

## Mobile technologies for weed management

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Also on hand were the developers of “*What’s Invasive*”, UCLA Students from the CENS Program. Approximately 70 people attended this section.

### Summary

This discussion session was centered on two new mobile technologies for mapping plants within California. The first is *What’s Invasive*, a Android application created for the Santa Monica Mountains National Recreation Area to use as a citizen science tool to allow non-resource management employees collect data on invasive plants that they see in the park. The second is *The Observer* which is a professional version of the Android application and allows for users to collect more detailed data about both native and exotic plants within California.

The main difference between the two programs is the amount of data that can be collected and accessed. The *What’s Invasive* program is based around citizen science users. It is suppose to be fast and simple. *The Observer* is a professional tool. You can load longer species lists into it, it has more overall power, it links with CalFlora, and has links to latin names instead of common names.

Currently both programs only run on the Android mobile platform, but an Iphone application is currently in the works. A question was raised on whether or not Blackberrys will ever be supported. There are currently no plans to, but with pressure from the outside and a donation of phones to work on from RIM, then it could be a future possibility. If no one pushes for it, it won’t happen.

This is one of the first “weed” applications in the marketplace. It was originally created with the Santa Monica Mountains NRA to have other employees in the park collect data. It was designed to be fast and easy, so that anyone could figure it out. There has been zero marketing so far, but people have found the application and are setting it up in their local areas. Now that the release is stable, they are going to start pushing it a little harder along with the upcoming release of “What’s Blooming”.

### The Data

The data collected from *What’s Invasive* is currently available on [www.whatsinvasive.com](http://www.whatsinvasive.com). It can be downloaded into spreadsheets with UTM coordinates and links to Flickr photos. If you feel that an observation is wrong, it is possible to annotate someone else’s collection with proper information, but you cannot change it directly. If you think something is wrong, you can flag it as such. In other databases, such as CalPhotos, when contributors are told they have misidentified something, they will either change it, or remove it.

### Data Server

When you collect data in the field, it is either immediately uploaded to the main server, or else stored on your phone until you return to an area where you have service.

Currently the data for *What's Invasive* is being stored on a server at UCLA. The data for *The Observer* is being stored at Calfora.org. Ideally as the networks expand, there will be one place to store everything.

Some people may have privacy concerns as they collect a lot of data. There can be options added to individual users that the data stays private as long as the counts of the species are recorded.

If your park is using *What's Invasive*, all you have to do in order to find out where the weeds are is to log onto the site, and download the data. Then you can use your normal methods to plot the points on a map and kill them.

## **Features**

### *Other people's points*

The original application had an option that you could view other peoples points on the map while you were walking around, but it proved to be buggy and was removed from recent versions. They are working on a new way to view the data so that eventually you will be able to see it all again.

### *User interface*

In the future admins will be able to have emails sent out to users who frequent certain areas to let them know when certain species are blooming or else letting them know where places are that no one has visited in a long time.

The plan is to create a social system within the *What's Invasive* website. Utilize other social media platforms such as Twitter and Facebook. There will be announcements released to the community about special updates such as someone's 1,000<sup>th</sup> observation or the first appearance of a weed in a new location.

Users could also be contacted by location to announce weed eradication events.

### *Accuracy of GPS*

The Android system will tell you your accuracy when you are taking a point. You can keep pulling data until you feel that it is accurate enough. An upcoming version of *What's Invasive* will have a +/- deviation to the GPS location. Accuracy is currently between 10 and 20m, but people who have used the program feel that it actually puts the point exactly where you are.

Technically speaking, the GPS uses differential processing and may be able to be updated through software in the future to increase accuracy.

### *Timestamp*

The program does record a timestamp on all data collected. Data stamp is based on the observation time even if photo isn't uploaded until you return to civilization. The time is based on UTC, but is viewed online as local time from where you are viewing the data. Eventually the online program will change this function so that the time stamp will be from the time the point was collected within its original time zone.

### *Tracks*

The Android has other programs that can keep track of “tracks” to see where you’ve been searching. The main problem with them is that they are very battery intensive, and will quickly drain your power. There is an option of buying a battery pack, which can hold 4x the charge of a normal phone battery. There is also code available to load preprogrammed tracks into your Android, but it is not currently implemented in this applications.

#### *Recording Patch Size*

The developers said that the easiest way to do patches is to force them in the data entry phase. Have a field for cover and number of plants. Another planned feature is that when two points are reported nearby one another, they will soon be clustered on the display map. The more points that are reported in a location, the larger the cluster becomes.

A question about determining patch size of a population was raised. A contractor stated that their group had gone away from using patch size measurements, and instead split their research areas into a ¼ hectare grid (.6 acres) and measure presence/absence. It is more efficient when remapping year after year, as well as easier to incorporate into a larger grid. It is also easy to mark off what has been looked at already, and what has not. The developers said that this could be instituted in future versions but is something that would need to be directly desired.

#### *Herbarium Sheets*

You have to option to create which ever fields you like in *The Observer* , which would allow you to create the proper fields for a label. Upon return to the office, it has an option to print Herbarium labels on the website.

#### *Rare Plants*

In theory, you could populate the map with rare plant data, but the CNDDDB is very sensitive with their plant locations. Currently they only report the data to quad level. Currently CNPS and CalFlora are rebuilding their rare plant inventory and it may be easier for managers to access the information.

#### *Animals*

Animals are already included in the *What’s Invasive* program. There is also another program called “Did you see it?” that tracks wild animal phenology.

#### *DFG BIOS*

You can aggregate data collected with these applications and upload it into the BIOS program, but it will not sync directly.

### **The Future:**

#### *Life after CENS*

The CENS program has limited funding to work with the application. After funding runs out, there needs to be a repository for data set up from an outside source. Since this program was designed for citizens, it will most likely be abused by citizens. There are plans to create a filter so that the program

automatically deletes pictures of non plants. *The Observer* data currently is being transported to CalFlora, and they are controlling it. As more people begin to use the program there will be a need to create membership fees to deal with the data. This will keep the technology improving as well as will allow for more students to be hired to perform the data processing. Without any additional funding the program will continue to function as it does today, but will never change. With increase funding, the application will continue to expand and include more species both invasive and native.

*What about the rest of the US?*

Currently both programs can be used in any state. *What's Invasive* is more compatible, because you can create a small search area and upload your species lists to the site. There are currently sites across the US and overseas in Denmark.

*The Observer* is currently limited to California plant species, but can be expanded to include anything. Currently all data from the observer is funneled through Calflora.com. Other states may want to have control of their own data which could be troublesome, but can be accomplished.

*How can we get involved?*

As the program gets bigger and more advanced, people will start to want to see new things, and have the application tailored to fit their needs. We hope that they will be willing to pay for these features, which will allow the project to keep growing.