examination of plots indicates that the techniques and equipment used are sufficient to accurately monitor body temperatures of free-ranging animals. It is clear from the plots generated that erroneous data points were also recorded even after filtering. We periodically observed the system during data collection and determined that erroneous points were the result of both static interference and interference by other users of our transmitter frequencies. Static interference increased as animal distance from the antenna increased and as animals apparently retreated into very deep hibernacula. We attempted to find an unused transmitter frequency, but had to use a frequency (159 MHz) that was minimally occupied. In more remote areas, this type of interference should not present as much of a problem. Using the amplitude signal to determine distance or movement was less successful. Several factors can affect signal amplitude, including obstructions (to line-of-sight), animal orientation (facing toward or away from antenna), depth belowground, and soil moisture. Thus, we could not assign small fluctuations in amplitude to specific activities. Further detailed observation and analysis are needed to better recognize animal movement in and out of burrows.

In a previous study, Katzner et al. (1997) used this telemetry system very effectively to collect body temperatures of pygmy rabbits kept in 12.3-m outdoor enclosures. Our study demonstrates that the system can also be used on a larger scale on free-ranging animals.

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WOODY PLANTS OF NORTH AMERICA

Woody Plants of North America (2 CDs). John R. Seiler, John A. Peterson, and Edward C. Jensen. Kendall/Hunt Publishing Company, 4050 Westmark Drive, P.O. Box 1840, Dubuque, IA 52004-1840. Phone: (800) 228-0810 Fax: (800) 772-9165 or (319) 589-1046. E-mail: orders@kendallhunt.com. Single-user license $84.95.

Identification of woody plants was the first "real" forestry class we took when beginning our college education; like most students, we found learning hundreds of species a daunting process. Latin names, morphology, classification keys, and differentiating similar species were all major challenges. We distinctly remember drilling ourselves on spelling and punctuation, family, genus, species, and common names, as well as important characteristics for identification, using whatever facilities were available. Unfortunately, many of the samples (either herbarium

mounts or "fresh" clippings) had suffered the examinations of hundreds of earlier students. Some species were represented only by a single discolored pressed leaf or fruit; rarely were other distinguishing features like bark, twigs, tree form, or habitat available. As with the untold number of forestry students before us, we survived this first exposure to dendrology. But even as freshmen, we couldn't help thinking that there must be a better way.

Modern technology has provided an aid to woody plant identification. Nothing can replace spending quality time in the field with a professional, but a recent offering from a group of such experts provides a good tool. *Woody Plants of North America* is a 2-CD set created using Macromedia technology available for PCs with Windows 95 (or higher), at least 16 MB of RAM, 30 MB of hard drive space, a CD or DVD player, and a color monitor. The product is intended to supplement (rather than replace) field instruction for identifying 470 of the most common native and introduced trees and shrubs in North America.

The program's interface has been designed as a user-friendly, graphics-rich front end that should be easily navigated by today's technology-savvy students. After introduction and credit screens, users are asked to choose one of four options (described in detail when the mouse is placed over them). Main menu choices include "Morphology," "Angiosperms," "Gymnosperms," or "Quiz." The Morphology submenu is a tour of primary plant structures used to identify woody species, including leaves, flowers and strobili, fruits and fruiting bodies, twigs, bark, and tree form. Each of these subunits has a series of pictures and animated graphics that identify key features and nomenclature (e.g., petioles, racemes, obovate leaf form, strobili). This section is intended not as an exhaustive menu of possible features, but a listing of technical and nontechnical descriptions and images to assist beginning students. Angiosperm and Gymnosperm menus are subdivided by family and genus to arrive at species. Once a species has been chosen, a screen appears, listing key taxonomic features, a scrollable written description of related attributes, and a set of color pictures with different examples of the highlighted structure. A range map is provided for most species, but is usually small and can be hard to read. In the Quiz section, users self-test their comprehension of species. Flexible designs allow students to consider a range of taxa or limit themselves to a specific family or genus. Instructors can also develop quizzes that cover the species that students are expected to know.

Differentiating between similar species is one of the biggest problems for students. *Woody Plants of North America* allows comparison of several examples of a given species (multiple photographs of leaves, twigs, flowers, fruits, bark, and form) and comparison with similar species ("look-alikes"). This feature, one of the best contributions, is not universal for all species (e.g., it was not available for American smoketree *Cotinus obovatus*, or pondapple *Annona glabra*). For common commercial species (e.g., white oak, *Quercus alba*), there are usually many specimens of similar-looking species for highlighted morphological structures. For the white oak bark description, there were four samples of look-alike species (overcup oak *Quercus lyrata*, bur oak *Q. macrocarpa*, post oak *Q. stellata*, and sand post oak *Q. margarettiae*), and brief descriptions of how they differ from white oak.

There are areas for improvement of this product. Species provided to the user are limited in scope and should be supplemented in future editions. The morphology section, while fairly detailed, lacked some examples of important characteristics (e.g., bipinnately compound leaves). Not all features are consistently available for all species—some lacked a range map or comparison with other species for features like bark or twigs. Many photographs were blurry or did not distinguish focal species within mixed canopy. It would be helpful to improve some species comparisons. For example, it may be beneficial to show the front and back of similar-shaped leaves in a single image to help differentiate species, especially if attributes like pubescence or color are prominent. More information on other frequently used names (both common and scientific) would be helpful. The Quiz section does not permit the user to change an entry once it has been accepted, and more feedback about correct answers would be nice. The program screens lack scalability, so large monitors cannot be used to full advantage. It would be good if there were an option during installation to deposit all information on the hard drive rather than keeping images and data on CDs. This would allow quicker response times and avoid program requests to insert the CD. Because many modern PCs come with 20+ GB hard drives, we don't think many people would mind dedicating the space.

These limitations aside, we feel that *Woody Plants of North America* would be a good aid for beginning dendrologists or those interested in a quick, visually oriented package to help learn local species. More advanced users are likely to appreciate this effort, even if it is somewhat limited in features and species. The moderately expensive price tag ($85, not including shipping and handling) may discourage some students from purchasing the product, given that they will probably be required to buy at least one other textbook. However, we would still recommend this tool because of the good color photographs and ability to compare different distinguishing characteristics, as well as opportunities to self-test knowledge. Today's students may be more inclined to apply this user-friendly program than a more technical, yet cumbersome, dendrology text or identification key. While a digital reference cannot replace seeing, feeling, or smelling a fresh specimen, any resource that garners interest from less-than-enthusiastic students will only help.

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