

2011 WEST VIRGINIA MAST SURVEY AND HUNTING OUTLOOK



AUTHORS

Michael L. Peters
William K. Igo
Christopher W. Ryan
Randy L. Tucker

Wildlife Resources Bulletin Number 11-4

**WEST VIRGINIA DIVISION
OF NATURAL RESOURCES
WILDLIFE RESOURCES SECTION**



Federal Aid Project

funded by your purchase of
hunting equipment

2011 West Virginia Mast Survey

Michael Peters, William Igo, Christopher Ryan and Randy Tucker

The Division of Natural Resources (DNR) in cooperation with the Division of Forestry, annually surveys the State to determine relative abundance of soft and hard mast of important trees and shrubs. Information on the quantity of wildlife food is provided to our cooperators, our hunters, and the news media.

Three hundred two (302) locations covering all regions of West Virginia were surveyed in 2011. Professionals from a variety of disciplines, including wildlife managers, foresters, wildlife biologists, retired wildlife managers and biologists, several conservation officers, one Natural Resources Commissioner, and a few other cooperators devoted their time to collect data. Without the efforts from all of these individuals this survey would not be possible. We sincerely thank everyone and extend our special thanks to retired persons and sportsmen that gave their time and effort without any monetary compensation.

The mast survey is a relative estimation of mast produced by 18 different species. A sample of the mast survey form is included in the Appendix. To collect mast survey information, cooperators are assigned counties and areas familiar to them. Mast data is subjectively evaluated as abundant, common, or scarce. The surveyor also documents species not seen. The mast index is calculated for each species by the following formula:

$$\text{Mast Index} = \left[\frac{\text{abundant observations}}{\text{total observations}} \right] + \left[\frac{\text{common observations} \times 0.5}{\text{total observations}} \right] \times 100$$

The mast index is calculated by species for each ecological region and elevation (high and low). The current year's index is compared to the previous year's index. It is also compared to a long-term average index spanning the life of the survey. Readers not familiar with our regions should refer to Figure 1 to determine the ecological region where they hunt.

Many wildlife species are highly dependent on mast produced by our trees and shrubs. Energy available in mast is more important for survival of many wildlife species than energy available in forage from agriculture crops and herbaceous plants. Seeds and fruits from trees and shrubs are necessary for not only overwinter survival, but also to assure that wildlife is in good physical condition to reproduce. Because of the importance of mast conditions, biologists and wildlife managers are able to forecast black bear, squirrel, white-tailed deer, wild boar, and wild turkey population changes and harvests.

Compared to the 2010 survey, the mast this year decreased considerably (Table 1). All hard mast species except walnut and beech decreased from last year's estimate.

Indices for chestnut oak and white oak decreased 80 and 73 percent, respectively. Apple index decreased only slightly (4 percent). Although black cherry was a heavy producer last year, cherry's index decreased by 90 percent. This is the second year walnuts have increased from the previous year. Walnut abundance increased 78 percent from 2010 levels. Unfortunately, hickory did not fare as well. Hickory decreased by 22 percent. Several soft mast species were also monitored. Greenbrier decreased by one percent from last year. Of the soft mast species, dogwood increased the most from 2010 (31 percent).

This year's mast crop may remind many of the dismal mast crop of 2009. While acorn production in 2010 could easily be described as a bumper crop, the black/red oak index declined 49 percent in 2011. The black/red oak index is only 19 percent below the 41-year average (Table 2). These oaks require two years for the fruit to mature so the index is a product of last year's germination.

Compared to the 41-year average (Fig. 2), the 2011 mast index for all species combined decreased 8 percent below the long term average (index of 43). The largest decrease was observed for black cherry (84 percent). Beech, walnut, yellow poplar, dogwood, crabapple and hawthorn increased above the 41-year average (Table 2).

The statewide index for combined hard mast species (beech, hickory, and oaks) and black cherry was well below the 41-year average (Figs. 3 and 4). Black/red oak appeared to be best in Regions 3, 4 and 6 although they did not produce at levels seen in 2010. Beech and walnut were the big hitters this year. Beech hit especially well in Regions 1, 2 and 4. Walnut appeared to mirror beech production except in Region 4. Because mast abundance can vary at different locations, caution should be exercised when comparing the abundance values of these indices. Nevertheless, the presence or absence of acorn production can be an important predictor in harvest. The 2009 mast crop was one of the worst since we began monitoring mast production. In many places, mast production this year may resemble the crop of 2009. Because we compare mast abundance to the previous year, caution should be exercised when interpreting the indices. Several factors can inflate or deflate the percent change in the index. Therefore, comparisons to the 41-year average should give us a tempered result that is more representative to the true mast condition.

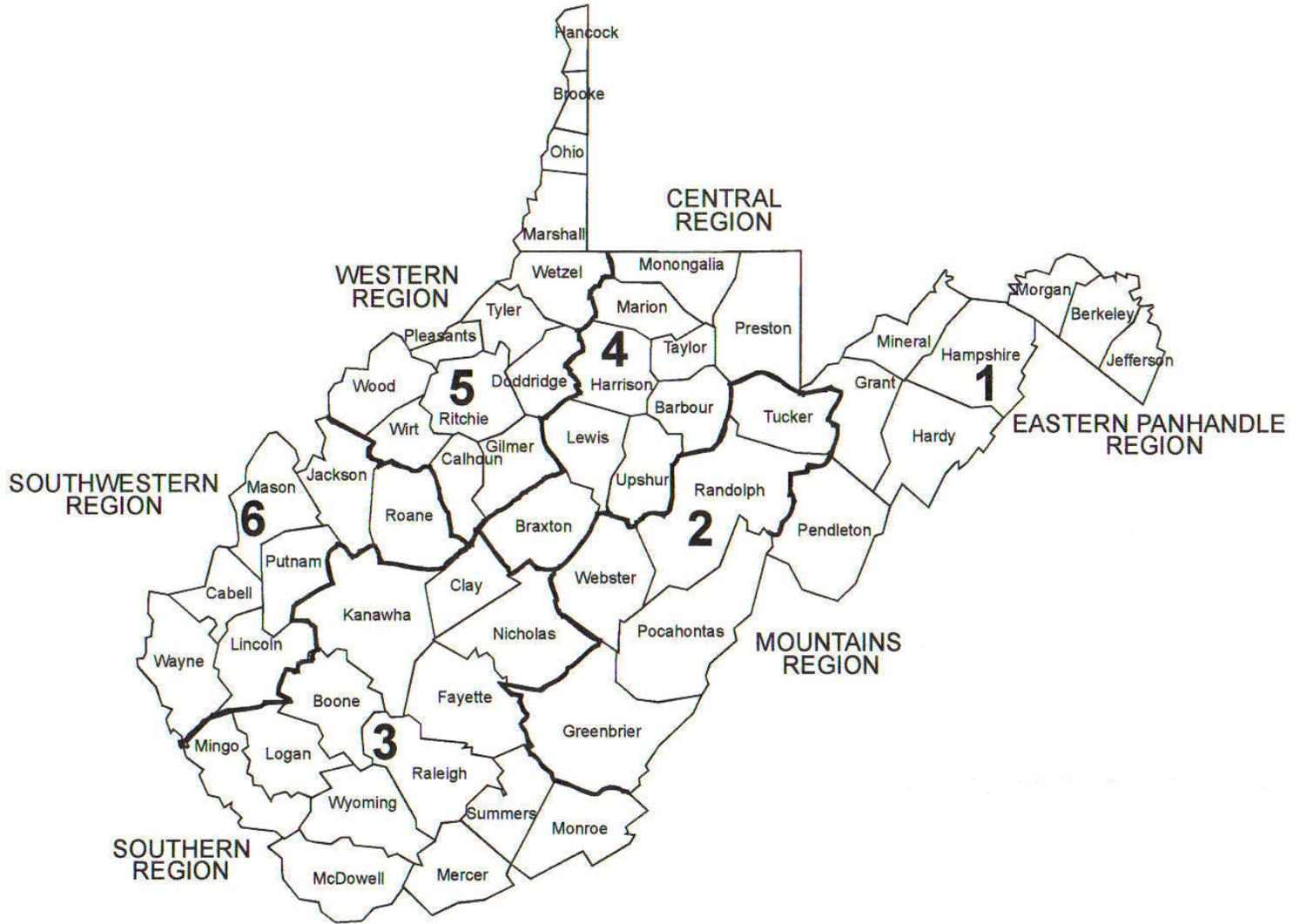
Soft mast species (grape, yellow poplar, hawthorn, crabapple and dogwood) were marginally better than the 41-year average. Blackberry and greenbrier were below the 41-year average by one (1) and 14 percent, respectively. Apple was the only species found at the 41-year average. These soft mast foods are particularly important because of their use by grouse and turkey.

For almost every species monitored, lower elevations statewide had higher indices than at higher elevations. This is particularly true for beech, walnut and hickory. Black/red oak and scarlet oak were found in greater abundance at higher elevations.

When the mast survey began in 1970, our main purpose was to use it to forecast squirrel populations and hunting outlook. Current mast conditions impact overwinter survival and reproductive success of many other wildlife species.

It is recommended that hunters review the regional trends in mast as shown in Tables 3 and 4 to learn of food conditions in their region of the State. There are always some regional differences.

Figure 1. Ecological regions of West Virginia.



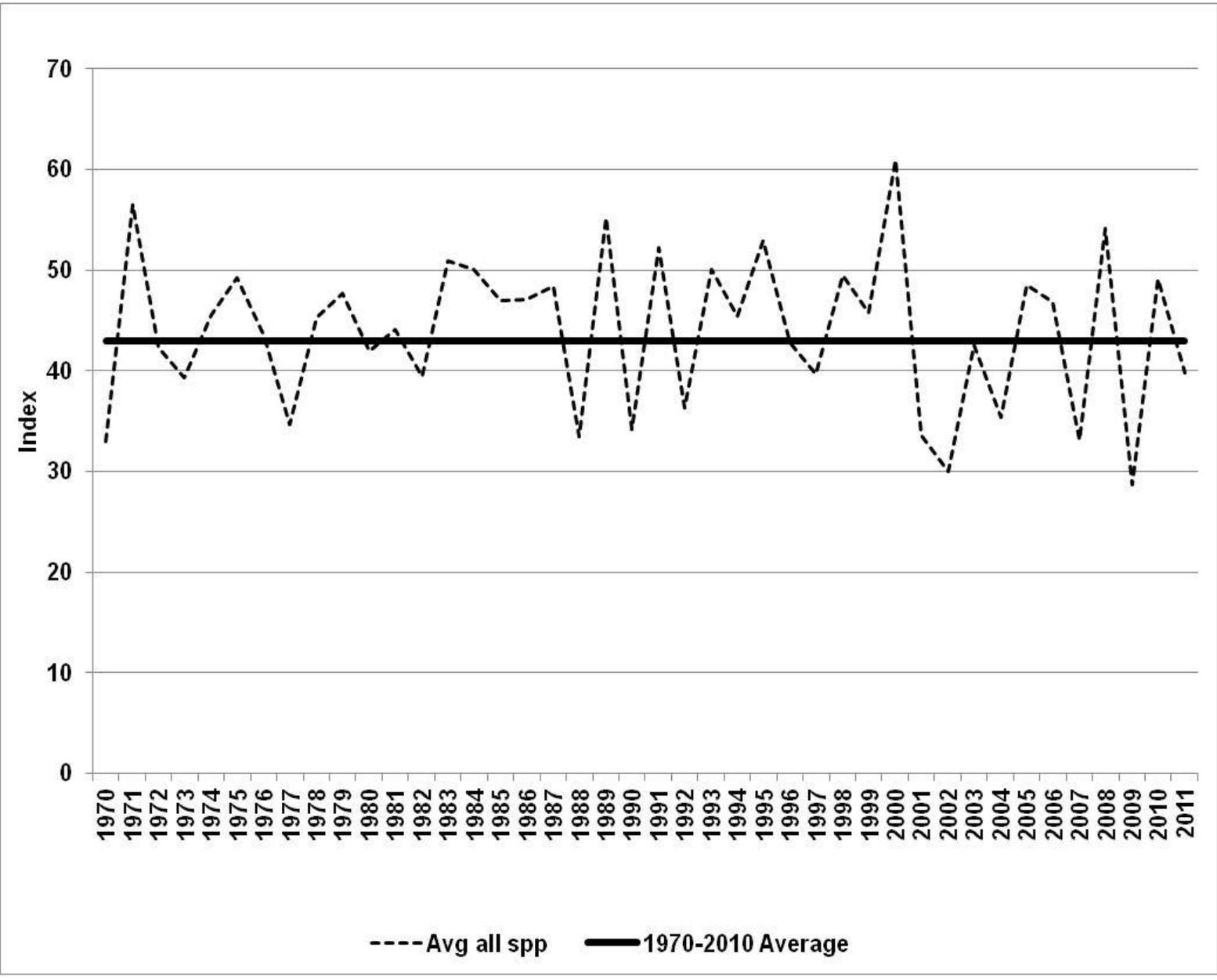


Figure 2. Indices of all mast species combined, 1970-2011.

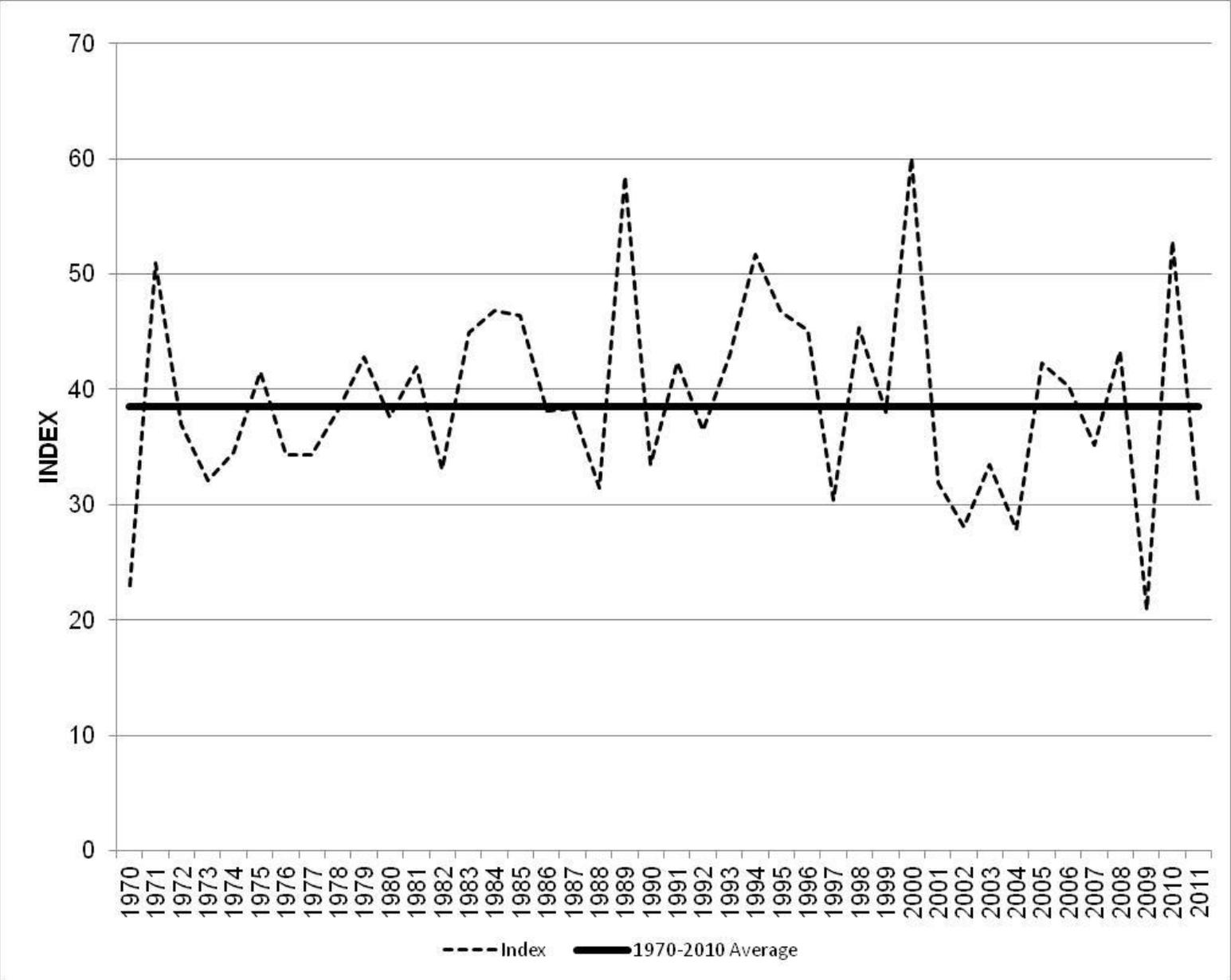


Figure 3. Indices of beech, hickory, oaks and black cherry, 1970-2011.

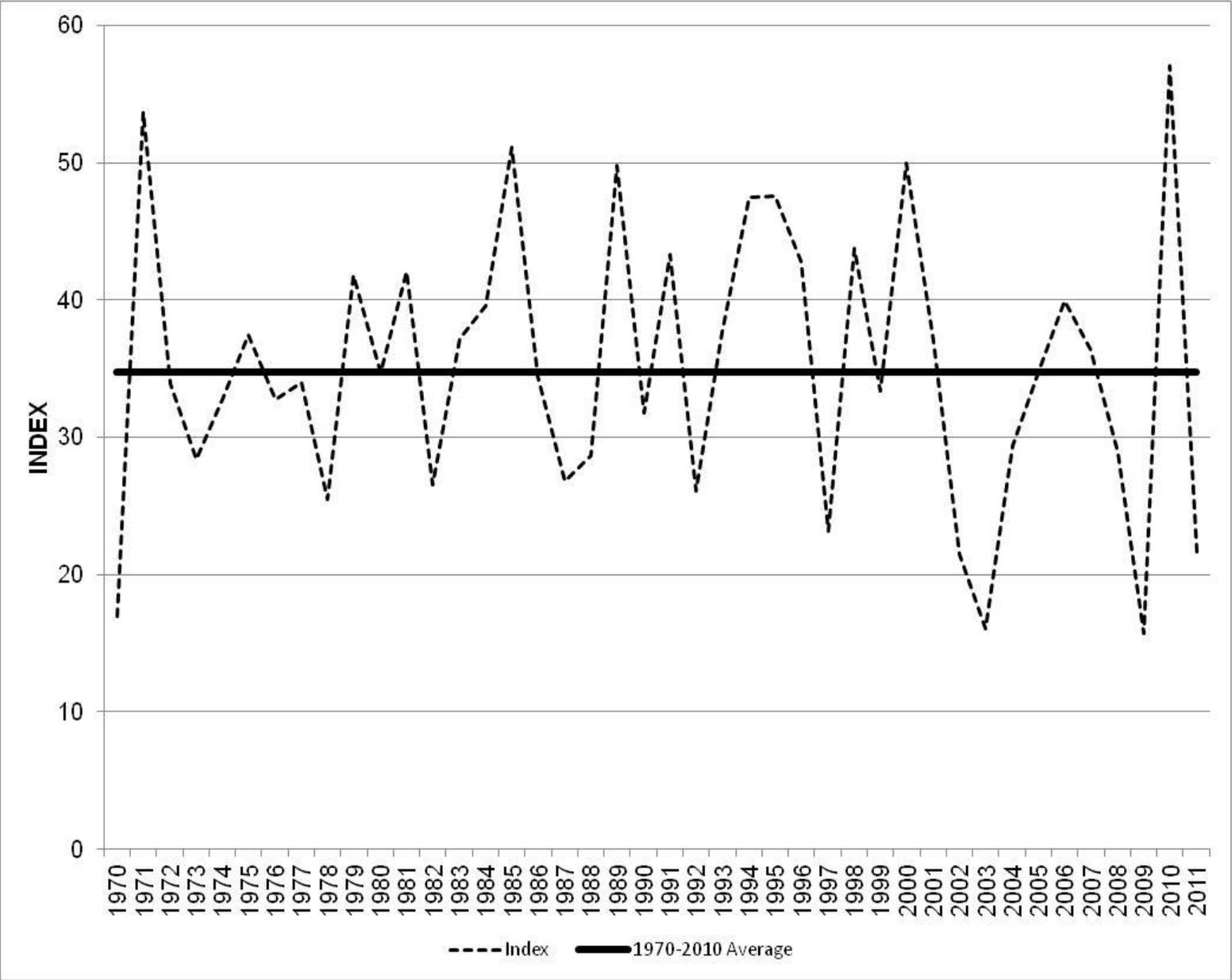


Figure 4. Index of all oaks, 1970-2011.

Table 1. 2011 statewide index compared to 2010 mast index.

Species	2010	2011	Percent Difference
Beech	29	66	131
Walnut	32	57	78
Hickory	54	42	-22
White Oak	66	18	-73
Chestnut Oak	68	14	-80
Black/red Oak	68	35	-49
Scarlet Oak	55	33	-39
Black Cherry	72	8	-90
Grape	43	43	0
Scrub Oak	43	35	-18
Yellow Poplar	45	49	8
Hawthorn	56	58	4
Crabapple	58	61	6
Dogwood	41	53	31
Blackberry	48	50	6
Greenbrier	35	35	0
Sassafras	38	23	-38
Apple	59	57	-4
Other	71	64	-10

Table 2. 2011 statewide index compared to 41-year average mast index.

Species	Avg Index	2011	Percent Difference
Beech	38	66	76
Walnut	37	57	55
Hickory	47	42	-10
White Oak	38	18	-53
Chestnut Oak	33	14	-59
Black/red Oak	43	35	-19
Scarlet Oak	33	33	0
Black Cherry	47	8	-84
Grape	41	43	7
Scrub Oak	36	35	-4
Yellow Poplar	47	49	3
Hawthorn	48	58	22
Crabapple	53	61	14
Dogwood	48	53	12
Blackberry	51	50	-1
Greenbrier	40	35	-14
Sassafras	37	23	-37
Apple	57	57	0
Other	68	64	-6

Table 3. Percent difference in mast index by species between 2010 and 2011 by ecological region.

Species	Ecological Region					
	1	2	3	4	5	6
Beech	900	297	89	183	70	38
Walnut	279	160	3	32	226	53
Hickory	-7	-5	-40	-23	-26	-23
White Oak	-71	-43	-75	-85	-82	-73
Chestnut Oak	-80	-88	-71	-93	-81	-64
Black/red Oak	-49	-79	-36	-42	-47	-30
Scarlet Oak	-25	-83	-33	-31	-41	-21
Black Cherry	-98	-97	-86	-96	-87	-67
Grape	-6	69	-5	7	-30	-8
Scrub Oak	-15	72	-61	N/A	N/A	-33
Yellow Poplar	-18	11	6	8	68	5
Hawthorn	-7	41	-1	-20	-17	8
Crabapple	0	43	13	0	-4	-31
Dogwood	63	22	1	45	52	61
Blackberry	13	22	-4	7	36	-28
Greenbrier	-14	6	4	-10	26	6
Sassafras	-57	-29	-43	-27	-27	-24
Apple	-33	90	-34	8	-23	-38
Other	-31	35	-18	-21	-17	-38

Table 4. Percent Change in 2011 mast index by species from average of years (1970-2010) by ecological region.

Species	Ecological Region					
	1	2	3	4	5	6
Beech	80	87	99	57	79	31
Walnut	72	120	31	37	57	36
Hickory	-4	12	-28	-6	-15	-10
White Oak	-40	-16	-53	-78	-66	-53
Chestnut Oak	-53	-73	-33	-87	-64	-35
Black/red Oak	-15	-69	16	-29	-8	15
Scarlet Oak	23	-77	41	-5	4	21
Black Cherry	-97	-95	-76	-94	-81	-48
Grape	8	30	6	8	-16	8
Scrub Oak	-8	-5	-57	75	-100	3
Yellow Poplar	7	-18	3	5	34	-5
Hawthorn	73	32	50	-24	2	15
Crabapple	70	24	32	-5	-10	-10
Dogwood	-13	3	-2	22	61	0
Blackberry	-1	-22	11	-18	40	-6
Greenbrier	-44	-16	-4	-16	14	-17
Sassafras	-54	-44	-26	-33	-28	-30
Apple	-1	42	-15	1	-26	-37
Other	-25	23	-8	-14	-8	-39

2011 West Virginia Hunting Outlook

Michael Peters, William Igo, Christopher Ryan and Randy Tucker

Predictions of hunting success are based on multiple considerations: current and previous years' mast conditions, nuisance complaints, information from other surveys (Spring Gobbler Survey, Bowhunter Survey, Raccoon Field Trial Survey), adjustments in regulations (such as bag limits, permit allocations, additional counties for antlerless season, and season length) and observations provided by field personnel of the Wildlife Resources and Law Enforcement Sections of the Division of Natural Resources (DNR), foresters from the Division of Forestry, retired DNR wildlife managers and biologists, and a few volunteer cooperators. Mast often dictates overwinter survival and reproductive success of many wildlife species the following year. Observations of field personnel were recorded on Hunter Prospects forms (see Appendix). The returned Hunter Prospects forms were summarized by the authors and used as an evaluation tool to aid in determining the hunting forecast.

Weather conditions during last winter were not as severe as the winter of 2009-2010 regarding snowfall and freezing temperatures. As a result, some species such as grouse received the hunting pressure normally expected during the year. Last year's abundant mast crop provided wildlife with enough energy reserves to survive the winter. As a result, winter kills of deer and turkey were expected to be minimal.

This year, several changes in hunting seasons will influence hunter harvest. Season length and number of counties open to fall turkey and black bear hunting have been reduced. The statewide archery deer season will open this year on October 1, 2011. The statewide squirrel hunting season will open this year on September 10, 2011. Please refer to the 2011-2012 Hunting and Trapping Regulation Summary for a complete listing of changes.

Table 1 is a quick chart of predicted statewide harvests of major game species for 2011. Harvests of most game species are expected to be either higher or lower than the harvests of 2010. Projected deer kills by season and regions are depicted in Table 2. Fall wild turkey forecasts are shown in Table 3. Hunting prospects on a regional basis are provided in Tables 4 through 8. Mast conditions vary throughout the state, so hunters will need to scout their favorite hunting spots to help ensure success. Hunters are reminded this outlook is designed to forecast general prospects and is not intended to predict hunting conditions at specific locales—preseason scouting will be a wise venture.

GRAY AND FOX SQUIRRELS

The abundant food conditions of 2010—particularly the enormous quantity of acorns, hickory nuts, and walnuts—resulted in excellent overwinter survival and numerous healthy litters of both gray and fox squirrels. The reported “spottiness” of 2011 mast conditions in many locales will have squirrels concentrated around food sources—hickory trees early, then beech and oak groves later. High bushytail numbers and local concentrations **will result in excellent hunting for the 2011-2012 season**, much improved from last year’s hunting period.

With poorer hard mast conditions observed for 2011 (particularly acorns) and the large squirrel population competing for food, expect poorer overwinter survival and lower productivity in 2012—and a poorer hunting outlook for the 2012-2013 season.

Field surveyors noted squirrels cutting hickory nuts as early as the first week in August. Early hunters in September should still find bushytails in hickories, but proper scouting will be necessary to find trees still with nuts. In many areas of the State, bushytails will be concentrated in red and black oaks along ridges and higher elevations, or in beech stands along hollows and moist slopes.

COTTONTAIL RABBITS

The bunny harvest **should be higher than last year**. Like 2010, good spring and early summer rains produced favorable cover for cottontails, followed by drought conditions in many areas of the State. September rains from Irene and Lee may enhance some grassy covers, but most forbs and other vegetation are through the growth period.

RACCOON

Better hunting is forecasted for 2011. Good mast conditions in 2010 should have resulted in a good carryover of ‘coons through the winter into spring. With this carry over, we would expect good reproduction rate and an increase in population. Poor mast conditions this year, especially black cherry will concentrate these critters on what mast is available (beech, hickory and walnut). The end result, expect to see more of these masked bandits being treed and trapped this year.

WHITE-TAILED DEER

This year's forecast should be **higher** for 2011. All regions should see a higher total harvest this year. The lower harvest in 2010 should mean that there are plenty of larger raked bucks available in 2011. In addition, reproduction was significantly increased in 2011 because of the great mast conditions of 2010 and the additional management units that are closer to their harvest objective. Therefore, we are predicting that hunters should see and harvest more deer in 2011.

All regions are predicting a higher archery harvest because of the poorer mast conditions in 2011. In addition to the incredible reproduction because of the good mast crop of 2010 and higher deer numbers, deer will be concentrated around specific food sources and more susceptible to harvest. This will make for plenty of opportunities to make the stick and string sing at a white-tailed in bow range. Archery hunters will also find deer around field edges as the few available acorns are consumed early in the year.

The buck harvest should be higher compared to the 2010 harvest. Numerous factors contributed to the lower harvest of 2010 but the numbers should rebound this year. While there will be an increased amount of mature bucks, the number of yearling bucks will not be significantly higher because of the poor mast conditions of 2009. However, due to the increased reproduction of 2011 the number of yearling bucks should be even higher in 2012. Cooperators are reporting an increased number of sightings of more mature, better raked bucks likely because of the reduced harvest of 2010 and endless food supply from last fall. All wildlife, including deer, entered the winter in prime condition and were able to come through the spring in better than average shape. Harvest in all regions should be higher this year.

The antlerless harvest should be slightly higher this year. Some counties will have a reduced bag limit in 2011 so hunters should check the hunting regulations closely for the specifics. Antlerless deer should be more concentrated around fields and specific food sources. In addition, the increased number of young born this year will provide hunters with additional recreational opportunities. Antlerless harvests in Regions 2 and 3 should be similar because of the similar hunting season structure and population in 2010 and 2011.

Muzzleloader hunters should see an increased harvest across all regions. Deer should be easier to harvest this year and should allow for plenty of black powder burning chances. Muzzleloader hunters are also reminded to purchase their black bear damage stamp for a chance to harvest a bruin. Every county in West Virginia is now open to some kind of bear gun season.

BLACK BEAR

This is the best of times for West Virginia bear hunters; however, **we are predicting a lower harvest after last year's record kill.** Extended seasons have been continued in 2011 but the poorer mast conditions will reduce the firearm harvest. Black bears should enter their winter dens earlier and will not be available for harvest during the traditional December season. However, gun hunters will still find plenty of bruins during the early September gun seasons in the traditional mountain counties.

The reduced oak mast should make for better bear hunting during archery season. The lesser amounts of food in 2011 will likely concentrate bears around specific food sources and make them more susceptible to the stick and string. Archery hunters should concentrate around black/red oak trees that produced a localized, heavy acorn crop and on beech flats that supplied a healthy supply of beechnuts. Although black cherry is often a favorite bruin food when acorns are in short supply, hunters will not find this food available in 2011. Therefore, hunters should do plenty of scouting and locate places where bruins are regularly feeding on beechnuts or specific black/red acorns.

The number of counties open to bear hunting during the traditional buck season has been reduced in 2011. Therefore, the harvest should be lower during this season. Hunters will still find ample opportunities to concurrently buck and bear hunt in Nicholas, Kanawha, Fayette, Boone, and Raleigh counties. The strong bruin population in these counties provides a unique hunting challenge for numerous West Virginia hunters. Hunters in these areas should scout for black/red or scarlet oak trees that produced acorns. Bruins will likely concentrate around these locations and may be easier to pattern than in previous years.

Although the bruin harvest should be reduced in 2011, hunters should not fear that the population is in jeopardy of a serious decline. Rather, hunters should take pride that they have cooperated with the DNR's early bear hunting seasons the last few years. This cooperation between hunters, landowners, and the DNR will ensure that bruin populations are maintained at a level that is compatible with the public's desires while ensuring a healthy population for hunting.

WILD TURKEY

Brood surveys in June depicted a poor outlook for turkeys in 2011 - however, July reports were higher than any July since 2007. This usually means a loss of first nests and subsequent reneating, and it appears reneaters did very well. Overall brood counts are higher than 2010 with good reports of higher poult production. Similar to better fall turkey harvests are predicted in the 14 traditional counties of the Eastern Panhandle and Mountains regions.

Counties with a spring harvest of 0.75 gobblers per square mile or more qualify for a two-week fall season and this year include Brooke, Hancock, Marshall, Mason, Ohio, Preston, and Wood counties. Counties with a spring harvest of 0.5 gobblers per square mile up to 0.75 per square mile are eligible for a one-week fall season and this year include Cabell, Harrison, Jackson, Lewis, Mercer, Monongalia, Pleasants, Putnam, Summers, Tyler, Wirt, and Upshur counties. Last year 13 counties were open to the one-week fall season, and 12 were open to a two-week fall season. With six less counties available for fall hunting in 2011, we would expect a lower harvest in “non-traditional” county hunting.

Mast conditions should play an important role in the fall turkey harvest of 2011. Abundant food supplies in 2010 had birds widely scattered and often in remote areas difficult to hunt. This year’s poorer food conditions should have flocks more concentrated, some around fields, and more available to hunters. Therefore, the **overall 2011 fall turkey harvest is predicted by surveyors to be similar to higher than 2010.**

RUFFED GROUSE

Last season, despite predicted lower flushing rates, we forecast harvest of ruffies would be higher than the previous year. This forecast was reliant on winter weather conditions in January and February (when most grouse hunting takes place) to be much improved than the severe winter of 2009-2010, with deep snowfalls greatly limiting hunting forays. The 2010-2011 winter period was back to normal snow conditions, and hunters were able to take more trips and harvest more thunderbirds. Grouse cooperators sent in more than 40% more wings from downed birds than the previous season!

This years brood counts are encouraging with more broods observed by DNR wildlife personnel. Chick and poult survival also appears to be good as some late broods have been reported with as many as 6 to 10 young per hen. Good soft mast production, particularly thornapple, dogwood, and greenbrier may have birds scattered. However, higher numbers of ruffies **should result in improved flushing rates and a high harvest for the 2011-2012 season.** Field surveyors noted that grape in many locales was very spotty—numerous arbors with nothing, then arbors with abundant grape clumps. Late season hunters should have good success if they can locate these producing grape thickets.

WILD BOAR

Like squirrels, the big ‘boom’ in hard mast conditions in 2010 resulted in higher productivity in litters for wild boar in 2011. Wild hogs have been described as “self-regulatory”—sparse acorn and other hard mast production results in little to no litters; abundant hard food supplies result in more frequent and healthier litters. Lower and spottier food sources will tend to concentrate boar, so scouting for producing beech groves and oak stands, along with characteristic hog rooting sign, should pay off. **A higher wild boar kill is expected for the 2011 season.**

Table 1. 2011 quick check chart of predicted statewide wildlife harvests.

Species	Higher	Similar	Lower
Gray and Fox Squirrels	X		
Cottontail Rabbits	X		
Ruffed Grouse	X		
Raccoon	X		
White-tailed Deer	X		
Wild Boar	X		
Wild Turkey		X	
Bear			X

Table 2. 2011 quick check chart of deer harvest forecast by region and season.

Region	Season				
	Bow	Buck	Antlerless	Muzzleloader	Total Kill
1	Higher	Higher	Higher	Higher	Higher
2	Higher	Higher	Similar	Higher	Higher
3	Higher	Higher	Similar	Higher	Higher
4	Higher	Higher	Higher	Higher	Higher
5	Higher	Higher	Higher	Higher	Higher
6	Higher	Higher	Higher	Higher	Higher
Statewide	Higher	Higher	Higher	Higher	Higher

Table 3. 2011 quick check chart of fall wild turkey harvest forecast by region.

Region	Higher	Similar	Lower
1	X		
2	X		
3			X
4			X
5			X
6			X
Statewide		X	

APPENDIX

**REPORT OF MAST CONDITIONS
(SEE OPPOSITE SIDE FOR INSTRUCTIONS)**

H L U

LOCATION: _____
COUNTY: _____
DATE: _____
ELEVATION: _____
ASPECT: _____

SPECIES	AVAILABLE MAST, FRUIT, ETC.			
	Abundant	Common	Scarce	Species Not Seen
BEECH				
WALNUTS				
HICKORIES				
WHITE OAK				
CHESTNUT OAK				
BLACK/RED OAK				
SCARLET OAK				
BLACK CHERRY				
GRAPES				
SCRUB OAK				
YELLOW-POPLAR				
HAWTHORNE				
CRABAPPLE				
DOGWOOD				
BLACKBERRY				
GREENBRIER				
SASSAFRAS				
APPLE				
OTHERS (LIST)				

REMARKS: _____

NAME OF PERSON REPORTING: _____
DIVISION: _____
ADDRESS: _____

INSTRUCTIONS FOR REPORTING MAST CONDITIONS

LOCATION: Give the nearest post office address or some other adequate description. Example: Alpena Post Office, or two miles south of Alpena near head of Roaring Creek. Do not give such descriptions as “on the ridge above George Walker’s Store.”

COUNTY: Name the county in which the survey was made.

DATE: Give the date on which the survey was made.

ELEVATION: Give the approximate elevation. Example: 2,500 feet, 800 feet, etc.

AVAILABLE MAST, FRUIT, ETC.

Please indicate the relative abundance of the mast, fruit, etc. this season by placing an X under the proper column opposite the species concerned. Do not write in any wording such as poor, very poor, not so good, etc. Mark X under column species not seen if you did not see the tree or shrub species, or if it does not occur in the area you conducted the survey.

Please return the forms by September 2 so that compilations can be made immediately thereafter.

Mail completed forms to:

WV Division of Natural Resources
Mast Survey
PO Box 67
Elkins, WV 26241

RETURN BY SEPTEMBER 2, 2011

2011 HUNTING PROSPECTS

PLEASE CHECK BELOW WHETHER YOU THINK HUNTING WILL BE THE SAME, BETTER OR POORER THAN 2010 FOR EACH GAME SPECIES LISTED. LIST COUNTY OR COUNTIES YOU ARE RATING. IF YOU DO NOT KNOW, OR THE GAME SPECIES ARE NOT PRESENT IN YOUR WORK AREA, DO NOT CHECK ANYTHING.

COUNTY(IES) RATED: _____

GAME SPECIES	(1) BETTER	(2) SAME	(3) POORER
SQUIRRELS			
RABBITS			
GROUSE			
RACCOON			
DEER			
TURKEY			
QUAIL			
BEAR			
OTHERS (LIST)			

REMARKS:

NAME OF PERSON REPORTING: _____

DIVISION: _____

ADDRESS: _____

Mast Survey

Wildlife Resources
*West Virginia Division of
Natural Resources*

324 Fourth Avenue
South Charleston, WV 25303

(304) 558-2771
Fax: (304) 558-3147

Bulletin 11-04



It is the policy of the Division of Natural Resources to provide its facilities, services, programs, and employment opportunities to all persons without regard to sex, race, age, religion, national origin or ancestry, disability, or other protected group status.

11/09

400

.....
....