

Western Maryland Mast Survey Summary 2021

Procedure

The annual mast survey is a three-step process that involves assessing the amount of hard and soft mast in specific study areas. In Maryland, surveys are conducted anytime between August 15 and September 1. A quantitative approach is used where individual acorns on specific study trees are counted and averaged. On these same trees a subjective approach is also used where surveyors scan the crown of the tree and estimate the percentage of the crown that contains acorns. Lastly, a qualitative approach is employed throughout the region where surveyors make a general assessment of both hard and soft mast producing trees, shrubs, and herbaceous plants in the study area.

Results

Quantitative Assessment

Acorn abundance is quantified as an average number of acorns per branch for the black oak group and the white oak group (Table 1). A unit average of both the black oak and white oak groups is also expressed below.

	2017	2018	2019	2020	2021
GARRETT					
<i>Black Oak</i>	11.48	0.00	0.00	0.00	17.02
<i>White Oak</i>	4.45	2.78	0.00	4.60	6.80
<i>Unit Average</i>	7.90	1.39	0.00	0.57	11.91
ALLEGANY					
<i>Black Oak</i>	16.40	7.35	22.33	0.75	1.97
<i>White Oak</i>	8.90	8.45	1.43	14.77	1.90
<i>Unit Average</i>	12.65	7.90	11.88	7.76	1.92
WASHINGTON					
<i>Black Oak</i>	10.20	7.28	12.93	71.80	5.75
<i>White Oak</i>	9.40	2.05	1.38	0.00	4.30
<i>Unit Average</i>	9.80	4.66	7.15	8.98	5.04
FREDERICK					
<i>Black Oak</i>	7.25	1.25	4.28	3.25	2.65
<i>White Oak</i>	4.80	0.00	0.00	0.00	0.00
<i>Unit Average</i>	6.04	0.63	2.13	1.63	1.31

Table 1: Quantitative assessment of acorn abundance expressed as an average number of acorns per branch (2017 - 2021).

To more easily see the range of annual variations, annual mast yields are classified according to the following rating system:

- I – Mast Failure
- II – Poor and Spotty
- III – Average
- IV – Abundant
- V – Bumper Crop

	2017	2018	2019	2020	2021
GARRETT					
<i>Black Oak</i>	II	I	I	I	II
<i>White Oak</i>	I	I	I	I	II
<i>Unit Average</i>	II	I	I	I	II
ALLEGANY					
<i>Black Oak</i>	II	I	III	I	I
<i>White Oak</i>	II	II	I	III	I
<i>Unit Average</i>	III	II	II	II	I
WASHINGTON					
<i>Black Oak</i>	II	I	II	V	I
<i>White Oak</i>	II	I	I	I	I
<i>Unit Average</i>	II	I	I	II	I
FREDERICK					
<i>Black Oak</i>	I	I	I	I	I
<i>White Oak</i>	I	I	I	I	I
<i>Unit Average</i>	I	I	I	I	I

Table 2: Mast Abundance Ratings (2017 – 2021).

Subjective Assessment

In addition to a quantitative count, surveyors also employ a subjective assessment of the study trees. In this method, the crown of each tree is scanned with binoculars for 30 seconds and an estimate of the percentage of the crown with acorns is determined and reported in 5% increments (0%, 5%, 10%, etc). This procedure is a standardized method consistent with other states in the southeastern United States. As a result, resource managers from the southeast states can compare mast production trends and look at mast on a large, regional level. The subjective assessment results from study plots in western Maryland are shown in Table 3.

	2017		2018		2019		2020		2021	
	White Oak Group	Black Oak Group								
Garrett County	3.38%	12.13%	1.88%	0.00%	0.00%	0.00%	1.00%	0.00%	22.87%	34.87%
Allegany County	34.75%	36.00%	32.13%	25.75%	4.00%	54.50%	1.75%	34.00%	3.75%	1.45%
Washington County	6.75%	8.25%	1.50%	2.38%	0.50%	5.13%	0.00%	13.62%	1.62%	2.62%
Frederick County	15.25%	21.00%	0.00%	3.25%	0.00%	8.88%	0.00%	7.75%	0.00%	5.75%

Table 3: Subjective Assessment (2017-2021).

Qualitative Assessment

Though oak trees are the primary focus of the annual mast survey, observers are asked to make a general assessment of both hard and soft mast producing trees, shrubs, and herbaceous plants in the study area. There are five rankings of mast production for this portion of the survey; *None, Light, Moderate, Heavy, Species Not Present*. Species surveyed are:

Beech	Blueberry/	Greenbrier	Walnut
Black Cherry	Huckleberry	Hawthorne	Other
Black Gum	Crab Apple	Hickories	
Blackberry/	Dogwood	Oaks	
Raspberry	Grape	Spicebush	

Highlights of the qualitative assessment are as follows:

Garrett County reported beech and apple as *heavy*.

Allegany County ranked hawthorne and walnut as *heavy*.

Washington County reported black cherry and hickory as *heavy*.

Frederick County reported *heavy* production in fire cherry and hickory.

Note: The traditional mast survey plots are conducted on the following public lands; The Garrett County study area is on the Savage River State Forest, Allegany County’s study area is located on Warrior Mountain Wildlife Management Area, the Washington County site is located on the Indian Springs Wildlife Management Area and the Frederick County site is located on the Frederick City Watershed.

Conclusions

As the most abundant mast producing trees in the forests of Western Maryland, oak species are the major focus of mast analyses. Garrett County ranked Poor and Spotty overall in acorn production while Washington, Frederick, and Garrett counties each showed a unit average ranking of Mast Failure.

Years of poor or no mast production can present a challenge to the various wildlife species that depend on acorns as their primary food source. Conversely, abundant mast production allows those same species the opportunity to feed heavily and store valuable energy reserves to help them survive through the lean winter months between growing seasons when natural foods become scarce.

During years of mast shortage, wildlife managers typically observe higher harvest rates by forest game hunters as the fall movements of wildlife species become much more predictable and are of a greater frequency. Likewise, there is often an inverse relationship between hunter harvest rates and higher mast production in the forest. When the woods are rich in food production, game animals typically need not travel as far or often to find the resources they need and are therefore less likely to walk past an occupied hunting stand. Similarly, the amount of agricultural crop damage and the number of wildlife/vehicle collisions are influenced by these same factors of food abundance. Each either increases or decreases inversely to the amount of natural food abundance.

This long-term survey provides data relative to mast production, but is localized at the areas of the study plots and may not necessarily reflect county-wide productivity. Though most tree species react generally to environmental factors (weather, predation, disease) there are always localized variations to be found.