



Department of
Environmental
Conservation

GIANT HOGWEED PROGRAM

2018 ANNUAL REPORT

DIVISION OF LANDS AND FORESTS

BUREAU OF INVASIVE SPECIES AND ECOSYSTEM HEALTH

Andrew M. Cuomo, Governor | Basil Seggos, Commissioner



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Year in Review

Through the ongoing work of the Department of Environmental Conservation (DEC) Giant Hogweed Program and our partners, the number of giant hogweed (GH) plants at many sites throughout New York State continues to decline.

During the 2018 season, crews surveyed 660 sites previously treated for GH infestations and found no GH plants. We designated 118 of these as eradicated—no GH plants for 3 consecutive years. This brings the total of eradicated sites to 623, up from 498 in 2017. Of all the sites that had been previously treated for infestation, 43 percent (1,071 sites) had no GH plants in 2018.

Of the sites that still have GH plants, 71 percent (1,005 sites) now have fewer than 100 plants and are considered small sites. Since small sites can be eradicated relatively quickly, we expect many more of these sites to have no GH plants in the next few years.

Larger sites are also responding well to control measures. Many larger sites that previously required herbicide treatment are now small enough to be treated by root cutting. Fewer sites have large flowering plants and, in general, sites are patchier than in previous years.

2018 Highlights

- 2,484 confirmed sites in 51 counties (new sites in Seneca and Richmond)
- 1,861 of the confirmed sites in the monitor or treatment stages
- 118 sites newly designated as eradicated for a total of 623 eradicated sites (no plants for 3 consecutive years)
- 2,076 sites (84%) have 0–99 plants
- 37.6 miles of stream surveyed, with 53 new sites found
- 223 new sites identified
- 1,993 sites visited
- 1,271 sites and approximately 678,000 plants controlled
- 2,428 calls and e-mails responded to by GH information line staff
- 675,968 visits to DEC's GH webpages

Cumulative Site Totals

- Total sites: 2,484
- Sites with no plants: 1,071
 - Eradicated sites (no plants for 3 consecutive years): 623
 - Monitor sites (no plants found or expected, but needs to be surveyed): 448
- Sites with plants: 1,413
 - 1–99 plants: 1,005
 - 100–399 plants: 205
 - 400 or more plants: 203

Staffing

Much GH Program work depends on seasonal staff. In 2018, we hired 19 seasonal staff. Field staff work full time for three to four months surveying sites for GH and controlling plants by root-cutting or applying herbicide. We commend their hard work, dedication, and professionalism. Ten staff were returning professionals. Their collective knowledge and expertise have been extraordinary assets to our program.

Partnerships

Collaboration improves success. The GH Program has strong working relationships with other organizations and groups. Program staff have trained staff from seven other organizations who have subsequently developed survey, control, and outreach programs for GH in their areas. These collaborative efforts resulted in 133 treatment or monitor sites. We truly appreciate these partnerships and control efforts as their assistance enables us to reach more sites.

Outreach

Outreach plays a significant part in the GH Program. We provide the public and our partners with information on how to identify, report, and safely and effectively control GH. We have also assisted agencies in Canada and other U.S. states in planning their own GH control and outreach programs.

In 2018, GH staff responded to 2,428 phone calls and e-mails to the GH information line. In addition, program staff and partners distributed more than 7,400 educational brochures, posters, and control guides.

The GH information webpages (www.dec.ny.gov and search “hogweed”) provide extensive information on this plant. The webpages are frequently accessed by people from New York State and around the world. People visited the webpages 675,968 times during 2018 and have visited them 3,147,419 times since their inception.

Looking Forward

New York State’s GH Program has been tremendously successful. The control of this plant is a personal safety issue that people care deeply about. We will continue to build upon past successes and look forward to eradicating many more GH infestations.

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Introduction

About Giant Hogweed

Giant hogweed (GH) is a significant public health and environmental issue. It is a public health hazard because it can cause severe burns when skin comes in contact with the sap and is then exposed to sunlight ([Figure 1](#)). It is an environmental problem because it is an invasive plant that threatens biodiversity by shading and out-competing native plants, which can also lead to soil erosion along slopes and riparian areas.

GH is listed by the federal government as a “noxious weed.” New York State law prohibits possession of GH with the intent to sell, import, purchase, transport, introduce, or propagate it.

GH (*Heracleum mantegazzianum*) is a monocarpic perennial, which generally flowers in its third or fourth year, sets seed, and then dies. The plant produces an average of 20,000 seeds that mostly fall within a few meters of the parent plant. Seedling mortality is generally high under these crowded conditions. The delayed flowering and limited dispersal (except where seed travel is assisted by people or water), in conjunction with very effective manual and chemical control methods, make eradication of GH a feasible goal for most sites in New York State.



Figure 1. Skin reaction to GH sap over a five-month period (Photo credits: Bob Kleinberg)



Figure 2. GH grows in a variety of settings: riparian areas, fields, forests, yards, parks, and roadsides.

GH grows in a variety of settings, e.g., riparian areas, fields, forests, yards, parks, and roadsides. Control is very manageable when the number of plants is low, especially before seeds have dropped. But since each adult plant produces an average of 20,000 seeds, a site can quickly grow from a few plants to hundreds within a short time. It is critical, therefore, that we deal with known sites as soon as possible. Landowners, as well as town, county, and state governments, need help and guidance in finding and dealing with GH.

DEC's Approach

DEC uses an integrated pest management strategy to control and eradicate GH from public and private lands in New York. The program uses manual and chemical control methods with an emphasis on minimal ecosystem impact from treatment. This strategy:

- Enables native plants and trees to reoccupy former GH sites;
- Increases biodiversity;
- Reduces impacts on streams and fisheries from soil erosion;
- Encourages outdoor recreation; and
- Reduces human health risks.

We have shown that repeated treatments over multiple years are effective at eradicating GH from entire sites. DEC's public awareness component improves understanding of GH's dangers and reduces human health risks through education and outreach. The GH Program has strengthened DEC's partnerships with other organizations to train and encourage them to help with outreach, survey, and control.

2018 Staff



Figure 3. 2018 DEC Giant Hogweed Program staff pictured: Naja Kraus, Andrew MoskaLee, Dylan Hurd, Jeff Fridman, Blake Matacale, Alex Wyatt, Sylvia Albrecht, Dan Waldhorn, Alex McGraw, Rose Louk, Joe Bodine, Joe Ordway, Lydia Martin, Brandon Anderson, Jerry Carlson, Shannon Booth, Erin Baccari, Nia Puccio, William DiRenzo, Bailey Whiffen, Bob Slocum, Patty Wakefield-Brown, Matthew Dieffenbach, Meaghan Schwartz. Not pictured: Brandon Swart.

DEC hired 19 seasonal staff for the 2018 field season (Figure 3). DEC offices in Avon, New Paltz, and Syracuse hosted field crews. Crews consisted of:

- Three one-person crews that used the root-cutting method at sites with less than 400 plants;
- Six two-person crews that applied herbicide at sites with more than 400 plants and applied herbicide or root-cut control at smaller sites at nearby locations. The 2018 program had six DEC-certified commercial pesticide applicators, three pesticide technicians, and six pesticide apprentices;
- One two-person stream survey crew that surveyed the upper reaches of streams with known sites to search for new GH sites; and
- Two information line staff who managed the information line, performed control on southeastern New York sites, and helped with the overall program.

Ten staff were returning professionals with prior experience working in the GH Program. Their knowledge, dedication, professionalism, and expertise have been extraordinary assets.

Six partner agencies conducted outreach, survey, and control for some or all of the GH sites within their boundaries:

- Adirondack Park Invasive Plant Program (APIPP) Partnership for Regional Invasive Species Management (PRISM)
- Capital/Mohawk PRISM
- Catskill Regional Invasive Species Partnership (CRISP) PRISM
- Lower Hudson PRISM
- Saint Lawrence Eastern Lake Ontario (SLELO) PRISM
- Oswego County Soil and Water Conservation District (OCSWCD)



Figure 4. 2018 PRISM partners

Training

DEC held GH trainings April 16–19 and May 21–24. We trained returning staff on all protocol and paperwork changes from last year. We trained new staff on the following topics:

- How to identify GH and its look-alikes
- Knowing the hazards of the plant and what to do if they encounter the sap
- How to safely and effectively apply root-cutting, umbel removal, and herbicide control methods
- Program protocols and paperwork
- Data collection methods, including the use of GPS, GIS, and associated applications
- Herbicide protocols and safety for herbicide crews

Funding

DEC hired 12 seasonal staff and 7 interns. The interns were hired through a cooperative program with the State University of New York College of Environmental Science and Forestry (SUNY-ESF). Nine of the seasonal staff and the seven interns were funded by various state funding sources, including the Environmental Protection Fund. Three seasonal staff were funded through a cooperative agreement between the United States Department of Agriculture (USDA) Natural Resources Conservation Service and the Finger Lakes Institute in conjunction with the Finger Lakes PRISM. DEC also received funding from the USDA U.S. Forest Service to help fund this program.

2018 Field Season Activities

Site Visits

During the 2018 field season, DEC and partner agency crews visited 1,993 of 2,083 total active sites (96%). A GH site is defined as a unique property (by tax parcel or owner) where GH plants have been confirmed.

The 2,083 active sites consisted of:

- 223 new sites confirmed in 2018
- 1,360 sites that had plants in 2017
- 405 monitor sites that had no plants in 2017
- 95 eradicated sites last visited in 2015

At each of the 1,993 visited sites, where applicable, crews:

- Obtained signed permission forms or verbal/email approval to access the property and perform control;
- Surveyed for GH plants and applied control methods to plants found;
- Photographed, recorded GPS points, created GIS polygons, and collected other current site information (e.g., plant count and property-owner contact information); and
- Recorded control information (e.g., time spent on control, number of plants root-cut or that had umbels removed, or amount of herbicide applied).

Control was performed by DEC and partner agency crews at 1,271 sites ([Table 1](#)). Crews used root-cut control at 745 sites and herbicide control at 438 sites, and both forms of control at 52 sites. At 36 sites, crews used only umbel control (flower/seed-head removal). Crews also performed umbel control at 83 herbicide sites (19%), 141 root-cut sites (19%), and 15 root-cut and herbicide sites (29%). Mowing was used at one site. Landowners and other entities performed controls at 38 sites and assisted DEC and partner crews at another 23 sites. One hundred and twenty-six sites were not controlled for a variety of reasons, the most common being no landowner contact or permission (87%). Permission for control was refused at 23 of these sites.



Photo credit: Rose Louk

Table 1. 2018 Control Methods, Sites, and Plants Controlled Per Agency

Agency	Root-Cut Control	Herbicide Control	Umbel Control	Mowing Control	Sites and Plants Controlled	Sites Surveyed (No Plants Found)
DEC	747 sites 16,240 plants	458 sites 657,249 plants	271 sites 2,837 plants	0 sites	1,189 sites 674,710 plants	610
APIPP	3 sites 4 plants	1 site 20 plants	0 sites	0 sites	4 sites 24 plants	3
CAPMO	5 sites 57 plants	0 sites	1 site 3 plants	0 sites	5 sites 57 plants	1
CRISP	5 sites 347 plants	0 sites	2 sites 3 plants	0 sites	5 sites 347 plants	4
Lower Hudson	6 sites 82 plants	2 sites 78 plants	2 sites 38 plants	0 sites	9 sites 161 plants	12
OCSWCD	0 sites	26 sites 2,394 plants	0 sites	1 site	27 sites 2,394 plants	20
SLELO	31 sites 360 plants	2 sites 84 plants	0 sites	0 sites	33 sites 444 plants	10
DEC & partner agency crews total	797 sites 17,090 plants	489 sites 667,330 plants	276 sites 2,881 plants	0 sites	1,271 sites 678,137 plants	660



Before umbel control



After umbel control



Before herbicide control



After herbicide control

Treatments

Root-cutting is typically used at smaller sites (less than 400 plants), at sites where owners refuse to allow chemical treatment, and at ecologically sensitive portions of larger sites. DEC and partner crews used root-cutting at 797 sites, totaling 17,090 plants root-cut on 15 acres. Sites solely controlled by DEC root-cutting averaged 33 minutes of control per site. Sites with DEC root-cutting plus umbel removal averaged 51 minutes per site. Sites that were root-cut or root-cut with umbel removal had an average of 22 plants per site. The largest number of plants root-cut at a site was 800.

Herbicide control is typically used at larger sites (more than 400 plants). Herbicides are also used at smaller sites directly adjacent to larger sites, at sites where root-cutting is ineffective due to rocky soil conditions, and at smaller sites with fewer than 100 plants that are assigned to an herbicide crew for efficiency reasons. Herbicide control by DEC and partner crews occurred at 489 sites with a total of 667,000 plants sprayed on 38 acres. DEC crews used the herbicide Accord XRT II (EPA Reg. No. 62719-556) at most sites, and Spectracide (EPA Reg. No. 9688-109-8845) at one site. Sites solely controlled by DEC herbicide control averaged 124 minutes of control per site. Sites with herbicide control and umbel removal averaged

112 minutes per site. Sites that received herbicide control or herbicide and umbel removal had an average of 1,583 plants per site. The largest number of plants sprayed at a single site was about 110,000.

Umbel control is used at sites where flower/seed heads (umbels) are present. DEC and partner crews cut and removed 2,881 umbels from 276 sites. Umbel removal was the only form of control at 36 of those sites. Crews are trained on the importance of collecting umbels. This form of manual control keeps seeds from spreading and is an extremely important part of control, especially at small sites and areas where seed can easily spread to new sites (e.g., along streams and roadsides).

Owners/others performed control at 61 sites using a variety of control methods. Of these sites, 44 percent were controlled using herbicide, 25 percent were controlled by root-cutting and/or umbel removal, 16 percent were controlled by mowing, and 15 percent were controlled by other or unknown methods. Twenty-three of these 61 sites were also controlled by DEC and partners. Control outcomes should be even more effective at sites where landowners or other organizations provide an additional round of control.



DEC staff cutting a GH plant root



DEC staff spraying GH with herbicide (Photo credit: Rose Louk)



DEC staff removing GH seed heads (Photo credit: Rose Louk)

Stream Survey

Hogweed infestations growing along streams and other waterways have a high risk of spreading seeds downstream, reducing the efficacy of control efforts and introducing the species to new areas. In order to proactively locate GH infestations currently unknown to our program, two crew members conducted surveys for GH along streams with known infestations along their length. These surveys were focused on streams in western New York in Erie, Wyoming, Livingston, and Monroe counties, and included streams with significant hogweed infestations along their banks. GIS analysis was used to identify the sections of streams most likely to have previously unidentified infestations based on the distribution of known locations, and parcels were then selected to be surveyed along these sections.

Over the course of the 2018 field season, the survey crew visited 317 properties and surveyed 37.6 miles of stream frontage for GH plants



DEC staff surveying along streams for GH plants
(Photo credit: Jeff Fridman)

(Table 2). The stream surveyors obtained written or verbal permission from landowners to walk the streamside and along the floodplain to identify and note the locations of any GH infestations found. New GH infestations were found on 76 of these properties, 53 of which were not known to have any hogweed present prior to the surveys. Newly discovered sites were added to the database and passed along to other crews for control as time allowed.

Table 2. 2018 Streams Surveyed

Stream Surveyed	# of Tax Parcels Surveyed	Miles Surveyed	# of Sites (Tax Parcels) with GH Plants Found
Buffalo Creek	85	12.6	36
Cazenovia Creek	60	4.3	3
Conesus Lake tributaries	36	5.2	9
Eighteen Mile Creek	51	5.1	17
Monroe County streams	33	2.0	4
Oatka Creek	40	5.0	4
Salt Creek	6	2.5	0
Springwater Creek	6	0.9	3
Total	317	37.6	76

Data Management

The 2018 field data was entered by field crews using a mobile app. The data was later checked for accuracy and entered into the statewide database. In 2018, 223 new sites were discovered (Figure 5) by control crews, by the stream survey crew, or through information line reports.

Information line staff and field crews obtained owners' names and contact information for new sites and, if missing, for existing sites. One staff person worked during the off-season to gather missing owner and contact information. Field crews are more efficient when they can easily contact landowners regarding future control work.

We have signed property permission forms for 1,789 sites (72%) allowing us access to survey for plants and perform control. Additional landowners have given verbal permission, which is sufficient for root-cut control and surveying; signed permission forms are necessary for herbicide control. All signed property permission forms have been scanned and saved in electronic site folders. Digital photos taken during crew visits and by information line callers were also saved in the site folders.

Currently, there are 623 eradicated sites (Figure 6) and 1,861 active sites in the treatment or monitor stages throughout 51 counties in New York State (Figure 7).



DEC staff surveying along streams for GH plants (Photo credit: Jeff Fridman)

New Giant Hogweed Sites Detected Per Year

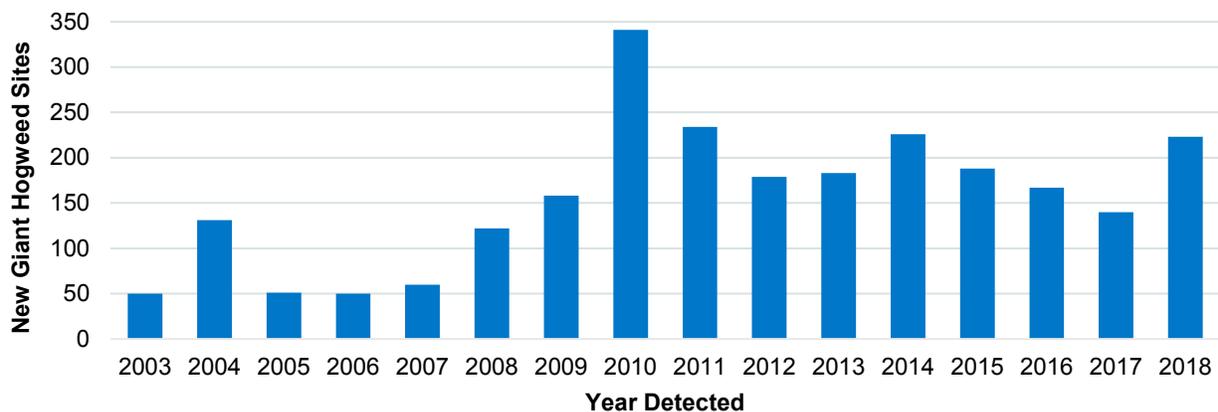


Figure 5. New sites detected per year

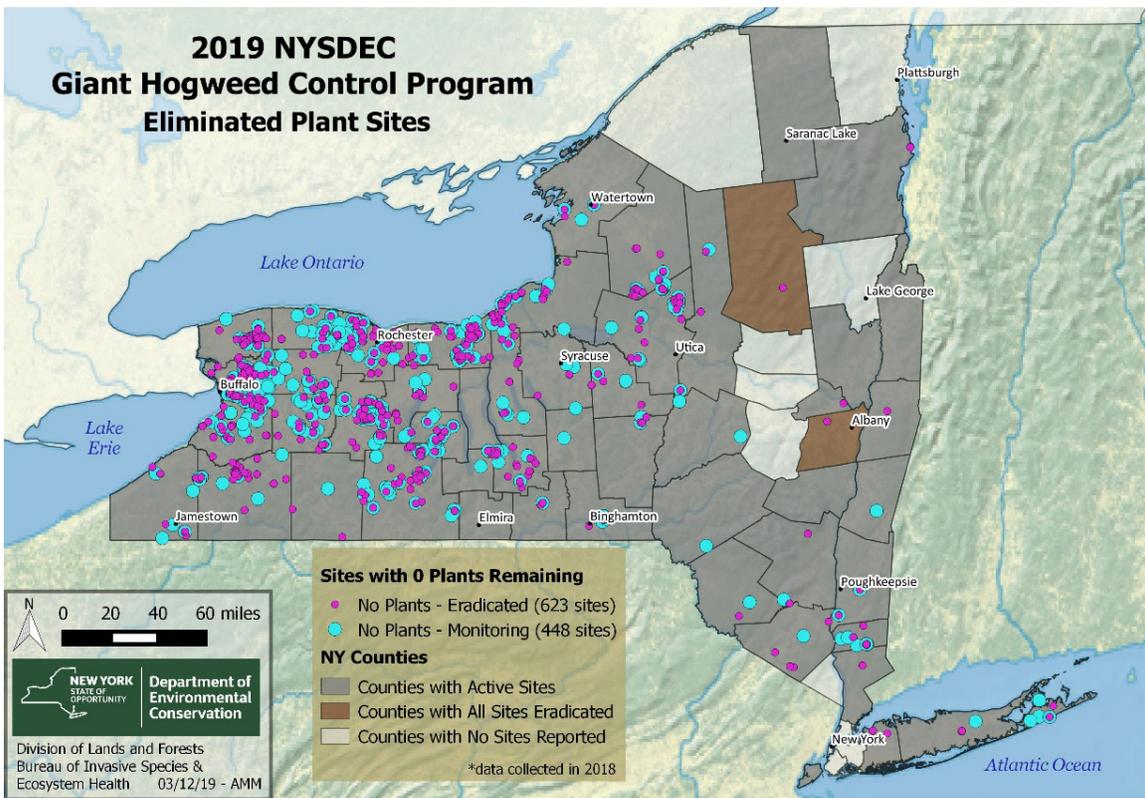


Figure 6. New York State giant hogweed sites with no plants (eradicated or still being surveyed). A site is considered eradicated after three consecutive years of surveying with no plants found during a site visit.

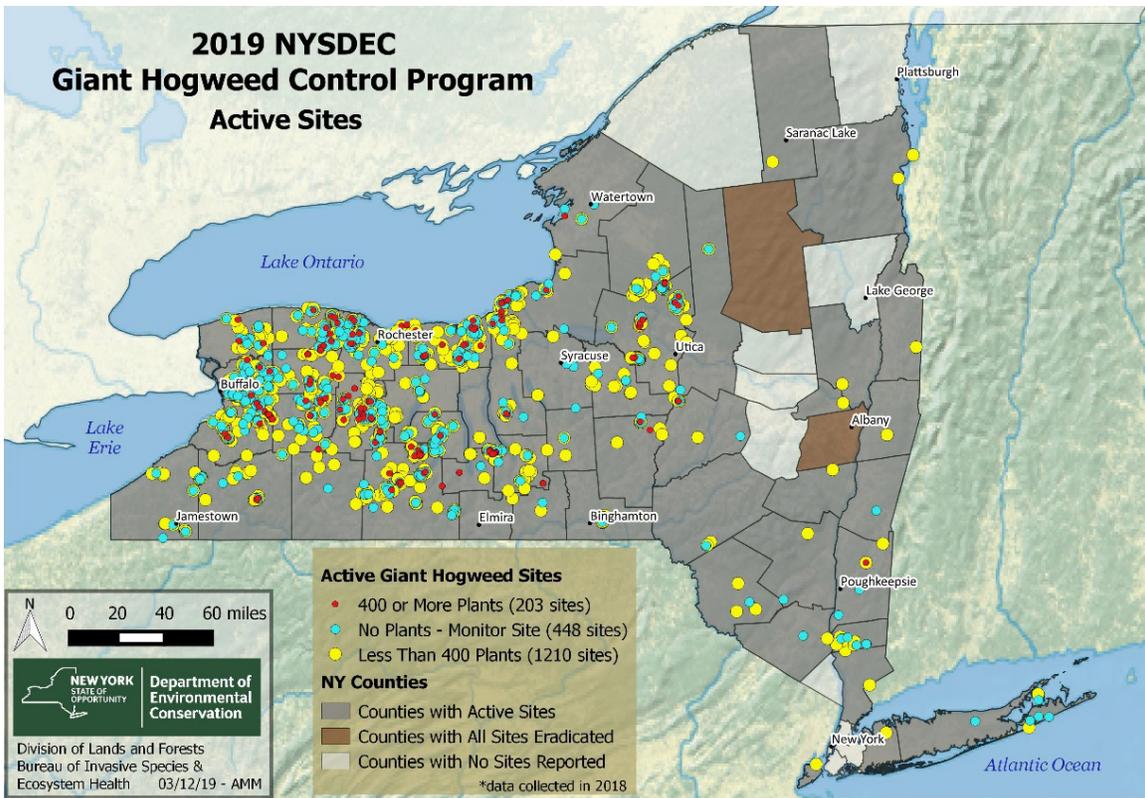


Figure 7. New York State active giant hogweed sites in treatment or monitor stages.

Control Effectiveness

DEC crews have greatly reduced the number of GH plants at many sites throughout New York State (Figures 4, 5 and 6). In 2018, crews found no GH plants at 1,071 properties that once had GH (Table 3), which means that 43% of all sites now have no GH plants.

We have found that small sites can be eradicated fairly quickly. Currently 1,167 active sites (63% of active sites) have fewer than 20 plants, and an additional 286 sites (15% of active sites) have 20–99 plants (Table 4).

Eradication is quick if there is no seed bank in the soil at the site. If seeds are present in the soil, control must continue yearly until all seeds have germinated and been controlled. Many of the small sites are now in the stage where we are controlling newly germinating plants from the seed bank. We should be able to remove the plants at these sites in the next few years.

Many larger sites that required herbicide treatment previously are now small enough to be reassigned to a root-cut crew. These sites are patchier than in prior years, and crews are seeing fewer large flowering plants as well.

Figure 8. Five photo examples of DEC giant hogweed control success

Site #373 - Wyoming County. This site is located behind a school and shows the amazing progress at a larger site after three years of herbicide control. There were 10,000 plants in 2008; in 2018 there were 14 plants root-cut.



2009 (5,500 plants)



2012 (382 plants)

Site #1867 - Cayuga County. This site has been controlled using herbicide starting in 2014 when there were 7,000 plants controlled. In 2018, after four years of control, 450 plants were controlled.



2013



2018

Site #579 - Livingston County. This site has been cooperatively controlled with the landowner since 2009, with no herbicide use permitted. In 2011, over 3,000 plants were root-cut. In 2018, 12 plants were root-cut



2012



2018

Site # 100 - Genesee County. This is a good example of the effectiveness of root-cut control and the importance of continued control to remove plants germinating from the seed bank. Plant numbers from 2008–2018: 425, 95, 35, 9, 0, 13, 3, 1, 0, 0, 0. Survey and control of this site continued until no plants were found for three consecutive years, and this site is now considered eradicated. As an added precaution, it will be visited again in 2021 and 2024.



2009



2018

Site # 849 - Broome County. This is a good example of the effectiveness of root-cut control at small sites with a limited seedbank. After three years of treatment (2011–2013), there were no plants found at this site in 2014, 2016, 2017, and 2018. One plant was controlled in 2015. Survey and control of this site continued until no plants were found for three consecutive years, and this site is now considered eradicated. As an added precaution, it will be visited again in 2021 and 2024.



2012



2017

Table 3. Sites per size class per year

Plants Per Site	0	1–99	100–399	400–999	1000+	Unknown	Total Number of Sites	Total Active Sites*
2018 season	1,071	1,005	200	93	109	6	2,484	1,861
2017 season	904	900	208	104	135	2	2,253	1,755
2016 season	823	892	191	73	127	10	2,116	1,729
2015 season	639	872	203	100	124	10	1,948	1,671
2014 season	501	793	214	116	108	28	1,760	1,521
2013 season	348	674	220	132	143	19	1,536	1,439
2012 season	339	563	172	105	135	35	1,349	1,252
2011 season	219	474	167	81	138	31	1,110	1,111
2010 season	139	414	119	91	113	68	944	944
2009 season	106	316	78	44	73	28	645	645
2008 season	64	155	85	38	77	78	497	497

Table 4. Sites per size class by county (2018 field data)

County	Sites w/ Plants	Sites w/o Plants	Eradicated (0 Plants for 3 Years)	Monitor (0 plants)	1–19 Plants	20–99 Plants	100–199 Plants	200–399 Plants	400–999 Plants	1000+ Plants	Unknown # of Plants
Albany	0	1	1								
Allegany	9	4	3	1	3	4	1	1			
Broome	10	19	11	8	8	1	1				
Cattaraugus	35	41	33	8	13	5	4	2	6	5	
Cayuga	67	34	21	13	36	9	4	8	4	6	
Chautauqua	22	16	10	6	11	8	2	1			
Chemung	1	0			1						
Chenango	10	7	5	2	4	2	1		2	1	
Columbia	0	1		1							
Cortland	2	2		2	1	1					
Delaware	2	1		1	1		1				
Dutchess	3	4	2	2	1			1		1	
Erie	233	174	92	82	139	47	15	6	11	15	
Essex	2	2	2		2						
Franklin	1	0			1						
Genesee	44	22	10	12	16	10	7		3	8	
Greene	1	0				1					
Hamilton	0	1	1								
Herkimer	2	7	5	2	1	1					

Table 4. Sites per size class by county (2018 field data)

County	Sites w/ Plants	Sites w/o Plants	Eradicated (0 Plants for 3 Years)	Monitor (0 plants)	1–19 Plants	20–99 Plants	100–199 Plants	200–399 Plants	400–999 Plants	1000+ Plants	Unknown # of Plants
Jefferson	4	7	4	3	1	2			1		
Lewis	31	20	16	4	25	5	1				
Livingston	125	74	43	31	45	26	13	17	9	13	2
Madison	9	6	3	3	5	3	1				
Monroe	110	94	55	39	57	20	12	7	7	7	
Nassau	1	2	2		1						
Niagara	34	56	40	16	15	10	4	2	2	1	
Oneida	88	41	20	21	38	15	9	8	7	11	
Onondaga	7	10	6	4	2	4	1				
Ontario	22	40	22	18	17	5					
Orange	2	4	3	1	2						
Orleans	36	35	14	21	19	6	1	4	5	1	
Oswego	42	27	17	10	25	10	2	1	3		1
Otsego	7	2		2	4		1		1	1	
Putnam	7	14	8	6	2	5					
Rensselaer	1	1	1			1					
Richmond	1	0			1						
Saratoga	3	0			3						
Schenectady	1	1	1		1						
Schuyler	35	10	7	3	9	8	4	6	3	5	
Seneca	1	0			1						
Steuben	132	83	42	41	70	21	9	9	10	11	2
Suffolk	2	11	6	5	2						
Sullivan	3	3	2	1	2		1				
Tioga	1	3	2	1				1			
Tompkins	51	26	21	5	20	13	3	4	3	8	
Ulster	1	3	2	1	1						
Washington	2	0			1	1					
Wayne	137	83	46	37	70	27	9	11	11	9	
Westchester	1	1	1		1						
Wyoming	52	43	23	20	32	9	2		3	5	1
Yates	20	35	20	15	9	6	1	1	2	1	
Grand Total	1413	1071	623	448	719	286	110	90	93	109	6

It is hard to judge control efficacy by using plant numbers following treatments since areas with seed banks will grow more plants from seeds in future years. After we control the larger plants at seed-bank sites, more and smaller plants grow from seed in the same space the following year. Even though control was effective and large plants were eliminated, the total number of plants for these sites will increase the following year. High plant numbers will likely continue until most seeds in the seed bank have germinated and are controlled, after which we will see numbers drop rapidly.

During the 2018 field season, we surveyed 660 sites previously treated for GH infestation and found no plants; 118 of these had no plants for three consecutive years, allowing us to designate them eradicated. This brings the total of eradicated sites to 623, up from 498 in 2017. We had 167 more sites without plants this year than last year. Of all sites that had been previously treated for infestation, 43 percent (1,071 sites) had no plants in 2018.

Of the 405 sites that started the 2018 field season as monitor sites (no plants found in previous year but not yet an eradicated site), 75% (304 sites) remained free of GH. Ten monitor sites were not visited because crews were unable to contact the landowners for permission to survey their property.

Eighty-seven percent of monitor sites where plants were found (88 of 101 sites) had fewer than 20 plants. Reappearance of GH indicates that seeds germinated from the seed bank, crews overlooked plants during prior visits, or seeds were spread from another site.

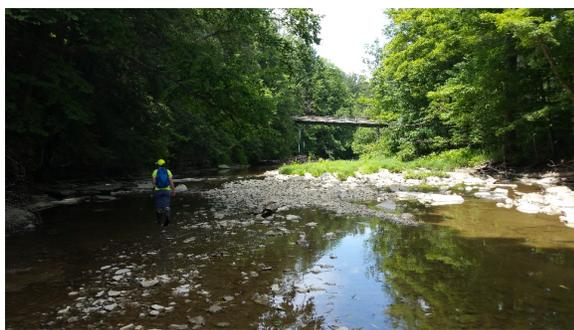


Photo credit: Jeff Fridman

It typically takes multiple years of control before we find no plants at a site. However, we occasionally find no plants at a site after just one year of control. Since the start of the GH Program, this has occurred 365 times. Eighty-four percent of these 365 sites originally had fewer than 20 plants. Small sites are easiest to eradicate due to having no seed bank or a small seed bank.

After we deem a site eradicated (no plants for three consecutive years), it becomes inactive. As an added precaution in case seeds germinate from a seed bank or new seeds spread to the site from another source (e.g., an upstream site), we now revisit inactive sites three years after they were last surveyed. Landowners are also provided with information to contact us should they notice new plants once we deem their property inactive.

In 2018, we surveyed 96 sites last surveyed in 2012–2015; plants were found and controlled at ten sites. This shows the importance of occasionally surveying inactive sites. Natural and human-assisted seed dispersal along dispersal corridors (e.g., streams and roads) have not stopped, so it remains likely that these sites have a higher probability of being infested again.



Outreach and Communications

Our program has a strong outreach component. We provide information to the public and partner organizations on how to identify and safely and effectively control GH. GH information line staff are busy all field season answering questions and identifying plants for the public. Every year, we incorporate lessons learned from previous seasons and improve our outreach materials. We offer training; distribute brochures, control guides, and posters; and post ample GH information on DEC's website. Our website information is accessed by people from around the world. We have also previously assisted agencies in Canada and other U.S. states in planning their own GH programs.

DEC's Giant Hogweed Information Line

DEC information line staff answered 1,423 calls and 1,005 e-mails from the public in 2018. One hundred and sixteen (116) new GH sites were confirmed from information line reports. Reports of possible GH locations made up 89 percent of the 2,428 calls and emails, around 3 percent of which were from landowners of established sites. The remaining 11 percent of calls and emails were for information about GH or other invasive species, not to report possible GH sites.

Of the portion of public calls and emails of possible GH sites, 28 percent were confirmed by information line staff as correctly identified, and 72 percent were determined to be look-alike plants, not GH. The most common look-alike plants reported were cow parsnip, wild parsnip, angelica, elderberry, wild lettuce, Queen Anne's lace, and pokeweed.

Of the portion of calls and emails where the reporter correctly identified GH, 38 percent were for new sites and 62 percent were for established/known sites.

Staff told callers about DEC's GH webpage and, if they were interested, sent them a GH brochure and control guide. We also sent callers with confirmed GH sightings on their properties a control guide and a license-to-enter-property form to sign and return.

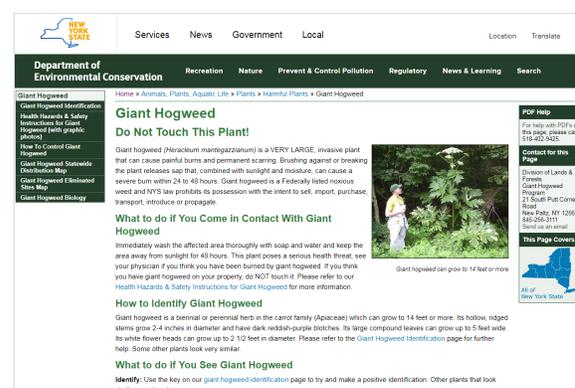
We confirmed sites by viewing photos of flowers, stems, leaves, and entire plants sent by callers via cell-phone texts, emails, or U.S. mail. In cases where callers were unable to provide photos, we reached out to Cornell Cooperative Extension (CCE) staff or PRISM partners for help. In many instances, CCE staff members, master gardeners, or PRISM staff were able to verify the sites in their counties for us.

Information line staff communicated newly confirmed sites to field crews, who incorporated them into their schedules if time allowed.

Giant Hogweed Maps

We posted updated maps on DEC's website www.dec.ny.gov/animals/39809.html. These maps reflect 2018 field data of known GH locations and locations where GH is no longer present in New York State (Figure 4 and 5). We passed along GH site information to the New York State invasive species database, iMapInvasives, to update GH data on their website (www.nyimainvasives.org).

Web Pages



The screenshot shows the DEC website page for Giant Hogweed. The page title is "Giant Hogweed Do Not Touch This Plant!". It includes a photo of a person standing next to a large plant, a map of New York State showing the distribution of Giant Hogweed, and various sections of text providing information on identification, control, and reporting.

DEC's GH webpage www.dec.ny.gov/animals/39809.html leads to a number of other webpages with information on GH identification, health hazards and safety instructions; control methods; maps; and links to articles, pest alerts, brochures, and non-DEC GH webpages. People visited DEC's GH webpages 675,968 times in 2018 and have visited them 3,147,419 since their inception.

Landowner Training

A small percentage of landowners assist with GH control. We train them to safely and effectively control the plant on their property. Though controlling GH requires caution, we emphasize that landowners can do it with proper training and protective clothing and equipment. We urge landowners to read and follow the health hazards and safety instructions in DEC's control guide prior to initiating control.

We advise owners to initially control plants early in the season when GH are small and less hazardous. Landowners usually live on the site where GH is growing, so we also advise them to control their GH patch many times each season. This stops latecomer seedlings from attaining a more dangerous size.

These best practices help keep plant numbers down and overall patch size small, leading to safer and speedier eradication. When training landowners, crews have learned to stress not only the health hazards of the plant but also the benefits of landowner control.

Partnerships

The GH Program has cultivated strong working relationships with Partnerships for Regional Invasive Species Management (PRISMs) and other organizations. DEC Program staff provided partner agencies with an initial training on GH identification, safe and effective control methods, and an overview of GH control program protocols and data collection. Partner agencies have been an integral part of the overall statewide program since 2012. In 2018, APIPP, Capital/Mohawk PRISM, CRISP, Lower Hudson PRISM, SLELO and OCSWCD conducted outreach, survey, and control for some or all of the GH sites within their boundaries.

Other partner agencies assisted with surveys, outreach, and program management:

- New York City Department of Environmental Protection (DEP) staff assisted by surveying their properties and neighboring areas in Putnam County for GH. Plants found were controlled by Lower Hudson PRISM staff and Trillium Invasive Species Management Crew.
- Finger Lakes PRISM, in conjunction with the Finger Lakes Institute, hired three staff to work with the GH control program and two staff to work on GH outreach using funding received through a cooperative agreement with the United States Department of Agriculture Natural Resources Conservation Service.
- The Western NY PRISM assisted with surveys and outreach.

As resources and interest allow, we work with state, county, town, and village highway departments. Many of them are concerned about how GH will affect the safety of their workers or park visitors. We train them to safely control GH, assign sites for them to control, coordinate primary and follow-up control, and join forces to control some of the larger sites together. When GH infestations occur on state, county, town, and village park land, we coordinate control efforts with park staff and, in some cases, we control the site for them. Control outcomes are more effective at sites where a partner agency or landowner provides an additional round of control.

Presentations and Interviews

Newspaper or television reporters interviewed GH staff more than twenty times during the 2018 field season. Staff also gave more than 20 presentations. Local interest is evident in the numerous interviews, special reports, and solicited presentations on television, radio, internet and print media, and at technical symposia and workshops since we started the program. New York's GH Program has also previously had national and international radio and television exposure. England, India, and Canada have interviewed GH staff for their national news, which dramatically increased public attention to the program's efforts and achievements. In addition, greater public awareness has led to us finding more small infestations at earlier stages.



Conclusion

Unlike many invasive species, we can potentially eradicate GH from most sites in New York State. Since each mature plant can produce an average of 20,000 seeds annually, consistent and continuous efforts are required to reach this goal. DEC and partner agency efforts have eliminated GH from 623 of the 2,484 known sites to date. An additional 448 sites had no GH plants in 2018. There were a total of 1,071 sites (43%) with no GH plants in 2018.

Numbers of mature plants at treated sites have dropped dramatically. New sites are identified each year because of public outreach efforts. Based on feedback from the public, this may be one of the most well-known invasive species in the state. The added use of partners for outreach and treatment activities increases the annual impact.



Appendix A

History of New York's Giant Hogweed Program

Starting in 1998, USDA, NYS Department of Agriculture & Markets (NYSDAM), and Cornell Cooperative Extension surveyed for this weed in New York through USDA's Cooperative Agricultural Pest Survey (CAPS) Program. CAPS led to the detection of GH in approximately half the state's counties, with most detection records coming from Western New York.

In 2006–2007, NYSDAM maintained the GH information line. DEC crews visited and confirmed reported GH sites and updated site information on known sites. A GH site is defined as a unique property (by tax parcel or owner) where GH plants have been confirmed. In 2007, property ownership information was also gathered by DEC using GIS data and an outreach mailing. In 2007, we also applied for and received a 2ee exemption letter allowing us to use the herbicide Rodeo for GH control.

DEC implemented manual control of GH plants starting in 2008 with three crews hired to control GH plants by root-cutting. DEC also began maintaining the GH information line at this time. In 2009, two crews were hired to control smaller sites using manual root-cutting, and one crew was hired to control larger sites using herbicide.

In 2010 and 2011, DEC received an American Recovery and Reinvestment Act (ARRA) grant, allowing the GH Program to double in size. Five

crews in 2010 and six crews in 2011 were hired to use either manual or chemical control tactics. In 2011, we applied for and received a 2ee exemption letter allowing the use of additional herbicides for GH control. We also applied for and received a statewide general wetland permit in 2011 which allows us to use herbicide to control GH in DEC-regulated wetlands and their regulated adjacent areas.

From 2012–2018, state funds were used to hire from six to nine control crews per season. USDA's Forest Service supplied partial GH Program funding from 2013–2015 through a Competitive Allocation Request Proposal (CARP), and from 2016–2018 through a Landscape Scale Restoration (LSR) grant. Starting in 2012, four partner organizations agreed to control GH sites within their boundaries: APIPP, CRISP, SLELO, and OCSWCD. In 2014 the Lower Hudson PRISM joined the statewide GH control effort. In 2015, the Capital Mohawk PRISM joined the statewide control effort. In 2016–2018, the Finger Lakes PRISM, in conjunction with the Finger Lakes Institute, hired three staff to work with the GH control program and two staff to work on GH outreach using funding received through a cooperative agreement with the USDA's Natural Resources Conservation Service. [Table 5](#) and [6](#) show GH Program accomplishments from 2006 to 2018.

Table 5. DEC Giant Hogweed Program Control and Surveying Accomplishments

Year	# of Sites Root-cut Controlled	# of Plants Root-cut Controlled	# of Sites Herbicide Controlled	# of Plants Herbicide Controlled*	# of Sites Surveyed** (No Plants Found)	# of New Sites Found
2018	797	17,090	489	667,330	660	223
2017	786	26,214	453	642,000	604	140
2016	812	34,995	391	563,000	620	167
2015	761	34,422	444	454,000	448	188
2014	556	22,255	551	397,000	354	226
2013	593	43,023	486	637,000	251	183
2012	494	38,781	347	375,000	282	179
2011	538	73,793	270	1,482,000	204	234
2010	402	39,411	210	1,177,000	139	341
2009	195	13,354	146	871,000	106	158
2008	130	10,558	N/A	N/A	64	122
2006/2007	N/A	N/A	N/A	N/A	N/A	60

*Starting in 2012, we used a different but more consistent method of calculating the number of plants controlled by herbicide to allow for better comparison to future plant counts. 2012's and later calculations are based on the amount of herbicide used; prior year plant counts were calculated using crews' plant density estimates.

**Surveyed sites have had prior control, but no GH regrowth/plants found during the latest yearly field season's surveying visit. After three consecutive yearly visits with no plants found, a site is deemed eradicated.

Table 6. DEC Giant Hogweed Program Outreach Accomplishments

Year	Information Line Calls	Information Line Emails	Website Visits
2018	1,423	1,005	675,968
2017	635	471	205,857
2016	945	1,006	326,918
2015	1,099	1,315	535,516
2014	1,019	1,472	642,798
2013	592	801	345,665
2012	967	1,045	65,044
2011	1,976	861	307,444
2010	912	237	25,066
2009	660	N/A	10,770
2008	200	N/A	6,373

Appendix B

Historical Funding

Funding for this program has come from a variety of sources since its inception:

- American Recovery and Reinvestment Act (ARRA)
- United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Plant Protection and Quarantine
- USDA Forest Service
- NYS Environmental Protection Fund
- NYS Invasive Species Coordination Unit
- NYS Department of Health

Appendix C

Additional Giant Hogweed Data

Table 7. Sites Per Size Class by DEC Region (2018 Field Data)

DEC Region	Sites w/ Plants	Sites w/o Plants	Eradicated (0 Plants for 3 years)	Monitor 0 Plants	1–19 Plants	20–99 Plants	100–199 Plants	200–399 Plants	400–999 Plants	1000+ Plants	Unknown # of Plants
1	3	13	8	5	3						
2	1	0			1						
3	17	29	18	11	9	5	1	1		1	
4	12	7	3	4	6	2	2		1	1	
5	8	3	3		7	1					
6	124	73	45	28	65	22	11	8	8	10	
7	200	136	86	50	101	44	12	14	12	16	1
8	664	476	259	217	314	129	56	56	50	55	4
9	384	334	201	133	213	83	28	11	22	26	1
Grand Total	1413	1071	623	448	719	286	110	90	93	109	6

Table 8. Sites Per Size Class by PRISM (2018 Field Data)

PRISM	Sites w/ Plants	Sites w/o Plants	Eradicated (0 Plants for 3 years)	Monitor 0 Plants	1–19 Plants	20–99 Plants	100–199 Plants	200–399 Plants	400–999 Plants	1000+ Plants	Unknown # of Plants
APIPP	4	8	7	1	3	1					
Capital Mohawk	9	6	4	2	6	3					
CRISP	13	7	3	4	8		3		1	1	
Finger Lakes	740	526	304	222	355	146	59	64	51	61	4
Long Island	4	13	8	5	4						
Lower Hudson	13	25	15	10	6	5		1		1	
SLELO	165	95	57	38	89	32	12	9	11	11	1
Western NY	465	391	225	166	248	99	36	16	30	35	1
Grand Total	1413	1071	623	448	719	286	110	90	93	109	6

Table 9. Sites Per Size Class for 2011–2018

Year	Sites w/ Plants	Sites w/o Plants	Eradicated (0 Plants for 3 years)	Monitor 0 Plants	1-19 Plants	20-99 Plants	100-199 Plants	200-399 Plants	400-999 Plants	1000+ Plants	Unknown # of Plants
2018	1413	1071	623	448	719	286	110	90	93	109	6
2017	1349	904	498	406	645	255	94	114	104	135	2
2016	1293	823	387	436	627	265	99	92	73	127	10
2015	1309	639	277	362	586	286	105	98	100	124	10
2014	1259	501	239	262	516	277	116	98	116	108	28
2013	1188	348	149	199	419	255	119	101	132	143	19
2012	1010	339	97	242	317	246	83	89	105	135	35
2011	947	219	55	164	310	220	88	79	81	138	31

Table 10. Sites and Plants Controlled by DEC/Partner Agencies 2012–2018

Year	Sites Controlled by DEC/Partner Agency	Plants Controlled by DEC/Partner Agency
2018	1,271	678,000
2017	1,233	668,000
2016	1,175	598,000
2015	1,180	489,000
2014	1,102	419,000
2013	1,067	680,000
2012	869	415,300

Table 11. Average Plant Number and Control Time at Root-Cut and Herbicide Sites 2012–2018

Year	Average Plant Number at Root Cut Sites	Average Plant Number at Herbicide Sites	Average Control Time at Root-Cut Sites* (min)	Average Control Time at Herbicide Sites* (min)
2018	22	1,583	33	124
2017	37	2,045	37	105
2016	41	1,741	43	148
2015	46	1,097	30	97
2014	39	824	30	76
2013	71	1,547	50	91
2012	79	1,084	51	91

*Average time for sites without umbel removal

Appendix D

Long-Term Conservation Goals

Eliminate GH from New York

Benefits: Increase plant diversity and decrease soil erosion. GH is an early colonizer that can quickly establish itself on exposed sites in riparian areas, fields, forest edges, wetlands, roadsides, and trails. Its rapid growth and broad leaves shade out native and desirable plants. Removing GH will allow other preferable species to grow and restore plant diversity at GH-colonized sites. Riparian areas and steep slopes with GH infestations are also prone to increased erosion as the large plants die back in the fall and expose large areas of bare soil. In many of our important fishery streams, bank erosion can be a critical factor threatening spawning beds. Controlling GH infestations on these sites will enable native plants to reoccupy and stabilize slopes, reducing sediment delivery to important fish habitat.

Benefits: Reduce human health risks. GH infestations in important recreation access areas, such as roads, trails and streambanks, significantly threaten public health and the quality of recreational experiences. Contact with the plant's sap can lead to severe burns. Children are particularly susceptible, as they find the large plants with hollow stalks interesting to play with. We have targeted all infested sites near locations where children live or visit, such as schools, daycares, playgrounds, and homes, as top priority for treatment and eradication. Recreational areas like fishing access sites, parks, campgrounds, nature centers, hiking trails, mini-golf courses, wildlife management areas, and sports fields are also targeted. Controlling GH and increasing awareness of its dangers will minimize the health risks to the public and return the sites to a state where people can safely resume recreation.



Bare soil underneath GH



Maintain and improve public awareness of GH's dangerous nature

Benefits: Reduce human health risks and improve GH infestation reporting. One of the major impediments to avoiding GH exposure is lack of knowledge of the plant's dangerous nature. Describing what GH looks like, how to distinguish it from similar plants, and how attending to sap exposure immediately can prevent serious burns are vital parts of our outreach effort. We will reduce human health risks from GH infestations through education and outreach efforts designed to:

- Describe how GH can cause harm;
- Enable people to properly identify GH and look-alike plants;
- Describe appropriate avoidance techniques;
- Describe personal safety clothing and equipment for avoiding injury while working near or controlling GH; and
- Describe treatment techniques and methodologies that minimize harm when people touch GH and are exposed to the sap.



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