TVA REGIONAL HERITAGE PROGRAM: A LAND-USE PLANNING TOOL FOR FISH AND WILDLIFE RESOURCE PLANNERS[a]

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Abstract: The TVA Regional Heritage Program uses an innovative data management system developed by The Nature Conservancy to aid in natural resources management. The system is particularly useful in early phases of environmental assessment and natural resources planning for identifying potential conflicts with sensitive features. Three cross-referenced files are used to organize the data: a map file, a manual file, and a computer file. Elements catalogued include threatened and endangered species, state and federal management areas, champion trees, and significant geological features. The Heritage Program is a tool that provides the framework for centralizing known locality data concerning sensitive natural resources. It is a rich potential source of information for fish and wildlife resources managers throughout the 7 state, 201 county TVA region.

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The Tennessee Valley Authority (TVA), a Government corporation, has been charged by Congress with the responsibility of furthering the proper use, conservation, and development of the natural resources of the Tennessee Valley region, a 201 county area within 7 southeastern states. To meet this responsibility, the TVA Regional Heritage Program was established within TVA's Office of Natural Resources. Program biologists use a natural resources data management system devised by The Nature Conservancy to assist in identification of potential land-use conflicts in early planning phases. The TVA Regional Heritage Program was established through a cooperative agreement between TVA and The Nature Conservancy on June 1, 1976.

PROGRAM DEVELOPMENT

The system focuses on elements of natural diversity, particularly those that are of interest through unique or exemplary qualities possessed or rare or endangered status as defined by state or federal agencies. This innovative approach allows consideration of the relative significance of the site.

Six states in the Southeast are currently using The Nature Conservancy system and have functional Heritage Programs: Kentucky, Mississippi, North and South Carolina, Tennessee, and West Virginia. Descriptions are available for some of the programs (Mississippi State Heritage Program 1975; North Carolina Natural Heritage Program 1977; South Carolina Heritage Trust 1975; and the Tennessee Heritage Program 1976, 1977).

Geographically referenced information collected by the TVA Heritage Program includes state and federally listed threatened or endangered species (for convenience, referred to as special species), sensitive wildlife habitats such as heronries or wetlands, geological formations, and state and federal management areas.

PROGRAM APPLICATION

The program constitutes an information source that facilitates environmental assessment and review, resources management and planning, and identification of significant natural areas. Data are used to indicate both potential limitations and

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opportunities for land use and management. When all existing locality data for the TVA region are in the data base, the assembled data can also be used to indicate research needs. This will allow the agency to comment on the relative rarity or abundance of a species and on the ecological significance of a potential construction site or other contemplated land use.

Environmental Assessment

During the past 12 months, 392 projects were reviewed for environmental impacts by Heritage Program personnel. Included in the reviews are 3 types of projects:

1. Non-TVA projects on TVA-administered lands (e.g., gravel removable from reservoirs).
2. Non-TVA projects receiving federal funds on private lands (e.g., draft Environmental Impact Statements on metropolitan subdivisions).
3. TVA projects on public and private lands (e.g., regional power plant and transmission line siting studies).

The review process involves locating the project in the map file and identifying potential land use conflicts. Comments include the legal status of species involved, the data source, the collection locality, and construction precautions. Program data are available to planning agencies; however, the data do not replace onsite inventory.

Resource Management and Land Planning

Identification of environmentally sensitive areas is an important consideration in many resources management and land planning processes. Data generated by the Heritage Program can be used independently or in combination with other geographically referenced data, such as topography, land cover/use, soils, water resources, and others (Baxter 1976). An example of potential use of endangered species habitat data in conjunction with other data in a complex investigation is afforded by the Catoosa Resource Wildlife Management Area in middle Tennessee. Endangered species locality information is used as a planning constraint; however, as management techniques are determined for the species, they may be incorporated into the managed area plan.

Identification of Significant Natural Areas

Significant natural areas on TVA lands can be identified by locating special species and determining the relative rarity of those species. Program information allows preservation priorities to be determined on the basis of sound data rather than on subjective judgments. Significant areas may be described and designated in such programs as the Small Wild Areas Program—a program within TVA's Office of Natural Resources that identifies areas of scenic or scientific value.

PROGRAM METHODOLOGY

Classification System

The classification system catalogues natural elements for inclusion in the program. Listed below are broad categories of elements in the classification system:

1. *Geological features* - includes caves and other geologic features or formations. These sites often provide habitat for threatened and endangered biota, such as the Indiana bat (*Myotis sodalis*) and Tennessee cave salamander (*Gyrinophillus palleucus*).
2. *Special animals* - includes threatened, endangered, or otherwise special animal species receiving or recommended to receive state or federal protection.
3. *Special plants* - includes threatened, endangered, or otherwise special plant species receiving or recommended to receive state or federal protection.

4. *Other* - includes American Forestry Association (Pardo 1978) and State Designated Champion Trees, unique biological areas (e.g., heron rookeries, species type localities), and other elements.
5. *Managed areas* - includes all state or federally managed areas (e.g., state parks, national wildlife refuges, state nature preserves) and National Natural Landmarks (USDI 1978).

Data Collection

Data have been obtained from museums and university collections, herbaria, scientific literature, local natural history organizations, agencies of state and federal governments, and private citizens. Many of the data points have not been field verified by TVA biologists, therefore the accuracy of locality data will vary with the accuracy of available information.

Data Management

Data are transcribed on a standard form and stored in 3 cross-referenced files: (1) topographic map file, (2) manual file, and (3) computerized file. Each element occurrence is assigned a unique index code sequence which identifies it throughout the data management system. All information pertaining to a particular element is stored and retrieved using the index code for that element.

1. *Topographic map file* - This file includes a set of 1600 7-1/2-minute U.S. Geological Survey topographic quadrangle maps covering the 201 county TVA region. Element occurrences are plotted on appropriate quadrangle sheets. The corresponding index code sequence and latitude-longitude coordinates are then transcribed in the upper right margin of the map. Managed area boundaries are delineated on the quad and the name is written in the upper left margin. Maps are organized sequentially using the TVA universal map code locator system. Each quadrangle is given a specific 6-digit number according to its position within a given 1° geodetic cell (Weber and Gregory 1975).
2. *Manual files* - The manual files are composed of 3 separate files. Information collected about an element occurrence is transcribed on a standard data sheet. Data sheets may be stored in the geographic and/or element file. The geographic manual file contains a folder for each topographic quadrangle map. The element manual file contains a folder for each element (i.e., species). This file may also store distributional information, management criteria, and life history studies. The managed area file stores boundary, ownership, and management information.
3. *Computer file* - The computer file provides the "bookkeeping system" for element occurrences processed by the Heritage Program. The computer system provides a framework for recording and storing data necessary for analysis of element distribution (Moyseenko 1974). The automated file provides efficient retrieval of specific subsets of the data base; for example, localities for the Indiana bat within Blount County, Tennessee, only, could be selected and retrieved. Data updates (deletion, correction, and addition of new information) are a standard operation performed on the computer system.

   Computer generated maps can be used to display element occurrence data geographically. These maps are most useful to overlay 1:24,000 and 1:250,000 scale topographic maps and 1 inch = 1 mile county base maps.

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