Central Arkansas Water
Maumelle River WMA

Silvicultural Management Plan

January, 2014

In cooperation with the Arkansas Game and Fish Commission, the Arkansas Forestry Commission and the Arkansas Field Office of The Nature Conservancy.
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Introduction

The Board of Commissioners (the Board), Central Arkansas Water (CAW) and staff of CAW embarked on a strategic planning process for the utility in July 2008. With many new initiatives and needs on the horizon, the Board and staff felt it was important to develop a plan to address these for both the near-term as well as the future. From 2001 until 2008, the consolidation agreement between Little Rock Water Works and the North Little Rock Water Department had served as the de facto strategic plan. In 2008, six key focus areas were identified by the Board and tasks were developed from those areas. Watershed Management was among the six key focus areas. Strategic Planning Task 2.7, develop plan for management of CAW forest stands, was initiated to provide a long-term management plan for the forested lands around Lake Maumelle that included forest habitat management using thinning and appropriate prescribed fire, Best Management Practices (BMPs), enhanced wildlife habitat and water quality protection, and provide long-term income from timber sales. The following report will provide history, current status and recommendations for the approximate 9,974 acres immediately surrounding Lake Maumelle, and the additional 2100 acres CAW owns in the watershed, based on research and information gathered from field reconnaissance and other sources.

History and Overview

Many of the forests in this watershed on Central Arkansas Water property originated from fire disturbance. Ages of mature shortleaf pines range from 90 to 120 years old, which corresponds with the massive timber cuts that occurred in the area between 1900 and 1928. The Fourche River Lumber Company at Bigelow was the largest sawmill in the region that depleted the virgin pine resource between 1899 and 1928 (at which time went bankrupt due to forest resource depletion). Wildfires were common and burned out of control regularly before the creation of the Arkansas Forestry Commission in 1932. Thus the forest resource to be managed has its roots in fire.

Construction began on the Maumelle Reservoir, now known as Lake Maumelle, in 1956 after extensive consideration of two sites, the North Fork River near Congo and the Maumelle River west of Little Rock. Lake Maumelle was constructed solely as a drinking water supply. Water began flowing from Lake Maumelle on June 3, 1958 and the City of Little Rock abandoned use of the Arkansas River as either a sole or supplemental drinking water source for the first time in 82 years. Today, Lake Maumelle serves approximately 400,000 customers in 17 communities. Over the past 52 years, Little Rock Municipal Water Works, and later Central Arkansas Water, has acquired approximately 10,050 acres surrounding Lake Maumelle. Since the construction of the lake, no active forest or habitat management activities have taken place. Thus, large amounts of downed woody debris now hold the potential for fueling a catastrophic wildfire. No significant fire event has been recorded on the property since construction. However, several small fires have occurred in various locations around the lake. The largest fire noted encompassed approximately 40 acres on the north side of Lake Maumelle (personal communication, Dennis Yarbro, February 2012, CAW). The lack of active management has also resulted in a high tree density per acre and shading of the forest floor. The only timber activity that has occurred was removing some downed trees due to high winds on the western end of the lake (personal communication, Dennis Yarbro, February 2012, CAW). The existing forest
conditions can contribute to disease, poor growth due to nutrient and water competition, and shading out of the herbaceous understory. All of these combined can contribute to a decrease in water quality by increasing the Total Organic Carbon (TOC) inputs into the lake and by decreasing sediment filtration of run-off from storm events.

In July of 1960, Metroplan provided Little Rock Municipal Water Works with a land management report titled “Considerations in Land Management – Maumelle Reservoir.” The report begins by stating, “Proper use and treatment of land is a primary consideration in erosion control and in watershed planning. It becomes increasingly important and essential when surface water is to be impounded and utilized for public consumption.” The intended purpose of the report was to “assist the Water Works Commission in a program of land management, the promotion of good forestry measures, conservation practices, and watershed protection for an improved water supply.” The report focused on the soil types and characteristics of the Maumelle watershed, and on ground cover and suggested treatments. It recommended that “all available means should be employed to protect the forest cover from disastrous fires.” Establishment of fire lanes and fire breaks, thinning, removal of cull hardwoods and planting pine in the open areas were also recommended. Even though specific recommendations were made for forest management, these were not initiated.

An ecological assessment of Pulaski County was initiated in 1999 by the Pulaski County Regional Solid Waste Management District (the District). In conducting its business and planning for solid waste management services county-wide, the District requires information about ecologically significant areas within Pulaski County in order to minimize its impact on these sensitive areas (The Nature Conservancy, 2002). The District also wanted to identify and inventory significant ecological areas to guide future decisions on locations of its facilities and to conserve areas from adverse impacts due to its operations. Areas including one or more of the following attributes were considered significant sites:

Ecologically important or rare plant and animal species
Significant or undisturbed natural communities
A wide diversity of natural communities in one area
A diverse group of plant or animal species (high biodiversity) (The Nature Conservancy, 2002)

The second phase of the assessment conducted in 2002 included the Maumelle River and Lake Maumelle in the report. The significant plant communities and wildlife species listed were old growth bald cypress forest, Ozark chinquapin and Bald Eagles. A brief description of the forest stated dense, overstocked conditions.

In February 2007, the Board of Commissioners, Central Arkansas Water, approved the Lake Maumelle Watershed Management Plan (the Plan). This plan was developed in response to increasing development pressure in the watershed and the utility’s desire to protect the high water quality of Lake Maumelle. The Plan, developed by Tetra Tech, Inc., calls for various management practices to be initiated in the watershed and also lists activities that can occur in the watershed without significant impact to Lake Maumelle. Water quality targets were established for Chlorophyll a, Total Organic Carbon (TOC), Turbidity and fecal coliform bacteria. Chapter 9 of the Plan focuses on forest management practices. The primary
recommendations made in this chapter were to maintain current levels of BMP implementation in the watershed for harvesting and other non-road forestry BMPs, encourage better application of forest road BMPs and to develop an enhanced fire management plan for the watershed. Another recommendation calls for the development of an “Enhanced Fire Management Plan … led by the Lake Maumelle Stewardship Coordinator working closely with state and federal forestry agencies.” Under the development scenarios in the Plan, hunting is listed as an activity that can occur in undisturbed open space, along with prescribed fire, thinning, and establishment of native understory grasses and other herbaceous species. The Plan also calls for CAW to continue to purchase conservation land in the watershed, especially land that is adjacent to property currently owned by CAW.

CAW began working with the Arkansas Game and Fish Commission (AGFC) in late 2008 and early 2009 to develop a Memorandum of Agreement to establish a Wildlife Management Area around Lake Maumelle. One of CAW’s primary interests in the agreement was having access to the expertise and resources available at AGFC for land management. A “demonstration” prescribed burn was conducted on the Bufflehead Bay Trail peninsula in March 2011. This burn ushered in a new shift in management philosophy from no active management to actively managing the forest for water quality benefits.

In early 2010, the Arkansas Forestry Commission (AFC) sent out for review its “Arkansas Statewide Forest Resource Assessment.” This document is in response to the U.S. Forest Service’s desire to redesign state and private forest programs. The report outlines several long-term strategies for addressing priority landscapes identified by each state. One of the strategies listed is quoted below:

*Enhance Public Benefits from Trees and Forests: including air and water quality, soil conservation, biological diversity, carbon storage, and forest products, forestry-related jobs, production of renewable energy and wildlife.*

*Protect and enhance water quality and quantity.*

*Improve air quality and conserve energy.*

*Assist communities in planning for and reducing wildfire risks.*

*Maintain and enhance the economic benefits and values of trees and forests.*

*Protect, conserve, and enhance wildlife and fish habitat.*

*Connect people to trees and forest, and engage them in environmental stewardship activities.*

*Manage and restore trees and forest to mitigate and adapt to global climate change.*

The report goes on to list the benefits of forested areas to clean water and the Lake Maumelle watershed is listed as a priority area which can benefit from forested waterways. Additionally, the Little Rock-Hot Springs Urban Expansion Area is designated for funding under the U.S. Forest Service Forest Legacy Program.

A work agreement was signed with AFC in February 2012 to perform road rehabilitation, maintenance and close out of old timber access roads on a section of property purchased from Deltic Timber Corporation. Forest roads can be a significant source of sediment runoff which degrades water quality.
CAW is working with its partners, Arkansas Game & Fish Commission, Arkansas Forestry Commission, and The Nature Conservancy (TNC), to further develop and refine appropriate management actions. These partners are providing assistance in implementing conservation strategies, enhancing wildlife habitat and forest health, improving forest roads, providing recreational and educational opportunities, and, most importantly, improving water quality. Based on recommendations in the Metroplan report, the Lake Maumelle Watershed Management Plan and Strategic Planning Task 2.7, the following Operations Plan for forest management has been developed.

**Property Description**

CAW owns approximately 10,000 acres around Lake Maumelle as indicated below:

- Portions of sections 03, 04, 05, T02N, R14W; Pulaski County, AR.
- Portions of sections 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33, 34 T03N, R14W; Pulaski County, AR.
- Portions of sections 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 T03N, R15W; Pulaski County, AR.

Lake Maumelle is located in the Ouachita Mountain Ecoregion of Arkansas. The area is characterized by west-east running ridges derived of sandstone and shale that are dominated by shortleaf pine (*Pinus echinata*) woodland and forest, as well as several species of oak and hickory, primarily post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), black hickory (*Carya texana*), and mockernut hickory (*Carya tomentosa*). Hardwood composition is more dominant on north aspects and mesic areas. Common shrubs and midstory vegetation include several blueberry species (*Vaccinium spp.*), winged elm (*Ulmus alata*), eastern hop hornbeam (*Ostrya virginiana*), red maple (*Acer rubrum*), and oak – hickory species. Characteristic herbaceous species include little bluestem (*Schizocarium scoparium*), woods oats (*Chasmanthium sessiloflorum*), poverty oak grass (*Danthonia spicata*) and a wide suite of other native grasses and forbs. Another natural community found at the site includes bottomland hardwood forest of sweetgum (*Liquidambar styraciflua*), willow oak (*Quercus phellos*), and bald cypress (*Taxodium distichium*) along the Maumelle River. Topography at the site ranges from flat in areas of bottomland hardwood along the Maumelle River and portions of the lake shore, to quite steep and rugged terrain more typical of the Ouachita Mountains. Lake Maumelle itself is an 8,900 acre reservoir, and the main drinking water source for all of central Arkansas. Three main state highways are in close proximity or run through the property including Highway 10 in the south, Highway 113 to the west, and Highway 300 to the east. The Ouachita Trail runs through the property from Highway 300 by the dam, around the north shore of the lake, and then west along the Maumelle River. Pinnacle Mountain State Park is adjacent to the southeast of the property. Jolly Rogers Marina and Alotian Golf Course are located on the south side of the lake. Deltic Timber owns much of the adjoining property to the south and west of the lake. Exurban development is common along the eastern boundary of the area (The Nature Conservancy, 2013).
Purpose

The main goal of forest and habitat management on CAW property is to improve and/or maintain water quality. This will be accomplished by restoring native herbaceous plant communities through selective thinning and controlled burning. CAW’s recent work with the conservation partnerships in Arkansas, including the Oak Ecosystem Restoration Team and Arkansas Prescribed Fire Council, has led to increased understandings of the natural vegetative communities present on these lands. Within the last two decades, scientific and historical data have greatly increased the knowledge of resource managers with regards to the forces that created and maintained the forest communities that we have inherited. Climatic conditions coupled with both natural and, the more consistent, cultural (human-set) fires through thousands of years provided for the ecology of these plants. Therefore upland forests dominated by shortleaf pine and oak are fire-dependent vegetative communities that include a host of other fire-adapted plant species now rare in their natural ranges. These sun-loving species are dependent upon disturbances that allow sunlight to penetrate the canopy and thus serve to sustain their existence on the landscape. In today’s society, broad-scaled forces, such as fires, have been successfully suppressed due to increased human population densities; infrastructure like powerlines, roads and buildings; and a lack of understanding by people of the important role fire plays. These forested communities are therefore dependent upon the use of wise management practices employed by trained resource professionals that include both forest management and the use of prescribed fire to best emulate these biological factors. Restricting any activities that continue the necessary disturbances for vegetative sustainability is therefore a poor management decision unless the landscapes are deemed inoperable or un-restorable. Without management, the resulting forest densification creates greater carbon (fuel) loads and increases threats from wildfires, insects and diseases, and reduced habitat biodiversity for our native and migratory wildlife species. This management plan develops a strategic path forward presenting both needed management options and restrictions that should be put in place to sustain and preserve water quality while restoring historical conditions.

Land Use Objectives

Improve water quality through reduction in TOC:
Through the reduction of accumulated forest fuels by the use of controlled burns. Organic matter contains carbon that can be returned to the atmosphere in the form of CO₂ and can also be washed into water sources. Harvesting and prescribed fire reduce the amount of surplus carbon on the ground so that excess nutrients don’t enter waterbodies.
Assist communities in planning for and reducing wildfire risks.
Wildfires can contribute massive amounts of carbon in a short amount of time. Sediments that become exposed during a wildfire, along with their associated nutrients, can overwhelm a water treatment facility. In many cases, the treatment facility has to be shut down and the reservoir can become unusable.
By the use of commercial thinning to encourage herbaceous cover for filtering runoff.
Lumber and other wood products can provide long-term storage of carbon and provide economic benefit to the community. Harvesting can also improve the overall health of the forest.
Through the use of standard BMPs in all road, openings, and firelane development.
Proper BMP use and installation can prevent excessive soil disturbance and runoff. Reduced impact logging can reduce damage to leave trees and decrease soil disturbance.

Propagate native herbaceous plant communities on the forest floor through forest management and rotational burns:
Reduce woody and non-targeted herbaceous growth in designated woodlands.
For increased wildlife habitat, food and cover.
Conscientious forest management provides many benefits such as protecting riparian areas by leaving shade, reducing stream temperatures, providing a decrease in transpiration which can increase baseflows, providing more efficient uptake of nutrients, and reducing competition for water and nutrients resulting in over-all healthier ecosystems.
Maintain and enhance the economic benefits and values of trees and forests.
Forests provide economic benefit through employment and timber production; recreational activities such as hunting, hiking, and bird watching; streambank stabilization which lessens sediment contributions to streams; and reducing water treatment costs.

Manage forest while meeting and enhancing air quality indices, and for climate change:
Strict compliance with smoke management guidelines for Arkansas.
Increase carbon storage through increased tree growth.
Manage and restore trees and forest to mitigate and adapt to global climate change.
Forests are important carbon pools that exchange CO$_2$ with the atmosphere. Anywhere from 35 to 65 percent of carbon is stored in the below-ground biomass (the root system) of trees (Forests and Climate Change, 2003).
Continue to manage for pine-oak communities.
Involvement with conservation community and regulatory agencies.

Implement invasive/exotic and less desirable species control through the prescribed use of approved herbicides:
For control and reduction of competition with natives plant species.
Control problem species including sericia lespedeza, Bermuda and fescue grasses, tree-of-heaven, royal paulownia, and Japanese honeysuckle.
Use of approved herbicides for forest thinnings, primarily mid- and understory, for manipulating woody species compositions (hack and squirt method).

Protect, conserve, and enhance wildlife and fish habitat:
Provide specific forested habitat requirements (structure, cover, cavities, browse, and nesting habitat) for a diverse population of native species.
Provide specific forested habitat requirements for migratory birds.
Work with partners in managing game populations through hunting.
Control measures for invasive species eradication (feral hogs).
Management of firelanes and openings for game management.
Monitoring for population trends.

Restore rare ecological habitat types:
Restoration of woodlands and savannas where appropriate.
Restoration of historic glades.
Biological diversity.

Promote public educational outreach through the development of interpretive signage, parking areas, demonstration areas, and trails:
Connect people to trees and forests, and engage them in environmental stewardship activities.
Through the development of forest trails with interpretive signs promoting forest management, and the use of fire and chemicals.
Conduct tours with partners for public schools and the general public.

Promote the economic value of managed forests:
Through forest products, forestry-related jobs, production of renewable energy, and lower water treatment costs.

Procedural Overview

Division of Lands:

Resource management strategies vary among agencies and partners, however, most agree with a rotational system of resource inventorying in a definitive schedule to ensure all properties are subject to inspection and evaluation within a ten year period of time. As an expected result of these periodic resource inventories, the entire terrestrial ownership of CAW will be divided into levels of administrative units. The division of properties will be initially based upon the purpose of administration, but then further based upon operability status and management purposes which, at a lower level, will serve to logically divide the landscape into more homogeneous vegetative conditions. As continued land acquisitions take place, new lands will be moved either into existing administrative units or additional ones will be created.

Compartments

This is the first division of property defined as a portion of property between 1,000 to 3,000 acres in size with well-defined boundaries that are fixed through time (i.e. roads, streams, property boundaries). These large administrative units enable periodic inspection of the entire landholding on a rotational schedule through a given time period (ten year or five year basis). Initially, these inspections are data collection inventories through a systematic random sampling of inventory points affording vegetative information. Then in subsequent years, provide a record of changes through time, an assessment of vegetative health, and potential resource problems. This plan defines ten (10) Compartments of terrestrial property around the lake that are detailed in the Compartment map (refer to Appendix I).

Because the forested properties owned by Central Arkansas Water have not been inventoried before, it is planned to use a more aggressive entry cycle. This will serve two key provisions of the plan; 1) to develop a resource information database and; 2) allow two (2) compartments each year to be inspected and management alternatives prescribed for the first five (5) years. The projected time frame of this 2 compartment per year inventory is FY 2014-FY 2018. This will
serve to accelerate the benefits of silvicultural treatments and reduce organic carbon from entering lake waters.

**Land Classes**

The next division of properties is into various Land Classes, which are defined as areas within each Compartment that are similar with regards to broad landscape characteristics such as forested, openland types, wetlands or water. Additionally, land classes define differences in allowable management practices over a given sub-compartment parcel of property, whether operable or non-operable or restrictive lands. For example, all properties within a given Compartment within the buffer zone along the lakeshore would be classified as having the same restrictive management allowances and thus be in a particular land class. From properties that are totally restricted from management to those that are very unique from other parcels whose location affords greater flexibility in management, these various land class divisions serve to separate the property into more descriptive management areas. A primary consideration on CAW lands is describing what parcels are actually operable for implementing management practices from those that are not. The list of Land Classes is included in Appendix II.

**Stands**

The last division of land is a Stand and is defined as a parcel of land, greater than ten (10) acres in size, with homogenous vegetative composition and structure which falls under the allowances or restrictions of management according to the Land class it falls into. It is at this level that specific management treatments are developed and approved. As management practices change vegetative conditions at the Stand level, adaptive management can and will effect stand boundaries to reflect compositional and structural heterogeneity in the future.

**Inventories and Entry Schedule:**

Compartment resource inventories are designed to collect field data, both vegetative and internal land features (fences, streams, wood’s road, etc.), through a series of stratified random plots along transect lines which are laid out perpendicular to the major drainages in a grid fashion. As these resource inventories are performed, the resulting data, including plot data and field maps, allows the complete division of properties into the Compartments, Land Class, Stand system. These compartment inventories are required periodically as described above from which recommended management strategies are developed. The procedural specifications of resource inventories are listed in Appendix III.

The ten (10) designated Compartments that make up the terrestrial properties will be inventoried once every ten years on a schedule that distributes management practices on the landscape while serving the overall inspection of all properties within this period. This schedule is referred to as the “Entry Schedule” since management recommendations are developed from each “entry” into the Compartments. The schedule can be adapted if need be due to unforeseen events. The
inventory information will be used to both determine the further divisions of land into manageable units, as well as, aide the development of a complete Geographical Information System (GIS) that includes specific vegetative data. The Entry Schedule for the next ten years is listed in Appendix IV.

Compartment Prescriptions:

The post-compartment inventory process produces specific tabular forest data that allows the manager to develop management recommendations to submit for approval by the Board. These prescribed treatments are detailed within a prescription document that includes maps; description of current conditions; vegetative needs; desired future conditions; the methods to be employed on specific Stands within the Compartment and a detailed budget for work to be done. The Compartment Prescription is then reviewed by various departments within CAW and signed off for approval by each. Because proposed desired conditions require multiple types of treatments in order to meet given desired conditions, compartment prescriptions can cover multiple years of treatments on the same acreages. This requires pre-approval in subsequent year budgets and is necessary to be successful in completing recommendations in the plans.

Assistance with the monitoring and management will come from Arkansas Game & Fish Commission (AGFC), The Nature Conservancy (TNC), Arkansas Forestry Commission (AFC) and Arkansas Natural Heritage commission (ANHC).

Management Considerations and Alternatives:

Most all of the forested communities on CAW lands originated from past disturbances, both natural and man-made, that afforded sunlight penetration to the ground level periodically through time, allowing the regeneration of forest cover. Other parcels were artificially developed through the planting of pine by previous commercial owners. As discussed in more detail later, fire played a significant role in maintaining what is now abundant pine and upland oak forest types. Other disturbances, like wind and ice storms, insects, and disease outbreaks, were also involved in creating the current forested conditions. However, a half a century of very little disturbance, have resulted in stagnated conditions as the forests have become overly dense. Well-planned management practices systematically implemented on the property will more imitate historic disturbances in a manner that ensures the sustainability of these fire-adapted forested communities. By reducing forest densification and through the use of appropriate fire, consumption of much of the organic carbon on the forest floor will take place. The resulting sunlight penetration to the forest floor will then allow for the necessary tree regeneration as well as the propagation of native understory plants. This is important for the filtering of run-off while enhancing wildlife habitat.

The primary management focus of CAW property being the maintaining of water quality, planned disturbances to the forested property, including tree thinnings, control of understory species compositions with select herbicides, and the use of fire are intended to create more suitable habitat conditions for wildlife while increasing water quality through the reduction of
organic carbon on the landscape. Partnering with other conservation agencies, including the Arkansas Game and Fish Commission, wildlife habitat ranks high as a secondary management objective, with most CAW lands designed as a state Wildlife Management Area (WMA). Therefore, this management plan outlines allowable resource management alternatives that can be used in meeting desired future conditions (DFCs) for the various vegetative systems and will include habitat-related benefits for most all vegetation strategies. The complication of successful resource management is if certain tools are restricted from use when trying to reach a desired outcome in a given vegetative community. Therefore, the goal will be to not restrict management recommendations, but evaluate each against the merits of how they contribute towards a successful outcome. The primary management philosophies governing each variable are listed in the following broad management categories that will be used to sustainably manage the listed DFCs

**Forest Management Practices**

*Uneven-aged vs. Even-aged Management*

As defined by forestry textbooks, uneven-aged forest management occurs when the forest is managed for sustainable conditions providing more than two age classes under the canopy at any given time. It represents a continuum of mature forest conditions through the use of both single-tree selection and group selection (patch) harvests that provide light for regeneration. Even-aged management, as practiced by the forest industry, is a forest management system where one age class of forest is taken to maturity, then either naturally regenerated with shelterwood or seedtree harvests, or clearcut and planted. Both of these harvest methods are used to create the next age-class. The primary objective of CAW land management is water quality and therefore cannot justify the removal of all forest cover systematically across the watershed. Therefore, uneven-aged management will be central to the forest management scheme. However, circumstances may arise that require an even-aged harvest, even clearcutting, as a responsible alternative to remedy given circumstances. An example of this would be lands purchased that were poorly managed and that require the best alternative to promote an ecologically desired outcome of shade-intolerant species (pine and oak) to again flourish. Another situation that may require the use of clearcutting is in the event of an insect (exotic or native) outbreak that requires a sanitation harvest. The various forest management options need to be available and judged against their effects upon water quality on their individual merits

*Single-tree Selection Harvests*

This is the practice of selecting individual trees to be harvested based upon predetermined criteria of species, spacing, health and/or merchantability for forest stand management goals. Coupled with group selection harvests, forest thinnings are aimed at allowing sunlight through the canopy to establish vegetative species below or advance growth of residual” leave” trees by increasing crown space.

*Group Selection Harvests*

The forest management practice to open the canopy wide enough to allow shade-intolerant regeneration to become established at the forest floor in keeping with an uneven-aged management system of having multiple age classes represented in a forest stand is called group
selection. The openings, or patch, where groups of trees are removed by harvest should be as wide as two times the height of the dominant forest trees.

**Basal Area Reductions**
Basal area is a forestry term of tree stocking and is defined as “the collection of cross-sectional areas of all stems on one acre measured at Diameter Breast Height expressed in square feet per acre” (Helms, John. A., *The Dictionary of Forestry*, 1998). It is used as an indication of tree density per acre when average tree diameters are applied. An example would be in a forest stand with an average tree diameter of 14 inches at breast height, a basal area of 120 square feet per acre would be a fairly dense forest with a probable closed canopy. Basal area measurements are routinely taken as part of a forest inventory to determine density.

**Variable Retention Harvest**
As a forest thinning method, variable retention harvests allow the manager to retain unique qualities of forest stands by the retention of specific forest characteristics throughout the sale area. This method is very useful in creating dynamic forest structure, both vertically and horizontally, important to increasing biodiversity for wildlife species. This plan proposes the use of a combination of single-tree selection and group selection harvesting techniques, coupled with a range of basal areas reduction (ex. 60-80 sq. ft./ac) using a variable retention harvest design across each stand. This is intended to create both patch openings for establishing regeneration during each entry while increasing horizontal and vertical diversity across the sale area. These types of harvests are normally integrated sales with the selection of both pulpwood and sawtimber products to be harvested together.

**Wildlife Stand Improvement**
Wildlife Stand Improvement (WSI) is the process of reducing the density of living trees (reducing stems/acre) for the overall improvement of a given forest stand. This is an active management process to improve the species composition, structure, health and growth of the forest stand. There are several methods involved in WSI: cutting, girdling and injecting. Cutting – or felling – is simply removing the trees or shrubs by cutting with a chain saw at or near ground level. Girdling involves killing the tree but leaving it standing, producing snags or “cull/den” trees within the forest stand. Girdling can sometimes be easier and safer than felling large trees, but should not be used on hollow trees. Injecting is an effective method of WSI and uses an injection device to release a calibrated dose of herbicide into a stem.

When doing WSI, consideration should be given to leaving soft mast trees because of their importance to wildlife year round. Species such as dogwoods, sassafras, persimmon and blackgum are soft mast trees that some of which will be retained depending upon their prevalence in the forest. Benefits to trees include increased light and nutrient availability, more growing space and faster growth, and more desirable species composition. Benefits to wildlife include increase in browse-layer vegetation, increased fruit production by remaining trees, girdled trees provide excellent nest trees for birds and squirrels, and felled trees provide excellent cover for rabbits and other small mammals.

**Cedar Removal (glade restoration)**
Glades are normally open rocky areas dominated by drought-adapted forbs and warm-season grasses. Found on western and southerly slopes, glades tend to have shallow soils and moisture
content which favors drought-tolerant species. However, much of the glade habitat has been overrun by the opportunistic Eastern red cedar and junipers. As cedars invade, vegetation that supplies food and nesting cover for quail is squeezed out. Cedars are also quite competitive with other tree species and can reduce mast (acorns, nuts and fruits) production. Cedar competition can be so severe that mature trees may be stressed to the point of dying. Under some circumstances wildlife habitat is lost because certain animals avoid areas with cedar. Some prairie bird species have been documented to avoid areas with cedars and turkeys routinely abandon roost sites that have grown up with cedar (Wildlifedepartment.com 3). Historical survey notes by the Government Land Office indicate that cedar was a component of the pre-settlement landscape in the shale glades of the Ouachitas, though it was less dominant at the time of the survey than it is today (Arkansas Natural Heritage Commission 13). Cedar removal in glades is important from a game and non-game wildlife perspective. Improving or increasing the grasses and forbs provides habitat for Northern Bobwhite Quail, openings in the woodlands around glades provides habitat for Chuck-will’s Widow, and the open glade habitat scattered with shrubs and trees is important for Painted Bunting. Prescribed fire and hand-removal of cedar is the common treatment.

Prescribed Burning
Prescribed fire is the use of fire by resource professionals in a controlled and scientific manner where both fuel conditions and predicted weather are used to model expected fire behavior. Specific fire objectives and the required climatic conditions are combined in an approved Burn Plan to accomplish specific conservation targets for land management objectives.

A comprehensive prescribed fire management program on CAW lands will reduce the hazardous conditions that are posed for potential wildfires in the future with large fuel accumulations. A devastating wildfire could cause detrimental sedimentation issues affecting water quality, fish and aquatic invertebrates, and threaten other properties as it has in western watershed lake areas in the near past. The Lake Maumelle Watershed Management Plan (2007) identified prescribed burning as a needed practice for forest management to protect the watershed, along with commercial thinning and fire lane construction. Additionally, dominant tree species in the vicinity reflect the past fire intensity across the landscape. Shortleaf pine is dominant on the hotter, drier south slopes and white oak-hickory dominates on the cooler, moister north slopes. Although fire behavior differs between these plant communities, the threat of too high of fuel loads can create hazardous conditions anywhere.

The use of fire by CAW will be in accordance with a more specific plan and therefore the timing and frequency of the prescribed burns will be based on the “Lake Maumelle Central Arkansas Water Fire Management Plan” written by The Nature Conservancy (2013). Prescribed burns will be conducted on each tract initially by dormant season burn to reduce fuel loading and begin to stimulate herbaceous growth in the understory. Growing season burns will then be conducted to help influence greater native herbaceous responses on the forest floor to provide the much needed vegetative filtering for improved water quality in the lake. Planning of burns will coincide with future forest management activities that are scheduled to increase sunlight penetration where burns occur. All burns will include post-burn monitoring at two weeks, six months, and 1 year durations to determine the fire effects on trees and herbaceous vegetation. Additionally, media outreach will be done to educate the public on the benefits of prescribed fire.
in the watershed. It is imperative that the public understands prescribed fire is an effective tool for managing and protecting the terrestrial resource, which directly influences the aquatic resource.

*Use of herbicides*

Herbicides are an important tool for forest management. They can be used carefully to selectively remove less-desirable tree and shrub species from a forest stand, favoring desirable tree species with increased soil moisture, sunlight, and growing space. Normally, certain woody species in the understory and midstory are targeted, so as to remove them from the forest stand leaving the merchantable stems to be commercially thinned or removed for income. Herbicides are used to control vegetation by killing them at the root, unlike severing, mowing, diskimg, or burning, after which most species will sprout prolifically. Although the use of herbicides can be an expensive treatment depending upon the number of stems per acre, desired future conditions that include an herbaceous forest floor cover cannot be achieved without control of the understory woody plants.

One method is foliar spray applications, which can be used for “blanket treatments” such as controlling patches of Chinese bush clover (Serecia lespedeza) growing in open areas or encroaching forests. There are specific herbicide formulations for each species that are commonly used to selectively kill target species without killing non-target species. Another, more common method in forestry is chemical injection (hack and squirt). It is used to control less desirable species by selecting each tree or shrub to be treated. Stems of targeted species are chopped with a machete or hatchet, and herbicide is sprayed into the opened cambium of the stem. This is done by trained applicators that are closely monitored to ensure proper application of the technique. Herbicides are available that control the injected plant with no effect to surrounding vegetation or other biological resources. Through these methods, plant species compositions can be manipulated towards more beneficial species to wildlife, that provide sources of fruits, berries and seeds.

Another important use of herbicides is the control of non-native invasive species of plants that can out-compete native vegetation for sunlight, moisture, and growing space. Invasive species do not have the natural controls or predators as our native species, and therefore can take over large sections of forested properties. Selective herbicide use can allow managers to give the competitive advantage to the native vegetation. Exotics/invasive species control is mandatory especially in burn units. Many problem species exist within the vicinity of CAW lands and include; Chinese bush clover (Serecia lespedeza), Tree-of-heaven, Royal paulownia and Japanese honeysuckle.

**Desired Future Conditions**

Over time, management will restore the forested areas around Lake Maumelle to pine and oak forests, woodlands, Post Oak savannas and glades. Goals to be accomplished through forest management are wildfire abatement, improved water quality by reduced TOC input through the use of prescribed fire and carbon sequestration, improved forest and ecosystem health, restored ecological conditions, development of sustainable forests and timber revenue, and protection of
restricted areas in the watershed. Once procedures and treatments are determined for each forest compartment, a long-term ongoing schedule will be developed to attain these goals. Other desired future conditions include the establishment of fire lanes and rehabilitation of roads on CAW property. Every effort will be made to use existing roads and natural boundaries as fire lanes to avoid additional soil disturbance. Some existing roads will be closed out as part of the management activities.

**Forestlands**

Forests, as a desired condition, are made up of multiple layers of woody vegetation. Overhead, a canopy of crop trees dominated by shade-intolerant species such as oaks and pines; below the canopy, a more diverse association of species and possibly advanced regeneration (oak and pine) make up the midstory and; an understory layer comprised of woody species that provides browse, fruits and berries and eventually, seedlings of the shade-intolerant overstory. Forest management must take into consideration rotation ages of the dominant overstory, and set limits by which to plan decades ahead for a sustainable forest plan to be feasible. Therefore, at some level of age, perhaps 120-150 years of age for most forestlands, a portion of the understory and midstory must have a percentage of shade-intolerant (oaks and pines) growth. Planned management strategies then are back-dated to a realistic acreage per year figure for replacement forests to be in place. This CAW management plan therefore promotes the use of an uneven-aged management strategy to reach these goals. Uneven-aged forests are more biologically diverse and, through time, exhibit at least three different ages of forest development towards sustainability. As forest information is gathered it is the intent of this plan to determine what percentage of the property will be managed for sustainable forest cover.

**Woodlands/Savannas**

Historically, research findings have shown that much of the central Arkansas highlands were open forests with grassy understories. Naturalists and early explorers wrote about conditions in the 1700s and early 1800s depicting landscapes of open pine and oak forests with wildflowers and native plants abundant on the ground under the sparse canopies. These conditions, known as woodlands, are defined as tree covered landscapes, where the canopy is open, with very little middle layering and, a ground layer of native herbaceous, non-woody species (grasses, sedges and legumes) of plants. Savannas are even more open and are best described as prairies with sparse tree cover. Frequent low-intensity fires were the prominent vector that managed these systems. Today, these highly productive habitats of woodlands and savannas are currently the rarest habitat types, and are the focus of restoration activities through the state. Biodiversity in these systems is very high and are required at a landscape scale to meet wildlife needs for both native and migrating species in decline. The management of these types of habitats requires the extensive use of forest thinnings, herbicide control of the midstory plants, and frequent prescribed fire. In demonstration areas on CAW properties, positive results have been experienced in restoring these conditions. With regards to the prime directive of managing for water quality, restored sites to woodlands and savanna conditions can create a dense understory of perennial plant structure that provides an even greater water filtering capability than leaf litter. As forest information is gathered, it is the intent of this plan to determine what percentage of the property will be managed for woodland conditions.
Glades
Glades are dry, open areas within a forest composed of rocky substrates and shallow soils. The vegetation of glades typically consists of grasses and other herbaceous plants that tolerate dry conditions. The thin, poor soils, along with fires that would burn through glades, historically limited the presence of trees in these areas. Arkansas possesses a number of different glade types, all differentiated from one another based upon the type of rock (sandstone, limestone, dolomite, shale) that underlies the area (Arkansas Natural Heritage Commission, 2013). Fire suppression has also led to the degradation of large areas of glade habitat. Without fire, glades can be invaded by some woody plants, most notably eastern red-cedar trees. As eastern red-cedar moves in, the area of useable habitat for glade-associated species is reduced, or even eliminated (Arkansas Natural Heritage Commission, 2013). Glades are often homes for rare and/or threatened species. The loss of this habitat type has resulted in the decline of many of those species. Glade habitat has not been definitively identified on CAW property; however, it is the goal of this plan to restore any potential glade habitat where feasible.

Special Management Areas:
The identification of lands with special or restrictive uses are listed in the Land Class definitions, and each category below will be defined based on criteria such as slope, security and access restrictions, and feasibility.

Buffer Zones: areas around the lake perimeter which serve as protection from run-off. Most buffer areas will be 150’, but may vary depending on topography. Management may or may not occur in these areas.

Restricted Areas: areas where access is permitted to authorized personnel only. These include the dam, spillway, and pumping station.

Open Land Management
Open land management includes the Winrock Grass Farm, fallow fields, firelanes, rights-of-way, logging roads and timber decking areas. The management of these areas will be in conjunction with the most appropriate and protective Best Management Practices (BMPs). Open areas provide important feeding, cover and nesting areas for wildlife because of their abundant herbaceous growth. These areas should incorporate native plant communities and important forage foods.
Sleepy Hollow Timber Harvest
Sign on tree reads “No Wood Cuttin”
Literature Cited

Heiligmann, R.B. Controlling undesirable trees, shrubs, and vines in your woodland. Extension Factsheet, The Ohio State University Extension. School of Natural Resources, Columbus, Ohio.
Appendix I. Compartment Map
## Appendix II. Land Classes

### LAND CLASS

<table>
<thead>
<tr>
<th>Land Class</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>10 – WATER</td>
<td>WATER</td>
</tr>
<tr>
<td>11 – Lakes/Ponds</td>
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</tr>
<tr>
<td>12 – Streams/Sloughs/Bayous</td>
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</tr>
<tr>
<td>13 – Reservoirs</td>
<td></td>
</tr>
<tr>
<td>14 – Wetlands</td>
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<tr>
<td>20 – NON-FORESTED</td>
<td>NON-FORESTED</td>
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<tr>
<td>21 – Firelanes</td>
<td>Firelanes</td>
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<tr>
<td>23 – Levees</td>
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<td>24 – Old Field</td>
<td>Old Field</td>
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<td>30 – RESERVED</td>
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<td>31 – Natural Area</td>
<td>Natural Area</td>
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<td>32 – Archeological</td>
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<td>40 – DEFERRED</td>
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<td>50 – FOREST LAND</td>
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<td>51 – Pine</td>
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<td>52 – Mixed</td>
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<tr>
<td>53 – Upland Hardwood</td>
<td>Upland Hardwood</td>
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<tr>
<td>54 – Bottomland Hardwood</td>
<td>Bottomland Hardwood</td>
</tr>
<tr>
<td>55 – Glades</td>
<td>Glades</td>
</tr>
<tr>
<td>56 – Woodlands</td>
<td>Woodlands</td>
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<tr>
<td>57 – Savannas</td>
<td>Savannas</td>
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<tr>
<td>60 – SPECIAL</td>
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<tr>
<td>61 – Stream Mgmt./Buffer Zone</td>
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<td>62 – Special Study Area</td>
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<tr>
<td>63 – Firing/Bow Ranges</td>
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<td>70 – MARGINAL</td>
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<td>80 – ADMINISTRATIVE</td>
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<td>81 – Pump Station/Buildings</td>
<td>Pump Station/Buildings</td>
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<td>82 – Day-Use Areas</td>
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<td>83 – Clubhouse/Pavilions</td>
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### FOREST TYPE

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<td>Black Walnut</td>
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<tr>
<td>Mockernut Hickory</td>
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</table>
Nutmeg Hickory  
Pecan  
Pignut Hickory  
Shagbark Hickory  
Shellbark Hickory  
Blue Ash  
Carolina Ash  
Green Ash  
White Ash  
Boxelder  
Red Maple  
Silver Maple  
Sugar Maple  
Drummond’s Red Maple  
Blackgum  
Sweetgum  
Tupelo Gum  
American Elm  
Cedar Elm  
Hackberry  
Planer Tree  
Slippery Elm  
Sugarberry  
Winged Elm  
Black Willow  
Eastern Cottonwood  
Sandbar Willow  
Black Locust  
Honey Locust  
Water Locust  
American Basswood  
Black Cherry  
Bois d’Arc  
Catalpa  
Corkwood  
Cucumber Tree  
Eastern Hophornbeam  
American Holly  
Hornbeam  
Red Mulberry  
Persimmon  
River Birch  
Sassafras  
Serviceberry  
Soapberry  
Sycamore  
Umbrella Magnolia  
Yellow Poplar  
Butternut  
Swamp Cottonwood  
Paper Mulberry

**STAND CONDITION**

Regeneration  
Seedling-sapling  
Pole Timber  
Immature Sawtimber  
Non-stock

**CULTURAL NEEDS**

None  
Selective Harvest  
Group Selection  
Salvage  
W.S.I.  
Regeneration Harvest  
Shelterwood  
Seed Tree  
Reforestation (pine)  
Reforestation (hdwd)  
Underplant (pine)  
Underplant (hdwd)  
Midstory Removal  
Understory Removal  
Wildlife Opening  
Prescribed Burn  
Firewood Harvest  
Veg. Control (Chem)  
Veg. Control (Mech)  
Veg. Control (Burn)  
Woody Planting
Field Planting
Firelane (D)
Firelane (M)
Boundary (M)
Brush Zone
Bridge Development
Bridge Repair
Easements

Firelane – Plant
Timber Access (D)
Boundary (D)

REPRODUCTION

Adequate Stock
Inadequate Stock

LAST DIGITS
3 Species in order of Dominance

RESTRICTIVE CODES

Boundary Line
Easement
Road Access (M)
Road (D)
Bridge Access (M)
Bridge (D)
Wet Conditions
Permit Required

INCLUSION ACRES
Acres not qualifying for stand designation; less than 10 acres

BASAL AREA
Total basal area of all stems

DATE WORK
Last two digits of year work is to be done
Appendix III. Resource Inventory Specifications

Reconnaissance Inventory
Portions of Maumelle WMA
Little Rock, AR

Transect Lines:
- **Direction:** Perpendicular to major topography
- **Density:** Three (3) lines per Forty or 440 feet apart
- **Line Data:** Forest type changes
  All roads, logging trails, infrastructure, cultural, etc.

Plots (along lines):
- **Density:** 264 feet apart or 4 chains
- **Plot Data:**
  - Forest Type (ex. SP-WO-PO; shortleaf-white oak-post oak)
  - Total BA (all stems)
  - Pine ST (> or = 10” dbh)
  - Oak ST (> or = 12” dbh)
  - Misc ST (> or = 12” dbh)
  - Woody sub-merch.

Forest Floor:
- Plant Coverage: (0-25% = 1; 25-75% = 2; > 75% = 3)
- Litter Depth: (0-4”= 1; 4-8”= 2; >8” = 3)
- Herbaceous: (sparse = 1; medium = 2’ thick = 3)

Regen Plot 1/100 acre: No. of stems < 4” @ 3.5 ft. tall

Operability (ex. too steep, or rugged)

Merchantability: (yes/no)

Comments:
- Slope condition
- Trespass
- Timber Damage
- Encroachments

Equipment and Report:
- Trimble Nomad
- GIS Shapefile
- Excel plot sheet
- Hardcopy Timber Type and Features Map @ 4” = mile
Appendix IV. Compartment Entry Schedule

<table>
<thead>
<tr>
<th>COMPARTMENT</th>
<th>ENTRY DATE</th>
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<tbody>
<tr>
<td>1 and 5</td>
<td>2014</td>
</tr>
<tr>
<td>2 and 6</td>
<td>2015</td>
</tr>
<tr>
<td>3 and 7</td>
<td>2016</td>
</tr>
<tr>
<td>4 and 8</td>
<td>2017</td>
</tr>
<tr>
<td>9</td>
<td>2018</td>
</tr>
<tr>
<td>10*</td>
<td>2014</td>
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</table>

* Compartment 10 has a separate management plan due to Forest Legacy Grant requirements.
Appendix V. Compartment Prescription (format)

Maumelle River
Wildlife Management Area

Owned and Operated by:
CENTRAL ARKANSAS WATER

In Cooperation with the:
ARKANSAS GAME & FISH COMMISSION

FORESTED HABITAT
MANAGEMENT PRESCRIPTION

DATE: February 14, 2011

This document complies with the practices and procedures that are outlined in the Central Arkansas Water Management Plan
Central Arkansas Water Prescription Review Committee:

______________________________________________________DATE:__________
Stewardship Coordinator

______________________________________________________DATE:__________
Director of Water Quality

______________________________________________________DATE:__________
Director of Source and Treatment

AGFC Cooperators:

Assistant Chief, Wildlife: __________________________
Habitat Coordinator: __________________________
WMA Area Biologist: __________________________

Approved By:

___________________________________________DATE:________________
Chief Executive Officer, Central Arkansas Water
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<tr>
<td>Objectives</td>
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<tr>
<td>Desired Future Condition</td>
</tr>
<tr>
<td>Compartment Project Map</td>
</tr>
<tr>
<td>Compartment/Stand Map</td>
</tr>
<tr>
<td>Compartment Summary</td>
</tr>
<tr>
<td>Estimated Costs/Revenues</td>
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</table>
1. A “fuel reduction” prescribed burn will be conducted on Stands 1 through 8 of this compartment for improving water quality in Lake Maumelle through the reduction of organic material on the selected unit. The extreme southwestern peninsula in Stand 1 will be left outside of the burn area due to its adjacent position to the rest of the unit. The prescribed burn will be conducted by a partnership effort lead by a crew from the Arkansas Field Office of The Nature Conservancy. Other organizations involved in conducting the burn will be members from Central Arkansas Water, the Arkansas Forestry Commission and the Arkansas Game & Fish Commission. Estimated acreage of the prescribed burn is 198 acres. The prescribed burn will be conducted during a period between late February to early March, weather permitting. Other burn details can be found in the approved Prescribed Burn Plan for this unit. A fire return interval of 2-4 years is further prescribed for this unit in order to reach desired conditions and maintain low fuel loads (refer to Objectives).

2. The forests in Stands 6 and 7, totaling approximately 54 acres, are predominantly shortleaf pine and they will be marked (painted) for selective thinning to a density of 50-70 square feet of basal area per acre. The selective tree marking operation will take place after the prescribed burn is conducted and will be 95% pine with a few scattered hardwoods being necessary to remove. A bid prospectus, which will contain all contract logging provisions will be sent to prospective timber companies and a “sealed bid” award will take place in late spring 2011. The timber harvesting operations will be conducted during the summer of 2011.

COMPARTMENT OVERVIEW

Habitat Conditions: Crown closure from lack of disturbance in the overstory of this portion of Compartment 1 has restricted the development of native grasses, forbs, sedges and legumes on the forest floor. Coupled with a historic build-up of leaf litter, which creates a potential threat of wildfire in times of drought, wildlife habitat is minimal. Food resources are restricted to only that which is created from a limited diversity of overstory tree species, primarily post oak.

The southern aspects on this tract are dominated by a mix of shortleaf pine and post oak while the northern aspects are more dominated by hardwood forests. Cover underneath the canopy layer is very limited. Horizontal as well as vertical structural diversity is low and therefore overall biodiversity is lacking.

Past Activities: Very little is known about what historically occurred in this forested terrain. With ownership records providing evidence that this compartment was made up of many small private ownerships, it is certain that previous forests were “high-graded” and portions of the tract
were previously in open conditions. With the preponderance of human-set fires on the landscapes in this portion of the state during previous centuries, it is most likely that open woodland conditions were prevalent with an herbaceous understory. The more recent history has been focused upon protection from any disturbance since the 1950s due to the area’s position within the watershed of the Maumelle Reservoir which serves over 400,000 citizens their drinking water.

**Wildlife Needs/Usage:** Deer, turkey, and squirrels will be the primary game species targeted for management across the WMA. Restoration of woodland-type habitats is of utmost importance in order to increase forbs and grasses for turkey nesting and brood range, and browse for deer. It is important to provide more diversity in both vegetative cover and spatial structure to accommodate all wildlife species which use the area. Many non-game species are expected to benefit once biodiversity is increased through the prescribed disturbances.

**General Management Objectives:** The main objective of management within this unit is to reduce the accumulation of the litter layer and open portions of the pine-dominated stands to increase light and the development of an understory of more plant diversity. Prescribed fire and additional light to the forest floor is the management required to attain these preferred conditions. Regaining historical plant diversity requires a dedication to repetitive treatments within the next decade.

**Special Areas/Features:** There are currently three (3) areas within this tract that offer special purpose and needs. Two are within Stand 5 and Stand 8 boundaries and are placed in the Administrative Land Class. A large parking lot in Stand 5 is located just north of State Highway 10 on the west side and an old house site and pond is located just north of the highway on the eastern side in Stand 8. There are remnants of other small structures in the center of the compartment but serve no useful purpose. The third special area is a birding trail along the western shore developed in partnership with the Arkansas Game and Fish Commission’s Education Division. It is anticipated that as habitat improvements are made through prescriptive management this trail can become part of a network of trails throughout the tract.

**Special Considerations:** All management activities are subject to necessary protective measures concerning any sediment movement and threats to water quality within the watershed basin. This includes that mandatory Best Management Practices are complied with throughout each phase of a given management operation. Prescribed fires should be kept within the required intensity levels within lake buffer zones so as to not remove protective soil horizons. Any road construction must be accompanied by soil stability measures including water barring, seeding and sediment curtains in appropriate places. Traffic signage will be used within project operations vicinities for public awareness and protection.
OBJECTIVES
(Correspond to Abstract Items)

1. The prescribed burn on this unit is intended to reduce “forest fuels” (leaf litter and coarse woody debris) for the primary purpose of decreasing the amount of organic material available in run-off into Lake Maumelle which negatively impacts water quality. This “fuel reduction” burn in turn also helps reduce the risk of future catastrophic wildfire which could drastically alter the forested landscape and increase sedimentation into the lake. Additionally, the burn is intended to increase a native herbaceous response on the forest floor where available sunlight exists. It is expected that this response will be evident along the lake shore (buffer zone) where more ample sidelight exists thus increasing filtration into the lake by stimulating a grassy understory. These responses are also expected to benefit both game and non-game species by increasing ground cover and foraging habitat. The native herbaceous plants that will eventually be stimulated will provide abundant food resources throughout the year for both native and migratory species. Additional prescribed burns will be required on a rotation of 2-4 years apart on this site to manage towards these desired conditions.

2. The commercial thinning of the pine-dominated sites on the south facing slope in Stands 6 and 7 is intended to open the forest canopy to allow greater light penetration to the forest floor. The forest thinning will be conducted under reasonably restrictive contract terms with an approved timber company and all logging operations will be conducted within approved Best Management Practices this next summer. Coupled with the inclusion of periodic fires in the next decade, a woodland condition of open overstory and native herbaceous understory will persist. It is anticipated that these management treatments will release grasses, forbs, sedges and legumes that previous existed historically. The biodiversity increase as well as the increased water filtration and reduced risk of wildfires will be the desired outcome.
DES I R E D F U T U R E  C O N D I T I O N S

The habitat management prescribed herein will provide the necessary disturbances in these forested acres to begin the process of restoring historical woodland conditions while providing increased water quality from runoff and more diverse wildlife habitat. As rotational prescribed fires reclaim the accumulated litter layer, available sunlight that is provided is expected to stimulate a native plant response from the dormant seed source. As forest thinning in pine-dominated stands is implemented, a park-like forest stand with an herbaceous understory will result and provide aesthetic viewing for passing motorists along the highway.

The conservation partners who have enlisted as supporters of this forested habitat management on the properties owned by Central Arkansas Water (CAW) agree that the juxtaposition of this portion of Compartment 1 being adjacent to west Little Rock presents an excellent site from which to demonstrate future management objectives of CAW on its land holdings. It is therefore prescribed that this peninsula be considered as an education/recreational area for citizens and visitors to learn more about the flora and fauna these lands offer when improved habitat conditions are reached. It is therefore proposed that plans for a trail system with interpretive signage be drawn up for increased public access and educational opportunities.
COMPARTMENT/STAND MAP

Maumelle River WMA

Stands: Stand 1, Stand 2, Stand 3, Stand 4, Stand 5, Stand 6, Stand 7, Stand 8

Scale: 0, 220, 440, 680, 1,320, 1,760 feet
## COMPARTMENT SUMMARY SHEET

**WILDLIFE MANAGEMENT AREA** Maumelle River **COMPARTMENT 1** **DATE** 02/11

<table>
<thead>
<tr>
<th>STAND NO.</th>
<th>LAND CLASS</th>
<th>FOREST TYPE</th>
<th>GROSS ACRES</th>
<th>BASAL AREA</th>
<th>MGMT. TYPE</th>
<th>INCLUSIONS</th>
<th>REMARKS</th>
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<tbody>
<tr>
<td>01</td>
<td>Lake Buffer</td>
<td>Post Oak-Shortleaf Pine</td>
<td>49.6</td>
<td>TBD</td>
<td>Restricted Lake Buffer</td>
<td>Powerline</td>
<td>Hand crews only Burn only</td>
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<td>02</td>
<td>Standard Forest</td>
<td>Shortleaf Pine- Post Oak</td>
<td>15.2</td>
<td>TBD</td>
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<td>Powerline</td>
<td>Hand crews only Steep 60% Burn only</td>
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<tr>
<td>03</td>
<td>Standard Forest</td>
<td>Post Oak – Misc Hdw</td>
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<td>House site and pond</td>
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<td></td>
<td><strong>203.0</strong></td>
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## ESTIMATED COSTS/REVENUES

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<th>Item</th>
<th>Description</th>
<th>Unit $</th>
<th>Total $</th>
<th>Estimate Revenue</th>
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<td>Prescribed Burn</td>
<td>198 acres Contract</td>
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<td>Timber Marking</td>
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<td>54 acres Contract</td>
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<td>Totals</td>
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<td>$7,394.00</td>
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Appendix VI. Cooperative Agreement (example)

Agreement on Implementation and Demonstration of Best Management Practices on Forest Roads and Prescribed Fire Services

This Agreement, made effective as of January 1, 2011, is entered into by and between the Arkansas Forestry Commission, a constitutional agency of the State of Arkansas (AFC), and Central Arkansas Water, a public body corporate and politic created pursuant to the Consolidated Waterworks Authorization Act, 982 of the 83 General Assembly of the State of Arkansas (CAW).

Witnesseth:

Whereas, CAW is the owner of Lake Maumelle and certain surrounding lands including the designated area shown on Exhibit A attached hereto and incorporated by this reference; and

Whereas, AFC maintains guidelines for silviculture best management practices (BMPs) in its publication “Best Management Practices for Water Quality Protection, 2002”; and

Whereas, AFC and CAW are mutually interested in demonstrating proper installation and use of forest road BMPs that will protect water quality throughout Arkansas and specifically will help to protect water quality in Lake Maumelle; and

Whereas, CAW is interested in having the assistance of AFC when CAW, or another entity or agency working on behalf of CAW, is conducting a prescribed burn within the Lake Maumelle Watershed in furtherance of protecting and promoting good water quality and forestry practices; and

Whereas, both CAW and AFC agree that each organization will contribute on a project by project basis the funding and other resources needed to complete each project;

Now, therefore, for and in consideration of the mutual promises recited herein, as well as other good and valuable consideration, CAW and AFC agree as follows:

Section A. Throughout the duration of this Agreement, AFC agrees:

1. As needed and identified, to utilize its personnel and resources to install, operate, repair and maintain BMPs on forest roads on CAW property within the Lake Maumelle Watershed generally consisting of but not limited to:
   - Water bars and rolling dips
   - Install and stabilize firelines/roads
   - Widen, reshape, and refurbish firelines
   - Cleanout and finish wing ditches
   - Close out old sections of road
   - Install alternative BMPs such as conveyor belt sediment diversion structures, “Through-the-Bank” pipes, and/or the French mattress.

2. To provide technical guidance and perform other work needed to accomplish the above tasks.
3. To use the designated areas for educational purposes to demonstrate proper installation and maintenance of the various BMPS, and to demonstrate alternative BMPs that can be used to protect water quality.

4. To submit to CAW at least fifteen days prior to the beginning of each calendar quarter a proposed scope of work that AFC plans to complete within that calendar quarter. Each scope of work is to describe the project(s) planned and include an estimate of AFC staff hours, materials, and any related resources required to accomplish that work. All CAW services foreseen as necessary for AFC to complete its scope of work are also to be identified.

5. That CAW reserves the right to remove any item from AFC’s proposed scope of work and accomplish that work through its own forces or by a separate contract with another entity.

6. To provide assistance with fireline and fire protection services when CAW is engaged in prescribed burns affiliated with forest management.

7. To invoice CAW at least quarterly and not more than monthly for work performed. When applicable, charges should be based on AFC’s cost schedule for standard services, i.e. fireline construction. Otherwise, CAW will reimburse AFC based on documented labor, materials, and related project costs.

8. That AFC staff and parties under AFC’s supervision will comply with CAW’s Regulations for Public Use of Lake Maumelle and Surrounding Property or seek authorized exemptions from the regulations.

9. That all rights and privileges granted to AFC under this Agreement are subject and subordinate to CAW’s primary purpose of providing high quality potable water to CAW’s customers.

Section B. Throughout the duration of this Agreement, CAW agrees:

1. To provide AFC the right of access to the designated areas shown in Exhibit A to accomplish the agreed-upon work.

2. To provide AFC and parties under its supervision the right of access to the designated areas shown in Exhibit A for the purpose of instruction, education, and technical assistance concerning BMPs for forest roads.

3. To provide construction assistance, equipment and materials.

4. With prior notice and agreement, to construct or to contract for the construction of stormwater culverts, roads, and the rerouting of roads which are necessary to accomplish the tasks outlined in this Agreement.

Section C. Throughout the duration of this Agreement, it is mutually agreed:
1. CAW shall initially provide funding in an amount not to exceed $150,000 to establish the BMP demonstration areas with the area identified on Exhibit A.

2. From time to time, CAW and AFC shall determined if future projects should be conducted and CAW shall determine the amount, if any, that may be available to conduct those projects.

3. That all notices shall be addressed to Central Arkansas Water, c/o Graham Rich, CEO, 221 East Capitol Ave., Little Rock, AR 72201, or to other such person and address as CAW may stipulate; and that all notices shall be addressed to the John Shannon, State Forester, Arkansas Forestry Commission, 3821 West Roosevelt Road, Little Rock, AR 72204, or to other such person and address as the AFC may stipulate.

5. That this Agreement shall terminate at midnight December 31, 2012, but may be extended if mutually agreed by both CAW and AFC.

6. That this Agreement may be terminated upon thirty (30) days' written notice by either party when duly communicated by postal mail or hand delivered letter.

7. That in the event termination is effected, the AFC shall have up to sixty (60) days after termination to remove its equipment and materials supplied by it for the purposes of this Agreement.

8. That amendments to the Agreement may be proposed by either party upon written notice to the other, and such amendments shall become effective as soon as signed by the State Forester for AFC and the CEO for CAW.

9. That the demonstration areas shall be closed to any or all activities by AFC at the request of CAW when it is determined by CAW that such activities should temporarily or permanently cease in order to protect the water quality of Lake Maumelle or for other legitimate reason.

10. To the fullest extent of the law, neither the AFC or CAW shall be liable or responsible for any personal injury, whether resulting in death or not, nor for any property loss or damage, sustained or alleged to have been sustained by any person or persons whomsoever, or whether or not such persons or persons shall be on the demonstration property with permission or under the terms of this Agreement.

In Witness Whereof, the parties have executed this Agreement on Implementation and Demonstration of Best Management Practices on Forest Roads.

_______________________________  ______________________
Chair                                Date
Central Arkansas Water

_______________________________  ______________________
State Forester                      Date
Arkansas Forestry Commission
Appendix VII. Contracts (example)

CENTRAL ARKANSAS WATER

FOREST PRODUCTS SALE

BID AND AWARD
(return with bid)

INVITATION NO. 01-2012-TS

SALE NAME OR LOCATION North Shore Marina Sale

In compliance with the invitation identified on the cover hereof, and subject to all of the sale terms and conditions contained in Section I (Specific Provisions) and Section II, (Operational Provisions) all of which are incorporated as a part of this bid, the undersigned offers and agrees, if this bid be accepted within 30 calendar days after the date of Bid opening, to purchase as specified, and pay for any or all of the items listed for sale in Section I (Specific Provisions) and to remove the property and perform the other required work as specified hereinafter notice of acceptance by Central Arkansas Water.

Envelopes containing bids must be sealed and marked on the outside with the invitation number. (See Section III, Paragraph 1, Subsection b.)

Except as otherwise specifically provided, it is the intent of this contract that the Contractor and Central Arkansas Water shall mutually agree upon the interpretation and performance of this contract: Provided that within the limitations of the law, upon failure to reach an agreement, the decision of Central Arkansas Water as the company charged with the administration and protection of the timber land shall prevail.

AMOUNT OF BID $

Name and Address of Bidder: 
Authorized to Sign Bid:

_________________________  ______________________

_________________________  ______________________

_________________________  ______________________

Signature of Person
Signers Title and Date:

Telephone No:_________________
Sealed bids subject to terms and conditions set forth herein, for the purchase and removal of Central Arkansas Water owned property listed in this invitation, will be received until the time, date and at the place indicated below, and then publicly opened.

TIME OF OPENING: 11:00 A.M.

DATE OF OPENING: July 31, 2012

PLACE OF OPENING: Central Arkansas Water
221 East Capitol Ave.
Little Rock, Arkansas 72201
Attn: Stewardship Coordinator (501) 377-1331

FOREST PRODUCTS: 259 MBF of Pine Sawtimber and 246 cords of Pine Pulpwood.

PROPERTY LOCATION: West of Roland, AR along Highway 300 in the vicinity of the abandoned North Shore Marina and north of Highway 10 West, just west of the Jolly Rogers Marina, all in Pulaski County, containing approximately 182 acres (See maps).

BID DEPOSIT: A bid deposit is required in the form of surety bond, letter of credit, certified check, company check, cashier's check, money order, bank draft or equivalent, in the amount of **$10,000.00** [See Section III, Subsection 1, paragraph (1)].

Inspection is invited between 8:00 a.m. and 4:30 p.m., Monday through Friday, excluding holidays. Arrange with:

**Stephanie Hymel, CAW Contracting Officer, Office 501-377-1331; Cell 501-772-3564**

**Martin Blaney, AGFC Habitat Coordinator, Office 877-967-7577; Cell 479-747-2003**

TOUR INFORMATION: If you are interested in touring the sale area, please call either Stephanie Hymel or Martin Blaney.
# INDEX

## SECTION I - SPECIFIC PROVISIONS

1. Description of Sale Area
   a. Location
   b. Sale Area

2. Estimated Volumes
   a. Sawtimber
   b. Pulpwood

3. Type of Sale

## SECTION II - OPERATIONAL PROVISIONS

1. Timber to be Cut
   a. Description of timber included in sale.
   b. Method of utilizing stumpage for higher or different use.
   c. Damage to merchantable timber.

2. Period of Contract and Operation Schedule
   a. Commencement
   b. Pre-Contract Meeting
   c. Schedule of Harvesting and Completion
   d. Extension of Time

3. Payments
   a. Method
   b. Payment Remittance

4. Harvesting Operations
   a. Inspection and Supervision
   b. Order of Logging
   c. Methods of Logging
   d. Slash Disposal
   e. Stump Heights
   f. Directional Felling
   g. Protection
   h. Erosion Control Requirements
   i. Roadways
   j. Ingress and Egress
   k. Fire Suppression
   l. Equipment Restrictions
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## SECTION II - OPERATIONAL PROVISIONS (cont.)

5. Damages and Defaults
   a. Liquidated Damages
   b. Contract Modification and Termination

## SECTION III - BIDDERS INFORMATION

1. Instruction to Bidders
   a. Invitation, Bid, and Acceptance
   b. Submission of Bids
   c. Bid Opening
   d. Notice of Action
   e. Payments
   f. Liability
   g. Insurance Requirements
   h. Non-Discrimination

## SECTION IV - SPECIAL PROVISIONS

Exhibit A - Estimated Quantities

Exhibit B - Location Maps
SECTION I - SPECIFIC PROVISIONS

1. Description of Sale Area: (See Maps)
   
   a. Location:
      (1) County: Pulaski
      (2) Vicinity: West of Roland, AR along Highway 300 in the vicinity of the abandoned North Shore Marina and north of Highway 10 West, just west of the Jolly Rogers Marina.
      (3) Acreage: 182 approximately
   
   b. Sale Area:
      (Legal Description): Portions of the W/2, SE/4, Section 12 and the W/2, E/2, NE/4 and the W/2, NE/4 lying east of Lake Maumelle and the W/2, E/2, SE/4, and the W/2, SE/4 lying east of Lake Maumelle in Section 13, all in Township 3 North, Range 15 West of the Fifth Principal Meridian, containing approximately 136 acres; And that portion of the S/2, Section 24, lying north of Highway 10 West in Township 3 North, Range 15 West of the Fifth Principal Meridian, containing approximately 46 acres.

2. Estimated Volumes:
   
   a. Sawtimber:
      259 MBF of Pine Sawtimber
   
   b. Pulpwood:
      246 cords of Pine Pulpwood

Central Arkansas Water gives no guarantee, expressed or implied, as to the total volume of pine sawtimber and pulpwood which may be harvested under this contract. Bidders are urged to inspect the sale area and make their own estimates and determinations as to the volume of timber to be removed.

3. Type of Sale: Lump Sum

SECTION II - OPERATIONAL PROVISIONS

1. Timber to be Cut:
   
   a. Description of Timber in Sale: (see Exhibit B: Maps)
      All timber within the sale Units 1-3 are marked with yellow tree marking paint and Unit 4 is marked with blue tree marking paint. Trees are marked with a stump spot and at least one spot on the bole of the tree.
      Caution: the Ouachita Highlands Trail runs through Units 1-3 is marked with blue paint and the trail has been given a one chain buffer on either side from logging
activities. The trail will be closed to pedestrians and bowhunters during active harvesting under this contract.

b. **Method of Utilizing Stumpage for Higher or Different Use:**
   Timber sold under this contract may be removed as a product other than that specified.

c. **Damage to Merchantable Timber:**
   In the event any timber included in this contract is destroyed or damaged to the extent it is unmerchantable by fire, wind, flood, insects, diseases, or similar cause, the party holding title to the destroyed or damaged timber shall bear the loss in stumpage and required deposits resulting from such destruction or damage, and there shall be no obligation on the part of Central Arkansas Water to supply or on the Contractor to accept or pay for, other timber in lieu of that destroyed or damaged: Provided that damage to or loss of timber removed from the sale area shall be borne by the Contractor, and: Provided further, that this paragraph shall not be construed to relieve either party of liability for negligence.

2. **Period of Contract and Operation Schedule:**

   a. **Commencement:**
      The Contractor will commence the harvesting and removal of timber within N/A days after the date of written notice of bid acceptance, but only after notifying the CAW Contracting Officer and if conditions are permitting.

   b. **Pre-Contract Meeting:**
      Prior to initiating **any** work on the sale area, the Contractor is **required** to have a pre-contract meeting with the Contracting Officer. This meeting will be to review and clarify all aspects and requirements of the contract. It will entail looking over the work area and answering any questions either party may have concerning the job, access, equipment, specifications or any other aspect of the contract. This meeting is an absolute requirement and cannot be waived or delayed, subject to penalty or default of the contract.

   c. **Schedule of Harvesting and Completion:**
      The Contractor agrees to cut and remove from the sale area all timber designated to be harvested under this contract on or before **November 30, 2012**.

   d. **Extension of Time:**
      The Contracting Officer may, upon written request by the Contractor, extend the contract period allocated for the following reasons:

      (1) For days lost by the Contractor due to stoppages or temporary suspensions ordered by the Contracting Officer, except when the stoppage or suspensions are ordered because of the Contractor failure to comply with provisions of the contract.
(2) For labor disputes and catastrophic events beyond the Contractor control, the Contractor shall notify the Contracting Officer as soon as practical after such a delay begins.

(3) When the total volume of the forest products designated for removal exceeds the estimated volume advertised, the time allocated for removal may be extended for an equitable period; based upon the minimum weekly production required to complete the removal of the original estimated contract volume within the original allocated time.

(4) When the Contractor desires a reasonable extension of time for his own convenience, provided: (1) The Contracting Officer determines that the extension will not endanger final required management deadlines; and (2) monetary consideration due to Central Arkansas Water for such extensions shall be a sum representing any increased monetary value of the timber remaining on the sale area, less the timber value assigned in the contract.

(5) When extreme fire conditions persist and Central Arkansas Water poses a temporary halt to logging operations due to the potential for ignition from logging activities.

3. **Payment:**
   
   a. **Method**
      
      (1) **Lump Sum Sale:**
         
         The Contractor, before starting operations and within 30 calendar days of written notice of bid acceptance will be required to make full payment to Central Arkansas Water.

   b. **Payment Remittance:**
      
      (1) All payments shall be made payable to: Central Arkansas Water.

      (2) Payments will be remitted to:
         
         Central Arkansas Water
         
         P.O. Box 1789
         
         Little Rock, Arkansas 72201
         
         Attention: Stephanie Hymel, Contracting Officer

4. **Harvesting Operations:**
   
   a. **Inspection and Supervision:**
      
      The Contractor's harvesting operations covered by this contract agreement and all books and records relating thereto shall be open to inspection at any time by the
Contracting Officer, with the understanding that the information obtained shall be regarded as confidential.

b. **Order of Logging:**
Weather conditions permitting, each phase of the logging operations shall be completed by the Contractor, within a unit being operated and structural restoration requirements made including, culvert and fill removals, stream-crossings restoration and haul and skid trail repairs, prior to the commencement of logging operations in another unit. All phases of the operation shall proceed in an orderly manner, in accordance with the directions of the Contracting Officer.

c. **Methods of Logging:**
(1) Loading points (decks) will be designated only by the Contracting Officer before harvesting begins.

(2) So far as practicable, trees shall be felled in a direction with reference to skid roads which will facilitate skidding and result in minimum damage to residual trees. All haul roads and main skid roads/trails shall be located on the ground in advance of felling operations.

(3) No swamping or cutting of ground tree growth to clear ground for skidding shall be done except at the landings.

(4) Tractors/Skidders/Cutters shall not be driven through groups of hardwood timber not marked with products described herein nor shall they be driven across from one tractor road to another either empty or loaded.

(5) No cut trees or tops will be left leaning against other trees. No broken top or splintered trees will be left standing within one hundred feet (100’) view of any road or fire lane. All leaning and broken or splintered trees will be downed by the Contractor before moving to another cutting area.

(6) Tree length logging will be allowed. Tractors will not drag logs longer than N/A feet in length. Contractor will plan and limit skid trails through the sale area and utilize the same marked trees as turn trees during operations.

d. **Slash Disposal:**
The unused portion of all tops and branches must be removed from roads, ditches, fire lanes, and mowed areas and will be scattered from the loading decks back into the harvested areas and reduced to less than three feet (< 3’) in height. Slash will not be deposited within a fire-hazardous radius of residual trees in the stand nor within the described buffer zones of the Ouachita Highlands Trail or Lake Maumelle.
e. **Stump Heights:**

Stumps of trees shall be cut no higher than **12 inches** for sawtimber trees, and **6 inches** for pulp trees, except for those trees wherein wire, nails, visible defects, or excessive flare necessitate cutting higher than the above stated limit.

f. **Directional Felling:**

Methods used shall result in felling trees away from the Ouachita Highlands Trail buffer zone (66 feet), Highway 300 R-O-W, the Exxon-Mobile Pipeline, the designated Lake Maumelle buffer zone, and adjacent private property boundaries.

g. **Protection:**

1. Central Arkansas Water facilities such as utility lines, ditches, roads and shoulders, bridges, culverts, fences, gates, and other property, will be protected and if damaged, shall be repaired immediately by the Contactor.

2. The Exxon-Mobile pipeline right-of-way dividing Unit 1 and Unit 2 is restricted from all activities by the Contractor and his assignees. This includes no felling of trees on the right-of-way, no deadheading of equipment or skidding or vehicle parking.

3. The Contractor's operations shall be conducted to minimize damage and pollution to stream courses within the sale area which are shown on the sale area map. Culverts or bridges of appropriate dimensions will be required at all designated permitted highway access points, crossing points and such facilities shall be of sufficient size and design to provide an unobstructed flow of water. All streams shall be cleared of debris including felled trees, tops, and logs resulting from the Contractor's operations. All stream crossings shall be approved in advance by the Contracting Officer. In the event the Contractor causes debris to enter stream courses in amounts which may adversely affect the natural flow or the stream, water quality or fishery resource, the Contractor shall remove such debris as soon as practicable, but not to exceed 48 hours, and in an agreed manner that will cause the least disturbance to stream courses. As a part of this agreement a **one hundred foot (100’) buffer** around Lake Maumelle has been designated as a no logging or travel corridor for any equipment.

4. The Contractor shall be required to conform to applicable federal, state, county, and local regulations as necessary to prevent the pollution or degradation of environmental quality. Littering Central Arkansas Water property with glass, metal, paper, plastic, oils, lubricants, fuels, detergents, or any other solid or liquid pollutants is prohibited. Persistent pollution of the land in and around cutting units or areas used to gain access, may be cause for immediate shutdown of harvesting operations and possible termination of this contract.

(4) Before releasing the Contractor's bond and/or releasing him/ her from further responsibility under this contract, all structures, equipment, temporary culverts or
bridges, fill materials, debris, and litter resulting from the Contractor's operation shall be removed from the property.

h. **Erosion Control Requirements:**
Units 3 and 4 of the sale area are within the watershed of and in close proximity to Lake Maumelle, a public drinking water reservoir. Erosion control measures along haul roads, skid trails and stream crossings as a part of harvesting operations within these areas shall be implemented in accordance with the Arkansas State Best Management Practices (BMPs) for Water Quality Protection. Potentially, sediment barriers, water bars, and other measures may be required and will be best determined by the Contracting Officer in consultation with the Contractor.

i. **Roadways:**
Temporary logging roads, trails, and skid roads may be established when permitted in advance by the Contracting Officer in accordance with the following:

(1) Permanent roads, trails, and designated fire lanes shall at all times be kept free of logs and debris, resulting from the Contractor's operations and any road or trail used by the Contractor in connection with this sale that is damaged or injured beyond ordinary wear and tear through such use shall be promptly repaired by him to its original condition.

(2) Upon completion of logging operations in any portion of the sale area, the Contractor will, as soon as is practical, perform such work as may be necessary to prevent soil erosion.

j. **Ingress and Egress:**
The Contractor shall have free ingress and egress over Central Arkansas Water property through only designated travel ways to the site involved. Securing rights of ingress and egress over adjoining property shall be the responsibility of the Contractor.

k. **Fire Suppression:**
The Contractor shall protect his/her operations from fire, and shall use his employees and equipment to suppress fires on the sale areas. The Contractor will be held responsible for damages resulting from negligence in his operations or those of his employees or agents. When extreme fire conditions persist, Central Arkansas Water may pose a temporary halt to logging operations due to the potential for ignition from logging activities.

l. **Equipment Restrictions:**
(1) No logging equipment with floatation tires is allowed in the sale units and no equipment exceeding 12 feet in width is allowed throughout the operation.

(2) The Contractor shall at no time have in his possession any tree marking equipment of any type while on the sale area. Possession of such equipment will be cause for forfeiture of the contract performance bond.
5. **Damages and Defaults:**

   a. **Liquidated Damages:**
      (1) No unnecessary cutting or injury shall be done to unmarked trees, witness trees, monuments, and timber reproduction. The Contractor shall pay at a rate of $2.00/inch at stump diameter for unnecessary damage to unmarked trees, witness trees, monuments and timber reproduction.

      (2) Unmarked trees which are unavoidably damaged shall, if required by the Contracting Officer or his designee, be cut and paid for at the value designated in 5.a.(1).

      (3) Failure of the Contractor to notify the Contracting Officer immediately of any unauthorized timber marking in the sale area will be cause for cancellation of the sale contract. The Contractor shall pay at a rate of $10.00/inch at stump diameter for unauthorized marked trees that are cut.

      (4) The Contractor shall pay at a rate of $1.00/inch diameter at breast heights for failure to cut marked trees. Allowable error for missed trees will be 5% for the total number of trees 6" - 12" DBH and 2% of the total number of trees 14 inches and above DBH.

      (5) Continued failure to cut stumps in accordance with specifications will result in a fine of fifty (50) cents per stump.

      (6) Degradation of environmental quality through persistent littering and pollution of Central Arkansas Water-owned or controlled land and water shall result in fines payable by the Contractor to the Central Arkansas Water, in an amount equal to the actual cleanup costs incurred by the Central Arkansas Water.

      (7) The determination of the Contracting Officer, or his designee, in charge as to damages and defaults sustained shall be final and binding on the Contractor subject only to appeal within 30 days, to the Contracting Officer, whose decision shall be final.

   b. **Contract Modification and Termination:**
      (1) Modification of the terms of this contract, termination of rates provided herein, and termination shall be in writing and may be made on behalf of Central Arkansas Water only by the Contracting Officer in behalf of Central Arkansas Water. Notices, requests, or other actions where formal written notice is required herein, or is appropriate, will be made for, and accepted on behalf of Central Arkansas Water by the CEO or his representative.

      (2) This contract may not be transferred in whole or in part. Subcontracting of the operations is, however, permissible and such subcontracting shall not be regarded as a transfer of the contract.
SECTION III - BIDDERS INFORMATION

1. Instructions to Bidders:

   a. Invitation, Bid, and Acceptance:

      (1) This "invitation, bid and acceptance" shall constitute the entire contract agreement between the Contractor and Central Arkansas Water.

      (2) The right is reserved as the interest of Central Arkansas Water may require rejection of any and all bids, and to waive any defect or informality in bids received.

      (3) All bids submitted shall be deemed to have been made with full knowledge of all the terms, conditions, and requirements contained herein.

      (4) All bids received, at the option of Central Arkansas Water, remain open for acceptance or rejection for a period of 30 days from the date of opening bids.

      (5) Bids may be withdrawn on written or telegraphic requests received from bidders prior to the time fixed for opening. Negligence on the part of the bidder in preparing his bid confers no right for the withdrawal of the bid after it has been opened.

      (6) Prior to bidding, each prospective bidder should satisfy themselves as to the logging conditions, location, access and volume of timber to be removed from the designated areas. This contract agreement shall be construed to have the intent of covering all of the designated timber of the specified species, grade, and sizes on the area, and as described thereto and shall include all of such timber whether less than, equal to, or in excess of the estimated quantity states.

      (7) No letters of explanation or exception to any of the conditions set forth herein will be attached to or become a part of this contract. The rights and duties of Central Arkansas Water under this contract as herein expressed will be exercised or discharged by the CEO, or by the Contracting Officer or such representatives as he may designate to supervise the operations herein authorized.

   b. Submission of Bids:

      (1) Sealed bids must be submitted on the bid form accompanying this invitation for bids and specifications of sale, or on exact copies thereof. Invitation and bid forms or any additional information pertaining to this contract, may be obtained from: Stephanie Hymel, Contracting Officer, Central Arkansas Water, 221 East Capitol Avenue, Little Rock, AR 72201, telephone no. (501) 377-1331.

      (2) Bids must be enclosed in a sealed envelope, which clearly indicates the following information:
c. **Bid Opening:**
   It will be the duty of each bidder to see that his bid is delivered by the time and at the place prescribed in this invitation. Only bids in properly marked envelopes, as required above, received prior to the time for opening, will be securely kept, unopened, until the time for opening bids. Hand carried bids will be delivered to the Receptionist at Central Arkansas Water, 221 East Capitol Avenue, Little Rock, Arkansas 72201.

   At the time fixed for opening bids, their contents will be made public by announcement for the information of bidders and others provided, however, that any submitted, the disclosure of which might tend to subject the person submitting the bid to a competitive business disadvantage, will upon request, be held in strict confidence by Central Arkansas Water.

   Central Arkansas Water reserves the right, subsequent to opening of bids, to require a showing by the successful bidder of his experience and facilities to perform the operation in a satisfactory manner.

d. **Notice of Action:**
   Notice of acceptance or rejection of bids, notice of authority to proceed with removal of the purchased property, and any other notices hereunder shall be deemed to have been sufficiently given when emailed or mailed to the bidder or his duly authorized representative at the address indicated in the bid.

e. **Payments:**
   (1) **Bid Deposit:**
   No bid will be considered unless it is accompanied by a deposit of not less than $10,000.00. Such deposit must be in the form of a surety bond, letter of credit, cashier's check, company check, certified check, bank draft, money order, or equivalent, not subject to stoppage or revocation, made payable to Central Arkansas Water. The deposits of unsuccessful bidders will be returned to them as soon as possible after the bids have been opened.

   (2) **Performance Bond:** $10,000.00
   The successful bidder's deposit will be retained by Central Arkansas Water as partial payment or as the whole payment of the performance bond. In the event of no damages, default charges, or outstanding expenses incurred by Central Arkansas Water as a result of the Contractor's actions in performance of this contract, the bond will be returned at the completion of harvesting, when the Contractor and Contractor are released from further responsibilities under this contract.
f. **Liability:**
   (1) Central Arkansas Water assumes no liability for an independent Contractor or its employees. The Contractor shall specifically and distinctly assume all risks of damage or injury to persons or property resulting from any actions or operations in connection with this work, and shall protect and defend Central Arkansas Water, its officers, agents and employees harmless of liability of any nature or kind.

   (2) Contractor agrees that in the performance of this contract the Contractor will comply with the Federal Fair Labor Standards Act of 1939, as amended and all the laws of the State of Arkansas; and the Contractor agrees to pay, prior to delinquency, all Federal and State Social Security, Unemployment, and similar taxes as are or may be due or imposed, and to indemnify and protect Central Arkansas Water from all claims and liability on account thereof.

g. **Contractor's Insurance Requirements:**
   The Contractor shall purchase and maintain such insurance as will protect him from such claims as set forth below which may arise out of or result from the Contractor's operations under this contract, whether such operations be by himself or his designee; and will comply with or protect him from the following:

   a) Claims under Workmen's Compensation, Disability Benefit, and other similar benefit act;

   b) Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

   c) Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

   d) Claims for damages insured by usual personal injury liability coverage which are sustained;

   e) Claims under comprehensive General Liability for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom. Coverage for "completed operations" shall be required under this comprehensive liability section.

h. **Non-Discrimination:**
   Central Arkansas Water has adopted and implements a policy of non-discrimination toward bidders with regard to race, creed, sex, age, national origin, sexual preference, or non-disqualifying handicap.
SECTION IV - SPECIAL PROVISIONS

The special provision(s) pertinent to this sale are listed below:

1. Logging season will be from bid acceptance through November 30, 2012.

2. All Best Management Practices and Unit Rehabilitation requirements, such as, culvert and fill removals, stream crossing restoration, haul and skid roads/trails smoothed will be accomplished prior to moving to another Unit (see Section 4.b.).

3. All required seeding will be accomplished according to moisture conditions that ensure germination with seeding rates and species approved by the Contracting Officer.

4. All access areas to Highway 300 West and Highway 10 West (Unit 4) will be blocked from non-authorized access with consultation and approval with Contracting Officer.

5. Access to the logging tracts off AR Highways 300 and 10 must be made in accordance with Arkansas Highway Department requirements. Traffic control for egress and ingress to the tracts shall comply with the current issue of the Manual on Uniform Traffic Control Devices for Streets and Highways.

6. The only access from Highway 300 into Unit 3 occurs within a blind curve and therefore the Arkansas Highway Permit only allows entry and exiting through the use of up to three (3) flagmen may be required in both directions at an appropriate distance to halt oncoming traffic.

7. The need and method of erosion control measures for portions of Units 3 and 4 will be designated by the Contracting Officer in consultation with the Contractor to prevent sediment flows to enter the Lake.
## Unit 1 (6 acres)

### Pine Pulpwood

<table>
<thead>
<tr>
<th>DBH</th>
<th>No. of Stems</th>
<th>Volume in Cords</th>
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<td><strong>Totals</strong></td>
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### Pine Sawtimber

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<td><strong>Totals</strong></td>
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## Unit 2 (31 acres)

### Pine Pulpwood

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### Pine Sawtimber

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<td><strong>Totals</strong></td>
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### Unit 3 (99 acres)

#### Pine Pulpwood

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#### Pine Sawtimber

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Unit 4 (46 acres)

### Pine Pulpwood

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<td><strong>Totals</strong></td>
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### Pine Sawtimber

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Central Arkansas Water
Contractual Agreement

Contract: To assist in developing a method for natural resource reconnaissance inventories of Central Arkansas Water properties.

Contractor: Progressive Timber Resources, LLC ; 139 Fawn Lane Monticello, AR 71655, Owner: Bobby Roberts, Phone: 870-814-1733
Federal Employer No: 27-0928465

Description of Work: Contractor has been selected due to his expertise in forestland resource inventories and familiarity with current GPS/GIS technologies and Trimble-Navigation field computers. The Contractor is being asked to assist the AR Game & Fish Commission Habitat Coordinator and Central Arkansas Water (CAW) representative in developing a resource inventory method template to be used in future contractual agreements with various forestry consultant businesses in the inventorying of CAW lands.

Once completed on a sample site of approximately 300 acres, the computer data fields and map resulting from the field inventories will be used as a GIS layer in determining habitat polygons for future management recommendations.

Product of Work: The Contractor will submit a resource timber type and features map of the sample area at a scale of 4 inches per mile which details all land features, changes in vegetative overstory types, roads, structures and possible encroachments. Additionally, an excel spreadsheet will be provided detailing all forest attribute datasets requested by CAW.

Rate: $18.00 per sample plot.


Contractor: ____________________________ Date: ________________
Signature of Owner
Sealed bids subject to the terms and conditions set forth herein, for the forest management projects listed in this invitation, will be received until the time, date and at the place indicated below, and then publicly opened.

**TIME OF OPENING:** 11:00 A.M.

**DATE OF OPENING:** April 16, 2013

**PLACE OF OPENING:** Arkansas Game and Fish Commission
Wildlife Management Division
#2 Natural Resources Drive
Little Rock, Arkansas 72205
Telephone: 1-800-364-4263 ext. 6431

**PROJECT:** Wildlife Stand Improvement by Injection on approximately 220 acres.

**PROPERTY LOCATION:** Gene Rush Wildlife Management Area, Newton & Searcy Counties, Compartments 14 (see attached maps).

**BID DEPOSIT:** A bid deposit is required in the form of surety bond, letter of credit, certified check, company check, cashier's check, money order, bank draft, or equivalent, in the amount of $500.00.

**BID PACKET:** If you are interested in obtaining a bid packet please contact Martin Blaney at 877-967-7577 ext 22 or by e-mail at mblaney@agfc.state.ar.us.

Inspection invited between 8:00 A.M. and 4:00 P.M., Monday through Friday, excluding holidays. Arrange with:

- Area Manager, Office 870-446-2236
- Regional Habitat Biologist, Office 877-967-7577, Cell 479-857-5434
- Habitat Coordinator, Office 877-967-7577
1. **Description of Work Area:**
The Gene Rush Wildlife Management Area is located near Mount Judea, Arkansas, in Newton and Searcy Counties. The work area is in Compartments 14 (see attached maps), and comprises 220 acres within the treatment area.

2. **Performance Bond:** $500.00
The successful bidder's bid deposit will be retained by the Commission as a performance bond. In the event of no damages, default charges, or outstanding expenses incurred by the Commission as a result of the Contractor's actions in performance of this contract, this bond will be returned at the completion and acceptance of the work described herein.

3. **Pre-Contract Meeting:**
Prior to initiating any work on the Management Area, the Contractor is required to have a pre-contract meeting with the Contracting Officer (CO). This meeting will be to review and clarify all aspects and requirements of the contract. It will entail looking over the treatment area and answering any questions concerning the contract specifications. This meeting is mandatory and cannot be waived, subject to penalty or default of the contract. The Regional Habitat Biologist and Area Manager will work with crews during startup to insure understanding of the treatment.

4. **Description of Work:**
   a) The Vendor will be required to inject all trees within the designated 220 acres, as specified in the following guidelines. (See attached maps.)
   
   b) Injection Guidelines: (Technical Specifications -- Trees)
      
      (1) Species: All Woody Species within the diameter limits listed below.
      
      (2) Diameter(s): 1.0 inch up to 6.0 inches.
      
      (3) Exceptions: Diameter limit for Oak species will be 2.0 inches up to 6.0 inches. Diameter limit for Hickories will be 1.0 inches up to 10.0 inches. Dogwoods, Black Cherry, & Pine will not be injected regardless of diameter.
      
      (4) Chemical Specifications: Chemicals will be provided and mixed by AGFC.

5. **Technical Specifications -- Methods:**
All trees designated above and/or marked with orange paint or flagging will not be injected within the treatment area. Injection may be done with metered injectors or using a hack and squirt method.
a) **Hack and Squirt method** - hacks will be made deep enough to penetrate the cambium layer of tissue at 2 inch measured intervals along the entire circumference of each tree at approximately 2 to 4 feet above the ground. Herbicide will be applied to the cut surface up to the point of run-off.

b) **Hypo-hatchet injector** - herbicide applied in a one milliliter (1 ml.) undiluted dose per injection at 2 inch intervals around the entire circumference of each tree at approximately 2 to 4 feet above the ground.

c) The chemicals to be used will be Triclopyr (3 lbs amine).

The Vendor will furnish all labor and other materials, equipment, tools, transportation, supervision, and supplies. AGFC will provide the required chemicals.

6. **Removal of Timber From Work Area:**
Title to all timber on the treatment area will remain with the Commission.

7. **Resource Protection:**
   a) The Vendor and his personnel will be required to help suppress and control any fire resulting from the Vendor's operation.

   b) Before final acceptance, all trash, rubbish and debris resulting from the Vendor's operations shall be removed from the Wildlife Management Area.

   c) During the handling, transporting and use of all chemicals, the Vendor shall use extreme caution in preventing chemical spillage and pollution of any streams, ponds, or lakes in or near the treatment areas. **All herbicide containers will be recapped and removed from the Wildlife Management Area. Injection equipment will not be cleaned up in the treatment area or on the Wildlife Management Area, but will be transported off the Area by the Vendor and disposed of legally and in an environmentally safe manner.**

8. **Inspection and Acceptance:**
Inspection of the work performed under this contract shall be made by the contracting officer (CO) as the work progresses and at such intervals as are necessary to insure compliance with the contract specifications. If the work is not accepted by the contracting officer, the Vendor shall complete any remedial work required to bring the work up to standards acceptable under contract specification, or forfeit the performance bond.

9. **Payment:**
Payment will be made for the actual number of acres satisfactorily completed and accepted by the contracting officer. Payment will be made at the completion of all specified work.

10. **Schedule and Completion Date:**
All work will proceed in an orderly fashion as specified by the C.O. The Vendor agrees to begin the above listed work on **April 30, 2013** and to complete all of the above listed work by **June 20, 2013**.
11. Liability:
   a) The Arkansas Game and Fish Commission assume no liability for an independent Vendor or its employees. The Vendor shall specifically and distinctly assume all risks of damage or injury to persons or property resulting from any actions or operations in connection with this work, and shall protect and defend the Commission, its officers, agents, and employees harmless of liability of any nature or kind.

   b) Vendor agrees that in the performance of this contract the Vendor will comply with the Federal Fair Labor Standards Act of 1939, as amended, and all the laws of the State of Arkansas; and Vendor agrees to pay, prior to delinquency, all Federal and State Social Security, Unemployment, and similar taxes as are or may be due or imposed, and to indemnify and protect Arkansas Game and Fish Commission from all claims and liability on account thereof.

12. Contractor's Insurance Requirements:
The Contractor shall purchase and maintain such insurance as will protect him from such claims as set forth below which may arise out of or result from the Vendor's operations under this contract, whether such operations be by himself or his designee; and will comply with or protect him from the following:

   a) Claims under Workmen's Compensation, Disability Benefit, and other similar benefit act;

   b) Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

   c) Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

   d) Claims for damages insured by usual personal injury liability coverage, which are sustained

      (1) by any person as a result of an action or offense directly or indirectly related to the employment of such person by the Contract Officer; or

      (2) by any person; and

   e) The Contractor shall provide and maintain during the term of this contract, at the contractor's expense, Comprehensive Automobile Liability Insurance at limits no less than the statutory requirements and it shall be shown on the certificate in per person, per accident terms for bodily injury and per accident for property damages.

   f) Claims under comprehensive General Liability for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom. Coverage for "completed operations" shall be required under this comprehensive liability section.
13. **Penalties:**
   a) A penalty may be assessed for any work done prior to the mandatory pre-contract meeting (see Section 3).

   b) Arkansas Game and Fish Commission will assess a $2.00 per stem penalty for each tree wrongfully injected in violation of the injection guidelines (Section 4).

14. **Commission Right of Bid Rejection:**
    The Commission reserves the right to accept or reject, in whole or in part, any and all bids.

15. **Non-Discrimination:**
    Arkansas Game and Fish Commission has adopted and implements a policy of non-discrimination toward bidders with regard to race, creed, sex, age, national origin, sexual preference, or non-disqualifying handicap.
CONTRACT SPECIFICATIONS
FOR
BOUNDARY MARKING
ON
MAUMELLE RIVER WMA

AREA: Maumelle River WMA (refer to attached map)

Archery Deer Permit Hunting and Restricted Squirrel Hunting Area (30.46 miles)
STANDARDS: Tree markings along the exterior boundary of the Archery Deer Permit Hunting and Restricted Squirrel Hunting Area will consist of first preparing the surface of the tree to be marked by lightly smoothing the bark surface and then applying a paint spot no smaller than a 4-inch circular or square mark made with orange (semi-paste) boundary marking paint. Care will be taken to ensure each selected tree is not “blazed” or inner wood is not exposed. The tree marking surface is to only be smoothed for good paint adherence and visibility. Tree markings will be located as follows: all prominent trees within 3 feet of boundary line will be marked towards the outside of the management area boundary; only line trees that are easily identifiable will be marked; all existing witness trees and corner trees will be refurbished; any trees on opposing sides of a road will be ringed with paint; under no circumstances should any tree marking face toward the management area. AGFC boundary signs will be furnished by the Commission; contractor will post boundary signs facing to the outside of the management area; signs must be placed at intervals along the boundary to insure inter-visibility of the boundary line from any point outside of the management area; boundary signs must be placed as high as possible on the selected tree; boundary signs must be placed using only aluminum nails and allow for sufficient room for tree growth; in the event insufficient trees are present to adequately mark the boundary, the Contractor will post the boundary signs on T-posts at intervals, no farther than 400 feet along the boundary to insure visibility of the boundary line from any point. In steep conditions signs should be placed on ridgetops and at the tow slopes along the boundary. Any areas along the exterior property line that the known ownership boundary is questionable should not be marked or signed; Contractor will be responsible for identifying these areas on a map and notifying the Commission immediately; the Commission will work with Central Arkansas Water to resolve any boundary questions and provide the Contractor with direction to complete the boundary marking in these areas. All nails, paint and T-posts will be furnished by the Contractor.

Contract Completion Date
STANDARDS: The Contractor must provide a sufficient number of personnel to complete the described work to the satisfaction of the Commission by September 30, 2010.

Billing
STANDARDS: Contractor will submit all invoices following work completion. Each invoice should include Contractor’s name, address, Social Security Number or Federal ID Number, and the exact dates the work was performed. All invoices should be submitted to the AGFC Regional Biologist. The total invoiced amount may not exceed the limit stated in the contract without prior written approval from the Commission.
CONTRACT FOR SERVICES
between
ARKANSAS STATE GAME & FISH COMMISSION
and
NAME OF CONTRACTOR

THIS CONTRACT, dated _____, by and between the Arkansas State Game and Fish Commission, hereinafter called "COMMISSION," and:

Name:

SS Number: or Fed ID Number:

Address:

Phone #: Fax #:

E-mail:

hereinafter called the "CONTRACTOR".

1. TERM. The term of this Contract will begin on the ____ day of ____, 20____, and shall end on the ____ day of ____, 20____.

2. WORK OBJECTIVE AND SCOPE.

Project Name:

Project Number:

CONTRACTOR shall be responsible for performing the following services:

Contractor will blaze, paint and sign the exterior boundary of the Archery Deer Hunting and Restricted Squirrel Area (33.25 miles more or less) as specified in Exhibit A, an addendum of this contract agreement and shown on the attached Maumelle River WMA map. Contractor will blaze, paint and sign the exterior and interior boundary of the Restricted Area (6.66 miles more or less) as specified in Exhibit A of this contract and shown on the attached Maumelle River WMA map. Contractor will blaze, paint and sign the exterior and interior boundary of the Hunting Prohibited Area (17.6 miles more or less) as specified in Exhibit A of this contract agreement and shown on the attached Maumelle River WMA map. All work described above must be completed by the Contractor to the satisfaction of the Commission by September 30, 2010.
3. **CALCULATION AND RENDERING OF COMPENSATION.** The CONTRACTOR in consideration for performance of the above outlined services shall be paid by the COMMISSION a sum of money not to exceed $______, to be paid in the following manner: Contractor will be paid upon satisfactory completion of all contract obligations as described in Exhibit A, an addendum of the contract agreement, and the submission of an invoice to the Commission. Payment will be based on a rate of $_________ per mile, not to exceed a total of $_____________.

4. **COMPLETION OF SERVICES.** CONTRACTOR agrees to furnish and pay for all labor, materials, tools and equipment necessary to complete the services described above. The services described above shall be done in a manner, which meets the COMMISSION'S satisfaction. Except for advising the CONTRACTOR of what is to be done and the results expected, the COMMISSION shall have no direct supervision over the CONTRACTOR. The CONTRACTOR will pursue the completion of services using its own methods. The CONTRACTOR is solely responsible for the results of the work.

5. **EQUIPMENT SAFETY.** CONTRACTOR agrees to maintain all equipment in a safe operating condition. All equipment will have proper safety devices and shields. All appropriate safety/warning signs will be in place while and where work is in progress. CONTRACTOR shall exercise due care in performing the work described herein to avoid damage or risk to person or property.

6. **LEGAL COMPLIANCE.** CONTRACTOR shall at all times observe and fully comply with any and all Federal, State and local laws, statutes, orders, ordinances and regulations.

7. **INSURANCE.** CONTRACTOR shall maintain during the term hereof: (a) Comprehensive Vehicle Liability Insurance with coverage for bodily injury liability and property damage liability; (b) Comprehensive General Liability Insurance; and (c) Workers Compensation Insurance and Employers Liability Insurance, if required by law, fully covering all employees and supervisors participating in CONTRACTOR'S operations hereunder. Prior to commencing operations hereunder, a Certificate of Insurance evidencing such coverage, satisfactory to the COMMISSION, shall be furnished to the COMMISSION.

8. **EQUAL EMPLOYMENT OPPORTUNITY.** CONTRACTOR agrees not to discriminate in its employment practices or subcontracts with regard to race, color, sex, age, religion, national origin or disability.

9. **LIABILITY.** It is clearly understood and agreed that the CONTRACTOR, in consideration of the amount due under this Contract, shall be solely responsible for all manner of claims, causes of action or liability arising out of any accident, injury or damage to CONTRACTOR, its equipment or property, to its employees or agents and to any third party's person or property while conducting the activity described in this Contract. The CONTRACTOR shall indemnify, defend, protect and hold harmless the COMMISSION and its Commissioners, Director and employees from or against any and all claims, causes of action, liability, damages, and expenses of whatsoever nature arising from or directly related to the CONTRACTOR'S services under this Contract.
10. **TERMINATION.** If, at any time during the progress of the Contract, the work is not performed in an efficient, satisfactory and timely manner as agreed in this Contract, the COMMISSION may, without bias to any other right or remedy, after Seven (7) days written notice to the CONTRACTOR, terminate this Contract paying only for work satisfactorily completed prior to termination.

11. **LIQUIDATED DAMAGES.** If the CONTRACTOR fails to complete the work in the time herein specified, CONTRACTOR shall pay to the COMMISSION, as liquidated damages, the sum of N/A Dollars ($N/A) per day for each day the project is delayed, and such amount shall be deducted from the final amount of the Compensation specified above in Paragraph 3.

12. **NON-WAIVER.** No waiver by the COMMISSION of any breach of any provision of this Contract shall constitute a waiver of any prior, concurrent or subsequent breach of the same or any other provision hereof, and no waiver shall be effective unless made in writing and signed by an authorized representative of the COMMISSION. No delay or omission by the COMMISSION in the exercise of any right or remedy upon any breach by the CONTRACTOR shall impair such right or remedy or be construed as a waiver.

13. **ASSIGNMENT.** Neither party to this Contract shall assign this Contract nor any interest in it without written consent of the other party; nor shall the CONTRACTOR subcontract any portion of the work without first obtaining the written permission of the COMMISSION.

14. **APPLICABLE LAW.** Any and all disputes under this Contract shall be governed by the laws of the State of Arkansas and the appropriate venue shall be in the Arkansas State Claims Commission, Pulaski County, Arkansas.

15. **ENTIRE AGREEMENT.** This Contract constitutes the entire agreement between the parties hereto and may not be amended or modified except by written agreement signed by both parties. All additions or deletions contained in this Contract were read and agreed to by both parties before it was signed.

**ARKANSAS STATE GAME AND FISH COMMISSION**

By: ________________________________
Commission representative & title*

By: ________________________________
Contractor representative & title

Date: _____________________________

**CONTRACTOR**

Date: _____________________________

Form CS

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09/09
* The Chief of the Division is authorized to sign contracts not exceeding $10,000.00. Deputy Directors are authorized to sign contracts up to $25,000.00. The Director must sign contracts exceeding $25,000.00.