

TVA's Aquatic Plant Management Program

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May 2014





The Tennessee River System

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Aquatic Plant Management

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1970s, 1980s to mid-1990s

- Valley-Wide in Scope
- Control with Water Level Fluctuation and Herbicide Application in Areas of Developed Shoreline
- Weed Concept versus Fish/Wildlife Habitat
- Management Decisions & All Work Conducted “In-House”
- Funded Primarily by Appropriated Dollars Through 1999
- Major Outside Criticism of TVA’s Management Program



Stakeholder Management Plans

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- Began with Development of Guntersville Aquatic Plant Management Plan in 1999
- Include and Receive Input from All Major Stakeholders
- Develop a Consensus Plan - Balance User Needs
- Reservoir Specific
- Plans Developed for Guntersville, Nickajack, and Chickamauga Reservoirs - Implemented 1999 through mid 2009
- Treatments Along Public, Commercial, Residential Shoreline
- Management Methods Identical – Herbicides (Near-Shore) & Mechanical Harvesters (Boating Access Lanes)





Herbicide Application

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Herbicide Post-Treatment

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Herbicide Treatments

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- Herbicides EPA Approved for Aquatic Use
- Applications Conducted Under Pesticide General Permit ALG870022 & TNP100003
- Guntersville Treatment Schedule Published in Local Newspapers and on TVA Website
- Signs Posted Along the Shoreline at the Time of Treatment
 - Date, Herbicide Used, Water Use Restrictions and Contact Information





Mechanical Harvester

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Boating Access Lane

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Boating Access Lane

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Herbicide & Harvester

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Herbicide & Harvester

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TVA's Current Management Approach

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2010 to Present

- TVA Manages Aquatic Plants Only in the Vicinity of Public Facilities - Greater Equitability for Ratepayers and Best Use of TVA Resources
- Valley-Wide in Scope
- Fully Implemented Beginning in 2010
- Use Herbicides in Near-Shore Areas and Harvester for Boating Access Lanes
- Herbicide Treatments in Residential & Commercial Areas – Gunterville Beginning in 2014
 - a) Stakeholder Plan in Place
 - b) Stakeholder Group Actively Seeking Long-term Funding
 - c) Developing “In-House” Ability to Manage Aquatic Plants



Water Level Fluctuations

- Provides Some Control of Aquatic Plants – Freezing & Drying
- Amplitude Important – Tributary Reservoirs (10 to >60 ft.) versus Main Stem Reservoirs (2.0 to 7.5 feet)
- Plants with Seeds (e.g., Spiny-leaf Naiad) and Underground Structures (e.g., Tubers in Hydrilla) Survive
- Shoreline Property Owners Frequently Suggest as Control Measure
- Amplitude Changes Usually Can't Be Implemented Due to Integrated System Operation and Other Constraints (e.g., Water Intakes, Power Generation, Navigation, Flood Control, Wildlife Impacts, etc.)





Integrated Management – Manual Removal

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Integrated Management – Benthic Mats

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Benthic Mat – Two Months After Placement

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The Big Picture in Management

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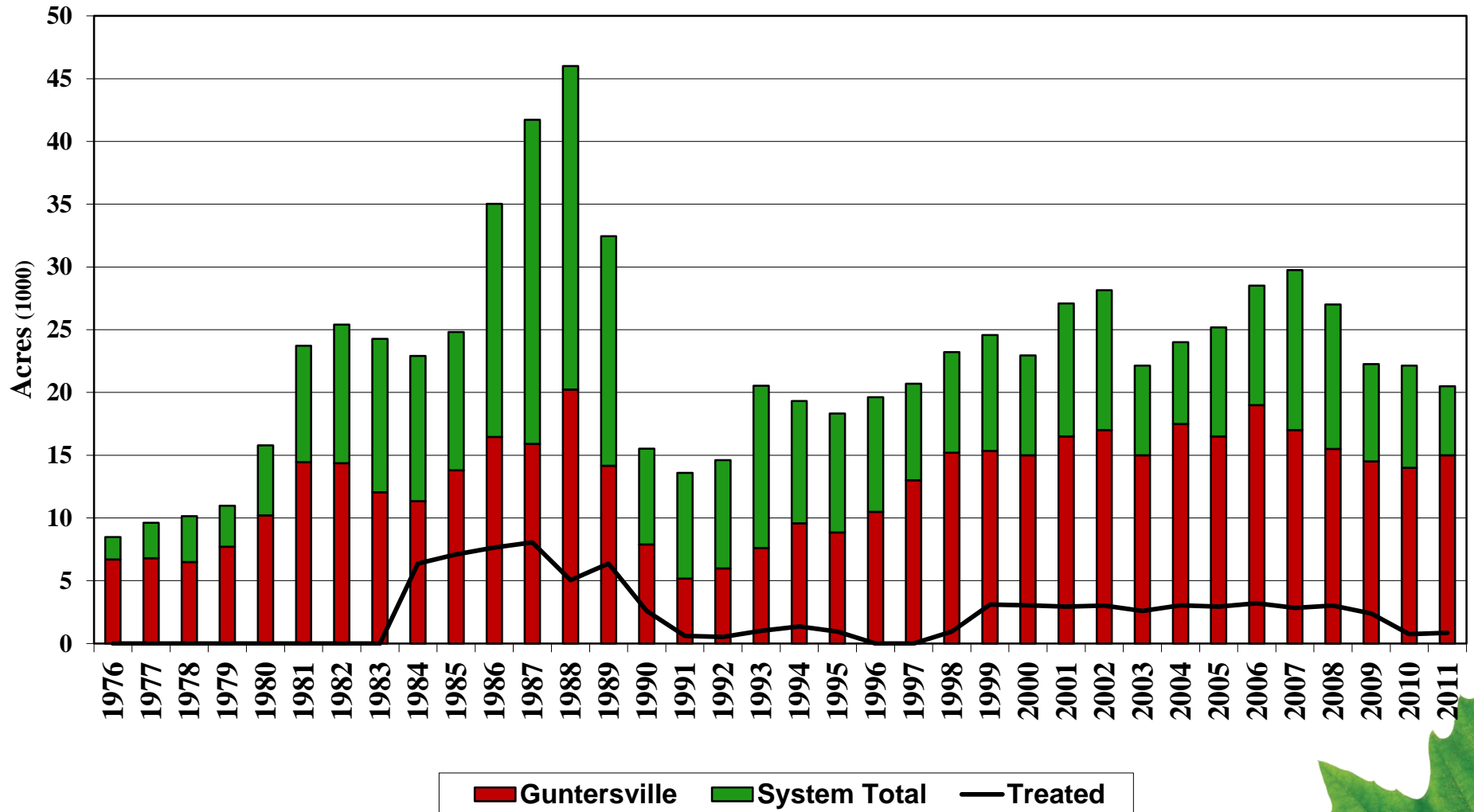
- Dominant Problem Species – Invasive Exotics – Hydrilla (Two Forms), Spiny-leaf Naiad, Milfoil
- Nuisance Native Species – Southern Naiad, Coon-tail, Pondweeds
- Wide Variety of Users Groups – Differ in Objectives and Perspectives
- Natural Succession – 70-Year Old Mainstem Reservoirs
- Cyclic Fluctuations – Dramatic in Some Years
- Causes – Climatic & Unknown



Macrophyte Coverage in TVA Reservoirs – 1976 to 2011

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Hydrilla – Gunterville Reservoir

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Hydrilla - *Hydrilla verticillata*

- Hydrilla – First Discovered in TVA System on Guntersville Reservoir – 1982
- “Dioecious Biotype” – Female Plants Only
- Present in Several Mainstem TVA Reservoirs
- “Monoecious Biotype” – Nickajack Reservoir – early 2000s
- Rapid Spread and Now Established in Most TVA Mainstem Reservoirs, Two Tributary Reservoirs, and Obed River in TN
- Habitat - TVA Reservoirs
 - “Dioecious Biotype” - Deep Water Sites
 - “Monoecious Biotype” – Shallow Water Sites – Often in Fluctuation Zone



Monoecious Hydrilla

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The “Two” Hydrillas

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The “Two” Hydrillas

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Giant Cutgrass – *Zizaniopsis miliacea*

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Uruguayan Primrose – *Ludwigia grandiflora* ssp. *hexapetala*

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Alligatorweed – *Alternanthera philoxeroides*

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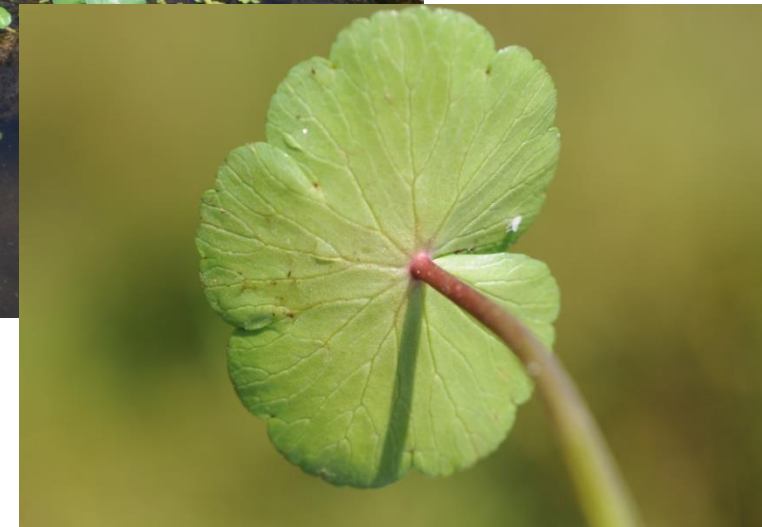




Water Pennywort – *Hydrocotyle ranunculoides*

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Asian Day Flower – *Murdannia keisak*

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Cutgrass & Floating Mat Mix

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Cuban Bullrush - *Oxycaryum cubense*

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Water Spiderwort Orchid – *Habenaria repens*

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Torpedo Grass – *Panicum repens*

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Water Spangles - *Salvinia minima*

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Common Reed – *Phragmites australis*

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Wild Taro – *Colocasia esculenta*

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Eelgrass – *Vallisneria americana*

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The End







Hockney Cutter

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