Putting the Ghosts into the Machine
Digitizing Field Notebooks at the UMMZ

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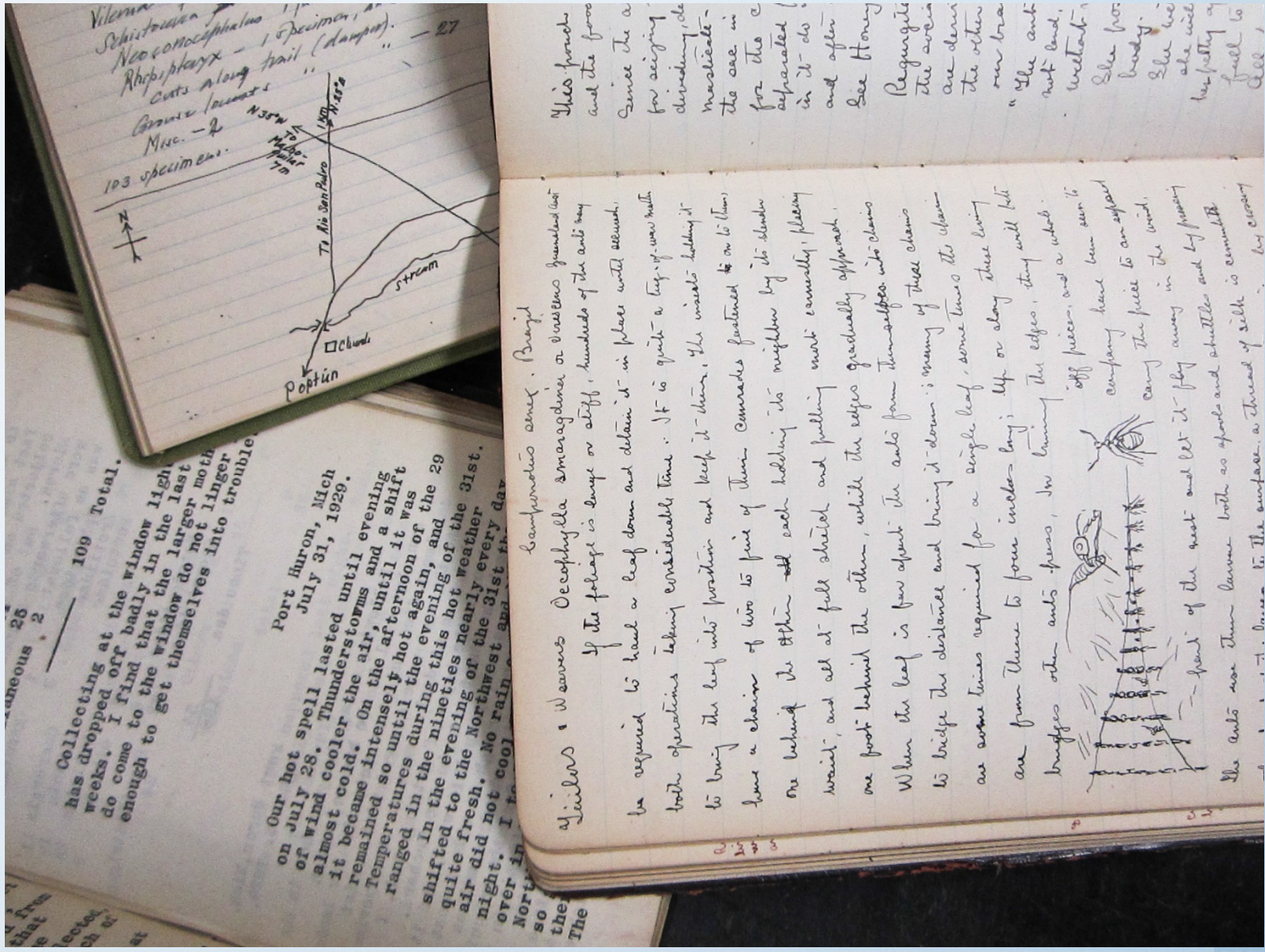
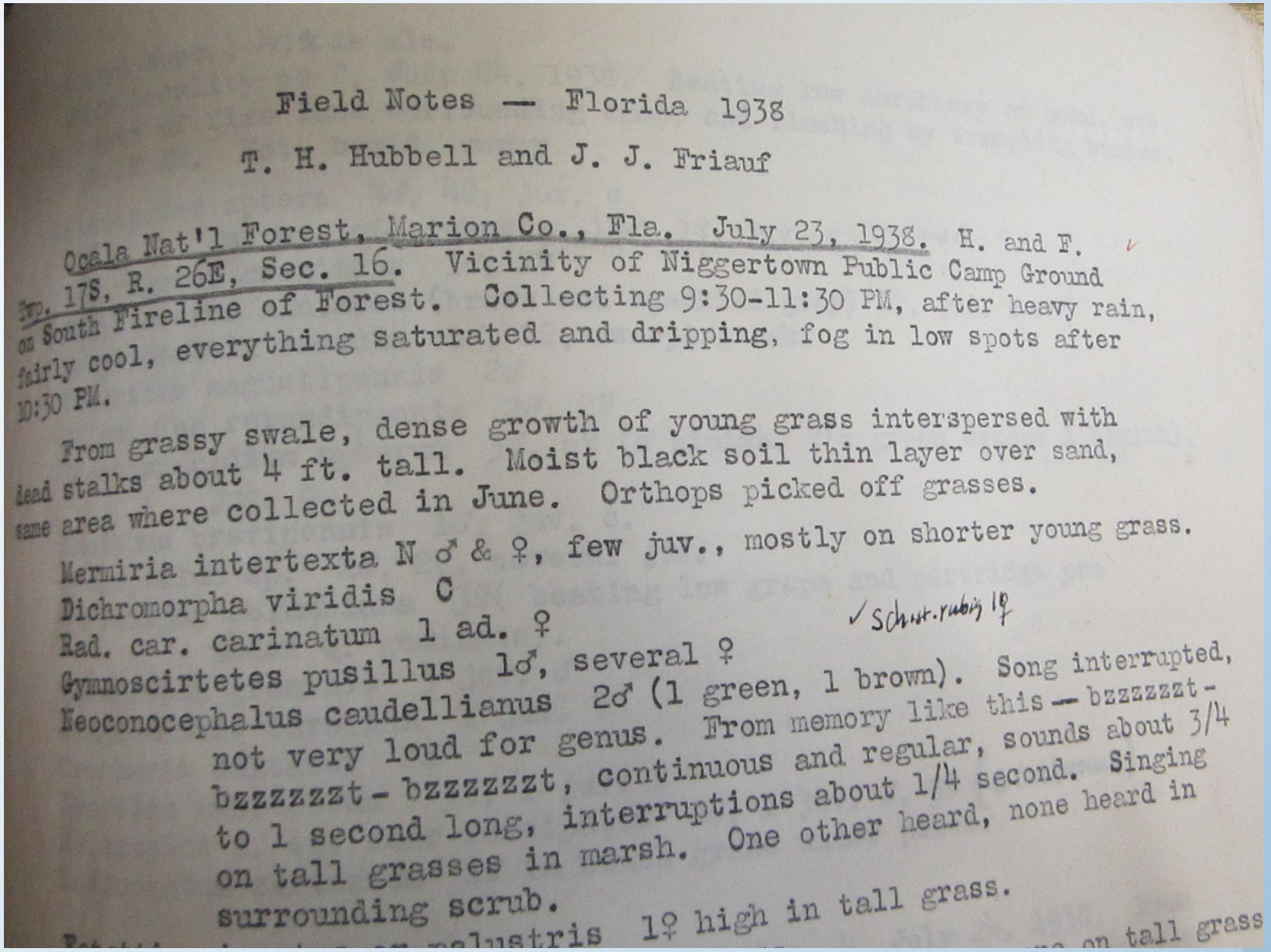
Why Digitize Field Notebooks?

- Digital Archiving and Preservation
- Online Sharing
- Data Corroboration
- Augmentation of label data
- Synergy across disciplines

Field Notes represent primary source documentation provided by people that were trained in the sciences and observation of nature — and the importance of details.



They represent a source of information that is often not included on the label of a pinned insect.



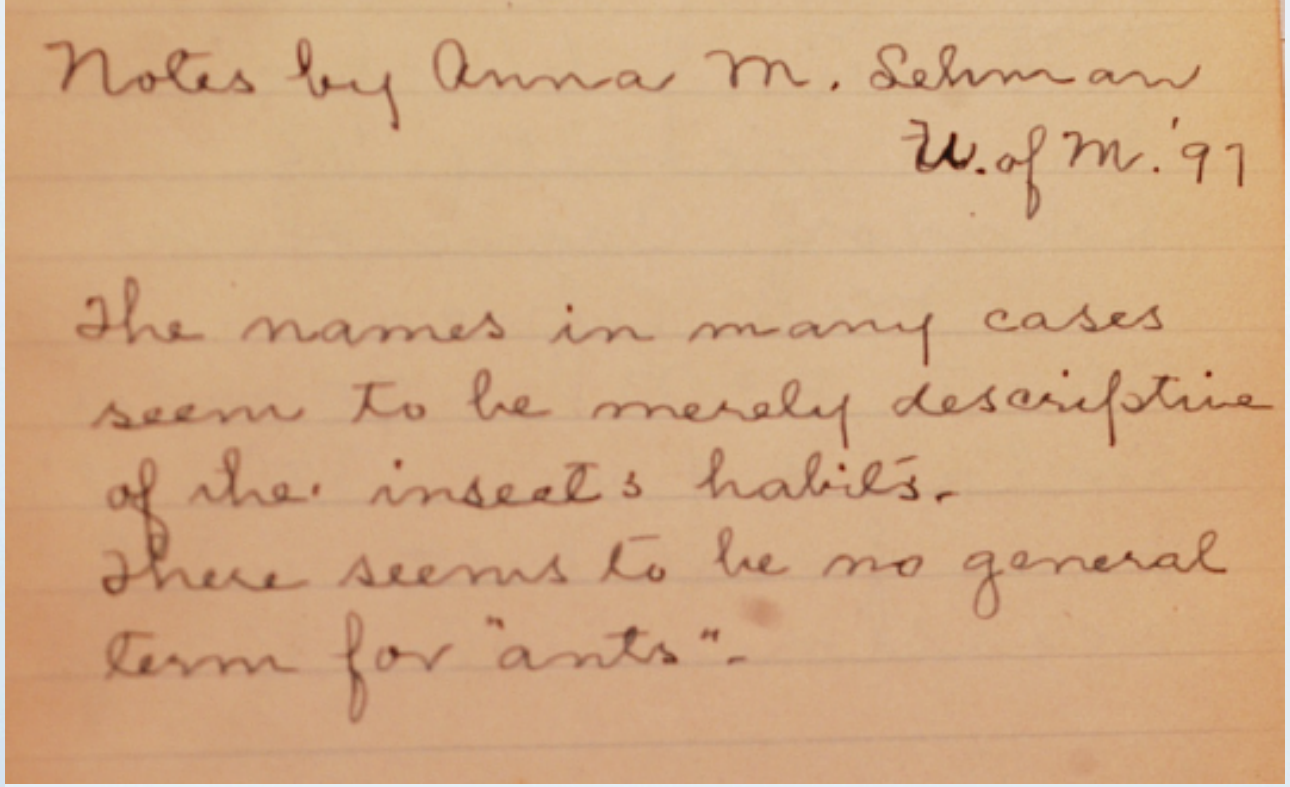
Field Notes — Florida 1938

T. H. Hubbell and J. J. Friauf

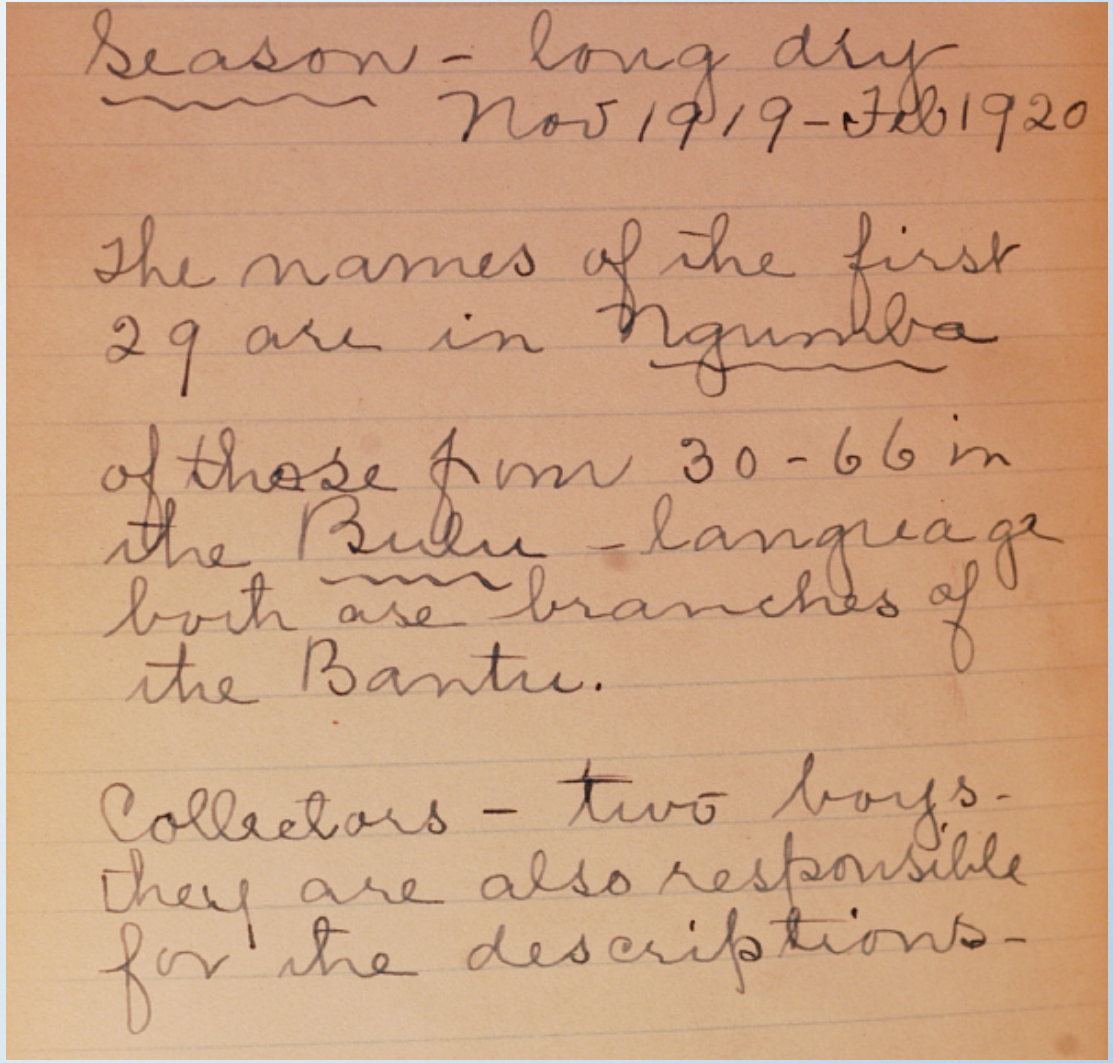
Ocala Nat'l Forest, Marion Co., Fla. July 23, 1938. H. and F. Grp. 17S, R. 26E, Sec. 16. Vicinity of Niggertown Public Camp Ground on South Fireline of Forest. Collecting 9:30-11:30 PM, after heavy rain, fairly cool, everything saturated and dripping, fog in low spots after 10:30 PM.

From grassy swale, dense growth of young grass interspersed with dead stalks about 4 ft. tall. Moist black soil thin layer over sand, same area where collected in June. Orthops picked off grasses.

Mermiria intertexta N ♂ & ♀, few juv., mostly on shorter young grass.
Dichromorpha viridis C
Rad. car. carinatum 1 ad. ♀
Gymnoscirtetes pusillus 1♂, several ♀
Neoconocephalus caudellianus 2♂ (1 green, 1 brown). Song interrupted, not very loud for genus. From memory like this — bzzzzzzt - bzzzzzzt - bzzzzzzt, continuous and regular, sounds about 3/4 to 1 second long, interruptions about 1/4 second. Singing on tall grasses in marsh. One other heard, none heard in surrounding scrub.
✓ Schist. rubiginosus 1♀
[illegible] palustris 1♀ high in tall grass.
[illegible] on tall grass


Notes by Anna M. Lehman
U. of M. '97

The names in many cases seem to be merely descriptive of the insect's habits.
There seems to be no general term for "ants".


Season - long dry
Nov 1919 - Feb 1920

The names of the first 29 are in Nguniba

of those from 30-66 in the Bulu - language both are branches of the Bantu.

Collectors - two boys. They are also responsible for the descriptions -

Field notes are also sources of collateral information that may be useful in other areas of study.

The UMMZ Insect Division contains hundreds of field notebooks dating as far back as 1908. We often get requests to search for a particular set of notes by a collector or locality.

In 2013, I initiated an effort to start digitizing the field notes for several purposes:

- To better preserve the integrity of the old notebooks
- To be able to share the information more readily
- To correlate data in the notes with the specimens in the collection
- To avoid the “institutional memory” black hole.

The field notebooks are predominantly 4-3/8 x 7" perfect bound books with leather or cloth bindings. A smaller number are pocket notebooks or ring-bound letter-sized sheets, and variations in between. The condition, binding, and age of the notebook often determined how it was digitized.

The “ghosts” wrote these notes to:

- Keep track of events during a collecting trip
- Maintain a catalog of specimens and observations about them.
- Maintain a diary of one’s work
- Provide collecting information for the recipient (in the case of people collecting for others) who may have originated the project.
- Maintain better records for museum collections.
- Be responsible researchers.

The “ghosts”

- Did not usually think about archival qualities
- Were usually writing these notes for themselves
- Developed ad-hoc methods for data recording and notation
- Were smart enough to deposit their notebooks in the Museum

Some “ghost” facts

- We are lucky that these documents were deposited within the confines of the UMMZ. A few people, such as Theodore H. Hubbell, (1897-1989) knew that field notes were a valuable asset and it is no surprise that a great majority of the field notebooks in the UMMZ Insect Division are due to his interests in the Orthoptera.
- The ant field notes of Frederick M. Gaige are missing, and were most likely lost after Gaige retired as director in 1946. This was a tragedy that we are still lamenting.
- The earliest Insect field notes were written in 1903, and recent notes are being deposited.

Results Thus Far

- Since 2013, we have digitized over 400 discrete sets of field notes.
- Each file is saved as an Adobe PDF file.
- Files may be a few pages to hundreds.
- Documents are searchable in a Filemaker 11 database.
- PDFs are stored on a central server.
- Original documents are conserved within our means to do so.
- We can document the usefulness of the notes to researchers.

Basic Workflow 1

Select document and scanning setup

1. Loose pages -- feed into Fujitsu Scan Snap
2. Bound volume – place on flatbed scanner
3. File Cards – Fujitsu Scan Snap
4. Photographs – flatbed scanner
5. Bound volumes that cannot be laid out flat – photograph w/DSLR

No. 2 was the most typical situation throughout the process

Basic Workflow 2

1. Place document on scanner and scan within Adobe Acrobat Pro
2. After scanning, crop and orient pages as necessary
3. Save file and add UMMZI Number and © Regents of the University of Michigan on page 1.
4. Enter data from scan into spreadsheet for tracking progress
5. Upload pdf file to server and update database

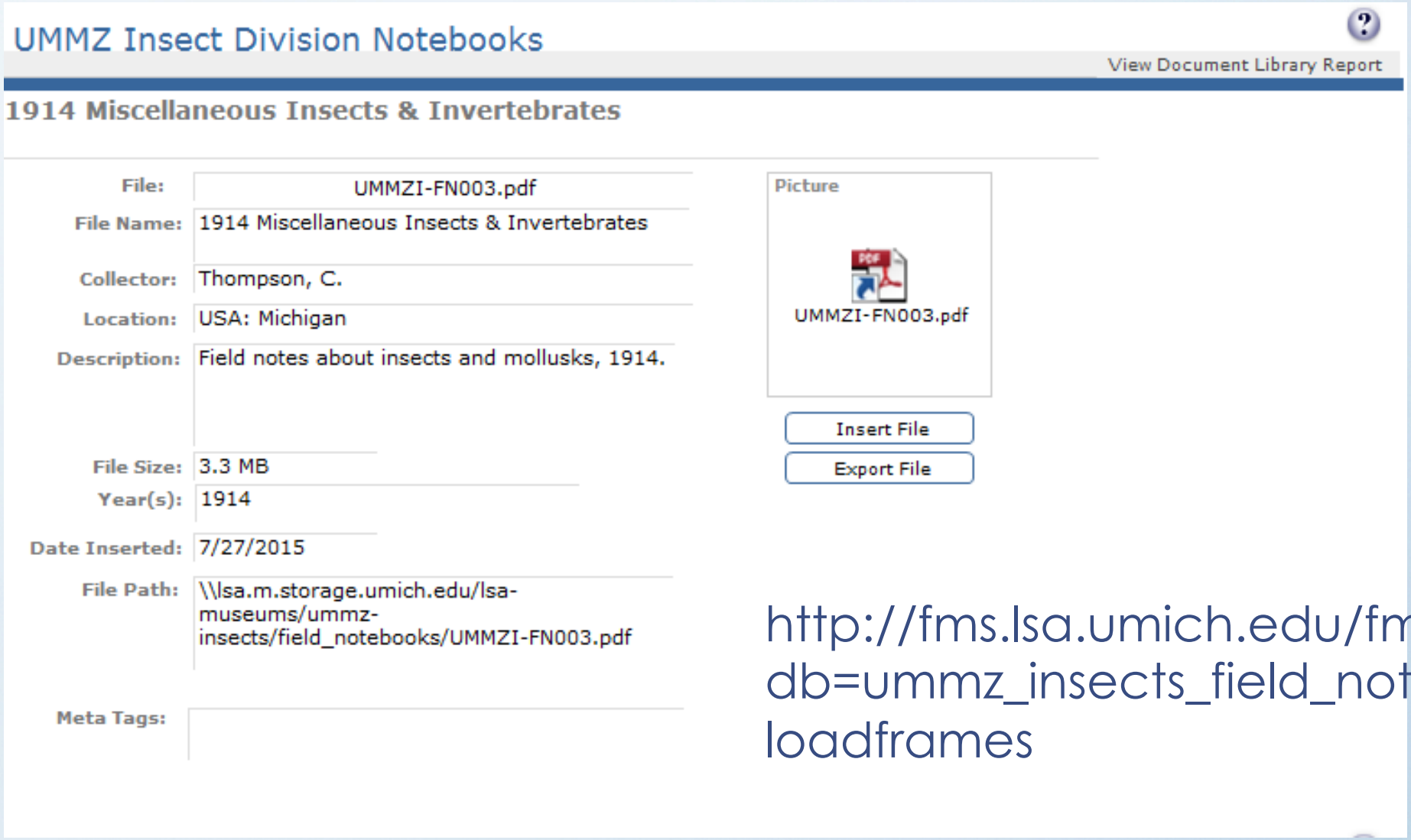
Basic Workflow 3

1. Photographing documents was done early on, but it was a more time-consuming process. After photographing the pages, files had to be copied to the computer, edited, and then brought into Acrobat to produce the PDF.
2. Document processors and the Fujitsu Snap Scan produce PDF files automatically and then save them wherever you need to work on them, or can be sent as email attachments.

Basic Workflow 4

1. Once the PDFs are accessible, one can go back to the file and review it to add metadata, and make any corrections in the database.

Database entry



http://fms.lsa.umich.edu/fmi/iwp/cgi?-db=ummz_insects_field_notebooks&-loadframes

Users and Primary Source Objects

Audience

- Entomologists
- Historians
- Ecologists
- Climate Change Researchers
- Museums Community
- Digital Collaborators

What to Share

- Field Notes
- Correspondence
- Research Notes
- Maps
- Photographs
- Other Primary Source Materials

Working Environment

Field Notebooks

- Variations in size
- Different amounts of information
- Physical dimensions and condition
- Legibility of text
- Pertinence of notes

Digitization Methods

- Photography
- Flat-bed scanning
- Specialty scanners
- Document processors

Reality

Limited Funds?

- Internal funding
- Temporary and Student Help
- Small-scale project
- Track progress
- Use Cloud Storage

Keep It Simple

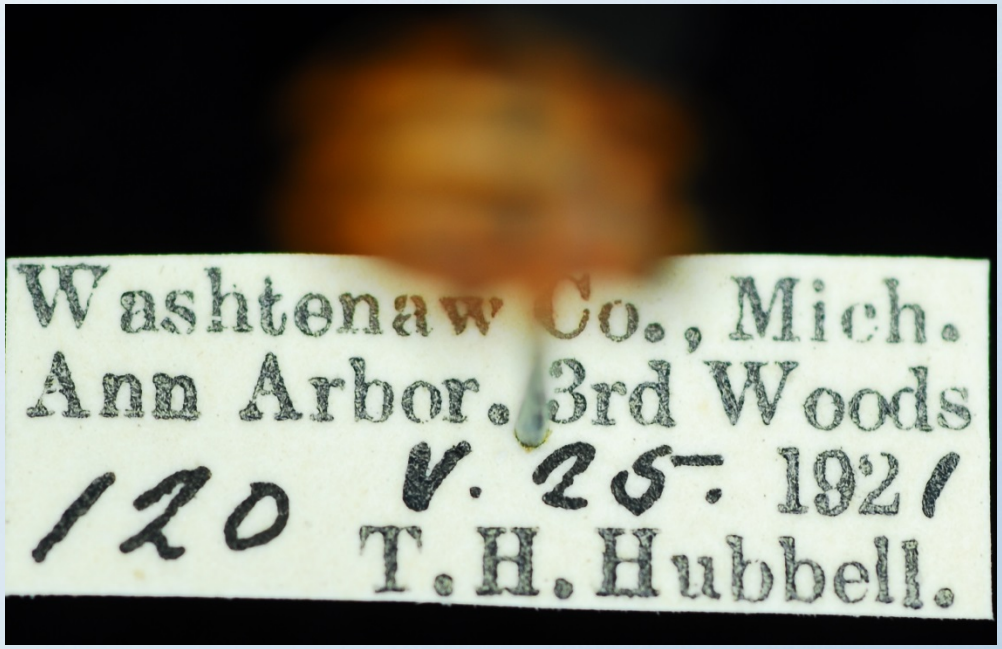
- Do what works best for you
- PDF Files
- Scan First, add metadata later
- Oldest documents first
- Set Realistic Goals

Examples of Results

- No. 1 – Internal use of notebooks to enhance data and provide ideas for future projects.
- No. 2 -- Rediscovering a "lost" species of *Melanoplus* (Acrididae)

- Suppose that you are trying to determine factors for the decline of various species of Coccinellidae across the United States. It would be useful to know something about earlier collections.

- This is the 13-spotted ladybird beetle, *Hippodamia tredecimpunctata* (Linn.)



- Collected in Washtenaw Co., Ann Arbor, MI in "3rd woods" on May 25, 1921, by T.H. Hubbell. The 120 refers to the field note entry.

By checking our Field Notes Catalog, we can come up with the original notebook entry.

File Edit View Insert Format Records Scripts Window Help

ummz_insects_fieldnotes (LSA-FMS01)

20 Records | 142 / 724 Found (Unsorted) | Show All | New Record | Delete Record | Find | Sort

Layout: full view | View As: | Preview

Insect Division Field Notebooks

Notebook No. 028 **Year** 1920-1928

Collectors Hubbell, T. H.

Notebook Title Field Catalogue, Misc. Insects, Washtenaw Co., MICH. 1920-1928

Region USA:Michigan: Ann Arbor

Taxa Miscellaneous Insects (exclusive of Orthoptera)

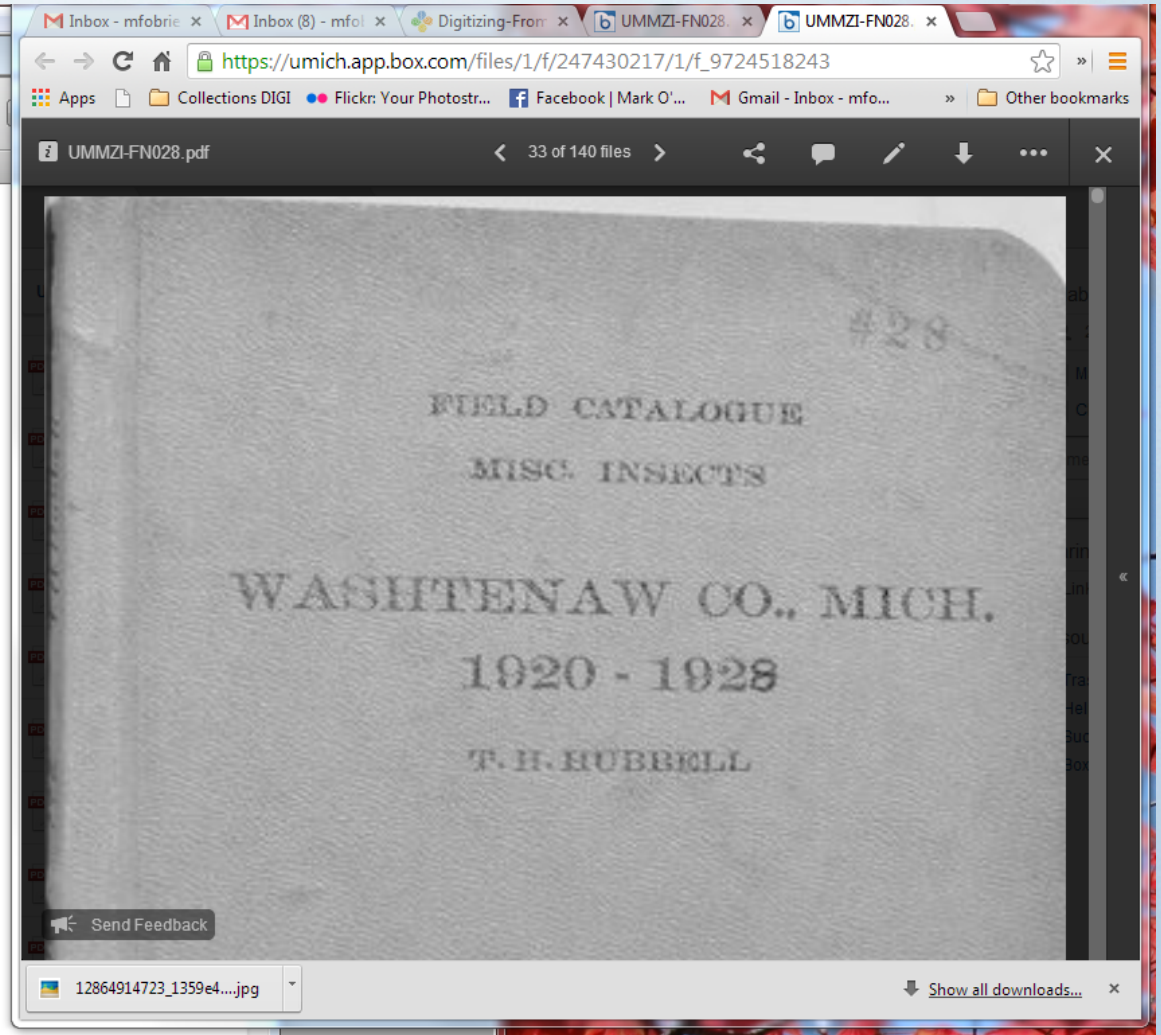
PDF UMMZI-FN28.pdf **where stored**

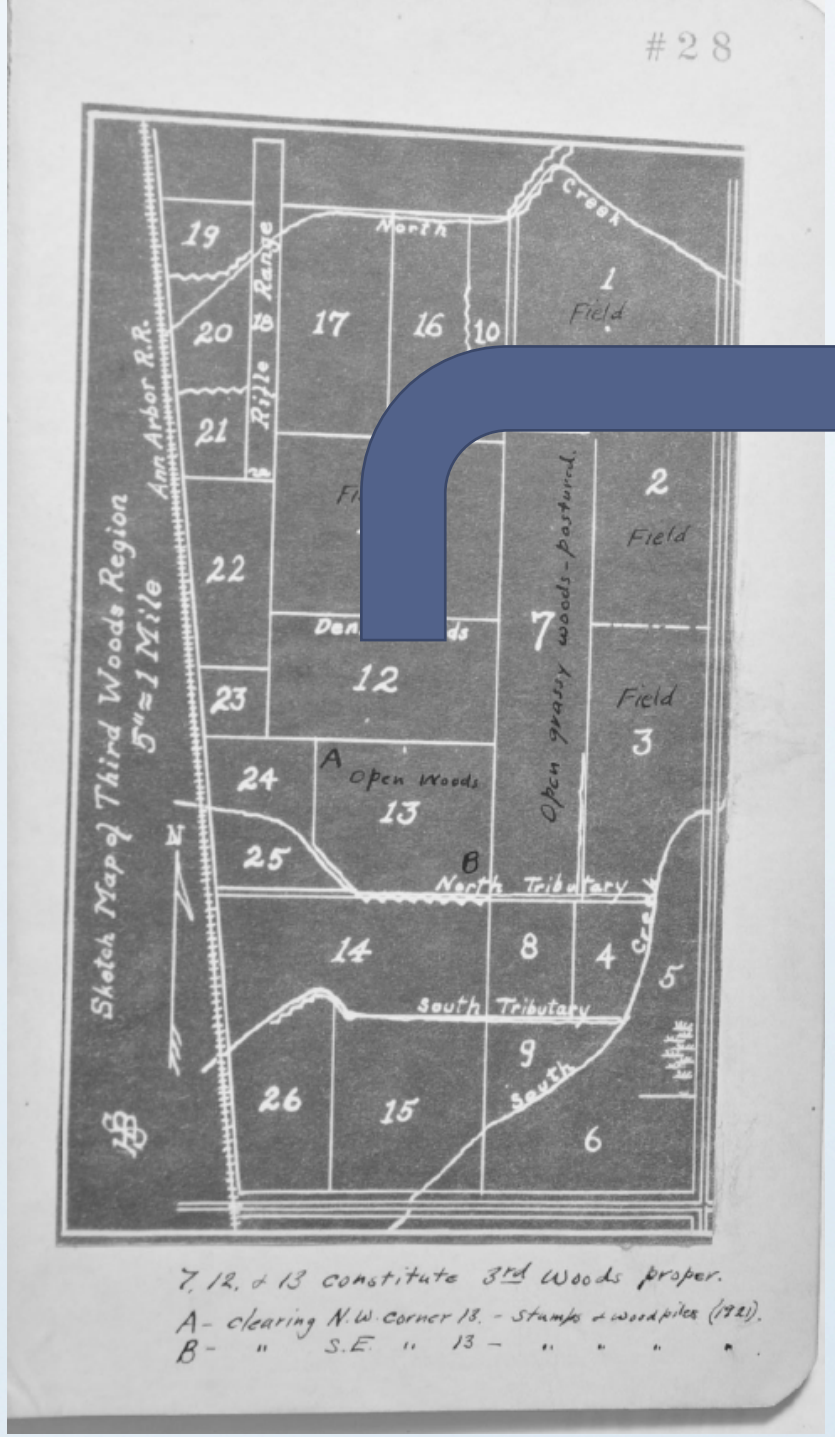
Dates 06/27/1920 - 05/10/1928

Comments Lots of entries around Third woods. "See sketch of numbered areas in Third Woods inside back cover. Third Woods was E of Steere's Swamp south of Stone School, about a mile, W side of Stone School Road. [Probably N 42.21842 W 83.72310, 02/12/2014, MFO]

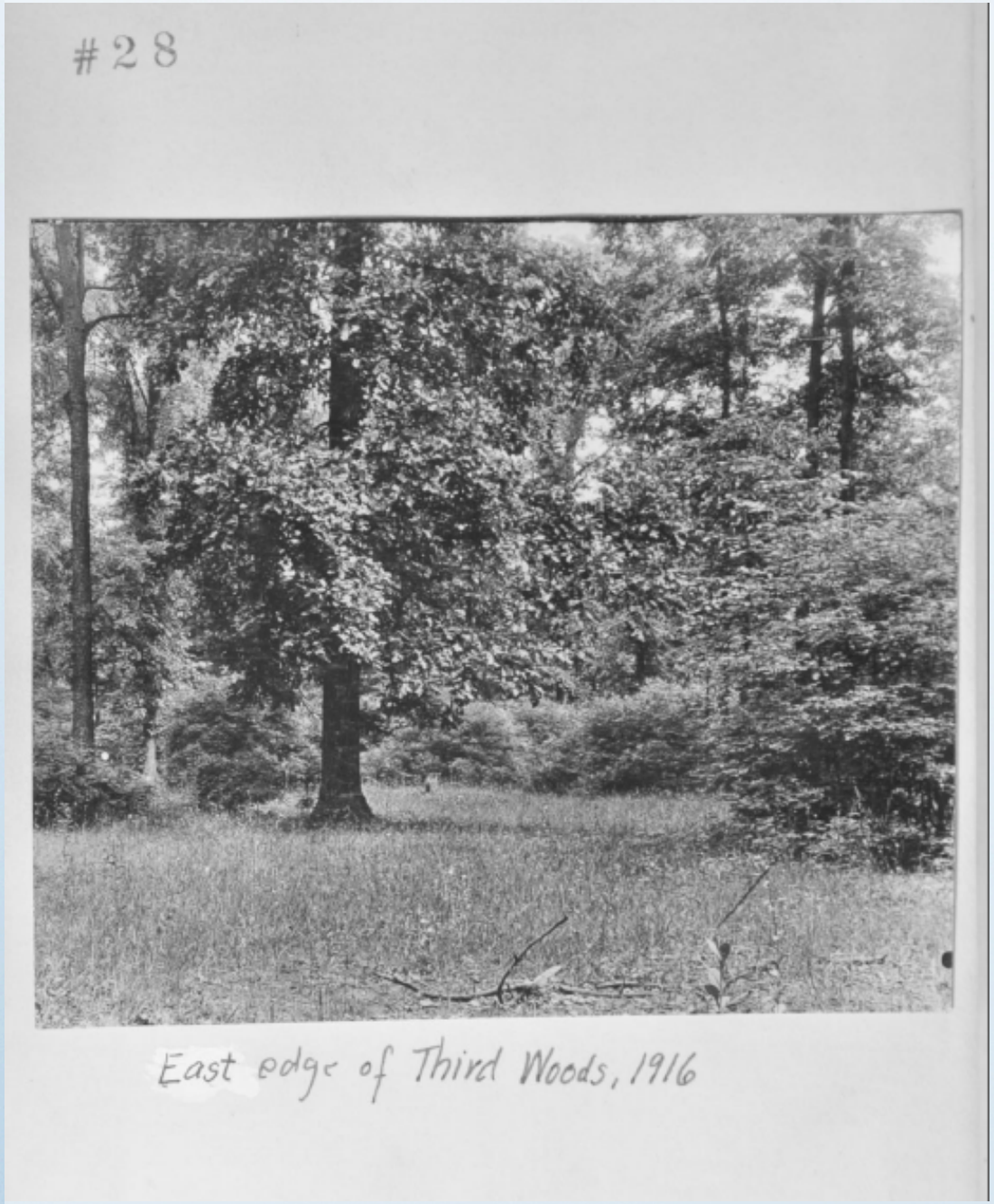
Metadata **Steere's Swamp, third woods, Hubbell, Ann Arbor, Washtenaw Co., Stone School, Pittsfield Twp.**

Click to view PDF





120. Misc. Insects.
Third Woods. V. 26. 1921.
Swept from ground herbage & low bushes in (12).



From T.H. Hubbell's entry – "See sketch of numbered areas in Third Woods inside back cover. Third Woods was E of Steere's Swamp south of Stone School, about a mile, W side of Stone School Road."

We can find the site easily with various online mapping apps.

W Ellsworth Rd
E Ellsworth Rd
Ellsworth Park
Cayman Chemical
Swift Drain
Platt Rd
Lillie Pa
S State St
Ann Arbor Municipal Airport
Ann Arbor Airport Community Garden
CARPENTER
PITTSFIELD CHARTER TOWNSHIP
Pittsfield Preserve

ACME Mapper 2.1 g+1 Print Email Link to this page

N 42.21833 W 83.72400 Mark

4.6 mi NE of Saline MI, 4.6 mi SxSE of Ann Arbor MI,
5.7 mi NW of Stony Creek MI, 5.9 mi WxSW of Ypsilanti MI

Find

About Here Markers Links Options ACME Labs

Thoughts from this example

- If all of the specimens collected at Third Woods are cataloged – insects, plants, vertebrates – we would have a snapshot of Third Woods nearly 100 years ago. (Bringing the scope of ATBI into play in modern efforts)
- Taxon-specific sampling (such as Coccinellidae) over time has a broader impact when one has more associated data.
- The use of appropriate metadata tags is helpful for any searching
- Using GIS tools really makes our jobs easier

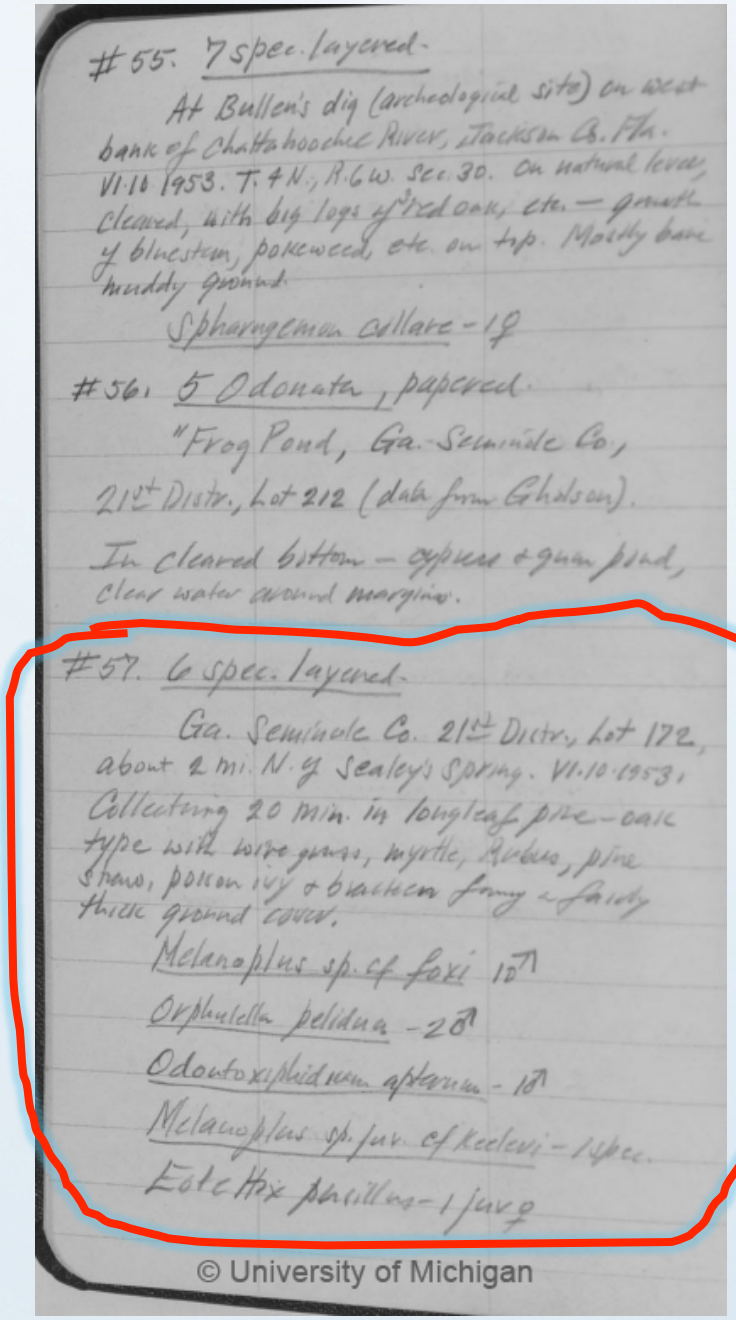
Example 2 – Finding “lost” species

Derek Woller & JoVonn Hill are studying short-winged species of *Melanoplus* grasshoppers in the SE US, and one of the species, *Melanoplus foxi* has not been recorded since the 1950s.

With the information from the Hubbell field notes, they were able to relocate the collecting sites :

Mark! JoVonn Hill and I are gearing up to publish a paper on our rediscovery of *Melanoplus foxi* (not collected since the fifties) and we found it thanks to your sharing of the Cohn and Hubbell field notebooks. If it's okay, we want to include a plate (attached) with photo-shopped (sharpened and brightened/contrasted) copies of the relevant *foxi* passages from 2 of Hubbell's notebooks. How would you like these cited and yourself acknowledged?

Derek A. Woller



#55. 7 spec. layered-

At Bullen's dig (archeological site) on west bank of Chattahoochee River, Jackson Co. Fla. VI.10.1953. T. 4 N., R. 6 W. Sec. 30. On natural levee, cleared, with big logs of red oak, etc. — growth of bluestem, pokeweed, etc. on top. Mostly bare muddy ground.

Spharagemon collare - 1♂

#56. 5 Odonata, papered.

"Frog Pond, Ga. Seminole Co., 21st Distr., Lot 212 (data from Gholson).

In cleared bottom — cypress & gum pond, clear water around margins.

#57. 6 spec. layered-

Ga. Seminole Co. 21st Distr., Lot 172, about 2 mi. N. of Sealey's Spring. VI.10.1953. Collecting 20 min. in longleaf pine-oak type with wire grass, myrtle, Rubus, pine saw, poison ivy & bracken fern - fairly thick ground cover.

Melanoplus sp. cf foxi 1♂

Orphulella pelidna - 2♂

Odontoxiphidium apterum - 1♂

Melanoplus sp. juv. cf keeleri - 1 spec.

Eotettix parvilus - 1 juv ♀

Field Notes for Flint - Chatahoochee Project (Jim Woodruff Dam) for Florida State Museum

File:	UMMZI-FN128.pdf
File Name:	Field Notes for Flint - Chatahoochee Project (Jim Woodruff Dam) for Florida State Museum
Collector:	Hubbell, T.H.
Location:	USA: Florida, Georgia
Description:	Field notes mostly on Orthoptera from Hubbell's trip to Florida and Georgia to study the Flint - Chatahoochee Project in 1953.
File Size:	18.86 MB
Year(s):	1953
Date Inserted:	7/30/2015
File Path:	\\lsa.m.storage.umich.edu/lsa-museums/ummz-insects/field_notebooks/UMMZI-FN128.pdf
Meta Tags:	Melanoplus foxi,

Picture

UMMZI-FN128.pdf

Insert File

Export File

UMMZ Field Notes

- Bird Division – currently scanning
- Mammal Division – to be scanned
- Mollusk Division – only catalogs scanned
- Fish Division – information transcribed and online
- Herpetology – Some notebooks scanned and online
- Insect Division 95% scanned – and available online soon.

Future Work Ahead

Current Database

- Move to Filemaker 14 and make it web-accessible
- Finish remaining notebooks
- Populate the meta tags

Moving to Specify - 2016

- Link field notes to collection

Thanks to:

- Ammerman Fund at UMMZ
- LSA-IT Intern Program
- Cheryl Meneghini (2013-2014)
- Katelyn Dreeze (2015)
- John Torgerson, LSA-IT
- UM School of Information Studies
- iDigBio for moral support

Contact: mfobrien@umich.edu