

2021 INVERTEBRATES IN EDUCATION AND CONSERVATION CONFERENCE

July 27 – July 31, 2021 Tucson, Arizona

Hosted by the Association of Zoos and Aquariums' Terrestrial Invertebrate Taxon Advisory Group (TITAG)

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KEEPING COOL

Getting too hot in the desert is no fun and is potentially dangerous. Here are some helpful hints for staying cool and enjoying your time in Southern Arizona.

- Wear loose-fitting, lightweight, light-colored clothing.
- Wear a wide-brimmed hat.
- Wear sunscreen (30 SPF or greater is recommended).
- Drink plenty of water throughout the day. Beverages with electrolytes may also be helpful.

If you experience any symptoms of heat exhaustion, stop any physical activity immediately, find a place to cool down, and notify a friend or colleague nearby. Symptoms can include headache, excessive thirst, nausea or vomiting, weakness, faintness, dizziness, confusion, or lethargy.

ABOUT COLLECTING

It is your personal responsibility to comply with state and federal regulations if you plan to collect while in Arizona. If you plan to collect in Mexico, contact USDA well in advance. Bringing live or dead specimens across international borders without proper permits is **illegal**.

If you choose to collect, please make proper arrangements to transport your live animals. *Please practice responsible collecting procedures* and follow collecting restrictions in designated areas. Collecting is at the discretion of any trip leader based on prevailing conditions.

BEING A GOOD NEIGHBOR

The conference continues to grow, and with success comes additional concerns. Your contribution to the conference is significant and your cooperation makes the event go smoothly.

Please wear your conference name tag throughout the weekend.

- When in the field, do not harass snakes or any other species. Remember that collecting vertebrates is strictly controlled and requires permits.
- Please practice respectful collecting etiquette. This includes but is not limited to: returning rocks, logs, cow patties, etc. to the position in which you found them; treading lightly when not on established paths; asking permission to collect at other people's black light sheets and taking responsibility for keeping live animals cool when in the field.
- If you see people engaged in disrespectful or illegal collecting, please notify a leader, conference organizer, or interrupt the behavior yourself. If someone needs information about a collecting practice, please provide the information.
- Dogs are not allowed at any conference event.

FULL SCHEDULE

TUESDAY, JULY 25

- | | |
|-----------------|--------------------------------------|
| 9:00am - 4:00pm | TITAG Meeting – Presidio III, IV & V |
| 1:00pm – 4:00pm | Registration- Presidio Foyer |
| 4:00pm – 6:00pm | Ice Breaker – Upper West poolside |

WEDNESDAY, JULY 28

Field trips leave promptly at the scheduled times. Breakfast is available in the resort beginning at 6:00 am. Field trips are for registered participants only and depart from Presidio Foyer. ***Please wear name tags!***

- | | |
|-----------------|------------------------------|
| 6:30am – 8:30am | Registration- Presidio Foyer |
| 1:30pm – 4:30pm | Registration- Presidio Foyer |

FIELD TRIPS

7:00am - 10:00pm

Bugs, birds, and bobcats- It's a Biodiversity Party! (10 participants) Led by Catherine Bartlett, Arizona-Sonora Desert Museum

Sweetwater Wetlands is teeming with life! Explore this 60 acre urban wildlife habitat and outdoor classroom, with Catherine Barelett. It is home to a plethora of species for you to find. This area is full of cattails, cottonwoods, and mesquites trees, creating plenty of diverse habitats for aquatic and terrestrial animals. Waterfowl, aquatic insects, reptiles, and an occasional mammal call this place home. If you use eBird, iNaturalist, or love the challenge of wildlife photography, this is the place for you! Sweetwater is right off I-10 in Tucson and has 2.5 miles of flat walking paths including a paved ADA accessible portion. We'll start at 7:00am since the early eBirder gets the worm. Bring binoculars for the best experience. (No collecting)

7:30am - 3:30pm

PAN...ACEA? THE DESERT SURE IS! (15 Participants) Led by Zack Lemann - Audubon Insectarium New Orleans

Assuming the bugs missed us as much as we missed them, this trip to the canyons south of Tucson should make for a fantastic reunion. "Cactus longhorn! I missed you so much!" "Giant with too many digits at the end of your limbs! What brought you back?" To be serious: a trip for observing and collecting arthropods after monsoon rains have made the Sonoran landscape spring to life is a special treat. This will be a car caravan lead by Zack Lemann, will be making approximately three stops to a variety of habitats ranging from cactus fields to rolling hills to moderate montane terrain. If you don't see a bug that makes your heart leap, you may have contracted a disease!

Details:

Water and route map provided, and trip leader will have a 1st aid kit, paper towels, and toilet paper. Lunch not provided - please pack your own. Responsible collecting allowed.

8:30 - 10:30am

Tucson Botanical Gardens (12 Participants)

Enjoy Tucson's mid-town oasis during monsoon season! A brief overview of the Gardens' history will be followed by a tour of the Gardens led by the Horticulture Manager. Topics during the tour will include an overview of the Gardens' integrated pest management program, bee box partnership, and soil formation. After the tour of the grounds, the Curator of the Tropical Conservatory will discuss the butterfly program, including a visit inside the greenhouse to see orchids and other tropical plants (butterflies are not present in the summer months). Following the tour, participants can then self-guide to areas of interest, and consider visiting the café and gift shop.

9:00am - noon

Arizona-Sonora Desert Museum (12 participants) Led by Howard Bryne, Arizona-Sonora Desert Museum

Ever wonder what happens behind the scenes of one of the best attractions in the Tucson area? Join Howard Bryne, Curator Extraordinaire as he leads you through the back areas of the Sonoran Desert museum, allowing participants to see sections of the facility not open to regular guests. Be prepared to be amazed at Howard's knowledge of herpetology, entomology, ichthyology and well as desertology. Tour will last until it is done and participants can then venture out and enjoy the rest of the museum at their own leisure. Only collecting allowed is the vast knowledge Howard will be sharing. There are two great cafés on grounds making this the perfect half day excursion for those not ready to tackle a full day field trip.

EVENING KEYNOTE ADDRESS

Presidio III, IV & V

5:30pm - Cocktails

6:00pm - Keynote address

7:30pm - Dinner

Welcome, Keynote Presentation, and Reception

Our IECC 2021 keynote speaker is [Sergio Avila](#)! Many of you know Sergio already, as he is a good friend of the Conference. He will be sharing his projects and perspectives on wildlife conservation and social justice in the natural world.

A little more about Sergio:

For over twenty years, Sergio has worked on local and regional conservation efforts along the U.S.-Mexico borderlands, as a conservation scientist, wildlife researcher and facilitator of bi-national conservation projects. He has led collaborative efforts on connectivity for wildlife, habitat restoration, public education and interpretation in the U.S. southwest and northwest Mexico.

For over ten years, Avila tracked and studied borderland jaguars and ocelots in Sonora and Arizona. More recently, he led efforts to protect monarch butterflies promoting pollinator gardens in Arizona, and connecting efforts with a new monarch-monitoring network in northwest Mexico.

Sergio now works for the national Sierra Club in the Outdoor Activities Team. His focus is to support staff and volunteers in New Mexico, Arizona, Colorado, Nevada and Utah, with the mission to connect all people with the natural world

and with the Sierra Club, by maintaining and enhancing diversified, superior, volunteer-run outdoor activities that support the Sierra Club's conservation mission.

THURSDAY, JULY 29

7:30am – 4:30pm Registration- Presidio Foyer

Registration may close during paper sessions and lunch

9:00am – 4:30pm Silent Auction - Presidio III, IV & V

8:00am – Welcome and Announcements - Presidio III, IV & V

8:10am – 12:00pm - Paper Sessions – Presidio III, IV & V

Please note: paper sessions start promptly at the time specified in the program. Name tags must be worn for admittance into the paper sessions. While formal talks are in session, please keep noise level in the exhibit area low. To reduce disruptions, please keep entering and exiting the paper sessions to a minimum.

Who We Are And What We Do

8:10am - 8:40am

Louise I. Lynch-O'Brien, University of Nebraska-Lincoln

The Philosophy of Entomology

We're entomologists. There is what the public thinks we do, what our friends think we do, what our parents think we do, what we want to do ...and what we actually do. But WHY do we do what we do? Take a brisk jaunt through the worldview upon which we have built our discipline. We'll consider methodology, the low hanging fruit that defines us as entomologists and dig deeper into our own thoughts on the nature of reality, knowledge, and values in entomological research.

8:40am – 9:00am

Jaret Daniels - Florida Museum of Natural History

Back from the brink: Collaborative conservation efforts to help save our only federally listed swallowtail

Schaus' swallowtail (*Heraclides aristodemus ponceanus*) is our only federally listed swallowtail and one of the rarest butterflies in North America. In 2012, range-wide comprehensive surveys documented only four adults, prompting significant concern about the continued future of this endemic taxon in south

Florida. As a result, an assurance population and captive breeding program was initiated at the Florida Museum of Natural History. The resulting collaborative recovery efforts have involved a combination of ex situ and in situ strategies including population monitoring, habitat restoration and population augmentation via organism reintroduction as well as a key citizen science component. Significant progress has been made over the past several years with spring 2021 survey results recording over 1700 adults, an increase of over 43,000%. Additional reintroduction efforts targeting currently unoccupied conservation areas in the Florida Keys have also yielded positive preliminary results.

9:00am - 9:10am

Paige Howorth, San Diego Zoo Wildlife Alliance

Not Just Another Little Brown Butterfly: The Return of the Laguna Mountains Skipper (Short)

Now known to only a few occurrences on Palomar Mountain in San Diego County, the Laguna Mountains Skipper has not been observed in its namesake range since the late 1990s. The U.S. Fish and Wildlife Service, San Diego Zoo Wildlife Alliance and WildSpring Ecology have collaborated to restore this tiny endangered butterfly to its former home.

9:10am - 9:30am

Sarah Jenkins - Omaha's Henry Doorly Zoo

An Update of the Captive Management and Reintroduction of the Salt Creek Tiger Beetle, *Cicindela nevadica lincolniana* (COLEOPTERA:CARABIDAE) at Omaha's Henry Doorly Zoo & Aquarium

The Salt Creek Tiger Beetle reintroduction program had amazing success in 2014 with the first zoo eclosed adult beetles. The differences in oviposition between wild pairs and zoo eclosed pairs were impressive. This will also update the current progress in the program.

9:30 am – 9:40

Winnifred Wolfe - Bowditch Middle School

Eight-legged Footprints: How Spiders Impact the World (Short)

All around the world people have different views of spiders and their kin. Some love them with all their hearts, some freak out at them and think they are vile, and then there is the people in between that respect them, but refuse to go near them, or vice-versa. My work this year is about how people look at spiders and feature them in their culture!

9:40am – 9:55am

Presenter Panel Discussion

9:55am – 10:15am

Announcements and Break

Education is the Key to Success

10:15 am - 10:35am

Faith J. Weeks, Towson University

“A mealy-what now?” Providing middle school teachers with authentic entomology research experiences to enhance student science curriculum

Authentic research experiences can increase student interest in science and their knowledge of science concepts, yet few teachers are trained in how to conduct research or utilize more of these experiences. In this study, middle school science teachers spent four weeks conducting entomological research on the symbiotic relationship between *Acropyga* ants and *Xenococcine* mealybugs. Participants then designed and taught lessons that integrated this experience into their science curriculum, utilizing live arthropods to engage students. All participants reported an increase in their interest in teaching with live insects, higher student engagement, and feeling more comfortable with entomology and the scientific process.

10:35am – 10:55am

Charles Wallace – Arizona State University

Don't Do What I Did: Mistakes to Avoid in Identification Guides

As part of my MS thesis, I completed a revision and photographic illustration of the “Otitidae” (the family now known as *Ulidiidae*) chapter in the *Manual of Nearctic Diptera*. By the time of the conference, it should be published by the *Canadian Journal of Arthropod Identification*. Since it's taken several years between completion (December 2017) and publication (soon, 2021), I've realized a series of mistakes I made during photography and writing I wish I could retroactively correct. I can't, so I want to let other people know about them so they won't make the same ones.

10:55am – 11:15am

Dr. Ron Wagler - The University of Texas at El Paso

Incorporating the Giant Peppered Roach (*Archimandrita tessellata*) into your Science Classroom

The giant peppered roach (*Archimandrita tessellata*) is one of the largest roach species on Earth! In the past, teachers could not possess this beautiful species. Recently, the United States federal government has allowed teachers to keep this calm and slow moving species in their classroom. This policy change provides an excellent opportunity for teachers and students alike to interact with this amazing insect! This presentation explains how to set up a simple, low-maintenance, inexpensive classroom enclosure that produces large numbers of healthy captive-bred giant peppered roaches. This presentation also provides examples of effective, hands-on classroom activities utilizing *Archimandrita tessellata*.

11:15am-11:35am

Miles Maxcer - The Ant Network

The Ant Network: A Unique Approach to Communicating Science & Developing the Hobbyist Community

Founded in 2015, The Ant Network was designed to unite ant keepers, researchers, and science educators as one community. As a science communication organization, we believe that by using ants and other wildlife, we can inspire people to take a closer look at the world beneath their feet. Our team has hunted elusive species around the globe, ranging from honeypot ants in the high Sonoran desert to the mysterious silk-spinning ants in the canopy of Madagascar's dry forest. We craft stories about wildlife and wild places through our engaging online videos, educational classroom presentations, and beautiful live insect exhibits.

11:35am – 11:45am

Gwen Pearson - Purdue Entomology

InsectFestivals.org: Can we develop a common evaluation for Bug Festivals? (short)

Can we develop a common evaluation for bug festivals? What are best practices for volunteers? Join this group and find out.

11:45am-noon

Presenter Panel Discussion

Noon - 1:30pm

Lunch (provided) – Presidio III, IV & V

WORKSHOP: 1:30pm – 4:30pm

Presidio I

Led by -Stephanie Dole - Beetlelady LLC

Sparking Curiosity and Connection Through Nature Journaling

Nature journaling is the practice of noticing and recording observations from the natural world. It is a powerful tool that connects people to nature and natural processes. This can be especially true for nature journaling with arthropods since they are ubiquitous, easily accessible, and often misunderstood. In this workshop, Dr. Stephanie Dole (Beetlelady) will teach simple ways to get started nature journaling on your own and in the classroom. We'll talk about tools, techniques, prompts, mindset, and lesson plans that you can bring back to your institution. Then, we will head outside and journal together in the beautiful Arizona landscape.

ROUNDTABLE: 1:30pm – 2:30pm

Presidio III, IV & V

Facilitated by Erin Sullivan, Woodland Park Zoo and Paige Howorth, San Diego Zoo

Invertebrate Welfare Roundtable

This informal discussion will focus on applying established concepts of animal welfare to enhance the lives of invertebrates in managed care.

ROUNDTABLE: 2:45pm-3:45pm

Presidio III, IV & V

Facilitated by Ann McKenzie - MSECRC, McPete Scientific, Education and Conservation Resource

THE B.S. OF BITES AND STINGS (HOW INVERTEBRATES LOVE US)

A layman's medical approach to skin & body reactions to various invertebrates.

EVENT: 7:00 pm - Insect Trivia Contest and Game Night– Presidio III, IV & V

FRIDAY, JULY 30

7:30am – 4:30pm Registration- Presidio Foyer

Registration may close during paper sessions and lunch

9:00am – 4:30pm Silent Auction – Presidio III, IV & V

8:00am – Welcome and Announcements - Presidio III, IV & V

8:10am – 9:50am - Paper Sessions – Presidio III, IV & V

10:10am – 11:30am - Paper Sessions – Presidio III, IV & V

Operation Critical

8:10am - 8:30am

Anita Schiller - Harris County PCT4 Biological Control Initiative

What do West Nile Virus Encephalitis, St. Louis Encephalitis, Dengue, Chikungunya and Zika Virus have in common?

They're viral infections with historic pandemics; all spread by mosquitoes; and their competent mosquito vectors can be found flying and biting in and around Houston, Texas. Now, picture a small captive Asian Tiger mosquito population that breeds year-round right in the middle of Houston in a lush tropical forest expertly created to showcase live flying butterflies- the Houston Museum of Natural Science Cockrell Butterfly Center Conservatory. With tens of thousands annual visitors to the conservatory, it's not hard to see the challenge this unique situation presents: How to eliminate the mosquito threat without harming the breadwinner butterflies- When pesticides aren't the answer, then what is?

8:30am - 8:50am

John Watts – Texas Discovery Gardens

Captain Chrysalis – In Search of *Acercophagus papaya*

Years three through nine at the RSSBH show a continuation of problems both biological and structural. Learn how Captain Chrysalis trekked through difficult governmental and regulatory jungles to find solutions to pestiferous populations of phytophagous insects. Witness bizarre reproductive confusions of lepidopteral proportions as Captain Chrysalis goes where no nymphalid should!

8:50am - 9:10am

Martin Feather - Fairchild Tropical Botanic Garden

7.5 years, 85,500 hours, then came COVID

Wings of the Tropics opened on 1st December 2012; we have relied entirely on volunteers for the daily running of the exhibit ever since. From early morning horticulture to dealing with pupae to opening, managing and closing the exhibit, volunteers are essential to our operations. This presentation looks at the different ways our awesome volunteers have been closely associated with the smooth running of this spectacular butterfly experience, including observations of issues thrown up by our reliance on the volunteers continuing availability, never more so than over the past 12 months as dealing with COVID became our new way of life.

9:10 am - 9:30am

Nathan Brockman – Reiman Gardens

Managing Invertebrate Care Activities with Trello

There are lots of ways to manage animal care and daily maintenance activities. Trello was originally designed to help teams of programmers work on code. In 2013 the Reiman Gardens staff switched Trello as their primary method for managing the invertebrate displays at Reiman Gardens. The use of Trello has evolved over the years as our understanding of the program grew and new features were rolled out. Here we will share what we have learned and how your organization might benefit from utilizing a similar tool.

9:30am – 9:45am

Panel Discussion

9:45am – 10:05am

Announcements and Break

Zoos Working Together

10:05am - 10:15am

Erin Sullivan, Woodland Park Zoo

Terrestrial Invertebrate Taxon Advisory Group (TITAG) Updates (short)

The Terrestrial Invertebrate Taxon Advisory Group (TITAG) was established in 1990 under the auspices of the Association of Zoos and Aquariums (AZA) in response to the pressing need to focus attention within the AZA and its member

like institutions on the conservation of invertebrates and the captive management needs of facilities exhibiting invertebrates for educational purposes. This paper will discuss who can be involved in TITAG. What the TAG supports. And why you should think about joining the team!

10:15am - 10:25am

Jessie Sutherland - Point Defiance Zoo

**Safety Web for Arthropod Reproduction and Management (SWARM)
(short)**

Analysis of the TITAG Regional Collection Plan illuminated that the invertebrate collections in most zoos relied on many of the same species. Some of these species are not currently being bred in captivity while other species were being maintained at only one or two zoos, making them vulnerable to extinction in our collections. With this in mind, TITAG developed the Safety Web for Arthropod Reproduction and Management (SWARM) project. The primary goal of SWARM is to promote the maintenance of sustainable populations for invertebrate programs and exhibition while reducing the risk of key populations disappearing from collections without warning.

10:25am – 10:45am

Glennon Frei and Kayla Garcia, Saint Louis Zoo

**All Hail the Snail! A 5-year review of Partula nail (Partula nodosa)
conservation and Future Possibilities**

As a Species Survival Program (SSP), partula snails were in a long-standing holding pattern of ex-situ care in an ever-changing group of participating zoos and aquaria. In 2016, that pattern changed with SSP and European equivalent EEP institutions collaborating to actively reintroduce snails back into French Polynesia. This talk will give an overview of how those reintroduction efforts have progressed and actively adjust to newly emerging developments moving forward. We will also discuss the steps and challenges the SSP is taking to address additional snail species of concern while trying not to muddle the whole process.

10:45am - 11:05am

Lily Maynard, PhD - Cincinnati Zoo & Botanical Garden, Zak Gezon - Disney's Animal Kingdom

Monarch SAFE

11:05am-11:20am

Panel Discussion

ROUNDTABLE: 11:20am – noon – Presidio III, IV & V

Wayne Wehling, USDA/APHIS PPQ

USDA Updates

The USDA permitting round table will be an opportunity to discuss changes to permitting requirements that affect the Arthropod exhibit community in the United States. Significant new changes may be in place by conference time. This gathering is an opportunity to ask questions, get answers, and seek change.

12:15pm – 1:30pm

Lunch (provided) - Presidio III, IV & V

WORKSHOP: 1:30pm – 4:30pm Presidio I

Led by - Louise I. Lynch-O'Brien, University of Nebraska-Lincoln

Cooking with Aquatics: How to create faux samples for distance programming about aquatic bioindicators

Guiding learners through the concept of aquatic invertebrates as bioindicators is tricky in virtual settings. But then, it's tricky under normal circumstances if the right habitats aren't accessible. Using (mostly) edible cooking materials, participants will learn how to create faux aquatic samples for use in distance programming about aquatic invertebrates. Of course, everyone has their own tastes. Whether it's a pinch of flour to increase turbidity, a drop of green food coloring to get things eutrophic, or a pile of pinto beans to mirror a fast-flowing stream, we will explore recipes and activities to bring aquatic entomology to participants' doorsteps.

ROUNDTABLE: 1:30pm – 3:30pm

Presidio III, IV & V

Facilitated By Robert Herndon – USFWS

US Fish and Wildlife. How can we help?

A round table to let folks bring issues and dialogue with USFWS on what we can do to help folks achieve their goals, while doing it legally.

ROUNDTABLE: 3:30pm – 4:30pm

Presidio III, IV & V

Facilitated by Erin Sullivan – Woodland Park Zoo

Pollinators! What is your institution doing?

What is your institution doing to help pollinators? Let's share ideas and inspire each other!

EVENT: 7:00pm – 9:00pm Evening Black Lighting Adventure, Catalina State Park

Black lights and sheets will be set up at this amazing location to enjoy the insect life as it flies in. Please note that this event is organized at no cost to conference participants. This means that there will be no meal provided, and participants are encouraged to eat before attending. Car caravans will be organized via a sign-up sheet in the exhibit hall, and will depart from the resort at 7 pm.

In case of inclement weather, please check in at the registration desk of to see if the event was canceled or moved.

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SATURDAY, JULY 29

7:00am – 1:00pm Registration - Presidio Foyer

7:00am – 1:00pm Silent Auction - Presidio III, IV & V

8:00am – Welcome and Announcements - Presidio III, IV & V

8:10am – 10:30am - Paper Session – Presidio III, IV & V

Tour time! Virtual Tours of Invertebrate Facilities

8:10am - 8:25am

Justin Dunning, Kurtis Herperger – Victoria Butterfly Gardens

Victoria Butterfly Gardens

Inverts eh! -- Please join us in a virtual flash tour of the Victoria Butterfly Gardens and Insectarium located in beautiful Brentwood Bay, British Columbia, Canada. This colourful tour is hosted by Justin Dunning (Living Collections Manager) and Kurtis Herperger (Gardens Manager).

8:25am - 8:40am

Amanda Lorenz, Michigan State University

The Bug House at Michigan State University

The Bug House at Michigan State has been serving the University and wider community for over twenty years. Founded as a space for members of the

Department of Entomology to engage the public in entomological outreach, the focus of the Bug House is to increase awareness of the positive roles insects and other arthropods play in the environment and their importance to human life. This presentation will discuss the facility and current educational programs through which the Bug House engages the University and surrounding community.

8:40am – 8:55am

Dave Clark - London Zoo

ZSL London Zoo's Tiny Giants exhibit

Our building showcasing invertebrates, originally opened as Web of Life in 1999 & then more recently called BUGS, has had a makeover. Now titled "Tiny Giants, from minibeasts to coral reefs", all the interpretation has been renewed with some updated interactives, and due to the closure of our ancient Aquarium, we now have an 8 metre long coral reef exhibit. Join Head of Invertebrates Dave Clarke for a whistle-stop tour of the new display.

8:55am - 9:10am

Ernesto Rodriguez - El Bosque Nuevo

El Bosque Nuevo Butterfly Farm

9:10am-9:30am

Panel Discussion

9:30am - 9:50am

Announcements and Break

Lets Talk About Husbandry

9:50am - 10:10am

Maia Holmes - Colorado State University

Diet Matters in the Growth of Captive African White Spotted Assassin Bug (*Platyeris biguttatus*)

Platyeris biguttatus (L. 1767) (AWSAB) is a large bodied bug, popular in both zoo and hobbyist living collections. While colonies of AWSAB have been commonly kept for decades, little has been published about them. My study focused on rearing AWSAB on crickets (*A. domesticus*), *Dubia* cockroaches (*B. dubia*), yellow mealworm larvae (*T. molitor*), or a combination of these species. Results indicate that the species of prey offered influences the growth rate, with individuals given multiple species of prey reaching maturity faster. Therefore,

steps should be taken to provide colonies of AWSAB a mixture of prey species instead of one species.

10:10am -10:30am

Michelle Faehr - Cincinnati Zoo & Botanical Garden

I Love You, Just Not in My Leaf Mold! A Guide to Nutrient Rich Leaf Mold, Without the Pesky Predators

Macro-organisms found in leaf mold piles are a sure sign of healthy soils; however, when attempting to raise beetle larvae, those macro-invertebrates are also pesky predators. After finding established populations of predacious ants in our leaf mold pile located at the Cincinnati Zoo & Botanical Garden, the World of the Insect staff had to dig deep to discover a way to effectively rid the leaf mold of potential predators. After trial and error, a new method of efficiently sterilizing large quantities of precious leaf mold was found and allowed our seven flower beetle species to thrive once again.

10:30am - 10:50am

Jeremy Jensen - Thanksgiving Point

The environmental conditions that leads to vinegaroon ecdysis

The giant vinegaroon (*Mastigoproctus giganteus*) is often referred to as the gateway arachnid because its large size and mild temperament are so approachable. While their general husbandry is well documented, records of ecdysial behaviors are sporadic and inconsistent. Ecdysis is important to the health and growth of many invertebrates and often critical to timing breeding events. Most *M. giganteus* are collected from southern Arizona, so by replicating yearly climatic cycles, we have induced ecdysial behaviors. This paper enumerates our giant vinegaroon husbandry protocols with the hope that this information contributes to improved health and breeding efforts in the field

10:50am – 11:00am

Mary Allen, Harris County Precinct 4, Texas Biological Control Initiative

More Than Fish Food: Raising *Dero* spp. for Aquatic Carnivores

"The small aquatic annelid, *Dero digitata* has long been known to aquaculturists as nutritious and easily cultured live fish food, but many species are being greatly underutilized. The single life stage organism varies in sizes from less than a centimeter to almost 10 cm in length, they are perfect food for many aquatic carnivorous, such as predacious dipterans, diving beetles, newts and salamanders. We will address how to field collect, identify, and set up cultures. Additionally, how to determine growth rates to create a tailormade sustainable harvest protocol. Whether they are fished out of a tree-hole or ordered from a

catalog, these easy to maintain worms are a breeze to set up in an aquatic worm farm.

11:00am-11:20am

Taylor Schwartz , Disney's Animal Kingdom

Training Jumping Spiders to Follow a Target

Jumping spiders have excellent vision with their four pairs of eyes. The secondary pairs on the side of their cephalothorax capture the movement while their main eyes capture more details which help them to be precise with their next move. These spiders are smart, animated, and curious. We began a training program in 2019 at Disney's Animal Kingdom with our regal jumping spiders (*Phidippus regius*). This paper will focus on the spiders amazing ability to target to a green laser pointer and the incredible behaviors we see through our ongoing training program.

11:20am -11:40am

Susi Ngoi, San Diego Zoo

How to Fill a Room with Spiders

11:40am-noon

Panel Discussion

Noon – 1:30pm

Lunch (on your own)

WORKSHOP: 1:30pm – 4:00pm Presidio I

Led by Charles Wallace – Arizona State University

Starting (and Running) an Educational Podcast

Less technically demanding than video and more accessible than live events, podcasts are a powerful tool for science communication, but it can be difficult to know where and how to start. Charles Wallace is one half of independent science podcast Assigned Scientist at Bachelor's (<https://asabpodcast.com/>) and in this workshop will guide you from idea to implementation, addressing questions such as: should you make a podcast? How good of a microphone do you actually need? Can you make a good podcast on a budget? How do you tailor content to your audience? Will you get sued? And more

WORKSHOP: 1:30pm – 4:00pm Presidio II

Led by Georgia Blum, Lady Buggy

Creative Oasis

Have you ever wanted your own pair of custom painted bug-themed shoes, but never had the time, supplies, or confidence to make them yourself? In this workshop, there will be no lecture or presentation. Just a dedicated time and space to create. You supply your white fabric/canvas item of choice such as shoes, cap, or bag, and I supply everything else you need to produce your own buggy masterpiece! There will be plenty of paints/brushes etc, plus examples and advice on techniques if you wish. Let's spend a relaxing few hours together visiting, painting, and being inspired. No experience necessary.

ROUNDTABLE: 1:30pm - 3:00pm Presidio III, IV & V

Facilitated by Julie LaTurner - Houston Zoo

Browse/Vegetation Needs Browse for invertebrates is very important, if not critical. This would be a round table to help each other with what types of browse we have been successful with and for what species. Lets share successes, surprises and challenges to supplying our collections with browse, not only for bug keeping veterans, but also for those new to the field.

BANQUET

6:00pm Final Silent Auction Bids

6:00pm – 10:00pm

Cash Bar, Banquet and Dancing– Presidio III, IV & V

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Steve Prchal Scholarship

TITAG extends our sincere gratitude to everyone who has donated to the Steve Prchal Scholarship over the last year. The first scholarships were given in 2015, we did not award in 2020, but since 2015 we have awarded 16 scholarships and have awarded over \$30,000!

Your generous donations have enabled us to grant two scholarships this year, allowing us to help foster the next generation of environmental educators and ensure that Steve's goal of "turning the world onto bugs" will continue on in his memory.

2021 Scholarship Recipients

Congratulations to Irene Dickinson and James Hall the recipients of the 2021 Steve Prchal Scholarship. Welcome to the conference! We hope this is the first of many in your professional career.



Mary Allen
HCPCT4 Biological Control Initiative
5707 Louetta Rd
Spring, TX 77379
US
mallen@hcp4.net
(281) 274-4345

Sue Andersen
Woodland Park Zoo
926 224th Crt. NE
Sammamish, WA 98074
US
fulmerwest@yahoo.com
(425) 502-1283

Amanda Barron
Woodland Park Zoo
5500 Phinney Ave N
Seattle, WA 98103
US
Amanda.Barron@zoo.org
(206) 548-2500

Catherine Bartlett
Arizona-Sonora Desert Museum
2021 N. Kinney Rd
Tucson, AZ 85743
US
cbartlett@desertmuseum.org
(520) 883-3004

Georgia Blum
Lady Buggy
108 Elgin Estates View SE
Calgary, AB T2Z0Y4
CA
georgiacblum@gmail.com
(403) 923-3689

Adrienne Brewster
Cambridge Butterfly Conservatory
2500 Kossuth Road
Cambridge, ON N1H2E2
CA
curator@cambridgebutterfly.com
(519) 760-3413

Nathan Brockman
Reiman Gardens Iowa State
Universtiy
1407 University Blvd
Ames, IA 50011
US
mantisnb@iastate.edu
(515) 294-2567

Shane Burchfield
Bugs of America
P.O. BOX 16251
Portal, AZ 85632
US
bugsofamerica@vtc.net
(520) 904-5151

Charlotte Bynar
Isaac's Ant Foundation
1168 North Flowing Springs Trail
Flagstaff, AZ 86004
US
charliebynar@bynar.com
(928) 380-1264

Anita Camacho
Tampa Bay Butterfly Foundation
4106 W San Miguel St
Tampa, FL 33629
US
Anita@ButterflyTampa.com
(813) 748-7098

Derrick Camacho
Tampa Bay Butterfly Foundation
4106 W San Miguel St
Tampa, FL 33629
US
DerrickMichael.J@gmail.com
(813) 526-1981

Celeste Castro
Cockrell Butterfly Center
5710 De Lange Ln
Houston, TX 77092
US
ccastro@hmns.org
(512) 632-6633

Lindsey Cathcart
Rock Creek Conservancy
3200 Wisconsin Ave Suite 500
Bethesda, MD 20814
US
lcathcart@rockcreekconservancy.org

John Chastain
Toledo Zoo
1317 Anderson Ave
Maumee, OH 43537-3026
US
bothrieichis83@gmail.com
(608) 287-6496

Traci Clevenger
Omaha Zoo
3701 S 10th St
Omaha, NE 68107
US
traci.clevenger@omahazoo.com
(402) 557-6926

Dayna Cooper
Harlow Gardens
5620 E Pima Street
Tucson, AZ 85712
US
Bugs2u@aol.com
(480) 433-9036

Jaret Daniels
Florida Museum of Natural History,
University of Florida
3215 Hull Road
Gainesville, FL 32611
US
jdaniels@flmnh.ufl.edu
(352) 273-2022

Lauren Davidson
Cockrell Butterfly Center
5555 Hermann Park Drive
Houston, TX 77030
US
ldavidson@hmns.org
(713) 639-4750

Mark Deering
Deering Photography
181 20th Ave NW
Naples, FL 34120
US
bflyphoto@earthlink.net
(239) 537-2732

Griffin Dole
Beetlelady LLC
35 North Norfolk Street
SAN MATEO, CA 94401
US
stephanie@beetlelady.com
(707) 228-5727

Stephanie Dole
Beetlelady LLC
35 North Norfolk Street
SAN MATEO, CA 94401
US
stephanie@beetlelady.com
(707) 228-5727

Michelle Faehr
Cincinnati Zoo & Botanical Garden
3400 vine street
CINCINNATI, OH 45220
US
lisa.sparks@cincinnati-zoo.org
(513) 487-3455

Madison Ferner
DMVA
26-151 Tomstown Road, FTIG
Annville, PA 17003
US
mferner@pa.gov
(717) 861-8181

Glennon Frei
SAINT LOUIS ZOO
#1 Government Drive
Saint Louis, MO 63110
US
frei@stlzoo.org
(314) 646-4830

John Fuentes
American Museum of Natural History
1560 Greene Avenue
Brooklyn, NY 11237
US
sdo.john@gmail.com

Ryan Garrett
Leaf House Scientific LLC
1083 E Street
Springfield, OR 97477
US
ryan@leafhousescientific.com
(541) 240-9431

James Hall
Phoenix Zoo
33891 N Slate Creek Dr
Queen Creek, AZ 85143
US
jhall@phoenixzoo.org
(928) 853-8699

Jack Henderson
San Miguel High School
1899 W Bothell Way
Tucson, AZ 85746
US
brojack@sanmiguelhigh.org
(559) 779-4555

Kurtis Herperger
Victoria Butterfly Gardens
1461 Benvenuto Ave
Brentwood Bay, BC V8M1J5
CA
kurtis@butterflygardnes.com
(250) 652-3822

Katherine Herzog
The Toledo Zoo
4714 290th St.
Toledo, OH 43611
US
katherine.herzog@toledozoo.org
(734) 558-7145

Maia Holmes
Colorado State University
1177 Plant Sciences Bld, CSU Main
Campus
Ft. Collins, CO 80523
US
maia.holmes@colostate.edu
(303) 726-1405

Kiffnie Holt
Kansas State University
123 West Waters Hall
Manhattan, KS 66506
US
kiffnie@ksu.edu

Kim Hoskins
None
6243 Babcock
San Antonio, TX 78240
US
khoskins@alamo.edu
(210) 696-3780

Nathan Hunt
135 juniper court
Collegeville, PA 19426
US
nhunt72103@gmail.com
(484) 447-6037

Bradley Hunt
Texas Discovery Gardens
1408 NEWBURY LN
PLANO, TX 75025
US
Bradleyhunt1@gmail.com
(469) 605-7044

Sarah Jenkins
Omaha's Henry Doorly Zoo &
Aquarium
3701 S 10th St
Omaha, NE 68107
US
sarah.jenkins@omahazoo.com
(208) 371-6729

Jeremy Jensen
Thanksgiving Point Butterfly
Biosphere
3003 N. Thanksgiving way
Lehi, UT 84043
US
jjensen@thanksgivingpoint.org

Josh Keiple
Towson University
8000 York Rd
Towson, MD 21252
US
jkeipl1@students.towson.edu

Josh & Amanda Kristinat
Ants Flagstaff
535 North Bertrand Street
FLAGSTAFF, AZ 86001
US
adkristinat@juno.com
(928) 225-5253

Julie LaTurner
Houston Zoo
1513 Cambridge St.
Houston, TX 77054
US
jlaturner@houstonzoo.org
(206) 769-6842

Zachary Lemann
Audubon Nature Institute
1 Canal St.
New Orleans, LA 70130
US
zlemann@auduboninstitute.org
(504) 587-2109

Clayton Leopold
Moody Gardens, Inc.
One Hope Blvd.
Galveston, TX 77554
US
lbarber@moodygardens.org
(409) 683-4000

Amanda Lorenz
Michigan State University
288 Farm Lane, Rm 243 Natural
Science
East Lansing, MI 48824
US
lorenzam@msu.edu
(734) 765-7399

Louise Lynch-O'Brien
University of Nebraska-Lincoln
1700 East Campus Loop
Lincoln, NE 68583
US
llynchobrien@unl.edu
(914) 443-5702

Michael Madsen
Tucson Botanical Gardens
2150 North Alvernon Way
Tucson, AZ 85712
US
butterflymagic@tucsonbotanical.org

Mitchell Magdich
The Toledo Zoo & Aquarium
2 Hippoway
Toledo, OH 43614
US
mitch.edu@toledozeo.org
(419) 385-5721

Akshay Mahajan
Amateur
1300 22nd St, Apt 2
San Francisco, CA 94107
US
akshay.mahajan9690@gmail.com
(408) 823-9411

Glenn Marangelo
Missoula Butterfly House and
Insectarium
PO Box 8885
Missoula, MT 59807-8885
US
glenn@missoulabutterflyhouse.org
(406) 214-5140

Jen Marangelo
Missoula Butterfly House and
Insectarium
PO Box 8885
Missoula, MT 59807-8885
US
jen@missoulabutterflyhouse.org
(406) 214-5036

Kirk Martin
Department of Agriculture
4700 River Rd
Riverdale, MD 20737
US
kirk.w.martin@usda.gov
(301) 851-2267

Sarah May
Cook Museum of Natural Science
3335 Avalon Lake Dr
Madison, AL 35756, AL 35756
US
smay@cookmuseum.org
(360) 936-8170

Ann McKenzie
MSECR (McPete Scientific,
Education & Conservation Resource
21699 County Road 77
Wabasha, MN 55981
US
jonmcpete@yahoo.com
(651) 564-0151

Erika McKinney
DMVA
Bldg. 0-11, FTIG
ANNVILLE, PA 17003
US
ermckinney@pa.gov
(717) 861-8181

Erin Mills
Houston Museum of Natural Science
2102 Madewood Drive
Missouri City, TX 77459
US
emills@hmns.org
(713) 933-9794

Randy Morgan
Cincinnati Zoo & Botanical Garden
1754 Cornelius Ln
Okeana, OH 45053
US
randyantmorgan@gmail.com
(513) 484-9697

Kevin Mudd
Idlewild Butterfly Farm
1100 Logan St.
Louisville, KY 40204
US
kevin@idlewildbutterflyfarm.com
(502) 435-9191

Nate Nelson
Sedgwick County Zoo
5555 W Zoo Blvd
Wichita, KS 67212
US
nnelson@scz.org
(316) 266-8265

Kaeli Nichols
Houston Museum of Natural Science
6301 Alemda Road, Apt 624
Houston, TX 77021
US
kaelinichols@gmail.com
(504) 782-1079

Trisha Nichols
Looking ;)
4111 Elbridge St.
Philadelphia, PA 19135
US
buggirl3216@gmail.com
(734) 552-5142

Gwen Pearson
Purdue University
901 W State Street
West Lafayette, IN 47909
US
gpearso@purdue.edu
(517) 410-7166

Jonathan Peterson
MSECR
21699 County Road 77
Wabasha, MN 55981
US
jonmcpete@yahoo.com
(651) 564-1545

Nicole Pruess
Sophia M. Sachs Butterfly House
4 Trost Ln
Warrenton, MO 63383
US
npruess@mobot.org
(314) 494-0127

Winton Ray
Cincinnati Zoo & Botanical Garden
3400 vine street
cincinnati, OH 45220
US
lisa.sparks@cincinnati-zoo.org
(513) 487-3455

Barbara Reger
Retired Teacher
4616 S State Road 9
Greenfield, IN 46140
US
barbarareger5@gmail.com
(317) 341-1707

Samantha Roberts
Towson University
4201 Falls Rd Apt 11
Baltimore, MD 21211
US
srober36@students.towson.edu

Ernesto Rodriguez
Mariposario del Bosque Nuevo
Santa Cecilia
La Cruz, 51002
CR
lasbrisas@racsa.co.cr
(506) 882-4682

Jeni Ruisch
Ohio State University
Rothenbuhler Honeybee Laboratory
2501 Carmack road
Columbus, OH 43210-1065
US
ruisch.2@osu.edu
(614) 743-8416

Anita Schiller
HCPCT4 Biological Control Initiative
5707 Louetta Rd
Spring, TX 77379
US
aschiller@hcp4.net
(281) 274-4344

Patrick Schlemmer
San Francisco Zoo
1 Zoo Road
San Francisco, CA 94132-1027
US
PatrickS@sfzoo.org
(415) 710-2907

Taylor Schwartz
Disneys Animal Kingdom
PO BOX 10000
Bay Lake, FL 32830
US
taylor.j.schwartz@disney.com
(952) 215-6799

Laurel Shawe
Bugs of America
P.O Box 16251
Portal, AZ 85632
US
laurelbrook@gmail.com

James Ship
IABES
Butterfly Farm
Stratford-upon-Avon, warwickshire
CV377LS
GB
accounts@butterflyfarm.co.uk

Jamie Sincage
Disney's Animal Kingdom
1200 North Savannah Circle East
Lake Buena Vista, FL 32830
US
jamie.sincage@disney.com
(321) 263-6334

Celia Stuart
BioQuip
2321 Gladwick St
Rancho Dominguez, CA 90220
US
celia@bioquip.com
(310) 667-8800

Erin Sullivan
Woodland Park Zoo
5500 Phinney Ave N
seattle, WA 98103
US
erin.sullivan@zoo.org
(206) 548-2512

Jessica Sutherland
Point Defiance Zoo & Aquarium
5400 N Pearl St
Tacoma, WA 98407
US
jessie.sutherland@pdza.org
(253) 404-3800

Mark Swartz
DMVA
Bldg. 0-11, FTIG
ANNVILLE, PA 17003
US
markswartz@pa.gov
(717) 861-8181

Kayli Thomas
DMVA
Bldg. 0-11
ANNVILLE, PA 17003
US
kaythomas@pa.gov
(717) 861-8181

Virginia Tilden
DMVA
Bldg. 0-11, FTIG
ANNVILLE, PA 17003
US
vtilden@pa.gov
(717) 861-8181

Matthew Trujillo
The Butterfly Palace
4106 W Hwy 76
Branson, MO 65616
US
matt@thebutterflypalace.com
(417) 239-7552

Tim Van Loan
ABQ BioPark
903 10th St SW
Albuquerque, NM 87102
US
timjvanloan@gmail.com
(520) 275-8228

Karen Verderame
Academy of Natural Sciences of
Drexel University
1900 Benjamin Franklin Parkway
Philadelphia, PA 19103
US
kcv28@drexel.edu
(215) 601-0857

Stacey Vielma
San Diego Natural History Museum
9735 Cactus Street, Apt. B
Lakeside, CA 92040
US
svielma@sdnhm.org
(619) 813-8060

Ron Wagler
The University of Texas at El Paso
1460 Cheyenne Ridge Drive
El Paso, TX 79912
US
rrwagler2@utep.edu
(915) 540-4496

Charles Wallace
Arizona State University
734 W Alameda Dr
Tempe, AZ 85281
US
charleswallaceformal@gmail.com
(919) 885-7648

John Watts
Texas Discovery Gardens
3601 Martin Luther King Jr Blvd
Dallas, TX 75218
US
jwatts@txdg.org
(303) 829-5405

Faith Weeks
Towson University
8000 York Rd
Towson, MD 21252
US
fweeks@towson.edu

Wayne Wehling
USDA
4700 River Rd
Riverdale, MD 20737
US
wayne.f.wehling@usda.gov
(301) 851-2336

Michael Weissmann
Kallima Consultants, Inc.
PO Box 33084
Northglenn, CO 80233
US
AskArtie@aol.com
(720) 872-6262

Rachel Williams
Kallima Consultants, Inc.
3729 E. 135th Dr.
Thornton, CO 80241
US
EWilli7669@aol.com
(303) 913-8631

Winnifred Wolfe
Bowditch Middle School
1151 Foster City Blvd
Foster City, CA 94404
US
freddie.wolfe2009@gmail.com
(805) 245-3664

Michael Wrubel
Bronx Zoo/WCS
2300 Southern Blvd
Bronx, NY 10460
US
Mwrubel@wcs.org

Tad Yankoski
Sophia Sachs Butterfly House
15050 Faust Park
Chesterfield, MO 63017
US
yankoski@gmail.com
(607) 351-4564