

## **PNW Garlic Mustard Working Group 2019 Meeting Notes**

**Nov 7, 2019 (10am-2pm) at East Multnomah Soil & Water Conservation District (SWCD)**  
5211 N Williams Ave, Portland, OR 97217

**Remote attendees:** Joel Donnelly (Yamhill SWCD), Kyle Strauss (Rogue Basin Partnership/ Strauss Ecological Services), John Hudson (SE AK Watershed Coalition in Juneau), Sam Leininger (Clackamas SWCD).

### **In-Person attendees:**

*City of Portland, Bureau of Environmental Services:* Mitch Bixby, Monte Mattsson

*Clackamas SWCD:* Lindsey Karr, Courtney Gattuso

*Clark County Noxious Weed Control Board:* Justin Collell, Denielle Cowley, Chris Walker, Joyce Madriz, Kara Hauge, Cia Bywater, Jeff Duval, Harris Kid

*East Multnomah SWCD:* Chris Aldassy, Jon Wagner

*King County Noxious Weed Control Program:* Maria Winkler, Margaret Wagner, Sara Price

*Portland Parks & Recreation:* Nichole Linehan, Alex Martin (East), Charlie Nappi (West)

*Tualatin SWCD:* Tyler Pedersen, Olivia Hurd, Trevor Norman

*West Multnomah SWCD:* Michelle Delepine, Ari DeMarco

### **Roundtable Updates from the Field**

Tualatin SWCD -- Glyphosate and Triclopyr were used for >10 years by Clean Water Services (CWS) and now Tualatin SWCD (who took over managing the CWS sites) say they're seeing evidence of resistance, possibly to Vastlan and Rodeo. CWS used to do Rodeo in spring, then Garlon 3A once plants started to bolt and flower (Clark County uses Garlon 3A in very early spring on rosettes, and switches to glyphosate around the same time others report using glyphosate on early bolting/flowering plants). Overall reduction in patch sizes but finding new sites. North Bethany area - lots of development going on and finding garlic mustard (GM) in housing development sites. They're trying to do outreach to the developers before earth moving. Hand pulling on Miller Rd-- 2000 flowering plants pulled along the shoulder of the road. Gales Creek, North Johnson Creek, Abbey Creek, Rock Creek, Cedar Mill Creek, Fanno Creek, Sylvan Creek - focusing efforts here. 62 stream miles surveyed and ~4 net acres treated this year. In 2009 CWS - 55-60 net acres. Fall treatments seem necessary. Gales Creek - did fall treatment here along w/ KW. Planning on hand pulling this fall/winter at upper Gales Creek major population (near an airsoft course...summer camps...lots of public use...so hand pulling is maybe best here). Gales Creek Campground site -- maybe from ODOT fill or someone dumped yard waste. Next year they are thinking about switching back to Garlon 3A. Oregon Invasives hotline has brought new sites to their attention.

City of Portland (Bureau of Environmental Services) -- ~170 gross acres treated. Most work is on west side of Portland. Bulk of work on roadsides, esp arterial roads. Arterial roads seem largely under control. Secondary roads also look like they're under control. New sites being found where water is washing off roads onto properties. Big 10,000 sq ft site found a few years ago is looking good now. But, how do we find those sites? Especially when we aren't allowed to access and treat. Mitch Bixby waits until plants are well-bolted to start treating, because when he's tried to do it earlier in the year, he's revisited 1 month later and finds plants that were missed. Wishes he could visit more than 1x/year. Garlon 3A seems to quickly kill plants with siliques. Vastlan doesn't seem to do that and Mitch doesn't use it anymore. Hasn't been able to revisit sites more than once per year, but started fall treatments in 2019.

Hood River SWCD - 2 distinct patches over 4 landowners in Hood River Valley at ~2000 ft elevation. In an organic orchard, so they can't spray. In 2019, for the first time, landowners were ok w/ spraying outside of orchards as long as they use a 50' buffer (approved by Tilth--OK as long as residue isn't found on fruit). Survey ~250 acres. Relied on 1-year weed board grant in the past, but now secured 3 years of funding through Forest Service starting 2020! Uses Verde to handpull within the orchard boundaries; Kris says they are great at GM and totally worth paying for the drive time. ODA helped with surveys this year. They survey and treat last week of April/first week of May because they can only do 1 treatment per year. Densities have decreased pretty drastically. Feels like spraying is a bit of a risk anyways, since they can't follow up on efficacy. But, there are also risks of not getting all the roots if the timing of hand pulling is wrong. Ground squirrels are spreading GM! 4-6" green mulch layer from a specialized mowing tool used in the orchards has been incredibly effective at controlling GM. Organic orchards also have a machine that disturbs the top layer of soil in between tree rows (to keep rows clear for sprinklers, etc.; in non-organic orchards they spray it), and this seems to flush GM seedlings and then weed GM rosettes, which is helpful for control.

Clark Co. Vegetation Management - Positive results w/ fall applications, but new patches popping up. Reduction in densities in big sites. Policy changes -- can now enter properties to survey (after giving notice) and can do some sort of control on those. Mixed attitudes from landowners. So far they aren't allowed to re-visit and provide control for landowner, instead relying on landowner control. Field Inspection Program -- people call in for weed ID, or they review sites that have county pre-notification or pre-construction permits, and they use site visits to survey for GM as much as possible. County Parks -- have been installing boot brushes via Boy Scouts in Salmon Creek Greenway. Fall herbicide treatment: Garlon 3A + BroncMax (contains an ammonium sulfate\*). Spring herbicide treatment -- Garlon 3A (Feb to mid-April), then Roundup once it starts bolting/going to seed. Milestone and Capstone haven't been successful in spring treatments. Washington Cons Corps and temp staff used to handpull. No GM community handpull event because not enough GM to handpull and its also a huge vectoring risk. Early October -- seeing a couple flowering GM plants on disturbed areas, including on plants that previously flowered. -They start rosette treatments late Feb/early March. Garlon or glyphosate in the spring... then glyphosate once plants start to lengthen and bolt...then once flowers are on, they start hand pulling. Spray around 50-degree range.

\*BroncMax lowers pH of the water and helps leaves to absorb herbicide. Also used successfully w/ glyphosate+sufactant on reed canarygrass. TSWCD uses a mix of 2.5% Class Act with 1-1.5% Rodeo for effective control of purple loosestrife and reed canarygrass.. John Goetz III (CWS) is researching rates and timing of ammonium sulfate 1% glyphosate + 2.5%ClassAct seems the best. King Co has had good control w/ fall Milestone (but not in spring).

King Co. Noxious Weed Control Program - steep drainages going down into the Sound, but "so much" better than when Maria Winkler started controlling 17 years ago. In King County at the garlic mustard peak in 2011, the gross infested area was: 3.4 acres, with 48% cover/density. In 2018 gross infested area : 1.2 acres, with 11% cover/density.

Insignificant new sites found every year. Public weed reporting app/website (with photos!!) is helpful-- the county developed it <https://www.kingcounty.gov/services/customer-service/mobile-app.aspx> It works well ( isn't' shareable/open source) No new garlic mustard sites have been reported on it yet, but some existing sites were confirmed. The public are getting better at ID and the photo submit field has been helpful for other weed species and also for outreach/communication with those landowners who report it. Being able to spray since 2007 has made the most difference. Margaret Wagner works in riparian areas- they treat GM at knotweed sites in the late summer & fall using imazapyr at 1% with 1% AgriDex. Seattle parks properties are steep, loose soil, tough terrain. Need more of a "fine tooth comb" in those areas, i.e., people with a really good search image for it instead of Conservation Corps crews. New digital data collection protocol in the last couple years allows riparian teams and crews to share data. City of Seattle City doesn't allow glyphosate on city owned properties, triclopyr is still allowed. Fall spray seems very helpful. Sara works on Skykomish River-- found the first GM patch of rosettes on the side of a gravel road near a new fish chute (contaminated gravel, equipment?). She plans to revisit 3 times next year to prevent spread on Skykomish River. Mountain beavers spread GM a lot!

East Multnomah SWCD - >10year sites looking positive, esp in the last 5 years. Number of sites increasing, but density decreasing. ~1/2 acre net coverage, which is a huge decrease. ~250 properties. Jon thinks that fall sprays help a lot, especially in areas with native forbs. One large property with native forbs and lots of GM also has a landowner running cows through there... and EMSWCD doesn't have any teeth to stop him from doing that. Landowner doesn't want cattle eating certain species, like Delphinium, so isn't a huge fan of all the native forbs. Chris Aldassy talked with folks at ODA about potential biocontrol options -- dense areas look like good candidates for biocontrol research/release. Biocontrol might eat 50% of the seeds though, so...it's not going to be a silver bullet. Elk will also be moving seeds around from treatment area to wild areas. Chris thinks sniffer dogs might be a good option for those areas but he's not super hopeful about those wild areas. There is a site in the gorge that they hadn't seen GM for years and had considered retired...but after the fire, someone reported GM along the trail and it was in that exact same spot. It had been >8 years (since before Chris started at WMSWCD) since any GM was seen there. GM is super happy /huge plants in burned area.

West Multnomah SWCD - Treat ~280 sites a year. Density and net acres continue to go down (from 13 gross acres in 2018 to 9.8 gross ac 2019 and 30% avg density 2018; 23% avg density 2019). Most sites are relatively small, or have scattered plants, but require visits to numerous properties. A large 4+ ac site discovered outside the general treatment area in 2018 (via community member report) was delineated and appears isolated (likely introduced during home building).

Juneau - Western IPM Center gave John Hudson a grant to document the downtown Juneau infestation (one of two infestations in Juneau) and develop a management plan this year **and looking for advice**. There has been very spotty treatment of this site over the last 20 years. The area is 5.4 acres in size and consists of 50 parcels, most of them privately owned. 2,700 s.f. Of GM was documented in Aug. 2019. The other Juneau site is very small, on Forest Service land, and gets hand-pulled annually. John hasn't looked outside of the downtown site for satellite infestations. Second-year plants dominated areas without understory/overstory

canopy; plants growing in dense stands of thimble and salmonberry were largely first-year plants. The site is very steep, densely vegetated and unstable. Alaskan Invasive Species Partnership is widespread and active throughout AK, but Juneau support consists of John, 1 part-time Forest Service person, and occasional volunteers. **Next GM Working Group meeting should be in Juneau.**

Clackamas SWCD - About \_\_\_ sites total = ~40% increase in number of sites up the watershed. Downward trend in new sites (only 8 new sites). Thirty sites had no new plants this year! Island sites in the river (supposed source population) got treated 2nd year in a row. While a lot of good work appears to be making a difference, Sam and Lindsey feel the current level of treatment may not be sustainable (\$\$\$). Lots of small private props in Lake Oswego area new tech is working on. Sam reports their District budget will be increasingly strained, and scrutinized. Lindsey says there was high water and sediment in the early spring which may have killed the first flush of rosettes as well as spreading seeds... CSWCD gave up on Vastlan last year and is curious about who's still using it. Fewer new observations over the last 3 years. ~30 sites seem to have GM eradicated this year, they'll follow up on these if it seems needed. This is the 2nd year of Fall treatments in Clackamas basin where they're treating knotweed anyways, spraying GM with imazapyr but Lindsey doesn't have a good sense of the efficacy of that. Net acres: 63 ac. A couple sites take contractors >1 week. 8 new sites this year. Net acres: still increasing. Number of sites: increasing, but slowing down from earlier numbers. Courtney Gattuso-Sandy River sites -- mainly handpullable. New patches in high-traffic areas (trails, bike paths, trails to river, ROW areas), co-occurring w/ knotweed, policeman's helmet. Boot brushing should be done better. BLM manages trail system and will be putting in a bike wash station hopefully in 2020. 7 GM sites in Sandy Basin and her goal is to do both spring and fall treatments at those next year.

PP&R East - Did a lot of treatments this year but more satellite patches. More capacity this year allowed south section of Ross Island to be treated fairly comprehensively. North side of RI is now handpulled with WotE crew. Oaks Bottom Bluff has been targeted for treatment and density has been reduced. Updated mapping and new tech staff are promising for the future.

PP&R West - New tech helped but no positive or negative change overall. Visit GM sites 2x/year. For the first time this year, Charlie used glyphosate for the first application, then Vastlan in the fall (as opposed to Vastlan for both treatments). Public pushback r.e. glyphosate... but not too bad. Installed a couple new boot brushes: Riverview Natural Area and Marquam Nature Park, there are also 3 stations in Forest Park. Started using pesticide signs in multiple languages for the first time this year. **Biggest concern: Restore Forest Park** effort (to treat ALL ivy and blackberry, starting in Balch Creek) will open up a lot of ground for GM, shiny geranium, etc., to move in-- and the terrain there is super scary, loose, steep, contractors won't even work in some of those places.

PP&R Integrated Pest Management - closing down trailheads, changing signage, adding languages, looking at different herbicides that fit the site (including risk/benefit of product remaining in soil). Challenges to communicating risk of glyphosate with the public; worried about the public bringing glyphosate ban to city council. Haven't found any other promising herbicides for GM.

Rogue Basin Partnership - The RB Partnership works w/ 3 contractors of which Kyle is one. Kyle feels like they've identified all current sites. There have been 8 years of treatment so far, he's looking forward to seeing the seed bank diminish. 2010 - Valley of the Rogue State Park was 1st infestation. Downhill of Gold Hill past Grants Pass. 1 "new" infestation on Applegate trib

in 2016, landowners moved from Portland and Kyle thinks they brought it with them. Density is decreasing but still seeing new germinates come up. Triclopyr in the fall is a test treatment one of the other contractors is working on. Hopeful to keep getting funding.

Yamhill SWCD - two main known sites: 1, border w/ Clackamas, 2nd population in McMinnville discovered ~2016, still surveying, seems manageable. Working on getting permission from landowners. **Joel Donnelly is looking for advice on best time for surveying.** Cozine Creek - shrinking patch size but new patches being discovered in hard-to-access areas like steep, blackberry covered slopes. Overall patches seem smaller than elsewhere in the Portland Metro area. Joel is optimistic about eradication in Cozine Creek. East side of county -- doesn't know of any large patches. Joel will be doing some intensive surveys there in the early spring and should have a better sense of that later next year. Some prior concern about GM having been spread by logging equipment, but Joel hasn't seen evidence of that yet. County will be doing bridge replacement on Cozine Creek and there's a risk of equipment spreading seeds throughout the county-- the county doesn't have a lot of experience with cleaning/preventing spread, Joel will be reminding them of that...**folks in Bull Run watershed have experience with full vehicle washes, etc.**

General feelings: Thumbs cautiously optimistic, Thumbs @ 45 degrees up. High density sites are getting under control, but satellite patches are continually popping up. King County has seen huge improvements overall. Average: 4.0 (of 5.0 scale), or Thumbs 45° Up

Thumbs up: 8, Thumbs 45° Up: 9, Tepid (neither up/down): 6, Thumbs 45° Down: 1, Thumbs down: 0

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### **Highlights from North American Invasive Species Management Assoc (NAISMA) 2019 Conference**

Michelle met a grad student from UMass Stinson Lab (Laura Hancock) who has been doing a *lot* of data collecting and number crunching regarding GM and will be keeping in touch with her. Overall takeaway is that garlic mustard inside the forest cover will constantly be under threat if large, fecund & robust plants on forest edges are not dealt with. See the following link for the Stinson Lab Garlic Mustard Management Workshop Jan 2019  
<https://sites.google.com/umass.edu/stinsonlab/outreach?authuser=0>

There are 2 lines of thinking in the Northeast about GM control: A couple folks who've been working on it since the 90s say that there's a buildup of pathogens in the soil that will eventually lead to its decline and it's not worth trying to control it-- they are very vocal proponents of not managing. However, the eastern system is dominated by invasive earthworms and deer, whereas ours aren't to the same extent. And, the temporal nature of this decline is unknown (cyclical? temporary?). In contrast, people working on the ground in New York and the Midwest still seem to find value in managing GM to avoid permanent alterations of the system. Even in places like NY where GM has been for a long time, people are still actively managing GM instead of "giving up on it".

Long-term strategies might involve long-term treatment, and that's ok -- that's a viable strategy.

Reports from Nebraska that GM has erupted into the dominant plant in lots of areas over the past two years or so. Leading edge of invasion is SO important to control-- so maybe preventing spread in our area is more important than eradicating within a given zone.

In NY, they seem to have a goal of protecting super valuable habitats.

Mitch thinks that not having a super well-defined goal is OK for us here, since we haven't had a long time to figure out what's feasible. Climate change also presents a moving target. We don't have the luxury of doing 5-year studies, for example.

There was interest in following up with Victoria Nuzzo and Laura Hancock, to define possible future research studies. Possible sites include Corbett Containment Area, and Whatcom County (WA).

Question for the group - should we lay out our strategy and framework formalizing the experience in the room, building off our IPM document, as a reference document?

**Volunteers to draft/review this formal reference doc: Chris from WMSWCD, Maria from King Co., Mitch from Portland, Tyler from TSWCD, Lindsey from CSWCD, Charlie from PP&R, Michelle (WMSWCD).**

### **Best Management Practices and IPM Matrix Update**

*Mechanical* - no updates

*Manual* - could update the last sentence with a reference to what % of rosettes make it to the following year. Change language to "dig rosettes" not "handpull rosettes" (rosettes break off above the roots too easily). Recommend pulling in the spring instead of in the fall (*fall produces too much vegetable mass*)? Handpull and then spraying a pulled plant works to kill the plants? Handpulling and then pulling off flowers or siliques works ok too. Leaving bags to rot all summer also works ok but is pretty unpleasant.

*Chemical* - Mention visiting sites twice in the spring and give recommended treatment; maybe reference the IPM column a bit more clearly. **Mitch, Michelle, Clark Co., and Maria will help wordsmith this to make the timing more clear.**

*Timing* - Cutoff for glyphosate is agreed to be the end of flowering. EMSWCD sprays triclopyr until they start to see ridges/texture in siliques and that seems to be working well. TSWCD used Rodeo/Vastlan mix this year and timing seemed to be more vital than mix. Late April/early May spray sites did better...mid-May treatment sites need to be pulled. **TSWCD potted up some sprayed seed source (plants that had seed when they were sprayed with 2% Rodeo + 1.5% Vastlan) and will see how they do next year - there's interest in the results.**

*Triclopyr variations* - Mitch proposes giving Vastlan one more year before removing it from the recommended herbicide list. Olivia from TSWCD says **Garlon SDS label has been changed to Caution from Danger** and doesn't say that it causes permanent eye damage anymore. According to Mitch, Beth from ODA says it was the criteria for the warning sign that changed, not the research/formulation of Garlon. Michelle shared OSHA eyewash recommendations with the group. There was some concern that the "portable" stations are very heavy and not always practical for the work that we do.

EMSWCD uses 2% Garlon 3a followed up with handpull.

Herbicide rep Michelle spoke to says ester form of triclopyr in the winter provides good control (prob won't volatilize as much in February, and there are fewer forbs etc on the landscape).

Garlon4 (ester form) for ivy control in winter was super effective in one case, says Margaret. Techline put out an article comparing the difference, Garlon4 came out the best for GM (but Garlon3a wasn't compared). **Lindsey or Sam will send the article to the group?**

*Glyphosate + triclopyr mix* - If mixed well, no crystallization problems with glyphosate + triclopyr mixes. TSWCD uses a mix, King Co used to use a mix until Seattle said they couldn't. Maybe put this into a chemical recommendation?

*BroncMax* - Clark Co. uses 0/5oz/1 oz/gallon mixed in (you have to dilute it first tho bc it crystallizes with garlon). **Maria wonders if BroncMax w/ Vastlan would be helpful.**

*Pre-emergent herbicides* - King Co uses Gallery 75 dry flowable mixed w/ triclopyr in the fall. Milestone has some residual control in fall applications. It's about equal efficacy with mulching. Hard to remember to broadcast spray instead of spot spray. CSWCD has started a couple trials on other products to get residual controls – Escort (metsulfuron), Clopyralid and aminopyralid.

*Imazapyr* - Imazapyr 1% + rodeo 2% mix that TSWCD uses on knotweed may be effective for GM fall control, but they are only using 2% rodeo on larger, higher density garlic mustard sites (which showed potential resistance) due to residual properties of imazapyr and need to limit off-target damage to surrounding veg. **Change imazapyr to "0.5%-1%" concentration since there are different concentrations available.** Maria from King Co. says that imazapyr late summer to early fall spray on GM rosettes was key to Cedar River GM control.

*WeedSlayer* organic herbicide isn't well researched and even the reps don't know that much about it. Nichole Linehan followed up with ODA on WeedSlayer (25b label)-- ODA says you can use it in a natural area with "best judgement". None of the 25b label products are aquatic approved. Its also >\$500/gallon! Hood River SWCD tried using BurnOut (clove oil-based organic herbicide) and it wasn't at all worth it; you need the temperature and pH to be just right, too. TSWCD tried WeedSlayer in injectors (for knotweed) and says that it leaks out of the threads.

**Change phrasing on "milky" language to something more descriptive: "when seeds inside the seedpod are round and green" or "when you can start to see seeds forming inside seedpod" - add a photo?!**

**Kris from Hood River SWCD suggests compiling everyone's treatments, including things that didn't work and the best timing/bad timing of each product tried.**

*Other notes* - King Co tried torching, but didn't find it to be successful at all.

*IPM* - seeding with grass maybe doesn't suppress GM, but holds soil esp on steep slopes. EMSWCD uses blue wildrye. TSWCD uses blue wildrye and California and sitka brome. Clark CO uses annual rye (cheapest), romer's fescue, various blends, but doesn't work on flooded areas.

## **Prevention Strategies to Invest In**

Angie Kimpo has a boot brush in a plastic tote and she might've grown out seeds from it at some point

Mitch - hoping to start integrating GM mapping to larger construction process; worries that contractors are bringing/moving GM seed to construction sites.

Oregon Invasive Species Council Education and Outreach grant - applications due very early next year. **Michelle will forward the announcement when it's published.**

TSWCD working on putting together a training for landscaping companies. They have received reports of weeds being spread through potted nursery stock.

King Co has done some Spanish language workshops that seem to have been helpful.

Look at Strava, MapMyRun, other publicly posted "exercise tracking" apps, to see if people have been moving through infested areas. Maria has used Strava to do this in the past, it has informed Seattle parks in putting up exclusion fencing <https://www.strava.com/heatmap#14.00/-122.72476/45.52396/hot/all>

NextDoor, Facebook, Instagram, Twitter -- people interact with Clark Co. folks through these websites. Might need to be in "public safety" sector for NextDoor.

Pressurized water boot brushes advocated for.

People want more boot brush stickers!

**Oregon State Weed Board grants due Dec 15**, Beth Myers-Shenai and other ODA Weed Staff are happy to review applications a couple weeks prior to that.