Small Ponds & Wetlands in Watershed Ecological Design

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OCLWA
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Session introduction

- Themes:
  - How wet Oklahoma?
  - Watershed ecological design
    - Cumulative benefit of small interventions across the landscape
    - Cumulative benefit of small interventions over time
    - Partnering with beaver

How wet Oklahoma?

- 387,000 ponds (< 10 acres)



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- 897,280 acres of lakes & ponds



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- 387,000 ponds (< 10 acres)
- 3,000 lakes (>10 acres)
- 897,280 acres of lakes & ponds
- 2% of Oklahoma land surface (OWRB 2015)



How wet Oklahoma?

- 2,842,600 acres wetlands (1780) (Dahl 1990)



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- 949,700 acres wetlands (1980)
- 2.1 %



How wet Oklahoma?

- 897,280 acres – lakes & ponds (2015)
- 949,700 acres – wetlands (1980)
- 2,842,600 acres – wetlands (1780)



How wet Oklahoma?

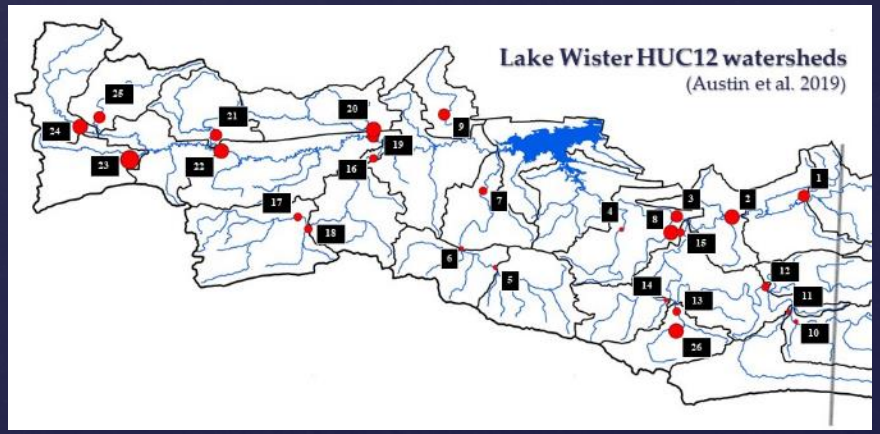
- NRCS:
  - 5,500 new ponds (2005-2018)
  - 16,778 acres wetland creation (2005-2018)

(NRCS 2019)



Watershed ecological design

- NRCS supports pond building & wetland creation
- Siting is currently based on farmer interest
- Can we think & plan systematically & strategically about location and improve water quality benefits and create cumulative, collective benefits?
- Scott, Nairn presentations
- New Farm Bill (2018) – NRCS 10% of all conservation $ on Sourcewater Protection

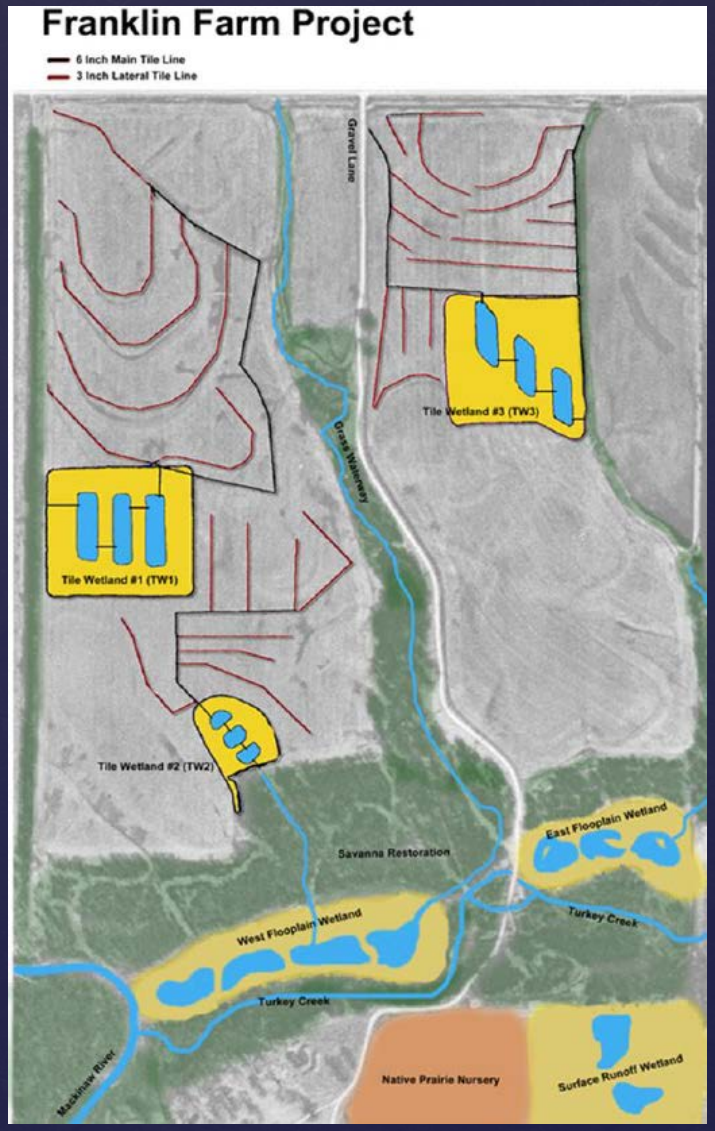


Small interventions across the landscape:
Farm-Scale Wetlands in Illinois

- TNC & partners

- Created three sets of three wetland cells
- Each cell sized at 3% of field size
- Treatment at 3%, 6%, & 9%
- 10 years of data

- @ 3% - 19% nitrate removal & 49% dissolved P
- @ 6% - 36-44% nitrate removal & 59% dissolved P
- @ 9% - 47% nitrate removal & 58% dissolved P



Small interventions over time

- 80% reduction TP required - Lake Wister
- 91% reduction TP required – Illinois River

Small interventions over time

- 80% reduction TP required - Lake Wister
- 91% reduction TP required – Illinois River
- In the 1990s – 2% reduction in Total Phosphorus via pond building in the Lake Wister watershed
- 2%/year x 40 years = 80%

Allison Arieff Retweeted

Taras Grescoe @grescoe · 18h

"#Copenhagen took away three percent of inner city parking every year. If you do it slowly enough, nobody notices."—Jan Gehl, @citiesforpeople

The Strøget, 1954 and today.

9

Small interventions over time

Small interventions over time

- Philadelphia needs to reduce combined sewer overflows by 85 %
- 25 year program to create a citywide mosaic of green stormwater infrastructure

- The unit of measure for progress is "one greened acre"
- Goal is to create 10,000 greened acres

THE NORMAN
TRANSCRIPT
Norman, Oklahoma

Because you asked

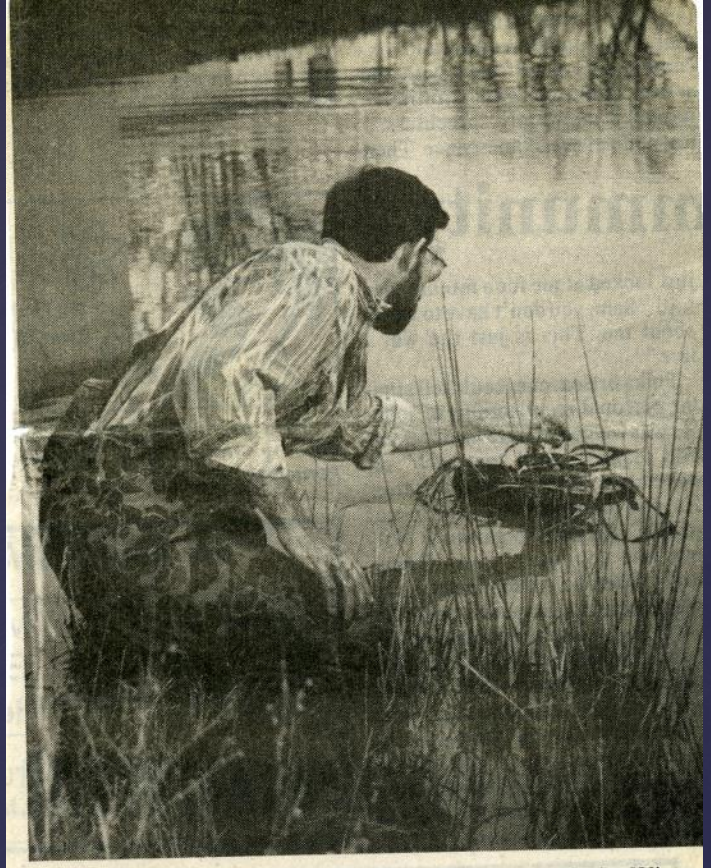
Detention ponds 101

By Joy Hampton Senior Staff Writer Dec 9, 2016

Lake Misty (Photo: Joy Hampton)

Maintenance, Education, & Outreach

- Fleming & Salvo presentation



Paul Koenig places a starter plant in a pond near Lake Wister

Lake Study Growing

Heavener Ledger 3-5-98

by Fran Johnson

Knee-deep in water, Paul Koenig carefully places a freshly potted plant into a pond near Lake Wister. On shore, his assistant readies several more starter plants for placement in the watery 'nursery'.

From the pond, the dozens of aquatic plants will be transplanted into Lake Wister.

Why are plants being introduced into the lake?

According to Koenig, Environmental Specialist Supervisor for the Oklahoma Water Resources Board (OWRB), Lake Wister -- a man-made reservoir -- has no established plant

Maline Arm were selected fr
available areas for test plantings.

Plantings will include species
survive at varying planting depth
from those commonly found at
edge of the water to plants liv
completely under water.

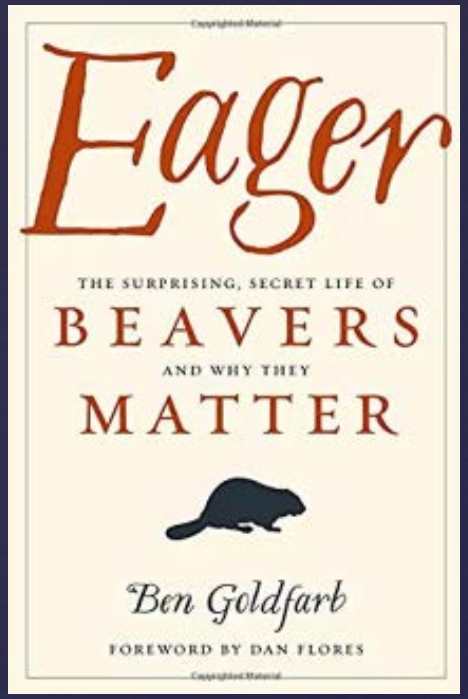
Planting units will be monito
monthly by OWRB personnel.

After monitoring is complete
July 1998, the Corps and
Lewisville Aquaqtic Ecosys
Research Facility will work
OWRB personnel to analyze re
of the test plantings and a report
be prepared.

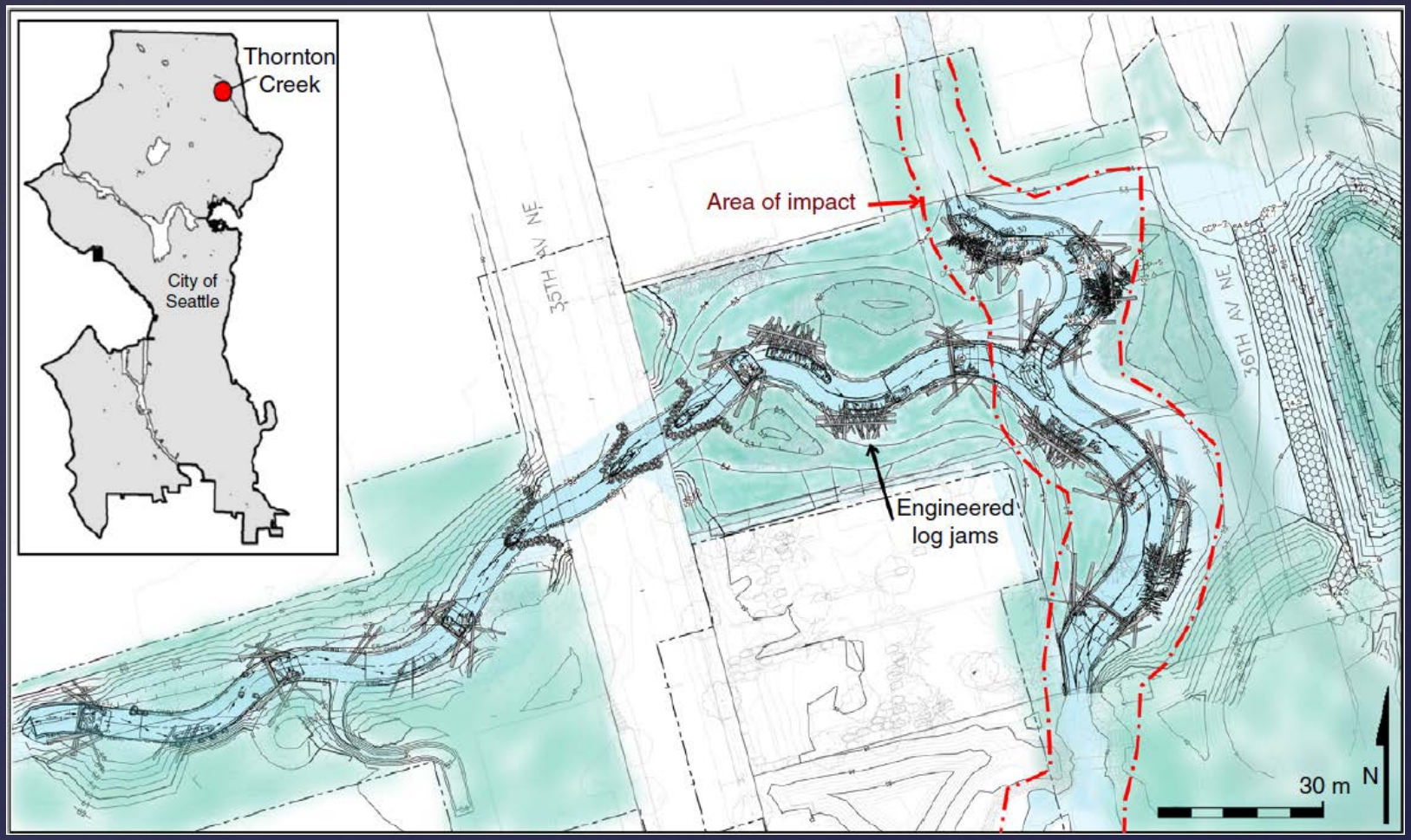
Pond plants

- Koenig presentation

Beaver Ponds & Wetlands



- Tucker, Phillips, Nairn presentations
- Beaver mostly extirpated in US by 1840's (except Pacific Northwest)
- 1952 ~ 485 beaver remain in west-central Oklahoma
- Today, nationally, beaver numbers still only ~ 10% of historic population



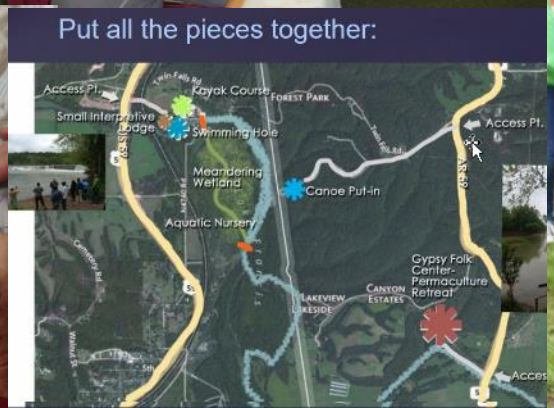
Thornton Creek Confluence Restoration Project, Seattle, WA

Bailey et al. 2019. Reintegrating the North American beaver (*Castor canadensis*) in the urban landscape. WIREs Water 2019. (wires.wiley.com/water)

Beaver Ponds & Wetlands


Eufaula
WETLAND
PARK

Questions?


Put all the pieces together:
Access Pt.
Kayak Course
Small Interpretive Lodge
Swimming Hole
Forest Park
Access Pt.
Meandering Wetland
Canoe Put-in
Aquatic Nursery
Gypsy Folk Center- Permaculture Retreat
Lakeview Lakeside
Canyon Estates

Tahoe City Wetland

- Constructed 1997
- 56 acre catchment area
- Designed to promote both sedimentation and biological processing
- Sediment cores taken prior to renovation in 2014

- 3.2 cm/year sediment accretion
- Carbon 280 g/m2/year
- Nitrogen 17.7 g/m2/year
- Phosphorus 3.74 g/m2/year