Historical Land Survey Records Pilot Project

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IGIC Cadastral, Boundaries, PLSS Workgroup Co-Chair
What is a Historical Land Survey Record

• It is a Surveyors’ field notes and plats that describe the boundaries of Township/Range and Sections of the Public Land Survey System (PLSS)

• Indiana was originally part of the Northwest Territory

• The Government contracted to have Surveyors survey the Territory and Grant Lands so land could be sold
Land Survey Records = Surveying Field Notes and Plats

- Surveying was the first step towards distributing the land.

- Deputy surveyors took their instruments into the wilderness and, under miserable conditions, compiled their field notes: the complete description of the border lines of each section and the monuments marking the corners of the rectangular grid (PLSS). These notes often included cursory evaluations of the land itself, its agricultural potential, access to water or timber, types of trees, stream meanders and so on.

- From these notes, the surveyors compiled plats - or maps - graphic representations of the field notes for every township, with each section delineated, and roads, trails, rivers and streams marked.

Source: BLM
Example of Field Book (Notes) - Photo
Reference

Map Showing
• Base Line
• Principal Meridian and
• Clarks’ Grant

Indiana Records
Described by:
• Township # Dir
• Range # Dir
or
• Grant and Lot #

Source:
BLM

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Section is 1 mile by 1 mile

Township is 6 miles by 6 miles or 480 Chains by 480 Chains

Section 14 shows both normal division of the section into aliquot parts and the fractional division into government lots.

Indiana PM02 T2S R3W Sec 14
Survey Land Records

• 1786 - 1789 – Clarks’ Grant surveys

• 1804 – 1883 - Land Survey Record Time frames
  – Original Field Notes
  – (pilot project)

• 1805 - Second Principal Meridian (PM02) Adopted
  – Majority of Indiana
  – Governing surveys - Illinois and Indiana.
  – Initial Point - Latitude 38-28-14, Longitude 86-27-21

• 1814 - First Principal Meridian (PM01) Adopted
  – Small portion of Eastern Indiana
  – Governing surveys - Ohio and Indiana
  – Initial Point - Latitude 40-59-22, Longitude 84-48-11
Why are GIS Professionals Interested in Survey Records?

• GIS professionals map and analyze data. All the data relates to the Land System
• The IGIC Cadastral, Boundaries, PLSS Workgroup mission is to work with groups and compile the best set of data for Indiana’s Land System and make it available as a state-wide GIS layer(s) on IndianaMap
• Working with Surveyors is imperative to establish a good GIS for the Cadastral, Boundaries and PLSS layers
• We are all working with the same data but in different capacities for different reasons at different scales
• Makes sense to work together
• Goal: Link Field Notes to T/R layer in IndianaMap
What Makes the Historical Land Records Important

• Basis for Indiana’s Land Records System
• Every land transaction today relates back to the Original Land Survey Records.
• Valuable to Surveying, Forestry, Hydrology, Genealogy, History, GIS, and others because of the wealth of historical information
• One data source, many different functions
• Enables us to retrace our States’ history
Where Did the Idea Come from to Scan Historical Records? The Surveyors

- IGIC formed the Geodetic Workgroup in 2003 to work with the Surveying community as it related to GIS
- The group consisted of members from IGIC, ISPLS, County Surveyors, the Geodetic Advisor, and public and private companies
- In 2006 the workgroup proposed a strategy for collecting data relevant to the States Land Survey System
- August 2007 – Workgroup was reorganized and split into two groups:
  - Cadastral, Boundaries, PLSS Workgroup (pilot project)
  - Geodetic Control Workgroup
IGIC and ISPLS

• Recognized the importance of historical land records information
• Lacked funds and personnel to achieve goals that were identified in 2006
• A SHRAB grant opportunity arose in 2014
• IGIC worked with ISPLS, IPLSF and State Archives
• IGIC applied for the grant
Grant

• IGIC was awarded a grant to scan Historical Land Survey Records in July 29, 2014

• SHRAB (State Historical Restoration Advisory Board) approved a grant for $10,000
  – $5,000 funds
  – $5,000 in-kind services

• In-kind services provided by:
  – IGIC; State Archives; IGS; Clayton Hogston, Surveyor; Indiana GIO; ISPLS and IN Professional Land Surveyors Foundation
SHRAB Grant Deliverables

• Land Survey Records Scanned:
  – 532 Original Land Survey Records
    • Field notes of Township Range surveys
      – Town Line Books Vol. 1 & 2
      – Clarks’ Grant
    – Miscellaneous Land Records
      • Original and Transcribed records
Why Scan Records When They Were Available on Microfilm?

- The public access microfilm copies of the land records were worn and sometimes difficult to read due to over use.
- Original records were handwritten using ink and sometimes pencil. We needed better resolution to be able to read the documents.
- New State Archive book scanner was acquired.
- Resulted in better quality PDF and Tiff copies.
Four Types of Land Survey Records

1. Original Field Survey Notes
   - Originally written by the Surveyor in field
   - Available at the State Archives (30%)
   - Pilot Project

2. Federal Notes
   - Transcribed by the GLO
   - Available at the National Archives
   - Clayton Hogston created digital dataset

3. State Notes
   - Transcribed by the GLO
   - Available at the State Archives

4. County Notes
   - Transcribed by the State Auditor
   - Available at the County Surveyor’s Office

Source: Clayton Hogston, Indiana Surveyor

White = Original Notes on microfilm

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Are All Four Datasets the Same?

Four Dataset Comparison for One Township, Tippecanoe County

• Clayton Hogston, Surveyor, compared all four datasets T21N R4W
• Four authors
• Four time periods
• Results showed their were errors between the different datasets
Clayton Hogston Analyzed Notes
T21N R4W - Tippecanoe County
(Compared all four datasets)

Example of a copy error:

10. Hickory 12 in. 3.33
W. Oak 15 41.2.25

a. Hickory 12 in. diam. bears North 353° dist. 3
a W. Oak 15 3 5 N41° 225° 5

a. Hickory 12 in. diam. bears North 353° dist. 3
a W. Oak 15 3 5 N41° 225° 5

Source: Clayton Hogston
Clayton Hogston Analyzed Notes

• Results of study:
  – T21N-R4W contains 28 data conflicts

• Total number of errors by set:
  – Original    3
  – Federal    9
  – State      16
  – County   21

Source: Clayton Hogston
Process Steps for Scanning Historic Land Records

1. Develop File Naming Convention
2. Compile Reference Material
3. Paper Inventory of Files
4. Document Preparation
5. Scan
6. Name Files
7. Name Folders
8. Combine CSV Files
9. Create Access Database
10. Quality Control/Quality Assurance
11. File Naming Evolution
12. Review Time

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1. Initial File Naming Convention

Important:
- Identify source of records
- Contain federal name equivalent

2014 IGIC/ISPLS & IPLSF approved naming convention at the beginning of the project

Series are labeled A, B, C, D, E
M = Microfilm
Merged = Combined all individual pages per TR into one document
F = Federal transcribed
O = Original field notes
S = State Transcribed
C = County Transcribed (none shown above)
1. File Naming Convention August 2015

O_PM02T01SR08W_1804_No1_NoSk_Pa_Ac1960001_P024.tif

• Document Origin = O, S, F, or C
• Principal Meridian = PM01 or PM02
• Township, Number, & Direction = T01S
• Range, Number, & Direction = R08W
• Date/ Version (if needed) = 1804_No1
• Document Type = Note, Sketch, Plat, Town Line
• Source Media = Paper, Microfilm, Photostatic, Blue Print, Negative
• Accession # = State Archives # = Ac1960001
• Pages (total # of images in the scan) = P024
1. File Naming Convention

• As the Project processes evolved the Naming Convention had to be revised. Below are examples of the revised August 2015 Naming Convention:

O_PM02T36NR03W_Note_Pa_Ac1960001_P021 (for pdf and tiff)
O_PM02T37NR06E_NoPl_Pa_Ac1960001-04.png (for png)
O_PM02T01SR08W_1804_No1_NoSk_Pa_Ac1960001_P024.tif
2. Compile References

Gathered maps and references that would help with the project.

IGS IndianaMap: Township Range graphic Shows Baseline, Principal Meridian (PM 02 light blue & PM01 dark blue)

Districts subdivided by US Surveyor. Lists surveyor name and date surveyed.

Indian and Treaty Boundaries overlain on map showing Eight Volumes of Plats
2. Compile References

Treaty Parcels
Boundaries, Indiana

US Government gained title to Parcels from Native Inhabitants prior to surveying

Source:
Map and text from Hoosier Surveyor.
Map from Bureau of American Ethnology

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2. Compile Documents

Boxes 1-10 of Original Land Survey Field Notes
532 Field Survey Books
2. Compile Documents

Example of box label on box of microfilm

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3. Paper Inventory

Recorded relevant information needed for scanning. Listed info on an archive safe paper used for wrapping field note booklet.

INFO:
PM T R
Surveyor
Date of Survey
Compiled
4. Document Preparation

Documents were flattened and pressed (if needed) using Document Archival Processes.
5. Scan

Documents 8 1/2 x 11 or less were scanned at 600 dots per inch (dpi). Oversized documents were scanned at 400 dpi because the scanner won't allow scanning at a higher dpi.

The paper scanning:
Started in December 2014
Completed May 31, 2015.
Example of Field Book Notes - Photo

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February 18th 1814

North between Sections 30 9 34
20 30
Brook 12 0 W a bed of stone boulders
40 30 at half Mile post from which a Brook 11 15 2 0 22
20 0 30 18 8 14
41 50 Small Brook 8

000ft post corner to outcrop
27 28 33 34 from which
a white oak 30 in. diam. on line
set 1/4 sec. from which a hickory 15 in.
diam. bears S. 87° E. 5'6" ths and a hick-
ory 12 in. diam. bears S. 75° W. 27" ths
set fort corner to sections 22, 23, 26, 27.
Bourn 1 S. R. No. 4. 8 from which a red oak
15 in. diam. bears S. 53° E. 40" ths and a
red oak 6 in. diam. bears S. 41° W. 19" ths
this mile over level land hickory, oak
timber green briars and grape vines
for under growth

1806
Field Notes – Zoomed in on Scan

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6. Name Files

Documents are filed by Accession Numbers so the main folders were organized by the type of document and the Accession Number.

- O North IN Boundary Kendrick Notes M Reel3470 Box28
- O Original Field Survey Notes Box1 10 Pa Ac1960001 Isle53
- O Original Field Survey Notes Henderson 1830 LMapCab21 5
- O Original Field Survey Notes Microfilm by County Ac1961004
- S Clark Grant P310
- S IN1836 Instructions to Surveyors
- S INState Line 1827 Kendrick Map Neg LMapCab21 3
- S INState Line 1827 Kendrick Map Pa LMapCab27 1
- S Photos State Archives Land Records Proj
- S Plat Maps Photostatic S PM02T38N R1 4W and R1 15E Ps Ac1985051
- S Plat Maps Pa S PM02T38N LMapCab21 D4 AccessionRegisterNone-copy
- S Park Town Line Vol 1 2 Isle53
6. **Name Files:** Book scanner automatically named files during scanning. All single files were named with the appropriate extension.
6. Name Files

Below are examples of the single page image thumbnails (pngs) and a multi-page tif that had to be renamed.

New Name =
6. Name Files

• All 29,518 individual files and associated folders needed to be renamed manually.
6. Name Files

New file name of digital copy of Field Book

Cover of Field Book

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6. Name Files

Example of file names of digital copies of field books

O_PM02T01NR02W_Stone_NoSk_Pa_Ac1960001_P012.tif
O_PM02T01_2_3NR01W__T01NR01_2_3_4_5_6E_1806_Notes_Pa_Ac1960001_P067.tif
O_PM02T01NR01W_R06E_Baseline_T01N_03NR01W_Notes_pa_1960001_P065.tif
O_PM02T01_2_3NR01W__T01NR01_2_3_4_5_6E_1806_Notes_Pa_Ac1960001_P067.tif
O_PM02T01NR04E_1806_Notes_Pa_Ac1960001_P090.tif
O_PM02T01NR01W_R06E_Baseline_T01N_03NR01W_Notes_pa_1960001_P065.tif
O_PM02T01NR04W_1804_Notes_Pa_Ac1960001_P044.tif
O_PM02T03NR04W_T02NR04W_T01NR04W_1804_NoSK_Pa_Ac1960001_P016.tif
O_PM02T01_2_3NR01W__T01NR01_2_3_4_5_6E_1806_Notes_Pa_Ac1960001_P067.tif
7. Name Folders: New File Structure

O_Original Field Survey Notes_Box1_10_Pa_Ac1960001_Isle53

PM02 T01S R01W 000026

PDF

Thumbnails

O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001_P012.pdf

O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-01.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-02.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-03.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-04.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-05.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-06.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-07.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-08.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-09.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-10.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-11.png
O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001-12.png

TIFF

O_PM02T01SR01W_1804_NoSk_Pa_Ac1960001_P012.tif

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8. Combined CSV Files Pertaining to Original Field Notes to Create Index File

- Csv files were created when the document was scanned
- Csv file contained information, typed in manually, from the paper inventory sheet
- There were 532 Field Books and 532 separate csv files
- All 532 csv files were combined and imported into an Access Database
9. Created Access databases

- Original paper Field Notes (boxes 1-10)
- Clarks’ Grant
  - Also referred to as "Illinois Regiment Land Grant"
9. Create Access Database

• Field Notes were reviewed and additional information was extracted from the field books to populate the Access table.

• Additional TR's were often identified during the in depth document review as well as other important information.

• This information was used to populate the database and files name.

• Often the new information required that the document be renamed again.
9. Access Database
Sort by T R

<table>
<thead>
<tr>
<th>Rev_TownshipRange_LW_split_from_F</th>
</tr>
</thead>
<tbody>
<tr>
<td>T01N R01E Baseline</td>
</tr>
<tr>
<td>T01N R01W</td>
</tr>
<tr>
<td>T01N R01W</td>
</tr>
<tr>
<td>T01N R01W 1805</td>
</tr>
<tr>
<td>T01N R01W 1807</td>
</tr>
<tr>
<td>T01N R01W Baseline</td>
</tr>
<tr>
<td>T01N R01W Baseline through T01N R12W</td>
</tr>
<tr>
<td>T01N R01W Meridian</td>
</tr>
</tbody>
</table>
9. Access Database - Entries/Attributes

<table>
<thead>
<tr>
<th>Scanning Seq. No.</th>
<th>Original Field Book Scan</th>
</tr>
</thead>
<tbody>
<tr>
<td>158a</td>
<td>T01N R05W 1804</td>
</tr>
<tr>
<td>158b</td>
<td>T02N R05W 1804</td>
</tr>
<tr>
<td>158c</td>
<td>T03N R05W 1804</td>
</tr>
<tr>
<td>158d</td>
<td>T04N R05W 1804</td>
</tr>
<tr>
<td>158e</td>
<td>T05N R05W 1804</td>
</tr>
</tbody>
</table>

Scanning Seq. No. with letter to show multiple database entries of one Field Book. Allows for sorting by TR in multiple Field Books.

Township Range Date

- 158a: T01N R05W 1804
- 158b: T02N R05W 1804
- 158c: T03N R05W 1804
- 158d: T04N R05W 1804
- 158e: T05N R05W 1804

Same File Names

- O_PM02T01NR05W_T02_03_04_05NR05W_1804_NoSk_Pa_Ac1960001_P106.tif
- O_PM02T01NR05W_T02_03_04_05NR05W_1804_NoSk_Pa_Ac1960001_P106.tif
- O_PM02T01NR05W_T02_03_04_05NR05W_1804_NoSk_Pa_Ac1960001_P106.tif
- O_PM02T01NR05W_T02_03_04_05NR05W_1804_NoSk_Pa_Ac1960001_P106.tif
- O_PM02T01NR05W_T02_03_04_05NR05W_1804_NoSk_Pa_Ac1960001_P106.tif

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Rock Solid GIS, IGIC Cadastral Boundaries, PLSS Workgroup
### 9. Access Database Fields

(fields 1-30 not shown)

<table>
<thead>
<tr>
<th>No.</th>
<th>Field Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>Accession_No</td>
<td>Text</td>
</tr>
<tr>
<td>32</td>
<td>Surveyed_by</td>
<td>Text</td>
</tr>
<tr>
<td>33</td>
<td>Survey_EndDate</td>
<td>Text</td>
</tr>
<tr>
<td>34</td>
<td>Survey_BegDate</td>
<td>Text</td>
</tr>
<tr>
<td>35</td>
<td>SeqNoA_DupRecord</td>
<td>Text</td>
</tr>
<tr>
<td></td>
<td>dwAlphabet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Use to sort by TR</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Survey_txt_EndDate</td>
<td>Text</td>
</tr>
<tr>
<td>37</td>
<td>Survey_txt_BegDate</td>
<td>Text</td>
</tr>
<tr>
<td>38</td>
<td>Need to rescan</td>
<td>Text</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Need Renaming</td>
<td>Text</td>
</tr>
<tr>
<td></td>
<td>Certified</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>Text</td>
</tr>
<tr>
<td>41</td>
<td>Compared</td>
<td>Text</td>
</tr>
<tr>
<td>42</td>
<td>County</td>
<td>Text</td>
</tr>
<tr>
<td>43</td>
<td>Approved</td>
<td>Text</td>
</tr>
</tbody>
</table>
## 9. Access Database Fields

<table>
<thead>
<tr>
<th>Transcribed</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded</td>
<td>Text</td>
</tr>
<tr>
<td>Copy</td>
<td>Text</td>
</tr>
<tr>
<td>Indian_Reservation</td>
<td>Text</td>
</tr>
<tr>
<td>Grants</td>
<td>Text</td>
</tr>
<tr>
<td>Residue</td>
<td>Text</td>
</tr>
<tr>
<td>State Line</td>
<td>Text</td>
</tr>
<tr>
<td>Plat_Notated</td>
<td>Text</td>
</tr>
<tr>
<td>VincennesTrace</td>
<td>Text</td>
</tr>
<tr>
<td>Lot_Nos</td>
<td>Text</td>
</tr>
<tr>
<td>SurveyedForClaimant</td>
<td>Text</td>
</tr>
<tr>
<td>In_Right_Of_Assignee1</td>
<td>Text</td>
</tr>
<tr>
<td>Acres</td>
<td>Text</td>
</tr>
<tr>
<td>LotSurveydate</td>
<td>Text</td>
</tr>
<tr>
<td>Comments5</td>
<td>Text</td>
</tr>
<tr>
<td>ImagePageRangeNo</td>
<td>Text</td>
</tr>
</tbody>
</table>
Significant terms below were exacted from the Original Field Notes Versions. There may be multiple versions of a township/range document depending on the terms below. Info in database columns or comments.

**Significant Terms in Field Notes**

- compared
- compared read first
- compared read last
- copied
- copy
- copy remeasurement
- copy see original
- corrections
- defective
- defective notes
- duplicate copy
- map
- meanders
- note index field sheet
- original

original field notes
original plat made
recorded
recorded, resurvey
Resurveyed
Subdivisions (of T R)
Town Lines & Range Lines
Town Lines & Range Lines & Subdivisions
survey of the morass
A true copy of the original field notes
transcribed
true copy transcribed
variation of compass

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10. Quality Control/Quality Assurance

• In-depth review of the Field Notes revealed that the original cursory inventory sometimes needed to be revised due to additional information.

• Creating a database was necessary to know which TR’s had multiple entries.

• Database field’s were created to help in the QA/QC process.
11. File Naming Evolution

• New information gained from in-depth reviews often resulted in having to rename files several times.
• Finally it was determined the Access database needed to be populated first and then the files could be renamed.
• There were multiple Field Book (scans) that would reference a T R and it was difficult to differentiate them.
• The file names expanded so that the TR documents could be differentiated.
12. Review time

- Review time per document (doesn't include scanning or document preparation)
- The average time to process a document is about 2 to 2.5 hours
- Some may take less, 20 to 30 minutes, but some may require significantly more time.
- The more the township/ranges in the document the longer it takes to process.
- The quality of the hand writing also impacts the amount of time spent during the process.
- Future time estimates just for renaming and databases entries should be calculated at no fewer than 2.5 hours.
13. Citation for use of Grant materials

Historic Land Survey Records
Pilot Project
Grant Agreement EDS#A187-5-2377

Acknowledgement for Project:

"Made possible by a grant from the Indiana State Historic Records Advisory Board (SHRAB) and the National Historical Publications and Records Commission."
Summary

• All scanning in the Grant is 100% complete
• Project is only about 20% complete
  – Approximately 80% of files need to be named
  – Approximately 80% of the database entries need completed
  – Additional databases (or database entries needed for the other Accessions)
• Need addition funding and staff to complete
• There are still files that need to be scanned that were not part of the pilot project
  – Plats
  – Most of the State’s Transcribed Field Note Books
  – Many other documents relevant to the Land Records
• The databases created will make it much easier to find the information and the file names will help differentiate between different Field Books that relate to the same TR.

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Deliverables: Draft Map

Field Notes scanned - dark blue

(not all Townships, Grant Lots, and Indian Grant lands are shown)

2/19/2016 Lorraine Wright, Rock Solid GIS
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Deliverables

Town Line Books Vol 1 & 2

Clarks’ Grant

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IndianaMAP Pilot Demonstration: Scanned Land Records Attached to Township Range GIS Layer

1. Select Township/Range in the dropdown box on IndianaMap.

2. For Marion County: Type in “16N4E” or “15N3E” in the Township/Range Box on the IndianaMap demo link below.

3. For Tippecanoe County: Type in “21N4W” in the Township/Range Box on the IndianaMap demo link below.

http://demo.maps.indiana.edu/index.html?URLLayers=Reference.PLSS.Townships
INMAP Pilot Demo
Marion County (example of Land Records)

http://demo.maps.indiana.edu/index.html?URLLayers=Reference_PLSS_Townships

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IGIC Cadastral, Boundaries, PLSS Workgroup
Indiana Map Pilot Demo

Land Survey Records Layer – Tippecanoe Co 21N4W
Credit for the project goes to:

Indiana SHRAB and NHPRC
Indiana Archives and Records Administration
Indiana State Archives - Staff and Interns
Indiana Geographic Information Council
  - Phil Worrall & Lorraine Wright
  - Cadastral, Boundaries, PLSS Workgroup
Indiana Geographic Information Officer - Jim Sparks
Indiana Surveyor - Clayton Hogston
Indiana Society of Professional Land Surveyors
Indiana Professional Land Surveyors Foundation
Indiana Geological Survey

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