

Information and Environmental Education Session

Development of a Statewide Watchable Wildlife Program and Wildlife Viewing Guide in Tennessee

Laura J. Mitchell, *USDA Forest Service, Cherokee National Forest, P.O. Box 2010, Cleveland, TN 37320*

Robert M. Hatcher, *Tennessee Wildlife Resources Agency, P.O. Box 40747, Nashville, TN 37204*

Abstract: A coalition of natural resource agencies and private interests in Tennessee is currently enhancing a statewide network of conservation lands and developing a supportive public constituency by creating and promoting watchable wildlife opportunities. This program addresses the national and statewide trends for growing public interest in viewing and photographing wildlife and native plants. In Tennessee, program development has been underway for 12 years. Components are similar to those of the National Watchable Wildlife Program (recreation, education, and conservation) although the element of emphasis may vary from site to site. Goals for the future include improved linkage of both tourist and resident expenditures with conservation programs and local economies; ongoing linkage with Project CENTS (an award-winning statewide conservation education program); and support for the existing statewide Biodiversity Program based on results of an ongoing statewide GAP analysis.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 47:757-766

Trends in Tennessee's nonconsumptive wildlife activities may be projected from both nationwide and statewide surveys of wildlife-related activities conducted in 1980, 1985, and 1991 (U.S. Fish and Wildl. Serv. (USFWS) and U.S. Bur. Census 1982, USFWS 1988, USFWS 1989, USFWS 1992). The proportion of Tennessee's nonconsumptive wildlife activity increased from 65.8% of the total fish- and wildlife-associated participation in 1985 (Whitehead, pers. commun.) to 72.4% in 1991 (USFWS 1992).

Survey techniques used for the 1991 national survey yielded inherently more conservative counts than prior national surveys (USFWS 1992). This does not indicate an actual decrease in participation, but is a result of adjustment in survey methodology. Preliminary results of this survey estimate 2.6 million resident non-

Table 1. Jobs and expenditures (in millions of dollars) associated with wildlife-related activities in 1985 (Whitehead pers. commun.).

	Nonconsumptive	Hunting	Fishing
Jobs generated	10,600	9,300	18,000
Expenditures	\$274 M	\$235 M	\$481 M
Total economic impact	\$486 M	\$419 M	\$819 M
Sales tax revenue	\$39 M	\$35 M	\$41 M

consumptive wildlife participants in Tennessee in 1991. These participants spent more than \$295 million on trip-related costs; supplies including field guides, cameras, and binoculars; and other related contributions and subscriptions. Additional millions of dollars were spent on items such as bird seed. In the 4-state geographic region (East South Central) of which Tennessee is a part, 42% of the regional residents participated in nonconsumptive wildlife activities including observing, feeding, and photographing wildlife (USFWS 1992).

By applying the multiplier techniques of the Bureau of Economic Analysis, U.S. Department of Commerce (Anon. 1986) to the 1985 national survey data, economic impacts of Tennessee’s wildlife-related activities can be estimated and compared (Table 1).

Identical techniques were used to project the future economic impacts of non-consumptive wildlife activity based on the 1985 national survey (USFWS 1988) (Table 2).

These figures clearly outline a need and an opportunity for continued development and enhancement of the statewide wildlife viewing program.

The authors gratefully acknowledge the cooperative efforts of hundreds of specialists and volunteers, both locally and nationally, who pioneered this process and who continue to bring it to life.

History and Status of Statewide Program in Tennessee

The Tennessee Wildlife Resources Agency (TWRA) was one of the earliest state wildlife agencies to include development of Wildlife Observation Areas

Table 2. Projected nonconsumptive wildlife users in Tennessee and associated economic impacts (in millions of dollars) through the year 2000 (Whitehead 1991).

Year	Dollars Multiplier				
	Users	Spent	Impact	Jobs	Taxes
1990–1991	3.0 M	\$301 M	\$533 M	11,615	\$47.9 M
1995–1996	3.3 M	\$331 M	\$586 M	12,761	\$52.6 M
1999–2000	3.6 M	\$357 M	\$632 M	13,759	\$56.7 M

(WOA's) in their operational plans (TWRA 1979, Vickerman 1991). Two initial goals of the program were established: to provide (1) high quality opportunities for wildlife viewing in Tennessee's natural habitats, and (2) interpretation of wildlife-habitat relationships (TWRA 1979). Tennessee's first 13 WOA's were officially designated by TWRA in 1981, and an additional 13 were dedicated in 1983. The remainder have been designated since 1983 (Hatcher 1984). Tennessee's first statewide printed guide to the WOA's was a reprint of a *Tennessee Wildlife* magazine article describing 39 sites (Hatcher 1986). A supplementary leaflet described 5 revisions (TWRA 1990).

In order to alleviate the common problem of limited funding for interpretation and wildlife habitat improvements, 32 of the 45 WOA's (as of June 1993) are cooperative projects between TWRA and other public and private agencies and organizations. The lead agency is determined by mutual agreement, and is typically the agency that has on-site management personnel.

Positive public interactions with wildlife are intended to stimulate interest in and foster understanding of the resource, and to result in a broader and more informed supportive constituency. The program offers many opportunities for both interested citizens and agency employees to become involved with a variety of conservation and education activities ranging from exotic plant eradication to river cleanups.

Although recreation, education, and conservation are each desired elements at a viewing area, a single element may be emphasized depending on site characteristics and goals of the manager (Hudson 1992). The educational aspect is often emphasized at smaller, biologically-isolated urban sites and nature centers. These sites may occasionally lack inherently high natural or biological value, but their accessibility to urban populations, availability of a variety of public programs and activities, plus relatively high staffing levels may offer the best learning opportunities—particularly for school children, the physically challenged, and older adults.

At the opposite end of the spectrum, the conservation aspect may be emphasized at less intensively managed (or unmanaged), more remote sites, including wild and scenic rivers and other large tracts of public land with special designations. These areas often provide critical habitat for endangered species, or for species with specialized requirements for large home ranges or freedom from human disturbance. Viewing opportunities may be comparatively low here in terms of probability of seeing concentrations of a featured animal. Interpretation and facility development may be lacking.

The recreational aspect, or actual emphasis on the viewing activity itself, is most often featured at intensively managed sites where there is a high probability of viewing abundant wildlife in concentrated numbers. Opportunities may center around a single featured species, or a particular taxonomic group (i.e., wading birds, waterfowl). These areas are typically centered around bodies of water and/or cropland designed to attract wildlife. Other examples include scenic auto tours or float trips, combining recreational driving, canoeing, and rafting with viewing.

Examples of Tennessee's Cooperative Wildlife Viewing Areas

Reelfoot Lake

The Reelfoot Lake complex, located in the Mississippi River Valley of north-west Tennessee, is managed cooperatively by the USFWS, the Tennessee Department of Environment and Conservation's Bureau of State Parks, and TWRA. It was designated as a cooperative WOA in 1981 (TWRA 1986).

The lake contains 6,275 surface ha and was created by a series of earthquakes during 1811–12. Of the 1.5 million annual visitors, approximately 615,000 participate in wildlife viewing (Weaver and Hammitt 1986). Many viewers are attracted by an opportunity to view the 270 bird species recorded in the Reelfoot Lake watershed. Between 1 December and mid-March each year, approximately 12,000 visitors use the State Park's daily guided bald eagle tours and related educational programs. Up to 200 bald eagles winter at the lake each year, and 5 eagle nests are currently active within 5 miles of the lake. Visitors are also drawn by an opportunity to view concentrations of waterfowl. Peak winter populations average approximately 127,000 ducks and 75,000 geese (1981–1986). During the warmer months, the State Park provides daily guided pontoon boat tours to view herons, egrets, beavers, abundant amphibians and reptiles, and numerous other species. Viewing opportunities are enhanced by availability of driving tours, viewing platforms, hiking trails, checklists, brochures, and maps.

Monsanto Ponds

The Monsanto Ponds were used for up to 50 years as tailing ponds for phosphorus production. The ponds gradually became valuable marshlands that have attracted at least 160 species of birds, many of them rare to the physiographic area or to the state (Stedman 1987). When phosphorus production ceased in 1986, the Monsanto Company agreed to retain and enhance as much habitat as feasible. In 1990, 85 ha adjacent to the Duck River were dedicated as a WOA. Cooperators include the Monsanto Company, TWRA, and the Tennessee Ornithological Society (TOS).

Enhancements on the WOA and adjacent 2,025 ha of Monsanto land include water level controls, sharecropped wildlife food plots, brush piles, boundary vegetation, mineral blocks, and more than 100 nesting structures. The area also features 3 viewing blinds, one of which is barrier free, and an information kiosk, maps, and brochures. The Monsanto Ponds WOA has received at least 12 state, national, and international awards (W. Perdue, pers. commun.).

Expanding the Statewide Program

Expansion and development of the existing statewide program is underway. This process involves inclusion of a larger network of 81 uniformly-signed viewing sites throughout the state, printing of 25,000 copies of an educational viewing guide, and the development of more wildlife education opportunities. Education

opportunities range from a corresponding curriculum for classroom teachers to guided tours, scheduled programming, and interpretive signing.

Developing a Wildlife Viewing Guide

A national viewing guide series was initiated by Defenders of Wildlife (a non-profit organization) and a coalition of federal, state, and private cooperators in 1988. The publisher of this series is Falcon Press in Helena, Montana. Following this action, a national Memorandum of Understanding was developed and endorsed by 13 signatories in December 1990. In July 1993, Tennessee became the second Southeastern state, and the 12th nationally, to issue a state wildlife viewing guide.

The *Tennessee Wildlife Viewing Guide* (Hamel 1993) is a 96-page hard-cover book featuring descriptions of 81 "hot spots" for viewing wildlife in Tennessee. It is designed to teach viewers, primarily ages teen through adult, about wildlife and wildlife habitat relationships in addition to basic environmental and viewing ethics. Through the Guide, users may also be introduced to a number of environmental programs and organizations, including the State Scenic Rivers Program, Tennessee Native Plant Society, the National Speleological Society, and Tennessee's Biodiversity Program. Color photographs and original, educational color artwork are included to stimulate initial interest in the material.

The initial step in development of the viewing guide involved securing key agency political, monetary, and in-kind support, and establishment of a project manager and steering committee. The U.S. Forest Service (USFS) initiated 2 organizational meetings in June 1991 and January 1992. A project manager was named in April 1992, and a steering committee was formed from representatives of each of the key sponsoring agencies, organizations, and corporations.

The steering committee approved site evaluation criteria adapted from those listed in Hudson (1992) (Fig. 1). Other general goals were to provide a wide range of public access, including viewing from an automobile, from a boat, or along hiking trails; barrier-free access was featured whenever possible. A broad representation of physiographic areas and habitats, as well as an illustration of diverse resource themes and management styles was desired.

Site nomination forms were distributed by committee members primarily to professional biologists and a network of active conservationists. Over 100 sites were nominated for inclusion, and each was visited, evaluated, and ranked by the project manager. Each of the site evaluation criteria was ranked on a scale of 1 to 10, and each site was assigned a total score. Based on the final scores and personal recommendations, 81 of the best sites were selected by the steering committee. The written copy underwent a peer review process and was edited based on the comments of a network of wildlife professionals, researchers, experienced naturalists, and on-site managers.

Development of the educational artwork themes was achieved by interviewing and polling steering committee members and additional interpretive and education specialists recommended by the committee. Design and content were created through research and ongoing dialogue between the project manager and

TENNESSEE WILDLIFE VIEWING GUIDE
SITE EVALUATION FORM—FOR FIELD RESEARCH

Name of Site: _____
Evaluated by: _____
Date of Visit: _____ Hours Visited: _____

1. Answer the following "Y" or "N". If any answers are "N" the site will not be included in the Viewing Guide.
 - a) Is the site as currently managed (or as of May 1993) able to withstand public use without significant impact to the resource? _____
 - b) Is access to the site legal and safe? _____
 - c) Can the public view wildlife without being affected by conflicting uses, as currently managed with use stipulations published in the Guide? _____
 - d) Are freely-moving native wildlife present in "natural" habitat? _____

2. Rate the site, using numbers 1–10, against the criteria below (10 = the highest or best). Comment if needed.
 - _____ Reasonable access by car, foot trail, boat, etc. Goal: to feature a variety of access types, levels of difficulty.
 - _____ Reliable viewing opportunity during the appropriate season(s).
 - _____ Abundance and diversity of wildlife species present at the appropriate season.
 - _____ Scenic/aesthetic quality (visual quality, nuclear or toxic materials, offensive odors).
 - _____ Special efforts to promote, interpret wildlife values—signs, brochures, planned improvements (10 = in place, 5 = budgeted, 1 = not planned or budgeted).
 - _____ Targeted species/community contributes to guide diversity. (10 = unique to state, 5 = unique to region, 1 = common throughout).
 - _____ TOTAL (Possible 60)

Figure 1. Site evaluation form used for selection of sites to be featured in the *Tennessee Wildlife Viewing Guide*, Page One.

natural science illustrator. The artwork also underwent a peer review process by academicians, researchers, and appropriate steering committee members.

The Steering Committee opted to diverge from overall national trends through the inclusion of 2 sites. One site is a state-designated wildlife management area owned by an industrial timber corporation. Management practices on this property include clearcutting and prescribed burning, as well as management practices to enhance primarily game wildlife species. The committee saw this as a potential learning opportunity for the public, provided that the manager agreed

to provide and maintain on-site informational materials on commercial timber management practices and their potential long-term and short-term benefits to wildlife.

The second divergence was the inclusion of an urban complex featuring the state's only known breeding population of a popular viewing species, the black-necked stilt. The site is a waste-disposal and recycling center where visitors may be subject to the noise of heavy equipment operations and unpleasant odors. The site is popular with local birdwatching clubs and features a checklist and information center. In addition, the site features sludge compost processing, demonstrations of sod and crop agriculture with sludge, solid waste recycling, and wildlife conservation. Again, the committee weighed the positive learning opportunities against the potential for slight visitor discomfort and opted to include the complex as a site in the Viewing Guide.

Highway Signage Network

An integral component of the watchable wildlife program, both statewide and nationally, is a network of uniform traffic signs. Signs featuring the binoculars logo, the national watchable wildlife symbol approved by the Federal Highway Administration, have been installed by the Tennessee Department of Transportation on state and U.S. routes leading to Tennessee's viewing sites. Additional signage is to be purchased and installed by individual site owners, to be coordinated with local highway jurisdictions. The signs will lead visitors to viewing sites along a route that can be controlled by site managers, and will also provide recognition and visibility for the project.

A Supporting Educational Curriculum

The primary Viewing Guide educational component is modeled after Project CENTS, or "Conservation Education Now For Tennessee Students." CENTS is administered by the Tennessee Department of Education (TDOE) and co-sponsored by 6 federal, state, and private partners, including TDOE, TWRA, Tennessee Conservation League (TCL), Tennessee Division of Forestry, Tennessee Forestry Association, and the Tennessee Department of Environment and Conservation (TDEC).

This unique environmental education program disseminates selected conservation education materials, including Project WILD, Aquatic WILD, and Project Learning Tree, to classroom teachers and other educators through a network of trained facilitators. Programs are designed to prepare students to make wise decisions about conservation practices and resource use.

Quarterly CENTS newsletters are printed by TWRA and distributed to over 16,000 educators and other resource professionals. TWRA and other resource agency professionals (180 active trained facilitators) are responsible for conducting workshops for about 2,500 teachers per year. Teachers are trained and provided with literature for teaching wildlife related materials. For the period 1983 through 1992, 19,976 Tennessee teachers and approximately one-half million students were served.

The USFS provided Natural Resource Conservation Education Funds for distribution of approximately 3,300 viewing guides to CENTS facilitators and for the development of a supplementary environmental education curriculum. These will be distributed at a workshop planned to train 50 educators to become facilitators of the Viewing Guide project. This workshop is planned for early 1994. An educator/coordinator under contract with TCL is working with an education subcommittee (USFS, TDOE, TWRA, TCL, and Carson-Newman College) to develop the lesson plans and coordinate subsequent workshops for classroom teachers. The curriculum will contain lesson plans and activities cross-referenced to specific viewing sites and to natural resource concepts, including unique or endangered wildlife species, habitats in short supply, and relationships between wildlife and quality habitat in the context of the human environment. Focus will be on Tennessee's natural resource issues and habitats. Students will be able to identify and adopt a wildlife viewing area in their county or city of residence and learn about the values of wildlife habitat relationships demonstrated at that site. Local biologists, academicians, and resource managers will be listed as field trip hosts. The positive "hands-on" field experience and increased knowledge is likely to provide a cornerstone for conservation awareness and responsible behaviors in students.

Tennessee Wildlife Resources Agency Education Program

TWRA conducts its own wildlife education workshops and aquatic education workshops providing teachers with free materials and basic background in wildlife biology, identification, and management. Workshops are tailored to wildlife issues specific to the locale in which they are conducted. TWRA is to distribute 250 viewing guides through this education program, 200 to agency personnel, 100 to nongame and endangered species volunteers, and 950 to customers for a minimum donation of \$10.

Partnership Potential

The statewide watchable wildlife program encourages active cooperation between agencies and organizations to accomplish common conservation and education goals, and offers unique partnership potential among specialists including educators, wildlife professionals, engineers, tourism specialists, landscape architects, and many other disciplines. Potential interaction between the private and public sector is also enhanced. An opportunity is present to bridge the traditional, divisive wildlife disciplines, game and nongame. Each agency and organization offers an area of expertise and plays a unique role.

Partners that have joined the Watchable Wildlife coalition in Tennessee include the USFS, Tennessee Valley Authority, Department of Defense, TWRA, U.S. Army Corps of Engineers, USFWS, TDEC, National Fish and Wildlife Foundation, Monsanto Company, Tennessee Department of Transportation, Tennessee Department of Tourist Development, Defenders of Wildlife, Westvaco Corporation,

Tennessee Aquarium, Cradle of Forestry in American Interpretive Association, Nantahala Outdoor Center, TCL, and the TOS.

Tennessee's Wildlife Viewing Program: Vision for the Future

Long term goals of the statewide program include securing a constituency for a sustaining source of political support and funding for wildlife and conservation programs. Building interest and support within agencies, organizations, and corporations is critical to the success of the program, for members and employees represent a key opportunity to draw attention to the need for and value of a strong network of conservation lands. Continued communications and publicity for the program must be emphasized to keep public awareness at the desired level. The state steering committee must remain intact to oversee and share responsibility for the program, and to continue to improve the quality of program.

TWRA has included watchable wildlife as an integral element of acquisition, development, and management planning for 8 wetland sites purchased with a portion of a property transfer tax. Passage of the Wetland Acquisition Act has enabled TWRA to acquire 9,093 ha of wetlands at a land cost of \$13,257,229 during the period 1986–1992. As of December 1992 an acquisition of an additional 4,871 ha of wetlands was planned at a projected cost of \$5,104,533. Wherever feasible, wetland enhancement is planned to provide improved habitat for waterfowl, shorebirds, rails, sandhill cranes, and other wetland-dependent species. Proposed enhancements include viewing towers, photos of key species, and wildlife habitat interpretive material (Hopper, pers. commun.).

Thirty-eight of the 81 sites featured in the viewing guide are WOA's (June 1993). Many others are candidates for official state WOA designation. TWRA will encourage nomination of these and other sites as WOA's as cooperative projects with TWRA.

There will be a continuing need to provide funding and personnel to improve both viewing and educational opportunities on wildlife viewing areas and WOA's across the state. Funding is currently needed to attain a suggested minimum level of interpretation (a brochure or bulletin board) at each site.

TWRA's existing Nongame Contribution Fund is performing well, but could benefit from increased publicity. Initial 1992 contributions totaled over \$37,000. This fund is intended to support current conservation activities for nongame and endangered species.

A new Watchable Wildlife Endowment Fund, established on 29 March 1993, will supplement the Nongame Contribution Fund. The principal of this fund will not be spent until the principal and earnings reach a balance of \$500,000. The fund will be administered by the State Treasurer, and may benefit all wildlife species or subspecies when the specified use is nonconsumptive, to the extent that these activities are consistent with the species' legal taking and welfare. Nongame, endangered, and threatened species, or species in need of management, may also benefit. The endowment is considered to be a long-term self-perpetuating source of funding for the statewide program.

Literature Cited

- Anon. 1986. Regional multipliers: a user handbook for regional input-output modeling system (RIMS-II). Bur. Econ. Anal. U.S. Gov. Printing Office. Washington, D.C. 10pp.
- Hamel, P. 1993. Tennessee Wildlife Viewing Guide. Falcon Press Publ. Co., Inc. Helena, Mont. 96pp.
- Hatcher, R. M. 1984. Tennessee wildlife observation area program. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 38:662-670.
- . 1986. Hot spots for viewing wildlife - wildlife observation areas. Tenn. Wildl. Tenn. Wildl. Resour. Agency 9(4)5-12.
- Hudson, W. E., ed. 1992. Nature Watch: a resource for enhancing wildlife viewing areas. Falcon Press Publ. Co., Inc., Helena and Billings, Mont. 199pp.
- Stedman, S. J. 1987. Monsanto ponds - Rare marshland habitat. Tenn. Wildl. Tenn. Wildl. Resour. Agency 10(6):16-19.
- Tennessee Wildlife Resources Agency. 1979. Nongame wildlife operational plan. Pages 8, 19.
- . 1986. Reelfoot Lake fifty year management plan. 294pp.
- . 1990. Supplement to "Wildlife observation areas - hot spots for viewing wildlife". 2pp.
- U.S. Fish and Wildlife Service. 1988. 1985 national survey of fishing, hunting and wildlife-associated recreation. 167pp.
- . 1989. 1985 national survey of fishing, hunting and wildlife-associated recreation - Tennessee. 81pp.
- . 1992. 1991 national survey of fishing, hunting and wildlife-associated recreation - state overview, preliminary findings. 24pp.
- and U.S. Bureau of Census. 1982. 1980 national survey of fishing, hunting, and wildlife-associated recreation. 156pp.
- Vickerman, S. 1991. Watchable wildlife: a national initiative. Defenders Wildl. 87pp.
- Weaver, L. A. and W. E. Hammitt. 1986. Reelfoot Lake visitor use study. Univ. Tenn., Knoxville. 145pp.
- Whitehead, C. J. 1991. Fisheries, small game, migratory bird, and non-game program outputs. Tenn. Wildl. Resour. Agency. 22pp.