**Hard and Soft Mast Survey Report**
**Western North Carolina, Summer and Fall 2005**
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Wildlife Commission personnel have surveyed hard mast in the Mountain Region since 1983. The 2005 hard mast survey was conducted on 11 routes in western North Carolina. A total of 1,136 trees were sampled including 404 from the white oak group, 586 from the red oak group, 99 hickories, 30 beeches, and 17 black walnuts. Combining all groups of species, mast was rated in the very low "fair" range with an overall index of 2.14 (Table 1). This is the second lowest rating recorded since 2000. White oak production (0.70) was in the low part of the "poor" range, but red oak production (3.11) was slightly above the long-term average for the species. Hickory production was below the long-term average for the species, but beech production was close to its long-term average in the "good" range. As in previous years, hard mast production varied significantly by location and species (Table 2). Only the Edgemont and Linville Mountain routes produced white oak above 1.0, and it appears this will be a lean year for white oak acorns in most areas. In terms of red oak production, things were much better with all areas except South Mountains producing levels above 2. Hickory production was variable with levels from 0 to 3.36 depending on the area. As in most years, sample sizes were a problem for beech trees in all but 3 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 reduced 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 2005, blackberry production was good while blueberry, huckleberry, and pokeberry production levels were poor (Table 3). All summer soft mast species, except blackberry, produced fruit below long-term averages in 2005, and this was the same phenomenon we recorded 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 2005 fall soft mast indices yielded varying results by species (Table 5). Pokeberry and blackgum were near long-term averages while cherry and grapes produced 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, fall soft mast varied by species and location and may supplement hard mast crops in some areas.

This season's hard mast crop is one of the lowest we have recorded in recent years with only 2 lower rankings in eight years. White oak production was particularly poor. Hopefully, the slightly higher than average red oak crop will offset the poor white oak crop. Beech, which appears to be a consistent producer in areas where it is found, may supplement reduced oak crops as well. 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 increased bear harvests in local areas due to the low availability of white oak acorns. NCWRC efforts to refine and improve the mast survey technique should be continued.

Table 1. Hard Mast Survey Results for Western North Carolina, 1983-2005.

| 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 |
| 2005 | 0.70 | 3.11 | 1.86 | 4.30 | 2.14 |
| **1983-2005 Average** | **1.84** | **2.97** | **2.32** | **4.25** | **2.55** |

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, 2005.

| Area | White Oak | Red Oak | Hickory | Beech |
|---|---|---|---|---|
| Avery Creek | 0.30 | 2.16 | 3.00 | 3.00 |
| Edgemont | 2.08 | 3.41 | * | * |
| Fires Creek | 0.52 | 5.52 | 2.38 | 5.33 |
| Harmon Den | 0.25 | 2.61 | 1.00 | * |
| Linville Mtn. | 1.39 | 2.58 | 0.00 | * |
| Nantahala | 0.73 | 3.44 | 1.86 | * |
| Poplar | 0.14 | 3.19 | 0.00 | * |
| Santeetlah | 0.72 | 4.35 | 3.27 | 3.78 |
| Sherwood | 0.31 | 2.62 | 1.20 | * |
| South Mountains | 0.19 | 1.05 | 3.36 | * |
| Standing Indian | 0.63 | 2.33 | 1.00 | * |

* Not enough data for a calculation

Table 3. Results of Mountain Summer Soft Mast Surveys, 1993-2005.

| 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 |
| 2005 | 1.57 | 1.41 | 4.07 | 1.48 |
| **1993-2005 Average** | **2.32** | **2.43** | **3.45** | **1.56** |

Table 4. Local Results of Mountain Summer Soft Mast Surveys, 2005.

| Area | Blueberry | Huckleberry | Blackberry | Pokeberry |
|---|---|---|---|---|
| Daniel Boone Area | 1.50 | 1.25 | 0.75 | 0.25 |
| Fire's Creek/Santeetlah | 1.40 | 2.80 | 5.60 | 1.80 |
| Harmon Den | 1.00 | 0.00 | 4.67 | 0.33 |
| Pisgah Area | 1.20 | 1.50 | 0.80 | 0.00 |
| Rich Mountain | 1.50 | 0.50 | 1.50 | 1.50 |
| 711 | * | * | * | * |
| Mt. Mitchell | 1.50 | 0.75 | 3.75 | 0.50 |
| Flattop | 1.00 | 1.00 | 6.00 | 4.00 |
| Standing Indian | * | * | * | * |
| Thurmond Chatham | 1.00 | 0.67 | 2.33 | 0.67 |
| Other U.S. Forest Service | 1.60 | 1.60 | 4.40 | 1.20 |
| South Mountains | 4.00 | 4.00 | 6.00 | 4.00 |
| Gorges State Park | * | * | 9.00 | 2.00 |
| Average of all Areas: | **1.57** | **1.41** | **4.07** | **1.48** |

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

Table 5. Results of Mountain Fall Soft Mast Surveys, 1993-2005.

| 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 |
| 2005 | 2.45 | 2.09 | 1.36 | 1.55 |
| **1993-2005 Average** | **2.61** | **2.63** | **2.89** | **1.46** |

Table 6. Local Results of Mountain Fall Soft Mast Surveys, 2005.

| Area | Pokeberry | Cherry | Grapes | Blackgum |
|---|---|---|---|---|
| Avery Creek | 4 | 2 | 1 | 2 |
| Edgemont | 2 | 2 | 0 | 0 |
| Fires Creek | 2 | 2 | 4 | 2 |
| Harmon Den | 4 | 2 | 0 | 0 |
| Linville Mtn. | 2 | 1 | 1 | 6 |
| Nantahala | 1 | 4 | 0 | 0 |
| Poplar | 2 | 2 | 4 | 0 |
| Santeetlah | 2 | 2 | 3 | 2 |
| Sherwood | 4 | 2 | 0 | 1 |
| South Mountains | 0 | 0 | 0 | 4 |
| Standing Indian | 4 | 4 | 2 | 0 |
| Average of all Areas: | **2.45** | **2.09** | **1.36** | **1.55** |

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