Tennessee Wildlife Resource Agency
Comprehensive Wildlife Conservation Strategy (CWCS)

As part of its State Wildlife Action Plan (SWAP) – used extensively in planning efforts at various scales – the Tennessee Wildlife Resources Agency (TWRA) collaborated with The Nature Conservancy (TNC) to develop an ArcGIS-based model that scores HUC-12 watersheds in terms of the rarity and viability of important riparian aquatic species within their boundaries. Together with priorities it identifies for forest and subterranean habitats, its aquatic habitat priorities are used primarily to guide the allocation of funding for State Wildlife Grants. TWRA's model may serve as an example for states interested in extending their SWAP into a systematic method for identifying priority areas in which to target restoration and conservation efforts.

OVERVIEW

Lead developer(s): The Tennessee Wildlife Resources Agency (TWRA) and The Nature Conservancy (TNC).[1]

Year developed: 2005.[1]

Geographic area: The state of Tennessee with scores determined for each HUC-12 watershed (Figure 1).

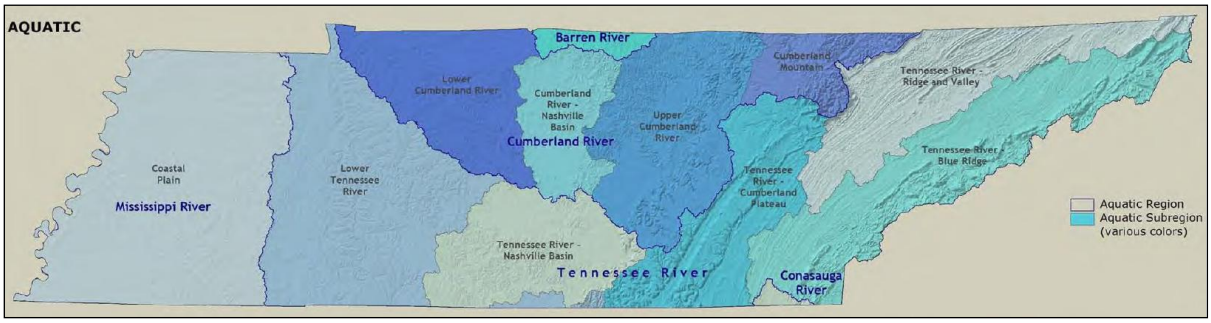

Figure 1. Tennessee's aquatic subregions, each of which contains a unique assemblage of aquatic habitats.

Aquatic resource types: Streams.[1]

Restoration/conservation: Restoration (reestablishment and rehabilitation), creation, enhancement, preservation/protection, and acquisition without preservation/protection.[2]

Stakeholders: Federal and state agencies and NGOs that consider wildlife in their land management decisions.[2]

Current status: Prioritization results currently used by the State Wildlife Grants Program to evaluate funding applications, forest management programs for planning, and various NGOs to target land for acquisition. TWRA currently has a contract with TNC to update the model using higher resolution data to improve its assessment of small habitat patches.[2]

Updated: 4/12/2012

PRIORITIZATION ANALYSIS

HUC-12 aquatic resource prioritization tool: TWRA identified priority areas (HUC-12 watersheds) in which to focus aquatic resource restoration and conservation (in addition to terrestrial and subterranean habitats) using an ArcGIS computer model integrated with a Microsoft Access database. In the model, HUC-12 watersheds were scored based on the rarity and viability of aquatic species of greatest conservation need (GCN), with GIS maps for each GCN species delineated based on species occurrence data from various databases, scientific experts, and the published literature. For each species, a rarity score was calculated as the species' global rank added to its state rank and a viability score was calculated by multiplying species population size (i.e., number of individuals), condition, and landscape context. In the CWCS model, rarity and viability scores were combined for each species to produce a total priority score, which was used to assign an overall priority score to each HUC-12. This was done for Tier 1, Tier 2, and Tier 3 species to produce prioritization maps of HUC-12 watersheds for species of varying conservation significance (Figure 2). CWCS model incorporates the factors and data listed in Table 1.[1]

Prioritization objectives assessed:

- Habitat quality

Table 1. Factors and associated data sources used to prioritize HUC-12 for riparian wildlife resources.[1]

Factor used in analysis		**Data source(s)**
12-digit hydrologic units (HUC-12s)		NRCS
Species distribution maps	Species occurrence data	TN Division of Natural Heritage Rare Species Database (Biotics), TN Amphibian and Reptile Database (TAROD), TN Aquatics Database (TADS), Chicago Field Museum of Natural History Terrestrial Snail Database, TN Breeding Bird Atlas Database, TWRA-Parmalee Mussel Database, and TNC Cave Fauna Database.
Aquatic habitats (rivers, streams, and lakes)		TNC's Freshwater Initiative[3]

NRCS = United States Department of Agriculture Natural Resources Conservation Service

Prioritization products: Prioritization results can be visualized using GIS data or static maps (Figure 2). Using its GIS database, TWRA personnel can generate custom maps based on the individual datasets for species occurrences. The custom maps that they produce prioritize areas in terms of their suitability for individual species.[2]

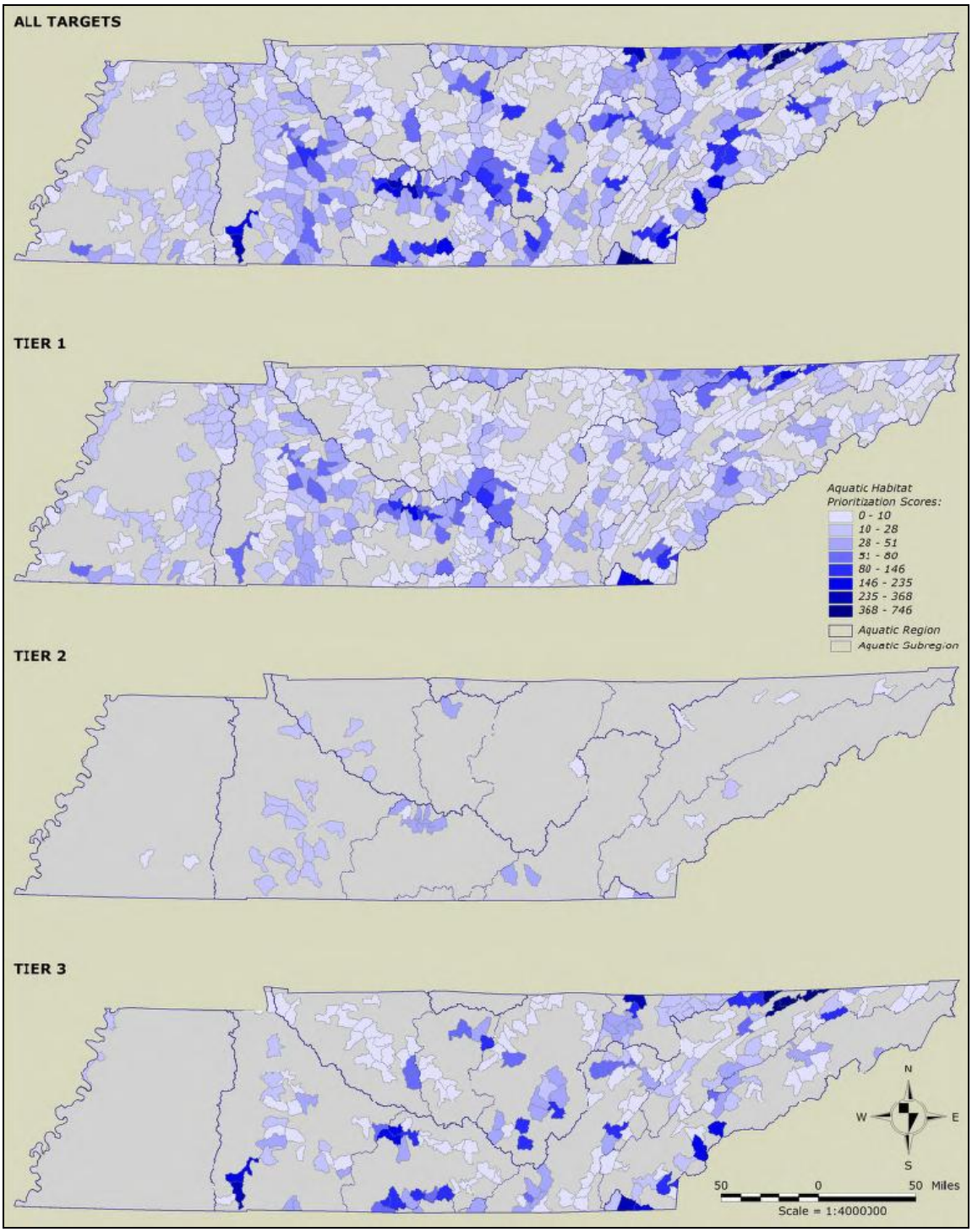

Figure 2. Prioritization of HUC-12 watersheds by the CWCS model based on occurrences of riparian species can inform aquatic resource restoration and conservation efforts throughout Tennessee. Used with permission of the Tennessee Wildlife Resources Agency.

IMPLEMENTATION

Regulatory/non-regulatory programs:

- State Wildlife Grant Program: The prioritization component of the SWAP is used to fulfill the USFWS requirement that the SWAP support State Wildlife Grant funding decisions. Applicants for the grants use the priority maps to support their application. In addition, to receive research funding under the grant program, applicants have to show how their research fits criteria that TWRA developed based on the prioritization results. Applicants to State Wildlife Grants have an incentive to target areas that have been identified as priorities for rare species because those areas are favored in the awarding of funding.[2]
- NGOs involved in land acquisition sometimes approach TWRA to inquire about the priority status of lands they are considering acquiring.[2]

Transferability:

- For states that have completed SWAPs but haven't mapped priority habitats, the CWCS approach can serve as a model for applying a prioritization analysis to existing SWAPs. For example, TWRA successfully "crosswalked" its SWAP approach to combine it with that of Kentucky for the Cumberland Plateau area. CWCS anticipates that crosswalking will be used in future LCC efforts around the country.[4]

Data gaps:

- A lack of distinct wetland features: wetland data exist only as embedded classifications within forest features due to the fact that the land cover classifications used by the CWCS model area are based on NatureServe Ecological Systems, a forest based dataset that does not account for wetlands well. These data gaps can be filled by mapping wetlands at the project level – more data for wetlands mapped on the ground would be useful.[2]
- Because TWRA manages Tennessee's data collection efforts, it can sometimes use data collected for other purposed to fill data gaps in its SWAP.[2]

Barriers:

- Bureaucratic barriers may start to reduce application of the CWCS prioritization results if Washington continues to decrease funding for State Wildlife Grants.[2]

Future goals:

- Within the next five years, TWRA would like its CWCS model to be updated and fully incorporated into the planning process of the Tennessee's conservation community, cities, and counties, as well as in-house.[2]
- Though no obstacles exist to TWRA's effort to complete the update, funding will limit its ability to disseminate the new results.[2]

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[1] Tennessee Wildlife Resources Agency. 2005. Tennessee's Comprehensive Wildlife Conservation Strategy. TWRA: Nashville, Tennessee.
[2] Interview on 12/9/2011 with Mark Thurman, Fisheries Program Manager, Tennessee Wildlife Resources Agency.
[3] http://www.nature.org/ourinitiatives/habitats/riverslakes/index.htm.
[4] Feedback received on 5/15/2012 from Mark Thurman, Fisheries Program Manager, Tennessee Wildlife Resources Agency.