

# Bonneville CWMA EDRR Weed Control In Summit and Salt Lake Counties

## 2016 ISM Year End Report



### **Prepared By:**

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### **Prepared For our Partners:**

Utah Department of Agriculture, ISM Grant Committee  
Salt Lake County Weed Control Program  
Summit County Weed Control Program  
Summit Cooperative Weed Management Area  
Park City Municipal Corporation, Park Department  
Salt Lake City Public Utilities, Watershed Protection



## Summary of Project

The EDRR Weed Control project in Summit and Salt Lake Counties is a grant funded project through the Utah Department of Agriculture, Invasive Species Mitigation Fund. The project is focused on the Class 1B state noxious weed Garlic mustard, *Alliaria petiolata*. In January of 2016 the Bonneville CWMA was awarded \$50,400 for treatments of garlic mustard within Summit and Salt Lake Counties.

The project proposal was aimed at containing the spread of garlic mustard within Summit County, thus reducing the threat to Salt Lake County which has limited infestations on the eastern county perimeter. In addition, we focused on decreasing the cover and/ or density of garlic mustard within known areas, after having four years of treatment, thus reducing the populations to a manageable level for landowners, both public and private. In the spring of 2016 and fall of 2016, Provida Management Group (PMG) and Bruce Glisson Consulting (Fall 2016), were contracted to control garlic mustard. PMG was focused in three priority areas within Summit County: Summit Park, Park City, and Synderville. They were also contracted to help supplement control by Salt Lake City Public Utilities in several EDRR focus areas within Salt Lake County, including Little Dell Reservoir and Salt Lake Watershed lands at Summit Park. Bruce Glisson, Ph. D., Botany & Ecology Consultant, was contracted to control and map infestations on the eastern edge of Salt Lake County in September 2016. Bruce and his crew had several field days in between September 18 - 30, 2016. They were able to hike to remote locations and pull infestations that threaten the high diversity and priority habitat of Lamb's Canyon. The project consisted of pulling some of the seedlings at various infestation points encountered during the surveys as well as a more focused seedling pull effort at a large, previously mapped garlic mustard infestation in eastern Salt Lake County just west of Summit Park. None of the seedling pull areas should be considered complete control efforts, but served to reduce established plants that would otherwise contribute to the following season's seed production.



*Salt Lake City Watershed Lands at Summit Park. These lands are a priority for garlic mustard control and the focus of this EDRR project.*

## Treatment Results by PMG



*McCloud Creek Trail in Park City near the Park City Skate Park.*

Treatment by PMG occurred on 26 days in 2016 on both private and public land, primarily in the months of May, June, September and October. A complete breakdown of the dates, herbicide rates, and locations is provided in the excel worksheet "GM Breakdown 2016". PMG used primarily 2, 4-D (Amine) and MSM 60 in 2016. Herbicide rates and combinations were tailored for the location, watershed restrictions, and relationship to sensitive individuals and properties.

In addition to chemically treating garlic mustard, PMG provided us with GIS shp files of both the treated areas as well as areas that were surveyed for garlic mustard and are considered “weed free” of garlic mustard. This was a high priority for the partners to establish a ratio of treated vs. monitored (garlic mustard weed free), in order to highlight the success we are finding with multiple years of treatment and the decrease in cover and infestation sizes overall.

In the spring of 2016 the ratio of treated to monitored by was 14.02%, with approximately 14% treated and 86% weed free. Therefore PMG treated approximately 14% of those lands inventoried, and 86% was “weed free”. In the fall of 2016, PMG and Bruce Glisson treated 19.6% and 80.4 % was weed free. Overall, in 2016 grant funds were used to treat garlic mustard on approximately 18% of the lands inventoried, and found approximately 82% of those lands to be weed free of garlic mustard.

All of the mapped points, treatment, and weed free areas from 2012 to 2016 can be found at <http://slco.maps.arcgis.com/apps/Viewer/index.html?appid=e5be68f0ebfe44c5aa57756acb508518>

**2016 Garlic Mustard Chemical Control and “Weed Free” acreage by PMG & Bruce Glisson:**

Season & Year	Treated	Monitored (Garlic mustard weed free)
Spring 2016	18.13 acres	129.36 acres
Fall 2016	50.65 acres	258.5 acres
<b>Total(s)</b>	<b>68.78 acres</b>	<b>387.86 acres</b>

This year marks the fourth year of ISM funding to treat garlic mustard, and the third year of contiguous treatment in both the spring and fall of the same year. PMG noted that they are seeing significant decrease in the density of some infestations, particularly in the Synderville area. However, they are still seeing an increase in infestation size and density in areas such as Summit Park. This may be due to the high elevation of this community, where timing of application is difficult both in the spring and fall due to temperature precipitation extremes. PMG also noted that educational efforts are proving effective in the Summit Park area, as many residents seem to know about garlic mustard and are actively pulling / and or treating their own infestations. There does still need to be



*Example of garlic mustard rosettes with beginning signs of herbicide damage. Some of the rosettes do not appear to have been damaged, and will need additional chemical treatments in order not to bolt and produce seed. This picture illustrates how constant monitoring for new germination is so important, followed by repeat chemical applications and often manual control as well.*



*A typical response of a garlic mustard rosette to chemical treatment. Note drooping stems, yellowing of leaves, and dry crispy leaf margins.*

more education in particular on how to identify the plant in rosette stage. In the Park City Area, PMG noted that they are seeing some reductions in density in areas such as Rotary Park, however they are still seeing garlic mustard infestations spreading into new areas, and many infestations which don't seem to be reducing in density. It appears that maintaining an annual spray program is imperative to keeping garlic mustard in check within these areas, and that more monitoring and



treatments are needed throughout the season, rather than just spring and fall.

In addition to treatment by PMG, several public agencies and private partners participated in this grant by controlling garlic mustard on lands they manage and by coordinating the project. The main partners include, Mindy Wheeler of Summit County CWMA, Maria Brandt of Park City Parks Department, Patrick Nelson of Salt Lake City Department of Public Utilities, Dave Bingham of Summit County, Jan Reinhart of UDAF, and Sage Fitch of Salt Lake County.

Mindy Wheeler, Chair of the Summit County CWMA played an instrumental role in project coordination, GIS analysis, organization and mailing of the consent letters, site visits, monitoring, landowner coordination, and grant writing. Mindy's perspective on the success and challenges of this project are noted below in the "Challenges and future goals" section of this report.

Maria Brandt, Park City Parks oversaw both chemical and manual treatments throughout Park City Proper, and coordinated with PMG on treatment within Park City Open Space and parks land. Park City also helped with the mailing of the hundreds of consent letters. Maria's perspective of treatments this year in Park City was that she is not seeing a substantial reduction in existing infestation size or density. She feels that depleting the seed source is nearly impossible, and that a big part of the issue is the plants ability to germinate throughout the season, creating both a carpet of seedlings and flowering/ seeding plants in the same area at the same time.

Patrick Nelson, Salt Lake City Public Utilities (SLCPU) Watershed Supervisor provided the following summary for SLCPU's 2016 garlic mustard control efforts:



*Garlic mustard, ready to seed but about to be pulled, at one of our highest priority infestations on Salt Lake City Watershed lands in Summit Park.*



*A Utah Conservation Corp member pulls a bouquet of garlic mustard on Salt Lake City Watershed Lands.*

"For the 2016 field season, SLC Department of Public Utilities only hand pulled garlic mustard. All spraying was done via the contractor PMG via funding from the Utah Invasive Species Mitigation program, for which we are grateful.

Given the success of initial, aggressive efforts, the main trend of SLC DPU's program of Garlic Mustard treatment is to transition towards hand pulling and light spot treatments as the densities of population decrease and the need for reseeding increases. Glyphosate has been an important component but in the less dense populations we have switched to Metsulfuron. Hand pulling has been very successful the last two years in a hybrid program with light spot treatments via PMG.



SLCDPU has seen progress in City Creek and the Summit Park populations. The difficulty of accessing the Little Dell population has hindered the same pace of success as the Garlic Mustard is located on the ground beneath an ultra-dense thicket of Black Hawthorne. Saws were utilized to open up access routes last Fall of 2015 to allow for better access and pulling has gotten easier. This population would be sprayed but is too close to the stream to comply with Salt Lake City ordinance 17.04, which mandates a 100' setback.

Finally, a new 2 acre population was discovered in early November in Emigration Canyon. Treatment efforts and further reconnaissance will begin Spring 2017.

Funding that would contribute towards mapping would be highly useful given that our staff spends the entirety of its time treating weeds, hindering the successful deployment of an Early Detection, Rapid Response model."

Summit County sprayed and mapped garlic mustard points in the ROW in 2016 in multiple areas throughout Summit County. Dave Bingham, Summit County Weed Supervisor wrote this:

"Summit County has been working with Salt Lake County, Park City and other organizations on this very important Garlic mustard project since it was started. The project for Summit County started in Summit Park and in Park City. Since then we have found it in other places in the county. We have found it in Jeremy Ranch, Pinebrook, and Bear Hollow areas. We try very hard to keep it off of our right of ways. In 2014 we sprayed 10 acres on our right of ways in Summit Park. This year we sprayed 1 acre. I feel that we are making progress in some areas but as we go along we are finding Garlic Mustard in more places than we thought it was in the beginning. There is plenty of work to do. As we learn more about Garlic mustard we hope to be able to continue educating people about this problem. Mapping and monitoring are a big part of this project. We are using this information to better understand where this weed is and where it could possibly go."

Sage Fitch, Salt Lake County Noxious Weed Supervisor played the role of grant writer, coordinator, and GIS collection and analysis. As the project manager, Sage was responsible for handling all of the grant proposal writing, submittal, and reporting. She kept everyone on track by organizing the meetings, site visits, and monitoring. In addition, Salt Lake County handled a portion of the GIS and map making, and created maps for the project proposal as well as post treatment maps. To help analyze all of the multiple years of treatment and weed free areas, Salt Lake County created an online, ESRI based, interactive map of the garlic mustard treatment. It can be found at

<http://slco.maps.arcgis.com/apps/Viewer/index.html?appid=e5be68f0ebfe44c5aa57756acb508518>

### **Monitoring results by Jan Reinhart of UDAF**

Quantitative monitoring data was collected by UDAF's Jan Reinhart in May and September 2016 prior to chemical treatment at three separate locations using sample point cover and line intercept cover. Transect #1 is on Salt Lake City Watershed property at Summit Park. According to UDAF transect #1 data, garlic mustard percent cover increased to 1.7% in September 2016, up slightly from 0.3% in August 2015.

Transect #2 is near the Park City Skate Park adjacent to a paved trail. This site has been controlled by both chemical and manual treatments, followed by some reseeding by Park City Staff. According to UDAF transect #2 data, garlic mustard percent cover increased to 0.4% in September 2016, up only so slightly from 0.3% in August 2015.



Transect #3 is in Park City adjacent to McCloud Creek. This transect was added in 2015 in response to the need to show an additional representation in the Park City area. According to UDAF transect #3 data, the garlic mustard percent cover decreased to 3.3% in September 2016, down from 10.8% in August 2015.



Transect #3 at McCloud Creek, Park City, Utah. The photo point on the left was taken in May 2016 and shows how adept garlic mustard is at being the first to germinate and bolt, before any other native plants have begun growing. The photo point on the right illustrates brown dead (hopefully from being sprayed) skeleton plants, as well as green rosettes (far left corner) still going strong up until the snow flies.

A separate document titled “UDAF 2016 Monitoring Results” and “SummitCoGarlicMustard\_2016” describe in greater detail the monitoring statistics and show visually the changes in cover class from May 2016 to October September 2016.

### Challenges and Goals for the future

The biggest challenge of 2016 appears to be that garlic mustard infestations are showing up in more and more locations. Many new large scale infestations are being found in neighboring counties, such as Utah County, and in remote and difficult to access locations (ie. Hi Ute Ranch in Summit County). **The scale of the problem is now not just a two county problem, but a statewide problem and will require additional funding, partnership, and coordination.** Mindy Wheeler noted that “we are finding that garlic mustard has proven to be quite adept at invading intact vegetation communities and appears to have a multitude of vectors that make it difficult to formulate a strategic plan. Several ‘new’ satellite populations as well as the large infestations found on Hi Ute Ranch has emphasized that it will be necessary to take more of a defensive approach to this weed. In particular, in order to prevent infestations on national forest lands as well as watershed lands, it will be necessary to use everything from large scale treatments, backpack sprayers for difficult to access areas to large volunteer pulling events to revegetation of treated areas. This will necessitate ongoing surveys, mapping and treatment. Of critical importance is to prevent the infestation on Hi Ute lands from jumping over adjacent ridges into Salt Lake County’s watershed lands as well as on National Forest lands nearby.”

In addition, the high number of private properties continues to be an issue that requires a large amount of coordination with the partners, PMG and the residents. Education of these residents, HOA’s, and additional partners is a critical part of the success of this project and yet it often is not implemented to the full extent simply because the scale of which is needed is outside of the scope of the current project partners and their capacity. In short, this project has now reached a statewide landscape level, and will require additional funding and coordination at a statewide level in order to contain known infestations.



## **Follow up and future control**

Overall, this project is finding success, in that after 4 years of treatment we see either a reduction in size or density in treated infestations, simply because they are treated twice a year, and we continue to deplete the seed source. It is also a success because we have been able to consistently work with the same private and public partners since the inception of this project in 2012, and continue that coordination and partnership through staff changes and turnover. It is the only large scale EDRR treatment of garlic mustard within these watersheds, and would not have taken place without the ISM grant funding. We are excited to continue this project, having now had a fourth year of treatment under our belts, and with three consecutive years of spring and fall treatments. We strongly feel that although the overall percentage cover of garlic mustard has been reduced at monitored locations below 5%, without consistent funding and annual treatment garlic mustard populations could easily recover and spread at an unprecedented rate. Annual treatment will be imperative in order to keep populations within a manageable level, and eradication unlikely. Future control plans include:

- Focus on developing a statewide garlic mustard program, with additional funding and coordination efforts.
- Focus on developing an adaptive approach which prioritizes high diversity habitat (Lamb's Canyon).
- Continue the successful strategy of both spring and fall herbicide treatment.
- Focus on new infestations in and contracting with additional consultants for remote pulling/ mapping.
- Continue to Involve and educate the whole community.
- Continued coordination between new partners on public land (Basin Rec and Open Space, Utah County).

## **Garlic Mustard Control Partners**

Thank you so much to our partners and sponsors for their contribution to this program. In particular, thanks to the Utah Department of Agriculture and Food for funding this project, and to Jan Reinhart for her help in monitoring. We appreciate her technical expertise in being able to quantitatively show the progress of treatments in 2016.

- Bonneville CWMA and Castleland RC&D
- Maria Barndt and Park City Municipal Corporation/ Park Department
- Patrick Nelson and Salt Lake City Public Utilities: Watershed Protection
- Sage Fitch and Salt Lake County Weed Control Program
- Dave Bingham and Summit County Weed Control Program
- Mindy Wheeler and the Summit Cooperative Weed Management Area
- Jan Reinhart and Utah Department of Agriculture and Food