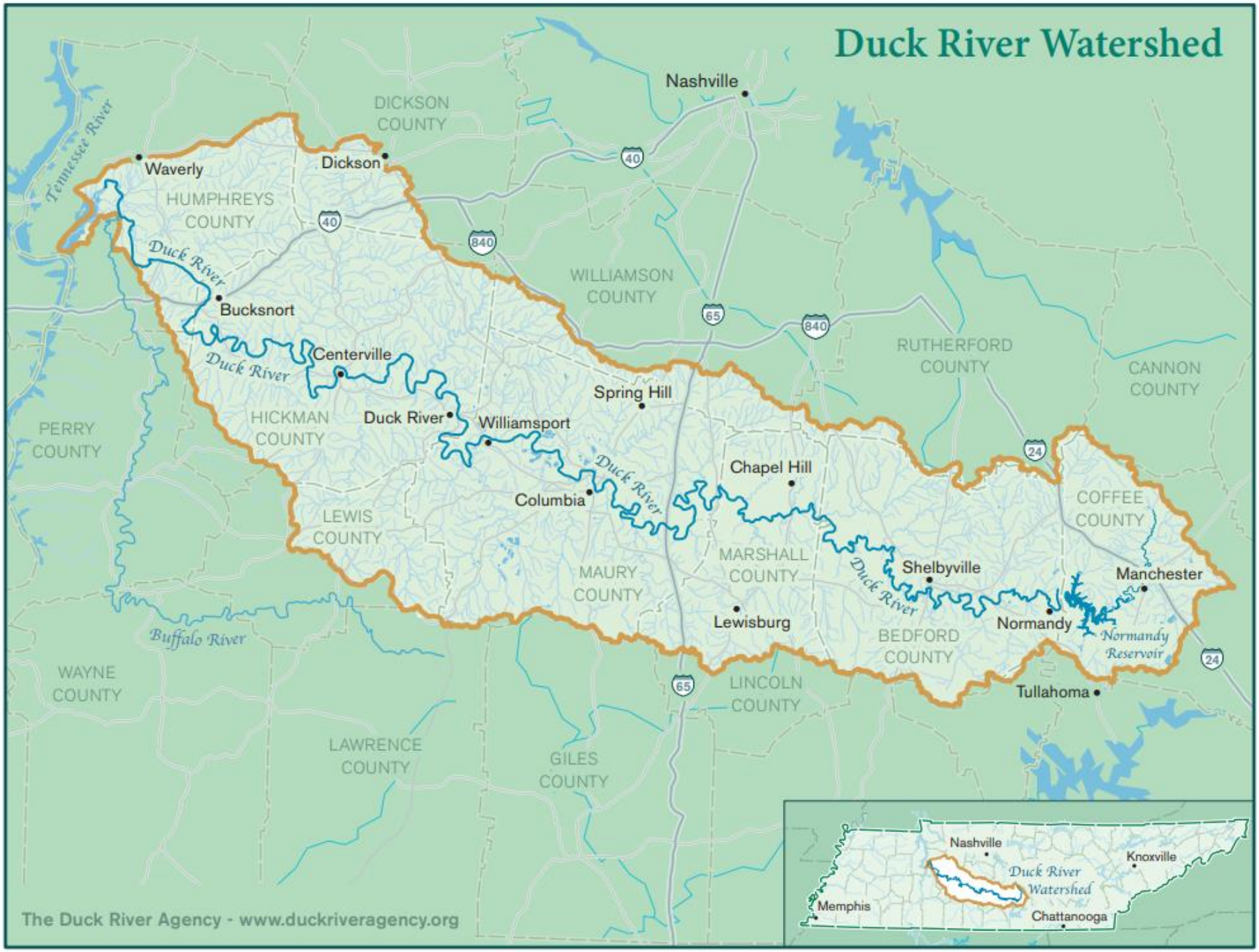

Duck River Watershed
Nashville
DICKSON COUNTY
Tennessee River
Waverly
Dickson
HUMPHREYS COUNTY
40
840
Duck River
Bucksnort
WILLIAMSON COUNTY
65
840
RUTHERFORD COUNTY
CANNON COUNTY
Centerville
Duck River
Spring Hill
PERRY COUNTY
HICKMAN COUNTY
Duck River
Williamsport
24
Chapel Hill
Columbia
Duck River
COFFEE COUNTY
LEWIS COUNTY
MARSHALL COUNTY
Shelbyville
Manchester
MAURY COUNTY
Duck River
Lewisburg
Normandy
Normandy Reservoir
Buffalo River
BEDFORD COUNTY
24
WAYNE COUNTY
65
LINCOLN COUNTY
Tullahoma
LAWRENCE COUNTY
GILES COUNTY
Nashville
Knoxville
Duck River Watershed
Memphis
Chattanooga
The Duck River Agency - www.duckriveragency.org

Duck River Watershed Planning Partnership Presentation

“WORKING TOGETHER WORKS”

May 5, 2025

Doug Murphy, DRA

Duck River Region Water Supply History

Duck River Region Water Supply History

1930's

Report to 71st Congress evaluating 6 dam sites on the Duck River

1950's

TVA evaluated 3 dam sites on the Duck River

- Normandy
- Columbia
- Hickman/Maury County Line RM100

Duck River Region Water Supply History

1960's

1964 -Leaders in Maury, Marshall, Bedford, and Coffee Counties organize the UDRA (including 7 municipalities)

1965 -TDRDA is form by TCA § 64-1-6

1966 -TDRDA and government leaders visit Congress to obtain support and funding

1967 -TVA drops the County Line RM100 site

1969 -Congress approves funding to TVA for the Duck River Project (Columbia and Normandy Reservoir)

Purpose of reservoirs:

- Flood Control
- Recreation
- Water Quality/Waste-Water Assimilation
- Water Supply

Duck River Region Water Supply History

1970's

1971 -TDRA signs $16.2M agreement with TVA for water supply

-Environmental Impact Statement (EIS) initiated

1972 -Clean Water Act becomes federal law

-Land acquisition at Normandy and Columbia.

-Normandy Reservoir construction begins

-Environmental Defense Fund Lawsuit

1973 -Construction begins at Columbia Reservoir

-Endangered Species Act (ESA) passed in Congress

1976 -USFWS list 5 T&E mussels

-Normandy Reservoir completed: cost $37.4million

1977 -Columbia Reservoir is jeopardized with 2-T&E mussels (Birdwing Pearly & Cumberland Monkeyface Mussel)

1979 -OMB challenges TVA (funding ?)

-Alternative reservoir pool levels are considered

Duck River Region Water Supply History

1980's

1980 -Thirty-First Report by Committee on Government Operations "TVA's Columbia Dam Project on the Duck River in Tennessee"

-Construction on Columbia Reservoir is halted

1982 -T&E mussels are transplanted in other rivers

-Construction on Columbia Reservoir resumes

1983 -Construction on Columbia Reservoir is again stopped

1986 -OMB rules on an unfavorable benefit/cost analysis to complete Columbia Reservoir

- Concrete Dam 92% completed
- Earthen Dam 60% completed
- Land Purchases 45% Completed

Duck River Region Water Supply History

1990's

1990 -More Duck River T&E species are added to the list

1994 -TVA begins assistance with regional water supply alternatives

1995 -TVA announces formal cancelation of Columbia Reservoir

- Project cost totaled over $80M, need estimate $123M to complete

1997 -Landowners in Maury County file lawsuit

1998 -TVA begins regional water supply needs analysis

-TVA begins Land Use EIS for land purchased for Columbia Reservoir project

1999 -Supreme Court is petition by Columbia Reservoir supporters

-TVA issues EIS on land-use

-Columbia Dam is removed, and land is transferred to the State of Tennessee (TWRA)

Summary of reasons for Columbia Dam not being built

- Benefit/Cost ratio not justified for funding
- Congress stopped appropriations
- Water quality, taste, odor problems (retention/low flows)
- One out four years would not be able to fill to summer pool
- Alternative pool levels evaluated
- Flood control: 12,000acre summer pool /4,000acre winter pool
- Endanger Species Act
- Scenic River Act
- Designated Critical Federal Habitat Area

Big lost to the TDRDA and the citizens of the Duck River Watershed

Duck River Region Water Supply History

2000's

2000 -TVA completes PEIS, "*Future Water Supply Needs in the Upper Duck River Basin"* listing five alternatives

- No Action
- Fountain Creek Reservoir
- New water intake downstream of Columbia
- Raise Normandy Dam
- Pump water from Tims Ford Reservoir

2007 -DRA request TVA to begin the project to raise Normandy Reservoir for more water storage/supply

-TVA ask DRA to investigate all possible water supply alternatives to make sure the Normandy Reservoir project is the best one

-The Duck River Region is faced with the worst drought on record and Normandy Reservoir reaches record lows

-Oct TVA releases first EA to reduce flows from Normandy Reservoir

Duck River Region Water Supply History

2000's continue

2008 -Feb TVA releases second EA to reduce flows from Normandy Reservoir(42% capacity)

2009 -DRA creates a Strategic Planning Team to develop the:
"Duck River Comprehensive Regional Water Supply Plan"

2010 -DRA invites state and federal agencies, NGO's, water utilities, others to participate in regional water supply plan development

2011 Duck River Comprehensive Regional Water Supply Plan

50-Year Plan with a 100-Year Vision

"Growth Pays for Growth"

Why Regional Planning

- **Multiple Uses depend on the Duck River and Normandy Reservoir**
  - 250,000 residential customers
  - Industrial and commercial use
  - Agricultural
  - Waste load assimilation
  - Recreation
  - Biologically diverse river including endangered species
- **2007 Drought of Record**
  - Normandy Reservoir reached 42% capacity
  - Flow in the upper Duck River was dependent on Normandy Reservoir
- **Legislation**
  - House Bill 3545
  - Senate Bill 2464
- **Emotions**
  - Public perception
- **No long-term credible regional plan**
  - Good science
  - Data driven
  - Proven decision-making model
  - Implementable
  - Phase-able

WSP Strategic Team

O'Brien & Gere - Principal consultant

CTI Engineers, Inc. - TN engineering firm

BDY Environmental, LLC – Environmental/Permitting

HydroLogics, Inc - Modeling

Trauger & Tuke - Legal

Participants

Water Resource Council

- **Water Systems**
  - Bedford County Utility District
  - Columbia Power and Water Systems
  - Duck River Utility Commission
  - HB&TS Utility District
  - Lewisburg Water and Waste-Water
  - Manchester Water Systems
  - Maury County Water System
  - Tullahoma Utility Board
  - Shelbyville Water and Sewer
  - Spring Hill Water Systems
- **Federal Agencies**
  - Natural Resource Conservation Service
  - Tennessee Valley Authority
  - U S Department Agricultural
  - U S Fish and Wildlife Service
  - U S Geological Survey
- **State Agencies**
  - Tennessee Advisory Commission on Intergovernmental Relations
  - Tennessee Department of Environment
  - Tennessee Water Resource Technical Advisory Committee
  - Tennessee Wildlife Resource Agency
- **Non – Government Organizations**
  - Duck River Watershed Association
  - Friends of Short Springs
  - Tennessee Environmental Council
  - Tennessee Duck River Agency Board
  - Tennessee Farm Bureau Federation
  - The Nature Conservancy
  - World Wildlife Fund
- **Municipals**
  - Columbia
  - Lewisburg
  - Manchester
  - Tullahoma
  - Shelbyville
  - Spring Hill
  - Wartrace
- **Legislators**
  - Senator Bill Ketron
  - Senator Jim Tracy

Regional Water Supply Plan Goal 2010

"The project goal is to have a Comprehensive Plan that will provide direction to the Duck River Agency regarding the management of available water resources, including the implementation of specific water supply infrastructure projects."

50-Year Plan with a 100-Year Vision

Alternatives

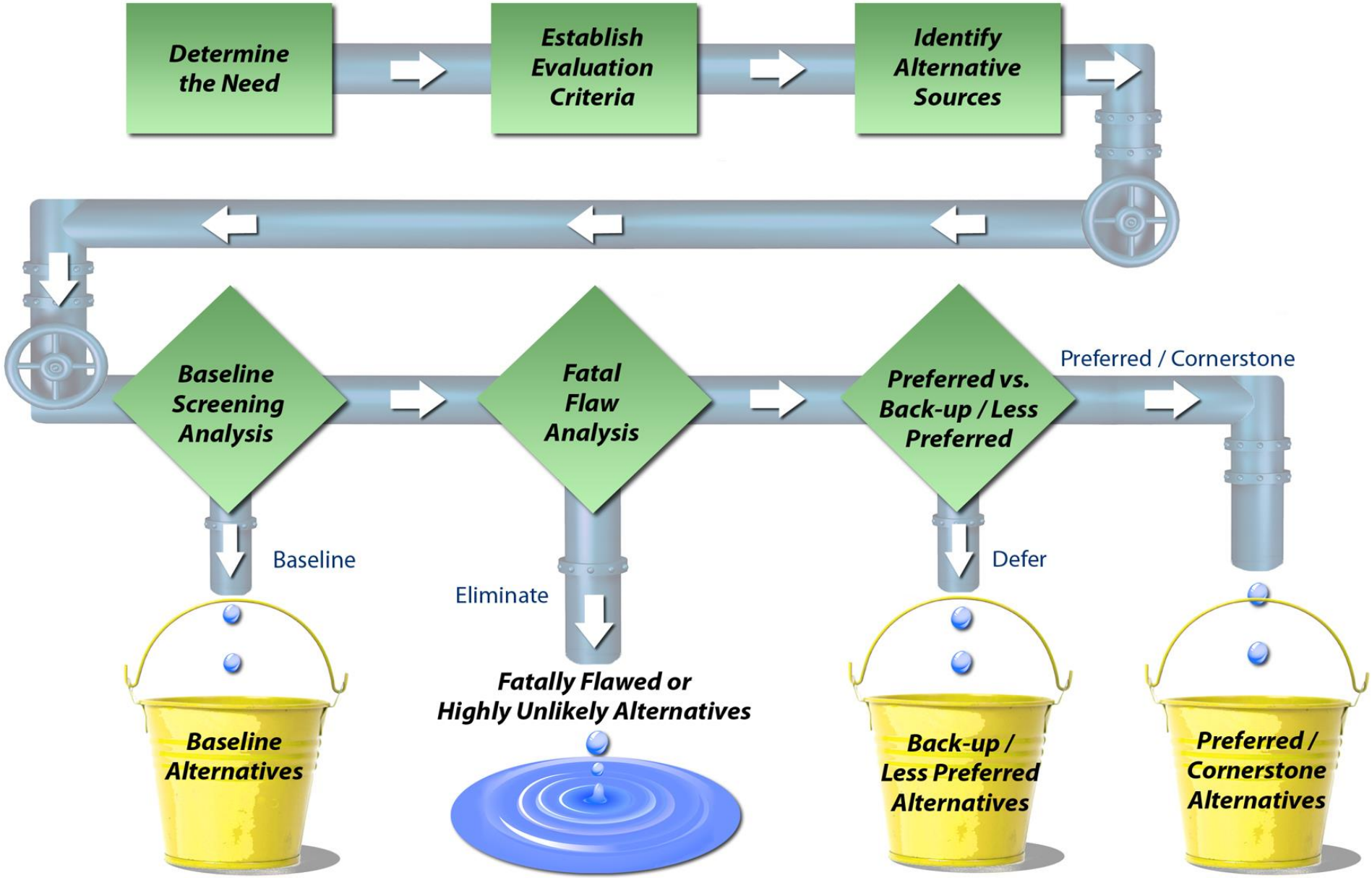
Started with over 40 non-structural and structural alternatives including:

- Implementing additional water efficiency measures
- Implementing a regional drought management plan
- Changing operation of Normandy Reservoir
- Modifying river constraints
- Constructing pipelines from reservoirs, rivers or other water systems
- Constructing tributary reservoirs (Fountain Creek Reservoir)
- Building off-stream storage reservoirs (pumped storage)
- Utilizing quarries
- Raising Normandy Dam

Alternative Analysis

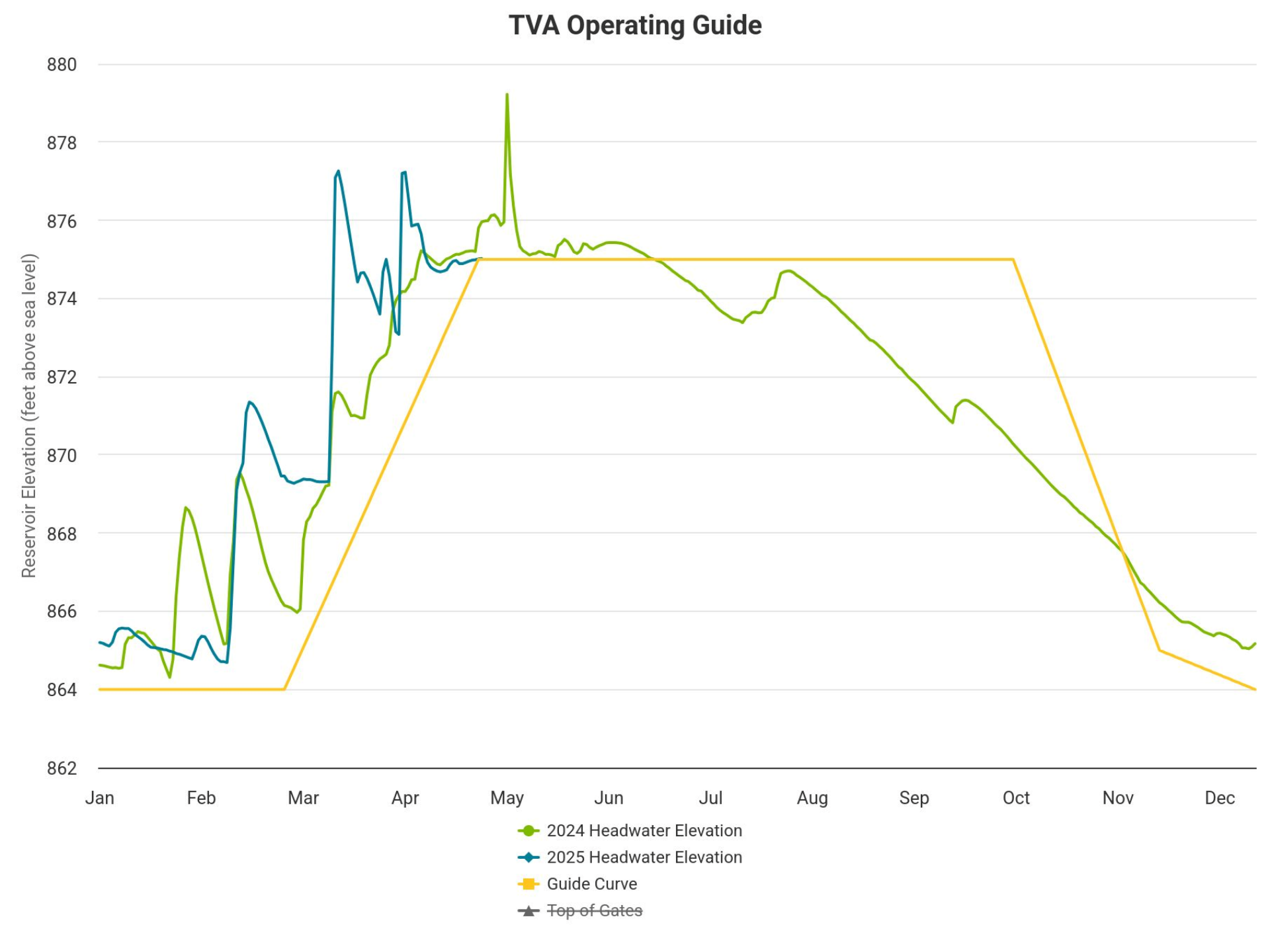
- **Each alternative was subject to 7 criteria for review:**
  1. Reliable capacity
  2. Raw water quality
  3. Cost
  4. Implementable
  5. Flexibility
  6. Environmental benefits
  7. Recreation
- **The alternatives were sorted into the following groups:**
  1. Baseline
  2. Fatally flaw
  3. Backup
  4. Cornerstone

Evaluation Process



Duck River Regional Water Supply Programs and Projects

Programs/Projects	Purpose
Regional Drought Management Plan	Manage reservoir water for all uses during extended drought period
Optimizing Normandy Reservoir Releases	Provides efficient use of reservoir water
Water-Use Efficiency Program	A program identifying how we use water and recommending how we can be more efficient
Williamsport/Natchez Trace New Downstream Intake (First Phase to the TN River)	Additional water supply to meet growth demands in Maury County and water demands during an extended drought period (removes reliance from Normandy Reservoir)
Normandy Reservoir Capacity Improvements	Additional water insurance for all uses during extended drought period


TVA Operating Guide
880
878
876
874
872
870
868
866
864
862
Reservoir Elevation (feet above sea level)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2024 Headwater Elevation
2025 Headwater Elevation
Guide Curve
Top of Gates

January 2008

Regional Drought Management Plan (DMP)

2013 -Developed DMP with Team

2014 -DRA requested TVA and TDEC to adopt the DMP

2015 -Wetted perimeter and water quality models developed

2016 -Signed MOU with TVA to begin environmental review (EA) for DMP and ONRR Program

2022 -Draft EA sent to TVA for review

2023 -TVA conducted internal study *"Drought Operations Alternative Analysis"*

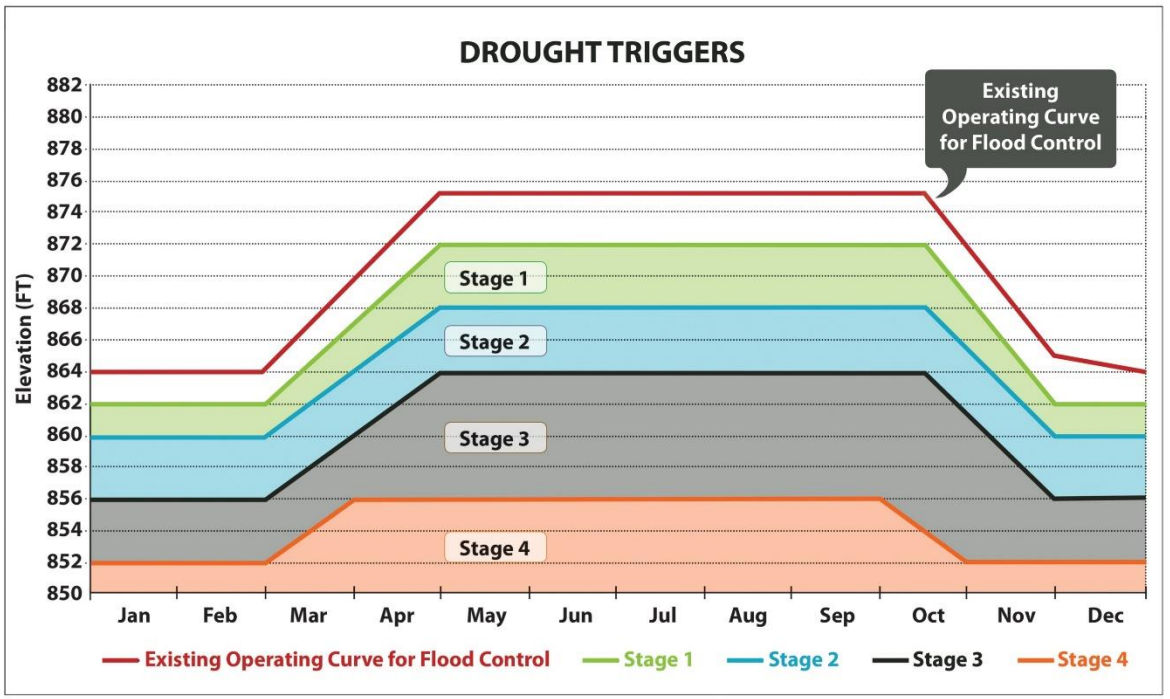
-TDEC issues ARAP's with 175cfs flow constraint

-Modified DMP was discussed

2024 -It was decided to pause the DMP EA and separate the ONRR and DMP EA

-Need a Habitat Conservation Plan

Regional Drought Management Plan Triggers and Stages



DROUGHT STAGES

STAGE 1	STAGE 2	STAGE 3	STAGE 4
Drought Monitoring	**Drought Alert**	**Drought Warning**	**Drought Emergency**
③ Initiate Drought Monitoring	③ Alert Drought Committee ③ Initiate Public Awareness	③ 10 cfs / week reduction of Shelbyville target (down to 120 cfs) ③ 10% reduction of public water use	③ 10 cfs / week reduction of Shelbyville target (down to 80 cfs) ③ 20% reduction of public water use

③ Impose 28 day waiting period between stages

③ Move out of stage if above trigger for at least 7 days

Optimizing Normandy Reservoir Releases (ONRR)

2013 -Developed ONRR Program

2014 to 2023 -Same path as the DMP

2024 -ONRR EA separated from the DMP
-TVA held Public Meeting for ONRR EA
-EA Team compiled public comments and responses
-Draft EA completed

2025 -USFWS review and Biological Opinion completed
-March 28 TVA releases final EA
-June 1 becomes TVA Operation Policy for Normandy Reservoir
-Provides reliability for filling Normandy Reservoir in the spring
-Delays drought actions

PROJECT COMPLETED ☺

Optimizing Normandy Reservoir Releases

Current Operating Flow Constraints

- Minimum **instantaneous** flow of 155 cfs for the period of June 1 through November 30
- Minimum **instantaneous** flow of 120 cfs for the period of December 1 through May 31

Proposed Operating Flow Constraints

- 7-day rolling **average** flow of 155 cfs for the period of June 1 through November 30 with a minimum flow of 145 cfs
- 7-day rolling **average** flow of 120 cfs for the period of December 1 through May 31 with a minimum flow of 110 cfs

Water-Use Efficiency Program (WUEP)

2015 -*"Regional Water Data Collection and Demand Projection Analysis"* Maddaus Water Management

2016 -Decision Support System Model (DSS) was developed

- Customer-class Data Base
- Baseline
- Water-use report finished

2024 -Fee charged on water withdrawals

- DRA develops scope of work for WUEP to share with stakeholders

2025 -DRA hires additional staff for WUEP development and implementation

Water-Use Efficiency Program

- A program designed to understand how we use our water
- Water-use efficiency/conservation education programs
- Model regional water demand trends: industrial, commercial, agricultural, residential
- Perform water audits and provide recommendations
- Reduce unaccountable water lost
- Reduce average gallons used per person
- Find the “Hidden Reservoir”

Williamsport/Natchez Trace New Downstream Intake

(First Phase to the TN River)

2014 -*"Maury County Water Supply Feasibility Study"*

2015 -*"Maury County Water Supply Strategic Plan"*

2017 -*"Water Supply Intake and Pumping Station Siting Study"*

2018 -CPWS took leadership role to complete permitting, engineering, implementation and finance strategy

2021 -CPWS asked DRA for $10 million for partial project funding

2022 -DRA CPWS signed agreement

2025 -CPWS received TDEC ARAP permit and BO from FWS

Williamsport/Natchez Trace New Downstream Intake

- Downstream of the 100cfs flow-by constraint
- Removes CPWS reliance for water supply from Normandy Reservoir
  - Which would leave more water in the reservoir during drought periods
- Near Maury/Hickman County Line
- Approximately 35 river miles, 20 land miles
- First phase of pipeline to TN River
- Supports projected water supply needs
- CPWS is currently in the permit application process

Normandy Reservoir Capacity Improvement (NRCI)

2011 - Completed the Normandy Dam Pre-Preliminary Stability Analysis Calculations

2013 - Completed the Preliminary Stability Analysis Summary Report

2015 - Completed the NRCI report

2016 - TVA recommended a hold on the project

2023 - TVA's Net Water Demand Analysis for Normandy Reservoir recommended available water below the DRUC pumping capacity

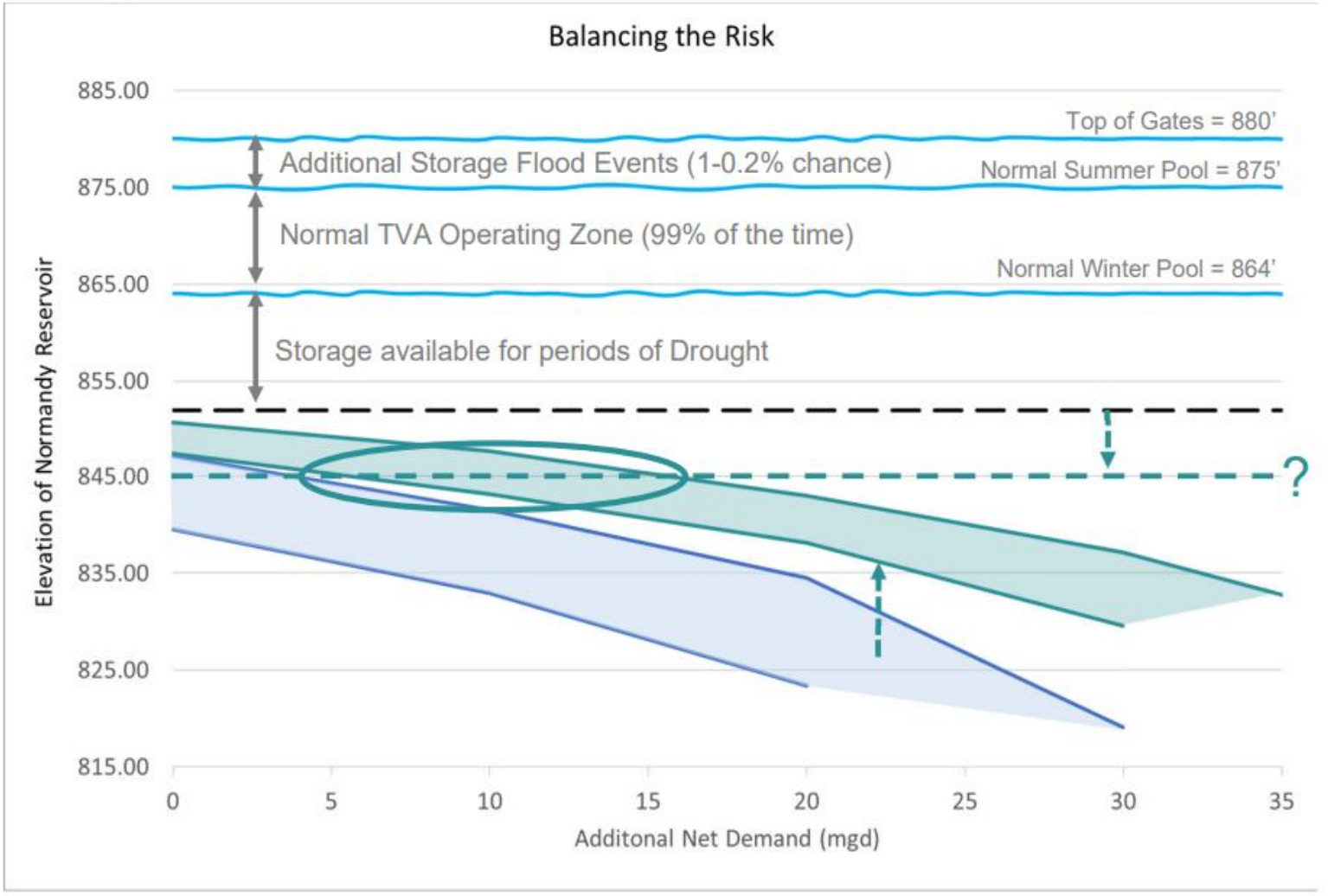
-"Going Down, Before Going Up"

- DRUC began engineering analysis for pumphouse renovations

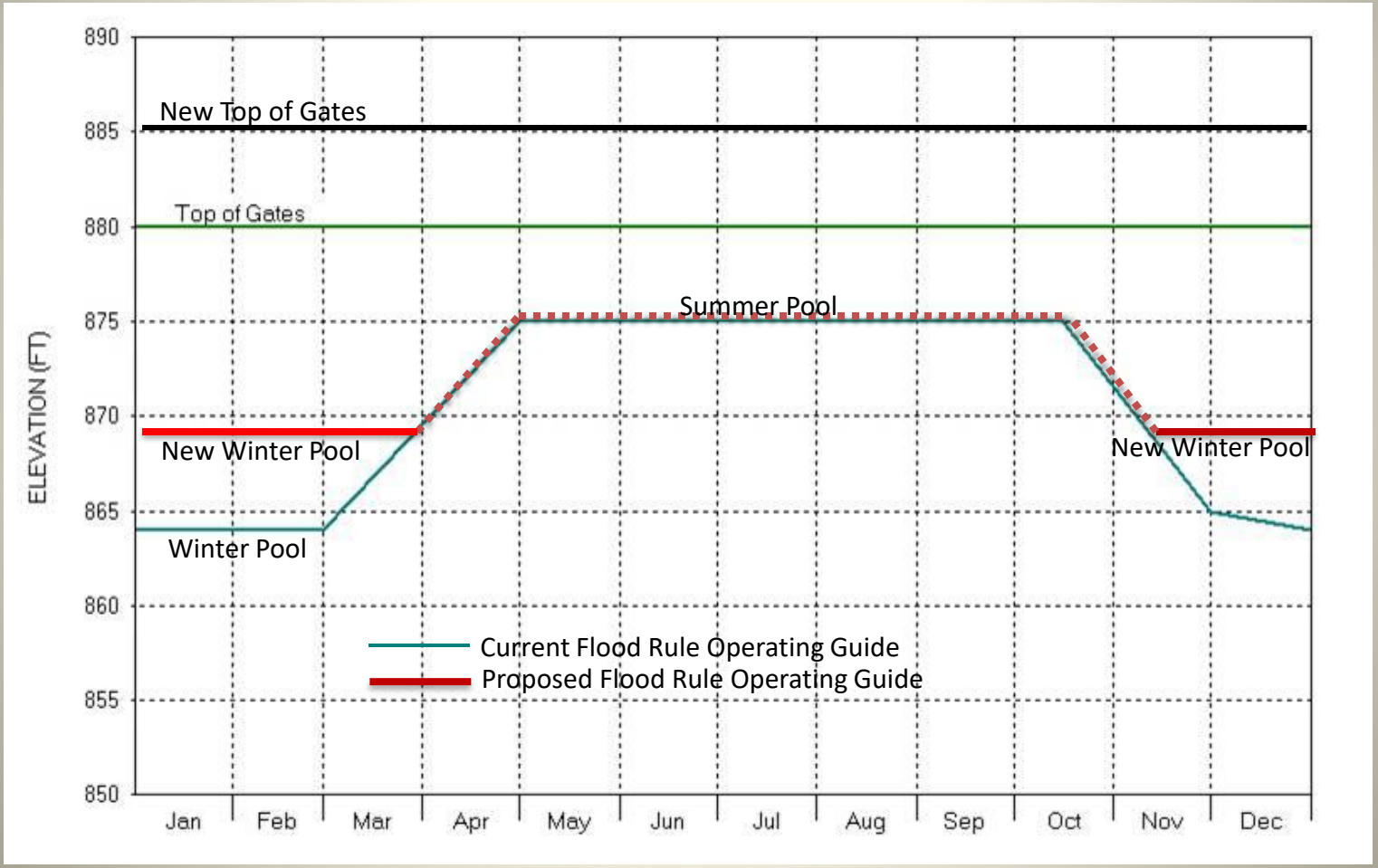
2024 - DRUC received a grant from TDEC for $8 mil

- DRUC signed agreement with DRA for $3 mil

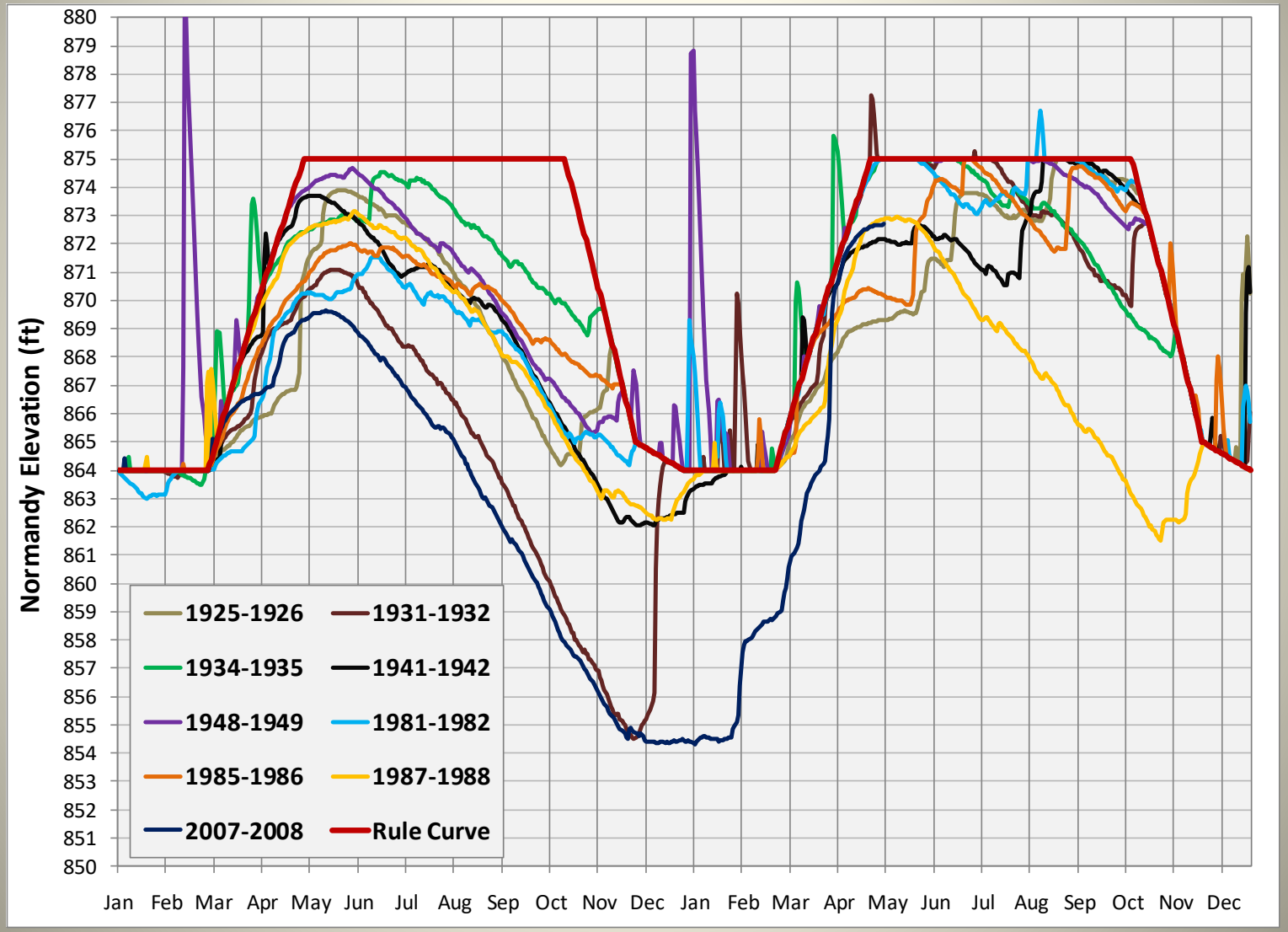
Balancing the Risk



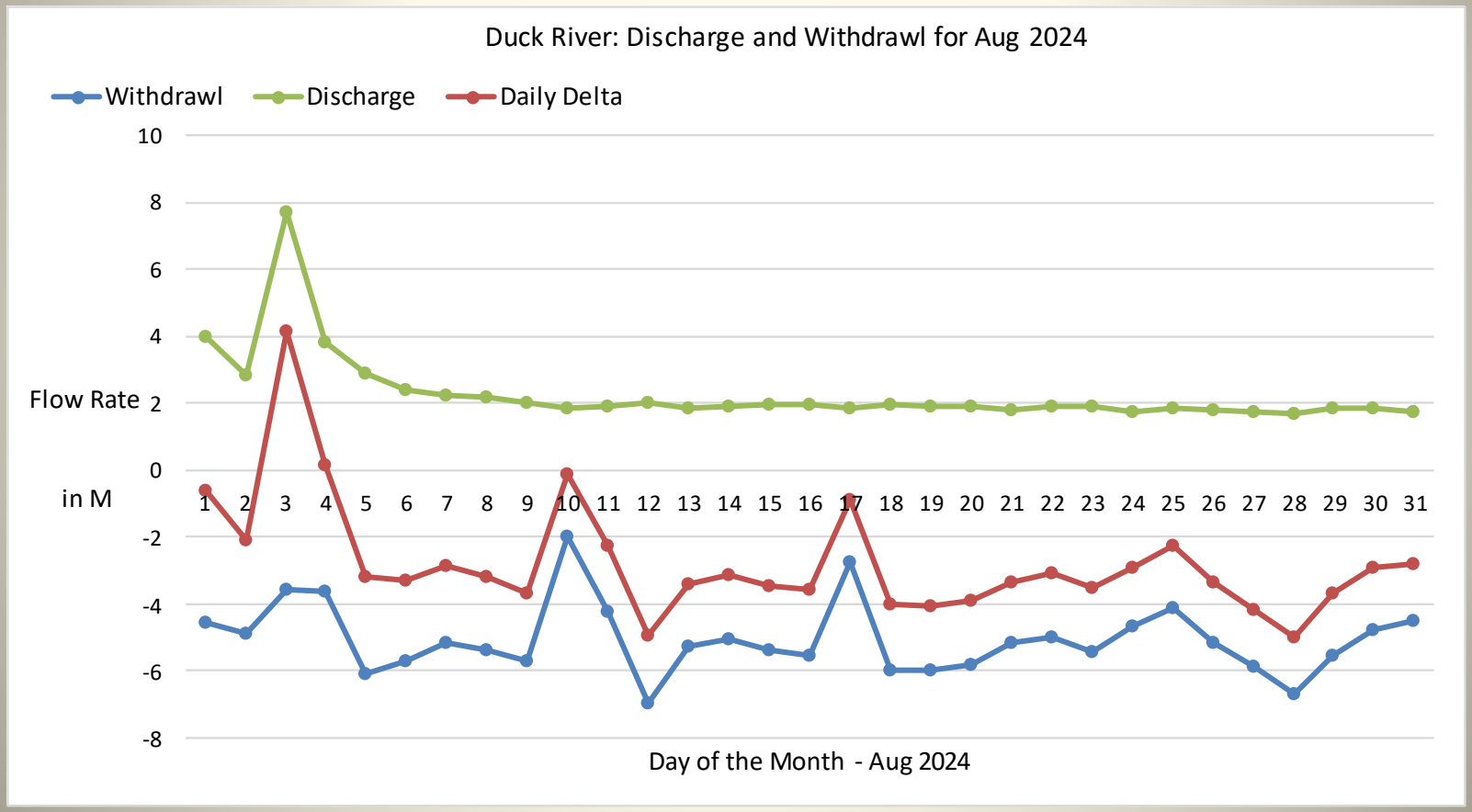
Normandy Reservoir Capacity Improvements: Proposed Changes to Flood Guide



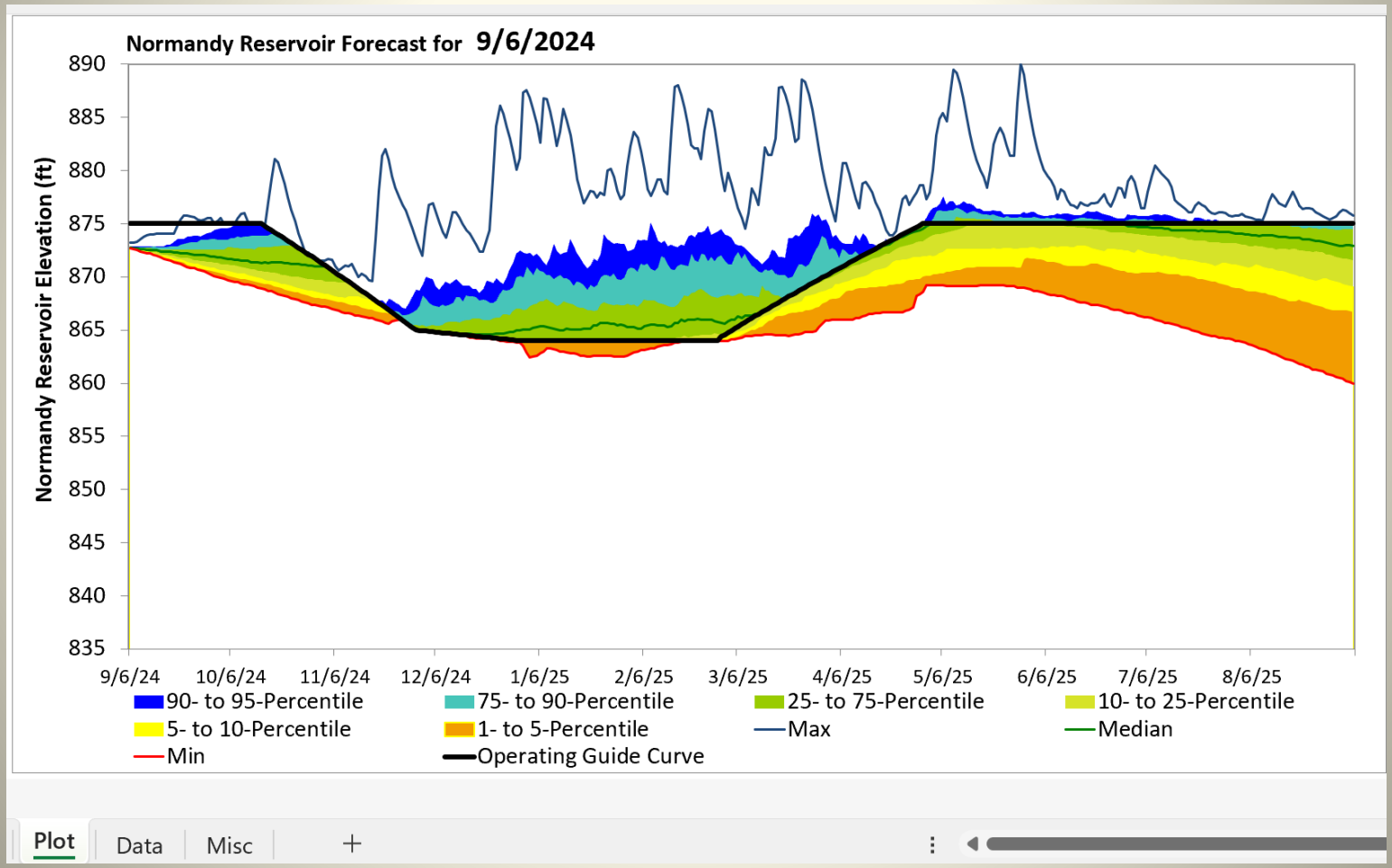
Major Normandy Droughts – Existing Rule Curve, 2020 Demands



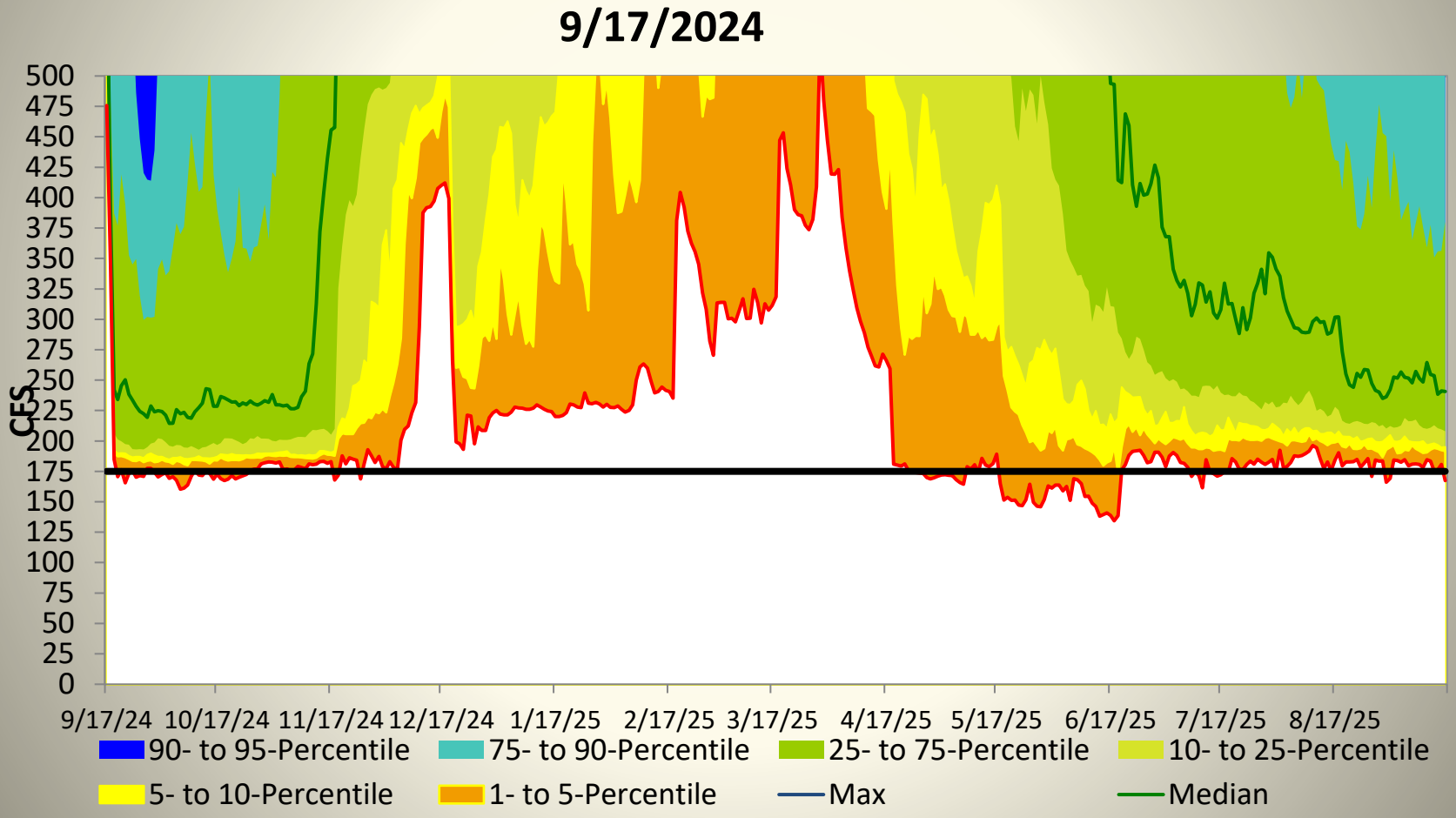
Water-Use Data Dashboard



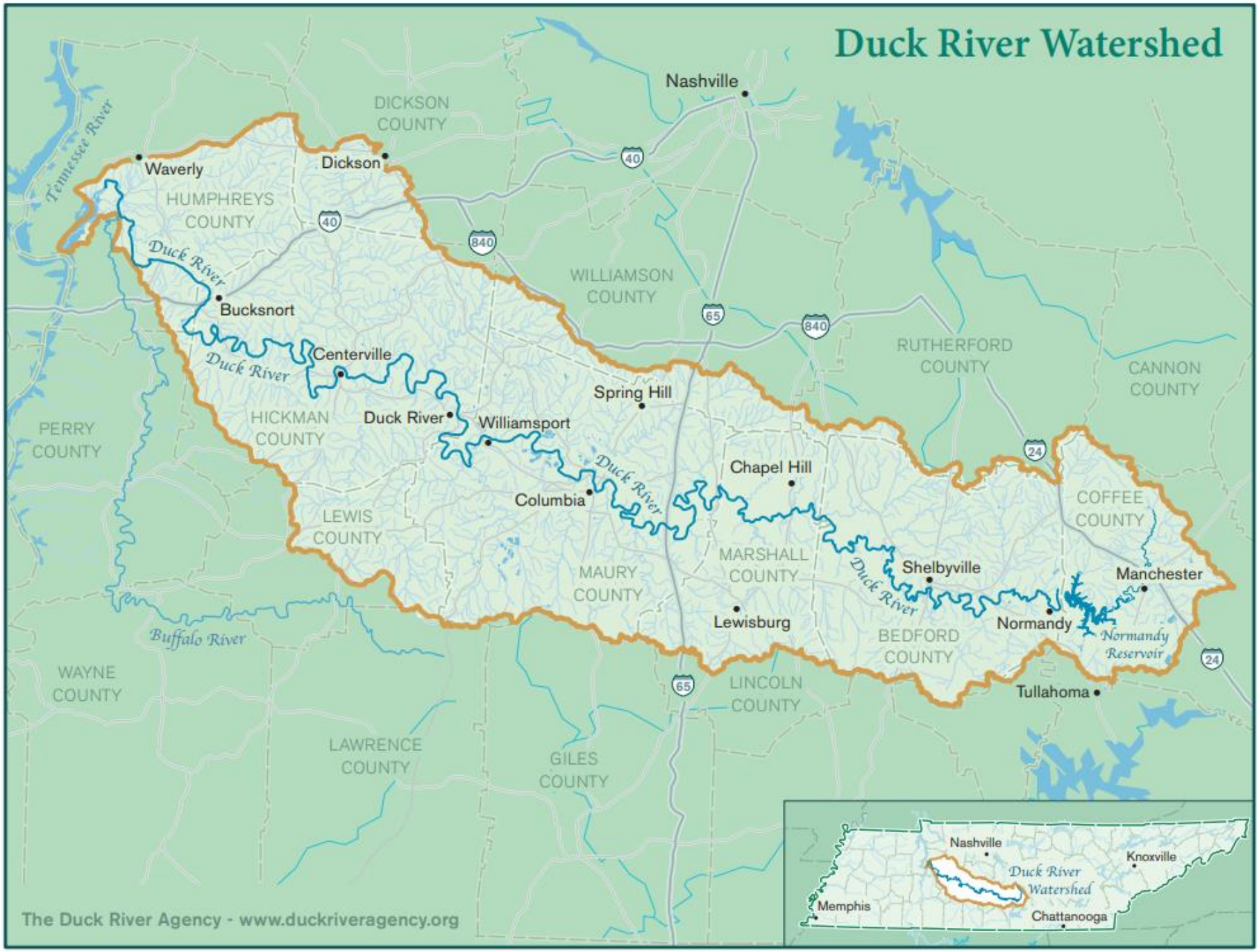
Normandy Reservoir Forecast Model



Milltown Gage Forecast Model




No fish is better than any day in the office
Working Together Works
DRA is Investment Worthy
Need $$$ for Projects
Failure to Plan is Planning to Fail
No Water No Coffee
Growth Pays for Growth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