



In-Lieu-Fee Instrument

May 15, 2013



US Army Corps
of Engineers®



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1.0 Preamble

The purpose of this Instrument is to establish guidelines, responsibilities and standards for the continued use, operation and management of the Tennessee Stream Mitigation Program (TSMP). Since August 16, 2002, the TSMP has operated under the terms and conditions of the "In Lieu Fee Stream Mitigation Program Memorandum of Agreement". This Instrument represents a modification of the previous Memorandum of Agreement to satisfy the current regulatory requirements for the operation and use of In-Lieu-fee Programs as stated in 33 CFR 332.

1.1 Objectives

The primary objectives of the TSMP are as follows:

- Provide effective compensatory mitigation for unavoidable impacts resulting from activities authorized under §§ 404/401 of the *Clean Water Act* and §10 of the *Rivers and Harbors Act of 1899*.
- Provide an alternative to permittee-responsible compensatory mitigation through the identification, development and implementation of mitigation projects adequate to meet the current and expected demand for credits in each service area.
- Implement ecologically substantial restoration/enhancement projects that sustain aquatic resource functions and services consistent with a watershed approach.
- Maintain accountability for all program transactions including mitigation obligations, fees collected, funds dispersed, advance credits and released credits by service area.
- Provide a synergy to ongoing water quality initiatives by working closely with public and private stakeholders at both a statewide and watershed level.

1.2 Program Transition

Since its inception, the TSMP has implemented a number of projects across the state in accordance with the original agreement. Upon execution of this Instrument, all previously debited credits and credits generated under the original agreement, will be assigned to the appropriate geographic service area and will be applied to the geographic service area's advance credit allocation described herein. Henceforth, all remaining credit obligations will be fulfilled under the terms of this Instrument, and all remaining funds in the program account at the effective date of this Instrument will be subject to the terms of this Instrument.

2.0 Parties

2.1 U.S. Army Corps of Engineers (USACE)

The U.S. Army Corps of Engineers is responsible for the administration of §404 of the *Clean Water Act* and §10 of the *Rivers and Harbors Act of 1899*. Compensatory mitigation to replace lost aquatic resource functions and services is typically required in permits authorizing unavoidable impacts under these authorities. This Instrument is set forth in compliance with 33 CFR 325 and 332 published on April 10, 2008 (Federal Mitigation Rule). Compensatory mitigation objectives and guidance are also provided in the 1990 Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army concerning the Determination of Mitigation Under the *Clean Water Act* §404(b)(1) Guidelines, where not superseded by 33 CFR 332.

2.2 Tennessee Department of Environment and Conservation (TDEC)

The Division of Water Resources, within the Tennessee Department of Environment and Conservation, has a regulatory authority over waters of the state under §401 of the *Clean Water Act*, the *TN Water Quality Control Act* and the Rules of the Water Quality Control Board.

2.3 Tennessee Valley Authority (TVA)

Through §26a of the *Tennessee Valley Authority Act*, the Tennessee Valley Authority has regulatory authority over all watercourses that flow to the Tennessee River.

2.4 Tennessee Wildlife Resources Foundation, Inc. (TWRP)

The Tennessee Wildlife Resources Foundation is a 501(c)(3) non-profit organization established in 1999 to promote conservation, responsible land stewardship and Tennessee's rich hunting and fishing heritage. As the Sponsor under this Instrument, the TWRP is responsible for overseeing the development, operation and management of the TSMP.

2.5 Tennessee Stream Mitigation Program (TSMP)

The Tennessee Stream Mitigation Program is an in-lieu-fee (ILF) program that provides compensatory mitigation throughout Tennessee in compliance with this Instrument and applicable federal and state rules, regulations and guidelines. The TSMP was created in 2002 and has successfully implemented twenty six stream restoration and/or enhancement projects totaling more than 233,000 linear feet.

2.6 Interagency Review Team (IRT)

The Interagency Review Team is chaired by a representative from the USACE, (Nashville or Memphis District) and may be co-chaired with a representative from TDEC's Division of Water Resources. Other agencies represented on the IRT include: U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), Natural Resources Conservation Service (NRCS), Tennessee Valley Authority and the Tennessee Wildlife Resources Agency (TWRA). The primary role of the IRT is to assist the District Engineer (DE) in the evaluation of mitigation plans, review of monitoring reports, recommendation of remedial measures, approval of credit releases, and the approval of modifications to this Instrument. The IRT's role and responsibilities are more fully set forth in 33 CFR 332.8.

The parties to this Instrument intend that the members of the IRT will review such documents and mitigation sites as each considers necessary to provide meaningful input, and express any recommendations, concerns, or potential improvements related to the use, operation and management of the TSMP. The IRT will strive to reach a consensus on its actions.

2.7 Disclaimer

The language in this Instrument shall not be construed as to diminish or abrogate statutory authorities and/or responsibilities of any of the signatory agencies.

3.0 Program Availability & Use

3.1 Permitting Process

The USACE and TDEC will make decisions concerning compensatory mitigation requirements for permits or authorizations issued to any entity that proposes to utilize the TSMP for some or all of its compensatory mitigation requirements as part of their decision on the individual permit or general permit authorization for each proposed project, in compliance with all applicable federal and state regulations, rules and/or guidance. The parties to this Instrument recognize that permit decisions regarding the need for, type, quantity and appropriateness of compensatory mitigation are to be made by the regulatory authorities.

Once permits have been issued, the USACE and TDEC may provide copies of the permit authorization document to the TSMP in order to initiate the transfer of legal liability for the compensatory mitigation requirements. The provided information should include the permittee name and address, quantity and type of required mitigation, the service area in which the mitigation is required and the coordinates of the associated impact(s).

3.2 Program Utilization

This Instrument establishes the TSMP as one alternative to permittee-responsible compensatory mitigation. Participation in this program is voluntary. Likewise the TSMP may, at its discretion, accept or refuse mitigation responsibilities on a case by case basis. Applicants wishing to utilize this program must obtain authorization from the USACE and/or TDEC and the TSMP. The USACE and TDEC will make the final decision regarding the amount and type of compensatory mitigation to be required of permittees, and determine whether and how the use of credits from the TSMP is appropriate to compensate for unavoidable impacts. Once permits have been issued allowing the purchase of credits from the TSMP, the TSMP may initiate the transfer of legal liability as described below in Section 3.2(b).

3.2(a) Preliminary Authorization

During the permitting process and prior to the issuance of any state and/or federal permits, it is the responsibility of the applicant to obtain a preliminary authorization letter from the TSMP stating that the TSMP is capable/willing, at that time, to accept legal liability of the compensatory mitigation requirement through the purchase of an estimated number of credits for a specific service area. This preliminary authorization letter does not serve as a final commitment for the transfer of legal liability from the applicant to the TSMP but rather as an acknowledgement that the TSMP has credits available for purchase in a given service area at the time of inquiry by the applicant.

3.2(b) Transfer of Legal Liability

The TSMP assumes all legal responsibilities for satisfying the mitigation requirements of the federal/state permits for which fees have been accepted (i.e., the identification, acquisition, development, implementation, performance and long-term management and preservation of the mitigation project(s) approved under this Instrument and subsequent mitigation plans).

The transfer of legal liability for compensatory mitigation is established only after the following:

- The permittee receives written authorization from both the TSMP and the appropriate regulatory agencies to utilize the TSMP for compensatory mitigation
- The transfer of fees from the permittee to the TSMP
- The issuance of a credit transaction certificate signed and dated by the TSMP and the permittee with copies provided to the DE and/or TDEC

Once the TSMP has accepted the legal liability for any permitted compensatory mitigation, that liability cannot be transferred or reduced without written consent from the DE and/or TDEC and the TSMP.

4.0 Program Administration & Operation

4.1 Geographic Service Area

The TSMP will provide compensatory mitigation statewide utilizing ten individual geographic service areas (Appendix A, Figure 1). The appropriate size and location of individual service areas was determined in consideration of factors including, but not limited to:

- Historic impacts or losses to aquatic resources
- Analysis of current aquatic resource conditions
- Current and future threats to aquatic resources
- Analysis of distribution, density, size and frequency of permitted impacts
- Geographic proximity of mitigation projects to permitted impacts
- Size of an individual service area as it relates to economic viability

These service areas were selected by the TSMP, in consultation with the DE and IRT, concluding that the scale is appropriate to ensure that the projects selected will be able to effectively compensate for adverse impacts across the entire service area. The TSMP will strive to provide ecologically substantial compensatory mitigation in close proximity to impacts through an analysis of the mitigation requirements for the entire service area (size and spatial distribution of impacts), date of permitted impacts and available mitigation opportunities in accordance with the Compensation Planning Framework (Appendix B).

The TSMP will provide compensatory mitigation for permitted impacts within the same geographic service area in which the impact occurs unless the DE, in consultation with the IRT, has agreed to an exemption (e.g., relatively small impacts or partially mitigated impacts in service area(s) that lack sufficient funds to complete a mitigation project and are not likely to receive additional impacts within the established timeframe for the completion of compensatory mitigation).

4.1(a) Ecological Resources of Concern

In circumstances where the regulatory agencies require more geographically focused mitigation, the TSMP may, at its discretion, accept mitigation responsibility for impacts for which the compensatory mitigation must be completed within the same sub-watershed or 12-digit HUC (e.g. impacts to Exceptional Tennessee Waters). Acceptance of such mitigation responsibilities will be determined based on the size of the impact(s) and the availability of suitable mitigation opportunities within the 12-digit HUC.

4.2 Advance Credit Allocation

Upon approval of this Instrument, the TSMP is permitted to sell advance credits within individual service areas. The number of advance credits available for sale varies by service area and can be found in Table 1.

Once the TSMP has sold all of the advance credits in a given service area, no additional advance credits may be sold in that service area until an equivalent number of credits have been released. As advance credits are converted to released credits, an equivalent number of advance credits will be made available in accordance with the approved credit release schedule outlined in a project-specific mitigation plan.

ADVANCE CREDIT ALLOCATION		
HUC	SERVICE AREA	STREAM CREDITS
N080102	North Hatchie-Obion	8,250
S080102	South Hatchie-Obion	30,000
060400	Lower Tennessee	30,750
060300	Middle Tennessee-Elk	13,500
W051302	West Lower Cumberland	42,750
E051307	East Lower Cumberland	19,500
051301	Upper Cumberland	21,000
060300	Middle Tennessee-Hiwassee	24,000
060102	Upper Tennessee	18,000
060101	French Broad-Holston	16,500

Table 1. Advance Credit Allocation

4.3 Released Credits

As released credits are produced and approved by the DE, they will be used to credit any advance credits that have already been debited in the service area before any of the remaining released credits can be sold or transferred to permittees. In order for credits to be released, the TSMP will submit the appropriate documentation to the DE

that demonstrates that the predetermined performance-based milestones for a given project have been achieved (e.g. acquisition, design, construction, and/or monitoring). The DE will then provide this documentation to the IRT members for review and any comments by IRT members must be provided back to the DE within 15 days of receiving the documentation. The DE may determine that a site visit is required and if so must schedule the site visit as soon as practicable depending on seasonal considerations. If a site visit is required then the IRT must provide any comments within 15 days of the site visit. After full consideration of any provided comments, the DE will determine whether the milestones have been achieved and the credits can be released. This decision shall be made within 30 days of the end of the comment period and the TSMP will be notified of the decision in writing.

4.4 Methodology for Determining/Revising Advance Credit Allocations

The figures in Table 1 represent an initial allocation of advance credits by service area. The quantity of advance credits is based on the analysis of two separate methodologies that independently converged with similar results. The first methodology used historic credit sales in each of the ten service areas over the span of ten years. The highest three years in each service area was totaled, rounded to the nearest 500 and an additional fifty percent was added to each rounded total to reflect the anticipated delay in credit releases based on expected credit release schedules for projects. The second methodology took into consideration current compensatory mitigation obligations, anticipated future impacts and associated compensatory mitigation requirements for TDOT as well as other development activities within each service area over the next 5-year period. The projected TDOT mitigation needs are based on reports produced through the Transportation Improvement Program (TIP). The projected impacts from other development activities and associated ILF mitigation needs were estimated based on historic permitting data, historical ILF mitigation demands, projected population growth estimates as well as current development trends. Due to the ever-changing patterns of development and the demand for mitigation, it is anticipated that the advance credit allocations may need to be revised periodically to reflect the changing needs of the program. The TSMP may make requests to the DE and the IRT for review and/or revisions to the advance credit allocations. Any adjustments to the advance credit allocation will constitute a modification of this Instrument and will be subject to the Instrument modification process established in 33 CFR 332.8(g).

4.5 Methodology for Determining Fees

The TSMP will establish fees for compensatory mitigation credits based upon the analysis of known, historic and projected costs associated with the restoration, enhancement and/or preservation of aquatic resources. All program costs including expenses for acquisition, planning and design, construction, plant materials, labor, legal fees, monitoring, maintenance or adaptive management activities, long-term management and protection as well as administration of the program are accounted for in the establishment of fees. The TSMP will provide in its annual report an analysis of the program's expenditures and determine whether or not a fee adjustment is

necessary. If a fee adjustment is necessary, the Sponsor may adjust the fee at any time by providing written notice to the USACE and the IRT. Fee adjustments do not constitute a modification to the Instrument and are therefore not subject to requirements set forth in 33 CFR 332.8(g). Program fees for stream credits will initially be established at \$240.00 per stream credit.

5.0 Mitigation Project Delivery

5.1 Compensation Planning Framework

All compensatory mitigation projects provided by the TSMP under the terms of this Instrument will comply with the Compensation Planning Framework found in Appendix B.

5.2 Mitigation Project Development

The TSMP shall manage, facilitate or perform the identification, evaluation, development, acquisition, planning, construction, monitoring, maintenance and long-term protection necessary to satisfy compensatory mitigation obligations transferred to the program for impacts authorized under §404/401 of the *Clean Water Act* and the *TN Water Quality Control Act*. The TSMP shall complete such work within the timeframe and in such a manner as described in this Instrument. Sites shall be selected in accordance with the Compensation Planning Framework and with any other guidelines established by the DE and IRT.

The TSMP shall prepare a site-specific mitigation plan for all proposed compensatory mitigation projects. The TSMP shall provide a copy of each site-specific mitigation plan to the DE, TDEC and the IRT. This requirement may be satisfied by posting such reports on an accessible website, with e-mail notification to each recipient that such reports have been posted. Upon approval by the DE, in consultation with the IRT, the TSMP may proceed with the development and implementation of the mitigation project.

The TSMP should complete land acquisition/site protection and initial physical and biological improvements by the third full growing season after the securing of the first advance credits by a permittee in each individual service area. If the TSMP fails to meet this deadline, the DE may either make a determination that more time is needed to plan and implement an in-lieu-fee project or, if doing so would not be in the public interest, direct the TSMP to provide alternative mitigation which would likely entail disbursement of funds from the TSMP program account to fulfill those compensation obligations. This may include purchasing the appropriate amount of credits from a DE approved mitigation bank.

5.3 Project-Specific Credit Determinations and Credit Release Schedule

The TSMP shall propose the type and number of credits to be generated by each mitigation project. The number of proposed credits to be generated by each project, along with the rationale for estimating credit yield, will be provided in the mitigation plan and will be based on current federal and state guidance or on a functional or conditional assessment tool. The final credit schedule for each project will be determined by the DE in consultation with the IRT.

The credit release schedule will be project specific and determined by the type of mitigation being performed (e.g. restoration, enhancement, preservation), the associated likelihood of success and/or risk and the nature and amount of work needed to generate the credits. The release of credits will be tied to performance-based milestones and should reserve a significant share of the total credits for release once the success criteria have been met and the DE has issued a written notification of release from monitoring.

5.4 Mitigation Project Review

As new project sites are identified, the TSMP will seek DE and IRT consultation and preliminary approval prior to the formal approval process specific to each proposed project as outlined in 33 CFR 332.8(g). The TSMP will provide adequate information to the DE and IRT for review that will include but may not be limited to the following information; concept plan, site protection agreement, scope of work, preliminary credit estimate, and proposed credit release schedule. This preliminary approval may result in expenditures from the program account in order to satisfy the requirements needed for formal approval as outlined in 33 CFR 332.4(c)(2) through (14).

5.5 Mitigation Project Approval

Approval of proposed mitigation projects will be accomplished in accordance with 33 CFR 332.8(g). The TSMP shall secure all necessary permits prior to construction of a mitigation project. The state and federal permit application, when applicable, shall include a complete mitigation plan as described in 33 CFR 332.4(c)(2) through (14). Each mitigation plan will include a project specific determination of estimated credits produced as well as a project specific milestone-based credit release schedule in accordance with 33 CFR 332.8(o). The DE, in consultation with the IRT, will review the plans and take action in a timely manner as detailed in 33 CFR 332.8.

5.6 Mitigation Project Monitoring

For each compensatory mitigation project, the TSMP shall prepare monitoring reports, as specified in the mitigation plan. Following project implementation, the DE, in consultation with the IRT, may reduce or waive the remaining monitoring requirements upon a determination that the compensatory mitigation project has achieved its performance standards. Monitoring requirements for TSMP mitigation projects are more

particularly described in Section 6.2(d) (“Mitigation Project Monitoring Reports”) of this Instrument and will be conducted in accordance with the requirements set forth in 33 CFR 332.6. Once the DE, in consultation with the IRT, deems that success criteria have been met, the DE will issue written notification of release from monitoring.

5.7 Long-Term Management Responsibilities

All TSMP projects are intended to be self-sustaining over time. Compensatory mitigation projects should include long-term protection agreements. These agreements may include, but are not limited to, the following: a conservation easement granted by the landowner(s), the purchasing of the property and applying appropriate deed restrictions, locating projects on public property that is protected through management plans, deed restrictions or through ownership by qualified conservation organizations, institutions or agencies unless otherwise approved by the DE in consultation with the IRT. The legal mechanism(s) and the party responsible for the long term management and protection of the project site will be detailed in each individual mitigation plan. The responsible party will be required to provide adequate provisions for the protection and long-term management of the project site. Any long-term management plan should include a description of long-term management needs and the funding mechanism(s) that will be used to address those needs.

5.8 Financial Arrangements for Long-Term Management

The long-term management plan shall address any provisions necessary to provide for the long-term financial assurance and financing of each individual mitigation project. Appropriate long-term mechanisms for financial arrangements may include non-wasting endowments, trusts, contractual arrangements with future responsible parties or other appropriate financial instruments.

6.0 Program Accountability

6.1 Accounting Procedures

The TSMP shall establish and maintain a system for accounting for the production of credits, credit transactions and financial transactions between the TSMP and permittees. Credit transactions, credit production and financial transactions must be accounted for on a programmatic basis (e.g., the number of available credits for the program by service area).

6.1(a) Financial Accounting

The TSMP program account will be established prior to the acceptance of any in-lieu-fee (ILF) funds. The USACE and/or TDEC have the authority to audit, at their discretion and expense, the TSMP’s program account at any time.

The program account must be held at a financial institution that is a member of the Federal Deposit Insurance Corporation. Any and all interest accruing from the account will be used to provide compensatory mitigation for impacts to aquatic resources. The TSMP program account will be maintained in accordance to the guidance set forth in 33 CFR 332.8(i).

6.1(a)(1) Program Income

The TSMP shall account for ILF funds and any interest earned by the program account. The ledgers shall also include a list of all the permits for which ILF program funds were accepted, including the appropriate permit number (USACE and/or TDEC permit), the service area in which the specific authorized impacts are located, the amount (linear feet) of authorized impacts, the aquatic resource type impacted, the amount of compensatory mitigation required, the amount paid to the ILF program for each of the authorized impacts and the date the funds were received from the permittee.

6.1(a)(2) Program Expenditures

Funds paid into the TSMP account may only be used for identification, development, acquisition, implementation, monitoring, maintenance and administration of compensatory mitigation projects. Administrative costs in any year may not exceed fifteen percent of the average annual program expenditures for the preceding five-year period. The TSMP shall establish and maintain a report ledger that will track all program disbursements/expenditures and the nature of the disbursement (i.e., costs of land acquisition, planning, design, construction, monitoring, maintenance, contingencies, and administration).

6.1(a)(3) Credit Accounting

Reporting requirements for the annual report are detailed in Section 6.2(b)(2), ("Credit Transactions"). The TSMP shall establish and maintain a ledger that tracks available advance credits and the release of credits by service area and for each individual mitigation project. The ledger shall also include, for each project, the service area in which the project is located, the amount of compensation being provided by method (i.e., restoration, enhancement or preservation), the aquatic resource type(s) represented, the amount of compensation being provided (linear feet) and the number of credits produced.

6.2 Reporting Protocols

The TSMP must report to the DE the following information:

- Credit transaction notifications
- An annual report including financial statements and credit transactions summarizing activity from the program account as detailed 33 CFR 332.8(i)(3).

- Project financial assurances and long-term management funding report as detailed in 33 CFR 332.8(q)(3).
- Monitoring reports, on a schedule and for a period as defined by project specific mitigation plans(s) and in 33 CFR 332.8(q)(2).

6.2(a) Credit Transaction Notification

Section 3.2(b), ("Transfer of Legal Liability"), establishes the terms by which the legal responsibility for compensation requirements is transferred from the permittee to the TSMP. These terms require the TSMP to submit a credit transaction certificate to the DE. The document must be signed and dated by the TSMP and the permittee. The credit transaction certificate must include the permit number(s) for which the TSMP is accepting fees, the number of credits being purchased, and resource type(s) of credits being purchased.

The TSMP must submit the signed and dated credit transaction certificate within 30 days of receiving the fees from the permittee. A copy of each credit transaction certificate will be retained in the USACE, TDEC's and the TSMP's administrative files.

6.2(b) Annual Program Report

The TSMP must submit an annual program report to the DE and the IRT. The DE will make the report available to the public upon request. The annual program report must contain all relevant data collected during the previous year ending December 31 (i.e., 2013 annual program report would contain information from January 1 - December 31, 2012). Reports shall be submitted no later than the first business day on or after May 1st unless a later submittal date is requested by the TSMP and agreed upon by the USACE and TDEC. The annual program report must include the following:

6.2(b)(1) Financial Statement

- All income received and interest earned by the program account for the program and by service area.
- A list of all permits for which in-lieu-fee program funds were accepted by service area, including:
 - Permit tracking number (USACE and/or TDEC)
 - Amount of authorized impacts
 - Amount of required compensatory mitigation
 - Amount paid to the in-lieu-fee program
 - Date the funds were received from the permittee

- A description of program expenditures from the account such as the costs of land acquisition or protection, planning/design, construction, monitoring, maintenance, contingencies adaptive management and administration.

6.2(b)(2) Credit Transactions

- The balance of advance credits and released credits at the end of the reporting period for each service area.
- The permitted impacts for each resource type.
- All additions and subtractions of credits.
- Other changes in credit availability (e.g., additional credits released, credit sales suspended).

6.2(c) Financial Assurance & Long-Term Management Funding Report

The TSMP must submit a detailed financial assurances and long-term management report to the DE and the IRT. This report must include:

- Beginning and ending balances of the account(s) providing for financial assurance and long-term management.
- Deposits into and any withdrawals from the account(s) providing funds for financial assurance and long-term management.
- Information on the amount of required financial assurances and the status of those assurances, including their potential expiration.

The TSMP is required to give the DE at least 120 days advance notice if the required financial assurances for an individual project will be exhausted, terminated or revoked. Inclusion of a summary of any changes to the financial assurances in the reporting year does not alter this separate obligation.

6.2(d) Mitigation Project Monitoring Reports

Monitoring is required of all compensatory mitigation projects to determine if the project is meeting its performance standards and if additional measures are necessary to ensure that the compensatory mitigation project is accomplishing its objectives. If the TSMP fails to submit monitoring reports in a timely manner, the DE may take appropriate compliance action(s) [see Section 6.3, (“Default and Closure”)].

Project-specific mitigation plans will detail the parameters to be monitored, the length of the monitoring period, the dates that the report must be submitted, the party responsible for conducting the monitoring, the frequency for submitting monitoring reports to the DE, and the party responsible for submitting those reports to the DE and the IRT. The level of detail and substance of the reports shall be commensurate with the scale and scope of the compensatory mitigation project. The

DE is required to provide monitoring reports to interested federal, tribal, state and local resource agencies, and the public, upon request.

6.3 Default and Closure Provisions

6.3(a) Default

If the DE, in consultation with the IRT, determines that the TSMP has failed to provide the required compensatory mitigation in a timely manner [i.e., TSMP has failed to meet performance-based milestones set forth in the project-specific mitigation plan, meet ecological performance standards, submit monitoring reports in a timely manner, establish and maintain accountability for financial and credit transactions, submit the required annual program report in accordance with the provisions in Section 6.2(b), ("Annual Program Report) of this Instrument, complete land acquisition and initial physical and biological improvements by the third full growing season after the first advance credit in that service area is secured by a permittee, and/or otherwise comply with the terms of this Instrument], the DE must take appropriate action to achieve compliance with the terms of the Instrument and all approved mitigation plans. Such actions may include suspending credits sales, decreasing available credits, requiring adaptive management measures, utilizing financial assurances or contingency funds, terminating the Instrument, using the financial assurances or contingency funds to provide alternative compensation, directing the TSMP to develop a plan for alternative mitigation, approval of which by the DE may result in expenditure of account funds (e.g., securing credits from another third-party mitigation provider), or taking appropriate enforcement action.

6.3(b) Force Majeure

Any delay or failure of the TSMP to comply with the terms of this Instrument shall not constitute a default if and to the extent that such a delay or failure is primarily caused by any force majeure or other conditions beyond the TSMP's reasonable control and substantially adversely affects its ability to perform its obligations hereunder; such as flood, drought, lightning, earthquake, fire, landslide, condemnation or other taking by any governmental body. The TSMP shall give written notice to the DE and IRT if the performance of any of its in-lieu-fee projects is affected by any such event as soon as reasonably practicable. It is the responsibility of the TSMP to demonstrate that a particular event was caused by circumstances beyond the control of the TSMP to foresee, prevent or mitigate.

6.3(c) Termination/Closure

Either party to this Instrument may terminate the Instrument within 60 days of written notification to the other party. In the event that the TSMP is terminated, the Sponsor (TWRF) is responsible for fulfilling any remaining project obligations including the successful completion of ongoing mitigation projects, relevant maintenance, monitoring and reporting. The Sponsor shall remain responsible for fulfilling these obligations until such time as the long-term financing obligations have been met and

the long-term ownership of all mitigation lands have been transferred to the party responsible for ownership and/or all long-term management of the project(s).

Funds remaining in the TSMP accounts after these obligations are satisfied must continue to be used for the restoration, establishment, enhancement and/or preservation of aquatic resources. The DE may direct the Sponsor to use these funds to secure credits from another source of third-party mitigation, such as another in-lieu-fee program or mitigation bank. The funds should be used to provide compensation for the amount and type of aquatic resource for which the fees were collected. The USACE itself cannot accept directly, retain, or draw upon these funds in the event of a default.

6.4 Effective Date

This Instrument shall become effective when signed by the Nashville and Memphis Districts of the U.S. Army Corps of Engineers, the Tennessee Department of Environment and Conservation and the Sponsor. IRT members are invited to sign this Instrument as an indication of their agreement to the terms of the Instrument but the decision of an IRT member to not sign this Instrument does not negate the effectiveness or implementation of the Instrument.

7.0 Signatures

APPENDICES

APPENDIX A: Geographic Service Areas

Figure 1: Map of Service Areas

APPENDIX B: Compensation Planning Framework

Appendix A

Geographic Service Areas

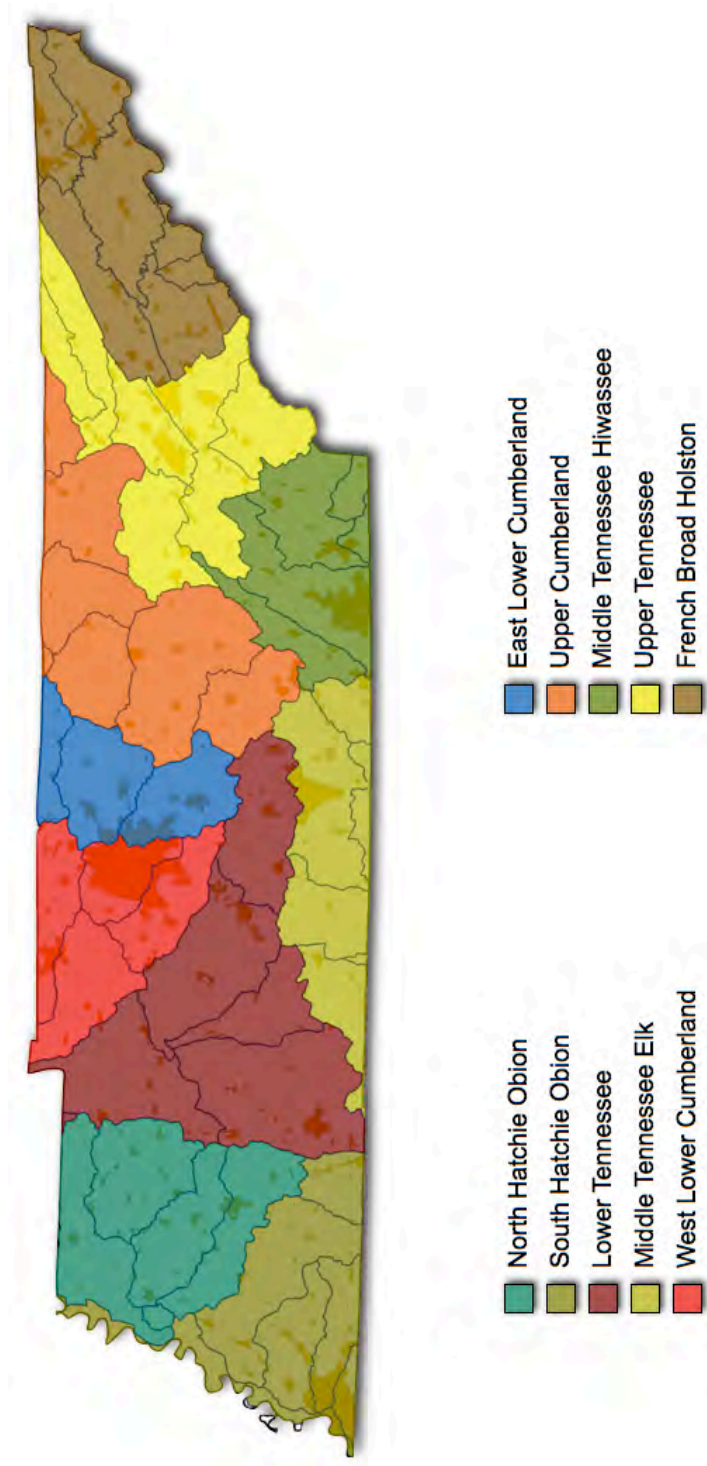


Figure 1

Appendix B

Compensation Planning Framework

Compensation Planning Framework

Executive Summary

The purpose of this Compensation Planning Framework is to provide a comprehensive plan for identifying, assessing, developing and implementing meaningful compensatory mitigation in association with impacts accepted under §404/401 of the *Clean Water Act* and §10 of the *Rivers and Harbors Act*. Within this framework, the Tennessee Stream Mitigation Program (TSMP) describes the rationale for the selection of the Geographic Service Areas (GSA), aquatic resource goals and objectives, strategy for selecting and implementing mitigation projects, preservation use and objectives, long term protection and management strategies and our strategy for periodic evaluation and reporting. Each GSA will also be described in detail and will include a description of current and historic aquatic resource threats, current aquatic resource conditions and a description of public and private stakeholder involvement for compensatory mitigation projects within the specific GSA.

Introduction

This Compensation Planning Framework has been developed based upon a requirement established in the federal rule, dated June 2008, by the U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) [33 CFR Part 332 and 40 CFR Part 230]. The 2008 Mitigation Rule governs compensation for unavoidable impacts to aquatic resources from activities permitted by the USACE and the Tennessee Department of Environment and Conservation (TDEC). According to both the state and federal permitting process, applicants must first avoid then minimize impacts to aquatic resources. When impacts are unavoidable, the applicant may then propose compensatory mitigation through the TSMP at a credit rate as determined by the appropriate regulatory authority. Once the TSMP has accepted the mitigation obligation through payment of the required fees, the TSMP then identifies degraded aquatic resources within the same geographic service area that meet the TSMP's requirements for performing compensatory mitigation. Once a potential project has been identified and the landowner has agreed to allow the TSMP to restore and/or enhance the degraded resource, the TSMP develops, designs, implements and monitors the mitigation project until the DE, in consultation with the IRT, deems that the project has met its ecological success criteria. The mitigation project is monitored on an annual basis until success criteria have been met or until the District Engineer (DE), in consultation with the Interagency Review Team (IRT), determines that monitoring can be discontinued.

Within the Compensation Planning Framework, the TSMP has identified ten individual geographic service areas. In general, the ten geographic service areas have the following seven elements in common:

1. A watershed based rationale for the delineation of the service areas
2. Aquatic resource threats

3. Aquatic resource goals and objectives
4. Strategy for selecting and implementing mitigation projects
5. Preservation use and objectives
6. Long term protection and management strategies
7. Strategy for periodic evaluation and reporting

For each individual geographic service area, the following five specific elements are discussed:

1. Description of the geographic service area
2. A description of the specific threats to aquatic resources in the service area, including how the in-lieu fee program will help offset impacts resulting from those threats
3. An analysis of historic aquatic resource loss within the service area
4. An analysis of current aquatic resource conditions in the service area, supported by field documentation
5. A description of any public and private stakeholder involvement in plan development and implementation, including coordination with federal, state, tribal and local aquatic resource management and regulatory authorities

Geographic Service Areas

In order to identify and implement meaningful compensatory mitigation, the TSMP has developed a Compensation Planning Framework for each of the ten geographic service areas within the state (Figure 1). These geographic service areas (Table 1) were established based upon both historic and projected aquatic resource impacts associated with the rapid rate of urbanization that have occurred over the past ten years. Other considerations included the projected rate of growth for the next ten years, an analysis of geospatial and field data and the economic viability of the individual geographic service areas to provide adequate mitigation needs to perform watershed scale type mitigation projects.

Service Area	8 Digit HUC Watersheds
North Hatchie - Obion	<ul style="list-style-type: none"> • 08010205 South Fork Forked Deer River • 08010206 Forked Deer River • 08010204 North Fork Forked Deer River • 08010203 South Fork Obion River • 08010202 Obion River
South Hatchie - Obion	<ul style="list-style-type: none"> • 08010211 Nonconnah Creek • 08010210 Wolf River • 08010209 Loosahatchie River • 08010208 Hatchie River • 08010207 Little Hatchie River • 08010100 Mississippi River

Service Area	8 Digit HUC Watersheds
Lower Tennessee	<ul style="list-style-type: none"> • 06040005 Tennessee River (NW TN) • 06040001 Tennessee River (SW TN) • 06040004 Buffalo River • 06040003 Lower Duck River • 06040002 Upper Duck River
West Lower Cumberland	<ul style="list-style-type: none"> • 05130205 Lake Barkley Reservoir • 05130206 Red River • 05130202 Cheatham Lake • 05130204 Harpeth River
East Lower Cumberland	<ul style="list-style-type: none"> • 05110002 Barren River • 05130201 Old Hickory • 05130203 Stones River
Middle Tennessee Elk	<ul style="list-style-type: none"> • 06030005 Pickwick Reservoir • 06030002 Lower Elk River • 06030004 Richland Creek • 06030003 Upper Elk River • 06030001 Battle Creek
Upper Cumberland	<ul style="list-style-type: none"> • 05130106 Cordell Hull • 05130105 Obey River • 05130104 Big South Fork • 05130101 Clear Fork / Cumberland River • 05130108 Caney Fork • 05130107 Collins River
Middle Tennessee Hiwassee	<ul style="list-style-type: none"> • 06020004 Sequatchie River • 06020001 Chickamauga Reservoir • 06020002 Hiwassee River • 03150101 Conasauga River • 06020003 Ocoee River
Upper Tennessee	<ul style="list-style-type: none"> • 06010208 Emory River • 06010201 Fort Loudoun Reservoir • 06010207 Clinch River • 06010204 Little Tennessee River • 06010205 Upper Clinch River • 06010206 Powell River
French Broad - Holston	<ul style="list-style-type: none"> • 06010104 Holston River • 06010107 Lower French Broad River • 06010106 Pigeon River • 06010105 Upper French Broad River • 06010108 Nolichucky River • 06010103 Watauga River • 06010102 South Fork Holston River • 06010101 North Fork Holston River

Aquatic Resource Threats

In order to effectively evaluate historic, current and potential aquatic resource threats, the TSMP uses a combination of existing field data, state and federal reports and geospatial data and analysis. When combined, these resources allow

the TSMP to efficiently and effectively identify the most imminent aquatic resource threats and provides for a greater understanding of how these threats may be addressed and reduced through restoration and/or enhancement mitigation projects.

Data used in determining actual aquatic resource threats across the state include but are not limited to the following:

- Annual population surveys and projected growth estimates
- USDA NRCS Agricultural Census Data Reports
- TDEC 303(d) Report
- TDEC Watershed Water Quality Management Plans

Aquatic Resource Goals and Objectives

The aquatic resource goals and objectives of the TSMP are as follows:

1. Implement ecologically substantial restoration projects that sustain aquatic resource functions and services consistent with a watershed approach.
2. Minimize the temporal loss of aquatic services and functions by striving to develop and implement mitigation projects concurrent with or in advance of mitigation needs.
3. Provide a synergy to ongoing water quality initiatives by working closely with public and private stakeholders at both a statewide and watershed level.

Specific goals and objectives are also established for each mitigation project and are proposed within each individual mitigation proposal. These project specific goals and objectives are dependent on current site conditions as well as project approach, intent and constraints.

Strategy for Selecting and Implementing Mitigation Projects

In order to effectively identify and implement meaningful compensatory mitigation, the TSMP uses the following criteria to prioritize potential projects within a given service area. In general, these include but are not limited to the following criteria:

- compensatory mitigation needs analysis within the service area
- geographic location and proximity to accepted impacts
- condition of sub-watershed based upon historic and current aquatic resource conditions (e.g. utilizing TDEC's 303(d) list and Recovery Potential Watershed Screening Tool)

For each specific potential project that is identified, the following criteria are used to establish potential project priority:

- willingness of potential project landowner(s)
- determination of project approach and associated project objectives

- analysis and determination of likely project success based on approach, goals and objectives
- analysis of potential project cost per credit

Preservation Use and Objectives

Preservation is to be used as a component of each project as it relates to the long-term protection of each project. As a stand-alone component of compensatory mitigation, the TSMP would examine, determine and document that the potential mitigation project site is under substantial and imminent threat of destruction or adverse modification. These stand-alone compensatory mitigation projects would be closely coordinated and approved by the DE and IRT.

Long Term Protection and Management Strategies

Enhancement and/or restoration projects implemented by the TSMP shall be protected using a long-term protection agreement. These agreements may include, but are not limited to, the following: a conservation easement granted by the landowner(s), the purchasing of the property and applying appropriate deed restrictions, locating projects on public property that is protected through management plans, deed restrictions or through ownership by qualified conservation organizations, institutions or agencies unless otherwise approved by the DE in consultation with the IRT. The legal mechanism(s) and the party responsible for the long term management and protection of the project site will be detailed in each individual approved mitigation plan.

All mitigation projects will also include an Adaptive Management Plan to identify and address potential issues that may arise after construction has been completed and during the monitoring and maintenance period. These Adaptive Management Plans will help ensure the long-term viability and success of the project and continued functionality of the aquatic and riparian resources associated with each project.

Strategy for Periodic Evaluation and Reporting

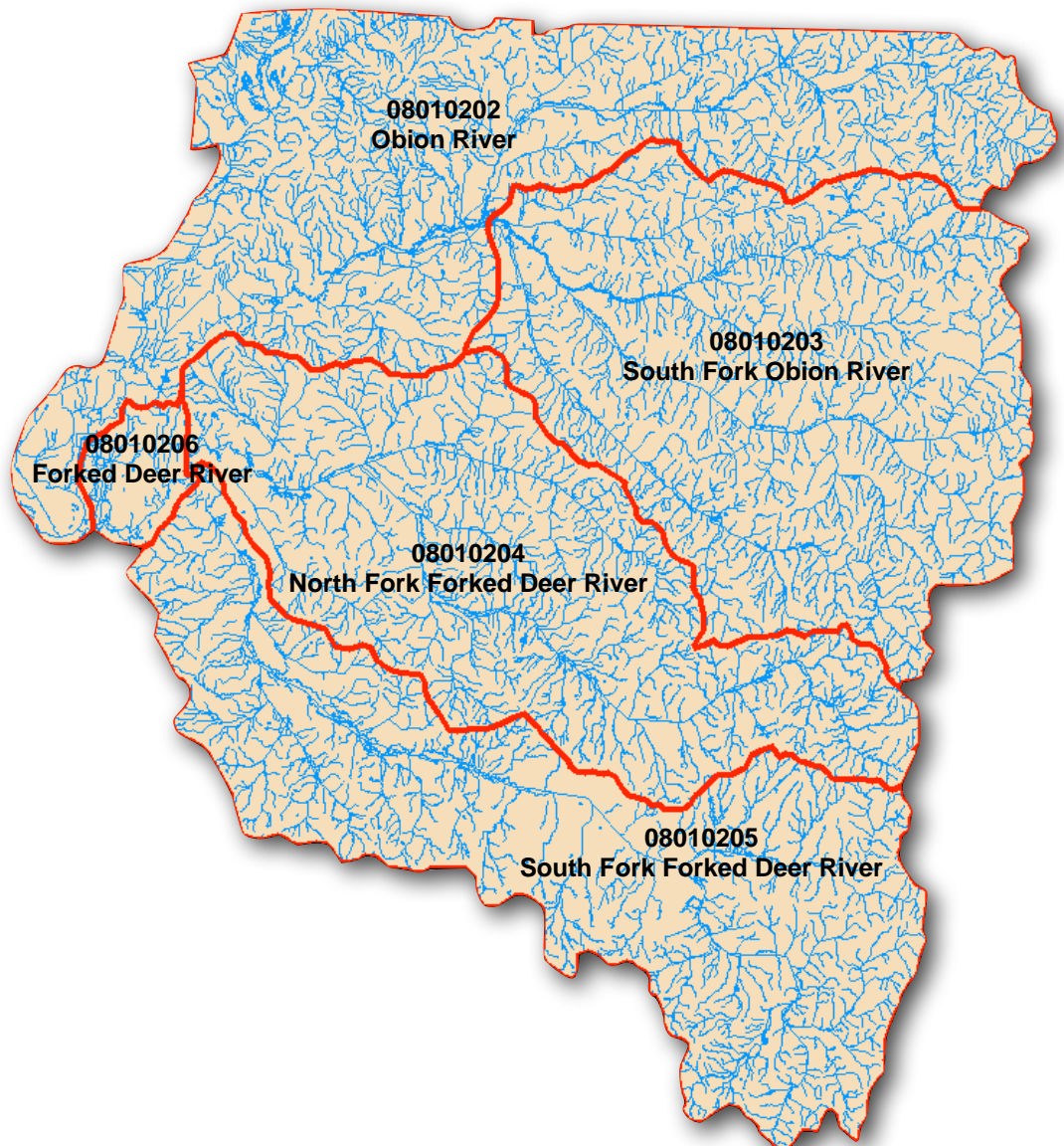
As geographic service areas evolve and change due to population changes and increases and/or decreases in residential, commercial and industrial growth and development, so should the Compensation Planning Framework for a given geographic service area. Taking this into consideration, the TSMP intends to update the DE and the IRT on a regular basis as to the current and projected aquatic resource threats within geographic service areas.

North Hatchie Obion Geographic Service Area

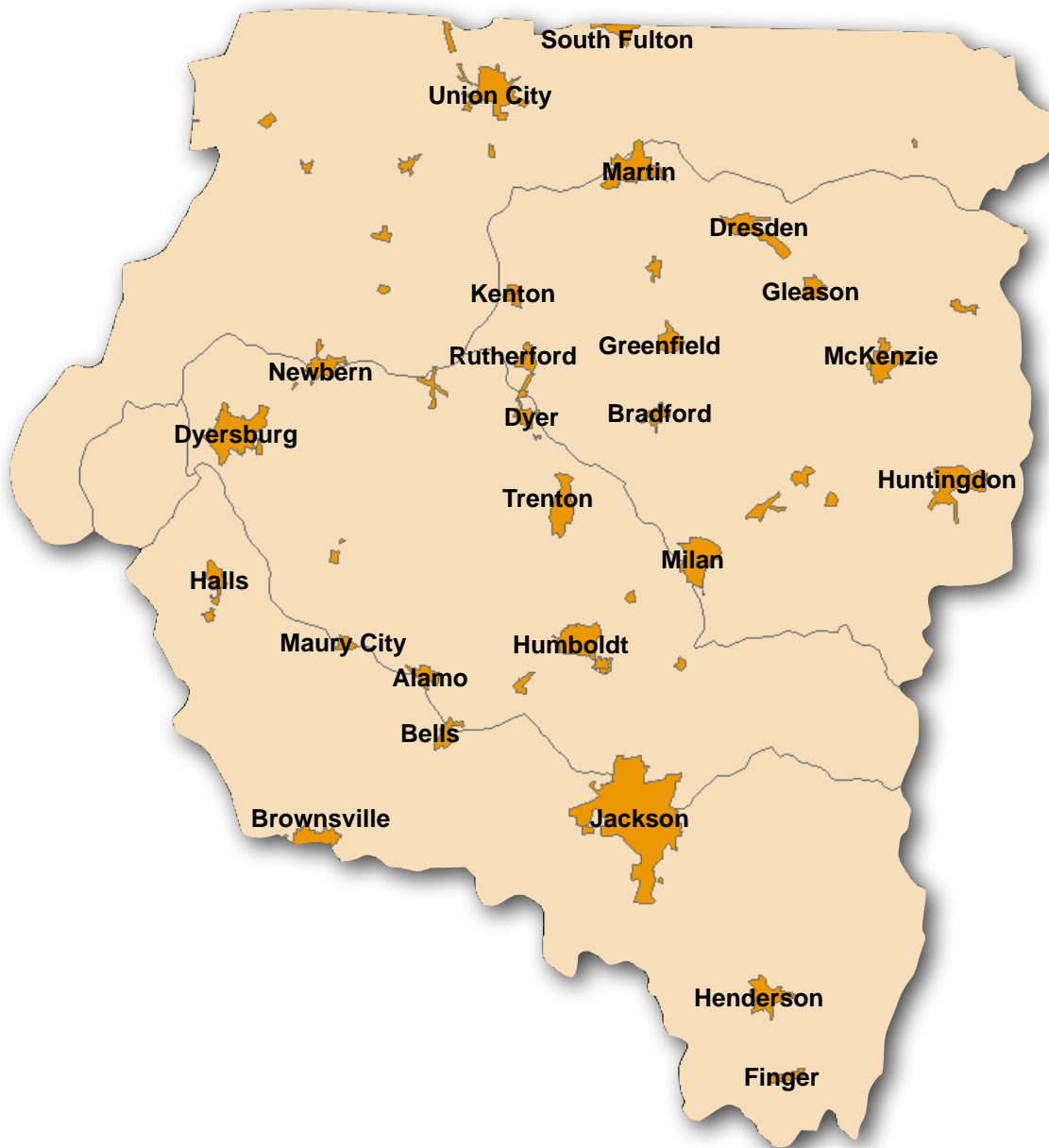
Geographic Service Area Overview

The North Hatchie Obion geographic service area is located in northwestern Tennessee and is comprised of the following five 8-digit HUC's listed and represented in the map below:

- 08010205 South Fork Forked Deer River
- 08010206 Forked Deer River
- 08010204 North Fork Forked Deer River
- 08010203 South Fork Obion River
- 08010202 Obion River



In total, this service area encompasses 4,566 square miles, approximately 6,722 stream miles and 16,725 lake acres. Major cities within this geographic service area include Jackson, Dyersburg, Brownsville, Martin and Union City. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes

- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 67% percent of the total land area within the service area, covering approximately 2.3 million acres. Despite a small increase of only 0.3% in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the North Hatchie Obion geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

While the population of the North Hatchie Obion geographic service area has increased by less than 2% over the last ten years and is projected to decrease by around 1% in the next ten years, urbanization is still an issue for water resources in this Service Area. Changes to land cover, such as the construction of necessary roads and utilities, is expected to cause changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a

combination of restoration, enhancement and/or preservation as outlined previously in the section “Strategy for Selecting and Implementing Mitigation Projects” of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

Despite little growth in the North Hatchie Obion geographic service area over the past ten years, aquatic resources have still endured stresses from various sources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 448 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 5% of all ARAP’s issued during this same period across the State of Tennessee. TDEC also issued individual ARAP’s requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 5,600 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC’s within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the North Hatchie Obion geographic service area, only 16% of the streams and rivers are classified as “fully supporting” while 28% are classified as “not supporting”. Those classified as “not supporting” has decreased by 2.5% during the time between the 2006 and 2008 303(d) reporting periods but remains the third highest (by percentage) of all the TSMP Service Areas.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the North Hatchie Obion service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Carroll County and city governments
- Chester County and city governments
- Crockett County and city governments
- Dyer County and city governments
- Gibson County and city governments
- Haywood County and city governments
- Henderson County and city governments
- Henry County and city governments
- Lake County and city governments
- Lauderdale County and city governments
- Madison County and city governments
- McNairy County and city governments
- Obion County and city governments
- Weakley County and city governments
- West Tennessee River Basin Authority (an agency of TDEC)
- The Nature Conservancy
- Kentucky Division Of Water - Four Rivers Basin Team
- Friends of West TN Refuges
- Davy Crockett RC&D Council

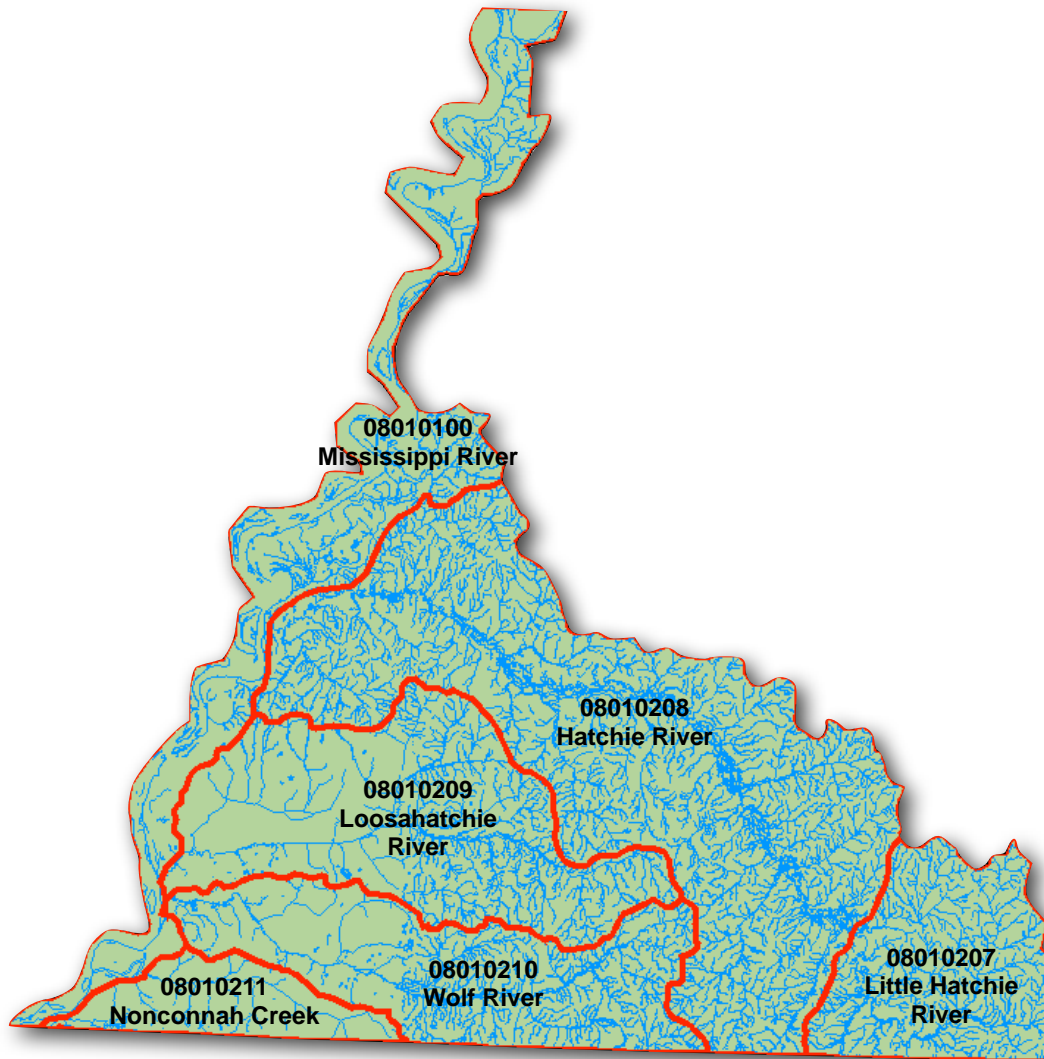
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

South Hatchie Obion Geographic Service Area

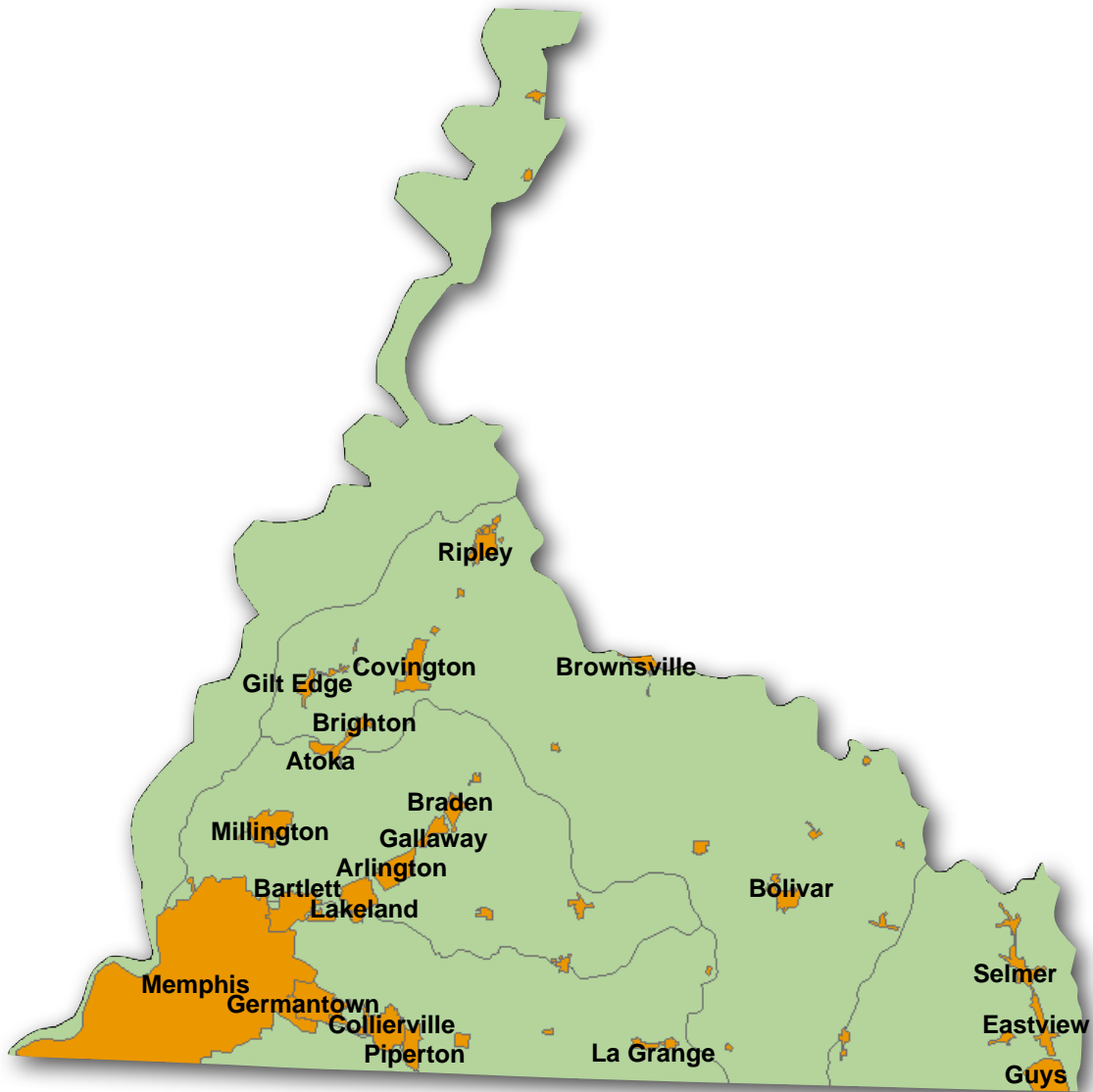
Geographic Service Area Overview

The South Hatchie Obion geographic service area is located in southwestern Tennessee and is comprised of the following six 8-digit HUC's listed and represented in the map below:

- 08010211 Nonconnah Creek
- 08010210 Wolf River
- 08010209 Loosahatchie River
- 08010208 Hatchie River
- 08010207 Little Hatchie River
- 08010100 Mississippi River



In total, this service area encompasses 5,478 square miles, approximately 6,556 stream miles and 383 lake acres. Major cities within this geographic service area include Memphis, Millington and Germantown. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading

- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 59% percent of the total land area within the Service Area, covering approximately 1.2 million acres. Despite an 8.2% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the South Hatchie Obion geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the South Hatchie Obion geographic service area has increased by about 3% but is projected to decrease by around 1% in the next ten years. Despite a projected decrease in population growth, urbanization is still an issue for water resources in this Geographic Service Area. Changes to land cover, such as the construction of necessary roads and utilities, is expected to cause changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation Projects" of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

Despite little growth in the South Hatchie Obion geographic service area over the past ten years, aquatic resources have still endured stresses from various sources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 688 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 8% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 32,400 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the South Hatchie Obion geographic service area, only 23% of the streams and rivers are classified as "fully supporting" while 32% are classified as "not supporting". Those classified as "not supporting" has increased by over 12% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the South Hatchie Obion service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Chester County and city governments
- Fayette County and city governments
- Hardeman County and city governments
- Haywood County and city governments
- Lauderdale County and city governments
- Madison County and city governments
- McNairy County and city governments
- Shelby County and city governments
- West Tennessee River Basin Authority (an agency of TDEC)
- Mississippi Department of Environmental Quality
- Kentucky Division of Water
- Tennessee Water Sentinels
- Wolf River Conservancy
- Friends of West TN Refuges
- Hatchie River Conservancy
- The Nature Conservancy
- The Chickasaw-Shiloh RC&D Council

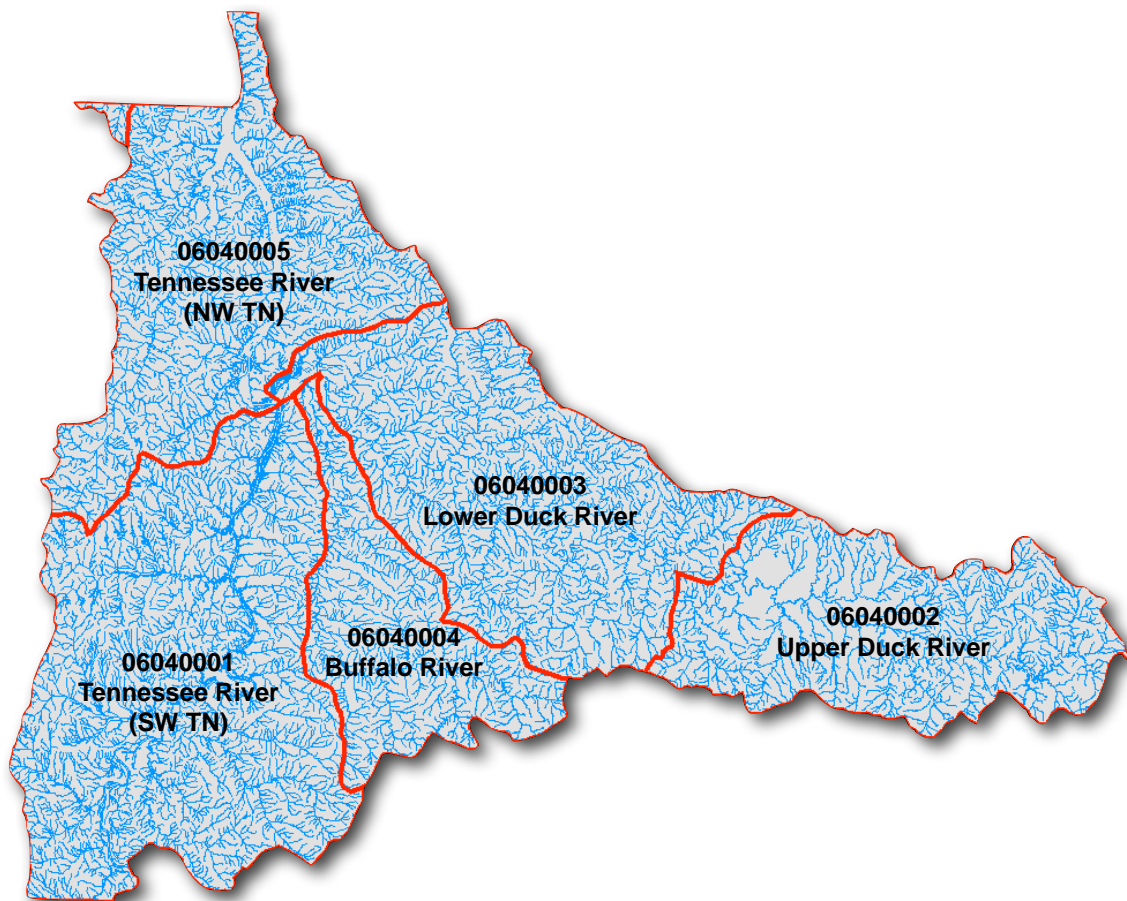
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

Lower Tennessee Geographic Service Area

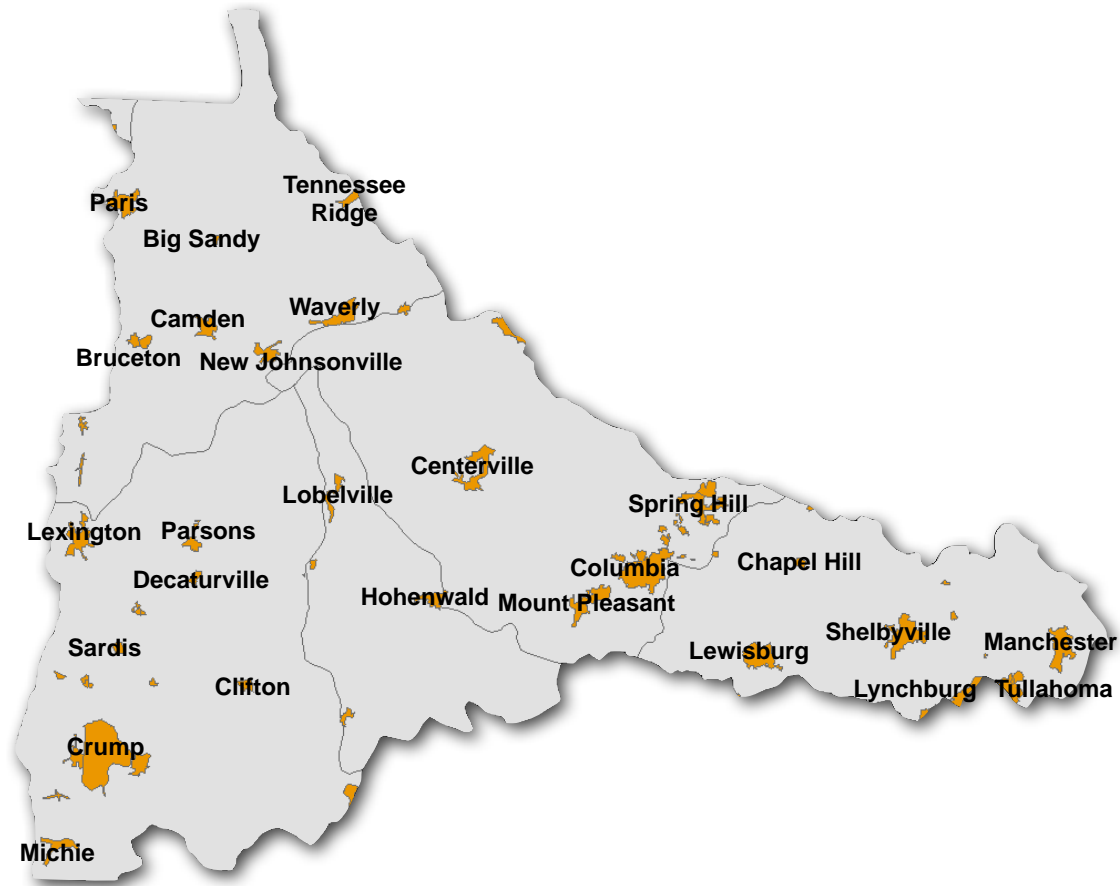
Geographic Service Area Overview

The Lower Tennessee geographic service area stretches from northwestern into southern middle Tennessee and is comprised of the following five 8-digit HUC's listed and represented in the map below:

- 06040005 Tennessee River (NW TN)
- 06040001 Tennessee River (SW TN)
- 06040004 Buffalo River
- 06040003 Lower Duck River
- 06040002 Upper Duck River



In total, this service area encompasses 7,017 square miles, approximately 10,772 stream miles and 124,385 lake acres. Major cities within this geographic service area include Columbia, Shelbyville and Mount Pleasant. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 26% percent of the total land area within the Service Area, covering approximately 1.2 million acres. Despite a 5.5% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the Lower Tennessee geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the Lower Tennessee geographic service area has increased by almost 10% and is projected to increase by over 12% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation Projects" of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The Lower Tennessee geographic service area has experienced rapid growth over the past ten years and is expected to continue this trend for at least the next ten years, which will continue to affect aquatic resources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 1,272 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 15% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 19,300 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the Lower Tennessee geographic service area, 44% of the streams and rivers are classified as "fully supporting" while almost 8% are classified as "not supporting". Those classified as "not supporting" has increased by 11% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the Lower Tennessee service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Bedford County and city governments
- Benton County and city governments
- Carroll County and city governments
- Coffee County and city governments
- Decatur County and city governments
- Dickson County and city governments
- Hardin County and city governments
- Henderson County and city governments
- Henry County and city governments
- Hickman County and city governments
- Houston County and city governments
- Humphreys County and city governments
- Lawrence County and city governments
- Marshall County and city governments
- Maury County and city governments
- McNairy County and city governments
- Perry County and city governments
- Rutherford County and city governments
- Stewart County and city governments
- Wayne County and city governments
- Williamson County and city governments

- Five Rivers RC & D Council
- Chickasaw-Shiloh RC & D Council
- Buffalo-Duck RC & D Council
- Southern Middle TN RC & D Council
- Central Basin RC & D Council
- Tennessee Duck River Development Agency
- The Tennessee Scenic River Association's Duck River Opportunities Project
- Swan Conservation Trust
- The Nature Conservancy Duck River Project

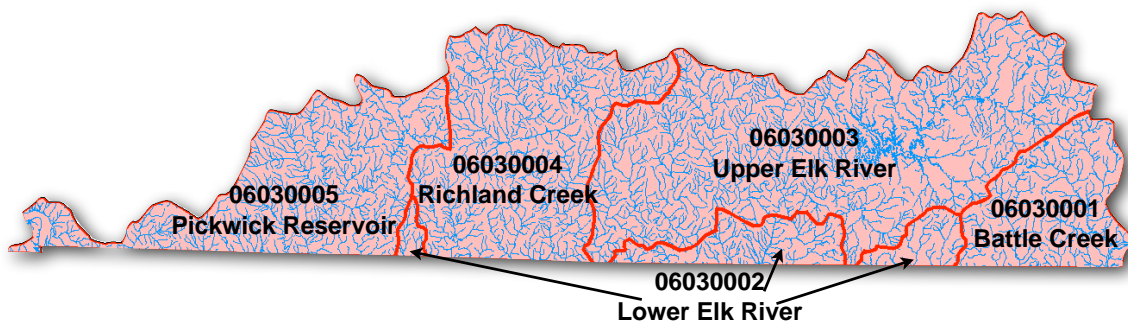
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

Middle Tennessee Elk Geographic Service Area

Geographic Service Area Overview

The Middle Tennessee Elk geographic service area is located in southern middle Tennessee and is comprised of the following five 8-digit HUC's listed and represented in the map below:

- 06030005 Pickwick Reservoir
- 06030002 Lower Elk River
- 06030004 Richland Creek
- 06030003 Upper Elk River
- 06030001 Battle Creek



In total, this service area encompasses 3,204 square miles, approximately 4,620 stream miles and 7,319 lake acres. Major cities within this geographic service area include Tullahoma, Fayetteville and Lawrenceburg. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 56% percent of the total land area within the Service Area, covering approximately 1.7 million acres. Despite a 5.7% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the Middle Tennessee Elk geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the Middle Tennessee Elk geographic service area has increased by around 4% and is projected to increase by over 4% in the next ten years. This continued population growth is likely to result in urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development

in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section “Strategy for Selecting and Implementing Mitigation Projects” of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The Middle Tennessee Elk geographic service area has experienced population growth over the past ten years and is expected to continue this trend for at least the next ten years, which will put a substantial stress on the aquatic resources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 765 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 9% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 10,300 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key

components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the Middle Tennessee Elk geographic service area, 48% of the streams and rivers are classified as “fully supporting” while almost 15% are classified as “not supporting”. Those classified as “not supporting” has increased by 10% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the Middle Tennessee Elk service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Coffee County and city governments
- Franklin County and city governments
- Giles County and city governments
- Grundy County and city governments
- Hardin County and city governments
- Lawrence County and city governments
- Lincoln County and city governments
- Marshall County and city governments
- Moore County and city governments
- Wayne County and city governments
- Alabama Department of Environmental Management
- Friends of the Elk River

- Tims Ford Council
- Southern Middle Tennessee RC & D Council
- Southeast Tennessee RC & D Council
- The Nature Conservancy

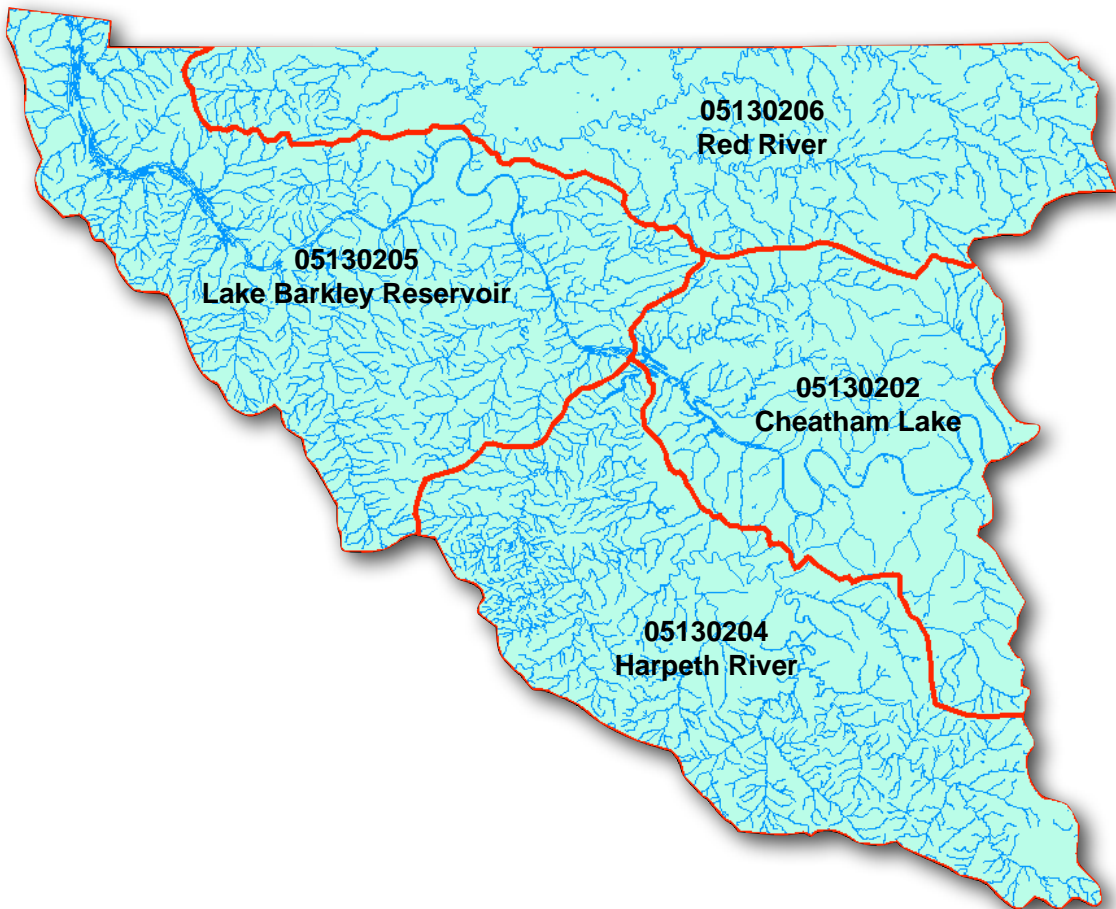
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

West Lower Cumberland Geographic Service Area

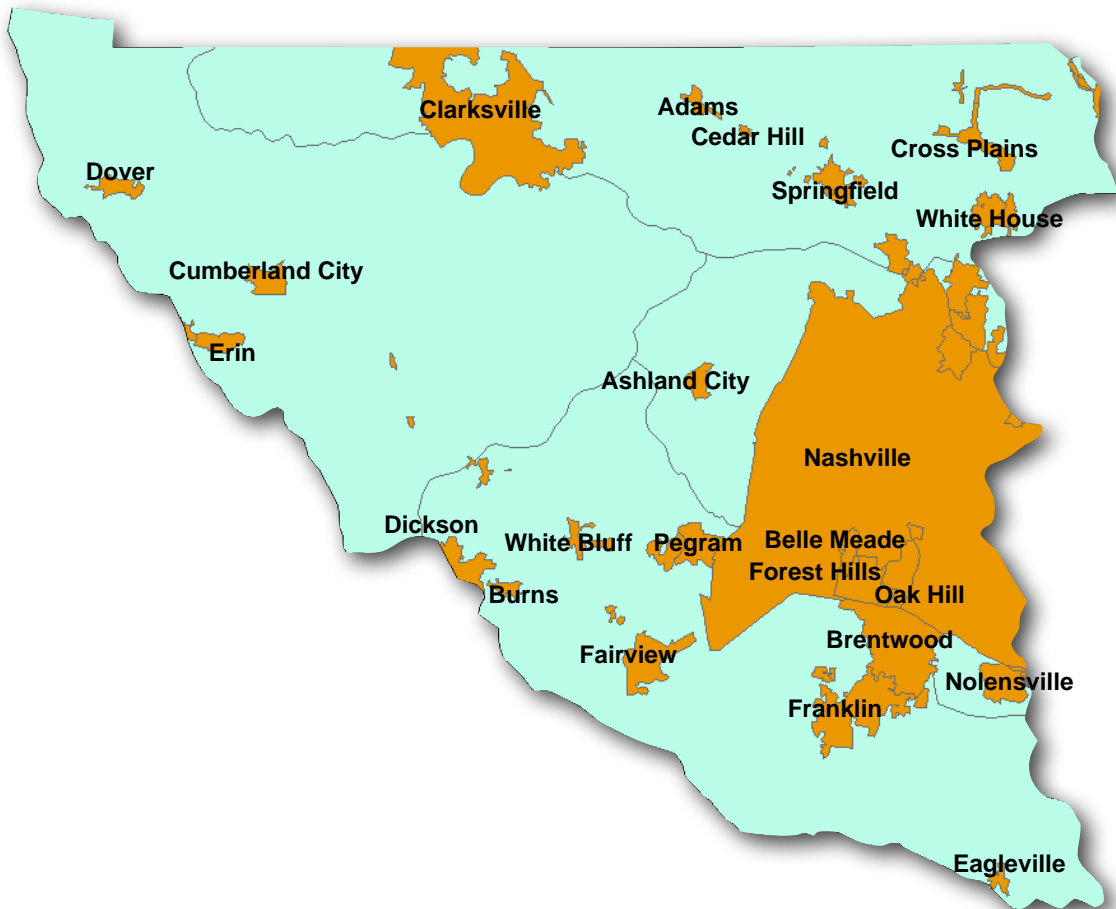
Geographic Service Area Overview

The West Lower Cumberland geographic service area is located in northern middle Tennessee and is comprised of the following four 8-digit HUC's listed and represented in the map below:

- 05130205 Lake Barkley Reservoir
- 05130206 Red River
- 05130202 Cheatham Lake
- 05130204 Harpeth River



In total, this service area encompasses 3,293 square miles, approximately 4,134 stream miles and 35,177 lake acres. Major cities within this geographic service area include Nashville, Clarksville, Franklin and Brentwood. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 52% percent of the total land area within the service area, covering approximately 1.5 million acres. Despite a 10.1% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the West Lower Cumberland geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the West Lower Cumberland geographic service area has increased by over 16% and is projected to increase by another 18% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation

Projects” of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The West Lower Cumberland geographic service area has experienced rapid growth over the past ten years and is expected to continue this trend for at least the next ten years, putting considerable stress on its aquatic resources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 1,049 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 12% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of around 40,500 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the West Lower Cumberland geographic service area, 52% of the streams and rivers are classified as “fully supporting” while 13% are classified as “not supporting”. Those classified as “not supporting” has increased by 7% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the West Lower Cumberland service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Cheatham County and city governments
- Davidson County and city governments
- Dickson County and city governments
- Hickman County and city governments
- Montgomery County and city governments
- Robertson County and city governments
- Rutherford County and city governments
- Stewart County and city governments
- Sumner County and city governments
- Williamson County and city governments
- The Cumberland River Compact
- Five Rivers RC&D Council
- Red River Watershed Association
- Central Basin RC&D Council
- The Nature Conservancy
- Harpeth River Watershed Association
- Harpeth River Watershed Sediment Study

These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close

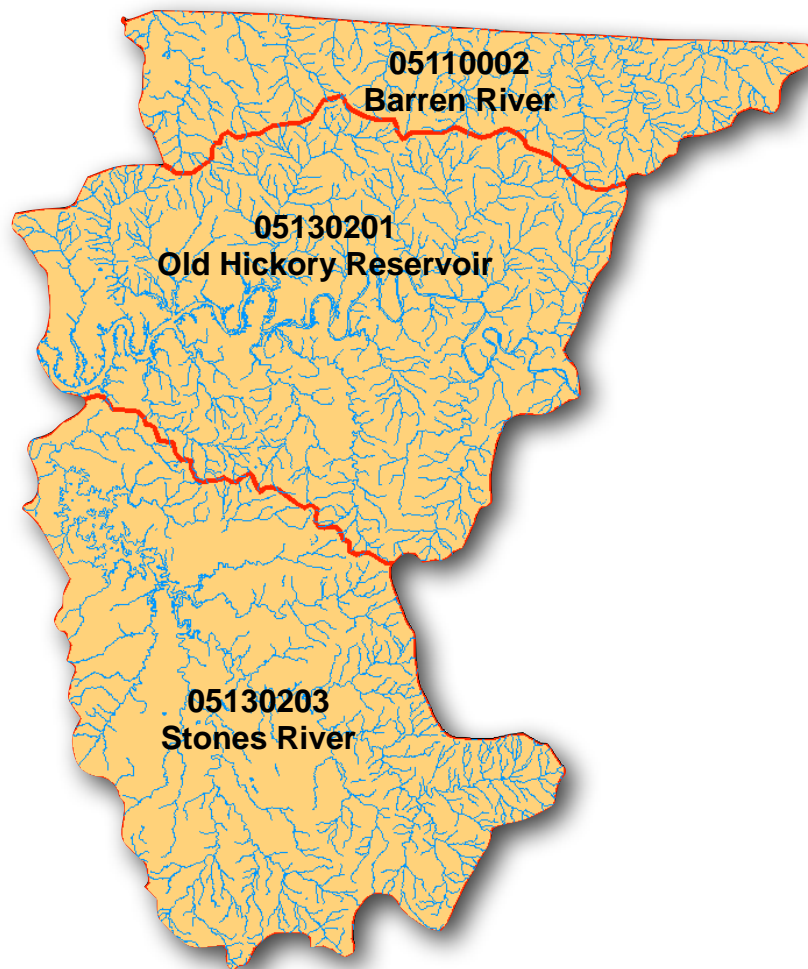
coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

East Lower Cumberland Geographic Service Area

Geographic Service Area Overview

The East Lower Cumberland geographic service area is located in northern middle Tennessee and is comprised of the following three 8-digit HUC's listed and represented in the map below:

- 05110002 Barren River
- 05130201 Old Hickory
- 05130203 Stones River



In total, this service area encompasses 2,336 square miles, approximately 2,758 stream miles and 50,175 lake acres. Major cities within this geographic service area include Nashville, Hendersonville, Gallatin, Lebanon and Murfreesboro. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 68% percent of the total land area within the service area, covering approximately 1.8 million acres. Despite a 12.9% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the Lower Cumberland East geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the East Lower Cumberland geographic service area has increased by over 23% and is projected to increase by nearly 27% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation

Projects” of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The East Lower Cumberland geographic service area has experienced rapid growth over the past ten years and is expected to continue this trend for at least the next ten years, putting considerable stress on its aquatic resources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAP’s are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 842 Aquatic Resource Alteration Permits. This accounts for approximately 10% of all ARAP’s issued during this same period across the State of Tennessee. TDEC also issued individual ARAP’s requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 16,400 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC’s within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the East Lower Cumberland geographic service area, only 23.24% of the streams and rivers are classified as “fully supporting” while 5.82% are classified as “not supporting”. Those classified as “not supporting” has increased by nearly 10% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the East Lower Cumberland service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Cannon County and City governments
- Clay County and City governments
- Davidson County government
- Macon County and City governments
- Rutherford County and City governments
- Smith County and City governments
- Sumner County and City governments
- Trousdale County and City governments
- Wilson County and City governments
- Central Basin RC&D Council
- Hull-York Lakeland RC&D Council
- The Cumberland River Compact
- Old Hickory Watershed Association
- Black Fox Wetland League
- Friends of Murfreesboro Greenway
- The Nature Conservancy

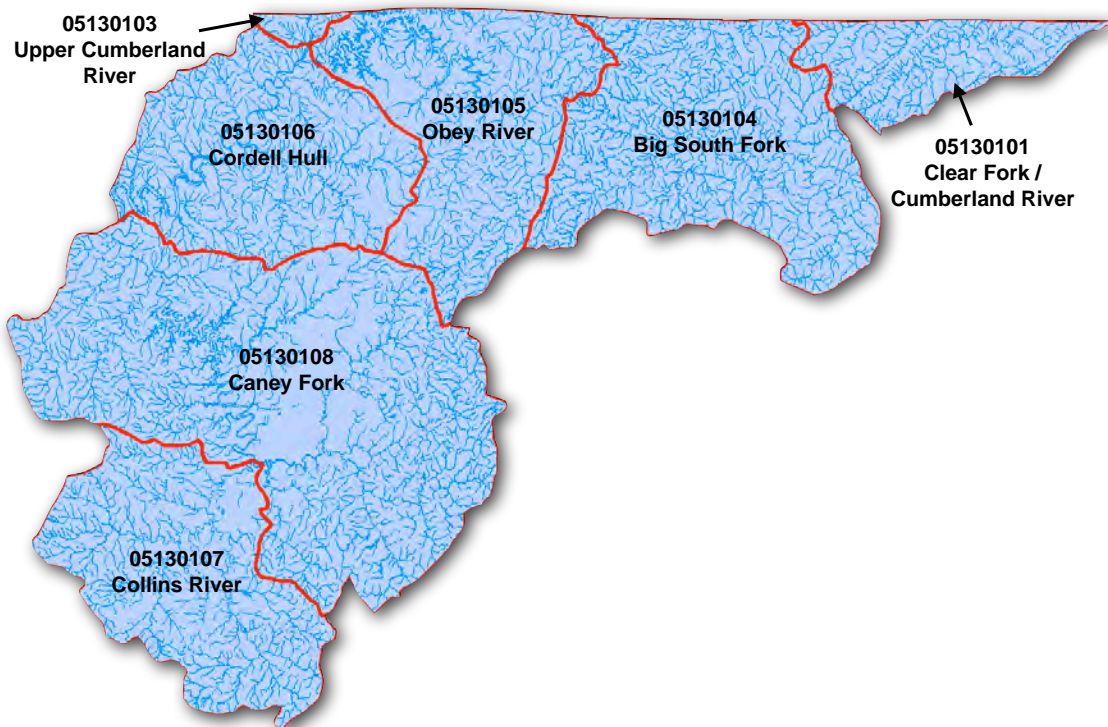
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

Upper Cumberland Geographic Service Area

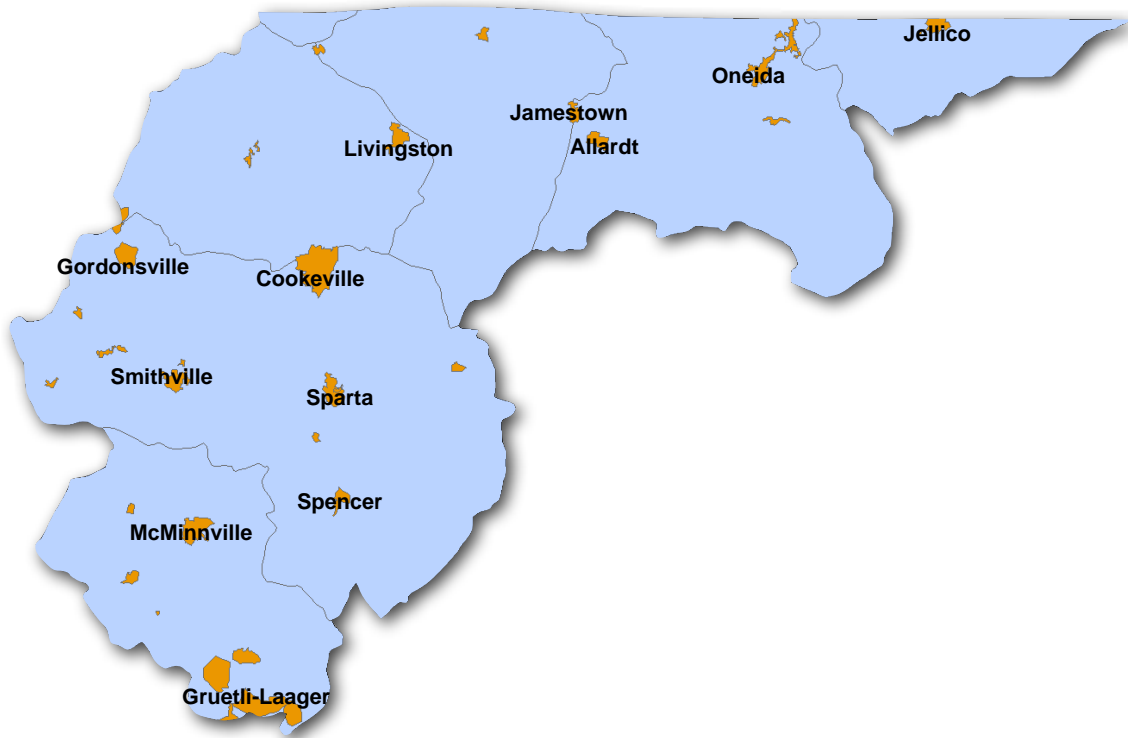
Geographic Service Area Overview

The Upper Cumberland geographic service area is located in northeastern middle Tennessee and is comprised of the following seven 8-digit HUC's listed and represented in the map below:

- 05130101 Clear Fork / Cumberland River
- 05130103 Upper Cumberland River
- 05130104 Big South Fork
- 05130105 Obey River
- 05130106 Cordell Hull
- 05130107 Collins River
- 05130108 Caney Fork



In total, this service area encompasses 5,672 square miles, approximately 6,571 stream miles and 61,792 lake acres. Major cities within this geographic service area include Cookeville, McMinnville and Sparta. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization

- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 18% percent of the total land area within the service area, covering approximately 0.6 million acres. Despite a 5.9% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the Upper Cumberland geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the Upper Cumberland geographic service area has increased by over 7.5% and is projected to increase by nearly 9.5% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section “Strategy for Selecting and Implementing Mitigation Projects” of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The Upper Cumberland geographic service area has experienced considerable growth over the past ten years and is expected to continue this trend for at least

the next ten years. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 840 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 10% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 12,600 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the Upper Cumberland geographic service area, 44% of the streams and rivers are classified as "fully supporting" while 12% are classified as "not supporting". Those classified as "not supporting" has increased by nearly 9% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the Upper Cumberland service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Anderson County and city governments
- Bledsoe County and city governments
- Campbell County and city governments
- Cannon County and city governments
- Claiborne County and city governments
- Clay County and city governments
- Coffee County and city governments
- Cumberland County and city governments
- De Kalb County and city governments
- Fentress County and city governments
- Grundy County and city governments
- Jackson County and city governments
- Macon County and city governments
- Morgan County and city governments
- Overton County and city governments
- Pickett County and city governments
- Putnam County and city governments
- Rutherford County and city governments
- Scott County and city governments
- Sequatchie County and city governments
- Smith County and city governments
- Van Buren County and city governments
- Warren County and city governments
- White County and city governments
- Wilson County and city governments

- The Cumberland River Compact
- Hull-York Lakeland RC&D Council
- South Fork Watershed Association
- Cumberland Mountain RC&D Council
- The Nature Conservancy

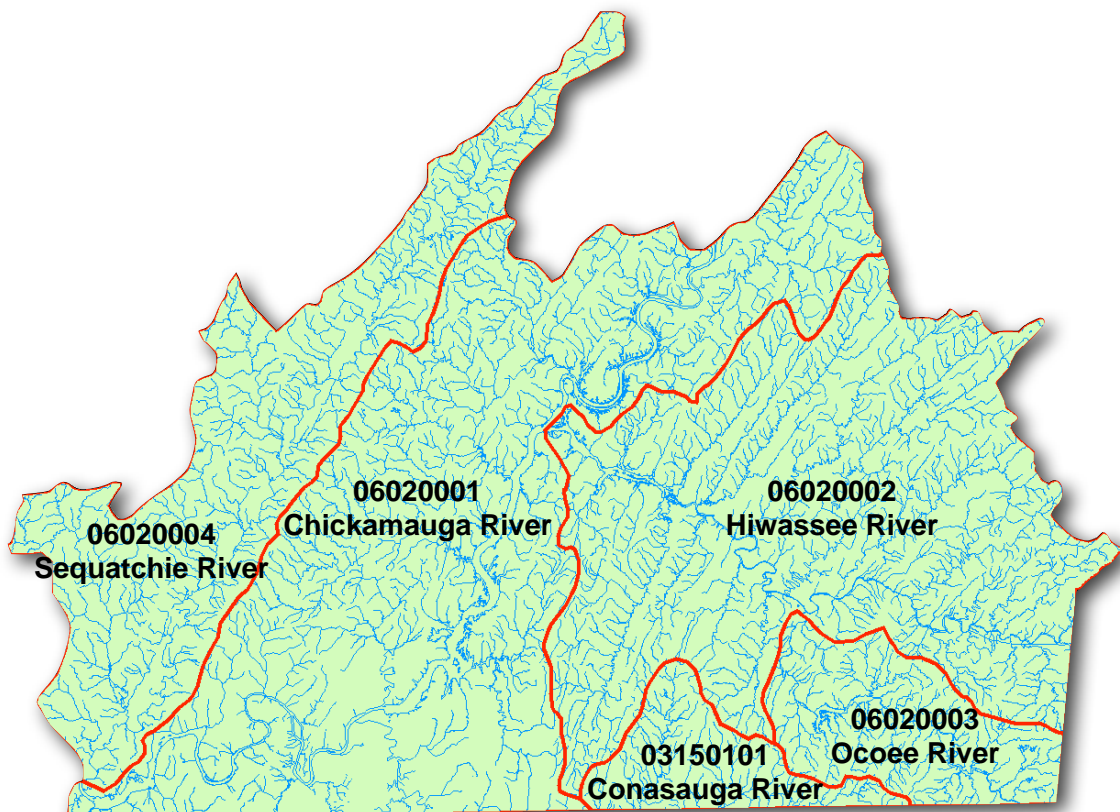
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

Middle Tennessee Hiwassee Geographic Service Area

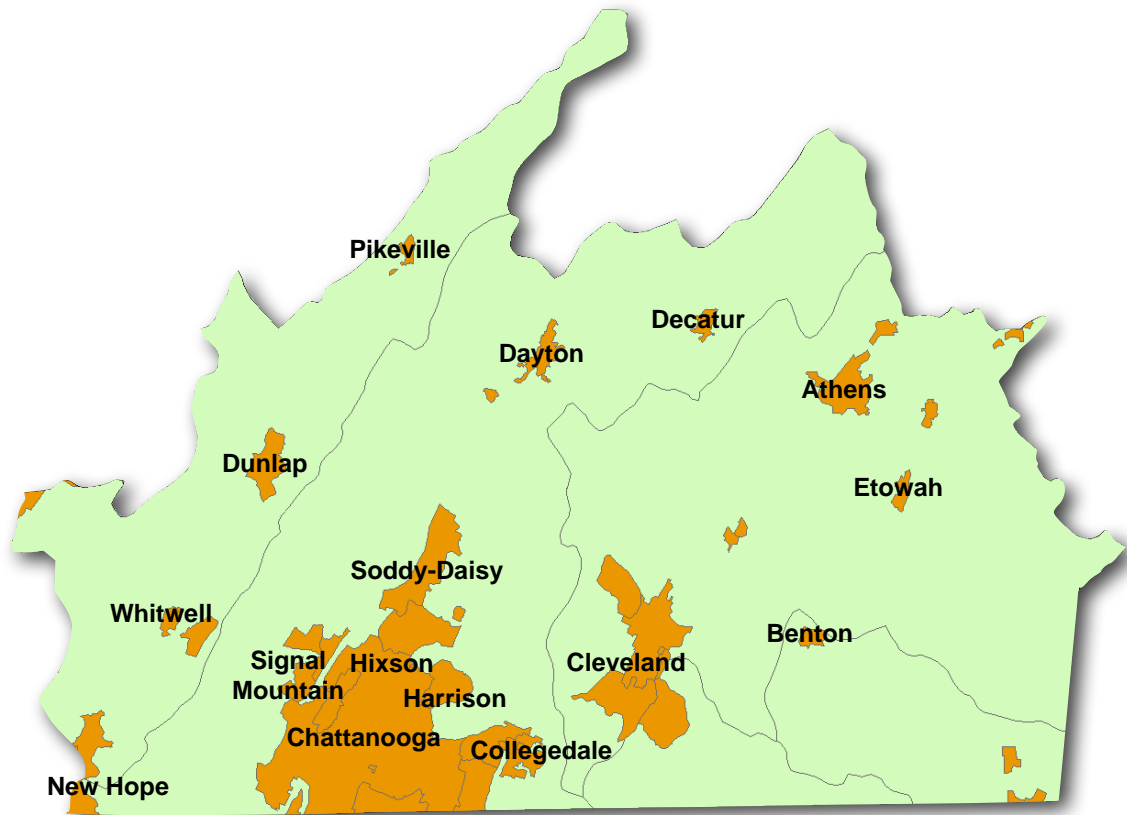
Geographic Service Area Overview

The Middle Tennessee Hiwassee geographic service area is located in southeastern Tennessee and is comprised of the following five 8-digit HUC's listed and represented in the map below:

- 06020004 Sequatchie River
- 06020001 Chickamauga Reservoir
- 06020002 Hiwassee River
- 03150101 Conasauga River
- 06020003 Ocoee River



In total, this service area encompasses 3,083 square miles, approximately 4,461 stream miles and 13,261 lake acres. Major cities within this geographic service area include Chattanooga, Hixson, Cleveland and Athens. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 20% percent of the total land area within the service area, covering approximately 0.5 million acres. Despite a 3.4% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the Middle Tennessee Hiwassee geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the Middle Tennessee Hiwassee geographic service area has increased by over 6.5% and is projected to increase by nearly 4% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation Projects" of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The Middle Tennessee Hiwassee geographic service area has experienced considerable growth over the past ten years and is expected to continue this trend for at least the next ten years, putting considerable stress on aquatic resources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 636 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 7% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 19,400 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the Middle Tennessee Hiwassee geographic service area, only 15% of the streams and rivers are classified as "fully supporting" while 25% are classified as "not supporting". Those classified as "not supporting" has increased by nearly 29% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the Middle Tennessee Hiwassee service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Bledsoe County and city governments
- Bradley County and city governments
- Cumberland County and city governments
- Grundy County and city governments
- Hamilton County and city governments
- Loudon County and city governments
- Marion County and city governments
- McMinn County and city governments
- Meigs County and city governments
- Monroe County and city governments
- Polk County and city governments
- Rhea County and city governments
- Roane County and city governments
- Sequatchie County and city governments
- Van Buren County and city governments
- Southeast Tennessee RC&D Council
- North Chickamauga Creek Conservancy
- South Chickamauga Creek Greenway Alliance
- The Nature Conservancy
- Hiwassee River Watershed Coalition

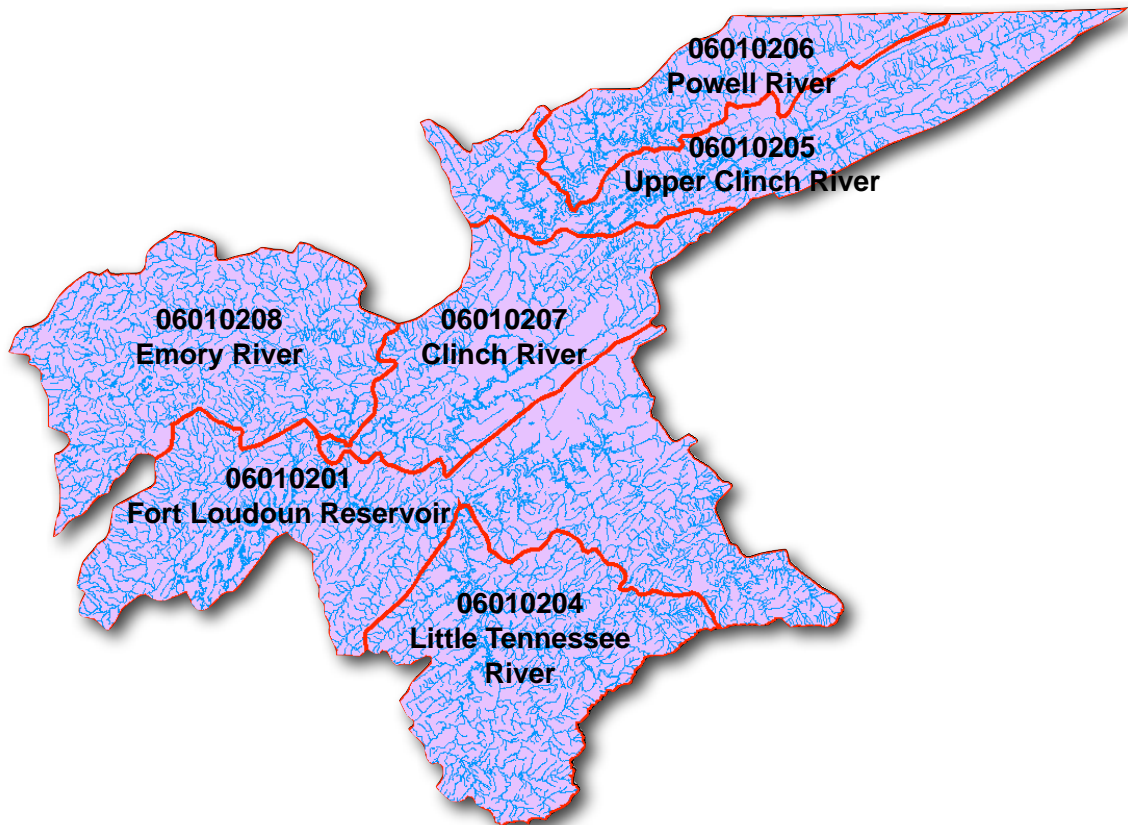
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

Upper Tennessee Geographic Service Area

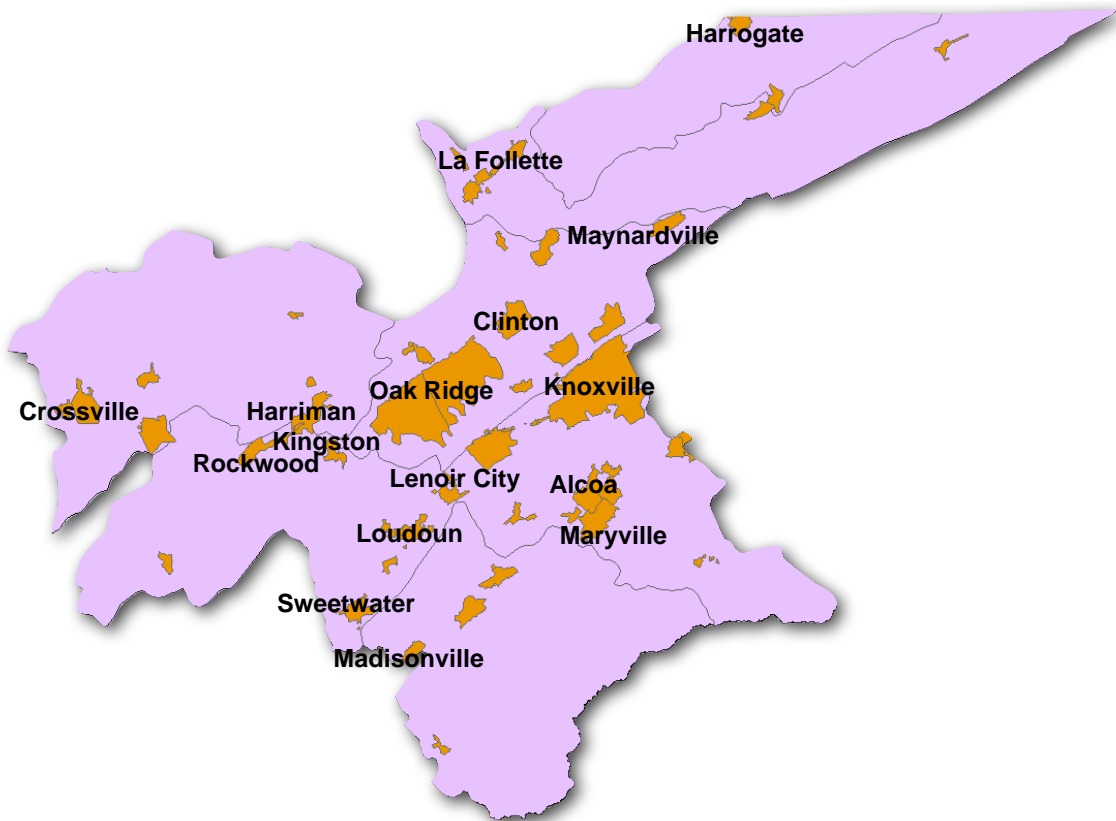
Geographic Service Area Overview

The Upper Tennessee geographic service area is located in eastern Tennessee and is comprised of the following six 8-digit HUC's listed and represented in the map below:

- 06010208 Emory River
- 06010201 Fort Loudoun Reservoir
- 06010207 Clinch River
- 06010204 Little Tennessee River
- 06010205 Upper Clinch River
- 06010206 Powell River



In total, this service area encompasses 4,719 square miles, approximately 6,139 stream miles and 90,496 lake acres. Major cities within this geographic service area include Knoxville, Maryville, Oak Ridge and Clinton. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 17% percent of the total land area within the service area, covering approximately 0.4 million acres. Despite a 6.3% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the Upper Tennessee geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the Upper Tennessee geographic service area has increased by approximately 7% and is projected to increase by nearly 4% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation Projects" of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The Upper Tennessee geographic service area has experienced considerable growth over the past ten years and is expected to continue this trend for at least the next ten years, which is likely to put considerable stress on aquatic resources. One indicator used in analyzing the stressors on aquatic resources is the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 1,030 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 12% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 14,300 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the Upper Tennessee geographic service area, 28% of the streams and rivers are classified as "fully supporting" while 28% are classified as "not supporting". Those classified as "not supporting" have decreased by nearly 2% during the time between the 2006 and 2008 303(d) reporting periods, but remains the second highest (by percentage) of all the TSMP Service Areas.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)
 - United States Geological Survey (USGS) Water Resources Programs
 - U.S. Fish and Wildlife Service
 - Tennessee Valley Authority (TVA)
 - National Park Service
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency
 - TDEC DOE-Oversight

Within the Upper Tennessee service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Anderson County and city governments
- Bledsoe County and city governments
- Campbell County and city governments
- Claiborne County and city governments
- Cumberland County and city governments
- Fentress County and city governments
- Grainger County and city governments
- Hancock County and city governments
- Hawkins County and city governments
- Knox County and city governments
- Loudon County and city governments
- McMinn County and city governments
- Meigs County and city governments
- Monroe County and city governments
- Morgan County and city governments
- Rhea County and city governments
- Roane County and city governments
- Sevier County and city governments

- Union County and city governments
- The Nature Conservancy
- Beaver Creek Task Force
- Beaver Creek Watershed Association
- Blount County Planning Commission
- Clinch River Chapter of Trout Unlimited
- Clinch-Powell RC&D Council
- Coal Creek Watershed Foundation
- Cumberland Mountain RC&D Council
- Emory River Watershed Association
- Hinds Creek Watershed Partnership
- Little River Watershed Association
- Oak Ridge Reservation Local Oversight Committee
- Obed Watershed Association
- Powell River Aquatic Research Station
- Tennessee Citizens for Wilderness Planning
- Tennessee Izaak Walton League
- Tennessee Paddle
- The Watershed Association of the Tellico Reservoir

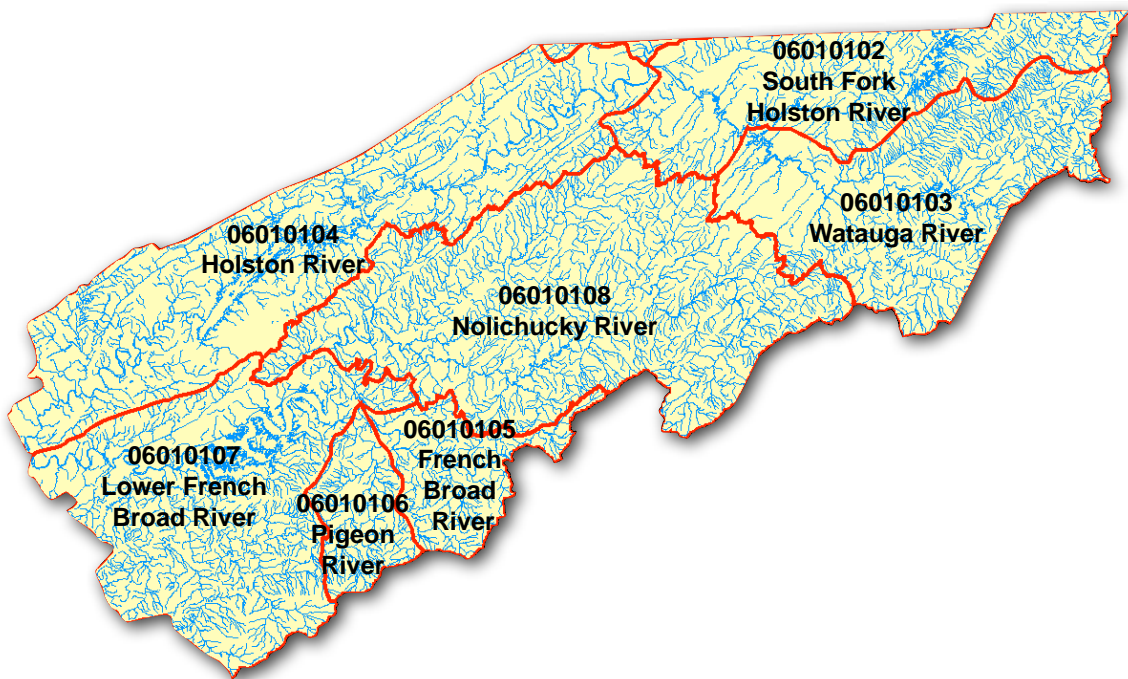
These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.

French Broad Holston Geographic Service Area

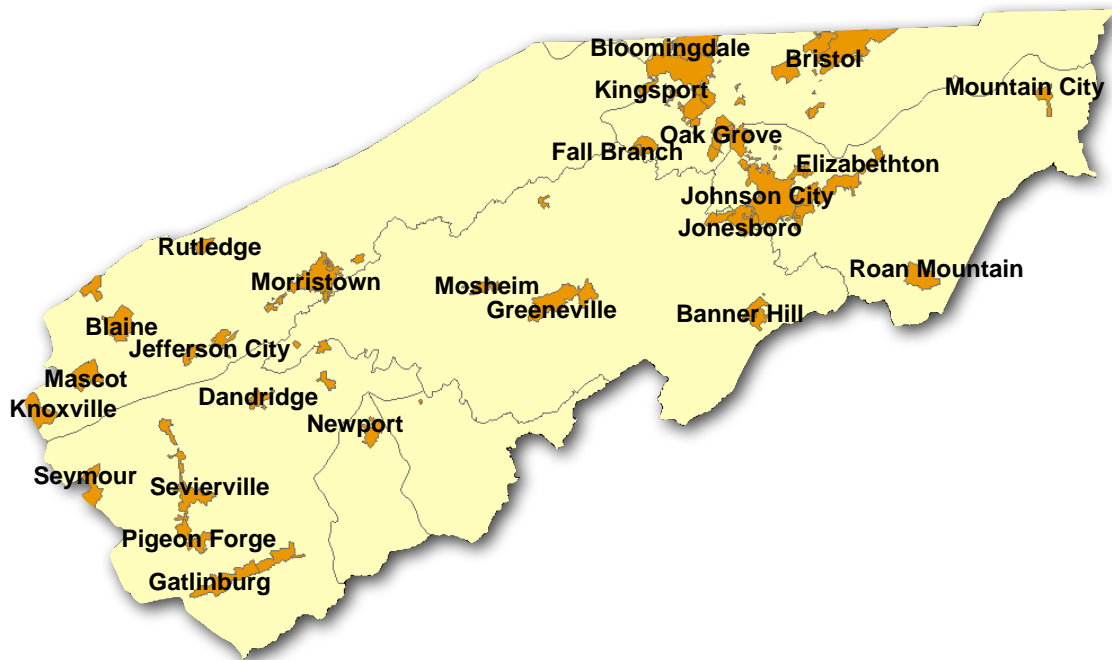
Geographic Service Area Overview

The French Broad Holston geographic service area is located in East Tennessee and is comprised of the following eight 8-digit HUC's listed and represented in the map below:

- 06010104 Holston River
- 06010107 Lower French Broad River
- 06010106 Pigeon River
- 06010105 Upper French Broad River
- 06010108 Nolichucky River
- 06010103 Watauga River
- 06010102 South Fork Holston River
- 06010101 North Fork Holston River



In total, this service area encompasses 5,033 square miles, approximately 7,840 stream miles and 55,758 lake acres. Major cities within this geographic service area include eastern Knoxville, Kingsport, Johnson City, and Bristol. Those cities as well as other smaller cities are represented on the following map.



Aquatic Resource Threats

The primary threats to aquatic resources throughout this geographic service area are:

- altered hydrologic regimes
- altered in-stream physical habitat conditions
- altered near-stream (buffer) habitat conditions
- sedimentation
- nutrient loading
- thermal alteration
- toxins and other contaminants

These aquatic resource threats are most often caused by:

- incompatible agricultural practices
- urbanization
- wastewater management practices
- water management practices
- invasive species

Of these, the most imminent threats are associated with incompatible agricultural practices and urbanization.

Agriculture

In the last Water Quality Management Plan, farmland accounted for approximately 29% percent of the total land area within the service area, covering approximately 0.8 million acres. Despite a 10% decrease in the amount of land in farming between 2002 and 2007, farming remains a substantial threat to water resources within the French Broad Holston geographic service area. Livestock, hay and row crop production practices often involve removal of riparian vegetation and disturbance of stream habitat through increased channelization, diversion of water to sinkholes and increasing nutrient and toxin levels.

Urbanization

Over the last ten years, the population of the French Broad Holston geographic service area has increased by approximately 8% and is projected to increase by over 9% in the next ten years. This continued population growth is likely to result in substantial urbanization and hydrologic changes within the geographic service area. Changes in land use from rural to urban can have a detrimental effect on aquatic resources in a variety of ways. Increasing urban land cover causes changes to the hydrologic regime of a watershed, as well as impacting the in and near-stream physical habitat, water quality and biota. The main types of development in the service areas are commercial, industrial and housing development as well as the construction of necessary roads and utilities.

Offsetting Impacts

By analyzing and identifying the most imminent aquatic resource threats, the TSMP can focus its resources on those specific areas that have been previously or are most likely to be impacted in the future by rapid urbanization due to industrial, commercial and/or residential growth. Impacts will be offset using a combination of restoration, enhancement and/or preservation as outlined previously in the section "Strategy for Selecting and Implementing Mitigation Projects" of the Compensation Planning Framework and Section 5.0 of the Tennessee Stream Mitigation Program In-Lieu Fee Instrument.

Historic Aquatic Resource Loss

The French Broad Holston geographic service area has experienced rapid growth over the past ten years and is expected to continue this trend for at least the next ten years, which is likely to put a substantial stress on aquatic resources. One indicator used in analyzing the stressors on aquatic resources is

the historic physical impacts associated with aquatic resource permits issued by the Tennessee Department of Environment and Conservation (TDEC). One such aquatic resource permit is the Aquatic Resource Alteration Permit or ARAP. ARAPs are required for any person wishing to make an alteration to a stream, river, lake or wetland. Activities that may require an ARAP include the following:

- Dredging, excavation, channel widening, or straightening
- Bank sloping; stabilization
- Channel relocation
- Water diversions or withdrawals
- Dams, weirs, dykes, levees or other similar structures
- Flooding, excavating, draining and/or filling a wetland
- Road and utility crossings
- Structural fill

Between 2000 and 2009, TDEC issued 1,181 Aquatic Resource Alteration Permits in this Service Area. This accounts for approximately 14% of all ARAP's issued during this same period across the State of Tennessee. TDEC also issued individual ARAP's requiring compensatory mitigation through the TSMP that resulted in the purchase of more than 8,300 credits.

Current Aquatic Resource Conditions

Understanding current aquatic resource conditions is a critical aspect in performing meaningful compensatory mitigation. The TDEC 303(d) Report, TDEC Watershed Water Quality Management Plans for the included 8-digit HUC's within the geographic service area, geospatial data and field data are key components used by the TSMP to evaluate and determine current aquatic resource conditions.

According to the 2008 303(d) report, in the French Broad Holston geographic service area, only 29% of the streams and rivers are classified as "fully supporting" while 27% are classified as "not supporting". Those classified as "not supporting" has increased by nearly 12% during the time between the 2006 and 2008 303(d) reporting periods and are expected to increase by the same during the time between the 2008 and 2010 report as well.

Stakeholder Involvement

In order to effectively identify and implement mitigation projects, the TSMP has developed many strategic partnerships across the state to assist in the identification and implementation of meaningful mitigation for the past seven years. State-wide these stakeholders include:

- **Federal partnerships:**
 - United States Army Corps of Engineers
 - Natural Resources Conservation Service (NRCS)

- United States Geological Survey (USGS) Water Resources Programs
- U.S. Fish and Wildlife Service
- Tennessee Valley Authority (TVA)
- National Park Service
- National Forest Service
- **State Partnerships:**
 - Tennessee Department of Environment and Conservation (TDEC)
 - Tennessee Department of Agriculture (TDA)
 - Tennessee Wildlife Resources Agency

Within the French Broad Holston service area, the following stakeholders have been identified and will be approached for their involvement during the site selection, assessment, development, design and/or implementation of projects within the service area:

- Carter County and city governments
- Cocke County and city governments
- Grainger County and city governments
- Greene County and city governments
- Hamblen County and city governments
- Hawkins County and city governments
- Jefferson County and city governments
- Johnson County and city governments
- Knox County and city governments
- Sevier County and city governments
- Sullivan County and city governments
- Unicoi County and city governments
- Union County and city governments
- Washington County and city governments
- Smoky Mountain RC&D Council
- Appalachian RC&D Council
- Greene County Soil Conservation District
- Caney Creek Watershed Partnership
- The Holston River Watershed Alliance
- Upper Nolichucky Watershed Alliance
- Middle Nolichucky Watershed Alliance
- Boone Watershed Partnership
- French Broad Preservation Association
- Kingsport Citizens for a Cleaner Environment
- Friends of Fort Patrick Henry
- Overmountain Chapter Trout Unlimited
- The Nature Conservancy

These federal, state and local stakeholders will be a key component in the success of all compensatory mitigation projects within the service area. Close coordination and input of key stakeholders is necessary to create and promote meaningful mitigation throughout the service area.