DRAFT
Logan Creek Conservation Area

Ten-Year Area Management Plan
FY 2017-2026

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OVERVIEW

- **Official Area Name:** Logan Creek Conservation Area, # 4615
- **Year of Initial Acquisition:** Mid-1940s
- **Acreage:** 11,973 acres
- **County:** Reynolds, Shannon
- **Division with Administrative Responsibility:** Forestry
- **Division with Maintenance Responsibility:** Forestry
- **Statements of Purpose:**
  - **A. Strategic Direction**
    Maintain contiguous forest and woodland cover to provide a diversity of habitat for native plants and animals. Maintain and enhance water quality in the Black and Current River Watersheds. Collaborate with conservation partners, such as Pioneer Forest, private landowners, and others, to provide seamless conservation practices on adjacent areas. Continue to serve as a study area for the Joint Fire Science Block 2 site. Protect the area's natural and cultural features.
  - **B. Desired Future Condition**
    The desired future condition of Logan Creek Conservation Area (CA) is a healthy forest/woodland complex.
  - **C. Federal Aid Statement**
    This area, or a portion thereof, was acquired with Pittman-Robertson Wildlife Restoration funds to restore and manage wildlife, conserve and restore suitable wildlife habitat, and provide public access for hunting or other wildlife-oriented recreation.

GENERAL INFORMATION AND CONDITIONS

I. <u>Special Considerations</u>

A. Priority Areas: Current River Hills Forest/Woodland – Forest and Woodland Conservation Opportunity Area, Current River Hills Glades – Glade Conservation Opportunity Area, Cave/Karst Conservation Opportunity Area #3 – Public Cave Karst Conservation Opportunity Area, Priority Forest Landscape, Elk Restoration Zone

B. Natural Areas: None

II. <u>Important Natural Features and Resources</u>

A. Species of Conservation Concern: Species of conservation concern are known from this area. Area managers should consult the Natural Heritage Database annually and review all management activities with the natural history biologist.

B. Caves: None

C. Springs: None

D. Other:

- Despite runoff into side hollows and a few valleys, most of the area will drain into Logan Creek or one of its tributaries.
- The largest landowner neighboring Logan Creek CA is Pioneer Forest. There are numerous other small landowners.
- The dominant landtype association of the area is the Black River Oak-Pine Woodland/Forest Hills. This makes up approximately 6,600 acres of the area (Figure 5). These forested landtypes consist of mostly even-aged mixed scarlet, black, and white oak. Much of the site conditions are capable of growing quality shortleaf pine.
- Ponds are spread throughout Logan Creek CA.
- Logan Creek CA has several natural communities, including pond shrub swamp, three forested sinkholes, and a dolomite glade.

III. Existing Infrastructure

- Panther Hill Tower (fire tower)
- Approximately 16 wildlife watering holes (2 acres total)
- Fire tower parking lot

IV. Area Restrictions or Limitations

A. Deed Restrictions or Ownership Considerations: The grantor retains oil and mineral rights on 120 acres purchased from the L-A-D Foundation for a period of 30 years from the purchase date (oil and mineral rights expire October 2030). This is located in T30N R1W Sec 4.

B. Federal Interest: Uses of land acquired with federal funds may not interfere with the purpose for which it was acquired. Federal funds may also be used in the management of this land. Fish and wildlife agencies may not allow recreational activities and related facilities that would interfere with the purpose for which the State is managing the land. Other uses may be acceptable and must be assessed in each specific situation.

C. Easements: Black River Electric Cooperative (Welch) has a utility easement through T31N R1W Sec 29. Black River Electric Cooperative (Schnieder) has a utility easement through T31N R1W Sec 29. The L-A-D Foundation has a railroad right of way easement through T30N R1W Sec 4.

D. Cultural Resources Findings: Yes, records kept with Missouri Department of Conservation (Department) environmental compliance specialist. Managers should follow best management practices for cultural resources found in the Department Resource Policy Manual.

E. **Endangered Species:** Endangered species are known from this area. Area managers should consult the Natural Heritage Database annually and review all management activities with the natural history biologist.
F. **Boundary Issues:** Establishing accurate and identifiable boundary markers is a priority for this property.

MANAGEMENT CONSIDERATIONS

V. Terrestrial Resource Management Considerations

Forested stands on the Logan Creek CA are primarily upland oak-hickory and oak-pine associations. Major components are scarlet oak, black oak, white oak, and hickories. Minor components include post oak and shortleaf pine. Shortleaf pine occurs on the upper south and west slopes and is usually found intermingled with oaks and hickories. Following the early twentieth-century, the merchantable forest was clear cut and consistently burnt. Since the Department began to manage Logan Creek CA, the primary objective has been resource management. Today, most of the woods are in an even-aged condition, and will be managed according to the Department's routine 20-year re-entry cycle, with an emphasis on forest ecosystem health, tree species diversity, and wildlife habitat maintenance or enhancement. Despite efforts to promote a healthy, appealing forest, in May 2009, much of the area was damaged by a derecho windstorm.

One dolomite glade has been recognized within Compartment 6 of Logan Creek CA. Due to its small size and difficult access from recent tree salvage activity, glade management is not feasible at this time.

The Joint Fire Science Project is conducted at Logan Creek CA and Clearwater CA. This study was designed to monitor the effects of four treatments across three slope position and aspect combinations.

Challenges and Opportunities:

1) There is a lack of tree species diversity in a predominantly red oak forest.
2) Reduce oak decline.
3) Communicate the benefits of timber harvesting to the public.
4) It is a challenge to market suppressed small diameter trees of low vigor.
5) Provide forest-based recreational opportunities.
6) Continue management of research areas to better inform resource managers.
7) Control invasive species.

Management Objective 1: Maintain a healthy and diverse forest to create a variety of habitat types, and sustain a diversity of plants and animals.

Strategy 1: Inventory compartments according to a 20-year re-inventory cycle. (Forestry)

Strategy 2: Conduct management based on inventory prescriptions. Focus on enhancing tree species diversity when possible. (Forestry)

Strategy 3: Control invasive species, as they occur, in order to preserve the native integrity of the forest ecosystem. (Forestry, Wildlife)

Management Objective 2: Continue management of research areas to better inform resource managers.

Strategy 1: Continue to burn Block 2 of the Joint Fire Science Project at appropriate intervals. (Forestry, Resource Science)

Management Objective 3: Communicate the benefits of timber harvesting to the public.

Strategy 1: Engage the public and forest industry via media on the benefits of forest management by communicating the distinct difference between managed harvests, i.e., the best trees are retained to provide a prescribed habitat condition; as opposed to merchantability harvests, i.e., the biggest and best trees are removed with no regard to the outcome of residual habitat conditions. (Forestry)

Strategy 2: Provide training areas for the professional timber harvester training program to assist the local forest products industry in their training efforts. (Forestry)

VI. Aquatic Resources Management Considerations

Both man-made and natural ponds occur throughout the area. Most are not large enough to support viable fish habitat.

Challenges and Opportunities:

1) Maintain the area's key wildlife watering holes and ponds.
2) Protect and enhance the area's riparian corridors.

Management Objective 1: Maintain the area's key wildlife watering holes and ponds.

Strategy 1: Retain viability of critical wildlife watering holes on the area by removing brush from dams and enhancing amphibian habitat, as needed. (Fisheries, Forestry, Wildlife)

Strategy 2: Minimize disturbance to naturally occurring ponds on the area due to sensitive or rare species that may occur there. (Fisheries, Forestry, Wildlife)

Management Objective 2: Protect and enhance the area's riparian corridors within the Current and Black River watersheds.

Strategy 1: Use best management practices as defined in the Department's *Missouri Watershed Protection Practices Recommended for Missouri Forests: 2014 Management Guidelines for Maintaining Forested Watersheds to Protect Streams* (Missouri Department of Conservation, 2014)to enhance best management practices during timber harvests and temporary sale access road construction; and to evaluate the impacts of existing area roads on the watershed. (Design and Development, Fisheries, Forestry)

VII. Public Use Management Considerations

Challenges and Opportunities:

1) Provide for public hunting and wildlife viewing opportunities.
2) Improve educational and interpretive opportunities.
3) Build relationships with neighboring landowners.

Management Objective 1: Provide public hunting, hiking, and wildlife viewing opportunities.

Strategy 1: Conduct management activities that will provide habitat for a diversity of species of wildlife. (Forestry)

Management Objective 2: Improve educational and interpretive opportunities on Logan Creek CA.

Strategy 1: Communicate recreational opportunities to the public (e.g., using brochures, Atlas database). (Forestry)

Strategy 2: Communicate to teachers, students, scout groups and youth groups the uniqueness of the area to facilitate as a possible destination for ecology classes, school programs, and workshops. (Outreach and Education)

Management Objective 3: Facilitate a good working relationship with neighboring landowners.

Strategy 1: Work with neighbors to minimize boundary, trespass or any other issues affecting Logan Creek CA or neighboring private property. (Forestry)

Strategy 2: Promote habitat management on neighboring landowner properties. (Private Land Services)

VIII. Administrative Considerations

Challenges and Opportunities:

1) Maintain area infrastructure at current levels.
2) Maintain boundary lines and area signage.
3) Consider land acquisition, when available.

Management Objective 1: Maintain area infrastructure at current levels.

Strategy 1: Maintain area infrastructure in accordance with Department guidelines. (Forestry)

Management Objective 2: Maintain boundary lines and area signage.

Strategy 1: Maintain the area's 76 miles of painted boundary lines with blue paint on a five-year rotation. (Forestry)

Strategy 2: Maintain or replace area signage and regulations postings, as needed. (Forestry)

Lands Proposed for Acquisition:

When available, inholdings and adjacent land may be considered for acquisition from willing sellers. Tracts that improve area access, provide public use opportunities, contain unique natural communities and/or species of conservation concern, or meet other Department priorities, as identified in the annual Department land acquisition priorities, may be considered.

MANAGEMENT TIMETABLE

Strategies are considered ongoing unless listed in the following table:

	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26
Terrestrial Resource Management										
Objective 1										
Strategy 1		X			X	X	X	X		X
Objective 2										
Strategy 1			X				X			
Administrative Considerations										
Objective 2										
Strategy 1		X	X		X		X	X		X

APPENDICES

Area Background:
In the fall of 2014, Dickens Valley, Logan Creek, and Powder Mill conservation areas were combined to create Logan Creek Conservation Area (CA). Most of this land was purchased in the late 1940s and early 1950s from private landowners. Anywhere from $1.00 to $2.50 per acre was paid for these lands (Missouri Department of Conservation, 1993). The Logan Creek CA now consists of 12 management units spread over 11,973 acres in Shannon and Reynolds Counties.

Logan Creek CA was subjected to very little forest management from the time of purchase until 1978. Subsequently, the forest was aggressively managed until 1980.

In 1990 the first application of uneven-age management occurred in Logan Creek CA. Oak decline has been an issue in the area due, in part, to the even-age structure of the forest. In addition to routine timber sales and mortality salvage sales, oak decline has been addressed through fuelwood permits and cultural operations (Missouri Department of Conservation, 1993).

The May 2009 Derecho windstorm devastated much of Logan Creek CA. By the end of 2010, the known blowdown had been salvaged, with some areas experiencing drastic forest changes.

A shortleaf pine study was established in what is now Logan Creek Compartment 5 in March 1988. The objective of the study was to evaluate the effects of bulldozer ripping on survival, height, diameter, volume, crown spread, and free-to-grow status of planted shortleaf pine seedlings. The study showed that while ripping was beneficial at ages three and younger, it was not at age 16 (Gwaze, Hauser, & Johanson, 2006). The study area was thinned in 2006 by a timber stand improvement contractor. Damage from the 2009 Derecho windstorm and salvage operations is likely.

The Joint Fire Science Project is conducted at Logan Creek CA and Clearwater CA. This study was designed to monitor the effects of four treatments across three slope position and aspect combinations. Treatments included prescribed fire (burn), commercial thinning (harvest), their combination (harvest-burn), and a control. Treatments were paired by slope and aspect to create 12, 5-acre units per block. Three complete blocks were initially established: two at Clearwater CA and one at Logan Creek CA, each approximately 60 acres in area. Timber harvests occurred during the summer and early fall 2002, prior to the first burn. Harvesting reduced stand density to 40 percent stocking by thinning from below. However, to achieve tree stocking goals, some dominant and co-dominant trees were removed. Preferred trees for retention were white oak and shortleaf pine because of the fire tolerance of these two species. Prescribed fires were applied

during spring for burn and harvest-burn units in 2003 and 2005. Each burn was executed using the ring fire method, while burning the ridges at the same time.
Block 2 of the Joint Fire Science Project is part of Logan Creek CA. Burns on all three blocks occurred in the spring of 2015. Stevenson and Anderson (2012) advise a controlled burn on each block every three to five years. It is planned to burn them on a four-year rotation.

Current Land and Water Types:

Land/Water Type	Acres	% of Area
Upland Forest	11,972	99
Glade	1	<1
Total	**11,973**	**100**

References:

Gwaze, D., Hauser, C., & Johanson, M. (2006). *A 16-year evaluation of effects of ripping on shortleaf pine on a Missouri Ozarks site* (Gen. Tech. Rep. SRS-92). Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station.

Missouri Department of Conservation. (1993). *Logan Creek Conservation Area plan*. Jefferson City, MO: Missouri Department of Conservation.

Missouri Department of Conservation. (2009). *Watershed and stream management guidelines for lands and waters managed by Missouri Department of Conservation.* Jefferson City, MO: Missouri Department of Conservation.

Missouri Department of Conservation. (2014). *Missouri watershed protection practices recommended for Missouri forests: 2014 management guidelines for maintaining forested watersheds to protect streams*. Jefferson City, MO: Conservation Commission of the State of Missouri.

Nigh, T. A. & Schroeder, W. A. (2002). *Atlas of Missouri ecoregions.* Jefferson City, MO: Missouri Department of Conservation.

Stevenson, A., & Anderson, C. (2012). *Fire effects on woodland vegetation and soil nutrients and carbon.* Jefferson City, MO: Missouri Department of Conservation.

Maps:

Figure 1: Area Map
Figure 2: Aerial Map/Land Cover Map
Figure 3: Compartment Map
Figure 4: Easement Map

Figure 5: 2009-2010 Blowdown Salvage Map
Figure 6: Land Type Association Map

Figure 1: Area Map

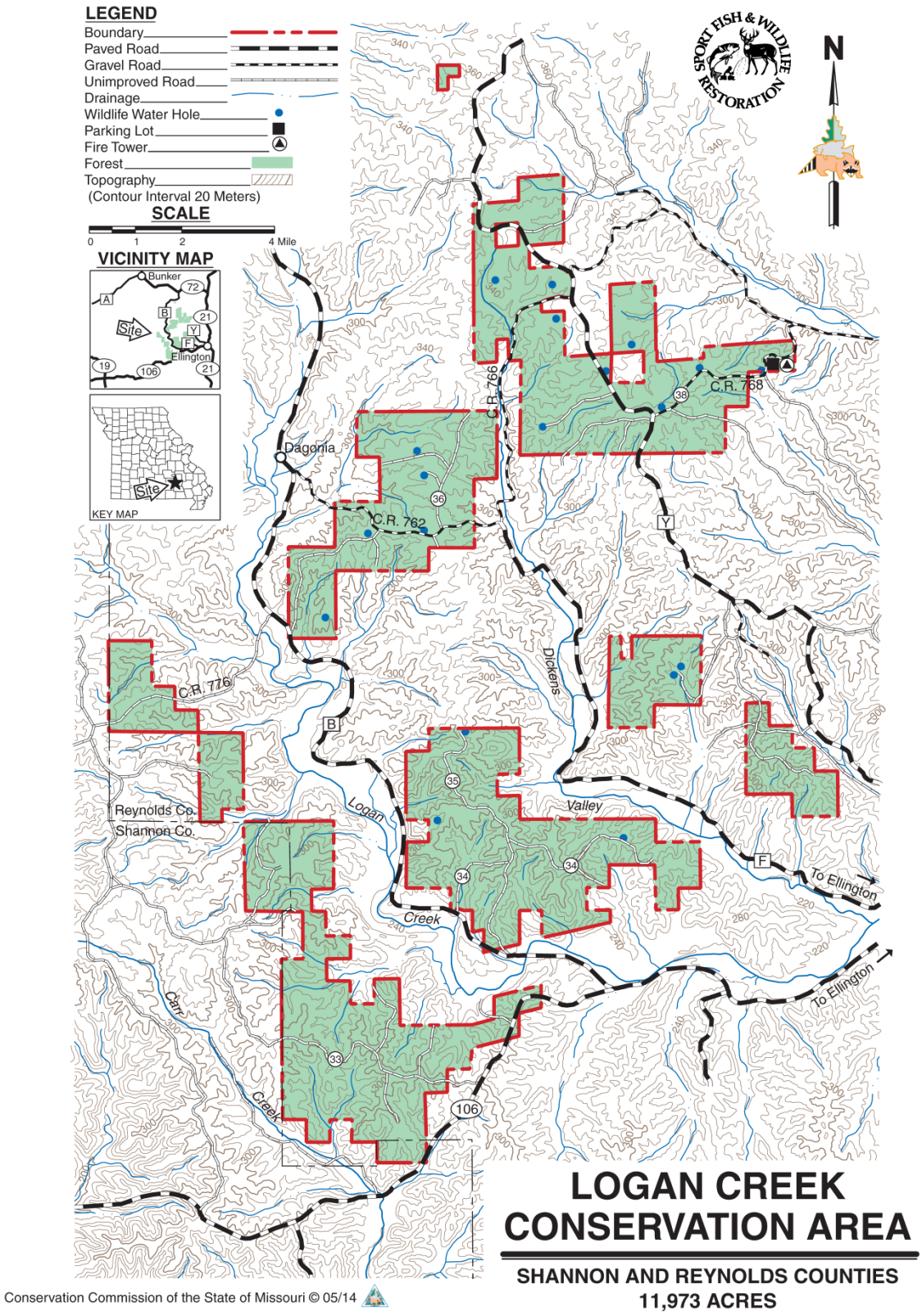


Figure 2: Aerial Map/Land Cover Map

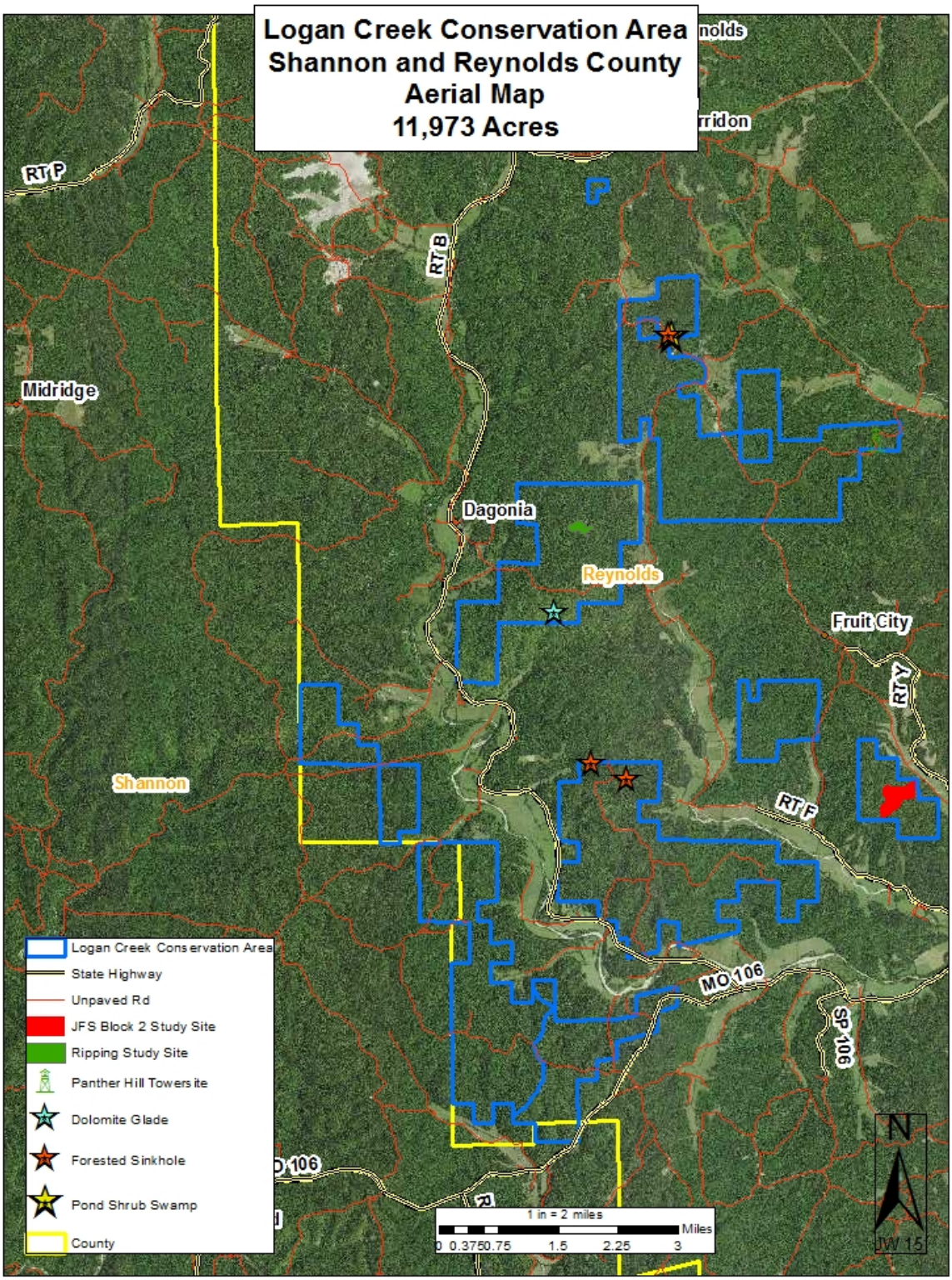


Figure 3: Compartment Map

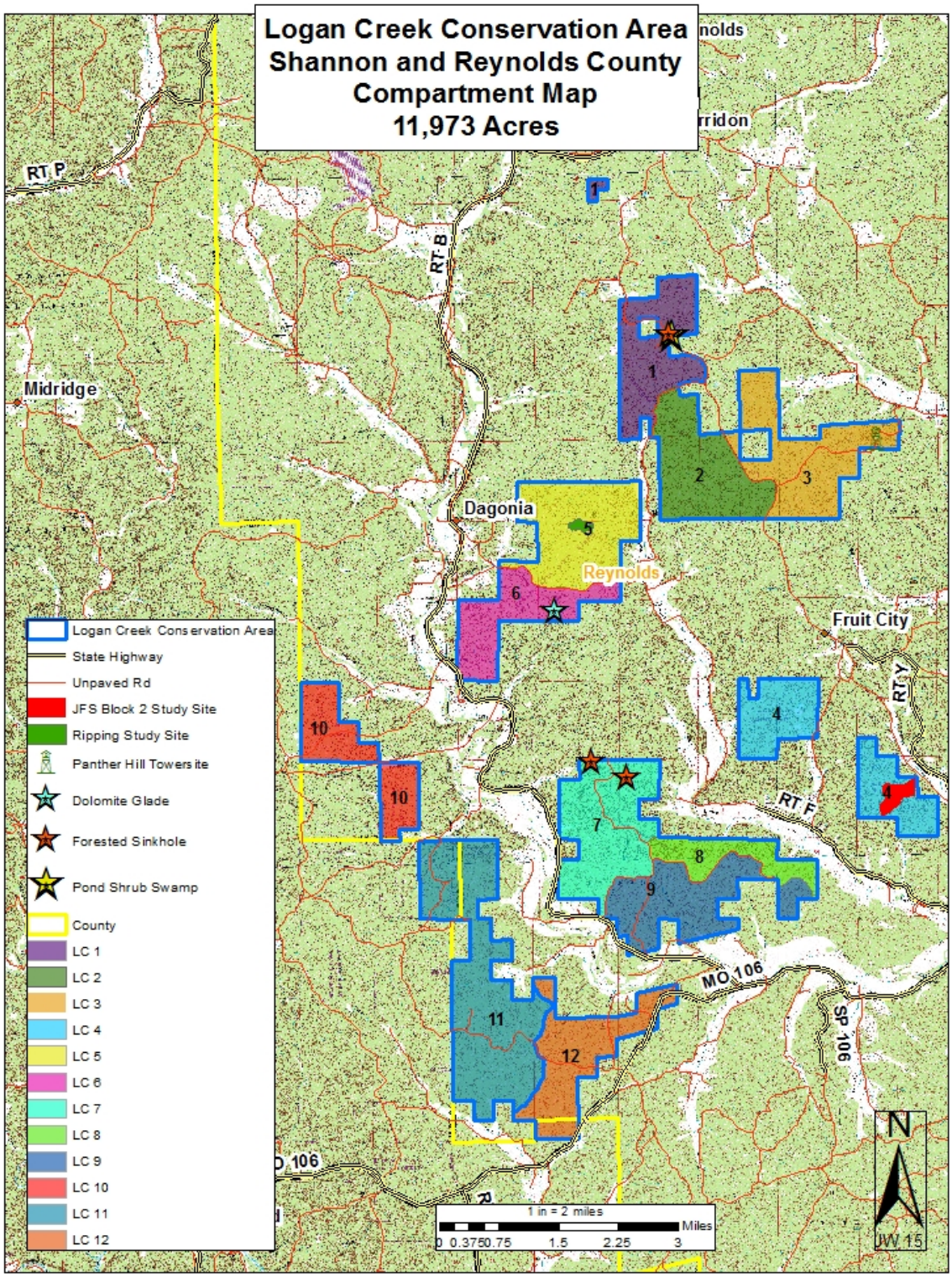


Figure 4: Easement Map

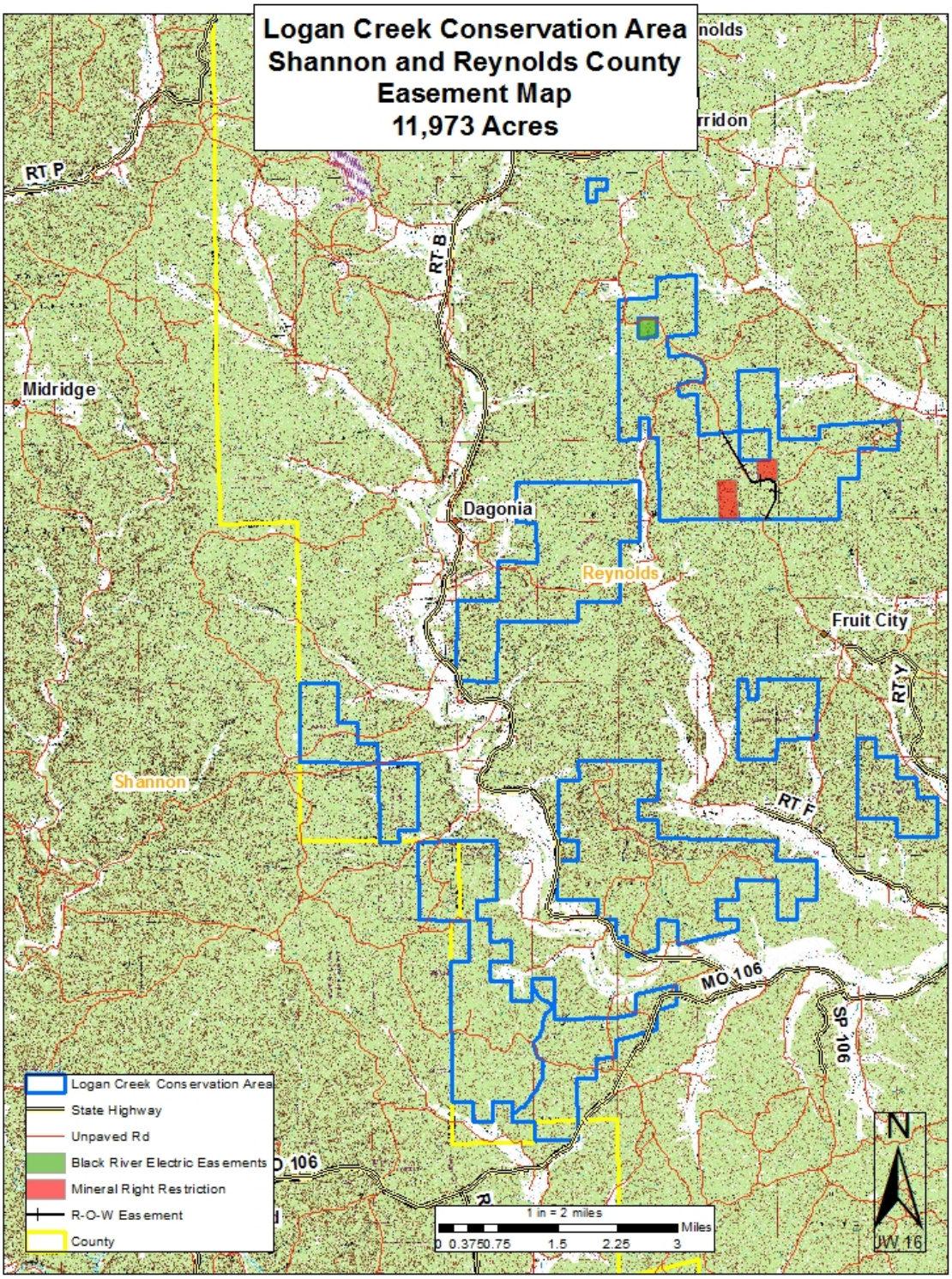


Figure 5: 2009-2010 Blowdown Salvage Map

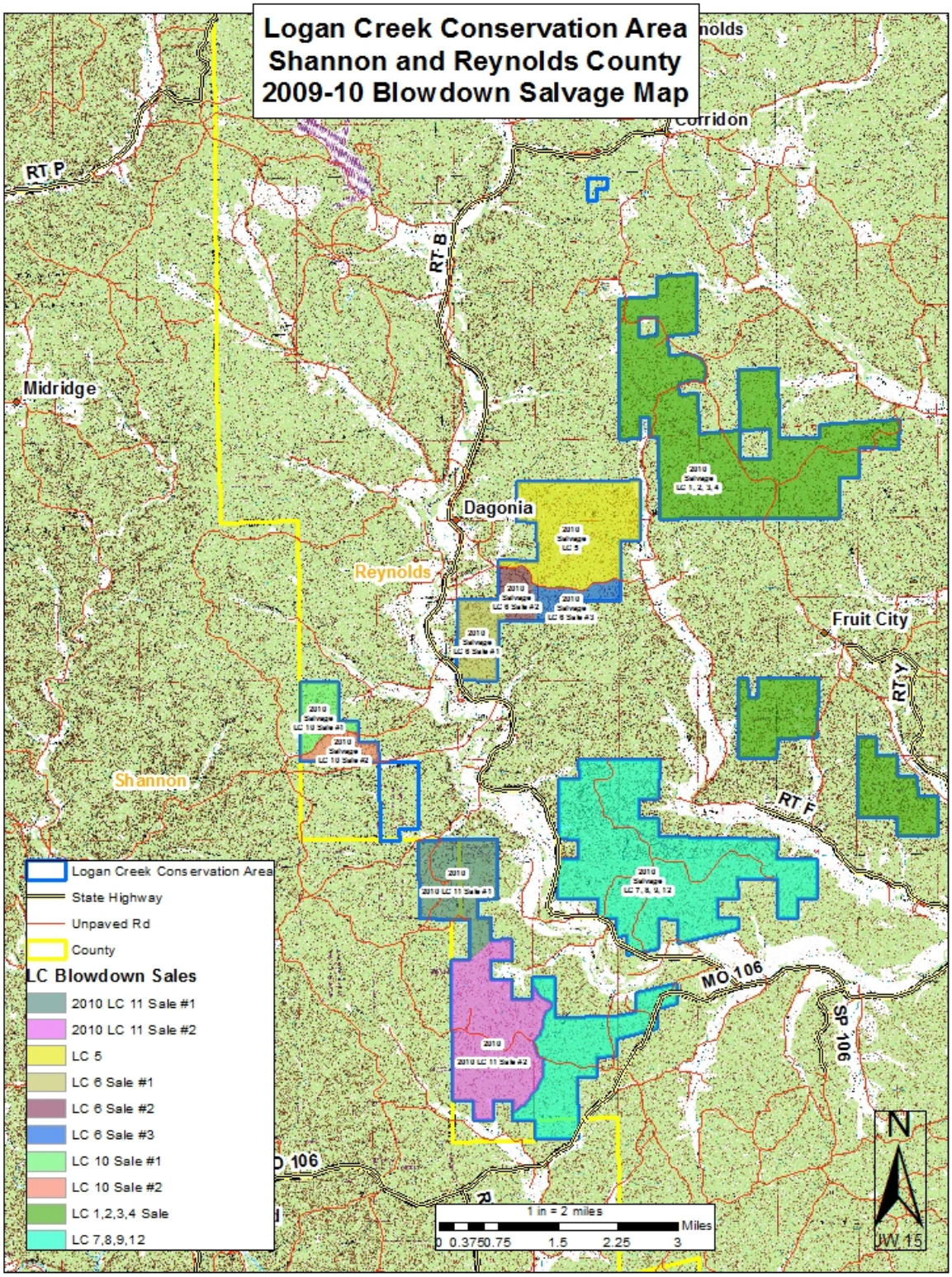
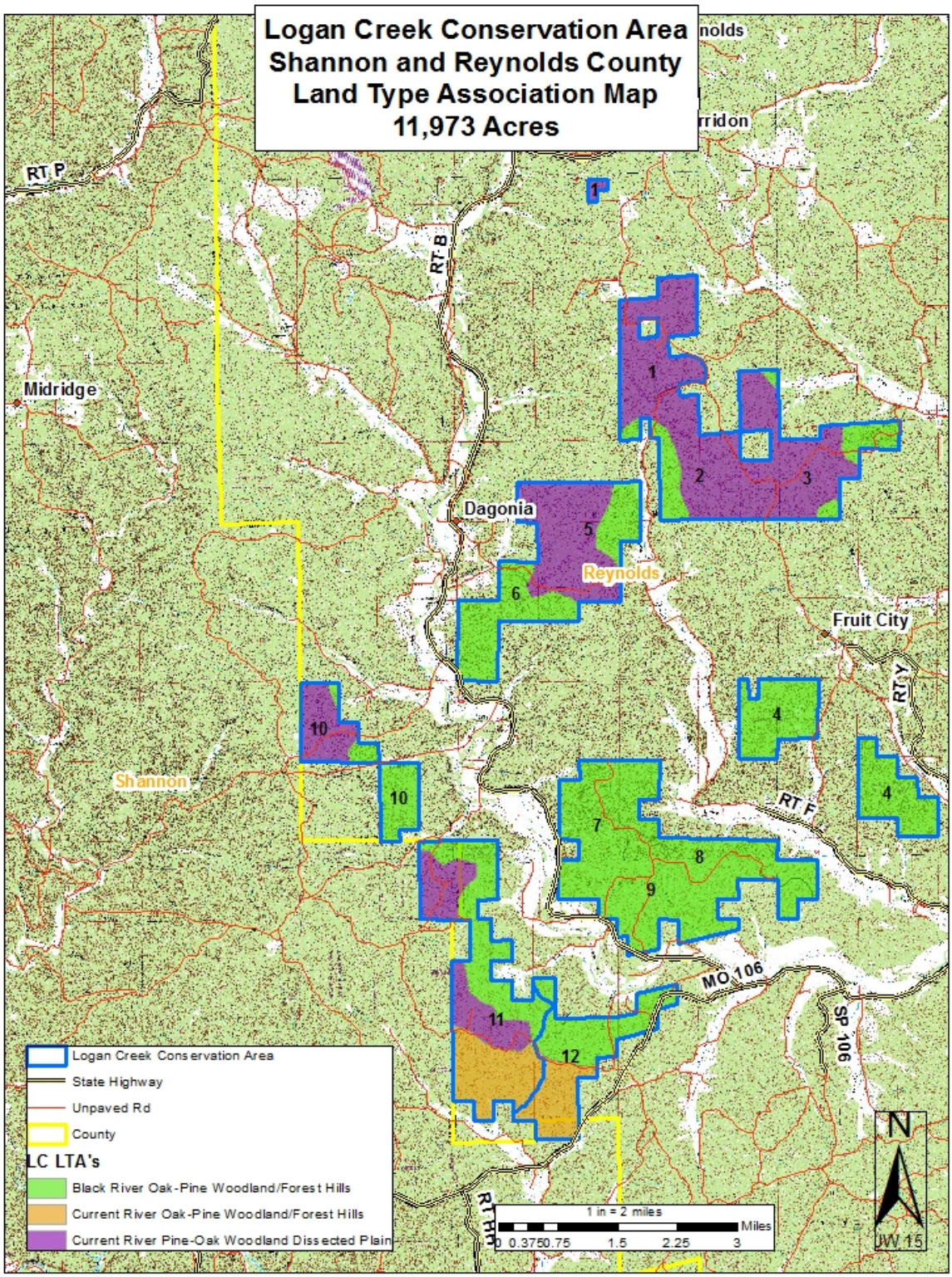


Figure 6: Land Type Association Map



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