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Weed mapping, what is a weed map, why is it important, and what does it accomplish? Valid questions when deciding on proper management strategies to use in the field when dealing with noxious weed infestations. Answering the question “what is a weed map” is; a visual representation of the weed situation observed in the field that is then used to guide decisions in the management of the weed species. Answering the questions of “why is it important” and “what does it accomplish” are as follows. Weed mapping is as important and needs to be categorized with treatment and eradication. The information gained from mapping can save time and money in the treatment of weeds. The important information obtained when mapping weeds includes; types of weeds, direction of spread, rate of spread, soil composition, and water table depths. The last two pieces of that information can be added by a GIS layer when working with maps, or contacting the Conservation District in the area. Once all these factors are taken into consideration, a weed manager can make the proper recommendation for management and treatment options. Proper chemical, mechanical, cultural, and biological treatments can be determined on a site by site basis. This handout will briefly explain some factors and considerations to be aware of when mapping weed infestations.



Hand drawn maps are just as useful when dealing with mapping noxious weeds in the field. (Photo courtesy of Steven Dewey Utah State University.)

The most important decision to be made when starting a weed mapping project is; to determine the objective of the project and what will the data collected be used for. The objective of the project determines; type of mapping category to be used, type of data categories and mapping grade options.

Types of mapping categories include; exploratory, reconnaissance, extensive and intensive. Exploratory means getting out there for the first time, and exploring what species are out there (usually hand drawn map). Reconnaissance means greater detail than exploratory, determining weed species, location, and abundance, emphasizing on new invaders and high probability sites. Extensive means, coverage of all areas to be managed including new invaders and widespread weeds to be managed, data not pertaining to weeds is minimal. Intensive means, all data that can be collected will be collected pertaining to site specific characteristics. For general weed mapping purposes falling somewhere between reconnaissance and extensive is appropriate.

Data to be collected can be simple or complex and decided for each project as needed. The data essentials and simple recommendations are species, location, and abundance/extent. For a more complex data set using the North American Weed Management Association (NAWMA) Weed Mapping Standards, is recommended. The data collection information is determined on the amount of time there is to collect in the field.

There are two types of mapping grades to take into consideration when determining the objectives they are Management Grade and Monitoring Grade. Management Grade mapping supports control options, with a main interest in locating infestations for control and re-treatment. Also determining size of infestations for estimate of cost and extent of future treatments. Monitoring Grade mapping is to measure change over time to support studies and evaluations. Management Grade mapping is usually more than enough detail, for general weed mapping, depending on objectives.

Using a combination of GPS and maps while mapping noxious weeds in the field can be helpful to navigate and locate weed infestations. (Photo courtesy of Steven Dewey Utah State University.)



After deciding the objectives and type of maps to utilize, determining the techniques to collect the data of weed infestations is the next step. There are a few Essential Elements that will be discussed for weed mapping. They include; Search Type, Target Area, Target Species, Target Growth Stage, Target Size, Search Thoroughness, and Detection Confidence. Defining them; Search Type, did the objectives determine that an inventory or a survey needed to be completed. Target Area, the amount of acreage to be searched, 5 acres or 1,000 acres. Target species, deciding to search for a



Determining the patch size, species and location of noxious weeds can easily be notated in a GPS while mapping in the field. (Above photo courtesy of Steven Dewey, Utah State University, Below photo courtesy of Dale Swenarton, CDA.)



specific weed species or multiple weed species. Target Growth Stage, mature or seedlings, or both, this is usually determined by the time of year. Target Size, identifying single plants, or large patch infestations. Search Thoroughness and Detection Confidence go together, these determine the level of accuracy expected in the mapping project. High level of thoroughness and accuracy, will also determine Target Size. The best way to have high accuracy and thoroughness is through quality training.

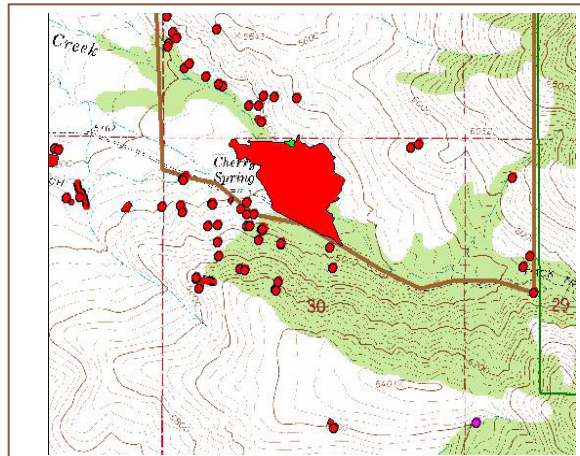
What types of tools will need to be used to achieve the level of mapping needed in the project, may be a difficult question to answer. This question should be easier to answer when the project objectives have been set. There are many different mapping tools and techniques. Paper maps, compasses, GPS, GIS, binoculars, and range finders are some of the tools that could be used in mapping weed infestations. Hand drawn maps do have there place when dealing with weed infestations. If the area to be mapped consists of a housing lot within in a neighborhood, GIS maps would be overkill and a hand drawn map would suffice.

The rest of this handout will focus on setting up and basic uses for a GPS to map weed infestations. GPS units are great tools for mapping weed infestations. GPS units range in prices and range in capabilities. There are

many different types of GPS units, that can collect different amounts of data. The lower end models of GPS units can still be an effective tool, locating weed infestations. The higher end, more complex models of GPS will allow more types of data and how it is collected. Both are effective and both can achieve quality weed maps the difference being how the data is displayed.

Depending on the GPS unit being used and how weed infestations are collected, so the data can be recognized once downloaded into a GIS map, is important. With some of the higher end models of GPS, they can use a Data Dictionary. The data dictionary is a useful tool, that allows the user to input certain attributes about a weed infestation while mapping. A data dictionary can be set up by the user or following guidelines set by other users, i.e. NAWMA. Lower end models of GPS usually don't have the capability of a data dictionary, but some of the same data can be collected using a code system when collecting a point. The most important data collected when mapping weed infestations are; species of weed, size of patch (estimate), and UTM or Lat./Long. coordinates. With this information collected a weed management decisions can be determined. Another feature that is dependant on the GPS unit being used is how the infestations are mapped. Are the infestations going to be represented as a point, line, or polygon feature. All three of these features are useful in their own respects. Once again, depending on the capabilities of the GPS unit being used, that will determine how infestations are shown on a map. Higher end models will allow all three features to be collected. Lower end models will allow point, and sometime one other type of feature to be collected. In most cases, a point feature will be sufficient in mapping weed infestations. A point feature can guide the user or crew back to the weed infestations for specific treatments. Combining the collected points with informational data collected can produce a useful map for management options. Placing the data into a map form is completed using a GIS and may take some additional assistance.

Weed mapping can be a useful tool within a weed management plan. The information gathered can assist with; representing the weed populations for a certain area, management strategies, and treatment options. Initial detection and mapping of noxious weed species leads to an adaptive weed management plan; utilizing weed management planning, proper management of weed species, measuring and monitoring of the plan and evaluating it's effectiveness. This can all be accomplished with a quality weed map.



GIS maps can show weed infestations with points or polygons, depending on the objectives of the weed project. (Photo courtesy of Steven Dewey Utah State University.)

