

**Soft and Hard Mast Survey Report**  
**Western North Carolina, Summer and Fall 2003**  
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Wildlife Commission personnel have surveyed hard mast in the Mountain Region since 1983. The 2003 hard mast survey was conducted on 11 routes in western North Carolina. A total of 1,181 trees were sampled; including 424 from the white oak group, 591 from the red oak group, 121 hickories, 31 beeches, and 14 black walnuts. Combining all groups of species, mast was rated as “poor” in the mountains with an overall index of 1.33 (Table 1). This “poor” mast index, the 3<sup>rd</sup> lowest recorded from 1983-2003, is within 0.04 of the all-time low recorded in 1997. White oak production (1.24) was poor, and red oak production (0.68) was the 2<sup>nd</sup> lowest ever recorded. Hickory and Beech production were higher than their long-term averages and may provide some relief to animals dependant on hard mast. As in previous years, hard mast production varied significantly by location and species (Table 2). Some areas, such as Fires Creek, Linville, and Santeetlah produced “fair” white oak this year, but 8 of the 11 areas we surveyed experienced “poor” white oak production. In terms of red oak production, Linville Mountain and South Mountains did much better than the other 9 areas surveyed (Table 2). Hickory production was “fair” to “good” in 10 of 11 areas. As in most years, sample sizes were a problem for beech trees in all but 2 areas. Beech has the highest long-term average (4.37) of any major group, and we should consider putting more effort into monitoring this mast resource where possible. In years with “poor” oak production, it may be a critical species for wildlife.

A soft mast survey was implemented during the summer and fall of 1993 to document berry production and abundance. During summer 2003, blueberry, huckleberry and blackberry production were fair while pokeberry production was poor (Table 3). All summer soft mast species, except pokeberry, produced fruit near long-term averages from 1993-2003. As usual, summer soft mast production varied significantly on a local basis with some areas failing to produce any significant fruit of certain species while producing “fair” to “excellent” crops of others (Table 4). This summer’s soft mast appears to have been near average overall but produced varying results across different areas in the Mountain region.

The 2003 fall soft mast indices yielded varying results by species (Table 5). Cherry and blackgum were slightly above long-term averages while pokeberry and grapes produced at levels below long-term averages. As always, local areas experienced variable production of fall soft mast with levels from 0 to 6 depending on species and area (Table 6). As with summer soft mast, the fall soft mast resource varied by species and location and may supplement the poor hard mast crop in some areas.

This season’s hard mast crop is one of the worst we have documented. With white oak and red oak production very low in many areas, mast dependent wildlife may be forced to move over large areas in order to meet winter food needs. Inconsistent soft mast crops will do little to supplement the hard mast shortage in some areas but may provide relief in others. Hickory and Beech, where available, may provide a hard mast alternative for those species able to utilize these resources.

Table 1. Hard Mast Survey Results for Western North Carolina, 1983-2003.

Year	White Oak	Red Oak	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
<b>1983-2003 Average</b>	<b>1.79</b>	<b>2.96</b>	<b>2.39</b>	<b>4.37</b>	<b>2.55</b>

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

Table 2. Hard Mast Survey Results by Area, 2003.

Area	White Oak	Red Oak	Hickory	Beech
Avery Creek	0.71	0.63	3.14	*
Edgemont	0.46	0.91	3.17	*
Fires Creek	2.47	0.75	3.32	3.70
Harmon Den	0.38	0.23	3.30	*
Linville Mtn.	2.17	2.21	3.40	*
Nantahala	1.33	0.22	5.67	*
Poplar	1.04	0.10	3.55	*
Santeetlah	2.86	0.52	5.00	6.36
Sherwood	0.41	0.72	5.11	*
South Mtn.	0.88	1.89	3.50	*
Standing Indian	0.10	0.10	2.45	*

\* Not enough data for a calculation

Table 3. Results of Mountain Summer Soft Mast Surveys, 1993-2003.

Year	Blueberry	Huckleberry	Blackberry	Pokeberry
1993	3.20	3.60	3.80	2.40
1994	3.20	3.50	3.50	1.40
1995	1.90	2.50	3.10	1.20
1996	2.00	2.00	3.40	1.50
1997	2.80	3.00	3.80	2.00
1998	1.90	1.20	3.30	2.33
1999	2.72	2.45	2.90	1.78
2000	2.70	2.72	2.99	1.64
2001	2.27	2.73	2.87	0.87
2002	1.87	2.22	3.55	1.32
2003	2.27	2.74	3.20	1.02
<b>1993-2003 Average</b>	<b>2.44</b>	<b>2.60</b>	<b>3.32</b>	<b>1.58</b>

Table 4. Local Results of Mountain Summer Soft Mast Surveys, 2003.

Area	Blueberry	Huckleberry	Blackberry	Pokeberry
Daniel Boone Area	2.50	1.75	0.50	0.25
Fire's Creek/Santeetlah	1.60	2.80	4.40	1.20
Harmon Den	2.00	2.00	5.00	*
Pisgah Area	3.40	3.00	1.40	0.00
Rich Mountain	2.50	0.50	1.50	0.50
711	*	*	*	*
Mt. Mitchell	1.33	0.00	1.00	1.00
Flattop	*	*	*	*
Standing Indian	*	*	*	*
Thurmond Chatham	3.00	1.33	2.00	1.00
Other U.S. Forest Service	3.40	4.00	5.20	1.20
South Mountains	1.00	6.00	9.00	4.00
Gorges State Park	2.00	6.00	2.00	0.00
Average of all Areas:	<b>2.27</b>	<b>2.74</b>	<b>3.20</b>	<b>1.02</b>

\* Species was not rated because it was not fruiting or was still green

Table 5. Results of Mountain Fall Soft Mast Surveys, 1993-2003.

Year	Pokeberry	Cherry Index	Grapes Index	Blackgum
1993	2.00	2.70	2.10	0.40
1994	3.10	2.00	3.80	1.70
1995	2.70	5.00	2.20	1.80
1996	2.40	1.60	3.30	1.80
1997	4.20	1.30	3.10	0.80
1998	4.63	2.67	2.80	1.50
1999	2.40	2.70	3.25	1.10
2000	2.20	2.70	3.30	1.00
2001	2.80	3.30	4.18	2.33
2002	1.10	2.45	2.73	1.27
2003	2.33	3.00	2.55	2.22
<b>1993-2003 Average</b>	<b>2.71</b>	<b>2.67</b>	<b>3.02</b>	<b>1.45</b>

Table 6. Local Results of Mountain Fall Soft Mast Surveys, 2003.

Area	Pokeberry	Cherry	Grapes	Blackgum
Avery Creek	2	4	2	1
Edgemont	2	1	2	1
Fires Creek	1	4	4	2
Harmon Den	2	2	2	1
Linville Mtn.	2	1	1	6
Nantahala	*	4	4	*
Poplar	0	0	0	3
Santeetlah	2	6	6	1
Sherwood	4	4	2	1
South Mountains	6	1	1	4
Standing Indian	*	6	4	*
<b>Average of all Areas:</b>	<b>2.33</b>	<b>3.00</b>	<b>2.55</b>	<b>2.22</b>

\* Species was not rated because it was not fruiting or was still green