

**A Review of Tennessee's Regulatory Framework  
for Habitat Conservation Planning Efforts in the Cumberland Region**

Julie Mawhorter  
White Paper, Cumberlands HCP Project  
The Nature Conservancy & University of Tennessee, Knoxville  
August 2006

## CONTENTS

|             |   |    |
|-------------|---|----|
| <b>I.</b>   | <b>Introduction</b>                                     | 3  |
| <b>II.</b>  | <b>Regulatory Framework</b>                             | 3  |
| 1.          | Major Federal Laws                                      | 3  |
|             | Endangered Species Act                                  | 4  |
|             | National Park Service Legislation                       | 4  |
|             | Clean Water Act   | 4  |
| 2.          | State Regulation  | 5  |
|             | Water Quality Standards                                 | 6  |
|             | Watershed Management Approach                           | 7  |
|             | Antidegradation Rules                                   | 8  |
| 3.          | Permitting Systems                                      | 9  |
|             | <i>Federal</i>  |    |
|             | Corps Section 404 & 401 Certification                   | 10 |
|             | TVA Section 26A   | 11 |
|             | ESA Section 7 Consultation                              | 11 |
|             | <i>State</i>  |    |
|             | Aquatic Resource Alteration Permit (ARAP)               | 12 |
|             | National Pollutant Discharge Elimination System (NPDES) | 14 |
|             | NPDES Small MS4 General Permit                          | 15 |
|             | NPDES Storm Water Construction General Permit           | 16 |
|             | Inter-basin Transfer Permit                             | 16 |
|             | Division of Water Supply Requirements                   | 17 |
| <b>III.</b> | <b>Limitations and Challenges</b>                       | 17 |
|             | Fragmentation and Uncertainty in Decision-Making        | 17 |
|             | Political and Institutional Challenges                  | 19 |
| <b>IV.</b>  | <b>Considerations and Opportunities</b>                 | 21 |
|             | Potential Benefits of an HCP Approach                   | 21 |
|             | Water Supply Considerations                             | 23 |
|             | Development Considerations                              |    |
|             | <b>References</b>                                       | 27 |
|             | <b>Endnotes</b>   | 29 |

## I. INTRODUCTION

The Cumberland Plateau and Mountains are home to extensive forested areas which are among the most diverse, temperate-zone forests in the world. Recently, the region has received international attention and interest as a hotspot of biodiversity for its abundant variety of plants, fish, mussels, salamanders, fungi, and other species. In Tennessee, the northern Plateau counties of Cumberland, Morgan, Fentress, and Scott are home to an impressive array of rare plant and animal species, including many federally-listed threatened or endangered species (*abbr. "T&E species"*): the spotfin chub, blackside dace, and duskytail darter (fish); the purple bean, Cumberland bean, Cumberland elktoe and several other mussels; the Indiana bat and gray bat; and the Cumberland rosemary, Cumberland sandwort, Virginia spiraea (plants).<sup>1</sup>

When the frontier expanded through Tennessee from east to west, settlement on the Plateau was limited due to its rugged terrain, isolation from major transportation routes, limited water resources, and relatively poor soils for agriculture. Population growth occurred during the late 1800s and early 1900s when logging and mining rapidly exploited the natural resources of the Cumberland Plateau and Mountains. Nevertheless, the Cumberland Plateau in Tennessee, wedged between the two sprawling urban areas of Knoxville and Nashville, has remained predominately rural. In the past decade especially, rapid population growth has occurred around the city of Crossville on the Plateau, with an influx of retirees moving to the area for its temperate climate, scenic beauty, and golfing resort communities. The rural landscape coupled with relatively low raw land costs has made the Plateau a new target for residential development, especially for second-homes and retirees. With population growth comes increased demand for infrastructure including water supply, solid waste and wastewater management, roads, utilities, commercial and industrial development, and recreational reservoirs.

Due to its sandstone geology and hydrology, with very low stream flows in late summer, the northern Plateau is water limited. Natural streams and rivers on the Plateau do not provide year-round dependable flows for direct withdrawals, and many streams have been impounded to create reservoirs. There are well over 3,000 impoundments in the Obed River watershed alone, most of which are in Cumberland County (Bakaletz 2006). A handful of these reservoirs are for public water supply, while the majority are on private land for agricultural, recreational, or scenic uses. Impoundments strain an already water-scarce system by permanently removing instream habitat and reducing downstream flows and water quality (Baker 2006). Further stresses include point source discharges (industrial or sewage treatment plants) and stormwater runoff containing sediment and pollution from a variety of sources. The capacity of streams to assimilate these pollutants is greatly reduced when flows are low. For example, as much as 56% of the water in the Obed River has been found to originate from the Crossville sewage treatment plant during times of low flow in September (Bakaletz 2006). The impacts to water quality and quantity will only increase as development continues, and Plateau counties will face significant constraints in terms of new water supply, assimilative capacity for wastewater discharges and other pollution sources, and the required maintenance of water quality standards for varied uses such as aquatic life, recreation,

drinking water, livestock watering, and industrial use. The presence of many federally protected T&E species which rely on high water quality and suitable habitat further adds to the challenge and opportunity facing Plateau communities to find a path of sustainable growth.

This paper contributes to the ongoing cooperative effort among The Nature Conservancy, University of Tennessee (UT), U.S. Fish and Wildlife Service (FWS), Tennessee Wildlife Resources Agency (TWRA), National Park Service (NPS), Tennessee Department of Environment and Conservation (TDEC), Tennessee Tech University, and other partners to evaluate whether a Habitat Conservation Plan could be a useful and viable strategy for addressing development-related issues and impacts to T&E species in the Cumberland region. A Habitat Conservation Plan (HCP) is a tool built into the Endangered Species Act which allows for stakeholders and/or communities to work together with natural resource agencies and organizations to plan for the needs of T&E species while also allowing for appropriate development to move forward. The study area for this HCP scoping process encompasses the Emory River and South Fork Cumberland watersheds, and potential local partners include the counties of Cumberland, Morgan, Fentress, and Scott, and municipalities located therein. An HCP is a completely voluntary agreement, with self-defined binding terms, wherein stakeholders (e.g. County governments, developers, utility districts) are fundamental in developing, approving, and implementing the rules created. The Nature Conservancy, UT, and agency and research partners would provide facilitation, technical expertise and assistance, and resources to communities and stakeholders developing an HCP.

One of the constraints on development is the complicated web of federal and state laws and permitting systems which regulate resource use activities to protect water quality, habitat, T&E species and other natural resource values. A primary purpose of this paper is to describe this web, or regulatory framework, with emphasis on its role in protecting T&E species (Section 2). Challenges and limitations of the regulatory framework are discussed in Section 3. The HCP process provides many potential benefits over the traditional regulatory process which are discussed in Section 4, with reference to water supply and development considerations in the Cumberland region. Much of the information and context provided throughout the paper draws from key informant interviews with staff from TDEC, FWS, TWRA, NPS, and relevant non-governmental organizations (NGOs) conducted from February-April of 2006 (see References).

## **II. REGULATORY FRAMEWORK**

### **1. Major Federal Laws – *Of relevance to T&E species***

A brief introduction is provided here to several key federal policies which come into play in the state regulatory process and have influence over management of T&E species in the Cumberland region.

## Endangered Species Act

The Endangered Species Act (ESA) is the law by which species may be listed as endangered or threatened and afforded federal protections to prevent extinction and promote recovery of the species. The ESA aims to prevent direct harms to T&E species and to protect the ecosystems upon which they depend for survival. Section 7 of the ESA prohibits federal agencies from taking actions which jeopardize T&E species or cause destruction or adverse modification of designated critical habitat and requires agencies to consult with the FWS to avoid such actions. Section 9 of the Act prohibits anyone from harming or “taking” a listed species, including significant habitat modification. In 1982, Section 10 of the ESA was amended to allow for an “incidental take permit” to be issued to non-federal parties whose normal business or land use activities might result in unintentional take of a T&E species. In order to receive an incidental take permit, the applicant must develop a comprehensive Habitat Conservation Plan (HCP) to protect the species and its habitat, and avoid and mitigate any adverse impacts.<sup>2</sup>

## National Park Service Legislation

The regulation of water resources in the Cumberland region is shaped in part by the presence of the Obed Wild and Scenic River and the Big South Fork National River and Recreation Area, both of which are managed by the National Park Service. The National Park Service Organic Act of 1916 directs the NPS to “conserve the scenery and the natural and historic objects and wild life therein and to...leave them unimpaired for the enjoyment of future generations”.<sup>3</sup> The Wild and Scenic Rivers Act of 1968 mandates that designated rivers “shall be preserved in free-flowing condition and that they and their immediate environments shall be protected for...present and future generations.”<sup>4</sup> Section 7 of this Act, which addresses water resource development restrictions and applies to both the Obed and Big South Fork areas, states “no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river might be designated.”<sup>5</sup> Under its federal authority to protect instream flows and water quality within these park units, both for biological and recreational values, the NPS has had significant involvement in regulatory decision-making in the Cumberland region, especially with respect to new impoundment proposals in the past ten years (Bakaletz 2006).

## Clean Water Act

The Federal Water Pollution Control Act of 1972, together with subsequent amendments collectively referred to as the Clean Water Act, governs all navigable waters of the United States, as well as others. Core functions of the Clean Water Act as administered through the EPA include setting water quality standards for surface waters, regulating point sources of pollution through the NPDES permitting system, and co-regulating with the U.S. Army Corps of Engineers the discharge of dredged or fill material into waters of the United States through the Section 404 permitting system. These functions are generally carried out at the state level, as described below, provided

that state law meets the minimum federal requirements set forth by the EPA and Clean Water Act (EPA 2003).

## **2. State Regulation – *Implementation of the Clean Water Act at the state level***

This section describes the basic regulatory framework for water quality and aquatic habitat derived from federal and state laws, which are implemented at the state level. The state's regulatory authority is established through the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101).

### Water Quality Standards

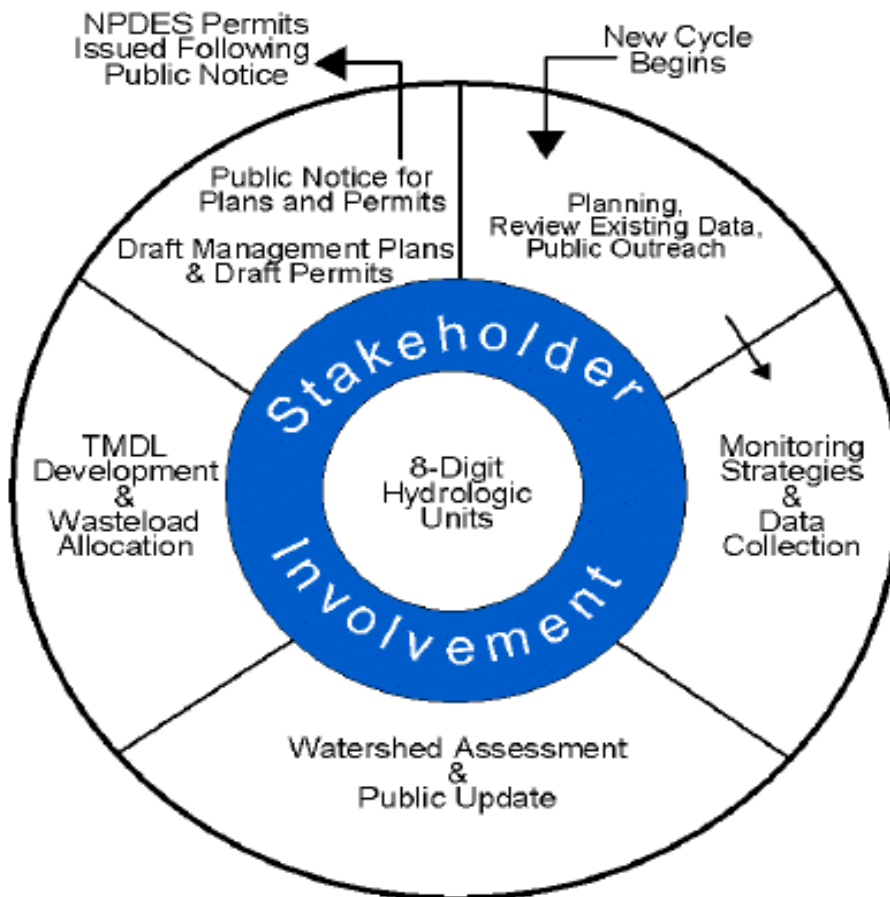
The EPA's regulation of water quality standards has three main components: designated uses, water quality criteria, and antidegradation policies. In Tennessee, these components are incorporated into state water rules which are promulgated by the Tennessee Water Quality Control Board and administered by the Division of Water Pollution Control (WPC) within TDEC. (TDEC 2006a) The state may develop more comprehensive or stringent standards than federal standards, subject to EPA's approval, but generally must provide scientific evidence that these are justifiable. Federal law requires that water quality standards be revisited every three years. Tennessee's water quality standards are currently under triennial review, and draft revisions are posted on TDEC's website for public review and comment. The revisions are currently scheduled to be reviewed by the Water Quality Control Board in September 2007, and must be approved by the Board and the EPA to take effect (Baker 2006).

The Division of WPC is responsible for assigning designated uses to all waters of the state, which in turn determine the water quality criteria that must be attained to support that use. Examples of designated uses include domestic water supply, fish and aquatic life, recreation, livestock watering and wildlife, and others. A stream or stream segment can be assigned multiple uses, but the most protective use criteria for each parameter is the basis for the standard (TDEC 2006a). The vast majority of waters in the Cumberland region must support the fish and aquatic life use, which generally requires the most stringent water quality criteria relative to other uses (Baker 2006).

Water quality criteria are descriptions of the conditions necessary in a waterbody to support the designated uses. These criteria can be numeric/quantitative (concentrations of pollutants, temperature, pH, toxicity units) or narrative/qualitative (descriptions of color, odor, visible appearance, etc.). Water quality criteria are developed and promulgated by the EPA at the national level and then adopted and implemented by the states. Again, the state may modify these criteria to make them more stringent or comprehensive but must have scientific justification to do so. If a waterbody is not meeting its given water quality criteria or not fully supporting its designated uses, it is defined as impaired or partially impaired. This distinction affects how permitting decisions are made regarding the waterbody in question (EPA 2003).

## Watershed Management Approach

In the last decade, Tennessee's Division of WPC has instituted a watershed management approach to fulfill its responsibilities in monitoring, evaluating, and regulating waters of the state. This program uses the 8-digit USGS Hydrologic Unit Codes to define 55 watershed units in the state of Tennessee and implements an ongoing 5-year management cycle of systematic assessment, decision-making, and public participation for all watersheds in the state. The end product of the 5-year assessment for each watershed is a Watershed Management Plan, which is intended to assist the Division in future permitting and management decisions for the next 5-year cycle. The watershed plans consist of a general description of the watershed, water quality assessment results including point and nonpoint sources of pollution, concerns raised in public meetings, and information on local, state, and federal management strategies. The most recent Emory River Watershed Management Plan was completed in 2002 and is available on TDEC's website.<sup>6</sup> The South Fork Cumberland watershed assessment is just being completed, and the management plan should be available in late 2006 or early 2007.<sup>7</sup>



**Figure 1:** Watershed Management Cycle from 2006 305(b) Report

The results of ongoing monitoring and evaluation of water quality in Tennessee are summarized in two biennial reports required by EPA and available to the general public: the 305(b) Report, Status of Water Quality in the State of Tennessee, and the 303(d) List of Impaired Waters. The watershed assessments focus on determining whether waters are meeting their designated use criteria or not, and on bringing impaired waters into attainment of water quality standards. Waters listed as impaired for one or more pollutants are afforded a higher level of protection, in that no additional discharges of the pollutant(s) can be permitted by the Division until water quality standards are met and ensured (TDEC 2006b). Impaired waters may require the development of Total Maximum Daily Loads (TMDLs) for the specific pollutants causing impairment. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive, from both point and nonpoint sources, and still meet water quality standards. Once a TMDL is set for a given pollutant in an impaired water, allowances to discharge the pollutant are distributed among point and nonpoint sources to bring total pollutant loadings under the TMDL and into attainment of water quality standards. The TMDL program was instituted by the EPA in 1992 to better address the pervasive problem of waters which are polluted through a combination of multiple point (regulated) and nonpoint (unregulated) sources.

It should be noted that only 50% or fewer of the stream miles in most watersheds have been assessed (TDEC 2006a). The more in-depth watershed monitoring and reporting occurs in five year cycles, so the information available from TDEC is not always the most up-to-date. At this point, the watershed management process does not encompass Tier designation or antidegradation compliance as described below.

### Antidegradation Rules

Antidegradation policies, which apply to waters meeting water quality standards, are designed to keep clean waters clean. The federal antidegradation rules establish a three-tiered system for rating and designating protections for unimpaired waters. Tier 3, or Outstanding National Resource Waters, are afforded the highest level of protection, with virtually no degradation of water quality allowed. In the Cumberland region, Tier 3 waters include the portion of Big South Fork Cumberland River within the BSF National River and Recreation Area, and portions of the Obed and Emory Rivers, Clear Creek, and Daddy's Creek associated with the Obed National Wild & Scenic River (TDEC 2006a). In Tier 2, or high quality waters, no further degradation is allowed unless certain conditions are met which are described below. High quality waters may be designated as such based on 1) presence of ecologically significant populations of aquatic or semi-aquatic species 2) recreational use dependent on high water quality, 3) outstanding scenic or geologic values, or 4) exceedance of water quality standards.<sup>9</sup> Segments of streams or rivers with known occurrences of state or federally listed T&E species must be designated as Tier 2, as must be those flowing through state or federal conservation lands (Baker 2006). Waters not designated Tier 3 or Tier 2 are evaluated on a parameter-by-parameter basis (Tier 1). For example, degradation from a specific pollutant may be allowed if there is additional assimilative capacity for that pollutant, but denied for a

different pollutant which is at or beyond the maximum set forth by the criteria. The degradation is allowed if it is determined to be in the public interest, with no non-degrading alternatives available, and causing no violation of water quality standards (TDEC 2006a).

Antidegradation rules are the primary source of regulatory protection for aquatic and semi-aquatic T&E species in Tennessee. The Division of WPC cannot issue a permit which would cause degradation to a Tier 2 stream, unless the permit applicant can sufficiently prove 1) socioeconomic necessity, 2) no reasonable non-degrading alternatives exist, and 3) water quality standards will be met (Baker 2006). This determination and its relevance for T&E species is described in more depth in the following section on permitting systems. The draft revisions to the state’s water quality rules are currently up for public comment as part of the triennial review process.<sup>10</sup> Specific proposed changes to the Antidegradation Statement include a shift from identifying waters by tier (Tier 2, Tier 3, etc.) to the categories Outstanding National Resource Waters (afforded Tier 3 protections) and Exceptional Tennessee Waters (afforded Tier 2 status plus some additional protections). All other waters (formerly “Tier 1”) would be identified as available or unavailable for receiving additional pollutant loadings on a parameter by parameter basis. These revisions, if formally adopted, would obviously change the language used to discuss antidegradation policy and raise new implementation concerns for water quality protection (Hoyos, Palmer 2006).

## Antidegradation Categories

| Category   | Protections   |
|--|---|
| <b>Tier I</b>  | Existing uses will be maintained by application of the general water quality criteria. Additional loadings of specific pollutants cannot be allowed if the water quality standard for those substances is currently being violated. Degradation can be allowed if the water has assimilative capacity, but only if non-degrading alternatives are unavailable. The degradation must be in the public’s interests. |
| <b>Tier II</b>   | No degradation will be allowed unless and until it is demonstrated that a change is justifiable as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters.   |
| <b>Tier III<br/>(Outstanding<br/>National Resource<br/>Waters)</b> | These constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges and waters of exceptional recreational or ecological significance. No degradation will be allowed in these waters (Table 1).  |

**Figure 2:** Tier designations from 2006 305(b) Report, TDEC.

### **3. Permitting Systems – *Implementation of laws and regulations through permits***

There are several environmental permitting systems administered by TDEC's Division of WPC which are authorized through the federal Clean Water Act and the Tennessee Water Quality Control Act. In addition, the U.S. Army Corps of Engineers administers the Section 404 permitting of dredge and fill operations under the Clean Water Act. The permits described below are those which are most relevant to development and water supply projects which may impact T&E species in the Cumberland region. Permits issued are either general or individual. General permits typically use standardized language and requirements to cover a category of activities considered by the agency to result in relatively minor impacts. Individual permits are required for projects or operations with more significant impacts and often include site-specific language and requirements to be met by the permit holder.

#### ***FEDERAL***

##### **Corps Section 404 permit & 401 certification**

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers is authorized to regulate the discharge of dredged or fill material into navigable waters of the United States through its Section 404 permitting system. Section 404 permits broadly include nationwide, regional, and state general permits, which streamline the review and processing required for certain categories of activities considered to have minimal adverse impacts. Individual permits are issued for activities with potentially significant impacts, and are to be reviewed and evaluated more thoroughly by the Corps than general permits.<sup>11</sup> When a Section 404 permit application is received, the Corps must first determine whether it has jurisdiction over the waters in question, and then decide whether the activity is covered under a general permit or requires an individual permit. Ephemeral and intermittent streams, wet-weather conveyances, and other small or isolated water bodies may not be considered navigable waters of the United States, and therefore would not be under Corps jurisdiction or subject to Section 404 requirements – though this determination is currently under review by the EPA and the Supreme Court. Section 401 of the Clean Water Act stipulates that before permitting a discharge to waters of the United States, federal agencies must first obtain certification from the state that the permitted action will not violate state water quality standards. Thus, all Corps-issued Section 404 permits must receive 401 certification from the Division of WPC.

The Corps general and individual Section 404 permits are administered through District offices in Nashville and Memphis. Typically, review of these permit applications tends to be more expedited than state water quality certification and permits through the Division of WPC. Thus, although the Clean Water Act requires 401 certification first, in practice the Corps will often review and issue a Section 404 permit to an applicant, on the condition that the applicant receives 401 certification from the state before beginning the work (Bay 2006). The Corps is required to give public notice for Section 404 permits on its website, followed by a 30-day public comment period. Agencies such as the FWS can make recommendations or raise concerns at this time, to be considered by the Corps in making their decision to issue or deny the permit. As with the state's public comment

periods, it should be noted that agencies have no more legal authority in the process than that of any commenting citizen. However, when issues with legal liabilities are raised – such as impacts to T&E species or to NPS park resources – agency comments may carry greater weight in the permitting agency’s decision-making (Bay, Bakaletz 2006). Because Corps permits are federal actions, the section below on ESA consultation requirements applies.

#### TVA – Section 26a permit

Under Section 26a of the TVA Act of 1933, construction activities along the shoreline and in waters of the Tennessee River system require the prior approval of TVA. Through its Section 26a permit system, TVA reviews over 2500 construction proposals a year to make sure that shoreline construction is compatible with its integrated river management goals, including flood control, power generation, recreation, navigation, and water quality. A water supply project for the Cumberland Plateau which proposes to draw water from the Tennessee River system (e.g. from Watts Bar or Nickajack reservoirs) would require TVA involvement and most likely a Section 26a permit. Also, because the Emory River drains to the Tennessee River system, TVA has some degree of interest and jurisdictional authority in the watershed. Section 26a permit approvals are considered federal actions and are subject to NEPA and ESA consultation requirements.<sup>12</sup>

#### ESA Section 7 Consultation Requirements

If a federal agency is involved in funding, permitting, or carrying out a project, consultation with the FWS is required under Section 7 of the ESA. These consultation requirements would come into play for most water supply projects which involve federal funds from Rural Development or the Corps of Engineers. It also applies to Corps-issued Section 404 permits or TVA-issued Section 26a permits. Consultation also occurs between the EPA and FWS when the EPA reviews state water quality standards every three years, and at the national level, FWS consults on EPA’s water quality standards and on general permits issued by the Corps and the EPA (Alexander 2006).

The Section 7 process generally begins with informal consultation, and if the action is determined likely to adversely impact a listed species, formal consultation must be initiated. Typically, the first step in informal consultation is that the federal agency (identified simply as “agency” in subsequent text) contacts the local FWS office to determine whether T&E species are present in the action area. If no species are present, or the agency determines that its actions will have no effect on the species, then no further consultation is required. However, if the agency concludes that its action may affect a listed species (positively or negatively), it conducts a biological assessment to determine whether or not the impact is likely to be adverse. If the agency concludes from the assessment that the action is not likely to cause adverse affect, and the FWS provides concurrence in writing, there is no further consultation requirement. During this informal consultation process, the agency and FWS may work together to modify the project to minimize or eliminate adverse impacts so that formal consultation is not necessary. If through the biological assessment and informal consultation, the action is found likely to

adversely affect a listed species, the agency must initiate formal consultation with the FWS in order to move forward with the project (Widlak 2006).

Formal consultation can take up to 135 days (or longer by mutual agreement), during which the FWS writes a biological opinion on whether the action is likely to jeopardize the existence of the species or result in destruction or adverse modification of designated critical habitat. A jeopardy or adverse modification opinion from the FWS may include reasonable and prudent alternatives to the proposed action that would avoid jeopardy or adverse habitat modification. The FWS may consult with the agency and/or permit applicant to develop these reasonable and prudent alternatives. A biological opinion concluding that the action is not likely to cause jeopardy or adverse modification of critical habitat will include a set of implementing terms and conditions to minimize incidental take of the species. The terms included in this incidental take statement (ITS), known as reasonable and prudent measures, are non-discretionary and binding in order for the agency (or permit applicant) to be protected from take which may occur during the project. The biological opinion concludes formal consultation requirements, and the agency/applicant must then decide whether to go ahead with the project as proposed, adopt the alternatives or conditions of the FWS opinion, abandon the project, or resubmit an alternative proposal. Consultation may need to be reinitiated if new information is obtained about the project's effect on a listed species, if the project is modified from the proposal that was considered, or if a new species listing or critical habitat determination occurs in the action area of the project.<sup>13</sup>

## *STATE*

The following permitting systems are administered at the state level in Tennessee - some stemming from federal and others from state mandated authority - and hold particular relevance to water supply and development issues in the Cumberland region: Aquatic Resource Alteration Permit (ARAP), National Pollutant Discharge Elimination System (NPDES) permits, Inter-Basin Transfer Permit, and Division of Water Supply's Safe Dams Construction Permit.

### Aquatic Resource Alteration Permit (ARAP)

The Tennessee Water Quality Control Act establishes a statewide permitting system for activities which cause physical alterations to waters of the state. Examples of activities requiring an Aquatic Resource Alteration Permit (ARAP) include water diversions or withdrawals, modifications to channels or banks, road and utility crossings, and impoundments. There are general ARAPs for the following categories of activities considered to result in minor impacts, which are issued by TDEC at the local field office level.

- Alteration of wet weather conveyances
- Bank stabilization
- Construction and removal of minor road crossings
- Construction of launching ramps and public access structures
- Construction of intake and outfall structures

- Emergency road repair
- Maintenance activities
- Minor alterations to wetlands
- Minor dredging and filling
- Sand and gravel dredging
- Sediment removal for stream remediation
- Stream restoration and habitat enhancement
- Surveying and geotechnical exploration
- Utility line crossings
- Wetlands restoration and enhancement

Individual ARAPs are required for projects with more significant impacts, such as water withdrawals, impoundments, and other larger alterations. Individual ARAPs are administered through the central TDEC office in Nashville, with the exception of ARAPs for surface mining which are processed by the Knoxville field office. Many activities which require an ARAP also require a Corps Section 404 permit for dredge and fill. In these cases, a 401 certification is issued through the same application process as the ARAP.

To apply for coverage under a general ARAP, the ARAP application must be submitted to the local field office along with the basic information required in the permit. The local field office reviews the application for completeness, and if there are no concerns about the project, issues the applicant a Notice of Coverage under the conditions of the general permit. This generally takes about three to four weeks, and there is no public notice or comment involved. If the field office determines that the activity does not qualify for general permit coverage, then the permit application must be processed by the central office in Nashville, as are all other individual ARAPs.<sup>14</sup>

In order to issue an individual ARAP, the Division of WPC must first determine whether the impacted waters are either impaired or listed as a high quality or Outstanding National Resource Water (Tier 2 or 3). If an assessment has not already been made for the waters in question, the local field office must collect physiochemical and biological data to make a Tier determination. The Division may obtain information on federal and state-listed and other rare species of concern from TDEC's Division of Natural Heritage which maintains a comprehensive database of species locations, and also possibly from FWS or TWRA. The permit writer takes this information into account and also works with the applicant to ascertain whether the proposed activity would cause degradation to the waters in question. For an activity such as an impoundment, the permit applicant must be able to prove that there will be no degradation to waters downstream (water quality, instream flow, habitat) or else antidegradation rules apply. If degradation will occur, the applicant must provide a socioeconomic and alternatives analysis to demonstrate 1) socioeconomic necessity and 2) no non-degrading alternatives exist. The applicant also must demonstrate that impacted waters will meet water quality standards for their designated uses. These basic requirements apply to both Tier 1 and Tier 2 streams. However the analyses that must be provided by the applicant for degradation of a Tier 2 stream must be more comprehensive and rigorous. If the Division determines

that the applicant has fulfilled these criteria, it may issue an ARAP which could cause degradation to a Tier 2 or Tier 1 water. Normally, individual ARAPs on streams require some amount of stream mitigation, either conducted by the permittee or paid for through Tennessee's Stream Mitigation Bank, to offset the impacts of the permitted activity (Baker, Eagar 2006).

Antidegradation rules set up a protocol for heightened public review and participation in permitting decisions involving degradation. Public participation requirements apply both to TDEC's decision on whether the proposed degradation is warranted by socioeconomic and alternatives analyses and to TDEC's decision on whether to issue the permit, and under what terms (Eagar 2006). Public notice during the stages of the permitting process is issued on TDEC's website and sent via post to interested parties across the state who have identified that they would like notice. The permit applicant is also required to place a Division-approved public notice in the local newspaper and post a placard near the project site. Public notice initiates a 30-day comment period during which the Division receives comments from the general public and interested NGOs and agencies (Baker 2006). The comment periods are the only formal opportunity for the FWS, TWRA, NPS and other groups to make a statement regarding the impact of the proposed activity and a recommendation on whether a permit should be issued, denied, or denied unless certain conditions are met. The Division reviews the comments and if significant issues or information needs are raised, may extend the review process by placing the application in pending status (Bay 2006). During the public comment period, if a public hearing is requested and there is significant public interest in the issue, the Division must provide one. When public review and final supervisory review is complete, the Division makes the decision to issue or deny the permit. Both the determination that degradation is warranted and the subsequent permitting decision can be appealed by any interested party who has participated in the public comment process. Appeals result in a hearing of the case by the Water Quality Control Board, and a final decision on the permit issuance (Eagar 2006).

#### National Pollutant Discharge Elimination System (NPDES)

NPDES is a federal permitting system under the Clean Water Act which regulates discharges to surface waters from point sources. The state of Tennessee has been granted primacy by the EPA to administer NPDES permits through TDEC's Division of Water Pollution Control. Direct dischargers to surface waters, including point sources of wastewater from industrial, commercial, or municipal sources, mining operations, and Concentrated Animal Feeding Operations, are required to apply for an individual NPDES permit. Industries sending wastewater to a public sewer system (POTW - publicly owned treatment works) are considered indirect dischargers, and require a discharge permit from the local POTW instead of an NPDES permit. NPDES permits typically set effluent limits for relevant pollution parameters and require monitoring and reporting to ensure that water quality standards are being met downstream from the discharge. Individual NPDES permits are administered through the central TDEC office and Nashville, and require a public notice and comment period during which the EPA, agencies and organizations, and the general public can comment on the draft permit. The permit

application process may take from six to twelve months to complete, or shorter for minor facilities.<sup>15</sup>

The first two decades of Clean Water Act implementation focused almost entirely on reducing and regulating point sources of pollution through the NPDES system. In recent years, EPA's programs have expanded in an attempt to better manage nonpoint source pollution through TMDLs, stormwater management permits, and other assistance programs. In fact, stormwater from most municipal storm sewer systems (MS4s), construction and industrial sites is now considered a point source discharge, and regulated through NPDES general permits.<sup>16</sup> General permits are typically approved in an expedited process, wherein applicants send the local TDEC field office a Notice of Intent to conduct their activities under the terms of the general permit, and the Division responds with a Notice of Coverage. The public notice and participation for general permits happens at the statewide level when a general permit to cover a category of activity is initially drafted or revised (Qualls 2006). For individual applicants under a general permit, The Notice of Intent may be posted on TDEC's website or sent in a master list of draft permits to agencies such as FWS for their review and comment/consultation (Alexander 2006). However, there is no formal public notice or comment period required of applications for general permit coverage. Because of their relevance to development issues in the Cumberland region, the Small MS4 General Permit and Construction Stormwater General Permit are described in more detail below.

In deciding whether to permit a discharge and under what terms, the Division of WPC must determine whether the receiving water will meet water quality standards for its designated uses. Impaired waters are protected from further loadings of specific pollutants, and TMDLs may apply. High quality waters are subject to the antidegradation rules and criteria discussed earlier. Under the Watershed Approach, NPDES permits are issued for a term of 5 years, and reapplication for permit coverage and revisions to general permits occur with public notice during the 5<sup>th</sup> year of the watershed management cycle.<sup>17</sup>

#### NPDES MS4 Program – Phase 2 (Municipal Separate Storm Sewer Systems)

In an effort to better address nonpoint source pollution from stormwater runoff, the EPA has implemented a stormwater management program which requires municipalities of a certain size to obtain NPDES permit coverage for their storm sewer systems (MS4s). Phase 1 of the program, promulgated in 1990 under the Clean Water Act, covered medium and large-sized municipal systems with populations over 100,000. Phase 2 extends stormwater management requirements to smaller urbanized areas (generally >10,000 population).<sup>18</sup> In February of 2003, Tennessee issued the Small MS4 General Permit under which Phase 2 MS4s can apply for coverage<sup>19</sup>. The posted list of Phase 2 MS4s in Tennessee includes no municipalities within the 4-county Cumberland HCP study area.<sup>20</sup> However, the city of Crossville has recently expanded its population beyond 10,000 and will have to develop a stormwater management plan under MS4 Phase 2 requirements.<sup>21</sup>

The Small MS4 General Permit involves six minimum controls which must be addressed: 1) Public Education, 2) Public Participation, 3) Illicit Discharges, 4) Erosion and Sedimentation (Construction), 5) Post Construction Pollution, 6) Municipal Housekeeping/Pollution Prevention.<sup>22</sup> The means and tools to enact these controls are chosen at the discretion of local and county governments to enable flexible implementation (Hoyos 2006). The MS4 permit requires the stormwater management plan to take into account T&E species in the proximity of the MS4 and to ensure that discharges covered under the permit will not result in take, jeopardy, or critical habitat destruction of a listed species. The University of Tennessee's MTAS (Municipal Technical Advisory Service) and Water Resources Research Center are two of the primary resources listed on TDEC's website for assisting communities with MS4 requirements. Also, the Tennessee Clean Water Network and Cumberland River Compact have extensive experience with stormwater issues, and could possibly provide technical assistance and training to communities in the Cumberland region in developing an MS4 program (Hoyos 2006).

#### NPDES Storm Water Construction General Permit

As of March 2003, operators of construction sites that disturb one or more acres must apply for coverage under the NPDES Storm Water Construction General Permit (CGP). Permitted activities have included construction of residential subdivisions, commercial and industrial buildings, golf courses, sewage treatment plants, utility lines, and roads. The permit applicant must submit a map of the site and receiving waters to the Division of WPC, and prepare a site-specific Storm Water Pollution Prevention Plan (SWPPP).<sup>23</sup> The SWPPP identifies potential sources of stormwater pollution from the site and should describe in detail the best management practices (BMPs) which will be implemented to minimize pollution and comply with conditions of the permit. There is a comprehensive set of guidelines for SWPPP's in Part 3 of the CGP. The CGP cannot authorize activities which would contribute to the impairment of a listed impaired water, or cause degradation of a high quality water (Tier 2). Therefore, high quality waters (which include areas with T&E species) and waters listed as impaired by sediment require additional protective measures to be incorporated in the SWPPP plan, such as a 60 foot riparian buffer zone and more frequent site inspections (Qualls 2006).

The SWPPP is in effect and fully enforceable until the construction site has been stabilized, at which point the permit is no longer required. The permit does not allow for any construction activities which violate water quality standards – if the Division determines a violation has occurred, there is a series of steps the permittee must take to correct the situation. The fee for permit violation is up to \$10,000 a day per violation, up to \$25,000 maximum. It should be noted that the CGP is a self-monitored permit. The permittee is required to do regular site inspections and report periodically to the Division on their SWPPP implementation. These inspections are to validate that BMP measures are in place, but do not include analytical monitoring to assess water quality impacts. There is no site inspection regime in place for the Division to monitor compliance, so violations are generally only discovered through citizen complaints or by TDEC staff while they are working in the field (Qualls 2006).

## Inter-Basin Transfer Permit

The Inter-Basin Transfer Permit was instituted in 2000 as a means for regulating transfers of water between major river basins. As water supply concerns and conflicts over water rights have arisen in the Southeast over the last decade, the need for new policies to proactively address these issues has emerged (Feldman 2001). Tennessee's Inter-Basin Transfer Act was passed in 2000 by the state legislature to allow for review and evaluation of potential water transfers by TDEC and the general public before they are approved. This provides a process for riparian conflicts to be addressed early on, before damage is done, and perhaps in lieu of litigation. The inter-basin transfer rules apply to potential inter-state transfers (eg. from Chattanooga to Georgia) as well as intra-state transfers (eg. from Center Hill Lake/Upper Cumberland basin to Crossville/Upper Tennessee basin). Any water supply projects in the Cumberland region which propose to transfer water between basins would require an Inter-Basin Transfer Permit and be subject to the public and agency review process it entails.<sup>24</sup>

## Division of Water Supply Requirements

TDEC's Division of Water Supply oversees safe dam construction rules, public water system approvals, and water withdrawal information, among other functions. The Certificate of Approval and Safety is required in order to construct, remove, alter, or operate a non-federal dam that is at least 20 feet high or holds 30-acre feet or more of water at maximum pool.<sup>25</sup> This permit is not required for farm ponds. The approval process does not involve environmental review, but rather a technical review to ensure that dams meet certain safety and engineering standards. A dam covered by this permit would still require an ARAP and/or Corps Section 404 permit with 401 certification.<sup>26</sup> The Division of Water Supply also must approve new public water systems, for example if a school or subdivision were to develop its own water system from a well, spring, or surface source, separate from a utility district. The Division reviews engineering and construction plans, requires testing for drinking water, and ensures that standards are met.<sup>27</sup> The Water Resources Information Act was passed in 2002 to enable the state to better track water use and significant withdrawals, and manage resources to prevent from over-utilization especially in critical times of drought (T.C.A. Section 69-8-103). This law requires that water withdrawals of 10,000 gallons or more on any day be registered with the Division of Water Supply.<sup>28</sup>

### **III. LIMITATIONS AND CHALLENGES - *Of regulatory approach to T&E Species***

The regulations and permitting systems described above serve an important function in the behemoth task of trying to keep waters clean and safe for multiple functions, in the face of a daunting array of impacts, pressures, and threats. They help protect a baseline of standards and values. However, they are not necessarily adequate or well-suited for addressing the complex challenges we face in managing for watershed health, biodiversity, and protection of T&E species. Specific limitations and challenges of the regulatory approach with regards to T&E species are discussed below.

## Fragmentation & Uncertainty in Decision-Making

Permitting decisions must be made on an individual, case-by-case basis, looking primarily at direct impacts of the regulated activity on receiving waters. However, many fish, mussels and other aquatic life which require relatively pristine, sediment-free waters with natural flow regimes face multiple stresses from upstream water withdrawals and impoundments, wastewater discharges, and stormwater runoff from urban areas, construction sites, mining and forestry operations, and agricultural land. These species may be able to handle most of these impacts most of the time, but a low-flow, high pollutant load period in September or a high-flow, sediment-laden flooding in April could mean death. The effects of these cumulative, watershed impacts are not well understood, monitored, or modeled to ensure that T&E species are adequately protected. Interviews with TDEC permit writers, natural resource agency permit reviewers, and NGO professionals alike echoed this common concern about cumulative impacts. How much sediment is too much? How much flow is too low (from withdrawals) or too high (from impervious surfaces)? What are the cumulative thresholds beyond which take or jeopardy of a T&E species may occur? How do we know whether this small reservoir or that new commercial development will take a species over its edge? We do not know these things conclusively, though our scientists are trying, and in the meantime, permitting decisions must be made. Although a permit writer may follow all procedures to avoid degradation of T&E species habitat, there is no assurance that the permit will be protective enough, given the multiple known and unknown stresses from cumulative impacts.

Under TDEC's regulation of water quality, additional protection and consideration are afforded to T&E species through the Tier designation process and antidegradation policies. While on paper these rules might seem to provide ample protection, there are limitations in the implementation of this process. Currently, designation of Tier 2 waters and protections for T&E species are based more narrowly on stream segments with point locations of known occurrence of T&E species, rather than the broader areas of suitable habitat where T&E species might occur. Fish move freely beyond these point locations and into smaller tributaries which may not be afforded the same protections. Furthermore, rare aquatic species may certainly be present in similar habitat areas which have not been fully assessed by biologists. Far removed permitted impacts to water quantity or quality upstream may degrade T&E species habitat, but are not likely to be considered in the project boundaries of the permitting decision. The TWRA recently completed a comprehensive State Wildlife Action Plan (SWAP) which demonstrates areas of priority and suitable habitat for federal and state T&E species, as well as other rare species and wildlife. Work is needed to format the SWAP data into an accessible resource which agencies and the public can use for better understanding and management of T&E species. As it becomes available, this information should expand the knowledge base for decision-making and be integrated into TDEC's process of Tier designation, permitting, and watershed management (Palmer 2006).

Theoretically, if there was a GIS map showing the locations of all permitted impacts (general and individual, ARAP and NPDES, etc.) we might be much closer to understanding and planning for cumulative impacts to T&E species. We could plug in

the numbers of expected discharges, flow alterations, pollutant loadings, etc. from each permit location, and model the impacts to habitat 1 or 10 or 100 miles downstream. This would enable more quantitative, objective, and transparent decision-making on whether or not to issue a permit, or what the terms of the permit should be. Under the Watershed Approach, TDEC is working towards more systematic collection of water quality data and assembling these data using GIS systems. However, TDEC has a long way to go before a comprehensive GIS database integrating ARAP, NPDES, and water quality data will be available for use in modeling and decision-making. Currently, there are no GIS layers available to resource agencies and the public depicting which stream segments are designated Tier 2 and Tier 3. There are GIS data available on impaired stream locations, monitoring locations, and individual NPDES permit sites, but the information available publicly is only as up-to-date as the most recent 5-year assessment for that watershed. TDEC is at some stage in the process of integrating its various data into a GIS system, but the task is complex and gargantuan. Nonetheless, given the need to better evaluate how permitting decisions and management actions are impacting water quality and T&E species, development of a comprehensive, accessible GIS database should be a high priority.

A data-oriented, modeling-based approach might help us substantially in better analyzing and predicting cumulative impacts, but applying them to the landscape will require a flexible and experimental approach. This type of approach, where decisions about an ecological system are made, monitored, evaluated, and then adjusted based on an ongoing cycle of feedback, is known as adaptive management. The regulatory system whereby EPA develops water quality standards to be implemented as law for the entire country leaves little room for adaptive management. For example, the standard toxicity test organisms used by EPA to develop water quality criteria (e.g. fathead minnow, *Ceriodaphnia*) may not be as sensitive as T&E species (Alexander 2006). Therefore, even streams meeting water quality standards for the fish and aquatic life use may not be suitable habitat for T&E species. States are allowed to modify standards to make them more protective at the local level if there is sufficient scientific justification to do so. This is exemplified in the Division of WPC's current triennial review process, in which input from agencies like the FWS and NGOs have resulted in proposed revisions strengthening protections for T&E species and instream flow (Alexander, Palmer 2006). Such adaptations do not come quickly or easily though, and "tightening" regulations from above is often met with resistance from regulated constituents.

### Political & Institutional Challenges

Beyond the scientific and technological limitations, permitting systems are constrained by political and institutional factors. As is common with top-down, command-and-control regulation, an adversarial dynamic develops between the regulator and the regulated, and between those who want stricter rules and those who want fewer rules. The regulated push for easier permits with fewer requirements, environmental groups and agencies push for greater protections, and TDEC in the middle aims to implement the laws given these pressures. There are times when protection prevails, as has occurred with several utility district proposals for new water supply impoundments

on the Cumberland Plateau which have been denied in recent years. And yet interviewees both within and outside of TDEC spoke of the significant political pressure not to say “no” very often in the permitting process. Because of these pressures, permitting decisions are made which may not be in the best interest, or adequately protective, of water quality, aquatic habitat, and T&E species. At the same time, using T&E species as sole justification to deny a permit can be counterproductive when it enflames “people vs. fish” conflicts and creates negativity around species protection. As one permit writer noted, protecting water quality provides multiple benefits to people (as well as T&E species) and permit decisions which protect T&E species may be better justified on these more universal grounds. (Baker 2006)

The permitting process holds difficulties for all parties involved. Permit applicants from the start may not have a clear sense of what information is needed, how to design a project to minimize impacts, and what kinds of projects (or locations) are more likely to get permitted than others. This can create an adversarial negotiating environment between the permit applicant and permit writer, where the applicant’s objective is to prove it will not cause degradation and win the permit, and the permit writer tries to hold firm to his or her sense of the rules and what is protective (Baker 2006). The permit writer and applicant do not always have clear guidelines and procedures for the socioeconomic and alternatives analyses required by antidegradation rules, which makes decision-making less transparent and more legally vulnerable (Eagar 2006). The permit writer has to be ready to defend in court whatever he/she allows, requires, or denies, if the decision is appealed. With backgrounds and focus on scientific and technical matters surrounding water quality, TDEC staff are not necessarily equipped to evaluate the socioeconomic analyses which are submitted to justify a project causing degradation. Projections of socioeconomic costs and benefits and the range of alternatives considered in these analyses can obviously be skewed in favor of the project they are aiming to justify, as was demonstrated in a recent critique of the economic analysis used for a new water treatment plant in Bon Aqua, TN.<sup>29</sup> Fortunately, antidegradation rules make these analyses and agency decisions available for third party scrutiny and appeal, but this both places the burden of proof on the public and also magnifies the adversarial, litigious quality of public decision making. All of these challenges point to the reality that permitting systems are one tool to align resource use and impacts with water quality standards, but they are not sufficient for grappling with the complex, landscape-level pressures, constraints, and trade-offs facing local communities (Baker, Eagar 2006).

Once permitting decisions are made, with the exception of individual NPDES permits with analytical monitoring regimes, there is very little follow up to determine whether the permit is serving its function adequately (protecting water quality and habitat) or even being followed. This gap in implementation capacity was raised as a primary concern in interviews with regulators, resource agencies, and NGOs alike. A major problem is that TDEC does not have the staff or resources (or political mandate, some might argue) to effectively track compliance for the extensive, perpetual list of permitted activities. Further, TDEC has no standardized enforcement program in place, a problem cited by agency audits conducted by the Comptroller of the Treasury in 2000

and 2005, and some argue that it underutilizes sanctions such as fines which could help to deter water quality violators (Hoyos 2006). Resources within the Division of WPC are not allocated toward tracking and enforcing permit compliance, with the exception of following up on citizen complaints. This reality begs the question, what use is a well-intentioned permit with even the best protective measures if its terms are disregarded and there is little threat of sanctions? As a chain is only as strong as its weakest link, a permitting system is only as effective as its enforcement capacity.

The bottom line is, a small group of TDEC staff, buried in permit applications and procedural requirements, cannot be expected to hold the big picture of what is happening and what needs to happen in the Cumberland region. This holistic decision-making process, wherein environmental constraints are weighed in with socioeconomic goals to find a sustainable path of development, must happen at the local level. It needs to be informed by and aligned with regulators, resource agencies, and NGOs, but the capacity for resource planning and decision-making to protect water quality, biodiversity and T&E species must be built at the local level. Many rural communities do not have the support of resource planners, information systems, technical training, and public education to shift towards lower-impact project design and implementation and proactive planning. These capacities can be better fostered through a collaborative approach, drawing on relevant expertise and information from cooperating agencies, organizations, and research institutions.

#### **IV. CONSIDERATIONS AND OPPORTUNITIES - *for an HCP Approach***

##### Potential Benefits of an HCP Approach

Many of the challenges and limitations of the traditional regulatory approach to T&E species could be better addressed through a Habitat Conservation Planning process. HCP planning brings together scientific and technical expertise, information and funding resources, and interagency collaboration to address problems at the *local scale*. As an agency with finite resources responsible for regulating multiple resources across the entire state, TDEC has very limited ability to work proactively at the local level. Agencies like the FWS and TWRA are similarly stretched across statewide responsibilities, and differing jurisdictional authorities and mandates sometimes challenge interagency collaboration. An HCP process targets the attention and resources of agencies towards a more comprehensive, cooperative, and proactive effort to support communities in addressing localized problems.

As mentioned above, the effectiveness of current regulations and permitting systems in protecting water quality and T&E species is constrained by many factors, including but not limited to: fragmented permit-by-permit decision-making, limited scientific understanding of cumulative impacts, confusing and/or adversarial nature of permitting process for participants, and weak oversight/enforcement capacity of regulating agencies. An HCP could address these challenges in several ways:

1) *More comprehensive and science-based* - Enhanced cooperation and funding for research, monitoring, analysis, and modeling would yield a clearer understanding of T&E species needs and responses to specific and cumulative impacts at the watershed level. This would aid planning and decision-making at the local level, and provide a common, up-front understanding of what kinds of projects are likely to be permitted, and what constraints exist. It would assist agencies involved in permitting decisions by providing a common basis of “best available science” and more consistent guidelines for minimizing impacts of permitted activities.

2) *More adaptive and flexible* – HCPs must be designed with an adaptive management component, so that the impacts of policies and decision-making can be effectively monitored and evaluated over time, and adjusted based on what’s happening on the ground. This helps ensure that investments in conservation planning are meeting the desired goal, and if not, allows for modification.

3) *More collaborative and empowering* - The HCP process rearranges the typical adversarial regulator vs. regulated dynamic by allowing local stakeholders to help create and consent to whatever new policies are developed, and involving them directly in the implementation. This shifts decision-making from an “us vs. them” struggle towards a “we’re all in this together” forum where win-win – or at least mutually acceptable – strategies can be crafted. All parties involved learn new information and technical tools to minimize impacts, and the permitting process hopefully becomes less uncertain, and more straightforward, consistent, and transparent.

4) *More locally implemented and enforced* – TDEC and the Corps may never have the ability to adequately monitor and enforce all the general and individual permits they issue, even if they succeed in developing an enforcement program. Through the process of developing and implementing an HCP, awareness and capacity are built at the local level to monitor land use activities and enforce rules and policies. Most rural communities do not necessarily have resources and expertise devoted to local environmental planning and oversight, and do not have local ordinances to support conservation and sustainable development goals. Through the learning process of developing an HCP, local governments and communities are empowered to play a stronger stewardship role, which includes ensuring that resources are protected and imposing sanctions on irresponsible actions that undermine community goals. The HCP that is developed must spell out procedures for ongoing monitoring, management, and enforcement by the HCP holder, as well as provide funding assurances that the resources needed to carry out the plan are available.

### Water Supply Considerations

One of the main constraints to further growth and development in the Cumberland region is the provision of adequate water supply. Due to the hydrology of the Cumberland Plateau, natural stream flows are not a dependable source of water using consistent withdrawals. Stream flows throughout Plateau watersheds are lowest in August-September, and there are a number of streams draining over 100 square miles that

at times cease to flow. In 1997, six independent water utility districts in Cumberland County signed a letter wherein they committed to work collectively to find a regional water supply reservoir for the county. The Corps of Engineers (Nashville district) completed an options analysis in 1998 which provided a preliminary survey of construction costs, estimated yields, environmental and other considerations for several possible water supply scenarios.<sup>30</sup> In 1999, several communities in the area formally joined together in a compact known as the Cumberland Plateau Regional Water Authority. According to the compact, “the purpose of the authority is...to plan and develop the water resources of the geographic region and to provide necessary wastewater collection and treatment...to secure economic benefits to the geographic region that it encompasses”<sup>31</sup> Since there has been opposition to new water supply impoundments on the Plateau for environmental reasons, one incentive for a regional approach is to pool resources for the successful permitting and funding of a larger water supply project bringing water from off the Plateau. (Feldman and Elmendorf 2000) Such collaborative efforts constitute an effort towards “regionalization” which has been defined as “placing a greater emphasis on regional water demand (and supply) assessments in order to broaden available options, reduce costs upon a single community or district, minimize adverse environmental impacts, and...build political consensus” (Feldman and Albertson 2003).

In reviewing permit applications for water supply projects, TDEC favors proposals which are regional in scope, as these are typically the most cost-effective and least environmentally damaging (Baker 2006). Some environmental NGOs have also been working with Rural Development, the federal agency which funds most water supply projects, to encourage giving priority to regional projects, for similar reasons (Palmer 2006). Nonetheless there are significant political obstacles which have thus far prevented a successful regional water supply project from moving forward. Differing interests and/or approaches exist regarding how to move forward in addressing water supply for Crossville and Cumberland County (Baker, Bay 2006). In the past, most of the utility districts serving areas outside of Crossville bought their water from the city of Crossville. There has been growing concern among utility districts about water prices and future water supplies. These concerns are a main reason that the Regional Water Authority formed in 1999 has since dissolved. Several utility districts in the past five years or more have submitted various proposals to develop their own water supply sources, many of which have been rejected by TDEC on the basis of cost-effectiveness (lacking), environmental impacts, and the presence of better alternatives (buying water from an intact system) (Baker 2006).

The Corps is currently working on the Cumberland County Water Supply Project, which will pick up where the options analysis left off and provide a more complete and formal evaluation of water supply options, culminating in an agency preferred alternative. This project will involve a detailed water needs analysis, an environmental impact statement (EIS) covering alternatives considered, and consultation with the FWS under Section 7 of the ESA and Fish and Wildlife Coordination Act requirements. Water supply alternatives to be considered include raising Meadow Park Lake Dam (City of Crossville’s current supply), building a pipeline from the Tennessee River or a reservoir

on the Cumberland River system, new impoundments, water conservation measures, and possibly others.<sup>32</sup> The Corps' study aims to bring the City, County and utility districts back to the table to continue the search for a regional water supply solution. If the city of Crossville were to implement a large water supply project, aiming to continue selling water to other utility districts on its own terms, there may be a lack of desire to participate from the other districts seeking out independent water supply projects. Furthermore, it seems unlikely that TDEC or Rural Development would support multiple separate projects if adequate water supply is available for purchase, and regionalization is favored. The Corps' EIS should be complete by late 2007 and will include opportunities for public participation during its development (Higgs 2006). The project will hopefully be useful in identifying a technically feasible, cost-effective, and environmentally preferred regional water supply project. Important political questions remain to be addressed surrounding how collaboratively and equitably the costs, benefits, and decision-making authority will be shared among the utility districts and City/County.

What role might an HCP play in the Cumberland region's water supply issue? Almost any significant water supply project will involve federal funds (Rural Development or Corps) and permits (Corps or TVA), which makes the action fall under Section 7 of the ESA rather than Section 9. An HCP applies to incidental take which occurs through the action of non-federal entities (local or state government, developers, landowners, etc.) If the action is federal, it will go through the Section 7 consultation process with the FWS and may involve an Incidental Take Statement with a binding set of reasonable and prudent measures to minimize adverse impacts to T&E species. So, it is not likely that a local government would *need* an HCP to protect itself from incidental take resulting from a water supply project, where federal agencies are involved. On the other hand, if local government(s) did proactively develop an HCP designed to minimize impacts from a water supply project and/or the additional development which would likely occur, they might have a much easier time of getting the permitting and funding approved (McKinney 2006). An HCP of this type would demonstrate regional collaboration, attention to T&E species needs and other environmental concerns, and local support – if combined with technical feasibility and cost-effectiveness, this could present a very favorable project to both funders and regulators. The HCP development process should be closely linked early on with the agencies involved with carrying out the project (FWS, TDEC, Corps and/or TVA, Rural Development). If these agencies are on board with the HCP intent and development process, an interagency Memorandum of Understanding/ Agreement (MOU/MOA) could possibly be formed which would streamline the permitting process and add greater certainty that the project would be approved (Hoyos 2006). Because large-scale federal and state actions involve public participation requirements, the HCP should also be well linked to interest groups (environmental and other stakeholders) and the general public.

Clearly, water supply in Cumberland County is an issue with a loaded historical and political context, and a life of its own that is currently playing itself out through the Corps' Water Supply Project and other forums. Does an HCP have any place in that unfolding drama? Some would say water supply is a moot point – the Corps will do its study, Crossville will do its water supply project, which will provide enough water for the

rest of the county to purchase, and any additional projects would be unnecessary/inefficient (reasonable alternative exists) and not permitted. This is all very possible, and so an HCP might be better suited to a different task.

But might an HCP bring additional benefits to the community beyond the scenario above? Currently, there is no forum or facilitating entity bringing people together to work through conflicts to find collaborative, win-win solutions to the water supply problem. If - and this is a crucial if - there is enough interest in local officials, utility districts, and stakeholders to engage in such a collaborative process, the long-term benefits to the community may very well exceed what is possible through the piecemeal strategies and adversarial power struggles which are currently the norm. Also, an HCP serving the larger Emory Watershed area (and possibly South Fork Cumberland) could help expand the focus beyond Crossville/Cumberland County issues to a multi-county water supply strategy. This extent of collaboration could hold even greater value in the eyes of regulators and potential funders, and thus bring expanded resources to support growing communities in the Cumberland region. However, it should be acknowledged, the larger the project, the more parties involved, the more difficult the HCP will be to manage. All of these considerations must be evaluated in determining whether an HCP is an appropriate and desirable tool for addressing water supply concerns in the Cumberland region.

### Development Considerations

With or without a large-scale water supply project, communities in the Cumberland region are growing - rapidly in some areas - and this growth raises concerns for water quality and T&E species. Construction of new roads, subdivisions, and utility lines disturbs, fragments, and degrades both forested and aquatic habitats. For reasons discussed earlier, the permitting processes designed to minimize these impacts on a case-by-case basis are often not adequate to ensure protection of species and water quality, especially in the face of cumulative watershed stresses and weak oversight/enforcement. Development brings an increase in impervious surfaces, which alters the natural hydrology, bringing increased pollution and flooding to streams and diminished recharge of groundwater resources. Perhaps most significantly, more people means more wastewater that must be discharged somewhere. The capacity of Plateau watersheds to assimilate discharges is already used up during times of low flow, and so the question of how to accommodate more people and not degrade resources will be critical in the coming years. Developers and new residents seek out mountain vistas and waterfront properties, but in many cases these may not be appropriate or cost-effective given the ecological constraints of the region. If communities in the Cumberland region wish to sustain their natural assets into the future, they will have to wrestle with issues of carrying capacity, appropriate design and development, and environmental planning across the landscape.

The Etowah HCP in Georgia provides one useful model of how development activities and impacts can be addressed through an HCP. The Etowah River basin in northern Georgia is an area targeted for development, due to its proximity to the ever-

expanding metro population of Atlanta. The counties in the Etowah basin are predominately rural, and future development will put pressures on existing populations of imperiled fish species. To protect these species and allow for development, the Etowah HCP incorporates local county ordinances for the following: runoff limits for priority habitat areas, stormwater management, conservation subdivisions, utility crossings using directional boring under streams, and road crossings. These innovative policies have been crafted through several years of negotiations among committees of city and county officials, developers, planners, utilities, researchers, agencies, and NGOs.<sup>33</sup> There is no standard model for what an HCP in the Cumberland region should look like. Communities in the Cumberland region could draw on the valuable learning and experience of the Etowah HCP to develop their own set of innovative strategies to manage future growth and safeguard watershed health and biodiversity.

### Concluding Thoughts

The continued growth and development of the Cumberland region will no doubt generate additional stresses to water resources and biodiversity which are already to some degree strained. In this water limited system, the capacity of streams and rivers to provide for consumptive uses, assimilate discharges and stormwater pollutants, and sustain aquatic life is finite. These constraints will increasingly factor into permitting decisions as resource agencies follow their mandates to protect water quality, aquatic habitat, and T&E species under federal and state laws. The extent of conflict this creates, and the resulting outcomes for communities and their natural resources, will depend greatly upon how future development is planned and executed. Historically, local governments in rural areas have not had to deal with the environmental concerns resulting from concentrated development. Impacts have been sparsely dispersed across a largely intact natural ecosystem, and the need for oversight, planning and coordination has perhaps not been so great. Regardless of our different opinions and preferences, we have all seen new developments on the landscape which we wish could be undone, or done better, but which we are now stuck with going into the future. When this happens on the ecological scale, we often do not recognize our losses until it is too late.

Residents and leaders in the Cumberland region face a unique opportunity at this time to come together in constructive dialogue to address these complex issues, learn about their natural assets and constraints, and work towards a path of sustainable development. The HCP process offers a tool and forum to proactively integrate T&E species concerns into the big picture of each county's and the region's future. If an understanding is built among local leadership, utility districts, developers, agencies, etc. of what the conservation needs are and how to implement them collaboratively, perhaps everyone could be saved some of the struggle and losses of a regulatory process fraught with limitations.

## References

- Alexander, Steve. Interview with NPDES permit reviewer on April 7, 2006. U.S. Fish & Wildlife Service, Cookeville Field Office.
- Baker, Robert. Interviews with ARAP permit writer on March 16 and April 17, 2006. TDEC Division of Water Pollution Control, Natural Resources Section, Nashville headquarters.
- Barger, Don. Interview on March 10, 2006. Southeast Regional Director, National Parks Conservation Association, Knoxville.
- Bay, Robert. Interview with ARAP and Section 404 permit reviewer on March 30, 2006. U.S. Fish & Wildlife Service, Cookeville Field Office.
- Bakaletz, Steve. Telephone interview with wildlife biologist and permit reviewer on April 3, 2006. National Park Service, Big South Fork National River & Recreation Area.
- Eagar, Dan. Interview on ARAP and Stream Mitigation Program on April 17, 2006. TDEC Division of Water Pollution Control, Natural Resources Section, Nashville headquarters.
- EPA. (2003). *Introduction to the Clean Water Act*. Retrieved 5/2/06 from Watershed Academy Web: <http://www.epa.gov/watertrain/cwa/>.
- Feldman, David and Julia Elmendorf. (2000). *Water Supply Challenges Facing Tennessee: Case Study Analyses and the Need for Long-Term Planning*. Energy, Environment and Resources Center. Retrieved 4/15/06 from [http://eerc.ra.utk.edu/divisions/wrrc/water\\_supply/Default.htm](http://eerc.ra.utk.edu/divisions/wrrc/water_supply/Default.htm).
- Feldman, David L. (2001). "Tennessee's Inter-Basin Water Transfer Act: a changing water policy agenda." University of Tennessee Energy, Environment and Resources Center. *Water Policy* 3 (2001):1-12.
- Feldman, David and Elizabeth Albertson. (2003). Research Needs for Protecting Tennessee's Water Supply: A Baseline for Continued Policy Development. University of Tennessee Energy, Environment and Resources Center. Retrieved 4/15/06 from <http://radan22.ag.utk.edu/swpi/Papers/TN%20research%20needs.pdf>
- Higgs, Tim. Interview with environmental engineer for Cumberland County Water Supply Project on April 17, 2006. U.S. Army Corps of Engineers, Nashville District Office.
- Hoyos, Renee. Interview on March 23, 2006. Executive Director, Tennessee Clean Water Network, Knoxville.

## References - continued

- McKinney, David. Telephone interview with permit reviewer on April 10, 2006. Tennessee Wildlife Resources Agency, Nashville office.
- Palmer, Sally. Telephone interview on March 24, 2006. Science Program Coordinator, The Nature Conservancy, Duck River Office.
- Qualls, Saya. Interview with NPDES Chief Engineer on April 17, 2006. TDEC Division of Water Pollution Control, Natural Resources Section, Nashville headquarters.
- TDEC (2006a) *2006 305(b) Report: The Status of Water Quality in Tennessee*. Retrieved 5/2/06 from <http://www.state.tn.us/environment/wpc/publications/2006305b.pdf>
- TDEC (2006b) *First Draft Year 2006 303(d) List*. Retrieved 5/2/06 from [http://www.state.tn.us/environment/wpc/publications/2006\\_303d.pdf](http://www.state.tn.us/environment/wpc/publications/2006_303d.pdf)
- U.S. Army Corps of Engineers. (1998). *Cumberland County Regional Water Supply: Preliminary Engineering Report*.
- Widlak, James. Interview on Section 7 consultation process on April 7, 2006. U.S. Fish & Wildlife Service, Cookeville Field Office.

## Endnotes

---

<sup>1</sup> Information from The Nature Conservancy's compiled dataset of rare species in Tennessee and 2004 HCP Planning Assistance Grant Proposal

<sup>2</sup> U.S. Fish & Wildlife Service. (2005). Habitat Conservation Plans: Section 10 of the Endangered Species Act. Retrieved 5/11/06 from website: [http://www.fws.gov/endangered/hcp/HCP\\_Incidental\\_Take.pdf](http://www.fws.gov/endangered/hcp/HCP_Incidental_Take.pdf).

<sup>3</sup> National Park Service. Excerpt from Organic Act of 1916, 16 U.S.C.1. Retrived 5/9/06 from website: <http://www.nps.gov/legacy/mission.html>.

<sup>4</sup> National Park Service, Excerpt from Wild and Scenic Rivers Act of 1968. Retrieved 5/9/06 from website: <http://www.nps.gov/rivers/about.html>.

<sup>5</sup> National Park Service. Wild and Scenic Rivers Act, Section 7. Retrieved on 8/1/06 from <http://www.nps.gov/rivers/wsract.html>

<sup>6</sup> TDEC. Watershed Management Approach and *Emory River Watershed Management Plan*. Retrieved on 5/1/06 from <http://www.tdec.net/wpc/watershed/> and <http://www.state.tn.us/environment/wpc/watershed/wsmplans/emory/>

<sup>7</sup> Personal communication with David Duhl, TDEC, 3/06

<sup>8</sup> EPA. (2006). Introduction to TMDLs. Retrieved on 5/2/06 from <http://www.epa.gov/owow/tmdl/intro.html>

<sup>9</sup> TDEC. (2004 version) *General Water Quality Criteria Rules*. Chapter 1200-4-3-.06, Antidegradation Statement. Retrieved on 5/1/06 from <http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-03.pdf>.

<sup>10</sup> TDEC. Water Pollution Control Public Participation Opportunities. Retrieved on 5/5/06 from <http://www.state.tn.us/environment/wpc/wpcppo/>.

<sup>11</sup> EPA. Wetlands Regulatory Authority. Retrieved on 5/4/06 from [http://www.epa.gov/owow/wetlands/pdf/reg\\_authority\\_pr.pdf](http://www.epa.gov/owow/wetlands/pdf/reg_authority_pr.pdf)

<sup>12</sup> TVA. Section 26a of the TVA Act: Shoreline Construction Permits. Retrieved on 5/4/06 from <http://www.tva.gov/river/26apermits/index.htm>

<sup>13</sup> FWS. Consultations with Federal Agencies. Retrieved on 5/5/06 from [http://www.fws.gov/Endangered/consultations/sec7\\_faq.html](http://www.fws.gov/Endangered/consultations/sec7_faq.html).

<sup>14</sup> TDEC. Environmental Permits Handbook: Aquatic Resource Alteration Permit. Retrieved on 5/9/06 from <http://www.state.tn.us/environment/permits/arap.php#who>.

<sup>15</sup> TDEC. Environmental Permits Handbook: NPDES. Retrieved on 5/6/06 from <http://www.state.tn.us/environment/permits/npdes.php>

<sup>16</sup> EPA. NPDES Stormwater Program. Retrieved on 5/6/06 from [http://cfpub.epa.gov/npdes/home.cfm?program\\_id=6](http://cfpub.epa.gov/npdes/home.cfm?program_id=6).

<sup>17</sup> TDEC. Watershed Management Cycle. Retrieved on 5/7/06 from <http://www.state.tn.us/environment/wpc/watershed/cycle.php>

- 
- <sup>18</sup> EPA. (2005). *Stormwater Phase II Final Rule: Small MS4 Stormwater Program Overview*. Retrieved on 5/6/06 from <http://www.epa.gov/npdes/pubs/fact2-0.pdf>.
- <sup>19</sup> TDEC. Storm Water Permitting: Phase II MS4s. Retrieved on 5/6/06 from <http://www.state.tn.us/environment/wpc/stormh2o/MS4II.php>
- <sup>20</sup> TDEC. (2006). *List of Facilities with Coverage under the NPDES Permit for Discharges from Municipal Separate Storm Sewer Systems*. Retrieved on 5/6/06 from <http://www.state.tn.us/environment/wpc/stormh2o/permlist/MS4perm.pdf>
- <sup>21</sup> Personal communication from Crossville GIS technician at Obed Watershed Mapping Workshop on 4/27/06
- <sup>22</sup> UT Municipal Technical Advisory Service. (2003). Best Management Practices Tool Kit. Retrieved on 5.6.06 from <http://www.mtas.utk.edu/bmptoolkit.htm>.
- <sup>23</sup> TDEC. Environmental Permits Handbook: NPDES Storm Water Construction Permit. Retrieved 5/5/06 from <http://www.state.tn.us/environment/permits/conststrm.php>.
- <sup>24</sup> TDEC. Environmental Permits Handbook: Inter-Basin Transfer Permit. Retrieved 4/15/06 from <http://www.state.tn.us/environment/permits/intbasin.php>.
- <sup>25</sup> TDEC. Certificate of Approval and Safety for Dams. Retrieved on 5/3/06 from <http://www.tennessee.gov/environment/permits/safedam.php>
- <sup>26</sup> TDEC. State Requirements for Building a New Dam in Tennessee. Retrieved on 5/6/06 from <http://www.state.tn.us/environment/dws/newdam.php>
- <sup>27</sup> TDEC. Environmental Permitting Handbook: Plans Review and Approval for Public Water Systems. Retrieved on 5/5/06 from <http://www.state.tn.us/environment/permits/pubh2o.php>.
- <sup>28</sup> TDEC. Division of Water Supply: Water Withdrawal Registration Program. Retrieved on 5/5/06 from <http://www.state.tn.us/environment/dws/WWregprog.php>
- <sup>29</sup> Report by William Wade "Bon Aqua-Lyles Demand Projection and Economic Evaluation of Alternatives 1 & 2: Build a 2.6 mgd Plant or Buy Water" dated July 18, 2005
- <sup>30</sup> Boatman, Todd. (1999). Partnered Study Yields Long-Term Benefits. U.S. Army Corps of Engineers, Nashville District. Retrieved on 5/11/06 from <http://www.hq.usace.army.mil/cepa/pubs/feb99/story4.htm>.
- <sup>31</sup> *Cumberland County Regional Water Authority*, Resolution 599-8, May 18, 1999.
- <sup>32</sup> U.S. Army Corps of Engineers. (2006). Cumberland County Study for Regional Water Supply Underway. News Release 2/13/06. Retrieved on 5/5/06 from [http://www.lrn.usace.army.mil/pao/news\\_releases/2006%20News%20Releases/06-10.pdf](http://www.lrn.usace.army.mil/pao/news_releases/2006%20News%20Releases/06-10.pdf)
- <sup>33</sup> Personal communication with Curt Gervich, Etowah HCP, on 4/19/06. Information available from <http://www.etowahhcop.org/>