MONITORING INVASIVE PLANTS IN WISCONSIN

Wisconsin First Detector Network + Dane County Parks

Monitoring Invasive Plants in Wisconsin is a handbook designed for land managers and volunteers who are monitoring invasive plants using tools associated with the Early Detection and Distribution Mapping System (EDDMapS) and the Great Lakes Early Detection Network (GLEDN). This handbook is a collaboration between the Wisconsin First Detector Network (WIFDN) and Dane County Parks as part of a project supported by Wisconsin Citizen-Based Monitoring Network's Partnership Program. Questions or comments about the handbook should be directed to WIFDN.

The Wisconsin First Detector Network (WIFDN) is a statewide citizen science network for invasive species monitoring and education. WIFDN's goal is to improve early detection of invasive species by training citizen scientists to recognize and report invasive species. Contact us or visit our website for assistance with invasive species monitoring and other invasive species questions.

WIFDNcoordinator@gmail.com | 608-262-9570 | fyi.uwex.edu/wifdn

Dane County Parks offers a variety of recreational opportunities for the outdoor enthusiast. Natural environments are venues for quiet getaways as well as unique locations for your special event. Dane County Parks is dedicated to making your experience enjoyable and takes an active role to enhance and preserve the county's finest natural resources. Dane County Parks welcomes 2.5 million visitors annually and manages over 12,000 acres of land.

https://parks-lwrd.countyofdane.com/

The Wisconsin Citizen-Based Monitoring Network is a comprehensive stakeholder collaboration designed to improve the efficiency and effectiveness of monitoring efforts by providing coordination, communications, technical and financial resources and recognition to members of the Wisconsin citizen-based monitoring community.

http://wiatri.net/cbm/

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PART 1: MONITORING INVASIVE SPECIES

What are invasive species?
Invasive species are species that:
- Are not native to an area,
- Are rapidly growing and/or spreading,
- AND cause or are likely to cause economic or environmental harm or harm to human health

Wisconsin has over 140 regulated invasive plant species, and there are many other species that behave similar to listed species but are not currently regulated.

Why monitor invasive species?
Early detection of new invasive species allows for rapid and effective management that mitigates their impacts. **Unfortunately, natural resource professionals don't have the resources to** conduct annual monitoring of all lands they manage, so infestations can often go undetected for many years. These undetected populations have the potential to rapidly expand, increasing the impacts to the environment and the effort and cost to control them. Citizen science volunteers who are trained to identify and report invasive species play a crucial role in monitoring invasive species. Information collected and shared can improve our understanding of distribution of populations and help prioritize management efforts. With the development of free online and app-based tools, **it's easier than ever** for volunteers to collect and share this information to improve knowledge of invasive species locations and improve early detection in Wisconsin.

Garlic mustard (L) is a common invasive plant in Wisconsin. If invasive species are left undetected, their infestations can spread like the garlic mustard dominating the understory of this forest (R).

PART 2: IDENTIFYING INVASIVE PLANTS

A wealth of identification resources are available in print, video, and online form.

UW Extension has factsheets and videos that describe invasive plant identification, including key characteristics and similar species. Visit the WIFDN website to access fact sheets and videos: fyi.uwex.edu/wifdn.

Wisconsin DNR's Field Guide to Terrestrial Invasive Plants is a useful field guide that is nicely sized for field use. It is available as a pdf, or printed copies can be ordered from DNR. Wisconsin DNR's terrestrial invasive species webpage also contains identification information for all regulated invasive plants. To access these resources, click on the links or go to the DNR website (dnr.wi.gov) and use the search box on the homepage.
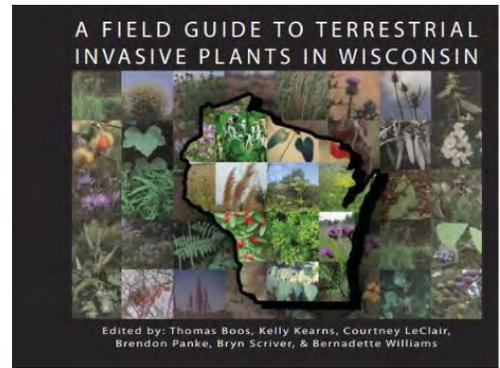
Online tools to help identify unknown species
- UW Online Weed Key: weedid.wisc.edu.
- Minnesota Wildflowers: minnesotawildflowers.info
- Illinois Wildflowers: illinoiswildflowers.info
- Missouri Plants: missouriplants.com

What species to look for
- WI DNR lists of regulated terrestrial plants and aquatic plants
- County priority species lists map
- Check the WIFDN website, WIFDN Update email newsletter, and WIFDN Facebook page for additional suggestions throughout the year

If you are new to invasive plants, focus on learning 3-5 new species at a time and then add additional species once you feel confident you have mastered identification of the first species. If you are not sure what species to look for and report, you can ask if there is a priority list for the area or your park of interest. You can also contact WIFDN to learn about species you are likely to find in your area.

PART 3: HOW TO REPORT INVASIVE SPECIES

WIFDN uses the Early Detection and Distribution Mapping System (EDDMapS) database as its platform for reporting invasive species. EDDMapS is a national database of invasive species reports and is accessible to all people for free. Invasive species can be reported on the EDDMapS website (eddmaps.org) or using the Great Lakes Early Detection Network (GLEDN) mobile application. GLEDN is the easiest way to map and share invasive species in the field. If you are not comfortable using these resources, please contact WIFDN for support. Or you can record the location of the infestation using a GPS unit or by writing it down on a detailed map. Then, contact your local park staff, WIFDN, or Wisconsin DNR to ensure the information is incorporated into the system. Please include photos if possible to help staff confirm identification of the species.

Reporting on the EDDMapS Website

Step 1: Create an EDDMapS Account

To report invasive species with EDDMapS or GLEDN, you must first register for a free EDDMapS account. Go to www.eddmaps.org and click on Register to create an account. With your account, you can manage (view, download, edit) your own invasive species records and download any records in the database. Report reviewers will also be able to contact you if they need additional information to verify your reports.
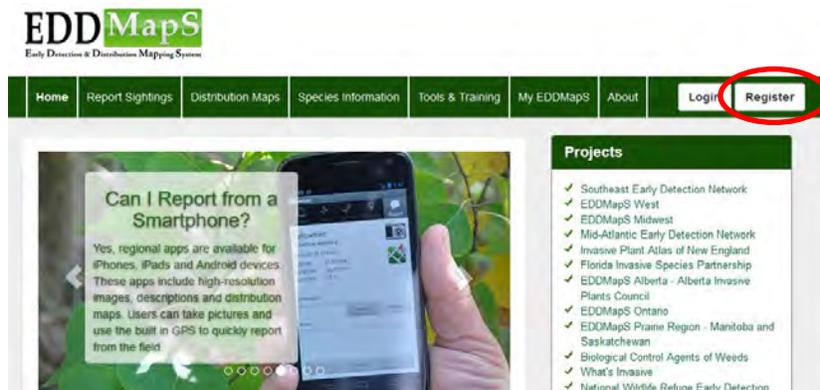
Step 2: Click on "Report Sightings"
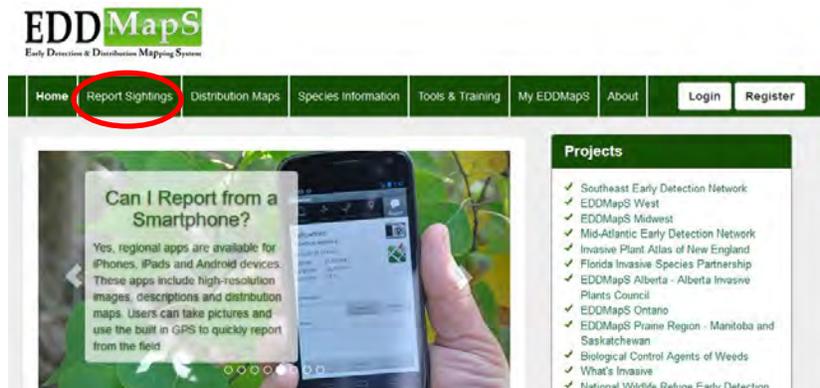
Click on your state of interest and the reporting form for that state will load.

Step 3: Fill out the Reporting Form

Red fields are required, but entering additional information will improve the value of information, ESPECIALLY if populations are new and were previously unknown. Click on (?) to view a description of the field.

Species: start typing the name (common or scientific) of your species in the "Pest" field and select your species.

Status: Positive = species is present
Negative = species not present
Treated = species is present and management of that infestation has occurred

Observation Date: fill in date that the observation occurred (note: field will automatically fill in date the report is created)

Infested Area: area occupied by the invasive species

Gross Area: general area of infestation, may include area not occupied by the invasive species

Habitat: the habitat where the species is was observed

Canopy Closure: the percent of ground covered by foliage of the invasive species

Abundance: spatial description of infestation

Plant Description: select the life stage(s) of the invasive species in the reported infestation.

You can fill in Location information with the fields shown at left or by placing a marker on the map (see below).

Site Name: for Dane County Parks, type "Dane County" in Site Name field and select your park. If the park is not listed, leave the Site Name field blank.

Latitude/Longitude: If you have latitude/longitude in degrees, minutes, seconds instead of decimal degrees, click on "lat/long conversion tools" to convert to decimal degrees

To select the location on the map, zoom in to the infestation and mark it with a point, line, or polygon.

Point: for a single plant or very small infestation

Line: useful for roadsides and other edge habitats where the infestation is linear in shape

Polygon: to denote a large infestation or an area that contains too many individual plants to be mapped as points

Other information:

Ownership: select the most appropriate ownership category

Private: Select "Yes" if you want the exact location of the infestation to be hidden from all people except EDDMapS administrators

Images

Image 1:

[   ] Choose file

(.jpg)

Caption:

[   ]

Photo by:

[   ]

Images are used by report reviewers to verify your reports. Please include clear images of the whole plant and of identifying features (e.g., leaf shape/ arrangement, flowers, fruit).

At the bottom of the report form, you can fill in additional comments about the infestation. **When you've filled in all of the information about the infestation, click on "Submit Report"**.

Reporting with the GLEDN App

Before using the app in the field, you should have already:
1) Registered for an EDDMapS account
2) Downloaded the GLEDN app
3) Signed into EDDMapS from the GLEDN app
4) Enabled GPS tracking/location services for the GLEDN app.

To report an invasive species infestation with the GLEDN app, follow the steps below. *Note: the images and directions below closely follow the iOS version of the app; the Android version is slightly different.* Contact WIFDN (WIFDNcoordinator@gmail.com) if you need assistance with the GLEDN app.

Step 1: Select Species to Report
This can be done in one of two ways:

A) *Select species from All Species list*
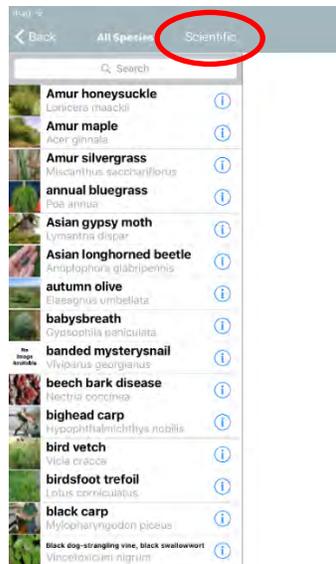
Use the search box or scroll through the list to find your species.

Select Scientific to search or sort by scientific name.

B) *Create a custom My Species List and select species from that list.*
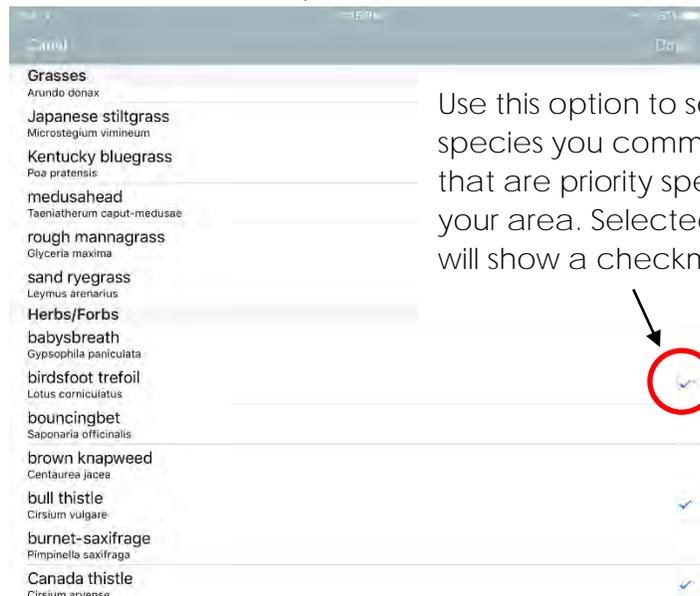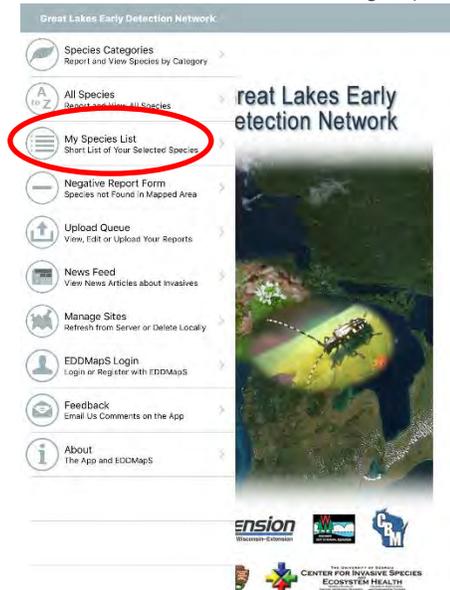
Use this option to select species you commonly see or that are priority species for your area. Selected species will show a checkmark.

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Step 2: Allow GPS Tracking
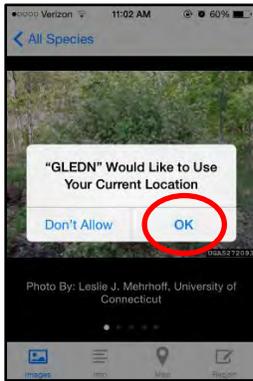
Tip:
Select the blue information icon next to a species name to see pictures and descriptions of that species. This is one way to check that you are correctly

Step 3: Fill in Infestation Information
When you select a species, the app will load the reporting form:

A: Check species, date, time, and site name

B: Add photo(s) to your report for verification

C: Map the infestation

D: Additional information

E: Save report

A: *Check species, date, time, and site name*

Make sure you have selected the correct species and that the date and time are accurate. If you know you are working in a defined site, you can select the site from the drop-down list.
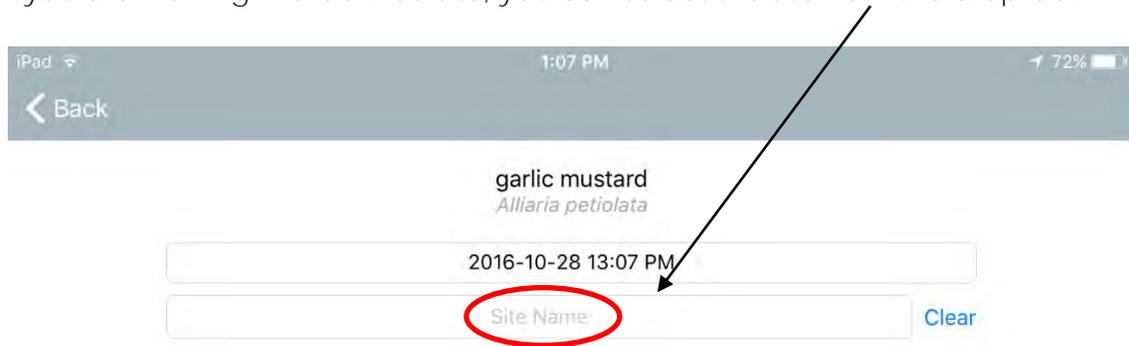
B: *Add photo(s) to your report for verification*

After you submit your reports, they are verified before they are added to EDDMapS. Taking good photos is key for verification- if a report cannot be verified with the photos, it may not be added to EDDMapS.
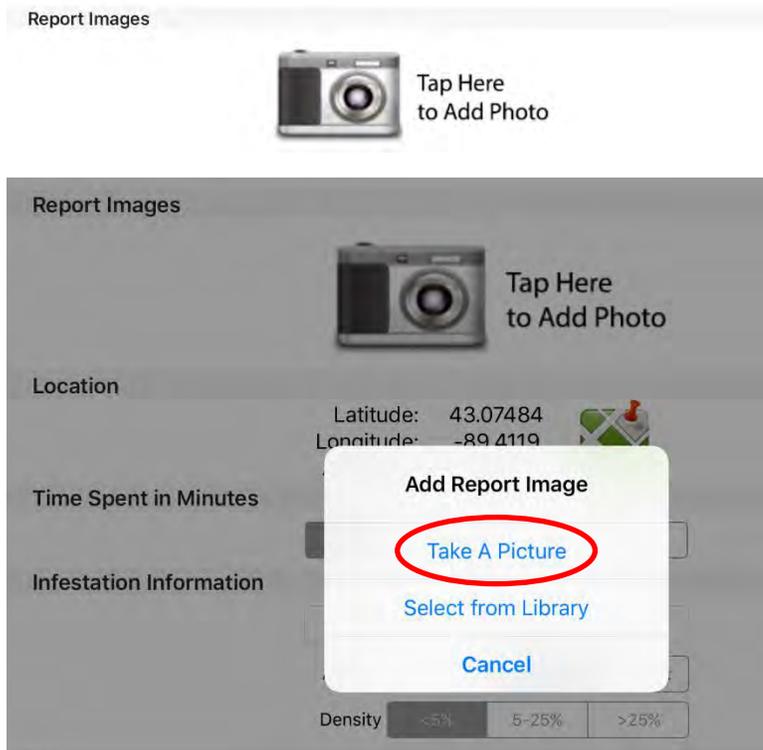
When you tap the camera icon to take a photo, you can take a **picture with your device's** camera. When you have taken one photo, you can delete it or save it. To take another picture, select the camera icon again.

> ### Tip:
> Take at least one photo of the whole plant and at least one close-up photo of defining characteristics like flowers, fruits, and leaves.

C: Map the infestation

Select the map icon to map the infestation.

The map will show a red marker where it is mapping your infestation (below, left). If you want to place the point somewhere else, tap the screen in that location. A blue circle will mark your point.

If you choose to map your infestation as a polygon (for instance, if you have a large patch of one species), select Polygon from the bottom of the map page (below, right). Then draw your polygon.

When you are done mapping, select Done to save the map.

Tip:

It might be difficult to decide whether to map a point or a polygon. If you are reporting a single, lone plant, then it makes sense to use a point. However, if you are faced with a large infestation of plants, using a polygon will surely save you a lot of time.

If you plan to use the data yourself, you might consider how you will use the data and whether it makes sense to be able to track individual plants or to use more general polygon information. If you are collecting data for someone else, you can ask them if they have a preference.

D: *Additional information*

Recording additional information in the boxes below or in the notes section can be helpful for tracking the infestation over time. For instance, if you map a polygon but want to further characterize the infestation, you can select a plant density range or add an estimate of the number of individual plants or life stage of plants in the notes section.

E: *Save report*

When you save your report, it will be added to your Upload Queue, which holds the reports in the app until you upload them to EDDMapS.
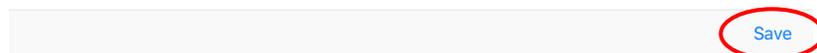
Step 4: Upload Your Reports
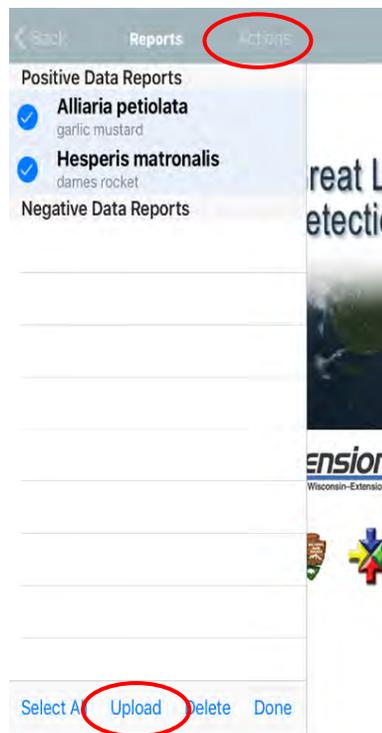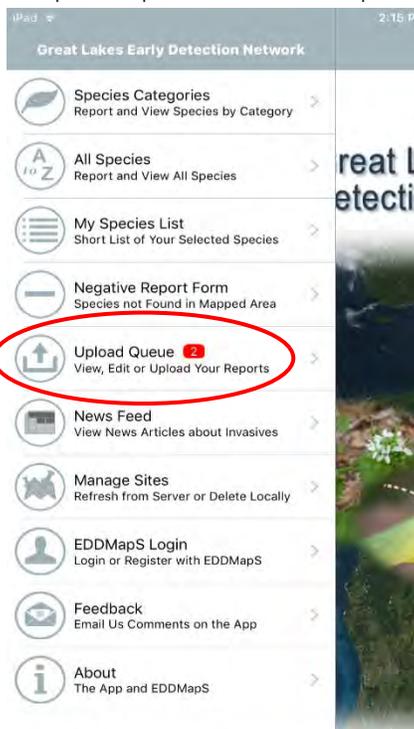
When you have reports to upload, the main menu will show a number in the Upload Queue (left).

When you select Upload Queue, you will see a list of your reports (right).

At the top of the list, select Actions, then select the reports to upload.

Tip:
When you select Upload, it may look like nothing is happening. Be patient! When the reports have uploaded, you will see a message on the screen. If you select Upload multiple times, you will submit duplicate reports.

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Negative Reports with GLEDN

If you survey a site and don't find species to report, you can still record your survey using the Negative Report Form on the GLEDN app.

Step 1: Open Negative Report Form
The Negative Report Form is found on the main menu of the GLEDN app.

Step 2: Fill out Negative Report Form

A: Check date and time

B: List species that were part of the survey but were not **present. Select "Edit" and** select species from drop-down list.

C: Enter amount of time spent on the survey

D: Draw point or polygon over area surveyed. Select **"Edit" to open t**he map to draw polygon.

E: Add any additional notes

F: Save your report. It will be added to your upload queue.

Step 3: Upload Your Reports
Uploading negative reports is the same as uploading positive reports. Follow the instructions in Step 4 of Reporting with the GLEDN App.

PART 4: WHAT HAPPENS TO YOUR REPORTS?

Complete, accurate reports are verified by EDDMapS reviewers, at which point the reports become part of the EDDMapS database. This means anyone can view the reports on eddmaps.org, and registered EDDMapS users can download report data. The process for reporters, EDDMapS reviewers, and EDDMapS users is outlined below.

Reporter (You)	EDDMapS Reviewer	EDDMapS User
You upload reports from GLEDN app or report directly via the form on eddmaps.org.	EDDMapS report reviewer is notified that EDDMapS user has submitted reports	
You can immediately manage reports through "My EDDMapS" portal on eddmaps.org.	EDDMapS reviewer views report. If reviewer needs more information, they will contact you. If the report is complete and accurate, it is verified.	Other EDDMapS users (anyone not on your account) cannot view or download your reports at first.
If contacted by EDDMapS report reviewer, provide the additional information required to verify the report.	Once verified, reports are publically availale on EDDMapS database	Once reports are verified, other EDDMapS users can view and download your reports (unless reports designated as "private").

PART 5: TECHNOLOGY TIPS

The GLEDN app works on both iOS (Apple) and Android smartphones and tablets. Two main functions of the app require either wi-fi or data connection to fully function:
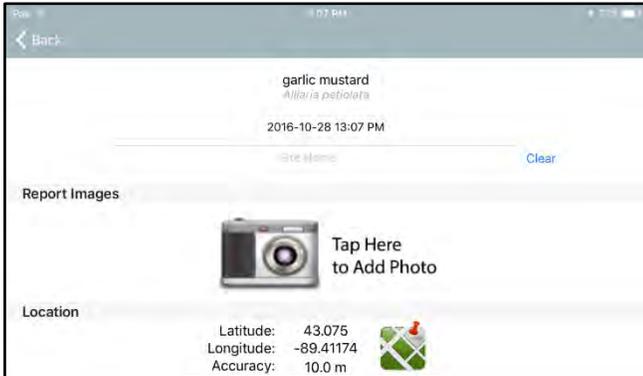
Obtaining accurate GPS location

An accurate GPS location is required for your report to be verified. Accurate GPS can be obtained on a device connected to wi-fi or a cell network. Some devices also have built-in GPS receiver, which will give an accurate location on its own, but will work more slowly than when connected to wi-fi or a cell network.

Loading the map

The GLEDN app uses a Google Maps platform for its maps. You need to be connected to wi-fi or a data network to load the map from the field. If you can obtain an accurate GPS location, it is not always necessary to be able to view the map. However, if you want to check your location, draw a polygon, or otherwise use the map, you will need to be able to view the map.

Using the GLEDN App Without Wi-fi or Data Connection

If you are not connected to wi-fi or a cell/data plan, there are a few work-arounds that will allow you to take full advantage of the GLEDN app's capabilities. Check your device's specifications to see if it has a built-in GPS receiver.

Device has built-in GPS receiver	Device DOES NOT have built-in GPS receiver
Location will be accurate, but may load slowly	Location will not be accurate ➔ Work-around: use an external GPS receiver
Map will not load in field ➔ Work-around: load map ahead of time	Map will not load in field ➔ Work-around: load map ahead of time

External GPS Receivers

External GPS receivers connect to your smartphone or tablet via Bluetooth. An external GPS receiver (e.g., Garmin Glo) will provide accurate GPS locations, but will not do anything to help the map load. If you are using a device that is not already connected to a data plan, an external GPS receiver may be a more cost-effective option to gain GPS accuracy compared to connecting your device to a data plan.

Pre-loading the Map

To have the map available for use in the field where you will have no wi-fi or data connection, you can load the map ahead of time when you do have wi-fi or data connection. To load the map ahead of time, open the GLEDN app, select any species to open a reporting form, and open the map in the reporting form by selecting the map icon. On the map, pan to your site on the map and zoom in to the greatest level of detail. While zoomed in, pan across your whole site at the zoomed in level. If you do not use the app between opening with wi-fi and being in the field, the map you just looked at will be cached in the app and will be visible in the field, even with no wi-fi or cell signal in the field. This can work over a large area. For example, WIFDN users working in the Kickapoo Valley Watershed have pre-loaded the map covering the entire watershed prior to using the app at multiple properties in the watershed later in the day.

PART 6: TIPS FOR THE FIELD

Before you go into the field to map invasive species, you should make a plan. Consider the following:

Time Constraints

Are you visiting the site only once, or will you visit it repeatedly throughout the year? Do you have 15 minutes or several hours to monitor? Answers to these questions can help you form your monitoring plan. If you are short on time, you might consider looking only for priority species. Another option if you are short on time is to do a comprehensive survey in one portion of the site. If you have more time, you can include more species and/or more areas of the site.

Time of the Season

The time of the season will impact which species are present and easiest to detect. Species like **garlic mustard and dame's rocket can be easy to spot** in the spring when they are flowering, but they might appear to be absent in late summer. Species like burning bush might not be visible until their leaves turn bright red in the fall. If possible, visit the same site multiple times during the growing season.

Access

Consider the site characteristics, including habitat types, trail infrastructure, and permission to access the site. A site with a lot of open area might be easier to comprehensively monitor than a forested site with a thick understory. If trails are present, they are a great place to monitor, not **only because it's easier to walk on trails. Trails act as corridors of invasive species spread, and are** often the first place new invasive species will be detected in a site. Other invasive species corridors like water ways and utility rights-of-way are also good places to monitor for new invasive species.

Public Property

On public properties with trails, you shouldn't need permission to monitor invasive species if you stay on the trails. However, it's a good idea to contact the site manager to let them know you are monitoring invasive species and to see if they have any tips or requests for you. If you plan to go off trail, make sure you have permission to do so.

Private Property

If you are monitoring on private property, it is important to make sure:

(1) You have permission to monitor on the property, and
(2) You have permission to upload the reports to EDDMapS, where the information will be publically accessible. If privacy is a concern, reports can be **set to "private" on EDDMapS so** only the reporter and select EDDMapS administrators can view the reports.

Roadsides

Some roadside monitoring will require permits. For instance, monitoring along state and federal roads in Wisconsin requires a free permit from the Wisconsin Department of Transportation. Counties, townships, and municipalities may also require permits to monitor roadside vegetation. Before conducting a survey along a roadside, make sure to contact the managing authority for that road and acquire any necessary permits.

THANK YOU!

Thank you for your interest in monitoring invasive plants in Wisconsin. For EDDMapS and GLEDN support, more invasive species information, or other questions, please contact the Wisconsin First Detector Network.

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