

WILD TURKEY: COMPUTER-BASED CONSULTATION PROGRAM

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Abstract: WILD TURKEY is a computer-based consultation program that mimics a conversation between a landowner and a wildlife expert. The consultation program asks the same questions the expert would if called on the phone. It is designed to help the landowner maintain and enhance wild turkey (*Meleagris gallopavo*) habitat. WILD TURKEY can be used to stand in for the wildlife expert, back up the expert, and as a training tool. Computer-based consultation programs are a new way to reduce the workload and increase the effectiveness of resource professionals. WILD TURKEY is an example of a computer consultation program that could be developed for most any wildlife species inhabiting California's oak woodlands.

Oak woodland (Barbour and Major 1988) habitat occurs on about 7.4 million acres of California. The habitat encircles the Central Valley and continues south along the coast to the Mexican border. More species of wildlife live in this habitat type than any other major habitat in the state (Ohmann and Mayer 1987, Verner and Boss 1980). Wild turkeys, successfully introduced to California in the 1960's (Graves 1975), are now an important component of California's oak-woodland habitats. California is one of the top 10 states nationally in number of wild turkeys (National Wild Turkey Federation, Inc. 1986). They are enjoyed by the state's hunters, ranchers, bird watchers, photographers, and nature enthusiasts of all sorts.

Because of this interest, and the considerable potential for managing and maintaining the state's oak-woodland habitats for wild turkeys, resource professionals in California are increasingly being called on for information on the ecology and management of wild turkeys. Generally, the same types of questions are asked: the landowner volunteers information about the location, acreage, and tree cover of the ranch; then the wildlife expert asks questions about the intended use of the land. The conversation ends with the wildlife expert making one or more management recommendations.

Recent developments in computer-based consultation programming have made it possible to delegate this type of routine problem solution to the computer (Goldenburg 1985). Computers are now present in the workplace of nearly all resource managers and educators. Although used primarily for data processing, computers are increasingly being recognized for their decision-aiding role.

Here, we explain in step-by-step fashion the functioning of the computer-based consultation program, WILD TURKEY. We then discuss how WILD TURKEY might be used to help agency and

university personnel with their natural-resource management or education responsibilities.

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WILD TURKEY

WILD TURKEY is designed to mimic a consultation with a wildlife expert. An actual example can best illustrate the use of WILD TURKEY. A rancher calls on a wildlife expert for information needed to incorporate wild turkey management into ranch-management plans.

Gathering Background Information.--WILD TURKEY asks for a general description of the ranch (Fig. 1). First, the consultation program asks the size of the property. The consultation program considers one square mile, or 640 acres, the minimum amount of living space needed by a flock of wild turkeys. So, if the ranch is less than 640 acres, the wild turkeys will use the neighbors' land and the landowner will have to consider management activities on neighboring land. This may not be necessary if the ranch is over 640 acres.

Next, WILD TURKEY asks the proportions of the management area that are covered by grass, chaparral, and trees. If the treed area is less than 200 acres, the system advises that no trees be cut, since any cutting could harm the wild turkey habitat. Finally, the user is asked the landowner's primary management objective: firewood cutting, livestock grazing, or wildlife enhancement. Once the management practice of choice is given, the consultation program asks more questions and assesses the impact the management practice would

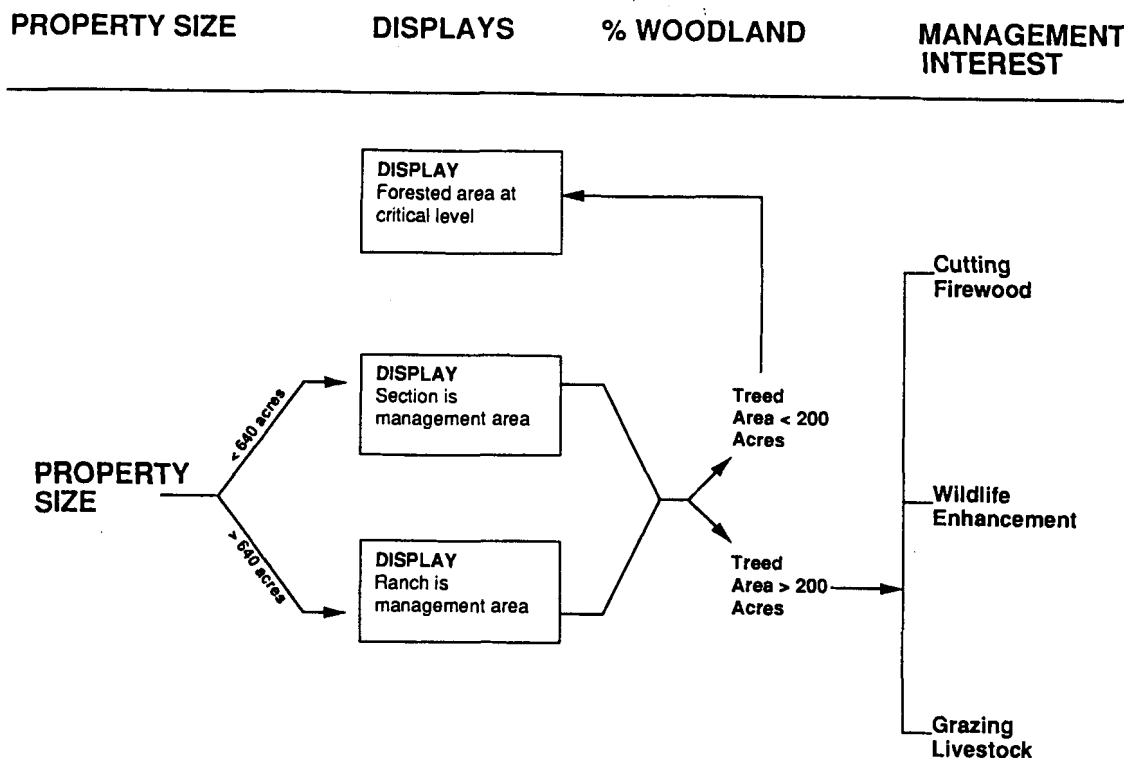


Fig. 1. Diagram of the questions WILD TURKEY asks to gather basic information about the ranch and management objectives of the landowner.

have on wild turkeys.

Wildlife Enhancement Choice. --The rancher in our example is interested primarily in managing the land for wildlife production, with an emphasis on enhancing the oak woodland for wild turkeys. The management-practice choice: "Wildlife Enhancement" is then selected from the computer screen. The consultation program asks the user whether certain habitat components, which are necessary for wild turkeys, are present (Fig. 2). The user selects "true" or "false" from the computer screen. For example, the user may respond "true" to the query of "Have Acorn Trees?". WILD TURKEY would then display the following management recommendation:

"Trees that are good acorn producers are very valuable. Turkey diet favors acorns, up to a quarter pound per day during the autumn. Ideally, there should be at least two of these "acorn trees" per acre. Avoid cutting these trees while they are in their peak production years. Plan for the future by marking and saving trees that are reaching maturity and show promise of being good acorn producers."

If the situation is best described by the answer "false" to the query of "Have Water?", the following management recommendation would be displayed:

"Ideally, water should be available within each quarter section of oak rangeland habitat. Riparian habitat is very important to wild turkeys. They use these areas for feeding, nesting, and thermal cover. Manage to maintain riparian habitat on your land.

If you are considering creating water impoundments, locate them at the margins of open areas near the woodland rather than in the middle of the meadow. Preserve any natural vegetation around the impoundment or plant some shrubs or trees. If livestock need access to the water, fence the livestock from the best cover. Water development that mimics a stream is more useful to wild turkeys than a stock pond."

A similar process is followed for the other two management-practice choices: "firewood cutting" and "grazing livestock". For all choices, WILD TURKEY asks questions about the ranch and management goals of the rancher. Then it asks

particular location and acreage of land and the management objectives of the landowner.

Once developed, it is necessary to test the consultation program to see that it performs the way it should, both mechanically and biologically. The expert should be the first user of the program. All logical paths need to be tested to see that they arrive unfailingly at the right conclusions. This process of seeing that the system has been developed correctly and does not contain technical errors is called verification (Geissman and Schultz 1988). Expand this step by encouraging others to go through the consultation program. If problems are encountered in understanding the questions or supplying the facts, the expert can re-examine the system and make adjustments. It is not unlikely that an important piece of information was inadvertently omitted from the consultation program.

Finally, the consultation program is ready for validation, or ensuring that the program meets its users' needs (Geissman and Schultz 1988). For peer review, we sent WILD TURKEY to several wildlife experts. We also presented WILD TURKEY at a professional meeting of potential users and solicited input from them. Because of the nature of the shell, it is easy to edit the computer-based consultation program. Validation is an ongoing process; as new information becomes available, it can be incorporated easily.

USES OF WILD TURKEY

Although a computer-based consultation program such as WILD TURKEY is unlikely to ever completely capture the wildlife expert's full range of knowledge or judgement, it can help the wildlife expert or non-expert in several important ways. If the expert is out of the office, WILD TURKEY could stand in for the expert. A wildlife consultation program can serve as a backup for agency or university personnel who are not trained in wildlife management. Whether used as a stand-in or a backup, the consultation program will help ensure that the right questions are asked and the correct answers are given.

WILD TURKEY also makes an excellent training tool. It works on a one-on-one basis so the trainee can work at his or her own pace. All the information is available at the trainee's fingertips. More importantly, the trainee learns the expert's

methodology. He or she learns what questions to ask and what information is important.

STATUS AND FUTURE OF WILD TURKEY

WILD TURKEY runs in an easy-to-use format on an IBM-PC or IBM compatible computer. Documentation of WILD TURKEY is available from the authors. It includes directions for use, path diagrams of the logic of the program, and the text for each conclusion.

We hope to incorporate graphics in WILD TURKEY. For example, if the client cannot identify the predominant oak species, we would like the system to pull up images of acorns, leaves, and tree shapes to help with the choice. There is interest in a Macintosh computer version too. Computer-based consultation programs for other oak-woodland wildlife species are also planned.

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