How first detectors are improving knowledge of invasive species locations and potential spread in Wisconsin

Anne Pearce + Mark Renz

Wisconsin First Detector Network

University of Wisconsin-Madison

UW Extension

University of Wisconsin-Extension

Invasive Species are a Problem

Citizen Scientists are an often overlooked resource for natural resource problems

In order to channel efforts we created:

Wisconsin First Detector Network (WIFDN)

ESTABLISHED 2013

A statewide citizen science network for invasive species detection and education

Visit our webite at

http://fyi.uwex.edu/wifdn

WIFDN Impacts 2014-2017

2089
participants attended **64** in person trainings led by WIFDN

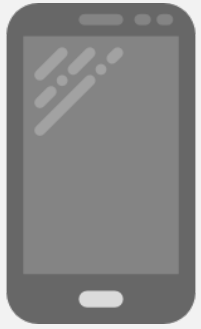
200
people trained via webinar series

14,372
views of WIFDN videos, totaling over **1080** hours of training material viewed

http://fyi.uwex.edu/wifdn

WIFDN Impacts 2014-2017

9620
reported volunteer hours



7272
invasive species reports

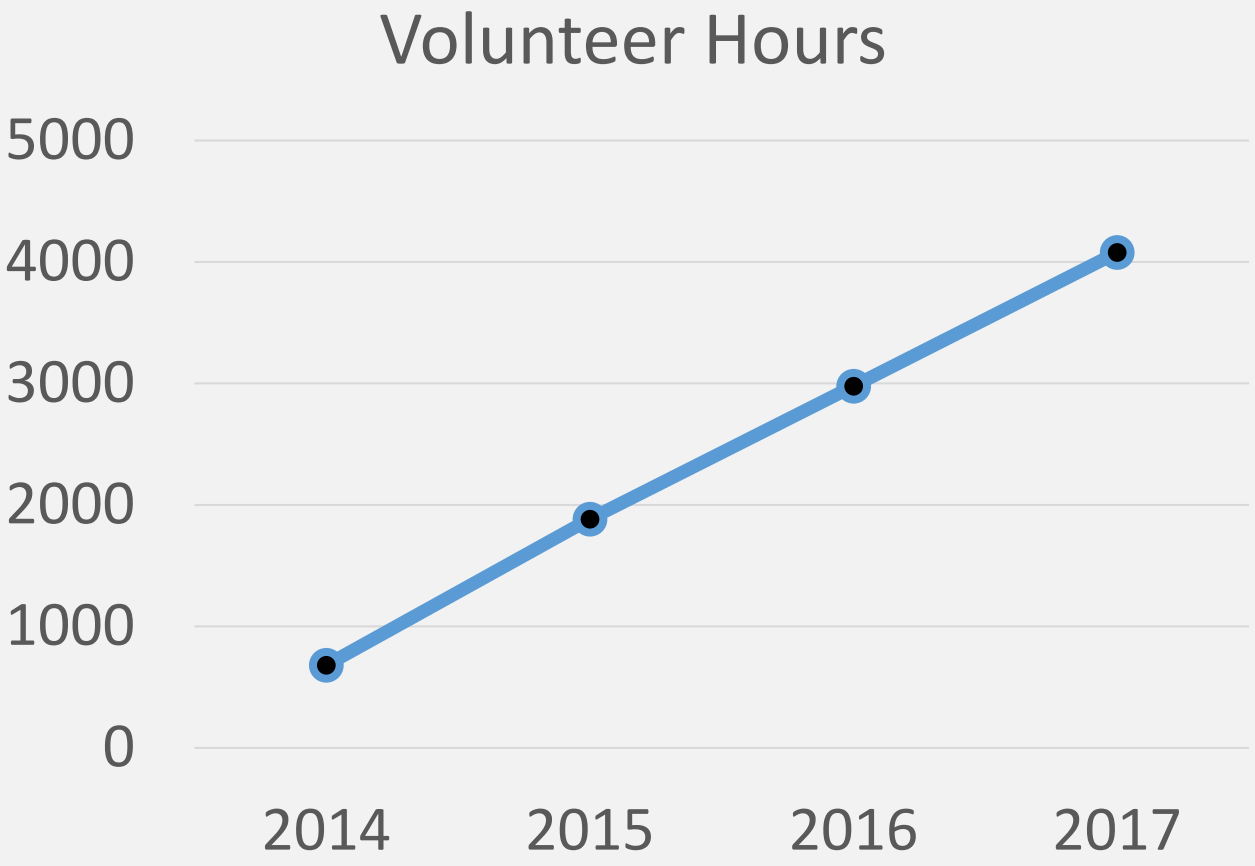
9286
miles driven to volunteer activities

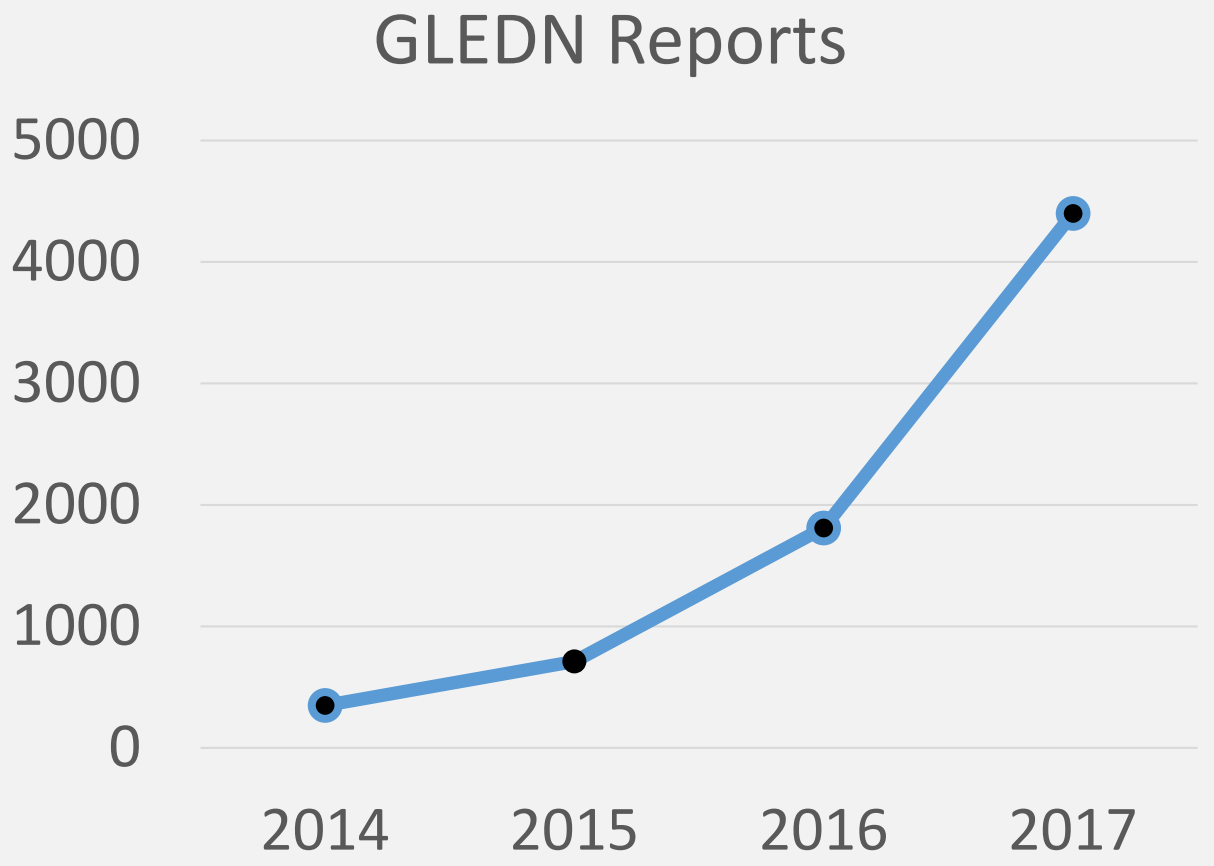
443
baseball diamonds surveyed for *Cerceris* wasps

1004
insects collected, **75** EAB from 2014-2015

http://fyi.uwex.edu/wifdn

Impacts are increasing



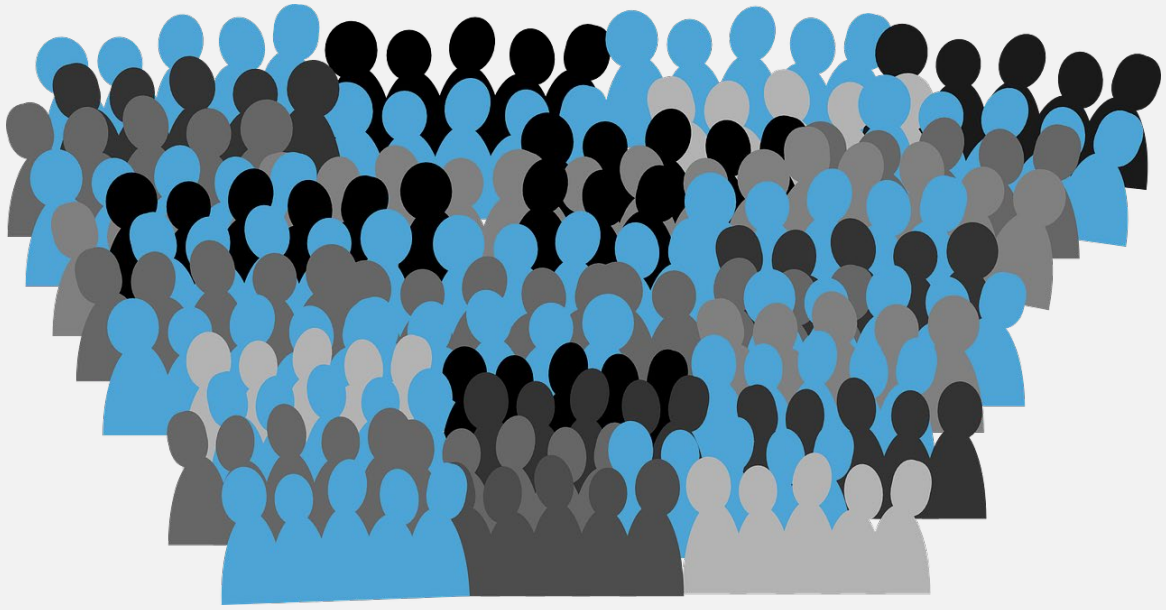


How have we been successful?

We built a network with a specific purpose

- Purpose = Early Detection
- Tools = GLEDN App
- **People**
- **Training**

- We kept our network engaged!
  - Newsletter
  - Volunteer opportunities



People- Recruiting Volunteers

- Relied on existing volunteer groups
  - Master Gardeners
  - Master Naturalists
- Expanded to other conservation groups
  - Friends groups
  - Nature centers
  - Classrooms

Training

- Webinars
- Videos
- Print resources
- Website
- In person workshops


MANAGEMENT OF

INVASIVE PLANTS IN WISCONSIN

A3924-15

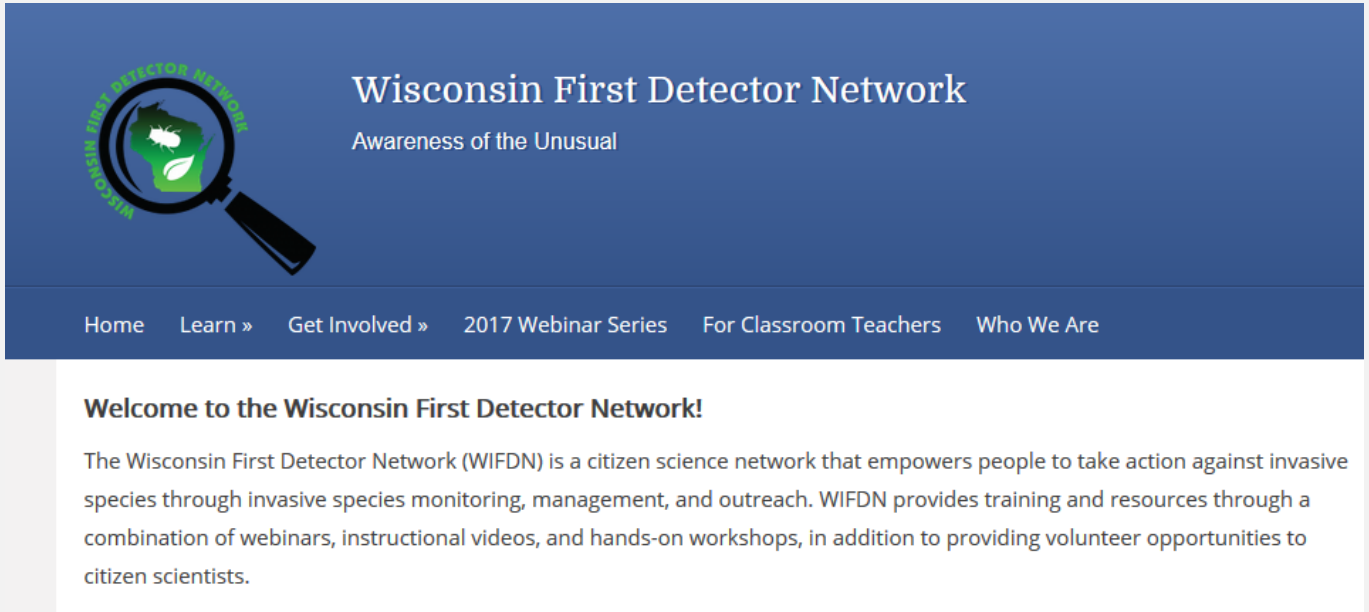
Wild parsnip

(*Pastinaca sativa*)

Brendon Panke, Ryan deRegnier, and Mark Renz

Wild parsnip is an herbaceous plant that establishes as a rosette with upright leaves persisting for at least one year. Plants flower in subsequent years (typically 2nd or 3rd year), but after plants flower, they die

Similar species: Wild parsnip is distinguished from other species in the parsley family by its yellow flowers and pinnately compound leaves, which are divided once into more than five leaflets. Golden alexander (*Zizia aurea*; native)



http://fyi.uwex.edu/wifdn

One example of WIFDN improving efforts in WI

Invasive Plant prioritization: Story Map

Land manager problem

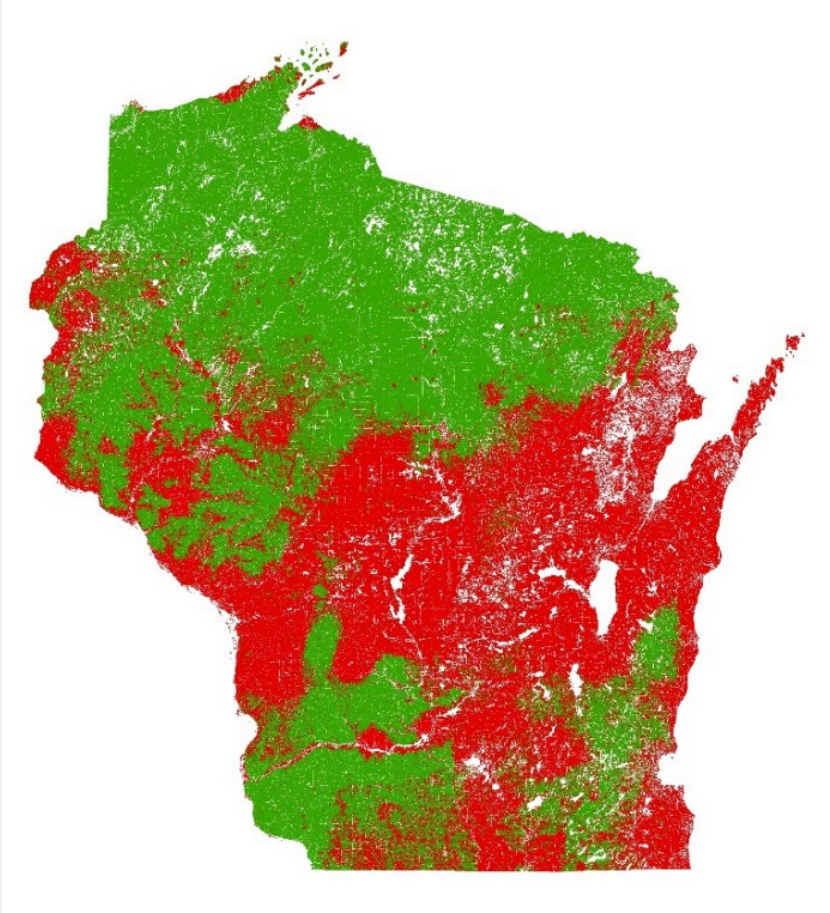
- Over 145 invasive plants are regulated by NR40
  - Unclear on current distribution in WI
  - Need a prioritized list
- "What species do I really need to be concerned about in my area?"

Researcher Problem

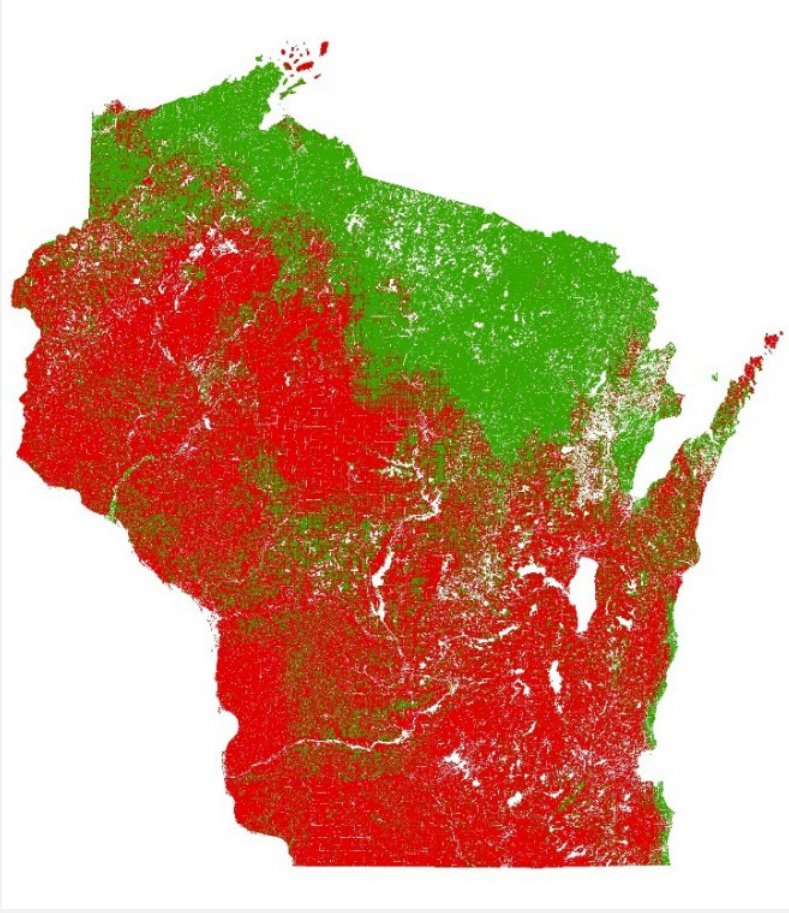
- Limited data hampers efforts to model potential spread
  - Need more data
  - Need better distribution of data
- How can we get people to share information?

We can create models but are they accurate?

Phragmites



Wild Parsnip



Priority Invasive Species

Secure | https://www.arcgis.com/apps/MapSeries/index.html?appid=f473e7c3c0e540f6931b27866da62e57

Priority Invasive Species Lists in Wisconsin

An Invasive Plants Story Map

County Specific Priority Lists | Autumn Olive | Canada Thistle | Common Buckthorn | Crown Vetch | European Marsh Thistle | Exotic Honeysuckles | Garden Valerian | Garlic Mustard | Glossy Buckthorn | Hedgeparsleys | Japanese Barberry

Invasive plants are a pervasive problem. The ability to detect an invasive species in the early stages of an invasion is critical to control and eradicate populations. The following map series depicts the results of efforts to model the suitable habitat of regulated invasive plants across the state of Wisconsin. This research was performed in the Renz Lab at the University of Wisconsin – Madison in conjunction with UW-Extension. ***Our goals are to:***

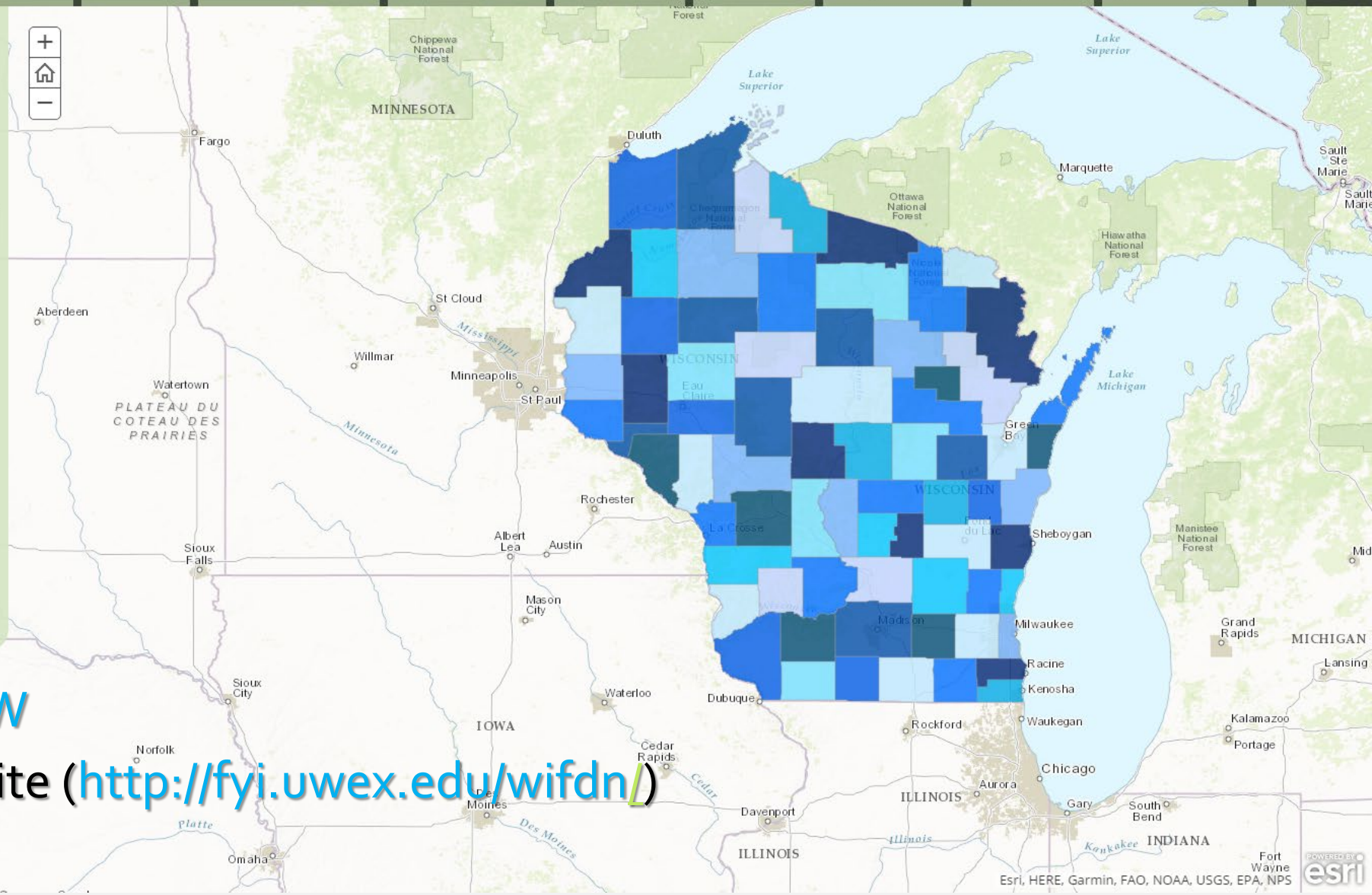
1. Provide a platform to investigate the current known distribution of select invasive plants
2. Display county-specific species lists for invasive species likely to be present (***10-15 species***)
3. Encourage reporting invasive species occurrences

If you are interested in getting involved with our project, we need help locating these (and other) species! Click on your county on the map to the right to find out which invasive plant species are of greatest priority. Species highlighted in ***yellow*** (high priority species) have been identified as those with large areas of suitable habitat in the county, but very few, if any, species occurrence records are currently available. If you are not sure if your location has been reported, click the tab that lists the species of interest to view a map of known locations and links to resources to aid in identification.

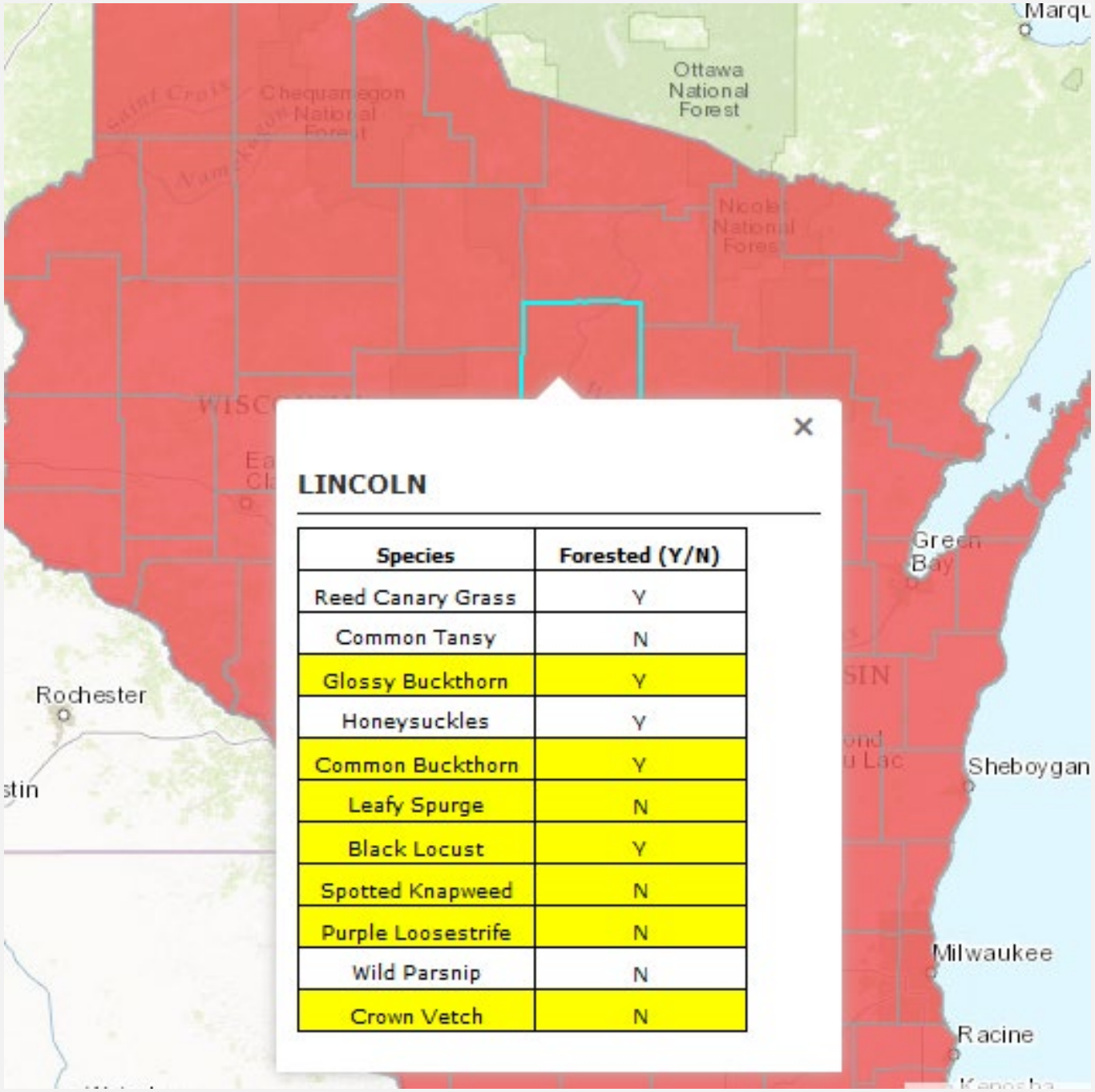
New species locations can be uploaded by:

1. The GLEDN mobile app (http://apps.bugwood.org/apps/gledn/)
2. Via the Early Detection and Distribution Mapping website (www.eddmaps.org/)
3. By emailing the Wisconsin DNR (invasive.species@wi.gov)
4. Or send them to us! We can help upload them to EDDMapS for you!

Please contact Niels Jorgensen (njorgensen@wisc.edu) with any other questions or comments.



- http://arcg.is/20b5PdW
- Visit the WIFDN website (http://fyi.uwex.edu/wifdn/)

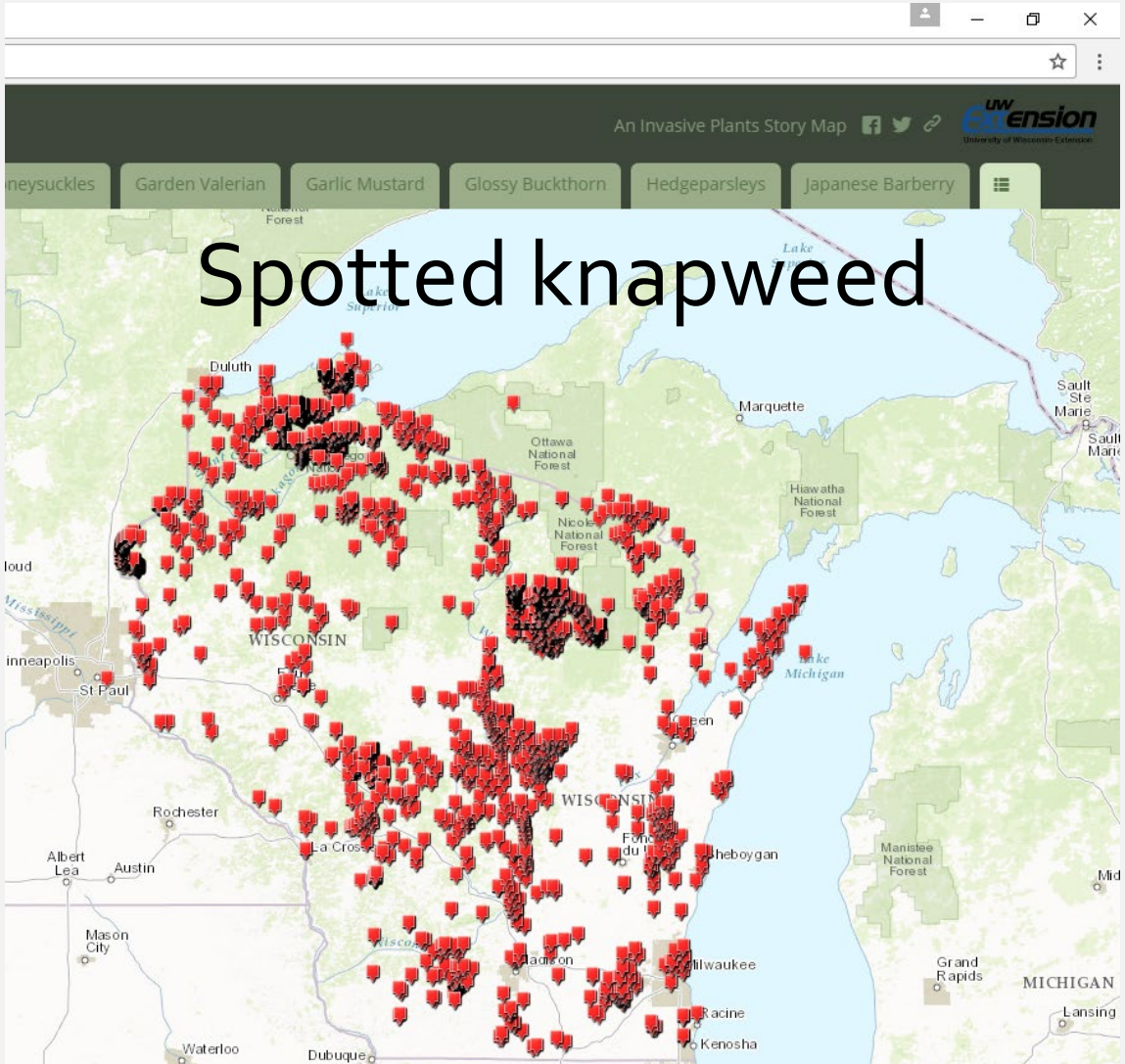


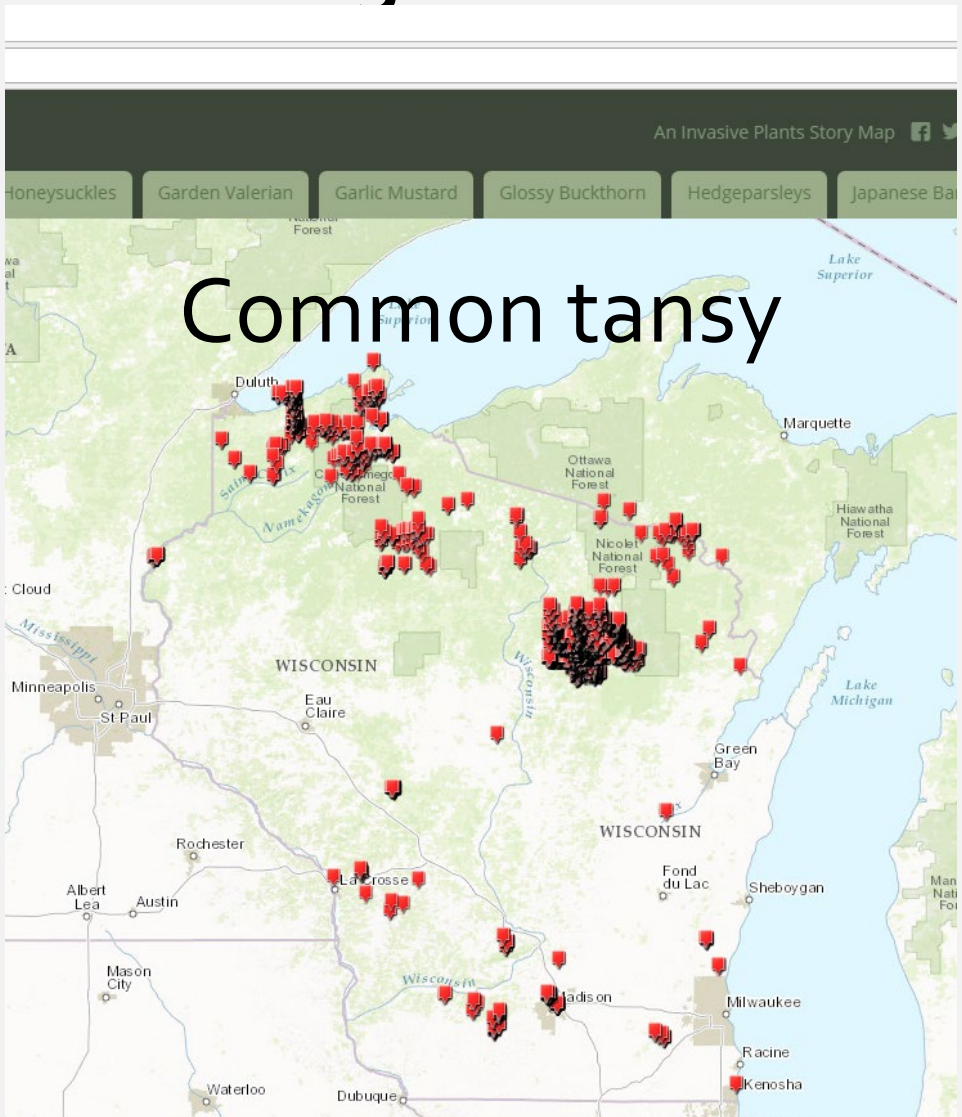
LINCOLN

Species	Forested (Y/N)
Reed Canary Grass	Y
Common Tansy	N
Glossy Buckthorn	Y
Honeysuckles	Y
Common Buckthorn	Y
Leafy Spurge	N
Black Locust	Y
Spotted Knapweed	N
Purple Loosestrife	N
Wild Parsnip	N
Crown Vetch	N

Also allows users to presence by species

interactive map allows for zooming……





Promoted WIFDN members to use this to report invasive plants

- Done through 2016 and 2017
  - Webinars
  - WIFDN newsletters
- In person training

WIFDN Update

August 8, 2017

In this update:

1. August GLEDN Monthly Challenge
2. Update on Mini GLEDN Challenge
3. Volunteer Hours- Report in September
4. New EDDMapS Tutorial Video
5. Species Alert- Creeping Bellflower

1. August GLEDN Monthly Challenge

Wisconsin First Detector Network

Awareness of the Unusual

Home | Learn » | Get Involved » | Report a Pigweed | Who We Are

Home » Get Involved » Report Invasive Species

Report Invasive Species

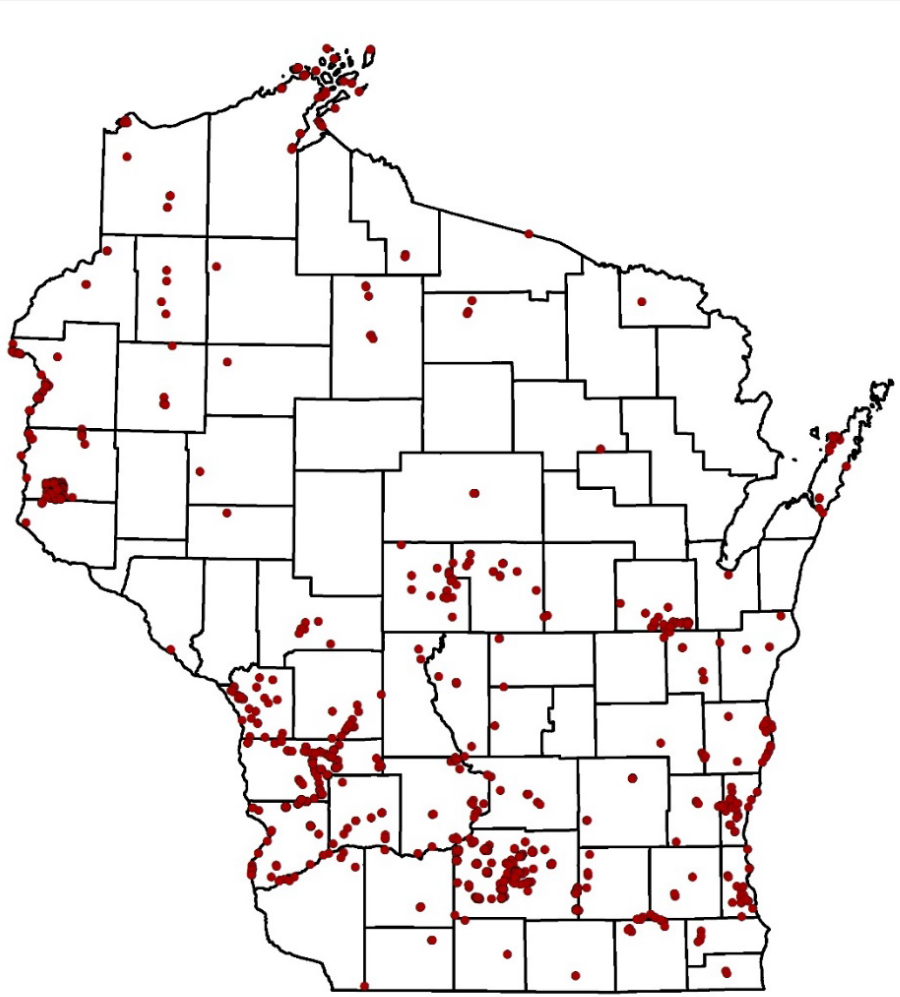
You have several options for reporting invasive species. If you have a smartphone or tablet, the easiest option is to use the Great Lakes Early Detection Network (GLEDN) app. No smartphone? You can still submit reports through the EDDMapS website. You can also email WIFDN or submit reports to WI DNR. Read on to pick the best option for you!

Look at a priority species list for your county

Tips for monitoring invasive plants: video

Was it effective?

- Webpages viewed over **22,000 times**
- **14,314** more points were shared between 2016-2017
  - 37% increase vs before
- Reports allowed us to:
  - Improve models (2016 data)
  - Validate models (2017 data)

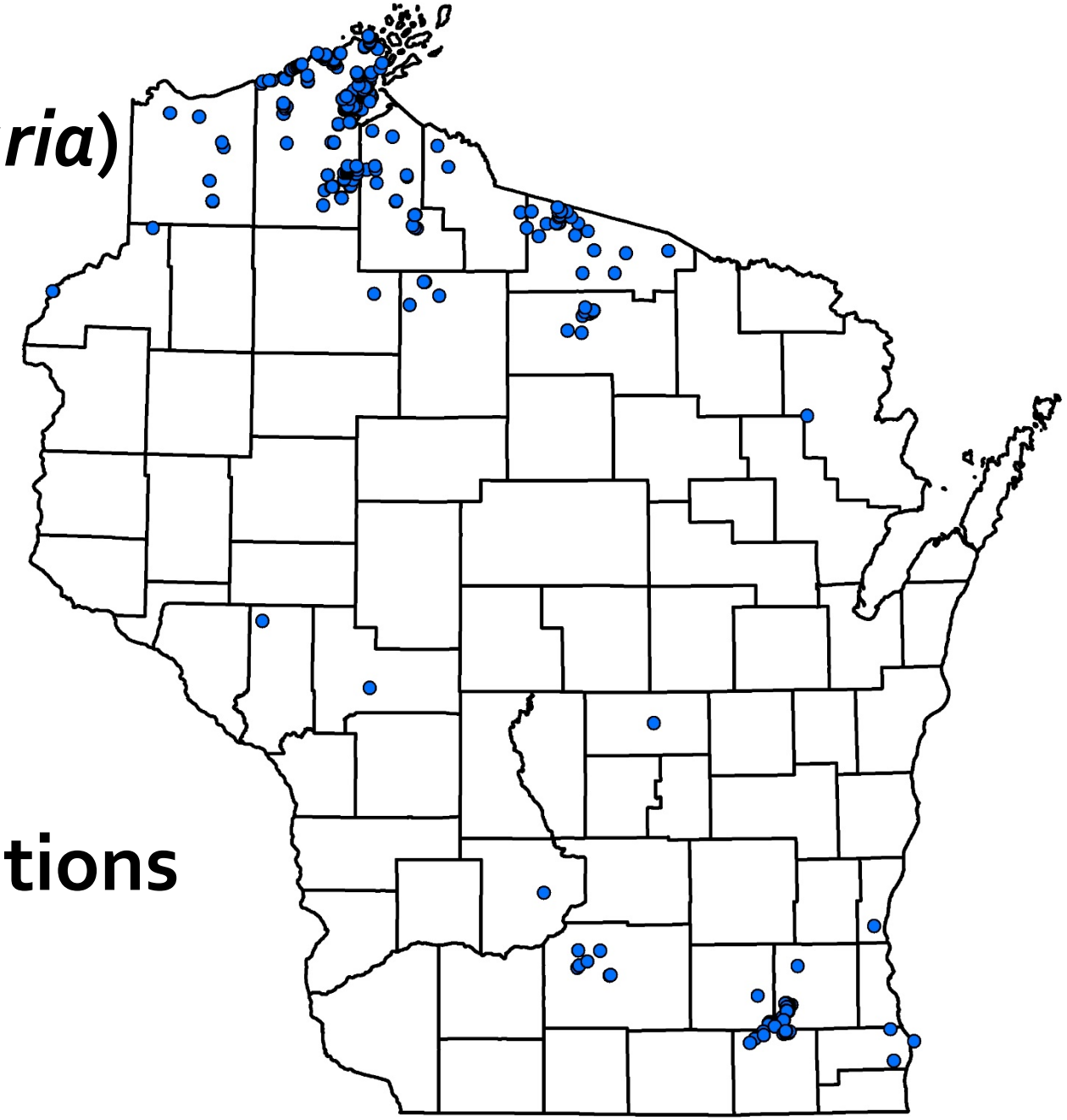


Results were specific to the species

Common Name	Scientific Name	inc	Total
Garlic mustard	*Allaria petiolata*	44%	3,520
Japanese barberry	*Berberis thunbergii*	13%	474
Oriental bittersweet	***Celastrus orbiculatus***	**4%**	**223**
Spotted knapweed	*Centaurea stoebe*	37%	6,899
European marsh thistle	***Cirsium palustre***	**59%**	**1,369**
Teasels	*Dipsacus spp.*	3%	1,541
Autumn olive	*Elaeagnus umbellata*	59%	156
Leafy spurge	*Euphorbia esula*	106%	698
Knotweeds	***Fallopia spp.***	**17%**	**1,069**
Bush honeysuckles	*Lonicera spp.*	27%	3,943

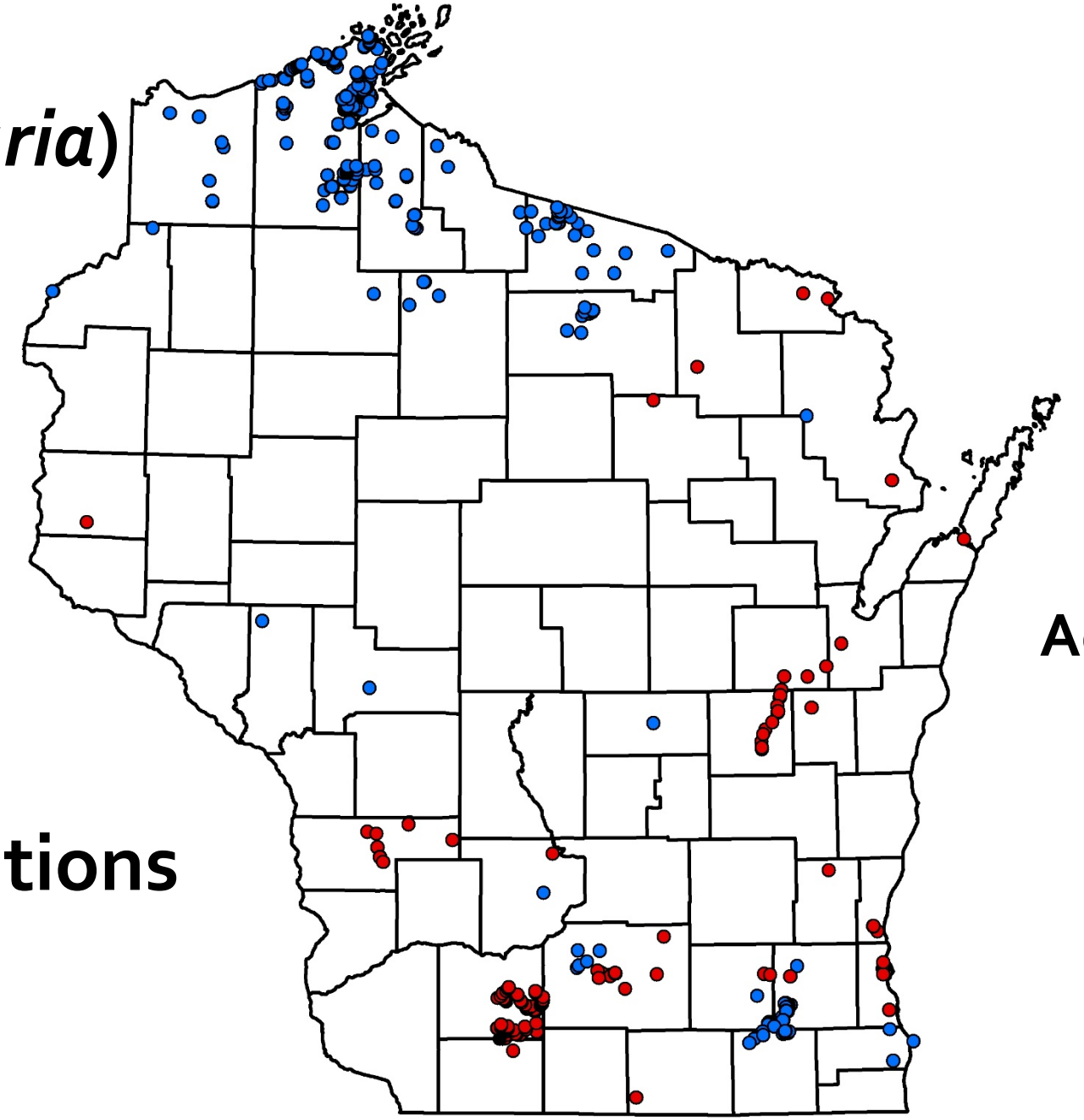
Common Name	Scientific Name	inc	Total
Purple loosestrife	*Lythrum salicaria*	17%	1,642
Wild parsnip	*Pastinaca sativa*	18%	8,139
Canada thistle	*Cirsium arvense*	-	4,250
Phragmites	***Phragmites australis***	**1%**	**5,529**
Common buckthorn	*Rhamnus cathartica*	63%	1,673
Glossy buckthorn	*Rhamnus frangula*	12%	753
Wild chervil		-	613
Crown vetch	*Securigera varia*	36%	988
Tansy	*Tanacetum vulgare*	148%	10,778
Hedgeparsleys	***Torilis spp.***	**12%**	**509**
Garden valerian	*Valeriana officinalis*	5%	506

Crown Vetch (*Securigera varia*)



Shared observations before 2016

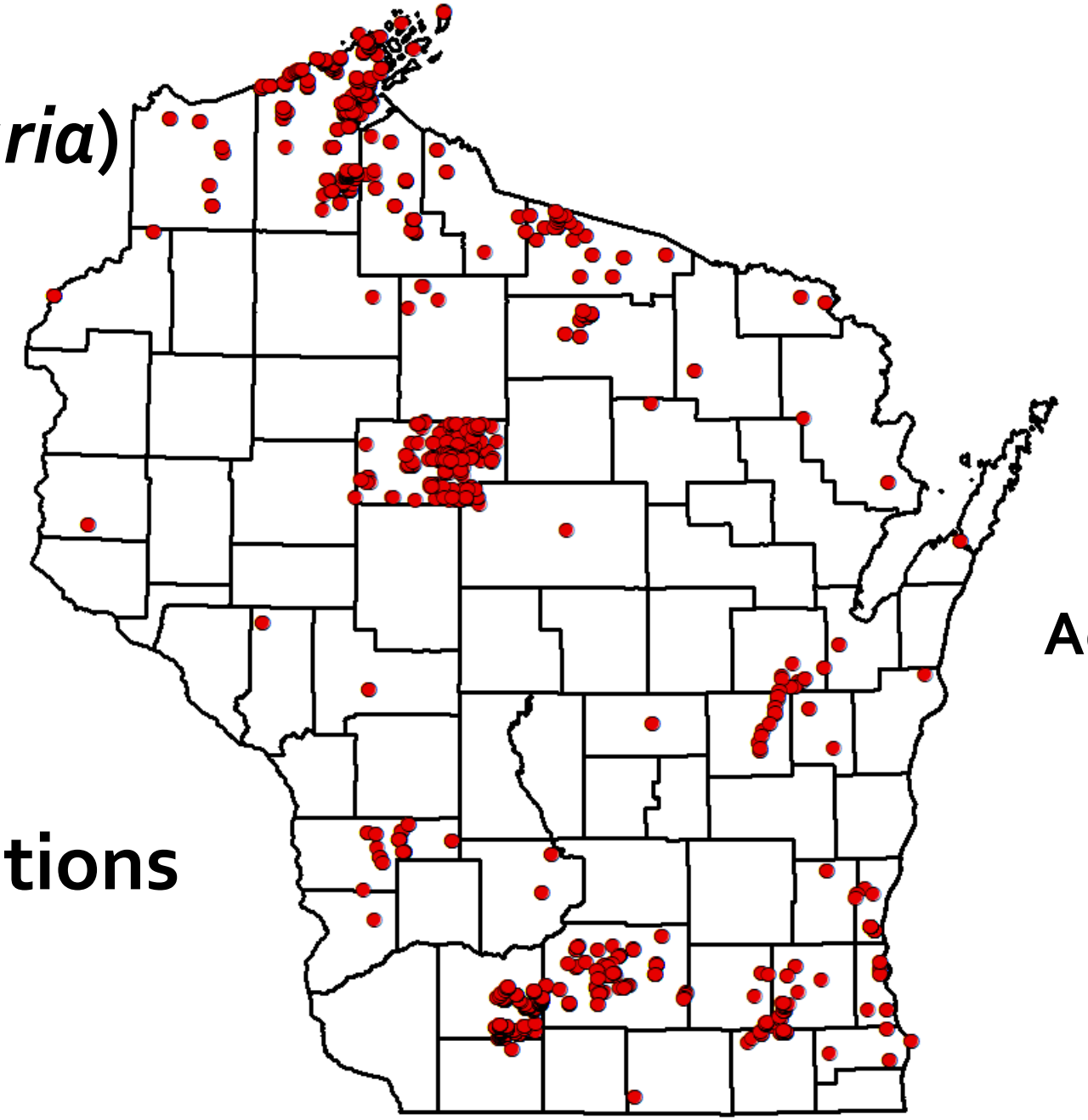
Crown Vetch (*Securigera varia*)



Added: 260 points

Shared observations end of 2016

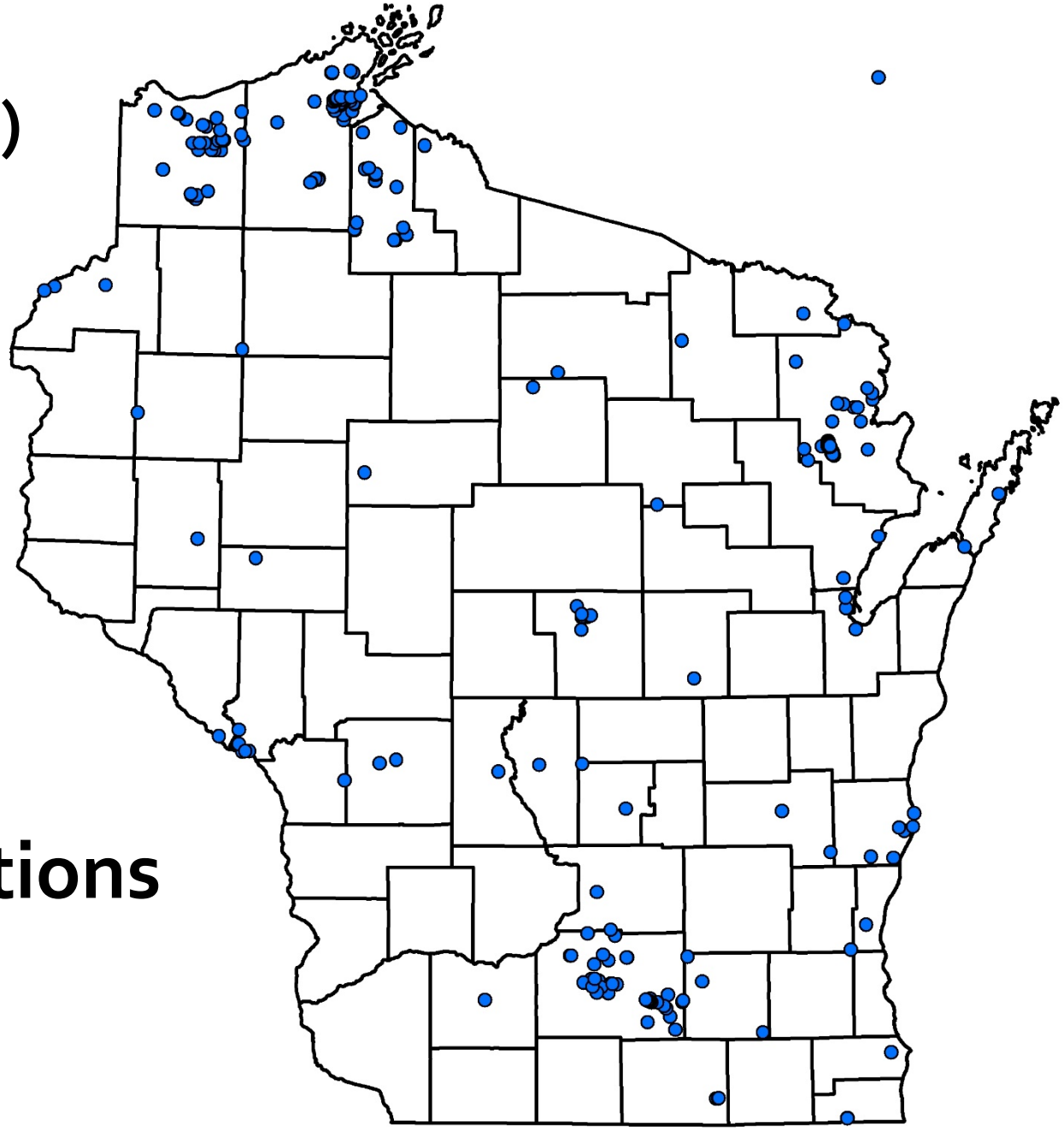
Crown Vetch (*Securigera varia*)



Added: 179 points

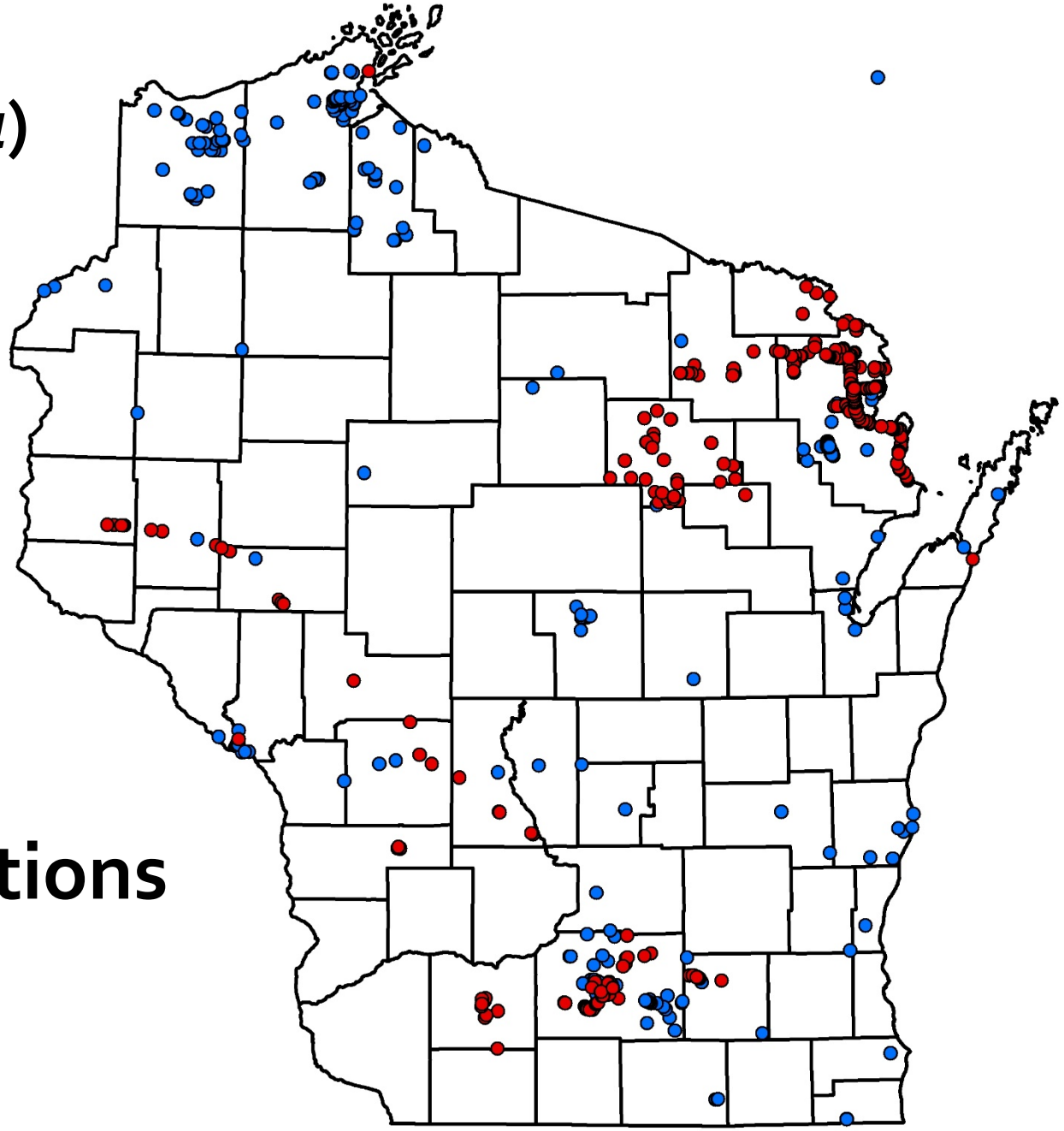
Shared observations end of 2017

Leafy Spurge (*Euphorbia esula*)



Shared observations before 2016

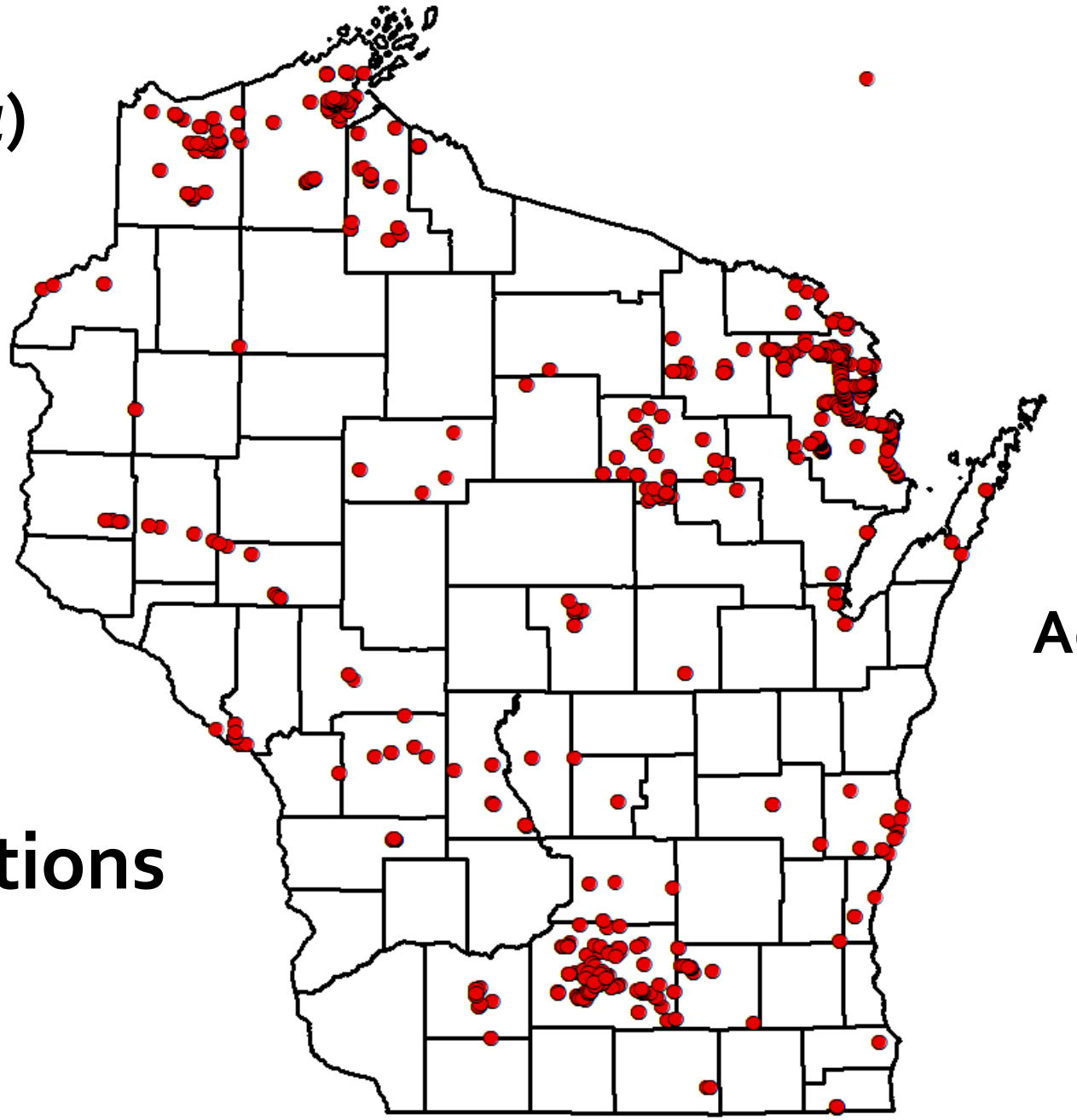
Leafy Spurge (*Euphorbia esula*)



Added: 359 points

Shared observations end of 2016

Leafy Spurge (*Euphorbia esula*)



Added: 58 points

Shared observations end of 2017

What we did with the information

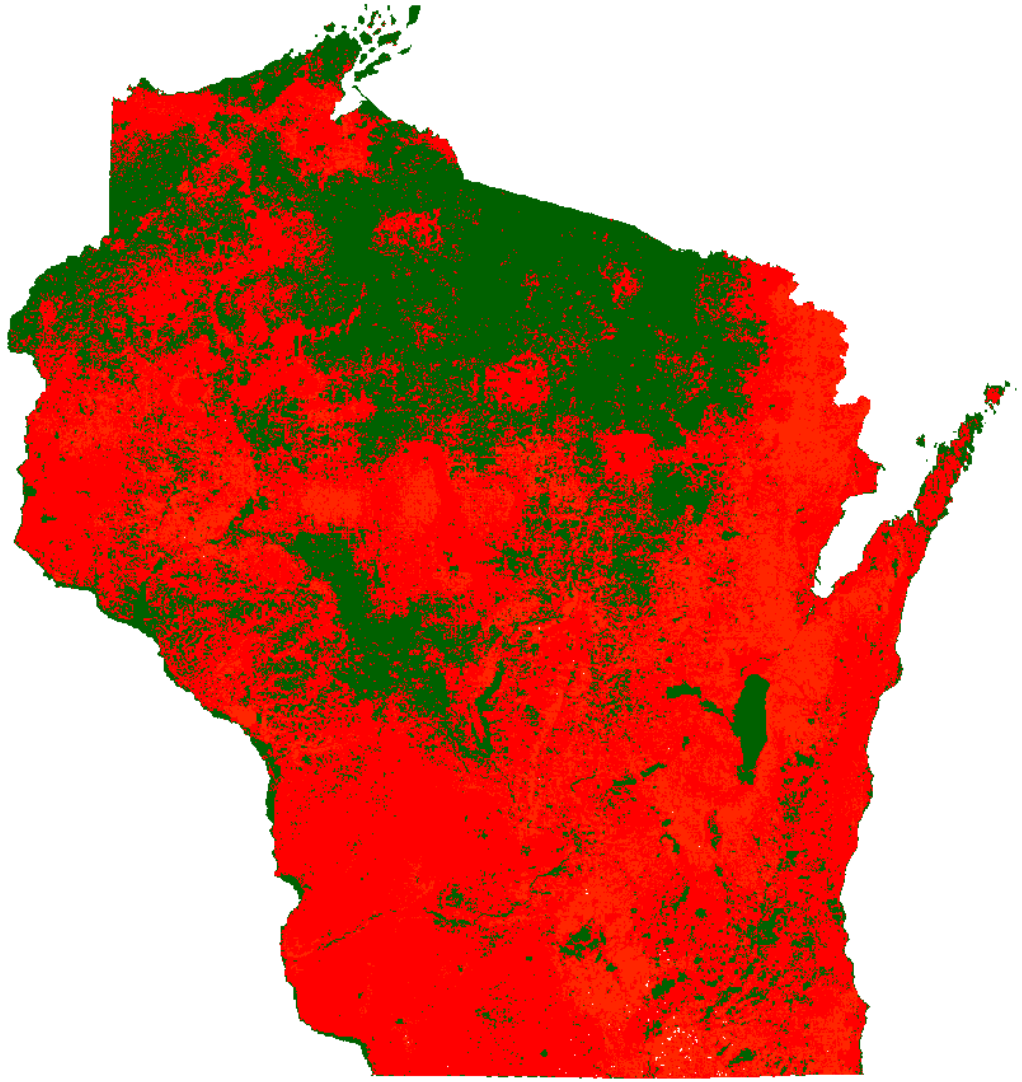
2016 data

- Updated/refined models
- **Tested if** improvements were made

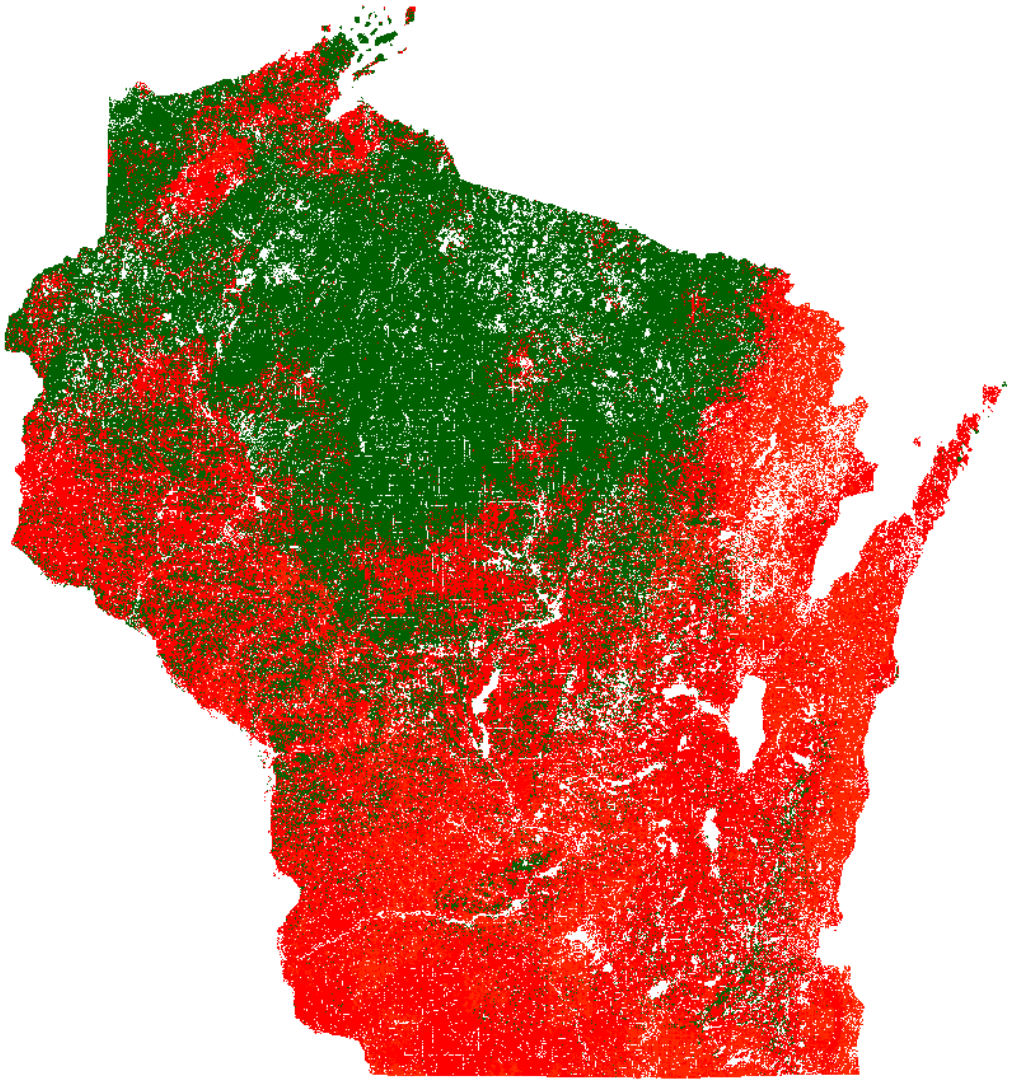
2017 data

- Validated with these data
  - Separate dataset to model development
- **Tested if** presence locations in 2017 were correct 80% of the time

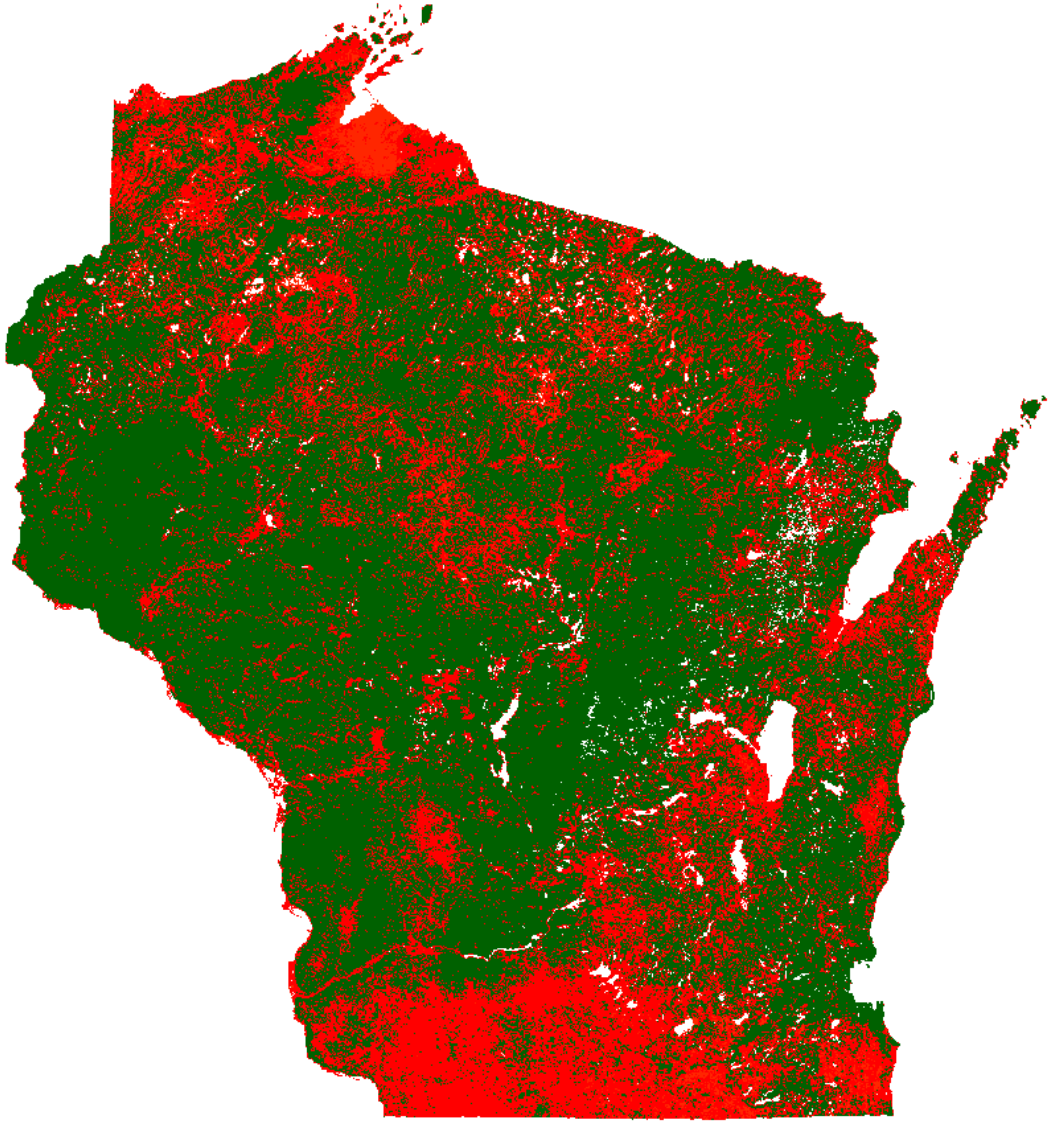
Leafy Spurge model (2015)



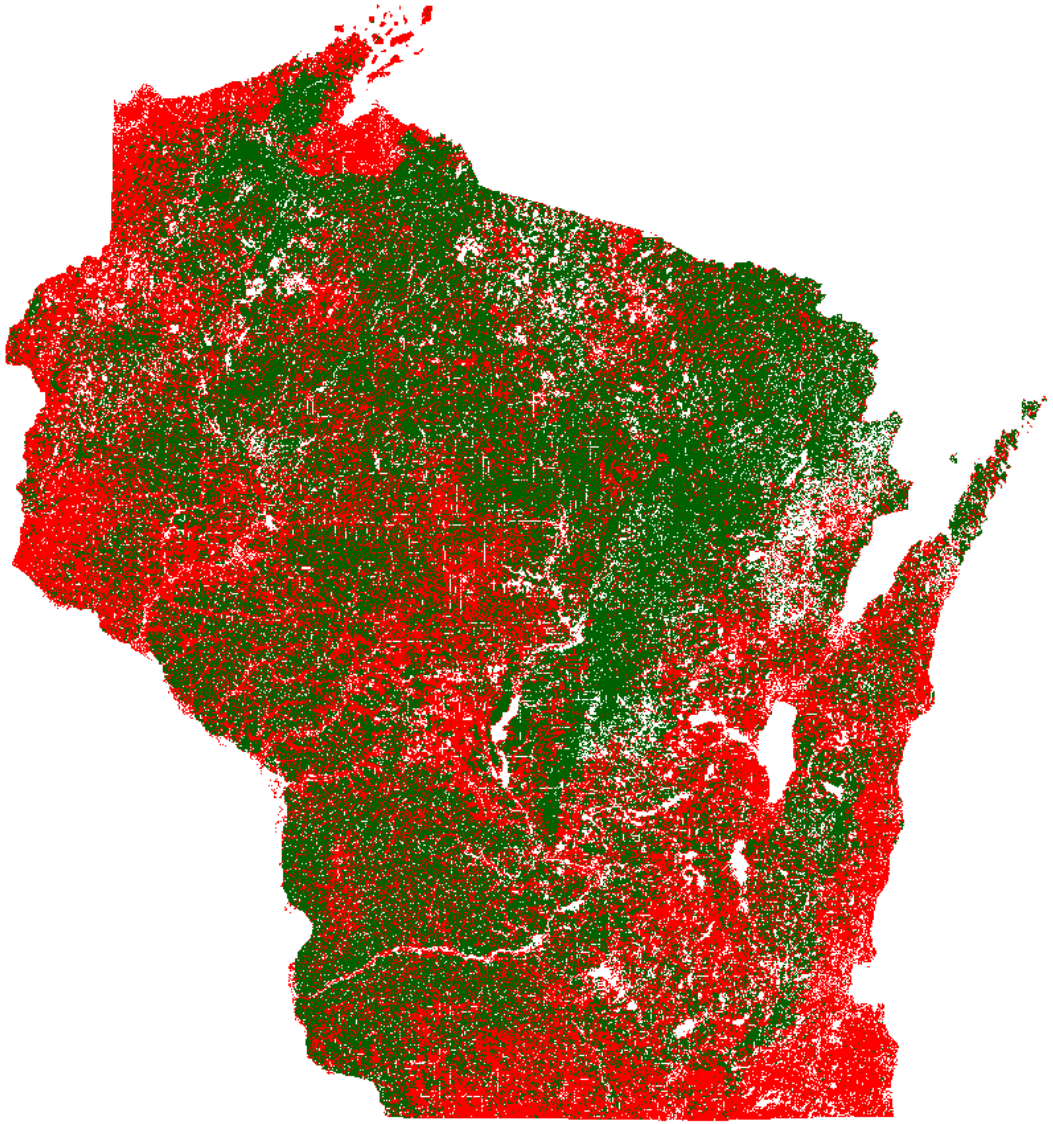
Leafy spurge model (2016)



Purple loosestrife model (2015)



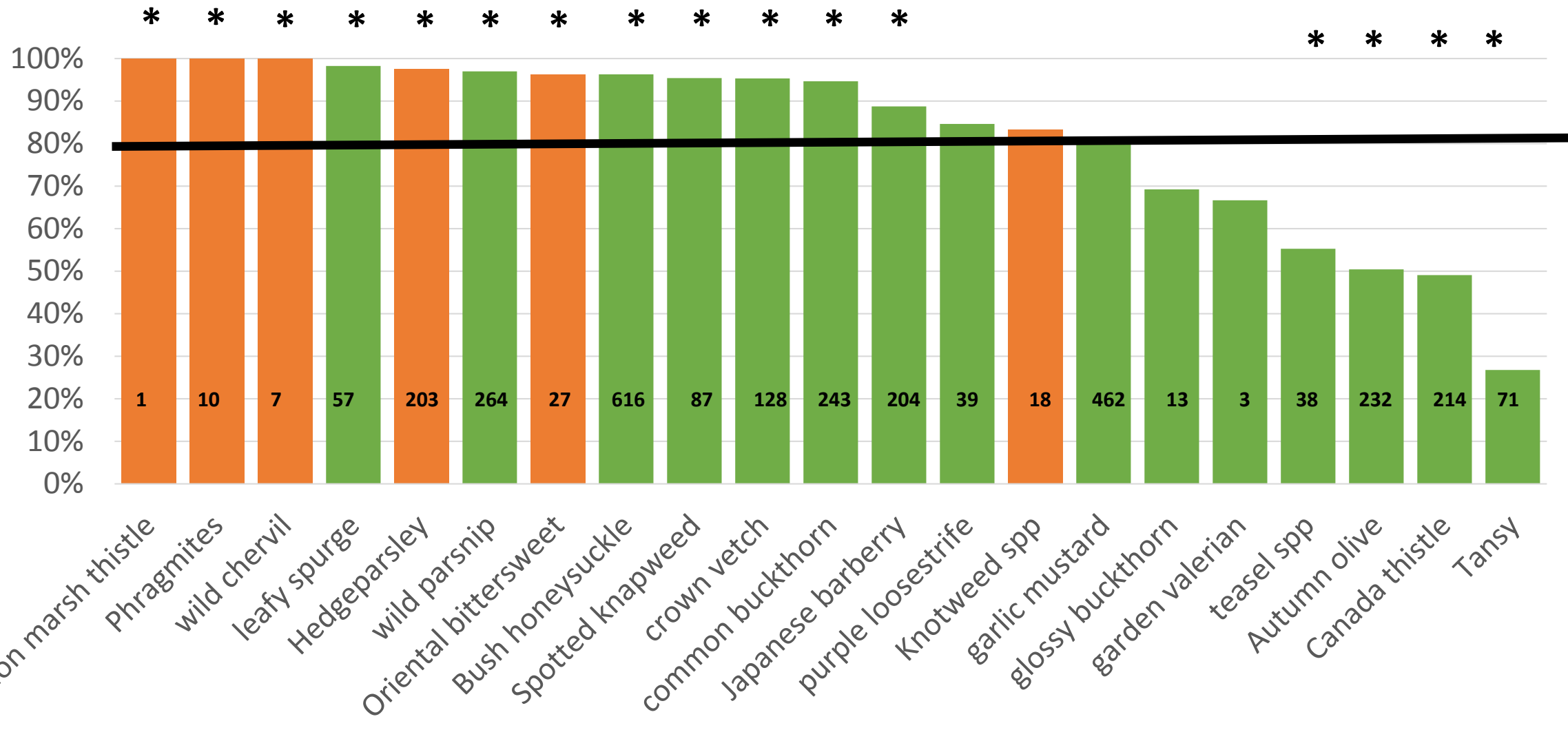
Purple loosestrife model (2016)



Validation of models

Percent correctly classified by species

* Chi square or Fisher's exact test



Next steps in this project

- Improve models of species that are not performing well
- Apply models to 5 climate change scenarios to predict how suitable habitat may change in future
  - Phragmites
  - Japanese barberry
  - Leafy spurge
  - Hedgeparsley

Summary

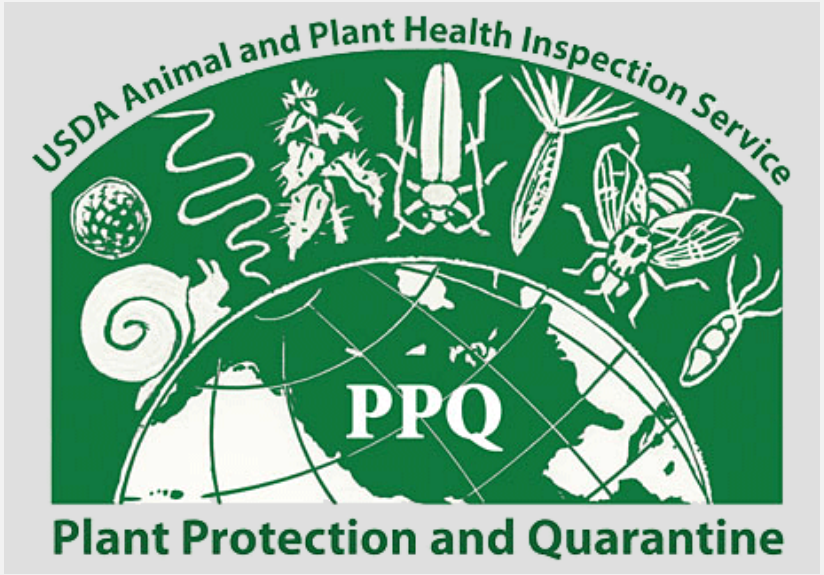
- Citizen Scientists can help!
  - improve our understanding of invasive plant locations
  - Monitoring for EAB and related insects (Cerceris survey)
- Resources are needed to focus efforts
  - Other volunteer opportunities that have not been actively supported have had less impact

UW Extension
University of Wisconsin-Extension

Funding


USDA


FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE


USDA Animal and Plant Health Inspection Service
PPQ
Plant Protection and Quarantine