
Cave Springs Area Karst Resource Conservation Initiative

Introduction

Northwest Arkansas is an area of the state that has experienced unprecedented periods of growth over the last decade, most notably from 2003 to 2007. The location of the corporate headquarters of Wal-Mart, Tyson Foods, J.B. Hunt, and other companies in Northwest Arkansas has been the primary factor in this growth. The rapid population growth has strained the local infrastructure. As a result, many new transportation infrastructure projects have been proposed to keep pace with the residential and commercial development.

Some of the major proposed transportation projects include the Springdale Northern Bypass, Northwest Arkansas Regional Airport Connector Road, upgrade of Interstate 540 to six lanes between Fayetteville and Bentonville, an improved north-south travel corridor along Highway 112, an improved eastern north-south travel corridor along Highway 265, Bellview Road improvements, Highway 264 Improvements, the Razorback Greenway Trail, and the Bella Vista Bypass. The existing development, the proposed transportation projects, and future development may affect local karst resources that support threatened and endangered species, as well as having potentially detrimental effects to groundwater and wildlife resources in general. This conservation initiative is proposed to mitigate for any potentially adverse effects to sensitive resources resulting from possible secondary and cumulative development.

Background

Construction of Interstate 540 extended for approximately 80 miles from near Ft. Smith, Arkansas to just north of Bentonville, Arkansas and was completed in 1999. As part of the NEPA process for this transportation facility, a recharge delineation was conducted for Cave Springs Cave in Cave Springs, Arkansas (1978). This cave supports the federally endangered gray bat and half the known population of the federally threatened Ozark cavefish. The recharge delineation resulted in the re-routing of the proposed project around the known recharge zone for the cave. During the environmental process for the NWARA Access Road, a study occurred to better define the boundaries of the Cave Springs recharge zone. It established that I-540 passed through the previously undefined secondary recharge zone (Aley and Moss 2001).

At this time, land use in the area was mostly agricultural, with little residential and commercial development; however, urban development was considered a potential future problem. As a result, the Northwest Arkansas Regional Planning Commission funded a study to identify efforts that would help prevent future adverse effects to threatened and endangered species, and their habitats within the sensitive karst landscapes of northwest Arkansas (Aley and Aley 1979). These adverse effects can be pronounced in karst landscapes that contain caves, sinkholes, springs and losing streams (all of which can be direct conduits to groundwater resources).

The study focused on several classes of threats to sensitive species and their habitats including residential and light commercial land development, industrial land development, transportation

and pipeline routes, agricultural activities and waste disposal activities. Recommendations from the study included endangered species surveys and recharge delineation studies for caves associated with endangered and threatened species. Other recommendations were focused on avoiding water quality degradation through community wastewater treatment facilities rather than septic systems; minimizing effects from transportation and pipeline projects/spills through context sensitive designs and planning; avoiding sedimentation and contaminants from confined animal feedlot operations through soil conservation efforts; and remediation of stormwater runoff from all such activities. The study concluded that without such efforts, it was likely that adverse effects to groundwater and other ecologically important resources could occur over time.

A 1997-1999 study (Graening and Brown 2003) of Cave Springs Cave concluded that groundwater in the system was indeed experiencing degradation that was altering cave biota community composition to favor more pollution tolerant species. This study was conducted prior to the rapid growth experienced in the area in the mid 2000s and further concluded that the reduction of anthropogenic pollution input into this ground water basin is necessary to restore ecosystem dynamics in Cave Springs Cave to its former condition.

Efforts by city planners and administrators to address sediment and contaminant inputs into karst systems have been primarily through the National Pollution Discharge Elimination System (NPDES), overseen by the Arkansas Department of Environmental Quality, and voluntary best management practices. The best management practices (BMPs) resulted from U.S Fish and Wildlife Service (USFWS) recommendations (USFWS 2007) for development activities in karst recharge zones. However, NPDES permitting is not sufficient to address the Endangered Species Act. Additionally, the recommended BMPs are voluntary with no regulatory oversight at the local, county or federal levels. Some of the aforementioned recommendations have been undertaken by community leaders and developers. Karst BMPs have been utilized for many development projects in the Cave Springs Cave recharge zone.

Given current aforementioned water quality trends for the cave and the proposed infrastructure projects likely to occur in northwest Arkansas over the coming years that could directly or indirectly affect the cave, the status of threatened and endangered species in the area remains uncertain. Since the use and development of the area has been rapidly changing, it is necessary that action be taken as soon as possible to protect natural resources associated with sensitive karst landscapes while enabling sustainable economic development within the region.

Proposed Scope of Effort

The proposed scope of effort has three primary objectives. The first objective is to seek out, consolidate and analyze existing water quality, species population data and development data in and around the study area, defined as the Cave Springs Cave Recharge Area, to determine trends and needs for additional data. The second objective is to work with the scientific community to determine appropriate actions necessary to ensure adequate protection of local karst recharge zones that support threatened and endangered species, and will build on previous efforts for karst conservation. The third objective is to work with local, county and state officials/administrators and other relevant stakeholders to determine the best mechanism to ensure that conservation actions are used effectively in the appropriate areas. This objective may also need long term

monitoring to determine the effectiveness of the actions in protecting the environmental quality and endangered species.

Objective One will involve the compilation of existing water quality, species population data, and development data to accurately determine trends and identify data gaps. If data gaps are identified, steps will be taken to gather pertinent scientific data. Results will be presented to the working group formed in Objective Two.

Action Plan for Objective One

- Contact local stakeholders as well as state, federal and local resource agencies to identify the existing scientific data and identify data gaps. (Cave Springs Cave is the primary focus area but additional information may be gathered on other nearby recharge areas with threatened or endangered species if comparative data is needed.)
- Work with agencies/organizations to complete the analysis of existing data.
- Conduct scientific studies to fill in data gaps.
- Collect and compile data about existing land use and land use controls in study area.
- Collect and compile information about existing efforts that are contributing to the protection of threatened and endangered karst species and habitats.
- Research, collect and compile existing karst conservation methods used in this and other areas that may be applicable and beneficial.
- Present findings to Stakeholders' Working Group formed in Objective Two.

Objective Two will draw upon the expertise of both governmental and non-governmental entities to determine appropriateness of conservation actions to protect threatened and endangered species and their habitats within the recharge zone of Cave Springs Cave. These entities could include representatives from state and federal resource agencies, non-profit conservation organizations, academia, city and county planners, and others.

Action Plan for Objective Two

- Form a working group (~10 people) from appropriate stakeholders to review compiled scientific data from Objective One.
- Recommend appropriate actions to be taken to provide adequate protection of local karst recharge zones and associated threatened and endangered species.
- Develop a karst BMP manual with conservation measures that will provide protection of threatened and endangered species within the recharge zone of Cave Springs.

Objective Three will require the coordination of city and county officials, administrators, economic developers and other relevant stakeholders to ensure karst BMPs are implemented effectively within the recharge zone of Cave Springs Cave. This may require adoption of local ordinances and will likely require incentives to comply with the BMPs for landowners within the Cave Springs Cave recharge zone. Municipalities with the greatest involvement would include Cave Springs, Lowell and Rogers. Springdale and unincorporated portions of Benton County comprise minor amounts of area within the Cave Springs Cave recharge zone.

Action Plan for Objective Three

- Develop an implementation strategy to enact recommended karst BMPs for the Cave Springs Cave recharge zone.
- Present the implementation strategy and products to the city and county officials for realization.
- Work with the local officials to enact the karst BMP recommendations using implementation strategy.
- Determine if a long term plan and adaptive management strategy that will allow monitoring of the efficacy of BMPs over time is needed, and how it may be feasible.

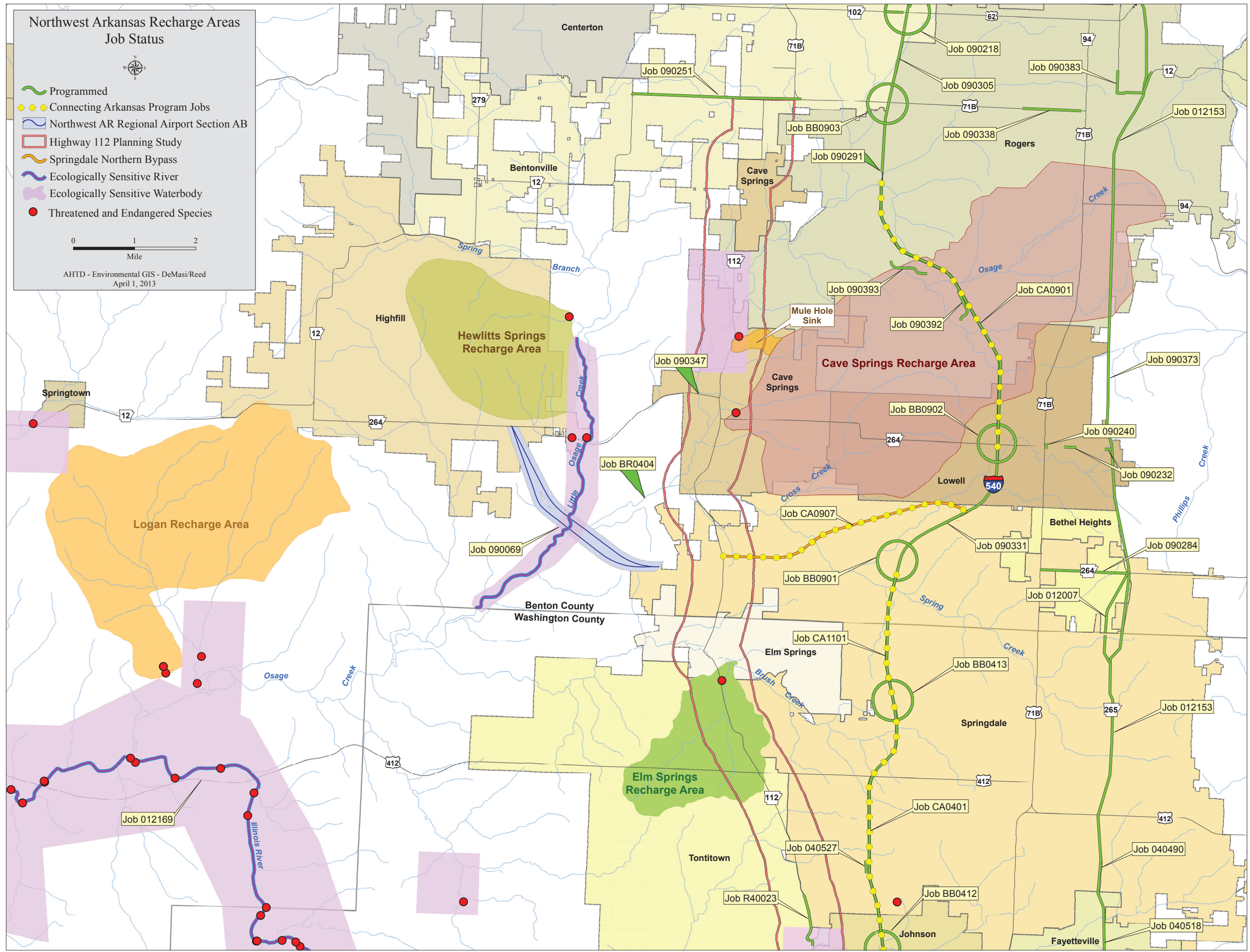
Literature Cited

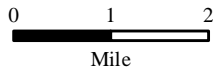
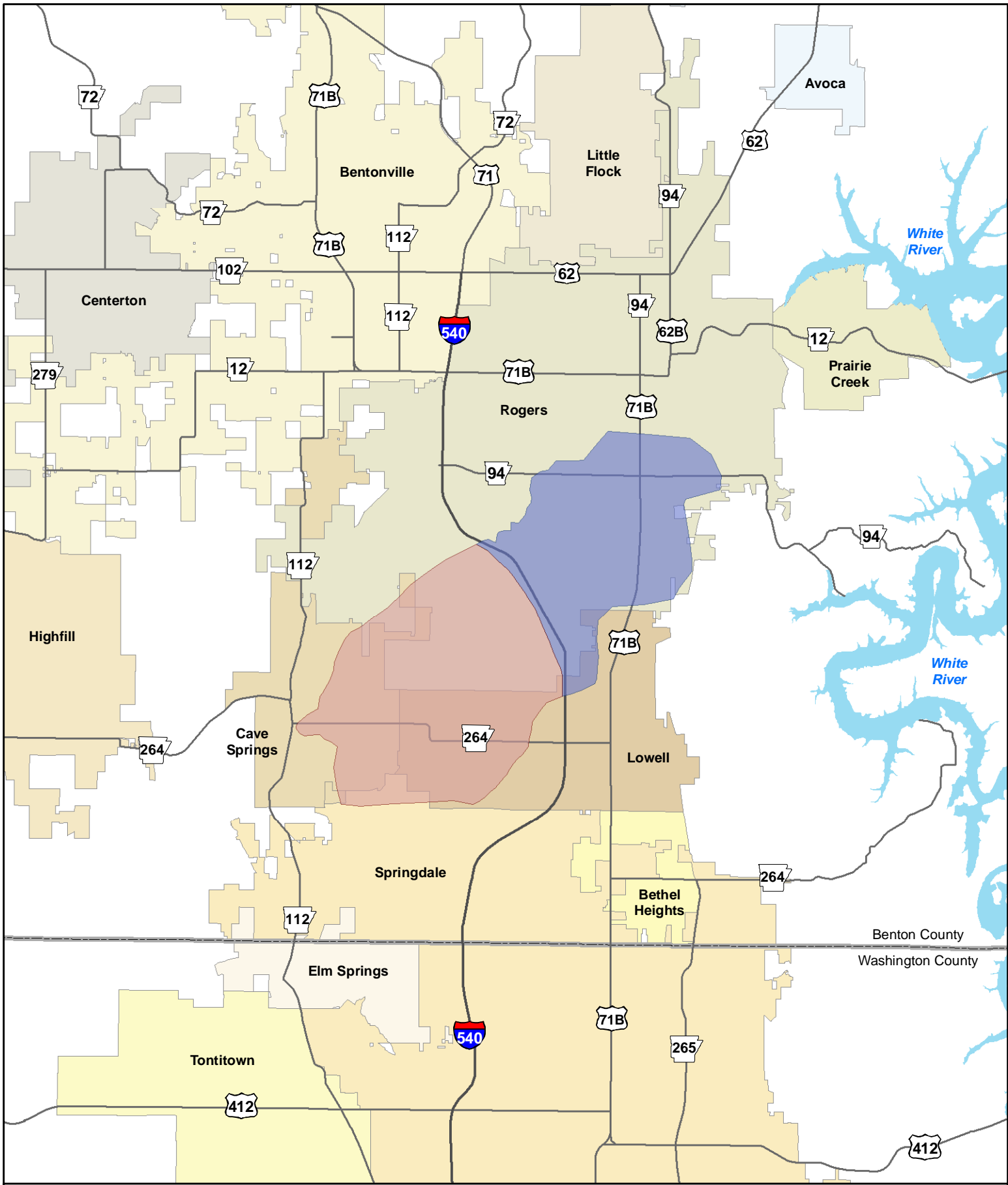
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**Northwest Arkansas Recharge Areas
Job Status**

- Programmed
- Connecting Arkansas Program Jobs
- Northwest AR Regional Airport Section AB
- Highway 112 Planning Study
- Springdale Northern Bypass
- Ecologically Sensitive River
- Ecologically Sensitive Waterbody
- Threatened and Endangered Species

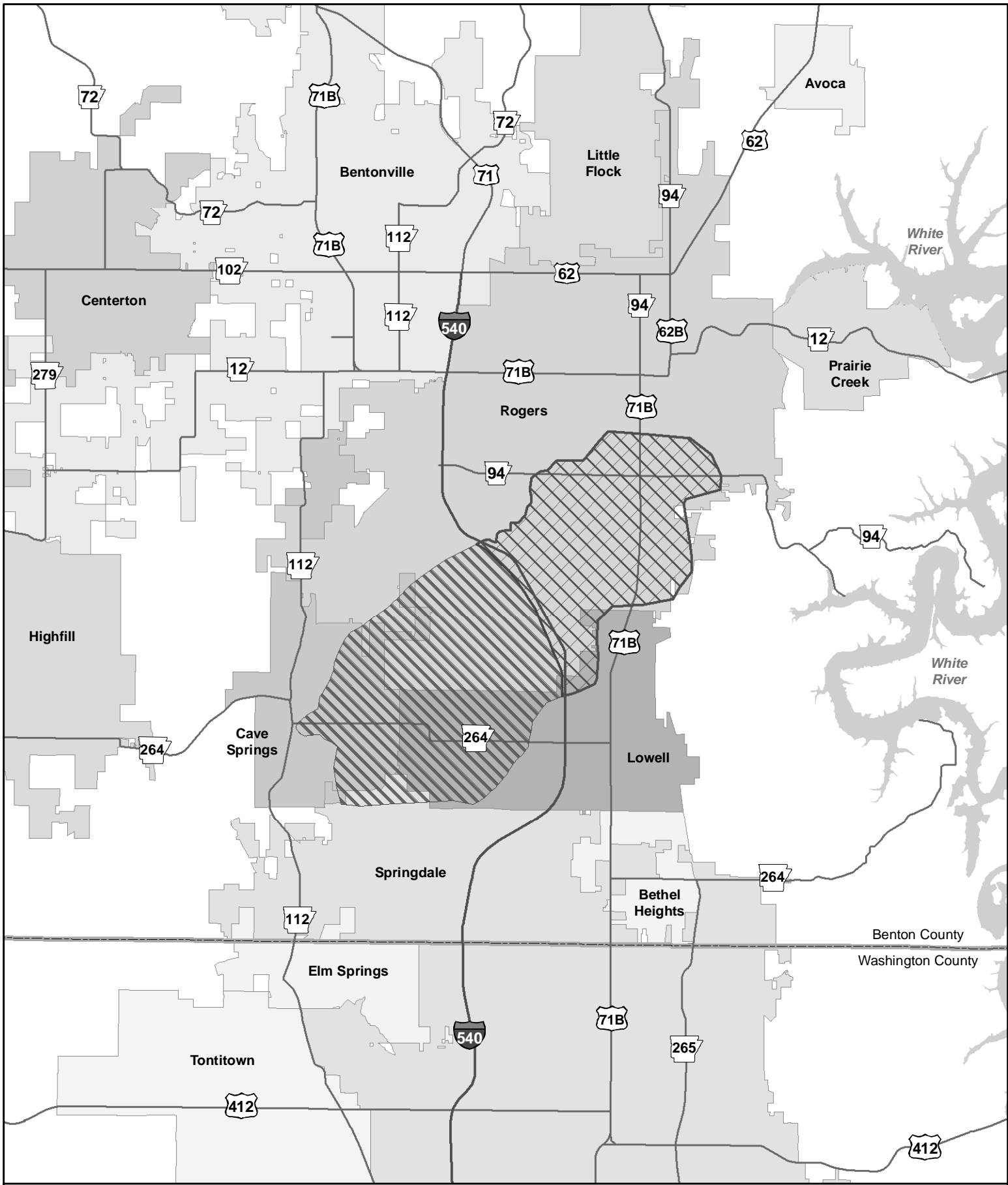
AHTD - Environmental GIS - DeMasi/Reed
April 1, 2013







Cave Springs
Recharge Area

- Cave Springs Direct Recharge Area
- Cave Springs Indirect Recharge Area



**Cave Springs
Recharge Area**

-  Cave Springs Direct Recharge Area
-  Cave Springs Indirect Recharge Area

