



Wetlands Working Group

The Wildlife Society

Newsletter, Volume 9, Issue 1
August 2019

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**It's been another busy year in the field of
wetland and wildlife conservation!**

Howdy! It's been another busy year in the field of wetland and wildlife conservation! During May 2018, the Wetland Working Group (WWG) co-sponsored a symposium entitled Arid Wetlands: Conservation Challenges and Research Needs at the Society of Wetland Scientists (SWS) annual conference in Denver, Colorado (see more below). Additionally, in-the-field professionals continued to conduct important research for wetland management: see our feature article on the impacts of neonicotinoids on wetland aquatic invertebrates by researchers in Missouri. Meanwhile, The Wildlife Society (TWS) had another productive annual meeting in Cleveland, Ohio during October 2018. But get ready, you can count on this year's meeting to be even bigger in Reno, Nevada when TWS teams up with the American Fisheries Society for the first-ever joint national conference.

At each annual conference, the WWG nominates and elects a new vice-chair position, as the current vice-chair moves up to assume the chair position. Drew Fowler is now the WWG Chair. Drew served as the vice-Chair last year and recently completed his doctorate at the University of Missouri in the School of Natural Resources where he studied heterogeneity in spring body condition of lesser snow geese. Prior to this work, he received his master's degree at Louisiana State University where he studied wetland management practices in semi-arid environments for wintering and spring waterbird habitat at the Bosque del Apache National Wildlife Refuge in central New Mexico. Throughout his PhD, he continued to work collaboratively with others towards wetland and waterbird conservation. In August of 2017, Drew helped teach a wetland management workshop in the Jilin Province of China designed to convey key technical wetland ecological and management concepts to improve wetland productivity for waterbirds, particularly Siberian cranes. Recently, Drew accepted a position with the Wisconsin Department of Natural Resources where he now serves as the waterfowl and migratory gamebird research ecologist. This position strongly integrates the management of populations and wetland habitats.

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WWG Annual Meeting

30 September 2019
12-1:30pm

Peppermill Sorrento 1 Rm

For conference schedule
visit <https://afstws2019.org/>

Assessing Impacts of Neonicotinoid Insecticides to Missouri's Public Wetlands

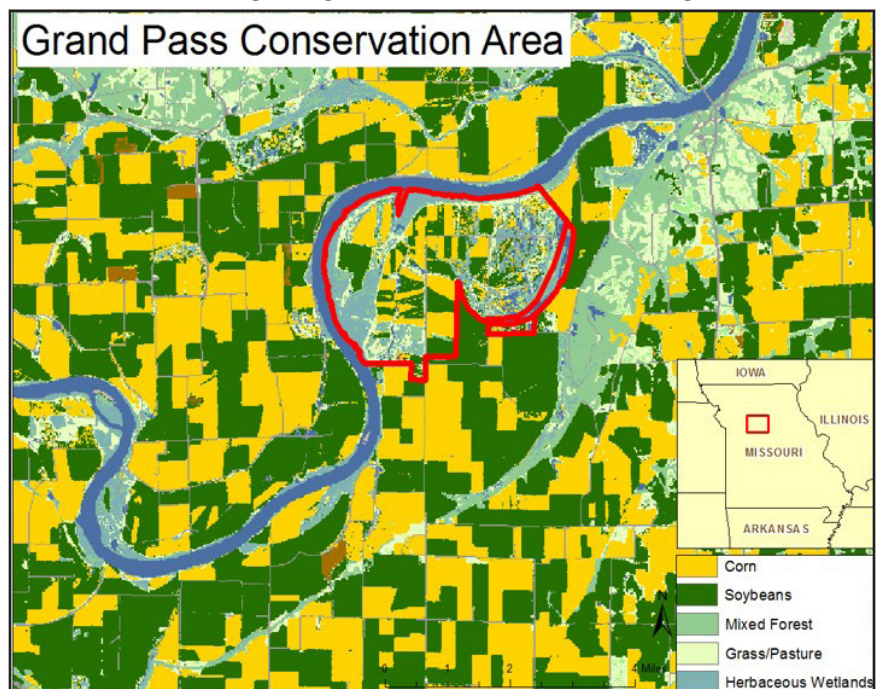
by Kyle Kuechle, Missouri Cooperative Fish and Wildlife Research Unit, University of Missouri
Anson Main, Missouri Cooperative Fish and Wildlife Research Unit, University of Missouri
Doreen Mengel, Resource Science Division, Missouri Department of Conservation

Neonicotinoids are a newer class of insecticides widely adopted for agricultural use throughout North America and Europe. In the 'Corn Belt', neonicotinoids are used as a preventative seed coating (i.e., seed treatment) on major row crops such as corn and soybeans. Much of their popularity is due to their ease of application and because they are selectively more toxic to insects than vertebrates compared to older pesticides (organochlorines, organophosphates). However, neonicotinoids do not come without environmental risks and may be detrimental to wetland ecosystems (Goulson 2013). Neonicotinoids are highly water soluble and can persist in soil exceeding 1000 days. The combination of these characteristics in tandem with their widespread use suggests neonicotinoids are able to move from fields via runoff into various surface waters such as streams and wetlands (Bonmatin et al. 2015). Researchers are beginning to achieve a broader understanding of neonicotinoid distribution and concentrations from studies occurring across North America (Anderson et al. 2013, Main et al. 2014, Hladik and Kolpin 2015). However, it is still unclear what factors influence neonicotinoid concentrations in wetlands, as well as the potential for harmful effects to wetland biota once they reach the wetland.

Since 2005, much of the debate surrounding neonicotinoids was due to the potential impacts on pollinators, especially honeybees, because of their importance in providing ecological services such as pollination of global agricultural crops. However, while neonicotinoids may be detrimental to native pollinators, they can also be a threat to aquatic insects (Chagnon et al. 2014). Aquatic insects are ecologically important for improving wetland function, for serving as a direct source of energetics for wetland-dependent fauna, as well as a transfer of energy from aquatic to terrestrial food-

webs with the emergence of adult insects. Emergent aquatic invertebrates are a crucial food resource for aerial insectivores, as they are seasonally abundant and have greater nutritional value than terrestrially derived invertebrates (Twining et al. 2016). In the Netherlands, aerial insectivores were found to experience greater population declines in the presence of increasing aquatic concentrations of the neonicotinoid imidacloprid due to hypothesized losses in food resources; however, no explicit causal link was drawn (Hallmann et al. 2014).

Missouri's flood-plain wetlands, like many other wetland areas of the United States, have been largely altered to accommodate agricultural production. The large scale conversion of wetlands to agriculture necessitates the management of wetlands for multiple species. Not only do wetlands need to be managed for a large suite of species, they also need to produce resources on an annual basis, meaning intensive management activities are required. Intensive management practices have led to planting of agricultural crops into wetlands to provide forage for migrating waterfowl while introducing needed



Land-use map of a study conservation area in the Missouri river flood-plain depicting expansive agriculture both surrounding and within the wetland complex.

Continued on page 3

Assessing Impacts of Neonicotinoid Insecticides (continued from page 2)



*Waterfowl feeding near corn planted in a Missouri wetland.
Photo by Doreen Mengel.*

soil disturbance for vegetative succession. Much of this planting may fall to permittee farmers who gain an economic benefit while contributing to the management of public wetlands. However, when crops were first used for wetland management, insecticides were not commonly applied as seed dressings, and managers decided what chemicals - if any - were applied in the wetland on a case-by-case basis. With the widespread adoption of neonicotinoid seed treatments, managers are now faced with potentially conflicting management decisions if the planting of treated seeds impacts other management objectives, such as the production of aquatic invertebrates.

Since 2016, we have conducted experiments at Conservation Areas in Missouri to 1) quantify neonicotinoids in Missouri public wetlands, 2) assess the impacts of neonicotinoids to aquatic invertebrates at field realistic neonicotinoid exposures, and 3) measure potential impacts of neonicotinoids moving up the food chain using nesting tree swallows and

their food source (emergent insects). For objective 1, we randomly selected 40 wetlands on 10 conservation areas. Objectives 2 & 3 were completed using a paired wetland ($n = 22$) study design where one wetland was designated treated and received the neonicotinoid thiamethoxam in the form of seed-treated corn. The corresponding untreated wetland was planted to the same proportion of corn without pesticides. In addition to water and sediment sampling for neonicotinoids, we collected aquatic invertebrates during pre-treatment, post-treatment, and one year following the pesticide treatment. Additionally, tree swallow nest boxes were established at study wetlands to measure nesting activity across a gradient of neonicotinoid concentrations and



Nestling tree swallow used to calculate nesting metrics, such as growth, at wetlands with varying neonicotinoid concentrations. Photo by Jessica Murray.



Floating aquatic emergent insect trap in study wetland used to measure available tree swallow forage. Photo by Kyle Kuechle.

treatment conditions. Finally, in spring 2017, we collected emergent insects as well as tree swallow nesting data to evaluate a potential food-web link between neonicotinoids and insectivorous bird declines.

In total we collected 157 water and sediment samples each and had them analyzed for the six most common neonicotinoid active ingredients. The neonicotinoids imidacloprid, clothianidin, and thiamethoxam were the most frequently detected in both wetland water and sediments and subsequently were the most concentrated. Concentrations ranged from below the level of detection (0.02 ppb water, 0.20 ppb sediments) to 0.97 ppb in water and 17.99 ppb in sediments. We found that neonicotinoid concentrations were

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Officer Election: Call for Nominations

Want to join a fun team to advance the mission of the Wetlands Working Group?

The Wetlands Working Group of the Wildlife Society is seeking nominations for open positions of Chair, Vice-Chair, and Secretary/Treasurer. The Chair would serve as such for the 2019-2020 term and then succeed to Past Chair for the 2020-2021 term. The Vice Chair would serve as such for the 2019-2020 term, succeed to Chair for 2020-2021, and then become Past Chair for the 2021-2022 term; a total service period of 3 years. The position of Secretary/Treasurer is a 2-year commitment that would span from 2019 to 2021. Service would begin at the annual membership meeting for the Wetland Working Group, to be held during the TWS Annual Conference.

Officers develop content for the biannual newsletter, assist with organizing symposia, identify social media content applicable to the Group's mission, and participate in other activities as needed to increase communication about wetland and wildlife-related issues among WWG members. Board Meetings are once a month by conference call (1 hour), so you can participate from anywhere! Including monthly meetings, time commitments average 2-4 hours/month for Vice Chair, Past Chair, and Secretary/Treasurer, and 4-8 hours/month for Chair.

The duties are outlined in the WWG Charter, and are summarized as follows:

CHAIR — The Chair shall have general supervisory responsibility for the Executive Board; shall preside at all meetings of the Executive Board and membership; shall appoint, with the advice of the Executive Board, chairs of all standing and special committees; and shall be an ex officio member of all committees, except the Nominating and Elections Committee. The Chair may represent the Working Group or appoint alternate representatives to other Working Group, Chapter, Section, or Society boards, committees, or meetings, including The Wildlife Society Council. The Chair shall be responsible for submitting an annual report of the Working Group's activity to the Society. Upon completion of a full term as Chair, the Chair succeeds to the position of immediate Past Chair.

VICE CHAIR — The Chair-elect serves as the Vice-Chair and assume the duties of the Chair in the absence of the Chair and performs other duties as needed. Upon completion of a full term as Chair-elect, the Chair-elect succeeds to the position of Chair. The Chair is responsible for running all meetings of the Executive Board and membership. The Chair may represent the Working Group or appoint alternate representatives to other Working Group, Chapter, Section, or Society boards, committees, or meetings, including The Wildlife Society Council. Upon completion of a full term as Chair, the Chair succeeds to the position of immediate Past Chair. In total, this is a 3-year term.

SECRETARY/TREASURER — The Secretary/Treasurer is responsible for maintaining the files, records, and funds of the Working Group. Duties include recording the minutes of all meetings; receiving and dispersing funds; preparing and submitting an annual fiscal-year report and annual budget. This is a 2-year term.

Consider nominating yourself or a colleague who is committed to wetland conservation!

New and existing members are welcome to run for board positions.

Please submit all nominations to the Nominations Committee Chair, Johanna Duffy, via email, jduffy@bartonandloguidice.com by Sept. 20, 2019.

Nominations should include name, contact information, and a brief bio.

Wetlands in the News

EPA says Pebble Mine DEIS
underestimates
water quality impacts.

Wetland Mitigation Banks
Profiteering or preservation?

Great Black Swamp
restoration could **save more**
money than it costs!

Urban wetlands in north-western
Himalaya are **shrinking**.

New species of **giant salamander**
described.

New Hampshire Governor **vetoed**
wetland bill.

A tiny creature threatens Utah's
\$1.8 billion **Lake Powell**
pipeline.

The concrete jungle has 587 miles
of **shoreline at risk**.

One of nature's smallest
flowering plants can **survive**
inside a duck.

Winery fined \$3.7 million for
filling in wetlands and
burying a stream.

Wetland vital to
protect cities.

New Publication
Typha (cattail) invasion in
North American wetlands:
biology, regional problems,
impacts, ecosystem services, and
management.
Wetlands. 2019. <https://doi.org/10.1007/s13157-019-01174-7>

Click on the **light blue** hyperlinked text
above for links to the original articles.

Learn About Wetland Management at AFS-TWS 2019 Joint Meeting!

A Process-based Approach to Wetland Management

29 September 2019, Reno, NV

Wetlands are diverse systems that cross all ecological regions and include floodplain forests, coastal marshes, prairie potholes, playa lakes, and wet meadows. Abiotic drivers that shape ecological processes in wetlands result in different vegetative structure and biotic communities among wetland habitats. A process-level understanding of wetlands can facilitate successful restoration and management. Improved wetland restoration and management approaches are needed because natural processes promoting biodiversity and productivity in wetlands have been compromised as a result of intensive human modifications. This workshop focuses on the foundational concepts required to recognize abiotic factors unique to each management site and link those conditions with the biotic communities that determine the potential for management success. Abiotic conditions that drive wetland processes, such as climatic, hydrologic, soil, and geomorphic, will be discussed at a level accessible to beginners and in a context that is meaningful to more experienced

wetland professionals. Interlinkages among abiotic processes and responses of plants, invertebrates, wildlife, and fish will then be explored. Examples of the successful application of these principles in temperate, arid, tropical, coastal, floodplain, and Mediterranean habitats across the United States will be presented, followed by an open discussion on wetlands. Instructors have over 200 years of wetland experience in all 50 states, on over 300 National Wildlife Refuges and many state and private management areas in a diversity of ecosystem settings. Their professional experiences range from university and graduate professors to state and federal wildlife biologists, land management experts, wetland ecologists, as well as private and nonprofit specialists.

Register on-line at:

<https://afstws2019.org/register/>

Workshop Description is also Available at:

<https://afstws2019.org/sessions/a-process-based-approach-to-wetland-management/>

Workshop Instructors

Leigh Fredrickson, Wetland Ecologist, Wetland Management and Educational Services, Inc.
Adonia Henry, Wetland Ecologist, Scaup & Willet LLC
Sammy King, Leader, Louisiana Cooperative Fish and Wildlife Research Unit, USGS
Cary Aloia, Wetland Biologist, Wetland Dynamics, LLC
John Vradenburg, Supervisory Biologist, USFWS Klamath Basin NWRC
Frank Nelson, Wetland Ecologist, Missouri Department of Conservation, Springfield, MO
Joe Silveira, Wildlife Refuge Manager, USFWS Sacramento River National Wildlife Refuge



Workshop Agenda

8:00	Introductions	1:45	Avian Bioenergetics. Leigh Fredrickson
8:15	Rationale for the Workshop. Leigh Fredrickson	2:15	Digging Dirt: The Edaphic Factor in Restoration and Management of Seasonal Wetlands in the Northern Sacramento Valley, California. Joe Silveira
8:45	Continental Wetland Overview from a Formative Process Perspective. Leigh Fredrickson	2:45	<i>Refreshment Break</i>
9:30	Geomorphic, Climatic, and Hydrologic Variability. Sammy King	3:00	Using Agricultural Tools to Duplicate Natural Disturbances. John Vradenburg
10:15	<i>Refreshment Break</i>	3:30	Meeting Tropical Wetland Challenges on Kauai. Adonia Henry and Leigh Fredrickson
10:30	Wetland Ecology. Leigh Fredrickson	4:00	Developing Partnerships to Manage Wetlands with Declining Water Resources in the San Luis Valley, Colorado. Cary Aloia
11:00	Aquatic Plant Ecology. Adonia Henry	4:30	Open group discussion on wetlands. All
11:30	Aquatic Invertebrate Ecology. Adonia Henry	5:00	<i>End of workshop</i>
12:00	<i>Lunch (provided as part of registration cost)</i>		
1:00	Aquatic Community Response to Wetland Restoration. Frank Nelson		

Workshop supported by Wetlands Working Group of TWS; Wetland Management and Educational Services, Inc; Scaup & Willet LLC; and Wetland Dynamics LLC

Assessing Impacts of Neonicotinoid Insecticides (continued from page 3)

positively influenced by agricultural activity both within the wetland and the surrounding area. Additionally, we collected ~1,000 aquatic invertebrate and ~400 emergent insect samples from study wetlands. Our invertebrate samples had representative individuals from 87 families that ranged in sensitivity to neonicotinoids from insensitive (e.g. Daphniidae) to moderately sensitive (Chironomidae) to highly sensitive (Baetidae) (Morrissey et al. 2015). Concurrent with emergent insect sampling, 35 tree swallow nests were monitored at study wetlands. Of nests we monitored clutch size ranged from 4 to 7 eggs laid with an overall mean of 5.7 eggs per nest. Hatching success (hatched at least

one egg) was high (94%), with no observed predation through the monitoring period. Overall fledging success was 91% of nests fledging at least one nestling; of nests that fledged at least one nestling >96% of nestlings eventually successfully fledged. We chose to measure aquatic invertebrates, emergent insects, and tree swallow nesting at the same wetlands in order to evaluate potential neonicotinoid impacts to broader wetland food webs. Results from this research will be useful to state, federal, and private wetland managers in making decisions on the inclusion of agriculture and seed treatments in their future wetland management and conservation plans. *See literature cited on page 8.*

Aldo Leopold Keynote Address: The View from my Bucket

1 October 2019, 1:10-1:55pm

Leigh Fredrickson, 2018 Aldo Leopold Memorial Award Recipient

Leigh has made major contributions to the field of wildlife management and wetland and waterbird ecology and conservation. These contributions are largely made through his mentoring of students and resource professionals, work with conservation partners, publication of many useful management guides and papers, site visit consultations, and practical workshops that focused on the needs of wetland managers and providing productive habitats for wetland wildlife. A diversity of intellects, *where every person matters*, are required for successful land management programs. *During the keynote*, Leigh will share his path of experiences that shaped his thinking and actions concerning conservation in general and land management for wetland habitats specifically.



Arid Wetlands Symposium Review by Drew Fowler, WWG Chair

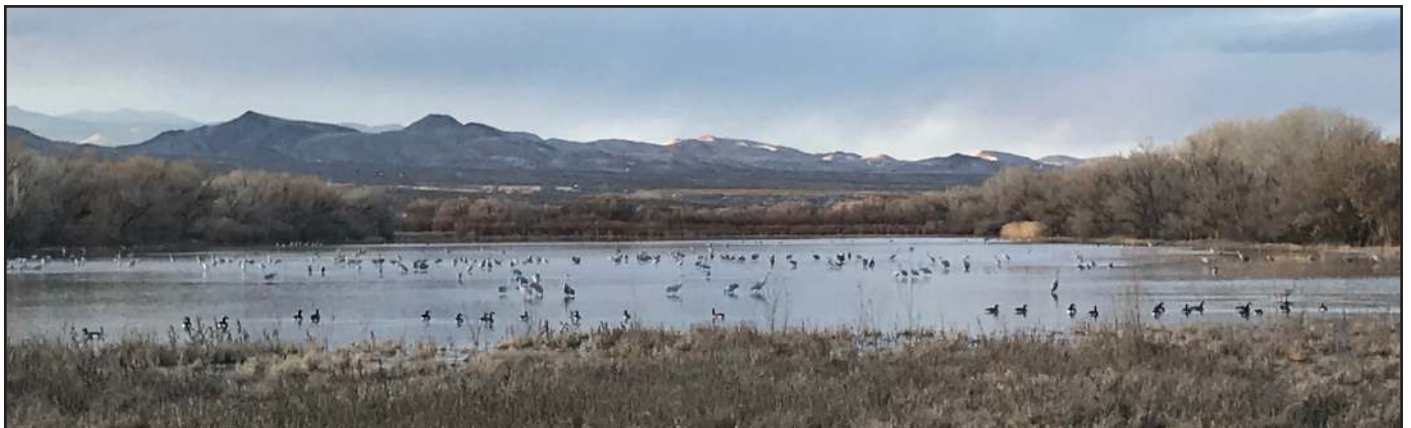
Last May, the Wetland Working Group of The Wildlife Society teamed up with the Wildlife Working Group from the Society of Wetland Scientist to host a symposium entitled Arid Wetlands: Conservation Challenges and Research Needs. The symposium was hosted by the Society of Wetland Scientist, during their annual meeting in Denver, Colorado. Arid wetlands are highly productive systems that are found across six continents and provide for a unique biodiversity of taxa adapted for arid environments at some point during their history. Simultaneously, these wetlands provide critical ecosystem services, like groundwater recharge, that sustain landscape productivity. While most arid wetlands are seasonal, the amount of water available for these wetlands is declining. Challenges threatening water availability include increased human consumption through groundwater pumping and surface water diversion for agriculture, as well as a changing climate, which scientists project will result in longer growing seasons. Symposium speakers discussed specific conservation challenges found across the world including talks from scientists and conservation planners in China, Jordan, and Mexico in addition to systems in California, Kansas, New Mexico, Oregon, Utah, and the Intermountain West. However, common to all wetland systems discussed, there remains the need to find creative solutions that sustain the socioeconomic needs of local communities while appropriating water for the management and restoration of productive arid

wetlands. For example, despite an over allocation of available water, approximately 70% of current water use in the western United States is used for agricultural production. Therefore, an increased understanding is required to recognize the drivers behind human behavior and their interactions with major policies, such as the Farm Bill. While continued uncertainty remains regarding water availability in



arid wetland ecosystems, some current efforts are finding success in restoring water regimes on landscapes that benefit ecosystems and the community. Minute 323, an international agreement signed in September of 2017 between the U.S. and Mexico to ensure floodplain restoration along the Colorado River and future water security is a great example of

ongoing work to solve complex water problems. A second theme identified during the symposium was the realized need to provide basic technical advice to arid wetland managers in countries worldwide. This initiative is currently taking place in relationships between U.S. scientists and managers and those in China, where large arid wetland ecosystems are in jeopardy of soil salinization and diminished water resources while managing for important waterbirds, like the endangered Siberian crane (*Grus leucogeranus*). In all, the symposium highlighted the importance of arid wetland systems and the need for continued collaboration in conservation and management efforts. If you would like to learn more or continue the dialogue about arid wetland conservation, please reach out to us!



Wetlands at the Great Salt Lake, Utah (top) and Bosque del Apache National Wildlife Refuge, New Mexico (bottom). Photos by Adonia Henry.

Meet the Board (continued from page 1)

Kelly Chinnners Reiss serves as the Secretary/Treasurer for WWG. Kelly is a wetland community ecologist with an interest in landscape connectivity. Her research interests involve indicators of wetland condition, geographically isolated wetlands, wetland creation, restoration, and mitigation, as well as landscape connectivity and remote sensing. Currently Professor and Program Director in Environmental Science, School of Science, Technology, Engineering and Math, American Public University (APU), and a research affiliate with the HT Odum Center for Wetlands, University of Florida, she holds degrees in Forest Resources and Conservation (BS) and Environmental Engineering Sciences (MS, PhD). Kelly is currently working on a project with APU students, alumni, and faculty on living shorelines, including urban planning and disaster management, remote sensing for monitoring, and emergy synthesis.

Serving as Chair last year, Johanna Duffy is the WWG's Past Chair. Johanna is an Environmental Scientist with Barton & Loguidice, D.P.C., a multi-discipline engineering firm, in Syracuse, NY. In addition consulting, Johanna has also held positions as a Wetland Biology Technician with the Environmental Division at the Fort Drum military installation and as a Research Associate, studying black bear population dynamics, with the Connecticut Department of Energy and Environmental Protection. She holds degrees in Wildlife Management (BT) and Wetland and Water Resources (MPS). Johanna also currently serves on the Board of the New York State Wetlands Forum (NYSWF), and is a certified Certified Wildlife Biologist with TWS.

Casey Setash has volunteered to serve as our Student and Social Media Representative to help promote the WWG. Casey recently completed her master's degree at Colorado State University studying the breeding ecology of cinnamon teal in the San Luis Valley. She is now starting a PhD at Colorado State studying the effects of agricultural water manipulations on breeding duck communities. Casey became fascinated by wetland ecosystems during her master's degree, seeing firsthand the complicated issues revolving around water in the west and the creative solutions local communities enact to protect their resources and livelihoods. When she's not working, she enjoys cooking, birding, duck hunting, and beer-related festivities.

We hope you all have a productive upcoming year of conservation work, but would love to hear from you! The WWG is now online! Check out our Twitter and Instagram (@TWSWetlandsWG) and look us up on Facebook for updates on what we're doing! We will be doing a regular #wetlandswednesday campaign to raise awareness of everyone's favorite ecosystem. Join us!



Casey Setash



Drew Fowler



Johanna Duffy

Literature Cited for Assessing Impacts of Neonicotinoid Insecticides on Missouri's Public Wetlands

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Training Opportunities & Upcoming Conferences

Association of State Wetland Managers
Calendar of Events for webinars, trainings, & special events

2019

American Fisheries Society and The Wildlife Society

Joint Annual Conference

28 Sept. - 3 Oct. 2019, Reno, NV

A Process-based approach to Wetland Management

TWS Hosted Workshop (see page 5 for details)

Supported by the Wetlands Working Group



Society for Ecological Restoration

Fall 2019 Regional Conferences

Columbus, GA; Tuscon, AZ; & Galveston, TX

8th World Conference on Ecological Restoration

22-27 September 2019, Cape Town, South Africa

Coastal and Estuarine Research Federation

3-7 November 2019, Mobile, AL

Waterbird Society 43rd Annual Conference

6-9 November 2019, Salisbury, MD

Entomological Society of America

17-20 November 2019, St. Louis, MO

2020

9th World Conference of Herpetology

5-10 January 2020, Dunedin, New Zealand

13th International Symposium on

Biogeochemistry of Wetlands

27-30 April 2020, Baton Rouge, LA

Society of Wetland Scientists Annual Meeting

7-11 June 2020, Quebec City, Canada

Questions?

Interested in sharing
your wetland experiences
and contributing to the
Newsletter?

Contact Us!

wwg.tws@gmail.com

@TWSWetlandsWG

2019 Board Members

Drew Fowler, Chair

drew.fowler@wisconsin.gov

Vice Chair

vacant

Kelly Chinnners Reiss, Treasurer/Secretary

kreiss@apus.edu

Johanna Duffy, Past Chair

jduffy@bartonandloguidice.com

Casey Setash, Student & Social Media

Representative

csetash@rams.colostate.edu

How to Join WWG

When you renew your TWS membership,
sign up for the Wetlands Working Group!

If you're already a member of TWS, you can
add membership in the Wetlands Working

Group at any time by logging into your
account at

<http://wildlife.org/>.

Membership dues are only \$5 annually,
which helps support activities at meetings,
student travel awards, and outreach events.

Support the WWG

Reusable Chico Bags

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(free shipping)

Contact Adonia at

adoniarhenry@gmail.com

to get yours today!

