



# Wetlands Working Group

The Wildlife Society

Newsletter, Volume 7, Issue 1  
July 2017



## In This Issue....

### Feature Article

*Amphibian Ecology in Northern Prairie Wetlands*

### Wetlands, Water, & Wildlife Symposium

*Sponsored by WWG*

### Other WWG News

*Nominations Open!*  
*Social Media Liaison Needed*  
*All Working Group Table*  
*Arid Wetlands Symposium*  
*Support the WWG!*

### On Capitol Hill

*Clean Water*  
*FY2018 Budget Slashes*  
*Endangered Species*

### Wetlands in the News

### Upcoming Conferences



## Wetlands, Water, & Wildlife: Finding Common Ground Among Diverse Stakeholders

### Half Day Symposium at the TWS Annual Conference

27 September 2017 from 1:10-5:00 pm

*Sponsored by the Wetlands Working Group*

**Water is essential to life** and thus the thread uniting all social, economic, and ecological enterprises. In some places in North America, parties are at odds over the allocation and use of limited pools of water resources. Elsewhere, they spar over the consequences of practices that degrade water quality and divert externalities downstream. Without exception, where broad social challenges exist over water – either quality or quantity – wildlife and wildlife habitats are impacted. In this symposium, we will draw together examples from across North America of people and programs involved in promoting protection of wildlife habitat and populations amid water-related challenges. We will explore national perspectives on water quality and wildlife policies and hear from local examples of people and places that took advantage of broad social discourse on water related issues to advance wildlife habitat initiatives. We will also explore persistent challenges and research ongoing to inform decision makers about how wildlife can be affected under different water allocation or treatment scenarios. Presentations will represent diverse entities including university researchers, federal agencies, and non-profit organizations involved in water quality and quantity issues across the country. The symposium will provide examples of successful models, add to conversations about emerging challenges, and provide attendees with tools to advance wetland and wildlife conservation initiatives amidst broad social conversations around water challenges in the 21st century.

Thanks to WWG members Adam Janke, Sammy King, and Adonia Henry for organizing the symposium! We look forward to seeing you in Albuquerque!

For a complete list of speakers and presentation abstracts, visit the TWS conference website at [twsconference.org/sessions/wetlands-water-wildlife-finding-common-ground-among-diverse-stakeholders/](http://twsconference.org/sessions/wetlands-water-wildlife-finding-common-ground-among-diverse-stakeholders/)



# Amphibian Ecology in Northern Prairie Wetlands Challenges of Conservation in the Real World

by Robert Newman, Associate Professor & Director of Graduate Studies,  
University of North Dakota

## Just the Facts –

- North Dakota is nationally a leading producer of many agricultural commodities, from beans to wheat (1st in 10 of 26 crop categories, 2nd or 3rd in 7 others, 1st in honey, 10th in beef cattle).
- Most of the land in North Dakota is privately owned and 90% overall is in farms and ranches.
- North Dakota has become a leading energy-producing state, including fossil fuels (2nd nationally in oil) and renewables (wind and biomass-derived).
- North Dakota is the center of the Prairie Pothole Region, an ecologically distinctive landscape with a high density of wetlands and well-known for waterfowl production.
- Landscapes and wetlands are temporally dynamic from climate variations (Figures 2-4) and changing agricultural and energy economies.
- **Ecological processes and wildlife population dynamics play out on intensively worked and constantly changing landscapes devoted primarily to critical human activities (food and energy production).**
- How can these co-exist, or how well do they?
- Things to think about:
  - HOW do State and Federal environmental policies (Farm Bill and producer incentives, conservation programs such as Conservation Reserve Program, Agricultural Conservation Easements, wetland regulations, fracking and well siting, etc.) affect ecological function?
  - What measures can be taken to maintain and provide resilience in biological diversity and ecosystem services?

**The Northern Plains** – If anyone knows anything about the northern plains (or the Great Plains more broadly), it is that it is a vast region formerly inhabited by large numbers of large mammals, including the official national mammal of the United States, the iconic bison. Most people also know that it is sparsely occupied by humans, most involved in some way with agriculture, the predominant land use that emerged following European colonization in the late 19th and into the 20th centuries (Figure 1). And pressed, a geographically knowledgeable person will know that it is the flat land you have to cross on your way to the Rocky Mountains or to the rolling wooded landscapes of the Midwest, depending on your direction of travel.

But waterfowl enthusiasts will also know that the Prairie Pothole Region (PPR) of the northern plains, stretching from northern Nebraska to the central Canadian provinces, contains incredible numbers of wetlands (see Stewart and Kantrud 1971), even after dramatic losses resulting from the massive conversion of prairie to agriculture over the last century (Batt 1996). The landscapes and wetlands are temporally dynamic from climate variations (Figures 2-4) and

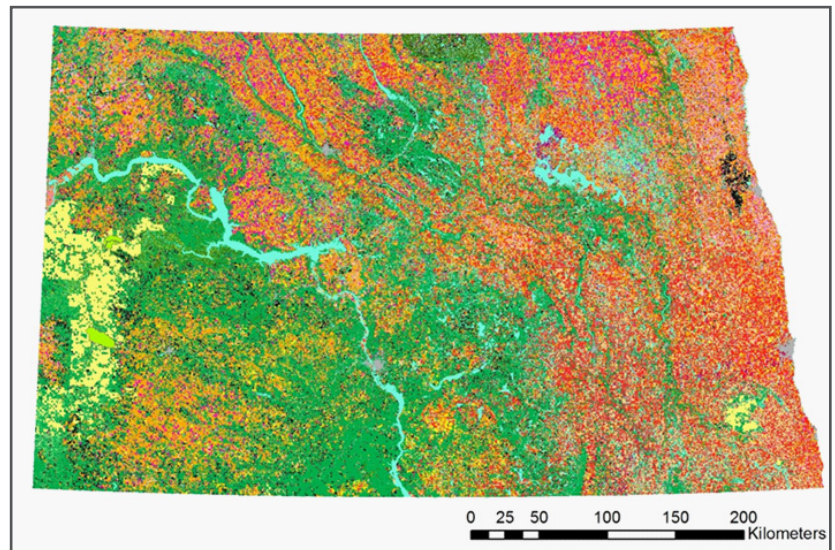


Figure 1. North Dakota land cover and ownership. Federal land in *yellow* that shows up at this scale is USDA Forest Service National Grasslands. National Park Service land is in *bright green* (Theodore Roosevelt National Park is embedded in the Little Missouri National Grassland on the western side of the state). *Orange/red* is private farmland and most of the *dark green* is some type of privately owned grassland, either hay, pasture, or ranch land. The Missouri and Souris rivers and “closed”-basin Devils Lake are visible, but a comprehensive wetland layer (e.g., National Wetland Inventory) is not shown because it would obscure most of the map.

Photo (top): Northern leopard frog by Brian Gratwicke.

*Continued on page 3*



# Amphibian Ecology in Northern Prairie Wetlands (continued from page 2)



Figure 2. The PPR has historically alternated regularly between dry (left, 1991) and wet (1996) periods in the last century (see Fig. 3). A several year drought in the late 1980's greatly reduced the number of wetlands available for wildlife, but increased precipitation, including record snowfall in 1995-96 and again in 1996-97, refilled basins and drastically altered the landscape for farming and wildlife! Notably, Devils Lake, a "closed" basin lake in north-central ND (see Figure 1) was considered at risk of drying by the early 1990's, but dramatically expanded by the mid-1990s putting the town of Devils Lake at risk of inundation and submerging large tracts of farmland.

changing economies. Despite the obvious changes to the landscape, the PPR retains some portion of its native biological diversity, including the waterfowl that breed in or fly over the region, migratory and resident songbirds and raptors, small and large mammals, and a diverse array of insects, native prairie plants, and soil organisms that drive ecosystem processes (so we should not forget about them). The usual invasive, and often ecologically harmful, mostly plant species that follow humans wherever we go, are present too.

**The problem faced** by any wild species in this landscape are the same faced by any anywhere: all need suitable habitat to carry out the essential functions for making a living – food, shelter, breeding and nesting or denning sites, etc. The spatial scale on which individuals and populations live is largely dependent on their abilities to move around on that landscape, and some species are more constrained in this regard than others. Perhaps no other taxa, as a group, is more challenged when habitat is lost or degraded than amphibians. This, of course, is open to all sorts of insightful ecological debate among taxonomic interest groups, focused on various aspects of ecology, physiology, behavior, or other biological function (just pick your preferred supporting evidence). But, certain things cannot be challenged: amphibians are small-bodied (high surface area-to-volume, high

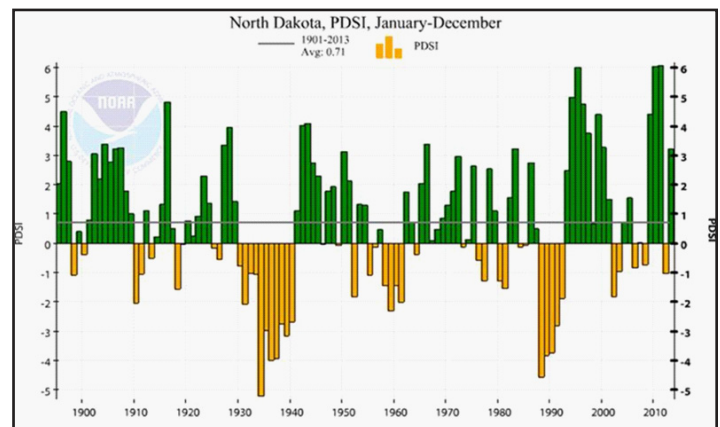


Figure 3. NOAA Drought monitor data, illustrating climate fluctuations estimated using the Palmer Drought Severity Index (PDSI), which is a function of precipitation and potential evapotranspiration. Data from <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/>.

environmental exchange rate), thin-skinned ectotherms that are notoriously sensitive to a broad suite of physical and chemical factors in the environment. Nearly all of the northern plains species require both water bodies (wetlands, lakes, puddles, etc.) and upland terrestrial habitat to make a living, and they have limited capacity to move around to escape unpleasant circumstances should the need arise. They may avoid entering neighborhoods that appear to be unfavorable, but otherwise often have to "survive in place." Mobility is constrained by their small size, and physiological tolerances to extremes of temperature, humidity, and chemicals (if they attempt to traverse

*Continued on page 5*

# Wetlands Working Group News

## Get Involved!

### Nominate Yourself for Vice Chair or Treasurer/Secretary

Board Meetings are once a month by conference call (1 hr), so **you can participate from anywhere!** Officers develop content for the biannual newsletter, assist with organizing symposia, maintain our website and Facebook page, and participate in other activities as needed to increase communication about wetland and wildlife-related issues among WWG members. Including monthly meetings, time commitments average 2-4 hrs/month for vice chair, past chair, and secretary/treasurer, and 4-8 hrs/month for Chair. The duties are outlined in the WWG Charter, and are summarized as follows:

**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, Adonia Henry, via email, [adoniarhenry@gmail.com](mailto:adoniarhenry@gmail.com) by 31 July 2017.**

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

## 2018 Arid Wetlands Symposium

The Wildlife Section of the Society of Wetland Scientist (SWS) is planning an Arid Wetlands Symposium at the 2018 SWS meeting in Denver, Colorado. The goal is to bring together scientists and managers from arid wetlands across North America and Asia to address the unique challenges posed in managing and conserving arid wetlands and their species.

If you are interested in being part of the symposium contact Sammy King ([SKing@agcenter.lsu.edu](mailto:SKing@agcenter.lsu.edu)) or Auriel Fournier ([aurielfournier@gmail.com](mailto:aurielfournier@gmail.com)).

## WANTED: Social Media Liaison!

**Do you love social media?** If so, help us keep WWG members up to date on wetland related news & activities.

## All Working Group Table at TWS Conference

At the request of several working groups, including ours, TWS will be hosting an All Working Group Table at this year's annual conference. Look for it outside the exhibit hall and stop by learn about other working groups and meet members. And don't forget to spread the word about the Wetlands Working Group!



**24th Annual Conference 23-27 Sept. 2017** Visit <http://twsconference.org/> for more info.

## Wetlands in the News

### Wetland Revenue "Stream"

Stream restoration creates jobs in [coal county](#).

**Canada's 1st National Wetland Assessment** identifies threats to 20% of the global water supply.

**Mexico City's pre-Columbian Waterways at risk** from aquifer pumping and land subsidence

**North Bering Sea** designation [short lived](#).

**Soil Clouds** (a.k.a. dust storms) increase with the [decline of CRP](#).

**Remnant NYC Salt Marsh** projects flooding threats to [\\$25 billion in infrastructure](#).

**Bifenthrin in Australian Wetland Sediments** high enough to [kill amphipods](#).

**2 M Gallons of Drilling Fluid** from Rover Pipeline spilled into [Tuscarawas R. wetlands](#).

**Developer Plans to Restore 400 ac**, the [largest wetland bank](#) in southeast Wisconsin.

**Constructed Wetlands** may help [farmers manage nutrients](#).

### New Publication

Phytoplankton functional dynamics in a shallow polymictic tropical lake: the influence of emergent macrophytes  
[Hydrobiologia \(2017\) 797: 69. doi:10.1007/s10750-017-3161-z](#)

Click on the [light blue](#) hyperlinked text above for links to the original articles.



## Amphibian Ecology in Northern Prairie Wetlands (continued from page 3)



Figure 4. Small (upper) and large (lower) Prairie Pothole wetlands in dry (left) and wet (right) years. Both of these ponds are used for breeding by several species of amphibians. Photos courtesy of the author.

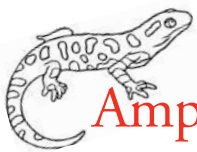
fields where fertilizer or pesticides have been applied). Amphibians simply cannot skip over large stretches of inhospitable land the way flying animals can, and they cannot quickly transit such areas the way a long-legged and highly mobile mammal can. When they are out in the open, assuming they can survive the elements, everyone likes to eat them (primarily birds, mid-sized mammals, and reptiles). They are also increasingly exposed to several microbial pathogens (ranavirus and chytrid fungus), which may be more likely to overcome immune defenses if the animal is already experiencing impaired health from some other environmental stressor. It is no wonder that many amphibians are experiencing declines in all parts of the world where they are found (Adams et al. 2013).

**Despite all the challenges** they face, we also know this about northern prairie amphibians: although diversity is not particularly high (the state of North Dakota records 10 species, including 9 anurans [frogs and toads] in 5 genera and 1 salamander), some of them

are quite abundant and widespread, at least in North Dakota. The latter include most notably the Northern Leopard frog (*Lithobates pipiens* - *Rana pipiens*), the Wood frog (of all things to be found on the prairie!; *Lithobates sylvaticus* - *Rana sylvatica*), the Boreal chorus frog (*Pseudacris maculata*), and the Gray tiger salamander (*Ambystoma mavortium*). North Dakota is thought to have lost about half its pre-agricultural wetlands (Dahl 1990), and large portions of the landscape are at least somewhat hostile to amphibians, but there apparently are still sufficient breeding sites and adequate demographic connectivity to permit persistence of the species that do occur in the region. It is certainly true that we have limited information about the composition and structure of the pre-European ecological communities, and what we have comes primarily from notes of early explorers, trappers, and other naturalists who did not particularly pay attention to the herpetofauna [fur was no good ;)]. Nor do we have any real insight into historical trends for the non-

*Continued on page 6*





# Amphibian Ecology in Northern Prairie Wetlands (continued from page 5)

harvested, non-avian species that are here now (who was watching?), but there are still species that seem to be making a living out there! For conservation biologists and wildlife and land managers, **the important question now is what does it take to keep these species in the game?**

The short answer to this key question is also the standard generic answer, but this simply underscores the fundamental truth that all species need sufficient suitable habitat to support viable breeding populations, and that habitat accounting must provide resilience to expected disturbances. Perhaps this could be in the form of extra capacity as a buffer to population declines, or spatial refugia that are resistant to perturbations, such as those related to climate variations (e.g. drought) and changes in land-use that alters hydrology or degrades, reduces or fragments habitat. Equally importantly, landscape configuration must support meaningful demographic connectivity to allow adequate rates of spatial processes including dispersal, (re-)colonization, and gene flow (Quesnelle et al. 2015). For example, periods of drought, which are common in prairie ecosystems, may lead to contraction of the range of wetland-dependent species to locations with reliably persistent water (drought refugia), but the long-term viability of species will be enhanced if they have the ability to expand their range more broadly when wetter periods refill basins and potentially productive habitat becomes available. During periods of geographic contraction, species are literally putting their eggs into fewer baskets, so an expansion into more locations provides a more robust demographic buffer with corresponding greater total abundance and genetic variation. A corollary of this dynamic is that current unoccupied habitat, including unfilled wetland basins, may play an important role in long-term species viability

on that landscape because of the lag in recolonization following a disturbance. In both locations where I have conducted “long-term” studies (10 years in Big Bend National Park, TX, and more than 20 years in the PPR of northeastern ND), species distributions have clearly fluctuated in response to landscape-level changes in moisture.

**All of this will** be familiar ground to any field ecologist, regardless of ecosystem or focal species. Additionally, it is widely recognized by now that all bets are



Wood frog. Photo by Hobberg & Gatusse.

off as far as forecasting wildlife futures. Changes in U.S. federal farm policy and economies of farming led to substantial reductions in the last five years in land enrolled in the Conservation Reserve Program (Figure 5). Farming, as essential a role as it plays, and even fossil fuel production, are associated with altered hydrology and lowering of water tables (McCauley et al. 2015). Increased use of tile drainage has also directly impacted hydrological dynamics at the landscape scale. Wetlands remain at risk. Chemicals used for fertilizers and for pest control degrade water quality and demographic function of wetlands and entire landscapes. Climate change has at least the potential, if not already realized, to dramatically alter the ecological stage for wild species. This includes changes in temperature and evaporative return of moisture to the atmosphere, which along with predicted changes in precipitation directly influence wetland dynamics (Johnson and Poiani 2016). Changes in seasonality and within-season timing and magnitude of temperature and precipitation fluctuations are also likely to play significant roles in demographic performance. And amphibians will be directly or

*Continued on page 7*



Figure 5. A wetland complex (looking north) embedded in conservation easement land, photographed in 2011 (left image). The same landscape (looking south from the northern (former) edge), photographed 2015, with greatly reduced grassland and wetland cover. Photos courtesy of the author.

# Amphibian Ecology in Northern Prairie Wetlands (continued from page 6)

indirectly sensitive to it all. These factors do not act independently, either. Chemical stressors, for example, may increase susceptibility to diseases and changes in seasonality may result in different patterns of exposure to human activities. For all of these reasons, it is more important than ever to provide buffers (spatial refugia, landscape connectivity) to maintain demographic resilience.

**Finally**, if you made it this far, you probably do not need additional justification to pay attention to amphibians (or you were just having trouble falling asleep). But in case you feel the need to explain to someone else why they should be concerned about amphibians anyway, here are a few reasons. For the ecologically-minded, it is worth remembering that



*Gray tiger salamander. Photo courtesy of UND.*

amphibians are centrally-located in both aquatic and terrestrial food webs, and in some places may be a large fraction of the biomass (at least among vertebrates). That's a lot of eating (or being eaten) for somebody. This may be the case in prairie wetlands with abundant adult or larval frog or salamander populations. Because they are sensitive to many factors in the environment, amphibians are good bio-indicators of ecosystem health: after all, do you really want to eat ducks or fish that came from a pond with a bunch of 7-legged frogs or eyes growing from non-standard body parts? And the answer that satisfied at least one ranch manager – small juvenile toads eat a lot of chiggers! (See page 9 for literature cited).



*Boreal chorus frog.  
Photo by Scott Gillingwater,  
www.naturewatch.ca*

## Update on the Clean Water Rule by Jen Chutz, WWG Chair

**In yet another chapter** in the evolution of the Clean Water Rule, President Trump issued [Executive Order \(E.O.\) 13778](#) on 'Restoring the Rule of Law, Federalism, and the Economic Growth by Reviewing the "Waters of the United States" [WOTUS] Rule'. This brief E.O. calls on the Environmental Protection Agency (EPA) Administrator and the Assistant Secretary of the Army for Civil Works (as part of the U.S. Army Corps of Engineers [USACE]) to review the final Clean Water Rule and "publish for notice and comment a proposed rule rescinding or revising the rule...". It also directs that the review "shall consider interpreting the term 'navigable waters'" in a manner "consistent with Justice Scalia's opinion" in



*Vernal pool fairy shrimp (Branchinecta lynchi; ESA threatened). Photo by D. Anderson & P.J. Bryant, UCI.*

[Rapanos \(2006\)](#). Justice Scalia's opinion indicates Clean Water Act (CWA) jurisdiction includes relatively permanent waters and wetlands with a continuous surface connection to relatively permanent waters.

As a result of the [stay](#) of the [2015 regulatory definition of WOTUS](#) implemented by the U.S. Court of Appeals for the Sixth Circuit, the current definition is that from 1986/1988 outlined in [40 CFR 230.3\(o\)](#) and implemented consistently with subsequent Supreme Court decisions and guidance documents. The EPA and USACE recently signed a [proposed rule](#) to revise and recodify the Code of Federal Regulations (CFR) to reflect the definition currently in effect under the stay. They will then begin the long process of reevaluating and revising the WOTUS definition in accordance with the E.O.

The EPA and USACE offered state, tribal and local governments, as well as NGOs that represent those entities, an opportunity to hold discussion sessions and make comments in response to these developments, which were due by June 19, 2017. Wetland scientists from seven scientific societies, representing more than 200,000 total members, [spoke out against the E.O. in a letter](#) to the Trump administration. For more information on the Clean Water Rule, visit the EPA's '[WOTUS Rulemaking website](#)'.



## FY2018 Budget Slashes Science, Including Wetland Programs

by Jen Chutz, WWG Chair

On May 5th, the Consolidated Appropriations Act of 2017 (H.R. 244), authorizing appropriated funds through the remainder of FY17, was signed into law by President Trump. Later that month, the administration released the 2018 US Budget titled “A New Foundation for American Greatness” in which the President’s budget request outlines proposed spending and a plan to reduce government spending by \$3.6 trillion over the next ten years.

Scientific agencies are proposed to take severe cuts, with the overall EPA budget slated for reductions of over 30%, the USACE by 16%, USGS by 10%, DOI by 12%, USDA by 18%, and the National Science Foundation by nearly 11%. The White House wants to cut federal spending on basic research by \$4.3 billion (13%), compounding the overall decline in basic research funding provided by the federal government, from roughly 70% in the 1960s and 1970s to an estimated 44% in 2015.

Specific budget cuts to wetlands programs include a \$14 million (3%) cut to the National Wildlife Refuge System, a \$4.4 million (11.5%) cut to the N.A. Wetlands Conservation Fund, a \$3 million (17%) cut to EPA’s Wetlands budget, and the elimination of spending on the EPA’s National Estuary Program/Coastal Waterways, which was allocated \$26 million in FY17. According to the EPA’s ‘Budget in Brief’, their grants programs will all be cut by 30% to 100%. While categorical grants that support state and tribal implementation of the Clean Water Act like the Wetlands Program Development Grants are proposed for 30% cut, the Nonpoint Source grants under Section 319 of the CWA will be eliminated.

TWS has submitted written testimony concerning the FY18 budget to both the U.S. House and Senate Appropriations Subcommittees on Interior, Environment, and Related Agencies, as well as the Appropriations Subcommittee on Agriculture. Budget discussions for FY18 are expected to continue in Congress through July. For more information, [click here](#).



## Endangered Species Act Vulnerable

by Auriel Fournier,  
WWG Treasurer/Secretary

The Senate Environment & Public Works Committee is expected to act on legislation to rewrite the Endangered Species Act (ESA) by the August recess. It is likely this rewrite would weaken this crucial piece of legislation, despite it being supported by 90% of voters. The most recent hearing focused on giving the states more authority for protecting (or not protecting) species, despite the law already encouraging federal, tribal, state and local officials to work together to prevent extinction. Critics of the law are upset that for every 100 species added to the list, only 3 are removed, while supporters point out that 98% of listed species have not gone extinct, which means the law is working, even if they are not delisted. Other proposed changes include removing every species from the endangered species list after just five years unless Congress voted to relist them, further removing science from the delisting process. Additional new changes include blocking any review by the court system. The ESA is crucial legislation for protecting and recovering species we would otherwise lose forever.

### Threatened & Endangered Frogs:

Top: Oregon spotted frog (*Rana pretiosa*), photo from Oregon Zoo.  
Bottom: Nevada yellow-legged frog (*Rana sierrae*), photo from NPS.



### Literature Cited for Amphibian Ecology in Northern Prairie Wetlands

- Adams, M.J., D.A. Miller, E. Muths, . . . , and S.C. Walls. 2013. Trends in amphibian occupancy in the United States. *PLoS One* 8:e64347.
- Batt, B.D.J. 1996. Prairie ecology: prairie wetlands. Ch. 6 pp. 77-88 In Samson FB and Knopf FL, *Prairie Conservation: Preserving North America’s Most Endangered Ecosystem*, Island Press, Washington, D.C.
- Dahl, T.E. 1990. Wetlands losses in the United States, 1780’s to 1980’s. Report to the Congress. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 13pp.
- Johnson, W.C., and K.A. Poiani. 2016. Climate change effects on Prairie Pothole wetlands: findings from a twenty-five year numerical modeling project. *Wetlands* 36 (Suppl 2): S273-S285.
- McCauley L.A., M.J. Anteau, M.P. van der Burg, M.T. Wiltermuth. 2015. Land use and wetland drainage affect water levels and dynamics of remaining wetlands. *Ecosphere* 6(6):92. <http://dx.doi.org/10.1890/ES14-00494.1>
- Quesnelle, P.E., K.E. Lindsay, L. Fahrig. 2015. Relative effects of landscape-scale wetland amount and landscape matrix quality on wetland vertebrates: a meta-analysis. *Ecological Applications* 25: 812-825.
- Stewart, R.E., Kantrud HA. 1971. Classification of natural ponds and lakes in the glaciated prairie region. Resource Publication 92, Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/wetlands/pondlake/index.htm> (Version 16APR1998).



# Training Opportunities & Upcoming Conferences

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

2017

Joint Meeting of Ichthyologists and Herpetologists  
12-16 July 2017, Austin, TX

American Fisheries Society Annual Meeting  
20-24 August 2017, Tampa, FL

International Congress of Ecology (INTECOL 2017)  
20-25 August 2017, Beijing, China

International Symposium for Wetland Pollution  
Dynamics and Control (WETPOL)  
21-25 August 2017, Big Sky Resort, MT

7th World Congress on Ecological Restoration  
27 Aug. - 1 Sept. 2017, Foz do Iguassu, Brazil

Southeast Association of Fish and Wildlife Agencies  
29 Oct. - 1 Nov. 2017, Louisville, KY

2018

78th Midwest Fish & Wildlife Conference  
28-31 January 2018, Milwaukee, WI

National Mitigation & Ecosystem Banking Conference  
8-11 May 2018, Louisville, KY

Society of Wetland Scientists Annual Meeting  
29 May - 1 June 2018, Denver, CO

Wetland Science: Integrating Research, Practice and Policy -  
An Exchange of Expertise  
*Arid Wetlands Symposium (see page 4 for details)*



Wood frog eggs. Females each lay an egg ball, typically congregating in the same location for oviposition (communal oviposition).  
Photo by Robert Newman.

## Questions?

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

Contact Us!  
wwg.tws@gmail.com

## 2017 Board Members

**Jennifer Chutz, Chair**  
dciwestbiological@gmail.com

**Johanna Duffy, Vice Chair**  
jduffy@bartonandloguidice.com

**Auriel Fournier, Treasurer/Secretary**  
aurielfournier@gmail.com

**Adonia Henry, Past Chair**  
adoniarhenry@gmail.com

## 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.



Blotched tiger salamander. Photo courtesy of UND.

## Support the WWG

**Reusable Chico Bags  
only \$10 each  
(free shipping)**

Contact Adonia at  
[adoniarhenry@gmail.com](mailto:adoniarhenry@gmail.com)  
to get yours today!

