Hard and Soft Mast Survey Report
Western North Carolina, Summer and Fall 2004

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Wildlife Commission personnel have surveyed hard mast in the Mountain Region since 1983. The 2004 hard mast survey was conducted on 10 routes in western North Carolina. A total of 1,101 trees were sampled including 375 from the white oak group, 589 from the red oak group, 91 hickories, 31 beeches, 14 black walnuts, and 1 pecan. Combining all groups of species, mast was rated as "fair" in the mountains with an overall index of 3.09 (Table 1). With the exception of 2001's banner crop, this "fair" mast index is the best index we have had since 1998. White oak production (3.99) was almost in the "good" range and actually represents the best white oak crop we have ever documented. Red oak production (2.93) was much better than last year's index of 0.68. Hickory and Beech production were lower than their long-term averages. As in previous years, hard mast production varied significantly by location and species (Table 2). Five areas; Avery Creek, Fires Creek, Linville Mountain, Santeetlah, and Sherwood produced "good" white oak this year, and the remaining five areas experienced "fair" white oak production. In terms of red oak production, Santeetlah produced a "good" crop while Nantahala produced a "poor" crop. The other eight areas produced "fair" red oak. Hickory production was "poor" in all areas. As in most years, sample sizes were a problem for beech trees in all but 4 areas. Beech has the highest long-term average (4.25) of any major group, and we should consider putting more effort into monitoring this mast resource where possible. In years with "poor" oak production, beech 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 2004, blackberry production was good while blueberry, huckleberry, and pokeberry production were poor (Table 3). All summer soft mast species, except blackberry, produced fruit below long-term averages in 2004. 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 below average overall but produced varying results across different areas in the Mountain region.

As usual, the 2004 fall soft mast indices yielded varying results by species (Table 5). Cherry, grape, and blackgum were near long-term averages while pokeberry 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 hard mast crop in some areas.

This season's hard mast crop is the second best we have seen since 1998 and much better than the crops of 2002 and 2003. An all-time record white oak production coupled with normal red oak production should provide substantial amounts of favored food resources for bear, deer, grouse, squirrels, turkey, and many other species this winter despite the poor performance of hickory and beech. Inconsistent soft mast crops will do little to supplement the hard mast crop in some areas but may provide some resources in other areas. Based on results of past seasons, we may see reduced bear harvests due to this year's abundant oak crops.

Table 1. Hard Mast Survey Results for Western North Carolina, 1983-2004.

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
2004	3.99	2.93	1.32	1.65	3.09
1983-2004 Average	**1.89**	**2.96**	**2.34**	**4.25**	**2.57**

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, 2004.

Area	White Oak	Red Oak	Hickory	Beech
Avery Creek	4.78	2.46	1.14	0.4
Edgemont	2.57	2.14	1.0	0.33
Fires Creek	6.14	3.54	0.73	1.82
Harmon Den	2.47	2.77	1.60	*
Linville Mtn.	4.79	2.07	1.44	*
Nantahala	2.65	0.57	0.75	*
Poplar	3.67	3.65	1.0	*
Santeetlah	4.49	5.48	0.27	2.0
Sherwood	4.05	2.66	1.86	*
Standing Indian	2.64	3.03	3.6	*

* Not enough data for a calculation

Table 3. Results of Mountain Summer Soft Mast Surveys, 1993-2004.

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
2004	1.67	1.61	4.25	1.41
1993-2004 Average	**2.38**	**2.52**	**3.40**	**1.57**

Table 4. Local Results of Mountain Summer Soft Mast Surveys, 2004.

Area	Blueberry	Huckleberry	Blackberry	Pokeberry
Daniel Boone Area	1.25	0.75	0.75	0.25
Fire's Creek/Santeetlah	1.40	2.80	6.00	1.60
Harmon Den	2.00	1.00	8.00	2.00
Pisgah Area	2.40	3.00	0.80	0.00
Rich Mountain	3.50	2.50	2.00	0.50
711	*	*	*	*
Mt. Mitchell	1.50	0.75	3.50	0.25
Flattop	1.00	1.00	6.00	4.00
Standing Indian	*	*	*	*
Thurmond Chatham	0.67	0.33	2.33	0.67
Other U.S. Forest Service	1.60	1.60	4.40	1.20
South Mountains	2.00	3.00	4.00	4.00
Gorges State Park	1.00	1.00	9.00	1.00
Average of all Areas:	**1.67**	**1.61**	**4.25**	**1.41**

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

Table 5. Results of Mountain Fall Soft Mast Surveys, 1993-2004.

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
2004	1.67	2.70	3.00	1.44
1993-2004 Average	**2.62**	**2.67**	**3.02**	**1.45**

Table 6. Local Results of Mountain Fall Soft Mast Surveys, 2004.

Area	Pokeberry	Cherry	Grapes	Blackgum
Avery Creek	1	2	3	0
Edgemont	2	2	2	1
Fires Creek	2	4	4	4
Harmon Den	2	0	2	0
Linville Mtn.	2	1	1	6
Nantahala	0	4	0	0
Poplar	2	2	4	0
Santeetlah	2	6	6	2
Sherwood	2	0	4	0
Standing Indian	*	6	4	*
Average of all Areas:	**1.67**	**2.70**	**3.00**	**1.44**

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