



Fighting Weeds with EDDMapSWest in Nevada

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EDDMapSWest Early Detection and Distribution Mapping System for the Western United States, is the latest tool being used to target one of the most difficult problems facing agriculture, natural resources, recreation and urban areas in Nevada: weeds. Weeds have been identified in statewide efforts as the most common pest in Nevada. Invasive weed species have been credited with increasing the timing and intensity of wildfires (Whisenant 1990), reducing important sage-grouse habitat (Knick et al. 2003) and impacting landowners and managers with the costs of treating out-of-control weeds. It is difficult to control weeds in Nevada, with its large amount of public land and a lack of resources and manpower to find and treat weed problems.

One of the most difficult issues encountered by agencies and private individuals is securing a reliable source of funding to manage weeds (Creech et al. 2010). To obtain funding, it is necessary to document need and the extent of the weed problem. A reliable, easily shared way of mapping weeds would improve documentation of weed management needs. Weed infestations need to be documented and tracked for progress to show impact of any work funded.

A series of efforts to map weeds statewide have been conducted. In 2008, the Nevada Heritage Foundation conducted a survey and mapping project of all category "C" species known to occur in the state. Category C noxious weeds are widely established in an area or are weeds that can cause significant agricultural risk. University of Nevada Cooperative Extension conducted a mapping survey using

knowledgeable people in each county to create county level records of weeds known to be in the county by individuals; however, actual weed locations were not mapped (Blecker et al. 2014). In 2011, the Nevada Department of Agriculture started an intensive mapping program, using a set of mapping standards and helping interested people access geographic positioning system (GPS) equipment to more accurately map weeds. While all of these efforts were valuable, they had three major barriers: 1) few people were collecting or sharing data; 2) there were a variety of data collection techniques, and the data was stored in various formats; and 3) the Nevada Department of Agriculture lacked the staff and time to manipulate the data into useful maps.

EDDMapSWest is a data collection and mapping tool that helps bridge some of the barriers that previous mapping efforts struggled to accomplish (Rawlins et al. 2011). As individual users record data points, it also saves those points into the EDDMapSWest System, which anyone can then access, sharing the information quickly. EDDMapSWest is so user-friendly that most smartphone users can easily collect data. EDDMapSWest can accept data previously collected and add it to the rest of the database in the same format. Maps can easily be created by users or the Department of Agriculture, making it easier to create maps for any purpose. Data can be checked for accuracy, with weed identification and infestation size being verified by trained people ensuring data accuracy. Information on treatments can be stored with the data, allowing

an historical record of weed locations and information about treatment success.

This is a great tool for land managers who do a lot of mapping. This free software can accomplish the same goals as more expensive software, with the added feature of sharing the information with others in your area concerned about weeds. The maps are also verified by Nevada Department of Agriculture and serve as longstanding documentation of weeds in the area. The data is in multiple locations and can be accessed from multiple computers or smartphones.

The other great way to access EDDMapSWest is with an iPhone. While there are slight differences between the iPhone and android platform applications, they both offer essentially the same easy access to reporting weeds and viewing real-time species distribution maps of weeds centered on location. iPhone androids allow the user to upload photos of the weed, resulting in faster verification of weed patches. The application has a feature for offline reporting that saves the report and uploads it when network connectivity is regained. The application version has species identification guides with images and descriptions of weeds throughout the Western United States. There is a glossary of plant identification terms that can aid in field identification. There are other invasive species resources available within the application that can be useful in the field. Users may also submit an unknown weed for identification.

The EDDMapSWEST System is an extremely functional program accessible via desktop portal or mobile device. (Both IOS and Android are supported.) Since EDDMapSWest was initially designed for use with a desktop program, it contains the greatest number of available features when accessed in this format. The full suite of utilities includes complete map access and manipulation, as well as user-creatable maps and highly detailed data entry. From mobile devices, EDDMapSWest is still very useful, allowing the user to view real time weed distribution maps and even upload photographs of weeds for identification. The mobile application also contains a field guide and plant identification glossary and many other features. The ability to

operate completely offline is also very useful for weed mapping in areas without wireless signal.

How to get started

Registration is free as an EDDMapSWest user and is prompted automatically upon downloading the program, either on a desktop workstation or as a mobile app. Once logged into the software or site, a reporting form may be submitted with details about a weed sighting, or photos can be uploaded. Confirmed reports appear on distribution maps for the reported species and can be accessed for free by all EDDMapSWest users. Although information can be accessed by other users of EDDMapSWest, only administrators can zoom in to exact locations. There are many more tools that EDDMapSWest has to offer. For more additional detailed information, visit <http://www.EDDMapSWest.org/>.

What is EDDMapSWest used for in Nevada?

While there are many state and federal agencies, cooperative management areas and weed districts that can use EDDMapSWest, several programs exist that will be using the information generated in EDDMapSWest. For instance, the Nevada Department of Agriculture is using EDDMapSWest to develop GIS applications that can be shared online with other states.

University of Nevada Cooperative Extension is using EDDMapSWest to focus on appropriate weeds for educational information and programs in counties across Nevada. The information collected will then be used to document weed management needs of counties and target Integrated Pest Management (IPM) approaches to address these weed issues. This will also enable the use of Early Detection and Rapid Response (EDRR) education methods to prevent further spread of these weeds into areas where they have not invaded. The cost of eradicating an invasive species is low if the plant is found and reported before the infestation becomes large (Simberloff 2003). Working with communities to identify weeds of concern and utilizing EDDMapSWest to report fledgling infestations reduces the cost and staffing needed to

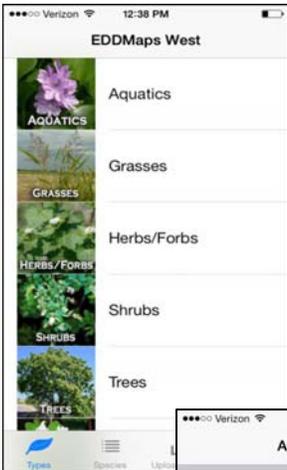
EDDMapS West Screenshots for Smartphones



Open the App

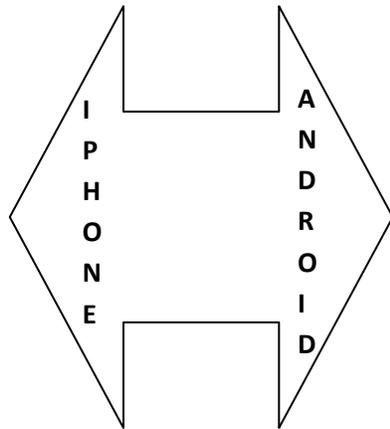
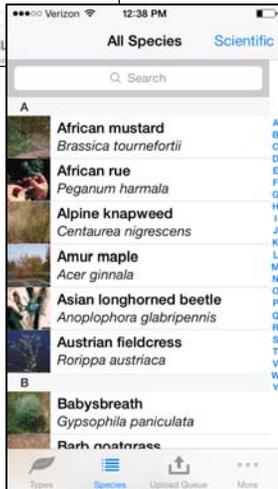
Select your weed group

Select your weed group



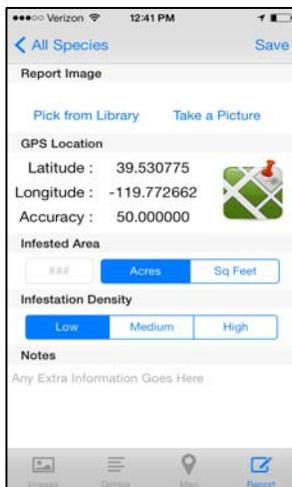
Select your weed species

Select your weed species



Confirm and report your weed

Confirm and report your weed



Upload your weed report

Upload your weed report



maintain native vegetation and habitat (Pokorny and Krueger-Mangold 2007). The IPM team at University of Nevada Cooperative Extension will conduct training workshops on how to use EDDMapSWest, followed by educational workshops focusing on weeds newly detected in counties to give stakeholders the best information on the newest weeds that could be spreading into their area.

Small working groups are also going to be using EDDMapSWest. University of Nevada Cooperative Extension is currently using EDDMapSWest to work with conservation groups in Carson City. Applications in EDDMapSWest are allowing local weed management organizations to create much-needed maps and inventories without the burden of purchasing costly specialized mapping software and hiring a full-time mapping specialist. With this technology, everyone in the community can report invasive weed sightings. Individuals can make notes on the site, including habitat, disturbance, site characteristics and infestation size. Local plant experts can check the site to verify identification and pass on the information to property owners. Land managers can then establish a treatment prescription and coordinate treatment, restoration and follow-up monitoring. The individual who reported the infestation can also return to the site and see the results of a proactive weed program. Working together in this fashion reduces the otherwise staggering costs of weed control.

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