75%	66%	61%	67%	65%
MADISON	45%	56%	45%	73%	47%	35%	43%	30%	45%
MARTIN	4%	16%	8%	33%	23%	23%	23%	13%	21%
MCDOWELL	57%	48%	59%	58%	54%	51%	74%	60%	59%
MECKLENBURG	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MITCHELL	55%	55%	60%	73%	57%	58%	58%	50%	59%
MONTGOMERY	ns	ns	ns	100%	N/A	N/A	N/A	N/A	100%
MOORE	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NASH	ns	ns	N/A	N/A	0%	N/A	N/A	N/A	0%
NEW HANOVER	67%	67%	100%	40%	0%	25%	0%	0%	28%
NORTHAMPTON	13%	40%	13%	36%	56%	63%	35%	35%	40%
ONSLOW	61%	43%	51%	73%	63%	51%	43%	46%	55%
ORANGE	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
PAMLICO	32%	24%	44%	36%	43%	48%	45%	60%	46%
PASQUOTANK	50%	82%	63%	52%	71%	83%	63%	51%	64%

County	2011	2012	2013	2014	2015	2016	2017	2018	5-year average
PENDER	47%	53%	46%	61%	40%	55%	51%	35%	48%
PERQUIMANS	60%	71%	30%	64%	80%	38%	45%	36%	49%
PERSON	ns	ns	ns	75%	43%	44%	57%	50%	54%
PITT	25%	35%	42%	51%	50%	45%	42%	43%	45%
POLK	0%	0%	0%	20%	11%	33%	29%	13%	18%
RANDOLPH	ns	ns	ns	N/A	N/A	100%	N/A	N/A	100%
RICHMOND	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
ROBESON	ns	ns	ns	N/A	50%	N/A	N/A	N/A	50%
ROCKINGHAM	ns	ns	ns	100%	33%	80%	0%	20%	47%
ROWAN	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
RUTHERFORD	33%	10%	20%	57%	36%	23%	38%	29%	34%
SAMPSON	41%	24%	42%	54%	70%	46%	42%	54%	51%
SCOTLAND	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
STANLY	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
STOKES	ns	100%	0%	0%	63%	67%	42%	50%	37%
SURRY	20%	18%	0%	17%	38%	29%	39%	50%	29%
SWAIN	70%	46%	43%	64%	54%	4%	18%	21%	34%
TRANSYLVANIA	28%	14%	6%	39%	21%	24%	12%	27%	21%
TYRRELL	55%	44%	54%	69%	45%	51%	62%	44%	54%
UNION	ns	ns	ns	N/A	N/A	N/A	N/A	N/A	N/A
VANCE	ns	ns	ns	0%	0%	67%	50%	0%	23%
WAKE	ns	ns	ns	N/A	N/A	N/A	N/A	0%	0%
WARREN	ns	0%	50%	50%	100%	33%	71%	47%	59%
WASHINGTON	33%	35%	42%	47%	55%	55%	56%	42%	50%
WATAUGA	22%	10%	0%	38%	54%	30%	47%	44%	35%
WAYNE	ns	N/A	N/A	0%	N/A	N/A	0%	0%	0%
WILKES	21%	23%	13%	0%	45%	22%	17%	32%	21%
WILSON	ns	60%	33%	33%	0%	25%	75%	N/A	33%
YADKIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0%	0%
YANCEY	83%	82%	73%	88%	87%	85%	65%	58%	76%

[1] N/A: Submission rates not available because no bears were harvested in that county.
[2] ns: No season

Participation by hunting methods: Two types of hunting methods are utilized in North Carolina, still/stand and dog hunting. The use of dogs to "strike" and "tree" bears has been a technique that goes back centuries. North Carolinians developed a strain of hound to hunt bears, known as the Plott Hound, which has been designated by the Legislature as the official state dog of North Carolina. Still hunting or stand hunting is also an important hunting method. This is a technique whereby hunters place stands on either trails, field edges, or in areas frequented by bears to feed.

Since 2009, NCWRC biological staff has been able to collect information on method of hunt by hunters reporting their harvest, allowing us to compare reported harvest to the sampled harvest. Bear houndsmen participation in the Bear Cooperator Program has been substantially higher than participation by still hunters (Table 23; Figure 38). In 2018, 51% of houndsmen who harvested a bear also submitted biological information. Still hunter submission rates have improved since the NCWRC started sending out bear cooperator packets to all Bear e-stamp holders, but in 2018, 36% of still hunters submitted a biological sample from their harvested bear, a decline from the previous season and below the 10-year average (Table 23; Figure 38).

Houndsmen participation is likely higher than still hunters due to their greater awareness of the Bear Cooperator Program. Since data collection began in 1969, NCWRC staff have worked closely with houndsmen in the collection biological samples, such as sex, weight, age and location of harvest. In addition, party leaders regularly collect biological samples from all bears harvested by their party and submit them to NCWRC staff at the end of the bear season. Houndsmen are also more visible to NCWRC roving check stations, and have more established hunt clubs, so NCWRC staff are able to identify houndsmen during the bear season. In contrast, still hunters are individuals that are more difficult to identify by NCWRC staff during the bear season. A portion of the still harvest is opportunistic to deer hunting; these hunters are not traditional bear hunters and less likely to be aware of the Bear Cooperator Program and other black bear monitoring efforts.

Table 23. Bear Cooperator Program participation rates (%) of still hunters and houndsmen in the three bear management units of North Carolina (2009-2018).

	Statewide		**CBMU**		**MBMU**		**PBMU**	
	Still	**Dogs**	**Still**	**Dogs**	**Still**	**Dogs**	**Still**	**Dogs**
2009 Participation Rates	20%	62%	23%	58%	15%	66%	0%	N/A[1]
2010 Participation Rates	25%	59%	26%	57%	18%	63%	N/A[2]	N/A
2011 Participation Rates	21%	61%	22%	59%	19%	64%	0%	N/A
2012 Participation Rates	27%	57%	29%	58%	20%	54%	50%	N/A
2013 Participation Rates	27%	57%	32%	60%	18%	53%	0%	50%
2014 Participation Rates	45%	65%	47%	66%	34%	62%	47%	100%
2015 Participation Rates	45%	61%	51%	61%	32%	61%	43%	25%
2016 Participation Rates	40%	58%	43%	58%	30%	58%	49%	60%
2017 Participation Rates	44%	61%	50%	62%	29%	60%	51%	29%
2018 Participation Rates	36%	51%	45%	50%	23%	52%	51%	25%

[1] N/A: Submission rates not available because no bears were harvested by hound hunters in that management unit.
[2] N/A: Submission rates not available because no bears were harvested by hound hunters in that management unit.

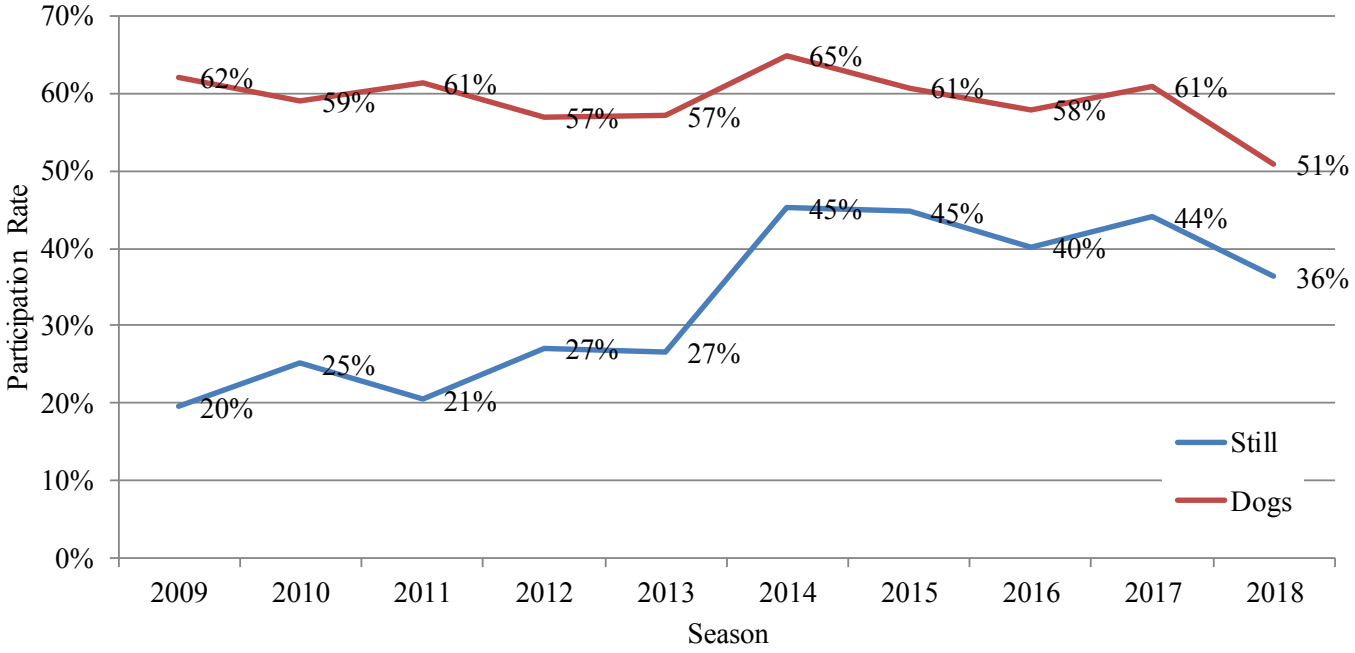


Figure 38. Participation in the bear cooperator program by hunting methods from 2009 through 2018 in North Carolina.

Hunter Input on Bear Cooperator Program: Bear hunters frequently ask the NCWRC staff on whether the Bear Cooperator Program would become mandatory. These inquiries have increased since 2014 as a result in changes in bear management (i.e., use of unprocessed bait, liberalization of some CBMU bear seasons). In reviewing the regulations for other states that have bears seasons, 26 of 33 states with a bear season (includes Florida) require mandatory tooth submission (79%), 21 have mandatory physical check or check station (61%), and 5 have voluntary tooth submission programs (15%); 2 are unknown (Nevada, Oklahoma). Including states with mandatory tooth submission and mandatory check stations, 82% of states with a bear season have stricter measures than North Carolina to monitor the harvest and obtain biological data. Within the last 3 years, two states, Florida and West Virginia, have implemented mandatory tooth submission. Florida implemented mandatory tooth submission when they reopened their bear hunting season in 2015. West Virginia changed from a voluntary program to a mandatory program in 2016. Five of 26 states with mandatory tooth submission allow hunters to submit the tooth by mail. North Carolina is the only state that allows use of bait as an aid in bear hunting that does not have mandatory tooth submission.

From March through April 2017, the NCWRC conducted 5 bear forums across the state. In addition, the NCWRC conducted a bear focus group meeting with party leaders in Waynesville in July 2017. During these meetings, the WRC asked attendees whether they supported mandatory tooth submission. Results indicate substantial support for mandatory tooth submission (74%; Table 24). Note that the question focused on increasing the ability of the WRC to model the bear population on a smaller scale, and did not discuss the other benefits (e.g., more accurately compare age structure of harvest by method, remove bias due to older male bears overrepresented in the sample) that would occur with mandatory tooth submission.

Table 24. Results of six bear forums conducted in North Carolina in 2017.

Question.	**To model the bear population at a smaller scale we need higher tooth submission rates?** ***Would you support mandatory tooth submission by successful hunters?***		
	Yes	**No**	**I need to think about it**
Marion	67% (20)	30% (9)	3% (1)
Thomasville	100% (5)	0	0
Bladen Co.	88% (37)	12% (5)	0
Williamston	68% (30)	30% (13)	2% (1)
New Bern	94% (30)	0	6% (2)
Waynesville	56% (28)	38 (19)	6% (3)
Statewide	**74% (150)**	**23% (46)**	**3% (7)**

Age information gathered from the upper premolar tooth are used for analyzing the age structure of the harvested population and for population reconstruction modeling. Our bear population estimates and population growth rates are based on a population reconstruction model (see page 70). Hunter submissions are critical to the program's success. However, due to low submission rates in several counties, we are unable to extrapolate population growth rates or estimates at a scale lower than the existing bear management units (e.g., CBMU, MBMU). We are unable to determine changes in population growth rates within the new CBMU zones (zones 1 to 5) approved in 2017 or determine the age structure of females in the PBMU, which would help us identify if reproducing females are populating this bear management unit.

Another issue is in comparing the age structure of bears harvested by hunting method, as low submission rates likely result in biased data. With recent changes in bear management (e.g., use of unprocessed food by still hunters, liberalization of CBMU seasons), the WRC is often asked whether there are differences in bears harvested by still hunters and houndsmens. Bear houndsmen participation in the Bear Cooperator Program has been substantially higher than participation by still hunters (Table 23). For example, in 2009, 62% of houndsmen and 20% of still hunters submitted an upper premolar for aging. But submission rates have declined among hound hunters (51% in 2018) and remain low for still hunters (36% in 2018; Table 23). While still hunter submission rates have improved since the NCWRC started sending out bear cooperator packets to all Bear e-stamp holders, submission rates are still too low for confident analysis. Samples received from both hunting methods are more likely to be biased towards older, male bears.

Method of Harvest

Prior to 2008, the WRC was able to track method of harvest only through information provided voluntarily by hunters when they submitted a premolar tooth for aging. In 2008, the big game registration system started requesting method of harvest from hunters registering their harvested bear on-line or via phone. In 2009, the NCWRC requested information on method of take through all three registration systems. However, we refined the question on the big game cooperator sheets in 2010 to improve data collection; the question on method of take was changed to a "yes/no" question.

Use of dogs remains the primary method for successfully harvesting bears in North Carolina (60% in 2018; Table 25). However, statewide, the method of harvest used to hunt bears is split evenly between stand/still hunting and dog hunting (Table 20); several hunters employ both methods during the bear hunting season. Since the big game registration system reflects all reported bear harvests, the data we collect voluntarily from bear hunters appears to be biased towards bear hunters using dogs, likely due to their awareness of the bear cooperator program.

Table 25. Method of harvest from voluntary tooth submission and from big game registration system, 1992-2018.

	Tooth Submission Data			Registered Harvest		
Season	**Dog**	**Still**	**Unknown**	**Dog**	**Still**	**Unknown**
1992	76%	22%	2%	N/A	N/A	N/A
1993	77%	22%	0.6%	N/A	N/A	N/A
1994	77%	23%	0.4%	N/A	N/A	N/A
1995	74%	24%	2%	N/A	N/A	N/A
1996	79%	20%	1%	N/A	N/A	N/A
1997	78%	20%	2%	N/A	N/A	N/A
1998	75%	24%	1%	N/A	N/A	N/A
1999	77%	21%	2%	N/A	N/A	N/A
2000	77%	23%	0.3%	N/A	N/A	N/A
2001	81%	17%	1%	N/A	N/A	N/A
2002	81%	17%	2%	N/A	N/A	N/A
2003	81%	17%	2%	N/A	N/A	N/A
2004	82%	16%	3%	N/A	N/A	N/A
2005	82%	16%	2%	N/A	N/A	N/A
2006	85%	13%	2%	N/A	N/A	N/A
2007	84%	14%	2%	N/A	N/A	N/A
2008[1]	87%	12%	0.6%	37%	25%	38%
2009[2]	84%	16%	0.5%	63%	36%	0.1%
2010	84%	15%	0.5%	69%	30%	0.1%
2011	88%	12%	0.0%	71%	29%	0.0%
2012	83%	16%	0.8%	68%	31%	0.1%
2013	82%	18%	0.1%	69%	31%	0.0%
2014	74%	24%	2.6%	68%	32%	0.0%
2015	72%	27%	0.6%	66%	34%	0.0%
2016	73%	27%	0.2%	65%	35%	0.0%
2017	71%	29%	0.0%	63%	37%	0.0%
2018	68%	32%	0.0%	60%	40%	0.0%

[1]In 2008, the big game registration system started collecting information on method of hunting on-line and via telephone.
[2]In 2009, the big game registration system added method of harvest to the big game cooperator sheets.

Regional method of harvest: The majority of bears harvested in the CBMU and MBMU are by houndsmen, while most bears taken in the PBMU are by still hunters (Table 26). Still hunting of bears is more common in the CBMU and the PBMU, than in the MBMU. In 2009, 2011, 2013, 2015, 2017, and 2018 the percentage of bears taken by still hunters increased in the MBMU. This is likely due the low abundance of hard mast during these years; when there is a lack of hard mast, bears are more attracted to unnatural food sources, such as bait, and look for food over larger unfamiliar areas, making them more accessible to hunters.

Table 26. Method of harvest by bear management unit, based on 2009[1] through 2018 registered harvest.

	CBMU			MBMU			PBMU	
Year	**Still**	**Dog**	**Unknown**	**Still**	**Dog**	**Unknown**	**Still**	**Dog**
2009[1]	39%	59%	1.7%	33%	66%	0.3%	100%	0%
2010[2]	36%	64%	0.1%	15%	84%	0.3%	0%	0%
2011	31%	69%	0.1%	27%	73%	0.0%	100%	0%
2012	36%	64%	0.2%	24%	76%	0.0%	67%	33%
2013	33%	67%	0%	29%	71%	0.0%	50%	50%
2014	37%	63%	0.1%	14%	86%	0%	75%	25%
2015	37%	63%	0%	26%	74%	0%	90%	10%
2016	38%	62%	0%	27%	73%	0%	70%	30%
2017	40%	60%	0%	30%	70%	0%	87%	13%
2018	41%	59%	0%	38%	62%	0%	74%	26%

[1]In 2009, the big game registration system started collecting information on method of hunting on all three registration methods (i.e. on-line, telephone, big game cooperator sheets).
[2] In 2010, method of harvest on the big game cooperator sheets was refined to improve data collection.

District and County method of harvest: While use of dogs is the primary method of successful bear harvest in most wildlife districts, still hunters took 89% of harvested bears in District 5 and District 7, respectively (Table 27). Of the remaining wildlife districts, Districts 8 and 9 had the highest percent of bears taken by houndsmen (68%; Table 27).

Table 27. Method of harvest by district, based on the 2018 registered harvest.

District	Dogs	Still	% Dogs	% Still
1	589	463	56%	44%
2	460	281	62%	38%
3	32	19	63%	37%
4	122	70	64%	36%
5	2	17	11%	89%
6	0	0	NA	NA
7	16	130	11%	89%
8	290	139	68%	32%
9	612	288	68%	32%
Statewide	**2123**	**1407**	**60%**	**40%**

During 2018, still hunters harvested 100% of the bears in 11 counties; 5 of these counties are in the PBMU and 1 county (Pamlico County) prohibits pursuing bears with hounds by local law (Table 28). Similar to the 2017 season, houndsmen harvested the majority of the bears in 39 counties, both methods harvested bears in equal ratios in Tyrrell County, and still hunters harvested the majority of bears in 29 counties (Table 28). No harvest took place in 31 counties. In the MBMU, Yadkin (100%; Note: 1 bear harvested, Graham (97%), Yancey (87%), Swain (87%), Jackson (85%), Cherokee (83%), and Haywood (82%) counties had the highest percent of bears taken by houndsmen. In the CBMU, Greene (100%), Harnett (100%), Martin (85%), Pitt (76%), and Jones (75%) counties had the highest percent of bears taken by houndsmen.

Table 28. Method of harvest by county, based on the 2018 registered harvest.

County	Still	Dog
Alamance	N/A[1]	N/A
Alexander	N/A	N/A
Alleghany	100%	0%
Anson	N/A	N/A
Ashe	95%	5%
Avery	31%	69%
Beaufort	29%	71%
Bertie	35%	65%
Bladen	41%	59%
Brunswick	34%	66%
Buncombe	78%	22%
Burke	25%	75%
Cabarrus	N/A	N/A
Caldwell	36%	64%
Camden	33%	67%
Carteret	31%	69%
Caswell	75%	25%
Catawba	N/A	N/A
Chatham	N/A	N/A
Cherokee	17%	83%
Chowan	57%	43%
Clay	25%	75%
Cleveland	N/A	N/A
Columbus	47%	53%
Craven	37%	63%
Cumberland	26%	74%
Currituck	43%	57%
Dare	100%	0%
Davidson	N/A	N/A

County	Still	Dog
Davie	N/A	N/A
Duplin	56%	44%
Durham	N/A	N/A
Edgecombe	36%	64%
Forsyth	N/A	N/A
Franklin	100%	0%
Gaston	N/A	N/A
Gates	34%	66%
Graham	3%	97%
Granville	83%	17%
Greene	0%	100%
Guilford	N/A	N/A
Halifax	75%	25%
Harnett	0%	100%
Haywood	18%	82%
Henderson	85%	15%
Hertford	29%	71%
Hoke	N/A	N/A
Hyde	54%	46%
Iredell	N/A	N/A
Jackson	15%	85%
Johnston	N/A	N/A
Jones	25%	75%
Lee	N/A	N/A
Lenoir	73%	28%
Lincoln	N/A	N/A
Macon	22%	78%
Madison	27%	73%
Martin	15%	85%
McDowell	35%	65%
Mecklenburg	N/A	N/A
Mitchell	48%	52%
Montgomery	N/A	N/A
Moore	N/A	N/A
Nash	N/A	N/A
New Hanover	100%	0%
Northampton	71%	29%
Onslow	37%	63%
Orange	N/A	N/A

County	Still	Dog
Pamlico	100%	0%
Pasquotank	54%	46%
Pender	47%	53%
Perquimans	43%	57%
Person	100%	0%
Pitt	24%	76%
Polk	93%	7%
Randolph	N/A	N/A
Richmond	N/A	N/A
Robeson	N/A	N/A
Rockingham	100%	0%
Rowan	N/A	N/A
Rutherford	63%	38%
Sampson	27%	73%
Scotland	N/A	N/A
Stanly	N/A	N/A
Stokes	75%	25%
Surry	100%	0%
Swain	13%	87%
Transylvania	49%	51%
Tyrrell	50%	50%
Union	N/A	N/A
Vance	100%	0%
Wake	100%	0%
Warren	60%	40%
Washington	36%	64%
Watauga	78%	22%
Wayne	100%	0%
Wilkes	89%	11%
Wilson	N/A	N/A
Yadkin	0%	100%
Yancey	13%	87%

[1] N/A: Percent method of harvest not available because no bears were harvested in that county.

Sex Ratio by method of harvest and region: Statewide, a majority of bears harvested by all hunters were male (Table 29). During the 2018 season, still hunters in the CBMU harvested an equal ratio of males to females (50%), whereas still hunters in the MBMU and PBMU harvested a greater ratio of males (59% and 71%, respectively; Table 29). Typically, when mast is fair to poor in the MBMU, still hunters are likely to harvest a greater ratio of females than in years with good mast crop. This is due to the poor acorn crop causing bears to travel more extensively, making them more vulnerable to harvest and more likely to be attracted to artificial food sources. In 2018, mast was poor and still hunters harvested a higher ratio of females, though houndsmen also harvested a higher ratio females than previous years (41%). But compared to still hunters, houndsmen in all the CBMU and MBMU showed greater selectivity for male bears than female bears (Table 29).

Table 29. Sex ratio by method of harvest based on the 2011 through 2018 registered harvest.

		CBMU		MBMU		PBMU		Statewide	
	Method	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
2012	**Dog**	63% (n=748)	37% (n=438)	59% (n=440)	41% (n=309)	100% (n=1)	0% (n=0)	61% (n=1,189)	39% (n=747)
	Still	51% (n=332)	49% (n=323)	63% (n=145)	37% (n=86)	100% (n=2)	0% (n=0)	54% (n=479)	46% (n=409)
2013	**Dog**	65% (n=781)	35% (n=419)	60% (n=512)	40% (n=339)	100% (n=2)	0% (n=0)	63% (n=1,295)	37% (n=758)
	Still	53% (n=307)	47% (n=273)	52% (n=185)	48% (n=171)	50% (n=1)	50% (n=1)	53% (n=493)	47% (n=445)
2014	**Dog**	62% (n=773)	38% (n=441)	57% (n=311)	43% (n=233)	60% (n=3)	40% (n=2)	61% (n=1,047)	39% (n=676)
	Still	53% (n=369)	47% (n=323)	68% (n=61)	32% (n=29)	87% (n=13)	13% (n=2)	56% (n=443)	44% (n=354)
2015	**Dog**	65% (n=771)	34% (n=405)	66% (n=585)	35% (n=297)	100% (n=4)	0% (n=0)	66% (n=1,360)	34% (n=702)
	Still	49% (n=344)	51% (n=357)	63% (n=199)	37% (n=118)	77% (n=27)	23% (n=8)	54% (n=570)	46% (n=483)
2016	**Dog**	61% (n=764)	39% (n=496)	62% (n=476)	38% (n=292)	73% (n=11)	27% (n=4)	61% (n=1,251)	39% (n=792)
	Still	49% (n=376)	51% (n=386)	67% (n=190)	33% (n=93)	60% (n=21)	40% (n=14)	54% (n=587)	46% (n=493)
2017	**Dog**	63% (n=813)	37% (n=472)	69% (n=615)	31% (n=270)	43% (n=3)	57% (n=4)	66% (n=1,431)	34% (n=746)
	Still	52% (n=439)	48% (n=413)	68% (n=257)	32% (n=122)	67% (n=30)	33% (n=19)	57% (n=726)	43% (n=550)
2018	**Dog**	62% (n=734)	38% (n=450)	61% (n=558)	39% (n=356)	83% (n=10)	17% (n=2)	62% (n=1,302)	38% (n=808)
	Still	50% (n=416)	50% (n=418)	59% (n=323)	41% (n=228)	71% (n=25)	29% (n=10)	54% (n=764)	46% (n=646)

Sex ratio by method, district and county: In 8 of 8 wildlife districts where bear harvest occurred, houndsmen harvested a higher ratio of male bears than female bears (57% to 100% male; Table 30). In 6 of 8 wildlife districts, still hunters harvested a higher ratio of male bears to females bears (47% to 88% male; Table 30). Houndsmen and still hunters harvested the highest ratio of males in Districts 5, which is located in the PBMU. The PBMU not only has a less established bear population compared to the CBMU and MBMU, but is a BMU in which bears are still expanding their range into. Bear range expansion is initially led by dispersing males, so the PBMU likely has many more males than females, as reflected in the harvest. Houndsmen harvested the highest ratio of females in District 7 (43% female), while still hunters harvested the highest ratio in District 1 (44% females) and District 4 (45% females).

Table 30. Sex ratio by method of harvest by district based on 2018 registered harvest.

	Dogs		Still		Dogs		Still		All Methods	
District	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	356	233	238	225	60%	40%	51%	49%	56%	44%
2	299	161	131	150	65%	35%	47%	53%	58%	42%
3	16	3	19	13	84%	16%	59%	41%	69%	31%
4	70	52	35	35	57%	43%	50%	50%	55%	45%
5	2	0	15	2	100%	0%	88%	12%	89%	11%
7	11	5	75	55	69%	31%	58%	42%	59%	41%
8	187	103	72	67	64%	36%	52%	48%	60%	40%
9	364	248	179	109	59%	41%	62%	38%	60%	40%

Table 31. Method of harvest by county and sex, based on the 2017 registered harvest.

	Still			Dog				Percent Method	
County	Male	Female	Total	Male	Female	Total	County total	Still	Dog
Alamance	0	0	0	0	0	0	0	N/A[1]	N/A
Alexander	0	0	0	0	0	0	0	N/A	N/A
Alleghany	6	8	14	0	0	0	14	100%	0%
Anson	0	0	0	0	0	0	0	N/A	N/A
Ashe	19	16	35	2	0	2	37	95%	5%
Avery	5	11	16	19	17	36	52	31%	69%
Beaufort	19	38	57	82	55	137	194	29%	71%
Bertie	11	15	26	26	23	49	75	35%	65%
Bladen	18	21	39	31	25	56	95	41%	59%
Brunswick	5	6	11	11	10	21	32	34%	66%
Buncombe	49	31	80	13	10	23	103	78%	22%
Burke	7	4	11	20	13	33	44	25%	75%
Cabarrus	0	0	0	0	0	0	0	N/A	N/A
Caldwell	9	7	16	21	8	29	45	36%	64%
Camden	14	7	21	23	19	42	63	33%	67%
Carteret	6	5	11	20	4	24	35	31%	69%

	Still			Dog				Percent Method	
County	Male	Female	Total	Male	Female	Total	County total	Still	Dog
Caswell	2	1	3	1	0	1	4	75%	25%
Catawba	0	0	0	0	0	0	0	N/A	N/A
Chatham	0	0	0	0	0	0	0	N/A	N/A
Cherokee	6	4	10	31	19	50	60	17%	83%
Chowan	1	3	4	1	2	3	7	57%	43%
Clay	6	4	10	19	11	30	40	25%	75%
Cleveland	0	0	0	0	0	0	0	N/A	N/A
Columbus	5	2	7	5	3	8	15	47%	53%
Craven	11	26	37	46	17	63	100	37%	63%
Cumberland	4	2	6	9	8	17	23	26%	74%
Currituck	7	3	10	5	8	13	23	43%	57%
Dare	8	1	9	0	0	0	9	100%	0%
Davidson	0	0	0	0	0	0	0	N/A	N/A
Davie	0	0	0	0	0	0	0	N/A	N/A
Duplin	5	5	10	7	1	8	18	56%	44%
Durham	0	0	0	0	0	0	0	N/A	N/A
Edgecombe	2	2	4	6	1	7	11	36%	64%
Forsyth	0	0	0	0	0	0	0	N/A	N/A
Franklin	1	0	1	0	0	0	1	100%	0%
Gaston	0	0	0	0	0	0	0	N/A	N/A
Gates	15	14	29	29	27	56	85	34%	66%
Graham	2	1	3	50	42	92	95	3%	97%
Granville	5	0	5	1	0	1	6	83%	17%
Greene	0	0	0	3	0	3	3	0%	100%
Guilford	0	0	0	0	0	0	0	N/A	N/A
Halifax	3	0	3	1	0	1	4	75%	25%
Harnett	0	0	0	0	1	1	1	0%	100%
Haywood	14	11	25	63	54	117	142	18%	82%
Henderson	33	19	52	6	3	9	61	85%	15%
Hertford	1	12	13	19	13	32	45	29%	71%
Hoke	0	0	0	0	0	0	0	N/A	N/A
Hyde	85	57	142	79	41	120	262	54%	46%
Iredell	0	0	0	0	0	0	0	N/A	N/A
Jackson	7	5	12	43	25	68	80	15%	85%
Johnston	0	0	0	0	0	0	0	N/A	N/A
Jones	23	17	40	68	51	119	159	25%	75%
Lee	0	0	0	0	0	0	0	N/A	N/A
Lenoir	14	15	29	7	4	11	40	73%	28%

	Still			Dog				Percent Method	
County	Male	Female	Total	Male	Female	Total	County total	Still	Dog
Lincoln	0	0	0	0	0	0	0	N/A	N/A
Macon	11	5	16	34	22	56	72	22%	78%
Madison	25	12	37	62	36	98	135	27%	73%
Martin	4	3	7	27	13	40	47	15%	85%
McDowell	21	24	45	54	29	83	128	35%	65%
Mecklenburg	0	0	0	0	0	0	0	N/A	N/A
Mitchell	14	11	25	16	11	27	52	48%	52%
Montgomery	0	0	0	0	0	0	0	N/A	N/A
Moore	0	0	0	0	0	0	0	N/A	N/A
Nash	0	0	0	0	0	0	0	N/A	N/A
New Hanover	1	1	2	0	0	0	2	100%	0%
Northampton	6	6	12	3	2	5	17	71%	29%
Onslow	4	11	15	21	5	26	41	37%	63%
Orange	0	0	0	0	0	0	0	N/A	N/A
Pamlico[2]	23	17	40	0	0	0	40	100%	0%
Pasquotank	7	14	21	13	5	18	39	54%	46%
Pender	18	10	28	23	9	32	60	47%	53%
Perquimans	2	4	6	6	2	8	14	43%	57%
Person	4	0	4	0	0	0	4	100%	0%
Pitt	7	5	12	22	15	37	49	24%	76%
Polk	12	2	14	0	1	1	15	93%	7%
Randolph	0	0	0	0	0	0	0	N/A	N/A
Richmond	0	0	0	0	0	0	0	N/A	N/A
Robeson	0	0	0	0	0	0	0	N/A	N/A
Rockingham	4	1	5	0	0	0	5	100%	0%
Rowan	0	0	0	0	0	0	0	N/A	N/A
Rutherford	9	6	15	8	1	9	24	63%	38%
Sampson	3	4	7	14	5	19	26	27%	73%
Scotland	0	0	0	0	0	0	0	N/A	N/A
Stanly	0	0	0	0	0	0	0	N/A	N/A
Stokes	3	3	6	2	0	2	8	75%	25%
Surry	4	2	6	0	0	0	6	100%	0%
Swain	3	4	7	27	18	45	52	13%	87%
Transylvania	11	11	22	16	7	23	45	49%	51%
Tyrrell	67	63	130	81	47	128	258	50%	50%
Union	0	0	0	0	0	0	0	N/A	N/A
Vance	1	0	1	0	0	0	1	100%	0%

	Still			Dog				Percent Method	
County	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**County total**	**Still**	**Dog**
Wake	1	0	1	0	0	0	1	100%	0%
Warren	4	5	9	6	0	6	15	60%	40%
Washington	16	29	45	47	33	80	125	36%	64%
Watauga	7	7	14	2	2	4	18	78%	22%
Wayne	1	0	1	0	0	0	1	100%	0%
Wilkes	36	19	55	5	2	7	62	89%	11%
Wilson	0	0	0	0	0	0	0	N/A	N/A
Yadkin	0	0	0	0	1	1	1	0%	100%
Yancey	7	4	11	49	24	73	84	13%	87%
Total	**764**	**656**	**1420**	**1305**	**805**	**2110**	**3530**	40%	60%

[1] N/A: No harvest occurred in the county
[2] Pamlico: Session law 1983, c. 448 prohibits taking bears with dogs.

Weights of Sampled Harvested Bears

Mortality information from harvested bears, including the collection of premolar teeth and reproductive tracts, began in 1969. NCWRC staff continue to work closely with bear hunters to collect biological data from harvested bears. Age and sex information gathered from biological samples are used for analyzing the age structure of the harvested population and for population reconstruction modeling.

During the 2018 hunting season, 3 bears were sampled that weighed over 700 lbs. (Table 32). Hyde County has produced the 2nd and 3rd largest bears in North Carolina, and 5 of the top ten bears have been harvested in Hyde County (Table 33). Since 1976, 26 harvested bears that were sampled by NCWRC staff weighed over 700 lbs. (Table 34).

Table 32. Number of harvested bears sampled that weighed greater than 400 lbs. during the 2018 hunting season.

	2018 Hunting Season			
Weight Category	**Statewide Total**	**MBMU**	**CBMU**	**PBMU**
400-499 lbs	102	20	82	0
500-599 lbs	89	5	84	0
600-699 lbs	27	0	27	0
700-799 lbs	3	0	3	0

Table 33. Top ten male bear weights recorded by NCWRC from 1976 through 2018.

Rank	Year	County	Region	Type of Hunt	Weight	Sex	Age
1	1998	CRAVEN	C	DG	880	M	10.75
2	2014	HYDE	C	DG	784	M	9.75
3	2014	HYDE	C	ST	782	M	9.75
4	2012	WASHINGTON	C	DG	780	M	6.75
4	2013	CRAVEN	C	DG	780	M	8.75
5	2009	HYDE	C	ST	760	M	6.75
6	2016	HYDE	C	DG	757	M	8.75
7	2007	DARE	C	ST	752	M	7.75
8	2001	GATES	C	DG	742	M	9.75
9	2001	BEAUFORT	C	DG	740	M	13.75
10	2012	HYDE	C	DG	735	M	11.75
10	2014	TYRRELL	C	DG	735	M	7.75

Table 34. Number of harvested male bears sampled that weighed greater than 500 lbs., 1976 through 2018, North Carolina.

Weight Category	Number of Bears	MBMU	CBMU	PBMU
> 500 lbs.	1,281	59	1,220	2
> 600 lbs.	321	7	313	1
> 700 lbs.	26	0	26	0
> 800 lbs.	1	0	1	0

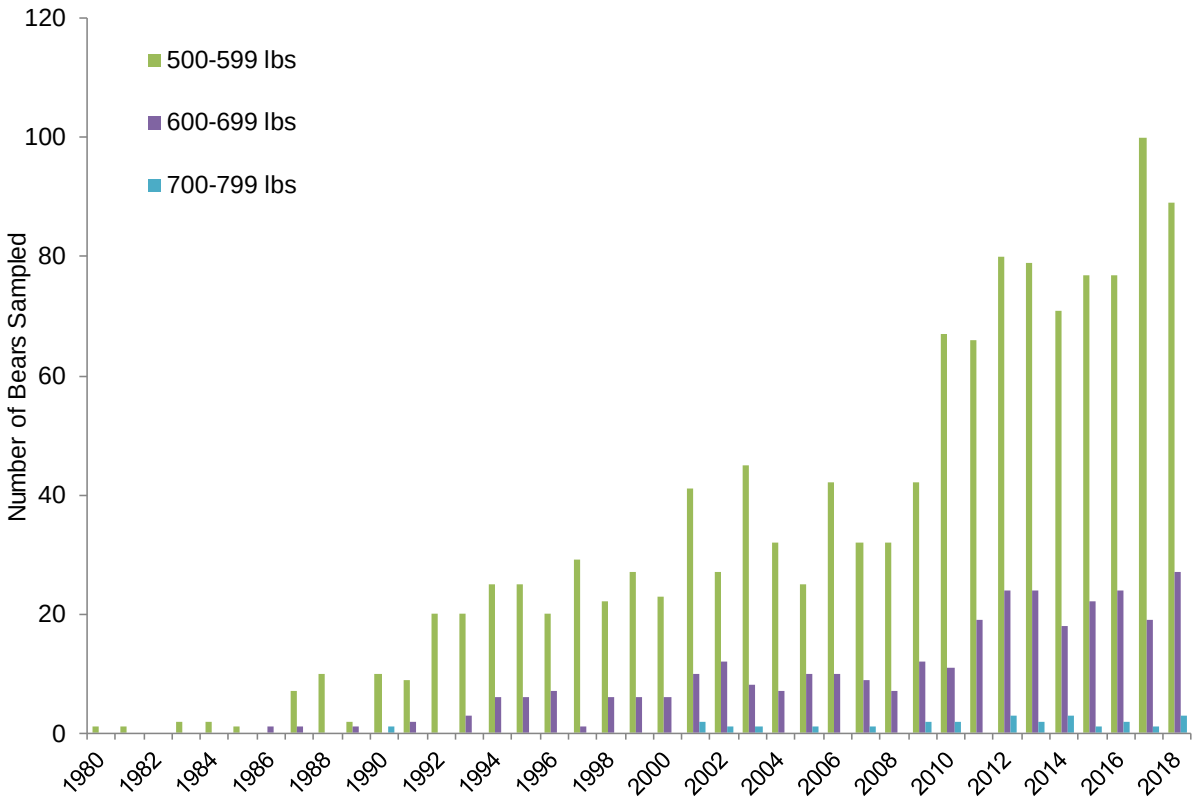


Figure 39. The number of harvested black bears sampled by the Commission that weighed over 500 lbs. from 1980 through 2018.

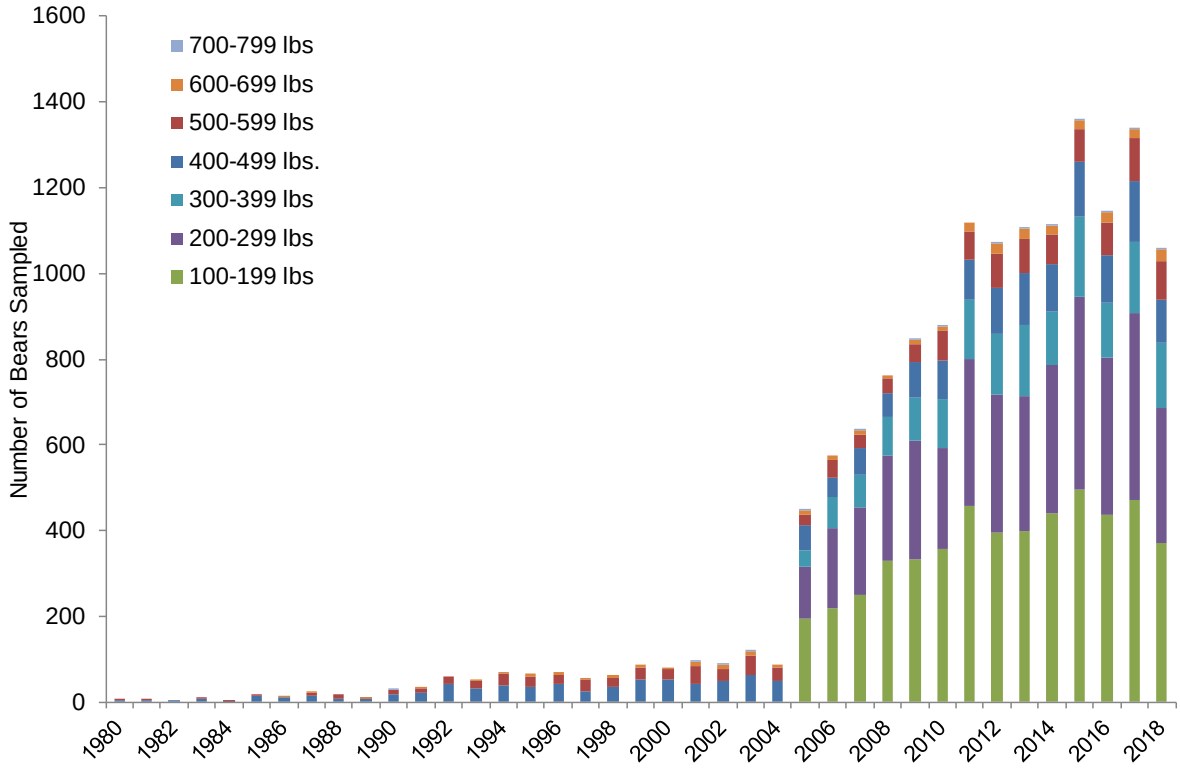


Figure 40. The number of harvested black bears sampled by weight category from 1980 through 2018.

Table 35. Mean age and weight for harvested bears sampled from North Carolina during the 2018 season and 10-year averages.

			Mean Age (yr.)		Mean Weight (lbs.)	
Season	**Region**	**Hunting Method**	**Male**	**Female**	**Male**	**Female**
2018	CBMU	Still Hunters	5.8	5.2	388	191
		Houndsmen	4.8	5.5	348	221
		All Hunters	*5.1*	*5.4*	*361*	*209*
2018	MBMU	Still Hunters	2.9	5.0	211	191
		Houndsmen	3.5	6.0	230	205
		All Hunters	*3.4*	*5.8*	*231*	*203*
2018	PBMU	Still Hunters	2.5	2.0	212	182
		Houndsmen	3.1	N/A	298	N/A
		All Hunters	*2.6*	*2.0*	*228*	*182*
2009-2018 (10-yr. average)	CBMU	Still Hunters	4.9	5.1	347	183
		Houndsmen	4.6	5.3	337	214
		All Hunters	*4.7*	*5.2*	*339*	*205*
2009-2018 (10-yr. average)	MBMU	Still Hunters	3.1	4.6	234	191
		Houndsmen	3.6	5.4	220	177
		All Hunters	*3.5*	*5.3*	*221*	*178*
2009-2018 (10-yr. average)	PBMU	Still Hunters	2.5	2.8	253	197
		Houndsmen	2.7	5.8	256	246
		All Hunters	*2.6*	*3.2*	*254*	*209*

Weight by Bear Management Unit: Male and female bears sampled in the CBMU during the 2018 hunting season weighed more, on average, than their counterparts in the MBMU and PBMU (All hunters; Table 35, Figure 41). The mean weight of male bears in the CBMU were 130 lbs. and 133 lbs. heavier than male bears in the MBMU and PBMU, respectively (Table 35). The mean weight of female bears in the CBMU were 6 lbs. and 27 lbs. heavier than female bears in the MBMU and PBMU, respectively (Table 35). This difference in weight between the bear management units is expected; bears in the MBMU are dependent on availability of natural food sources (i.e., soft and hard mast) that fluctuate annually in abundance, which can limit how much weight they can gain. In addition, natural food sources in the MBMU are only available during late spring through fall. The opposite occurs in the CBMU; not only are food sources (e.g., soft mast, hard mast, agricultural crops) relatively stable from year to year, but these food sources are available during a longer period of time during the year, due to the longer growing season. Much of the PBMU has a recently expanded bear population, in which younger, thus smaller, male bears will more likely comprise the population and the harvest. Mean weight of male and female bears in the MBMU and CBMU were heavier in 2018 then the 10-year average (Table 35).

Weight by Method of Hunt: For the 2018 season, females sampled from houndsmen were heavier than females sampled from still hunters in the CBMU and MBMU (Table 35). Weights of males sampled from still hunters in the CBMU were 40 lbs. heavier then weights sampled from houndsmen. In the

MBMU, houndsmen harvested heavier male bears than still hunters (Table 35). Limited interpretation should be given to these results, since we are unable to sample all harvested bears and submission rates from still hunters remain lower than houndsmen in both the CBMU and MBMU (Table 23). Still hunters, and hunters in general, are more likely to provide information on larger bears vs. smaller bears.

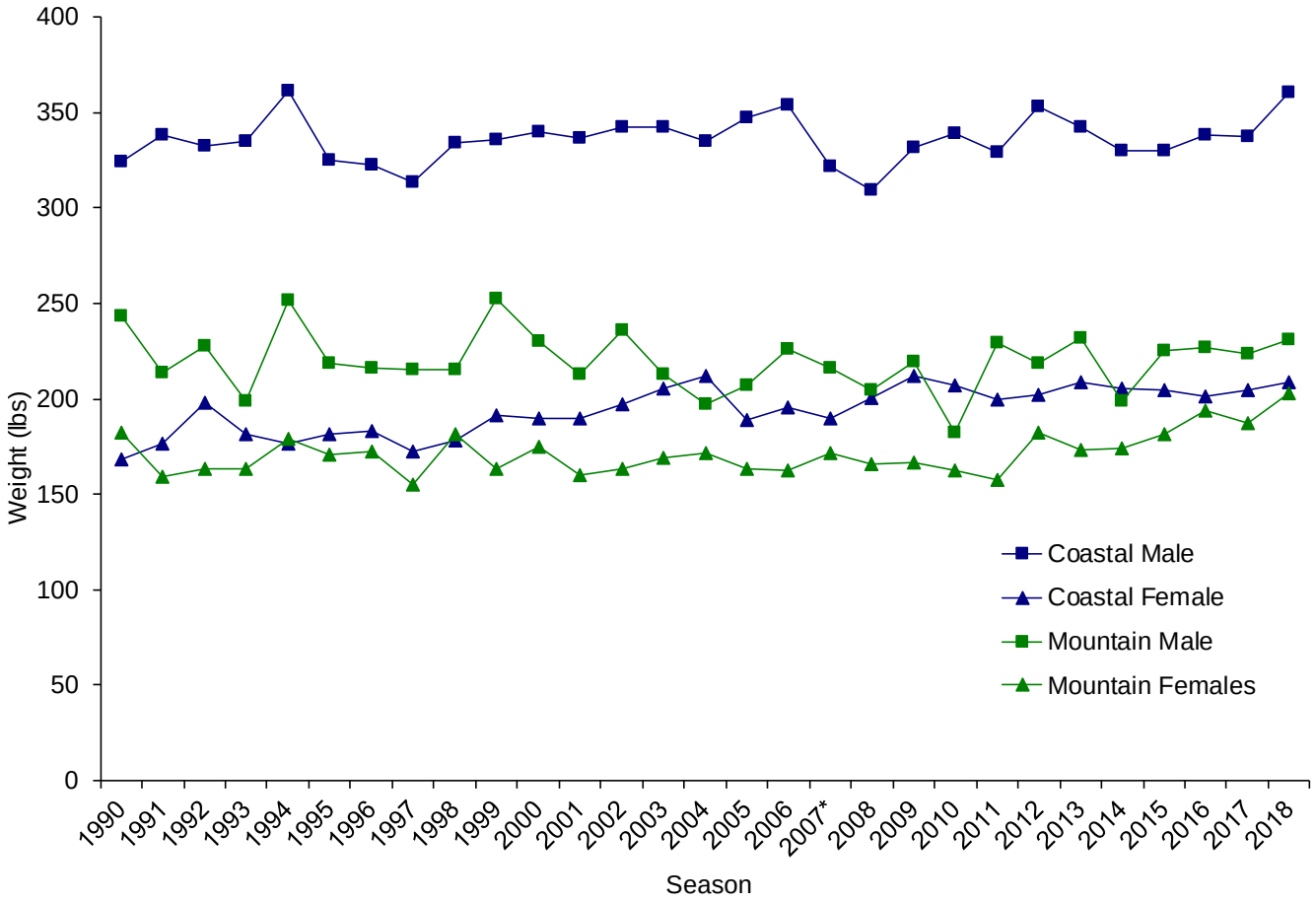


Figure 41. Average weight of sampled male and female bears in the Mountain and Coastal Bear Management Unit from 1990 through 2018.

MBMU weights: Through 2014, the average ($\bar{x}$) weight of harvested male bears sampled in the MBMU has varied (blue bars; Figure 42). However, for the past four seasons (2015-2018), the average weight of male bears sampled has been similar (224-231 lbs.; Figure 42). From 2000 through 2018, the average weight of male bears sampled was lowest in 2010 ($\bar{x}$=182 lbs.) and highest in 2002 ($\bar{x}$=236 lbs.). In 2018, the average weight of male bears sampled was 231 lbs., which was similar to sampled weights in 2015 ($\bar{x}$=225 lbs.), 2016 ($\bar{x}$=227 lbs.) and 2017 ($\bar{x}$=224 lbs.), but significantly higher than the 2014 season ($\bar{x}$=198 lbs.; $p<0.05$). Further analysis is needed to determine if certain factors, such as the annual variation in hard mast abundance, limited participation of still hunters in the bear cooperator program, and the ability of both still hunters (first half of bear season) and hound hunters (all season) to use unprocessed bait to aid in hunting bears, has influenced the sampled male bear weights over the past few years.

Unlike harvested MBMU male bears, the average ($\bar{x}$) weight of harvested female bears sampled in the MBMU has remained stable to slightly increasing over the past 19 years (red bars; Figure 42), with weight varying by 43 lbs. during this time period. Female weights likely reflect greater hunter selectivity and the fact that female bears are limited in size, due to variation in natural food supplies and the energetic demands of raising cubs. The average weight of female bears was lowest in 2011 ($\bar{x}$=157 lbs.) and highest in 2018 ($\bar{x}$=203 lbs.), which was a significant difference in weight ($p<0.05$). The sampled weight from 2016 ($\bar{x}$=194 lbs.) and 2018 were also significantly higher than 2014 ($\bar{x}$=174 lbs.) and 2015 ($\bar{x}$=181 lbs.). The 2018 sampled weight for females was the highest sampled weight since 2000 and was significantly higher than several previous seasons. This could be due to several factors. For example, the 2018 sampled female weight may have reflected the good mast crop in fall 2017, which contributed to bears being in better nutritional condition during 2018 (Table 39). The sampled female weight for 2018 could also reflect greater hunter selectivity. We observed a similar trend with the 2016 sampled harvest; the 2016 sampled female weight was the 2nd highest on record since 2000 and likely the good mast crop in fall 2015.

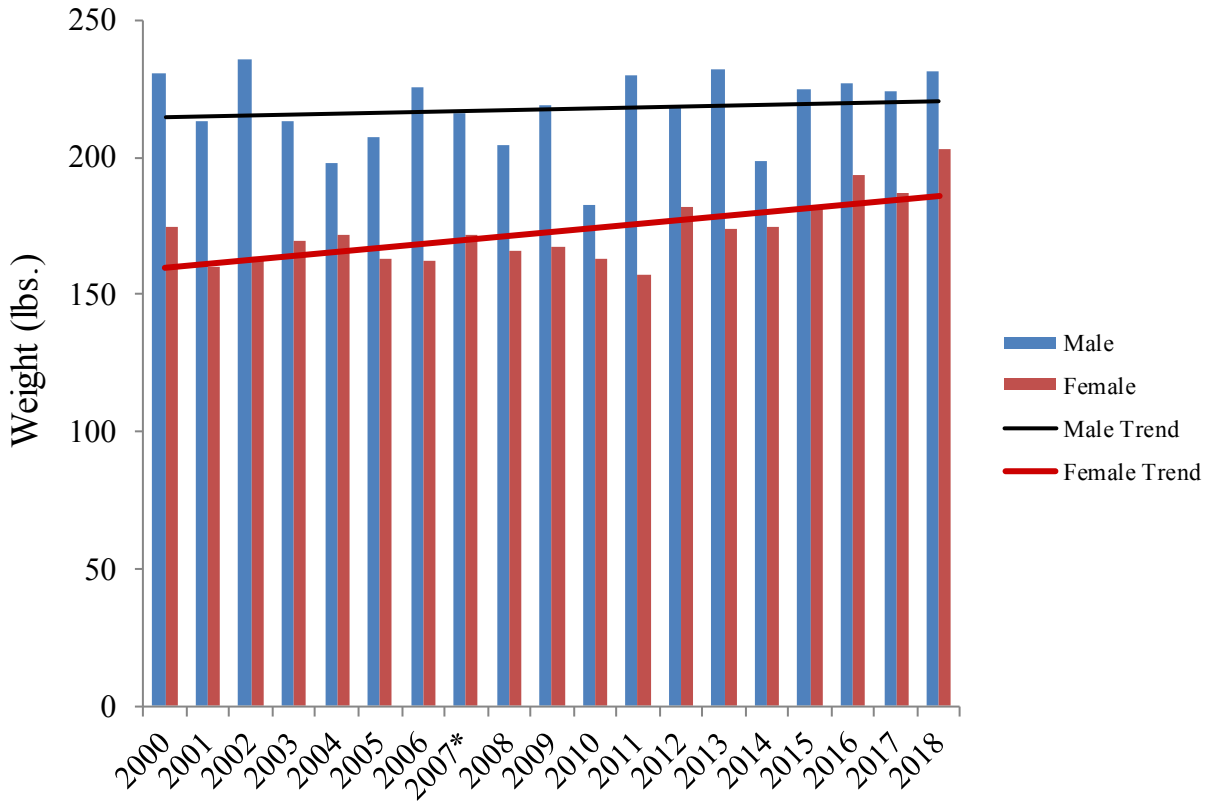


Figure 42. Average weight of harvested male and female bears sampled in the MBMU, 2000-2018.

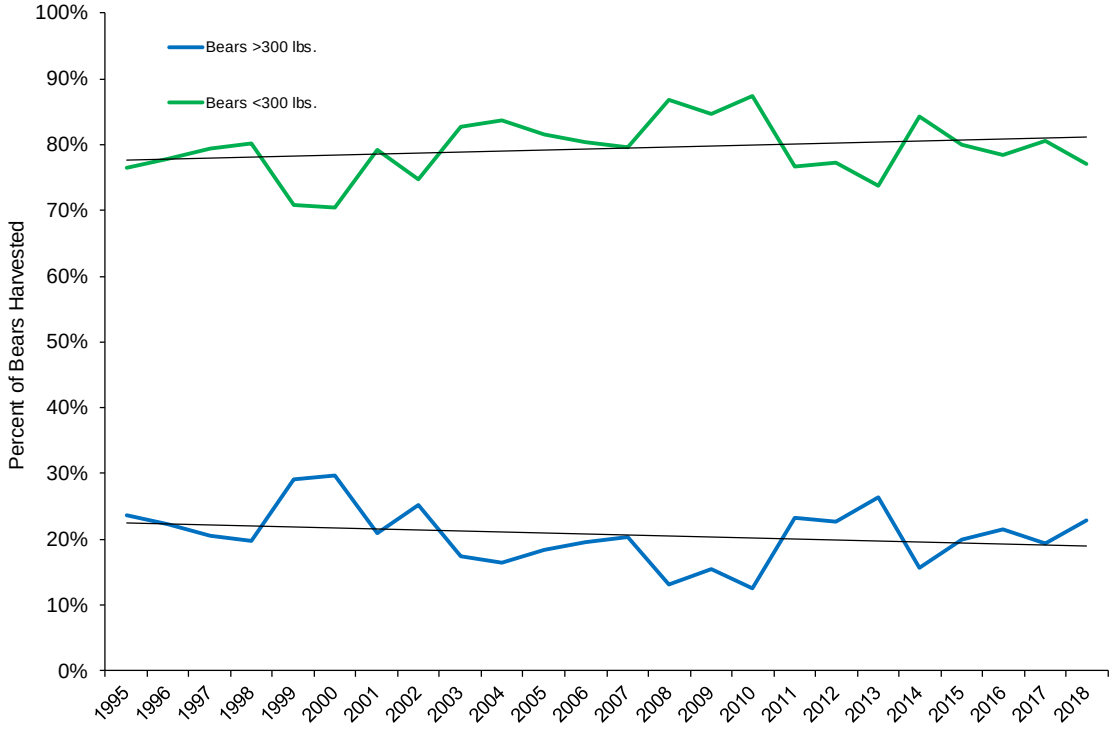


Figure 43. Percent of male bears sampled in the MBMU that weighed over and under 300 lbs. from 1995 through 2018 in North Carolina.

CBMU Weights: From 2000 through 2018, average ($\bar{x}$) weights of harvested male bears sampled in the CBMU has remained fairly stable (blue bars; Figure 44), likely reflecting year-round stable food resources (e.g., hard mast, agricultural crops). However, in 2008 the average weight of harvested male bears declined to 309 lbs., which was the lowest average weight recorded during the past 19 years. The highest average weights for harvested males occurred during the 2018 ($\bar{x}$=361 lbs.), 2006 ($\bar{x}$=354 lbs.) and 2012 ($\bar{x}$=352 lbs.) seasons. The sampled bear weights from the 2018 season differed significantly ($p \leq 0.05$) from the previous 4 seasons. In 2018, the Commission approved changes to bear hunting seasons in the CBMU that aligned seasons to zones (Figure 19), added Saturday openers for the November and December seasons in zones 1 through 4, changed the November season start date and end date in Zone 4, and extended the November season in Zone 1 from 6 days to 16 days, which also added 3 weekends. These season changes, especially in Zone 1 (6 Dare, Hyde and Tyrrell counties), may have allowed hunters more time to select for larger bears. Change in weight may also reflect low sampling weight of harvested bears. There is a slight trend upwards in the percentage of male bears sampled that weigh over 500 lbs. (Figure 45).

The average ($\bar{x}$) weight of harvested female bears sampled in the CBMU has also remained fairly stable over the past 19 years, ranging from $\bar{x}$=189 lbs. to $\bar{x}$=212 lbs. (red bars; Figure 44). The heaviest average weight occurred during the 2004 and 2009 seasons ($\bar{x}$=212 lbs.). In 2018, the average weight of female bears sampled was 209 lbs., which was similar to sampled weights from the last four years (201 to 206 lbs., respectively; Figure 44).

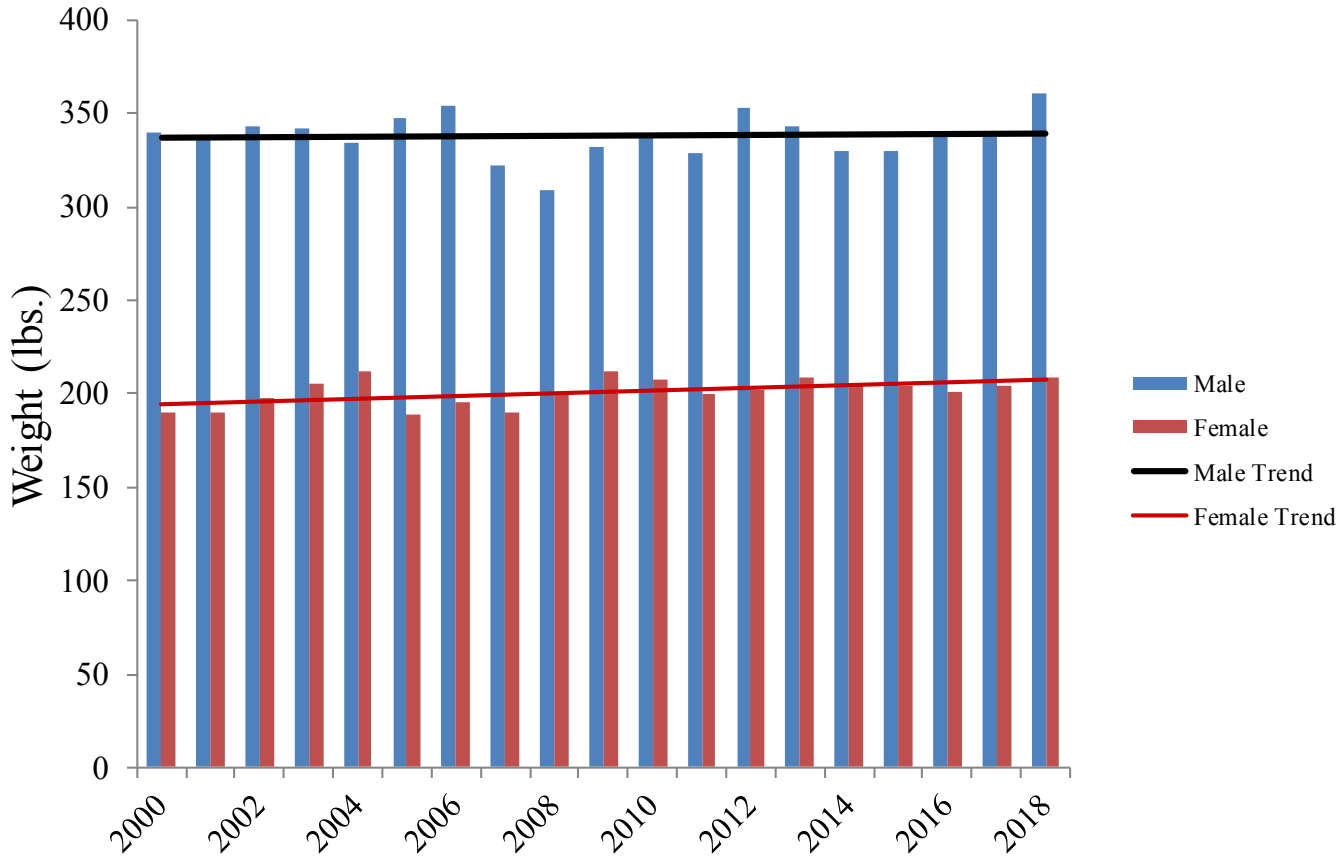


Figure 44. Average weight of harvested male and females bears sampled in the CBMU, 2000-2018.

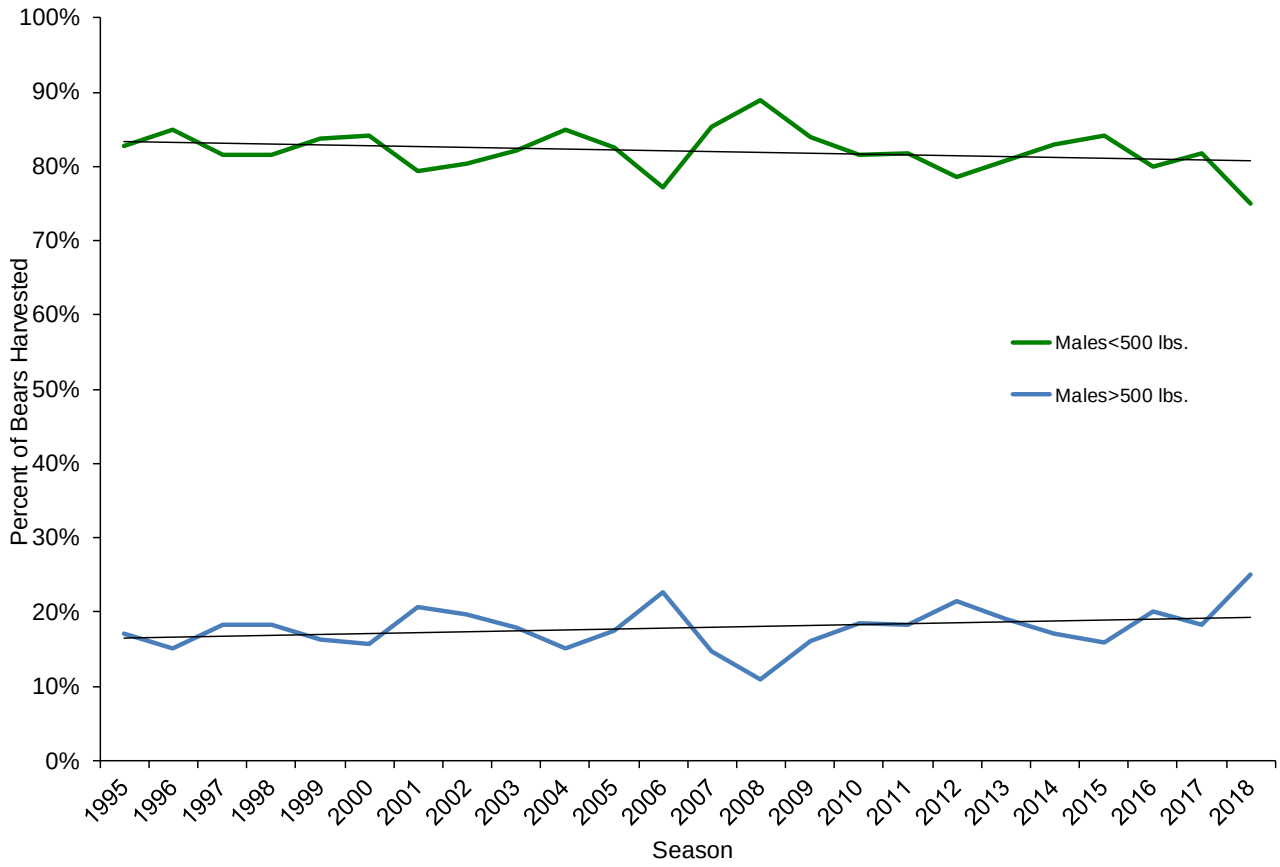


Figure 45. Percent of male bears sampled in the CBMU that weighed over and under 500 lbs. from 1995 through 2018 in North Carolina.

Ages of Sampled Harvested Bears

During the 2018 bear hunting seasons, the oldest bear harvested was by a still/stand hunter in Haywood County (MBMU) that was a 22.75 female bear (weight unknown). Two female bears and 3 male bears were harvested in the CBMU that were 18.75 years old; two bears were harvested by houndsmen and the other three bears were harvested by still/stand hunters. The oldest bear harvested in North Carolina was a 26.75 year old female bear taken in 2003 by a still hunter in the MBMU (Table 35). The oldest male bears harvested in North Carolina were both 23.75 years old and taken in the CBMU in 2005 and 2013 (Table 35). The oldest male bear taken in the MBMU was 22.75 years old harvested by houndsmen in 1969.

Table 35. Top five bear ages, based on sampled harvest, recorded by NCWRC from 1969 through 2018.

Rank	Year	County	Region	Type of Hunt	Sex	Age	Weight
1	2003	McDowell	MBMU	Still/Stand	F	26.75	200
2	2011	Beaufort	CBMU	Still/Stand	F	24.75	180
3	2005	Bertie	CBMU	Dog	M	23.75	460
3	2009	Chowan	CBMU	Still/Stand	F	23.75	NA
3	2013	Chowan	CBMU	Dog	F	23.75	150
3	2003	Haywood	MBMU	Dog	F	23.75	NA
3	2013	Hyde	CBMU	Dog	M	23.75	545
3	1998	Madison	MBMU	Dog	F	23.75	NA
3	2005	McDowell	MBMU	Still/Stand	F	23.75	100
3	2005	Pamlico	CBMU	Still/Stand	F	23.75	275
4	2015	Bladen	CBMU	Dog	F	22.75	250
4	1969	Graham	MBMU	Dog	M	22.75	NA
4	2000	Graham	MBMU	Dog	F	22.75	NA
4	2009	Macon	MBMU	Dog	F	22.75	140
4	2018	Haywood	CBMU	Still/Stand	F	22.75	NA
5	2013	Bertie	CBMU	Dog	F	21.75	285
5	2011	Hyde	CBMU	Dog	M	21.75	320
5	1990	Onslow	CBMU	Unknown	F	21.75	200
5	1995	Tyrrell	CBMU	Still/Stand	F	21.75	NA
5	1992	Yancey	MBMU	Still/Stand	F	21.75	NA
5	2017	Craven	CBMU	Dog	F	21.75	325

Table 36. Number of harvested bears sampled that were greater than 15 years old, 1969 through 2018, North Carolina.

Age (yrs.)	Number of Bears	MBMU	CBMU
15.75	119	25	94
16.75	66	20	46
17.75	50	18	32
18.75	26	5	21
19.75	20	5	15
20.75	22	4	18
21.75	6	1	5
22.75	5	4	1
23.75	8	3	5
24.75	1	0	1
26.75	1	1	0

CBMU Ages: There is a fairly stable trend in the average ($\bar{x}$) age of harvested males sampled in the CBMU (Figure 46). In 2018, the average age of sampled bears was 5.1 years old, which was significantly older than the 2017 season ($\bar{x}$=4.7 years old). While the average age of males has been stable overall, male bears sampled from the 2018 season were significantly older than bears sampled during the previous 4 seasons (2014-2017) and bears sampled from 2007 through 2011 bear seasons.

From 2005 through 2018, the average ($\bar{x}$) age of harvested female bears sampled in the CBMU has slightly varied, ranging from 4.8 yrs. old to 6.0 yrs. old (red bars; Figure 46). There is an overall declining trend in the average age of females sampled (Figure 46); average age of female bears peaked in 2003 ($\bar{x}$=7.1 yrs. old). In 2018, the average age of females sampled was 5.4 years old, a slight increase from the 2017 season ($\bar{x}$=4.9 years old) and similar to the 2015 season ($\bar{x}$=5.4 years old). Since a decline in female age sampled from 2015 to 2016, the age of sampled females has increased over the past two hunting seasons and females sampled in 2018 were significantly older than females from the 2016 season (Figure 46).

MBMU Ages: There has been variation in the average ($\bar{x}$) age of harvested male bears over the past 14 years, likely due to annual changes in hard mast abundance, which heavily influences harvest pressure (blue bars; Figure 47). The average age harvested was lowest during the 2015 seasons ($\bar{x}$=3.2 yrs. old), and highest during the 2011 and 2013 ($\bar{x}$=4.0 yrs. old) seasons. Overall, there is a declining trend in male ages sampled (Figure 47). In 2018, the average age of sampled male bears ($\bar{x}$=3.4 yrs. old) was similar to the previous three seasons (2015-2017), but significantly younger than male bears sampled in the 2011, 2012, and 2013 seasons.

The average ($\bar{x}$) age of harvested female bears sampled has also varied significantly from 2005 through 2018 and shows a declining trend in female bear age (red bars; Figure 47). As with males in the MBMU, this variation is likely due to annual changes in hard mast abundance, which heavily influences harvest pressure. The average age harvested was lowest during the 2014, 2016 and 2017 seasons ($\bar{x}$=4.1 yrs. old) and highest during the 2011 season ($\bar{x}$=6.2 yrs. old). The average age of harvested female bears sampled during the 2018 season ($\bar{x}$=5.8 yrs. old) was significantly higher than earlier seasons (2008, 2009, 2010, 2012, 2014, 2016, 2017).

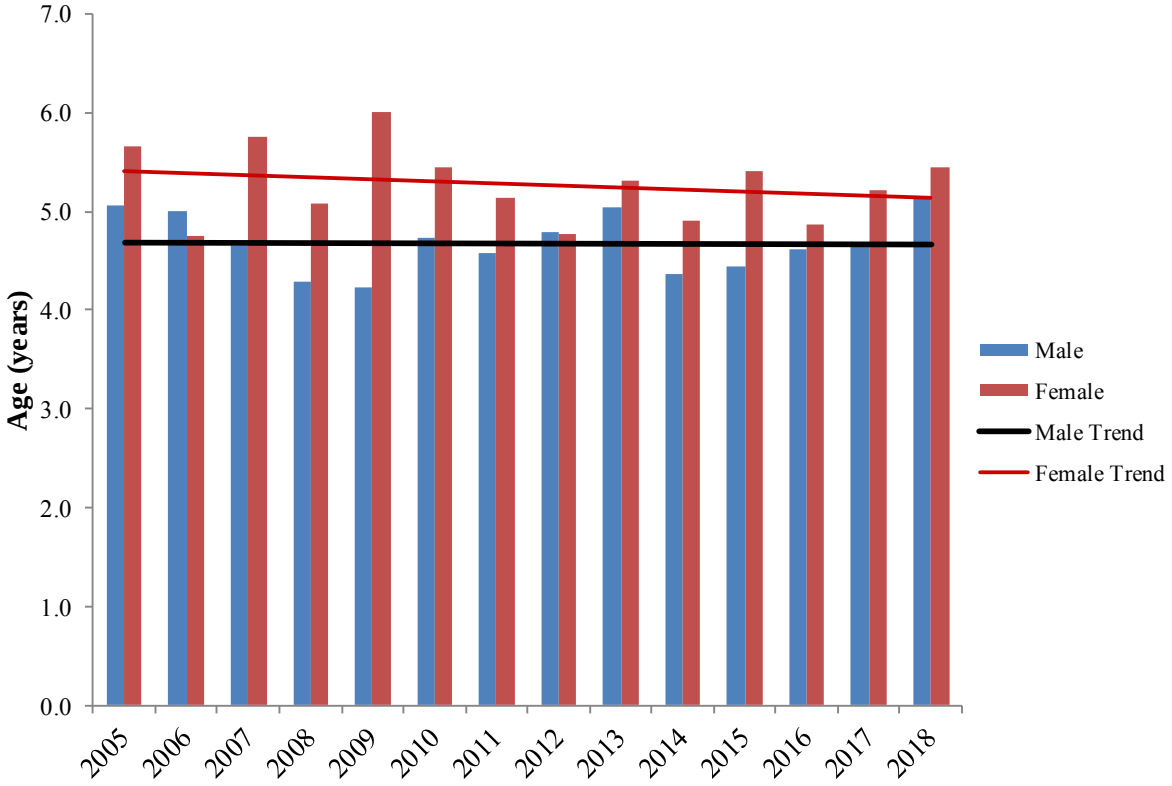


Figure 46. Average age of harvested male and female bears sampled in the CBMU, 2005-2018.

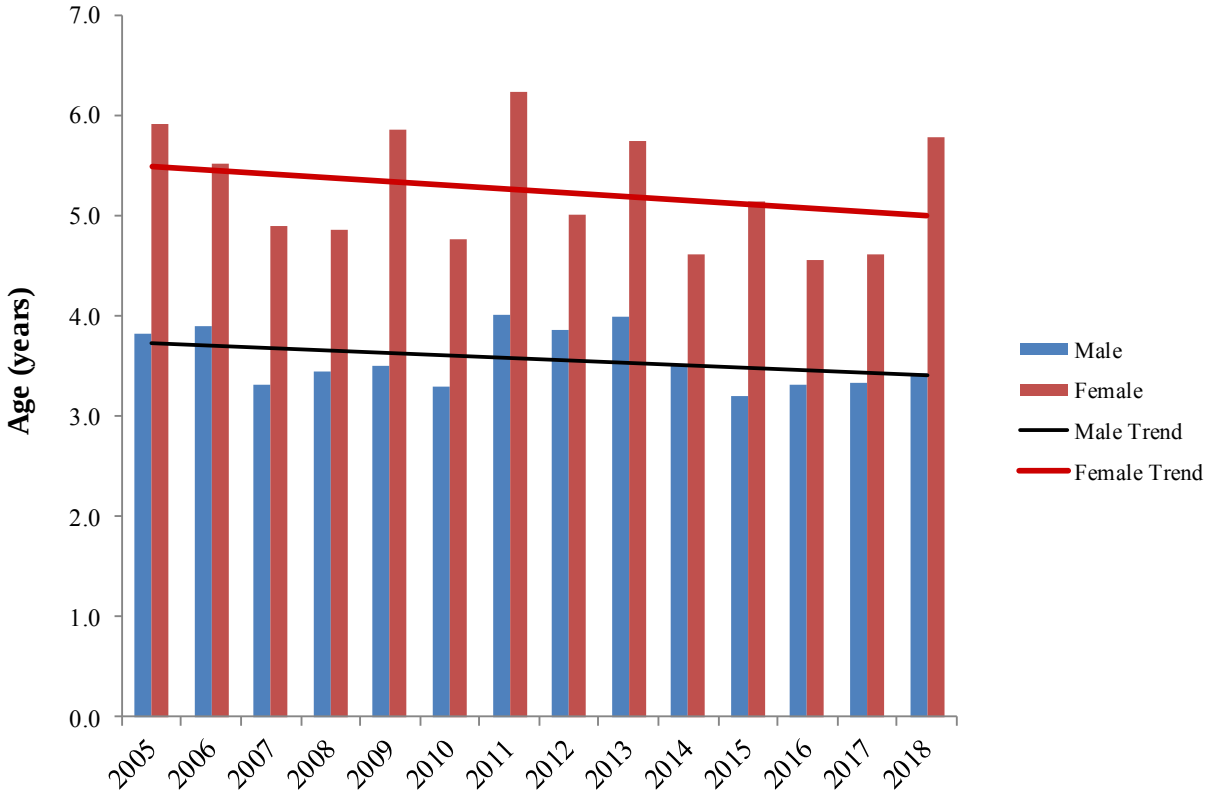


Figure 47. Average age of harvested male and female bears sampled in the MBMU, 2005-2018.

Population Growth Rates and Estimates

Our bear population estimates and population growth rates are based on population reconstruction which relies on biological data collected voluntarily from harvested bears (see page 51) on Bear Cooperator Program. This method of population analysis reconstructs the age structure of the bear population three years prior to when the biological data is collected. For example, biological data collected during the 2018 harvest season reconstructs the size of the bear population in 2015 (Figures 48 and 49). Therefore, impacts of harvest on the bear population are not known until three years after any regulatory change has occurred. Because of this lag time, caution should be taken in setting specific harvest levels for bears until a more robust population model can be identified and developed. In addition, population reconstruction is sensitive to changes in harvest levels, so population trends may follow harvest trends (Figures 48 and 49). Population reconstruction relies on the assumption that the sampled harvest reflects the actual harvest (e.g., % younger bears in the harvest equals % younger bears in sampled harvest). Anecdotal evidence indicates the sampled harvest is biased towards older bears, because hunters are less interested in receiving age results from younger bears (e.g., yearlings, subadults). To overcome biases in sampling, as well as to be able to have more accurate growth rates and population estimates at the bear management unit level and CBMU zone level, tooth submission rates should be above 80%. Lastly, population reconstruction is mainly meant as a tool to monitor bear population trends (i.e., growth rates, λ) over time, rather than to come up with precise population estimates.

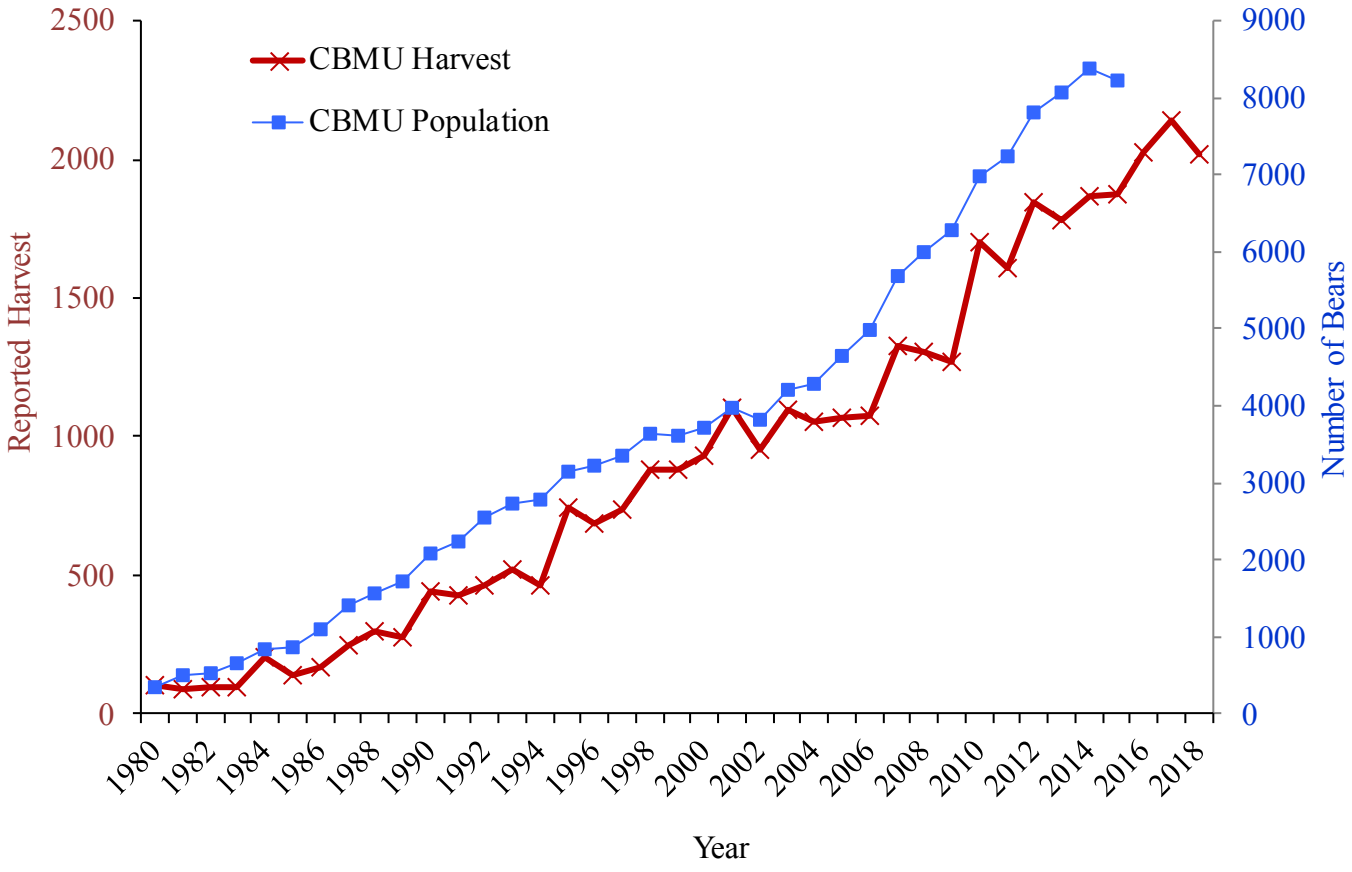


Figure 48. Reported harvest (1980-2018) and estimated black bear population (1980-2015) in the CBMU of North Carolina.

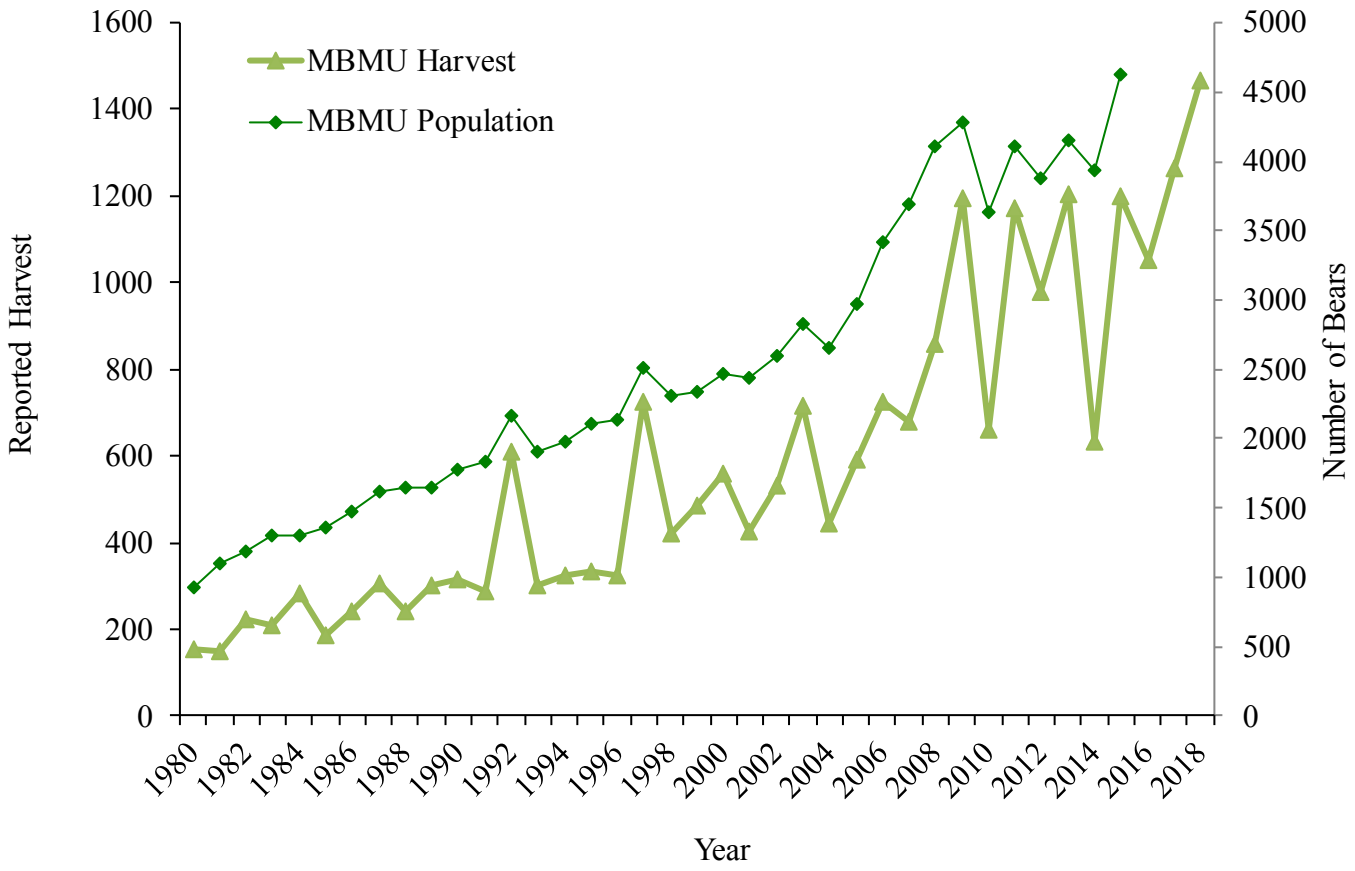


Figure 49. Reported harvest (1980-2018) and estimated black bear population (1980-2015) in the BMU of North Carolina.

Based on the population reconstruction model, the bear population was estimated to be 4,200 to 5,000 bears in the MBMU and 8,300 to 10,000 bears in the CBMU during 2015 (Figures 48 and 49). These estimates are lower than previous estimates, due to the addition of 2017 and 2018 age data, and do not include the bear populations that live on designated bear sanctuaries and other lands in which harvest does not occur (e.g., Asheville Watershed, Pocosin Lakes National Wildlife Refuge). Other influences on population estimates are submission rates; where submission rates are low, population reconstruction may underestimate the population. For example, submission rates from District 7, which comprises 11 counties in the MBMU, is relatively low (34%), so the model will underestimate the population in the MBMU as a result. Submission rates are lowest in District 3 (33%), with portions in the CBMU and PBMU. Thus, these population estimates are likely conservative.

Population growth rates in the CBMU and the MBMU show a declining trend (Figures 50 and 51). The population objectives of the MBMU and the CBMU, based on the 2012-2022 Black Bear Management Plan, were to lower the rate of population growth in order to stabilize bear populations and keep them within cultural carrying capacity. The Commission may be meeting those objectives in the CBMU (Figure 50), likely due to the changes on bear season structures (e.g., lengthening seasons) and hunting methods (i.e., legalization of use of unprocessed bait) that have occurred since 2007.

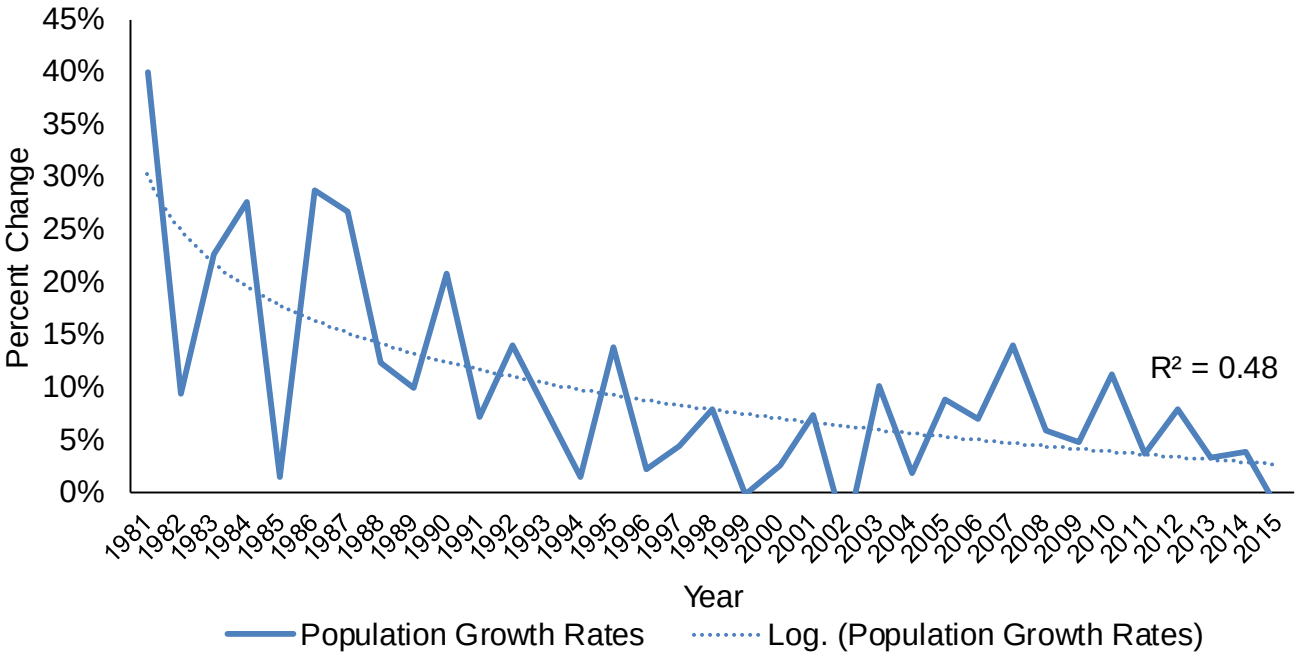


Figure 50. Population growth rates of the CBMU bear population (1981-2015)

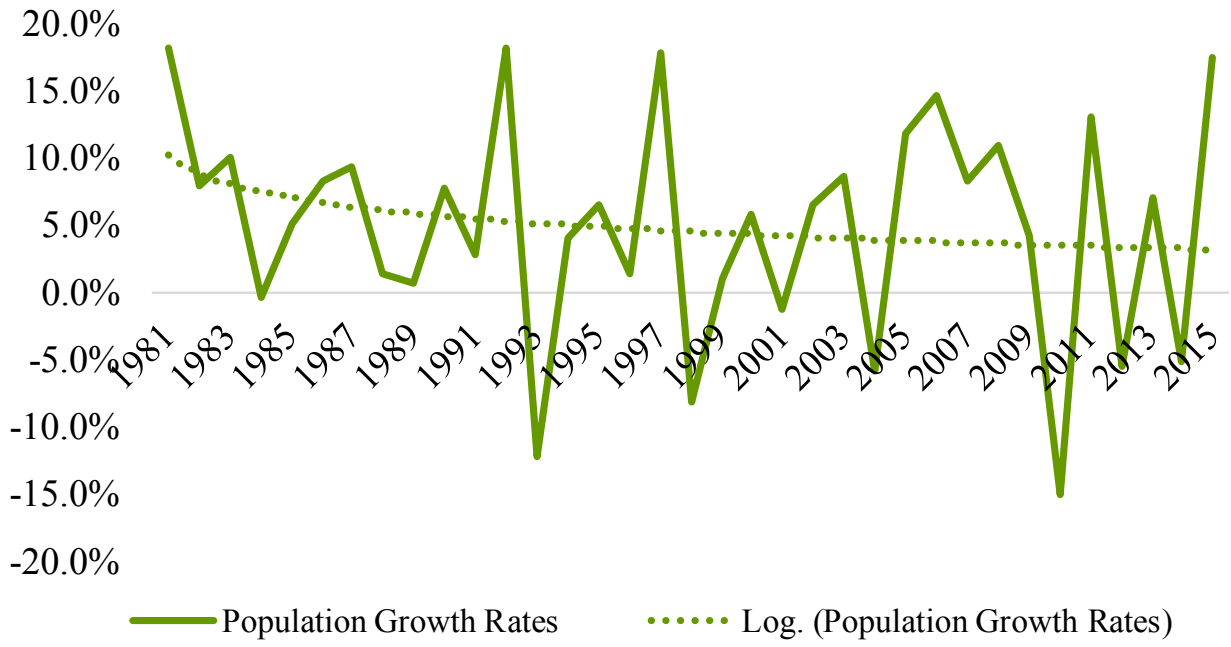


Figure 51. Population growth rates of the MBMU bear population (1981-2015).

Non-Harvest Mortality

Human-induced mortality is the greatest source of black bear mortality in North Carolina (Figure 52). Regulated hunting remains the primary cause of mortality in black bears, with vehicle collisions being the second leading cause of mortality.

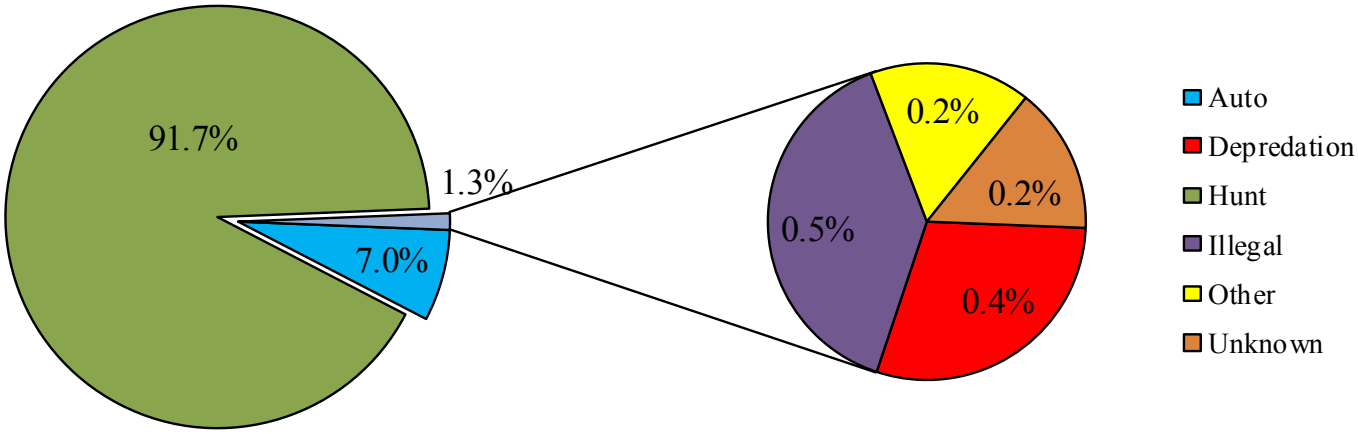


Figure 52. Causes of mortality among bears sampled by NCWRC from 1969 through 2018.

During 2018, there were 362 non-harvest mortalities in North Carolina (Table 37); 93% of these mortalities were from vehicle collisions, followed by depredation (n=10) and illegal mortalities (n=6). Depredation mortalities increased 67% in 2018, particularly in the MBMU (n=8; Figures 53 and 54), while illegal mortalities increased 500% (n=6; Figure 55).

Vehicle-caused mortalities increased 38% from the prior year (n=336; Figure 56). Sixty-three percent of vehicle-caused mortalities occurred in the CBMU during 2018 (Figure 57), likely reflecting the higher bear population and number of highways in that region. A majority of vehicle-caused mortalities occur in October, followed by November and June (Figures 58 and 59). The increase in the number of roadkills that occur in June is primarily due to increased movements by younger bears; when the female's offspring are just over a year old, they will separate from their mother sometime after den emergence (late April through mid-June) and disperse until they establish a home range. Male yearlings and subadults tend to travel further from their natal home range than females, thus they comprise the majority of roadkills (Figure 60).

The increases in roadkills that occur in October and November is due to increased travel by both male and female bears in search of foods (Figures 58 and 59). During fall, black bears must consume mass amounts of food to prepare their body for winter, when they must rely on their body fat for nutrition, maintenance, production of cubs and lactation. The need to find foods in fall in order to have adequate body fat for the lactation and the production of cubs is likely the main reason female adults (>3 years old) comprise the majority of roadkilled female bears (Figure 61).

Table 37. Non-harvest mortalities by district during 2018.

District	Vehicle	Depredation	Illegal	Other	Unknown	Total
1	114	2	3	3	0	122
2	79	0	0	1	2	82
3	5	0	0	1	0	6
4	11	0	0	0	0	11
5	4	0	0	0	0	4
6	0	0	0	0	0	0
7	6	0	0	0	0	6
8	37	1	1	0	1	40
9	79	7	2	1	2	91
Total	**335**	**10**	**6**	**6**	**5**	**362**

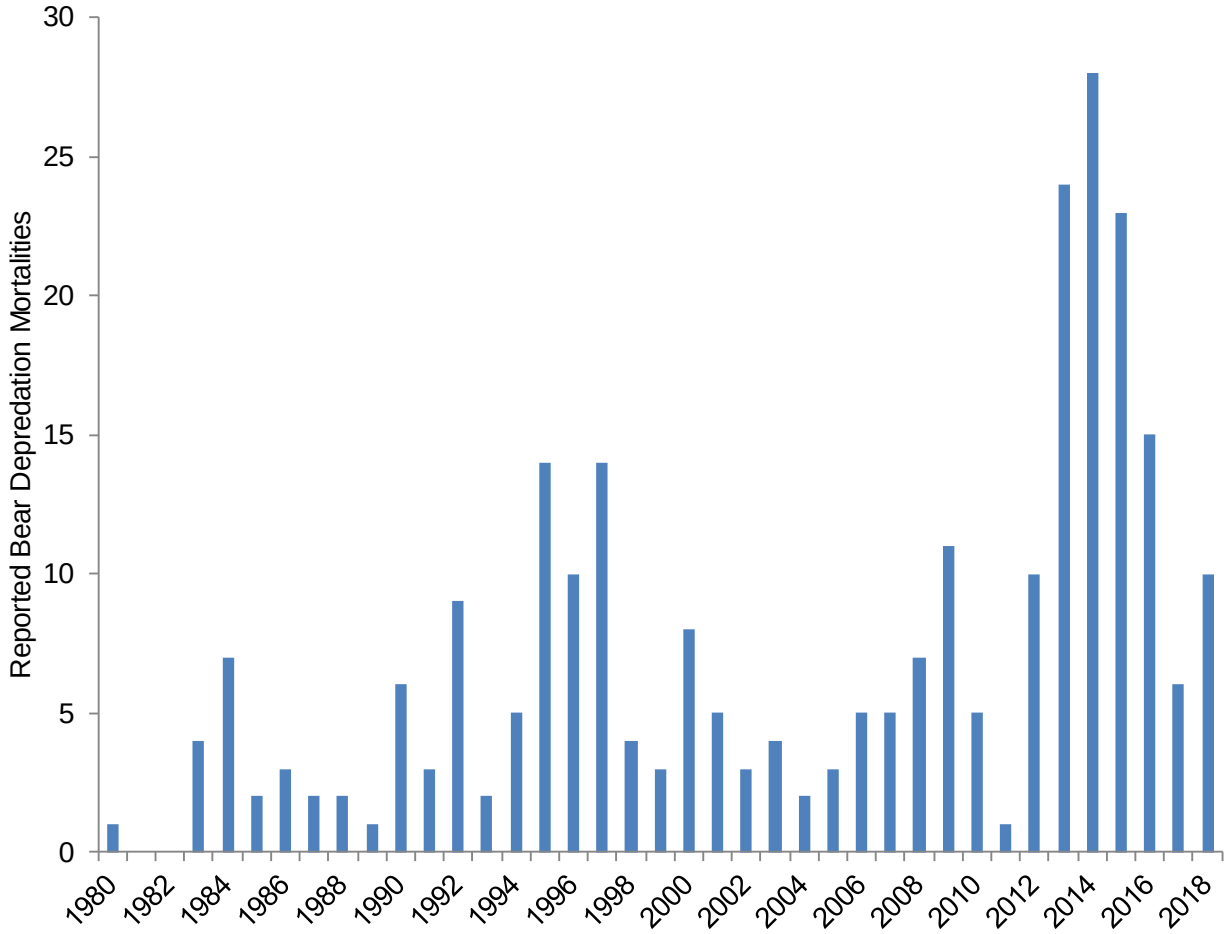


Figure 53. Number of reported bear mortalities caused by depredation from 1980 through 2018 in North Carolina.

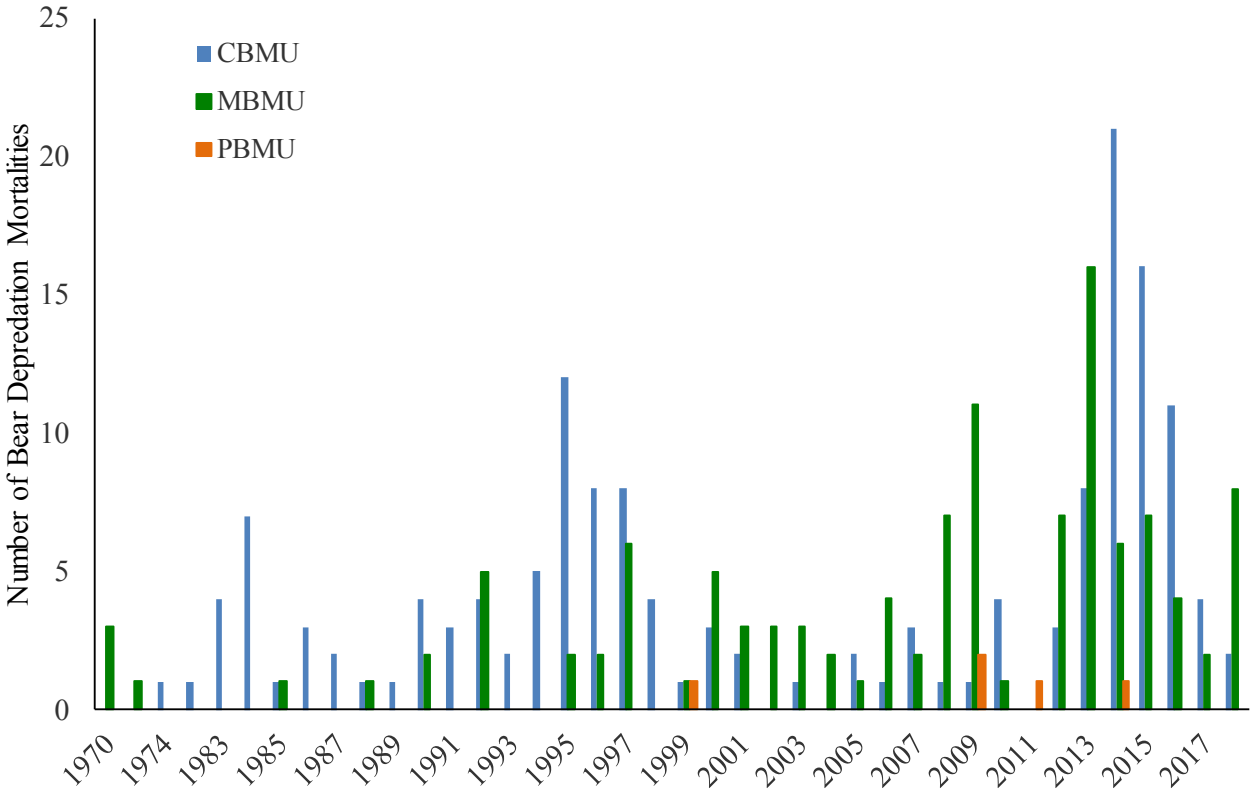


Figure 54. Number of reported bear mortalities caused by depredation from 1980 through 2018 in North Carolina by bear management unit.

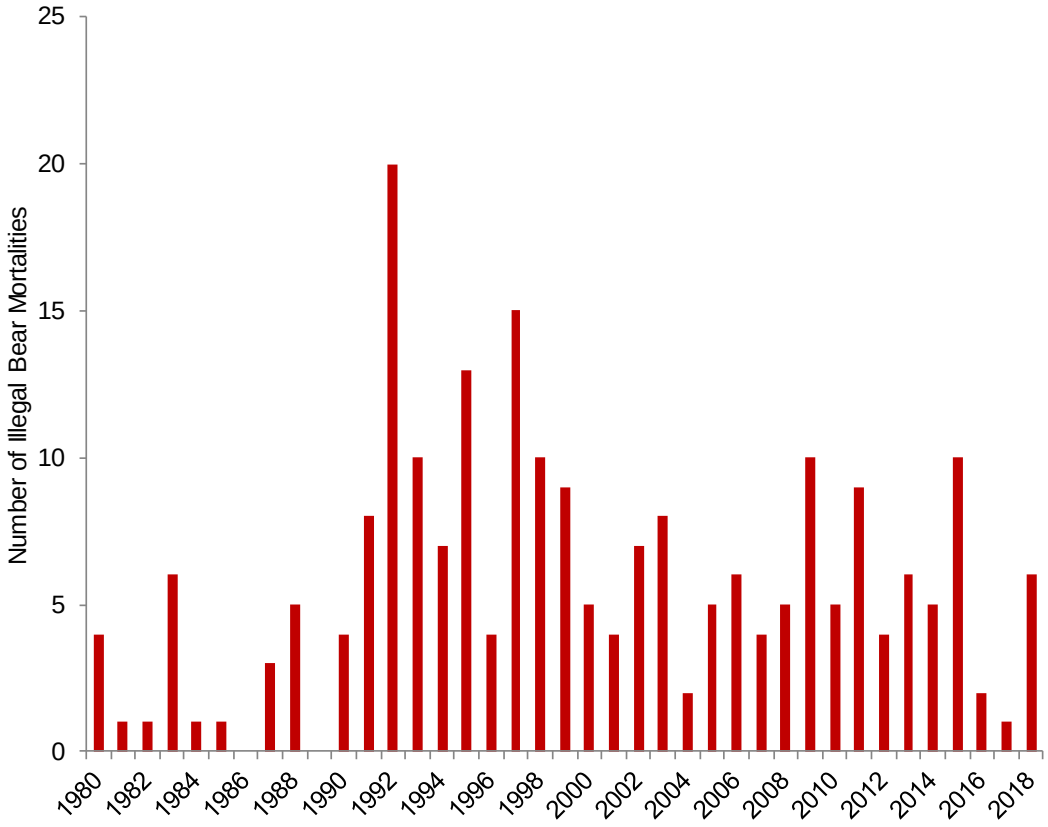


Figure 55. Number of illegal bear mortalities in North Carolina from 1980 through 2018.

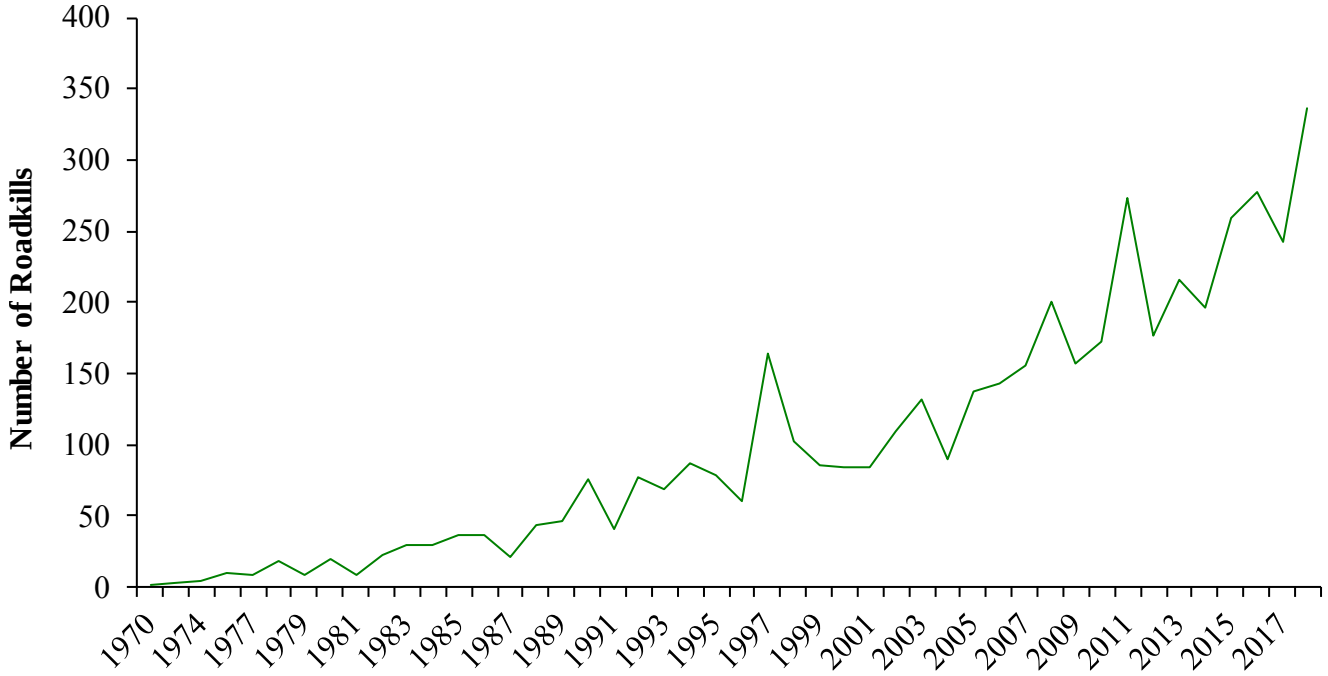


Figure 56. Total number of vehicle-caused black bear mortalities in North Carolina from 1970 through 2018.

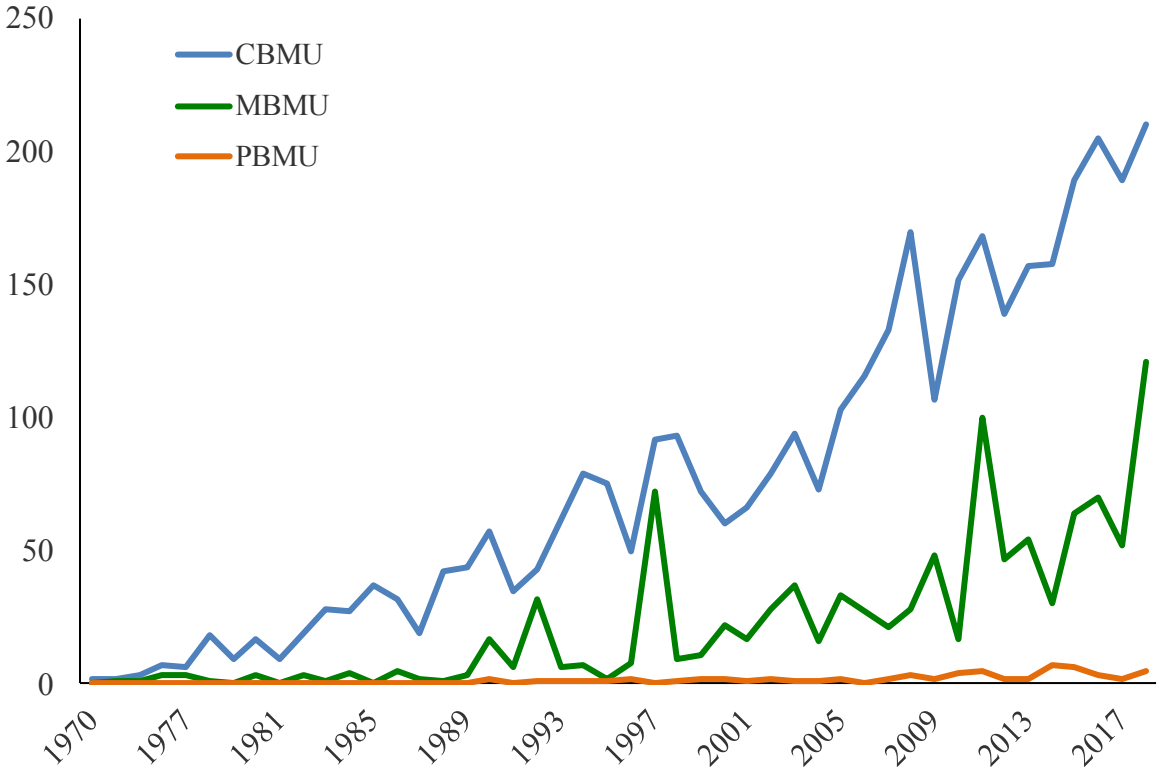


Figure 57. Total number of vehicle-caused black bear mortalities in North Carolina from 1970 through 2018 by bear management unit.

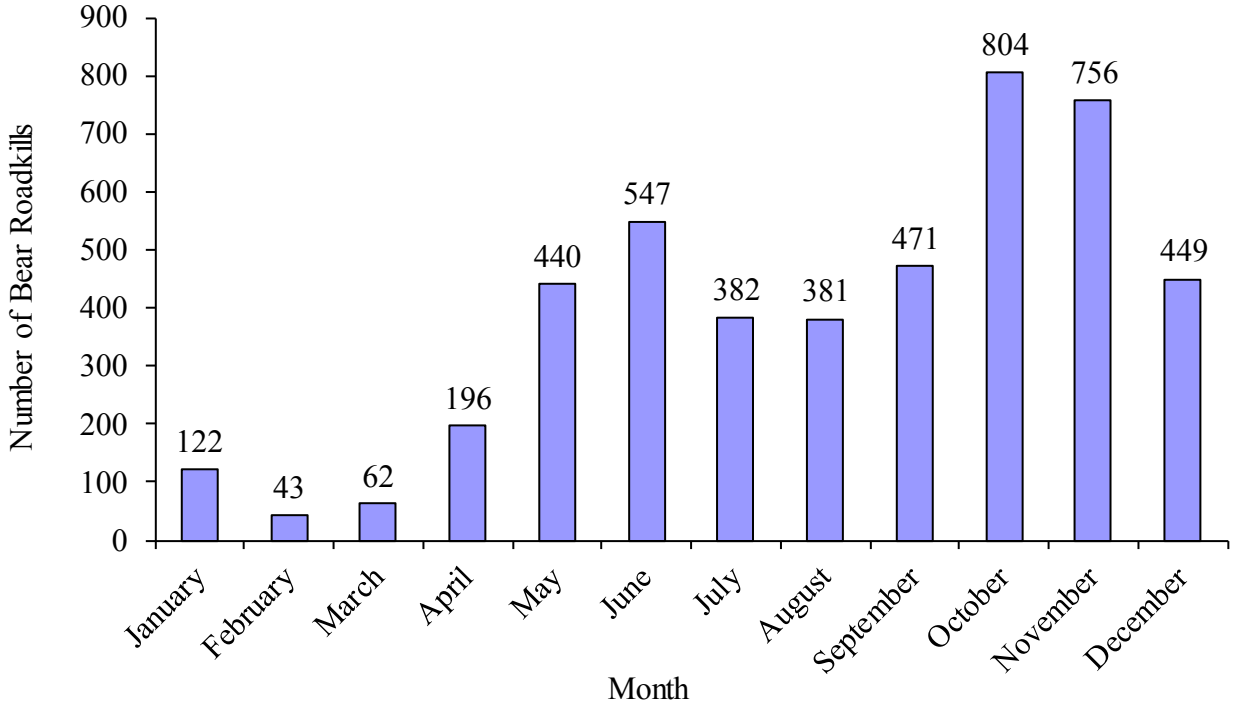


Figure 58. Number of vehicle-caused mortalities by month in North Carolina, 1970-2018.

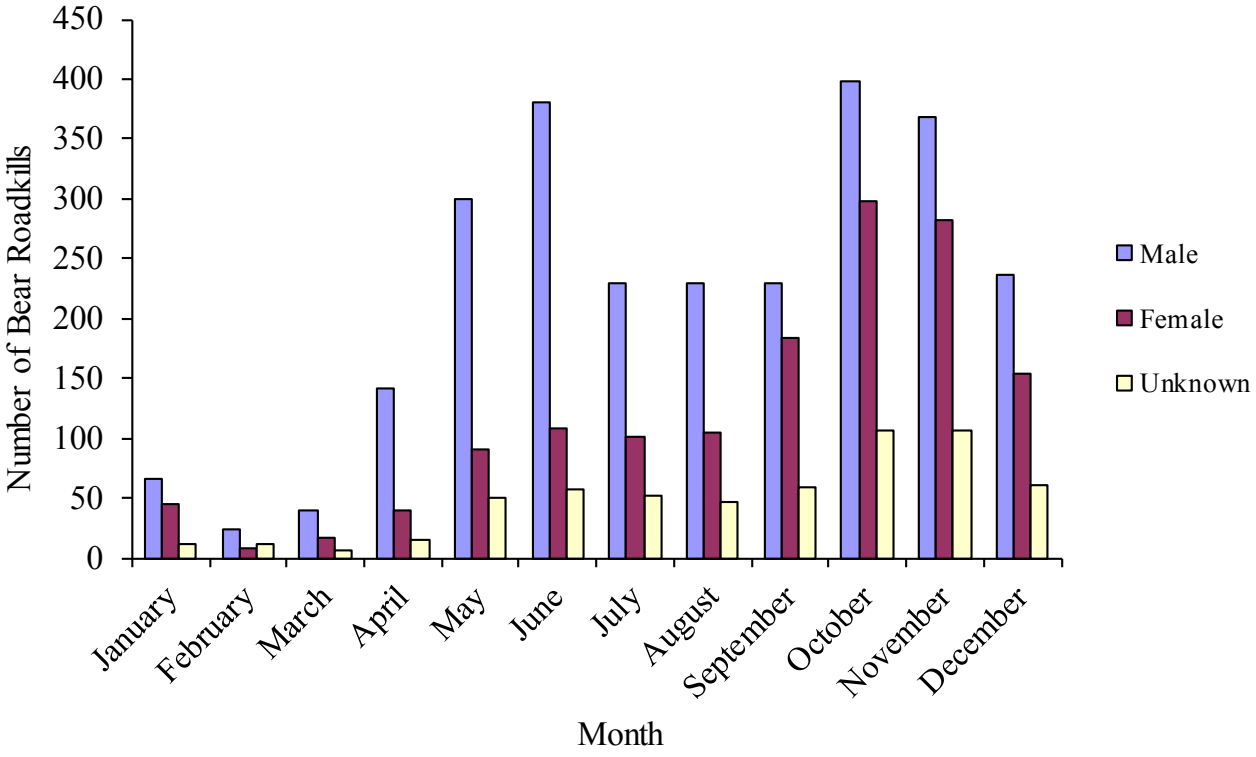


Figure 59. Number of vehicle-caused mortalities by month and by sex in North Carolina, 1970 through 2018.

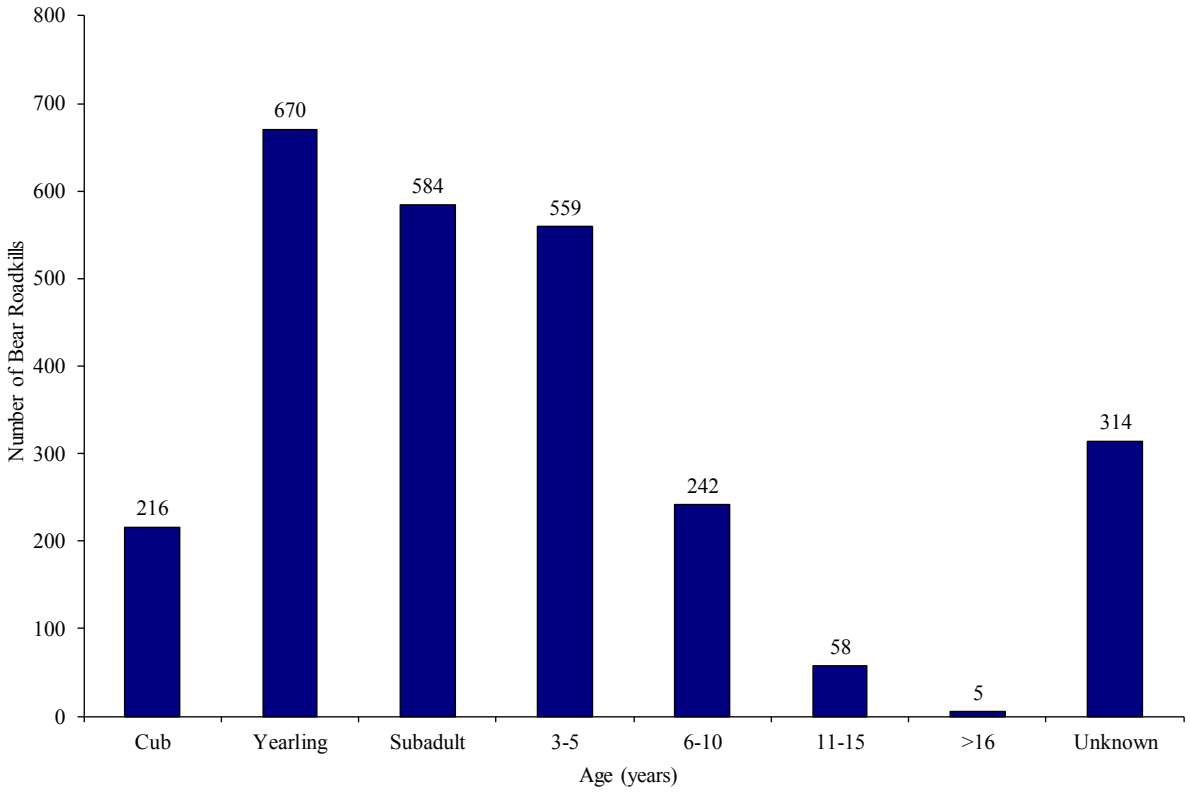


Figure 60. Number of vehicle-caused mortalities of male bears by age category in North Carolina, 1970-2018.

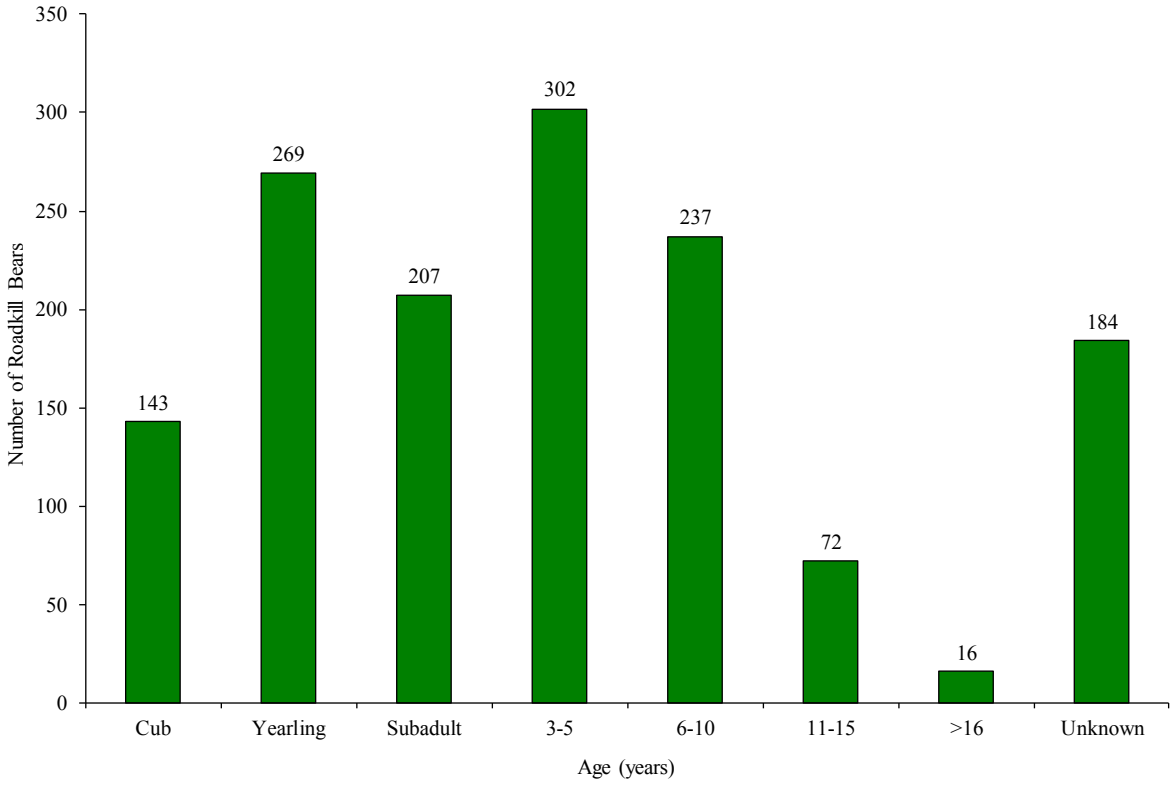


Figure 61. Number of vehicle-caused mortalities of female bears by age category in North Carolina, 1970-2018.

Human-Bear Interactions

Since 1993, WRC biological staff have recorded human-bear interaction reports (Table 37; Figure 62). A human-bear interaction includes both bear observations and conflicts with bears. This information not only aids in tracking bear population trends, behavior and occurrences, but helps the WRC predict when most interactions may occur (Figures 64, 65, and 66) and identify common sources of conflict so that we can properly address human-bear interactions and provide effective technical guidance to resolve conflicts.

In 2018, observations and complaints about black bears increased 48%, from 1,167 in 2017 to 1,751 in 2018 (Table 38; Figure 62). This was the highest recorded number of human-bear interactions since the NCWRC started recording this data. However, the increase was partly due to the new WRC Wildlife Helpline (866-318-2401), which was started in late 2016 and heavily promoted to the public during 2017 and 2018. As observed in other states that created a statewide 1-800 helpline, the number of phone calls to the agency about wildlife, including bears, increases due to the awareness and ease of this new tool. In 2018, the soft and hard mast was poor, which also contributed to the increase in human-bear interactions. In poor mast years when natural foods are scarce, bears travel more to find food, making it more likely they will encounter people. In poor natural food years, bears are also more attracted to unnatural food sources (e.g., trash, bird feeders). As in past years, the MBMU had the highest number of human-bear interactions (77% of total phone calls), particularly District 9, which comprised 66% of all interactions (Table 38). The high number of human-bear interactions in District 9 is largely driven by the high human population in Buncombe County, coupled with high bear densities in this area, due to limited hunter access, topography and habitat that aids in bear dispersal, and the high amount of artificial food resources in and around Asheville (e.g., bird feeders, purposeful feeding).

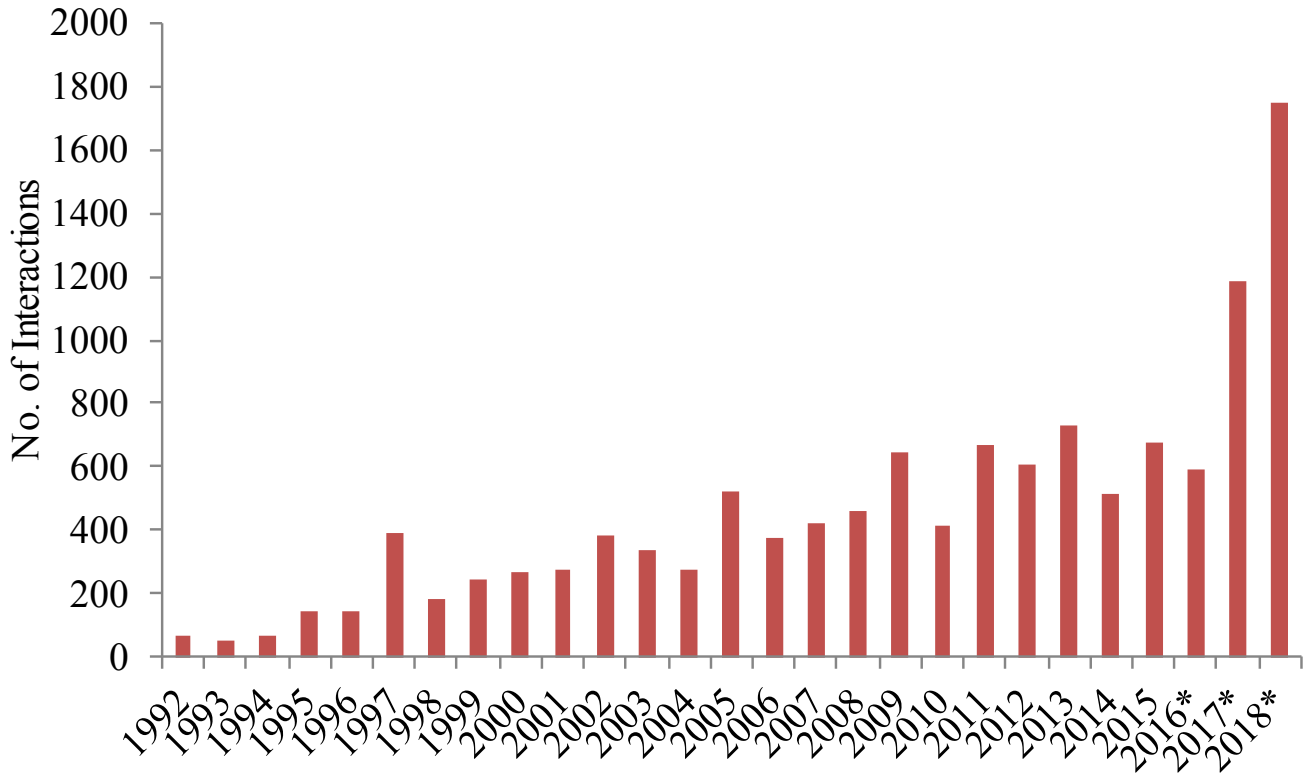


Figure 62. Number of human-bear interactions by year in North Carolina, 1993 through 2018. *Change in how human-bear interactions are recorded and implementation of statewide wildlife helpline number.

Table 38. Number of Human-Bear Interactions Received by the North Carolina Wildlife Resources Commission, 1998-2018.

District	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*	2017*	2018
1	7	9	7	2	6	9	17	30	31	21	44	46	48	53	48	58	70	90	103	93
2	8	3	10	10	8	12	19	14	9	3	27	33	22	25	52	49	40	31	104	157
3	4	2	5	3	0	16	12	13	13	12	22	11	17	14	6	5	6	9	24	39
4	5	6	5	6	7	8	6	5	15	5	9	9	11	17	11	11	14	23	42	36
5	1	4	9	10	8	11	16	12	7	13	11	6	14	12	14	12	18	12	15	30
6	0	1	0	0	0	0	0	4	4	3	3	0	8	3	15	6	6	2	14	13
7	32	4	7	13	15	12	16	29	27	30	34	15	29	24	46	36	39	39	50	93
8	27	40	18	55	82	40	51	37	41	70	91	63	97	70	74	62	63	46	144	129
9	160	201	216	278	226	184	397	232	271	302	405	234	425	385	465	272	419	331	671	1143
Totals	**244**	**270**	**277**	**377**	**352**	**292**	**534**	**376**	**418**	**459**	**646**	**417**	**671**	**603**	**731**	**511**	**675**	**583**	**1182**	**1733**

*New call center created and all Commission staff now reporting phone calls about bears.

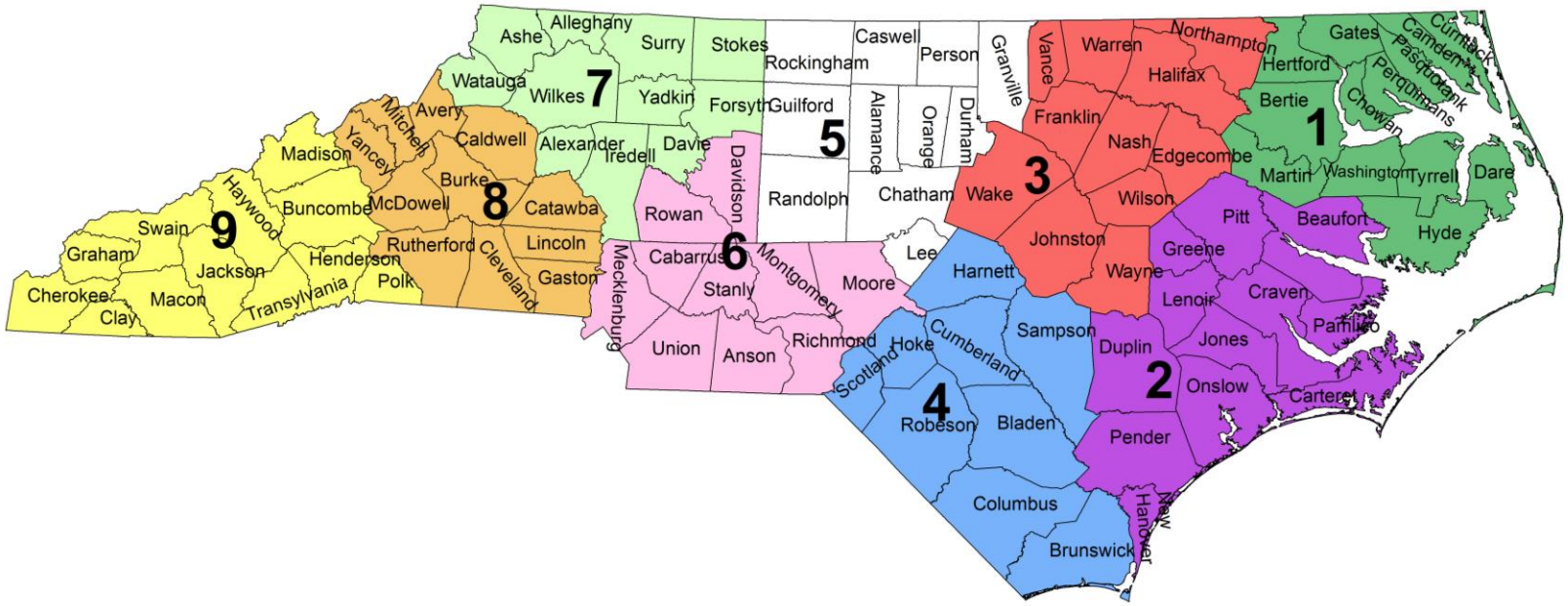


Figure 63. The nine wildlife districts of the North Carolina Wildlife Resources Commission.

Since 1993, a majority of observations and complaints about black bears occur in May through July (Figure 64), when bears are more active due to increased traveling to locate scarce spring natural food resources. Due to scarce natural foods, bears may become more attracted to unnatural foods, such as bird feeders and garbage. May and June are also the time of year when yearling bears are dispersing away from their mothers and more likely to encounter human development and unnatural food sources. Unlike the 26-year trend, monthly patterns human-bear interactions in 2018 were similar to what the Commission observed in 2017, when interactions did not decline into the fall, but actually increased in October, likely due to the poor mast crop that occurred in the MBMU (Figures 64, 64 and 65).

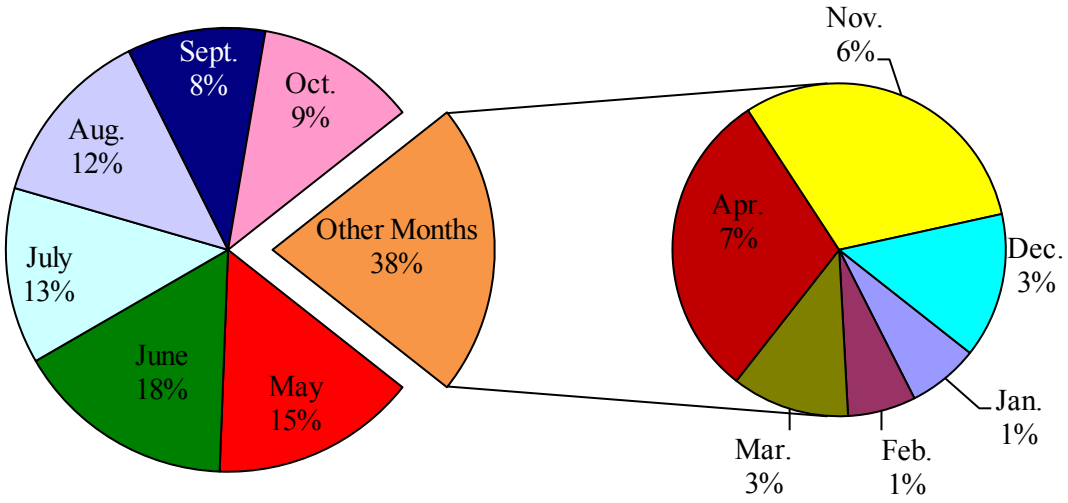


Figure 64. Percentage of statewide black bear observations and complaints by month for 1993-2018.

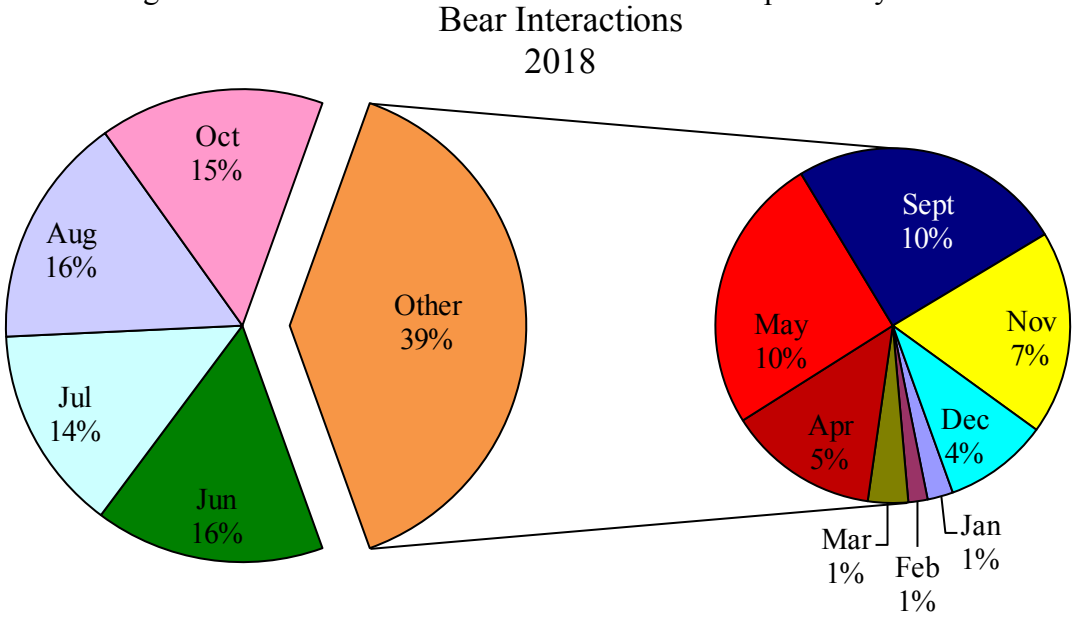


Figure 65. Percentage of statewide black bear observations and complaints by month for 2018.

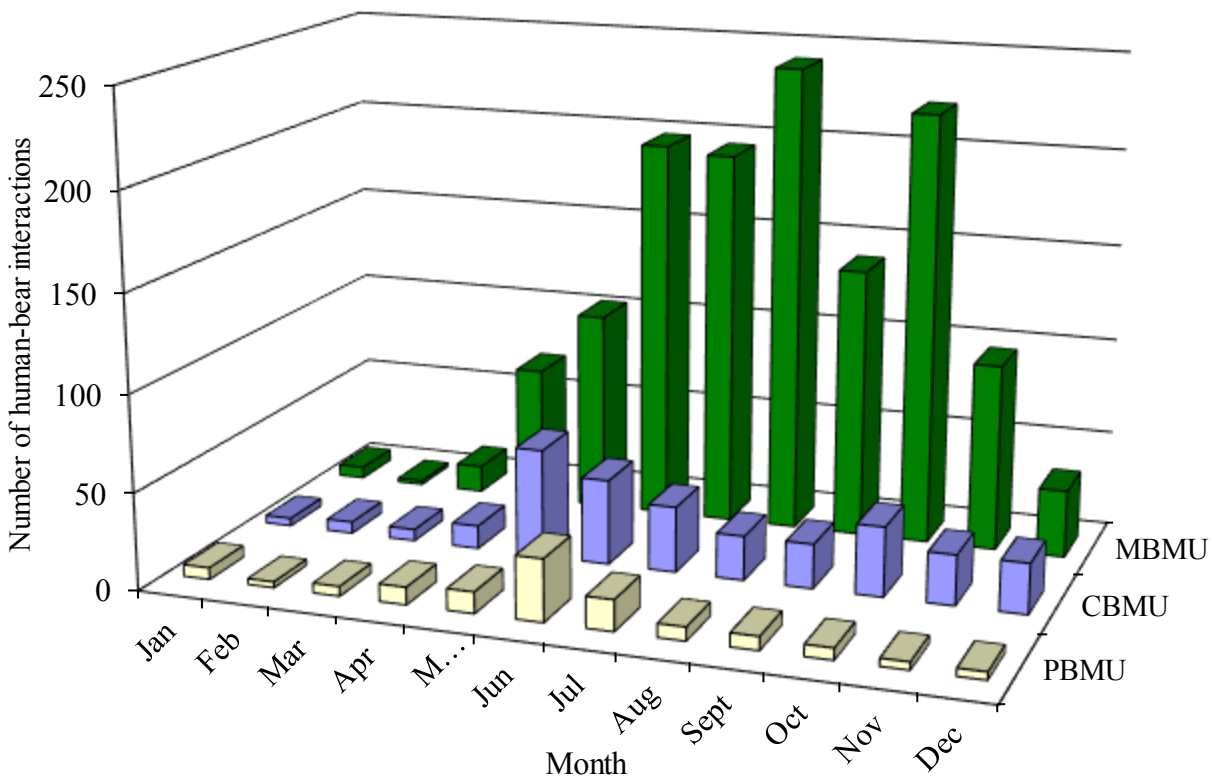


Figure 66. Number of human-bear interactions by month and bear management unit in 2018 in North Carolina.

Hard Mast Surveys

NCWRC personnel have surveyed hard mast in the Mountain Region of North Carolina since 1983. From 1983-2005, North Carolina's hard mast surveys were conducted and reported using a method developed by Whitehead (1969) with slight modifications (Wentworth et al. 1992). Beginning with the 2006 survey, we are using a new protocol and formula for determining mast indices (Greenberg and Warburton 2007). The new protocol only requires simple calculation of percent crown with acorns in the field. In order to maintain consistency with the old technique, the new technique uses statistically verified equations to convert mast index values to numbers previously used with the Whitehead (1969) method. Hard mast results reported in this document utilize the techniques described in Greenberg and Warburton (2007) and are described using the scale used by our agency since 1983. Due to small sample sizes, results will no longer be reported for individual routes for hickory and beech, but overall values for these species will be reported.

The 2018 hard mast survey was conducted by WRC Land and Water Access staff, WRC Wildlife Management Division Private Lands staff, and South Mountains State Park staff on 12 routes in western North Carolina. A total of 1,394 trees were sampled including 539 from the white oak group, 682 from the red oak group, 138 hickories, and 35 beeches. Combining all groups of species, mast was rated as poor, with an overall index of 1.58, which is a decline from last year's mast crop index (3.44; Table 1). Since 1983, North Carolina has experienced 12 years out of 36 years in which the hard mast index was rated as poor. Including only the oak species, mast production rated as poor (1.61; Table 1).

White oak production rated as poor (0.94) and was below both the long-term average (1.86) below last year's index (2.13; Table 1). When the white oak group is separated by species, chestnut oak and white oak production rated as poor (0.62 and 1.32, respectively; Table 2). Red oak production rated as fair (2.14) and below the long-term average (2.83; Table 1) for the species. Separated by species, black oak and scarlet oak rated as fair and northern red oak rated as poor (3.99, 2.41, and 1.89, respectively; Table 2). Hickory production rated as poor (1.58) and below the long-term average (2.34) for the species (Table 1). Beech production (1.11) was poor and below the long-term average (4.04; Table 1).

This season's hard mast crop was the twelfth year since 1983 in which the overall hard mast index was poor. The fall hard mast index was lower in 2018 than in 2017, and was consistently low across most locations, with most areas experiencing poor production. For example, several areas experienced very poor production of white oaks (Table 3; Figures 1 and 2). Red oak productivity (Fair; 2.14) was better than white oak productivity (Poor; 0.94; Table 1). Surrounding states, including Georgia, South Carolina and Virginia, also reported fair to poor hard mast production. Georgia reported poor white oak (1.4) and fair red oak (2.7) productivity. South Carolina also reported poor white oak (2.0) and fair red oak (3.4) and productivity. The overall trend in hard mast production shows a very slight declining trend since surveys were initiated in 1983 (Figure 4).

For the detailed report on the 2018 mast survey, as well as prior years' survey reports, please visit ncwildlife.org/bear and click the "Surveys and Reports" tab, where you will find the link to the "Hard and Soft Mast Survey"

Table 39. Hard Mast Survey Results for Western North Carolina, 1983-2018.

Year	White Oak	Red Oak	All Oaks	Hickory	Beech	Total
1983	1.43	2.59		1.99	5.51	2.25
1984	1.08	2.73		3.05	4.28	2.30
1985	2.01	3.66		0.80	3.06	2.80
1986	1.32	1.98		2.25	5.22	1.90
1987	1.16	0.56		3.57	5.75	1.31
1988	3.16	4.07		2.04	4.25	3.57
1989	0.43	4.89		2.78	6.44	3.14
1990	1.85	2.62		1.20	1.89	2.17
1991	2.38	1.93		3.75	6.89	2.43
1992	1.07	2.45		0.72	1.17	1.78
1993	0.65	3.58		2.43	4.77	2.48
1994	2.06	3.48		2.02	6.20	2.85
1995	2.80	5.60		2.48	0.36	4.22
1996	3.70	1.99		2.81	4.31	2.72
1997	0.53	1.79		1.17	2.35	1.29
1998	2.26	4.68		3.27	4.70	3.69
1999	3.28	2.76		2.80	6.22	3.05
2000	0.50	2.11		2.73	5.71	1.82
2001	2.83	4.92		2.88	3.97	3.98
2002	1.90	3.01		1.75	3.44	2.47
2003	1.24	0.68		3.58	5.42	1.33
2004	3.99	2.93		1.32	1.65	3.09
2005	0.70	3.11		1.86	4.30	2.14
2006	1.70	1.40	1.50*	3.20	4.10	1.80
2007	3.02	1.19	2.04	0.73	2.71	1.90
2008	1.01	2.40	1.76	3.82	4.34	2.06
2009	0.48	2.47	1.55	1.72	5.58	1.67
2010	3.46	3.97	3.75	3.50	0.87	3.66
2011	1.17	2.22	1.74	1.30	4.96	1.76
2012	1.87	2.68	2.31	2.01	3.14	2.29
2013	1.00	1.43	1.23	2.43	4.45	1.44
2014	4.43	4.36	4.42	2.33	1.23	4.10
2015	1.07	2.65	1.92	2.64	5.77	2.09
2016	2.71	2.60	2.66	2.45	4.08	2.67
2017	2.13	4.42	3.40	3.20	5.69	3.44
2018	0.94	2.14	1.61	1.58	1.11	1.58
Average	**1.86**	**2.83**	**2.30**	**2.34**	**4.05**	**2.48**

Numerical Rating = Crop Quality

0.0 to 2.0 = Poor 2.1 to 4.0 = Fair
4.1 to 6.0 = Good 6.1 to 8.0 = Excellent

* Not reported for prior years.

Bait Station Surveys

Bait station surveys in the MBMU were initiated in 1992 to provide the Commission an additional technique for monitoring bear populations. This survey provides monitoring tool that is independent of harvest and human-bear interaction data, which both have biases. The surveys were conducted annually until 2005, then based on recommendations from the Southern Appalachian Black Bear Study Group, changed to every two years. Several other states in the southeast use this tool to monitor trends in the bear population. All surveys are conducted on public lands (i.e., game lands, national forest), where the Commission has long-term access. In 1998, bait station surveys were conducted in the CBMU to see if this technique could be used to monitor the CBMU's bear population. Due to the abundance of natural foods and agricultural crops, which resulted in bears less likely to visit the bait station, as well as the lower amount of public lands to conduct the surveys, it was determined this technique was not an effective tool in the CBMU.

The previous bait station survey was conducted in summer 2017 by LAWA staff. A total of 809 bait stations were set in areas of occupied bear range in western North Carolina during July 2017. After removing 24 stations disturbed by non-target animals, 785 stations were visited 392 times by black bears for a visitation rate of 50% (Figure 67). This rate is a slight increase in visitation rates since 2015. The decline in visitation rates from 2009 through 2013 reflect a host of factors, including record rainfall that occurred during the summer 2013 and changes made to the survey lines in 2011 and 2013. These changes included the removal of several bait stations and survey lines, and the addition of 4 new survey lines. No changes were made to survey lines in 2015.

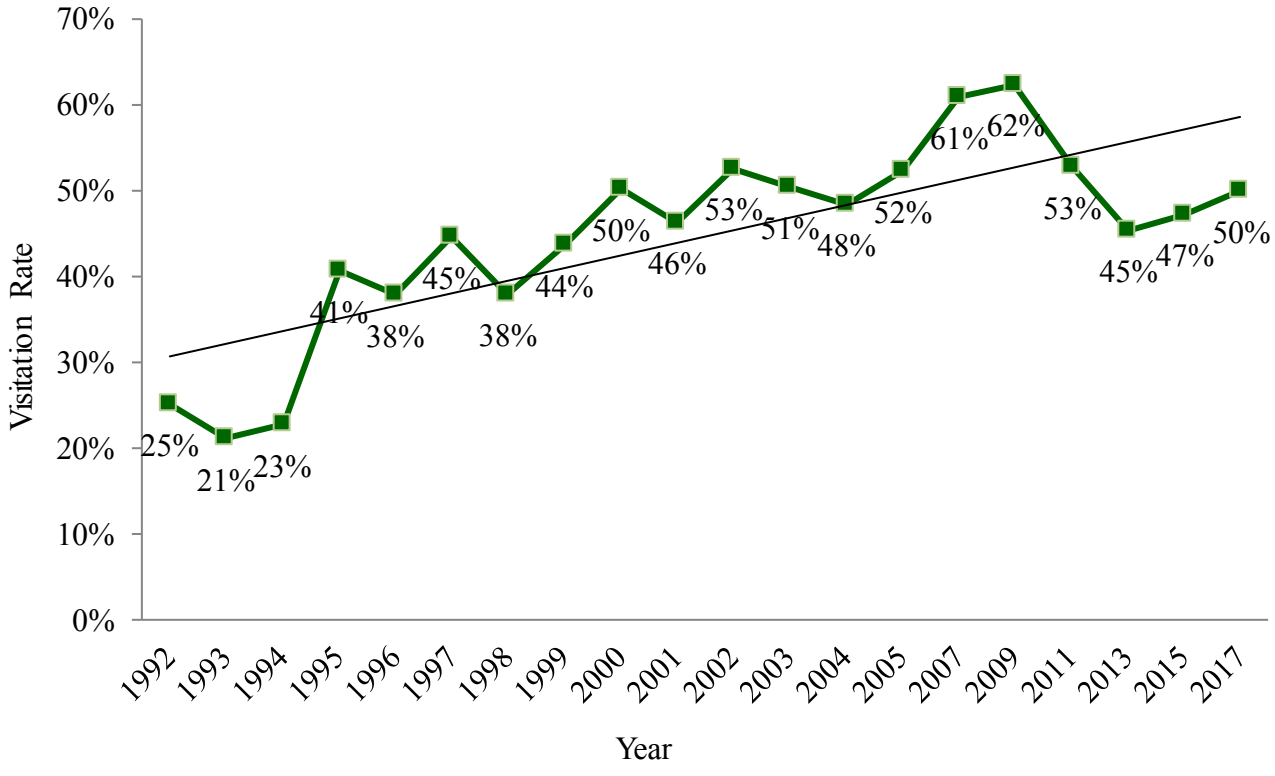


Figure 67. Mountain Black Bear Bait Survey Visitation Rate (%), 1992-2017.

North Carolina Wildlife Resources Commission (NCWRC)
Bear e-Stamp Holder Survey

Attention Bear e-Stamp holder: The NCWRC is conducting this survey to help us make the best management decisions for black bears and bear hunters. Please take a few minutes to complete this important questionnaire, **even if you did not hunt for bears during the 2018 season.**

«First_Name» «Middle_Name» «Last_Name» «Suffix»
«Address_1_»
«Address_2_»
«City» «State_» «Zip» «Zip_4»

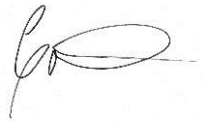
WRC Customer Number:
«WRCcustomernumber»

Your response is very important. Your response will help us determine the annual number of active bear hunters in North Carolina and hunter success rates by harvest method. Your information will also help us determine if changes in harvest levels are due to changes in hunting methods, the number of bear hunters, or actual changes in the bear population. This information will assist us in evaluating both current and future regulations and statutes, as well as management options.

We appreciate you taking an active part in the management of North Carolina's wildlife resources.

Please complete the following bear e-Stamp Holder survey and return it in the enclosed business reply envelope, or complete the survey online at, ncwildlife.org/bearsurvey by using the following access code: <<WRC_#>>

Sincerely,



Colleen Olfenbuttel, Black Bear and Furbearer Biologist

2018 Bear e-Stamp Holder Survey

It is important that you complete and return this survey even if you did not hunt or harvest a bear.

1. What is the most important reason you obtained the Bear e-Stamp? ☑ **Check only one**

24% It was free with my lifetime license (if purchased prior to July 1, 2014), but I did not intend to hunt bears.

4% I did not know I was issued a Bear e-Stamp until I received this survey.

If you checked one of the boxes above, skip Question 2 and <u>please proceed to Question 3.</u>

72% I obtained the Bear e-Stamp, so that I could legally hunt and/or kill a bear during the past 2018 season.

2. Which of these two statements best described your hunting plans for the past 2018 season?

34% I usually hunt bears every year and planned on hunting bears in 2018.

66% I usually don't hunt bears in North Carolina, but planned on hunting bears during the 2018 season because **(check all that apply)**:

61% I might see a bear while hunting other game species.

18% there are more bears where I hunt.

11% Other reason

6% the use of unprocessed bait to harvest a bear was expanded.

3% the bear season in my county was extended.

3. Do you consider yourself a bear hunter? **27%**: Yes **73%**: No

4. Have you hunted specifically for bears in North Carolina *<u>before</u>* the **2018** season?
39%: Yes **61%**: No

5. Which *best* describes your bear hunting efforts *<u>during</u>* the **2018** season:

51% I hunted specifically for <u>other game species</u> (deer, feral hogs, squirrel, etc…), but may have taken a bear had I seen one.

35% I did not hunt for bears during the 2018 season.

14% I hunted specifically for <u>bear</u>.

6. Are you a commercial bear hunting guide for other hunters? **1%**: Yes **99%**: No

7. Are you a hunting party leader for other bear hunters? **6%**: Yes **94%**: No

8. Hunting by County (*skip this question if you did not specifically hunt for bears during the 2018 season*):

Still/Stand Hunting Results:

Bear Management Unit	Est. # of hunters	Number of Days You Hunted	Reported Harvest	Effort (Harvest/Days)	Success Rate
CBMU	4,300	26,625	344	3.55	25%
MBMU	1,719	10,876	112	2.83	20%
PBMU	344	3,022	5	0.46	11%

Dog Hunting Results:

Bear Management Unit	Est. # of hunters	Number of Days You Hunted	Reported Harvest	Effort (Harvest/Days)	Success Rate
CBMU	3,893	31,755	354	3.06	22%
MBMU	2,510	33,672	185	1.51	18%
PBMU	50	201	2	2.74	4%

9. Did you harvest a bear during the 2018 season:

1%: Yes, while hunting specifically for other game

5%: Yes, while hunting specifically for bear

94%: No, I did not harvest a bear

10. If you harvested a bear during the 2018 season, which hunting method did you use to harvest your bear during the 2018 season?

32%: Still or Stand Hunt *with* aid of bait*

25%: Dog Hunt *with* aid of bait*

17%: Still or Stand Hunt *without* aid of bait

26%: Dog Hunt *without* aid of bait

*bait means unprocessed foods, such as corn, peanuts, and sweet potatoes.

11. Please select from the following to describe why you harvested your particular bear:

37%: Bear was large enough for me

23%: My first bear harvested

11%: Only bear I had the opportunity to harvest

8%: First bear I saw while hunting

6%: Last opportunity for me to harvest a bear for the season

6%: Other

5%: Targeted commonly-seen bear

4%: Bear was fighting/injuring dogs