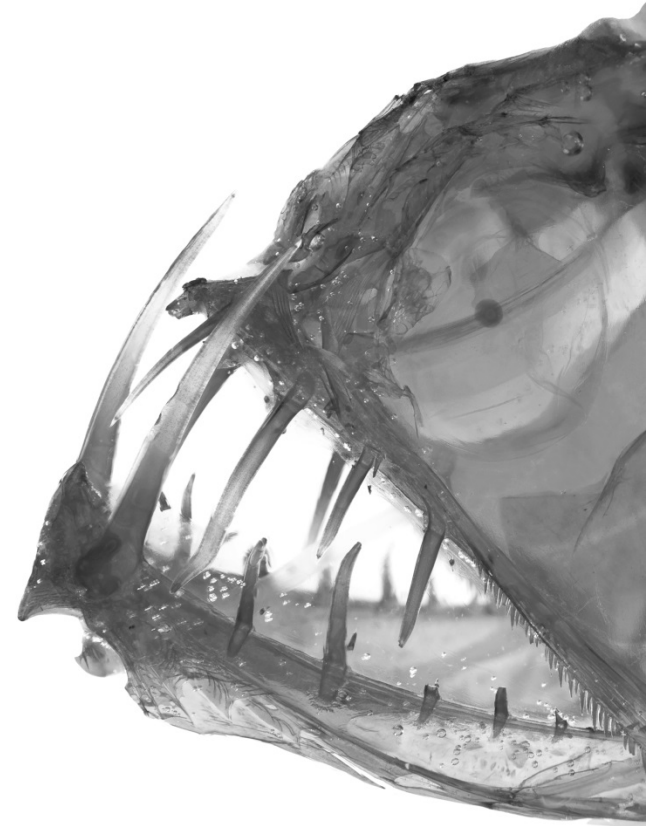
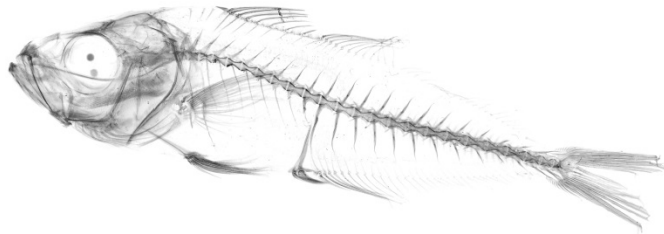
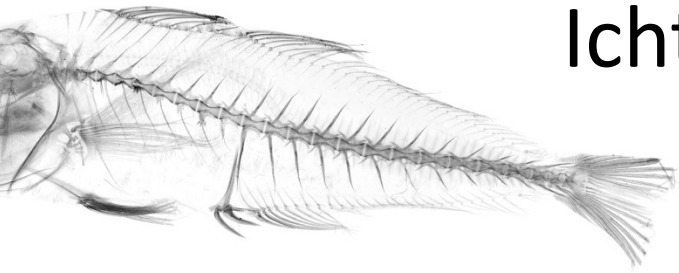


# Vertebrate Imaging Techniques & Ichthyology Workflows



Zach Randall  
Ichthyology & iDigBio



- Overview of imaging options

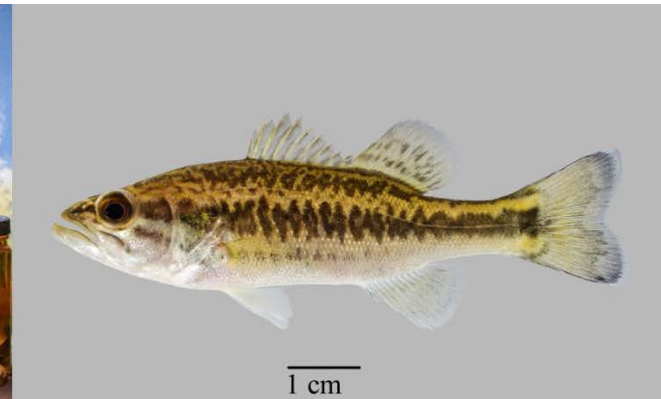
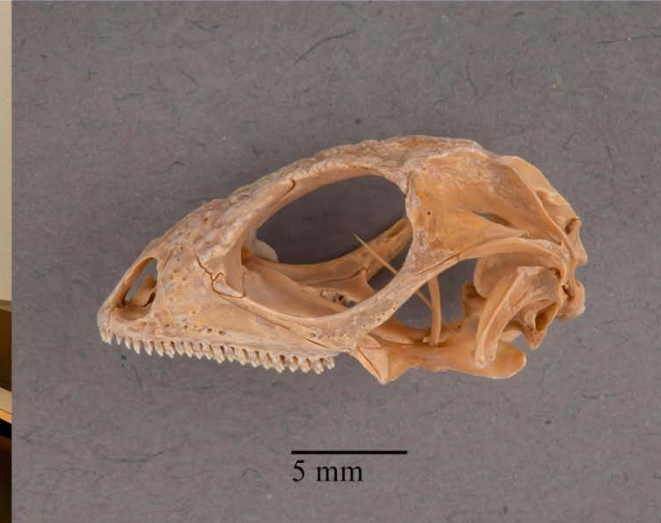
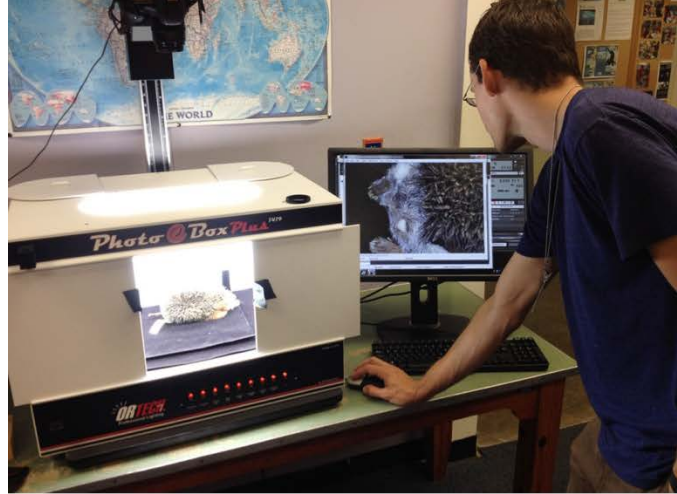


1 mm

- Workflow in ichthyology
  - In Field
  - In Lab



# What are my options?



# What are you trying to image?

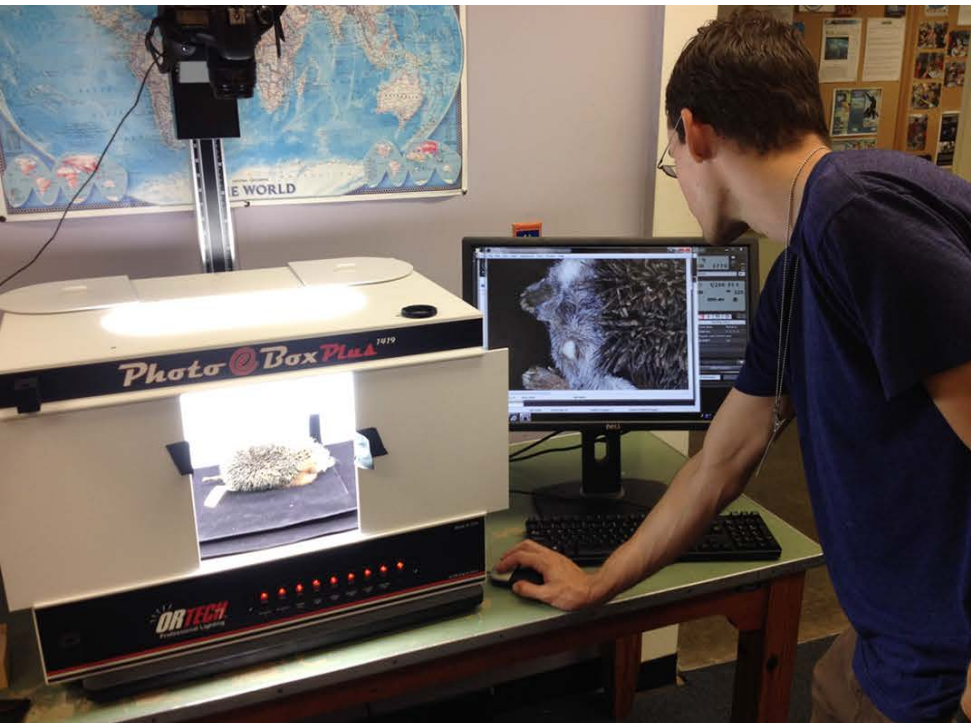
How is the specimen preserved?

- Wet (ethanol, glycerin)
- Dry (skins, skeletons, fossils, eggs, nests etc.)



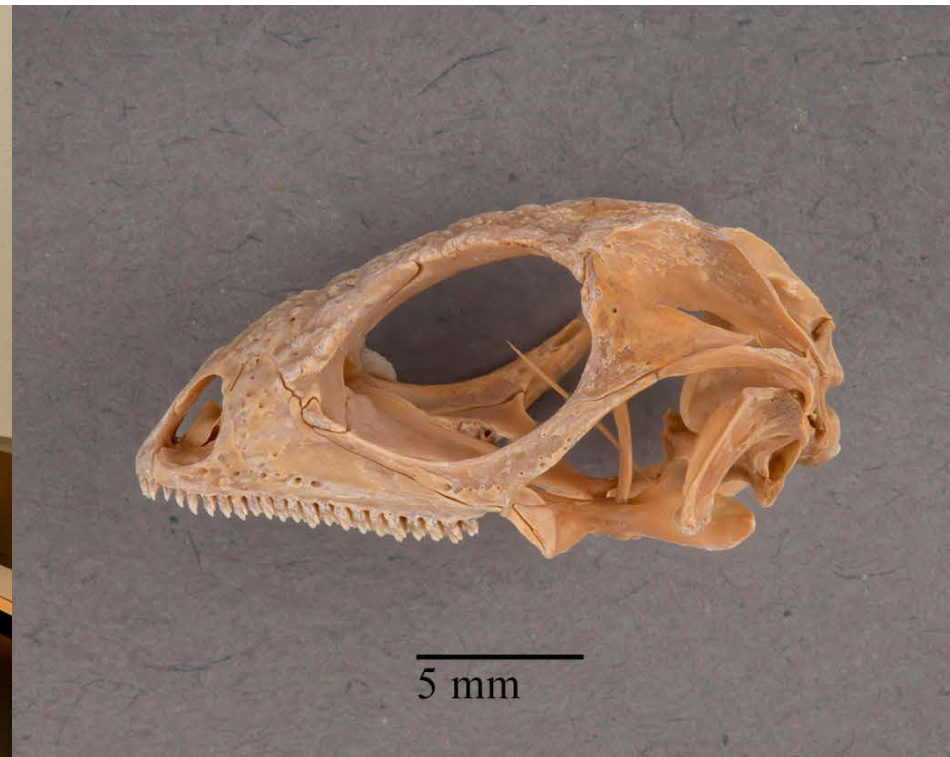
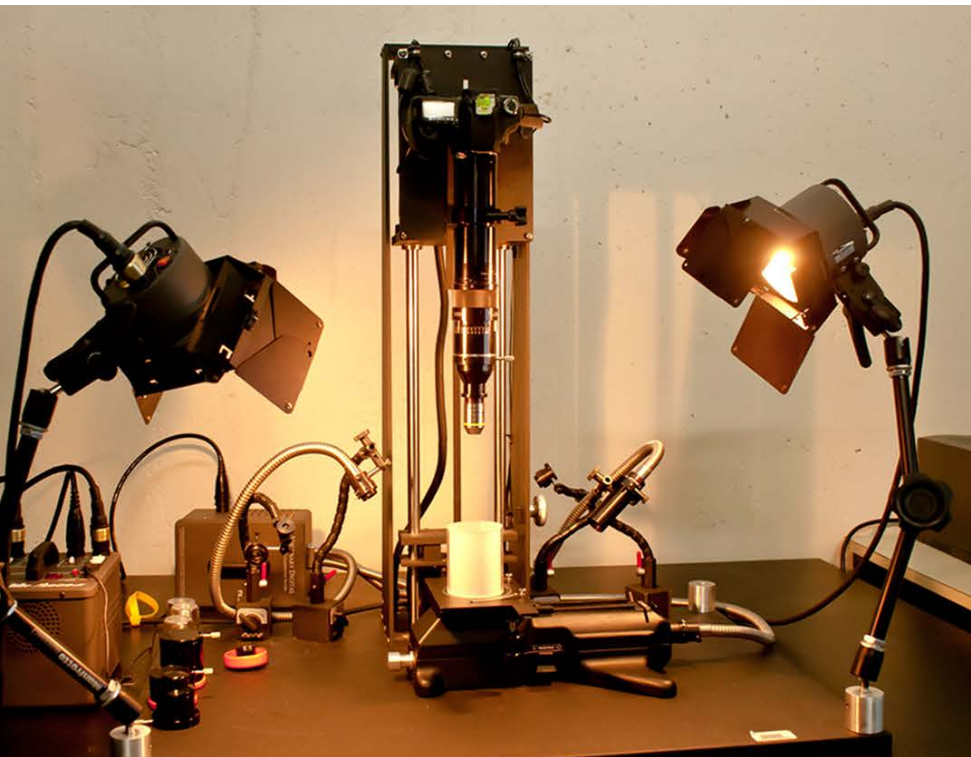
# Photo e-Box (Light Box) Dry specimens

- Box lined with continuous fluorescent lighting and 1-foot LED Light Strip
- Diffused light eliminating shadows, reflections, and hotspots
- Camera mounted above the box on a copy stand or in front of the box on a tripod.



# Copy Stand Dry specimens/wet specimens

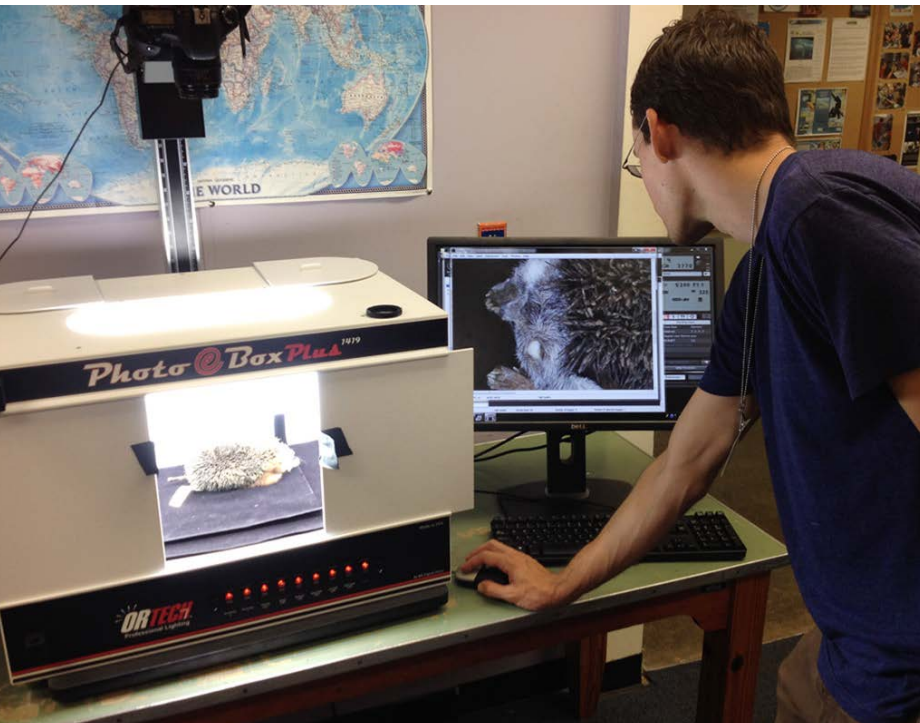
- Camera connected to a lift that can manually be raised or lowered
- Stationed between light units (flash or continuous) which are placed to its side
- Option of having direct or diffused lighting



# Lighting

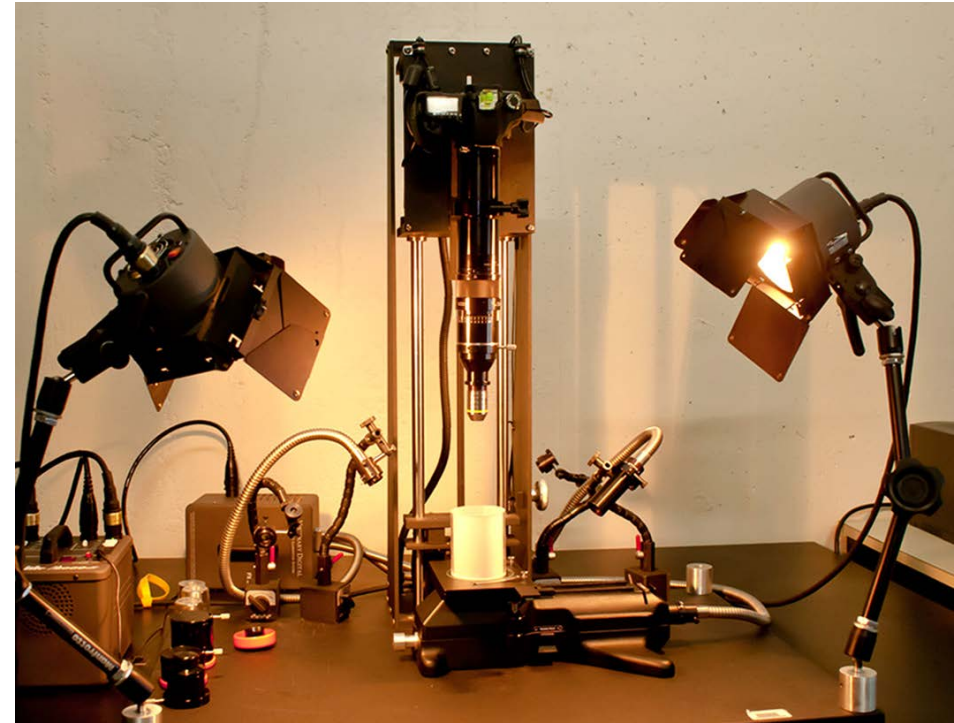
## Light box

- Continuous
- No shadows
- Diffused/Soft light



## Copy Stand

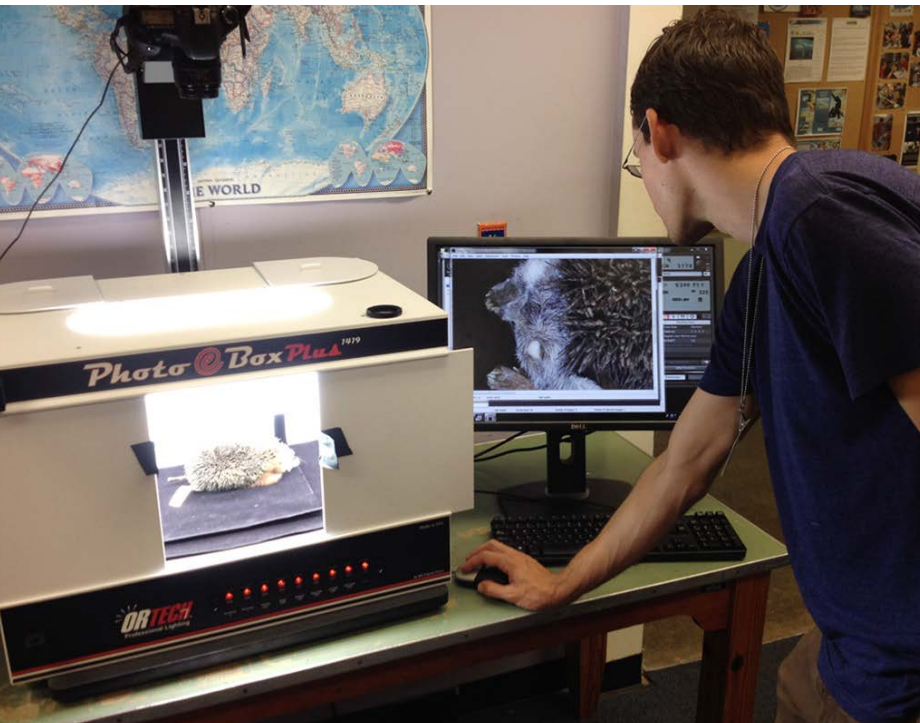
- Continuous, flash
- Shadows
- Contrast



# Lighting

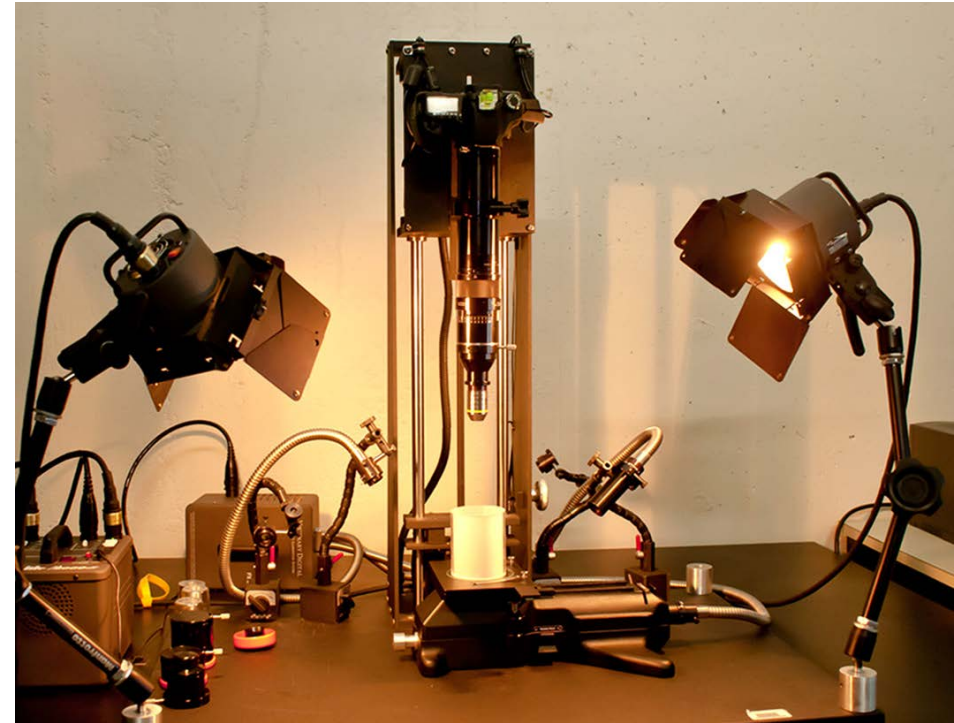
## Light box

- Continuous
- No shadows
- Diffused light



## Copy Stand

- Continuous, flash
- Shadows, **No shadows**
- Contrast, **Diffused light**





# Squeeze Tank

Wet specimens

- Glass/plexiglass tank held together with silicone with separate moveable glass plate used to “squeeze” specimen in place.
- Filled with distilled water or 70% ethanol
- Stationed between light units placed to the sides and slightly above the squeezebox
- Camera mounted on a tripod in front of tank



# Squeeze tank

- Will accommodate 80-90% of specimens in the wet collections.
- Dorsal, lateral, and ventral views easily obtainable
- Change out solution (preference distilled H<sub>2</sub>O)



Image in solution (H<sub>2</sub>O or ethanol)

- Prevents glare
- Prevents specimen from drying out!

Out of water



In water





# Setup

- Customize tank size (Glass / plexiglass/ silicon)
  - Front-glass (minimal scratching)
  - All other sides plexiglass
  - Dimensions 38 x 30 x 12 cm
- Computer setup to tether image files
  - Optional (more time efficient)
- Lighting
  - Flash; Natural light
- Average 10 minutes per specimen



# Camera settings

- Manual mode, ISO 100, F.11, Shutter 1/200<sup>th</sup>
- File types: RAW & JPG (low-med resolution)
- Automatic white balance (shoot with WhiBal gray card when possible)



# Storage

Field photography

External hard drives

Lab photography

FLMNH Project (P:) drive

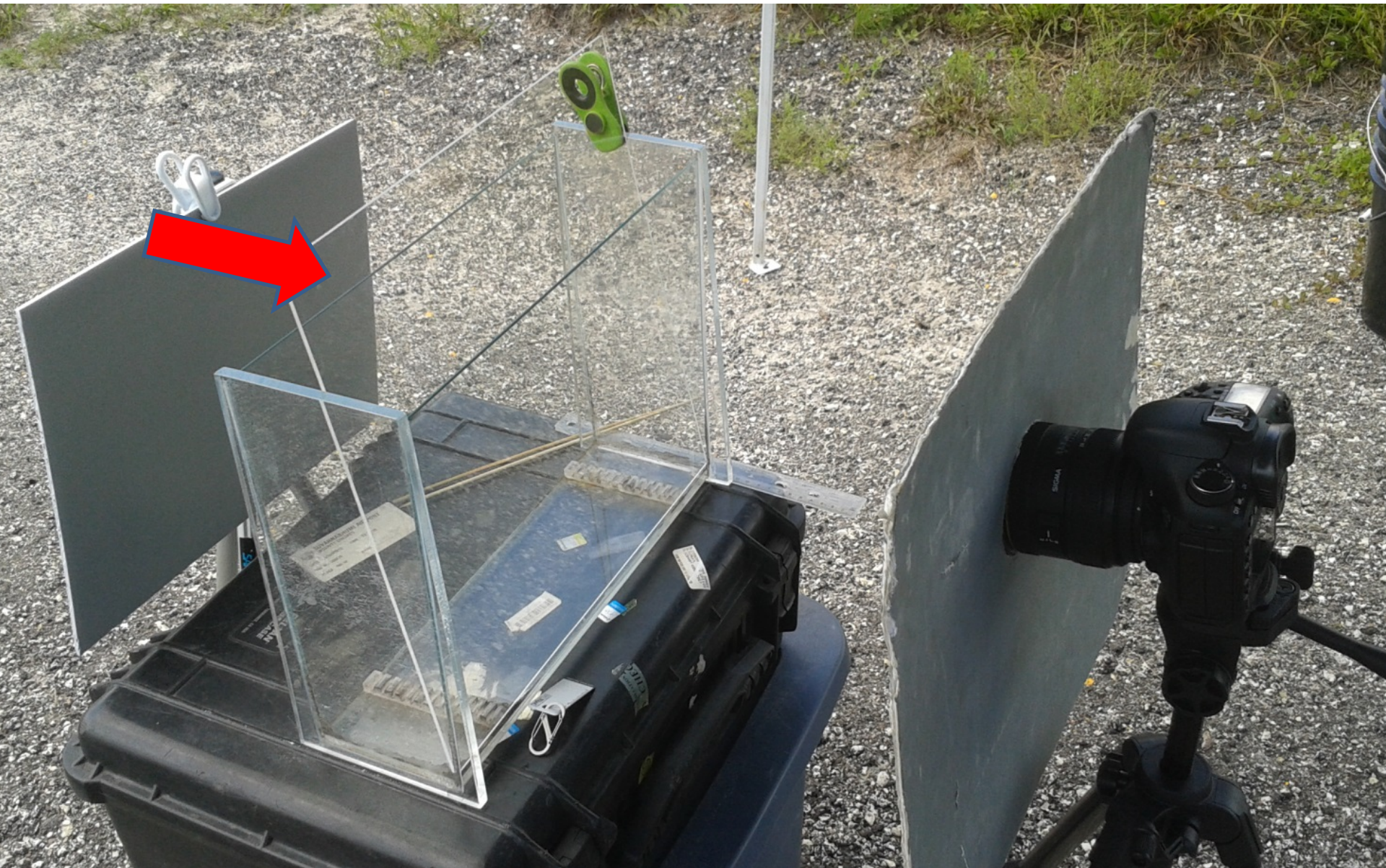


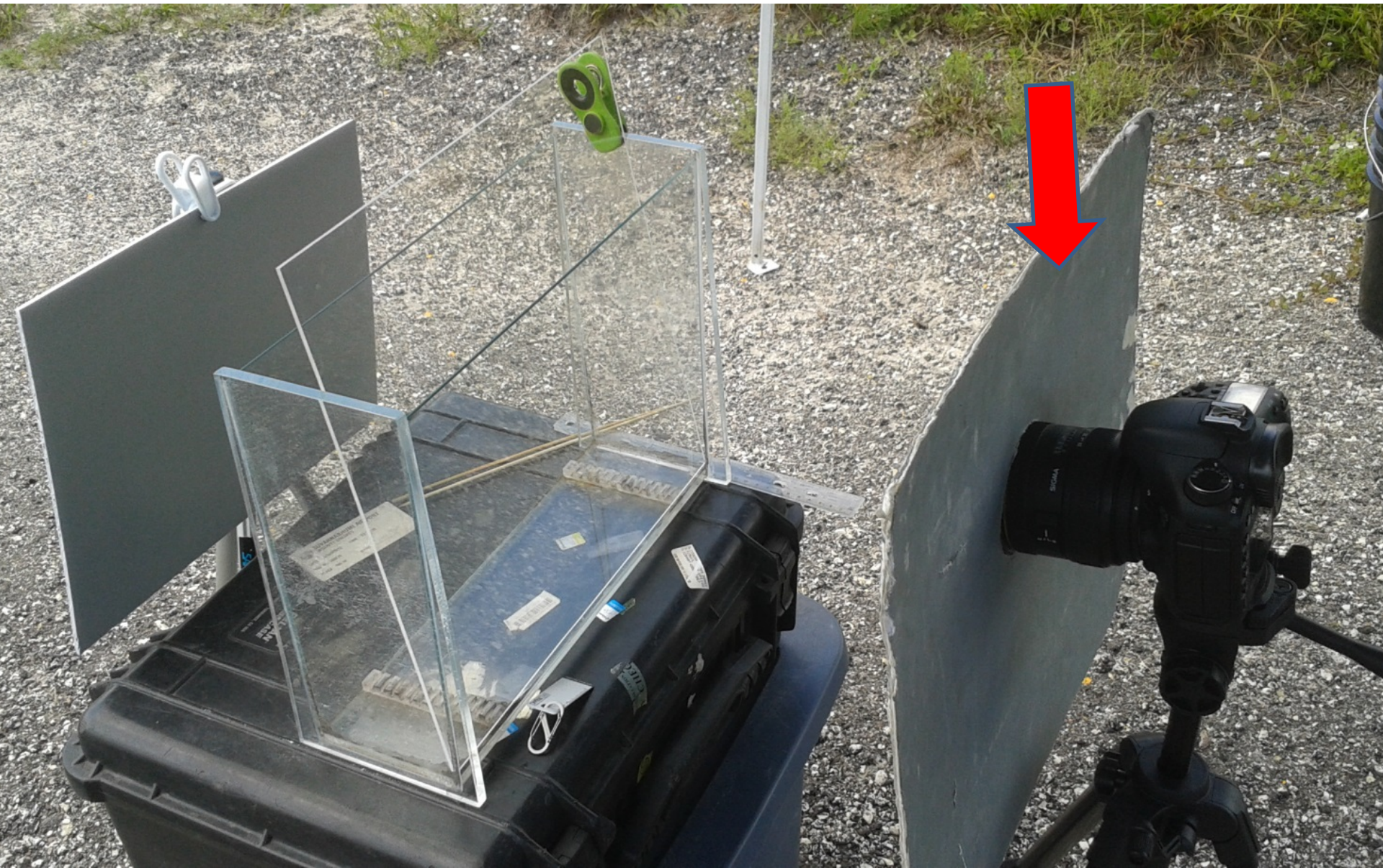
# Live photos

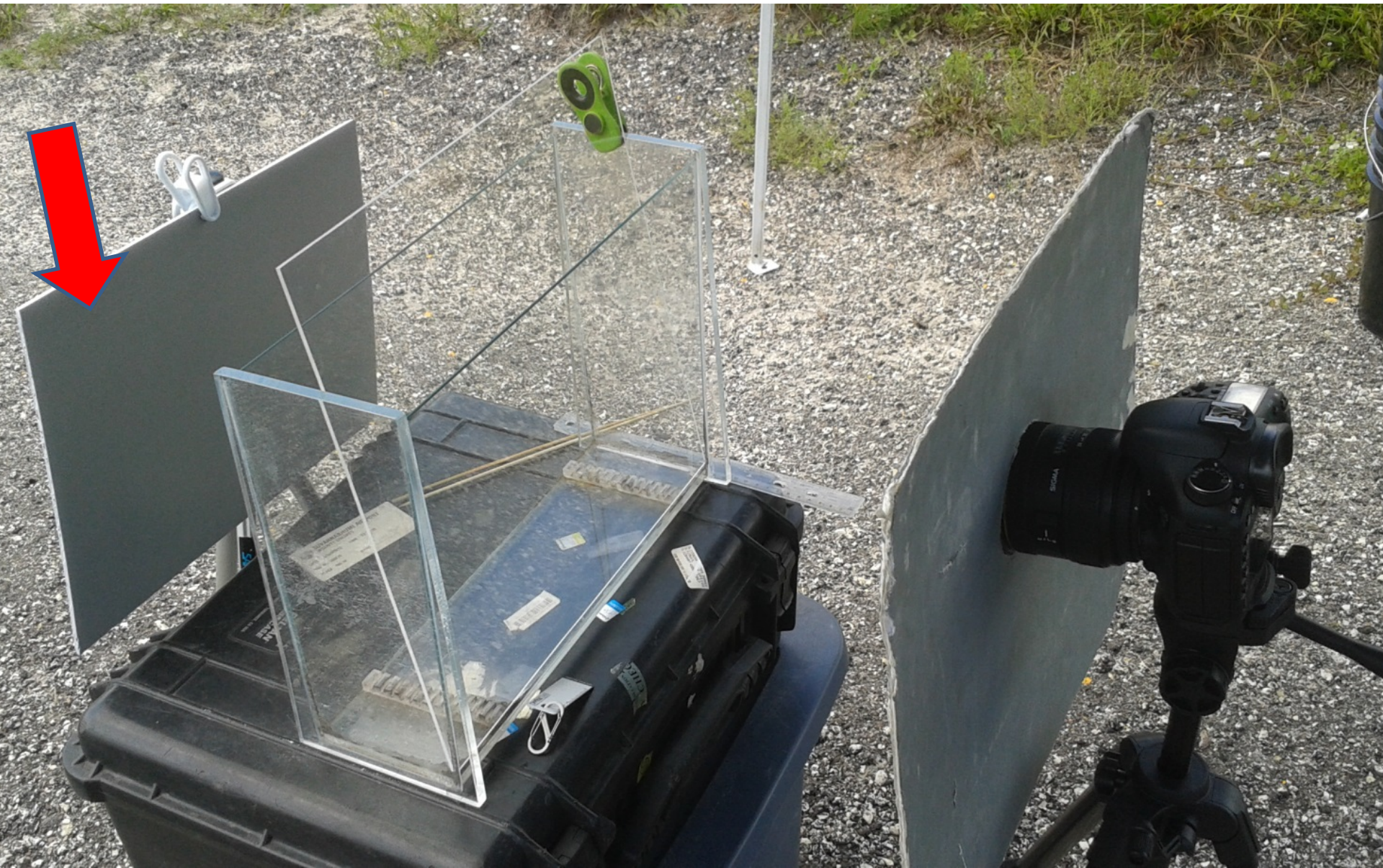




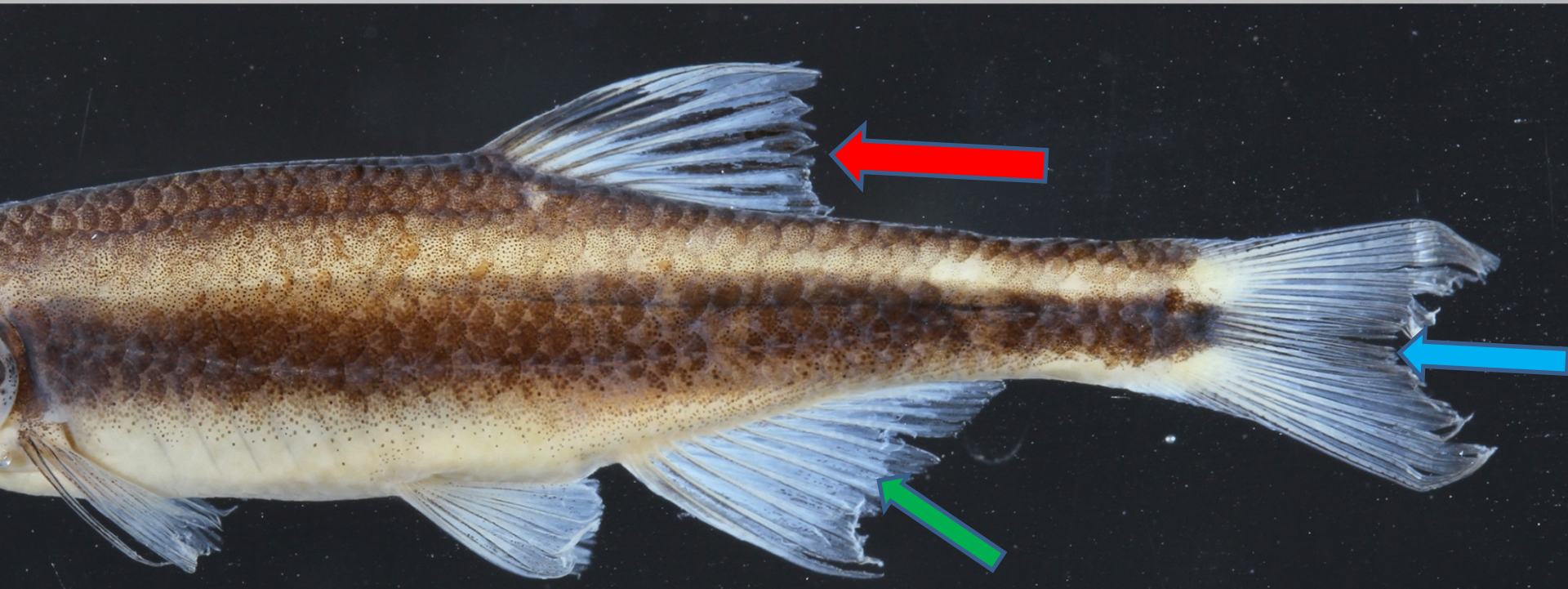
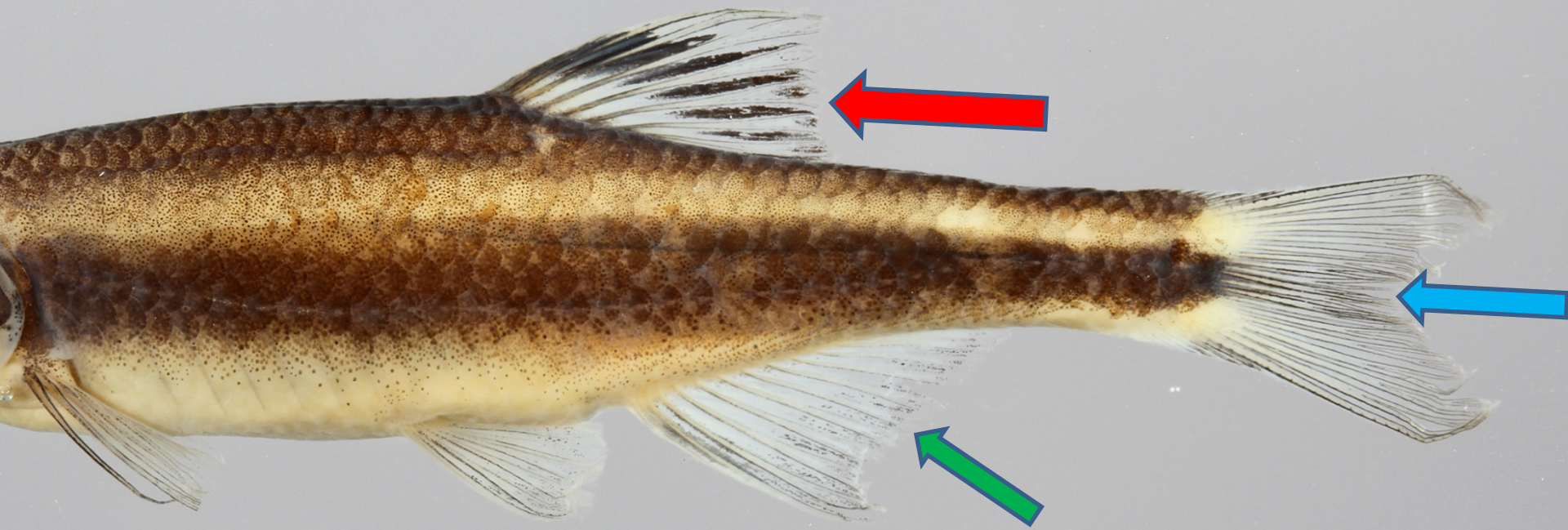
# Field Setup













TH 16-15

17.03710

100.36888

Lam Nam

Kwaei Noi

19 Jan. 2016



- Name
- TH16-28
- TH16-29
- TH16-30
- TH16-31
- TH16-32
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- TH16-56
- TH16-57
- TH16-58
- TH16-59
- TH16-61
- Copy of TH16 locality data.xlsx

	A	B	C	D	E	F	G	H	I
1	FIELD NO	DATE	LOCALITY	DRAINAGE	DISTRICT (AMP	PROVINCE (CHA	COUNTRY	LATITUDE	L
2	TH16-01	10 Jan 2016	Khong River at Rt. 1095 approx. 7.5 km N	Pai River	Pai	Mae Hong Son	Thailand	19.424591	
3	TH16-02	10 Jan 2016	Khong River at Ban Huai San on Rt. 1095	Pai River	Pang Mapha	Mae Hong Son	Thailand	19.535783	
4	TH16-03	10 Jan 2016	Pai River at Mae Hong Son Inland Fisheries	Salween River	Mueang Mae H	Mae Hong Son	Thailand	19.255453	
5	TH16-04	11 Jan 2016	Surin River approx. 1.5 km N of Ban Mae S	Pai River	Khun Yuam	Mae Hong Son	Thailand	18.927690	
6	TH16-05	11 Jan 2016	Yuam River at Ban Mae Tia on Rt. 108	Salween River	Mae La Noi	Mae Hong Son	Thailand	18.298351	
7	TH16-06	12 Jan 2016	Market at Mae Sariang	Salween River	Mae Sariang	Mae Hong Son	Thailand	18.158562	
8	TH16-07	12 Jan 2016	Sam Laep River at Ban Mae Sam Laep	Salween River	Sop Moei	Mae Hong Son	Thailand	17.978262	
9	TH16-08	12 Jan 2016	Moei River at Rt. 105 approx. 7 km SE of E	Salween River	Tha Song Yang	Tak	Thailand	17.516345	
10	TH16-09	15 Jan 2016	Mae Chaem River at Rt. 108 bridge approx	Ping River	Hot	Chiang Mai	Thailand	18.222638	
11	TH16-10	15 Jan 2016	Mae Chaem River at Ban Om Kood on Rt.	Ping River	Mae Chaem	Chiang Mai	Thailand	18.276885	
12	TH16-11	17 Jan 2016	Yom River SSW of Ban Nong Muang Khai	Nan River	Nong Muang Kl	Phrae	Thailand	18.252339	
13	TH16-12	17 Jan 2016	Yom River below dam at Ban Nun Nuea	Nan River	Song	Phrae	Thailand	18.484272	
14	TH16-13	18 Jan 2016	Yom River approx. 3 km N of Ban Khlong	Nan River	Sawankhalok	Sukhothai	Thailand	17.200491	
15	TH16-14	18 Jan 2016	Yom River at bridge off Rt. 101 approx. 3	Nan River	Si Satchanalai	Sukhothai	Thailand	17.551068	
16	TH16-15	19 Jan 2016	Khwaie Noi River off Rt. 1026 approx. 7.5	Nan River	Wat Bot	Phitsanulok	Thailand	17.035996	
17	TH16-16	19 Jan 2016	Wang Thong River at Rt. 12 approx. 22 km	Krong Kreng Ri	Wang Thong	Phitsanulok	Thailand	16.852211	
18	TH16-17	19 Jan 2016	Nan River at Ban Bang Sai on Rt. 1063	Chao Phraya R	Mueang Phitsar	Phitsanulok	Thailand	16.682376	
19	TH16-18	20 Jan 2016	Pa Sak River at Rt. 12 bridge	Chao Phraya R	Lom Sak	Phetchabun	Thailand	16.729801	
20	TH16-19	20 Jan 2016	Loei River at Loei	Mekong River	Mueang Loei	Loei	Thailand	17.508872	
21	TH16-20	20 Jan 2016	Loei River at bridge S of Ban Wang Saphur	Mekong River	Wang Saphung	Loei	Thailand	17.287783	
22	TH16-21	21 Jan 2016	Kong Si River at bridge ESE of Ban Kumph	Lam Pao River	Kumphawapi	Udon Thani	Thailand	17.096920	
23	TH16-22	21 Jan 2016	Phai Chan Yai River at Rt. 2035 bridge	Lam Pao River	Nong Han	Udon Thani	Thailand	17.216134	
24	TH16-23	22 Jan 2016	Luang River at bridge N of Ban Sam Phrao	Mekong River	Mueang Udon T	Udon Thani	Thailand	17.455778	
25	TH16-24	22 Jan 2016	Mong River at Rt. 2348 bridge	Mekong River	Ban Phue	Udon Thani	Thailand	17.712757	
26	TH16-25	22 Jan 2016	Mekong River at NNW edge of Ban Phon S	South China Se	Tha Bo	Nong Khai	Thailand	17.819783	
27	TH16-26	23 Jan 2016	Mekong River at Nong Khai	South China Se	Mueang Nong k	Nong Khai	Thailand	17.882349	
28	TH16-27	24 Jan 2016	Mekong River approx. 70 km NW of Tha B	South China Se	Sangkhom	Nong Khai	Thailand	18.111062	
29	TH16-28	24 Jan 2016	Trib. of Mekong River at Rt. 211 bridge ap	Mekong River	Sangkhom	Nong Khai	Thailand	18.151070	
30	TH16-29	24 Jan 2016	Mekong River at confluence with Mong Ri	South China Se	Tha Bo	Nong Khai	Thailand	17.851984	
31	TH16-30	25 Jan 2016	Songkhram River at bridge W of Ban Na Si	Mekong River	Charoen Sin	Sakon Nakhon	Thailand	17.729470	
32	TH16-31	25 Jan 2016	Un River at Rt. 222 bridge	Songkhram Riv	Phang Khon	Sakon Nakhon	Thailand	17.442618	
33	TH16-32	26 Jan 2016	Un River at bridge approx. 3 km E of Ban	Songkhram Riv	Na Wa	Sakon Nakhon	Thailand	17.480165	
34	TH16-33	26 Jan 2016	Songkhram River near confluence with Ur	Mekong River	Si Songkhram	Nakhon Phanom	Thailand	17.634146	
35	TH16-34	27 Jan 2016	Trib. of Mekong River downstream of Rt.	Mekong River	Mueang Bueng	Bueng Kan	Thailand	18.332383	
36	TH16-35	27 Jan 2016	Mekong River at Ban Tha Pho on Rt. 212	South China Se	Mueang Bueng	Bueng Kan	Thailand	18.338504	
37	TH16-36	27 Jan 2016	Mekong River at Ban Huai Sueam Nuea or	South China Se	Mueang Bueng	Bueng Kan	Thailand	18.416475	
38	TH16-37	28 Jan 2016	Mao River below dam at Rt. 212 bridge ap	Mekong River	Mueang Bueng	Bueng Kan	Thailand	18.282598	
39	TH16-38	28 Jan 2016	Mekong River at Ban Bung Khla	South China Se	Bung Khla	Bueng Kan	Thailand	18.301226	
40	TH16-39	28 Jan 2016	Thuai River at Rt. 212 bridge S of Tha Uth	Mekong River	Tha Uthen	Nakhon Phanom	Thailand	17.562192	
41	TH16-40	28 Jan 2016	Bo River at confluence with Mekong River	Mekong River	Mueang Nakhon	Nakhon Phanom	Thailand	17.490645	



- ★ Favorites
  - Downloads
  - Desktop
  - Dropbox
  - Timeline Explorer
  - Recent Places
- Libraries
  - Documents
  - Music
  - Pictures
  - Videos
- Computer
  - Local Disk (C:)
  - Removable Disk (E:)
  - Projects (P:)**
  - Shared3 (R:)
  - Shared (S:)
  - zach150 (U:)
- Network

- Name
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  - Gagata\_dolichonema
  - Gonorynchus\_bicornis
  - Opsarius\_infracasciatus
  - Osteobrama\_cunma
  - Parambassis\_vollmeri
  - Random
  - Schistura\_poculi
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  - IMG\_5482.JPG
  - IMG\_5483.CR2
  - IMG\_5483\_USE.JPG
  - IMG\_5484.CR2
  - IMG\_5484.JPG
  - IMG\_5485.CR2
  - IMG\_5485.JPG
  - IMG\_5486.CR2
  - IMG\_5486\_USE.JPG**
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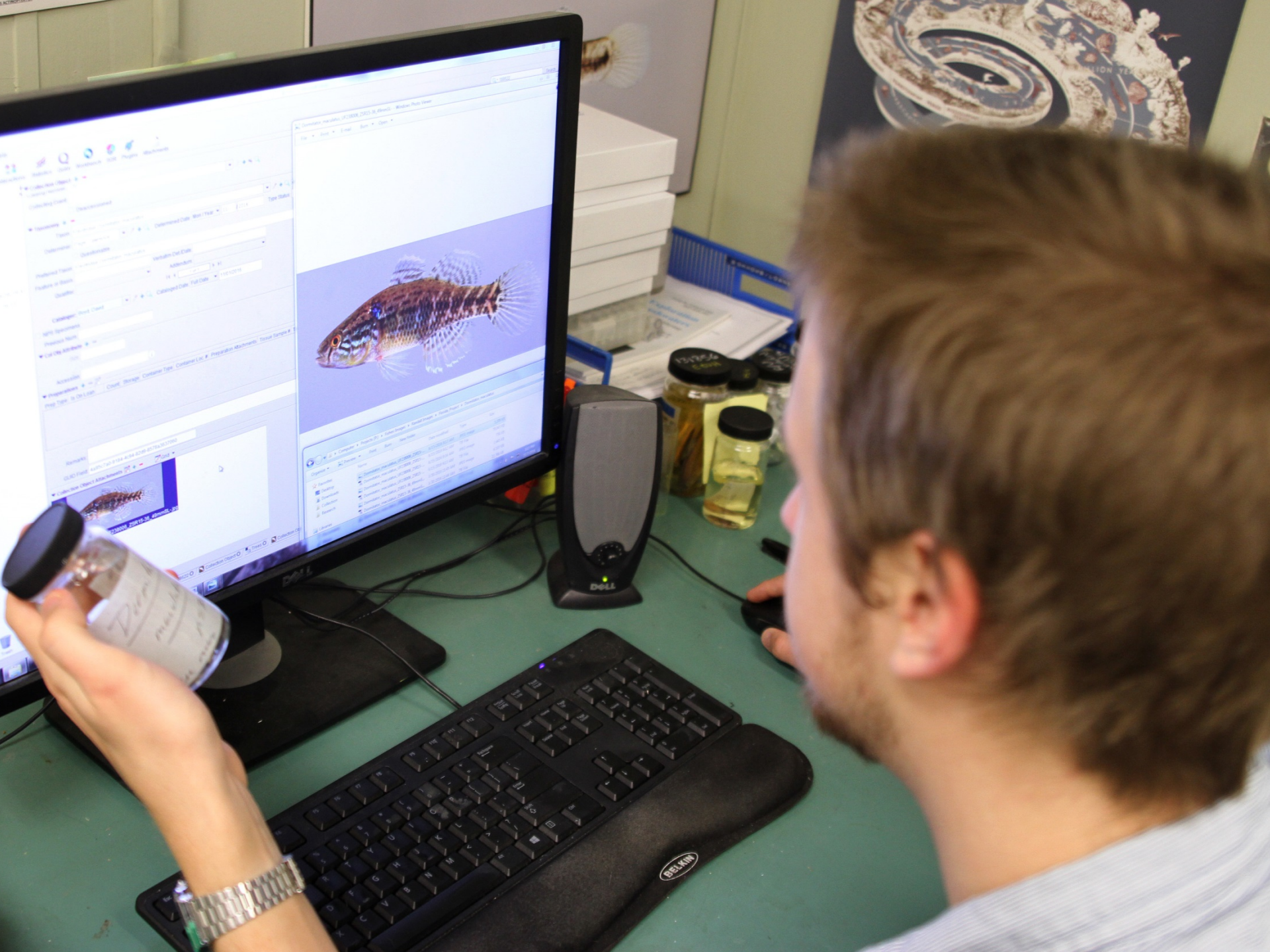
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JPG File Tags: Add a tag

Rating: ☆☆☆☆☆  
Dimensions: 2592 x 1728

Size: 1.45 MB  
Title: Add a title

Authors: Add an author  
Comments: Add comments

Offline availability: Not available  
Offline status: Online



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- IMG\_5532.JPG
- IMG\_5530.JPG
- IMG\_5530.CR2
- IMG\_5529.JPG
- IMG\_5529.CR2
- IMG\_5528.JPG
- IMG\_5528.CR2
- IMG\_5527.JPG
- IMG\_5527.CR2
- IMG\_5527\_Scale\_84mmSL.tif
- IMG\_5526.JPG
- IMG\_5526.CR2
- IMG\_5525.JPG
- IMG\_5525.CR2
- IMG\_5524.JPG
- IMG\_5524.CR2
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- Gagata\_gasawyuh\_TH16-07\_IMG\_5531.tif
- Gagata\_dolichonema\_UF188261\_TH16-07\_IMG\_5531....
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IMG\_5531\_USE.JPG Date taken: 1/11/2016 11:17 AM Rating: ☆☆☆☆ Dimensions: 2592 x 1728 Size: 741 KB Title: Add a title Authors: Add an author Comments: Add comments Offline availability: Not available Offline status: Online Camera maker: Canon

Genus\_species\_UF\_Catalog#\_IMG#

- Name
- Gagata\_dolichonema\_UF188261\_TH16-07\_IMG\_!
- Gagata\_dolichonema\_UF188261\_TH16-07\_IMG\_!
- Gagata\_gasawuyh\_TH16-07\_IMG\_5531.tif
- Gagata\_gasawuyh\_TH16-07\_IMG\_5531\_84mmSL
- Gagata\_gasawuyh\_TH16-07\_IMG\_5531\_84mmSL
- IMG\_5524.CR2
- IMG\_5524.JPG
- IMG\_5525.CR2
- IMG\_5525.JPG
- IMG\_5526.CR2
- IMG\_5526.JPG
- IMG\_5527.CR2
- IMG\_5527.JPG
- IMG\_5527\_Scale\_84mmSL.tif
- IMG\_5528.CR2
- IMG\_5528.JPG
- IMG\_5529.CR2
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- IMG\_5530.CR2
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Tags: Add a tag

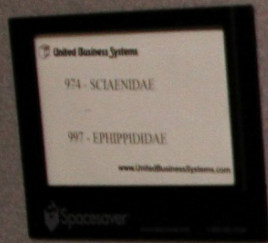
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Authors: Add an author  
Comments: Add comments

Offline availability: Not available

# Collection imaging



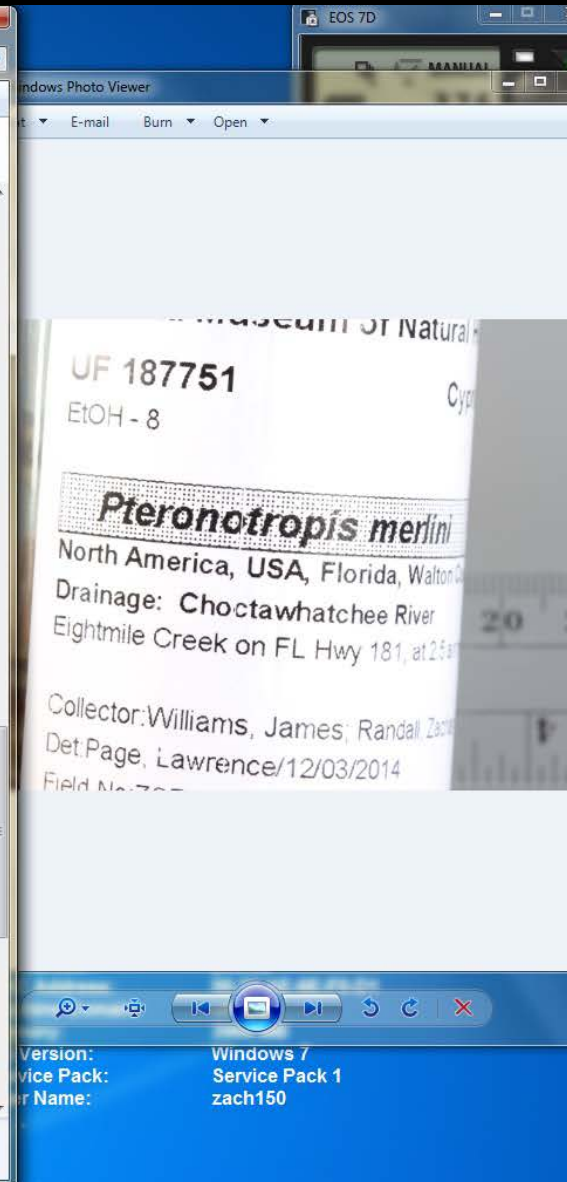
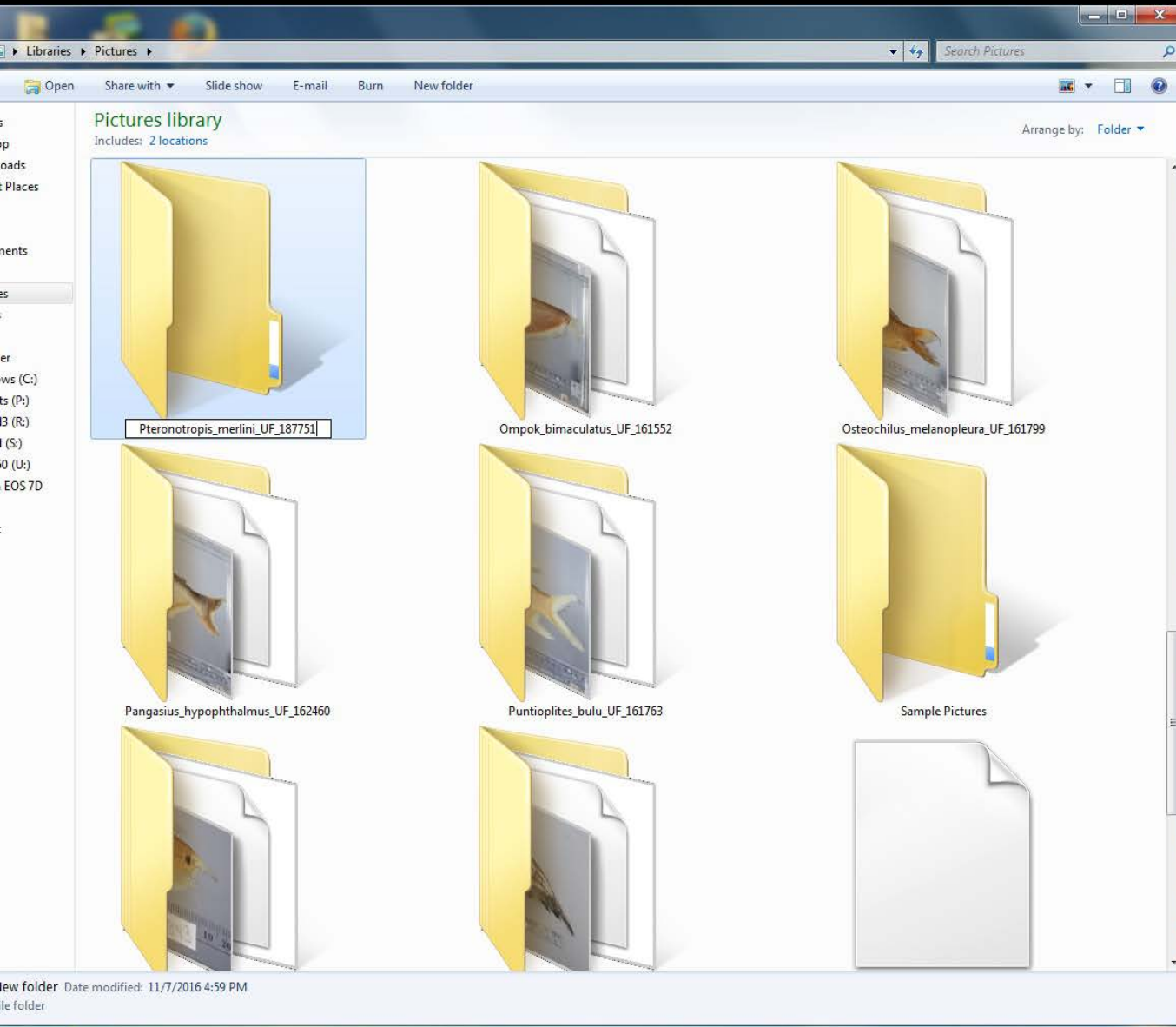
53





# Camera is tethered to Canon Utilities (default camera software)

Recommended to automatically import images to Lightroom (adjust exposure, add metadata, and convert RAW file to DNG)



Unedited jpg (3MB)+RAW (21 MB)



13

14

15

16

17

18



Unedited jpg (3MB)+RAW (21 MB)



Genus\_species\_UF\_Catalog#\_IMG#

## Create/Update

- Collection Object
- Collecting Event
- Taxon
- Agent
- Geography
- Locality
- More Forms
- Record Sets
- All Lepomis tissue
- Handpaint
- Lepomis tissue

## Collection Object + -

 Deaccessioned

## Taxonomy + -

Taxon:   CurrentDeterminer:  Determined D...   Type Sta...  QuestionablePreferred Ta... Feature or B...  Verbatim Det./... Qualifier:  Addendum: 

1 of 1

Grid

Cataloger:  Cataloged D...   NPS SpecimensPrevious Num: 

## Col Obj Attribute + -

Size: Accession: 

## Preparations + -

Prep Ty...	Is On Lo...	Co...	Stora...	Container T...	Container Lo...	Preparation Attachm...	Tissue Sampl...	Tissue Sou...	Invent...
EtOH	No	8		standard jar					Found



Form

Remarks: GUID Field: 

## Collection Object Attachments Grid



Pteronotropis\_merlini\_UF\_187751\_IMG\_0221.JPG

1 of 1



Trash

Questions?

