2015 Mast Survey Report

Virginia Department of Game and Inland Fisheries

Katie Martin
District Wildlife Biologist
Virginia Department of Game and Inland Fisheries
107 Foxwood Drive Farmville, VA 23901
katie.martin@dgif.virginia.gov

Gary Norman
Forest Game Bird Project Leader
Virginia Department of Game and Inland Fisheries
P.O. Box 996
Verona, VA 24482
gary.norman@dgif.virginia.gov

The Department of Game and Inland Fisheries, in cooperation with personnel from the University of Virginia, the Smithsonian Institute, the Cumberland Gap NP, two military installations, and the Department of Conservation and Recreation annually survey red and white oak production throughout Virginia. Survey results have proven very helpful in our assessment of changes in deer, bear, and wild turkey harvests since its inception. The availability of acorns also plays an important role in the ecology of other game and non-game wildlife in Virginia. Additionally, the data provide important information for hunters and outdoor writers as they prepare for the hunting seasons.

Thirty-three routes are surveyed annually in Virginia by cooperators from mid-August through mid-September. The method used to monitor acorn production was developed by a panel of scientists with extensive experience studying the ecology and management of oaks. Regional interest was high across many of the northeast and Mid-Atlantic States when this survey methodology was being developed and Virginia is one of at least eleven states that are currently using this survey technique to estimate acorn production each fall. The technique entails estimating the percent crown cover on marked trees along designated routes. The technique was designed to facilitate accurate but quick estimates of the percentage of the crown with acorns (PCA). Observers scan the canopy of marked trees for 30 seconds to derive a rapid, precise estimate of crown cover along the route. Results of each survey are entered into a regional database that is maintained by Dr. Bill McShea at the Smithsonian Institute's Conservation Center. We intend to eventually apply our data to a model that has been developed by Dr. Greenburg of the USFS in Ashville, NC to estimate acorn abundance in further detail. In the meantime, Dave Steffen suggested we compare differences in PCA among years using the study median. The median represents the value of the middle of the data observed. One-half of the annual averages should be above the median and ½ of annual averages should be below the median value. We also include the upper and lower 95% confidence interval so the reader can have an idea of the probability that the interval produced by the method employed includes the true value of the parameter.

White Oak.-- The mean percentage of the canopy of designated routes with marked trees was a disappointing rating of 4 percent. The median score for white oak over the survey period (2007-15) is 14% (Fig. 1). White oak PCA in 2015 was the third lowest since survey inception in Virginia, with only two other years (2008, 2013) having lower annual means. Only 2 sites, both in northern Virginia, had double-digit ratings of percent acorns in their crowns. Kevin Walters reported a score of 25% white oak acorns on Ft. Belvoir while Fred Frenzel reported the highest ranking (37%) on the Lee Ranger District (Table 1). The only good news we can take away from the 2015 season is that white oak mast typically alternates between years, so 2016 should be an improvement!

Red Oak. -- The mean score of percent of red oak acorns in the canopy was 11.3, much higher than the white oak rating (4%). Good scores of acorns in the canopy were seen across the state with noticeable pockets in the north, northeast, south Piedmont, and southwest. Despite the good production relative to white oak, the red oak acorn abundance was half of the survey median (22.5%). Nevertheless, red oak acorns were important to the ecology of many wildlife species in 2015, without which they would have experienced difficult circumstances that may have influenced their over-winter survival and spring reproduction.

One new site was picked up this year and the credit goes to Aaron Proctor; thanks Aaron. We could certainly use more sites in the coastal areas of Virginia. To help make up for this lack of marked survey routes we employ a second mast survey which is completed by the Department of Forestry, Department of Conservation and Recreation and military installation staff across the state. Figure 3 depicts the counties that are covered by either, both, or neither survey. If you would like a copy of the other mast survey contact Gary Norman at gary.norman@dgif.virginia.gov.

Table 1. White oak percent crown acorns (PCA) in Virginia, 2007-15.

Site Number	Site Name	2007	2008	2009	2010	2011	2012	2013	2014	2015
VA-1	Conservation Center	0	2	17	84	1	8	1	39	6
VA-2	Shenandoah NP	23	19	24	64	16	32	5	22	13
VA-3	Lee District	11		33	95	7	80			25
VA-4	Rapidan WMA	15	4	8	57	18	87		18	10
VA-5	Deerfield RD	15	2	56	65	9	18	2		0
VA-6	Highland WMA	36	4			6	87	7	18	1
VA-7	Warm Springs RD	39		18	85	11	45	11	43	2
VA-8	Little North Mt WMA	49	10	15	75	33	85	5	24	1
VA-9	Gathright WMA	24	10	28	83	31	43	3	10	1
VA-10	James River RD	45	5	13	80	30	68	4	57	5
VA-11	Hardware River WMA	36	0		90	20	95	0		12
VA-13	Pedlar RD	18	4	3	30	26	85	2	15	15
VA-14	James River WMA	17	5	50	100	50	88	0	32	41
VA-15	Powhatan WMA	32	8		78	19	0	0	5	
VA-16	Horsepen WMA	37	6	38	53	7	100	10	40	11
VA-17	Glenwood RD	24	6	13	85	37	57	10	10	1
VA-18	New Castle	15	8	63	88	11	65	2	3	0
VA-19	Stoney Creek - Giles Co.	16	27	50	74	4	83	13	21	4
VA-20	Dismal - Giles & Bland Co	16	48	78	68	13	38	5	10	30
VA-22	White Oak Mt. WMA	40		46	83	28	40	1	41	13
VA-23	Fairystone Farms WMA	61	0	90	95	37	55	3	21	31
VA-24	Round Mt.	22	32	68	93	12	100	18	8	17
VA-25	Clinch Mt. WMA	20	15	43	65	13	73	26	16	7
VA-26	High Knob	9	5	48	70	6	58	1	9	4
VA-27	Walker Mt.	8	5	35	93	24	73	13	23	5
VA-28	Mt. Rogers NRA	11	20	65	80	35	Dropped			
VA-29	Briery Creek WMA	60		85	85	44	75	13	30	20
VA-30	Quantico MCB	36	9	78	75	21	88	2	15	12
VA-31	Cumberland Gap NP	39	12	88	88	26	100	16	28	3
VA-32	Ft. Belvoir							39	39	50
VA-33	Chickahominy							15	15	2
VA-34	VCU Rice Center							6	27	8
VA-35	York River							20	16	2
VA-36	Ft. Pickett								21	13
VA-37	Southhampton Correctional Center									8
	State	27	10	45	78	20	65	8	23	11

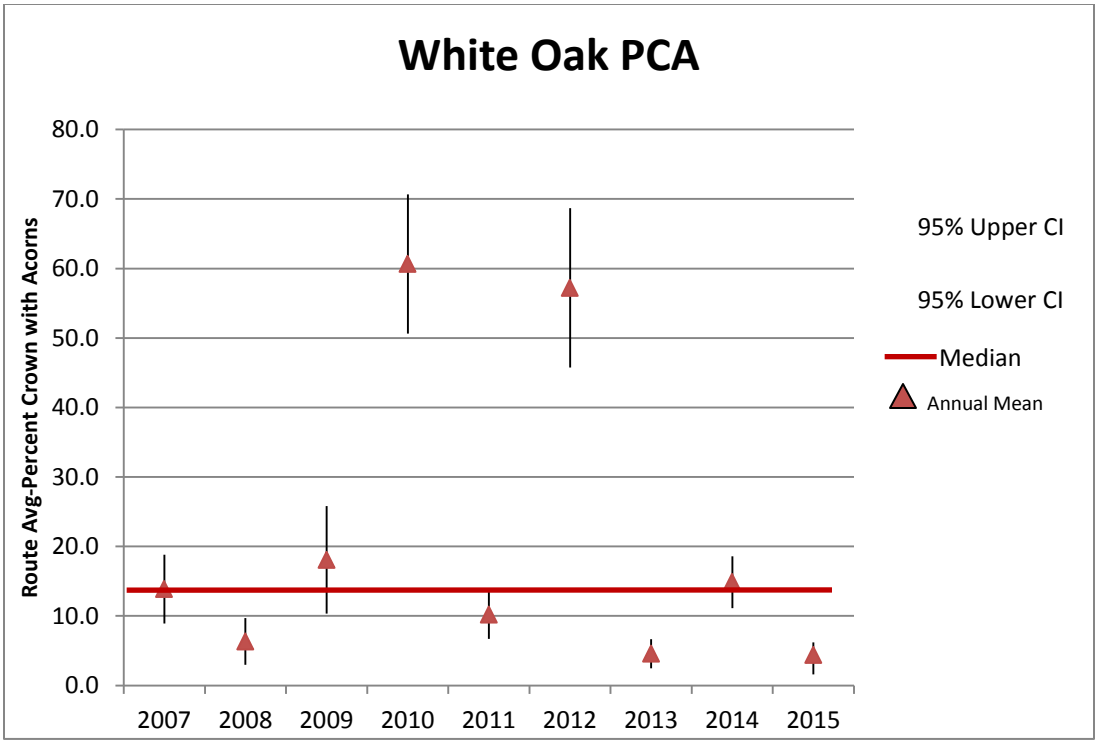

Figure 1. White oak percent crown with acorns (PCA) for 2007-15 in Virginia.

Table 2. Red oak percent crown with acorns (PCA), 2007-2015.

Site Number	Site Name	2007	2008	2009	2010	2011	2012	2013	2014	2015
VA-1	Cons. Center	0	2	17	84	1	8	1	39	6
VA-2	Shenandoah NP	23	19	24	64	16	32	5	22	13
VA-3	Lee District	11		33	95	7	80			25
VA-4	Rapidan WMA	15	4	8	57	18	87		18	10
VA-5	Deerfield RD	15	2	56	65	9	18	2		0
VA-6	Highland WMA	36	4			6	87	7	18	1
VA-7	Warm Springs RD	39		18	85	11	45	11	43	2
VA-8	Little North Mt WMA	49	10	15	75	33	85	5	24	1
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VA-11	Hardware River WMA	36	0		90	20	95	0		12
VA-13	Pedlar RD	18	4	3	30	26	85	2	15	15
VA-14	James River WMA	17	5	50	100	50	88	0	32	41
VA-15	Powhatan WMA	32	8		78	19	0	0	5	
VA-16	Horsepen WMA	37	6	38	53	7	100	10	40	11
VA-17	Glenwood RD	24	6	13	85	37	57	10	10	1
VA-18	New Castle	15	8	63	88	11	65	2	3	0
VA-19	Stoney Creek - Giles Co.	16	27	50	74	4	83	13	21	4
VA-20	Dismal - Giles & Bland Co	16	48	78	68	13	38	5	10	30
VA-22	White Oak Mt. WMA	40		46	83	28	40	1	41	13
VA-23	Fairystone Farms WMA	61	0	90	95	37	55	3	21	31
VA-24	Round Mt.	22	32	68	93	12	100	18	8	17
VA-25	Clinch Mt. WMA	20	15	43	65	13	73	26	16	7
VA-26	High Knob	9	5	48	70	6	58	1	9	4
VA-27	Walker Mt.	8	5	35	93	24	73	13	23	5
VA-28	Mt. Rogers NRA	11	20	65	80	35	Dropped			
VA-29	Briery Creek WMA	60		85	85	44	75	13	30	20
VA-30	Quantico MCB	36	9	78	75	21	88	2	15	12
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	State	27	10	45	78	20	65	8	23	11

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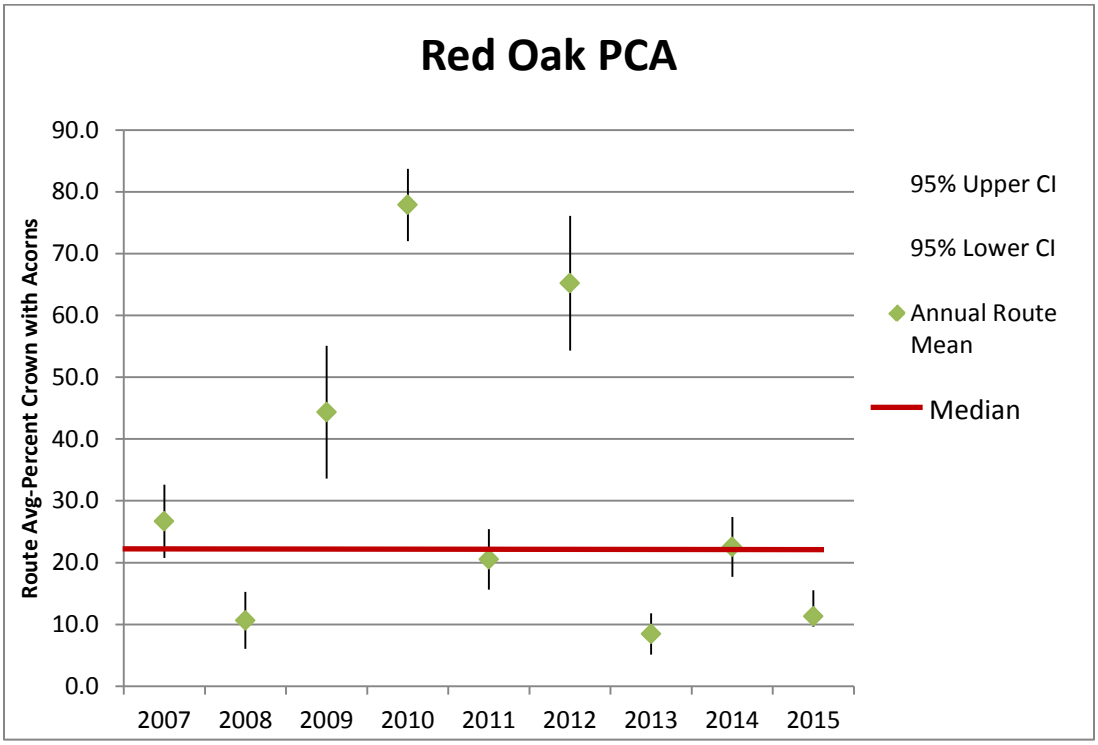

Table 2. Red oak percent crown with acorns, 2007-2015 in Virginia.

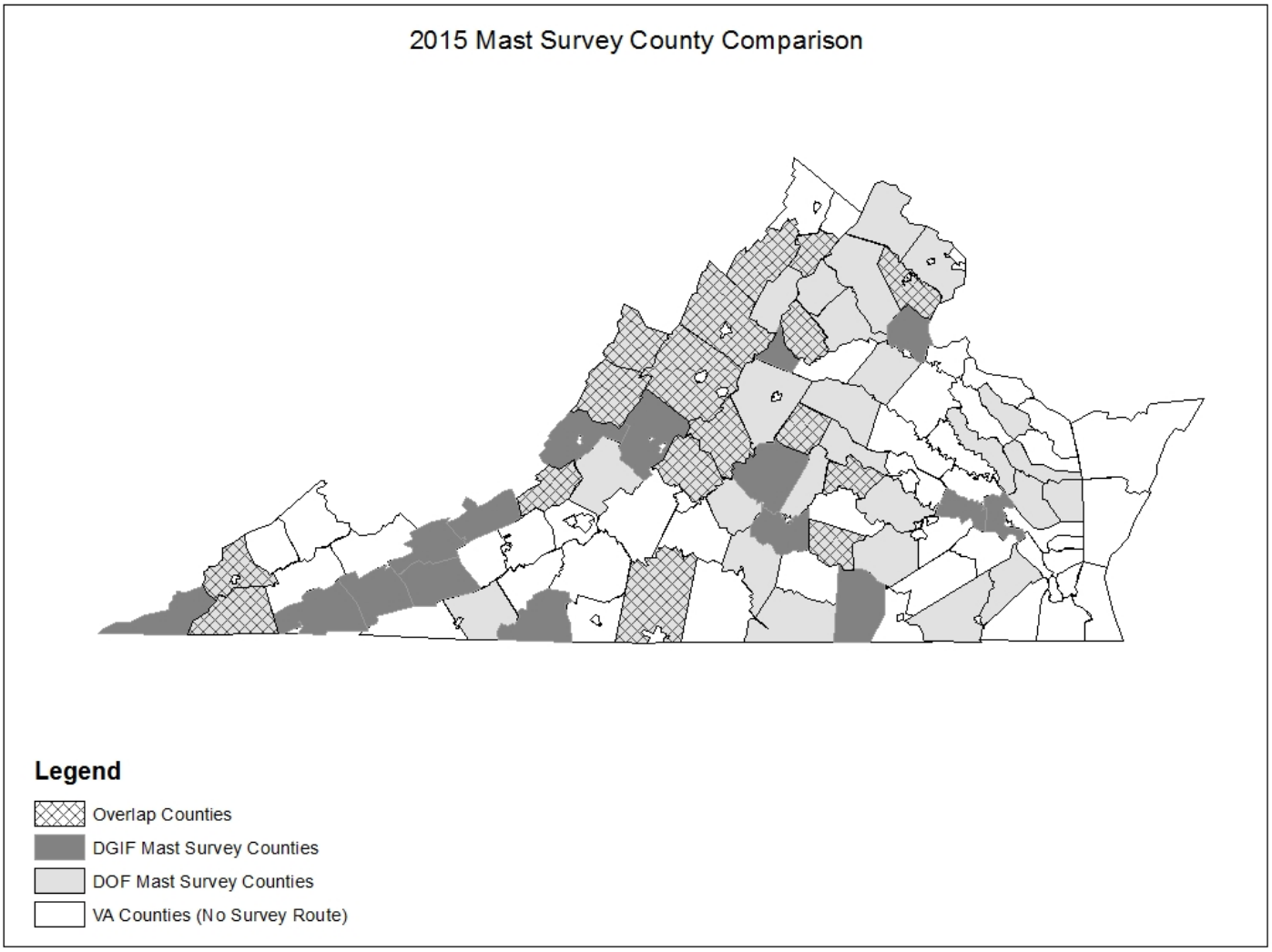

Figure 3: Mast survey type comparison across VA counties.