

**Elsa Heckman McMakin, M. A.**

Co-owner Foxfire Geophysics, LLC  
121 Conder Rd,  
Marietta, SC 29661  
USA  
E-mail: [elsa@foxfiregeophysics.com](mailto:elsa@foxfiregeophysics.com)

**Academic Degrees:**

- M. A. in Anthropology, University of Arkansas (2005)
- B. A. in Anthropology, University of Georgia (1997)

**Select Project Experience**

**Archaeo-Geophysics**

*Lewis and Clark Expedition, Nez Perce Longhouse in Hell's Canyon, Idaho.* In collaboration with the Idaho State Archaeologist's office and the Archaeo-Imaging Laboratory, Ms. McMakin conducted geophysical testing on a Nez Perce longhouse site believed to be associated with the Lewis and Clark expedition (1806 A.D). If confirmed, this site will be the only remaining physical evidence of The Corp of Discovery Expedition in the state of Idaho.

*Archaeo-Imaging Laboratory, University of Arkansas, Ground Based Remote Sensing survey of Double Ditch State Park, North Dakota.* Ms. McMakin worked with a team of professional archaeologists conducting geophysical surveys on this important prehistoric and historic Mandan Indian village north of Bismarck, North Dakota. Techniques included ground penetrating radar (GPR), Electromagnetic (EM) induction, magnetometry, electrical resistance and surface feature mapping.

*SERDP research project: New Approaches to the Use and Integration of Multi-sensor Remote Sensing for Historic Resource Identification and Evaluation. Alamogordo, New Mexico.* Working with a team of professional archaeologists, Ms. McMakin participated in the geophysical survey of a prehistoric Pueblo site, utilizing the following technologies: GPR, EM induction, magnetic susceptibility, magnetometry, electrical resistance and surface feature mapping.

*Graduate Student, University of Arkansas, Fayetteville. Geophysical Methodologies and Test Site for Battlefield Archaeology.* As part of Ms. McMakin's Master's thesis research, she created a Civil War battlefield test site on which she tested various remote-sensing instruments' suitability for detecting small metallic artifacts. She fused conventional metal detecting with state of the art geophysical prospection methods to arrive at an advanced understanding of how best to conduct archaeological investigations on our nation's battlefields. Methods implemented included: conventional metal detecting, electromagnetic induction (conductivity), and magnetometry.

**Archaeology**

*Archaeological Survey of Lake Keowee Shoreline, Recreation Areas and Islands, Oconee and Pickens Counties, South Carolina.* For New South Associates, Ms. McMakin supervised and conducted the survey of approximately 251 miles of shoreline, 83 islands, and approximately 465 Acres of land associated with this project. She also designed and created the accompanying GIS.

*Valley County Wind Energy Project, Montana.* Employed by Kleinfelder, Inc., Meridian, Idaho, Ms. McMakin supported a siting study and Section 106 compliance application for a proposed 500-megawatt wind energy development in northeastern Montana. The first phase of the project involved the assessment of cultural resource sensitivity for alternative transmission line corridors and windfarm development phases. Ms. McMakin managed and directed all fieldwork for the first phase of the project and prepared the draft technical report summarizing the results of the 2005 field survey.

*U.S. 91 Bear River Bridge, north of Preston, Idaho.* For Kleinfelder, Inc. and the Idaho Transportation Department (ITD) District 5, Ms. McMakin acted as cultural resources monitor for a bridge replacement over the Bear River on U.S. Highway 91 in Franklin County, Idaho. The

undertaking was located at the Bear River Massacre Site, a National Historic Landmark and a site of great spiritual importance to both the Shoshone-Bannock and the Northwestern Band of the Shoshone tribes. She was responsible for coordinating and conducting the fieldwork as well as preparing a technical report summarizing project results.

*SH-75 Slate Creek Bridge.* For Kleinfelder, Inc. and ITD, District 4, Ms. McMakin prepared a Determination of Adverse Effect (DAE) for the replacement of a 1933 concrete bridge across the Salmon River in Custer County, Idaho. The area of potential effect included a wagon road dating back to the 1860s and the remains of a placer mining site.

*Merrill Pit Source, PW-84C, Power Co, Idaho.* For Kleinfelder, Inc. and J.K Merrill and Sons, Ms. McMakin conducted a cultural resource investigation of a 150-acre parcel 5 miles northwest of Pocatello, Idaho and prepared a summary report of project findings.

*Boise River Wetlands Trust, Ada Co, Idaho.* Boise River Wetlands Trust, in cooperation with the Sundance Company of Boise, Idaho, proposed the development of a wetlands mitigation site along the Boise River, near the town of Star. Employed by Kleinfelder, Inc., Ms. McMakin managed the cultural resource investigation of this site as well as authored the technical report summarizing the results of the field survey.

*TF-25 Expansion, Twin Falls Co, Idaho.* Ms. McMakin directed and conducted a 330-acre cultural resources survey for Idaho Transportation Department District 4 (ITD) in preparation for the proposed expansion of an existing material source (Tf-25) in Twin Falls County, Idaho. She also prepared the technical report summarizing the results of the field survey for Kleinfelder, Inc.

*Cherry Lane Bridge Replacement, Idaho.* For the Idaho Local Highway Transportation Advisory Committee (LTHAC), Idaho Transportation Department (ITD), and other parties, Ms. McMakin, employed by Kleinfelder, Inc., provided cultural resource support for this proposed bridge replacement across the Clearwater River. Project tasks included monitoring of geotechnical investigations, a cultural resource survey of bridge alternatives, Section 106, 4(f), and integration of results into the NEPA document.

*Phase I survey of the Saylor Creek Missile Range, Bruneau Desert, Idaho.* Employed by The Environmental Company, Boise, Idaho, Ms. McMakin's duties included visual survey and archaeological site mapping of desert cultural resources.

*Archaeologist, Phase I Cultural Resources Survey and Archaeological Inventory of the proposed expansion of I-10 from US 29 (Pensacola Blvd.) to US 90 (Scenic Highway) and I-110 from Maxwell Street to I-10, Escambia County, Florida.* Employed by R.C. Goodwin and Associates, New Orleans, Louisiana, Ms. McMakin conducted phase I archaeological survey of the proposed project area and performed archaeological site recordation.

*Assistant Project Manager, Phase II Testing of Archaeological Site 40CK184 in Cocke County, Tennessee, in conjunction with proposed State Route 35 (US-321/411) from Good Hope Road to east of the Cocke/Greene County Line, Cocke and Green counties, Tennessee.* Employed by Alexander Archaeological Consultants, Ms. McMakin co-supervised fieldwork, conducted all laboratory analysis, and prepared the background history for a multi-component archaeological site with deposits spanning from the Late Archaic period to the early 1800s.

*Crew Chief, Phase I Archaeological Investigation of State Route 320 (East Brainerd Rd) from 325 ft east of Graysville Rd to 125 E of State Route 321 (Ooltewah – Ringold Rd), Hamilton County, Tennessee.* For Alexander Archaeological Consultants, Chattanooga, Tennessee.

*Crew Chief, Phase I Archaeological Survey of Proposed State route 475, the Knoxville Beltway, in Anderson, Knox, Loudon, and Roane counties, Tennessee.* For Alexander Archaeological Consultants, Chattanooga, Tennessee.

*Field Technician, Phase I Archaeological Survey of proposed Interstate 140 extension (Pellissippi Parkway) from west of Cusick Rd to State Route 73 (US 321), Blount County, Tennessee.* For Alexander Archaeological Consultants, Chattanooga, Tennessee.

*Field Technician, Intensive Phase I testing of a 4.8 acre tract in the Carden Farm Industrial Park, Anderson County, Tennessee.* For Alexander Archaeological Consultants, Chattanooga, Tennessee.

*Archaeologist I, Phase I Cultural Resources Survey and Archeological Inventory of the proposed Southern Natural Gas Company (SNG) South System Expansion Project, Sumter, Perry, Dallas, Autauga, Tallapoosa, Macon, and Lee counties, Alabama. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist I, Phase III data recovery excavations at Sites 40SW228 (Puckett Site) and 40SW340, Cross Creeks National Wildlife Refuge, Stewart County, Tennessee. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist I, Phase I Cultural Resources Survey and Archeological Inventory of the Texas portion of the proposed Caballero Pipeline Project, Hartley and Moore counties, Texas. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist II, Phase I Cultural Resources Survey and Archeological Inventory of the proposed 3.7 mile Southern Natural Gas Company 16 in O.D. Upson County and West Georgia Generating Meter Station Project Corridor, Upson County, Georgia. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist II, Cultural Resources Survey and Inventory, Florida Gas Transmission Phase V Expansion, FGT Mobile Bay Lateral, Loop A and Loop B, Mobile and Baldwin counties, Alabama. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist II, Phase I Cultural Resources Survey and Archeological Inventory of two pipeline loops (Loop J and Loop K) and 10 ancillary use facilities associated with the proposed Florida Gas Transmission Phase V Expansion, FGT Mobile Bay Lateral, Loop A, and Loop B, Gilchrist and Levy counties, Florida. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist II, Phase I Cultural Resources Survey and Archeological Inventory of the proposed expansion of I-10 from US 29 (Pensacola Blvd.) to US 90 (Scenic Highway) and I-110 from Maxwell Street to I-10, Escambia County, Florida. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase I Cultural Resources Survey and Inventory of Oaklands Mansion/Oaklands Spring, Nickajack Trace/Lytle Creek, and Black Fox Spring, Rutherford County, Tennessee. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase II Cultural Resource Assessment, Survey and Testing at Cross Creeks National Wildlife Refuge, Stewart County, Tennessee. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase I Cultural Resources Survey and Inventory of a 48.5 mile segment of the proposed 98.8 mile Koch Pipeline Southeast, Inc., Pascagoula Pipeline Project, Assumption, St. James, St John the Baptist, St. Charles, and St. Tammany parishes, Louisiana. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase I Cultural Resources Survey and Inventory of the proposed Chandeleurs - Destin Extension Project, Jackson County, Mississippi. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Supplemental Phase I Cultural Resources Survey and Inventory of the proposed Destin Pipeline Project, Jackson, George, Greene, Wayne, and Clarke counties, Mississippi. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase I Cultural Resources Survey and Inventory of the proposed Etowah LNG Company, L.L.C. 12.75 in O.D. Etowah Pipeline Project, Polk County, Georgia. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase I Cultural Resources Survey and Inventory of the proposed Etowah LNG Company L.L.C. Jurisdictional Etowah LNG Peakshaving Facility, Polk County, Georgia. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III/Ethnographer, Phase I Marine and Terrestrial Cultural Resources Survey of 13 project items located on Marsh Island, Iberia Parish, Louisiana. For R.C. Goodwin and Assoc., New Orleans, LA.*

*Archaeologist III, Phase I Cultural Resources Survey and Archeological Inventory of the proposed TENDS Breaux Bridge System Pipeline Project, Vermilion, Lafayette, and St. Martin parishes, Louisiana.* For R.C. Goodwin and Assoc., New Orleans, LA.

*Archaeologist III, Phase II Archeological Testing and National Register Evaluation of four Archeological Sites (16BO400, 16CD87, 16CD235, and 16CD239) within the area of potential effect of the Pool 5 Impoundment Area, Bossier and Caddo parishes, Louisiana.* For R.C. Goodwin and Assoc., New Orleans, LA.

## **GIS**

*Archaeological and Historical Survey and Preparation of a Battlefield Protection Plan for the Western Perimeter of the Lookout Mountain Battlefield, Hamilton County, Tennessee.* Ms. McMakin supervised fieldwork and the electromagnetic survey of a 700-acre portion of the Lookout Mountain Civil War Battlefield in Chattanooga, Tennessee. She developed and carried out a comprehensive mapping strategy for the survey area by integrating historic maps, on-the-ground site locations, GPS coordinates, and historical records by implementing and maintaining a GIS. For this same project she crafted a compatible artifact database for efficient spatial analysis of the battlefield landscape. Ms. McMakin prepared the report and report graphics for submission to the National Park Service (NPS) and presented project results at several professional conferences while employed by Alexander Archaeological Consultants

*Battlefield Viewsheds, or What the General Saw: Lookout Mountain Battlefield, Chattanooga, Tennessee.* Ms. McMakin's Independent research was presented at the American Battlefield Protection Program 7<sup>th</sup> National Conference on Battlefield Preservation in Nashville, Tennessee 4/04 and later published in an edited volume (referenced below in "Publications"). A series of viewsheds were projected from known points of strategic importance and were used to analyze the man-on-the ground perspective of the Federal assault on Lookout Mountain in 1863. This research led to new conclusions being drawn regarding the role that terrain and visibility played in the outcome of that famous battle.

*Phase III mitigation of archaeological sites 3PO608 and 3PO610 in Poinsett County, Arkansas.* With the intent to examine Native American land use patterns, Ms. McMakin used GIS methods to recreate the early historic forest composition of a township in Poinsett County, Arkansas based on 1841 General Land Office "Witness Tree" survey data. This work was done in support of Mid-Continental Research Associates (MCRA), Lowell, Arkansas.

*Avimor Planned Community, Ada County, Idaho.* NRCS soils data was compiled into a GIS with geologic, physiographic, and topographic datasets in order to assess and analyze "risk" for building in given locations based on soil properties. Ms. McMakin conducted this study for Kleinfelder, Inc., Meridian, Idaho.

## **Publications and Papers Presented**

Heckman, McMakin. E.

2007 *Battlefield Viewsheds, or What the General Saw: Lookout Mountain Battlefield, Chattanooga, Tennessee.* In *Fields of Conflict: Battlefield Archaeology from the Roman Empire to the Korean War*, edited by D.D. Scott, L.E. Babits and C.M. Haecker, pp.75-83. Praeger Security International, Westport, CT.

Heckman, McMakin. E.

2005 *Geophysical Methodologies and Test Site for Battlefield Archaeology.* Unpublished Master's Thesis. University of Arkansas.

Heckman, McMakin. E

2004 *Viewshed analysis on the Lookout Mountain Battlefield.* Paper presented at the American Battlefield Protection Program 7<sup>th</sup> National Conference on Battlefield Preservation in Nashville, Tennessee 4/04.

Alexander L.S., Elsa Heckman McMakin

2002 *Interpreting and Protecting the Past at the Lookout Mountain Battlefield in Chattanooga, Tennessee.* Alexander Archaeological Consultants, Chattanooga, Tennessee. Paper presented at the American Battlefield Protection Program 6<sup>th</sup> National Conference on Battlefield Preservation in Albany, New York.

Alexander L.S., Elsa Heckman McMakin  
2002 *Archaeology of the Battlefield at Lookout Mountain, Tennessee*. Alexander Archaeological Consultants, Chattanooga, Tennessee. Paper presented at the Annual Meeting for Current Research in Tennessee Archaeology. Nashville, Tennessee.

Alexander L.S., Elsa Heckman McMakin, Jim Moore, Bruce Council, Doug Cubbison, and Harry Hayes

2001 *Archaeological and Historical Survey of the Western Perimeter of the Lookout Mountain Battlefield*. Alexander Archaeological Consultants, Chattanooga, Tennessee. Technical Report Submitted to the National Park Service.

Alexander L.S., Elsa Heckman McMakin, Jim Moore

2001 *Archaeological and Historical Survey of the Western Perimeter of the Lookout Mountain Battlefield*. Paper presented at the Southeastern Archaeological Conference in Chattanooga, Tennessee.

Alexander L.S., Richard Walling, Elsa Heckman McMakin

2001 *Phase II Testing of Archaeological Site 40CK184 in Cocke Co. Tennessee, In Conjunction With Proposed State Route 35 (US-321/411) From Good Hope Road to East of the Cocke/Greene County Line, Cocke and Green Counties, Tennessee*. Technical report submitted to the Tennessee Department of Transportation

### **Seminars/Training Workshops**

*Cultural Resources Management*. Semester-long course taught by Dr. Tom Green at the University of Arkansas, Spring 2003. Concentrated discussion and application of management problems relative to cultural resources and historic preservation, including review and interpretation of relevant federal legislation (NEPA, NHPA, and Section 106), research vs. planning needs, public involvement and sponsor planning, and assessment of resources relative to scientific needs.

*Advisory Council for Historic Preservation (ACHP) Section 106 training workshop*. San Juan, Puerto Rico, April 2006.

*FHWA 4(f) training workshop*. Salt Lake City, Utah, July 2006.

*Participant, Current Archaeological Prospection Advances for Non-Destructive Investigations in the 21st Century*. Archaeological remote-sensing course offered by the National Park Service.

*Participant, GPS Training*. Offered by ENSR environmental Company, Atlanta, Georgia.