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The trick for increasing your odds is to find areas within the ecoregion that provide the landscape pattern and composition shown to yield higher numbers of big trophies. Seek out that ideal mosaic of grasslands, agricultural fields, and forests and you should have a better chance at taking that dream-of-a-lifetime buck.

ding BIG Bucks

Trophy Whitetail Deer in Relation to Ecoregions

Every year thousands of hunters across North America embark on the challenge of harvesting a whitetail deer (*Odocoileus virginianus*). The range of whitetail deer, spanning from Mexico to Canada and from the Atlantic coast to the Rocky Mountains, makes them one of the most abundant and sought-after big-game species. Each season, a select group of hunters will be fortunate enough to harvest a Boone and Crockett-class trophy, which requires a minimum score of 160 for typical antlers and 185 for non-typical specimens.

By Greg Sanders

About the Author

A graduate of Lakehead University, Greg Sanders recently worked as a seasonal conservation officer in the Cold Lake District of Alberta. Currently he is at home in Shedden, Ontario, scouting for trophy whitetails and for his next job in the wildlife field.

It is widely accepted that environmental factors affect antler development in whitetail deer and can make the difference between a trophy-class buck and an average buck. Which environmental factors provide optimal growth? With that information, a person might be better positioned to find that sought-after trophy. As a student at Lakehead University, I set out to investigate this question in an undergraduate thesis.

A Passion for Whitetails

Selection of this topic stems from a deep personal interest in whitetail hunting. I began hunting when I was 13 years old—a natural step since I come from a hunting family. Growing up in Shedden, a small town in southern Ontario, I found ample hunting locations nearby on farms owned by my uncles and cousins. Whitetail deer are abundant in this area, and I took to bowhunting right from the start. I loved the challenge that presented itself every fall, and savored the time and memories made with friends and family.

My interest in whitetails accompanied me to Lakehead University in Thunder Bay, Ontario, where I pursued an education in environmental studies, majoring in forest conservation. During those years my interests would circle back to wildlife, and specifically whitetail deer, in selecting topics for projects and reports. When it came time to complete the undergraduate thesis, there was no question of what the subject species would be. I sent a proposal to Jack Reneau, director of big game records for the Boone and Crockett Club, requesting access to the Club's trophy database to carry out a thesis on whitetail deer records. The Club granted access to its online trophy database, Trophy Search, at no cost, and before long, I was at work on a research project that had always intrigued me. Brian McLaren, a wildlife professor at Lakehead University, assisted me throughout.

My project aimed to increase a hunter's chances of bagging a Boone and Crockett-class trophy by identifying environmental factors that show an association with the likelihood of trophy-class whitetails being harvested. My approach was based on ecoregion classifications in the U.S. I sought to relate the number of trophies and trophy size to characteristics that each ecoregion possessed. Insight into the best hunting locations might be gained by examining habitat suitability for the

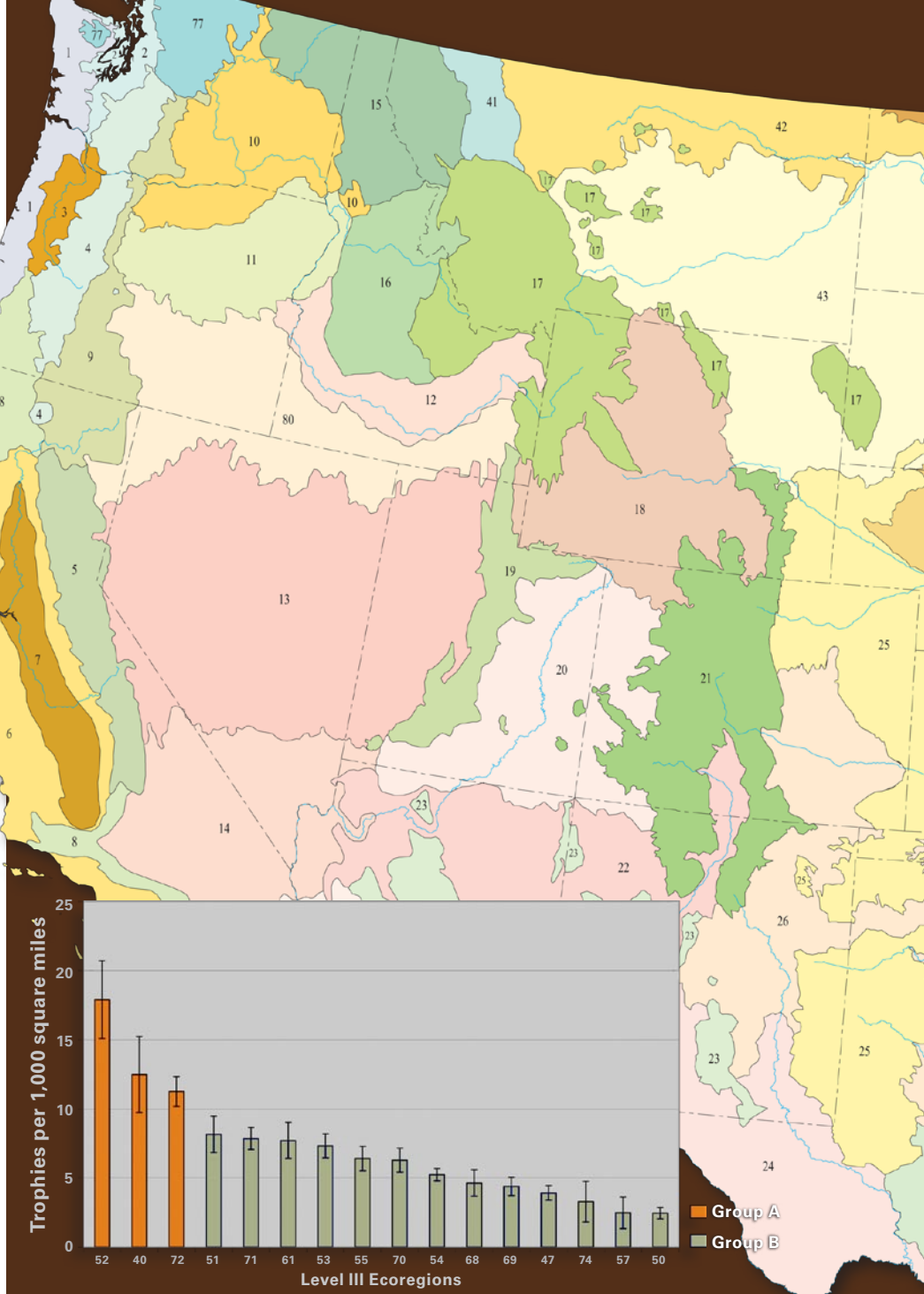


Figure 1. Trophy whitetail deer per ecoregion 2000-2009.
Error bars show ± 1 standard deviation.

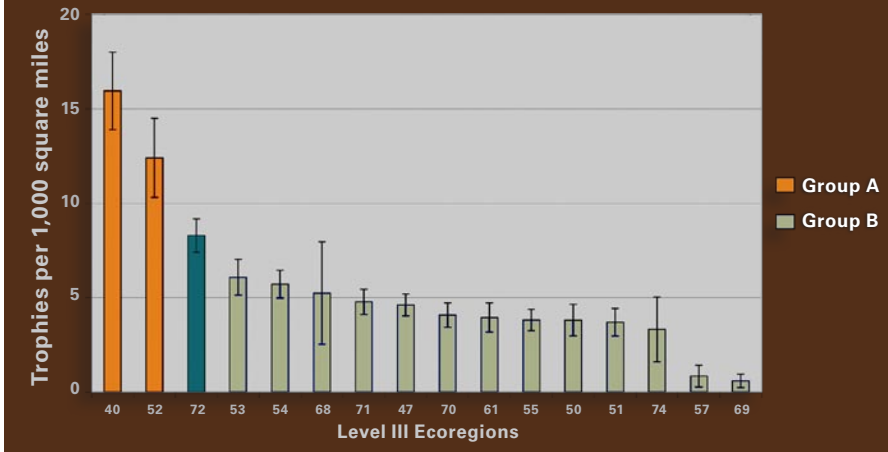
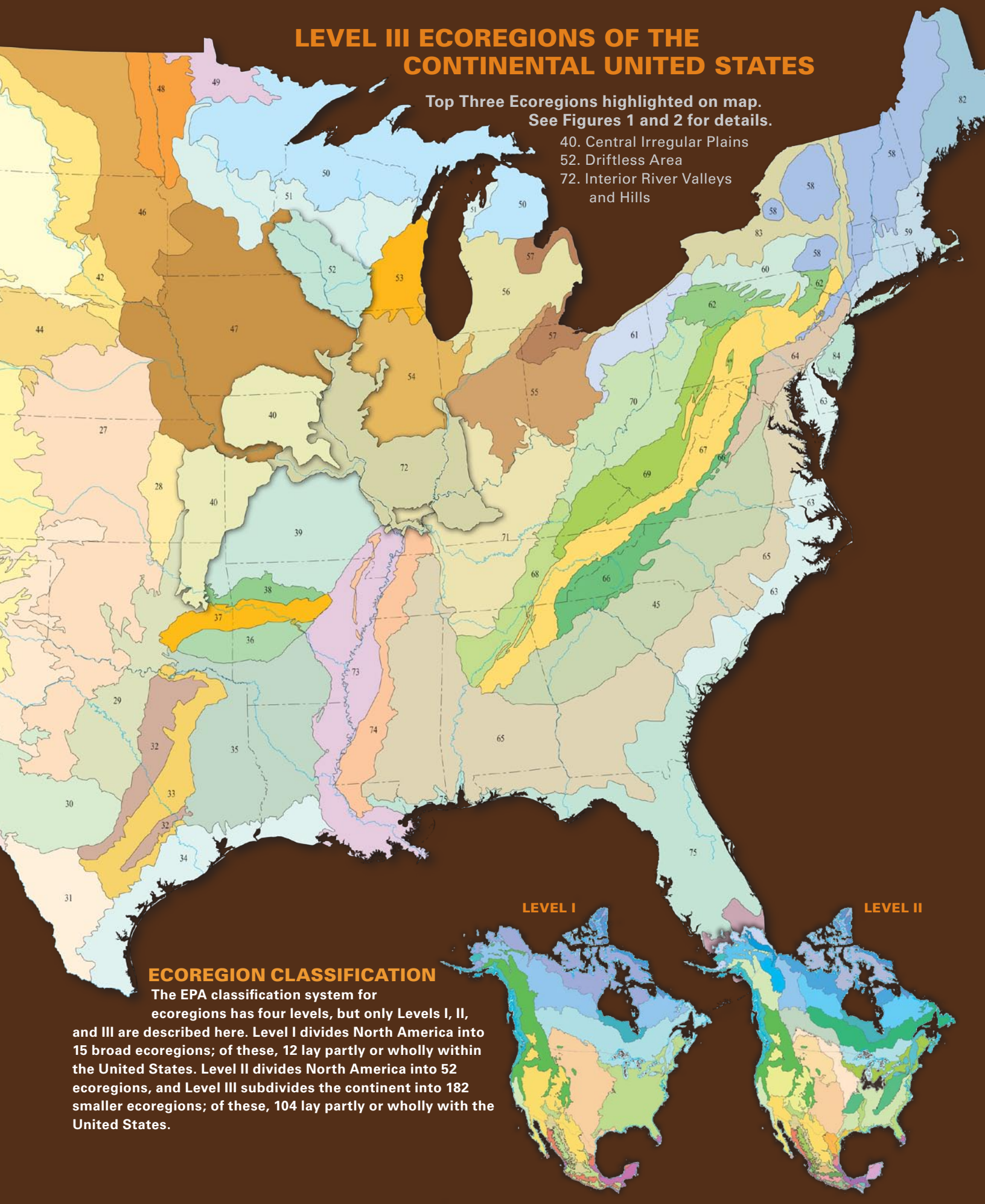


Figure 2. Trophy whitetail deer per ecoregion 1990-1999.
Error bars show ± 1 standard deviation.

LEVEL III ECOREGIONS OF THE CONTINENTAL UNITED STATES

Top Three Ecoregions highlighted on map.
See Figures 1 and 2 for details.

40. Central Irregular Plains
52. Driftless Area
72. Interior River Valleys and Hills



ECOREGION CLASSIFICATION

The EPA classification system for ecoregions has four levels, but only Levels I, II, and III are described here. Level I divides North America into 15 broad ecoregions; of these, 12 lay partly or wholly within the United States. Level II divides North America into 52 ecoregions, and Level III subdivides the continent into 182 smaller ecoregions; of these, 104 lay partly or wholly with the United States.

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development of secondary sexual traits—in this case, antlers.

Which Ecoregions Produce Big Bucks?

First things first: what is an ecoregion? Ecoregions, also called ecological regions or bioregions, are ecologically and geographically defined areas that cover relatively large acreages of land or water. An ecoregion contains characteristic and geographically distinct assemblages of natural communities and species. The quality and quantity of ecosystem components such as soils, vegetation, climate, geology, and physiography are relatively homogeneous within an ecoregion.

I began the research by examining data for every trophy whitetail deer submitted to Boone and Crockett over two decades, 1990-99 and 2000-09, from Iowa, Illinois, Kentucky, Wisconsin, and Ohio. These five states had the highest number of trophy submissions in North America. The next step was to use the online database of the Environmental Protection Agency (EPA) to establish the ecoregions within these states (See map on previous page).

Boone and Crockett trophies are reported by county, so the next step was to use the National County Database to establish the size and number of counties within the selected ecoregions in each state. This information allowed me to establish the average number of trophy whitetail deer per square mile per ecoregion. Finally, an analysis of variation (ANOVA) test in conjunction with Tukey's post-hoc test was used to distinguish groups showing significant differences in the sizes and numbers of whitetail deer trophies. In each of the two periods, two significantly different groups were identified (Figures 1 and 2).

Three ecoregions (52, 40 and 72—Group A) had the highest number of trophy whitetail deer per square mile. Comparison of the three ecoregions in this group clearly revealed that they had similarities. All three contained a mix of agricultural lands (corn, soybeans), grasslands (natural and hay fields), and woodlands—components essential for whitetail habitat. In addition, the potential natural vegetation of all three ecoregions suggested a mix of open grasslands and oak-mixed forests. However, the key ingredient seemed to be a landscape mosaic with all three characteristics interspersed.

The remaining ecoregions comprised Group B. Each of these ecoregions had at least one, or a combination of, landscape compositions: extensive farming,

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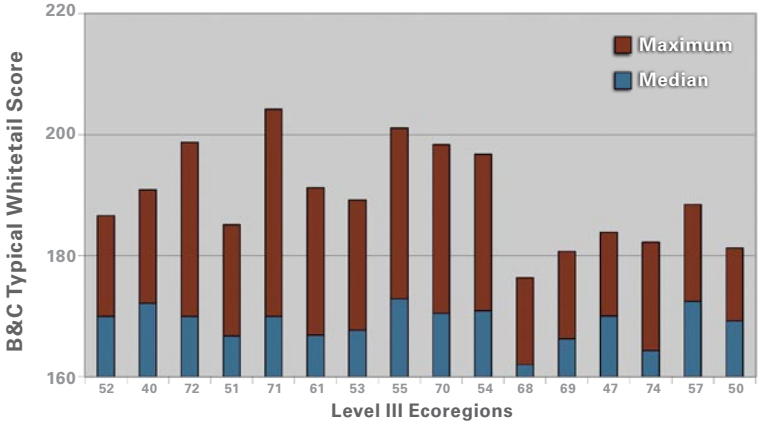

Figure 3. Typical trophy whitetail deer median and maximum scores for 2000-2009.
Based on ecoregions in Figure 1 on page 34.

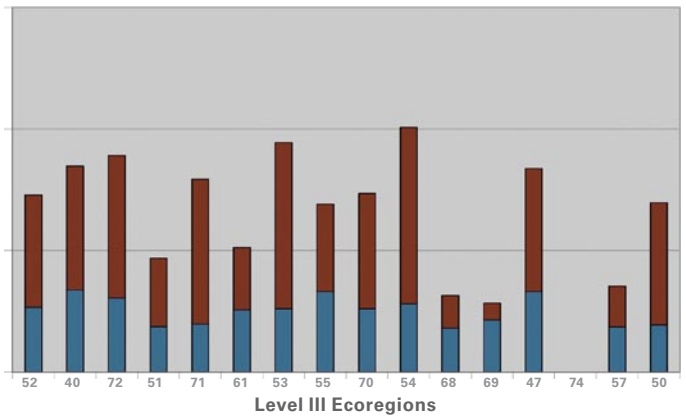

Figure 4. Typical trophy whitetail deer median and maximum scores for 1990-1999.
Based on ecoregions in Figure 1 on page 34.

urbanization, industrialization (forestry, coal mines), or extensive forests. They also produced fewer trophy whitetails even though some had natural vegetation similar to that in the Group A ecoregions. This comparison showed that a more homogeneous landscape did not promote trophy whitetail production. Even ecoregion 72, which had the lowest number of trophies in Group A, is characterized as having larger tracts of woodlands and agriculture and less of a mosaic pattern than ecoregions 52 and 40. This may be why, in the analysis of time period two, it did not definitively fit into Group A or Group B.

The project also examined the median and maximum antler scores for each ecoregion. Antler scores seemed to follow only one trend: while trophy whitetails came from the Group B ecoregions, the maximum and median antler scores tended to be lower than scores from the Group A ecoregions. Thus while most habitats can produce a trophy-class whitetail, the better-quality habitats in ecoregions 52, 40, and 72 produced more, and generally larger, trophies (Figures 3, 4, 5, and 6).

What Should a Hunter Do?

This study found that three ecoregions had consistently more and larger trophy whitetail deer. So it's simple; just go hunt there and you will have a better chance at that once-in-a-lifetime trophy, right? Not exactly. It's a matter of scale. Some of these ecoregions are up to 30,000 square miles, with varying numbers of trophies in each county. That's a lot of scouting! Instead, a more valuable approach to finding high numbers of trophy whitetails takes into account the best landscape composition—that which contains a mixture of grasslands, agricultural crops and woodlands. Since the analysis showed that all the ecoregions examined are capable of producing trophy-class whitetails, it is reasonable to expect that harvesting a trophy buck can be accomplished in any of the ecoregions. The trick for increasing your odds is to find areas within the ecoregion that provide the landscape pattern and composition shown to yield higher numbers of big trophies. Seek out that ideal mosaic of grasslands, agricultural fields, and forests and you should have a better chance at taking that dream-of-a-lifetime buck.

These findings can also be put to use by landowners and managers. Habitat management that creates or maintains a balanced mosaic of grasslands, agricultural crops, and woodlands—preferably oak-mixed forests—could potentially increase the number of trophy-class whitetails on the property. By providing optimal habitat, you are giving whitetails the best chance to reach their full potential and size.

Further Investigations

While this introductory study helped satisfy my curiosity about how landscape and vegetation relate to the prevalence of trophy whitetails, it raised other questions that merit further examination. For example, hunting pressure could be examined to determine whether this has an effect on the number of trophies harvested. Do more hunters actually mean more trophies, or is it pre-determined by the environment? How does technological advantage (rifles versus archery) figure in? There are many more things we can investigate in the quest to understand the where, when, and how of harvesting a big whitetail buck. ■

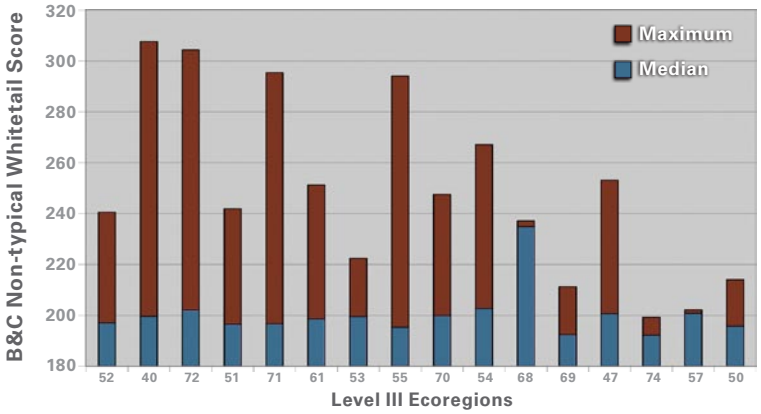

Figure 5. Non-typical trophy whitetail deer median and maximum scores for 2000-2009.
Based on ecoregions in Figure 1 on page 34.

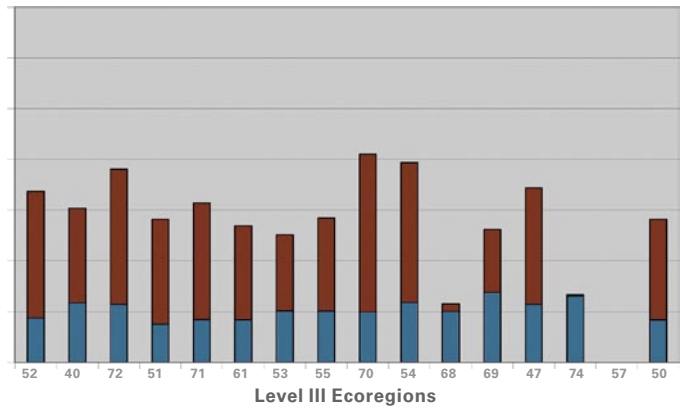

Figure 6. Non-typical trophy whitetail deer median and maximum scores for 1990-1999.
Based on ecoregions in Figure 1 on page 34.