

The Association of State Wetland Managers Presents:  
**Improving Wetland Restoration Success  
2014 — 2015 Webinar Series**

**Wetland Restoration in Urban and Highly  
Disturbed Landscapes**

**Presenters:**

**Steven I. Apfelbaum, Applied Ecological Services, Inc.**

**Thomas Ries, Ecosphere Restoration Institute**

**Alexander J. Felson, PhD, Yale University School of Architecture  
& School of Forestry and Environmental Studies**

**Moderators: Jeanne Christie & Marla Stelk**



Supported by EPA Wetland Program Development Grant 83541601



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1. You were sent a link to instructions for how to use the Go To Webinar software.
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# AGENDA

- **Welcome and Introductions (5 minutes)**
  - **Restoration Webinar Schedule & Future Recordings (5 minutes)**
- **Wetland Restoration in Urban and Highly Disturbed Landscapes (60 minutes)**
- **Question & Answer (15 minutes)**
- **Wrap up (5 minutes)**



# WEBINAR MODERATORS



Jeanne Christie,  
Executive Director



Marla Stelk,  
Policy Analyst

# WETLAND RESTORATION PROJECT

- Interdisciplinary workgroup of 22 experts
- Monthly webinar series
- Draft white paper based on webinars, participant feedback, external review
- Pursuing strategies that:
  - Maximize outcomes for watershed management
    - Ecosystem benefits
    - Climate change
    - Invasive species
  - Improve permit applications and review
  - Develop a national strategy for improving wetland restoration success



**ACTION PLAN ➡ IMPLEMENTATION**

# WEBINAR SCHEDULE & RECORDINGS

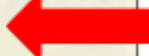
## Association of State Wetland Managers - Protecting the Nation's Wetlands.



### ASWM Upcoming Webinars

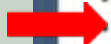
- Stream/Wet Meadow Restoration - September 8, 2015
- The Florida Wetlands Integrity Dataset: Part 2 - September 16, 2015
- Solar Project Siting and Wetland Permitting - September 29, 2015

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### ASWM Publications

#### Journal of Monitoring and Assessment in Wetland Programs

The Association of State Wetland Managers has released a new report - *Uses of Wetland Monitoring and Assessment: Considerations for State and Tribal Programs*. This report - which was prepared with technical assistance from an EPA State Wetland Program Development Grant - explores the various ways that states and tribes could make better use of existing monitoring and assessment methods to obtain science-based answers to wetland management problems. While it provides an overview of many common approaches to wetland monitoring, the focus is primarily on **why** these methods are selected for a given purpose. This report encourages the thoughtful identification of the most appropriate and efficient methods in light of available financial and staff resources.



### Picture of the Week *Lovely Weeds*



Jeanne Christie Photo

For information about this picture and to see past pictures of the week click [here](#).

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#### ASWM Webinars/Conference Schedule

The Association of State Wetland Managers holds webinars on various topics, most of which relate to a specific project and work group. In addition, ASWM holds webinars as part of its members' webinar series on topics of interest to members. Please click on the webinar group name below for more details about individual webinars. In all cases, if you have any questions about registering for a webinar, please contact Laura at [laura@aswm.org](mailto:laura@aswm.org). If you are a member, and you missed a webinar that was part of the members' webinar series, please contact us. We will post the recordings of the webinars going ahead.

If you haven't used Go To Webinar before or you just need a refresher, please view our guide prior to the webinar here.



A presentation given during a webinar

#### Special Topics Webinars

Future Past

#### Members' Wetland Webinar Series

Future Past: Members Only Past: Nonmembers

#### Natural Floodplain Functions Alliance (NFFA)

Future Past

#### Wetland Mapping Consortium (WMC)

Future Past

#### Improving Wetland Restoration Success Project

Future Past



WEBINAR  
 SCHEDULE &  
 RECORDINGS



# FUTURE SCHEDULE - 2015

- **Thursday, November 19, 3:00pm eastern:**
  - **Novel Ecosystems and Restoration**  
Presented by:  
**Joy Zedler, PhD, University of Wisconsin-Madison; and  
Marilyn Jordan, PhD, Retired, The Nature Conservancy**
- **Tuesday, December 8, 3:00pm eastern:**
  - **Wetland Restoration: What We've Learned**  
Presented by:  
**Jeanne Christie, Executive Director, ASWM; and  
Marla Stelk, Policy Analyst, ASWM**

**FOR FULL SCHEDULE, GO TO:** <http://aswm.org/aswm/6774-future-webinars-improving-wetland-restoration-success-project>

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[laura@aswm.org](mailto:laura@aswm.org)

(207) 892-3399

Provide:

- Your full name (as registered)
- Webinar date and Title

# PRESENTERS



**Steven I. Apfelbaum**  
Principal Ecologist & Chairman,  
Applied Ecological Services, Inc.



**Thomas Ries**  
President and Founder,  
Ecosphere Restoration  
Institute



**Alexander J. Felson,**  
PhD, RLA, Assistant  
Professor, Yale University  
School of Architecture &  
School of Forestry and  
Environmental Studies

## A “COOKBOOK” APPROACH TO WETLAND RESTORATION WON’ T WORK

*There are too many variables.*

- *Ingredients are always different*
- *Reason for ‘cooking’ varies*
- *Recipe isn ’t always correct*
- *Inexperienced cooks*
- *Cooking time varies*
- *Poor inspection when “cooking”*
- *Additional ingredients may be needed*
- *Is it really done?*



# MasterChef



**WE NEED TO  
UNDERSTAND THE  
PLANNING PROCESS  
AND VARIABLES FROM  
SITE TO SITE THAT  
MUST BE STUDIED,  
UNDERSTOOD AND  
ADDRESSED**



# Major Reasons for Failure (examples)

## Overarching

- Poorly Defined Outcomes/Performance Criteria
- Lack of Access to Expertise and Training
- Lack of Accountability and Enforcement
- Altered and Changing Landscapes/Climate
- Separation of Professions – The ‘Silo’ effect

## Site-Specific

- Planning issues, i.e., Inadequate Assessment of landscape, hydrology & soils
- Construction issues, i.e., failure to implement design, no adaptive management
- Post construction issues, i.e., poor record keeping, limited follow up activity to address problems

# How Do We Improve?

- Better defined goals and performance criteria
- Improve Access to Knowledge and Training
- Require Accountability
- Require Documentation of Credentials
- Develop a Common Taxonomy
- Adopt New Science and Technology into Regulations and Guidance
- Engage Multi-Disciplinary, Integrated Teams
- Regional Data Depositories to Document Reasons for Success and Failure



## EACH WETLAND RESTORATION PROJECT IS UNIQUE:

- *Consider both historic and current landscape setting*
- *Analyze how water moves into and out of the site*
- *Evaluate soils present and identify any onsite drainage*
- *Focus first on hydrology and soil first, last on plants*
- *Develop a plan that is achievable for the site*
- *Develop comprehensive cost estimates*
- *Ensure plan is followed*
- *Hire experienced and knowledgeable contractors*
- *Adapt plan as needed during construction*
- *Determine if monitoring criteria will measure progress*
- *Keep good records and share with others*



# Wetland Restoration in Urban and Highly Disturbed Landscapes

IT WILL TAKE US A FEW MOMENTS TO MAKE THE SWITCH...



Photo Credit: Marla Stelk

## Apfelbaum's Recommendations

Cause of Failure	Recommendation	Selected Measures
Location, Location, Location	Inappropriate hydraulic, hydrologic and land use context	Watershed context placement is necessary
Inadequate quantity, quality of seed/plant used and planting swamped by invasive plant seedbank (which was not understood)	Seedbank quantitative analysis and planting of cover crops, annual, biennial and perennial final species	Seed bank evaluation using soil sampling and greenhouse growing; seedbank management to reduce risk of invasive plant dominance using cover crops, soil preparation to stimulate undesirable seed banks. Also understand seed and propagule rain from upstream watersheds
Misunderstanding hydraulic performance and water quality and overdeepening and overly increased depth duration	Confirm hydraulic performance through field measurements and indicators rather than rely on H and H modeling.	Measure hydraulics and depth duration and align with planting specifications and construction plans
Substrate compaction	Heavy substrate compaction (often coupled with deicing materials salt-related substrate structure collapse) from earth moving restricts plant growth.	Use of low loading construction equipment, polyacrilimiad resins, and other techniques to reduce compaction.

# Ries' recommendations for urban habitat restoration projects

Cause of Failure	Recommendation	Selected Details
Lack of historic records or as-built surveys to understand the geotechnical conditions	Research historic aerials & photos of the site to get a better understanding of it's prior use which might affect the designs	NRCS (or original SCS) records as well as the original survey field notes can very useful tools to ascertain the prior site conditions. Also, interviews with former land owners can be useful in learning about a site's history
Contaminated soils	Perform many more borings and even pit digs to really investigate the potential for contamination which will affect the design	Highly urbanized sites have a long history of various uses, much of which may of occurred prior to today's regulatory rules and restrictions; it is imperative to look for potential contamination in these types of settings
Undocumented utilities and subsurface conduits	Ground Penetrating Radar (GPR) may be necessary to identify the location of undocumented utilities and potential conflicts	
Archaeological ramifications	Perform a through archaeological investigation when there's greater than 50 years of urban use at a site	Archaeological conflicts can completely 'kill' a site plan. Historic building foundations may need to be preserved and acknowledged so avoidance of these potential conflicts is paramount
'Loved To Death'	Habitat restoration in urban settings provide <u>very</u> affect ways to educating a large populace, however, too many people can negatively affect it's ecology	Roping off sensitive areas from tramping and keeping the public a distance from the wildlife, especially protected species is important and should be addressed in the design with buffer areas, limited access locations while still providing some access to the site

# Felson's Recommendations

Cause of Failure	Recommendation	Selected Measures
<p>Urban stressors create a new range of pressures</p>	<p>Coordinate with other professionals involved in city making and maintenance to explore better restoration options.</p>	<p>Integrate adaptive management into restored urban ecosystems. Develop restoration projects as design experiments to test performance and function. Rethink reference ecosystems and historic landscapes to guide our approach</p>
<p>Go beyond the “biggest bang for the buck” approach focusing on the greatest habitat restoration potential and include lower value locations where funding exists.</p>	<p>Diversify restoration types to include a range of urban interventions</p>	<p>Develop ecosystem functions including social ecological values for restored ecosystems and develop an education and marketing campaign to promote specific restored landscape types as tools for urban ecosystem function. Piggyback on the green infrastructure movement and learn from other fields already involved in building projects. Build restoration into multiple areas (e.g. infrastructure, parkland, streetscapes, neighborhoods).</p>
<p>Take on more risks and ethical challenges at multiple levels in order to increase the role of restoration ecologists in society.</p>	<p>Maintain an open and inclusive attitude towards restoration projects and look for opportunities to expand the types of restored ecosystems projects.</p>	<p>Rather than taking a hard stance on restoration ecology and issues such as invasive species, allow more diverse perspectives and approaches to permeate. This needs to be balanced with the recognized value of field experience and the application of a deep understanding of historic landscape reference sites within the context of a changing climate.</p>
<p>Expand opportunities for restoration ecologists.</p>	<p>Restoration ecology is a fairly conservative field. Consider expanding the role restoration ecologists play in city making.</p>	<p>Restoration ecologists could focus on a wider range of themes including project siting and scope, stakeholder and local negotiations, project design and aesthetics. Develop multifunctional landscapes with restoration as a component.</p>
<p>Bridge across theory and practice, linking basic and applied science: the world needs more restoration ecologists.</p>	<p>Restoration ecologists have a rich history of bridging theoretical ideas in ecology with applied practice. This integration needs to be further promoted and supported through bridging academics with practitioners and building experiments and testing into design projects.</p>	<p>Funding that could support interdisciplinary restoration ecology linking academics with practitioners is essential. Restoration ecologists also need to recognize where there is uncertainty or missing knowledge in order to better grapple with what areas need further research. Many assumptions about what makes a good restoration project need to be reevaluated critically and explored in greater detail through rigorous testing and field experiments. We need to integrate increased monitoring and assessment on the restoration projects that are built.</p>

# Questions?



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*Thank you for your  
participation!*

