# TENNESSEE WETLANDS CONSERVATION STRATEGY

## SECOND EDITION: CURRENT PROGRESS AND CONTINUING GOALS


**by the**
**Governor's Interagency Wetlands Committee**
**and its**
**Technical Working Group**

**January 1996**

**EPA #904-R-96-001**

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STATE OF TENNESSEE

DON SUNDQUIST
GOVERNOR

January 18, 1995

Dear Fellow Tennesseans,

I am very pleased to share with you the *Tennessee Wetlands Conservation Strategy. Second Edition: Current Progress and Continuing Goals.* This plan and its accomplishments result from a concerted effort by private, state and federal interests to balance the genuine necessity of wetlands conservation with a sensitivity to the rights and concerns of our citizens.

Over the last two years, the *Strategy* has been implemented largely on schedule with success inside and outside of Tennessee. The *Strategy* has encouraged state agencies to direct state and federal funding for wetlands conservation in much more effective directions than the past. State wetlands and soils information has been computerized not only for the benefit of wetlands, but also for more thoughtful agricultural, economic and transportation activities. Gradual improvements are being made in the fairness and objectivity of wetlands regulations. More information and technical support are being provided to improve the natural and economic opportunities for privately owned wetlands. In addition, the *Strategy* and its unique consensus approach has catalyzed numerous out of state requests for copies of the plan and advice

It is true that wetlands resources are vital components of Tennessee's valuable and sometimes threatened ecosystems. Recent data and current professional opinion indicate that the rate of wetlands loss has significantly declined. However, we still recognize that our "no net loss" goal for the state's wetlands remains a challenge To maintain the momentum of our accomplishments, my administration will continue to support the *Strategy* and its related activities. To all citizens of Tennessee, I urge your support and assistance

Sincerely,

Don Sundquist

Don Sundquist

**State Capitol, Nashville, Tennessee 37243-0001**
**Telephone No. (615) 741-2001**

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# ACKNOWLEDGMENTS

The State of Tennessee gratefully acknowledges the contributions and efforts of the following individuals and organizations who made the Tennessee Wetlands Conservation Strategy possible The support of Governor Don Sundquist and former Governor Ned McWherter is especially gratefully acknowledged. Their support empowered, sanctioned and catalyzed the planning and implementation participants Without their support, the Strategy would not be a national model of bi-partisanship and a true state wetland conservation plan.

Representative Page Walley and the members of the Joint Committee on West Tennessee Tributaries and Streams are recognized for fostering awareness and support for the Strategy and its accomplishments in the Tennessee General Assembly.

The contributions of Dr. Ruth Neff are gratefully acknowledged Dr Neff provided critical guidance, wisdom and vision as Chair of the planning committee and as author/editor of the original Strategy. Also acknowledged are the contributions of Mr. Tom Talley. Mr. Talley provided sound expertise as technical coordinator of the planning process. He completed three pilot studies identifying worthy wetlands research and information technology investments and greatly contributed to the development of this document.

Special recognition is due the members of the Governor's Interagency Wetlands Committee and its diligent Technical Working Group (See Appendix A). These individuals provided the commitment and cooperation needed to develop and implement the Strategy

The Strategy and its progress would not have been possible without the generous financial and professional support of the United States Environmental Protection Agency

Tony Campbell, formally of the Tennessee Conservation League and Julius Johnson of the Tennessee Farm Bureau are recognized for initiating and sustaining the consensus process and implementation of the Strategy during uncertain transition periods.

Commissioner Don Dills of the Tennessee Department of Environment and Conservation and Mr. Leonard Bradley, Assistant to the Governor for Policy are recognized for continuing important executive level coordination in the Sundquist Administration.

The State also gratefully acknowledges the contributions of Ms. Melanie Reddy who capably edited and revised the text and style of the document and its new status of actions.

# PREFACE

The Tennessee Wetlands Conservation Strategy, first published in February 1994, created a blueprint to guide agency and organizational decisions, research, and actions to better understand and conserve Tennessee's wetlands resources. This is the second edition of the Strategy, developed to provide a progress report on actions accomplished, changes in institutional support and challenges that continue to be addressed since the first publication. Much of the original plan text remains unchanged (with the exception of this preface, revisions in institutional names and updated data). However, this edition will reflect a shift in focus from planning to implementation.

The development of a Wetlands Strategy in Tennessee began in the fall of 1989, when Governor Ned McWherter appointed an Interagency Wetlands Committee (IWC) to advise him concerning the status of the state's wetlands Members of the Committee are the leaders of state and federal agencies with program responsibilities related to wetlands, and the leaders of private user groups and organizations The purpose of the Committee is to exchange information and coordinate the programs of federal, state, and local agencies, conservation organizations and private landowners to manage, conserve or restore wetlands for beneficial uses The Committee appointed a Technical Working Group (TWG), consisting of professional staff members from each agency or organization, to carry out necessary research and technical analysis. A list of present members of the Committee and of the Working Group appears in Appendix A, Part I.

In December 1989, the IWC recommended that the State develop a comprehensive statewide Wetlands Conservation Plan for Tennessee. Their decision was partially based on guidance from the 1987 National Wetlands Policy Forum, which recommended that all states develop conservation plans. In July 1990, EPA awarded a $102,910 Wetland Program Development Grant to the State to initiate the planning process.

Tennessee was one of the first two states in the nation to attempt development of a State Wetlands Conservation Plan (WCP). As work on the state plan progressed, it became quickly apparent that data needed to formulate quantified objectives were not available.

Concurrently, the state of the science of wetlands qualification, including classification, characterization, and functional value assessment was undergoing a major transition.

The TWG concluded that it was not possible to produce a comprehensive State Wetlands Conservation Plan as originally conceived, but that it was possible to develop a comprehensive conservation ***strategy*** to guide statewide wetlands policy and technology development.

At about the same time, the World Wildlife Fund (WWF) convened an advisory panel, including Tennessee and 16 other states, to formulate State Wetlands Conservation Plan Guidelines. WWF's advisory panel also agreed that a Strategy rather than a comprehensive plan was the most viable option.

The TWG decided to prepare a Wetlands Conservation Strategy following the 1992 WWF strategy guide. A strategy defines a process that can be used to adopt a statewide goal and define objectives; to review the current status of the state's wetlands resources, and the programs affecting them; and to develop an action plan to meet the State's objectives

The TWG developed the state strategy through an interactive and iterative process. Members of the group worked intensively to capture the group's knowledge and advice, and to draft a Strategy document which the State can use for guiding policy decisions

On August 24, 1993, the Clinton administration issued a wetlands policy document entitled "Protecting America's Wetlands· A Fair, Flexible and Effective Approach" The policy paper proposed a series of improvements to the federal wetlands regulatory programs, and other programs. The proposed actions are intended to simplify regulatory programs, improve interagency coordination, and decrease uncertainty for landowners and the regulated community. The 1993 proposal confirms the previously adopted "no overall net loss" policy, and the policy "to increase both the quantity and quality of the nation's wetland resource" as a long term goal.

After finding the Strategy to be consistent with the President's policy, the final document was approved by the IWC. On February 22, 1994, Governor Ned McWherter endorsed the Strategy as an official instrument of state wetland policy.

Tennessee's current Governor, Don Sundquist, has recognized the value of the consensus approach taken by the IWC, as well as the importance of executive level

sponsorship of the Strategy. His adoption of the Strategy has enabled the IWC and the TWG to continue to work toward fulfilling its objectives.

The generous financial support of the Environmental Protection Agency in developing the Tennessee Wetlands Conservation Strategy has been a critical component of its success Since 1989, the State has received $903,047 in grants from EPA for the development and implementation of the Strategy.

Implementation of the plan is predominantly on schedule, and the first year has seen several successes in the advancement of our wetlands knowledge base through targeted research and advances in geographical information system data collection. The focused, action oriented structure of the Strategy has enabled it to be a working plan, rather than just a policy document. Its broad based support, and cooperative tone have helped to lessen negative perceptions of wetland conservation by non-environmental interests. It has also encouraged numerous state program actions and has increased federal and state interagency and intraagency coordination (See Appendix I for detailed information concerning implementation accomplishments)

Growing interest in the Strategy across the nation but particularly the southeast has provided Tennessee with the opportunity to present the Strategy as a planning model for other states. Since its adoption, nine presentations have been made at state regional and national conferences sponsored by private and public interests. Persons from 38 different states have requested a copy of the Strategy and information related to "lessons learned" in the Tennessee planning experience (See Appendix G for summary of "lessons")

Overall, the atmosphere for wetiands conservation in Tennessee has been very positive in the last two years. Acquisition of targeted wetlands by the Tennessee Wildlife Resources Agency has continued. Increased cooperation among other wetlands interests to purchase and protect unique wetlands has also occurred. In 1995, local organizations, state agencies and national conservation groups banded together to purchase a largely pristine, 4000 acre tract of bottomland hardwood and cypress-tupelo swamp wetlands on the Wolfe River in Fayette County. Important advances also continue to be made through the stable consensus of the West Tennessee Tributaries Steering Committee Their restoration demonstration project seeks to restore over 21 miles of river meanders along a previously channelized river. Federal

wetland grants, received through the Strategy, have played a significant role in its development. Federal and state sanctioned mitigation banking, with a strong emphasis on wetland restoration as opposed to creation and preservation continues to grow. Renewed emphasis on greenways also offers new opportunities for wetland conservation in rapidly urbanizing areas.

Challenges in wetland conservation still exist. Polarization over wetlands issues continues at the national level as the reauthorization of the Clean Water Act and its federal wetlands regulatory policy is being considered. The balance between growth and conservation in Tennessee continues to be a challenge not only for wetlands resources but also for open space, farm communities and farmland, "viewsheds" and floodplains. An emerging threat is the invasion of purple loosestrife in Tennessee wetlands. This aggressive pest plant has already displaced natural vegetation and has sterilized valuable habitat in thousands of acres of wetlands in other states (See Appendix I, Part C).

It is clear, after two years of plan implementation, that interagency and interorganizational cooperation can effectively focus a broad array of resources and expertise on a mutually agreed set of objectives and actions The end result however, must be true, "on the ground" conservation of wetlands in Tennessee (i e , no net loss of acreage and wetlands restoration). This success has still yet to be determined by solid data. Continued implementation and active data collection on the status and trends of Tennessee's wetlands over the next four years will hopefully reveal the progress of this Strategy and associated conservation efforts

# CHAPTER I
# TENNESSEE WETLAND RESOURCES: DESCRIPTION, STATUS, AND TRENDS

**What Wetlands Does the Strategy Consider?**

Wetlands are transition zones controlled by landscape and hydrology, and they typically contain attributes of both aquatic and uplands environments Some, such as deep swamps, bogs and marshes are typically recognized as wetlands by the prominence of water and distinct wetland vegetation. Others, such as bottomland hardwood forests which lack permanent standing water, and submerged aquatic beds which exhibit hydrologic regimes equivalent to aquatic environments are less recognizable. This variation in physical characteristics of wetlands tends to confuse public perception of wetland definition

Wetlands are defined and delineated for various legal, scientific and economic purposes, including regulation, functional assessment, ecosystem and landscape management, and human use. Within the framework of regulatory programs, wetlands definition and delineation is usually interpreted conservatively, whereas, in a landscape management context, such as wetlands habitat assessment, a broader interpretation is needed Wetland definition for specialized purposes such as acquisition and inventory may include river channels, open waters of lakes and reservoirs, sand bars, mud flats, levees, islands and floodplain terraces that do not fit the classic character of vegetated wetlands, or regulatory program definition. An overview and discussion of the several Federal wetlands definitions appears in APPENDIX B

The intent and purpose of a wetlands definition is fundamental to its interpretation and application Due to the significant influence of federal programs and national initiatives on state wetland conservation matters, the formulation and use of an independent state definition of wetlands was not pursued. Instead, the State elected to defer to the federal agencies in defining and delineating wetlands. It was concluded that the development of an independent state definition at this time was unnecessary, and could be counter-productive

In the August 24, 1993 White House policy document, "Protecting Wetlands. A Fair Flexible and Effective Approach," the Clinton administration offered no new recommendations

with regard to the delineation of jurisdictional wetlands by federal agencies Instead, the administration will defer a decision on a preferred delineation method to be used by federal agencies until the National Academy of Sciences committee completes an independent study of the technical criteria, and makes its recommendations to the President and sponsoring agencies Due to the dynamic nature of this process, the State will continue to defer to federal guidance with respect to the delineation of jurisdictional wetlands.

The wetlands of most concern in Tennessee and the wetlands targeted in the Strategy are those shallow, freshwater wetlands which contain submerged, emergent and or woody vegetation, and are collectively referred to as **palustrine wetlands**.

**How Many Wetlands are there in Tennessee?**

Wetlands inventories have been made during the past one hundred years or more. The earliest surveys were made by the federal agricultural and land management agencies to determine drainage needs. As interest in wildlife conservation grew, inventories were made to determine the quantity of habitat available for select water dependent species, especially waterfowl. No complete wetlands inventory has ever been specifically conducted in Tennessee, and no national wetlands inventory has accurately quantified the wetlands of Tennessee.

In 1993, six references and/or datasets were used to determine the acreage of wetlands in Tennessee. None of them can be directly compared to another, because of two fundamental issues: (1) differences in defining, identifying, and delineating the resource base being inventoried; and (2) differences in the accuracy of the methods employed in the inventory

Data from the six inventories have been rectified to a common base in an attempt to make them more comparable This data is displayed in TABLE 1. However, it should be noted that the interpretations of wetlands types made in TABLE 1 are based on the best professional judgment of the TWG staff, and not the authors of the referenced publications.

An indirect estimate of the state's "wetlands capability base," areas that are capable of supporting wetlands, can be made based on the occurrence of hydric soils USDA Natural Resource Conservation Service (1991) soil survey data maintained by the Iowa State University Statistical Laboratory were summarized for Tennessee. The analysis indicated hydric soils

## TABLE 1
## ACRES OF WETLANDS AND WETLAND INDICATORS FOUND BY VARIOUS SURVEYS

| WETLAND TYPE[1] | SCS SOILS DATA | DAHL 1780'S | SHAW & FREDINE 1956 | DAHL 1980'S | NRI 1982 | NRI 1987 | TWP 1988 | TWRA GIS 170 QUADS |
|---|---|---|---|---|---|---|---|---|
| **Palustrine** | | | | | | | 639,177 | |
| • Forested | | | | | 737,000 | 730,400 | | 522.467 |
| • Scrub-Shrub | | | | | 8,500 | 8,500 | | 25,516 |
| • Emergent | | | | | 53,800 | 53,800 | | 27,518 |
| **Subtotal** | | | | | 799,700 | 792,700 | | 575,501 |
| • Open Water | | | | | 64,000 | | | 38,191 |
| • Unconsol. Bottom | | 1,937,000 | 828,000 | 787,000 | 863,000 | 856,000 | | 3,132 |
| • Unconsol. Shore | | | | | | | | 1,621 |
| **Subtotal** | | | | | 64,000 | | | 42,944 |
| **Total Palustrine** | | | | | | | | 618,445 |
| **Lacustrine** | | | | | | | | |
| • Limnetic | | | | | | | | 44,061 |
| • Littoral | | | | | | | | 3,851 |
| **Subtotal** | | | | | | | | 47,912 |
| **Riverine** | | | | | | | | |
| • Lower Perennial | | | | | | | | 117,025 |
| • Upper Perennial | | | | | | | | 96 |
| • Intermittent | | | | | | | | 19 |
| **Subtotal** | | | | | | | | 117,140 |
| **GRAND TOTAL** | | | | | | | | **783,497** |
| **Soils** | | | | | | | | |
| • Hydric | 1,546,254 | | | | | | | |
| • Potential Hydric | 1,236,946 | | | | | | | |
| **Subtotal** | 2,783,200 | | | | | | | |

[1] as described by Cowardin, et al, 1979.

acreage of approximately 1 55 million acres Distribution of the general hydric soils of Tennessee is shown in FIGURE 1.

An additional 1.24 million acres are considered by the TWG to be potentially hydric, and as such, portions may support vegetation that can be detected as wetlands by remote sensing methods typically used in wetlands inventories Portions of the potentially hydric soils may in fact be hydric, and, if vegetated, may be jurisdictional wetlands. The remainder of these potentially hydric soils generally would not meet hydric soil criteria and may lack sufficient hydrology to meet the wetlands definition

Based on this data, it is projected that Tennessee has approximately 2 million (or more) acres of wetlands capability base. However, many of these acres have previously been converted to non-wetlands uses and are no longer considered wetlands An analysis of soils occurrence in individual counties from the USDA (1991) soil survey database shows that 80% of the hydric soils occur in the western grand division of the state Sixteen percent occur in the central division, and only 4% in the eastern division.

FIGURE 1 reflects this distribution by showing that the percentage of area containing hydric soils decreases from west to east Each percentile range indicates that some hydric soils do occur, even though the amount may be near the lowest value within that range

Dahl (1990) used data from the National Wetlands Inventory and other sources to determine the status and trends of wetlands nationally. His data for Tennessee was derived from an analysis performed for the Southeast by Hefner and Brown (1984) Thirty-three square mile sample plots (equaling 0 3% of the state's total area) were used to statistically determine that Tennessee contained 787,000 acres (+/- 16%) of wetlands in the mid 1980's Dahl then added this acreage to USDA agricultural drainage statistics (Pavelis, 1987) to determine that 1,937,000 acres probably existed in the 1780's Shaw and Freding (1956) inventoried areas of high waterfowl habitat concentration in their early 1950's national survey. They inventoried all of the state west of Kentucky Lake, the reservoirs of the east Tennessee ridge and valley province, and some of the perched wetlands on the Eastern Highland Rim They estimated that Tennessee has 828,000 acres of waterfowl habitat (assumed to be vegetated wetlands).

It is noteworthy that Shaw and Freding (1956) described 447,600 acres of the total as "high quality" habitat, ranking the state sixth in quantity of high quality habitat. It was surpassed only by Minnesota, Arkansas, Louisiana, Texas and North Dakota.

The USDA conducts a National Resource Inventory (NRI) every five years, and uses the Shaw and Fredine wetland classification system The NRI in past years was performed by sampling numerous points across the state with reported with a 95% condfidence interval. The 1982 and 1987 inventories indicated 863,700, and 856,700 acres respectively of palustrine wetlands (*this data is based on 1993 calculations*[1])

In 1988, the former Tennessee Department of Conservation formulated a "State Wetlands Plan" as an addendum to the State Recreation Planning Report, in compliance with the Federal Emergency Wetlands Resource Act. Aerial photography and satellite imagery were used to determine that the state's vegetated wetlands comprised 639,177 acres (571,000 ac. or 89% in the western grand division and 68,177 ac. or 11% in the remainder of the state).

Tennessee Wildlife Resources Agency is currently digitizing National Wetlands Inventory (NWI) maps into their Geographic Information System (GIS). Digitization provides for a relatively accurate determination of the acreage of wetlands digitized. To date approximately 60% of the state's total area in NWI quadrangles have been digitized (*this represents a 38% increase since 1993* - See Figure 2). Maps have been prioritized for digitization based on areas of known wetlands concentration.

Out of 170 digitized maps analyzed in 1993, one hundred forty digitized maps occurred in West Tennessee. The remaining 30 were in areas of high wetlands concentration in the central and eastern grand divisions. Analysis indicated that there were 783,497 acres of wetlands on 170 digitized quadrangles; 618,445 of these acres are palustrine wetlands. Based on distribution of hydric soils, it appears that 80% to 85% of the state's wetlands may have been digitized. Extrapolation of this data indicated approximately 773,000 to 825,000 acres of palustrine wetlands statewide.

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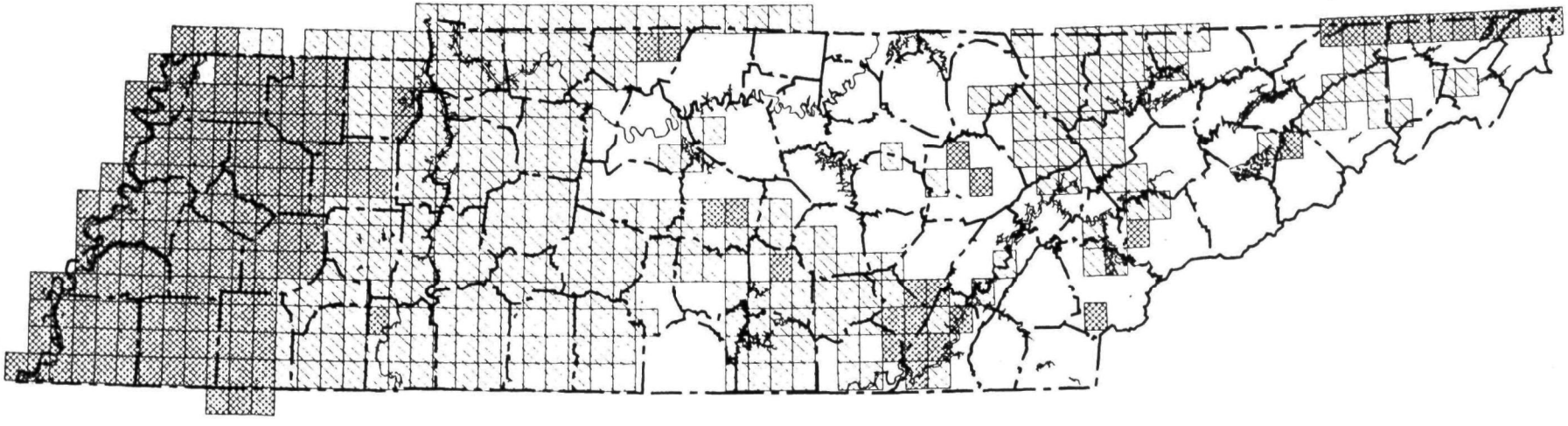
[1] In 1994, adjustments were made in the 1982 NRI data to better conform to the Cowardin (1979) wetland classification system and to make certain corrections. These adjustments resulted in revised estimates of 664,000 acres (± 68,000 acres) of palustrine wetlands on non-federal lands. The 1992 NRI estimated 668,100 acres (± 67,900 acres) of palustrine wetlands on non-federal lands. Adding federal wetlands acres would provide a state total The confidence intervals of the data indicates no statistical difference between samples (i.e., an increase of acreage from 1987 to 1992 cannot be assumed and a no net loss might be presumed—Quoted from state NRCS staff).

# *FIGURE 2: STATUS OF NATIONAL WETLANDS INVENTORY DIGITIZATION*



## LEGEND

- NWI Digitization Completed Prior to 10/11/93
- NWI Digitization Completed Between 10/11/93 and 08/16/95
- County Boundaries
- Major Rivers and Reservoirs

TENNESSEE WILDLIFE RESOURCES AGENCY

[illegible] one knows the exact acreage of Tennessee's wetlands In 1993, TWRA's digitized [illegible] concluded that a minimum of 618,445 acres of palustrine wetlands existed Hefner and [illegible]1984) concluded a statistically derived maximum of 912,920 acres of palustrine wetlands. [illegible] range of Hefner and Brown (1984), SCS 1987 NRI, and TWRA's GIS projected data [illegible] approximately 814,000 acres of palustrine wetlands in the state

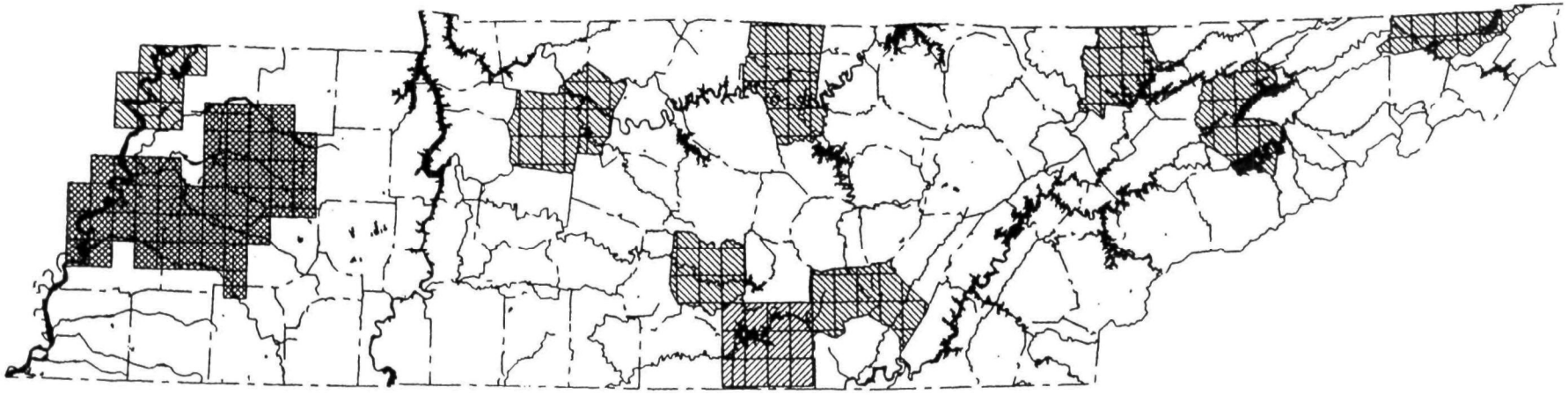
A more accurate estimate of Tennessee's total wetlands acreage will be possible as [illegible] of the NWI and hydric soils data for the entire state is completed and imported into [illegible] system. Digital data from additional NWI quadrangles acquired and digitized in to date [illegible] with the aid of a FY 1993 program development grant from USEPA are near completion (See [illegible] FIGURE 2) Soil survey quadrangles are being digitized by a similar USEPA grant with [illegible] progress Other soil surveys have been digitized as new soil surveys are completed [illegible] RE 3; *EPA funding aided the central West TN efforts.*)

Additional data concerning wetland data quality has been provided by the digitization of [illegible] statistical analysis of seven test quadrangles. This data was combined with field [illegible] to test the correlation between hydric soils, mapped NWI wetlands, and vegetative [illegible]e quadrangles, representing six of the state's physiographic provinces, are listed and [illegible]n TABLE 2. FIGURE 4 illustrates the distribution of physiographic regions where [illegible] quads were selected.

[illegible]e results of a statistical analysis conducted with GIS with resulting maps and overlays [illegible] reported along with field investigation of soils, plant species and prevalence indices for [illegible] seven quadrangles identified in Table 2 (See APPENDIX C for a complete list of [illegible] Reports supporting the Strategy). Based on these and other studies, opportunities for [illegible] soils correlation combined with the use of informative soil survey meta data files has [illegible]creased the state's interest in soils digitization.

New approaches for evaluating "subphysiographic province" resource characteristics are [illegible]sued by Tennessee as "ecoregion delineation". This data layer may provide new [illegible]ding of wetland systems based on geomorphological positioning, climate and other [illegible] See FIGURE 5) It is recommended that in the future, inventory and field data should be [illegible] and reported at least according to the US Geologic Survey (USGS) hydrologic units [illegible]URE 6), and by wetlands type.

# *FIGURE 3: STATUS OF SOIL SURVEY DIGITIZATION*



LEGEND

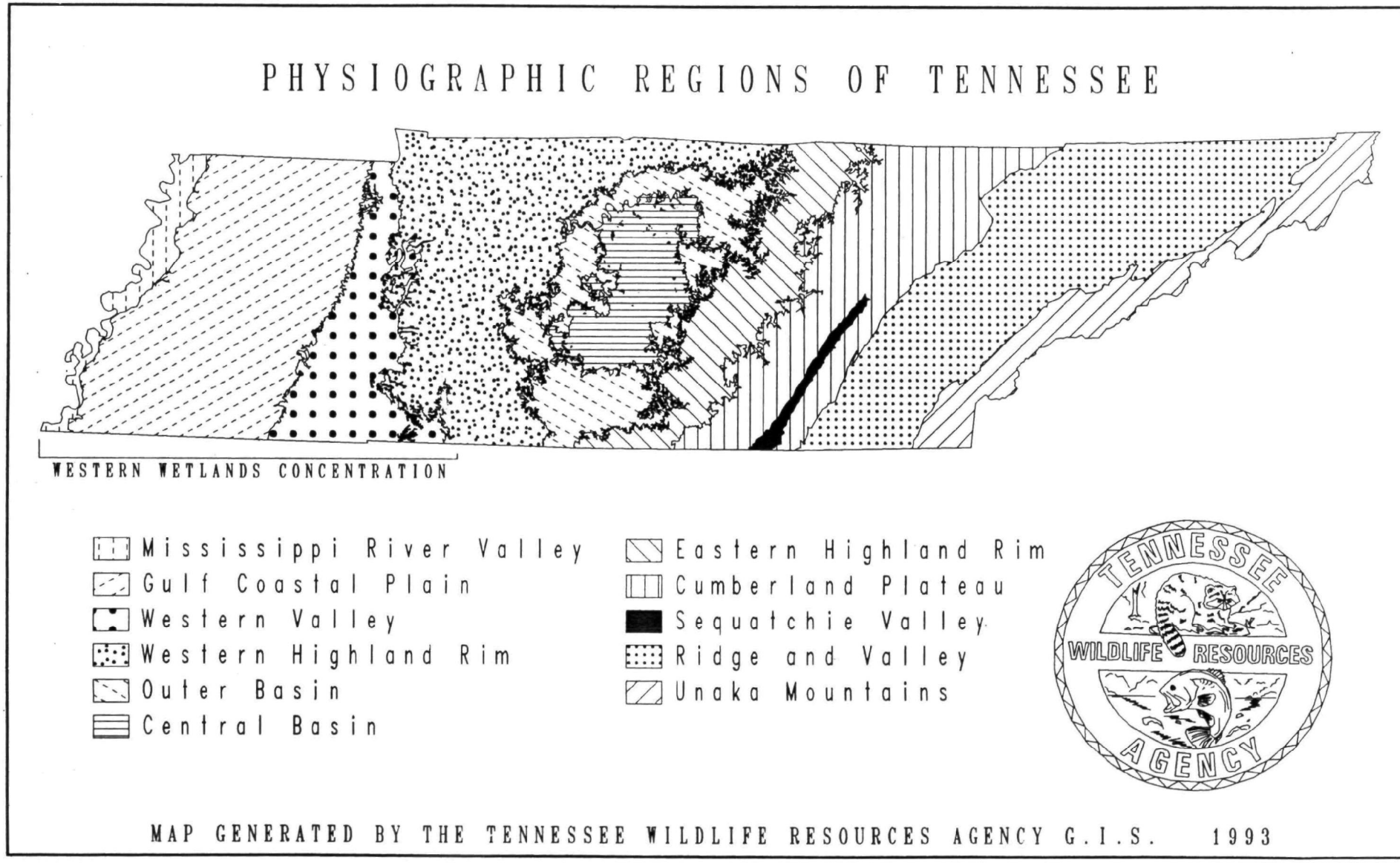
- Soil Recompilation Completed
- Soil Digitization Completed
- Soil Digitization Draft
- County Boundaries
- Major Rivers and Reservoirs

SOURCE: SOIL DATA PROVIDED BY TWRA AND NRCS.

## TABLE 2
## TEST QUADRANGLES SELECTED FOR DIGITIZATION, GIS MAPPING AND ANALYSES

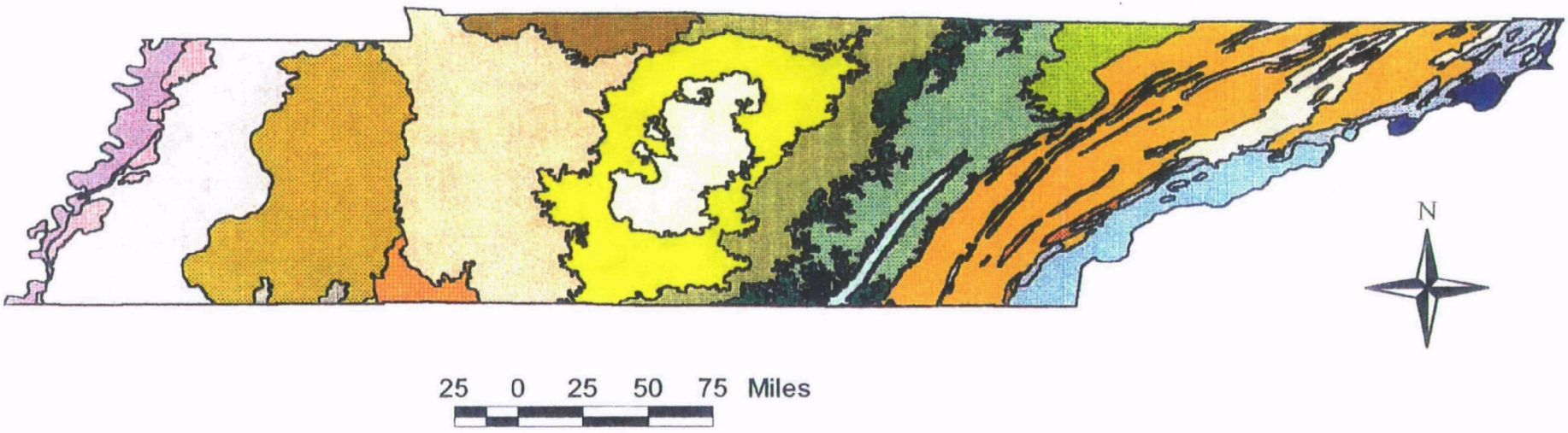
| QUADRANGLE | PHYSIOGRAPHIC PROVINCE | COUNTIES | RIVER | HYDROLOGIC UNIT | PERCENT OF QUADRANGLE |
|---|---|---|---|---|---|
| Knob Creek | Mississippi Alluvial Valley | Lauderdale<br>Dyer | Forked Deer<br>South Fork Forked Deer | 08010206<br>08010205 | 40%<br>10% |
| | | | Obion<br>Upper Mississippi | 08010202<br>08010100 | 20%<br>30% |
| Rutherford | Gulf Coastal Plain | Weakley<br>Obion<br>Gibson | South Fork Obion | 08010203 | 100% |
| Turnpike | Gulf Coastal Plain | Haywood<br>Tipton<br>Lauderdale | Hatchie | 08010208 | 100% |
| Milledgeville | Western Valley | Hardin<br>McNairy | Tennessee | 06040001 | 100% |
| Fredonia | Highland Rim | Coffee | Upper Duck<br>Barren Fork of Collins | 06040002<br>05130107 | 70%<br>30% |
| Isoline | Cumberland Plateau | Cumberland | Emory<br>South Fork of Cumberland | 06010208<br>05130105 | 95%<br>5% |
| Tellico Plains | Blue Ridge<br>Ridge and Valley | Monroe | Little Tennessee<br>Hiwassee | 06010204<br>06020002 | 50%<br>50% |

# FIGURE 4

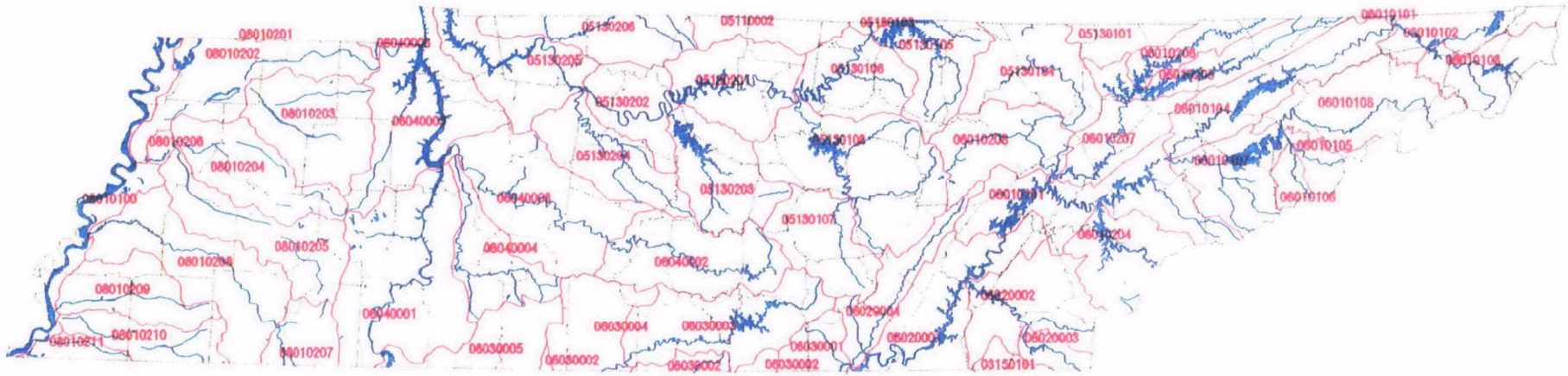

PHYSIOGRAPHIC REGIONS OF TENNESSEE
WESTERN WETLANDS CONCENTRATION
Mississippi River Valley
Gulf Coastal Plain
Western Valley
Western Highland Rim
Outer Basin
Central Basin
Eastern Highland Rim
Cumberland Plateau
Sequatchie Valley
Ridge and Valley
Unaka Mountains
TENNESSEE
WILDLIFE RESOURCES
AGENCY
MAP GENERATED BY THE TENNESSEE WILDLIFE RESOURCES AGENCY G.I.S. 1993

# *FIGURE 5: SUB-ECOREGIONS OF TENNESSEE*

***January 1996 - Draft in Progress***



# *FIGURE 6: HYDROLOGIC UNITS OF TENNESSEE*




*LEGEND:*

| | |
|---|---|
| 06040002 *Hydrologic Unit Number* | *County Boundaries* |
| *Hydrologic Unit Boundaries* | *Major Rivers* |
| | *Water Bodies* |

*MAP GENERATED BY THE TENNESSEE WILDLIFE RESOURCES AGENCY G.I.S. 1993*

**What Are the Basic Types of Wetlands?**

The Wetlands Strategy proposes a new method for classifying the various types of wetlands in Tennessee· grouping those similar in function. The approach is known as a hydrogeomorphic (HGM) classification (Brinson 1992) The concept of HGM classification is evolving nationally with input from scientists of various disciplines. Several institutions and agencies in Tennessee are participating in the development of the HGM classification system.

HGM classification offers advantages over previously used methods, including application of a broader range of characterizing parameters and consideration of wetlands functions. Additionally, HGM is applicable to a broad scale of applications, from site specific to landscape

Wetlands scientists recognize that hydrology is the most significant factor influencing wetlands character, functions and interactions. However, defining and describing hydrology is more complex and difficult than identifying and categorizing the vegetation types traditionally used in wetlands characterization. Using HGM, wetland types are distinguished by four indicators of hydrology. They are:

- geomorphic setting (position in the landscape)
- landform (the wetland's topography or shape)
- water source
- hydrologic profile (water duration, depth, and flow)

Data currently used to determine these indicators include·

- topographic analysis
- soil characteristics
- hydrologic data and indicators
- watershed analyses
- vegetative indicators

HGM classification is a holistic approach which facilitates the classification of wetlands and the assessment of wetlands functions while recognizing the continuum of wetlands from wettest to driest. HGM classification is presently unconstrained by any single-purpose definition or interpretation of wetland types. It is not intended to define wetlands for jurisdictional purposes. However, it is a tool that can be used in many aspects of wetlands assessment and management.

Ten wetland types based on HGM concepts have been identified in Tennessee[2]. These occur within landscape and landform settings that often have wetland hydrology, hydric soils, and that under normal circumstances would support hydrophytic vegetation The following are archetypes upon which a system of HGM classification can be built in Tennessee.

1. **Deep floodplain basins:** old river channels, oxbows, or deep sloughs typically devoid of woody vegetation; often colonized by submergent or floating leafed plants
2. **Floodplain depressions:** shallow oxbows or sloughs typically dominated by bald cypress and/or water tupelo (similar to above, but not as deep)
3. **Backswamps:** frequently flooded and poorly drained portions of the floodplains often with surface water standing well into the growing season, typically dominated by overcup oak and water hickory
4. **Overflow flats:** seasonally inundated portions of the floodplain dominated by species such as willow oak, red maple and green ash
5. **Floodplain ridges:** high portions of the floodplain, (including riverfronts, levees and terraces); typical species include cherrybark oak, swamp oak, water oak, sycamore, silver maple, boxelder and cottonwood
6. **Low fringes:** semipermanently flooded lake fringes typically dominated by herbaceous emergent and/or scrub/shrub vegetation
7. **Elevated fringes:** semipermanently saturated and seasonally flooded areas around lakes and reservoirs, typically forested
8. **Flow-through depressions:** meandering drainways without outlets, found in upland landscapes in association with intermittent or first order streams whose gradient increases significantly downstream; vegetation varies from wet meadow dominated by rushes, sedges, grasses and herbaceous species to wet forests
9. **Closed depressions:** isolated low-lying depressions without outlets found in upland landscapes, typified by high water tables for long periods, typical vegetation includes rushes, alder, and/or red maple/sweetgum forest
10. **Slope seeps:** sites on, or at the toe of, a slope where groundwater discharges in a diffuse pattern, and results in semipermanent saturation in the immediate downstream area; vegetation is highly variable

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[2] Two additional classes were offered to the list of ten by Talley (1994): 11. **Terrace Flats:** saturated, infrequently flooded flats on terraces and 12. **Upland flats** saturated, rarely ponded flat areas on uplands See Appendix C, *Tennessee Hydrogeomorphic Wetlands Classification and Functional Assessment* report

These wetlands types are generalized concepts of types within Tennessee's wetlands universe Some types may need further subdivision, and some individual wetlands will exhibit key characteristics of two or more types, giving rise to additional types or combinations A Technical Report is presently available on the HGM concept and its application in Tennessee.

**What Are the Functions and Uses of Tennessee Wetlands?**

Historically, wetlands were considered to be wastelands that should be drained as soon as possible, for farming, residential or industrial development Wetlands were not considered to be valuable resources, and their complex ecological and hydrological functions were for the most part unrecognized.

Only recently have wetlands been recognized as valuable natural resources, that if maintained and properly managed, provide important benefits to the public and the environment For example, wetlands can protect or enhance water supplies, improve water quality, help control flood damage, provide valuable habitat for wildlife, and contribute to the biological diversity and stability of the ecosystems where they are found

Wetlands functions are directly beneficial to people and to the integrity of the environment where they are found Not every wetland will perform all of the possible functions, and not all functions are performed equally well in every wetland The degree to which a wetland performs a function is related to and defined by a complex web of interrelations between the wetland's characteristics and its landscape setting, upstream contributors, downstream receivers, and biotic interactions.

There are five functions associated with Tennessee wetlands·

**1. Water Quality Enhancement**

Wetlands enhance the physical and chemical condition of water from a base condition by two methods·

***Sediment/Toxic Substance Retention*** Reducing the concentration of suspended and bed-load sediment, and attendant toxicant load, through energy dissipation, precipitation, ionization, and/or biotic bonding

***Nutrient Removal/Transformation***: Reducing the concentration or modifying the form of nitrogen, phosphorus, and potassium ions through oxidation, reduction, assimilation, or other bio-chemical processes

**2. Flood Impact Mitigation**

Wetlands reduce the volume and physical energy of water below a base condition through two means

***Flood Peak Reduction***: Wetlands influence regional water-flow regimes by intercepting storm runoff and temporarily storing excess surface waters, thereby reducing storm runoff peak discharges by storing and slowly releasing runoff over a longer period of time.

***Erosion Potential Reduction*** Wetlands in the natural state are usually vegetated, and this vegetation reduces the velocity of flood waters and wave action, thereby lessening the potential erosion of shorelines and floodplain areas The root systems of wetland vegetation bind the floodplain and shoreline soils to further resist erosive forces.

**3. Biological Productivity**

Wetlands provide habitat (including requisite temporal conditions of food, water, cover, and reproductive features) that supports a diverse array of wetland dependent or indicative species and populations. Examples include:

***Aquatic Species***: Vertebrate and invertebrate species that complete their life cycles in water.

*Resident*: Species that typically spend all life stages in an area or habitat of analogous physical conditions

*Transient*: Species that typically move in response to changing habitat conditions and/or with specific life stage requisites.

***Semiaquatic Species***· Vertebrate and invertebrate species that spend certain life stages in water

*Wetland Wildlife Species*: Vertebrate species, typically mammals, birds, and reptiles that spend most or all of their life stages above the water's surface, but are heavily dependent on aquatic or wetland conditions to fulfill requisite needs

*Resident*: Species whose annual requirements are met within a single home range

*Migratory*: Species whose annual life stage requirements are met by a series of distant ranges accessed by predictable relocation

*Vegetation*: Species of plants typically adapted to periodically anaerobic soil conditions.

***Food Chain Support***. Providing primary productivity (organic debris) that supports faunal communities within the wetland and in adjacent and downstream waterbodies.

**4. Ground Water Influence**

Wetlands significantly influence shallow water aquifers within their vicinity by three processes.

***Ground Water Recharge***: Retaining water and allowing for its percolation into the underlying aquifer.

***Low Flow Augmentation***: Releasing water to adjacent streams or waterbodies during dry periods of the year and during drought.

***Ground Water Discharge Buffering*** Enhancing the quality of groundwater discharge by providing a biochemical treatment system.

**5. Direct Human Benefits**

In addition to the societal benefits provided by normal wetlands functions, several direct human benefits can be derived from wetlands and their functions through managed use. Opportunities for human uses that are compatible with sustained wetland conditions include:

***Recreation***: Use for play, amusement, relaxation, and/or physical and mental refreshment

***Education***. Use for training and developing knowledge, skill, and character.

***Timber Production***: Providing the potential for profitable production of wetland endemic trees through management that is compatible with sustained wetland conditions.

***Agricultural production***: Providing the potential for agricultural resource management consistent with sustained wetland conditions

**What is the Condition of Tennessee Wetlands?**

Tennessee's wetlands are varied and dynamic systems They occur in topographic positions ranging from upland slopes and divides to the floodplains of low-gradient coastal plain streams. They support plant communities that include submerged, floating and emergent plants, shrubs, and trees Under natural conditions, wetlands may undergo changes in wetness, species composition, and morphology in response to climate, geology, and ecological succession Wetlands are also subject to a wide variety of direct and indirect human influences

The effects of human activities on the physical and biological condition of Tennessee wetlands are hard to overstate Wetlands are owned and managed by farmers, hunt clubs, timber concerns, developers, state and federal agencies, and other interests Land uses in wetlands include timber extraction, agricultural production, outdoor recreation, and wildlife habitat. Large areas of wetlands have been converted to non-wetland environments through filling, draining, or diversion of water.

Wetlands are integral parts of hydrologic systems that extend across wide portions of the landscape. They are affected by natural processes and human activities that occur outside wetland boundaries. Changes in rainfall, runoff, or erosion in a drainage basin can alter the quantity and quality of water and sediment delivered to wetlands, changing their physical or biological character. Wetlands in Tennessee can be found in every possible condition from nearly pristine to severely degraded to completely destroyed.

Wetlands are created, maintained, modified, and destroyed by the physical processes that control the distribution and storage of water These processes include rainfall, infiltration, evaporation, groundwater discharge, erosion, and sedimentation These hydrologic processes are largely driven by climate and topography, with major influences from geology, soil properties and vegetation. All of these factors are subject to natural change and tend to equilibrate over time.

Human influences can accelerate, reduce, or reverse the direction of hydrologic processes. Across much of the Tennessee landscape, agriculture, construction, and mining have reduced infiltration, increased runoff and erosion on the hillslopes, and increased valley sedimentation rates Dam construction has raised the base level upstream of the dams, leading to the formation of deltas and valley sedimentation Reaches downstream of dams are deprived of sediment and

may begin to down-cut through their alluvial valleys, significantly lowering the channel bottom, and thereby altering hydrology

Most of West Tennessee's floodplain wetland acreage has had its wetness reduced by agricultural drainage and stream channelization. The magnitude and permanence of floodplain drainage are highly variable. In some cases, channelization has lead to a deepening and widening of stream channels sufficient to convert former floodplains into well-drained terraces. Elsewhere, beaver activity, debris, and oversupply of sediment from channelized reaches upstream have filled excavated channels restoring or increasing floodplain wetness.

The responses of hydrologic systems, including wetlands, to direct and indirect human interventions are often unforeseen and perceived as undesirable, leading to additional interventions As a result, Tennessee's wetlands are in a state of flux that often goes beyond their ability to adjust. Many systems are being pushed in several directions at once; they hardly begin to adjust to one set of perturbations before another set is imposed upon them to counteract the adjustment.

For instance, on many West Tennessee floodplains, local ponding has resulted from an oversupply of sediment upstream. Such areas are natural sediment traps, left alone they would most likely fill in and go through a succession of ecological communities adapted to progressively drier conditions Before this adjustment can occur, however, many such ponds are drained, without any action to reduce the high sediment loads that led to their creation. Sediment is either delivered downstream, where it causes similar problems, or, more likely, builds up in the same place, eventually resulting in a recurrence of the ponding This situation may be repeated in the same place several times during a few decades

Massive direct and indirect human impacts have led to a significant reduction in the quality of Tennessee's wetlands. Many areas have remained in a state of early ecological succession and not been allowed to develop toward ecological maturity Excessive or inadequate water inputs, high sediment or nutrient loads, and direct or indirect interference with vegetation have caused imbalance among the physical, chemical, and biological processes that determine wetland functions The natural processes that might restore functional equilibrium are rarely allowed to proceed without additional interference

Although the general picture of disequilibrium in Tennessee's wetlands is fairly clear, the detailed knowledge of wetland functions and quality that would allow land managers to quantify actual or potential benefits is almost wholly lacking No state or federal agency is systematically collecting, recording, or analyzing information on wetlands Except in relatively few cases where wetlands are perceived as threatened or are under consideration for purchase, little information is currently being collected on wetland functions. Such information as it is available is generally site-specific, and is collected under protocols narrowly designed to meet regulatory or agency requirements. There is a major need for a consistent statewide program to evaluate the quality and functions of wetlands and monitor their condition.

**Where Do Wetland Losses Occur and Why?**

The National Wetlands Inventory status and trends analysis (Dahl 1990) estimates that about 53% of the nation's historic wetlands had been lost by the mid 1980's. The greatest losses occurred in forested wetlands and freshwater marshes Dahl further estimates that Tennessee had lost 59% of its wetlands by the mid 1980's Using the estimated 2 million acre wetland capability base derived in this report from the 1991 Soil Survey Statistical Database as an indicator of historic wetland acreage, and the current 814,000 acres of existing wetlands indicated by averaging various recent inventories, an estimate of 59% of loss of wetlands can be further supported. However, the Council on Environmental Quality (CEQ) does not list Tennessee among the states suffering the most "significant" losses

In the past, losses of wetlands were primarily due to agricultural conversion, drainage, channelization, and sedimentation At present, the loss/gain balance is complicated and not well defined[3]. Factors affecting the balance include both primary land use conversions and long term changes in the hydrology of major drainage basins.

[3] Current professional opinion and supporting data from the 1992 National Resources Inventory contend that the rate of wetland losses in Tennessee has significantly declined.

Although each drainage system is unique, Tennessee's wetlands managers have identified several general trends, based on their observations, knowledge, and experience·

- Agricultural conversions are decreasing
- Marginal cropland is being abandoned and allowed to revert to wetlands
- There is less conversion of bottomland hardwoods (BLH) to cropland
- Urban conversions are increasing
- Transportation impacts (highways, airport construction) are a growing factor in wetland loss

Unfortunately, no data is now being collected that would allow the state to confirm these observations or to assess changes quantitatively

In the future, major losses are likely to be due to urban conversion impacts, transportation construction impacts, or to continuing changes in basin hydrology (channelization, drainage or impoundments). Potential factors that might impact wetlands in the future are· changes in timber harvest management strategies; the introduction of new agricultural crops; or changes in demand or prices of existing crops

**What Are the Economic Consequences of Wetland Loss?**

It is difficult to quantify or place an economic value on the loss of wetlands resources or their functions. Principal consequences are: increased costs for water pollution control and treatment of drinking water, higher costs from flood damages, and a decreased value of wildlife, timber, and crops.

A growing academic discipline is addressing natural resource economics, and in the foreseeable future it may be possible to estimate the economic costs of wetlands loss with more precision.

# CHAPTER II
# GOAL OF THE STATE WETLANDS STRATEGY

***It shall be the goal of the State of Tennessee to provide the maximum practicable wetlands benefits to Tennessee and her citizens by conserving, enhancing, and restoring the acreage, quality, and biological diversity of Tennessee wetlands.***

The management of wetlands and protection of their vital functions for the benefit of Tennessee citizens is a formidable challenge. It requires shared vision, intelligent resource-based planning, long term commitment, and consistent cooperation In the first year of implementation of the Strategy, we have increased our knowledge base to enable us to better understand and manage our wetland resource We continue to agree on a statewide goal and objectives, and the actions needed to realized that goal

The state's goal acknowledges that the majority of the state's wetland resources are currently in private ownership and management, and are likely to remain so. It follows that many management decisions that will affect the quality and functions of wetlands will be made by individuals, private corporations or non-profit organizations

For this reason, one theme of the strategy is to provide private owners of wetlands with the information they need to make informed management decisions that will benefit the owner, and at the same time protect wetlands functions and the public benefits that flow from wetlands. The strategy calls for the state to collect and share information about the resource, and to offer technical assistance to private wetlands landowners, upon request

The Strategy places responsibility for data collection and analysis with the State. Responsibilities include inventory and characterization of the state's wetland resources, creation of a GIS-based wetlands data base, research, analysis and long term monitoring of status and trends. The Strategy calls for regular dissemination of technical information to planners and wetlands managers.

The Strategy also calls for the State to identify unique wetlands and potential restoration sites, and to rank them. The Strategy endorses the existing state policy to acquire certain unique

or exceptionally high quality wetlands that provide many public benefits, and to manage these wetlands in such a way as to protect or enhance their functions and benefits to the public. Another strong theme in the strategy is enhancement and restoration of wetlands, both public and private, to offset previous losses, and to increase the resource base by approximately 10% by the year 2000.

The State has a broad mandate to protect its waters, including its wetlands. Tennessee shares this mandate with federal agencies. The Strategy recognizes the need for an effective regulatory program, and offers recommendations with regard to water quality standards, record keeping and follow up of mitigation projects

The conservation of wetlands is an institutional challenge, as well as a resource management challenge Wetlands management is fragmented and sometimes inconsistent; agency mandates and program responsibilities may overlap or conflict. Public interests may not coincide with private interests.

For this reason, another strong theme in the Strategy is coordination and cooperative action. The Strategy calls for sharing the work load, sharing information, pooling resources, and consistent communication and coordination among agencies and interest groups. In short, the Strategy calls for the creation of a working partnership between the public and private sectors.

The Strategy recognizes that the actions outlined here will require a commitment of staff and money. It endorses existing funding mechanisms, and calls on respective agencies to allocate adequate funds to carry out the responsibilities assigned to them.

The Strategy outlines the basic elements of a comprehensive, long range plan to conserve Tennessee wetlands and their functions. The plan elements will be developed incrementally over the next few years as we characterize the resource and gain a more secure understanding of wetlands functions.

# CHAPTER III
# OBJECTIVES

Ten objectives are recommended to achieve the state wetlands goal. They are.

1. **To characterize the wetlands resource more completely and identify the critical functions of the major types of wetlands in each physiographic province:** Both regulatory and restoration program managers need to understand the critical functions of major types of wetlands in order to place a high priority on maintaining and enhancing these critical functions

2. **To identify and prioritize unique, exceptionally high quality, or scarce wetland community types and sites for acquisition or other equally effective protection:** Currently, there is limited information on exceptional wetlands in Tennessee Certain unique, high-quality wetlands deserve a higher level of protection because of the public benefits and ecological functions they provide

3. **To identify priority wetlands restoration sites in each river corridor, based on site characteristics and the distribution and functions of existing wetlands:** The objective is not only to target suitable sites for restoration, but to identify opportunities to restore the biological integrity of river corridors at the landscape level.

4. **To restore 70,000 acres of wetlands in west Tennessee by the year 2000:** This objective calls for the restoration of approximately 10,000 acres/year from 1993 through 2000, or about a 10% gain in the acreage reported by Hefner and Brown (1984) The intent is to target marginal croplands for voluntary wetlands restoration

**5. To achieve no overall net loss of the wetlands functional base in each USGS hydrologic unit:** While individual projects may result in gains in some wetlands, offsetting losses in others, the result of the full array of regulatory and non-regulatory programs will be no further loss of function in any hydrologic unit.

**6. To develop the information needed to maintain or restore natural floodplain hydrology for the sake of wetlands function:** Every opportunity to restore natural meandering waterways without artificial levees should be pursued. It is not the intent of this objective to fill in canals, or dredge filled-in streams to historic elevations. Restoration work would be targeted to cases where a system is attempting to re-establish a stable equilibrium, and a relatively small intervention would enhance the natural process and restore hydrology.

**7. To increase the level of benefits from wetlands on private land:** Since a majority of Tennessee wetlands are in private ownership, it is important to sustain and enhance economic benefits of wetlands ownership and management. This may be achieved by education, technical assistance, and incentive programs for private landowners The sound and productive management of wetlands by private landowners will also assure that the public benefits of wetlands will be sustained.

**8. To create more urban riparian/wetland greenbelt areas:** The primary threats to wetlands at the urban fringes, or within an urban community, are land development, construction and associated road building As an alternative to development, wetlands can become a community asset if they are incorporated into an urban green belt plan or park and dedicated to low-impact recreational use and/or storm water management.

**9. To increase wetlands information delivery to local government, the public, and the schools:** Many critical wetlands decisions are made by local planning commissions and elected officials; these decisions are subject to public scrutiny It is important to provide current information on the local wetlands resources to these communities to ensure informed resource management decisions.

**10. To establish meaningful wetlands use classifications and water quality standards to protect those uses:** This is an EPA requirement. Tennessee's classification and standards will be based on wetland types and functions

Specific actions to achieve these objectives, as well as current accomplishments, are described in Chapter V.

# CHAPTER IV
# EXISTING WETLANDS AGENCIES, ORGANIZATIONS AND PROGRAMS

## ORGANIZATIONAL RESPONSIBILITIES

In Tennessee, the responsibility for wetlands conservation and management is shared among state and federal agencies, county and city planners, non-profit conservation organizations, corporations, and ultimately hundreds of private landowners who make day-to-day decisions about the management and use of the resource. None of the agencies, organizations or individuals *alone* have a sufficiently broad mandate, sufficient knowledge or resources (human or fiscal) to adequately protect wetlands and conserve their functions

A list of the agencies and organizations in Tennessee which administer programs affecting wetlands appears in TABLE 3. A general description of agency programs by program category follows

Tennessee wetlands managers and owners have made a conscious effort to work together to share information, pool resources and act cooperatively in order to carry out their program responsibilities for wetlands effectively and efficiently.

Wetlands program activities in Tennessee may be grouped into six major categories as follows

### 1. Data Collection, Analysis and Planning

At the federal level of government, the U.S. Fish and Wildlife Service (USFWS) has primary responsibility for conducting periodic inventories, and analyzing the status and trends of the nation's wetlands. TVA monitors the status of wetlands adjoining the Tennessee River, its tributaries, and reservoirs. EPA, through Wetlands Program Development Grants and its Advance Identification of Wetlands Program (ADID) supports wetlands characterization and planning at state and local levels.

# TABLE 3
# AGENCIES, ORGANIZATIONS AND PROGRAMS AFFECTING TENNESSEE WETLANDS

## I. FEDERAL AGENCIES AND PROGRAMS

**United States Department of Agriculture: USDA**

Farm Services Agency FSA
- Agriculture Conservation Program. ACP
- Conservation Reserve Program· CRP
- Wetlands Reserve Program. WRP
- Swampbuster

Natural Resource Conservation Service. NRCS
- Conservation Technical Assistance
- Cooperative Soil Surveys
- Wetland Delineation for 404 Permits (agriculture land only)
- Resource Conservation and Development Program RC & D.

Forest Service USFS
- Stewardship Incentive Program· SIP

**United States Department of Defense: USDOD**

Army Corps of Engineers· USCOE
- Clean Water Act, Section 404 Permit Program 404
- Water Resources Development Act: Section 1135

**United States Department of the Interior**

Fish and Wildlife Service FWS
- National Wetlands Inventory: NWI
- Fish & Wildlife Coordination Act· FWCA
- National Wetlands Priority Conservation Plan NWCP
- North American Waterfowl Management Plan NAWMP
- Partners for Wildlife
- Management of National Wildlife Refuges
- Endangered Species Act: ESA

Geological Survey. USGS
- Cooperative Research Program
- National Water Quality Assessment· NAWQA

**United States Environmental Protection Agency**

Wetlands Protection Development Grant Program: Section 104(b)(3)
Nonpoint Source Grant Program: NPS
Clean Water Act, Section 404 Permit Review: 404

## TABLE 3 (CONT'D)

**United States Environmental Protection Agency (cont'd)**
Advance Identification of Wetlands: ADID

**Tennessee Valley Authority: TVA**
Research and Technical Assistance
Constructed Wetlands Demonstrations
Management of Wetlands on TVA Reservoir Lands

**II. STATE AGENCIES AND PROGRAMS**

Tennessee Environmental Policy Office: TEPO
Interagency Wetlands Committee· IWC
Technical Working Group· TWG

**Department of Agriculture: TDA**
Division of Agriculture Resources. AR
- Local Conservation Technical Assistance
- State Nonpoint Source Program
- Federal 319 NPS Program Management NPS
- Soil Conservation Districts SCD

Division of Forestry· DF
- Forest Incentives Program. FIP
- Technical Assistance

**Department of Environment and Conservation: TDEC**
Division of Water Pollution Control. WPC
- Clean Water Act, Section 401 Certification. 401
- Aquatic Resource Alteration Permit Program ARAP

Division of Natural Heritage: NH
- Natural Areas Registration
- Biodiversity Program

Division of Recreation Services
- Parks and Recreation Technical Assistance Service: PARTAS
- State Comprehensive Outdoor Recreation Plan & Wetlands Adden - SCORP
- Land and Water Conservation Fund Grants: LWCF

**Department of Economic and Community Development: TECD**
Local Planning. LP
Development Districts: DD's

## TABLE 3 (CONT'D)

**Department of Transportation: TDOT**
Wetlands Mitigation Bank

**Tennessee Wildlife Resources Agency: TWRA**
Geographic Information Systems: GIS
Wetlands Acquisition Program WAF
North American Waterfowl Management Plan - NAWMP - & Tennessee Implementation Plan: TIP
Management of Wildlife Management Areas - WMA - Wildlife Refuges - WR - and Wildlife Observation Sites
Nongame Program (Habitat Protection)
Endangered/Threatened Species Act: ETS
Wetlands Mitigation Bank

**University of Tennessee: UT**
Water Resources Research Center: WRRC
Institute for Public Service IPS
- County Technical Assistance Services CTAS
- Municipal Technical Advisory Services. MTAS
- Cooperative Extension Service. CES

**Tennessee Technological University: TTU**
Center for the Management, Utilization and Protection of Water (Water Center)

**III. PRIVATE CONSERVATION ORGANIZATIONS & LANDOWNER ASSOCIATIONS**

Ducks Unlimited. DU
Tennessee Conservation League: TCL
The Nature Conservancy: TNC
Tennessee Farm Bureau Federation: TFBF
Tennessee Forestry Association: TFA
The Wolf River Conservancy: WRC
Tennessee Greenways: TG
The Conservation Fund· CF

**IV. JOINT EFFORTS**

Tennessee Partners Program (NRCS, USF&W, TWRA, TDA, UTAE and DU participating)

At the state level, the Department of Environment and Conservation (TDEC) and the Tennessee Wildlife Resources Agency (TWRA) collect and analyze data on wetlands water quality and the occurrences of rare plants, animals and communities TDEC includes wetlands in the State Comprehensive Outdoor Recreation Plan The Tennessee Environmental Policy Office (TEPO) leads and coordinates statewide wetlands policy and planning[4].

**2. Research**

At the federal level, the United States Geological Survey (USGS) conducts an active research program, focusing on wetlands hydrology and functions. The USCOE, at its Waterways Experiment Station, conducts active research, with emphasis on modeling and development of a wetlands functional assessment method. The USFWS, TVA, and EPA also sponsor or conduct wetlands research.

State research efforts are conducted primarily by scientists at its academic institutions, with various sponsors A major research effort, the Biodiversity Project, is led by the Tennessee Conservation League, with cooperation from both state and federal agencies

**3. Wetlands Acquisition, Restoration and Management**

In recent years, acquisition of wetlands in Tennessee has been primarily a state function, led by the TWRA with the active collaboration of TDEC and the Department of Agriculture (TDA). The Tennessee Nature Conservancy (TNC) frequently assists the state's acquisition program Increasingly grass roots organizations like the Wolf River Conservancy have led local fund raising efforts to purchase significant wetlands. Cooperation and assistance has also come from the regional organizations like the Conservation Fund.

Many of the wetlands purchased by TWRA, USFWS, or a state/federal/private joint venture are restored or enhanced after purchase. The state Department of Transportation (TDOT) buys and restores wetlands to mitigate unavoidable impacts of road construction on existing wetlands. Under relatively new program mandates, the USCOE may restore wetlands if their degradation is a consequence of former Corps projects

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[4] TEPO was established by the Sundquist Administration to replace the previous coordinating function of the Tennessee State Planning Office (SPO) after the SPO was abolished in 1995 All references to the SPO in first edition of the Strategy have been replaced with TEPO in this second edition.

At the federal level, the USFWS purchases wetlands and manages them Wetlands in public ownership are managed by the agencies, state or federal, that acquired them. Two new initiatives, the Tennessee Partners Project and the USDA Wetland reserve program have also increased opportunities to either permanently protect wetlands or to provide temporary habitat where habitat would not otherwise be available (See Table 4)

**Table 4**

**Tennessee Wetlands Acquisition, Restoration and Management**

**Wetlands Acquired by TWRA Wetlands Acquisition Funding 1986-95:** 34,791 acres

*(This amount includes non-wetland buffer zones)*

**Acreage Purchased by TWRA Region**

| | |
|---|---|
| Region 1: (West TN) | 31,509 acres |
| Region 2: (Middle TN) | 1,966 acres |
| Region 3: (the Cumberland Plateau) | 512 acres |
| Region 4 (Eastern TN) | 803 acres |

**Wetlands Enrolled in USDA Wetlands Reserve Program 1994-95 (restored wetlands under permanent conservation easements):** 3,500 acres *(offered and unsurveyed)*

**Cropland Enrolled in the Tennessee Partners Project 1993-95 (temporary waterfowl habitat on cropland during winter months with 10 year commitment):** 3000 acres

** The above data are rounded figures*

*** It should be noted that approximately 80 percent of Tennessee's wetlands are located in West Tennessee*

**4. Assistance to Private Landowners**

Providing technical and financial assistance to wetlands landowners is an important program activity for many state and federal agencies Some of the programs affect wetlands directly, but most affect them indirectly by improving the management of adjacent uplands.

At the federal level, technical and financial assistance is provided primarily by the U.S. Department of Agriculture (USDA) and its many targeted programs. A new program, the Tennessee Partners Project provides assistance for temporary waterfowl habitat on cropland using federal, state and private resources. The U.S. Forest Service offers assistance to managers of

forested wetlands through its Stewardship Incentive Program The State Division of Forestry administers federal assistance programs at the local level Similarly, the USFWS offers technical and financial assistance for restoration and management of wetlands as wildlife habitat through the Partners for Wildlife Program TVA offers technical assistance to landowners within their river corridors, upon request.

At the state level, technical and financial assistance is offered by several programs Of special note is a fully staffed and funded program to assist landowners to install best management practices (BMP's) on their property to reduce nonpoint source pollution in wetlands or streams. The TDA also now manages the EPA Non-Point Source (NPS) grant program within the state *[this was previously managed by TDEC-WPC].* The TDEC state Natural Areas program operates a registry for privately owned sites of special biological significance, including wetlands.

**5. Regulation**

Administration of Federal Section 404 (Clean Water Act) permit program, which regulates dredge and fill activities in the waters of the United States, including wetlands, is shared by USCOE and EPA

At the state level, the Water Pollution Control Division of TDEC reviews and certifies Section 404 permits, and operates the Aquatic Resources Alteration Permit Program (ARAP)

**6. Public Information, Education and Other Efforts**

Almost every agency and organization makes an effort to educate landowners, wetlands users and the public about wetlands and their functions and values The agencies and organizations disseminate information through publications, slide shows, video tapes, speakers and special events. The TDEC Division of Recreational Services and the Tennessee Greenways organization combine the multiple benefits of greenways (e.g., recreation, aesthetic improvement, and green space preservation) with wetlands conservation in a state wide greenways development project. The TDEC Division of Recreational Services also places emphasis on wetlands conservation through its broader recreational assistance programs By incorporating wetlands information in its education and outreach efforts, local government officials and recreation development directors become more aware of opportunities for wetlands in urban settings.

## EVALUATION OF WETLANDS PROGRAMS

The scope of this Strategy does not allow a comprehensive assessment of each program, or a full discussion of their respective strengths and limitations Several programs are especially noteworthy, and are commended by the IWC/TWG as a model for future program design. These are.

1. ***Tennessee Wetlands Acquisition Program*** The acquisition program is well designed, targeted, adequately funded, and broadly supported.
2. ***North American Waterfowl Management Plan*** This conservation program has had a stunning impact on the resource, in dollars and acres. It is a cooperative, public-private partnership with specific, clearly defined goals It is "politically correct," non-confrontational, and targeted, both geographically and with respect to the resources
3. ***Regulatory Programs (Sections 404, 401 and ARAP)***: These permit programs are controversial; however, they arguably have curtailed loss of wetlands to development The 401-404 permitting review process has frequently resulted in plan modification, and reduced adverse impacts on the resource In many cases, degraded wetlands are being restored as a mitigation for unavoidable adverse impacts However, some landowners avoid ownership and management of wetlands, because of regulatory restrictions
4. ***Federal Conservation Reserve Program (CRP)/Wetlands Reserve Program (WRP)***. CRP provides successful upland erosion control, with downstream benefits to wetlands WRP has the potential for major impact if/when funded nationwide

An effectively managed regulatory program combined with an incentive program for sound management is suggested as an effective future strategy for wetlands conservation.

## STRATEGY IMPLEMENTATION

The only agents for implementing the State Wetlands Conservation Strategy are the existing agencies, organizations and programs. It is not likely that there will be any new wetlands program, or a major wetlands program reorganization or consolidation. None is recommended in the Strategy. Instead the Strategy assumes that implementation of the Action Plan described in

Chapter V will be through the programs and people now working to conserve wetlands and use them wisely. Close and continuing coordination and cooperation will be required.

# CHAPTER V
# ACTION PLAN

## STRATEGIC OBJECTIVES

This Chapter describes specific actions needed to meet the objectives first set forth in Chapter III Some of the action items are intended to improve the effectiveness of existing programs, or to strengthen coordination and cooperative action The Strategy will describe, at least in concept, several new initiatives or programs needed to meet the stated objectives.

For each objective, the Strategy will state why the objective is important, and in what order the specific actions should be undertaken For each action item, the Strategy identifies the agency or agencies bearing primary implementation responsibility, and lists all cooperating agencies and organizations. Progress made since the initiation of the Strategy is noted for each action item in the left margin of this chapter and in the Chapter VI summary table

In short, the Action Plan is intended to state **who does what, when, and why.**

### OBJECTIVE 1: TO CHARACTERIZE THE STATE'S WETLANDS RESOURCE BASE MORE COMPLETELY AND IDENTIFY THE CRITICAL FUNCTIONS OF THE MAJOR TYPES OF WETLANDS IN EACH PHYSIOGRAPHIC PROVINCE

**Why?** In order to allocate scarce program and financial resources intelligently, the State must consolidate existing information and collect additional information to complete an accurately located and characterized inventory of its wetlands resources

Furthermore, both regulatory and restoration program managers need to identify and understand the critical functions of major types of wetlands, in order to maintain and enhance these critical functions.

The Tennessee Environmental Policy Office (TEPO), with the guidance of the IWC-TWG, should seek funding and coordinate a statewide effort to characterize its wetlands resources more adequately. Specific actions should include:

☒ A The State (TWRA) should identify appropriately geo-referenced wetlands-related digitized data, and import it into the state GIS Wetlands database, where possible.

☒ $ B The State (TWRA, TEPO) should request an appropriation (or seek other funding) to purchase digitized NWI data from the USFWS for all undigitized Tennessee quadrangles and import it into the state GIS wetlands database.

☒ C. As new county soils surveys are completed by NRCS, the State (TWRA) should acquire and import digitized soils survey data into the state GIS wetlands database.

☒ $ D For recent soils surveys that are not digitized, the State (TEPO, TWRA) and appropriate federal agencies should initiate a systematic program to convert data to digital form and incorporate it into the state GIS wetlands database. The State should:

1 Seek immediate funding to digitize soils maps for 21 west Tennessee counties
2. Develop a schedule for acquiring and digitizing all soils data within 5 years
3 Prepare cost estimates for statewide coverage

☑$ E The State (TEPO, IWC-TWG) should seek funding for and coordinate the development of a hydrogeomorphic functional assessment method The following steps are included

1 Refine the description of 10 types of wetlands in Tennessee, using a hydrogeomorphic approach
2 Develop a basic description, and/or identify one or more reference wetlands for each type
3 Identify wetlands types on selected test quadrangles and field-verify the basic descriptions
4. Identify and describe wetlands functions associated with each type
5 Develop criteria, and a standard state-level hydrogeomorphic assessment method, for the functional assessment of wetlands

☒ $ F The State (TEPO, IWC-TWG, and the University Water Centers) should fund and conduct research or field investigations to characterize wetlands hydrology and ecological functions more precisely

## OBJECTIVE 2: IDENTIFY AND PRIORITIZE UNIQUE, EXCEPTIONALLY HIGH QUALITY, OR SCARCE WETLAND COMMUNITY TYPES AND SITES FOR ACQUISITION, OR EQUALLY EFFECTIVE PROTECTION

**Why?** Certain unique, high-quality wetlands deserve a higher level of protection because of the public benefits and ecological functions they provide Examples of exceptional wetlands include: those wetlands which provide habitat for a threatened or endangered species or ecosystems, wetlands that represent a rare type in Tennessee; and wetlands that are of special value because of their function Each agency should develop its own criteria for an "exceptional wetland," based on its specific statutory mandates and program responsibilities. Unique wetlands should be identified and acquired (or otherwise protected) *before* development, conversion, or other adverse change in land use is proposed.

There has never been a comprehensive statewide search for unique or exceptional wetlands in Tennessee *[one is currently underway]*. Previous state wetlands inventory and assessment work has been concentrated largely in west Tennessee watersheds The State has limited information about the location, extent or condition of unique wetlands in the eastern two-thirds of the state. However, several analyses have been done based on topographic maps, NWI, or the occurrences of certain plant species. A systematic review and analysis of this body of literature should yield a master list of candidate sites. The acquired information could be used by several state programs to establish priorities and allocate available resources for acquisition, or less than fee protection Specific actions to implement this objective should include:

☒$ A. TDEC-NH and the Protection Planning Committee (PPC) should review recent academic studies and literature and compile a master list of candidate sites to be investigated and evaluated as exceptional wetlands.

☒$ B All participating state agencies and private organizations should support and fund the interagency Biodiversity and GAP Analysis, in order to complete the project's initial phase within 5 years Based on the GAP Analysis, participating state agencies should:

1. Identify and locate wetlands which support rare organisms or are otherwise of high ecological significance
2. Use the collected data to guide future intensive inventory efforts, including remote sensing and related ground truthing
3. Establish a priority list of high-quality wetlands for acquisition and/or other protection measures

☒$ C. The State (TWRA, TDEC-NH, PPC and TDOT) should strengthen the coordination of their priority lists for full fee and/or less-than-fee acquisition programs and coordinate them with federal agencies and private organizations The agencies should

1 Add objectives and criteria for protection of unique wetlands
2 Revisit current procedure for assigning priority
3. Schedule and carry out more extensive field work to
   > identify rare species/communities
   > develop a uniform methodology for quality judgment
   > share information
4 Consider placing a high priority on rare and unique wetlands for protection using conservation approaches other than simple fee acquisition

☒ D. The State (TWRA) should continue the existing Wetlands Acquisition Program at current levels, indefinitely (See Table 4, page 33).

☒ E. The State (TDEC-NH) should encourage the Natural Areas Program to include unique wetlands candidates for acquisition, using LWCF, or transfer tax funds *[TWRA proposal submitted]*.

☒ F. The State (TDEC-WPC) should, within 2 years, promulgate criteria and designate selected high quality, rare or unique wetlands as "Outstanding

Resource Wetlands " Such formally designated wetlands will require additional scrutiny, or more stringent restrictions on any proposed permits for projects which would affect their water quality, and/or critical wetlands functions

☐ G The State (TWRA, TDEC) and non-profit organizations should request the USFWS to renew its acquisition programs in Tennessee for purchase of rare or species-rich wetland sites

☐ H. The State (TWRA, TDEC, TDA, TDOT and the Tennessee Department of Finance and Administration) should establish and maintain the legal framework and cooperative atmosphere for joint ventures or public/private partnerships with federal agencies, local governments, businesses and private groups, and non-profit conservation organizations that share a common goal of protecting/acquiring rare or unique wetlands

These entities should focus on strategies that meet conservation intent, reduce total costs and accelerate closure once willing sellers in priority project areas are identified These entities should also develop strategies that facilitate the acceptance and appropriate monitoring of mandated, purchased, and donated conservation easements and fee simple interests associated with mitigation requirements

**OBJECTIVE 3: IDENTIFY PRIORITY WETLANDS RESTORATION SITES IN EACH RIVER CORRIDOR BASED ON SITE CHARACTERISTICS AND THE DISTRIBUTION AND FUNCTIONS OF EXISTING WETLANDS**

**Why?** This objective is intended not only to target suitable sites for restoration, but to identify opportunities to restore the biological integrity of river corridors at the landscape level, including consideration of corridors, contiguousness, and patch size. Identification should be site specific, and representative of landscape types. The candidate sites should be organized according to hydrologic units, watersheds, or existing basin authorities.

The process should also identify prime farmland, recognize its value for agricultural production, and consider this factor in assigning priority as a restoration site Specific actions to carry out this objective are

☒$ A. The State (TEPO, IWC-TWG, TDEC-NH) should develop, within 2 years, specific criteria to be used to evaluate and rank candidate restoration sites, and to predict the probable success of restoration. The development of criteria will require the collection of data and information on hydrology, but probably little additional research. Factors to be considered should include

> landscape unity;
> important functions to be performed by restored wetlands;
> presence of hydric soils;
> restorable hydrology; and
> agricultural production potential

☒ B. The field staff of all state and federal wetlands-related agencies should identify candidate wetland restoration sites in the course of their regular responsibilities and add them to a common list, or database (maintained by TEPO or TDEC-NH) for further evaluation

☒$ C. Using the evaluation criteria, the State (TEPO, TWG-IWC) should coordinate the evaluation of candidate restoration sites, prepare a list of priority restoration sites and distribute it to state and federal resource managers, local government officials, technical assistance providers, private landowners and wetlands conservation organizations

☐ D. The State should test the hypothesis that the presence of hydric soils is a reliable predictor of probable restoration success by determining the relationship between specific hydric soils and inventoried wetlands. As soils maps are imported into the GIS wetlands database, TWRA, TEPO and the IWC-TWG should:

1. Examine the correlation between hydric soils and NWI wetlands in the 21 West Tennessee counties

2 Examine soils/wetlands correlations in other watersheds, where hydric soils data is digitized

☒ E. The State (TEPO and cooperating agencies) should consider the possible reformulation of the West Tennessee Tributaries project as an opportunity to demonstrate a significant wetlands restoration, under Section 1135 of the Water Resources Development Act of 1990 *[different funding is being used].*

**OBJECTIVE 4: RESTORE 70,000 ACRES OF WETLANDS IN WEST TENNESSEE BY THE YEAR 2000**

**Why?** This objective calls for the restoration of approximately 10,000 acres per year from 1993 through 2000 This represents approximately a 10% gain over the wetlands acreage reported by the 1984 NWI It should be clearly understood that the objective targets restoration of *marginal* cropland to a functional wetland, it does not seek to affect prime agricultural land

The universe of prime candidate restoration sites overlaps, but does not coincide with, the universe of priority acquisition sites Restoration projects should be designed and carried out by each agency, according to its mission Information will be shared, and work coordinated by TEPO and IWC-TWG To realize this objective, the following actions are recommended

☑ A TEPO and IWC-TWG should develop a common definition for "restoration" and develop restoration criteria for each wetland type

☒$ B TEPO and IWC-TWG should develop a consolidated list of priority candidate wetlands restoration sites and disseminate the list widely to state and federal program planners and managers (See Objective 3C, *both objectives will be addressed by two separate grants*).

☒ C. TWRA should encourage and institutionalize joint ventures with private non-profit organizations to implement the North American Waterfowl Management Project and/or other wetlands restoration projects *[proposal currently submitted].*

☐ D. TWRA should consider use of the federal "Aid to Fisheries Act" (Wallop-Breaux) funds to enhance or restore fisheries in acquired wetlands, where necessary

☒$ E. TDA-AR *[previously TDEC-WPC; program moved to TDA]* should seek funding through CWA Nonpoint Source Abatement programs [Section 319 (h)] to restore and improve wetlands for water quality enhancement and related functions *[implemented in conjunction with Objective 3E and other efforts].*

☒ F. TDA-AR should continue its cost-sharing program for private landowners to implement NPS BMP's on private land

☐ G TDA-DF should place priority on wetlands restoration in administering the national Stewardship Incentive Program (SIP) on private land.

☒ H. TDOT should continue its mitigation banking program to restore wetlands in compensation for unavoidable adverse impacts of road construction on wetlands

☒ I USFWS should promote and implement the "Partners for Wildlife" program in Tennessee to restore wetlands functions supporting wildlife on privately owned wetlands

☐ J All state/local agencies should cooperate with USCOE to utilize Section 1135 programs to restore wetlands or wetlands functions in eligible Tennessee hydrologic units or watersheds.

☑ K. The State (TDA and TEPO) should seek the support of the Tennessee Farm Bureau Federation (TFBF) to designate Tennessee as a participating state in the next funding cycle of the USDA Wetlands Reserve Program (WRP).

☐ L. TEPO and IWC-TWG should track and evaluate state restoration projects. The group should record the number of acres restored (an administrative function) and document restoration of function, where possible (a research function). (See CHAPTER VII)

☒ M. A tracking system should be coordinated with the North American Waterfowl Management Plan Tracking System The system identifies

wetlands acquired and restored on public lands, wetlands on private land registered in a joint venture project, wetlands on private land participating in the Partners for Wildlife programs, and wetlands on private land under USDA conservation program contracts (See CHAPTER VII)

☐ N TEPO and IWC-TWG should prepare and issue an annual report to the Governor and legislature on the status of restoration projections and, if appropriate, offer recommendations to state leaders on revising the state's long range wetlands restoration strategy (see CHAPTER VII)

**OBJECTIVE 5· ACHIEVE NO OVERALL NET LOSS OF THE WETLANDS FUNCTIONAL BASE IN EACH USGS HYDROLOGIC UNIT**

**Why?** While individual projects will involve gains in some hydrologic units off-setting losses in other units, the result of the full array of both regulatory and voluntary cooperative wetlands programs should be no further loss of wetlands function(s) in any hydrologic unit, or sub-unit To meet this objective, the state should designate a lead agency for wetlands resource monitoring and fund the necessary data collection and analysis adequately All state and federal agencies should participate.

Many state agencies generate or collect data on wetlands functions related to their specific programs, e.g. waterfowl habitat, or water quality. However, there is currently no single state agency or program specifically charged with the continuing responsibility to compile *all* available qualitative and quantitative data on Tennessee wetlands location, condition, and functions, or to collect new data where it is lacking Nor is any agency directed to establish a clearinghouse and archive to assess the status of the state's wetlands resources, and monitor trends over time.

In CHAPTER VI, the Strategy strongly endorses a continuing oversight and coordinating role for TEPO through the existing Interagency Wetlands Committee, or a permanent statutory Wetlands Conservation Commission. This responsibility now requires about 50% of one full time professional staff position One additional permanent staff member will be needed to develop and administer a permanent program to receive, compile, collect and correlate wetlands data, to carry

out periodic status trends analyses, and to prepare reports, as described in CHAPTER VII Specific action items include.

☑ A. TDEC-WPC should apply the principals of the Interim Wetlands Mitigation Policy, adopted by the IWC (within each hydrologic unit, where feasible) in the implementation of the wetlands regulatory program).

☒ B The Governor should designate TEPO as the lead agency *[completed]* to coordinate and oversee a long term program to monitor Tennessee wetlands resources and their functions, TEPO should establish at least one full time position to carry out this responsibility *[no progress]*.

☒ C. TEPO, in cooperation with all agencies and organizations participating in the Interagency Wetlands Committee, should document the current status of, and where data is available, the functions provided by the state's wetlands resource base according to USGS hydrologic units (See above and Obj 1: A,B, & E)

☒ D TEPO, in cooperation with other agencies, should define (or initiate research to define) the major functions provided by the state's wetlands, according to USGS hydrologic unit (See Objectives 1E and 6)

☑ E The IWC-TWG and TEPO should design a common framework for entering, storing and analyzing statistical data collected by cooperating agencies. (Geographic data should be in digital form, when possible, for importation into the statewide GIS wetlands database) (See CHAPTER VII)

☒ F. TEPO staff should compile and update the monitoring data, at least biennially On a six year cycle, TEPO should correlate, and analyze the information to prepare a detailed "status and trends" report on Tennessee's wetlands resources The study should specifically evaluate the state's wetlands resource base in the context of the "No Overall Net Loss of Function" objective. (See CHAPTER VII)

☒ G. Based on the status and trends conclusions the IWC-TWG should evaluate the "No Overall Net Loss of Function" objective, and if the goal has not been achieved, prepare recommendations to the state leaders to strengthen both regulatory and the voluntary cooperative state programs

**OBJECTIVE 6: DEVELOP THE INFORMATION NEEDED TO MAINTAIN OR RESTORE "NATURAL" FLOOD PLAIN HYDROLOGY FOR THE SAKE OF WETLAND FUNCTION.**

**Why?** The behavior of water, the hydrologic regime, is the engine that drives wetlands function Our understanding of the "natural" hydrology of floodplains and the interactions of rivers, lakes, and aquifers with associated wetlands is incomplete, and should be systematically addressed by a cooperative research program, tailored to meet state wetlands information needs Projects including demonstration of techniques for restoring or maintaining natural floodplain hydrology should also include sufficient monitoring and follow up work to permit an assessment of the effectiveness and transferability of these techniques

As our understanding grows, every opportunity to restore natural meandering waterways without artificial levees should be pursued It is not the intent of this objective to fill in existing canals, or to dredge all streams to historic elevations

Restoration work would be targeted to those instances where a river system is attempting to reestablish a stable equilibrium, and a relatively small intervention would reinforce or enhance the natural process and restore hydrology.

☐ A. TEPO and the IWC-TWG should sponsor an annual meeting to allow wetlands researchers to report their findings and to solicit recommendations on future research needs, and areas in which research is most needed. A list of tentative research needs adopted by the IWC-TWG appears in APPENDIX D.

☐ B. When research needs have been determined, TEPO and the IWC-TWG should identify an appropriate agency to sponsor, fund, or conduct the needed research.

C. All research organizations (USGS, WRRC, TTU Water Center) should interpret and communicate relevant findings on wetland and floodplain hydrology to program managers and landowners

☒$ D. State resource management agencies should design and fund projects demonstrating restoration of wetland hydrology and incorporating natural meandering waterways.

☒ E State and federal agencies should support the demonstration of the restoration of wetlands and natural floodplain hydrology as components of agricultural and other flood damage reduction projects and project maintenance.

**OBJECTIVE 7: INCREASE THE LEVEL OF BENEFITS FROM WETLANDS ON PRIVATE LAND.**

**Why?** Since a majority of Tennessee wetlands are in private ownership, it is important to sustain and enhance economic benefits of wetlands ownership and management This may be achieved by education, technical assistance, and incentive programs for private landowners. The. sound and productive management of wetlands by private landowners will also assure that the public benefits of wetlands will be sustained The following specific actions are recommended·

☒ A. The State (TDA, UT-AES) and federal assistance agencies (USDA) should strengthen wetlands information delivery at the county level, using existing networks and staff. Suggested activities include.

1. Select a lead agency (TDA) to coordinate information delivery *[complete]*
2. Establish a county level information clearinghouse, preferably at the Natural Resources Conservation Service, Soil Conservation District office *[underway]*
3. Request UT-AES to develop and deliver a wetlands education program for technical assistance staff and landowners *[no progress]*

4 Develop a comprehensive brochure and directory promoting the value of wetlands and describing available programs to assist landowners in effective wetlands protection and management *[underway]*

5 Develop a special program to recognize and reward landowners who protect wetlands *[underway]*

☑ B TDA should employ at least one full-time employee to train and work with the county assistance providers, and/or directly with landowners to manage/protect wetlands and wetlands functions.

☒ C. The State (TDA-DF) and federal assistance agencies should provide technical assistance and cost-share programs to restore converted marginal cropland to bottomland hardwood forests.

☒$ D. The State (TDA ) and federal agencies should provide technical assistance to landowners who wish to establish or restore natural hydrologic conditions for bottomland hardwood forest.

☒ E The State (TDA) and federal assistance agencies should provide technical assistance to landowners to allow winter flooding of cropped fields (between October and March) to enhance waterfowl habitat and conserve soil moisture.

☒ F The State (TDA, TWRA) and federal assistance programs should provide technical assistance and information on planting waterfowl food crops compatible with landowners crop production regimes

☒ G The State should continue to support assistance and incentive programs that protect and enhance wetlands, and investigate the use of tax incentives for landowners who protect wetlands *[currently under legislative review].*

**OBJECTIVE 8: CREATE MORE URBAN RIPARIAN/WETLAND GREENBELT AREAS.**

**Why?** The primary threats to wetlands at the urban fringes, or within an urban community, are land development and associated road construction. As an alternative to development, wetlands can become a community asset if they are incorporated into an urban greenbelt plan or a park and dedicated to low impact recreational use

☒ A The TDEC Division of Recreation Services (RS) should incorporate wetlands conservation sites and riparian greenbelts into its Parks and Recreation Technical Assistance Service (PARTAS) and funding assistance (LWCF) programs to local governments.

☒ B TEPO, IWC-TWG and TDEC-RS should coordinate with, and encourage the federal conservation and recreation agencies to include wetlands in urban greenbelt plans (e g., USDI-NPS Rivers and Trails, TVA's Flood Reduction, Clean Rivers programs, and Tennessee Greenways)

☐ C The TDA-DF's Urban Forestry Program should include forested wetlands protection strategies in its activities

☒ D The state wetlands regulatory program (TDEC-WPC & RS) should coordinate potential wetland mitigation projects with established urban greenbelt plans Both state and federal agencies (TDEC-WPC & RS and US COE) should

1 Encourage communities to incorporate wetlands and floodplains into a greenbelt concept

2. Make urban planners aware of financial assistance for greenway projects

☐ E. The Department of Economic and Community Development, Local Planning Division (ECD-LP) should encourage local governments to consider wetlands in their Federal Emergency Management Agency (FEMA) flood insurance

plans Urban wetlands can be protected, as floodways are drawn on flood protection maps.

**OBJECTIVE 9: INCREASE WETLANDS INFORMATION DELIVERY TO LOCAL GOVERNMENTS, THE PUBLIC AND THE SCHOOLS.**

**Why?** Many critical wetlands decisions are made by private land developers, regulated by local planning commissions or local elected officials. Land-use decisions are subject to public review and scrutiny. It is important to provide current information on the affected wetlands resource to all interests (developer, local government and the public) to facilitate informed decisions.

The State should encourage local communities to protect wetlands functions, or to incorporate wetlands and floodplains into conservation programs that monitor and enhance natural wetlands functions, with emphasis on water quality, flood flow attenuation, wildlife habitat, open space and greenway continuity, recreation and education

It is also important for young people to understand the characteristics and functions of wetlands as an element of a sound environment Specific actions include

☒ A All state and federal agencies should provide copies of wetlands plans, maps and reports to state university and regional library reference room collections.

☒$ B TEPO and the IWC-TWG should develop and distribute a brochure targeted at County/City officials summarizing general values of wetlands and providing a directory of program managers and assistance providers

☒ C. TEPO and TWRA should make current wetlands maps, hydrologic data, and acquisition/restoration priority lists available to local planning commissions who review development plans; and to the local assistance providers who advise local governments (ECD-LP, UT-IPS MTAS and CTAS Advisors), professional planning associations, and architectural/engineering consultants *[FY 97 grant proposal submitted]*.

☒ D. The Biodiversity Project should include specific wetlands information in county resource maps to be developed by the project to support sound natural resource conservation in land use decisions by local government

☐ E The TDEC-WPC and ECD-LP should encourage communities where rapid growth may threaten wetlands functions, to apply for a planning grant and assistance for EPA and USCOE, in order to undertake a joint wetlands Advanced Identification study (ADID) to guide future regulatory decisions

☐ F. TEPO should expand the membership of the Governor's IWC to include a commercial developer, a local government representative, and a planner

☒ G. TEPO should prepare information about wetland functions, values and management to be included in the in-service teacher training delivered by the Department of Education's CENTS program.

☒ H TVA should incorporate wetlands information and management into its River Action Team/Clean River initiatives and programs

**OBJECTIVE 10: ESTABLISH MEANINGFUL STATE WETLANDS USE CLASSIFICATIONS AND WATER QUALITY STANDARDS**

**Why?** TDEC must develop and promulgate wetlands water quality standards as required by EPA. TDEC-WPC has received a grant to support this work. Tennessee's classification and standards will be based on wetlands types and functions as described in the Wetlands Conservation Strategy Specific milestones include

☒ A. Develop a classification system that encompasses all wetland types in the state.

☒ B. Designate uses for each wetlands type. The uses shall be based on the functions and values attributable to wetlands.

☒ C. Develop aesthetic and biological narrative criteria to protect the classified uses

☒ D. Adopt existing numeric water quality standards for those wetlands that are adjacent to or hydrologically connected to surface waters

☒ E Develop criteria for Outstanding Resource Wetlands (ORW)

☒ F. Extend the antidegradation policy and implementation methods to wetlands.

The assignment of Implementation and Reporting Responsibilities is summarized in TABLE 4

**ACTION PRIORITIES**

All of the ten objectives are important and interrelated None of them is trivial Nevertheless, the State clearly does not have sufficient information, adequate tools, enough people or money to undertake all of the individual action items simultaneously

The State should not be overwhelmed by the magnitude and complexity of the Strategy to the point of paralysis. Instead, it is necessary to establish priorities, share data, talent and information and/or to phase the recommended program in over several years as more resources are allocated to wetlands conservation (See Table 5 for agency summary) Estimated staffing and budgetary needs (where they can be determined), and a tentative timetable for implementation are discussed in Chapter VI.

**High Priority Objectives.** The highest priority for action is assigned to four Objectives These are:

Objective 1. To Characterize the State's Wetlands Resources and Identify their Critical Functions

Objective 2. To Identify and Prioritize Exceptional Wetlands for Acquisition

Objective 3 To Identify Priority Wetlands Restoration Sites

Objective 7 To Increase the Benefits from Wetlands on Private Land

The first three objectives are clearly related. It is imperative that the State identify and characterize its wetlands resource base more adequately than it has done in the past. We know approximately the quantity and distribution of Tennessee's wetlands, but for thousands of acres of wetlands we have no current data about their condition, or the functions that they provide.

## TABLE 5
## SUMMARY OF IMPLEMENTATION AND REPORTING RESPONSIBILITIES

| OBJECTIVE NUMBER | ACTION ITEM NUMBER | PRIMARY IMPLEMENTING AGENCIES | COOPERATING AGENCIES |
|---|---|---|---|
| 1. CHARACTERIZE WETLANDS AND IDENTIFY THEIR FUNCTIONS<br>***High Priority*** | A. Identify and import digitized data into the state GIS | TWRA | USFWS<br>SCS, TVA<br>TDEC-ES |
| | B. Request funds to buy digitized NWI data for the state GIS | TWRA | TEPO |
| | C. Acquire and import digitized soil survey data into state GIS | TWRA | SCS |
| | D. Initiate a program to digitize remaining soil survey data and import it into the state GIS | TWRA | TEPO, SCS<br>IWC-TWG |
| | E. Seek funding to develop a hydrogeomorphic functional assessment method as part of a state WCP | TEPO | IWC-TWG<br>TTU-Water Center |
| | F. Fund and conduct research/field studies to characterize wetlands hydrology and ecological functions | TEPO | IWC-TWG<br>UT-WRRC<br>TTU-Water Center |
| 2. IDENTIFY UNIQUE OR EXCEPTIONALLY HIGH QUALITY WETLANDS FOR ACQUISITION OR OTHER PROTECTION<br>***High Priority*** | A. Review recent academic studies & compile a master list of candidate sites for field investigation | TDEC-NH | PPC |
| | B. Support & fund biodiversity and GAP analysis project | TDEC-NH & TWRA | All Agencies & Non-Profits |
| | C. Strengthen coordination of priority lists | TWRA, TDEC-NH | PPC, TDOT, TNC<br>USFWS, NPS |
| | D. Continue existing wetlands acquisition program at current level | TWRA | TDA |
| | E. Acquire wetlands through LWCF | TDEC-NH | Local Governments |

## TABLE 5 (CONT'D)

| OBJECTIVE NUMBER | ACTION ITEM NUMBER | PRIMARY IMPLEMENTING AGENCIES | COOPERATING AGENCIES |
|---|---|---|---|
| 2. (CONTINUED)<br>***High Priority*** | F. Promulgate criteria and designate selected high quality, rare or unique wetlands as Outstanding Resource Wetlands | TDEC-WPC | IWC-TWG<br>All Agencies |
| | G. Request USFWS to renew acquisition of species rich wetlands | TDEC-NH | TWRA, USFWS |
| | H. Establish legal framework and cooperative atmosphere for public/private partnerships or joint ventures to acquire wetlands and monitor them | TWRA, TDEC<br>TDA, T F/A<br>TDOT | Federal Agencies<br>Non-Profits, Corps<br>Local Governments |
| 3. IDENTIFY PRIORITY WETLANDS RESTORATION SITES<br>***High Priority*** | A. Develop criteria to evaluate and rank candidate restoration sites | TDEC-NH<br>TWRA | IWC-TWG<br>All Agencies |
| | B. Identify candidate sites and add them to a common database for evaluation | TDEC-NH<br>TWRA | Field Staff<br>All Agencies |
| | C. Evaluate candidate sites, prepare & distribute a priority list to resource managers | TDEC-NH | IWC-TWG<br>All Agencies |
| | D. Test hydric soils as a predictor of successful restoration | TWRA, TEPO | IWC-TWG<br>All Agencies |
| | E. Consider reformulating WTT project as a wetlands restoration demonstration under Section 1135 | TEPO, USCOE<br>WTT Committee | WTT |
| 4. RESTORE 70,000 ACRES OF WEST TENNESSEE WETLANDS BY 2000<br>***Medium Priority*** | A. Define "restoration" and develop restoration criteria for each wetland type | TEPO | IWC-TWG |
| | B. Develop & distribute a consolidated list of priority candidate sites | TDEC-NH | IWC-TWG<br>All Agencies |
| | C. Encourage joint ventures to implement North American Waterfowl Plan in Tennessee | TWRA | Federal/State Agencies<br>Non-Profits, Corps<br>Local Governments |

## TABLE 5 (CONT'D)

| OBJECTIVE NUMBER | ACTION ITEM NUMBER | PRIMARY IMPLEMENTING AGENCIES | COOPERATING AGENCIES |
|---|---|---|---|
| 4. (Continued)<br><br>***Medium Priority*** | D. Consider use of "Wallop-Breaux funds" to restore wetlands functions supporting fisheries | TWRA | |
| | E. Target EPA/state NPS grant program to improve water quality and related functions in wetlands | TDA | EPA & USDA Agencies |
| | F. Continue state cost sharing program for landowners to implement NPS BMP's | TDA | USDA Agencies |
| | G. Place priority on wetland restoration in USFS/TDA forest stewardship incentive program for landowners | TDA-DF<br>USFS | USDA Agencies |
| | H. Continue mitigation banks to compensate for unavoidable impacts of road building | TDOT | TDEC-WPC<br>TDA-DF, TWRA |
| | I. Promote and implement "Partners for Wildlife" technical assistance program | USFWS | TWRA |
| | J. Utilize Section 1135 to restore wetlands and/or wetland function | TEPO<br>USCOE | All State/Local Agencies |
| | K. Seek participation of state in federal wetlands reserve program (WRP) | TDA, TEPO<br>TFBF | SCS, SCD'S<br>RC&D'S |
| | L. Monitor and evaluate state restoration projects, recording acreage and function (See Chapter VII) | TEPO<br>IWC-TWG | USGS, TTU/UT<br>All Agencies |
| | M. Coordinate state tracking system with annual NAWP monitoring system (See Chapter VII) | TEPO<br>TWRA | TWRA |
| | N. Prepare biennial report to Governor and General Assembly on status of restoration projects (See Chapter VII) | TEPO | IWC-TWG<br>All Agencies |
| 5. ACHIEVE NO OVERALL NET LOSS OF WETLAND FUNCTIONS | A. Apply interim wetlands mitigation policy in the state's regulatory program | TDEC-WPC<br>USCOE | All Reviewing Agencies |

## TABLE 5 (CONT'D)

| OBJECTIVE NUMBER | ACTION ITEM NUMBER | PRIMARY IMPLEMENTING AGENCIES | COOPERATING AGENCIES |
|---|---|---|---|
| 5. (CONTINUED)<br>***Medium Priority*** | B. Coordinate long term monitoring program and employ staff | TEPO | |
| | C. Document the status and function of TN wetlands by USGS hydrologic unit | TEPO<br>IWC-TWG | All Agencies |
| | D. Assess (or initiate research to define) the major function's provided by the state's wetlands | TEPO<br>IWC-TWG | USGS, UT-WRRC<br>TTU-Water Center |
| | E. Design a common reporting format for entry and storage of monitoring data | TEPO, IWC-TWG<br>TWRA | All Agencies |
| | F. Compile and update monitoring data, biennially, and prepare an analysis and report every 6 years | TEPO<br>IWC-TWG | All Agencies |
| | G. Evaluate and prepare recommendations for program revisions | TEPO, IWC-TWG | All Agencies |
| 6. DEVELOP INFORMATION TO RESTORE "NATURAL" FLOOD PLAIN HYDROLOGY<br>***Medium Priority*** | A. Sponsor annual wetlands research needs conference | TEPO | IWC-TWG<br>All Agencies |
| | B. Identify agency to sponsor or conduct needed research | TEPO,<br>IWC-TWG | USGS, UT-WRRC<br>TTU-Water Center |
| | C. Research agencies should report and interpret findings to program managers & landowners | USGS, UT-WRRC<br>TTU-Water Center | |
| | D. Support demonstration Projects | TEPO, IWC-TWG | All Agencies |
| | E. Include natural floodplain hydrology/wetlands restoration in flood damage reduction projects | USCOE | SCS, TDA<br>USDA Agencies |
| 7. INCREASE THE LEVEL OF BENEFITS FROM WETLANDS ON PRIVATE LAND | A. Strengthen wetlands information delivery at the county level | TDA | SCD, UT-AES<br>USDA Agencies |
| | B. Employ trainer & coordinator for local assistance providers | TDA | |

## TABLE 5 (CONT'D)

| OBJECTIVE NUMBER | ACTION ITEM NUMBER | PRIMARY IMPLEMENTING AGENCIES | COOPERATING AGENCIES |
|---|---|---|---|
| 7. (CONTINUED)<br>***High Priority*** | C. Provide technical assistance and cost share to restore converted marginal cropland to bottomland hardwood forest | TDA-DF | USFS<br>USDA Agencies |
| | D. Provide technical assistance to restore natural hydrology to bottomland hardwood forest land | TDA-DF | USFS<br>USDA Agencies |
| | E. Provide technical assistance to promote winter flooding of cropland | TDA-AR | USDA Agencies<br>USFS, TVA |
| | F. Provide technical assistance in selecting compatible food crops for waterfowl | TDA<br>TWRA | USDA Agencies |
| | G. Support technical and financial assistance to protect wetlands and investigate possible tax incentives for landowners who do | TDA | IWC-TWG<br>All Agencies<br>State Legislature |
| 8. CREATE MORE URBAN/RIPARIAN/WETLAND GREENBELTS<br>***Low Priority*** | A. Include wetlands and riparian greenbelts in recreation assistance programs | TDEC-RS<br>PARTAS | Local Governments |
| | B. Coordinate state wetlands conservation with federal conservation and recreation programs | TDEC-RS | TEPO, IWC-TWG<br>National Park Service<br>TVA |
| | C. Include forested wetlands in urban forestry program | TDA-DF | |
| | D. Coordinate wetlands mitigation projects with existing urban greenbelt plans | TDEC-WPC<br>TDEC-RS | TDOT<br>USCOE<br>Local Governments |
| | E. Encourage local governments to protect wetlands in flood insurance plans | EDC-LP | FEMA, TVA |
| 9. INCREASE DELIVERY OF WETLAND INFORMATION TO LOCAL GOVERNMENT, THE PUBLIC AND SCHOOLS | A. Provide copies of wetlands plans, maps and technical reports to libraries | All Agencies, TWRA | All Agencies |

## TABLE 5 (CONT'D)

| OBJECTIVE NUMBER | ACTION ITEM NUMBER | PRIMARY IMPLEMENTING AGENCIES | COOPERATING AGENCIES |
|---|---|---|---|
| 9. (CONTINUED)<br>***Low Priority*** | B. Develop & publish a general brochure on wetlands values, including a directory | TEPO | IWC-TWG |
| | C. Make GIS maps and priority lists available to local planners and advisors | TWRA<br>TEPO | ECD-LP<br>UT-IPS, TVA |
| | D. Include wetlands information in biodiversity handbooks | TCL, TWRA<br>TDEC-NH | |
| | E. Consider sponsoring an ADID study in communities where development threatens wetland function | USCOE, USEPA<br>Local Government | TDEC-WPC,<br>USFWS,<br>TDEC-ES, TWRA |
| | F. Expand IWC-TWG to include other interest groups | TEPO | IWC-TWG |
| | G. Develop wetlands information for in-service teacher training | TEPO | IWC-TWG |
| | H. Include wetlands information in clean river projects | TVA | IWC-TWG |
| 10. ESTABLISH STATE USE CLASSIFICATION AND WATER QUALITY STANDARDS FOR WETLANDS<br>***Medium Priority*** | A. Develop a classification system for all state wetlands types | TDEC-WPC | All Agencies |
| | B. Designates uses for each wetland type based on the functions and values attributable to wetlands | TDEC-WPC | All Agencies |
| | C. Develop aesthetic and biological narrative criteria to protect the classified uses | TDEC-WPC | All Agencies |
| | D. Adopt existing numeric water quality standards for wetlands adjacent or hydrologically connected to surface waters | TDEC-WPC | All Agencies |
| | E. Develop criteria for outstanding resource wetlands (ORW) | TDEC-WPC | All Agencies |
| | F. Extend the antidegradation policy to wetlands | TDEC-WPC | All Agencies |

Moreover, as was pointed out in Chapter I, while we have good information about a few wetlands functions, and a general understanding of others, we have limited hard data about wetlands hydrology, water quality and certain aspects of their ecological structure The Strategy calls for the State to capture existing data from many agencies, and to initiate a serious effort to collect new data on wetlands functions.

Data acquisition efforts should begin in the river corridors of West Tennessee, and move to other major river corridors and areas of wetlands concentration, and finally into areas of the state where wetlands are localized and rare The data will be compiled, and entered into a computerized format for easy access by planners and program managers.

The need to identify the so-called "unique" wetlands is particularly acute This information is needed to guide decisions regarding the purchase and long term management of high quality wetlands: Those that are rare, that support rare plants and animals, or that represent typical unaltered ecosystems.

The Strategy calls for restoration of degraded wetlands The State should develop a common definition of "restoration," and compile a list of potential wetlands restoration sites where the probability for successful restoration of beneficial wetlands function is high. The focus of accomplishing restoration lies in the acquisition of restorable sites, or use of private land initiatives to encourage restoration of marginal croplands

The fourth high-priority objective calls for a comprehensive cooperative effort to provide education, information, technical assistance, and in some cases, financial assistance to private landowners in order to increase the benefits of wetlands ownership. Sound information and program flexibility is as important to many landowners as financial incentives

It is important to increase benefits, tangible and intangible, to those landowners or land managers who are willing to protect and manage their wetlands in accordance with sound ecological principals. Well managed and functional wetlands will also provide valued benefits to society. There is no specific sequence in which the action items should be carried out; the technical assistance programs can be tailored to a specific group of property owners, and delivered simultaneously.

**Medium Priority Objectives.** The second tier of Objectives also includes four objectives. These are

Objective 4: To Restore 70,000 acres of Wetlands in West Tennessee by the Year 2000

Objective 5: To Achieve "No Overall Net Loss" of Wetland Function

Objective 6: To Develop Information to Maintain or Restore "Natural Floodplain Hydrology."

Objective 10 To Establish a Wetlands Use Classification and Water Quality Standards

The successful implementation of Objective 4, which calls on the State to restore 70,000 acres of degraded wetlands by the year 2000, coupled with the "No Overall Net Loss" Objective, would increase the state's resource base by approximately 10% in six years (2000)

The research objectives, Objectives 5 and 6, were placed in the second group Achieving these objectives will require both time and money Efforts should begin almost at once, but at a modest scale, and be phased in over several years

These two objectives may be initiated at a later date, if necessary, when adequate resources are available to pursue them

The Strategy recognized that the development of a system of classification and water quality standards for wetlands is needed at an early date. Clear regulatory criteria are needed to guide permitting and wetlands management decisions.

**Low Priority Objectives.** The remaining two objectives are important, but slightly less urgent, and are placed in the third category. These objectives are

Objective 9: Increase Delivery of Wetlands Information.

Objective 8: Create More Urban / Riparian Wetland Greenbelt Areas.

These two objectives may be initiated at a later date (if necessary), when the state's information and understanding of wetlands is more complete, and resources are available to pursue them.

# CHAPTER VI
# COORDINATION AND FUNDING

## COORDINATION

The responsibility for wetlands conservation and management is decentralized and shared among federal agencies and programs, state agencies and programs, regional organizations, county and city planning commissions, and ultimately hundreds of private landowners who make day-to-day decisions about their land

It is imperative that these agencies and individuals share their knowledge and coordinate their work and resources to implement the action plan outlined in CHAPTER V. The Governor's Interagency Wetlands Committee and its Technical Working Group, staffed by the Tennessee Environmental Policy Office (TEPO), has proved to be an effective forum for information exchange, coordination, and planning This strong coordination function should be continued and the concept should be incorporated into the state's long term strategy to conserve its wetlands

As effective as it has been, the Interagency Wetlands Committee is an ad hoc group, convened by the Governor and serving at his pleasure Although the Sundquist Administration has recognized the benefits of the IWC, it might not be retained by other administrations

It is recommended that the State establish a permanent Wetlands Coordinating Committee or Commission, staffed by TEPO Legislation would be required A statutory mandate would confer long term stability and consistency of coordination and oversight. Given future changes in state government, the IWC should review the need for a coordination committee in relationship to the current political climate

It is recommended that any membership of a permanent committee be similar to that of the existing committee, consisting of the leaders of state and federal agencies, conservation organizations and landowner associations. Responsibilities should include information sharing, program coordination, and advising the Governor on wetlands policy, budgets, and legislation

The TEPO should provide ongoing staff support to a permanent Wetlands Conservation Committee. TEPO should continue to broker federal grants for other agencies implementing the Strategy, draft and oversee publication of technical reports and/or public information and

educational materials, and coordinate wetlands programs with similar cross cutting resource management programs in Tennessee, such as the Biodiversity and GAP Analysis efforts

Because wetlands conservation and regulatory programs cut across so many boundaries, the Strategy places major new resource monitoring and reporting responsibilities in TEPO TEPO is directed to review the opportunities for a statewide wetlands information archive, identify research and information needs, and to "keep score," i e., to monitor, analyze, and report on the state's wetlands resources.

The proposed work load may require the establishment of one additional position to carry out these monitoring and reporting duties, or to oversee a contract with an academic institution to do so.

**FUNDING**

It is nearly impossible to calculate the financial resources now dedicated to wetlands conservation in Tennessee, or to determine their cost-effectiveness with precision. An early attempt to do so was abandoned by the TWG and staff.

This is due to the fact that the state's wetlands acquisition and restoration efforts, technical assistance programs, and regulatory programs are dispersed among so many agencies, organizations, and programs In some agencies, wetlands conservation is only part of a broader program mission, and staff and institutional support is shared The State has no information on the wetlands conservation costs incurred by private or non-profit organizations, or by private landowners

In CHAPTER IV. the Strategy identified several state and federal wetlands programs that were considered to be efficient and cost effective It is recognized that the EPA State Wetland Programmatic Development Grant has sustained progress for the Strategy. The EPA grant program has basically allowed an unfunded plan to be largely funded The Strategy commends these programs, and recommends their indefinite continuation at current or increased funding levels. These include: the state wetlands acquisition program administered by TWRA; the North American Waterfowl Management Plan joint-venture acquisition program; the federal USDA Wetlands Reserve Program (WRP), and the nonpoint source (NPS) technical assistance program

administered by TDA In general, the strategy calls for the indefinite continuation of these programs at current or expanded levels.

The Strategy also identified unmet needs and underfunded programs Implementation of the Action Plan outlined in CHAPTER V will clearly require a greater commitment of staff and money. The state's existing programs must be efficiently administered, and the work carefully coordinated; but additional resources will be required.

In general, three strategies to increase funding levels are suggested. These are.

1 TEPO should help other agencies seek another EPA Wetlands Program Development grant to implement elements of the Wetlands Conservation Strategy; complete a comprehensive state Wetlands Conservation Plan (WCP), and monitor progress toward its implementation. TEPO should request state appropriations to provide required state cost shares.

2 All state agencies should compete for other federal grants/cooperative program opportunities and allocate funds, or in-kind services to provide the required state cost share Funding assistance needs include

- wetlands function research (TEPO, TDEC)
- scanning and/or digitization of NWI data and recent soil surveys for counties in the state where there are abundant wetlands (TWRA, TEPO)
- monitoring, evaluation, and trends analyses (TEPO)

3 All state resource management agencies should pool their resources and data All agencies should contribute to and participate in state-wide, interagency data collection and evaluation projects, such as the Biodiversity and GAP Analysis project; geo-referenced data should be collected in a compatible format and shared with the Wetlands datasets, the Biodiversity datasets, the TDEC-TRIS, and Heritage databases.

## IMPLEMENTATION SCHEDULE AND MILESTONES

The IWC-TWG discussed and arrived at consensus about priorities for action; their recommendations have been discussed in CHAPTER V. The IWC-TWG identified four high priority objectives, and recommended that these objectives be undertaken as soon as possible. It

identified other objectives that should be initiated immediately, at a modest level, and phased in over a period of several years The remaining objectives, although deemed to be important, may be deferred or reduced in scope if resources are limited

Each agency has carefully reviewed the Strategy document, to determine how it would carry out the responsibilities assigned to it in the Action Plan Each agency was asked to review the assigned action items and determine their relative priority within the agency; to identify who within the agency would carry out each designated action, and what it would cost, and to lay out a tentative schedule for initiating and completing the work The information was then compiled and assembled into a tentative implementation schedule, which is summarized in TABLE 6 *[The original format has been revised to be more inclusive of all references to plan actions and to reflect past progress.]*

It should be noted that the financial assistance of the US EPA has allowed the State to implement the plan on or ahead of schedule

## TABLE 6: WETLANDS CONSERVATION STRATEGY - IMPLEMENTATION SCHEDULE AND STATUS

LEAD AGENCY: *TN DEPARTMENT OF AGRICULTURE*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **High Priority** | | | | | | | | | |
| 2H | Establish framework for joint ventures | X | → | → | → | → | → | → | |
| 7A | Strengthen WL information delivery at county level *(See pg. 51-52)* | X | → | → | → | | | | |
| | | | | *Revised Schedule* | | | | | |
| 7B | Employ coordinator/trainer for local assistance providers | ✓ | ← | → | → | → | → | → | |
| 7C | Provide TA to restore converted cropland to BLH forest | $ X | → | → | → | → | → | → | |
| 7D | Provide TA to restore BLH hydrology | X | → | → | → | → | → | → | |
| 7E | Provide TA to promote winter flooding on cropland | X | → | → | → | → | → | → | |
| 7F | Provide TA to select compatible waterfowl food crops | X | → | → | → | → | → | → | |
| | | | | | *Revised Schedule* | | | | |
| 7G | Investigate tax incentives | X | → | → | | | | | |
| **Med. Priority** | | | | | | | | | |
| 4E | Target NPS $ to improve WL water quality related WL functions | S X | → | → | → | → | → | → | |
| 4F | Continue cost-sharing program for private landowner NPS BMP | X | → | → | → | → | → | → | |



(S) = Status ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*

Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)
## LEAD AGENCY: *TN DEPARTMENT OF AGRICULTURE*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **Med. Priority** | | | | | | | | | |
| 4G | Emphasize WL restoration in TDF Forest Stewardship Program | X | → | → | → | → | → | → | |
| 4K | Seek participation in WRP | ✓ | → | | | | | | |
| **Low Priority** | | | | | | | | | |
| 8C | Include WL in urban forestry program | | | → | → | → | → | → | |
| **Other** | | | | | | | | | |
| Chapter VII #6 | Monitor wetland functions restored through NPS demonstrations | X | → | → | → | → | → | → | |
| #10 | Monitor and report on bottomland hardwood stands and other forested wetlands in enrolled in Forest Stewardship Program* | | | → | → | → | → | → | |
| #11 | Monitor status of hydrology in bottomland hardwoods, forested wetlands and adjacent farmland* | | | → | → | → | → | → | |
| #12 | Monitor privately owned wetlands in USDA programs* | X | → | → | → | → | → | → | |
| #13 | Share/receive program and NRI data with/from USDA* | X | → | → | → | → | → | → | |
| | * *These tasks are done in conjunction with the IWC and with the 6 year monitoring and reporting schedule.* | | | | | | | | |



(S) = Status: ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD AGENCY: *TN DEPARTMENT OF ENVIRONMENT & CONSERVATION - NATURAL HERITAGE*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **High Priority** | | | | | | | | | |
| 2A | Review academic studies & compile a list of candidate sites | $ X | | ← | → | | | | |
| | | | | | *Revised Schedule* | | | | |
| 2B | Support biodiversity project | X $ | | | | | | | |
| 2C | Strengthen coordination of lists | X | | | | | | | |
| 2E | Acquire WL's through LWCF, NRTF & SLAF | X | | | | | | | |
| 2H | Establish framework for joint ventures | | | | | | | | |
| 2G | Request USFWS to buy WL's | | ↔ | | | | | | |
| 3A & 3B | ID candidate restoration sites and develop criteria | $ X | | | | → | | | |
| **Medium Priority** | | | | | | | | | |
| 4B | Develop and distribute priority lists | X $ | | ← | | → | | | |
| **Low Priority** | | | | | | | | | |
| 9D | Include WL info in biodiversity manuals | | | ← | | | | → | |
| **Other** | | | | | | | | | |
| Chapter VII #8 | List, assess, and report condition of "unique" WL on ES database | X | | ↔ | | ↔ | | ↔ | |
| #9 | Report on status of privately owned wetlands in Natural Areas Registry | | | ↔ | | ↔ | | ↔ | |



(S) = Status: ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received; the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD AGENCY: *TN DEPT. OF ENVIRONMENT & CONSERVATION: WATER POLLUTION CONTROL*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **High Priority** | | | | | | | | | |
| 2F | Promulgate criteria & designate selected WL's as ORW's | X | → | → | | | | | |
| 2H | Establish framework for joint ventures | X | → | → | → | → | → | → | |
| **Med. Priority** | | | | | | | | | |
| 5A | Apply interim wetlands mitigation policy | X | → | → | → | → | → | → | |
| 10 A-F | Establish state use classifications & WQ standards for WL's | X | → | → | | | | | |
| **Low Priority** | | | | | | | | | |
| 8D | Coordinate mitigation with urban greenbelt plans (with TDEC-RS) | X | → | → | → | → | → | → | |
| 9E | With ECD encourage communities to apply for EPA-ADID assistance | | → | → | → | → | → | → | → |
| **Other** | | | | | | | | | |
| Chapter VII #3 | Monitor & report changes in WL from permitted acts | X | | ↔ | | ↔ | | ↔ | |
| #4 | Monitor gains & losses from permitted acts & report offsets | X | | ↔ | | ↔ | | ↔ | |
| #5 | Monitor & report on status of ORW's/reference WL's | X | | ↔ | | ↔ | | ↔ | |
| #7 | Report on status of mitigation sites | X | | | ↔ | ↔ | | | |



(S) = Status ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received; the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)
## LEAD AGENCY: *TN DEPT. OF TRANSPORTATION*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **High. Priority** | | | | | | | | | |
| 2C | Cooperating Agency - Strengthen the coordination of priority lists for full fee and/or less-than-fee acquisition | X | → | → | → | → | → | → | |
| 2H | Cooperating Agency Establish framework for joint ventures | X | → | → | → | → | → | → | |
| **Med. Priority** | | | | | | | | | |
| 4H | Continue its mitigation banking program | X | → | → | → | → | → | → | → |



(S) = Status: ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)
## LEAD AGENCY: *TN WILDLIFE RESOURCES AGENCY*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **High Priority** | | | | | | | | | |
| 1A | ID WL's databases & import to GIS | X | → | → | → | → | → | → | |
| 1B | Seek funding for NWI digital data | X<br>$ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | |
| 1C | Import existing digital soil surveys | X | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | |
| 1D | Initiate program to digitize soil data | X<br>$ | ← | → | → | → | → | → | |
| 2B | Support biodiversity/GAP analysis | X | → | → | → | → | → | → | |
| 2C | Coordinate Priority Lists | X | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | |
| 2D | Continue wetlands acquisition | X | → | → | → | → | → | → | |
| 2E | Request USFWS to purchase WL's in TN through LWCF | X | ↔ | | | | | | |
| 2H | Establish atmosphere for joint ventures and partnerships | X | → | → | → | → | → | → | |
| 3A & B | With TDEC-NH develop criteria & ID/rank candidate restoration sites | X | → | → | → | → | → | → | → |
| 3D | Test hydric soils as predictor of successful restoration | | | ↔ | ↔ | | | | |
| 7F | TA for waterfowl food crops on WL | X | → | → | → | → | → | → | |
| **Med. Priority** | | | | | | | | | |
| 4C | Continue TIP & NAWMP ventures | X | → | → | → | → | → | → | |
| 4D | Utilize Wallop-Breaux $ to enhance WL's | | → | → | → | → | → | → | |



(S) = Status. ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD ORGANIZATION: *TENNESSEE WILDLIFE RESOURCES AGENCY (TWRA) (CONT'D)*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **Med. Priority** | | | | | | | | | |
| 4J | Utilize 1135 where possible | | → | → | → | → | → | → | → |
| 4M | Coordinate NAWMP reports with TEPO | X | | ↔ | | ↔ | | ↔ | |
| **Low Priority** | | | | | | | | | |
| 9D | Include WL info in biodiversity Project | X | | ↔ | → | → | → | → | |
| **Other** | | | | | | | | | |
| Chapter VII | | | | | | | | | |
| #1 | Keep NWI data current | X | | ↔ | | ↔ | | ↔ | |
| #2 | Inspect, monitor & report on WL acquisition through WAF | X | → | → | → | → | → | → | |



(S) = Status ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD ORGANIZATION: *TN ENVIRONMENTAL POLICY OFFICE & GOVERNOR'S INTERAGENCY WETLAND COMMITTEE*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| *(Listed by Policy Category)* | | | | | | | | | |
| **CHARACTERIZE WL & IDENTIFY FUNCTION** | | | | | | | | | |
| **High Priority** | | | | | | | | | |
| 1B | Seek funds to buy/digitize NWI data | X $ | | | | | | | |
| 1D | Seek funds to buy/digitize soil data | X $ | | | | | | | |
| 1E | Seek funds to develop HG Method | ✓ $ | | | | | | | |
| 1F | Seek funds for hydrol /ecol research | X $ | | | | | | | |
| **Medium Priority** | | | | | | | | | |
| 5C | Document known WL functions | X | | | | | | | |
| **POLICY DEVELOPMENT: RESTORATION** | | | | | | | | | |
| **High Priority** | | | | | | | | | |
| 3A | Develop ranking criteria for candidate sites | X | | | | | | | |
| 3C (& 4B) | Compile candidate site list, evaluate and distribute priority list | X $ | | | | | | | |
| **Med. Priority** | | | | | | | | | |
| 4A | Define "restoration" and develop restoration criteria for each WL type | ✓ | | | | | | | |
| 4I | Promote Partners for Wildlife | | | | | | | | |
| 4J | Cooperate with USCOE to utilize Section 1135 programs | | | | | | | | |
| 4L | Track/ evaluate restoration projects | | | | | | | | |
| 4N | Issue annual report on restoration projections and long range strategy | | | | | | | | |




(S) = Status ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note. *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD ORGANIZATION: *TN ENVIRONMENTAL POLICY OFFICE & GOVERNOR'S INTERAGENCY WETLANDS COMMITTEE (CONT'D)*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **RESEARCH & DEMONSTRATIONS** | | | | | | | | | |
| **High Priority** | | | | | | | | | |
| 3D | Test hydric soils as indicator for successful restoration | | | ← | → | | | | |
| 3E | Consider reformulation of WTT as a WL restoration demo project | X | ← | | → | | | | |
| **Med. Priority** | | | | | | | | | |
| 5D | Assess (or investigate to define) WL functions | X | | ← | | | → | | |
| 6A | Sponsor annual WL research conference, & ID research needs | | ← → | ← → | ← → | ← → | ← → | ← → | |
| 6B & C | ID agency to sponsor/conduct needed studies & share data | | ← → | ← → | ← → | ← → | ← → | ← → | |
| 6D | Design & fund projects demonstrating restoration of hydrology | X $ | | ← | | | | → | |
| 6E | Include natural floodplain hydrology in flood damage reduction projects | X | | ← | | | | → | |



(S) = Status: ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received; the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD ORGANIZATION: *TN ENVIRONMENTAL POLICY OFFICE & GOVERNOR'S INTERAGENCY WETLANDS COMMITTEE (CONT'D)*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| | **MONITORING, ANALYSIS & REPORTING** | | | | | | | | |
| **Med. Priority** | | | | | | | | | |
| 4M | Coordinate state reports with NAWP reports, SCS Swampbuster reports, NRI, etc. | X | | | ← → | | ← → | | ← → |
| 5B | Designate agency (TEPO) to coordinate and oversee long term monitoring | ✓ | | → | | | | | |
| 5B | Employ/assign staff | | ← → | | | | | | |
| 5E | Design standard reporting format | ✓ | | ← → | | | | | |
| 5Fa | Compile monitoring data from other agencies & organizations (see 4L, M & Ch. VII) | X | | | ← → | | ← → | | ← → |
| 5Fb | Update and analyze monitoring data biennially | X | | | ← → | | ← → | | ← → |
| 5Fc | Prepare "status and trends" report on "NNL" goal | | | | | | | ← → | |
| 5G | Make recommendations to state leaders for improvements in regulatory and voluntary programs plan revisions | X | | | | | | | ← → |



(S) = Status ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

## TABLE 6 (CONT'D)

## LEAD ORGANIZATION: *TN ENVIRONMENTAL POLICY OFFICE & GOVERNOR'S INTERAGENCY WETLANDS COMMITTEE (CONT'D)*

| OBJECTIVE | ACTION & STATUS (S) | S | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **MONITORING, ANALYSIS & REPORTING** | | | | | | | | | |
| Other Chap. VII | Revisit and reevaluate the Strategy as needed | X | | ← | → | ← | → | ← | → |
| Chap. VII | Report to Governor and Legislature on plan progress | ✓ | 1996 only | ← | → | ← | → | ← | → |
| **COORDINATION / COMMUNICATION / FUNDING** | | | | | | | | | |
| Low Priority 8A | Promote WL's in TDEC PARTAS & LWCF | X | | | ← | | | → | |
| 8B | Promote wetlands in urban greenbelt plans | X | | | | | | → | |
| 8E | Promote wetlands in local flood insurance plans | | | | | | | → | |
| 9A/C | Provide wetland maps/info to local govt | X | | | ↔ | ↔ | ↔ | ↔ | ↔ |
| 9B | Write/publish WL brochure | X $ | | | | ← | → | | |
| 9F | Expand IWC-TWG representation | | | *Revised Schedules* | | | *Revised Schedule* | | |
| 9G | Develop in-service for WL through Project CENTS | | | | | ← | → | | |
| 9H | Encourage TVA wetland efforts | X | | | | | | | → |



(S) = Status: ✓ *denotes Action Item Completed,* X *denotes under way,* $ *denotes grant received, the absence of a symbol indicates "no progress"*
Note: *See Table 5 and associated item #s in Chapter 7 for list of cooperating agencies*

# CHAPTER VII
# MONITORING AND EVALUATION

## CONSIDERATIONS

There are two aspects to be considered for monitoring and evaluation of the implementation of the Strategy. The first concerns monitoring and evaluating the **actions** called for in CHAPTER V of the Strategy. The second aspect is monitoring the **condition** of the state's wetlands Periodic evaluation of the resource base is required to measure progress on Objectives These aspects are discussed as follows

### 1. Monitoring the Action Plan

The Action Plan as set forth in CHAPTER V, describes specific actions to be taken, and assigns responsibility for each item to one or more agencies, or programs Responsibility for tracking program milestones and providing progress reports is summarized in TABLE 4.

Each agency will be responsible for tracking its assigned responsibilities, documenting its program activities, and providing data and progress or status reports to the Tennessee Environmental Policy Office (TEPO) every two years TEPO will compile the reports, prepare and deliver a statewide progress report to the Governor, the General Assembly, and the public The first progress report will be produced two years after the State Wetlands Conservation Strategy is adopted *[as evidenced by this document]*, the second in four years A progress report should be prepared every two years thereafter

### 2. Monitoring, Evaluation and Trends Analyses

To determine whether Tennessee's remaining wetlands resources are being lost or adversely impacted by man's activities, a method must be developed or selected to periodically determine wetland gains or losses, the types of wetlands being impacted, the activities which are contributing to these wetland changes, and changes resulting from on-going natural processes at work across the state It is equally important to understand those activities and processes which

are contributing to increases in the overall wetlands base and the restoration or enhancement of wetland functions

Tennessee's wetlands are important components of the overall habitat fabric of our state. As such, their functions and importance to various wildlife and plant species, as well as their value to man, cannot be isolated and evaluated, monitored or managed without regard to those forces and activities at work within their hydrologic unit boundaries

## CONCLUSIONS

It is therefore proposed that evaluation and monitoring of the status and trends of Tennessee's wetlands be a part of a more comprehensive program of monitoring and evaluating changes in Tennessee's total habitat. Such a process has already been identified as a part of the Tennessee Biodiversity Program

The GIS-based habitat type mapping which is being done as a part to the Biodiversity Program has a built-in mechanism for 5-year updates of statewide vegetation mapping using satellite imagery Quantitative wetland habitat changes will be mapped as a part of these periodic updates. This information will be reinforced and/or refined by regular NWI inventory updates, and status and trends reports. However, not all relevant information can be captured or displayed on a GIS system

In order for the resource monitoring program to be successful, all agencies, both state and federal, involved in the management of some portion of Tennessee's wetlands resources, along with the regulatory community, must join in a partnership to inspect, monitor and evaluate both the quantity and quality of Tennessee wetlands It is crucial to document changes to the various ecosystem habitats across the state in an efficient and cost-effective manner

Resources information should be collected in a manner which is useable by a variety of resource managers Wetlands definition, types, and functional aspects should be agreed to by all parties for inventory purposes, and relevant information collected and reported in a format that can be understood and used by all (See Objective 5, CHAPTER V) TEPO should create a central archive to receive monitoring data and status reports, the office should compile and update the monitoring data every two years.

Examples of data to be reported include.

1. TWRA should acquire (or digitize) and keep National Wetlands Inventory data current
2. TWRA should biennially inspect, monitor and prepare a report on the quantity, quality and functions of the publicly owned wetlands acquired and enhanced/restored through the state acquisition programs.
3. TDEC-WPC (Natural Resources Section - NRS) should biennially monitor and document changes in water quality or other functions in wetlands, resulting from legally permitted activities or projects.
4. TDEC-WPC (NRS) should track gains and/or losses in acreage brought about by the permitting process, and examine actual delivery of wetlands functions through mitigation banking.
5. TDEC-WPC (NRS) should biennially inspect, assess and report on the status of wetlands designated as "Outstanding Resource Wetlands," or wetlands designated as "reference wetlands" for the state's regulatory wetlands classification scheme
6. TDEC-WPC (NRS) should biennially inspect, assess and document the status of wetlands functions restored through NPS abatement demonstration projects
7. TDEC-WPC (NRS), TDOT and TWRA should jointly inspect, assess and report on the status of wetlands purchased and restored to mitigate unavoidable adverse construction impacts on wetlands
8. TDEC-NH should biennially, as an element of the state's Heritage database, list, assess, and record the condition of those "unique" wetlands that support a rare ecosystem, or provide habitat for endangered plants and animals.
9. TDEC-NH should biennially inspect and record the status of wetlands in private ownership that are registered on the state "Natural Area Registry."
10. TDA-DF should biennially monitor and document the status of bottomland hardwood stands, or other forested wetlands in private ownership, which are participating in the Forest Stewardship Incentive Program.

11 TDA-DF should biennially monitor and document the status of hydrology in bottomland hardwood forests, and adjoining agricultural lands, with particular attention to emerging problems in the Gulf Coastal Plain province

12 USDA-NRCS (and/or the TDA-AR) should biennially monitor and report on the status of wetlands in private ownership enrolled in the USDA assistance programs

13 USDA-NRCS should share data collected on the status and trends of wetlands on agricultural land through the NRI assessment, and periodic "swampbuster" monitoring

14 USFWS *[with TWRA]* should biennially inspect and report on the status of wetlands acquired in fee, or by easement, under the North American Waterfowl Management Plan, or "Partners in Wildlife" (See Objective 4M, p. 50).

15. Other federal water resource agencies or land management agencies (e.g USCOE, TVA, NPS, etc.) should contribute data on the status of publicly owned wetlands on the lands which they manage in Tennessee.

Every six years, TEPO should analyze the information (or enter into a contract with one of the state's academic water resources centers to analyze the data) and prepare a detailed status and trends report on Tennessee's wetlands resources The report should specifically evaluate the resource base in the context of the "No Overall Net Loss of Wetlands Functions" and restoration goals.

The first statewide assessment of wetlands trends should be completed six years following the adoption of the plan, concurrent with the third biennial progress report, and prior to a major revision of the plan. The report should be delivered to the Governor, the members of the General Assembly, the leaders of state and federal agencies in Tennessee, and made available to the public.

Based on the conclusions of the report, the IWC (or its successor) should revisit and reevaluate the state's Wetlands Conservation Strategy. If the major goals have not been achieved, the committee should prepare recommendations to the state leadership to strengthen both the regulatory and the voluntary cooperative state programs

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# APPENDIX B
# WETLANDS DEFINITION, IDENTIFICATION, AND DELINEATION

*[The following is based on a 1993-94 analysis of agency guidelines and rules.]* Wetlands possess three unique identifying characteristics: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetlands hydrology. These characteristics individually or in combination determine classification and delineation of wetlands for numerous technical and/or legal purposes

Hydrophytic vegetation (hydrophytes) are macroscopic plants growing wholly or partly in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content Hydrophytes have adapted structurally, physiologically, and/or reproductively to the rigors of a periodically anaerobic environment The U S. Fish and Wildlife Service has published the "National List of Plant Species That Occur in Wetlands" (Reed, 1988). There are over 7,000 species on the National List and approximately 1,600 of these occur in Tennessee

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (typically 18 inches) In general, hydric soils are flooded, ponded, or saturated for two weeks or more during the "growing season" when the soil temperature is above biologic zero (41 degrees Fahrenheit) The National Technical Committee for Hydric Soils has developed criteria for hydric soils and has published a list of the soil phases considered hydric in "Hydric Soils of the United States" (USDA-SCS 1991)

Of the three technical criteria of wetland identification, wetlands hydrology is the most difficult to identify, due to annual, seasonal, and daily fluctuations Numerous factors influence the wetness of an area, including precipitation, topography, soil permeability, and plant cover. Permanent or periodic inundation or soil saturation are the driving forces behind wetland formation. The presence of water for two weeks or more during the growing season typically creates anaerobic conditions in the soil, which affect the types of plants that can grow and the types of soils that develop. On-site observation can sometimes be used to ascertain the presence of saturation and/or inundation. However, soil and vegetation characteristics and other surrogate indicators often must be relied upon as evidence of the hydrologic regime

Several definitions have been formulated to identify and delineate wetlands to meet various specific legal or technical needs of resource management. The U.S. Fish and Wildlife Service (FWS) developed a definition of wetlands for purposes of conducting a National Wetlands Inventory (NWI). The inventory is

performed by interpretation of aerial imagery, and observable surface conditions are a key component of the definition The definition covers vegetated and non-vegetated wetlands, recognizing that some types of wetlands lack vegetation (e g , open water lakes, river beds, mud flats, sand bars, rocky shores). The wetland definition and its technical application is fully explained in the FWS publication "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin, et al, 1979)

> Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes. (1) at least periodically, the land supports predominantly hydrophytes. (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season each year

The definition of wetlands used by EPA and Corps of Engineers for administering the Section 404 permit program is based primarily on hydrology, with soils and vegetation implicated as on-site indicators of hydrologic conditions

> Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions Wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR 230 3 and 33 CFR 328 3)

NRCS uses a definition that relies more on soils and hydrology to determine eligibility for U S Department of Agriculture program benefits under the provisions of the Food Security Act (USDA-1988)·

> Wetlands are defined as areas that have a predominance of hydric soils and that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions .(except certain permafrost lands in Alaska )

All four of the above agencies agreed on a unified approach for identifying and delineating wetlands for jurisdictional purposes (Federal Interagency Committee for Wetland Delineation, 1989).

> Wetlands possess three essential characteristics (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology...The three technical criteria specified are mandatory and must all be met for an area to be identified as a wetland Therefore, areas that meet these criteria are wetlands.

However, in the Energy and Water Development Act of 1992, Congress prohibited the use of the 1989 delineation manual for jurisdictional determinations The federal agencies are currently using the 1987 manual. The wetland delineation methods used by federal agencies are currently undergoing review and possible revision *[as of January 1994]* Some of the field procedures are being modified; however, present indications are that the technical criteria will be retained

# APPENDIX C
# TECHNICAL REPORTS

## TECHNICAL REPORTS SUPPORTING THE WETLANDS CONSERVATION STRATEGY

***(copies are available in Tennessee university and state regional libraries)***

1. *The Use of Geographic Information Systems to Enhance Wetlands Data Management and Analysis* (Thomas S Talley and Leonard Ray Tucker, June 1994)
2. *Wet Soils of Tennessee* (Thomas S Talley, May 1994)
3. *Characterization of Selected Types of Palustrine Wetlands in Tennessee* (Bradley W Bingham and Thomas H. Roberts, May 1994)
4. *Tennessee Hydrogeomorphic Wetlands Classification and Functional Assessment: A Development Concept for Tennessee* (Thomas S. Talley, June 1994)

## TECHNICAL WORKING GROUP SUBCOMMITTEE REPORTS INCORPORATED INTO THE STRATEGY

1. *Wetlands Technical Assistance: An Inventory and Assessment.* Report of the Private Landowner Technical Assistance Subcommittee June 10, 1991; revised 1993
2. *Tennessee Interim Wetlands Mitigation Policy.* Report of the Mitigation Subcommittee June 10, 1991.
3. **Note: See Appendix I and G for other process products.**

# APPENDIX D
# RECOMMENDED TENNESSEE WETLANDS RESEARCH TOPICS

## I. BASIC HYDROLOGY

- A. Hydrologic Regime of Wetlands
  - 1. Hydroperiods and Inundation Depths
  - 2. Sources, Sinks, and Pathways
    - a Evapotranspiration Rates and Controlling Factors
    - b Groundwater Interactions
    - c Flow Regimes (Velocities)

## II. WATER QUALITY

- A. Spatial and Temporal Variability
  - 1. Water Quality Effects of Wetlands
    - a Upstream vs. Downstream
    - b Wetlands vs. Drainage Canals
  - 2 Seasonal Variation of Water Quality

## III. ECOLOGY

- A. Plant Distribution and Succession
- B. Wildlife Utilization of Wetlands
- C. Fisheries Utilization of Wetlands
- D. Nutrient and Energy Pathways
- E Characterization of Geomorphic, Hydrologic and Biotic Interrelations

## IV. HISTORICAL CHANGES

- A. Sedimentation Rates
- B. Logging, Timber Kills, and Reforestation
- C. Channel Modification
  - 1 Catalog of Construction and Maintenance Activities
  - 2 Direct Causes and Effects of Modification
- D. Agricultural Expansion and Contraction
- E. Re-establishment and Spread of Beaver

## V. ECONOMICS

- A. Forest Management Practices
- B. Agricultural Uses and Benefits
- C. Private Ownership Benefits, Liabilities, and Opportunities
- D Public Interest Benefits, Liabilities, and Opportunities

# APPENDIX E
# GLOSSARY

**anaerobic**: a condition in which molecular oxygen is absent (or effectively so) from the environment

**aquifer**: a layer of rock or sediment containing water that can be withdrawn in usable quantities from a well

**best management practices**: a set of guidelines or standards detailing the methods to be employed in the conduct of an activity (e g timber harvest, road construction) to reduce its impacts

**biodiversity**: the number of species in an area; species richness

**bottomland hardwood forests** hardwood forests of periodically flooded lowlands and alluvial floodplains along streams and rivers, with diverse vegetation that varies in species composition and growth characteristics along gradients of flooding frequency and soil saturation

**climax**. the terminal stage of ecological succession resulting in a self perpetuating plant community

**conversion** to drastically alter land use, e.g , to clear a forested area and develop a subdivision on the site

**delineation manual** a set of procedures for precisely determining the boundaries of wetlands, based on hydrology, soils, and vegetation

**emergent vegetation** a rooted herbaceous plant that has parts extending above the water's surface

**endangered species** a species considered to be in immediate danger of extinction

**enhancement** to improve, in the context of wetlands, the process of improving the functional capability and therefore the quality of wetlands that have been degraded by past activities

**facultative hydrophyte**. a species of plant that is equally likely to occur in a wetland or a non-wetland (estimated probability 33 to 67 percent)

**function** the normal characteristic actions or activities of wetlands; e g , many wetlands perform the function of sequestering and transforming nutrients, distinguished from value

**GAP analysis**: a methodology for identifying areas in which there are gaps in biodiversity; based on GIS technology and the analysis and overlaying of plant and animal distribution data bases

**geographic information system (GIS)**: a methodology using computer maps integrated with multiple data bases; used to characterize, identify, and manage at local or landscape scales; a computerized approach for overlaying maps

**hydric soil.** a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part, conditions favor the growth and regeneration of hydrophytic vegetation

**hydrogeomorphic system** a classification system for wetlands based on geomorphic setting, water source, and hydrodynamics, used to identify and group functionally similar wetlands

**hydrologic modification** an alteration to an existing hydrologic regime

**hydrologic regime** the normal characteristics of frequency, duration, seasonality, depth, and movement of water in a waterbody or wetland

**hydrologic unit** land area having boundaries drawn mostly along surface water basin divides, Tennessee contains all or part of 57 cataloging units which are aggregated into 12 accounting units

**hydrology** the science dealing with the properties, distribution, and circulation of water, both above and below ground

**hydroperiod** pertaining to the temporal aspects of a hydrologic regime

**hydrophyte**: a plant (other than microscopic species) that grows in water or on a substrate that is periodically deficient in oxygen as a result of excessive water content; plants typically found in wet environments

**jurisdictional wetland** an area determined to have the characteristic hydrology, vegetation, and soils typical of wetlands, therefore the area is subject to various regulations such as section 404 of the CWA

**lacustrine** wetlands and deepwater habitats with all of the following characteristics (1) situated in a topographic depression or a dammed river channel, (2) lacking trees, shrubs, persistent emergent vegetation, emergent mosses, or lichens with greater than 30 percent aerial coverage; and (3) total area exceeds greater than 20 acres

*limnetic* all deepwater habitats in lacustrine waterbodies

*littoral* wetland habitats of a lacustrine system that extends from shore to a depth of 2 meters below low water or to the maximum extent of nonpersistent emergent plants

**levee.** a naturally created elongate ridge formed by deposition of waterborne sediment parallel to and adjoining the shoreline of a body of open water; or a manmade feature of the landscape that restricts movement of water into or through an area

**mitigation** the lessening or moderating of negative effects, in regards to wetlands, actions that result in reducing the loss or degradation of wetlands in an area

**mitigation bank** an area established for the purpose of offsetting unavoidable losses of wetlands, acreages (or other units based on function) are "withdrawn" from the bank to compensate for ones that have been lost

**nonpoint source pollution.** pollution not associated with a specific locality such as a discharge pipe, drain, etc.; broad-based input of pollutants

**no overall net loss**: in reference to wetlands, the concept that acreages and functional capability will not be reduced below existing or baseline levels, any wetlands lost must be replaced by creating new ones

**obligate hydrophyte** a plant that occurs almost always (estimated probability greater than 99 percent of the time) in wetlands; almost never occurs in non-wetlands

**palustrine wetlands**: nontidal wetlands dominated by trees, shrubs, or persistent emergent vegetation; and wetlands lacking such vegetation but with the following characteristics (1) area less than 20 acres in size; (2) lack of wave formed or bedrock features; and (3) water depth in the deepest part of the basin of less than 2 meters at low water

**poorly drained**· an condition in which water is removed from the soil so slowly that the soil is saturated periodically during the growing season or remains wet for long periods greater than 7 days

**potentially hydric soils** wetness limited soil map units that (1) are similar to hydric soils in taxonomy and water properties, (2) are not classified as hydric because they fail to demonstrate sufficient depth of saturation, flooding frequency, drainage rates or other essential criterion, and (3) may exhibit site specific morphological properties or inclusions of hydric soils upon field evaluation

**prevalence index**· a weighted average measure of the sum of the frequency of occurrences of all species along a single transect or as calculated for a plant community by averaging the prevalence index of all sample transects through the community

**primary productivity**: energy stored by the photosynthetic activity of producer organisms (chiefly green plants) in the form of organic substances which can be used as food materials

**remote sensing**: the gathering of information from instruments not actually on site, for example, using color infrared photography to study the species composition of a forest

**restoration**. the process of replacing some attribute that has been lost or decreased, with wetlands, manipulating vegetation or hydrology to facilitate the establishment and maintenance of conditions that previously existed

**riparian** associated with the banks of streams, rivers, or lakes

**riverine wetlands**: wetlands contained within a channel, exceptions include those dominated by trees, shrubs, and persistent emergents and those in which ocean-derived salinities are greater than 5 ppt

*lower perennial*: riverine systems with continuous flow and low gradient
*upper perennial*: riverine systems with continuous flow and high gradient
*intermittent*: riverine systems in which water does not flow for part of the year

**scrub-shrub**. dominated by wood vegetation less than 6 meters tall

**slough** a slowly flowing shallow swamp or marsh

**soil survey**· a process of identifying and mapping soils, usually within a county

**succession**· the orderly replacement of one plant community by another

**value** benefits, goods, and services that result from functions. e g , one function of many wetlands is the storage of surface water; the value of that function is to reduce flood damage

**wetland type.** a category of wetlands based on similar physical characteristics, such as vegetation, geomorphology, and/or hydrology

**wetlands capability base:** the acreage of existing soil map units that are indicative of existing and restorable conditions capable of supporting wetlands vegetation detectable by typical aerial inventory methodologies

**wetland(s) characterization·** describing the typical distinguishing attributes of a wetland type (e.g , deep floodplain basins) or the wetlands of a particular geographic area (e.g., Reelfoot Lake and watershed), including biological, geomorphological, hydrological, climatological, and chemical parameters; and socioeconomic and ecological processes and effects

**wetness limited soils.** those soils in which excessive water from flooding or saturation impairs or prohibits certain activities or uses, such as agriculture or septic system sewage disposal

# APPENDIX F
# COMMONLY USED ACRONYMS IN THE STRATEGY

| | |
|---|---|
| BLH | Bottomland Hardwoods |
| BMP | Best Management Practice |
| CRP | Conservation Reserve Program |
| CWA | Clean Water Act |
| FEMA | Federal Emergency Management Agency |
| FSA | Food Security Act |
| GIS | Geographic Information System |
| HGM | Hydrogeomorphic |
| LWCF | Land and Water Conservation Fund |
| MBCF | Migratory Bird Conservation Fund |
| NPS | Nonpoint Source Pollution |
| NRI | Natural Resource Inventory |
| SCD | Soil Conservation District |
| WCP | Wetlands Conservation Plan |
| WRDA | Water Resources Development Act |
| WRP | Wetlands Reserve Program |
| WTT | West Tennessee Tributaries Project |
| TSD | Technical Summary Document |

# APPENDIX G
# STATE WETLANDS PLANNING PROCESSES

*To interview staff call the TN Environmental Policy Office at 615-532-8545.*

**Lessons Learned for Successful State Wetlands Planning:**

- **Rely on "grass roots" support** - A planning process should be initiated by key special interest or lobbying groups. Strong grass roots support will help sustain progress during political change.
- **Be led by state government** - After securing grass roots support, the process should be led by the state, preferably the executive or legislative branch Federal agencies should participate
- **Seek broad participation and involve key stakeholders** - Key political interests (i.e , the lead political lobbies in your state) should be involved as well as groups directly affected by or involved in wetland programs or policies (e g , government agencies with wetland authorities or programs, and affected private interest groups) Planning committees should be diverse, relatively balanced and manageable in size. Some state and regional organization leaders offer effective representation for the general public and make consensus possible. Academic and legislative representation is important. The involvement of agency managers or staff who will implement the plan are very important for successful planning and final implementation.
- **Be committed to dialogue** - If facilitated correctly, the participants in a discussion of the issues will (1) become more personally acquainted, (2) alter personal biases and pre-conceived notions over time, and (3) learn to appreciate other participant's perspectives and values. Regular attendance by appointed committee members is important
- **Utilize a competent, objective and neutral "process coordinator", facilitator and if necessary, a mediator** - The process coordinator chairs meetings, sets schedules, and interacts with political sponsors (Governor, etc.). The facilitator (possibly the same as the coordinator) encourages participation, keeps everyone focused and moves the process along a structured path. A process led by an ineffective facilitator can result in false consensus, meeting delays, slow progress and loss of interest by key participants. A professional mediator is helpful for extremely polarized situations. All process leaders should be perceived as objective, neutral and fair.
- **Require a open and structured dialogue** - All viewpoints should be discussed openly. Personal attacks, value judgments or domination by individual members should be tightly controlled by the facilitator. Meetings should be perceived as objective, neutral and fair.
- **Seek 100 percent consensus** - If the dialogue is managed properly, total consensus can be reached on most key issues. Total consensus means that everyone (or at least each executive level

member) has a veto After exhaustive dialogue, if consensus can not be reached on a certain point, move on to other issues.

- **Plan using sound science and technical approaches** - Wetland or environmental policy should be based on sound science tempered by public values One successful scheme is to establish (1) a policy oversight committee of executive/management/political persons, and (2) a working group composed of key technical professionals and managers (those who implement), led by the process coordinator, to work out plan details. The executive committee approves working group products.
- **Plan within the context of larger systems** - Develop a plan that recognizes the larger system context in which wetlands reside (e g., wetlands are components of riparian zones, floodplains or watersheds, therefore larger system impacts should also be addressed).
- **Recognize political issues** - The planning process should recognize the political risks associated with plan products and seek to address them constructively or if necessary to avoid them.
- **Involve political leaders** - The governor or the legislature should sponsor the planning process. They empower and legitimize the planning process and final plan Their appointees also feel representative of higher authority and will usually participate more seriously.
- **Develop strategic actions and focus on results** - The planning process should focus on <u>actions</u> and "on-the-ground" results that can conserve, protect or restore wetlands
- **Move quickly from abstract planning to implementation** Plan implementation is the priority goal. The planning process should follow an efficient but realistic predetermined schedule

**The Final Plan - A State Wetland Plan Should:** *(from World Wildlife Fund recommendations and more)*

- **Describe the status of the state wetland resource** (e g., state wetland classes; state wetland distribution, state wetland losses; and sources of losses (mutually agreed by all)
- **Define a future vision** or a broad goal for the resource **and list measurable objectives and** <u>actions</u> to implement it.
- **Address the issues comprehensively and** <u>prioritize</u> **their importance** - The plan should address all relevant issues. However, the issues and corresponding actions to address them should be prioritized and scheduled over a limited time frame.
- **List existing programs and government agency responsibilities** (state, federal and private)
- **List why the actions are needed, what actions will be done, when to do them, who will do them and in what priority** - The plan should list specific actions, their implementation schedule and those responsible for implementing them in a concise and clear manner so that accountability can be established and progress measured.

## APPENDIX H
## ORIGINAL EXECUTIVE ENDORSEMENT LETTER

State of Tennessee

NED McWHERTER
GOVERNOR

February 22, 1994

To the Citizens of Tennessee:

In my seven years as Governor of Tennessee, we have attempted to move forward and resolve the most pressing and difficult issues of our time. The Tennessee Wetlands Conservation Strategy provides us with a consensus approach that addresses the issues surrounding wetland conservation. This Strategy provides us with a blueprint to guide a partnership of state and federal agencies, as well as private organizations, to make sound wetland policy and management decisions in the future.

We recognize that Tennessee's wetlands are important and vital components of our landscape. Properly functioning wetland areas enhance and support the diversity of our natural and biological resources as well as help lessen the intensity of artificially induced and naturally occurring impacts on our environment.

Through the Tennessee Wetlands Conservation Strategy, we seek to focus the financial and human resources currently available in our state to pursue a common goal. Together, we seek to conserve, enhance and restore the acreage, diversity and quality of wetlands in Tennessee. To accomplish this, we will quantify our wetland assets, prioritize our interests, address fundamental reasons for wetland losses and measure our progress.

Tennessee's wetlands and other natural resources are our inheritance and our gift to future generations. I urge every Tennessean to play a part in the public and private cooperation required to implement this Strategy.

Sincerely,

Ned McWherter

Ned McWherter

# APPENDIX I - PART A
# DETAIL CONCERNING KEY IMPLEMENTATION ACTIONS

The Tennessee Wetlands Conservation Strategy:

- resulted in a focused, action oriented, policy blueprint to guide state actions,
- catalyzed $903,047 in federal wetland grants to Tennessee (many are listed below),
- helped to direct over $473,000 of federal wetland funding toward a the West Tennessee Tributaries river/floodplain/wetlands restoration demonstration project;
- resulted in the digitization of over 60% of the state's National Wetland Inventory;
- resulted in the digitization of 88 quads (approximately 12 of 26 counties in West Tennessee Region (an additional proposal has been submitted to complete all by 2000 - this area constitutes over 80% of the state's hydric soils and wetlands),
- began efforts in 1994 to improve the predictability and objectiveness of state and federal regulatory wetland permitting using the hydrogeomorphic methodology (HGM) and functional assessment method,
- catalyzed a 1995 project to identify and prioritize wetland restoration sites in TN,
- catalyzed a 1993 technical assistance program for temporary waterfowl habitats,
- catalyzed a 1996 forestry assistance program for bottomland hardwood restoration,
- initiated a 1995 standard reporting system for wetlands restoration and mitigation;
- resulted in four pilot studies in 1994 identify effective technologies and methods,
- increased public and local government outreach and education (a local officials regional workshop was held Summer 1995, brochure slated for development in 1996);
- increased interagency coordination and communication through Governor's IWC;
- helped to initiate the "General Memorandum of Agreement for Wetlands Mitigation Banks in Tennessee (1 sanctioned bank and 3 "combined mitigation sites" exist); and
- catalyzed legislative investigations for landowner incentives (wetland property tax relief to be acted on in 1996 session), and
- through its consensus process, lessened negative perceptions and increased appreciation for wetland conservation among non-environmental interests

APPENDIX I - PART B

# POLICY GUIDANCE

## WETLAND RESTORATION, ENHANCEMENT AND CREATION

*Definitions and General Success Criteria for Wetlands in Tennessee*

by the

INTERAGENCY WETLANDS COMMITTEE AND ITS TECHNICAL WORKING GROUP

Adopted May 8, 1995

In previous years, over 59 percent of Tennessee's original wetlands have been converted or substantially degraded The goal of the State of Tennessee is to regain both the quantity and quality of wetlands *Restoration* of "converted wetlands" and *enhancement* of severely degraded wetlands are the preferred alternatives to achieve this goal. The focus of any effort to restore, enhance or create wetlands is to first establish natural hydrology from which all other attributes in a wetland will arise.

For the purposes of the Tennessee Wetlands Conservation Strategy wetland restoration goal *Restore 70,000 acres of wetlands in West Tennessee by the year 2000* and for regulatory activities in Tennessee, the State of Tennessee defines the following terms·

Wetland **Restoration**: To return a *former* wetland area to a wetland
Wetland **Enhancement**. To improve the functional capacity of a *degraded* wetland
Wetland **Creation**. To create a wetland where a wetland never existed

**General Success Criteria**: (*Use with the above definitions for all wetland types in Tennessee )*

In general, a successfully *restored, enhanced* or *created* wetland should:

- **possess naturally sustained and self-regulating hydrology** (Wetland hydrology·should not depend on "active management " However, it is recognized that actively managed wetland systems such as low-level terraces, waste water treatment wetlands and other "constructed wetlands," provide important functions);
- **use hydrology to drive the return and establishment of hydric soils, hydrophytic vegetation, and biological and chemical wetland functions;**
- **closely approximate a holistic set of functional attributes in a reference wetland** (an HGM or other "officially" designated reference site),
- **possess at a minimum certain critical functions (found in a reference site) within a very short time period after initial establishment** (other functions should return in due course);
- **be the result of a *process* that allows for passive *adaptive management*** (i e., mid-course corrections as needed over time until the wetland closely approximates its reference site),
- **be a dynamic system capable of natural change over time;**
- **when appropriate, be given additional legal protection** in the form of easements, deed restrictions, purchase of development rights or fee simple acquisition (In most situations, these transactions will be voluntary However, for regulatory mitigation or when public funds are invested to restore, enhance, or create wetlands, *perpetual* protection should be required ); **and**
- (*for restored and enhanced wetlands only*) **be established in an area with a predominance of historically wet soils** (hydric soils or soils with hydric indicators).

**Special Note**: *Wetland restoration for "prior converted" farmland should primarily target marginally productive land.*

**Preferred Assessment Methods**: The State of Tennessee is investigating the *Hydrogeomorphic Method* (HGM) as a process to classify wetlands by type and the *HGM Functional Assessment Models* as a procedure to identify and rate wetland functions. These methods, if found to be technically sound and practicable, may be adopted at a later date to measure objectively the success of wetland restoration, enhancement and creation projects.

APPENDIX I - PART C

# POLICY RECOMMENDATION

***Purple Loosestrife: A Threat to Tennessee's Wetlands***

**by the**

**INTERAGENCY WETLANDS COMMITTEE AND ITS TECHNICAL WORKING GROUP**

**Adopted May 8, 1995**

## Background

Purple Loosestrife (Lythrum salicaria) is an aquatic plant that has been transported into the United States from Europe. Purple Loosestrife has spread throughout the northeastern U S and is currently becoming established in several locations in Tennessee

Purple Loosestrife is an invasive, aggressive species that crowds out native vegetation
A single plant can produce up to 2.5 million seeds annually. The seeds have a germination rate in excess of 80 percent and are viable in wet soils for years. Plants can grow up to eight feet tall and six feet wide with 30-50 stems per plant Infestations in one state grew seven thousand acres in six years

*The following detrimental impacts of Purple Loosestrife have been documented*

- Purple Loosestrife displaces natural vegetation at an aggressive rate (much like Kudzu and Johnson Grass) and has no value for wildlife habitat or as a food source Aquatic habitats can be "sterilized" reducing acreage available for hunting and fishing
- State investments to restore or protect high quality wetlands can be nullified when Purple Loosestrife becomes established in wetlands
- Existing urban flood control ditches, agricultural drainage ditches, and highway drainage ditches can be choked by aggressive infestations of Purple Loosestrife increasing maintenance costs and impairing positive drainage.
- Loosestrife can invade bottomland pasture land by crowding out desirable forage.
- Loosestrife can reduce property value by limiting landuse opportunities through large, aggressive infestations that are very difficult to eradicate.

Many states have listed Purple Loosestrife as a noxious weed and have passed legislation to ban the planting and selling of Loosestrife No such designation exists in Tennessee Currently, nurseries and other businesses in Tennessee are selling Loosestrife to the public due to its attractive flowering plumage as a landscape perennial

## Policy Recommendation

Recently, the Legislature has expanded the authority of the Department of Agriculture (TDA) to control certain "pest plants". Plants species can be formally targeted as pest plants through "Departmental rule" and a public comment review processes. Quarantine procedures can be used to prevent the importation, sale, distribution and possession of targeted pest plants.

**Given the new authority delegated to TDA, the Interagency Wetlands Committee recommends that TDA develop rules to ban the propagation, importation and sale of Purple Loosestrife and related cultivars for the preservation of function, quality and value of wetlands and other water-oriented areas in Tennessee.**

# APPENDIX J
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