WATERSHED MANAGEMENT PLANNING FOR THE TABLE ROCK LAKE WATERSHED

THE ENVIRONMENTAL PROTECTION AGENCY REGION 7 THROUGH THE MISSOURI DEPARTMENT OF NATURAL RESOURCES HAS PROVIDED PARTIAL FUNDING FOR THIS PROJECT UNDER SECTION 319 OF THE CLEAN WATER ACT. G22-NPS-03

Image Credit: wanderthemap.com

MISSOURI STATE UNIVERSITY
OEWRI
Ozarks Environmental and Water Resources Institute

H2Ozarks
Cleaner Water Together!

MISSOURI DEPARTMENT OF NATURAL RESOURCES

EPA
United States Environmental Protection Agency

Welcome to the Technical Advisory Group Meeting!

Represented by:

MISSOURI DEPARTMENT OF CONSERVATION

MISSOURI DEPARTMENT OF NATURAL RESOURCES

MISSOURI SMALLFLOWS ORGANIZATION

STONE COUNTY HEALTH DEPARTMENT

STONE COUNTY SOIL & WATER

KINGS RIVER WATERSHED PARTNERSHIP

CITY OF BRANSON

CITY OF BRANSON WEST

PORT OF KIMBERLING

LIBERTY UTILITIES

SOUTHWEST MISSOURI COUNCIL OF GOVERNMENTS

Meeting Hosts:

Ozarks Environmental & Water Resources Institute and **H2Ozarks**

Photo Credit: Breakfastinamerica.me

Technical Advisory Group Meeting

April 30, 2025

- Introductions
- Project Timeline & Current Progress
- TRLW Land Use
- Pollutant Load Modeling (STEPL)
  - Pollutant Loads & Load Reductions
  - Identifying Priority Areas for BMP Implementation

9-ELEMENT WATERSHED MANAGEMENT PLAN (WMP)

United States Environmental Protection Agency

1. Identify Causes and Sources Of Pollution

2. Estimate Watershed Pollutant Loads and Load Reductions Needed to Meet Water Quality Standards

3. Describe Management Measures That Will Achieve Load Reductions ***<- Where your input is needed!***

4. Estimate Amounts of Technical & Financial Assistance and the Relevant Authorities Needed to Implement Plan

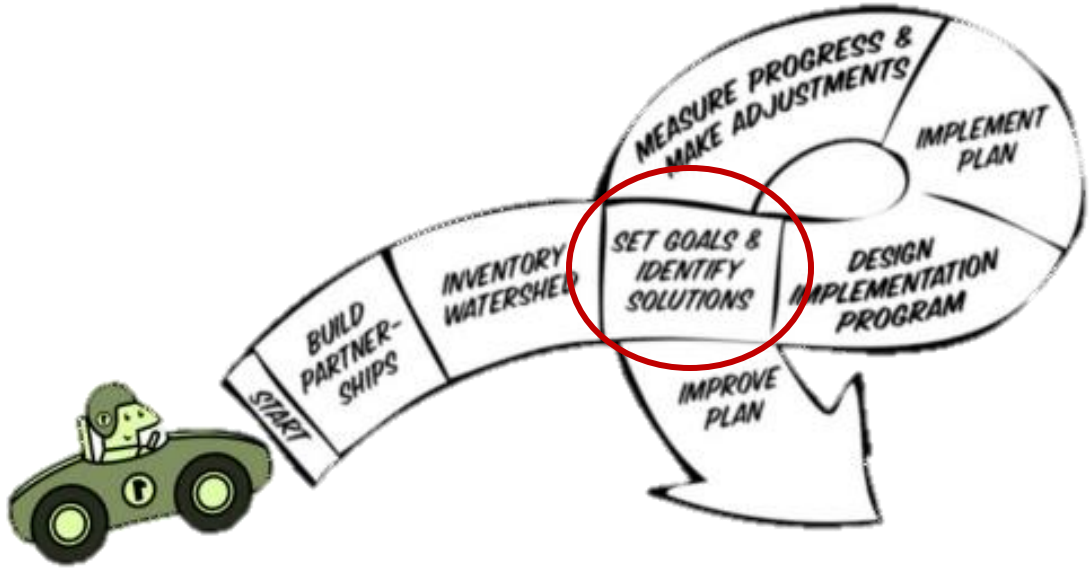
5. Develop an Information/Education Component

6. Develop a Project Implementation Schedule

7. Describe the Interim, Measurable Milestones

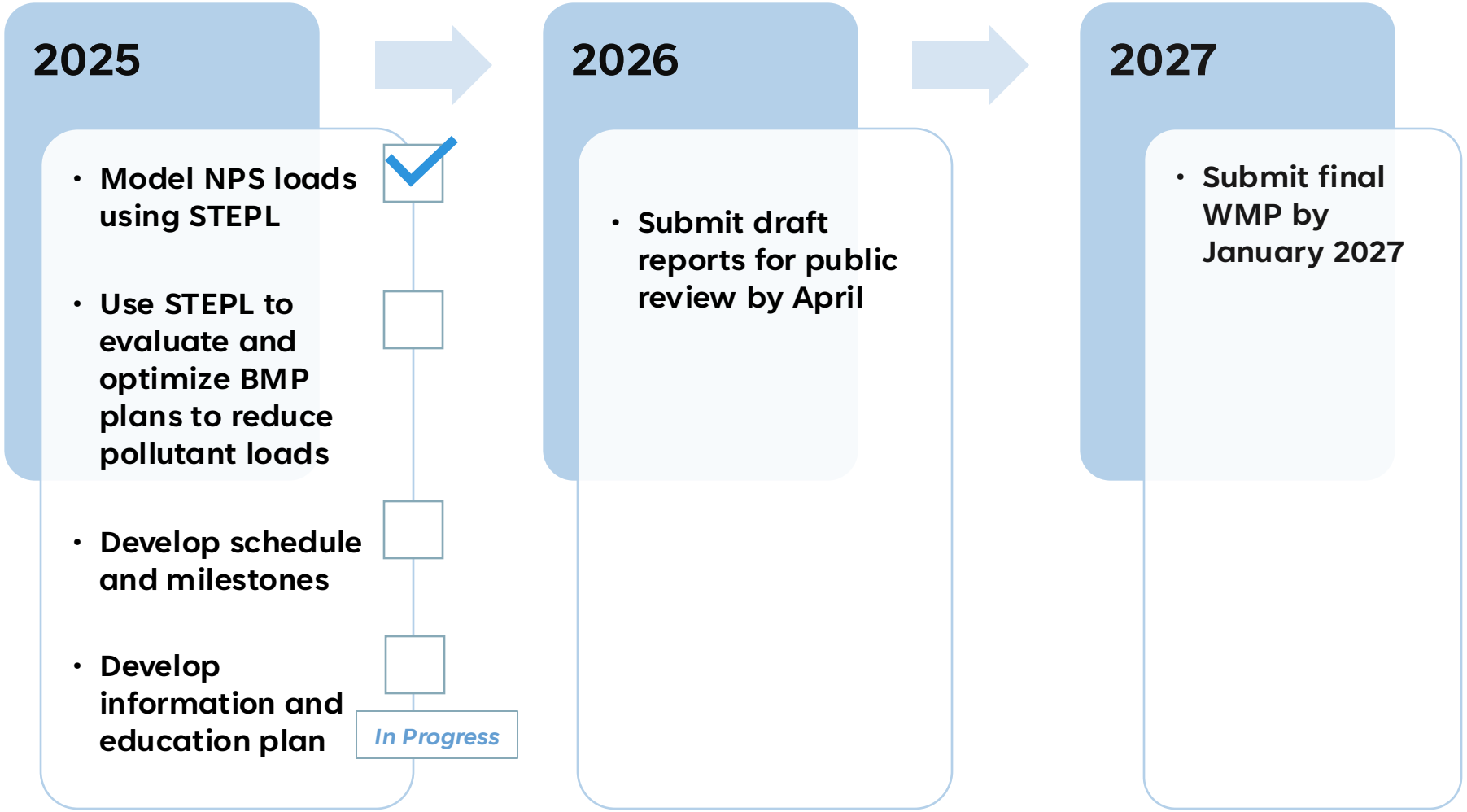
8. Identify Indicators to Measure Pollutant Reduction Progress

9. Develop a Monitoring Component



Project Purpose: Develop a 9-E WMP for the Table Rock Lake Watershed

PROJECT TIMELINE



WATER QUALITY CONCERNS

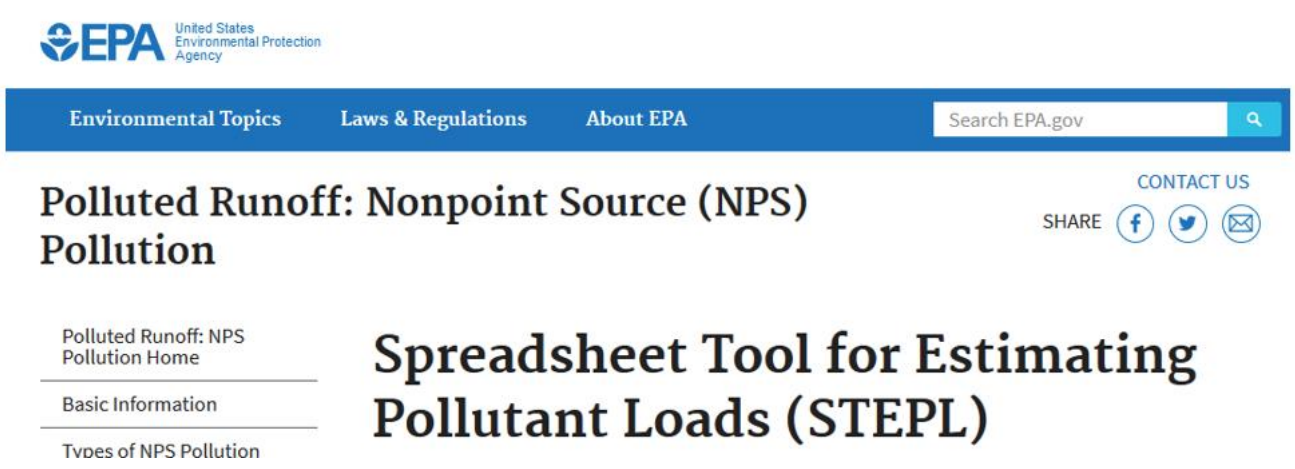
Results of survey from previous TAG/SAG meetings:

1. **Nutrients & bacteria (*E. coli*)**
    a. Septic systems
    b. Agriculture
2. **Sediment (TDS)**
    a. Bank Erosion
3. **Upstream water quality**
4. **Watercraft pollution**

POLLUTANT LOAD MODELING

Image Credit: BudgetTravel.com

STEPL MODEL



EPA model used to:

1) Assess nonpoint source loads from each HUC12 subwatershed

2) Target effective Best Management Practices (BMPs)

3) Estimate load reductions from different BMP scenarios

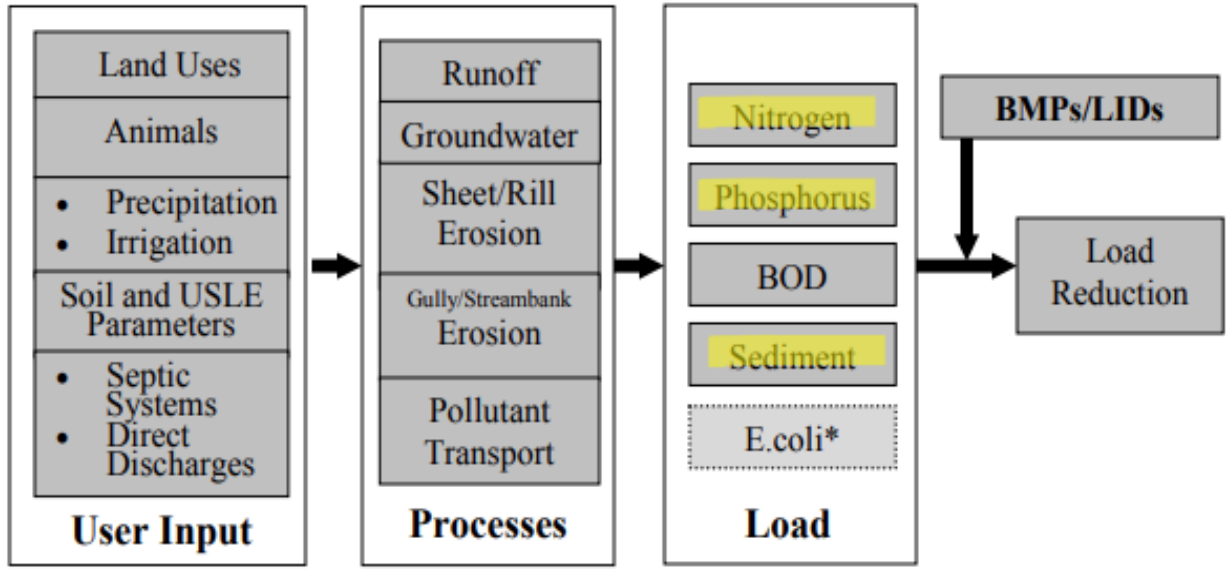
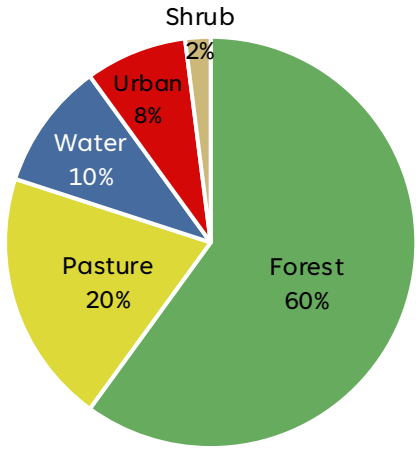
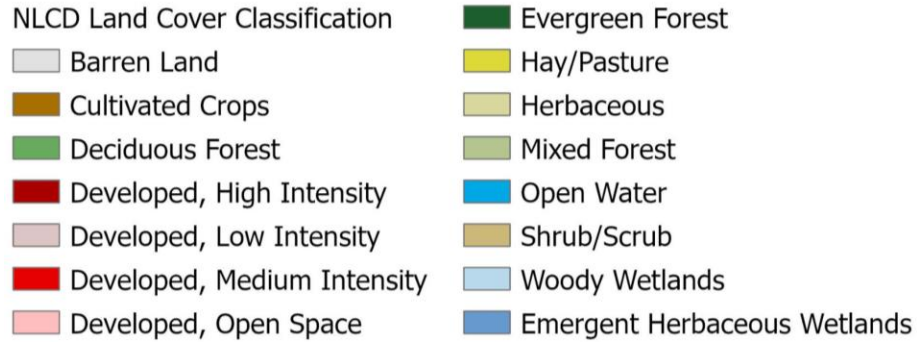


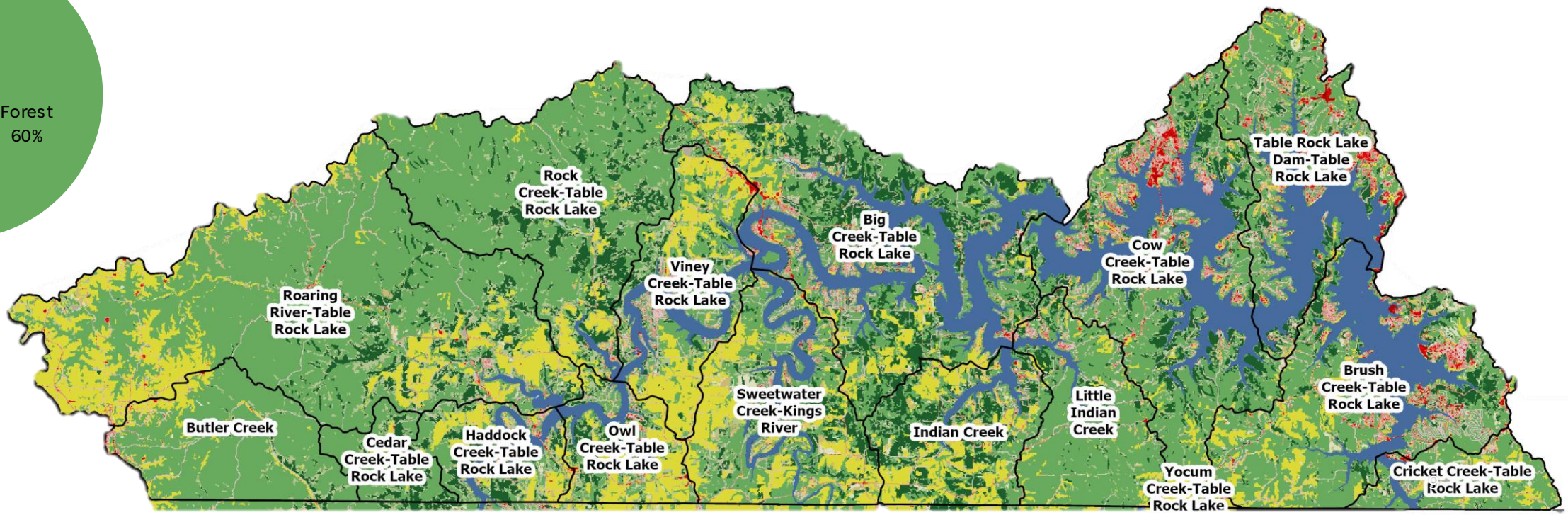
Figure 2. Spreadsheet structure (*place holder for next release).

LAND USE

- **Majority of TRLW forested**
- **Roaring River ≥ 2x drainage area of other HUCs**
- **Urban areas mostly within Eastern HUCs**
- **1 HUC with cropland (Viney Creek; 35 ac; <1% acreage)**





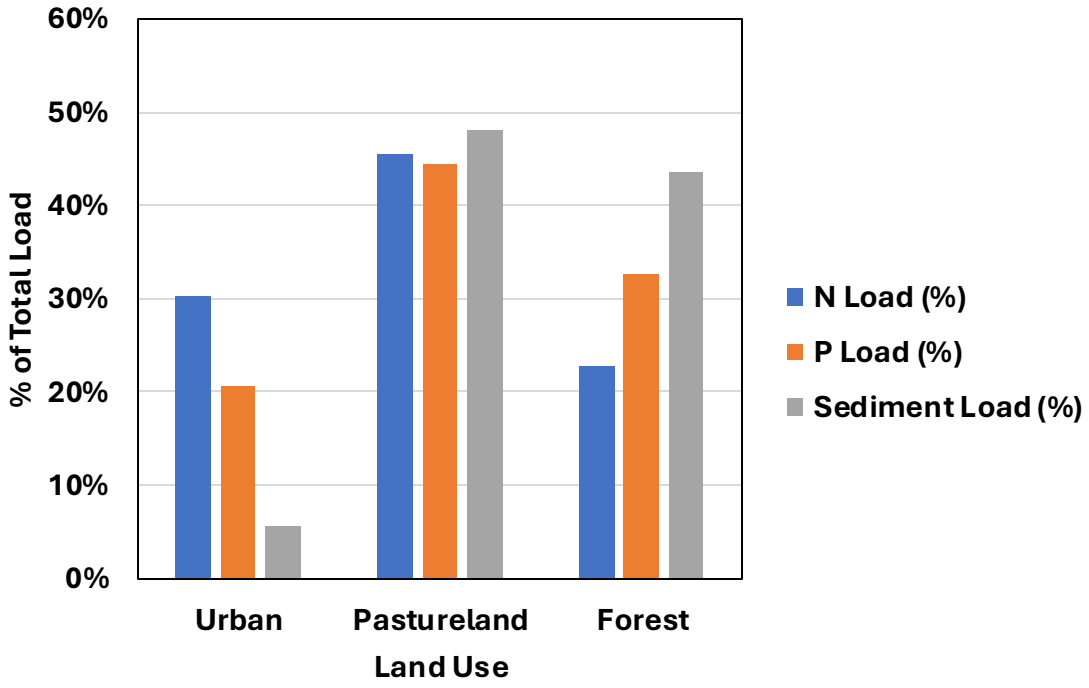


POLLUTANT LOAD MODELING RESULTS

1. **Pastureland is estimated to contribute the highest nitrogen, phosphorus, and sediment loads within the TRLW (44-48%)**

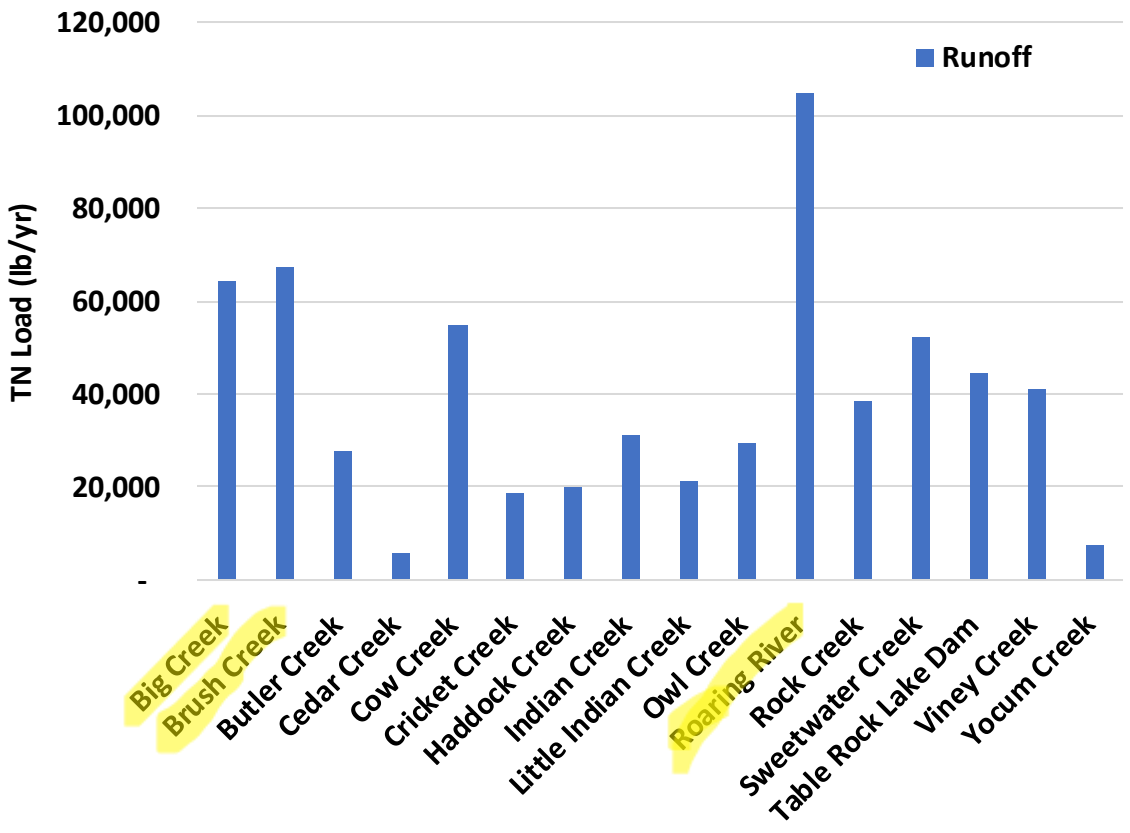
2. Forested areas contribute the 2nd highest phosphorus (33%) and sediment loads (43%)

3. Urban areas contribute the 2nd highest nitrogen loads (30%)

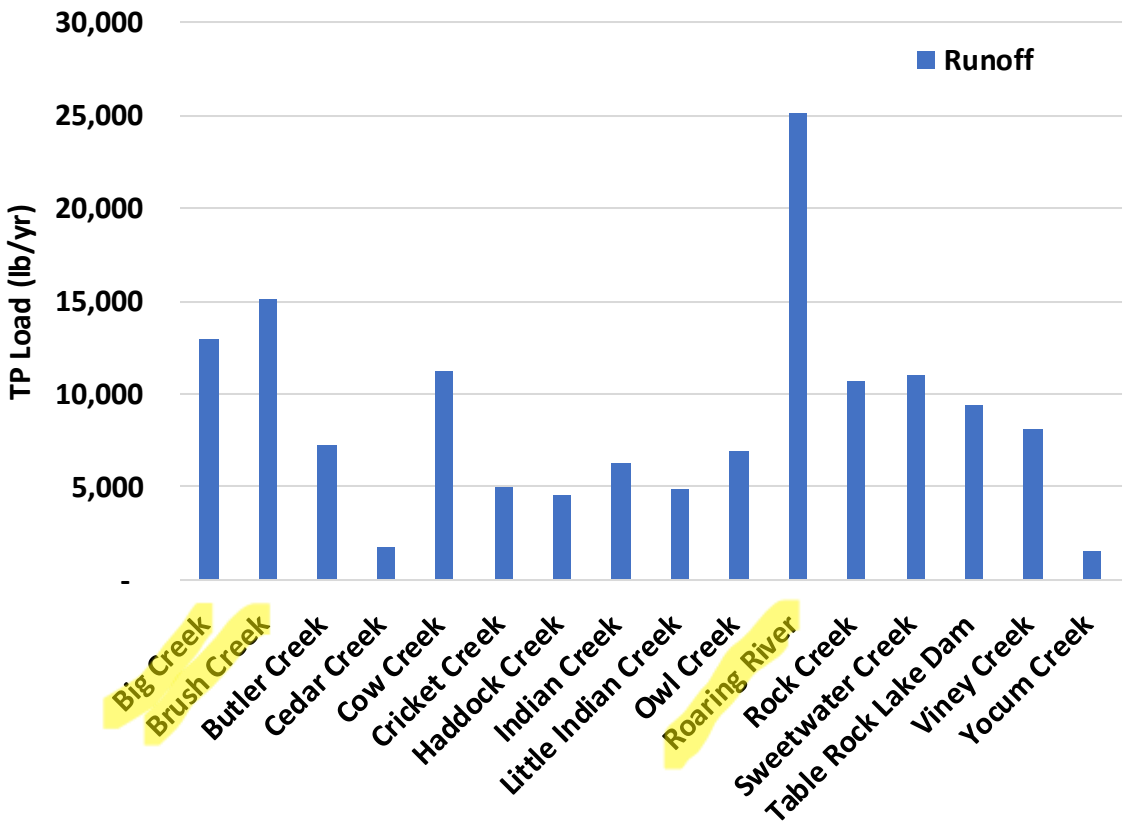


HUC12 POLLUTANT LOADS

Total Nitrogen



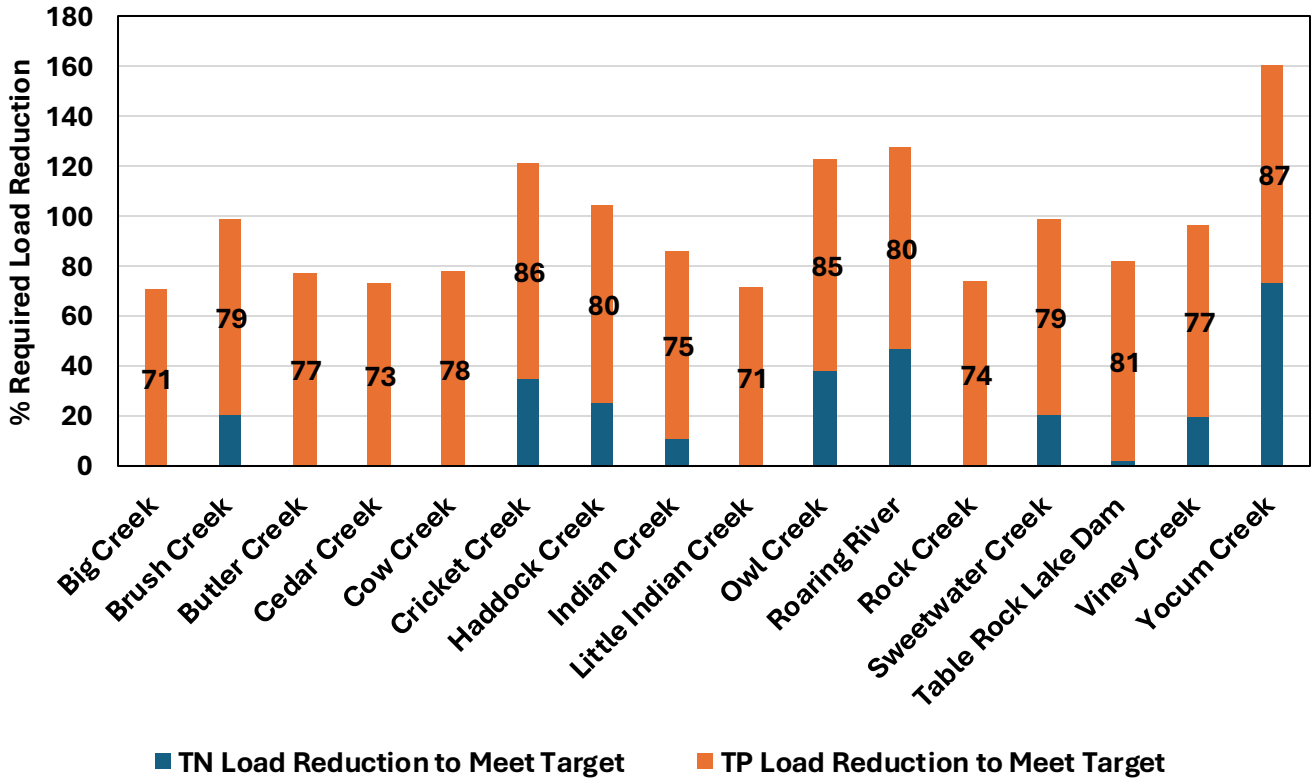
Total Phosphorus



Required Load Reductions

To meet EPA Eutrophic Threshold of:

- 1.5 mg/L TN
- 0.075 mg/L TP



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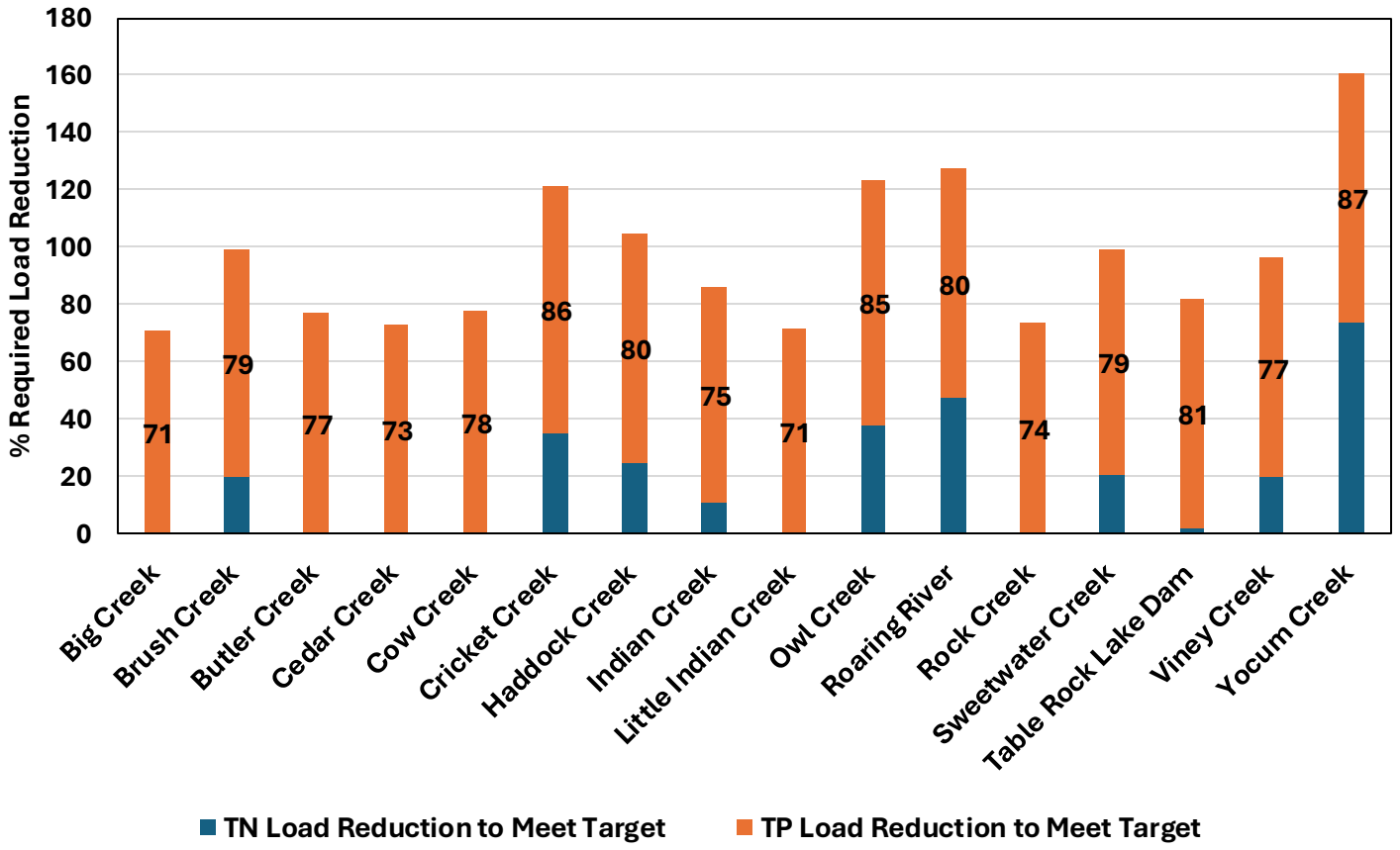


(USEPA, 2000) Nutrient Criteria Technical Guidance Manual Rivers and Streams. EPA-822-B-00-002.

Goals For Discussion:

Identify 1) Critical Source Areas and 2) Potential BMPs

- **Critical Source Areas:** Smaller land areas within watersheds that disproportionately contribute runoff or pollutants to waterways at levels where BMPs are needed to meet nonpoint source pollutant load reductions

- **Best Management Practices (BMPs):** Procedures that help prevent or reduce pollutants from entering waterways and causing impairments to water quality
  - Pastureland BMPs
  - Urban BMPs
  - Forested BMPs

BMP selections can be input to the STEPL Model to estimate resulting load reductions

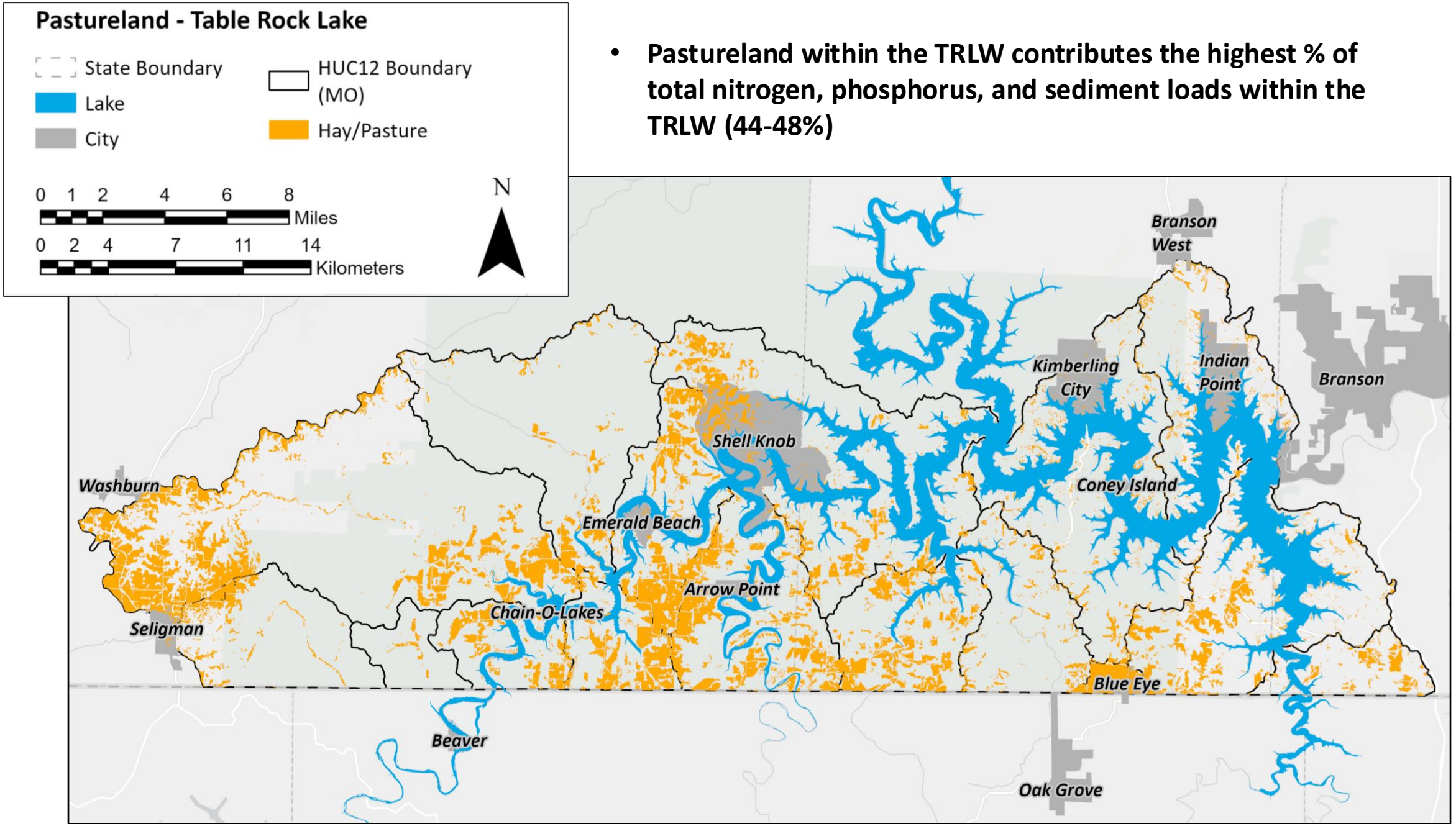
Specific Land Uses	Highest % of total N, P, and S loads from Pastureland
	High P and S load from Forested land
	High N from Urban land
	Previous WMP: prioritized pastureland within 1,500 ft buffer of the lake
Specific HUCs	Highest Loading
	Highest % (Pastureland, Forest, Urban) land use
Desired BMPs	Previously Implemented BMPs?
	Desired / Undesired BMPs?

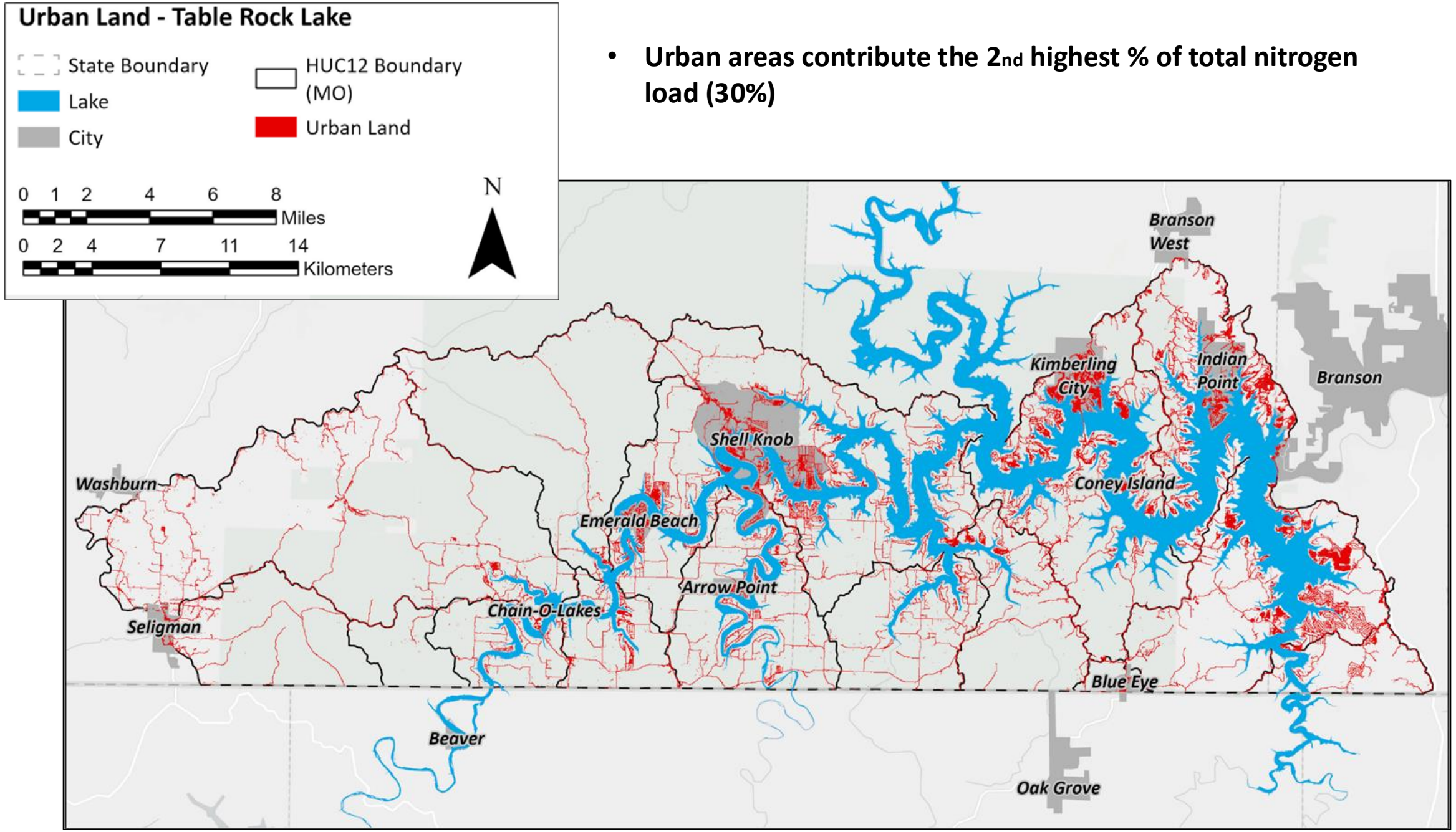
Previous Priority Areas

- **Factors used to determine previous priority areas:**
  - **Proximity to TRL and its tributaries**
    - Mention of ag (primarily poultry production) abundant within the West TRLW, with top concerns surrounding the spreading of poultry litter close to water resources without adequate buffers to filter the nutrients
  - **Water quality monitoring data**
    - Some of the larger tributaries exhibited higher nutrient loading than the main channel of TRL, partially due to the nutrients originating upstream of the watershed area included in this plan, and partially due to lakeshore development in the large tributaries (Kings)
  - **Land use factors**
    - Densely populated, aging subdivisions, cleared/underdeveloped land, and impervious surfaces are each potentially impacting water quality of TRL, contributing eroded sediment and/or nutrients from failing onsite WWT.

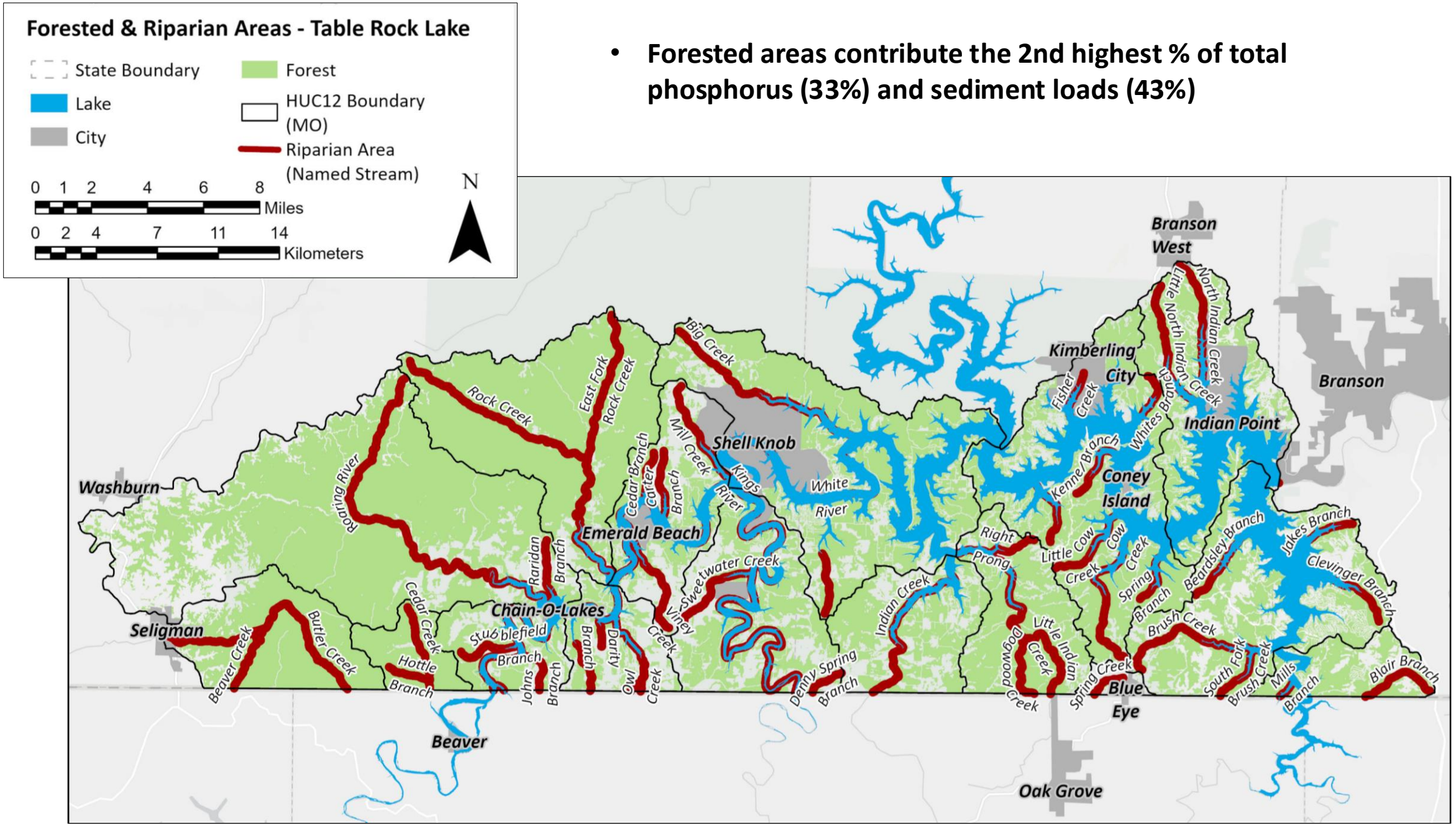
Overall, previous WMP prioritized: Pastureland and Open Space within a 1,500ft buffer of lake

- **Pastureland within the TRLW contributes the highest % of total nitrogen, phosphorus, and sediment loads within the TRLW (44-48%)**





- **Urban areas contribute the 2nd highest % of total nitrogen load (30%)**



- **Forested areas contribute the 2nd highest % of total phosphorus (33%) and sediment loads (43%)**

Targeting Critical Areas: Pastureland BMPs

- **Access Control**
  - Provides barriers (fences) that limit animal, human, and wildlife entry into specific areas to protect natural resources
- **Alternative Water**
  - Limiting livestock from entering streams by providing them with an alternative water source
- **Heavy Use Protection**
  - Involves the establishment of vegetation and/or the installation of erosion prevention materials where heavy traffic is expected
- **Forage and Biomass Planting**
  - Prevents soil erosion and improves water quality by establishing native or introduced forages in fields or pastures
- **Prescribed Grazing**
  - The controlled harvest of vegetation with grazing or browsing animals, managed with the intent to maintain or improve water quality and quantity


Access Control


Alternative Water


Prescribed Grazing

Targeting Critical Areas: Urban BMPs

- **Porous / Concrete Grid Pavement**
  - Asphalt alternatives that increase soil infiltration and reduce runoff
  - Examples: Kimberling City Center; Eiserman Park (Lake Taneycomo WMP)
- **Extended Wet Detention Basin**
  - Increases the length of time that storm water is retained, often heavily vegetated so the vegetation can filter pollutants
- **Dry Detention Basin**
  - Remains dry except for short periods following rainstorms or snowmelt events, during which it regulates flow, helping to control streambank erosion

Porous Pavement, Kimberling City Center

Wet Detention Basin

Dry Detention Basin

Targeting Critical Areas: Forest BMPs

- **Road Straw Mulch**
  - Method of broadcasting seeds without water or liquid used by the US Forest Service to revegetate inactive roads to provide erosion control long-term
- **Road Dry Seeding**
  - Method of broadcasting seeds without water or liquid used by the US Forest Service to revegetate inactive roads to provide erosion control long-term
- **Road Hydromulch**
  - A process by which wood fiber mulch, processed grass, hay/straw mulch is applied with a taking agent in a slurry with water to provide temporary stabilization of bare slopes or other bare areas. Can be combined wit hydroseeding. Provides economical slope protection.


Road Straw Mulching


Road Dry Seeding


Road Hydromulching

UPCOMING TECHNICAL ADVISORY MEETINGS & COMMUNICATIONS

Interested in attending a stakeholder meeting?

Technical Advisory Meetings are invitation only. To be considered for an invite, go to www.h2ozarks.org/trlwmp and click the button "*Become a Stakeholder*" at the bottom of the page.

Public meetings will be announced on our Social Media, and direct announcements will be emailed to individuals who have expressed interest through the "*Become a Stakeholder*" button on our website.

Written comments can be sent via email at any time:

Contact@h2ozarks.org

Subject Line: TRL WMP Comment

THANK YOU

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