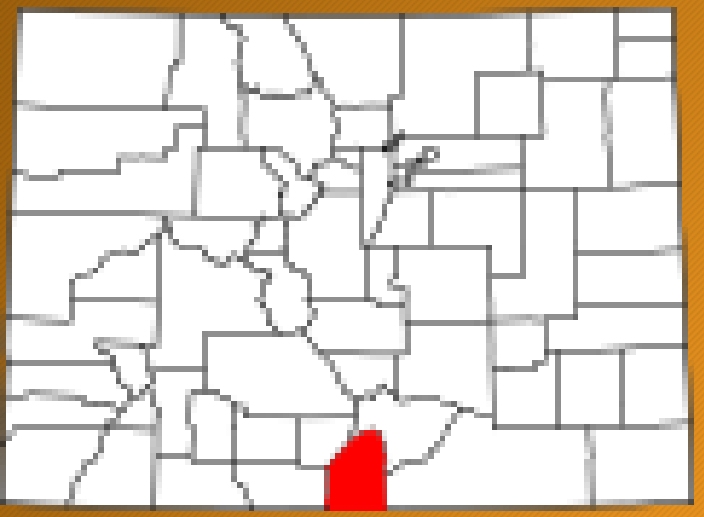
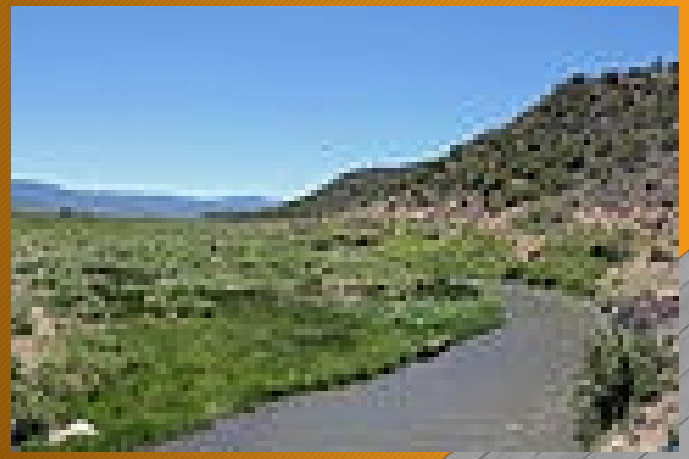
GIS MAPPING OF INVASIVE SPECIES USING DIFFERENT GIS TOOLS





Lucas Casias

AGENDA

- Introduction: Who am I? What do I do?
- Why is mapping important for invasive species professionals?
- Mapping projects using ESRI software
  - What software is available? What works for me may not work for you.
  - Tools and features of ESRI software that can help invasive species professionals
- Other methods of mapping using partner software's, i.e. MapItFast, EDDMaps
  - Tools and features of various software partners
- Conclusion and questions?

Who am I? What do I do?

My name is Lucas Casias. I am the Costilla County Noxious Weed Coordinator/GIS Coordinator and Emergency Manager. I have been the Noxious Weed/GIS Coordinator for around 15 years. I have certificates in ESRI Software and NAISMA Mapping Standards. I live in San Acacio, Colorado and have been married to my beautiful wife Lisa for 15 years and we have 5 children. A 26-year-old, 22-year-old, and 13-year-old triplets and adopted my now 19-year-old nephew. I am a past CWMA president and currently a CWMA Board Member.

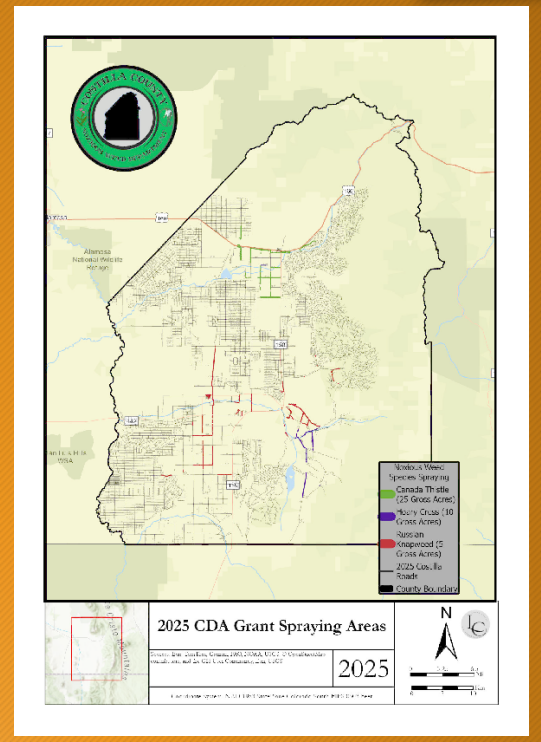
Why is GIS Mapping important for Invasive Species Professionals?

Why is mapping important?

- Most invasive species professionals rely on mapping to help them keep inventory of their species and help them acquire funding through state agencies and fiscal partnerships. Mapping helps those professionals and their partners understand progress with their control efforts. In essence good mapping can help you keep yourself in line with your efforts.

Roadside Spraying using
Spraylogger and MapitFast

Spraying of Black Henbane
along Indian Creek Ditch Bank



PDF Map made
by ESRI Software
for CDA Grant

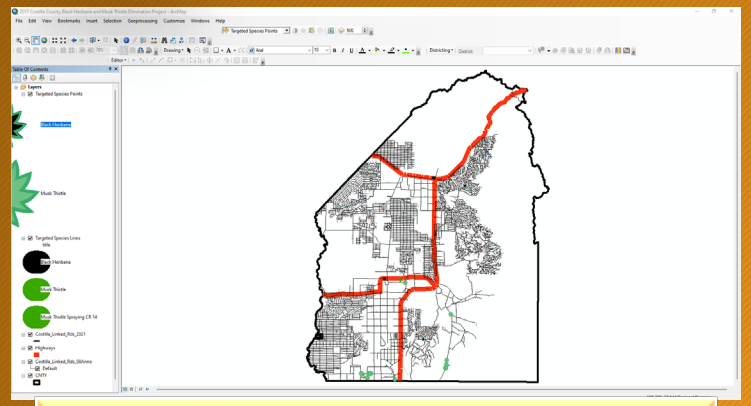
"There's no blank spots on the map anymore, anywhere on earth. If you want a blank spot on the map, you gotta leave the map behind."
Jon Krakauer

GIS MAPPING USING ESRI SOFTWARE AND PARTNER SOFTWARE

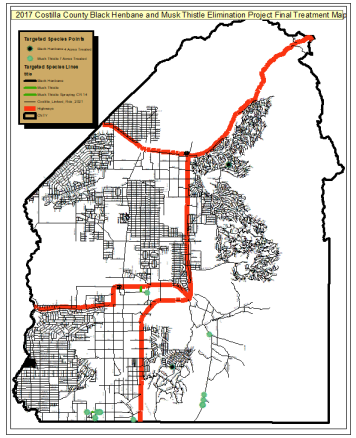
What kind of GIS software is available for invasive species management professionals?

- ESRI Software(Collector, Field Apps, Survey 123 and ArcPro), AgTerra (MapitFast, Strider, Spraylogger), EDDMaps (EDDMaps Pro) As well as numerous others

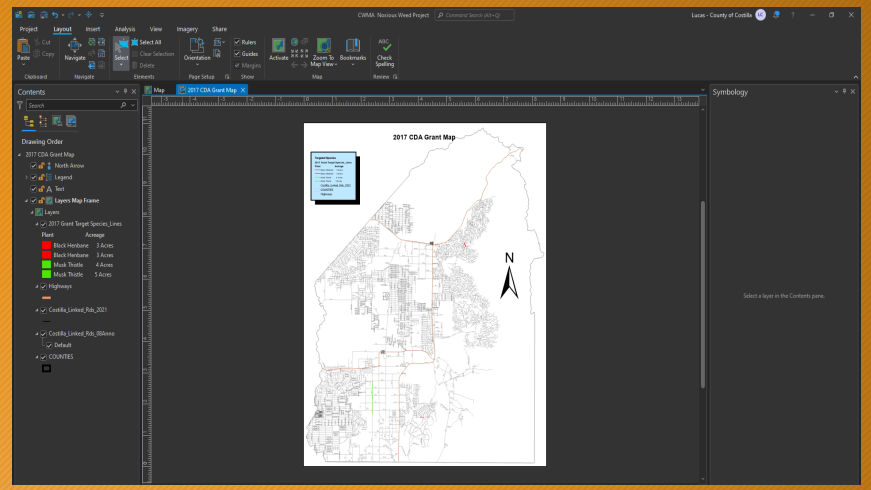
ARCMAP AND ARCPRO INVASIVE SPECIES MAPPING PROJECT EXAMPLES



ESRI ArcMap Project from 2017

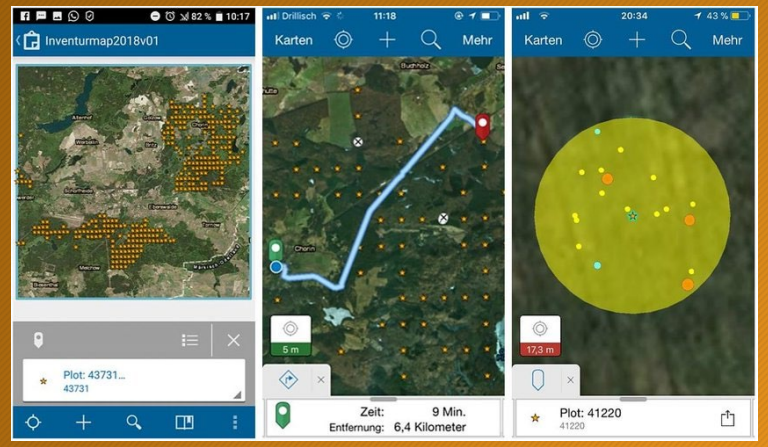


ARCMap and ARCPro are two GIS software's that are available through ESRI. They both require a license for the software. The prices of the software license can range from $300 to $2000 a year dependent on different add-ons you want and users you would like. They both offer great attribute drawing and point placement abilities.



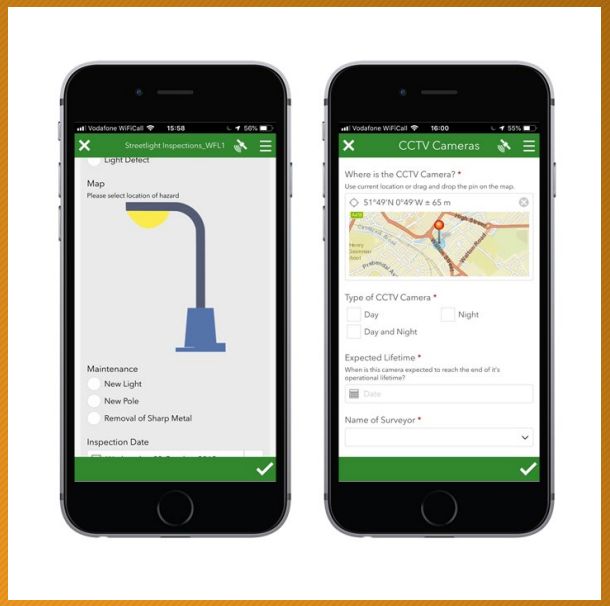
ESRI ARCPro Project from 2017

Other Software Examples



ArcGIS Collector Field APP

ArcGIS Collector and Survey 123 give you the option to map and obtain data with drop down menus and selections that can be customized to meat your needs. You can use a drop down menu option to select plant species, density, put a picture, etc.

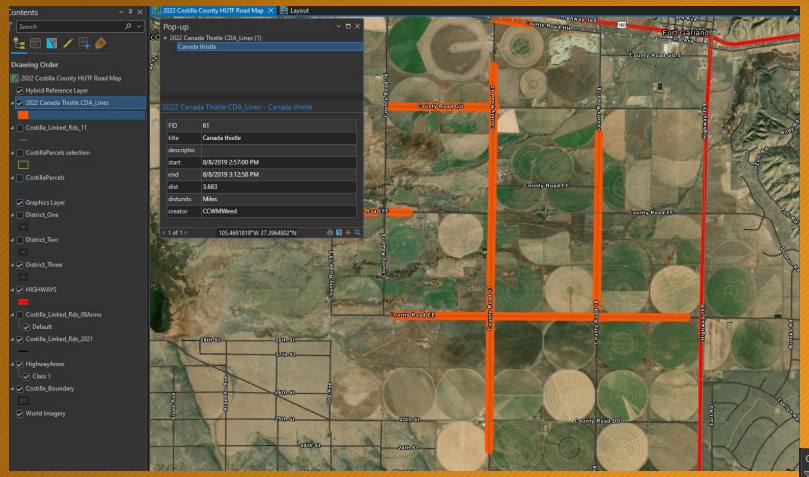


Survey 123 ArcGIS

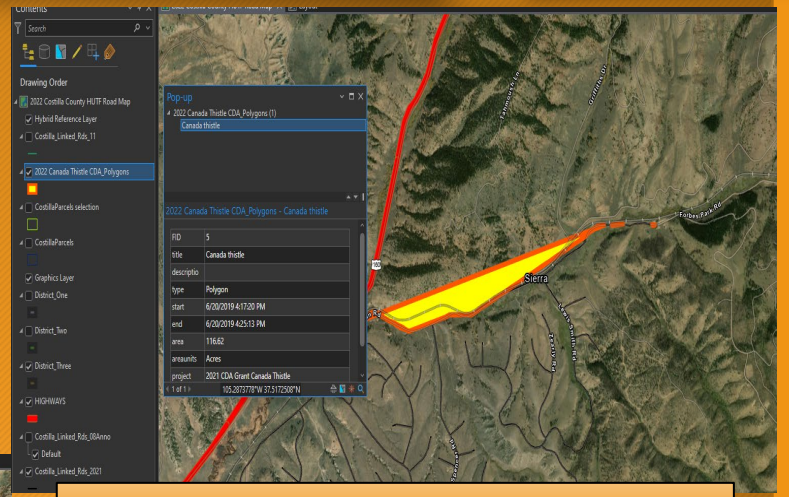
Tools and Features of ESRI Software that can help Invasive Professionals with Mapping Projects

- ESRI Software, whether it be ArcMap or ArcPro, offer various tools and features that can help mapping invasive species easier and beneficial for your organization.
- ESRI offers the ability to map point, line, and polygon data using the various drawing tools found within the software.
  - Point, line and polygon drawing allows the ability to map your infestations along roads, trails, ditches, open areas, natural areas, as well as numerous other land types.
  - With point data you can drop a point anywhere on your map to show small or single infestations, mark a point to show future treated locations and you can label the point with whatever information you may need for that point data.
  - Line data allows you the ability to trace infestations along roads, trails, edge of waterways and anywhere else you may find a long stretch of infestation.
    - Line mapping is great because it can show you your infestation length in miles, km, feet whatever unit you would like to visualize.
  - Polygon mapping is great in that this allows you to capture areas that are infested in acreage you can also label the data as treated, found , infested or monitored for future references.
  - All of these data capabilities allow you to export them to Google Earth or send by zipped file to any partner or fiscal agent you need to.

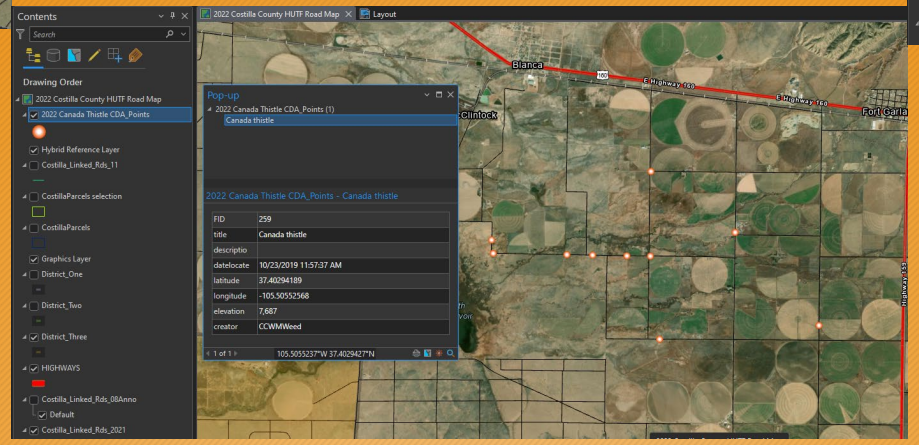
Examples of ArcMap and ArcPro Projects with Line, Point and Polygon Data



ArcPro project showing Line Data from 2021



ArcPro project showing polygon data from 2021



ArcPro project showing point data from 2021

MapitFast and EDDmaps Mapping Software

MapitFast software is a software that was developed by AgTerra Technologies in Sheridan, WY. The company has been around since 2003. AgTerra enables natural resource professionals to gather, map and report data from the field. AgTerra's mobile and Internet based applications are designed to be simple for anyone to use, anywhere. They offer the MapitFast software, as well as a spraylogger software and form building tools that can help with easily keeping track of your invasive species populations. EDDMaps is a web-based mapping system for documenting invasive species and pest distribution. It is fast, easy to use, and doesn't require Geographic Information Systems experience. Launched in 2005 by the Center for Invasive Species and Ecosystem Health at the University of Georgia, it was originally designed as a tool for state Exotic Pest Plant Councils to develop more complete distribution data of invasive species. Since then, the program has expanded to include the entire US and Canada as well as to document certain native pest species. Many of us know this is how the Colorado Department of Agriculture monitors our state invasive species mapping. Both MapitFast and EDDMaps have numerous training videos that can help you understand their software much better.

https://help.agterra.com/

Link to AgTerra's help videos

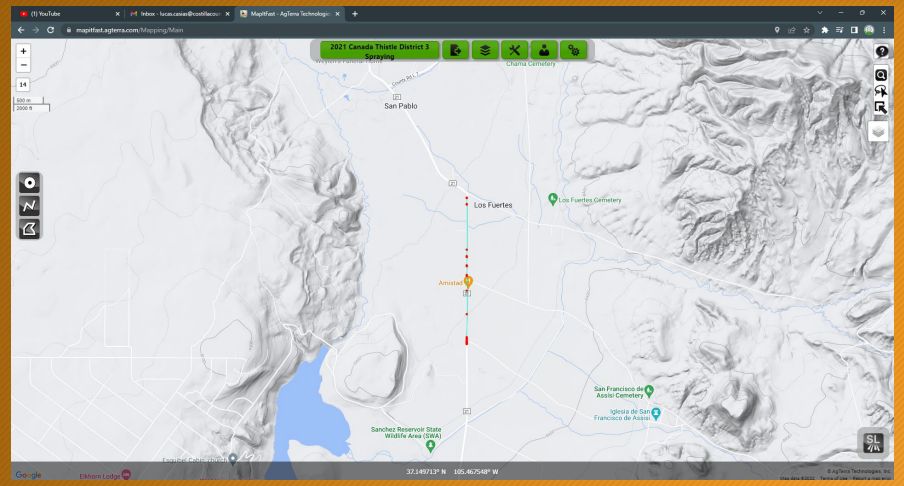
https://www.eddmaps.org/training/

Link to EDDMaps training materials

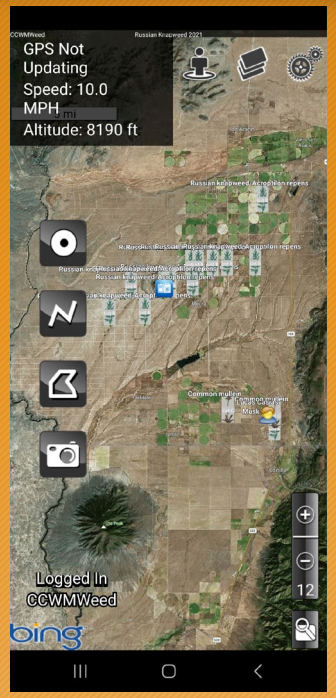
Tools and Features of MapitFast, EDDMaps and Partner Software

- Agterra's MapitFast has some of the same tools as ESRI but EDDmaps doesn't give the same tools and features that you can get with the premium software like ESRI.
  - MapitFast gives you the abilities like ESRI to do point, line and polygon drawing. The benefits of MapitFast is its ability to GPS track your spray rig along roads and offers real time drawing of lines and polygons. You can also drop points where you stand or manually draw lines and polygons on the web platform. MapitFast gives you the ability to export the data into any partner GIS platform you like to you use.
  - MapitFast has form building called Strider and a Spraylogger platform that tracks your spraying with real time accuracy.
  - Strider forms are available to help update your infestations to the Colorado Department of Agriculture
- EDDMaps allows any one in the country to be able to report infestations on county lands, private land, forest land etc. You are also able to identify the land type like, wetland, dryland, riparian area, aquatic etc.
  - EDDMaps allows photo documentation as well as you can upload photos of the infestation and leave your name as the identifier of the said infestation.
  - The labeling of the infestation can come as single infestation, acreage, and trace coverage.
  - Maps showing the infestations of certain species as they pertain to your jurisdiction are found on the EDDMaps website.
  - EDDMaps is the required reporting for the Colorado Department of Agriculture

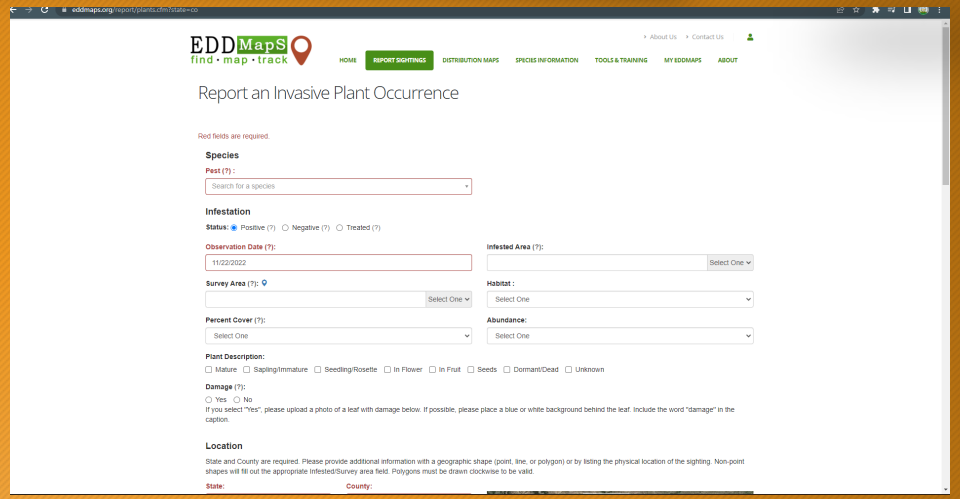
EDDMaps and MapitFast Project Examples



MapitFast Project from last year on the MapitFast web server platform



MapitFast Project on Android Device App



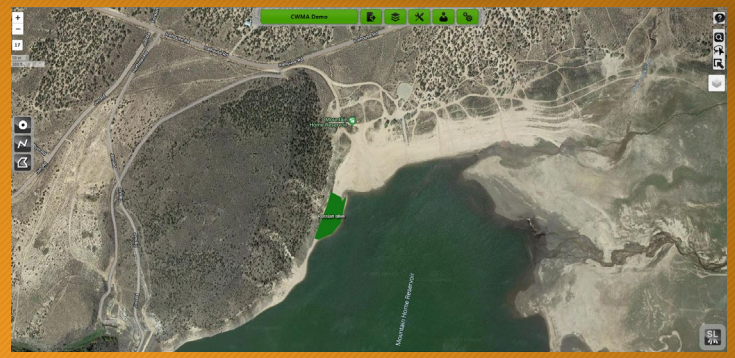
EDDMaps Website Reporting Platform

GIS Mapping of Invasive Species Using Different GIS Tools

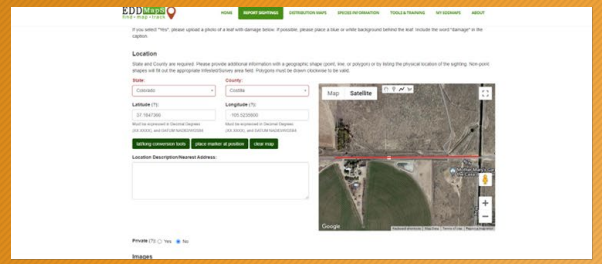
MapitFast Project Examples showing Line, Point and Polygon Data and EDDMaps Reporting Examples

MapitFast Project showing Line Data from 2022

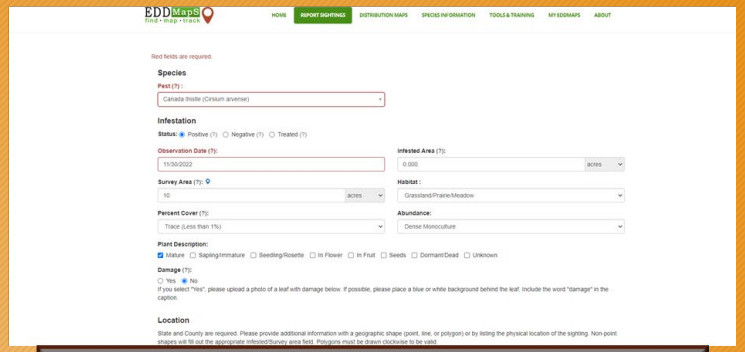
MapitFast Project showing point data



MapitFast Project showing Polygon Data



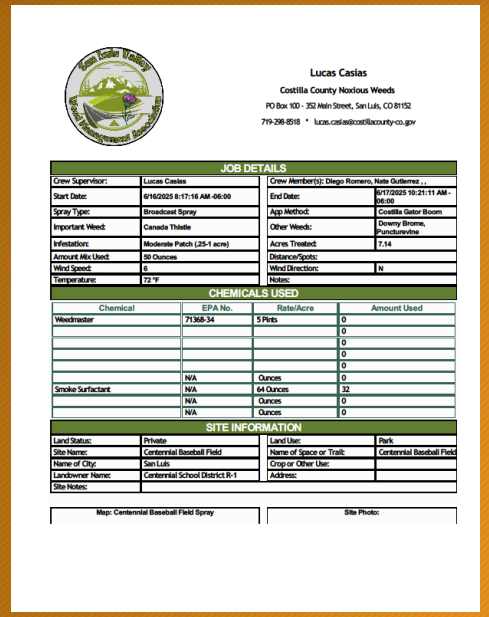
EDDMaps reporting showing the map view



EDDMaps reporting database inputs

GIS Mapping of Invasive Species Using Different GIS Tools

STRIDER AND SPRAYLOGGER FORM EXAMPLES



Lucas Casias
Costilla County Noxious Weeds
PO Box 100 - 352 Main Street, San Luis, CO 81152
719-298-8518 • lucas.casias@costillacounty-co.gov

JOB DETAILS

Crew Supervisor:	Lucas Casias	Crew Member(s):	Diego Romero, Nate Gutierrez , ,
Start Date:	6/16/2025 8:17:16 AM -06:00	End Date:	6/17/2025 10:21:11 AM -06:00
Spray Type:	Broadcast Spray	App Method:	Costilla Gator Boom
Important Weed:	Canada Thistle	Other Weeds:	Downy Brome, Puncturevine
Infestation:	Moderate Patch (.25-1 acre)	Acres Treated:	7.14
Amount Mix Used:	50 Ounces	Distance/Spots:	
Wind Speed:	6	Wind Direction:	N
Temperature:	72 °F	Notes:	

CHEMICALS USED

Chemical	EPA No.	Rate/Acre	Amount Used
Weedmaster	71368-34	5 Pints	0
			0
			0
			0
			0
	N/A	Ounces	0
Smoke Surfactant	N/A	64 Ounces	32
	N/A	Ounces	0
	N/A	Ounces	0

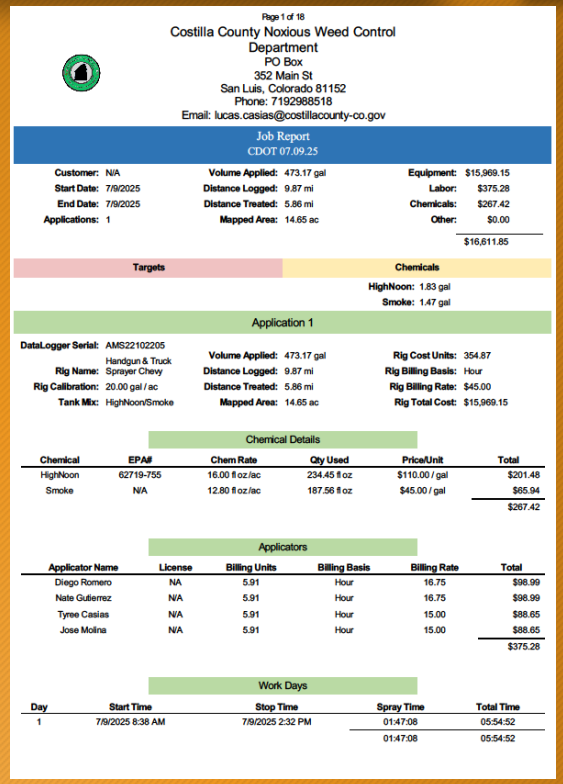
SITE INFORMATION

Land Status:	Private	Land Use:	Park
Site Name:	Centennial Baseball Field	Name of Space or Trail:	Centennial Baseball Field
Name of City:	San Luis	Crop or Other Use:	
Landowner Name:	Centennial School District R-1	Address:	
Site Notes:			

Map: Centennial Baseball Field Spray | Site Photo:

Strider Form Example from 2025 Spray Job in Costilla County

Strider and Spraylogger give you the option to email your reports to landowners and customers who need a copy and allows to ability to obtain signatures of all those involved and interested in the job performed. You have drop down boxes that allow all the data to be preloaded and if you need help AgTerra can help you make a form that suits your needs.



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Costilla County Noxious Weed Control Department
PO Box
352 Main St
San Luis, Colorado 81152
Phone: 7192988518
Email: lucas.casias@costillacounty-co.gov

Job Report
CDOT 07.09.25

Customer:	N/A	Volume Applied:	473.17 gal	Equipment:	$15,969.15
Start Date:	7/9/2025	Distance Logged:	9.87 mi	Labor:	$375.28
End Date:	7/9/2025	Distance Treated:	5.86 mi	Chemicals:	$267.42
Applications:	1	Mapped Area:	14.65 ac	Other:	$0.00
					$16,611.85

Targets | **Chemicals**
HighNoon: 1.83 gal
Smoke: 1.47 gal

Application 1

DataLogger Serial:	AMS22102205				
Rig Name:	Handgun & Truck Sprayer Chewy	Volume Applied:	473.17 gal	Rig Cost Units:	354.87
Rig Calibration:	20.00 gal / ac	Distance Logged:	9.87 mi	Rig Billing Basis:	Hour
Tank Mix:	HighNoon/Smoke	Distance Treated:	5.86 mi	Rig Billing Rate:	$45.00
		Mapped Area:	14.65 ac	Rig Total Cost:	$15,969.15

Chemical Details

Chemical	EPA#	Chem Rate	Qty Used	Price/Unit	Total
HighNoon	62719-755	16.00 fl oz/ac	234.45 fl oz	$110.00 / gal	$201.48
Smoke	N/A	12.80 fl oz/ac	187.56 fl oz	$45.00 / gal	$65.94
					$267.42

Applicators

Applicator Name	License	Billing Units	Billing Basis	Billing Rate	Total
Diego Romero	NA	5.91	Hour	16.75	$98.99
Nate Gutierrez	N/A	5.91	Hour	16.75	$98.99
Tyree Casias	N/A	5.91	Hour	15.00	$88.65
Jose Molina	N/A	5.91	Hour	15.00	$88.65
					$375.28

Work Days

Day	Start Time	Stop Time	Spray Time	Total Time
1	7/9/2025 8:38 AM	7/9/2025 2:32 PM	01:47:08	05:54:52
			01:47:08	05:54:52

Spraylogger Form from 2025 for CDOT Project in Costilla County

Conclusion and Questions?

GIS Mapping of your invasive species helps to increase your productivity within your organization and your partnerships. While I only showed today the ESRI, MapitFast and EDDMaps platforms please be aware that there are numerous other software and apps available to help you locate, identify and map your infestations. I only show these three platforms because I have had the best success with them. If you find a software program that best suits your needs then by all means run with it and if you have any questions on how to implement any software program into your organization then feel free to reach out to me and I can help you best implement to your abilities and needs.

?Questions?

Contact Information

Lucas Casias

Costilla County Noxious Weed Coordinator/GIS Coordinator/Emergency Manager

352 Main St San Luis CO

719-298-8518

lucas.casias@costillacounty-co.gov

You can reach me here for any questions on ESRI, EDDMaps and MapitFast Software

Thank you for your time today!!!!