2022 WEST VIRGINIA HUNTING OUTLOOK AND MAST SURVEY

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WEST VIRGINIA DIVISION OF NATURAL RESOURCES
WILDLIFE RESOURCES SECTION

HUNTING OUTLOOK

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Black Bear

Fall 2022 will feature much more conservative bear seasons than hunters have experienced in the past decade. Population reconstructions based on hunter submitted bear teeth have shown that the bear population in the mountain counties has been reduced. Reducing the bear population in the traditional bear range has been a goal since the implementation of the first Black Bear Management Plan in 2008. As a result, the early September season and the buck – gun season in the mountain counties has been removed in 2022 to allow the bear population to stabilize. In addition, the 2 early bear seasons that occur in southern West Virginia have been shortened in 2022. As in 2021, the bear archery season for 2022 is set to open concurrently with the deer archery season (September 24). Archers will have 14 weeks to hunt bears in 2022.

There will be 2 discrete early bear firearms seasons open for a total of 14 days in 9 different counties where hunters may use dogs. Four counties will be open for 7 days of firearms bear hunting from September 3 – September 11 with or without hounds. Five counties will be open for 7 days of firearms bear hunting from October 1 – October 7 with or without hounds. Youth, senior and handicapped hunters will have the opportunity to harvest a bear during a 2 – day antlerless deer season in mid – October. In addition, all or parts of 42 counties will be open for concurrent bear hunting for 4 days in late October during an antlerless firearms season.

All or parts of 42 counties will be open for bear hunting during the deer firearms season. All or parts of 26 counties will be open for 4 weeks of firearms bear hunting in December with or without hounds. Finally, all or parts of 35 counties will be open to 4 weeks of firearms bear hunting without hounds in December. Bear hunting seasons will be open for 108 days from September – December in West Virginia in 2022. Hunters will also have the opportunity to harvest a bear from January 12 – 15, 2023 during the Mountaineer Heritage Season. Sunday hunting is permitted on both private and public land. **Due to a reduction in hunting opportunity, we are predicting a lower bear harvest in 2022.**

Archery hunting success rates depend greatly on mast conditions. Harvests decrease in years of mast abundance and increase in years of mast scarcity. **The archery harvest should be slightly lower in 2022.** White oak and chestnut oak are the winners when it comes to hard mast in 2022. If hunters focus their efforts in the woods, especially early in the season, the archery harvest will be strong.

The firearms bear harvest will be lower than the harvest of 2021. Decreased hunting opportunity will be the main cause of the lower bear harvest. In addition, if the

white oak and chestnut oak mast get consumed before the traditional December season, bears will den early.

White – tailed Deer

The total white – tailed deer harvest in 2022 should be similar to that of 2021. The above average white oak crop will mean deer won't have to move as much this fall. This will hold true for the early part of the season, but deer movements should increase as the season progresses into late December and food supplies decrease. We still have a very healthy deer population with many management units near their objective, so hunters will be pleased with the abundance and health of the animals.

We are predicting a **lower archery harvest in 2022.** Archers would be wise to hunt white oak flats. These areas will hold mast the entire way through the bow season before Thanksgiving. It will provide for ideal locations for does to feed and thus draw bucks to those locations. Scouting will be essential this year because hunters may need to move the treestand a short distance to be closer to a particular tree that produced a heavy white oak crop. It will be best to move that treestand to the more ideal location before sitting in it one time only to see an animal just out of range.

The buck firearms season harvest should be similar to the harvest in 2021. Many of our management units, that are primarily based on county structure, are near or at their management objective. This should produce more consistent harvests throughout time and also ensure a healthy deer population. There will be regional differences throughout the harvest; therefore, counties that are predominately forested may have slightly lower harvests. Two of the key factors that will determine the buck firearms harvest are always weather and participation.

The antlerless harvest in 2022 should be similar to the harvest in 2021. The antlerless harvest will be influenced by many of the same factors that influence the buck firearms harvest. There have been only minor changes to the antlerless deer hunting regulations in 2022. Hunters around the state have ample opportunity to harvest an antlerless deer. We would encourage hunters to harvest antlerless deer earlier in the year. By removing the antlerless deer during an earlier season, the hunter will help to leave more food (mast) for the remaining animals. This will help to benefit the entire ecosystem since deer are the keystone species that influence a many species of wildlife.

The muzzleloader harvest should also be similar to 2021. Muzzleloader harvests have not varied much over the past 5 years and are influenced by weather and participation. Muzzleloader harvests decreased when the season was changed to open immediately after the buck firearms season. Even though the original season timing was brought back (1 week between buck firearms and antlerless) the harvest never increased back to the levels recorded before the change.

The Mountaineer Heritage Season harvest should be similar to 2021 (January 2022). This unique season has offered hunters with a different experience for those still wanting to get out in January. Most of the acorn crop should be gone by that time so it will make it easier for hunters to pattern and harvest animals, but the total won't be much higher than last year.

Gray and Fox Squirrels

The factor influencing squirrel numbers more than any other is the hard mast production in the previous year. Squirrels usually produce a summer litter, but the spring litter is dependent upon overwinter food availability. The hard mast component of 2021 was slightly above the long-term average. Average food availability translates into an average number of squirrels produced. Hunters should note that soft mast, beechnut, and walnut production is down statewide. White and chestnut oak acorns will be the primary food sources for hunters to key in on for a successful season as squirrels will be on the move in search of those pockets that produced well. **Hunters should expect harvests similar to 2021.**

Wild Turkey

Fall turkey harvests are heavily influenced by brood production in that year and available mast. Based on brood surveys this summer, brood production is about the same as last year. These past 2 summers were noted as the best production observed over the past 5 years. This year, WV did not have a periodical cicada hatch which would influence poult survival. This is an average mast production year for all species of oak and hickory combined, but turkey hunters should note the abundance of white oak acorns statewide. Birds will seek out these favored acorns in the woods and this will make them less likely to be visible in fields, in turn finding flocks of turkeys will be difficult.

Every county will again have some length of fall turkey season in 2022. Traditional counties will continue to have a 4-week season. Non-traditional counties will have either a one or two – week season. Hunters should check the 2022-2023 Hunting Regulations on page 42 to find out the fall turkey hunting regulations specific to their county. The Mountaineer Heritage Season in January 2023 permits participants to harvest one either-sex turkey. See page 34 of the 2022-2023 Hunting Regulations for more details on legal weapons. **The wild turkey harvest should be about the same as last year.**

Wild Boar

Hunters recorded the second highest harvest on record since the implementation of a hunting season in 1979. The 2021 harvest tied that of 2020 (145). Harvests have been on an upward trend since the introduction of the winter season. Hunters will again have the opportunity to pursue boar in early February, when the bulk of the harvest is recorded. Reproduction of wild boar is directly associated with mast conditions from the previous year. Ecological Region 3 has reported two consecutive years of mast production below the long-term average. Below average mast conditions coupled with high harvests from both 2020 and 2021 should result in **lower harvests than 2021.**

Raccoon

Hunters should expect higher raccoon populations in 2022 – 2023. Raccoon reproductive rates fluctuate based on the previous year's mast conditions. Mast conditions in 2021 were slightly better than the long – term average. Better than average mast coupled with the worldwide downturn in the fur industry with a resultant decrease in trapping pressure will lead to higher raccoon populations. Barring a local outbreak of canine distemper, raccoon populations should be robust statewide.

Cottontail Rabbits

An above average amount of summer rainfall has produced ideal conditions for rabbit reproduction. The bunnies seem to be running everywhere this year and that should make for some happy beagles and their owners. The precipitation put a damper on many summer swimming or cookout plans but it allowed for vegetation to stay green and lush well into the fall. It provided added protection from both avian and mammalian predators. Hunters should expect **higher rabbit populations** this year.

Rabbit hemorrhagic disease is a very highly infectious and lethal form of viral hepatitis that can have devasting impacts to the State's cottontail and hare populations. It was recently detected in Pennsylvania. The primary way the disease is spread is by moving animals. It is imperative to our wildlife that we do not move animals and don't release them into the wild.

Ruffed Grouse

Ruffed grouse populations this year continue a downward trend. Based on participation in the DNR Grouse Cooperator Survey, the 2021-2022 season reported the lowest flush/hr rate since the survey began in 1993. This survey was comprised of 26

hunters with a total of 253 hunts. At 0.35 birds per hour, many hunters had a very challenging grouse season. This spring was average weather conditions and should have led to successful brood rearing. Grouse brood surveys for this spring and summer are incomplete at this time.

American beech in all grouse regions is more scarce compared to previous years. This year, white oak and chestnut oak are above average mast production almost statewide. Focus for the early parts of the season should be on producing pockets of beech and white oak, where available. As the season progresses, focus should shift to chestnut oaks and pockets of available soft mast such as grapes and dogwood. Continued efforts in forest management are needed to ensure cover and food to sustain grouse populations, otherwise populations will continue to decline. **Hunters should expect similar or slightly lower flushing rates and harvests this year.**

Table 1. 2022 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
Quail	X		

Table 2. 2022 quick check chart of deer harvest forecast by region and season.

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

2022 West Virginia Mast Survey

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The Division of Natural Resources (DNR), in conjunction with the Division of Forestry, annually surveys the state to determine relative abundance of soft and hard mast produced by trees and shrubs of importance to wildlife populations. Information on the quantity of wildlife food is provided to our cooperators, hunters, and various media outlets.

Mast surveys were completed at 208 locations covering all regions of West Virginia in 2022. Professionals and volunteers -- including wildlife managers, foresters, wildlife biologists, Natural Resources Police Officers, Natural Resources Commissioners, and retired personnel from a multitude of natural resources related disciplines -- devoted their time and effort to collect data for this survey. Without the participation of these individuals, completion of the statewide mast survey would not be possible. We would like to extend our sincerest gratitude to everyone who assisted with data collection in this year's survey.

The mast survey is a relative estimation of mast produced by 18 different tree and shrub species that are widespread and locally common throughout the state and are of nutritional value to wildlife. A sample of the survey form is appended at the end of the report. Cooperators are assigned counties and areas familiar to them to collect mast production information, and the same areas are generally surveyed each year to ensure consistency in the survey across years. Mast crop production is subjectively evaluated as abundant, common, or scarce for each species encountered by the observer in the surveyed area. The surveyor also documents species that are not encountered, along with additional mast-producing species of local importance (e.g., Pawpaw, Persimmon, Cucumber-tree, Blueberry, Huckleberry, etc.) that do not appear on the statewide survey form. The mast index is calculated for each species, and in some cases guilds of species (e.g., hard mast producers, all oaks, oak-cherry-hickory, etc.), via the following formula:

$$\text{Mast Index} = [(\text{Abundant Observations}/\text{Total Observations}) + ((\text{Common Observations} \times 0.5)/\text{Total Observations})] \times 100$$

The mast index is calculated by species for each ecological region and elevation (high or low, relative to the local terrain of the surveyed county). The current year's index is compared to the previous year's index and the running long-term average spanning the life of the survey, which was first conducted in 1971. Readers unfamiliar with West Virginia ecoregions should refer to Figure 1 to determine the region(s) in which they hunt.

Many wildlife species are highly dependent upon mast crops produced by trees and shrubs, and dynamic factors -- including survival and reproduction or fecundity -- are affected by

mast availability. Caloric value available in mast is much more important to the survival of many wildlife species than the caloric value in agricultural crops, herbaceous plants, and supplemental feed. Seeds and fruits from trees and shrubs are necessary not only for overwinter survival, but also for ensuring animals are in good physical condition for reproduction in following months. Generally, animals that enter the winter months with abundant fat reserves will be more likely to survive the lean months of the year and will produce and successfully rear more offspring during the subsequent spring and summer months. Wildlife biologists and managers are able to predict hunting prospects and forecast population dynamics of black bears, squirrels, white-tailed deer, wild boars, wild turkeys, and other game species by using mast quantity and quality information gathered during the annual mast survey.

Compared to the 2021 survey year (Table 1), the statewide combined index for all monitored species was down approximately 22% for survey year 2022. While the statewide crops of White Oak and Chestnut Oak acorns were up quite substantially over 2021 levels (+137% and +52%, respectively), production of mast by nearly all other monitored species - besides Scrub Oak (+17%) and Sassafras (+18%) - declined measurably. Among hard mast producing species, Beech (-73%), Walnut (-67%), and Hickory (-28%) performed most poorly, while Red/Black Oak (-28%) and Scarlet Oak (-9%) abundance also declined statewide relative to last year's crop. Relative to the 51-year long-term survey average, only White Oak (+40%) and Chestnut Oak (+37%) exceeded mean production levels. All other hard mast producers performed between 8% (Scrub Oak) and a remarkable 54% (Beech) below the long-term average. The "spotty" and heterogeneous nature of oak production across the landscape in 2022 should allow diligent hunters to effectively pursue game animals such as squirrels, raccoons, bears, boars, and deer in successful fashion provided they scout the areas they plan to hunt and find the pockets of available hard mast. Areas with overstory White Oak and Chestnut Oak probably offer the best prospects in general in the 2022 Fall hunting seasons.

All soft mast producers underperformed -- in some cases considerably—the levels seen in survey year 2021. Apple (-42%), Hawthorn (-41%), and Crabapple (-40%) fruit production declined dramatically as blossoms fell victim to patchy late frost and trees were stressed by excessively wet conditions in many parts of West Virginia. Comparison to the long-term soft mast average paints a similar picture with Crabapple (-25%), Apple (-22%), and Hawthorn (-18%) fruit scarcer than in a typical year. Relative to the long-term average, nearly all surveyed soft mast producing species were off from 7% (Wild Grape) to a remarkable 31% (Yellow Poplar). Only Blackberry (+5%) was above average levels, and Dogwood fruit production was average. Soft mast provides significant and calorie-rich food resources for wild turkeys, ruffed grouse, black bears, and raccoons, all of which use soft mast extensively when and where it is available. Hunters should take note of regional mast survey information and scout accordingly -- species that heavily use soft mast may be concentrated in pockets of available food early in the season and knowing where these pockets exist should make the likelihood of a successful harvest higher. These species may have to roam more to find food as the autumn wears on.

Hunters should always pay attention to mast crop production in their area (Table 3; Table 4). Survey year 2022 revealed a crop that was generally poorer than that of 2021 across all ecoregions of West Virginia, but production among some key regional species like White Oak, Chestnut Oak, and Scrub Oak was up by a considerable degree. While Ecoregion 1 (Eastern Panhandle, -16%) had a poorer crop than last year, it seemed to fare better than the other five regions overall. White Oak and Chestnut Oak acorn production was up tremendously in the highlands (Region 2) and southern counties (Region 3), and White Oak production was much better than in 2021 in the central (Region 4) and western counties (Region 5). Comparisons to the long-term average provide a more tempered index to mast crop than do annual comparisons, wherein relatively small variations in production of a particular species can drastically influence percent change as indicated by the comparison and therefore may not provide a representative index to true abundance. The overall mast crop was down by 11 to 33% over the historic average statewide despite good masting by some species, indicating mixed conditions largely driven by large departures from average among species like Black Walnut, Beech, Red/Black Oak, and some of the soft mast producers.

Considering these long-term comparisons, the total mast crop of survey year 2022 appears to be about 16% below average. However, not all is troubling; oak mast was not catastrophically low, so species that rely heavily upon acorns to build their fat reserves for winter will find resources, but competition for limited resources may be locally high. Hunters should reap the rewards, in terms of game harvest, of increased game animal movement brought on by this decreased food availability on the landscape.

We recommend hunters review regional trends in mast production as reflected in Tables 3 and 4 to learn the wildlife food conditions in the regions of the state they intend to hunt. While this information should prove to be a valuable asset to all readers, local and regional differences are always at play when it comes to mast production. The West Virginia Mast Survey is intended to provide a representative regional and state-wide picture of wildlife food conditions “on the ground,” but it is not a substitute for diligent scouting!

2022 Mast Survey Highlights

- All Species Combined mast index is approximately 16% below the long-term average statewide, and 22% below 2021.

- All Hard Mast Species mast index is below the long-term average by 21% statewide and approximately 23% below 2021.

- While White and Chestnut Oak acorn production was up significantly from 2021 across much of the state, production of Red/Black and Scarlet Oak is generally well below 2021

levels and the long-term average. White and Chestnut Oak acorns, and in some regions Scrub Oak acorns, should be most available statewide and should supply good nutrition to the species that rely upon them.

- Beech, Walnut, and Hickory production was down markedly from 2021 levels and generally below average in all ecoregions.

- Soft mast production was mixed, although many species were near or above the long-term average statewide. However, soft mast production varied markedly by ecoregion.

Table 1. 2022 statewide index compared to 2021 mast index.

Species	**2021**	**2022**	**Percent Difference**
Beech	66	18	-73
Walnut	60	20	-67
Hickory	58	42	-28
White Oak	22	52	137
Chestnut Oak	30	45	52
Black/Red Oak	28	20	-28
Scarlet Oak	21	19	-9
Black Cherry	69	42	-39
Grape	52	38	-26
Scrub Oak	29	33	17
Yellow Poplar	37	32	-15
Hawthorn	67	40	-41
CrabApple	67	40	-40
Dogwood	53	49	-7
Blackberry	54	53	-2
Greenbrier	36	35	-3
Sassafras	21	24	18
Apple	76	44	-42
All Species	**46**	**36**	**-22**

Table 2. 2022 statewide index compared to 51-year average mast index.

Species	**Avg Index**	**2022**	**Percent Difference**
Beech	38	18	-54
Walnut	38	20	-48
Hickory	48	42	-12
White Oak	37	52	40
Chestnut Oak	33	45	37
Black/Red Oak	42	20	-52
Scarlet Oak	33	19	-43
Black Cherry	46	42	-8
Grape	41	38	-7
Scrub Oak	36	33	-8
Yellow Poplar	46	32	-31
Hawthorn	48	40	-18
CrabApple	54	40	-25
Dogwood	49	49	0
Blackberry	51	53	5
Greenbrier	39	35	-11
Sassafras	35	24	-30
Apple	56	44	-22
All Species	**43**	**36**	**-16**

Table 3. Percent difference in mast index by species between 2021 and 2022 by ecological region.

	Ecological Region					
Species	1	2	3	4	5	6
Beech	-65	-80	-82	-66	-46	-95
Walnut	-69	-82	-77	-47	-57	-70
Hickory	-14	-31	-22	-32	-37	-27
White Oak	36	238	268	100	129	40
Chestnut Oak	11	179	170	36	-38	26
Black/Red Oak	2	-28	-45	-34	-52	45
Scarlet Oak	-12	52	-19	-26	-15	-25
Black Cherry	16	-73	-68	-27	-33	5
Grape	-15	-43	-44	3	-25	-36
Scrub Oak	53	178	-17	NA	N/A	NA
Yellow Poplar	-41	-4	-28	-41	8	9
Hawthorn	-66	-26	-54	-30	-54	33
CrabApple	27	-50	-14	-41	-69	17
Dogwood	56	-29	-21	2	0	-5
Blackberry	4	6	-1	-9	-1	13
Greenbrier	5	-5	-19	5	-27	35
Sassafras	-29	-13	46	19	49	41
Apple	-44	-43	-38	-47	-57	-6
All Species	**-16**	**-28**	**-24**	**-21**	**-28**	**-8**

Table 4. Percent Change in 2022 mast index by species from average of years (1971-2021) by ecological region.

	Ecological Region					
Species	**1**	**2**	**3**	**4**	**5**	**6**
Beech	-7	-67	-70	-34	-20	-93
Walnut	-57	-70	-63	-31	-31	-56
Hickory	4	7	-14	-24	-22	-17
White Oak	-13	75	78	32	43	11
Chestnut Oak	-33	104	74	37	-2	48
Black/Red Oak	-38	-52	-75	-32	-58	-39
Scarlet Oak	-42	-1	-67	-13	-33	-77
Black Cherry	50	-50	-46	-16	-7	46
Grape	4	-16	-47	30	9	-9
Scrub Oak	-41	128	-21	NA	NA	NA
Yellow Poplar	-23	-23	-66	-49	5	15
Hawthorn	-47	-2	-12	-15	-51	42
CrabApple	69	-37	-8	-28	-66	40
Dogwood	22	-6	-7	-14	-2	9
Blackberry	-5	19	2	-9	16	10
Greenbrier	0	-23	-44	17	-14	13
Sassafras	-20	-26	-46	-60	1	-6
Apple	-30	-12	-19	-31	-43	-1
All Species	**-23**	**-21**	**-33**	**-21**	**-22**	**-11**

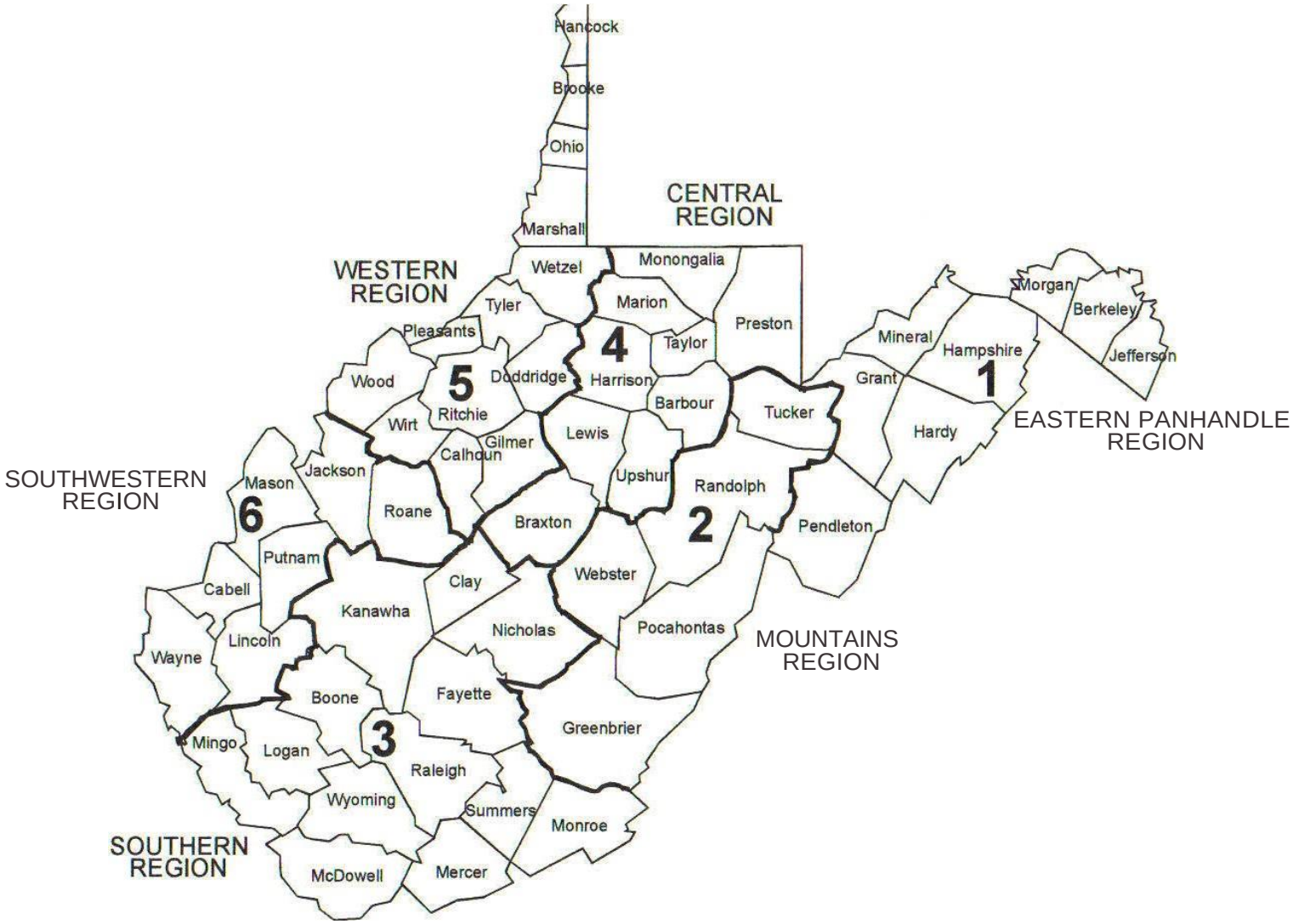

Figure 1. Ecological regions of West Virginia for 2022 mast survey.

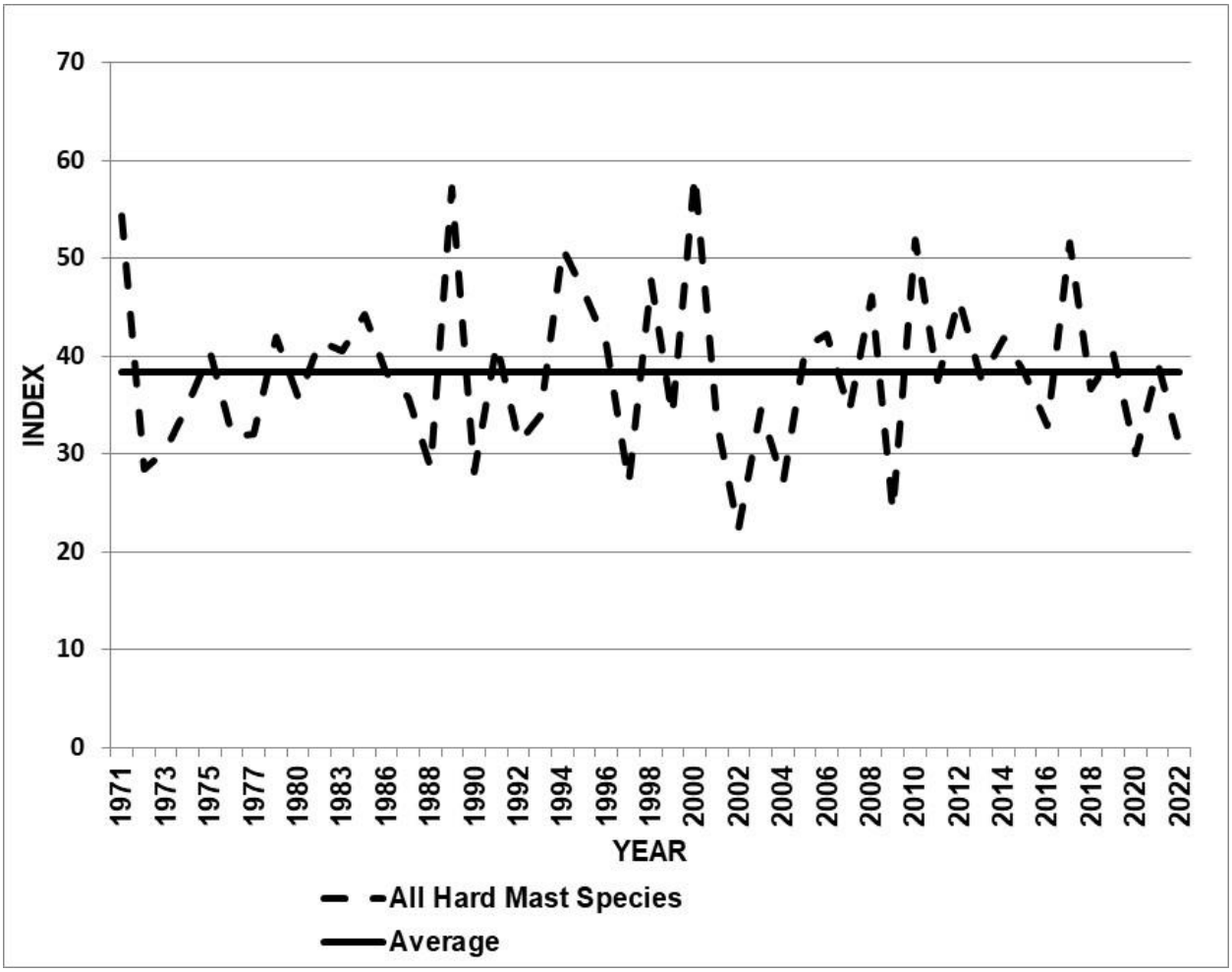

Figure 2. All West Virginia hard mast average index from 1971 - 2022.

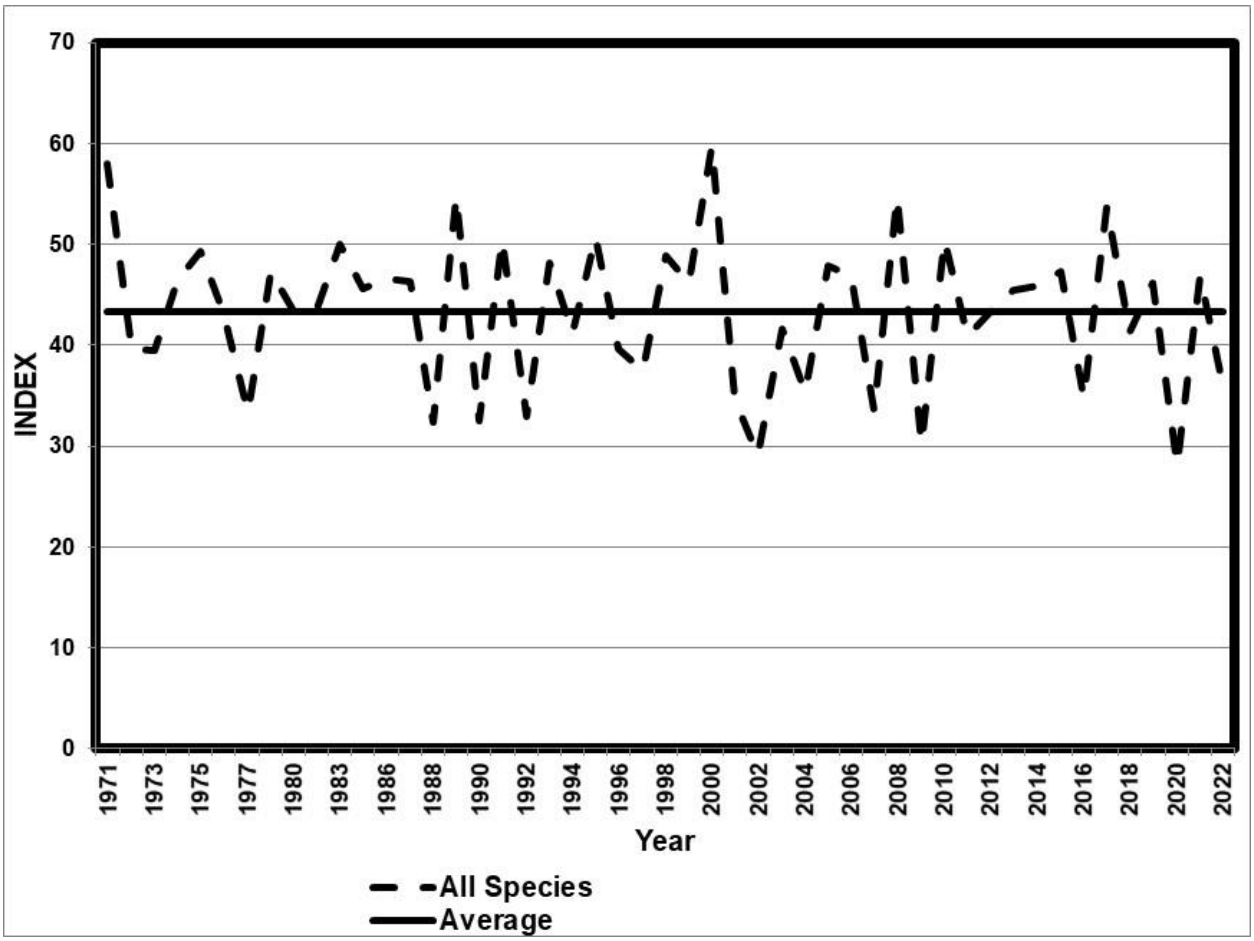

Figure 3. All West Virginia mast species average index from 1971-2022.

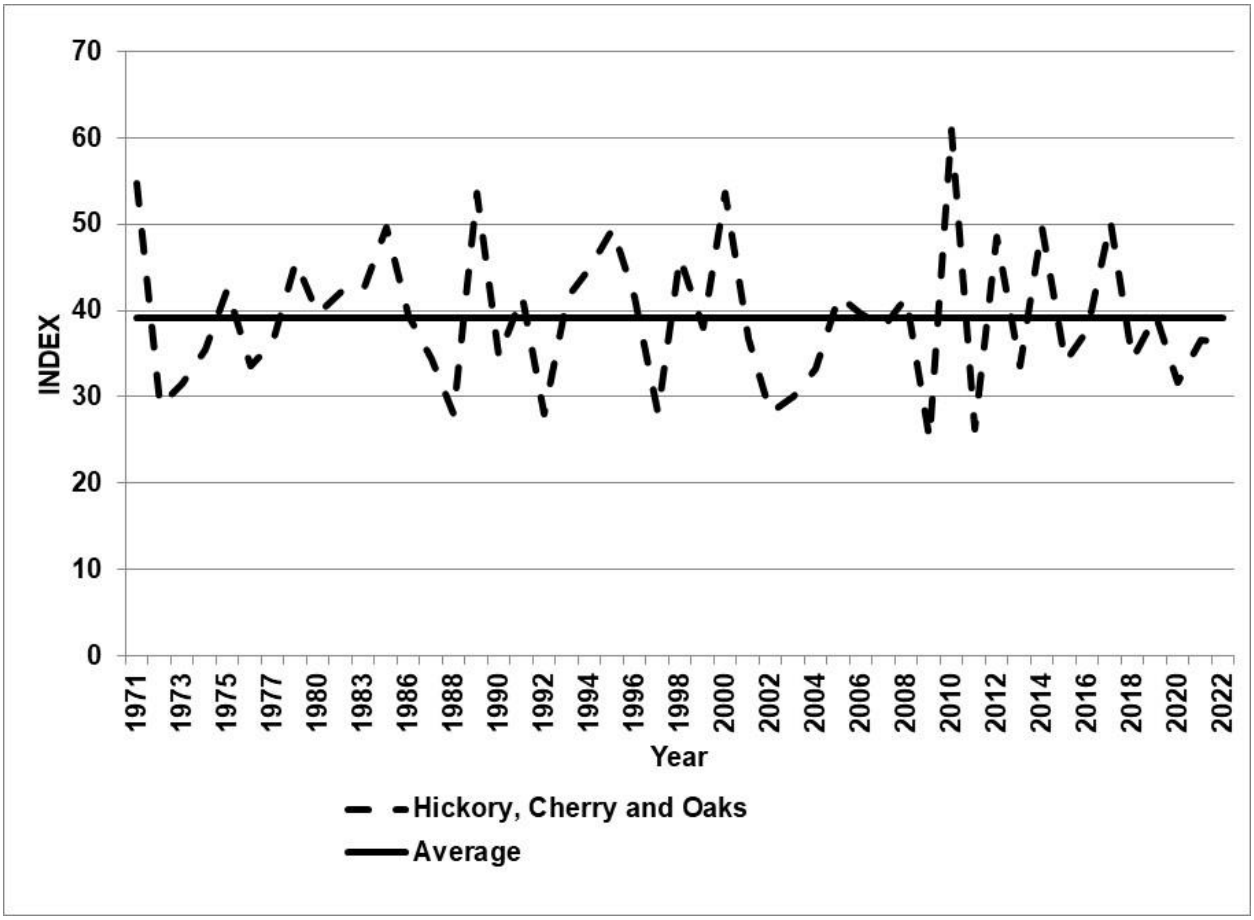

Figure 4. West Virginia hickory, black cherry and oak index from 1971 - 2022.

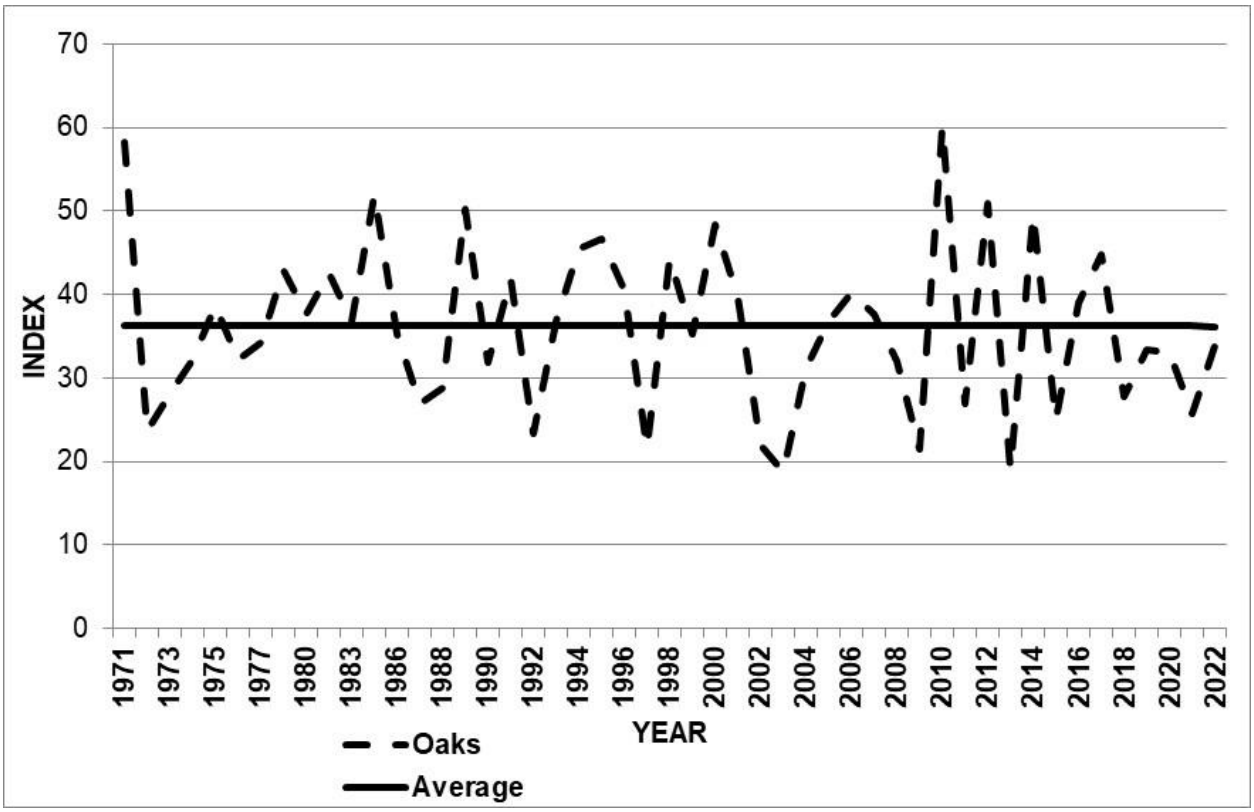

Figure 5. West Virginia average oak mast conditions from 1971 - 2022.

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