STATUS OF MINNESOTA BLACK BEARS, 2007

Report to Bear Committee

26 February 2008

Dave Garshelis

with contributions from

Karen Noyce

All data contained herein are subject to revision, due to updated information, improved analysis techniques, and/or regrouping of data for analysis.

TABLE OF CONTENTS

Key points: 2007 bear harvest, nuisance activity, foods & population status

Table 1	Permit applications have been declining since 1998, but increased slightly in 2007, compared to 2006. This may have been in response to the diminished number of permits available. No-quota license sales were the second-highest since the no-quota area was established in 1987. The estimated number of hunters in the field (11,200) was the lowest since 1995.
Fig. 1, Tables 2-3	Permits were reduced in 2007 in 9 of 11 BMUs in the Quota Zone, to reduce hunter crowding and also harvest pressure. Due to this reduction, only 3 of 11 BMUs were undersubscribed. Nearly all surplus licenses were purchased (except BMU 22, BWCAW).
Table 4	Total harvest (3172) for 2007 was close to the 5-year mean (~3100) , although was the lowest in the past 4 years. Harvest by BMU has fluctuated greatly from year-to-year in response to variable food conditions (and hence attraction of bears to bait), as well as varying numbers of hunters. In 2005, the northwestern no-quota area (BMU 11) had a record harvest; in 2007 this area had its second-highest harvest, suggesting an increasing population at this edge of the bear range. BMU 22 had a slightly higher-than-usual harvest, which was highly skewed to females (5M:10F). Of the remaining BMUs, 6 were above and 5 were below their 5-year mean harvest.
Table 5	Statewide hunting success (26-28%, depending on how it is measured; see also Table 1) has been consistent over the past 5 years. Within the quota zone, hunting success was equal to or higher than the previous 5-year mean in all BMUs (in part due to poor success in 2002, when natural food was very abundant). Compared to 2006, 4 BMUs were significantly lower and 4 were higher; in all of these BMUs, the number of hunters was lower than in 2006.
Table 6	As typical for a year with overall “average” fall food abundance, ~70% of the harvest occurred during the first week of the season. This does not vary with the day of the week for opening day (this year opened on a Saturday).
Tables 7-8	The number of wildlife and enforcement personnel submitting bear nuisance tally forms each month was about normal. The number of bear complaints investigated on-site (63) was typical of the past 6 years, whereas the total number of complaints statewide was an all-time low (443; 86% were handled by phone). The number of nuisance bears killed by hunters before the season (25) was higher than during the past 5 years (mean = 8), and more typical of what it was during 1996-2001. Car kills were typical of the past 5 years (mean ~20).

Tables 9-11 Fig. 2	Overall, natural food abundance was above normal in the north-central, and east-central portions of the state. Most summer foods were abundant across the bear range. In fall, wild plum was unusually abundant, but this tree is not common. Among the key fall foods, dogwood was near normal, hazel above normal in much of the range, but oak was below normal in the east-central and especially northwest parts of the range. The paucity of this key food seems to be largely responsible for the high harvest in BMU 11.
Fig. 2	A combination of two key factors, fall food abundance and number of hunters, accounts for 88% of the yearly variation in the harvest. In each of the past 6 years, however, the regression based on these 2 variables predicted a slightly higher harvest than actually occurred.
Fig. 3	Sex ratios of harvested bears reflect both the sex ratio of the living population as well as the relative vulnerability of the sexes to hunters. The statewide harvest sex ratio has ranged from 56-61% male during the past 8 years (Table 1). Harvest sex ratios tend to be more male-dominated and also more variable in the northwestern part of the range (BMUs 11 &12). However, BMU 11 (northwest no-quota) had the lowest sex ratio (highest percent females) since 1995, the last extreme food failure. When foods are reasonably good, a higher proportion of males than females come to hunters' baits, whereas when foods are poor the harvest tends to be more reflective of the population at large.
Fig. 4	Ages of harvested bears also reflect both the age structure of the living population as well as the relative vulnerability of bears to hunters (including hunter selection for larger, older bears). Harvest ages of females (shown in this figure) are more variable than for males, reflecting effects of varying food conditions on vulnerability to hunting (older females increasing in vulnerability in poorer food years). The more heavily-hunted, southerly BMUs have a younger age structure. The northern BMUs show high year-to-year variation in harvest ages due to fluctuating food resources. The females killed in BMU 12 during 2006 were unusually old (median = 6 years; only 1 yearling of 32 females that were aged).
Fig. 5-6	Ages of harvested bears of both sexes steadily declined for about 2 decades (decline in median age and increase in proportion of 1-2 year olds in the harvest), reflecting increasingly higher harvest levels over this period. More consistent harvests during the past 5 years (Table 1) seem to have stabilized the age structure.

Table 1. Bear permits, licenses, hunters, harvests, and success rates, 1986–2007.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Permit applications	20694	19687	25879	24096	24861	25890	26428	27365	30127	29922	30405	27353	30245	29384	29275	26824	21886	16431	16466	16153	15725	16345
Permits available	4730	4810	5310	5520	6370	7140	7920	8630	9400	11950	12030	11370	18210	20840	20710	20710	20610	20110	16450	15950	14850	13200
Licenses purchased (total)	4188	6054	5643	5901	7094	7757	8485	9224	9826	12448	12414	11440	16737	18355	19304	16510	14639	14409	13669	13199	13164	11936
Quota area [a]	4188	4213	4297	4628	5568	6257	6845	7528	8125	10304	10592	9655	14941	16563	17021	13632	12350	9833	10063	9340	9169	8905
Quota surplus/military [a]																235	209	2554	1356	1591	1561	526
No-quota area [a]		1841	1346	1273	1526	1500	1640	1696	1701	2144	1822	1785	1796	1792	2283	2643	2080	2022	2238	2268	2434	2505
% Licenses bought [b]																						
Of permits available [b]	88.5	87.6	80.9	83.8	87.4	87.6	86.4	87.2	86.4	86.2	88.0	84.9	82.0	79.5	82.2	67.0	60.9	61.6	69.4	68.5	72.3	71.4
Of permits issued [b]													84.4	87.2	83.9	69.8	66.3	65.7	68.3	67.1	68.9	70.0
Estimated no. hunters [c]	3900	5600	5100	5500	6600	7200	7900	8600	9100	11600	11500	10300	14500	15900	16800	15500	13700	13500	12800	12400	12400	11200
Harvest	1438	1577	1509	1930	2381	2143	3175	3003	2329	4956	1874	3212	4110	3620	3898	4936	1915	3598	3391	3340[d]	3290[d]	3172
Harvest sex ratio (%M) [e]	59	60	58	57	52	59	50	56	62	47	62	55	55	53	58	56	61	58	57	59	58	57
Success rate (%) [f]																						
Total harvest/hunters	37	28	30	35	36	30	40	35	26	43	16	31	28	23	23	29	14	26	26	26	26	28
Quota harvest/licenses		33	28	36	35	30	41	34	26	42	15	29	25	20	20	28	14	25	26	25	25	28

[a] Quota area established in 1982. No-quota area established in 1987. Surplus licenses from undersubscribed quota areas sold beginning in 2000; originally open only to unsuccessful permit applicants, but beginning in 2003, open to all. Total licenses = quota + quota surplus + no-quota + military (no permit needed).

[b] Quota licenses bought (including surplus)/permits available, or licenses bought (prior to surplus)/permits issued (permits issued more relevant for years when some areas were undersubscribed; see Table 3).

[c] Number of licensed hunters x percent of license-holders hunting. Percent hunting is based on data from bear hunter surveys conducted during 1981–91, 1998 (86.8%), and 2001(93.9%).

[d] Harvest estimated from tallied registration + lost registration data (ascertained from tooth envelopes received without matching registration data)..

[e] Sex ratio as reported by hunters; hunters classify about 10% of female bears as males, so the actual harvest has a lower %M than shown here. In good food years, the harvest is more male-biased.

[f] Success rates in 2001–2007 were calculated as number of successful hunters/total hunters, rather than bears killed/total hunters, because hunters could take 2 bears. In 2007, 63 hunters took more than 1 bear (59 took 2 bears on NQ license, 1 hunter took 1 quota and 1 NQ bear, and 3 hunters took 2 bears on a quota license [illegally]): thus, there were 3172-63 = 3109 successful hunters/11200 total hunters = 28% success.

Fig. 1. Bear management units (BMUs) within quota (white) and no-quota (gray) zones. Hunters in the quota zone are restricted to a single BMU, whereas no-quota hunters can hunt anywhere within that zone.

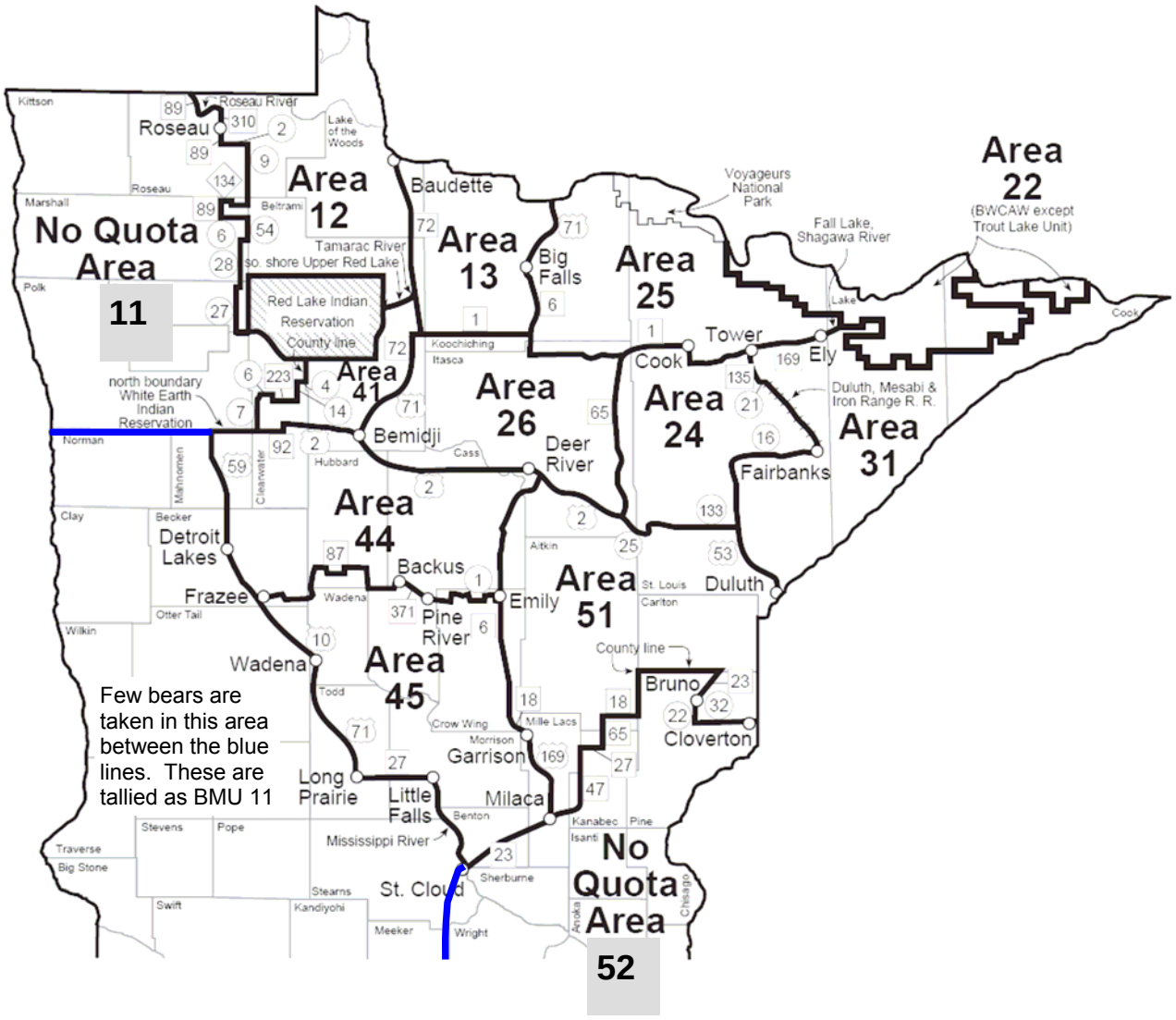


Table 2. Number of bear hunting permits available per year, 2003–2007 (aligned with permit applications in Table 3 below; highlighted numbers show drop from previous year).

BMU	2007	2006	2005	2004	2003
12	500	550	550	700	700
13	700	800	900	900	1100
22	150	150	150	150	250
24	900	1000	1200	1200	1500
25	1700	1900	1900	1900	2400
26	1250	1500	1500	1500	1500
31	1900	2100	2100	2100	2660
41	400	450	450	500	500
44	1500	1700	1700	2000	2500
45	1200	1200	1500	1500	2000
51	3000	3500	4000	4000	5000
Total	13200	14850	15950	16450	20110

Table 3. Number of bear hunting license applicants, and number and percent of available surplus licenses bought, 2003–2007[a].

BMU	2007		2006		2005		2004		2003	
	Apps	Surplus bought	Apps	Surplus bought	Apps	Surplus bought	Apps	Surplus bought	Apps	Surplus bought
12	811		1005		864		808		837	
13	745		680	120 100%	714	186 100%	670	129 56%	668	167 39%
22	87	51 81%	92	58 100%	65	46 54%	73	47 61%	88	26 16%
24	742	159 100%	624	367 98%	749	270 60%	766	259 60%	756	193 26%
25	1799		1789	112 100%	1923		1793	111 100%	1716	317 46%
26	2028		1915		1997		2110		2280	
31	2383		2290		2097	4 100%	2006	92 100%	1996	412 62%
41	577		683		653		601		688	
44	2669		2838		2884		2934		2855	
45	936	266 100%	840	360 100%	927	346 60%	1092	332 81%	1069	461 50%
51	3568		2969	531 100%	3276	726 100%	3613	386 100%	3467	978 64%
Total	16345	476 98%	15725	1548 ~100%	16149	1578 78%	16466	1356 78%	16431	2554 50%

[a] Surplus licenses available beginning in 2001.

Undersubscribed

Table 4. Minnesota bear harvest tally[a] for 2007 by Bear Management Unit (BMU) and sex compared to harvests during 2002-2006 and record high harvests.

	2007										
BMU	M	(%M)	F	Total	2006	2005	2004	2003	2002	5 year mean	Record high harvest (yr)
Quota											
12	71	(57)	53	124	70	165	165	174	104	136	263 (01)
13	93	(57)	70	163	151	205	197	185	116	171	258 (95)
22	5	(33)	10[b]	15	15	8	10	3	7	9	41 (89)
24	75	(56)	59	134	194	144	212	163	101	163	288 (95)
25	201	(54)	168	369	421	404	546	510	328	442	584 (01)
26	167	(53)	148	315	314	285	320	303	171	279	513 (95)
31	229	(58)	169	398	482	445	484	436	301	430	697 (01)
41	55	(53)	49	104	40	104	83	100	51	76	201 (01)
44	191	(57)	142	333	192	273	283	444	183	275	643 (95)
45	59	(52)	54	113	118	107	118	143	36	104	178 (01)
51	314	(56)	243	557	721	505	544	667	300	547	895 (01)
Total	1460	(56)	1165	2625	2718	2759[c]	2962	3128	1698	2653	4288 (01)
No Quota[d]											
11	195	(60)	133	328[e]	120	335	177	200	112	189	351 (05)
52	139	(63)	80	219	400	223	252	270	105	250	400 (06)
Total	334	(61)	213	547	520	581[c]	429	470	217	443	678 (95)
State	1794	(57)	1378	3172	3290[c]	3340[c]	3391	3598	1915	3107	4956 (95)

[a] Harvest data were obtained from registration slips electronic registration, and tooth envelopes. All data for 2007 was e-registration. The following table shows the number of tooth envelopes that had no corresponding registration slip or e-registration (these were added to the harvest tally).

Year	Quota area	No-quota area
2002	46	7
2003	84	13
2004	96	39
2005	179	31
2006	63	15
2007	27	9

[b] Second consecutive year with an unusually high harvest of females in this BMU (BWCAW).

[c] The estimated registered harvest, including those in which registration data were lost and no tooth envelope was received. Values for 2006 do not match column total because other data on table are uncorrected for estimated lost registration data.

[d] Some hunters with no-quota licenses hunted in the quota area, and their kills were assigned to the BMU where they hunted (*n*= 28 in 2006, 27 in 2007). Some quota area hunters also apparently hunted in the wrong BMU, based on the block where they said they killed a bear (*n*= 20 in 2006, 85 in 2007). However, some of these blocks may have been read wrong from the map, so all these were recorded in the BMU where they were assigned, not the BMU of the indicated harvest block.

[e] Second highest harvest for this area. Third highest was 321 bears in 2001.

Table 5. Bear hunting success (%) by BMU, measured as the registered harvest (excluding second bear) divided by the number of licenses sold[a], 2002–2007.

BMU	Mean success 2002-2006	2007		2006		2005[b]		2004		2003		2002	
		% Success	% Taking 2 bears[c]	% Success	% Taking 2 bears[c]	% Success	% Taking 2 bears[c]	% Success	% Taking 2 bears[c]	% Success	% Taking 2 bears[c]	% Success	% Taking 2 bears[c]
Quota	23	28		25		25		26		25		14	
12	30	36		19		41		33		35		22	
13	28	31		24		32		33		31		19	
22	9	14		14		10		11		4		8	
24	22	20		25		20		27		25		15	
25	31	31		30		30		38		34		23	
26	28	36		30		34		31		29		17	
31	28	28		33		31		33		25		17	
41	22	35		13		31		23		29		14	
44	19	30		16		24		20		26		9	
45	11	14		14		13		12		13		4	
51	19	27		28		18		19		21		9	
No Quota	19	19	(11)	22	(9)	23	(9)	18	(7)	21	(10)	10	(7)
Statewide	23	26		25		25		25		25		13	

[a] Harvest/licenses instead of harvest/hunters because BMU-year-specific estimates for the rate of hunting by licensed hunters are unreliable. Statewide estimates of harvest/hunters are presented in Table 1.

[b] For 2005, estimated registered harvest was used instead of known registered harvest due to a large loss of registration data.

[c] Percent of successful hunters that shot 2 bears; 2nd bear is not included in the calculation of hunting success. The taking of 2 bears was legal only in the no-quota area in 2002–2007.

Table 6. Cumulative bear harvest (% of total harvest) by date, 1990–2007.

Year	Day of week for opener	Aug 22/23 – Aug 31 (9–10 days)	Sep 1 – Sep 7 (7 days)	Sep 8 – Sep 14 (7 days)	Sep 15 – Sep 30 (16 days)
1990	Sat		69	82	96
1991	Sun		64	76	93
1992	Tue		72	86	96
1993	Wed		67	80	94
1994	Thu		67	78	92
1995	Fri		72	87	97
1996	Sun		56	70	87[a]
1997	Mon		76	88	97
1998	Tue		76	87	96
1999	Wed		69	81	95
2000	Wed	57	72	82	96
2001	Wed	67	82	88	98
2002	Sun		57	69	90[a]
2003	Mon		72	84	96
2004	Wed		68	82	95
2005	Thu		72	81	94
2006	Fri		69	83	96
2007	Sat		69	82	96

[a] The large proportion of the harvest taken late in the season in 1996 and 2002 (e.g., >10% in October) was related to the high abundance of food in those years.

Table 7. Number of people participating in nuisance bear survey, 1985 – 2007.

	Apr	May	Jun	Jul	Aug	Sep	Oct
1985	17	29	37	30	26	23	20
1986	37	52	52	51	47	46	32
1987	45	71	75	65	62	52	37
1988	68	74	77	75	73	68	69
1989	67	84	80	85	81	79	66
1990	75	79	80	81	78	74	70
1991	82	83	87	85	82	85	67
1992	74	79	81	85	83	74	62
1993	83	84	82	88	82	81	68
1994	77	88	82	86	83	68	61
1995	74	77	79	83	80	72	61
1996	71	83	84	77	75	67	54
1997	61	69	69	64	62	60	43
1998	34	67	71	63	55	41	33
1999	52	52	40	47	44	39	16
2000	60	58	50	54	42	37	33
2001 [a]	52	54	50	49	42	32	21
2002	50	44	43	46	35	29	19
2003	36	39	34	29	27	25	14
2004	28	33	34	32	32	24	13
2005	35	36	42	36	35	26	20
2006	28	39	46	43	30	29	24
2007	46	41	39	35	40	31	21

[a] Electronic submission of monthly complaint tally beginning in 2001.

Table 8. Number of nuisance bear complaints registered by Conservation Officers and Wildlife Managers during 1985–2007, including number of nuisance bears killed and translocated, and bears killed in vehicular collisions.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of personnel participating in survey [a]	52	75	77	85	81	87	85	88	86	83	84	69	71	52	60	54	50	39	34	42	46	46
Complaints examined on site [b]	972	789	771	1117	1890	935	1562	1010	696	1568	337	661	226	189	105	122	75	81	75	61	57	63
Complaints handled by phone [c]											959	2196	743	987	618	660	550	424	507	451	426	380
Total complaints received											1296	2857	969	1176	723	782	625	505	582	512	483	443
• % Handled by phone											74%	77%	77%	84%	85%	84%	88%	84%	87%	88%	88%	86%
Bears killed by:																						
• Private party or DNR	221	150	134	157	321	97	187	111	67	232	27	93	31	25	25	22	12	13	25	28	11	21
• Hunter before season [d]																						
– from nuisance survey	21	9	44	27	69	14	38	21	28	81	6	32	23	5	7	4	0	3	3	6	2	18
– from registration file	11	9	35	15	50	15	52	30	25	138	18	35	31	24	43	20	11	8	4	13	6	25
• Hunter during/after season [e]	3	6	11	15	21	16	19	8	3	13	0	4	3	0	1	1	0	0	0	1	0	0
• Permittee [f]						20	28	6	3	57	4	7	11	7	2	6	4	6	1	5	4	5
Bears translocated	123	152	109	257	358	214	342	180	171	295	64	115	24	29	1	6	3	1	3	3	3	1
• % bears translocated [g]	13	19	14	23	19	23	22	18	25	19	19	17	11	15	1	5	4	1	4	5	5	2
Bears killed by cars	95	75	46	69	74	50	90	54	40	68	42	52	61	60	39	43	26	25	16	22 [h]	18 [h]	20 [h]

Table 8 footnotes:

---

[a] Maximum number of people turning in a nuisance bear report each month (from Table 7). Monthly reports were required beginning in 1984.

[b] Adjusted for low and variable survey participation during 1981–86.

[c] Tallies of complaints handled by phone were made only during the indicated years.

[d] The discrepancy between the number recorded on the nuisance survey and the number registered before the opening of the season indicates incomplete data.

[e] Data only from nuisance survey because registration data do not indicate whether bear was a nuisance.

[f] A permit for non-landowners to take a nuisance bear before the bear season was officially implemented in 1992, but some COs individually implemented this program in 1991. Data are based on records from the nuisance survey, not directly from permit receipts.

[g] Percent of on-site investigations resulting in a bear being captured and translocated.

[h] Car kill data were reported on the monthly nuisance form for the first time in 2005. In all previous years, car kill data were from confiscation records. Values shown for 2005-2007 are either from the forms or from the confiscation records, whichever was greater (they differed very little).

Table 9. Bear food index values for five survey areas (see map below) in northern Minnesota's bear range, 1984 – 2007. Pink-shaded blocks indicate particularly low index values (<45); green blocks indicate particularly high index values (≥70).

	Survey Area					
Year	NW	NC	NE	WC	EC	Entire Range[a]
1984	32.3	66.8	48.9	51.4	45.4	51.8
1985	43.0	37.5	35.3	43.5	55.5	42.7
1986	83.9	66.0	54.7	74.7	61.1	67.7
1987	62.7	57.3	46.8	67.4	69.0	61.8
1988	51.2	61.1	62.7	54.4	47.3	56.0
1989	55.4	58.8	48.1	47.8	52.9	51.6
1990	29.1	39.4	55.4	44.0	47.9	44.1
1991	59.7	71.2	64.8	72.1	78.9	68.4
1992	52.3	59.9	48.6	48.1	63.3	58.2
1993	59.8	87.8	75.0	73.9	76.8	74.3
1994	68.6	82.3	61.3	81.5	68.2	72.3
1995	33.8	46.5	43.9	42.0	50.9	44.4
1996	89.5	93.2	88.4	92.2	82.1	87.6
1997	58.2	55.5	58.8	62.0	70.1	63.9
1998	56.9	72.8	66.4	72.3	84.5	71.1
1999	63.7	59.9	61.1	63.2	60.6	62.0
2000	57.7	68.0	54.7	69.2	67.4	62.3
2001	40.6	48.7	55.6	62.2	66.0	55.8
2002	53.1	63.4	60.4	68.6	68.3	66.8
2003	59.1	57.5	55.2	58.6	49.7	58.8
2004	57.0	60.5	61.1	70.3	67.9	64.4
2005	53.4	65.9	61.4	59.9	72.6	62.3
2006	51.0	64.9	53.4	51.0	52.1	56.9
2007	68.4	79.0	67.3	67.6	70.0	69.4

[a] Values represent the sums of mean statewide index values for 14 species surveyed. Means were calculated using all surveys completed in the state, not by averaging values from the 5 food survey areas.

Fig 1. Boundaries of Minnesota's 5 bear food survey areas.

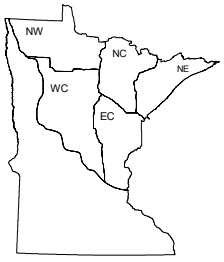


Table 10. Index values of bear food abundance[a] in 2007 compared to the previous 23-year mean (1984-2006) in 5 survey areas across Minnesota's bear range. Pink-shaded blocks indicate poor fruit abundance (abundance index ≥1 point lower than average); green blocks indicate high fruit abundance (≥1 point higher than average).

	NW		NC		NE		WC		EC		Entire Range	
FRUIT	23yr $\bar{x}$	2007 *n* = 14[b]	23yr $\bar{x}$	2007 *n* =16	23yr $\bar{x}$	2007 *n* = 13	23yr $\bar{x}$	2007 *n* = 10	23yr $\bar{x}$	2007 *n* = 9	23yr $\bar{x}$	2007 *n*=44[b]
SUMMER												
Sarsaparilla	4.2	5.4	5.9	6.5	5.4	5.1	4.6	3.6	5.7	5.6	5.0	5.0
Pincherry	3.2	4.0	4.4	6.3	4.0	5.3	4.1	3.4	3.7	4.7	3.8	5.0
Chokecherry	5.4	7.1	5.1	6.0	4.2	4.9	5.4	6.3	4.6	4.9	5.0	6.3
Juneberry	4.7	9.9	4.6	8.3	4.7	6.9	3.6	7.4	4.0	5.9	4.2	7.5
Elderberry	1.5	1.1	3.1	4.8	3.5	4.1	3.2	2.6	3.3	4.3	3.0	3.1
Blueberry	4.8	5.8	5.1	7.4	4.6	7.6	3.5	4.0	3.6	4.7	4.2	5.2
Raspberry	6.4	8.4	7.9	9.9	7.9	8.8	7.0	6.6	6.9	9.3	7.2	7.8
Blackberry	1.4	1.4	2.3	2.3	0.9	0.6	3.3	5.2	4.5	4.0	2.8	2.7
FALL												
Wild Plum	1.9	4.0	1.7	3.4	0.8	1.1	2.6	3.4	2.3	2.5	2.0	3.1
HB Cranberry	5.2	3.7	4.2	5.2	3.4	4.7	3.7	3.4	3.5	3.9	3.9	4.1
Dogwood	5.8	5.7	5.8	5.2	5.0	5.0	5.7	6.6	6.1	5.4	5.6	5.3
Oak	3.3	2.0	2.8	2.5	1.5	1.4	5.8	5.3	5.8	4.4	4.3	3.4
Mountain Ash	1.5	1.0	2.4	2.5	4.4	4.4	1.8	1.7	2.1	1.6	2.5	2.5
Hazel	6.1	8.9	7.5	8.7	7.2	7.4	8.2	8.1	7.8	8.8	7.4	8.4
TOTAL	55.4	68.4	62.8	79.0	57.5	67.3	62.5	67.6	63.9	70.0	60.9	69.4

[a] Food abundance indices were calculated by multiplying species abundance ratings x fruit production ratings.

[b] *n* = Number of surveys used to calculate 2007 area means.

[C] Sample size for the entire bear range does not equal the sum of the sample sizes of the 5 areas because some surveys were conducted on the border of 2 or more areas and were included in tabulations for each area.

Table 11. Regional productivity indices (summed) for oak, hazel, and dogwood, 1984 – 2007. Shaded blocks indicate particularly low (≤ 5.0, yellow) or high (≥7.5, tan) fall food productivity.

	Survey Area					
Year	NW	NC	NE	WC	EC	Entire Range[a]
1984	4.2	7.6	7.0	6.2	7.0	6.5
1985	4.9	2.8	4.2	4.7	5.3	4.4
1986	7.2	5.0	4.0	7.0	6.2	6.2
1987	8.0	7.8	7.3	7.6	8.0	7.7
1988	5.5	7.2	7.3	6.8	6.1	6.7
1989	6.0	5.3	4.1	5.7	6.4	5.8
1990	3.3	4.2	6.4	5.7	6.4	5.2
1991	6.2	6.2	5.4	7.2	7.7	6.7
1992	4.7	5.0	4.4	4.4	6.8	5.1
1993	5.3	7.1	6.7	6.2	7.7	6.5
1994	7.1	7.8	5.8	7.8	7.1	7.2
1995	4.8	4.8	5.1	4.6	5.3	4.9
1996	8.7	8.6	8.1	9.2	8.5	8.6
1997	5.8	5.4	5.1	6.8	6.5	6.2
1998	5.8	6.0	6.3	7.1	7.8	6.7
1999	6.4	5.1	5.9	6.6	6.0	6.2
2000	5.8	7.7	7.2	7.5	8.5	7.0
2001	3.4	4.1	5.7	6.0	6.5	5.2
2002	8.7	7.1	6.6	8.8	8.2	8.1
2003	6.3	6.0	5.5	6.2	6.0	6.1
2004	6.1	5.4	5.4	6.4	6.1	5.9
2005	5.8	5.8	6.1	6.4	7.0	6.2
2006	6.7	6.1	6.0	6.7	5.8	6.3
2007	6.0	5.8	5.7	6.6	6.4	6.2

[a] This value represents the sum of mean statewide productivity index values for hazel, oak, and dogwood. Means were calculated using all surveys completed in the state, not by averaging values from the 5 food survey areas.

Fig. 2. Fall production of primary bear foods, 2007.

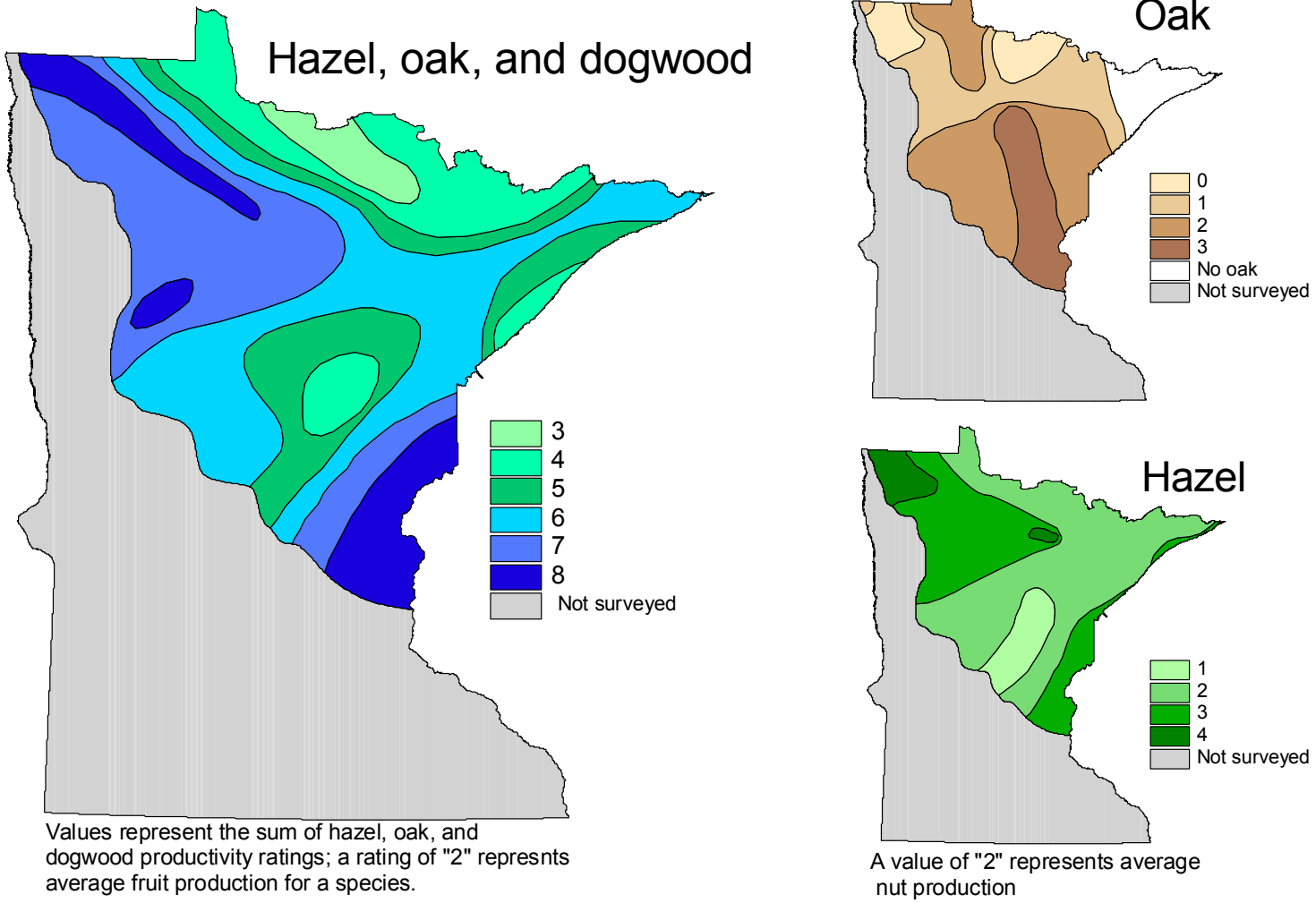


Fig 3. Number of bears killed vs. number predicted, based on fall food abundance and hunter numbers. Prediction for 2007 based on regression from 1984–2006 (R^2 = 0.88).

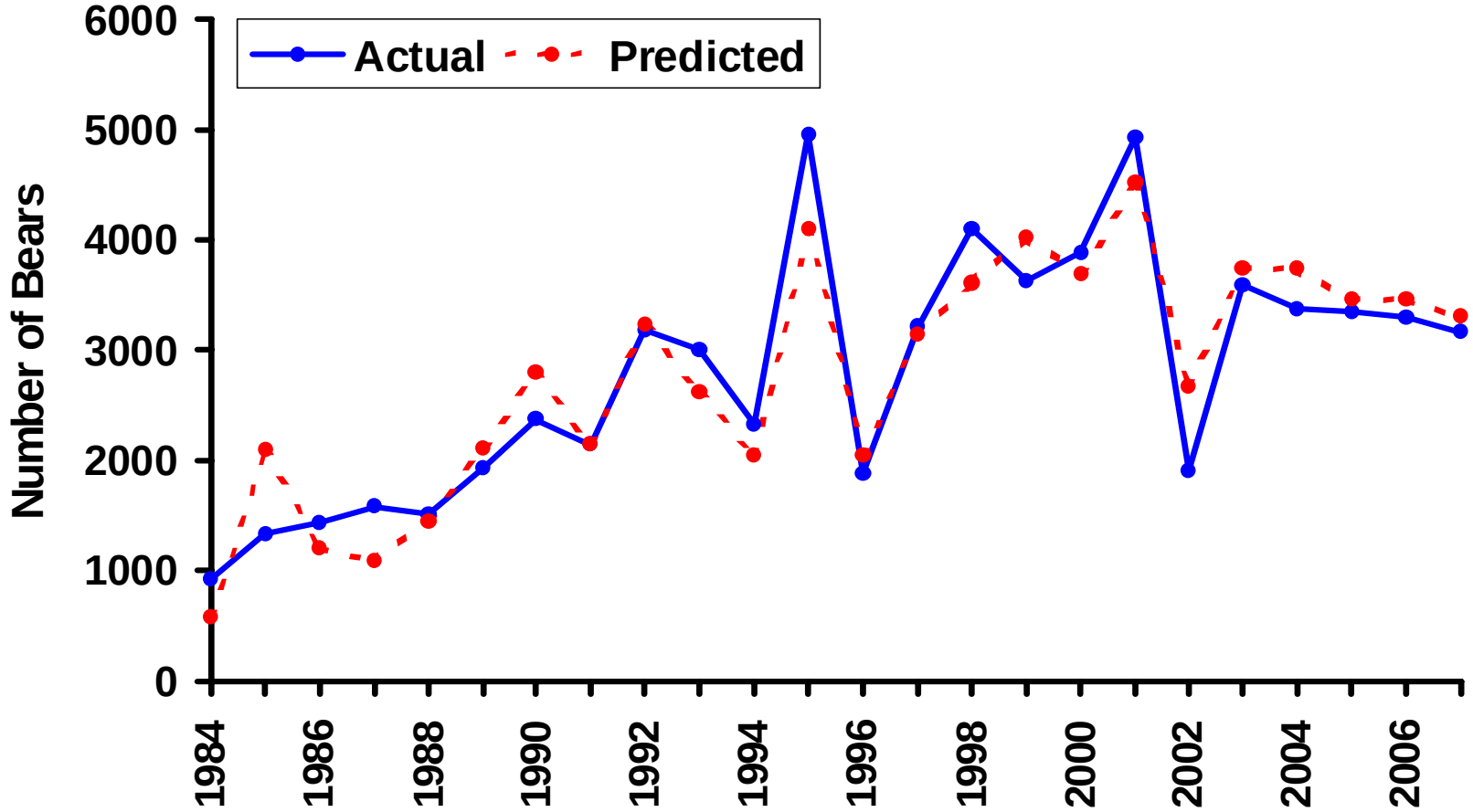


Fig 4. Sex ratios of harvested bears by BMU, 2001–2007

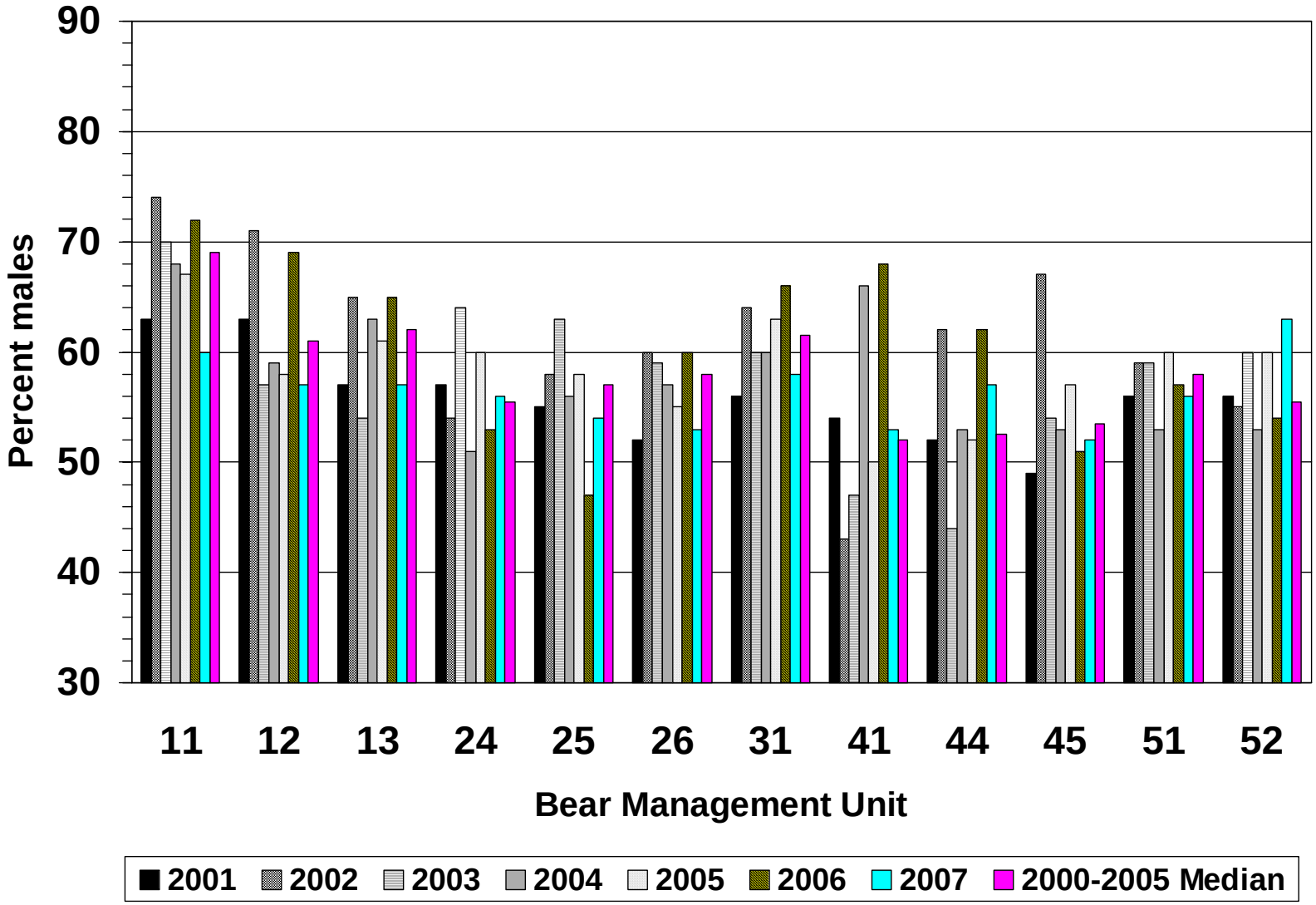
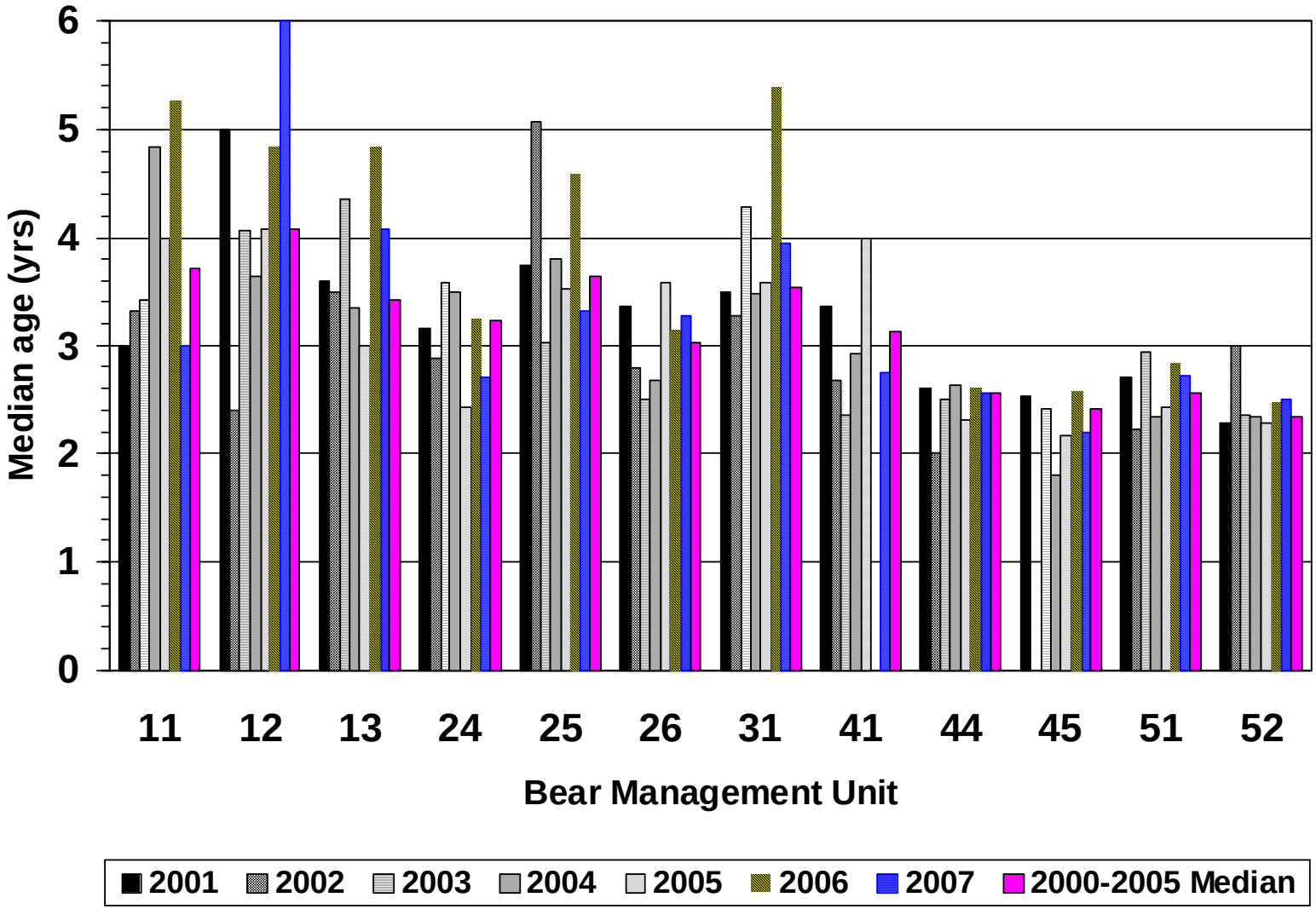


Fig 5. Median ages of harvested female bears by BMU, 2001–2007



Sample size too small in 2002 BMU 45 and 2006 BMU 41

Fig 6. Statewide harvest age structure: median ages by sex, 1982–2007

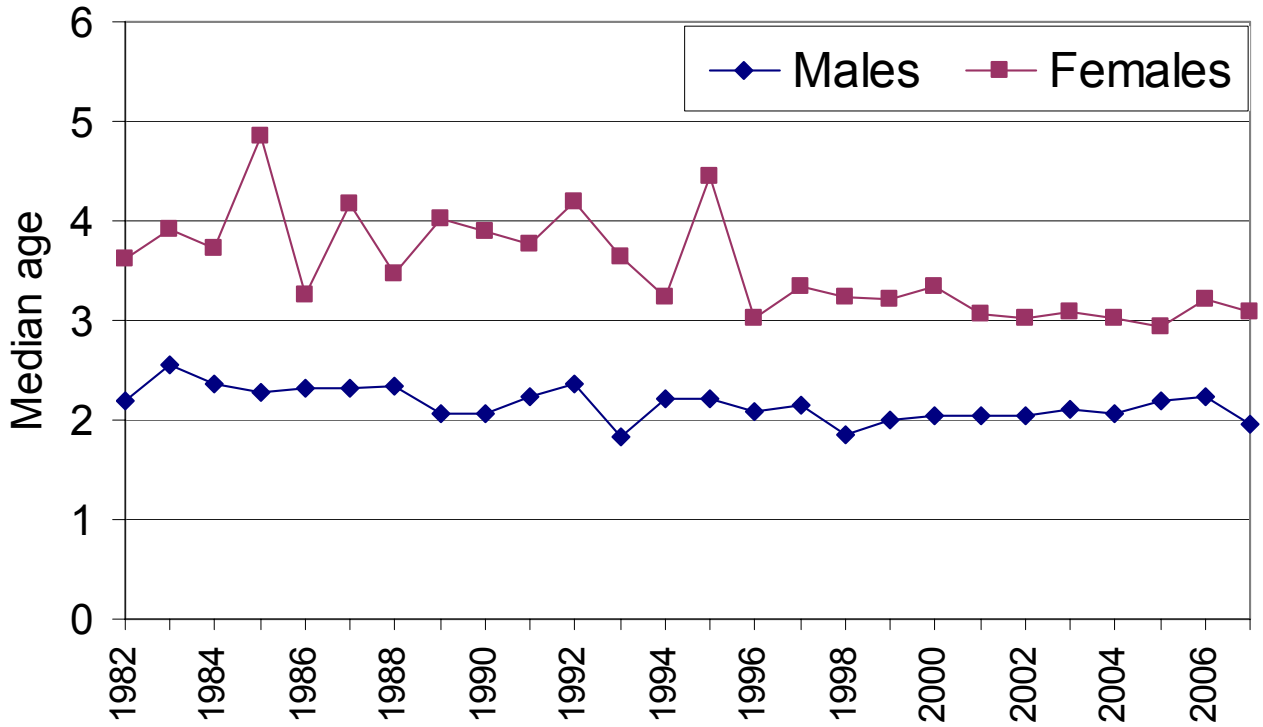


Fig 7. Statewide harvest age structure: proportion of each sex in age category, 1982–2007