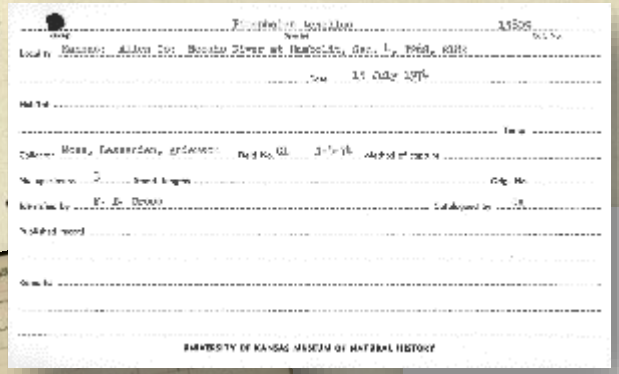
Ichthyology collection digitization



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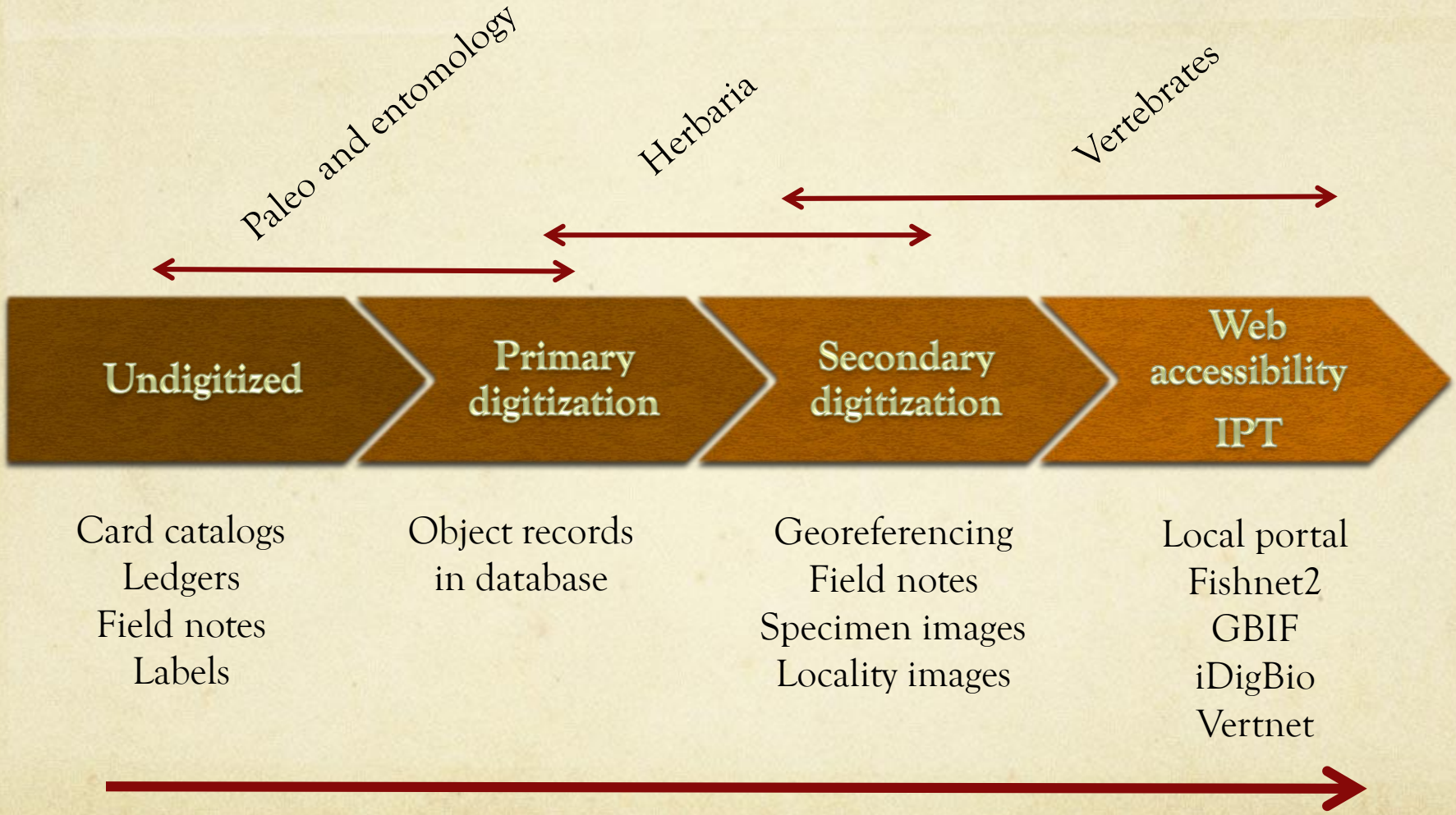
Vertebrate/Ichthyology advantages in digitization

- Collections relatively small
- Good historical practices of use of ledgers, card catalogs, field notes
- Early adopters of digitization
- Ichthyology – use of lots rather than individual specimens

Digitization progression



Digitization steps

- Primary digitization – primary data to create specimen records
  - Ledger
  - Card catalog
  - Labels
  - Field notes
- Secondary digitization – augmentation of specimen data with additional information from digitized content
  - Field notes
  - Specimen images (35mm slides and digital), X-Rays
  - Locality images
  - Other media – video, audio
  - PDFs of reference works

Primary digitization

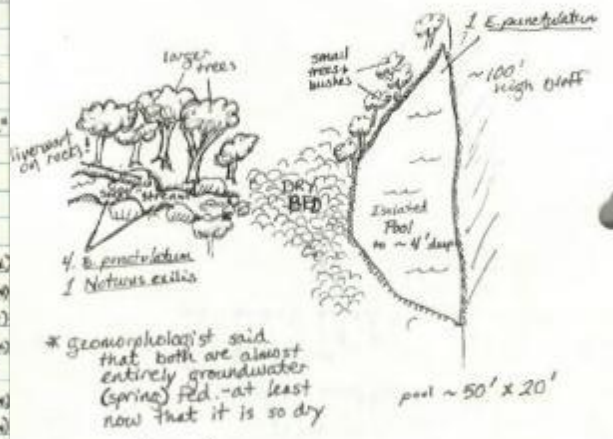
MJG1-94-15 Date: 1 Oct 1994
Collectors: M.J. Ghedotti, K.A. Shaw, C.A. Annett, M.J. Grose, C. Fielitz, J.P. Wolfe, L.N. Beverstock, J. Hunt
USA: Arkansas: Newton Co., Thomas Cr. at the Thomas Cr. bed & breakfast Sec. 32 T14N R22W
Drainage: White R. Time: 2:30 - 4:00 PM
Temp: ?
Turbidity: low Substrate: pool - gravel, sand, detritus; stream - gravel & lg. rock slabs
Cover: little in pool, rock slabs & brush in small "stream"
Depth: sampled to approx. 3.5'
Gear: 8' & 15' flat seines + electroshocker

Species:

Campostoma oligolepis	139 (10 FOR)
Luxilus pilsbryi	115 (20 FOR)
Etheostoma caeruleum ?	29 (9 FOR)
Etheostoma punctulatum *	5 (ALL IMM)
Notropis exilis *	1 —
Pharinus erythrogaster	772 (20 FOR)
Cottus carolinae	27 (9 FOR)
Semotilus atromaculatus	20 (5 FOR)
Noturus elegans	1 (DEAD)

other:
many rocks covered in liverworts!
horsehair worms
crayfish 73
frogs

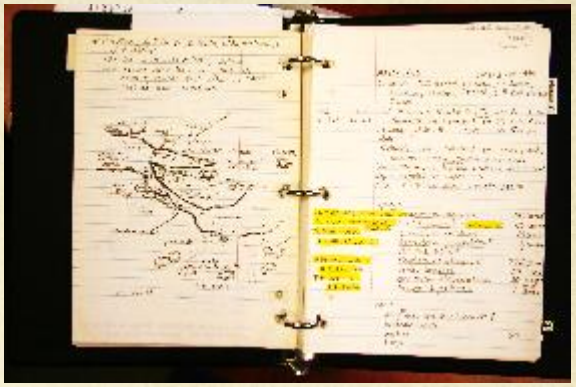
* All species #'s on the previous page are for specimens caught in the pool & the stream.
1 Noturus exilis
4 Etheostoma punctulatum
from small "stream"



* geomorphologist said that both are almost entirely groundwater (spring) fed - at least now that it is so dry
* beautiful area!
* the drive into the site was pretty nerve wracking (not an easily accessible site.) drove past "the guy that lives in a shack." and "the family that lives in a bus under the collapsed hillside."
CULTURAL EXPERIENCE

Bound vs. unbound

- Unbound
  - Scanner – preferably document feeder
  - Camera – light box, copy stand
  - Color



- Bound
  - More problematic
  - Scan or photograph – not ideal unless item can be opened flat
  - Book scanner – expensive and not readily available
  - Professional company – Scan America

Specimen Imaging

- Most ichthyology material better taken wet – either in water or preservative – to prevent desiccation and improve image quality – morphology rendered in higher quality
- Vast variety of sizes from larval to sharks and rays
- Cleared and stained and skeletal material
- Cost per unit effort – available resources – increases with increasing complexity – 2D field image, 2D high quality image with post processing, 3D image, MRI

Problems:

- Shadow
- Uneven lighting
- Glare

MK Digital Direct Light Box

http://www.mkdigitaldirect.com

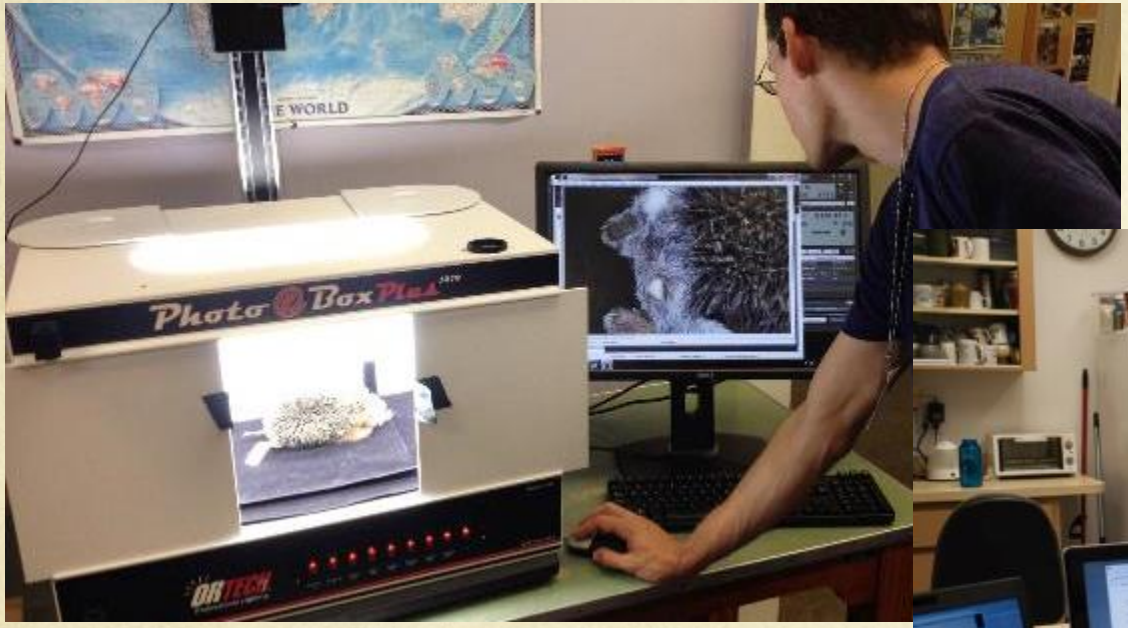
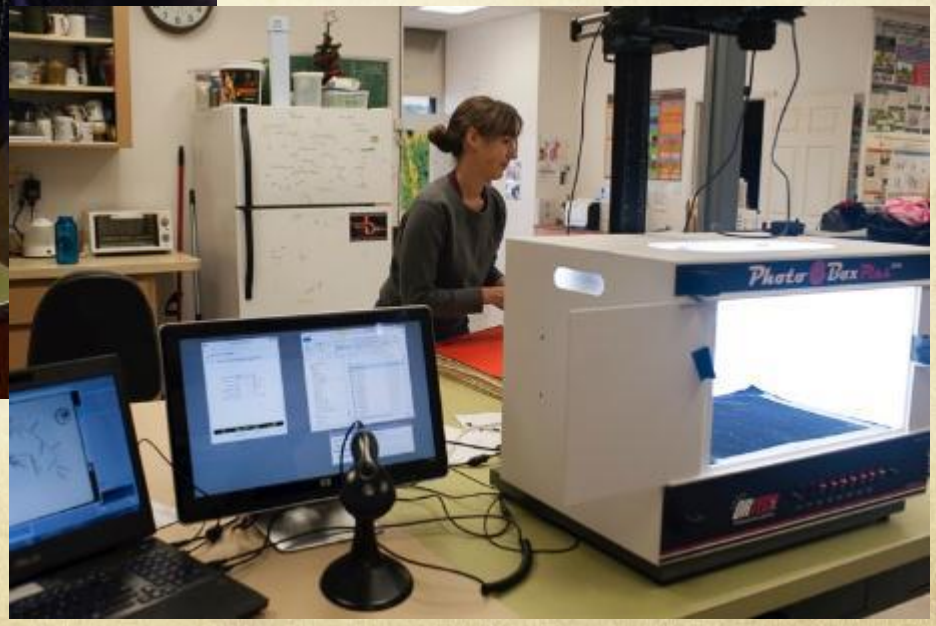
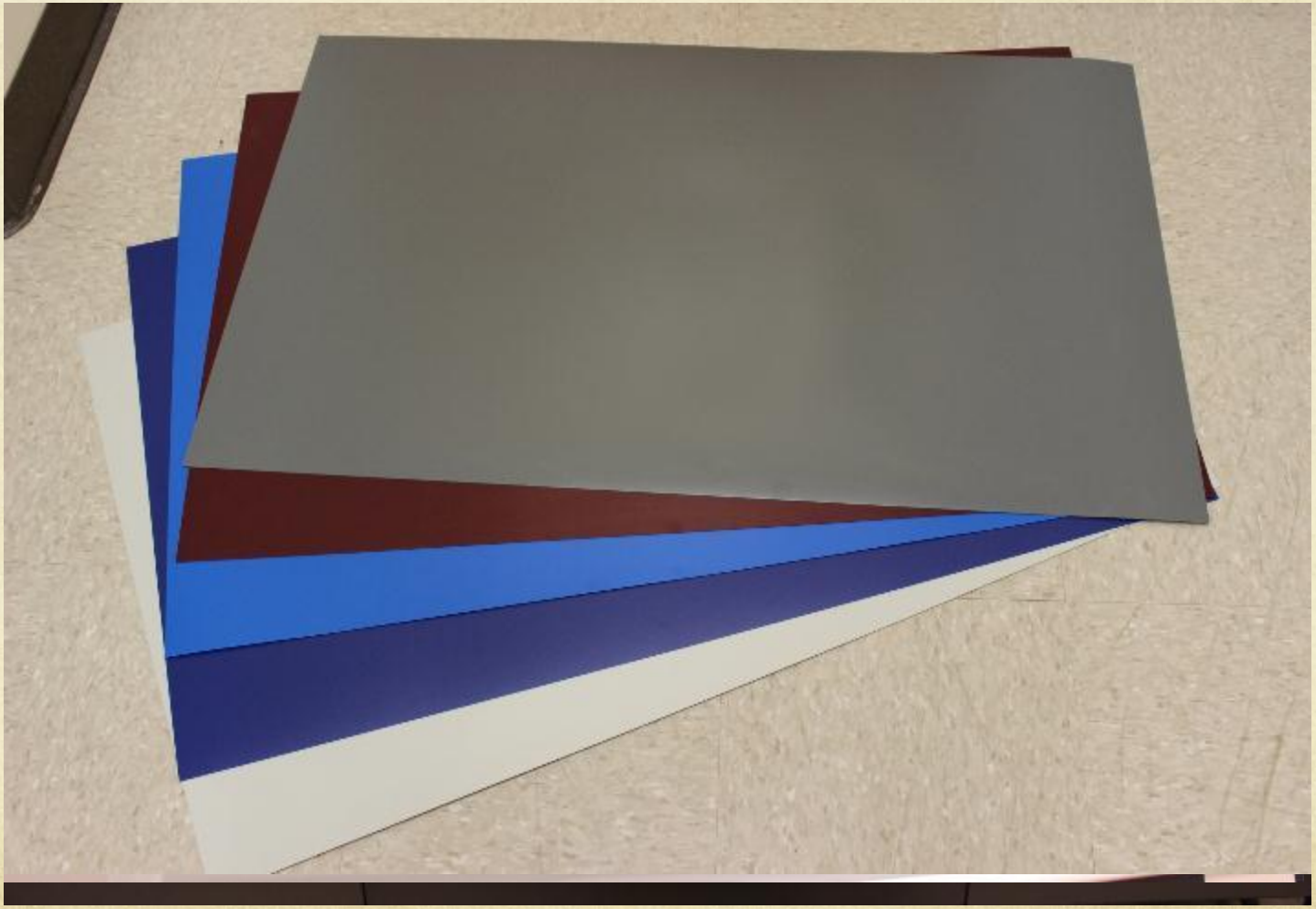


Photo e-Box



Internal platform size – 32 inches x 20 inches

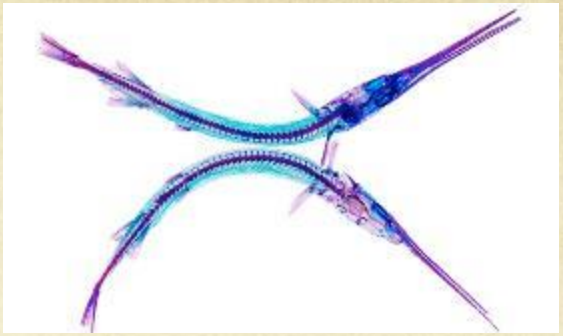
Features

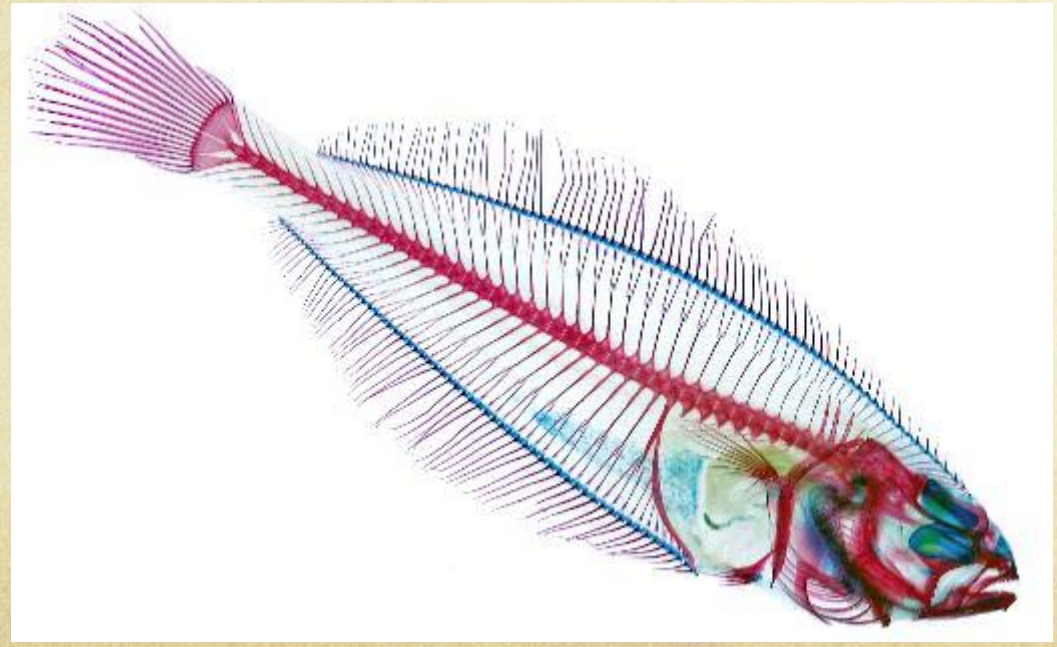


Wet boxes

KU 22705

139089





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Ichthyology

Priorities

- Type material *
- Tissue vouchers
- Rare/threatened/endangered
- Sp. material for identification
- As accumulated or requested – internal and external

In the field...

T 8480

T 8485

T 8545

Utility of Images

- Confirm or make identification
- Morphological examination – landmarking (3D)
- Color morphs*
- Field guides
- Publication
- Other external user groups – K-12, artists, publishers
- 3D, MRI – landmarks, internal structure

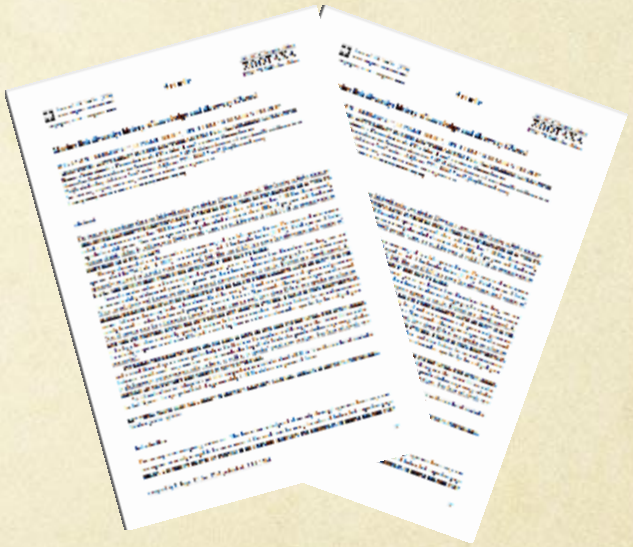
Utility of Field Notes

- Confirm collection information – dates, times, locality, collectors etc.
- Augment collection information
- Additional information – associated species, environmental parameters, specimens collected but not kept etc.
- Travelogue
- **Next step - Transcription – e.g. Notes from Nature**
  - **Higher value and integration of data**

Other augmented data

- Genbank sequences
  - Reuse of non-renewable resource
  - Metric of collection use
  - CO1 on BCoL and BOLD

- Publications and citations
  - Metric of collection use
  - Repeatable science
  - Copyright infringement?



- Video and audio – behavioral information, environment, interspecies interactions

Infrastructure & Management

- Database able to handle digital content – attachments able to accommodate all kinds of media – images, video, audio, PDFs etc.
- Server infrastructure able to handle volume of material – space requirements
- Ability to serve this content up to the outside world – local portal and webpage, aggregators, research users, other users

Access to data

- Final step to provide access to all data
- IPT portal and publishing through aggregator(s)
  - Vertnet, GBIF, iDigBio, Fishnet2
  - The more the merrier…
- Database web portal
- Data cleanliness – controlled vocabularies
- Exposing data to research community
- Provides assistance with data cleanup and ID
- Large and diverse external user community – big data
- Increase in use (loan traffic) and advocacy for collection

Other developments

- iDigBio
- SPNHC – best practices wiki
- Biodiversity Collections Network (BCON)
- Prezi - https://prezi.com/h9l4jfwexwsc/bcon-diagram/
- ASIH – Collection Committee and best practices
- TCN…