The power of volunteers in aquatic invasive plant control

Marci Krass
Willamette Riverkeeper

Melissa Newman
Benton SWCD

ODA Noxious Weed Forum
March 7, 2018

Effective use of volunteers

EDRR yellow floating heart

Hand pulling Ludwigia

Overview

- Highlight case studies of ways volunteers have been engaged to help control aquatic invasive plants
- Why engaging volunteers is important
- Power of volunteers
- Vision to effectively scale up the role volunteers in the future
  - Adopt a river reach
  - Train the trainer model
- Willamette River Surveys
- Community Fulcrum


Case Studies

willamette mainstem cooperative

Who We Are:

Landowners, partners, and volunteers working together to improve stewardship of Willamette River resources with a focus on the Corvallis to Albany river reach.

What We Do:

Foster Partnerships

- Collaborative projects
- Community events
- Outreach materials

Invasives Plant Management

- Survey and Assessment
- Treatments & Monitoring
- Encourage native plant establishment

Partners:

WILLAMETTE MAINSTEM COOPERATIVE PROJECT

Priority Weed Species

Priority Weed Species

- Water primrose (Ludwigia sp)
- Ivy (Hedera helix and Hedera sp.)
- False Brome (Brachypodium sylvaticum
- Old Man's Beard (Clematis vitalba.)
- Project Boundary
- Native habitat 2012/2013
- State & City Parks

Data collected 7/2012-7/2013 by Dick Brainerd / Canix Working Group

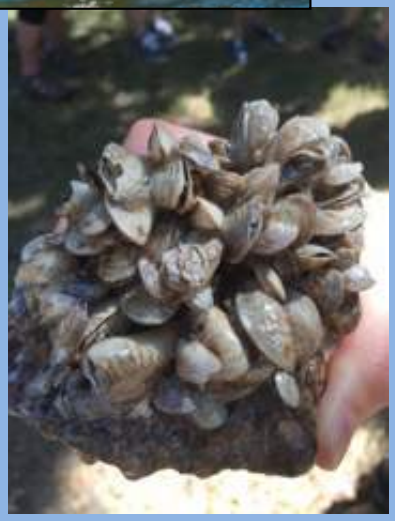
1 Mile

Map data:
BSWCD
City of Corvallis, City of Albany
Benton County
USGS, NAIP 2011 1m aerial

Map design:
Brian Wilson, GISP
brian@wildsong.biz
12/2013 v9

BENTON SOIL AND WATER CONSERVATION DISTRICT

Love Your River – AIS Workshops



Partners include: Benton SWCD, Willamette Riverkeeper, Oregon Department of Agriculture, Portland State University, Oregon State Parks, Calapooia Watershed Council, City of Albany Parks and Recreation

Love Your River – AIS Workshops

- Began in 2014
- 4 river workshops so far
- 1 classroom workshop
- > 80 community members
- Attendees from as far away as Portland and Eugene
- 2 workshops by partners planned for 2018

Paddle and Pull Volunteer Events

- Began in 2014
- 10 volunteer aquatic weed pull events
- > 100 community members
- 15 miles of river every year

Partners include: Benton SWCD, Willamette Riverkeeper, Oregon Department of Agriculture, Calapooia Watershed Council, City of Albany Parks and Recreation

Pairing Hand Pulling & Chemical Treatments

Lower Kiger Photo Point 1. July 16, 2016.

Lower Kiger Photo Point 1: July 8, 2017.

Lower Kiger Alcove

Lower Kiger Photo Point 2: Before initial herbicide treatment. July 16, 2015

Lower Kiger Photo Point 2: Before 2nd year of herbicide treatment. July 8, 2017.

EDRR – Yellow floating heart

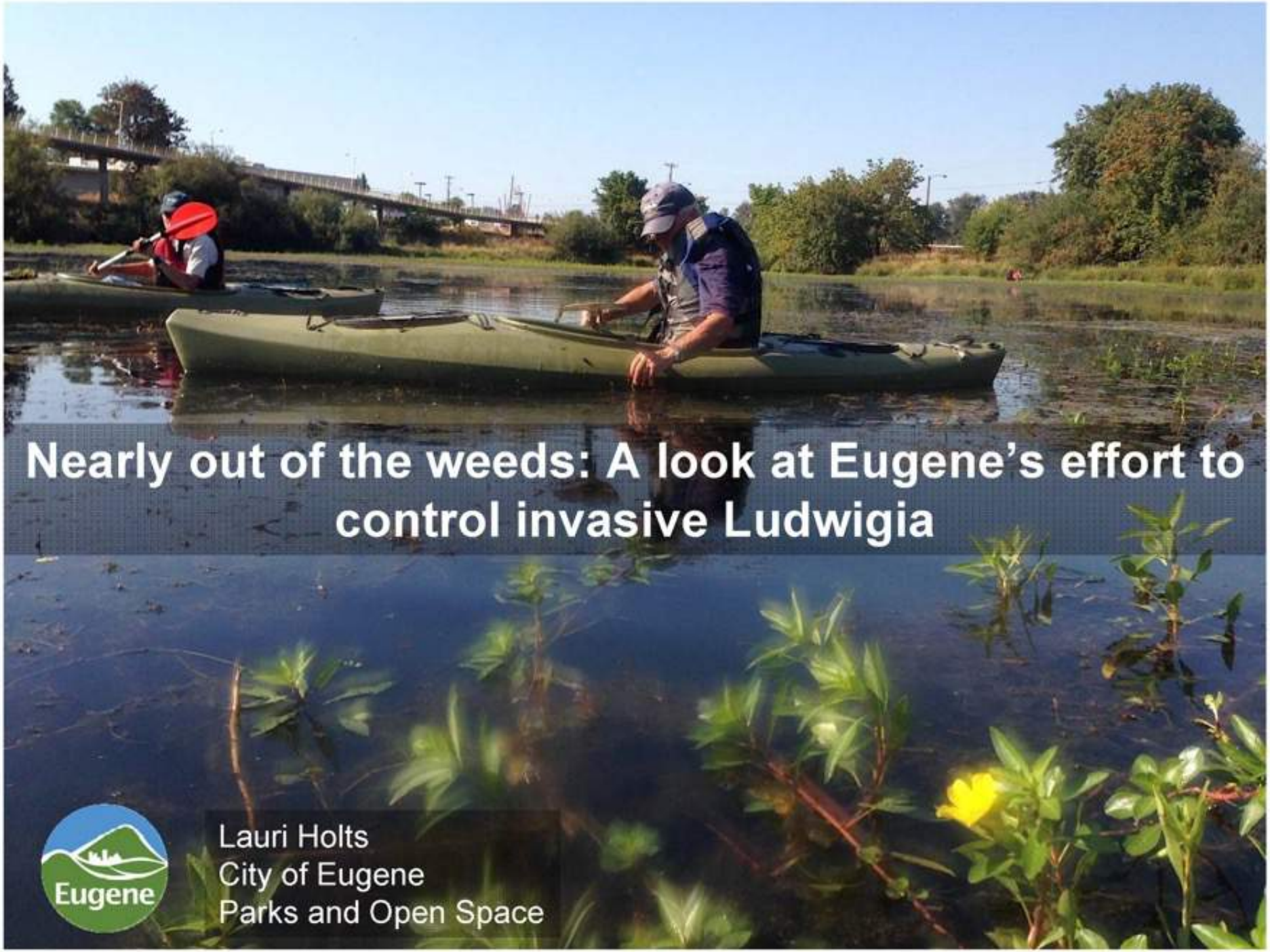
Lower Kiger Alcove

EDRR – Yellow floating heart

Tripp Island Greenway

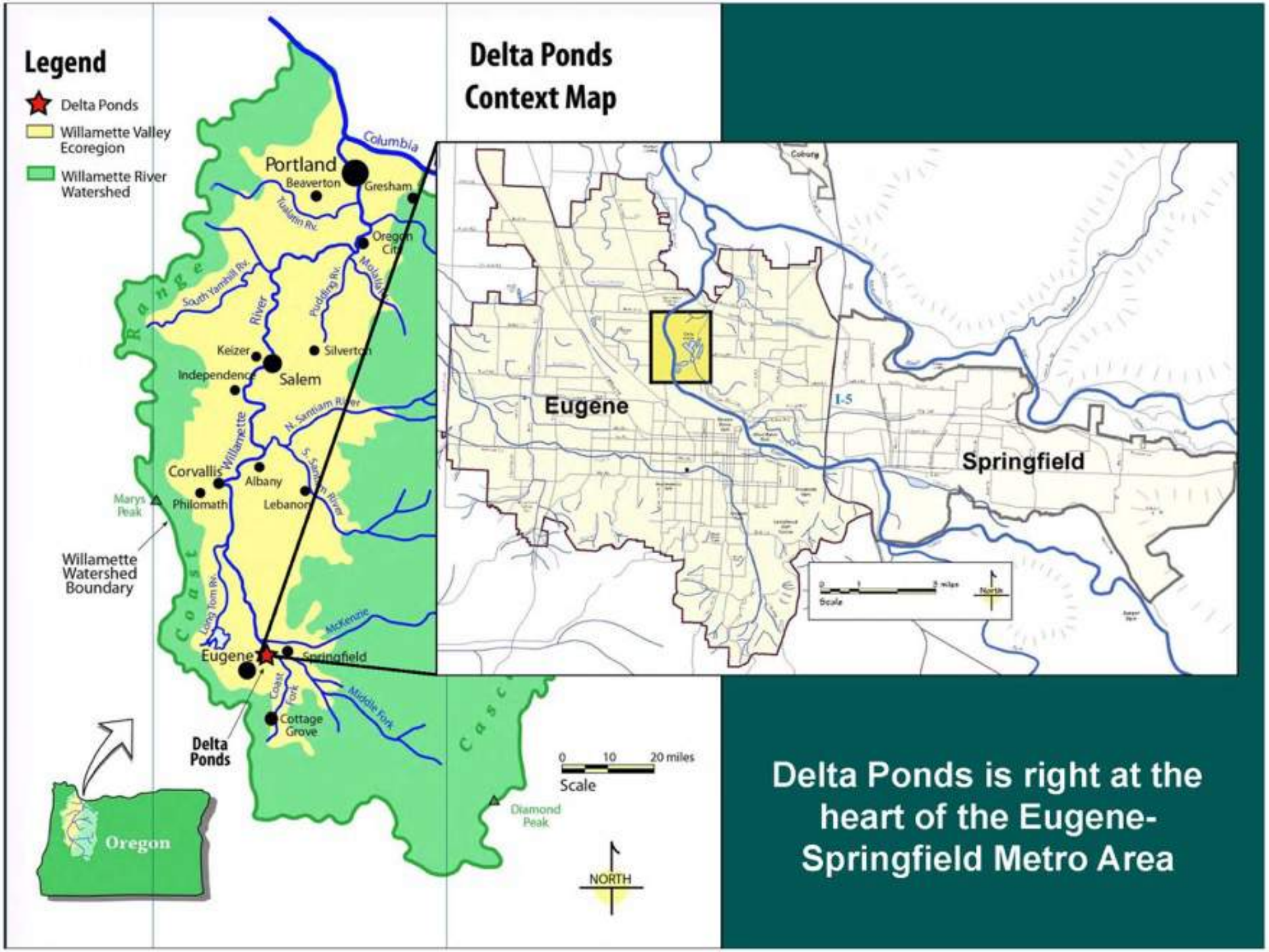
WMC Volunteer Events: Lessons Learned

- Manual control is effective for sparse infestations and in removing new occurrences before they become established
- EDRR
- Events and Weed Guide continue to be very useful education and outreach tool
- Collaborative Partnerships – Lessens the Load



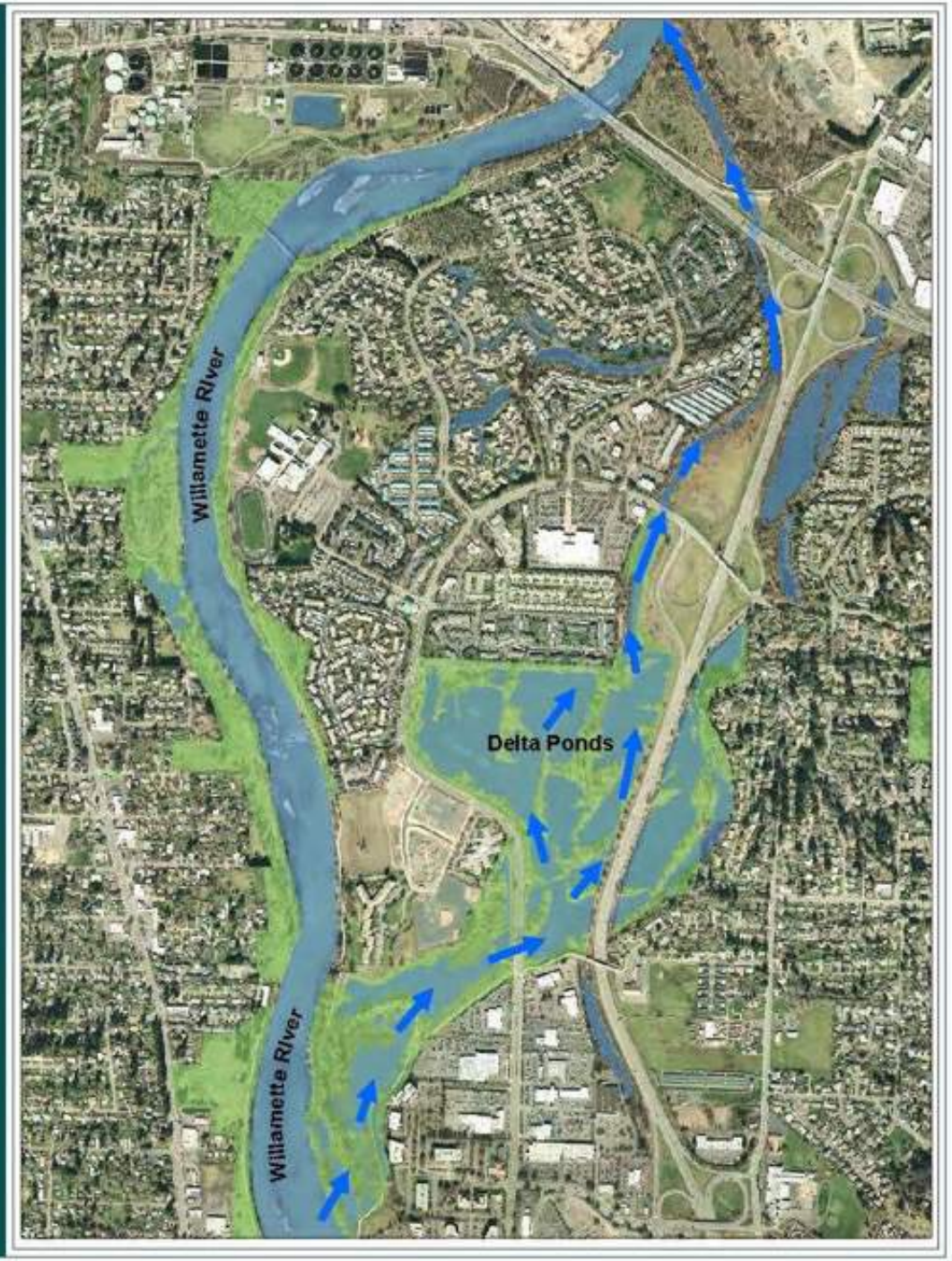
Nearly out of the weeds: A look at Eugene's effort to control invasive Ludwigia

Lauri Holts
City of Eugene
Parks and Open Space


Legend
Delta Ponds
Willamette Valley Ecoregion
Willamette River Watershed
Delta Ponds Context Map
Portland
Beaverton
Gresham
Tualatin Rv.
Oregon City
Columbia
South Yamhill Rv.
Willamette River
Pudding Rv.
Molalla R.
Keizer
Silverton
Independence
Salem
N. Santiam River
S. Santiam River
Corvallis
Albany
Philomath
Lebanon
Marys Peak
Willamette Watershed Boundary
Long Tom Rv.
McKenzie
Eugene
Springfield
Coast Fork
Middle Fork
Cottage Grove
Delta Ponds
Diamond Peak
0 10 20 miles
Scale
NORTH
Oregon
Coast Range
Cascades
Eugene
Springfield
I-5
Scale
North
Delta Ponds is right at the heart of the Eugene-Springfield Metro Area

Delta Ponds

- 150 acre side channel habitat restoration site
- Winter flow-through during storm and high water events
- Most upstream known population of *Ludwigia hexapetala* on the Willamette River
- High risk of movement of Ludwigia downstream

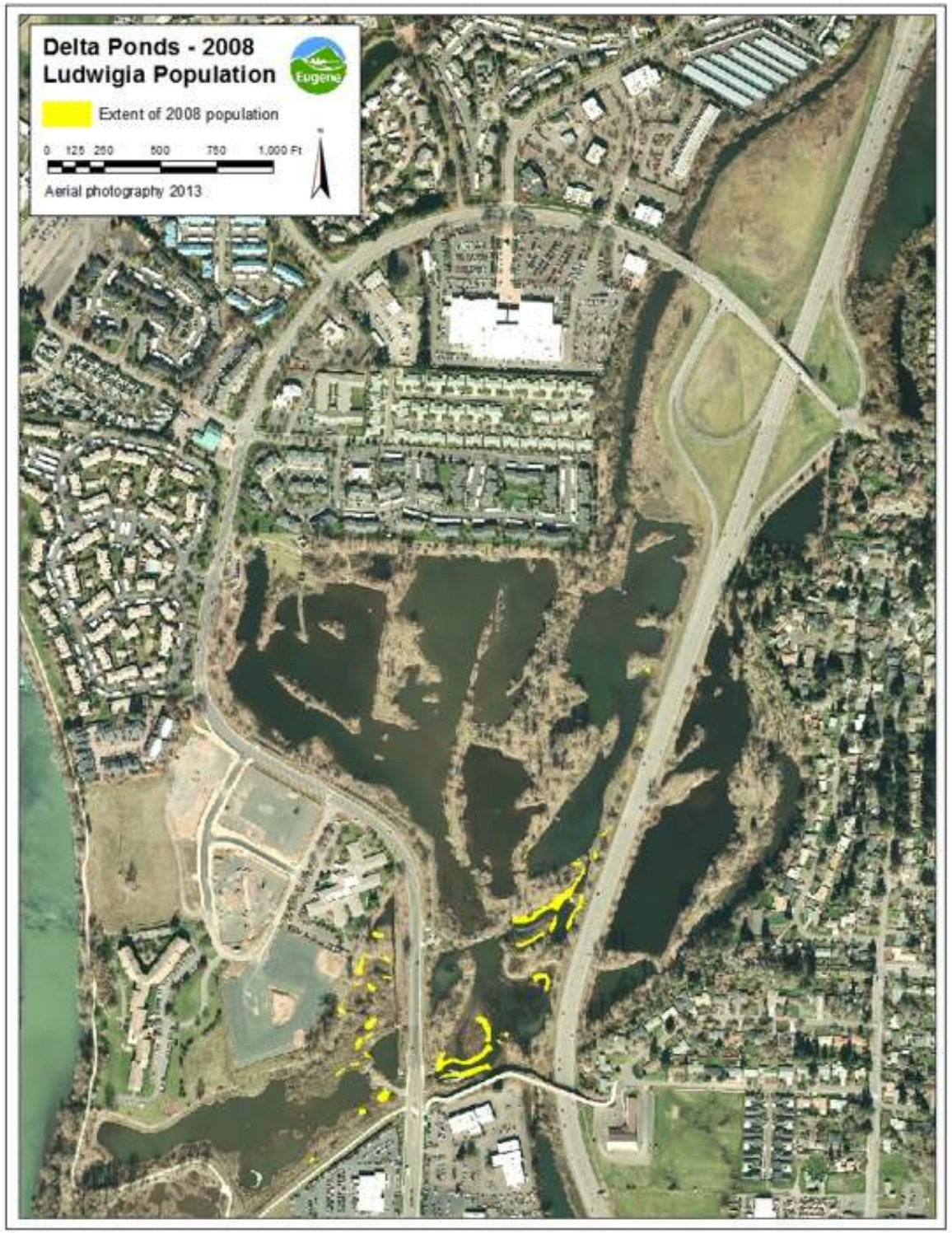


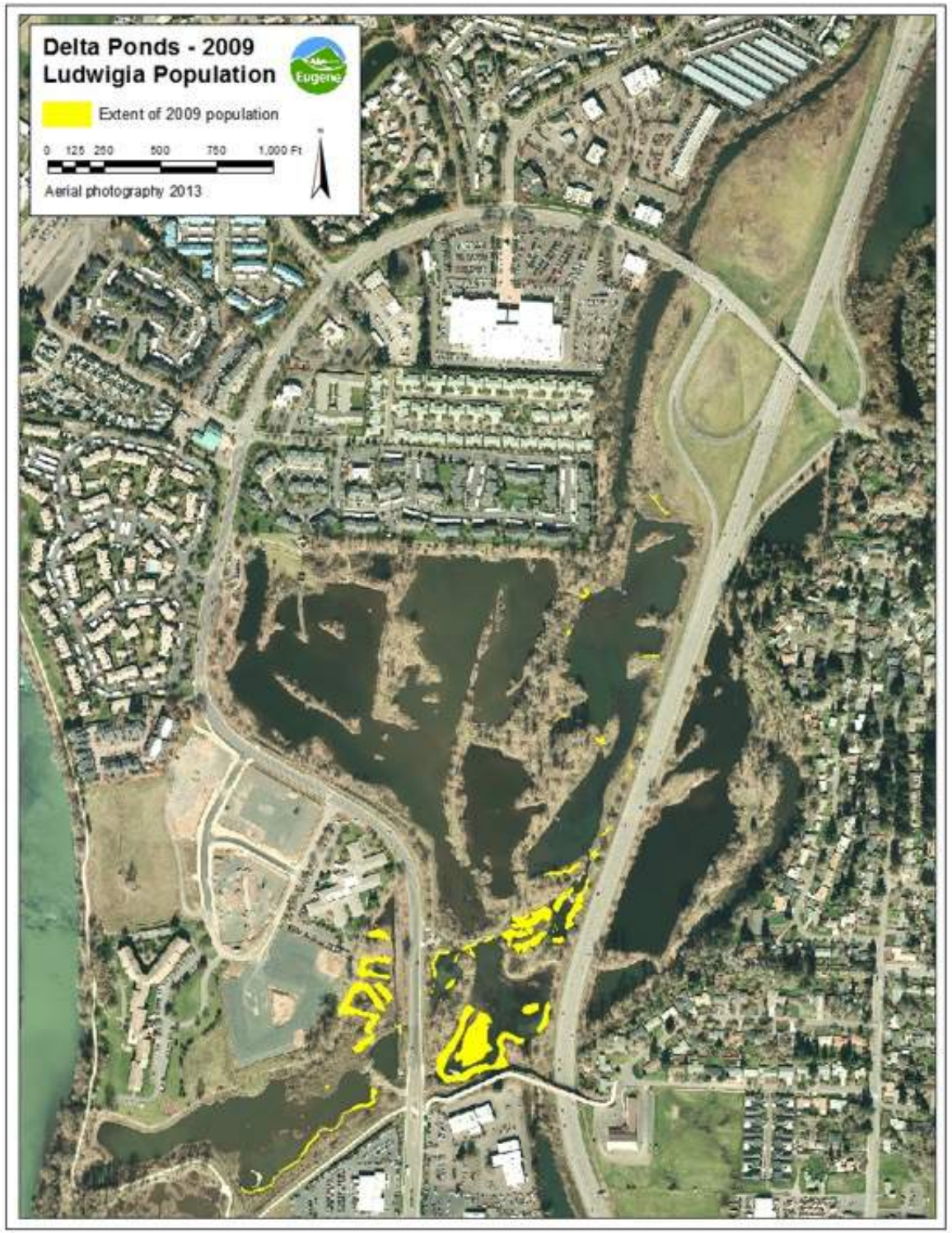
Uruguayan primrose-willow - *Ludwigia hexapetala*

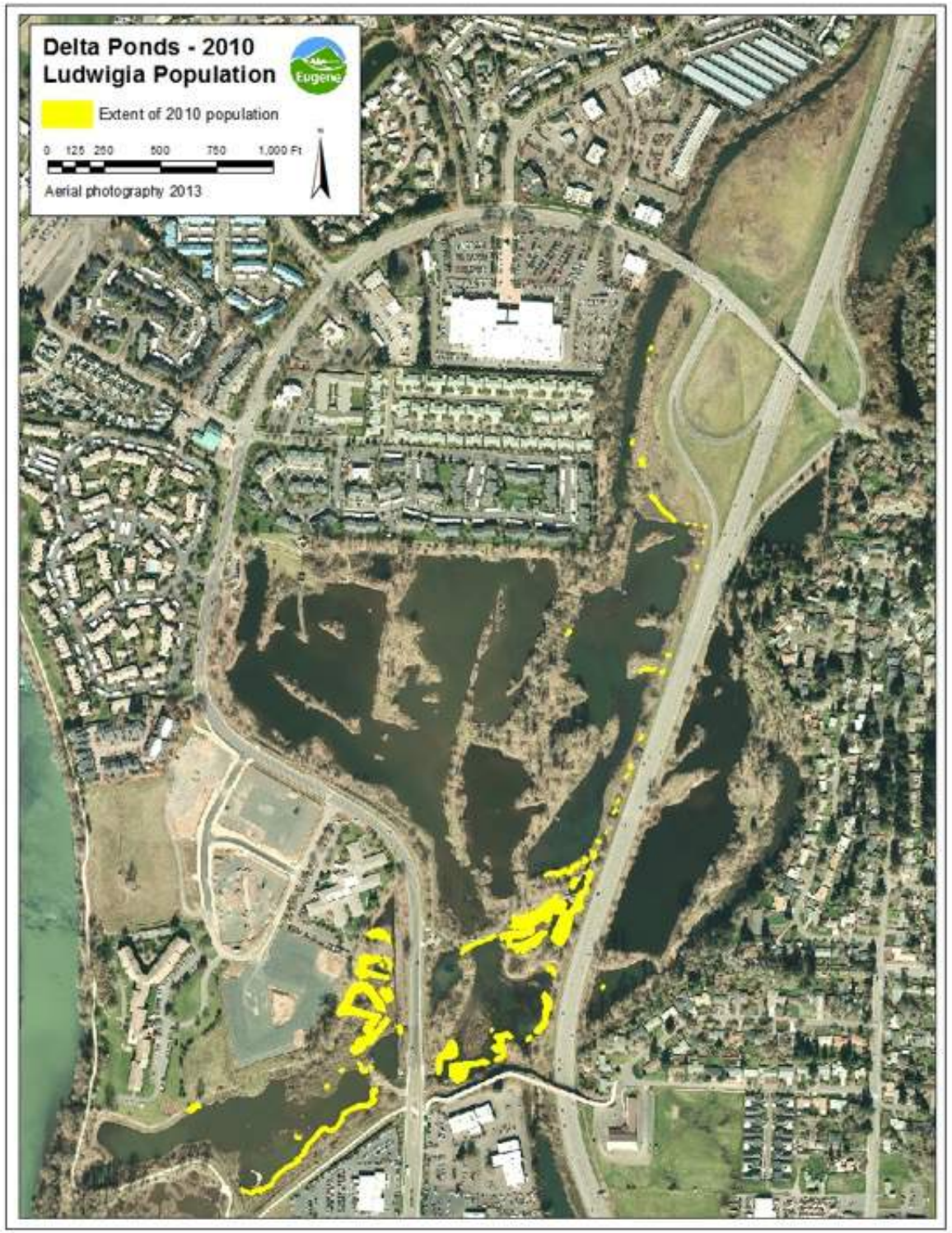
Ludwigia showed up in 2007 at the old boat ramp…

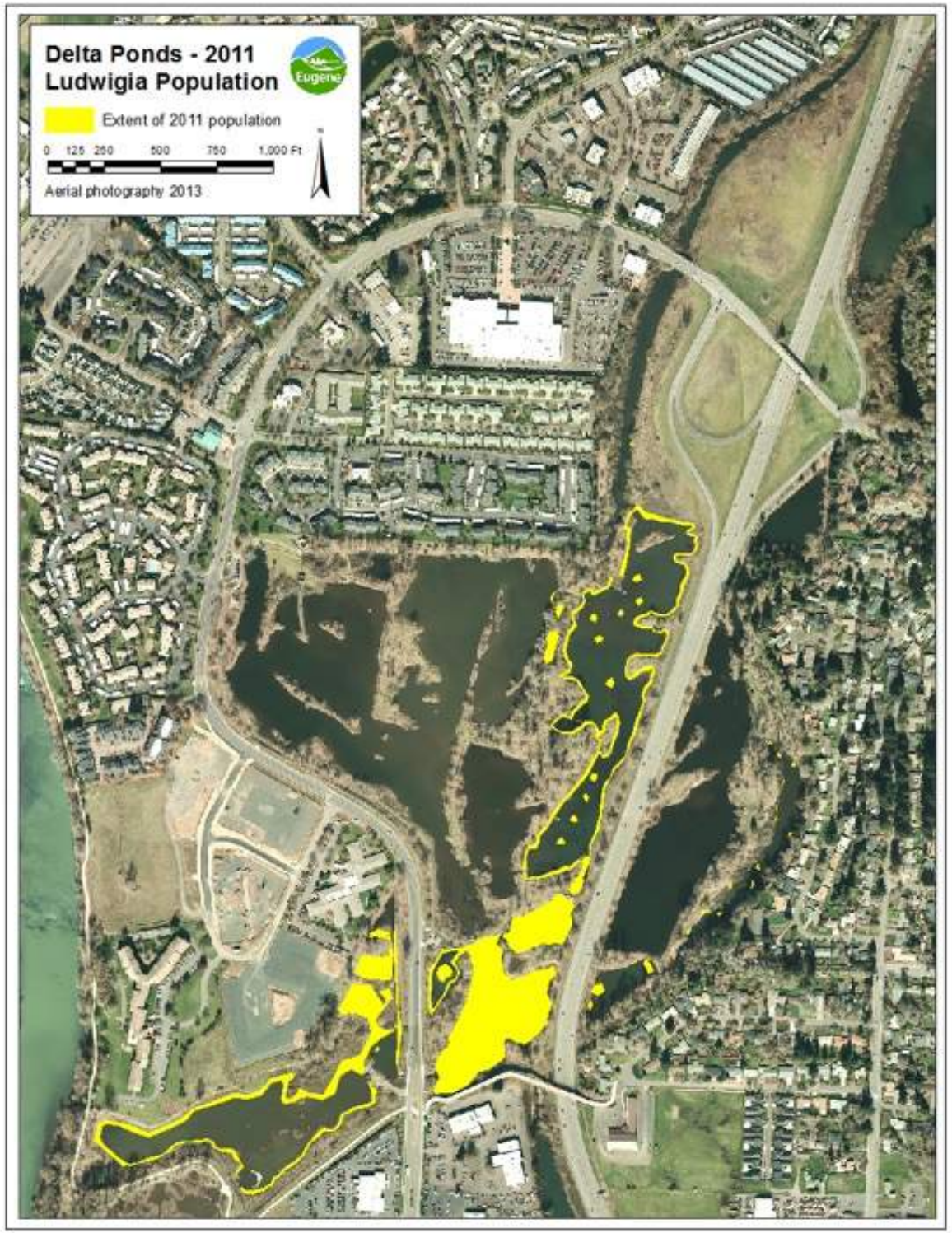
possibly dumped along with the contents of someone's aquarium

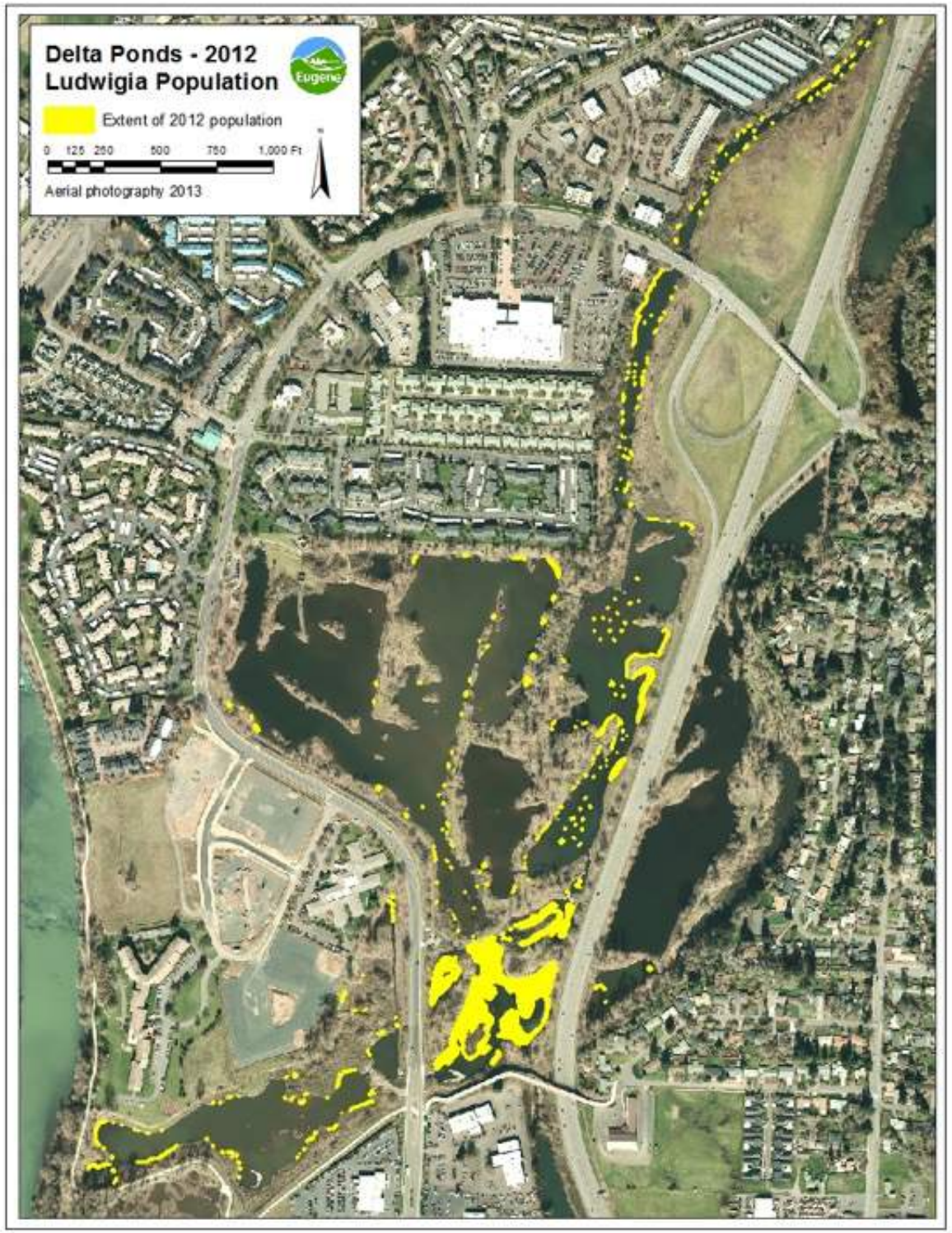

Delta Ponds - 2007
Ludwigia Population
First detection of Ludwigia
0 125 250 500 750 1,000 Ft
Aerial photography 2013


Delta Ponds - 2008
Ludwigia Population
Extent of 2008 population
0 125 250 500 750 1,000 Ft
Aerial photography 2013


Delta Ponds - 2009
Ludwigia Population
Extent of 2009 population
0 125 250 500 750 1,000 Ft
Aerial photography 2013


Delta Ponds - 2010
Ludwigia Population
Extent of 2010 population
0 125 250 500 750 1,000 Ft
Aerial photography 2013


Delta Ponds - 2011
Ludwigia Population
Extent of 2011 population
0 125 250 500 750 1,000 Ft
N
Aerial photography 2013


Delta Ponds - 2012
Ludwigia Population
Extent of 2012 population
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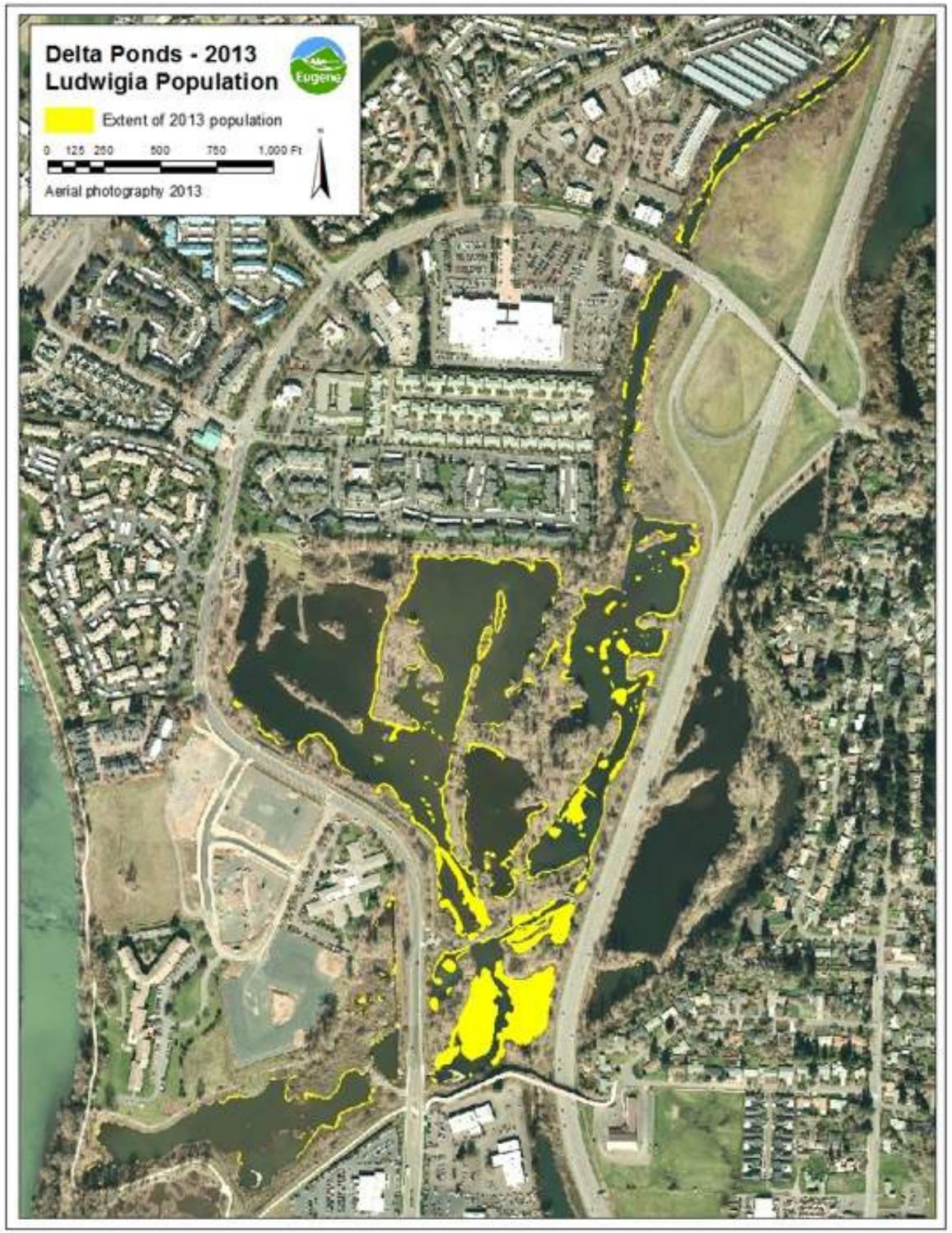
Aerial photography 2013


Delta Ponds - 2013
Ludwigia Population
Extent of 2013 population
0 125 250 500 750 1,000 Ft
N
Aerial photography 2013

Summer/Fall 2013-2014 – Began chemical control treatments

Chemical control

(late July/August)

Treated:
- plants growing on land
- dense aquatic patches

Chemical mixture:
3% glyphosate
0.5% Agridex surfactant
blue dye

First Volunteer Pull – September 2015

Six Volunteer Work Parties in 2016!

Delta Ponds Photopoint Station Photos - 2013 vs. 2017

LUHE01A-06-13

LUHE01A-06-17

LUHE01B-06-13

LUHE01B-06-17

Delta Ponds Photopoint Station Photos - 2013 vs. 2017

LUHE01C-06-13

LUHE01C-06-17

LUHE06A-06-13

LUHE06A-06-17

Delta Ponds Photopoint Station Photos - 2013 vs. 2017

LUHE06F-06-13

LUHE06F-06-17

LUHE08A-06-13

LUHE08A-06-17

Delta Ponds Photopoint Station Photos - 2013 vs. 2017

LUHE09C-06-13

LUHE09C-06-17

LUHE09D-06-13

LUHE09D-06-17

Native species that have appeared:

Marsh Pennywort (*Hydrocotyle ranunculoides*)
Water Smartweed (*Polygonum amphibium*)
Waterpepper (*Polygonum hydropiperoides*)
Water shield (*Brasenia schreberi*)
Floating-leaf pondweed (*Potamogeton natans*)
Native Ludwigia or Water Purslane (*Ludwigia palustris*)
Bur-reed (*Sparganium emersum*)
Yellow pond-lily (*Nuphar polysepalum*)
Nodding Beggerticks (*Bidens cernua*)
American Water Plantain (*Alisma plantago-aquatica*)
…and others

Ludwigia Lessons Learned

- Manual control is effective for sparse and moderate infestations
- Careful hand removal will allow other natives to establish
- Timing of herbicide spray is important
- Mild winter and sunny/dry weather benefited Ludwigia
- Low water levels that exposed mud flats at Delta Ponds resulted in lots of germination of seed bank
- Higher water levels resulted in less germination at Golden Gardens
- Full control will take years of consistent control effort
- Using volunteers is effective with sparse and moderate populations

Invasive Plant Management: Peconic River, NY

Peconic Estuary Program
Invasive Plant Management: Peconic River, NY
Ludwigia peploides

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Alison Branco
Peconic Estuary Program Director, Suffolk County
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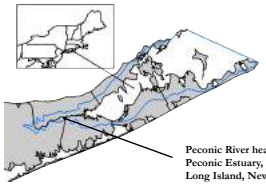
Alison.Branco@suffolkcountyny.gov)

LOCATION



Peconic River headwaters of the Peconic Estuary, Eastern Tip of Long Island, New York

SPECIES

***Ludwigia peploides* (Water Primrose/Floating Primrose Willow)**

Background:
- Floating, mat-forming aquatic perennial.
- Native to South America but used as ornamental.
- Alternate, net-veined leaves.
- Yellow 5-petal flowers appear during height of growing season.
- Red-purple stems.
- Inhabits ditches, riverbanks, ponds, and slow moving streams.
- Reproduces through fragmentation (seeds?).

Ecological Threats:
- Unsuitable fish habitat.
- Out-competes native plants.
- Reduces biodiversity.
- Adds little oxygen to water.
- Blocks sunlight penetration.
- Interferes with recreational uses.

INFESTATION MONITORING

Figure 1:
Ludwigia is monitored closely throughout its growing season in the Peconic River. Approximately 5 miles of the River, and 170 surface water acres are monitored. Monitoring and mapping infestations before and after removal events allow project coordinators to track infestation movements and assess the effectiveness of eradication efforts. Maps are used in the field to assist volunteers in identifying areas in which to focus eradication efforts.

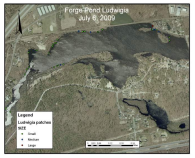


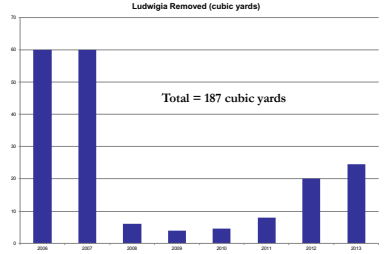
Figure 2:
Infestations are classified as either Small, Medium, or Large. Small infestations are usually single handfuls and ideal for kayakers to remove. Medium infestations are large enough to fill a few armfuls and ideal for volunteers paddling canoes to remove. Large infestations likely require placing several volunteers in the water and can fill several empty boats.

ABSTRACT

Ludwigia peploides, more commonly known as water primrose, is a South American species that was first detected in the Peconic River in 2003. This aquatic non-native, invasive plant grows primarily on the water surface. It spreads rapidly in warm weather months and can often take over entire slow-flowing waterbodies. *Ludwigia* poses a major threat to the Peconic River as it acts as unsuitable fish habitat, outcompetes native plants, reduces biodiversity, blocks sunlight to oxygen producing submerged plants, and severely impedes recreational uses of the river. The Peconic Estuary Program and its partners have embarked on a long term invasive species management plan in an attempt to reduce the population within the Peconic River and prevent its spread to other Long Island waters. Since the initiation of these efforts in the spring of 2006, 636 volunteers have spent 3555 hours hand-pulling 187 cubic yards of *Ludwigia* at 24 different removal events. Interpretive educational signs have been installed at 5 access sites along the Peconic River. Frequent monitoring suggests that this species will need constant management to keep populations at a low level.

METHOD OF CONTROL: VOLUNTEER HAND REMOVAL

1. Volunteer recruitment- email list-serves, direct distribution, and stakeholder website postings.
2. Project coordinators educate volunteers on *Ludwigia*, removal and safety procedures.
3. Empty boats and volunteers are dispatched and dropped off at large infestations.
4. Volunteers in kayaks and canoes paddle downstream to hit small/medium infestations.
5. Boats are emptied and sent back out. Water is skimmed to capture all fragments.
6. Volunteers sort through native vegetation to make sure all *Ludwigia* fragments are removed.
7. Boats full of pulled *Ludwigia* are towed back to the shoreline of the staging area.
8. Volunteers wade the sunny shallow riverbank where most large infestations thrive.
9. *Ludwigia* taken away by DEC Operations.



PARTNERSHIPS

The success of this Early Detection Rapid Response (EDRR) program is attributed to the large numbers of dedicated, active partners.

Project Partners:
- Peconic Estuary Program
- New York State Department of Environmental Conservation
- The Nature Conservancy
- United States Environmental Protection Agency
- Peconic Lake Estates Civic Organization
- Freshwater Anglers of Long Island
- Long Island Bassmasters
- Peconic River Fish Restoration Commission
- Suffolk County Department of Health Services
- Town of Riverhead, New York
- Central Pine Barrens Commission & SCA Native Plant Corps Team

In 2009, 5 educational signs were posted along the river to educate user groups and the general public about the invasive plant management effort, the ecological threat this invasive species poses, and the importance of maintaining the project.

NYSDEC funded, installed, and maintains several "Nuisance Invasive Species Disposal Stations" along the Peconic River and throughout New York State.

RESULTS

8.26.2006 **9.12.2006** **7.19.2007** **6.30.2009**

Pictures of the Upper Mills Spillway are featured above. The infestation was removed on 9.11.2006. The spillway still remains clear. Dams along the Peconic River often attract large infestations of *Ludwigia*.

September 2006 (Peconic Lake to Upper Mills) **July 2009** (Peconic Lake to Grangebel Park)

The Peconic Story

- Due to national estuary status, partners did not want to use herbicide
- Organized hundreds of volunteers to hand pull Ludwigia
- Worked with volunteers for a total of about 8-10 years hosting about 2-5 events / year
- Covered 3 miles of river with volunteers but found the plants were spreading downstream
- Repeat volunteers lived locally and were very invested
- Sites stayed cleared for about a year
- Any roots left would regrow
- Contained when plants hit the salt water in the estuary
- Viewed volunteer engagement more as an outreach tool rather than a management tool
- Used iMap Invasives
- No longer a priority to organize so many events
- Contact = Julie Nace, nace.julie@epa.gov

- Peconic River is 7 miles in length and is the longest river on Long Island, NY as well as the main tributary of the Peconic Estuary, a National Estuary Program site.

- Developed a Freshwater Invasive Plant Management Plan: *Ludwigia peploides* Peconic River Estuary Watershed in 2015.

"Paddle The River" 2013

Help remove invasive *Ludwigia*!

Earn community service hours !

Who:	**Volunteers who love to kayak and want to help the environment**
What:	***Paddle parts of the Peconic Lake and Peconic River** ***Pull out and remove water-primrose (Ludwigia), an invasive aquatic plant.** ***This plant displaces natural vegetation, degrades the water quality and destroys habitat for native species.**
When:	**Tuesday, September 24th 2013 at 9:30AM (rain or shine)**
Where:	**Meet at Peconic Lake Estates Civic Organization (PLECO), Calverton, NY.** **Directions will be provided to those who register.**
Bring:	**Your own kayak or canoe.** **Rubber gloves, water shoes, life jacket, water, brown bag lunch, and sunblock.**
RSVP:	**Julie Nace: 631.444.0871 or jsnace@gw.dec.state.ny.us** **Jennifer Skilbred: 631.765.6450 EXT 212 or jskilbred@eastendenvironment.org**

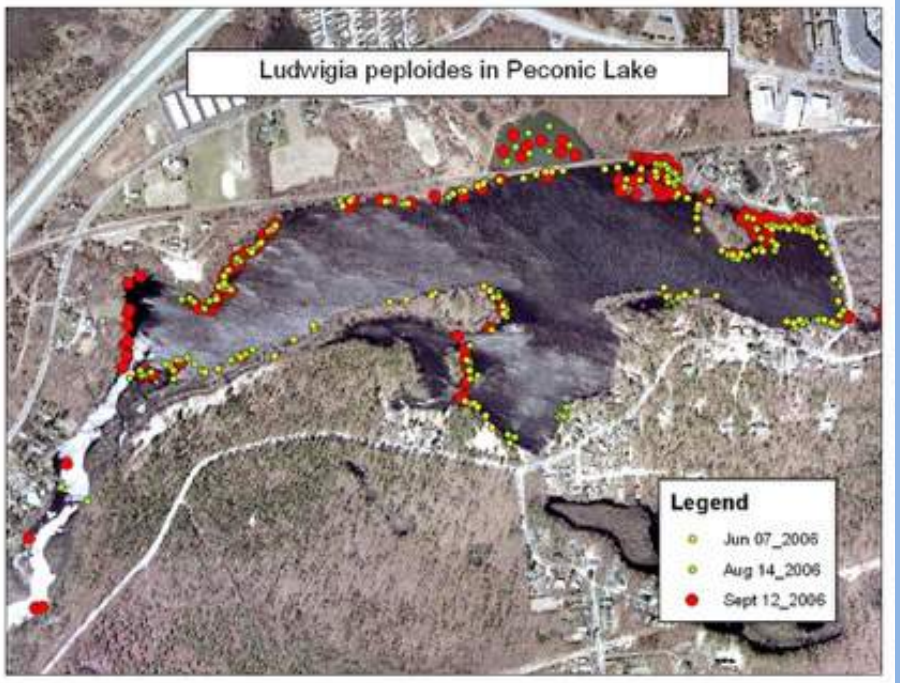
Check our FACEBOOK page, or our WEBSITE, for event updates and more information.

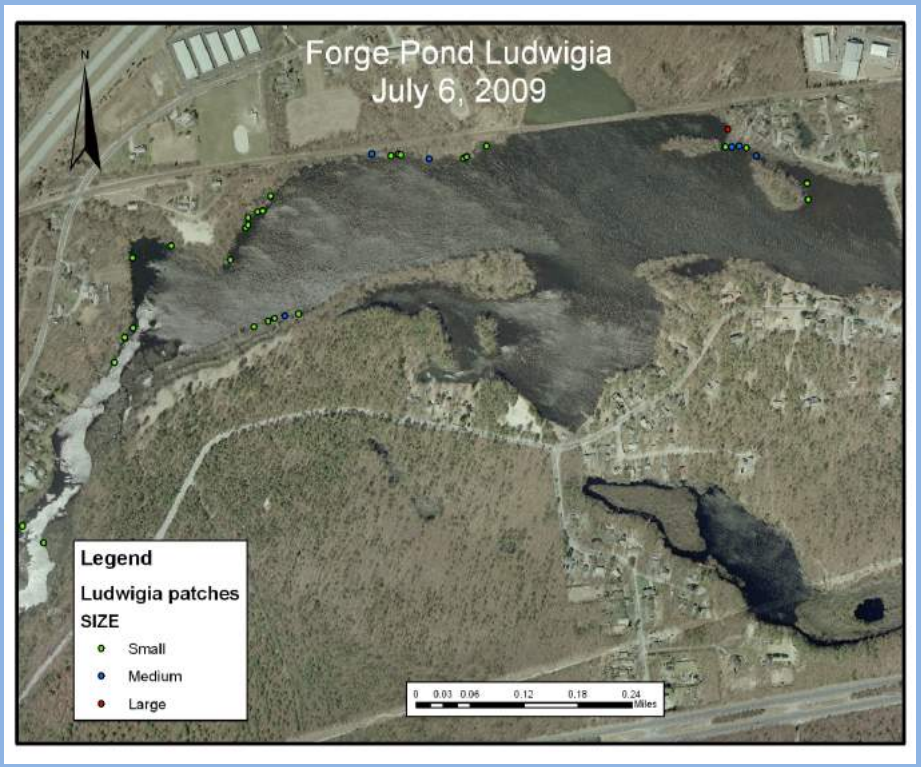
PECONIC ESTUARY PROGRAM

Protecting & Restoring Long Island's Peconic Bays

Ludwigia peploides, was first detected in the Peconic River in 2003. Ludwigia poses a major threat as it acts as unsuitable fish habitat, outcompetes native plants, reduces biodiversity, blocks sunlight to oxygen producing submerged plants, and severely impedes recreational uses of the river. The Peconic Estuary partners have embarked on a long term invasive species management plan to reduce the population and prevent its spread to other Long Island waters.

Since the initiation of these efforts in the spring of 2006, 636 volunteers have spent 3555 hours hand-pulling 187 cubic yards of Ludwigia at 24 different removal events. This species will need constant management to keep populations at a low level.





Lessons learned from the Peconic

- **Hand pulling as a sole strategy is not an effective means for control.**
- Past and current efforts have not been successful in removing *Ludwigia* from the Peconic River. And, in recent years, these efforts are just barely controlling the invasive plant.
- Project partners are concerned that only small scale hand removal with volunteers will not be enough to control the spread of this invasive plant into the future.
- Determination of best methods for removals (within contraints of funding, time and effectiveness)
  - Hand removal
  - Herbicide
  - Dredging
  - Combination
  - No Action
  - **Herbicide followed by hand pulling is most effective!**
- **Most invested, repeat volunteers are from the local community**

The importance of engaging volunteers

- More eyes on the ground
- Outreach tool to gain more broad community support for AIS control projects
- Diverse partnerships are key to extend the reach of information to many different audiences.

The power of volunteers

Al Grappel, Volunteer Extraordinaire

Vision for scaling up in the Willamette

- Engage volunteers to help with EDRR
- Engage volunteers to help with long term stewardship after several years of chemical spray treatment

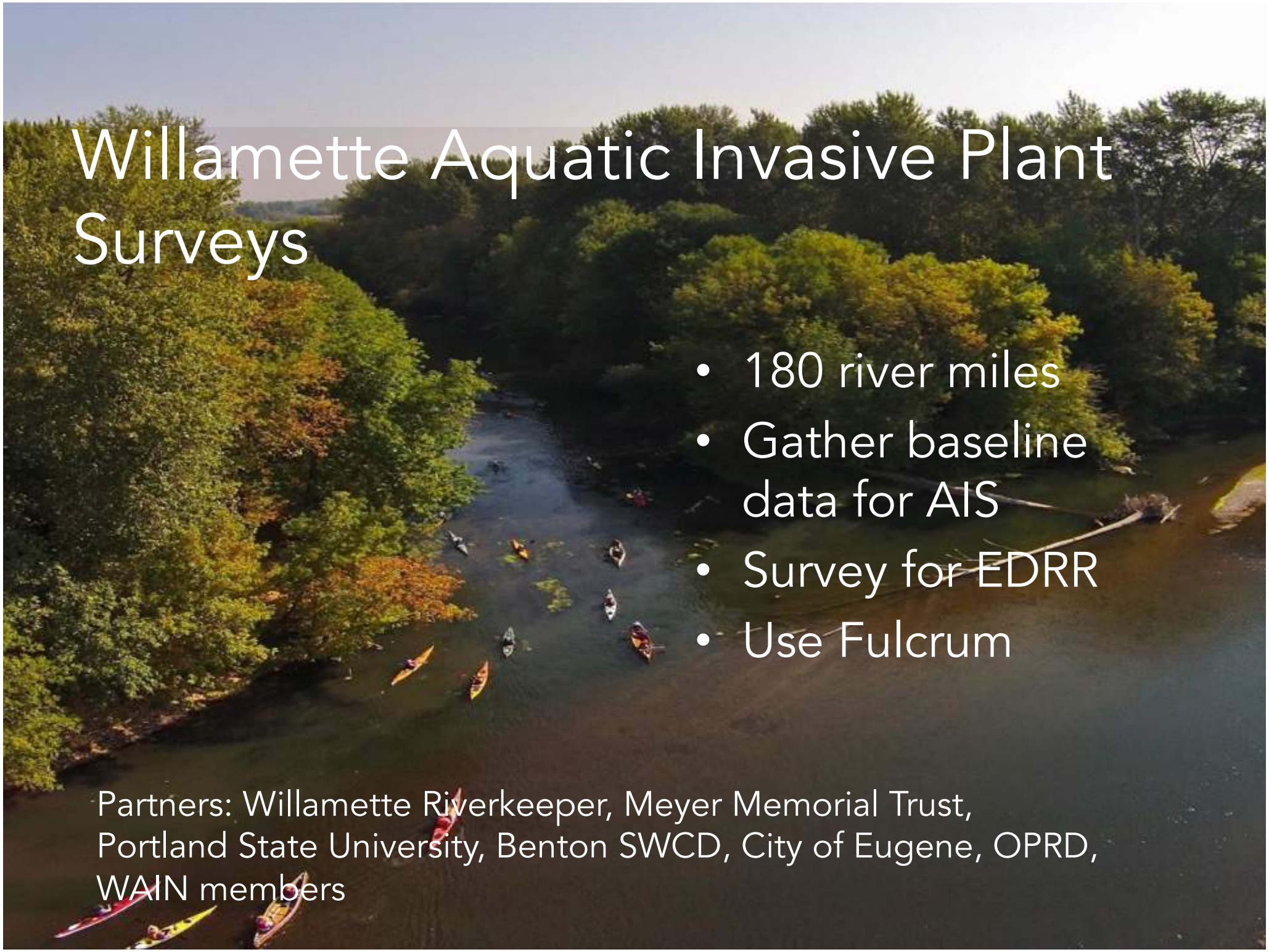

Windsor Slough

Adopt a River Reach

- Partners: Willamette Riverkeeper River Guardians, SOLVE, Willamette Aquatic Invasive Network members
- Individuals, community groups, businesses, and schools adopt a stretch of river and commit to organizing at least 2 projects a year for 2 years
- Local natural resource managers will help plan and lead where volunteers should focus
- Provide a certificate, free cleanup supplies, access to tools or other supplies, and ongoing advice and support

Train the Trainer

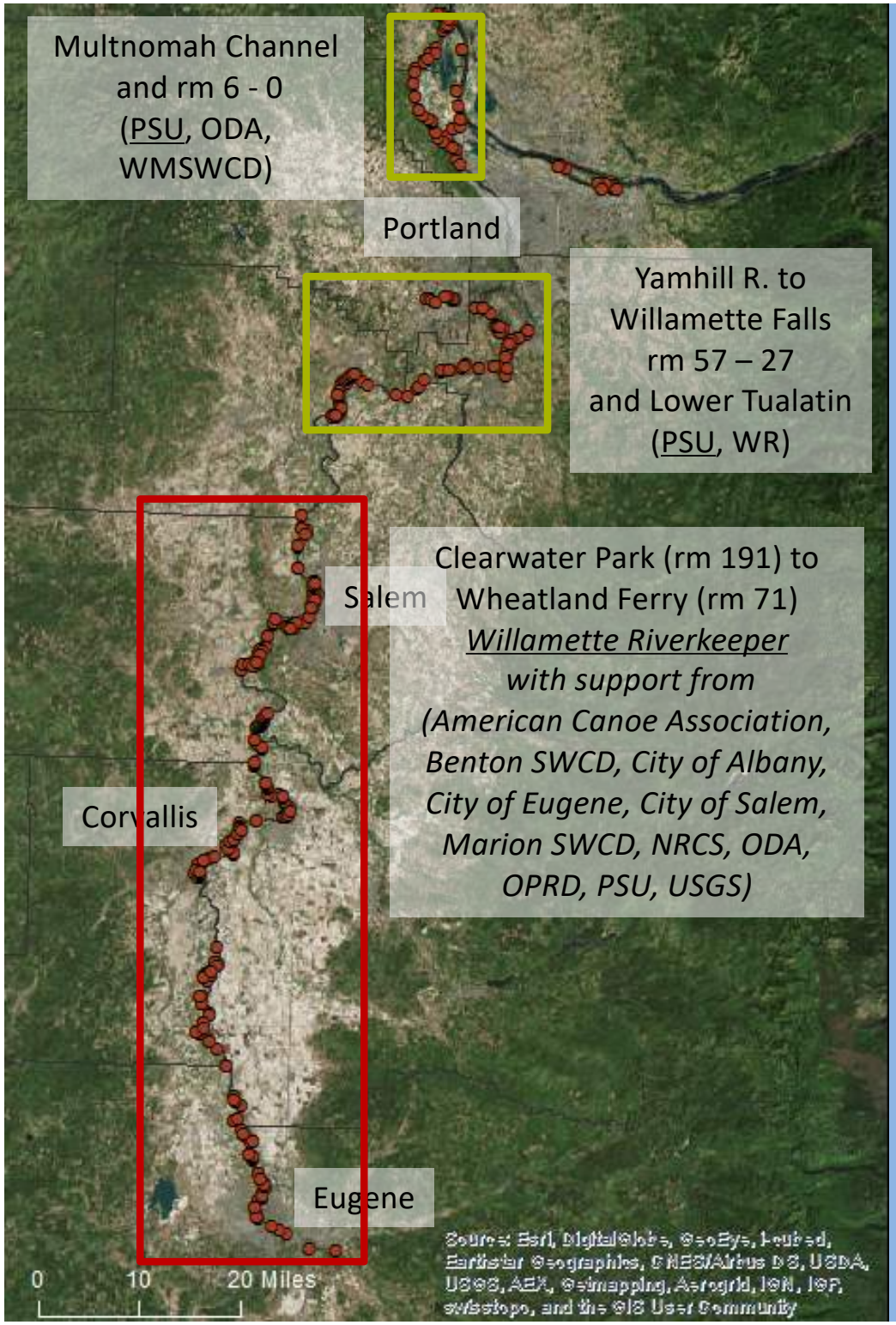
- Invest time in training volunteer leaders either individuals, or leaders within groups who can lead other volunteers in the field
- Friends of Trees and The Nature Conservancy have crew leader training programs that can be good models



Willamette Aquatic Invasive Plant Surveys

- 180 river miles
- Gather baseline data for AIS
- Survey for EDRR
- Use Fulcrum

Partners: Willamette Riverkeeper, Meyer Memorial Trust, Portland State University, Benton SWCD, City of Eugene, OPRD, WAIN members



Willamette Surveys

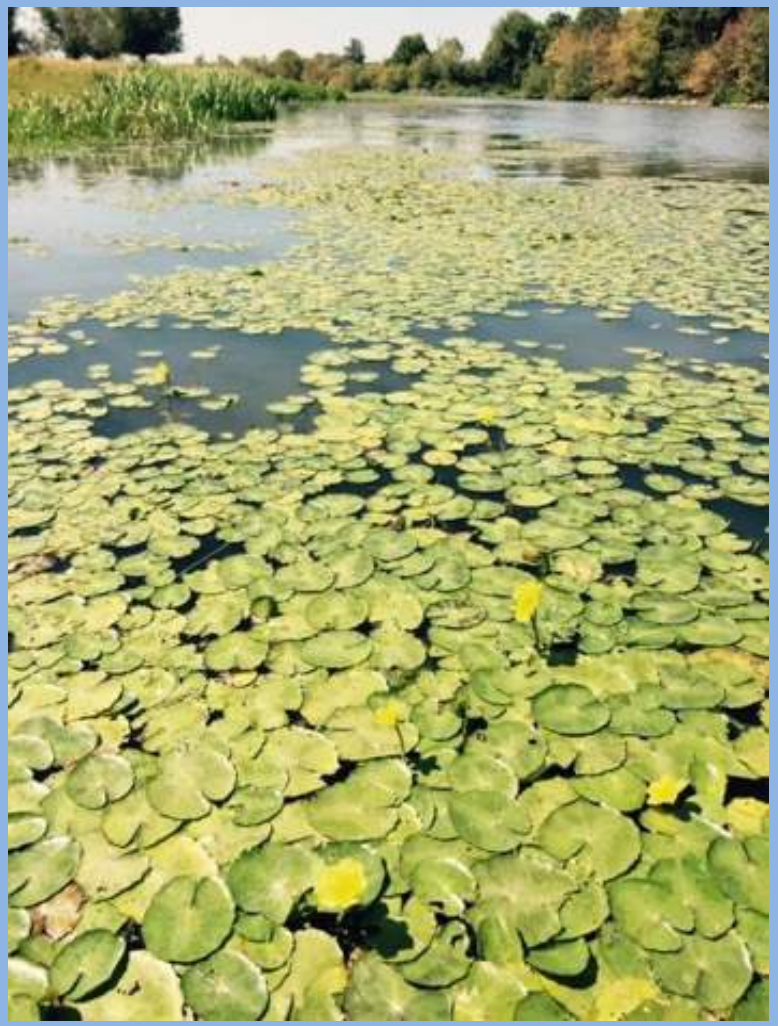
- Conducted 2015-2016
- Date recorded using Fulcrum App to facilitate sharing
- Survey data feeds in to prioritization of asset based management by Willamette Aquatic Invasives Network (WAIN)

Slide by Rich Miller, PSU

Upper Willamette

Partners: Willamette Riverkeeper, City of Eugene, American Canoe Association, Oregon State Parks, ODA, Long Tom Watershed Council, McKenzie Watershed Council, McKenzie River Trust.

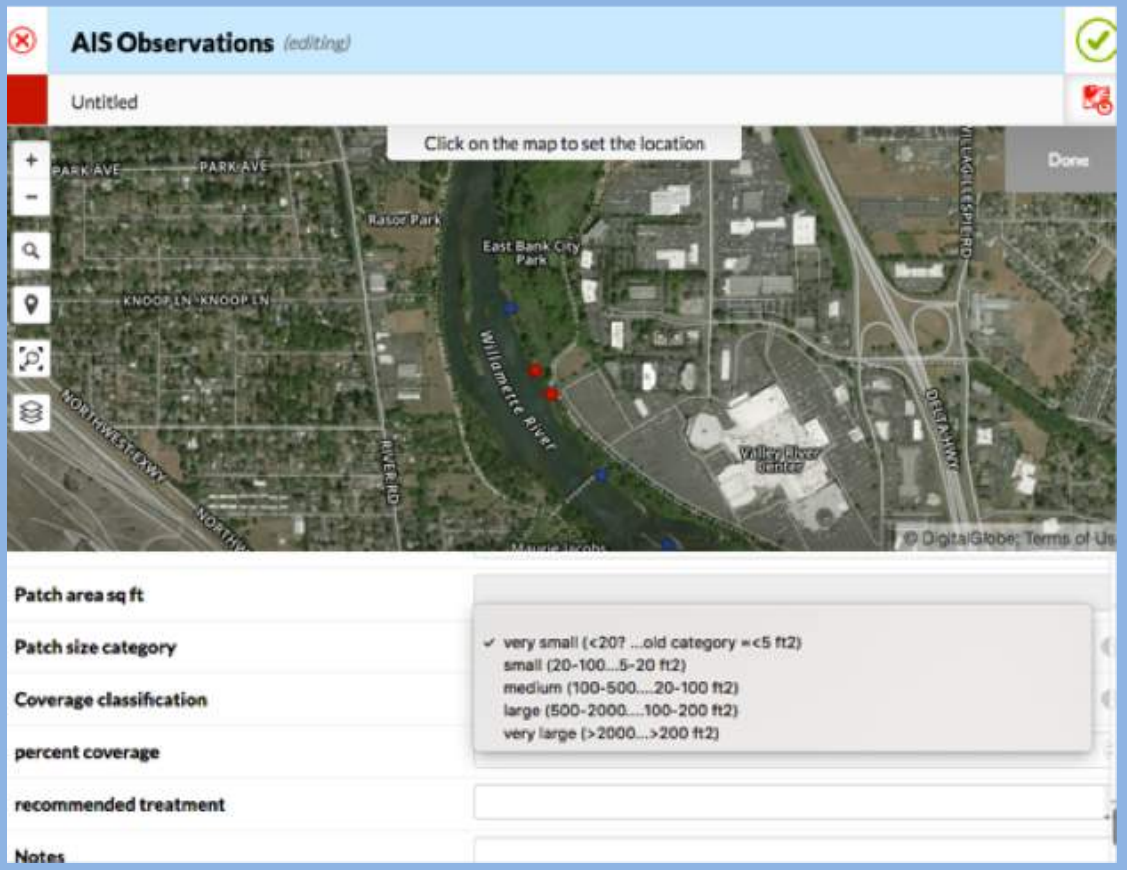
Yellow Floating Heart



Partners: Oregon Department of Agriculture, Oregon State Parks, Willamette Riverkeeper.

Fulcrum

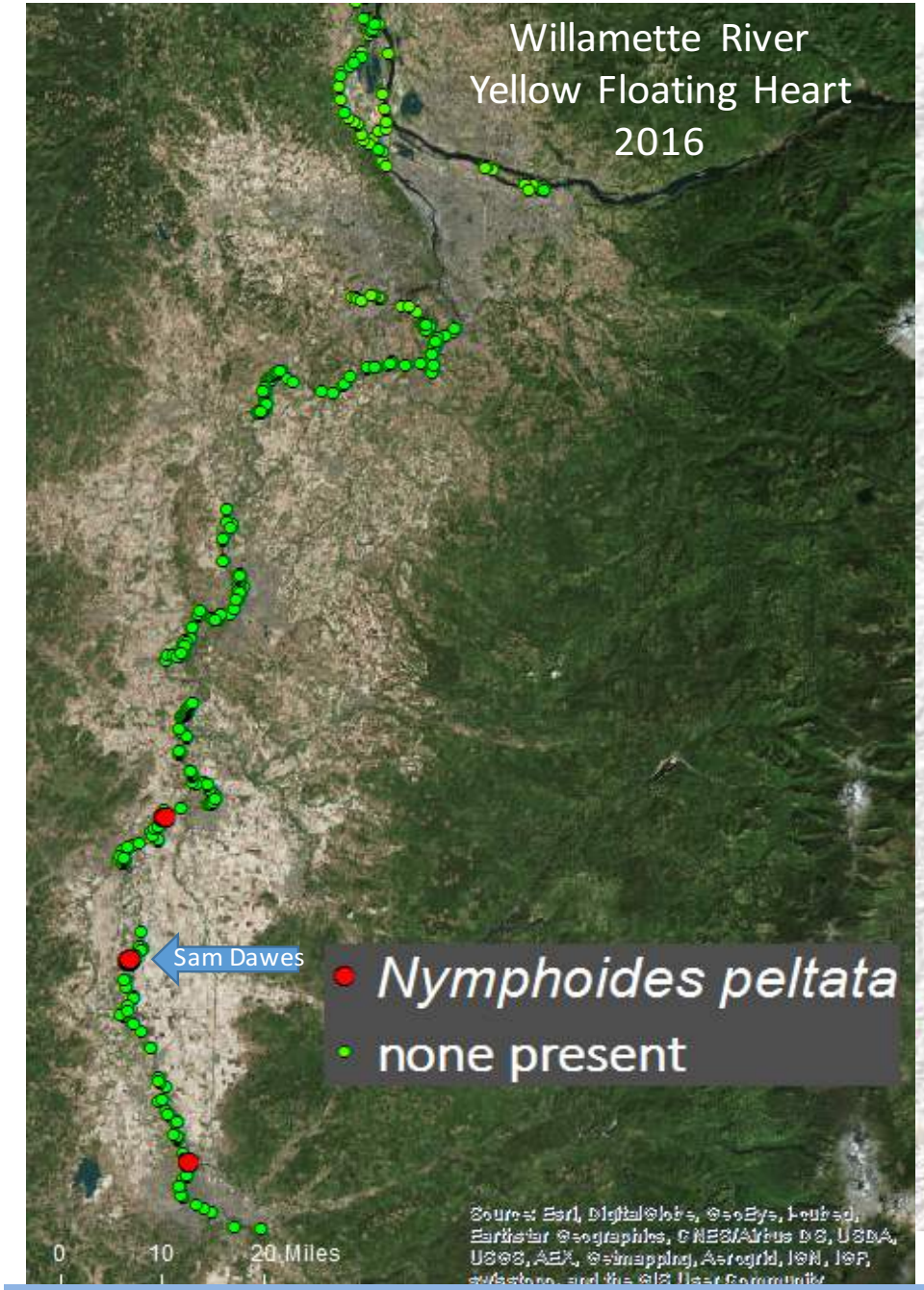
- Online tool to collect data
- Easy to use
- Tool to direct volunteers to very small and small patches that are appropriate for hand pulling
- Easy to share data between partners and with iMap Invasives

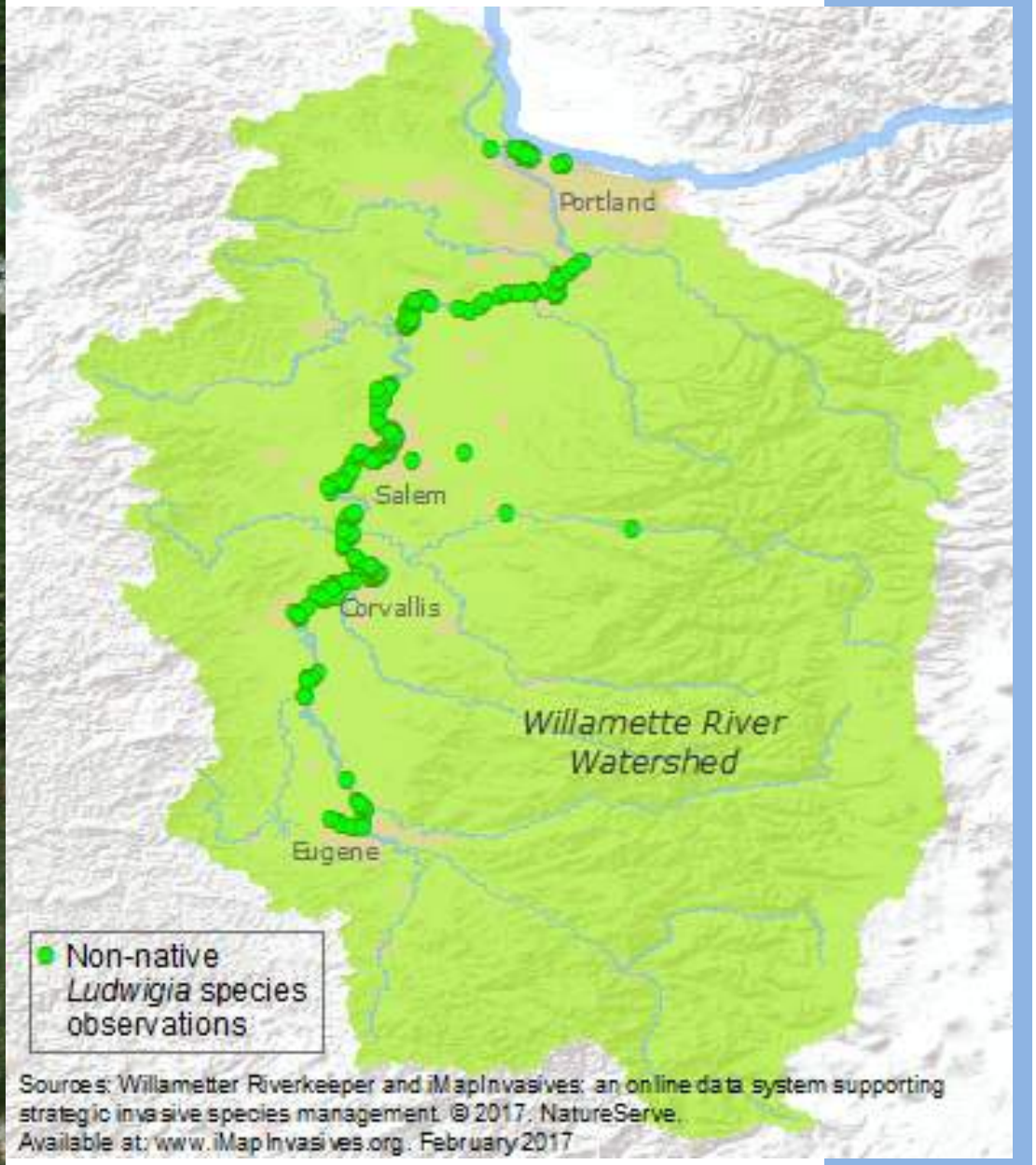


Fulcrum Community

- Fulcrum Community is a no-cost, short term crowdsourced data collection solution for qualified projects
- New in 2018 for mapping aquatic invasive species in the Willamette
- Natural resource professionals and volunteers can log on and collect data for free

fulcrum
mobile location leverage


Willamette River
Yellow Floating Heart
2016
Sam Dawes
Nymphoides peltata
none present
0
10
20 Miles


Portland
Salem
Corvallis
Eugene
Willamette River
Watershed
Non-native
Ludwigia species
observations
Sources: Willamette Riverkeeper and iMapInvasives: an online data system supporting strategic invasive species management. © 2017. NatureServe.
Available at: www.iMapInvasives.org. February 2017

Funding Partners

meyer MEMORIAL TRUST

Willamette RIVER INITIATIVE

OREGON WATERSHED ENHANCEMENT BOARD OWEB

Oregon Department of Agriculture

Bonneville POWER ADMINISTRATION

Thank you!

meyer MEMORIAL TRUST

Eugene

Cascade Pacific Resource Conservation + Development

CITY OF Salem AT YOUR SERVICE

Willamette RIVERKEEPER

OREGON WATERSHED ENHANCEMENT BOARD OWEB

Oregon Department of Agriculture

BENTON SOIL AND WATER CONSERVATION DISTRICT

BONNEVILLE POWER ADMINISTRATION

Oregon Lake Watch

OREGON STATE PARKS

WIN WESTERN INVASIVES NETWORK

patagonia

Portland State UNIVERSITY

USGS science for a changing world

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