

Data Aggregation:  
Data goes in, data goes out.  
You can't explain that

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THE UNIVERSITY OF GEORGIA  
**CENTER FOR INVASIVE SPECIES  
AND  
ECOSYSTEM HEALTH**  
WARNELL SCHOOL OF FORESTRY AND NATURAL RESOURCES      COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES



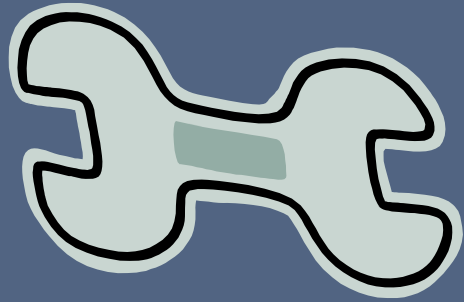
# Who am I?

- University of Georgia
  - MS Crop and Soil Sciences – Weed Science 2009
- AmeriCorps Florida State Parks 2010
- EDDMapS Data Coordinator 2011-present
  - Work with agencies, programs, groups to enter existing data into the EDDMapS Database
  - Work with verifiers in the record review process
  - Process specific data requests

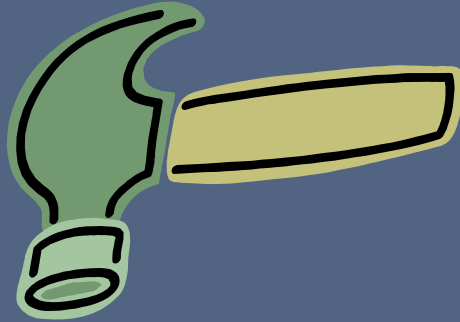
# Bugwood? Center?

- Started 1994 / Bugwood Network until Feb. 2008
- Outreach/Extension Focused
- Land Grant University – 100% match/no profit
- Work across agency, organization and discipline boundaries (work at landscape level)
- Provide easily accessible resources
- Combine Science with Technology
- Create freely available tools to help groups work together

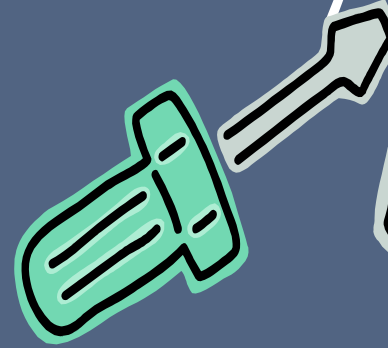
# There is a tool for every job...



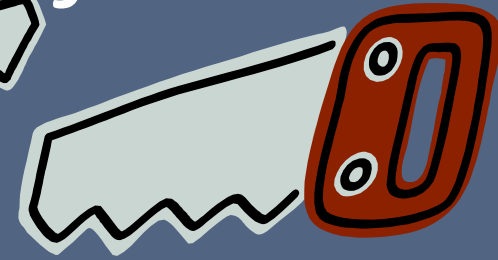
Early Detection



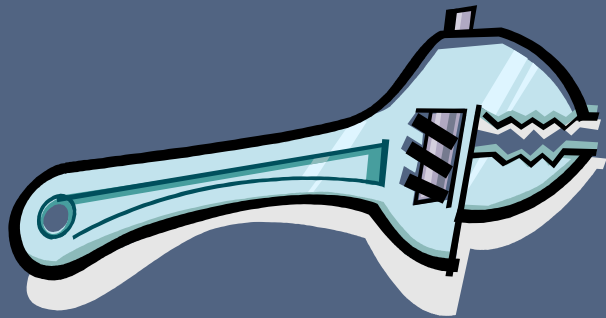
Verification



Alerts



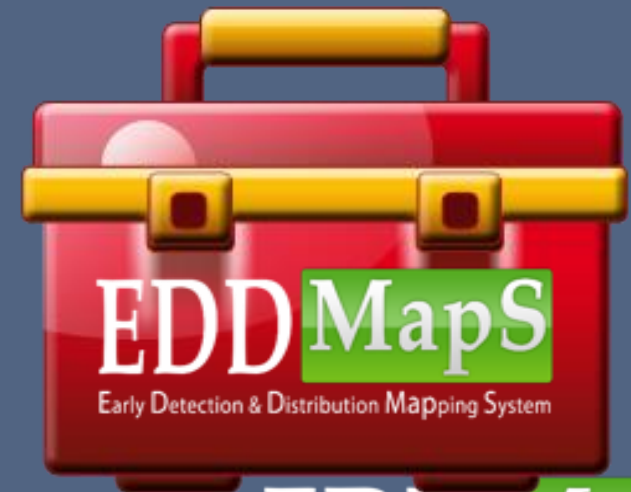
Visualization



Monitoring and  
Management



Data Sharing and  
Collaboration



EDD MapS

# EDDMapS Purpose

- Electronic Early Detection Tool
- Aggregate Data
  - Homeowners
  - Trained citizen scientists
  - Federal and State Agencies
  - Herbariums/Academic Institutions
  - Existing regional/topical databases
- Identify Existing Range, Gaps, and Leading Edge in Maps

The screenshot displays the EDDMapS (Early Detection & Diagnosis MapS) website. The main map shows the state of Georgia with county boundaries. A sidebar on the left contains text explaining the tool's purpose and providing a checklist of reasons why users should care about invasive species. The top of the page features the EDDMapS logo and navigation links. The bottom of the page includes logos for the USDA-NRCS-NGCE and Esri.

**EDDMapS**  
Early Detection & Diagnosis MapS

Home Report Site

**Why Should I care about invasive species?**

Below are several reasons why you should care about invasive species:

- ✓ I am a logger or forester.
- ✓ I am a hunter. Why should I care about invasive species?
- ✓ I am a hiker, biker, or camper.
- ✓ I am a gardener. Why should I care about invasive species?
- ✓ I am a fisherman or boater.
- ✓ I am a bird watcher.
- ✓ I am a rancher or farmer.
- ✓ Why should I care about invasive species?

**Where Do They Come From?**

Species which have been introduced to our own. Many from South America, Asia, and Europe.

**How Did They Get Here?**

Some species were brought here by shipping containers. We rely on non-native species for their usefulness in agriculture and industry.

**Why Should I care about invasive species?**

Below are several reasons why you should care about invasive species:

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- ✓ I am a bird watcher.
- ✓ I am a rancher or farmer.
- ✓ Why should I care about invasive species?

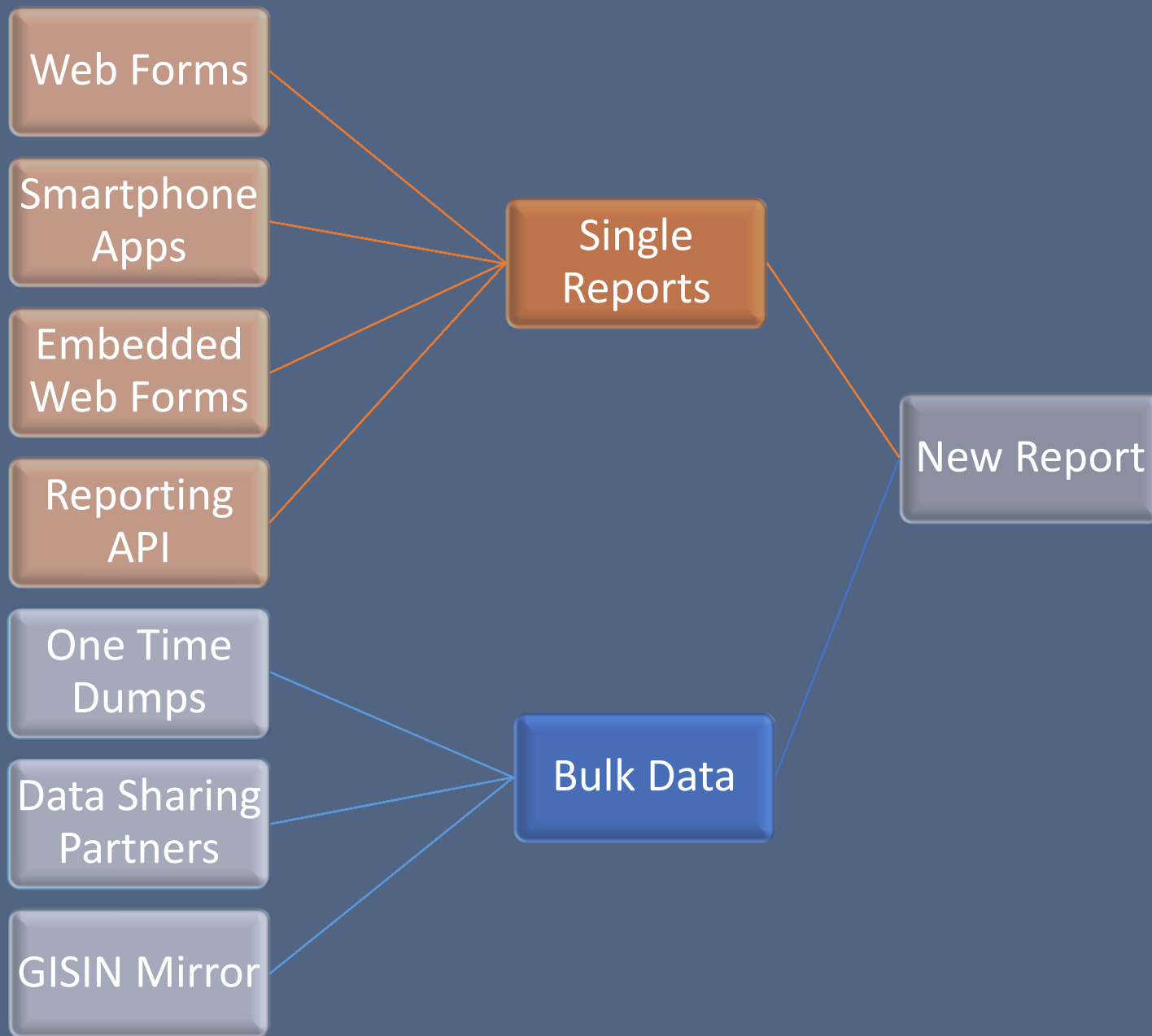
Symbol: LOJA

USDA-NRCS-NGCE esri

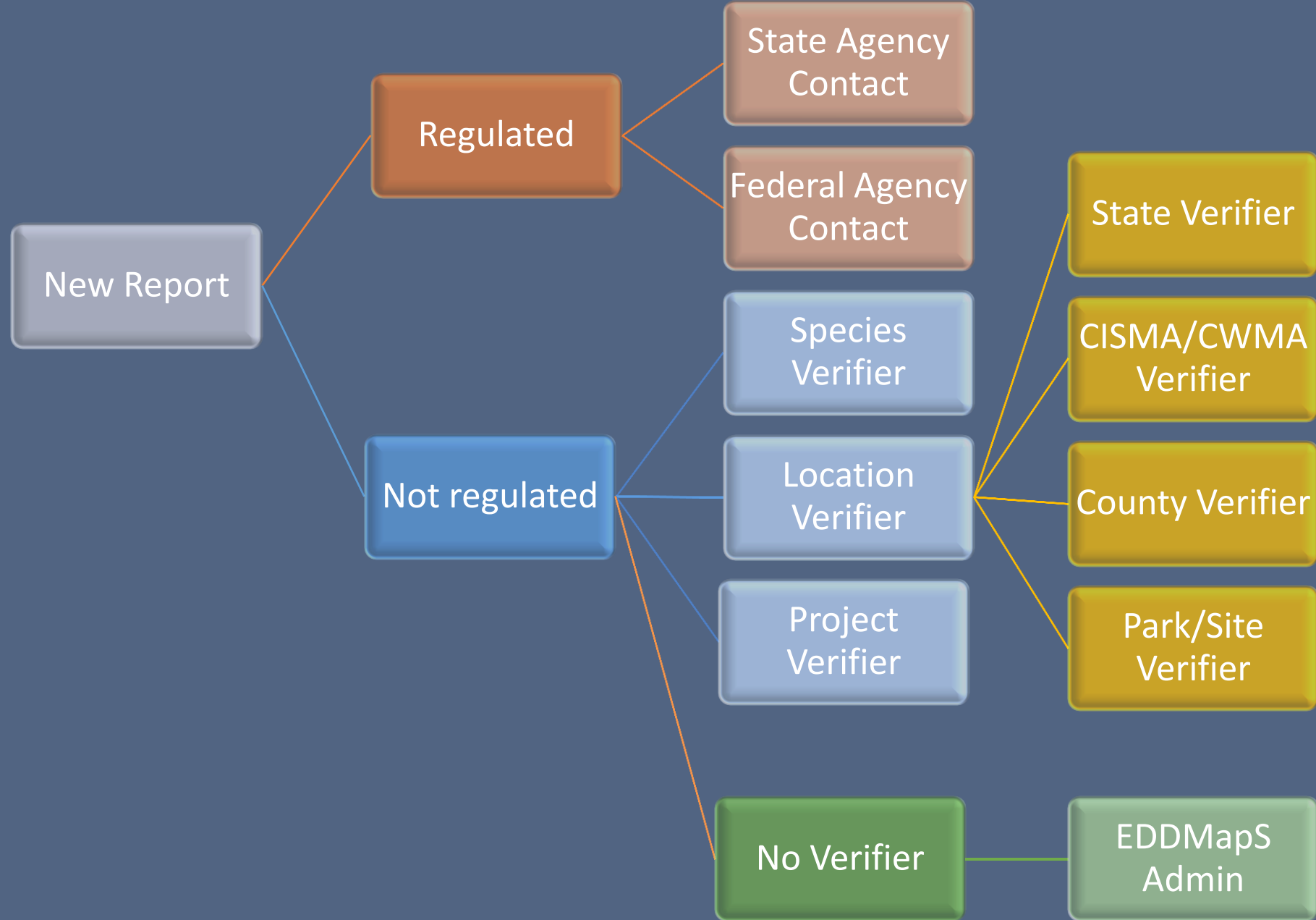
# EDDMapS Data Sources

- 3,302,970 County Reports
- 2,144,307 Point Reports
- 14,910 Reporters
- USDA NRCS Plants Database
- Biota of North America Program
- USFS Forest Inventory Analysis
- Florida Natural Areas Inventory Database
- Minnesota DNR
- SEWISC
- Alaska Natural Heritage Program

For more statistics:  
[www.eddmaps.org/stats.cfm](http://www.eddmaps.org/stats.cfm)









# Who will verify new reports?

Subject:

lionfish (*Pterois volitans*)



Subject: lionfish (*Pterois volitans*)  
Location: Miami-Dade County, Florida (25.39614, -80.41351)

## Who would receive the verification e-mail?

- Tony Pernas, National Park Service
- Pam Fuller, USGS
- FWCC Exotic Species Database, Florida Fish and Wildlife Conservation Commission
- Jeff Kline, Everglades National Park
- Christina Romagosa, University of Florida
- Edward Mercer, Florida Fish & Wildlife Conservation Commission
- Ian Bartoszek, Conservancy of Southwest Florida
- Michelle Collier, National Park Service
- Mike Rochford, University of Florida
- Matt Neilson, U.S. Geological Survey
- Bryan Falk, USGS
- Pam Schofield, U.S. Geological Survey
- Kelly Gestring, Florida Fish and Wildlife Conservation Commission
- Emma Hanslowe, USGS
- Murray Stanford, Florida Fish and Wildlife Conservation Commission
- Jenny Ketterlin Eckles, University of Florida
- Eric Suarez, Florida Fish and Wildlife Conservation Commission
- Christopher Kavanagh, National Park Service
- Ashley Lawrence, FWC
- Evan Freeman, FWC
- Rachel Brubaker, Florida Fish and Wildlife
- Eric LeVein, FDACS-Plant Industry
- Daniel Quinn, Florida FWC
- Tyson Dallas, Florida FWC
- clinton cunningham, FWC
- Jason Osborne, National Park Service
- Wesley Daniel, Cherokee Nation Technology

## Is the subject in the regulated species list?

- No

## Has the subject been previously reported

- in Florida? Yes
- in Miami-Dade County? Yes

## What apps/projects currently support reporting it?

- EDDMapS
- Southeast Early Detection Network
- US Army Corps of Engineers Invasive Species

## What Invasive Species Lists is it on?

- Everglades Cooperative Invasive Species Management Area
- Florida Invasive Species Partnership
- Invasive Species of Concern in Georgia
- [Southwest Florida Cooperative Invasive Species Mgmt. Area](#)

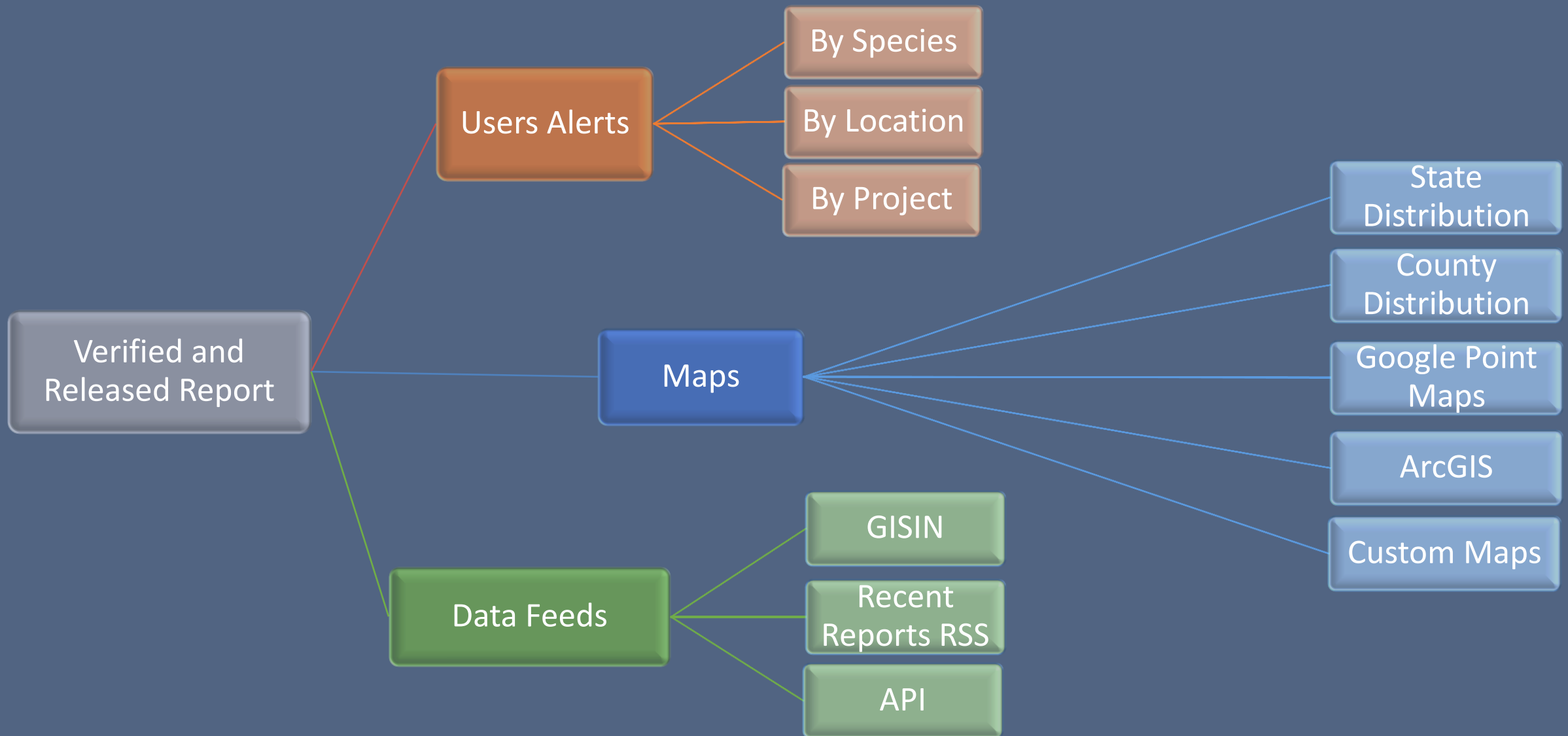
Who will Receive the verification Emails for this Species/Location?

Is this species on the regulated species list?

Has this species been previously reported in the State and/or County?

Which projects allow for reporting?

Which Invasive Species Lists is it on?



# kudzu

*Pueraria montana var. lobata* (Willd.) Maesen & S. Almeida

USDA PLANTS Symbol:PUMO

Invasive Plant Atlas

Species Information

States

Counties

Points

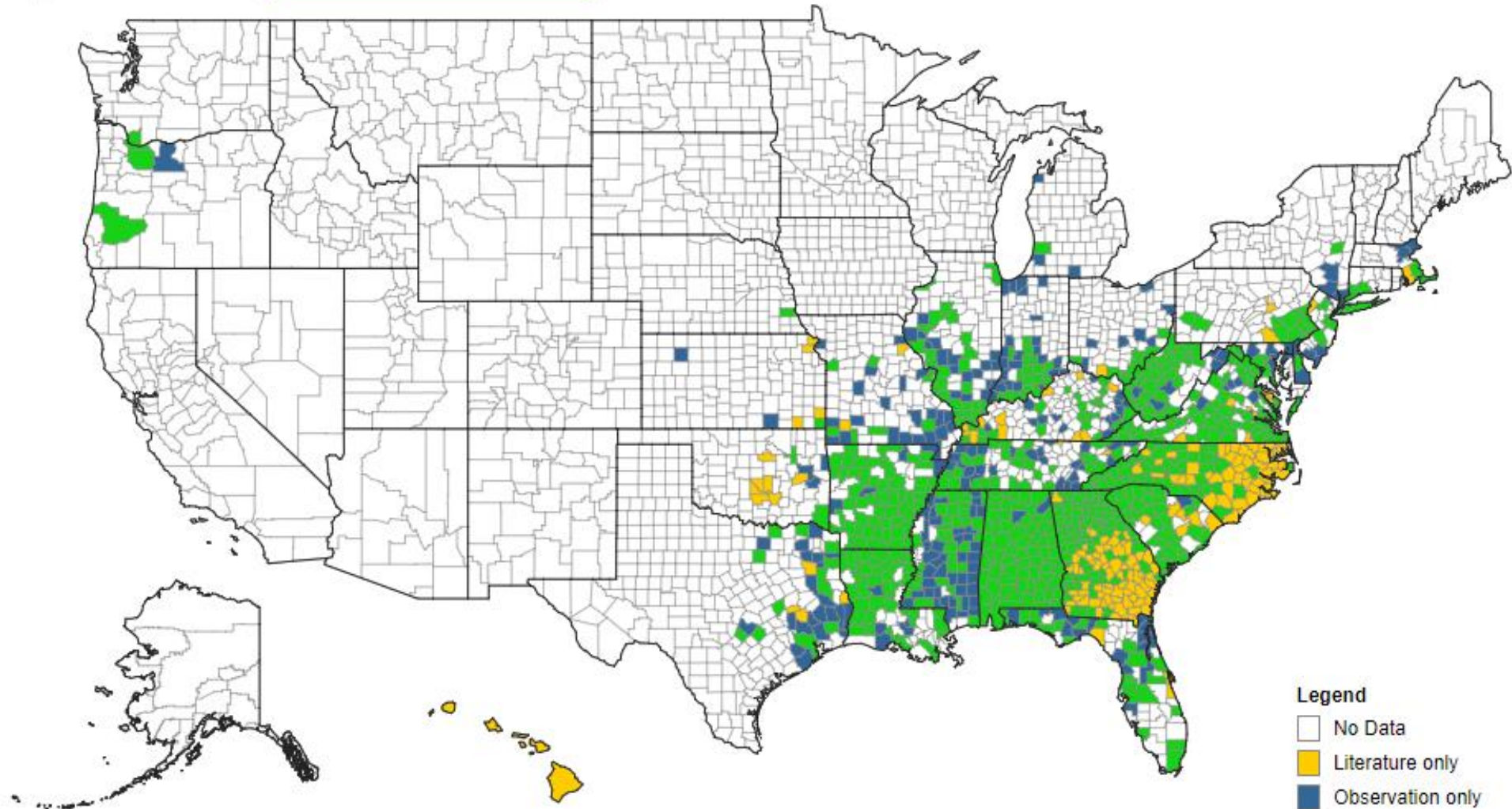
List

Distribution

Record Density

Literature vs Observation

CSV KML GPX Shapefile





# tree-of-heaven

*Ailanthus altissima* (P. Mill.) Swingle

USDA PLANTS Symbol: AIAL  
Invasive Plant Atlas  
Species Information

States Counties Points List

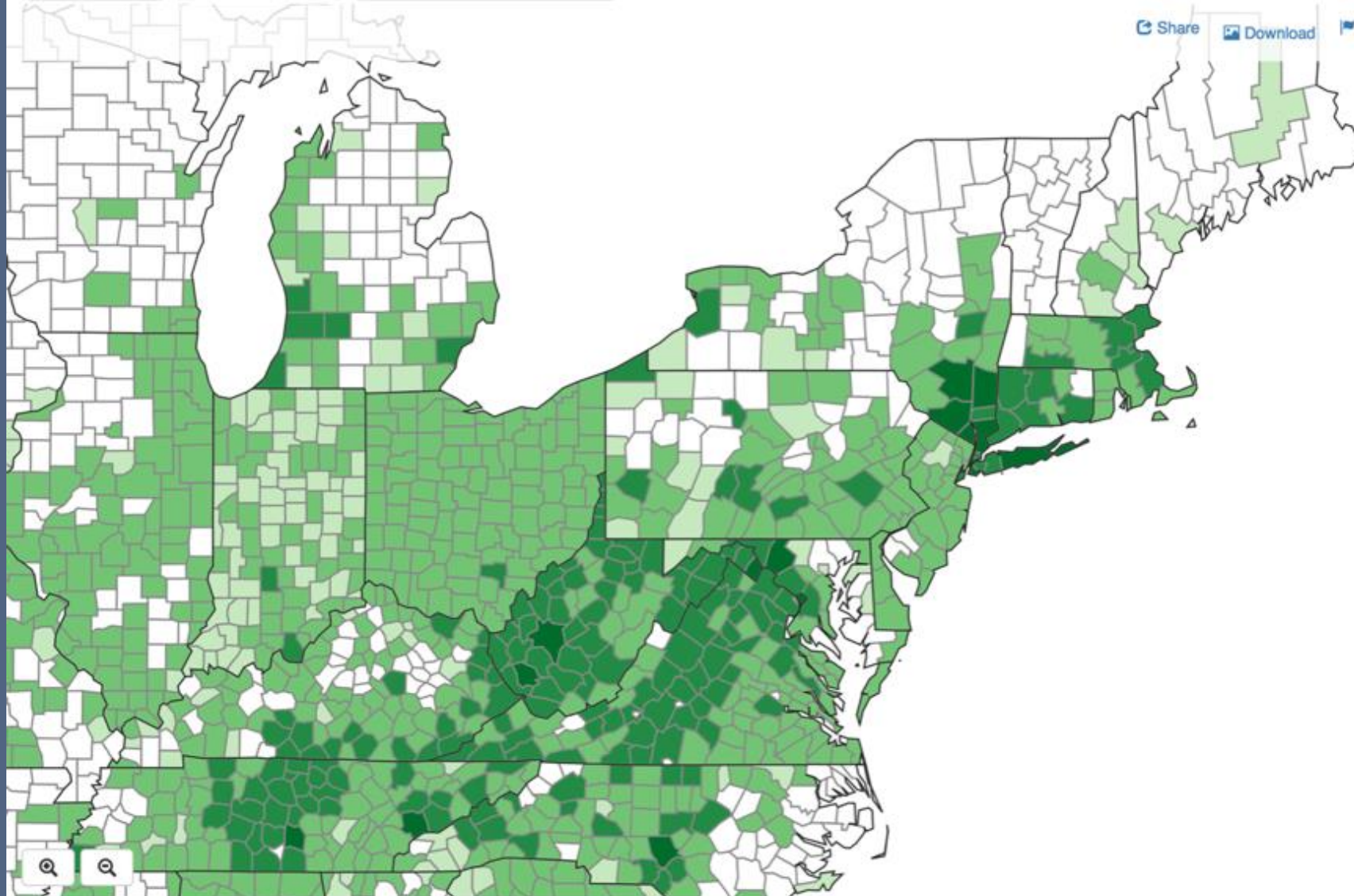
Distribution

Record Density

Literature vs Observation

CSV KML GPX Shapefile

Share Download Flag Fullscreen



## Legend

- No Data
- 1
- 2-10
- 11-100
- 101-500
- 501+

# Japanese honeysuckle

*Lonicera japonica* Thunb.

USDA PLANTS Symbol: LOJA

Invasive Plant Atlas

Species Information

States

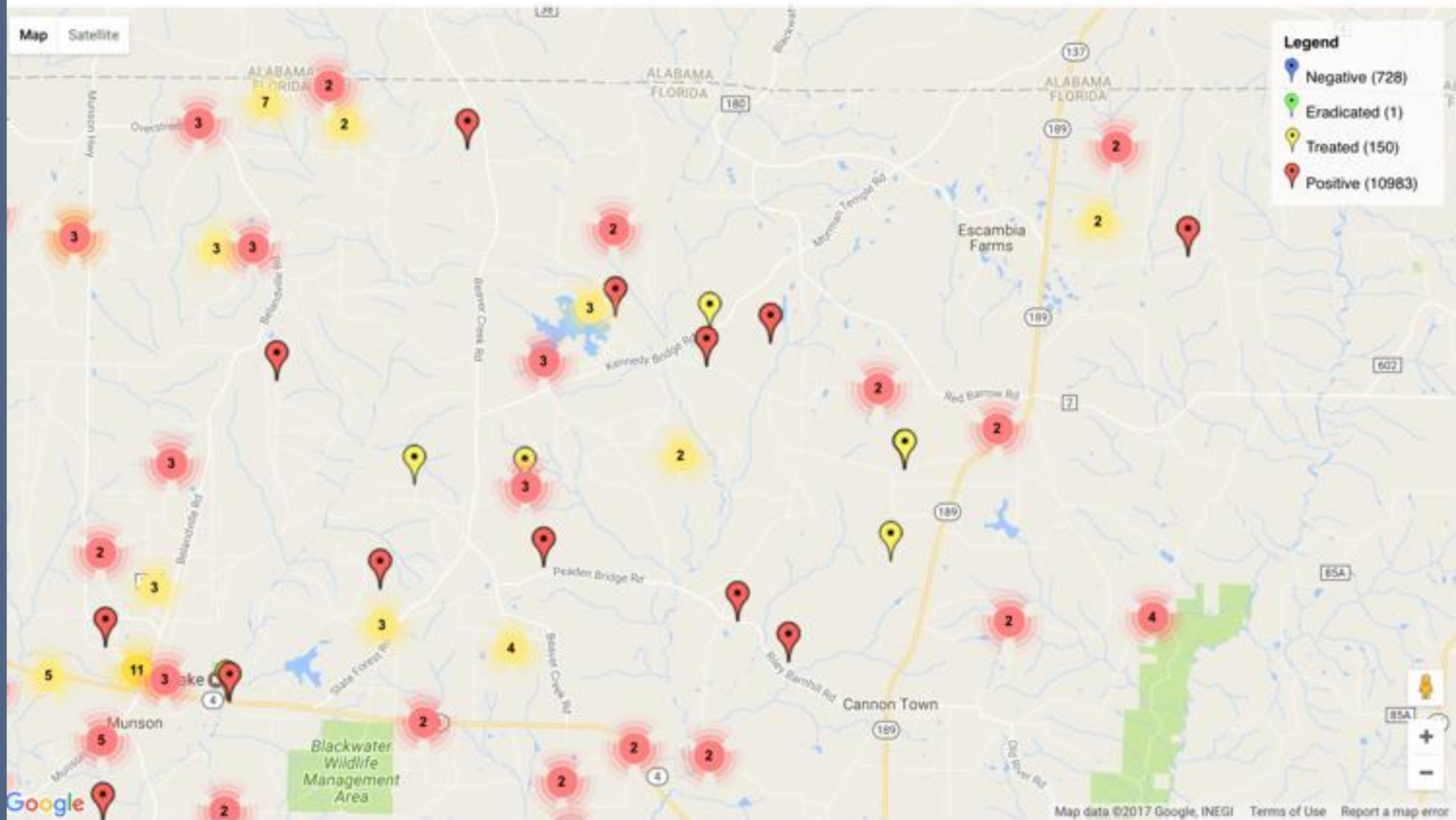
Counties

Points

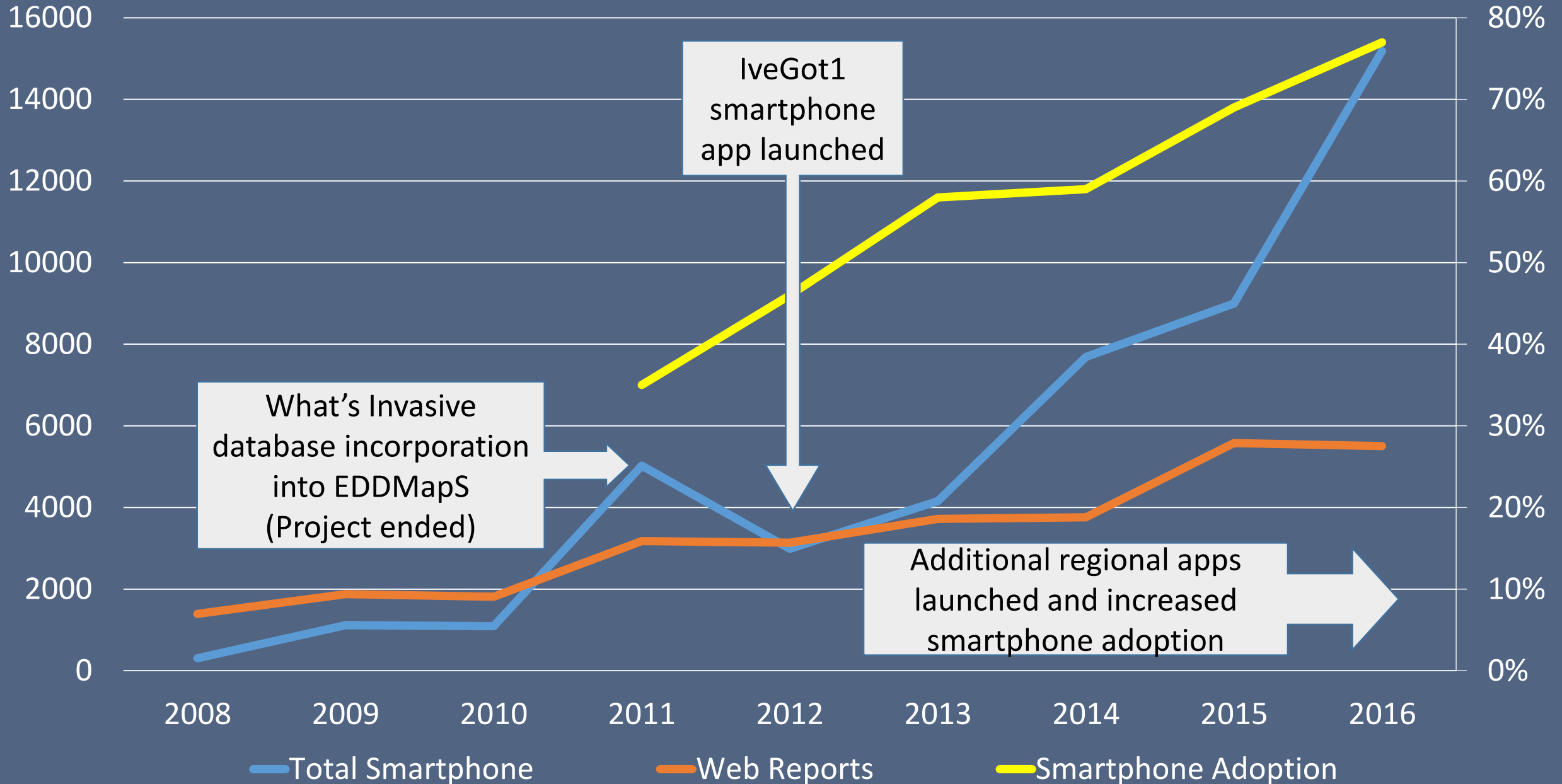
List

CSV KML GPX Shapefile

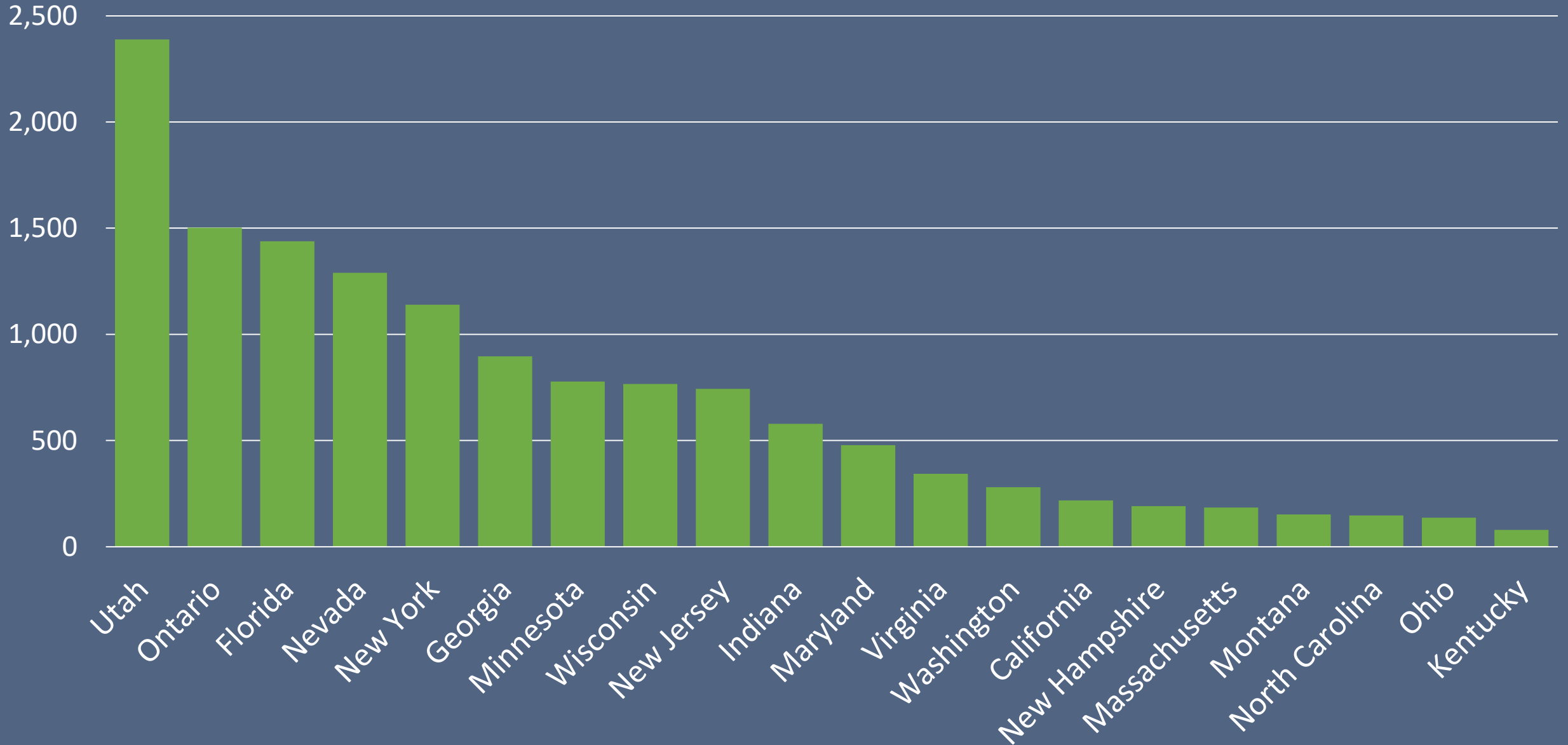
Zoom to My Location Share Download Flag Fullscreen



# Individual Reports by Source Over Time



# EDDMapS 2015 – All Reports





# 2016 - A New Partner

- Minnesota Department of Agriculture and Department of Natural Resources
- Submitted existing data for previous years invasive species records
- Live, real-time reporting through the GLEDN app
  - MN using iOS devices
- Verification network set up in-house



## Great Lakes Early Detection Network



### How Can I Help?

Educate yourself on known invasive species in your area  
Never plant, transmit, spread, or release invasive species  
Report invasive species occurrences to EDDMapS

[sign out](#)

### Statistics

552,772 County Reports  
376,453 Point Reports  
1,241 Species

### Recent Reports in EDDMapS Midwest

- ✓ lesser celandine, fig buttercup by Caitlin Reinartz in Milwaukee County, Wisconsin
- ✓ lesser celandine, fig buttercup by Caitlin Reinartz in Milwaukee County, Wisconsin
- ✓ lesser celandine, fig buttercup by Caitlin Reinartz in Milwaukee County, Wisconsin
- ✓ lesser celandine, fig buttercup by Caitlin Reinartz in Milwaukee County, Wisconsin
- ✓ lesser celandine, fig buttercup by Caitlin Reinartz in Milwaukee County, Wisconsin
- ✓ More Reports



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INFO INFO

Emerald Ash Borer from America near Detroit the 1990 Canadian expanding kills heal diameter of several inches in ash-dominated areas. Large galleries in field densities wood to single ge Atlantic s complete woodpec

DATE & TIME

2015-12-07

2015-12-07 4:15 PM

LIST OF SPECIES

Quagga Mussel  
Zebra Mussel

TIME SPENT

5 1

AREA SURVEYED

TIME SPENT IN

5 10

QUANTITY

Agrilus planipennis  
Emerald Ash Borer

2015-12-07 4:15 PM

SITE NAME

Choose a site

ATTACH IMAGES

No images

LOCATION

User-drawn polygon

TIME SPENT IN

5 10

QUANTITY

lat/Lng:  
(39.734102, -8)

OBSERVATION REPORTS

Emerald Ash Borer  
2015-12-07 4:15 PM

NEGATIVE REPORTS

Mussel (Dreissena b...  
2015-12-07 4:17 PM

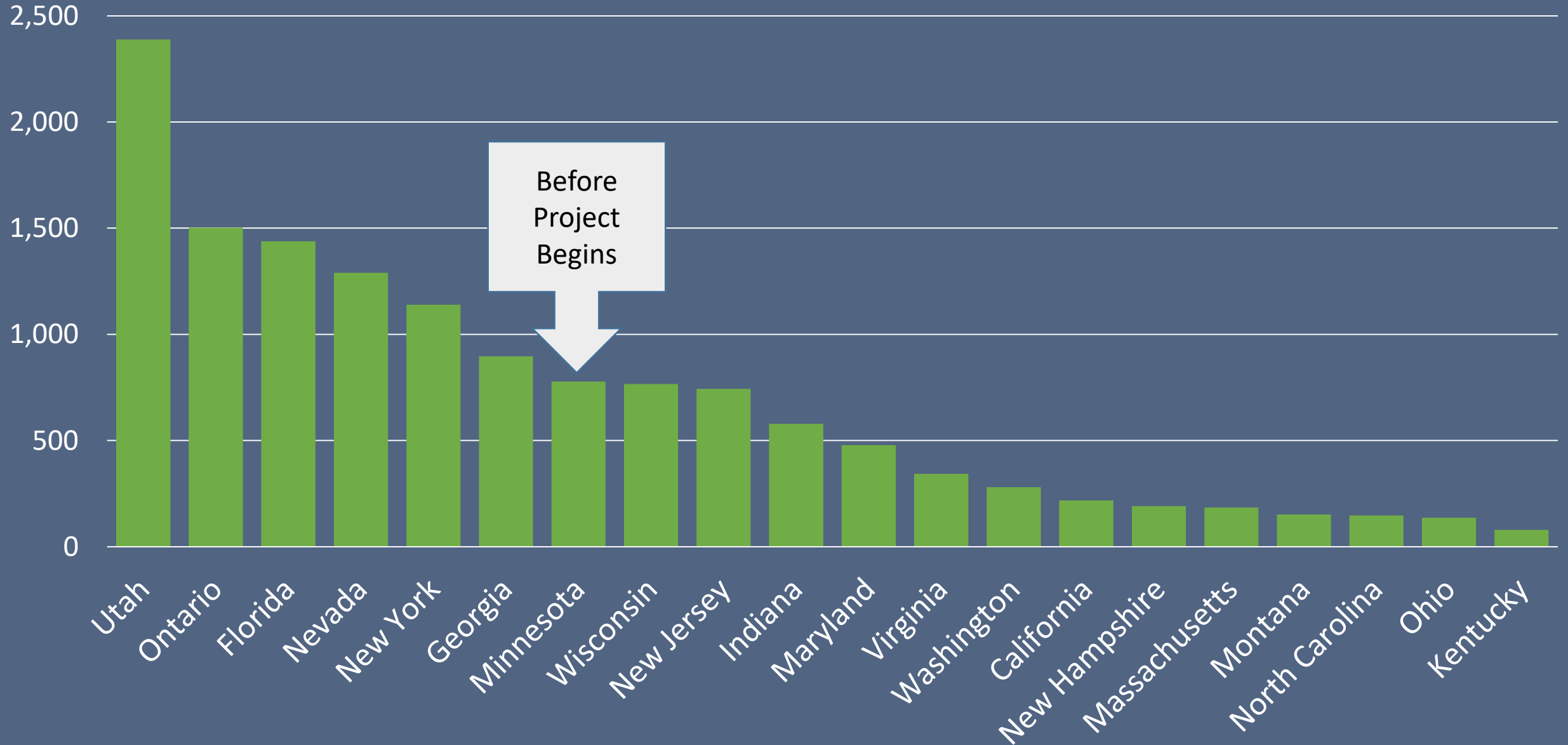
Delete

# Minnesota DNR Infested Waters

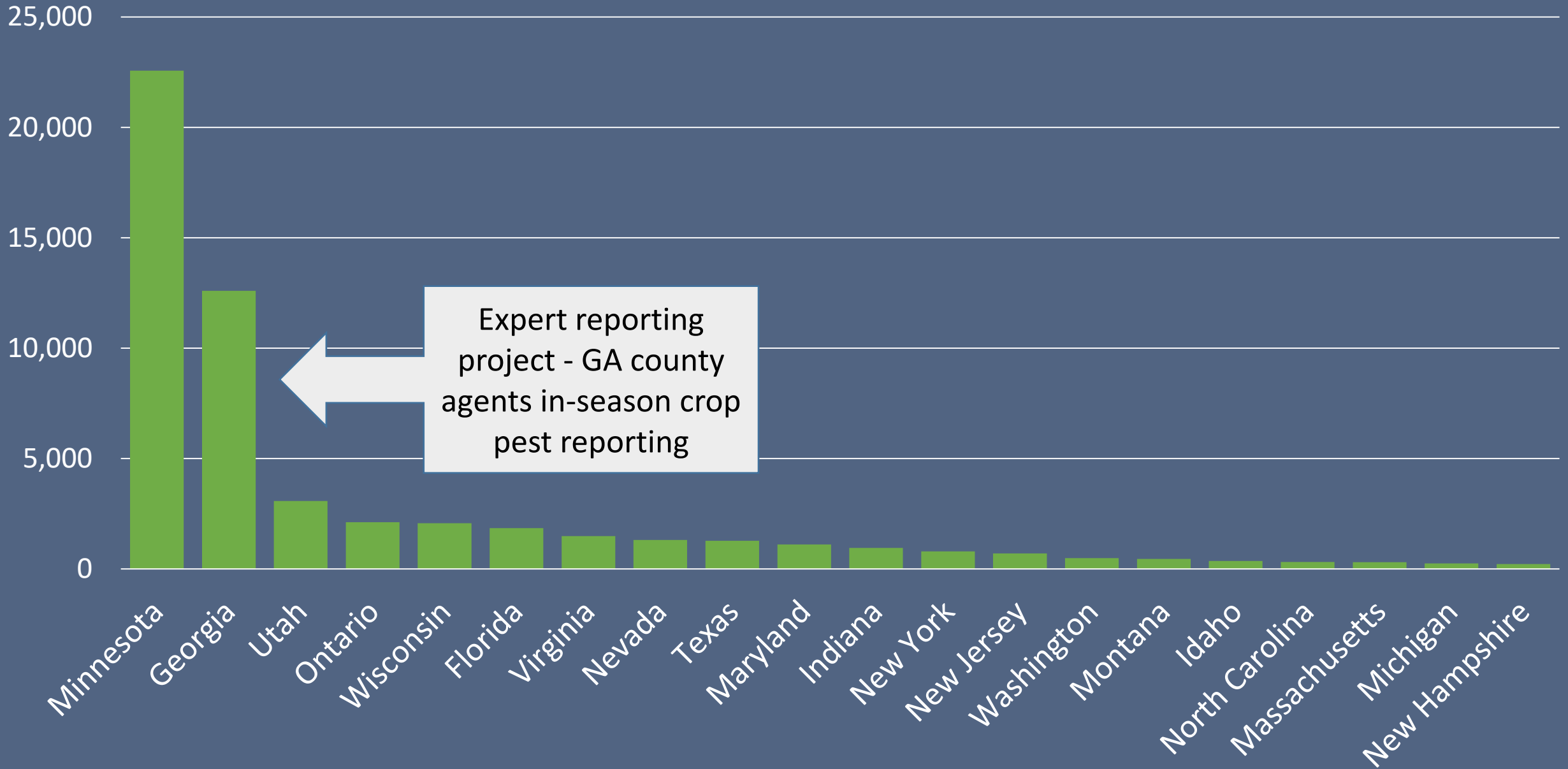
- High priority aquatic invasive species list
  - Mollusks
  - Fish
  - Plants
  - Invertebrates
  - Disease (VHS)
- Minnesota Water Bodies

| Water body name | County or counties | Listed for aquatic invasive species | Year listed as infested | Year species was first confirmed, or connected water body             | DOW number |
|-----------------|--------------------|-------------------------------------|-------------------------|---|------------|
| Adley           | Otter Tail         | zebra mussel                        | 2016                    | 2016  |            |
| Alexander       | Morrison           | Eurasian water-milfoil              | 2004                    | 2003  | 49007900   |
| Alice           | Washington         | Eurasian water-milfoil              | 2013                    | 2012  | 82028700   |
| Alimagnet       | Dakota             | Eurasian water-milfoil              | 2014                    | 2012  | 19002100   |
| Alstead Mine    | Crow Wing          | zebra mussel                        | 2017                    | connected to Mahanomen Mine Pit #1 and #2 (18-0440-01 and 18-0440-02) | 18044006   |
| Alvin           | Douglas            | zebra mussel                        | 2009                    | connected to Darling (21-0080)  | 21009300   |
| Amelia          | Anoka              | flowering-rush                      | 2014                    | 1968  | 02001400   |

# EDDMapS 2015 – All Reports



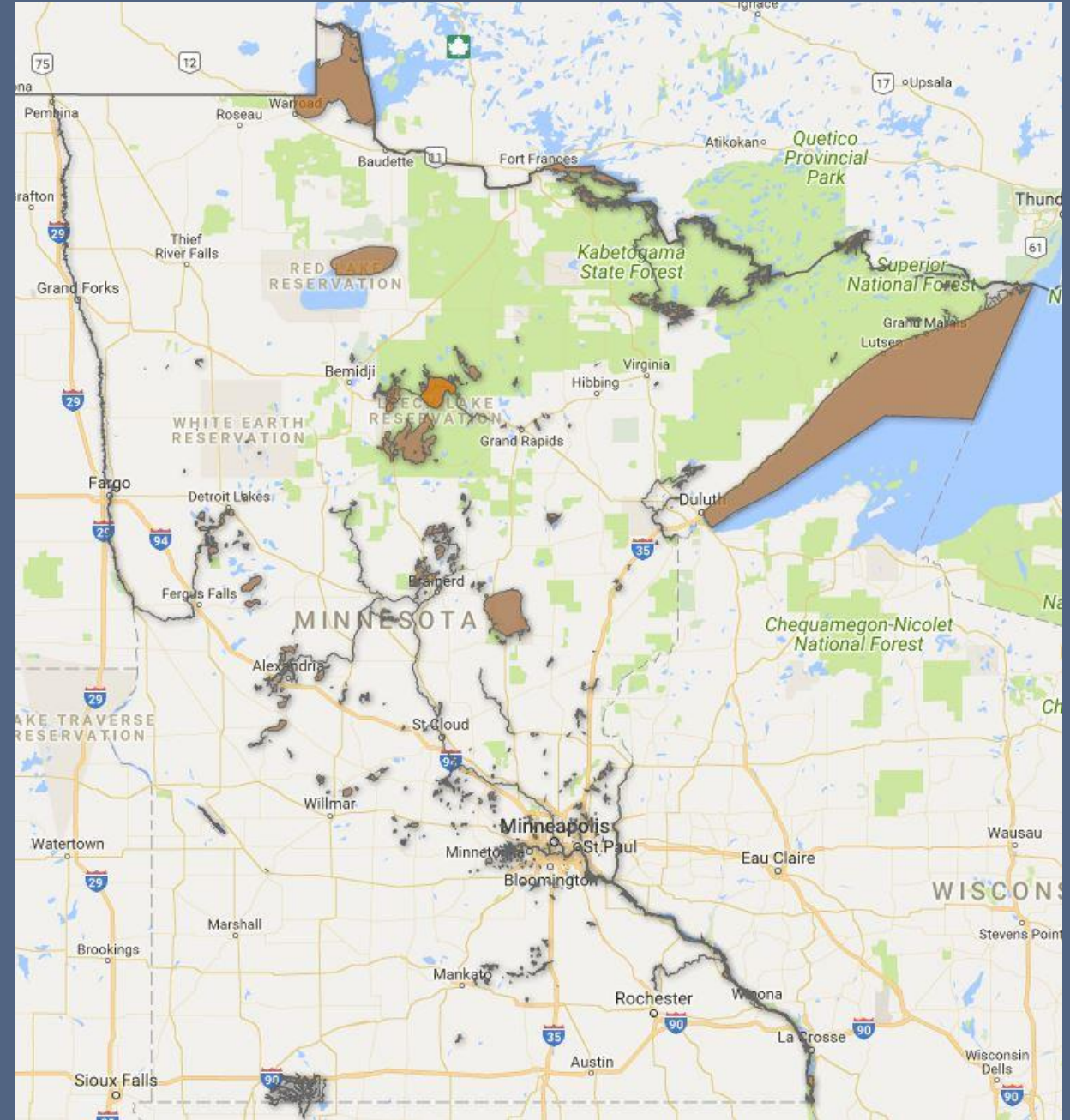
# EDDMapS 2016 – All Reports





# Infested Waters Map

- Colored waterbodies are infested with one of the high priority species
- Streams broken into multiple segments
  - Pools
  - Ephemerals
  - Ditches





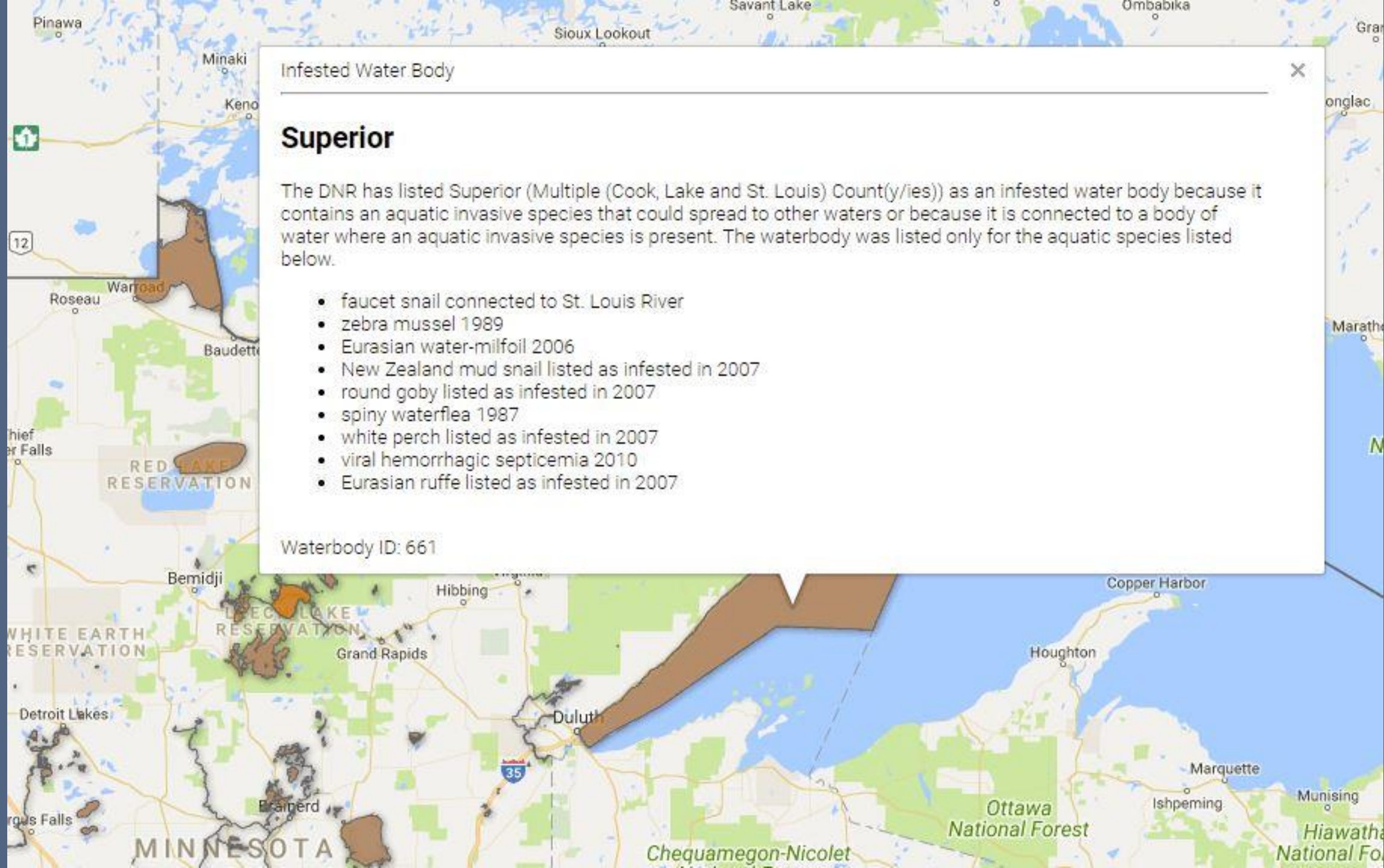
## Infested Water Body

### Superior

The DNR has listed Superior (Multiple (Cook, Lake and St. Louis) Count(y/ies)) as an infested water body because it contains an aquatic invasive species that could spread to other waters or because it is connected to a body of water where an aquatic invasive species is present. The waterbody was listed only for the aquatic species listed below.

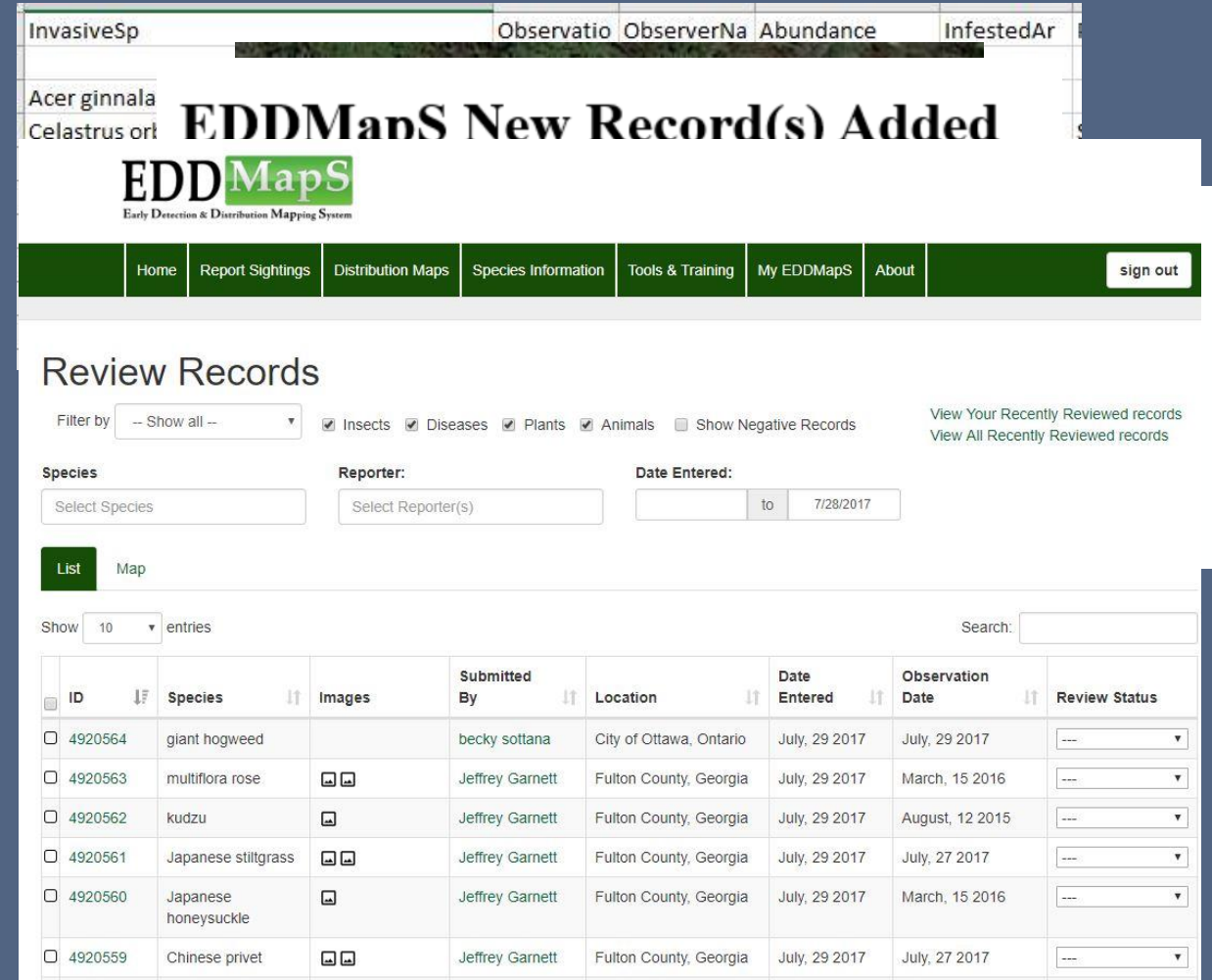
- faucet snail connected to St. Louis River
- zebra mussel 1989
- Eurasian water-milfoil 2006
- New Zealand mud snail listed as infested in 2007
- round goby listed as infested in 2007
- spiny waterflea 1987
- white perch listed as infested in 2007
- viral hemorrhagic septicemia 2010
- Eurasian ruffe listed as infested in 2007

Waterbody ID: 661



# Benefits of real-time, electronic form reporting

- No transcription time/errors
- Fewer data entry errors
- Fewer location errors
  - Mis-drawn polygons
- Review emails sent directly to select verifiers
- Verification through website
  - Records removed from queue once reviewed



The screenshot displays the EDDMapS (Early Detection & Distribution Mapping System) interface. At the top, a header bar contains the text "InvasiveSp", "Observatio", "ObserverNa", "Abundance", and "InfestedAr". Below this, a large green banner reads "EDDManS New Record(s) Added" with the EDDMapS logo underneath. A navigation bar includes links for Home, Report Sightings, Distribution Maps, Species Information, Tools & Training, My EDDMapS, About, and a sign out button. The main section is titled "Review Records" and features a filter dropdown set to "-- Show all --". Checkboxes for "Insects", "Diseases", "Plants", and "Animals" are all checked, while "Show Negative Records" is unchecked. There are input fields for "Species" (with a "Select Species" dropdown), "Reporter" (with a "Select Reporter(s)" dropdown), and "Date Entered" (with a date range from 7/28/2017). Below these are "List" and "Map" buttons. A table of records is shown with columns for ID, Species, Images, Submitted By, Location, Date Entered, Observation Date, and Review Status. The table lists six records, including "giant hogweed", "multiflora rose", "kudzu", "Japanese stiltgrass", "Japanese honeysuckle", and "Chinese privet".

| ID      | Species              | Images | Submitted By    | Location                | Date Entered  | Observation Date | Review Status |
|---------|----------------------|--------|-----------------|-------------------------|---------------|------------------|---------------|
| 4920564 | giant hogweed        |        | becky sottana   | City of Ottawa, Ontario | July, 29 2017 | July, 29 2017    | ---           |
| 4920563 | multiflora rose      |        | Jeffrey Garnett | Fulton County, Georgia  | July, 29 2017 | March, 15 2016   | ---           |
| 4920562 | kudzu                |        | Jeffrey Garnett | Fulton County, Georgia  | July, 29 2017 | August, 12 2015  | ---           |
| 4920561 | Japanese stiltgrass  |        | Jeffrey Garnett | Fulton County, Georgia  | July, 29 2017 | July, 27 2017    | ---           |
| 4920560 | Japanese honeysuckle |        | Jeffrey Garnett | Fulton County, Georgia  | July, 29 2017 | March, 15 2016   | ---           |
| 4920559 | Chinese privet       |        | Jeffrey Garnett | Fulton County, Georgia  | July, 29 2017 | July, 27 2017    | ---           |

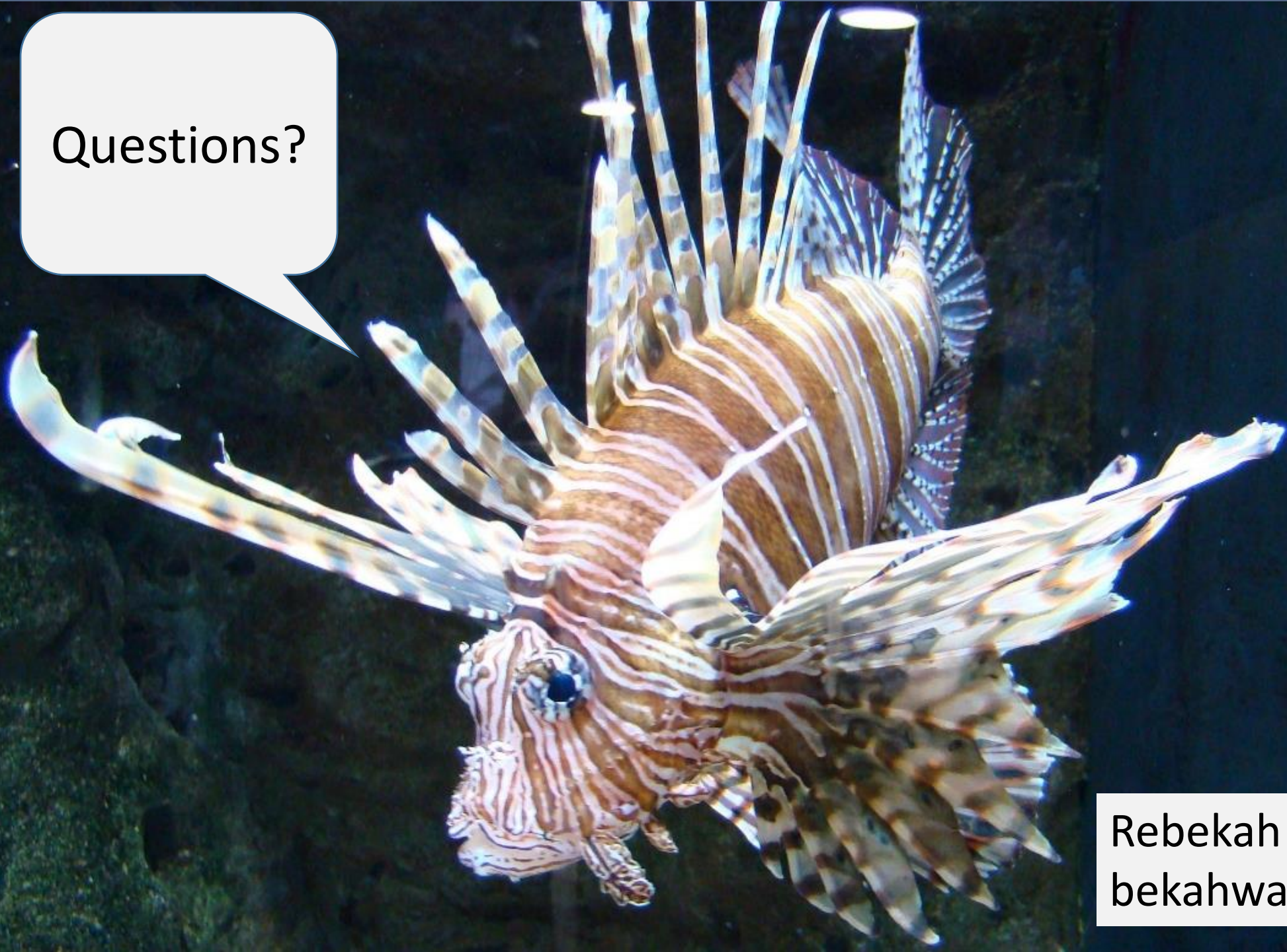
# Designated Species reported!

## What happens next? EDRR!

- Verification process
  - Photos, Reporter, Site visit, etc.
- Implement protocols
  - Bait/aquatic farm harvesting prohibited without permits
  - Water use (including water transportation) prohibited without permits
  - Signs posted
  - Equipment cleaning (MN requirement regardless)



Questions?



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