

The Sentinels and the Saviors
Exploring the plight of North America's most endangered animal

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at the University of Missouri in partial fulfillment
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DEDICATION

This project is dedicated to the scientists and conservation photographers across the country who are working in concert to raise awareness and help the connect us with the less well-known and often overlooked 'non-charismatic' endangered species.

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Chapter 1: INTRODUCTION

My journey to this point in my career, a photojournalism student at the University of Missouri, has come through a circuitous route. After an early life career as a registered nurse (for 8 years), I finished my undergraduate degree in Life Sciences and in 1994, went to work at the Missouri Department of Natural Resources, where I held various positions over the course of 22 years. Primarily an environmental regulator, it was my job to enforce federal and state environmental regulations aimed at protecting air and water quality, conserving soil, reclaiming mined lands, overseeing proper management of municipal and hazardous wastes, and ensuring safe drinking water.

Our major environmental laws were enacted decades ago, mostly in response to some event or course of events, and they tend to be relatively narrowly focused and siloed. Although many of the environmental laws have provisions to address direct impacts to fish and wildlife, such impacts are not considered in a holistic fashion that would protect or enhance biodiversity on a large scale. Even the Endangered Species Act, which was specifically intended to address the decline of species, is hampered by limited resources and controversy.

In other words, although there is some consideration for habitat and species impact in many of these laws, concerns related to the importance of biodiversity to all living systems is underserved by our current regulatory structure. My years in environmental work sparked my interest in biodiversity, specifically, how our actions affect not only human health, but earth's complex and interconnected ecology. My interest in

journalism, and photojournalism in particular, comes from a perspective of wanting to raise awareness about important issues. It is my hope that once people gain a better understanding about the problems affecting biodiversity, and the consequences of its loss, they will be compelled to act or at least to care about the decline in species diversity.

For my project, I chose to focus on freshwater mussels, one of the most endangered species in North America (Center for Biological Diversity, n.d.). A report by the Center for Biological Diversity in 2016 found money allocated for endangered species recovery woefully inadequate overall and freshwater mussels received disproportionately fewer dollars relative to the threat (Greenwald, et al, 2016). This makes increasing public awareness to elevate problems of the species' decline to the appropriate level on the public policy agenda critical to the cause of improving their likelihood of survival.

In addition to the fact that they among the most endangered animals, freshwater mussels interest me because, even though they play an important role in water quality and the food chain, people are not aware of their complex and fascinating life cycle. These creatures, which many deem 'non-charismatic', tend to garner less attention from the public than species such as polar bears, tigers, and pandas. This is, in part, because most of their life is spent buried in the gravel of a streambed and thus out of sight.

But even if these animals were more plainly visible in our environment, they do not have the characteristics of other, charismatic endangered species that tend to draw the sympathy of humans. While Ducarme, et al (2012) were unsuccessful in identifying a consensus definition among conservation biologist on what constitutes a ‘charismatic species,’ they determined such species are generally distinguished as “large mammals and vertebrates with some attractive traits for the human population considered, such as intelligence, beauty, valor, singularity or a strong symbolic” (Ducarme, et al, p. 7). While freshwater mussels do not have any of these traits, they are nonetheless fascinating creatures with an interesting life cycle and evolutionary adaptations. It is my goal with the professional skill component of this project to create visuals and an accompanying narrative to introduce the uninitiated to the plight of these incredible, yet little regarded and undervalued animals.

For the analysis portion of my project, I interviewed eight conservation photographers to gain insights about how they approach photographing endangered species, and what they hope to accomplish with their work. This included specific questions about species that are not inherently beautiful or attractive to humans. The professional skills portion of my project is a photo essay that seeks to attune readers to the importance of freshwater mussels in our ecosystems, inform them of some of the reasons for their decline, and highlight the efforts of scientists who are working to conserve and restore their depleted populations.

Chapter 2: LITERATURE REVIEW

In 1973, Congress passed the Endangered Species Act, and endorsed the view of scientists and conservationists in stating endangered wildlife and plants "are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." (U.S. Fish & Wildlife Service, 2020). Further, the U.S. Fish & Wildlife lists among the reasons to conserve species as benefits of natural diversity; contributions to medicine; biodiversity and agriculture; environmental monitors; ecosystem services; and other economic and intangible values. (U.S. Fish & Wildlife Service, 2020). Although the law passed with little fanfare, it has arguably become one of the most, if not the most, controversial laws on the books today (Doremus, 2010) and remains a partisan lightning rod. While the Act lays out broad, overarching goals, actual implementation of the Act with respect to some species has been at times highly complex, politically charged, and sometimes results in lengthy litigation which delays recovery action.

Declines in biodiversity have been covered outside of academic and government circles, raising general awareness. In 2014, *The New Yorker* science contributor Elizabeth Kolbert wrote the nonfiction book, *The Sixth Extinction: An Unnatural History*, which won the Pulitzer Prize for General Nonfiction in 2015 (The Pulitzer Prizes, n.d.). The book made number 12 on the New York Times 2014 best-seller list and was the first book profiled by *The Guardian* in a 2016 series highlighting the best in nonfiction books. Kolbert was moved to write the book, in part, by an article by herpetologists David Wake and Vance Vredenburg in the *Proceedings of the National Academy of Sciences*. In their paper, Wake and Vredenburg (2008) documented that as much as one-third of the 6,300 species of

amphibians were threatened with extinction. In 2019, the United Nations released a report documenting as many as 25% of plant and animal species are vulnerable and in their press materials issued a dire warning:

“Following the adoption of this historic report, no one will be able to claim that they did not know,” the head of the United Nations Educational, Scientific and Cultural Organization said. “We can no longer continue to destroy the diversity of life. This is our responsibility towards future generations.” Highlighting the universal importance of biodiversity – the diversity within species, between species and of ecosystems – [UNESCO Director-General Audrey] Azoulay said that protecting it “is as vital as fighting climate change” (UN report: Nature’s dangerous decline ‘unprecedented’; Species extinction rates ‘accelerating’, 2019, May 6).

These are just a couple of examples of high-profile attention to the issues of declining biodiversity. With such attention to the issue, one may expect a concomitant rise to the top of the public policy agenda. The ‘knowledge deficit model of science communication,’ or more simply the ‘deficit model,’ holds that if the public is given the requisite information on an important scientific topic, it will increase public support for science-informed decision-making among those educated (The Models of Science Communication, 2014). However, despite the persistence of the deficit model in scientific circles (Simis, et al, 2016) some researchers have questioned its effectiveness and called for alternative approaches. One approach, suggested by Jones and Crow (2017), calls for connecting audiences with an issue through storytelling and focusing on issues that matter to them. This has obvious relevance to journalism, and particularly photojournalism.

Because implementation of measures to ensure endangered species protection or work toward recovery can mean exerting a certain level of regulatory control over land use and development, the Act often implies conflicts between environmental interests and business interests. This has led to disagreements among stakeholders with competing value systems. Consequently, achieving a common understanding and consensus on a path forward with respect to any particular species can present challenges. Because much of endangered species' recovery involves actions or restrictions on private lands, building public support can be a critical component of moving forward with recovery efforts on a particular species.

Popular 'poster children' for biodiversity and species loss tend to be 'charismatic megafauna' like polar bears, tigers, and giant pandas (Cosier, 2009). Merriam-Webster defines 'charisma' as "a special magnetic charm or appeal." Consequently, these animals are ready made for campaigns to raise awareness or money in the hopes of reversing their plight. However, notwithstanding their relative popularity, even these species sometimes spark heated debate. The spotted owl in the Pacific Northwest, grey wolves in the Northern Rockies, and grizzly bears in the Greater Yellowstone Ecosystem provide just a few of many examples.

If conservation efforts for even the most charismatic species are not universally supported, what is to become of the lesser known or less attractive species such as invertebrates (including freshwater mussels), whose constituencies may be much smaller? This project will specifically focus on visual representation of endangered

species, and more specifically, freshwater mussels, an invertebrate, non-charismatic species with less public awareness and support.

Cardoso, et al, have identified seven impediments to invertebrate conservation:

“...(1) invertebrates and their ecological services are mostly unknown to the general public (the public dilemma); (2) policymakers and stakeholders are mostly unaware of invertebrate conservation problems (the political dilemma); (3) basic science on invertebrates is scarce and underfunded (the scientific dilemma); (4) most species are undescribed (the Linnean shortfall); (5) the distribution of described species is mostly unknown (the Wallacean shortfall); (6) the abundance of species and their changes in space and time are unknown (the Prestonian shortfall); (7) species ways of life and sensitivities to habitat change are largely unknown (the Hutchinsonian shortfall).” (Cardoso, et al, 2013, p. 2647).

By weaving together the importance of freshwater mussels in the ecosystem, and describing how anthropogenic factors have resulted in their endangerment, I hope to make the issue of freshwater mussel decline matter to the reader.

A recent Google search on “endangered species” focusing on the news tab of media outlet stories on the first two pages (as opposed to advocacy group press releases) is telling. The results include stories about turtles, whales, wolves, Indonesian tigers, Florida panthers, and Blakiston’s fish owl. This is obviously a snapshot in time and not a scientific study. However, based on my own experiences, it seems likely if you ask a lay person (as opposed to a scientist) to name an endangered species, they will be able to name at least one of the charismatic megafauna, but are unlikely to name an invertebrate (except perhaps the Monarch butterfly or bumblebee). This is despite the fact that invertebrates comprise 97% of all animal species on earth and the Union for the

Conservation of Nature estimates 30% are at risk of extinction (Center for Biological Diversity, n.d.).

Underrepresentation of non-charismatic endangered species is what motivated photographers Susan Middleton and Davide Littschwager to embark on a project to photographically document lesser-known endangered plant and animal species in California. "We never rejected anything for lack of charisma," noted Middleton. "Any living thing is astonishing in its own right-the challenge is to find its special beauty" (Moser, 1991). This is the mindset I have adopted and am hopeful my work will reveal the "astonishing" nature of freshwater mussels.

Research questions

RQ1: What framing and technical choices do photographers make when photographing non-charismatic endangered species to make the work compelling and impactful?

RQ2: What goals do conservation photographers photographing endangered species have for their work?

Theoretical framework

This study will be informed by framing theory. Davie summarizes framing theory as:

"... tied very closely to Agenda Setting theory. Both focus on how media draws the public's eye to specific topics – in this way they set the agenda. But Framing takes this a step further in the way in which the news is presented creates a frame for that information. This is usually a conscious choice by journalists – in this case a frame refers to the way media as gatekeepers organize and present the ideas, events, and topics they cover." (Davie, N.D.).

Lakoff contends (in discussing framing in the context of global warming) that contrary to conventional wisdom, people do not engage in “enlightenment thinking” where people are making rational decisions based on reason, but rather view the world through frames. Consequently, providing facts to people does not necessarily result in the “right” conclusion (Lakoff, 2010). The issue of global warming bears many similarities to species decline in that the causes are myriad, complex, and systemic.

Some examples of frames used in portraying endangered species include ‘anthropomorphizing’ them (Aswad, 2019) and focusing on more appealing or ‘charismatic’ species, known as ‘flagship’ species (Brambilla, 2013) (Smith, et al, 2012). Clucas, et al (2008) quantified this focus on flagship species and suggested that, while it can be an effective fundraising tool for conservation organizations, it may come at the expense of some non-charismatic species. The authors further suggested more focus on “...publish[ing] more cover articles that include, but are not limited to: the importance of biodiversity in ecosystem function; laboratory based methods of pinpointing areas of high biodiversity; the critical need to involve local stakeholders in conservation solutions; the import of working with industry to reduce greenhouse gas emissions; and engaging children’s interest in the natural world” (Clucas, et al, 2008, p. 1527).

In a review of literature and using the specific example of aquatic invertebrates, Joaquin Munoz (2007) also makes a case that focusing on flagship species can be detrimental to non-charismatic species and the overall message of biodiversity conservation. Other factors also result in these species garnering less attention. Leandro and Jay-Robert

found some bias against invertebrates in human perceptions of what constitutes biodiversity (2019). Liordos, et al (2017) found that species perceived as the most attractive and the safest (except for the brown bear) had higher support than those deemed uglier and more fearsome. A meta-analysis by Amuakwa-Mensah, et al (2018) found 'willingness-to-pay' for species conservation increases with threat level and charisma level. Some research shows even the relative appeal of names of species can have an impact on positive or negative reaction, suggesting this may be another way public support is influenced (Gregg, et al, 2020). In a study of photographs of penguins, Stokes (2007) found aesthetic differences in the photographs affected preferences among his study participants.

Researchers have identified several problems with conservation messaging, including: lack of audience targeting; a focus on educating and increasing awareness that does not compel behavior change; lack of grounding in theory; lack of strategic messaging; and limited research on effective means of communicating biodiversity issues (Kidd, et al, 2019). This aligns with a study by Echeverri, et al, which tested several types of messages related to endangered sea otters in Canada. The researchers found that initial attitudes about endangered species were important in crafting effective messages, i.e., if baseline attitudes are high in a particular target audience, a message targeting that attitude is unlikely to have a positive effect (Echeverri, et al, 2017). Kusamanoff, et al (2020) emphasize the importance of framing and offer "5 key lessons" for more effective communication of biodiversity messages: emphasizing what matters to the audience;

using social norms; reducing psychological distance; leveraging useful biases; and testing messages for effectiveness and unintended framing effects.

In analyzing two communication products related to biodiversity in the European Union, Ugglá found the visual materials emphasized esthetics and human connections, while avoiding the depiction of environmental degradation that negatively affects biodiversity, creating a message lacking unity (Ugglá, 2018). This is consistent with findings by Meisner and Takahashi's analysis of Time magazine covers (2013), which found the dominance of healthy, unharmed animals disconnected from the context of the environmental degradation that caused their decline.

Research suggests strong support for species conservation in principle, but less support when couched in terms of impacts to industrial development and property rights (McCune, et al, 2017). Within a political framework, there may be several factors at play among conservatives that “work against” environmentalism including the idea that people are above nature and is there for human exploitation; free-market ideology; thinking in terms of direct impacts as opposed to systemic; a “greed is good” mentality; worth of the environment determined in terms of value to human beings; and a negative view of liberalism (Lakoff, 2010, p.75). These differences in liberal and conservative values with respect to environmental sustainability can prove problematic for species recovery, and some research suggests framing messages from a conservative viewpoint that are relayed by a trusted messenger can help “[cross] the current political divide in the United States” (Hurst and Sturn, 2020, p. 9). However, in the case of highly politically polarized species (in this case the reintroduction of wolves in Colorado),

other research suggests message framing has little effect on attitudes and voting behavior (Niemiec, et al, 2020).

Notwithstanding these challenges, there is some support for the notion that increasing public awareness can assist in the plight of even the non-charismatic species.

Researchers analyzing marketing efforts at two conservation organizations and found substantial increases in marketing efforts could increase donations to support these animals (Verissimo, et al, 2017).

In this study I would like to explore how conservation photographers, in particular, use their craft to create messages, and what techniques and decisions do they use to tell a compelling story. As previously noted, for my own project I am particularly interested in freshwater mussels, as they are the most endangered species in North America. These animals are described colloquially as “rocks with guts” even by the malacologists working to save them from extinction. They spend the majority of their lives buried in the gravel of stream bed, out of sight and out of public consciousness. They lack a face, perhaps making them less relatable to humans, and could not by any generally accepted measure be considered cute or cuddly. My aim is similar to that of celebrated conservation photographer Joel Sartore with his project to document thousands of endangered animals. Sartore’s quote in *Audubon* resonates with me: “It’s become apparent to me: endangered species belong to all of us,” he says. “At the heart of the story is this, do we as a society treat the least among us with dignity and respect?” (Cosier, 2009).

However, because there may be relatively few conservation photographers who have done projects with non-charismatic species, much less freshwater mussels, for the research component of my project, I intend to seek out conservation photographers who have done projects on *any* endangered species. Learning how photographers frame endangered species in general may provide some insights into how to successfully make compelling projects that do not rely on the charisma of the species being photographed. While I have found some research on framing generally and how conservation and environmental photographers view the overall impact of their work, I have not yet discovered any research specifically exploring how environmental and conservation photographers frame (or how they would frame) their subjects when photographing non-charismatic species. In this study, I wish to explore how environmental and conservation photographers go about photographing endangered species, i.e., what are the conscious choices they make to create photographs and build a coherent, impactful story. In this way, I hope to add to the body of research describing photographers frame visual depictions of endangered species.

Chapter 3: PROFESSIONAL ANALYSIS

(Some quotes were lightly edited for flow)

If capturing human emotion or personality is a photojournalist's tried and true method of connecting their human photographic subjects with the consumers of their images, what are the techniques employed by wildlife photographers to grab the attention of the viewer? For species that are inherently beautiful and charismatic, simply making aesthetically pleasing portraits may be enough. But with some species, such as those that are mundane, or frightening, or 'ugly,' it may be difficult for the conservation photographer to make compelling images.

Freshwater mussels fall into this latter category. Because they spend their life halfway burrowed in stream beds, their visibility to humans is all but nonexistent. They lack eyes, or even a face, and are often called "rocks with guts," even by the scientists who study them. These 'non-charismatic' features pose special challenges to the conservation photographer. For this article, I interviewed eight renowned conservation photographers - Todd Amacker, Clay Bolt, Shane Gross, Amy Gulick, Steven David Johnson, David Liitschwager, Susan Middleton, and Noppadol Paothong - who share their insights about how they make their work stand out and try to connect viewers with their nonhuman subjects, especially those animals most people would not find beautiful or charismatic on the surface.

In most cases, those interviewed were primarily conservation photographers, however, Amacker is primarily a scientist who took up photography as a way of documenting his

work. Regardless of how they identified themselves, all of those interviewed felt photography was an important element in advancing the goals of environmental protection and conservation in general and believe it important to give some focus to lesser-known species. What follows are some of the common themes that arose from the interviews.

Making science and nature more accessible

Amy Gulick is a founding fellow of the International League of Conservation Photographers (ILCP) and has done two books on salmon. Gulick views herself as an interpreter of science and making science more accessible to the non-scientist. “In our head so many of us have separated ourselves [from nature],” notes Gulick. “I’m always trying to use my work to help people understand that we are connected, we are one thing, and why they should pay attention. Why it’s important.” Her book *Salmon in the Trees: Life in Alaska’s Tongass Rain Forest* was a project idea that arose when Gulick stumbled upon something she found intriguing in a highly technical, scientific paper involving how nutrients cycle through the ecosystem in the Tongass Rain Forest:

“[After reading the paper], the light bulb went on... [the paper’s authors] would never call it salmon in the trees, they called it the ‘upstream flow of marine derived nutrients in the terrestrial environment,’ ...that is scientifically accurate to say that. But if you want this really cool connection to get out there, and you want people to get excited about it, it’s like you, you gotta call it salmon in the trees.”

Shane Gross is a maritime conservation photographer and emerging league photographer with ILCP. Gross also sees a natural connection between science and conservation photography. He believes raising awareness is one goal of a multi-faceted

approach that also includes “helping with the science and helping with the conservation.” Gross thinks photography can play an important role in scientists being able to promote their work. “They come up with this amazing discovery...[and] if it's really, really groundbreaking it might get picked up by the news outlets, but if they have a photographer alongside them, documenting what they're doing, documenting the species...it has a better chance of getting the general public's attention, rather than just bouncing around in academic circles.”

Todd Amacker is a non-game fisheries biologist who has also become a published professional photographer. “I started off as a small child becoming interested in small organisms that most people would call non charismatic, and actually, most people might call bait.” Although his interest waned somewhat in high school, he went to college for environmental science and his passions were reawakened while teaching in South Africa, where he had the privilege of seeing charismatic megafauna, like lions, elephants, rhino, up close. This led to an interest in birds, and later insects. “When you become a really passionate naturalist, it's like when you pull on a thread of a sweater,” said Amacker. “You become a better ecologist because you understand how everything is connected.”

During graduate school, Amacker took a course on mollusks and he was hooked. “You hear all these fascinating stories about how they reproduce and how this one's only found in this stream, and what are the threats to that one ...[and the] charismatic versus non-charismatic, it doesn't matter,” said Amacker. “I want to learn them all, but I

prefer the smaller ones. And I think it really does just go back to my experience as a child.”

Being an ambassador for nature

Amacker got into photography as a way of documenting the species he studies, but he does employ his photography in other ways. He gives many talks on photography to various groups, such as students attending workshops presented by the North American Nature Photography Association. While he uses his photographs in his talks, he tends to focus more on the science. “[The host of the group will note I] never said anything about photography the entire time, but that's just not me,” said Amacker. “I want my passion for science to well up out of me and hopefully [it will inspire kids] to go into science.” Amacker also uses his photography to connect with groups that may not be otherwise interested in non-game species, such as fishing enthusiasts. He notes that even though some in these groups might not put themselves in the ‘conservationist’ category, they do have an interest:

“They are passionate about protecting habitat for species, usually game species, but they share habitat with non-game species that are threatened and endangered as well. And so I've always thought it very important to connect with fishermen and hunters and so I've given talks to fishing groups. My way of getting them interested is [to tell] them how female freshwater mussels are better at fishing than [they] are, and they are always like “What are you talking about?”... then I show them the mantle, lure and all that and they're always interested. I can't say I've ever had a group like not be interested.”

Noppadol Paothong is a nature photographer with the Missouri Department of Conservation, an associate fellow with the ILCP, and has published books on grassland grouse and sage grouse. Paothong also notes the importance of photographers

personally engaging with the public. “It’s not just images. Conservation photographers need to engage with the public, whether through public speaking, or being a good ambassador and talking about why we care,” says Paothong. “Because when you care, it shows in what you do, not just the images, but what you do.” He notes many conservation photographers do this, e.g., they may start a foundation or do a project, and in this way, they use not only their images, but their influence to change attitudes.

The camera sees things humans never notice

Often, making an image gives us the ability to see or study things we would otherwise overlook if we came across them in nature. A great example of this is on display in Steven David Johnson’s work. Johnson is a conservation photographer and professor of visual and communication arts at Eastern Mennonite University. His work on vernal pools in Appalachia brings us into a world few will notice with casual observation. Anyone who has trekked through the Mediterranean climates of the West coast or glaciated areas of the Midwest and Northeast may have come across these seasonal wetlands. While they may look nondescript, appearing as a temporary small puddle or shallow lake, these pools serve as home to an abundance of wildlife. But the life in these pools will only be seen if someone takes painstaking effort to photograph or film the tiny creatures that inhabit them. Johnson has captured the intricate details of animal activity in these ephemeral waterbodies, creating strikingly beautiful images of amphibians and other macroinvertebrates.

“I think photography plays a role in making things visible. There's ID photography, and there's relational or behavior photography. So the ID photography is the kind of standard stuff you see in a guide book...showing particular markings, showing how it differs from other species... But then there's the images that I make where I'm down

on my belly, face-to-face with a macro lens, kind of looking a creature in the eye. I feel like it's often those types of images that leave a lasting impression on people.”

Gross also notes the importance of species visibility to making people care. “There's that old saying, people protect what they love. It's hard to, it's hard to love something if you don't even know what it looks like,” said Gross. “When it comes to a species that people aren't familiar with...you've got to show them what they look like at least as a start...show parts of them people might not be familiar with, or maybe life cycle stages [or] maybe under a microscope they look really interesting.”

Clay Bolt is a natural history and conservation photographer, a fellow in the Linnean Society of London and associate fellow in the ILCP. Bolt's current project involves North America's native bees, and his photographic work in this area was instrumental in the listing of the rusty-patched bumble bee as the first federally protected native bee under the Endangered Species Act, which occurred in 2017. Bolt made a short film entitled *A Ghost in the Making: Searching for the Rusty Patch Bumblebee*, and presented it to several audiences, including National Geographic headquarters. Bolt and his colleagues also created a Change.Org petition that garnered 130,000 signatures, and Bolt spoke at a congressional briefing on Capitol Hill. Ultimately, the U.S. Fish & Wildlife Service decided to list the species.

“One thing that I find is that good photography is sometimes the only window that a person gets into a species life. So for example, with the rusty patch, there are a lot of photos of the species on a pin in a museum, but that's not inspirational...it is night and day between [what] one dead specimen looks like and an animal living in the field. And I think the other part of it is, and the thing that I really enjoy, is sort of trying to document more of a lifecycle of a species, showing interesting behavior and those kinds of things, which I think is really powerful for viewers.”

David Liitschwager is a freelance photographer who worked in advertising for many years, including a stint as an assistant to renowned portrait photographer Richard Avedon in New York City, before changing his focus to photographing natural history subjects. In one example, Liitschwager did a series of projects to discover how much life you can find in one cubic foot over a 24-hour period in various locations, e.g. under the Golden Gate Bridge, and on a reef crest in French Polynesia. He describes a part of this project in Central Park, involving "...sifting through the leaf litter and at one point, cutting open a fallen tree log and finding underneath it there were 200 millipedes and inside the log was another 150 termites," he said. For this project, Liitschwager stayed at the scale of 2 millimeter and above, but notes if he had gone down to the scale of one millimeter and below, "...you get into the oribatid mites...the tiny, tiny things that live on the surfaces of grains of dirt and soil...there is whole other scale of things...It's a fantastic opportunity to learn how amazing the world is." This work became a series of museum exhibits and a book entitled *One Cubic Foot*.

Bringing people into the picture

Some of the photographers talked about their work to show the interrelation of humans and the animals they photograph. Gross notes, "[Some of us] are interested in animals and endangered species and those kinds of things, we can see a picture or an article...and it can be really interesting to us. But a large portion of population connects more with people." Gross notes that sometimes focusing on the scientists themselves might draw another subset of potential audiences. In addition, indigenous peoples are often an important part of the story. "Looking into a lot of the environmental issues, a

lot of these animals or habitats have connections with indigenous peoples, and so I'm finding it's going to be really important to show that side of things and connect with [indigenous] people and the history ... and tell their story as best I can.”

Gulick’s past work has focused primarily on nature, wildlife, and ecosystems, and not so much the human element. However, her latest work, *The Salmon Way*, she describes as “totally people centric.” Although it took her out of her comfort zone, she pursued showing people and their relationship with salmon as a new way to tell the story. She wanted to show people whose way of life revolves around salmon. In this way, Gulick believes, conservation photography can capture a larger audience. “When you tell [the story of salmon] through the eyes of people, whether it's scientists studying the species, whether it's indigenous people who have lived with salmon for thousands and thousands of years ... and that's their whole culture, and that's how they survive, or commercial fishermen who catch and sell salmon. Now, you’ve really pulled a whole lot more people in, and a greater diversity of people.”

Susan Middleton is an artist, photographer, author and educator, who like Liitschwager, worked with Richard Avedon. Middleton uses her skills in portraiture to photograph rare and endangered species. Middleton and Liitschwager collaborated on a project for The California Nature Conservancy (CNC) to photograph a couple of species to support a legal action. Liitschwager notes they used the same techniques as high-end fashion photography, because the point was to show these animals as something of value, the same goal as advertising. The representative from the CNC, Middleton and

Liitschwager were pleased with the outcomes and ended up taking photographs of about 30 more animals, which became a travelling exhibit for the purposes of fundraising. The work eventually led to *Here Today: Portraits of Our Vanishing Wildlife*, published in 1991.

Susan Middleton recalled her experiences photographing freshwater mussels during her work with Liitschwager to photograph 100 endangered species; an experience that began to give her a deep appreciation for freshwater mussels and their lifestyles. Because she wanted to photograph more than just the shell, this required the biologist she was working with to temporarily remove one from the stream bed and place it in an aquarium and wait for the animal to emerge. Having little knowledge of the species before photographing them, she was immediately taken in, and even though photographing the mussels took a great deal of time and patience she found it very rewarding:

“I just felt a really strong desire to communicate some of their mystery and importance to the human realm...because most people just have no idea...Even when you're looking at them, if you're so lucky as to look at a live one, they're not immediately charismatic, but they are beautiful in their own right. The thing that really blew me away is how long they live, and how they stay attached to a particular place. They are sort of, to me, like the quintessential expression of that place.”

Middleton makes a point of photographing lesser known or less charismatic species because she wants people to understand their importance and that humans have a connection with these creatures in terms of biodiversity. “I want people to be able to have some ability to make their own connection, visually at least, with these animals and

plants so that they feel the connection, and then perhaps feel motivated to learn more and help in [their] preservation.”

Bolt believes most people do not have a very good sense of insects and invertebrates, and some publications want to portray them from the “creepy crawly” angle, which just perpetuates the dangerous or disgusting stereotypes. “I want people to love these things,” said Bolt. “I want people to see how amazing they are, so we have to shift that story.” Bolt is very concerned about the impending “insect apocalypse” and so he wants to do everything possible to help people see them in a different way.

In some cases, photography can be counterproductive to the cause of conservation. Bolt described how a much-maligned animal, the snake, is often portrayed in photographs. “You see this a lot . . . the snake is threatened, the mouth is open, the tongue is out. And that is a dramatic photograph,” said Bolt. “But what I realized is this reinforces the fear aspect of how people feel about snakes, and as I’ve become more experienced, I realized that that is an animal in distress.” Bolt said he has consciously moved away from photographing snakes in this manner. “I tend to just photograph everything in situ and not move it . . . [I] approach the animal in such a way that it doesn’t feel threatened. So it means ultimately, a lot of my reptile photos are a little bit less dramatic.”

While photographing a centipede, an animal he admits gives him “the willies a little bit,” Bolt saw the mother centipede who was clutching her eggs drop one and then pick it up

and bring it back to her body. Although he later read about this phenomenon in the scientific literature, at the time he witnessed it he was unaware of the behavior.

“She had all of those eggs, and she knew that one and fallen and she knew where it was at and she just used that leg to pull it back. I've never been able to look at centipedes in the same way. They do have that maternal care...And that was really like a mind-blowing moment to me...that was just a reminder to me that if you can photograph something that shifts the story for people, that can be really, really powerful . . . it's really more about trying to find behaviors that help people realize that we're more alike than we think. And sort of using those behaviors as a bridge.”

For his current work on bumblebees in North America, Bolt is using wide angle macro to capture the detail of the bee while simultaneously putting the bee in the context of its environment. “It's not what we would call traditional macro, but what it allows me to do is show a viewer, not only is this [animal] beautiful, but the habitat that it relies on is also really interesting and important.”

In 2009, Bolt co-founded a project called “Meet Your Neighbors” with Neil Bindi. The project uses a technique pioneered by Middleton, Liitschwager and James Balog – photographing the animal alone on a white background. Bolt uses a small white table in the field, capturing the subject for a few minutes to capture a detailed portrait, and releasing it back to the wild.

“... “Meet Your neighbors,” ... was a really influential project, because we had photographers participating all around the world...It was more of a franchise idea that photographers could learn the technique, they could take photographs of their subjects, and then share those images with the community to say, look, we have all of these amazing things here in our backyard. So it was really a local wildlife advocacy project, or biodiversity awareness project. . . what was so cool about it is a photograph of a species that I might have made, say, in South Carolina, was just as beautiful as something that was photographed in South America, because without the context of the background, it was hard to tell which one was exotic and which one was just your backyard species...I was really interested in this idea that there's always this concept that something in a faraway place is more valuable, . . . or more

worth protecting than something in your own backyard, because we tend to take for granted the things that we see every day or tend to not look closely, because those things in our backyard are just seen as mundane.”

Background research is critical to success

All of those interviewed stressed the importance of doing good background research before embarking on a project. Gulick does a lot of work in very remote locations, “People tend to think my life is 100% in some wild, gorgeous remote place in Alaska, and I'm on a river and I'm surrounded by bears, and they're catching salmon,” she said. In reality, she spends a lot of time on the phone and on the internet figuring out things like the best place to go, how to get to the location, and what is the best time of year to photograph. She notes, “It's a lot of networking, [and] talking to people, like maybe talking to government agencies that manage wildlife, [or] trying to get a biologist on the phone that studies the species I'm interested in.”

Paothong believes it is also about telling the whole story and being aware and knowledgeable about what you are photographing. “When you get a clear picture of what you are trying to work on it makes you a better photographer because you start seeing a story,” said Paothong. “[For example], maybe we need to photograph the habitat destruction and what caused the habitat destruction.”

Paothong recommends rigorous and comprehensive research for any big project, including talking to experts. “When I worked with sage grouse, I did research on the cultural connection with Native Americans, and that came from research, it came from understanding the background.” He recommends gaining an understanding of the

animal's habitat, its background, and the conservation issues surrounding it. Further, he stresses the importance of going beyond nature's beauty to look more holistically at the life of the animal. Paothong would also like to see more work done on lesser-known endangered species. "I think our conservation community needs to change our attitude toward the big, majestic, sexy wildlife [and start focusing] on a lot of the little things. As photographers, we need to do better," he said. "Many of my colleagues at ICLP [the International League of Conservation Photographers] are doing just that."

Gross reads the abstracts and conclusions of scientific papers and sets up Google Alerts to get notices in his inbox when news items are released about a species he is interested in. He also finds out what scientists are working on the species. "At some point, I'll reach out to them, and I have to say 99% of the time, they are happy that somebody wants to highlight their work and ... are really eager to collaborate," said Gross. "Having conversations with the scientists is the best way to learn, you get a lot more [of] the nuance [than you do from reading a scientific paper]."

Bolt says he typically reads as many books on his subject as possible. In a project involving the Wallace's giant bee, Bolt and a colleague spent two years reading through all of the research they could find in order to have the best chance of finding the animal in the wild.

"And it did pay off. But, you know, then there was this moment where we found a single bee and I had basically one shot to make this photograph of her at her nest after years of planning [and] traveling around to the other side of the world. [What really made it successful was] not only did I have this knowledge of what we thought the bee would do, but I had spent a ton of time photographing related species in the field."

Bolt further suggests conservation photographers need to 'play biologist.' He notes, "Essentially, you really need to do your research... I'm not exactly sure why but I feel like people often go into nature photography without feeling like they need to understand what's happening, the rules of the game, so to speak. So you know, I always use the example of imagine being a sports photographer covering the Super Bowl and you don't understand what a touchdown is... so you're shooting the other end of the zone. You know, you don't know where the action is happening."

Conclusion

One common thread among the individuals interviewed for this article is their curiosity about nature and passion for their work. Many mentioned the importance of helping humans see their connection to the natural world and described photographic techniques they use, coupled with a larger suite of communication tools, to convey their message. All had experience in finding beauty in the seemingly mundane and expressed the wonder they see in nature. They seek out and document those wonders, using the camera as a tool to bring to light the beauty they see that would otherwise stay hidden to most of the world.

Chapter 4: PHYSICAL EVIDENCE

Please refer to separate PDF file *The Sentinels and the Saviors*.

Chapter 5: CONCLUSION

When I first started the MA in Journalism program at Mizzou, I had thoughts of covering social justice of personal interest to me. With the increased political polarization of the country, I wanted to find issues where I could use photography to win hearts and minds. During Fundamentals of Photojournalism, I embarked on a project related to an issue I am passionate about – immigrants and refugees. Through a contact at the local refugee and immigration services, I did an initial interview with a young woman who had left unspeakable violence in her home country, and was settling into a life in Columbia, Missouri.

I conducted an initial visit and interview and felt positive about the project. However, within a few hours of this visit, I received a call from the person who had facilitated the meeting, who informed me that my subject no longer wanted to participate. I realized then that it would be very difficult to conduct such a project in the context of a semester-based class. It was completely understandable, and I should have anticipated the difficulty. Meaningful access requires building a substantial amount of trust, which takes time. Photojournalists might spend their entire career building up trust and getting more and more access to cover such stories. As I am embarking on this new vocation late in life, I do not have the luxury of that kind of time. Consequently, I shifted gears and decide to go back to my roots of environmental protection, where I have extensive background knowledge upon which to build.

During this project, through both the interviews for the analysis portion and my professional project work, the specific area where I want to focus my post-graduation efforts crystallized in my mind. Several of the conservation photographers I interviewed indicated that they work closely with scientists – gathering background information, going out in the field with them, and reading scientific papers or books to educate themselves on the subject they want to cover. I realized during these interviews and through my work, that I would like to focus my efforts on translating science to the lay person. In fact, the idea for focusing my final project on freshwater mussels evolved from a centerpiece story I did for the *Missourian*, which was a marriage of a long form story I completed in my science writing class and my final photo assignment in capstone. Because I have a science background and can, to a certain extent, talk the talk, I am hoping to build on this to carve out a niche in this area where there is an ever-increasing number of important topics to cover.

However, simply conveying facts about scientific topics to the public is no guarantee it will influence their behavior. We have two prevalent examples at the forefront of public discourse related to COVID and climate change, respectively. A significant proportion of the population remains vaccine hesitant even though billions are now fully vaccinated, and data show the vaccines are safe and effective. Continued public skepticism of climate change and lack of action to address it persists despite mountains of scientific information. These are but the most recent examples of the weakness of the knowledge deficit model.

It may be that the impending mass extinction some scientists are predicting calls for more than objective recitation of the facts and will require journalists to take on the role of advocate for species. Although the issue of advocacy journalism is controversial – some may even consider the phrase an oxymoron – the stakes for species are high.

I share the perspective offered explicitly by some of the conservation photographers I interviewed, namely, that we humans are not separate from nature. If we take this view, what is the role of objectivity in covering species demise? We are not objective about the deaths of millions of people worldwide in the last two years because of a global pandemic. It is heartbreaking. Why then should we be objective about the demise of nonhuman animal species?

Many people have not yet connected the dots that we are part of the same ecosystem as our nonhuman animal brethren, and their demise will not be without consequences for *homo sapiens*. I consider this belief foundational to my work. In addition, I am at a point in my life where I feel I need to take a side, and as I alluded to in my personal ethics statement, I intend to engage in advocacy journalism.

I found it interesting that none of the conservation photographers I interviewed talked about objectivity. It seemed like all of them focused on wanting to make an impact with their work. Whether it was the simple concept of raising awareness or supporting legal action to compel action under the Endangered Species Act, the photographers I interviewed seemed mission driven. I was also heartened by the fact that all the

photographers/scientists I interviewed saw a strong role for photography in advocating for environmental protection or conservation. Interestingly, a couple of the individuals I interviewed were scientists first, and photographers second. However, in looking at their photographs, you would not pick this up, as the work is extraordinary and is obviously different than scientists' typical documentation. As a follow up research question, it would be interesting to interview a larger group of conservation photographers, or to come up with a survey tool to ask this question in a more quantitative fashion, to see how many conservation photographers view themselves as advocacy journalists.

At any rate, journalistic ethics do not go by the wayside with advocacy journalism, which distinguishes it from propaganda. In my opinion, advocacy in the realm of environmental and conservation journalism comes in the topics you choose to cover. It is still critically important to get the facts right and to include all relevant voices in the story. The facts with respect to species decline speak are not pretty and there are plenty of stories to tell. The challenge is to help people see why it matters to them.

The power of documentary photography comes with its potential to weave a story that connects the audience to the subject and helps people understand why they should care. The conservation photographers I interviewed used a wide variety of techniques, most of which I was able to incorporate into this project. These include showing the inherent beauty of nature and animals; capturing fascinating aspects of animal behavior; providing context for how the animal fits into the larger ecosystem; and eliciting the practical and

cultural connections between their animal subjects and the humans with which they co-exist. I intend to continue practicing these techniques as I take on future projects.

I also really like writing in addition to making pictures. One of the conservation photographers I interviewed, Amy Gulick, talked about the importance of coupling good photos with narrative to ensure you are making the most of your efforts. In the future, I can envision making connections with scientists working on interesting conservation topics and partnering with them to help them report out the importance of their work.

I gained a great deal of insight from interviewing the eight conservation photographers for the analysis portion of my project. It was enjoyable, and I could have easily talked with each of them for several hours. One of the commonalities among those interviewed was their focus on conducting research of the science prior to embarking on a project. I do not think I had a real appreciation for this before this project – i.e., I did not know conservation photographers did so much preliminary research on their subjects.

Overall, I am pleased with how my project turned out. If I have one regret, it is that I did not have the ability to include more about the indigenous relationship to freshwater mussels. In planning my project to the Pacific Northwest, I found out very close to my departure time that I would need a permit to talk with tribal members. I was fortunate that the person in charge of the process expedited what would have normally been a several month process. I was able to talk with tribal members for my Pulitzer Center

project, but given more time, it would have been great to cover some of the cultural practices. Finally, this was my first foray into underwater photography. I used a simple point and shoot camera, but I would like to eventually have more sophisticated gear, including lighting.

It seems like everything is coming together from my undergraduate degree in life sciences (essentially biology with a heavy dose of chemistry), my previous career in environmental protection, my extreme concern about climate change and biodiversity, and my natural kinship with scientists.

I think there is a broad space for photojournalists and science writers who can translate scientific information into digestible and compelling forms for public consumption. A substantial portion of society has seemingly moved toward an anti-science orientation, or at least a science skeptic mindset. This did not happen overnight, and it will take time to get past the partisan divide and once again build trust in science and objective truth. I would like to be part of that effort.

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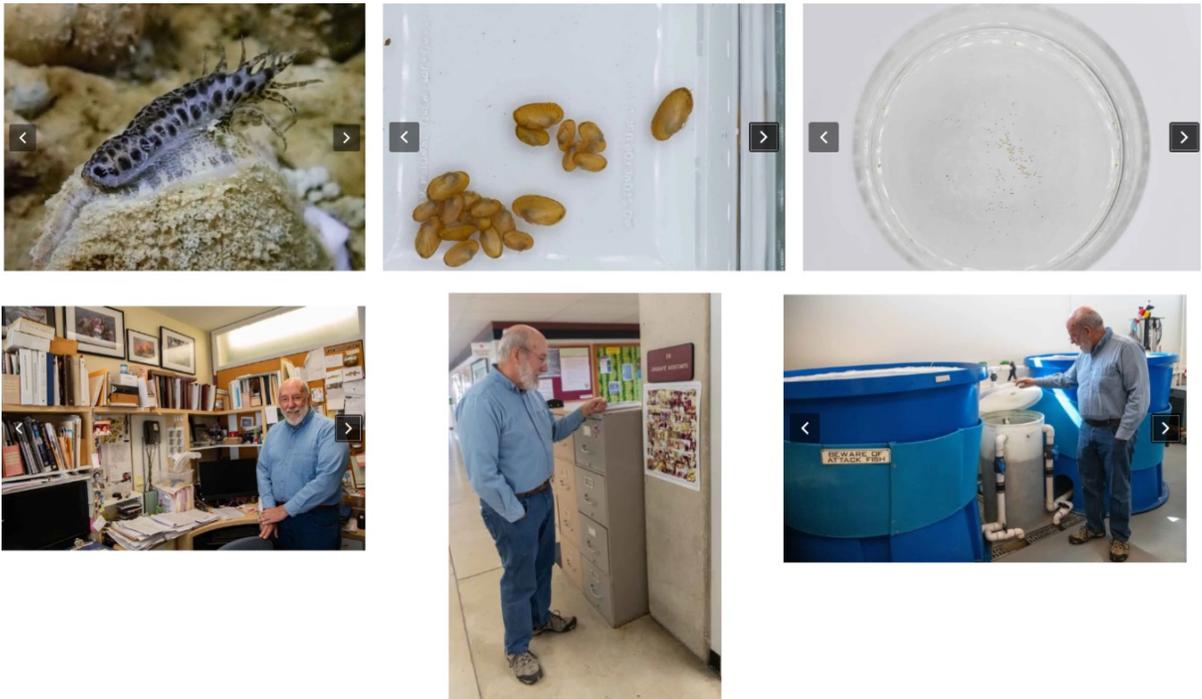
Appendix: FIELD NOTES

March 5 – April 4, 2022

Highlights/research progress/Goals for through the end of April

I visited CERC on March 14 as planned, and obtained some additional photographs of juvenile mussels, as well as a luring mussel, an unexpected bonus. I visited Chris Barnhart's lab on March 28. I submitted the first drafts of my abstract, introduction, analysis, and project book to Committee Chair Jackie Bell during spring break.

I am now in the final stages of completing my project, working on edits. The first three photos below are from the March 14 visit to CERC, and the last three are from the March 28 visit to Chris Barnhart's lab.



February 4 – March 4, 2022

Highlights/research progress

After getting further into the eight interviews I've done, I decided I have enough material to work with so I am not pursuing further interviews. I have been going through and highlighting themes, and refining transcripts as I go.

Work issues

I have made several additional contacts with Bryan Simmons to get access to Dr. Barnhart, to no avail. I will continue to make contacts. I think this is an important part of the story.

Goals for through the end of March

I obtained a light tent for purposes of re-photographing the juvenile mussels. I have an appointment scheduled at CERC for Monday, March 14. I also have an edit scheduled with Jackie Bell for the same day. I will work on an introduction and abstract.

January 18 – February 4, 2022

Highlights/research progress

I have been reviewing interview notes from the eight I have conducted, but still hope to interview two more photographers for a total of 10. I have been taking a graphic design course through Coursera over the interim and continuing into the spring to help me with book design. (On a side note, I am on vacation in Belize, which began February 5 and ends February 14).

Work issues

Bryan Simmons and I did not manage to get anything scheduled on January 10 with Dr. Barnhart, and my schedule has precluded the rest of January and to mid-February. Will pick up this effort upon return from Belize vacation. Same with re-photographing the juvenile mussels at CERC.

Goals for through the end of February

- Schedule a photo edit with Jackie
- Finish interviews

Final fall 2021 post

Highlights/research progress

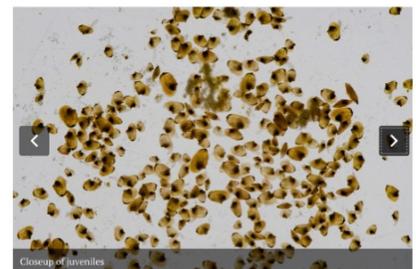
I interviewed Amy Gulick on December 14. I have been coordinating with Bryan Simmons in the hopes of scheduling time with Dr. Barnhart, but we have not firmed up a date yet. We are looking at the week of January 10. I visited the Columbia Environmental Research to get some photos of juvenile and young mussels – which were lacking in my body of work to date (some of these are similar to photos I took for the Missourian story).

Work issues

I am not quite satisfied with the photo of juvenile mussels (in the Petri dish on the light table), which I think is an important photo to include. Interestingly, when interviewing Amy Gulick, she told me about a similar shoot she did photographing salmon alevin (hatchlings that still have a yolk sack attached). She said she used a longer macro on a tripod with a light tent – so I may try to go back to CERC with this equipment for a re-shoot.

Goals for intersession and early spring semester

I hope to schedule time with Jackie early in spring semester to do another edit to complement the discussion I had a few weeks ago with Brian. During intersession I hope to make progress on research writing component and book design. I may still try to interview Ami Vitale in February, which would be my last interview. I would anticipate it would not be too difficult to weave in the information from one extra interview



November 6 – December 3, 2021

Highlights

I finished my final deliverable for the Smith-Patterson/Pulitzer Center fellowship, which was my field notes – which is essentially a personal reflection on my project https://pulitzercenter.org/stories/confederated-tribes-umatilla-indian-reservation-work-reverse-centuries-natural-resource?utm_medium=Social&utm_source=Twitter&utm_campaign=ConfederatedTribesFieldNote

Work issues/Research progress:

I did some additional research on female conservation photographers and got some tips from others. I have reached out to Katie Schuler, Amy Gulick, and Morgan Trimble. I had previously reached out to Morgan Heim, who replied she did not have sufficient time. I had also previously heard back from Ami Vitale, who said she may be free about this time, however, when I reached back out, she suggested February would be better for her. Of these, I have an interview scheduled with Amy Gulick and waiting to hear back from others.

Goals for upcoming two weeks

I am still hoping to get access to Dr. Chris Barnhart's lab, and I'm waiting to hear back from Bryan Simmons. COVID is complicating this, and I am still waiting to hear back. I have also reached out to James Kunz with USGS – as I would like to get some additional photos of at the Columbia Environmental Research Center. I also still need to get a photo review session scheduled with Jackie.

October 9 – November 5, 2021

Bi-weekly highlights:

I finally was able to make it out on the Osage River for a full day with the malacologists doing the survey/restoration work on the Osage River. I met with Brian on October 28 to do a rough edit. On a side note, my Pulitzer Center project was published on the PC website just in time for Native American Heritage Month. <https://pulitzercenter.org/stories/first-foods-confederated-tribes-umatilla-indian-reservation-serve-and-restore-freshwater>

Work issues/Research progress:

I have still not made a connection with another female conservation photographer, I may have to settle for what I have with Susan Middleton, but I may still try some others.

I am continuing work on analyzing/identifying themes with the interviews I have conducted to date.

Goals for upcoming two weeks

I would like to get into the studio soon to play around with photographing the punched shells. The feedback and examples really helped me wrap my mind around this and how it could work. I also want to see if I can schedule a visit to Dr. Chris Barnhart's lab – one of the malacologists on the Osage River project – Brian Simmons – works with Barnhart at Missouri State and said he would try to arrange something.

Photos from the Osage River trip are below. Here are a couple of videos of females displaying their lures.



Bryan Simmons shows a Pink Mucket to Josh Garner.



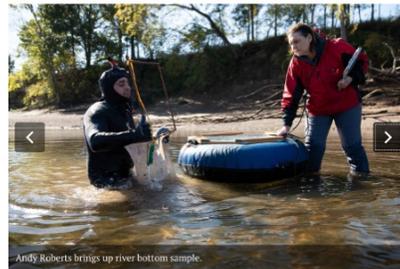
Bryan Simmons and Josh Garner view female mussels displaying lures in the Osage River.



Pink Mucket placed in 2011 with engraved identifier



Andy Roberts places river bottom sample on screen for sorting.



Andy Roberts brings up river bottom sample.



Andy Roberts counts the growth rings on a freshwater mussel to estimate its age.



Andy Roberts measures a mussel from the sample.



Georgianne Bowman records freshwater mussels from sample.



Georgianne Bowman displays mussel from the sample.



Deerfoot mussels found in a sample on the Osage River.



Sorts a sample of river gravel for freshwater m



Female displaying lure.

September 26 – October 8, 2021

Highlights

I interviewed Steven David Johnson and Todd Amacker for the research portion of my project. I feel like I am very close to getting what I need for my research questions on technical choices and goals of conservation photographers. However, I am still struggling because I would like some gender diversity. Steve gave me names of two additional women conservation photographers, whom I have reached out to but haven't heard back.

Work issues/Research progress:

Fieldwork with Andy Roberts has been twice scheduled and canceled. I have a specific question about how to do a particular photo. I collected some of the punched shells from the shore of the Mississippi River when I visited Muscatine. I would like to do a photograph of them — something similar to the buttons photo I took for the story that ran in the *Missourian*. I would like to brainstorm with Jackie when we meet to go over a loose edit.

Goals for the upcoming 2-weeks:

Hopefully I will be able to get out with Andy Roberts. I also need to schedule a time with Jackie to go over the photos I have to date. I will take a look at my calendar and also plan additional shoots -for later. I've been holding off because I am "on call" with Andy — and will get only a day's notice of when they go out.



Facade of National Pearl Button Museum.



Display made by Yada Baker in the window of the National Pearl Button Museum.



Merchandise case in front of display window at the National Pearl Button Museum.



National Pearl Button Museum director Dustin Joy displays some information related to the history of button-making in Muscatine.



Volunteer Yada Baker gives tour of museum while explaining the history of button-making in Muscatine.



Yada Baker displays a salad plate sized mussel shell. This animal lived to be approximately 150 years old.



Pearl buttons on display in the window of the National Pearl Button Museum.



Display of pearl buttons.



Hooks used to capture mussels.



Mussels latched on to hooks.



Pearl buttons adorn a child's dress.



The size of a salad plate that lived to be an estimated 150 years old.



Tool used to count buttons to fill button orders.



Closeup of the shell punching equipment.



Boepple's original shell punching machine.



Salad plate sized mussel shell. This mussel lived to be approximately 150 years old, which is estimated by the lines in the shell (each line represents one year).



September 11 – September 25, 2021

Bi-weekly highlights:

I interviewed Clay Bolt for the research portion of my project and he gave me two additional names and I am interviewing them next week. I visited Muscatine, IA, and the National Button Museum on September 18.

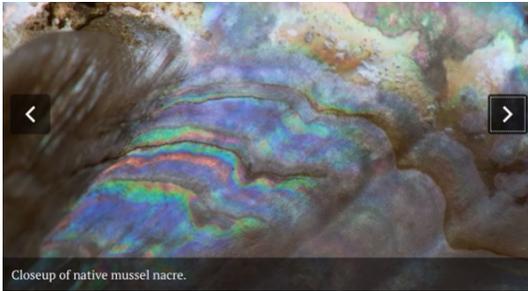
Work issues/Research progress:

Andy Roberts has still been delayed in his field due to Ameren generating, but I am on the list to be “on call” when the opportunity arises – which is going to be very short notice. I missed on day (Wednesday, September 22) because I teach a class that day and was not able to go along. There is still some work left this season, so I am hopeful I will be able to get away to join them in the field. I am interviewing [Steve Johnson](#) and [Todd Amacker](#).

Goals for the upcoming 2-weeks:

With the addition of Steve and Todd, I am up to 7 interviews. My goal is for the last 1 to 3 photographers I interview to be women or BIPOC, if possible (my initial goal for total number was 8 to 10).

Above: freshwater mussel shells on the banks of the Gasconade River in Pulaski County, and shell fragments in McCann Cave on the Gasconade. Shell fragments in the cave and near its entrance, which is at a high elevation above the level of the river, are likely artifacts of Native American use of freshwater mussels as a food source. (I plan to consult experts on this issue to confirm this speculation).



August 28 – September 10, 2021

Bi-weekly highlights:

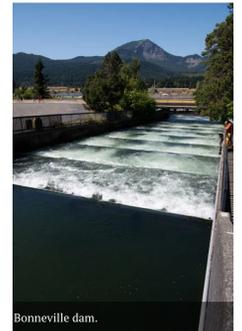
I conducted follow up interviews with Alexa Maine and Christine O'Brien, primarily for the CTUIR project, but it will also inform my project. They did have an additional photo op the week of Labor Day, but unfortunately scheduling conflicts precluded me from traveling back to Oregon/Washington. I also did more outreach to conservation photographers, did some photography on the Gasconade River, communicated with one of the USFWS malacologist about tagging along for field work, and reached out to the National Button Museum in Muscatine, IA.

Work issues/Research progress:

I have had a little success in connecting with additional photographers. I interviewed David Liittschwager this week (this means I have a total of four interviews done), and he gave me several additional ideas for photographers I can reach out to, including several women. He also sent a note to Ami Vitale (who had declined my request because she was going to be in unreliable internet areas for the next several months). Ami also provided four additional names for me in response to David's request. I heard back from a representative of Joel Sartore, who said he would not be able to do an interview because he is traveling.

Goals for the upcoming 2-weeks:

The malacologist working on the Osage River mussel restoration (Andy Roberts) has been delayed in his field work because Ameren is generating a lot (meaning they are releasing a lot of water from Bagnell Dam), so he is going to let me know when he can go out (hopefully next week, but he has to play it by ear). I heard back from the National Pearl Button Museum and am in the process of finalizing a date for my visit – hopefully September 18. Now that I have four interviews done, I will start reviewing my notes and identifying themes/concepts. I will also reach out to the additional photographers provided by David Liittschwager and Ami Vitale.



August 23 – August 27, 2021

Weekly highlights:

I contacted Alexa Maine and scheduled follow up interviews with Alexa and Christine O'Brien. I plan to see if there will be additional photo ops this fall, with the potential to return to Washington/Oregon – albeit for a shorter time period.

Work issues/Research progress:

I am having trouble connecting with photographers on my original list, so I will explore adding others in the hopes I can get about 5 more interviewees.

Goals for the upcoming 2-weeks:

I've been in contact with the USFWS malacologist for potential photo ops this fall, so I need to connect with him to see if we can nail down some field work.

July 26 – August 2, 2021

Summer semester wrap-up

I conducted an interview with Susan Middleton, and traded emails with Tim Flash, although haven't yet scheduled a date.

July 5 – July 25, 2021

Weekly highlights:

I conducted interviews with conservation photographer Shane Gross on July 7 and Noppadol Paothong on July 9. On Saturday July 10, I traveled to the Pacific Northwest for the CTUIR project. The week of July 12, I went to several field sites (survey and restoration) with the CTUIR scientists. The week of July 19th, I interviewed three tribal members and traveled to sites within the reservation and historical territory of the Plateau Indians. I also visited the Tamásklikt Cultural Institute, which provide a wealth of information of the tribal cultural traditions and history. I returned home on July 23.

Work issues:

CTUIR communications director Matt Johnson helped facilitate the permit I needed to talk with tribal members about the cultural aspects of the freshwater mussel restoration. Consequently, I stayed on for the second week. I was able to connect with two tribal members and an employee of the tribe to discuss the cultural aspects of the freshwater mussel work and the “bigger picture” related to ecosystem management. I

was not able to connect with a key individual, the CTUIR Department of Natural Resources director, but have sent a follow up to try to connect virtually.

Research progress:

Two interviews are completed and I have a third scheduled (with Susan Middleton) for August 2. Tim Flach has also responded that he is willing to do an interview with me, but we are still working on scheduling.

Goals for the upcoming week:

I will send follow up emails to the photographers I have not yet heard from and re-assess if I need to add to my list of potential interviewees.

June 21 – July 4, 2021

Weekly highlights:

The week of June 21 was lost due to a death in my family. The week of June 28 I sent interview requests to my list of conservation photographers. I met with Tony Briscoe over Zoom.

Work issues:

A late breaking development on my CTUIR project last week, when I learned that, under tribal rules, I will need a permit to speak to tribal members about the cultural aspect of the restoration work. I have applied for the permit, but it is unclear if it will be approved in time for my visit. If I am unable to obtain a permit for my planned trip (July 10 through 23rd), I may readjust my travel schedule and shorten this trip and make a second trip later. I had actually contemplated doing that in the first place, but went for the combined trip instead. I am waiting to hear back from the tribe's communication director.

Research progress:

I have heard back from several photographers already – 3 who are happy to participate, and 3 declined because they will be out in the field for many months.

Goals for the upcoming week:

I will start scheduling interviews with the photographers I have heard back from. I leave on Saturday for Portland, OR, and will rent a car to drive to meet up with Alexa Maine for her mussel field work next week.

June 7 – 20, 2021

Weekly highlights:

Pulitzer Center reporting fellows participated in daily, hourlong Zoom sessions for orientation June 7 through 11. I participated live on June 7-9, was unable to attend the happy hour on June 10, and watched the recorded video of the last session with Campus Consortium. The first day everyone gave a brief synopsis of their project. The second day, we were grouped with fellows with similar projects, and the third day we heard from alums about completed projects.

I also firmed up travel dates with Dr. Alexa Maine. I have made flight reservations departing July 10 and returning July 23. During this time, I will be covering scientific field work and visiting the cultural center on the reservation – i.e., making contact with both the scientists and tribal members.

Work issues:

Hearing from the alums and the seasoned professionals was very interesting and helpful. A common theme was gaining trust of your sources and recognizing the gift you are given when people trust you to tell their story for them. This will be especially important for me in covering the cultural aspect of the tribal restoration program.

Research progress:

N/A

Goals for the upcoming week:

Early next week I plan to compose an email to reach out to the photojournalists I hope to interview. I also have a Zoom session scheduled with my Pulitzer Center assigned mentor Tony Briscoe.