

Summer 8-2013

# DETERMINING THE FEASIBILITY OF INCLUDING HISTORIC ROADS AND ROUTES CONNECTING THE EASTERN LEGACY SITES IN THE EXTENSION OF THE NATIONAL HISTORIC LEWIS AND CLARK TRAIL

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DETERMINING THE FEASIBILITY OF INCLUDING HISTORIC ROADS AND ROUTES  
CONNECTING THE EASTERN LEGACY SITES IN THE EXTENSION OF THE  
NATIONAL HISTORIC LEWIS AND CLARK TRAIL

by

Kiana Mathew

AN UNDERGRADUATE THESIS

Presented to the Faculty of  
Environmental Studies Program at the University of Nebraska- Lincoln  
In Partial Fulfillment of Requirements  
For the Degree of Bachelor of Science

Major: Environmental Studies

With the Emphasis of Natural Resources

Under the Supervision of Ian Shanklin

Lincoln, Nebraska

August 2013

DETERMINING THE FEASIBILITY OF INCLUDING HISTORIC ROADS AND ROUTES  
CONNECTING THE EASTERN LEGACY SITES IN THE EXTENSION OF THE  
NATIONAL HISTORIC LEWIS AND CLARK TRAIL

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University of Nebraska at Lincoln, 2013

Advisor: Sara Yendra and Ian Shanklin

Worked with landscape architects and interdisciplinary study team conducting congressionally mandated Special Resource Study to determine the significance, desirability and feasibility of adding Eastern Sites and Segments, in several Mid-Atlantic, Midwest and Southern states, to the Lewis and Clark National Historic Trail as a formal Trail extension. Duties involve substantial field survey work and travel and included landscape evaluations, site and segment documentation and field verification of mapped data to support a National Historic Trail Extension feasibility determination based on National Trails System Act criteria. Knowledge of planning principles and cultural landscapes, strong computer, research, writing, and communication skills were vital. Worked with a mobile team environment in variable climatic, topographic, urban and isolated rural environments.

## ACKNOWLEDGMENTS

First, I would like to thank my Intern Advisor, Ian Shanklin, for being a passionate and inspirational advisor. He provided me with an amazing opportunity to be a part of something much greater than I could ever imagine, and also continuously supported me while I was working under him. He gave me the confidence and the opportunities to challenge myself, which I am so thankful for.

Second, I would like to thank Matt Colwin, one of the GIS Technicians at the Midwest Regional Office that I had the opportunity to work with throughout my internship experience. Matt was a great resource in helping me understand the magnitude of the project we were a part of and became a good friend.

Third, I would like to thank Luke, Joe and Jennifer, the three other interns that I had the opportunity to work with. We experienced a whirlwind of a summer together, and it has taken all of a long time to mentally process this amazing project that we were apart of.

Fourth, I would like to thank Sara Yendra and Dave Gosselin for their immense amount of patience with me. Sara and Dave bent over backwards to accommodate my inability to meet deadlines and I am forever grateful for this. I could not have processed my small role in the huge project that I was a part of without you.

Last, but certainly not least, I could not have done any of this without my sister. Her motivation, assistance, and accountability are the only reason that I am able to get my undergraduate degree. She continuously supported me throughout everything. Thank you for not giving up on me.

Without any one of these amazing people I got to work with, this thesis could not be possible. Thank you all.

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## INTRODUCTION

I participated in the National Parks Service Special Resource Preliminary Study to determine the feasibility of expanding the existing Lewis and Clark National Historic Trail. The existing trail goes from Saint Louis, MO where the Jefferson National Expansion Memorial, better known as “The Arch”, is where the trail begins along the Missouri River and continues all the way west to Cape Disappointment in Oregon, where their 2 year long journey came to an end. The purpose of the journey was to find a route to the West using only “navigable rivers”. Lewis and Clark travelled with a group now known as the “Corp of Discovery” which consisted of many able bodied men<sup>1</sup>.

The purpose of the study was to travel in the Eastern part of the country along the roads that were used by Lewis and Clark, separately over the course of the years 1800-1804, using any written record of these men during those years to trace their paths. The written records vary from letters, journals, ledgers from inns along the routes, receipts, and the written history of the time to piece together where Lewis and Clark were each day. A study team had done a majority of this preliminary research before we arrived to survey [See Appendix C]. The fieldwork that we performed was done in hopes of finding remnants of old roads that we might be able to match up to the trail routes that the GIS Technicians were creating. In addition, we were also trying to find existing trails, greenways, and bike paths that were near the “existing” trail routes. This information was significant because one of the goals of the study was to identify existing “recreational opportunities” near the routes, since that would add to the value for someone who wanted to visit the area.

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<sup>1</sup> (Monticello and the University of Virginia in Charlottesville)

The study was funded by a Congressional mandate to conduct a special resource study to assess the suitability and feasibility of adding the Eastern Legacy sites associated with the preparation and return phases of the Lewis and Clark Expedition [See Appendix A]. Interest in expanding the existing Lewis and Clark Trail is not a new effort. Efforts to create a complete east to west Lewis and Clark trail began in 1969, nine years before Congress even established the Lewis and Clark National Historic Trail from Wood River, Illinois to the mouth of the Columbia River in Oregon and Washington. There are many groups including the Lewis and Clark Trail Heritage Foundation, which have teamed up with Federal partners including the National Parks Service in order to preserve, promote and educate about the historic journey<sup>2</sup>.

The inception of this great journey began in Thomas Jefferson's home over the course of his years as a diplomat and leader<sup>3</sup>. He asked many different men to make this journey, including William Clark's more accomplished and famed older brother, George Williams Clark, who turned down being a part of this journey<sup>4</sup>. Meriwether proved himself to be a bright young man with a passion to learn and explore to Jefferson while he acted as a Secretary for Thomas Jefferson at his home in Mount Vernon<sup>5</sup>. During his time as a Secretary, Jefferson sent Lewis the most brilliant academic minds of the time to study Cartography, Paleontology, Botany, Astronomy, and Medicine. Jefferson did this to better prepare Lewis for the journey that he would be embarking on into the West, and also that Lewis would be able to make better observations on the journey. During this preparation, Lewis went back and forth from Jefferson's home in Monticello, West Virginia to the Nation's capitol and academic epicenter at the time, Philadelphia. We travelled to the remaining structures including Independence National

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<sup>2</sup> (Mallory)

<sup>3</sup> (Miller, 2002)

<sup>4</sup> (Indiana Bicentennial Commission)

<sup>5</sup> (Wilson, 2001)

Historical Park, where the nation's original capitol buildings still remain. Some of the stores structures that Lewis bought some supplies from in Philadelphia still remain<sup>6</sup>.

The geographic coordinates of the old structures were determined by overlaying topographic maps & city maps drawn from 1770-1810 over present-day maps using the ARCGIS software. GIS Technicians that are contracted by the National Parks Service worked on this for over 3 years before I became involved in this Resource Study. We utilized advanced GPS technology to record and locate the geographic coordinates posted on the ARC GIS maps. My job as an intern was to record those location's GPS points on site, and this information was later rendered and overlaid onto the researcher's maps to verify where they found the sites to be from their years of research. Essentially, as the on-site survey interns, we were physically verifying to see if the sites actually exist, and if they did, where the location would be on present-day maps.

The geographic locations that was the hardest to uncover was in the historic routes through Southern Indiana while we were trying to find evidence of the Historic Buffalo Trace. The Buffalo Trace was an ancient animal migration path that was created by bison from the Great Lakes to Tennessee. The bison were very large and traveled in packs, cutting massive paths in the ground that spanned up to 25-30 feet in certain places. The paths that the bison created were well known and travelled by the natives and the people who lived in the areas near them. The migration routes are unique because the bison would cross rivers and streams at shallow breaks, creating some of the oldest natural fords in that region<sup>7</sup>. The Buffalo Trace was very difficult to uncover. This was where landscape survey skills and topographic maps become helpful. When viewing the landscape against the horizon, we learned to train our eyes to identify "cuts" or "dips" in the land, which potentially could have been created by the bison. Since the

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<sup>6</sup> (Jackson, 1978)

<sup>7</sup>(Wilson G. R., 1919)



land that we were surveying has been heavily farmed and the landscape has significantly changed over the last 200 years, it was a huge stretch to immediately assume that any “dip” in the land was apart of the Buffalo Trace. Nonetheless, we still were required to carry the GIS equipment out into the cornfields and log a “line” in our Trimble as long as we could “bushwack” the cornstalks or the fear of coming across a snake would make us stop and turn back around to the gravel road.

Upon return from the three month excursion, we had compiled incredible amounts of data and all of the other interns were returning back to school, so I was left to organize and make sense of this information into a useable format for others to utilize as the study continues.

## MATERIALS AND METHODS

The research for my thesis was carried out in the form of a survey of all of the sites and roads that Lewis and Clark travelled. The study team was composed of 4 interns who travelled in pairs, with Ian Shanklin, the team leader, directing the study from the National Parks Service Midwest Regional Office located in downtown Omaha. The study routes were broken up into corridors by the team of researchers for us interns to use as maps to follow [See Appendix D-]. We then had to break the corridors up into 60 to 100 mile-long segments depending on where we would be staying each night. We only had one day to survey each segment as we drove to the next town where we would be spending the night. The two teams of interns would set out for three weeks at a time, and then there would be meeting points where we would stay in the same town and switch travel partners.

There were a few goals that the survey was hoping to achieve. The first was to scope out the existing infrastructure and resources already available along each of the corridors. This included existing recreational opportunities, trails, and greenways. This information would be used to help Congress determine a budget for expanding the National Historic Trail according to what resources already existed. The second goal was to assess the existing road conditions and paths in each segment, and also assess the potential infrastructure growth available along these roads. As interns we would assess the potential or feasibility of adding a bike trail to the shoulders on the roads or flat grassy setbacks next to the road. If there was already a bike path or a trail next to the road in place, we would determine whether or not the bike paths or lanes were actually safe for bikers to ride on.

In order to know how to use the equipment that we would be using, we spent 2 days training with the Trimble. A Trimble is a powerful handheld computer used for surveying and

mapping. It is an extremely accurate GPS device that stores lines, data points, and points of interest in multiple formats that can be processed into powerful mapping software, such as ARCGIS<sup>8</sup>. The purpose of using this piece of equipment was for us as interns to find the physical sites that were described in the Journals of Lewis and Clark and get data points using the Trimble as close to the site as possible. This information was used to create the most accurate map of the Eastern Legacy Route as possible.

The software that stored all of the maps that we used while on the road was on ARCGIS. For last-minute segments that were added or changed by our advisor, Ian, we would use KML files from Google Earth and overlay them into ARCGIS to have all of the information in one place. The lines on the maps followed the route were clearly marked, along with “significant places” and their approximate locations.

To portray the scenery or road conditions along our routes, we used a GPS-enabled Camera. When we took a photo with this camera, it was also necessary to log a data point into the Trimble for greater accuracy of location. In addition to this, we had a laptop where we would describe the condition of the road in Excel format. We used a standard format for where the notes would be placed in the Excel file, so that this information could later be converted into a data table on GIS when searching for attributes of the segments. When taking notes, we used the same descriptive words to describe the road conditions. [See Appendix B: Note Taking].

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<sup>8</sup> (Trimble)

## RESULTS

There was an immense amount of data that was collected during the survey. During the second part of my internship, at the National Parks Regional Office in Omaha, Nebraska, I processed and organized the data that we collected into a useable format. Since my funding and time working on the survey was limited, I had to organize all of the information that we collected over the summer into an approachable format so that any new interns could pick up on the project easily. This was crucial because this project started in 2010 and will continue for several more years, with a new intern working on the project every 6 months due to funding limitations. I created a filing system that organized the literature that we gathered during the survey at each of the sites. This includes brochures, books, and maps containing information about that specific site. The filing system was organized by state, and then by site in alphabetical order. I then created an inventory of all of the sites on the survey [see email sent to Dave and Sara with “Inventory of Sites” attachment]. The inventory included all of the information that was collected about each of the sites including:

- Name of Sight
- State
- Location
- Designation (if applicable) as a National Historic Landmark, National Register Site, Recognition by Bicentennial Commission, the presence of a Lewis and Clark Interpretive Sign, a Historic Marker etc
- Recreation Opportunity
- Natural Resource
- Museum

- Date of Registration as a National Landmark, or place of historic significance
- Relation to the Lewis and Clark journey – recruitment, preparation, etc
- Description of the significance of the site, along with description of the resources existing
- Sources

## DISCUSSION

Below is a timeline in which the Eastern Legacy Special Resource Study will continue to follow.

### **Phase I**

This survey was a small piece of a much larger project that was being performed. Prior to the Congressional Mandate in 2008 to perform a feasibility and significance study, the Eastern Legacy National Historic Landmark *Theme Study* Report was published in 2007. This report was conducted pursuant to Public Law 108-387, enacted on October 20, 2004, authorizing the Secretary of the Interior to update the 1958 Lewis and Clark National Historic Landmark (NHL) Theme Study to determine the historical significance of eastern sites related to the preparation and return phases of the Corps of Discovery Expedition<sup>9</sup>. This study is strictly a NHL Theme Study revision and serves as a preliminary component of the more comprehensive Eastern Legacy Special Resource Study that I participated in. The preliminary project set up began 2007-2009 after the NHL Theme Study was released.

### **Phase II**

Public Scoping which started in November 2010 and has continued until the present day. Public Scoping consists of public meetings across the Eastern Legacy states to gather interest and support for the study. The input about how to improve the study was collected and taken into account during the next phase. Interested parties can include small towns that want to be included along the historic trail to share the rich history of their town and its role in the historic journey.

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<sup>9</sup> (Salmon, 2007)

### **Phase III**

Our survey occurred at the same time that the planning team back at the Lewis and Clark Headquarters in Omaha were preparing the preliminary suitability and feasibility assessment. In order for the planning team to determine the feasibility of the historic routes as a whole, the data about each of the segments had to be collected. I had the opportunity to work on putting together this piece of legislation after my survey, when I worked at the Headquarters from August, upon my return from the survey, until January 2013 [See email to Dave and Sara on 8/13/13 entitled “Evaluation of National Significance”]. My advisor Ian informed me recently that the draft that I started has just been completed at the end of April 2013- a 300 page draft that is being sent to editors first to format the document, and then sent to scholars to edit and provide input to the document. Once this document has been polished, it is going to be sent to Congress to evaluate whether or not they want to fund the project.

### **Phase IV**

While the document is waiting to pass through Congress, the planning team is going to work on developing alternative trail routes. The information that we compiled about the conditions of each of the road segments will be used in this phase, when the planning and research team is trying to develop alternatives. The photos that we took and the descriptions for the road segments will help the planning team to assess the suitability and feasibility of extending the Trail to include Eastern Legacy sites. As part of this phase, the planning team will also assess the methods and means for protection and interpretation of these sites by the National Park Service with other federal, state, local, private or non-profit partners following direction provided in the 1968 National Trails System Act.

## **Phase V**

Once Congress gives this project the go-ahead, an Environmental Impact Statement (EIS) study is going to be performed according to each of the alternatives that the planning team creates. According to the Environmental Protection Agency, the EIS will provide a discussion of significant environmental impacts and reasonable alternatives, which would avoid or minimize adverse impacts or enhance the quality of the human environment<sup>10</sup>. That includes alternative routes and a no-trail alternative option.

## **Phase VI**

The final piece that the planning team has to do before this project gets funded is to combine the Suitability and Feasibility Assessment and the Environmental Impact Statement. If Congress approves and funds the Eastern Legacy extension, the project will then get passed off to another division in the National Parks Service that will devise a plan of management and the implementation of the trail.

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<sup>10</sup> (Environmental Assessments and Environmental Impact Statements)



## CONCLUSION

This study was performed to prove on a small-scale level whether historic roads and routes are feasible to include in the extension of the Lewis and Clark National Historic Trail. We were able to identify the historic routes and roads through satellite survey and record the exact location with advanced GPS tools. Through our field survey, we were also able to find existing trails, greenways and bike paths that were near the historic routes. The extensive data collection during our survey resulted in a more unified mapping system.

The data that we gathered about the existing conditions near the historic routes, the previous studies that have identified significant sites, and the public input regarding desired conditions for these sites, will all be considered, and the planning team will assess the suitability and feasibility of extending the Trail to include Eastern Legacy sites. This information will help Congress to make a more informed decision about where to place the extension. Further study to complete the Eastern Legacy Special Resource Study will follow the timeline that has been set by the planning team.

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## **Appendix A: Congressional Mandate**

Public Law 110-229, Sec. 343 (110th Congress) (became law on 5/8/2008)

### **LEWIS AND CLARK NATIONAL HISTORIC TRAIL EXTENSION.**

(a) Definitions. In this section:

(1) Eastern legacy sites. The term “Eastern Legacy sites” means the sites associated with the preparation or return phases of the Lewis and Clark expedition, commonly known as the “Eastern Legacy”, including sites in Virginia, the District of Columbia, Maryland, Delaware, Pennsylvania, West Virginia, Ohio, Kentucky, Tennessee, Indiana, Missouri, and Illinois. This includes the routes followed by Meriwether Lewis and William Clark, whether independently or together.

(2) Trail. The term “Trail” means the Lewis and Clark National Historic Trail designated by section 5(a)(6) of the National Trails System Act (16 U.S.C. 1244(a)(6)).

(b) Special Resource Study.

(1) In general. The Secretary shall complete a special resource study of the Eastern Legacy sites to determine:

(A) the suitability and feasibility of adding these sites to the Trail; and

(B) the methods and means for the protection and interpretation of these sites by the National Park Service, other Federal, State, or local government entities or private or non-profit organizations.

(2) Study requirements:

(A) In general. The Secretary shall conduct the study in accordance with section 5(b) of the National Trails System Act (16 U.S.C. 1244(b)).

(B) Impact on tourism. In conducting the study, the Secretary shall analyze the potential impact that the inclusion of the Eastern Legacy sites is likely to have on tourist visitation to the western portion of the trail.

(c) Report. Not later than 3 years after the date on which funds are made available to carry out this section, the Secretary shall submit to the Committee on Natural Resources of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report containing:

- (1) the results of the study; and
- (2) any recommendations of the Secretary.

## Appendix B: 6/21/2012 Notes on Road Conditions

In the following example, notes were taken from 9:30 am to 7:00 pm on this particular day. Large breaks between the time of note taking reveal the times that we would stop and do research at a location with internet. From 9:30 am to 3:00pm, notice how frequent we were logging data points to signify change in landscape and road condition. This is a note example from the beginning of the study. As the months of surveying out on the road continued, we formed different habits for note taking and created a shorthand language which all of the interns used to describe the road conditions. Because there was no set process for taking notes about the road, we as interns had to develop an efficient process and method for describing the roads. At the end of the day, we would connect to a secure network through the Department of the Interior, and send the data that we collected from the Trimble, the GPS Camera and a write-up of our notes for the day back to the Midwest Regional Office. When our computers had software updates, which occurred every single week, we had to drive to a National Park Office, which could take us off our route up to 6 hours to get to the nearest National Park. We could then access a secure network where GIS Technicians from the Midwest Regional Office could manually add the updates to our computers.

<b>Time</b>	<b>Note for</b>	<b>Note</b>
9:30	HWY 250	Two lane, brush cut back, large nice residential plots, alternates between areas of forest and pasture.
9:41	Three Notched Road	Gravel, two car, heavily, forested, little signage, residential, rustic feeling, old houses 1950's
9:45	Union Mills Road	Two lane residential
9:56	Landscape Change	Prison along HWY 250
9:59	Landscape Change	industry along HWY 250. much truck traffic
10:03	Historical Marker	Louisia County Historical Marker
10:05	Interchange	Laid out interchange at HWY 250 and J> Madison HWY old commercial
10:06	Historical Marker	Flora Molton historical marker

10:09	HWY 631	South off of 250, heavily forested, colonial wannabe signs, two lane, asphalt, brush cut back
10:11	Landscape Change	Farmland/pasture land
10:40	Grace Johnson Road	Pasture country road, old barns throughout, considered 3 Chopt, alternates between forested and pasture, some houses have large plots
10:50	Historical Home	
11:00	Whitesell Road	Old asphalt, no stripe, heavily forested, residential
11:04	Three Chopt	Old asphalt, heavily forested, canopy, backwoods residential, alternates between forested and pasture.
11:18	Three Chopt	Gravel, 1.5 lane, power lines
11:21	Three Chopt	2 lane asphalt, prairie residential
11:33	Pace Rd	2 ln, old asphalt, forested, nice medium income housing and bad low income housing
11:36	Pace Rd	Turn to gravel
11:54	Three Chopt	2 lane marked, old asphalt, canopy, light residential, smaller plots, alternates between forested and pasture.
1:26	Oilville	Enter Oilville intersection of HWY 250+HWY 271, roadside small commerce, new asphalt
1:30	Historical Marker	Reuben Ford Historical Marker
1:49	Centerville Rd	4 lane, new asphalt, rural suburb, mainstream commercial (gas station, restaurants, grocery)
1:51	Landscape Change	Highway overpass
1:56	Road Change	6 lane, rural developed
1:59	Three Notches Lane	Heavy forested, 1 lane, gravel primitive
2:02	Landscape Change	Heavy commercial, hotel, nice lands
2:04	Lauderdale Drive	4 lane asphalt, median, landscaped
2:06	Three Chopt Road	4 lane, no median, medium income residential suburb
2:10	Short Pump Park	Ballfield, pavilion, recreational activities, historic home, commercial across street
2:29	Three Chopt Road	two lane, big townhouses, suburbs, alternating commercial stretches
2:35	Landscape Change	Older suburbs 1960's
2:36	Road Change	Three Chopt back to 4 lane
2:39	Landscape Change	Commercial district/school
2:42	Road Change	2 lane old suburb, mature landscape
2:44	Road Change	4 lane older commerce
2:46	Road Change	2 lane old residential (1940), forested nice landscape
2:55	Landscape Change	University of Richmond on south side
2:57	North 147	Two lane, old historic homes
2:58	Historical Marker	Henry Clay Marker
2:59	Road Change	HWY 147 4 lane, historic homes line road, small mansions
3:03	Road Change	2 lane, one way, small shops, parallel parking, awnings, nice sidewalks, 1940's buildings
3:05	Landscape Change	Row Housing

6:08	Motts Reservoir	Nice natural looking man made pond, hiking trails, fishing, port, boats for rent, trolling motors, snack store, decks.
6:27	Motts Reservoir	Entrance to Motts is gravel, pretty rough, going into valley, lots of wood surrounding, 2 lane
6:42	Old Plank Road	Suburb, 2 lane, asphalt, heavy forested in some areas
7:00	NPS trail head	Trail head in Chancellorsville National Battlefield

## **Appendix C**

Eastern Legacy Comprehensive Timeline

Prepared by a team of researchers prior to my participation in the study. Included in attachment on Email sent to Dave and Sara on August 13, 2013.