



Department of
Environmental
Conservation

Giant Hogweed Program

2021 ANNUAL REPORT

DIVISION OF LANDS AND FORESTS

BUREAU OF INVASIVE SPECIES AND ECOSYSTEM HEALTH

Kathy Hochul, Governor | Basil Seggos, Commissioner



GIANT HOGWEED PROGRAM
2021 ANNUAL REPORT

Division of Lands and Forests
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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 2021 season, crews surveyed 930 sites previously treated for GH infestations and found no GH plants. We designated 186 of these as eradicated—no GH plants for 3 consecutive years. This brings the total of eradicated sites to 929. Of all the sites that had been previously treated for infestation, 54% (1,465 sites) had no GH plants in 2021.

Of the sites that still have GH plants, 72% (911 sites) 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.

2021 Highlights

- 2,726 confirmed sites in 52 counties
- 1,795 of the confirmed sites are in the monitor or treatment stages
- 186 sites newly designated as eradicated, for a total of 929 eradicated sites (no plants for 3 consecutive years)
- 2,376 sites (87%) have 0–99 plants
- 5.7 miles of stream surveyed, with 9 new sites found
- 56 new sites identified
- 2,017 sites visited
- 1,039 sites and approximately 252,000 plants controlled
- 1,531 DEC staff hours spent at GH sites
- 766 calls and emails responded to by GH information line staff
- 241,944 visits to DEC's GH webpages

Cumulative Site Totals

- Total sites: 2,726
- Sites with no plants: 1,465
 - Eradicated sites (no plants for 3 consecutive years): 929
 - Monitor sites (no plants found for 1 or 2 years): 536
- Sites with plants: 1,261
 - 1–99 plants: 911
 - 100–399 plants: 165
 - 400 or more plants: 185

Staffing

Much GH Program work depends on seasonal staff. In 2021, 21 seasonal field staff were hired. Field staff work full time for three to four months contacting landowners, surveying sites for GH, and controlling plants by root-cutting or applying herbicide. We commend their hard work and dedication. Nine 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 initially 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 236 hours spent at 143 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 states in planning their own GH control and outreach programs.

In 2021, GH staff responded to 766 phone calls and emails to the GH information line. In addition, program staff and partners distributed more than 2,243 educational brochures, posters, and control guides.

The GH information webpages (visit 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 241,944 times during 2021 and have visited them 3,830,609 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.

Table of Contents

Year in Review.....	ii
Introduction.....	1
2021 Staff.....	3
2021 Field Season Activities.....	5
Control Effectiveness.....	11
Outreach and Communications.....	17
Conclusion.....	20
Appendix A.....	21
Appendix B.....	23
Appendix C.....	24
Appendix D.....	26

Tables and Figures

Table 1. 2021 Control Methods, Sites, and Plants Controlled Per Agency.....	6
Table 2. 2021 Streams Surveyed.....	8
Table 3. Sites Per Size Class Per Year.....	13
Table 4. Sites Per Size Class by County (2021 field data).....	14
Table 5. DEC Giant Hogweed Program Control and Surveying Accomplishments.....	22
Table 6. DEC Giant Hogweed Program Outreach Accomplishments.....	22
Table 7. DEC Giant Hogweed Program Stream Survey Accomplishments.....	23
Table 8. Sites Per Size Class by DEC Region (2021 Field Data).....	24
Table 9. Sites Per Size Class by PRISM (2021 Field Data).....	24
Table 10. Sites Per Size Class for 2011–2021.....	25
Table 11. Sites and Plants Controlled by DEC/Partner Agencies 2012–2021.....	25
Table 12. Average Plant Number and Control Time at Root-Cut and Herbicide Sites 2012–2021.....	25
Figure 1. Skin reaction to GH sap over a five-month period.....	1
Figure 2. GH grows in a variety of settings: riparian areas, fields, forests, yards, parks, and roadsides.....	2
Figure 3. 2021 DEC Giant Hogweed Program staff.....	3
Figure 4. 2021 Partners that conducted GH control.....	4
Figure 5. New sites detected per year.....	9
Figure 6. New York State giant hogweed sites with no plants.....	10
Figure 7. New York State active giant hogweed sites in treatment or monitor stages.....	10
Figure 8. Five photo examples of DEC giant hogweed control success.....	11
Figure 9. Most common plants reported to the information line.....	17

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 that 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.



Giant hogweed plants can grow up to 14 feet tall.



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 people's 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.

2021 Staff

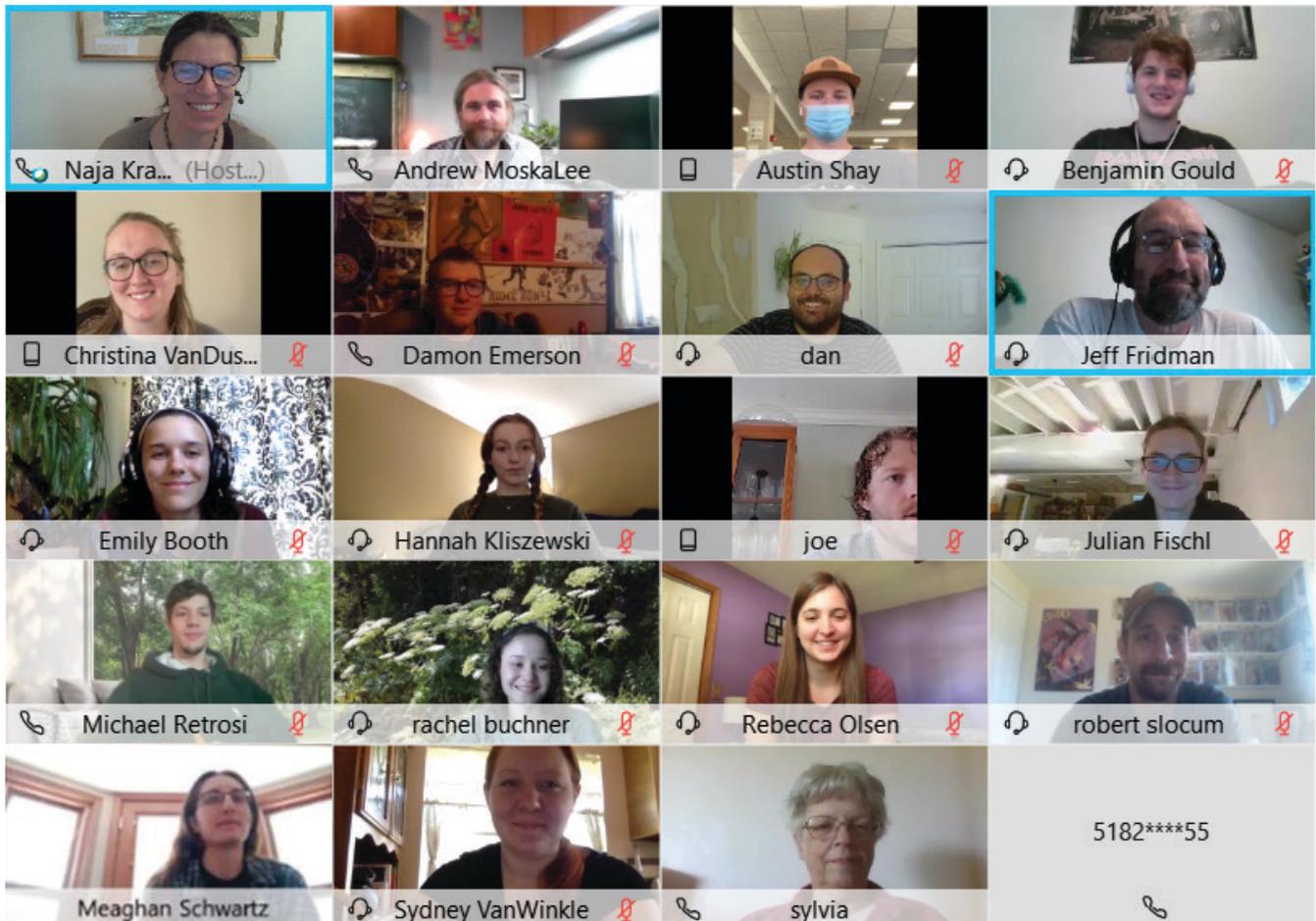


Figure 3. 2021 DEC Giant Hogweed Program staff: Naja Kraus, Andrew MoskaLee, Austin Shay, Benjamin Gould, Christina VanDusen, Damon Emerson, Dan Waldhorn, Jeff Fridman, Emily Booth, Hannah Kliszewski, Joe Bodine, Julian Fischl, Michael Retrosi, Rachel Buchner, Rebecca Olsen, Bob Slocum, Meaghan Schwartz, Sydney VanWinkle, Sylvia Albrecht. Not pictured: Steven Herzberg, Jay Kaplewicz, Jack Phillips

DEC hired 21 seasonal staff for the 2021 field season (Figure 3). DEC offices in Avon, New Paltz, and Syracuse and Knox Farm State Park hosted field crews. Crews consisted of:

- Five 1-person crews and three 2-person crews that used the root-cutting method at sites with fewer than 400 plants;
- Four 1-person crews and two 2-person crews that used the root-cutting method at small sites and also applied herbicide at sites with more than 100 plants. The 2021 program had six DEC-certified commercial pesticide applicators, two pesticide technicians and three pesticide apprentices; and
- Two information line staff who managed the information line, performed control on southeastern New York sites, and helped with the overall program.
- Nine staff were returning professionals with prior experience working in the GH Program. Their knowledge, dedication, and expertise have been extraordinary assets.

Six partner agencies (Figure 4) 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 Region 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)

Funding

DEC hired 11 seasonal staff and 8 interns that were funded by various state funding sources, including the Environmental Protection Fund. The interns were hired through a cooperative program with the State University of New York College of Environmental Science and Forestry (SUNY-ESF). Two 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 Forest Service to help fund this program.



Figure 4. 2021 partners that conducted GH control

2021 Field Season Activities

Site Visits

During the 2021 field season, DEC and partner agency crews visited 2,014 of 2,295 total active sites (88%). Crews spent 1,768 hours at these sites implementing GH surveys and controls. A GH site is defined as a unique property (by tax parcel or owner) where GH plants have been confirmed.

The 2,014 active sites consisted of:

- 1,032 of 1,195 sites that had plants in 2020;
- 642 of 706 monitor sites that had no plants in 2020;
- 296 of 338 eradicated sites last visited in 2014, 2015, 2017, and 2018; and
- 44 of 56 new sites confirmed in 2021.

At each of the 2,014 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-site, number of plants root-cut or that had umbels removed, or the amount of herbicide applied).

DEC and partner agency crews performed control at 1,038 sites (Table 1). Crews used root-cut control at 675 sites, herbicide control at 316 sites, and both forms of control at 24 of these sites. At 24 sites, crews used only umbel control (flower/seed-head removal). Crews also performed umbel control at 82 herbicide sites (26%), 166 root-cut sites (25%), and 6 root-cut and herbicide sites (25%).

Landowners and other entities performed controls at 18 sites and assisted DEC crews at another 4 sites. Three-hundred and two active sites were not monitored or controlled, the most common reason being no landowner contact or permission (53%). Permission for control was refused at 39 of these sites.

Table 1. 2021 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	681 sites 16,816 plants	307 sites 220,860 plants	267 sites 2,977 plants	0 sites	988 sites 238,163 plants	838
APIPP	6 sites 15 plants	0 sites	1 site 1 plant	0 sites	6 sites 15 plants	1
Capital Region	7 sites 639 plants	0 sites	3 sites 10 plants	0 sites	7 sites 639 plants	6
CRISP	3 sites 81 plants	0 sites	1 site 5 plants	0 sites	3 sites 81 plants	5
Lower Hudson	1 site 1 plant	5 sites 7,038 plants	3 sites 26 plants	0 sites	6 sites 7,039 plants	13
OCSWCD	0 sites	22 sites 6,330 plants	3 sites 31 plants	0 sites	22 sites 6,330 plants	29
SLELO	1 site 1 plant	6 sites 83 plants	0 sites	0 sites	7 sites 84 plants	38
DEC & partner agency crews total	699 sites 17,553 plants	340 sites 234,311 plants	278 sites 3,050 plants	0 sites	1,039 sites 252,351 plants	930



Before umbel control



After umbel control



Before herbicide control



After herbicide control

Treatments

Root-cutting is typically used at smaller sites (fewer 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 699 sites, totaling 17,553 plants root-cut. Sites solely controlled by DEC root-cutting averaged 45 minutes of time on site. Sites with DEC root-cutting plus umbel removal averaged 112 minutes on site. Sites that were root-cut or root-cut with umbel removal had an average of 25 plants per site. The largest number of plants root-cut at a site was 700.

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 340 sites, with a total of 234,311 plants sprayed. DEC crews used the herbicide Accord XRT II (EPA Reg. No. 62719-556). Sites solely controlled by DEC herbicide control averaged 102 minutes of time on site. Sites with herbicide control and umbel removal averaged 248

minutes on site. Sites that received herbicide control or herbicide and umbel removal had an average of 727 plants per site. The largest number of plants sprayed at a single site was about 7,192.

Umbel control is used at sites where flower/seed heads (umbels) are present. DEC and partner crews cut and removed umbels from 3,050 plants at 278 sites. Umbel removal was the only form of control at 24 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 seeds can easily spread to new sites (e.g., along streams and roadsides).

Owners/others performed control at 24 sites using a variety of control methods. Of these sites, 50% were controlled using herbicide, 25% were controlled by root-cutting and/or umbel removal, 8% were controlled by mowing, and 17% were controlled by other or unspecified methods. Six of these 24 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.

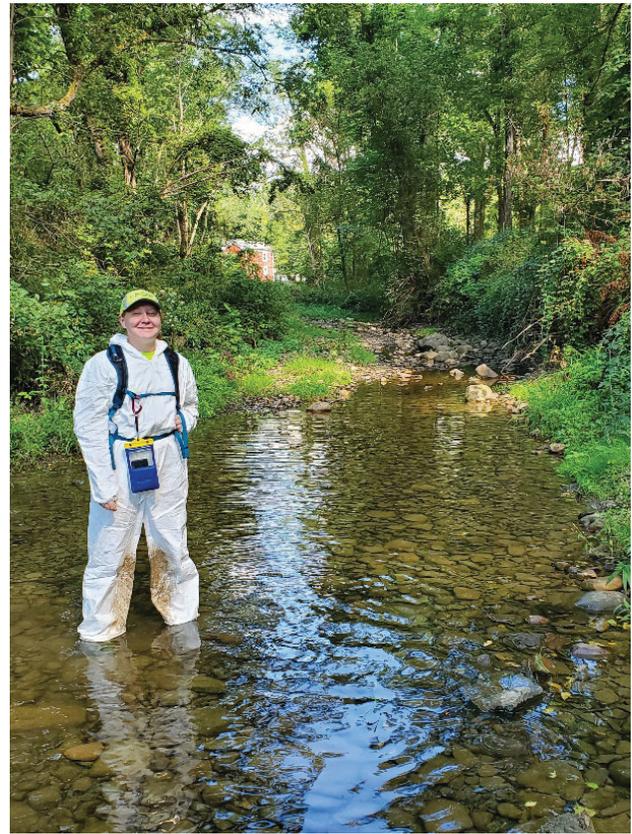


DEC staff removing GH seed heads.

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, a crew conducted surveys for GH along streams with known infestations along their length. These surveys were focused on streams in western New York and the Finger Lakes regions (specifically Erie and Livingston 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.

DEC staff conducted surveys over five days throughout the 2021 field season. The survey crew visited 27 properties and surveyed 5.7 miles of stream frontage for GH plants (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. GH infestations were found on nine of these properties, none of which were known to have any hogweed present prior to the surveys. Staff added newly discovered sites to the database and passed them along to other crews for control as time allowed.



DEC staff survey for giant hogweed plants along stream corridors.

Table 2. 2021 Streams Surveyed

Stream Surveyed	# of Tax Parcels Surveyed	Miles Surveyed	# of Sites (Tax Parcels) with GH Plants Found
Buffalo Creek	24	1.5	9
Canadice Lake Outlet	2	1.4	0
Genesee River	1	2.8	0
Total	27	5.7	9

Data Management

Field crews entered the 2021 field data using a mobile app. The data was later checked for accuracy and entered into the statewide database. In 2021, 55 new sites were discovered (Figure 5) by field crews or through information line reports.

Information line staff and field crews obtained owners' names and contact information for new sites and also for existing sites if any information was missing. 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.

The GH Program has signed property permission forms for 1,860 sites (68%), allowing us access to survey for plants and perform control if needed. 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 929 eradicated sites (Figure 6) and 1,796 active sites in the treatment or monitor stages throughout 52 counties in New York State (Figure 7).



DEC information line coordinator Dan Waldhorn

New Giant Hogweed Sites Detected Per Year

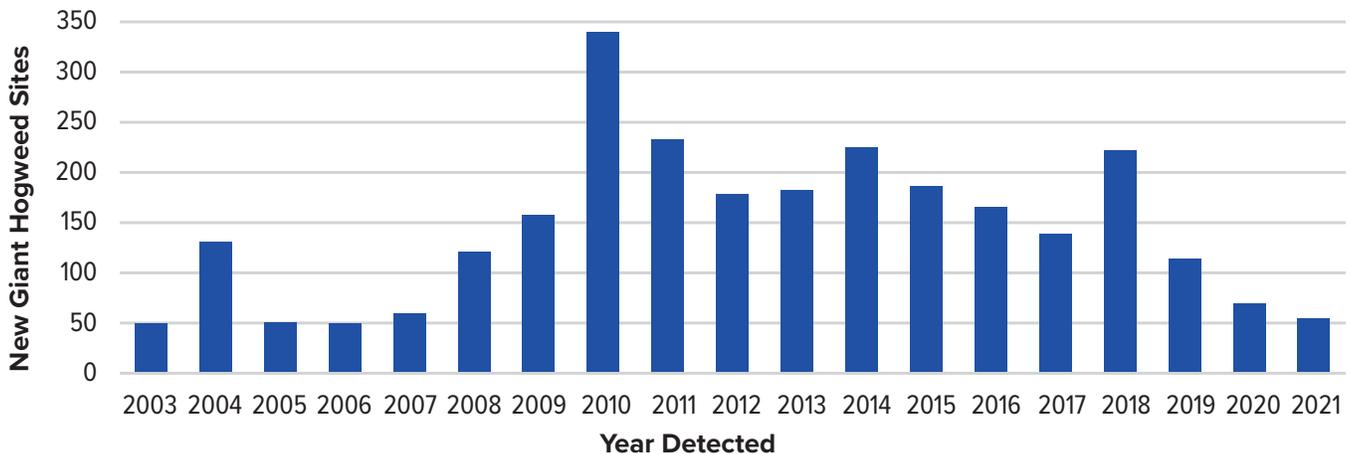


Figure 5. New sites detected per year

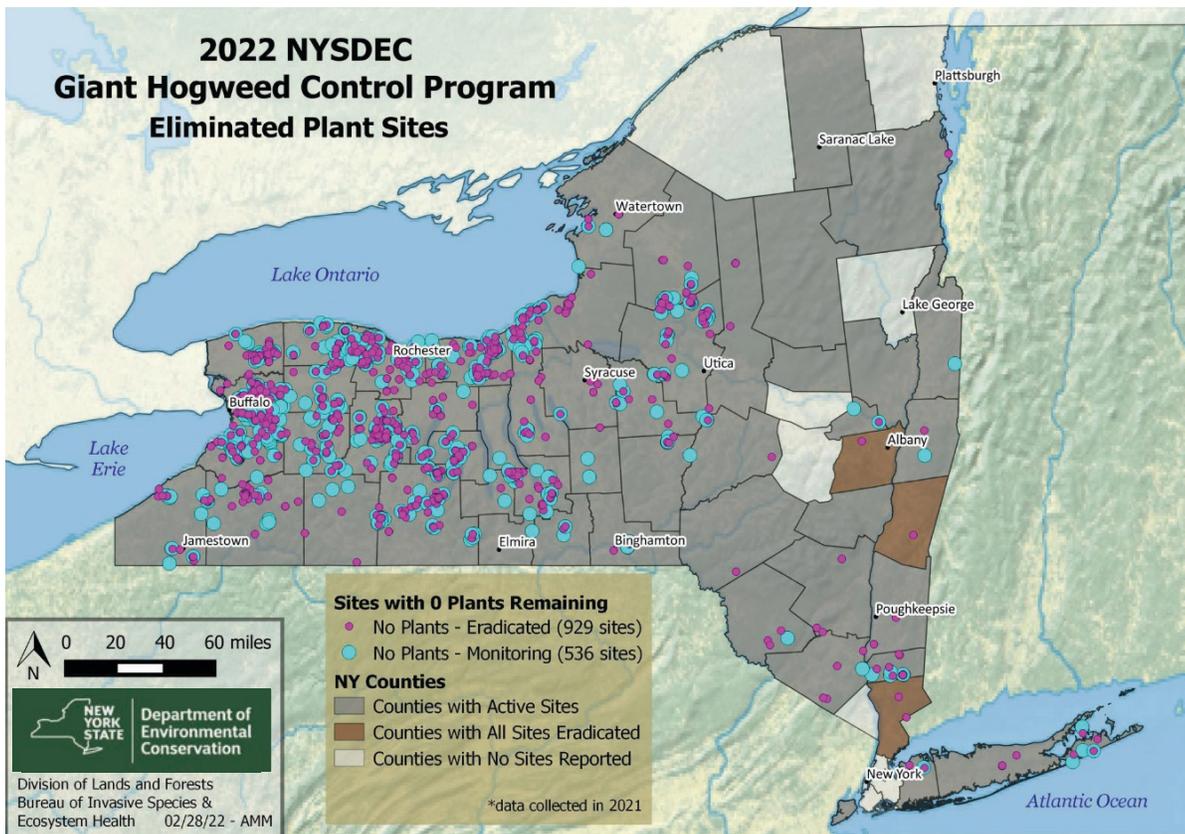


Figure 6. New York State giant hogweed sites with no plants (eradicated or still being surveyed). A site is considered eradicated after three consecutive years of surveying with no plants found during a site visit.

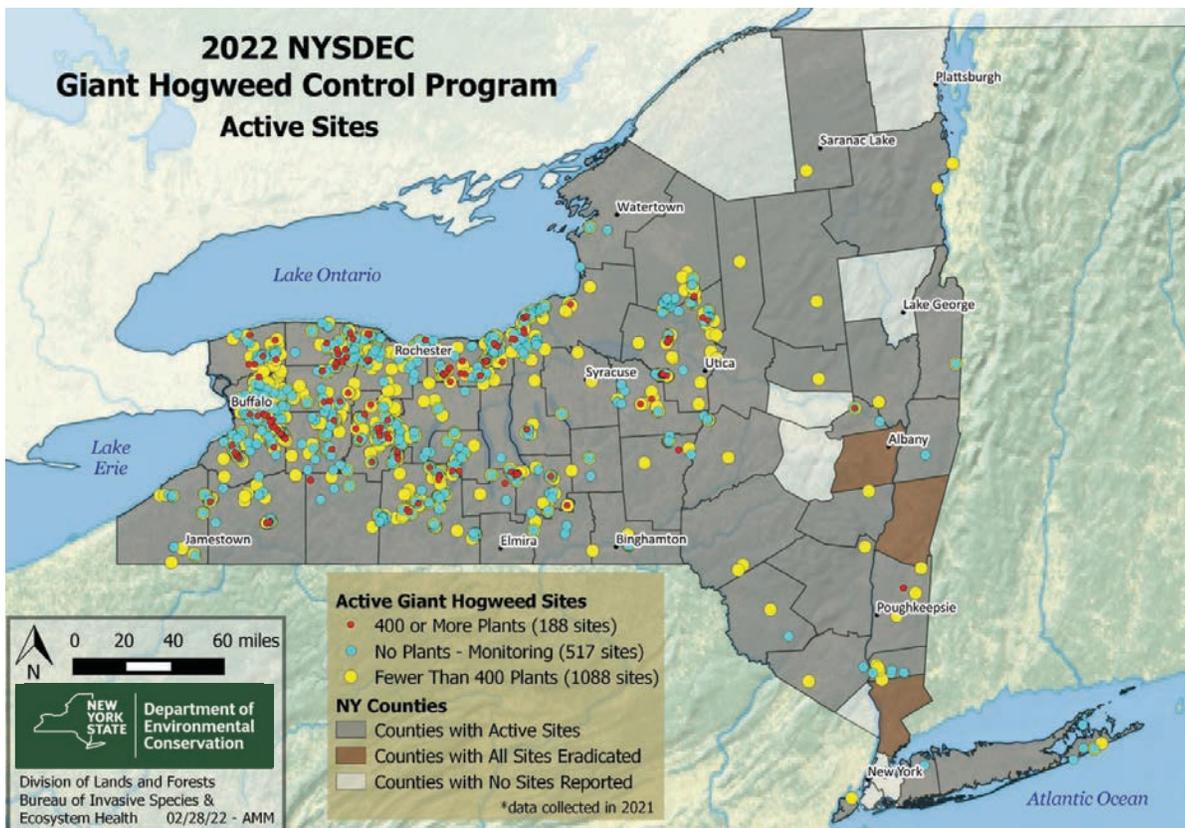


Figure 7. New York State active giant hogweed sites in treatment or monitor stages

Control Effectiveness

DEC crews have greatly reduced the number of GH plants at many sites throughout New York State (Figure 6). In 2021, crews found no GH plants at 1,466 properties that once had GH (Table 3), which means that 54% of all sites now have no GH plants due to prior control efforts.

We have found that small sites can be eradicated fairly quickly. Currently, 1,204 active sites (67% of active sites) have fewer than 20 plants, and an additional 244 sites (14% 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.

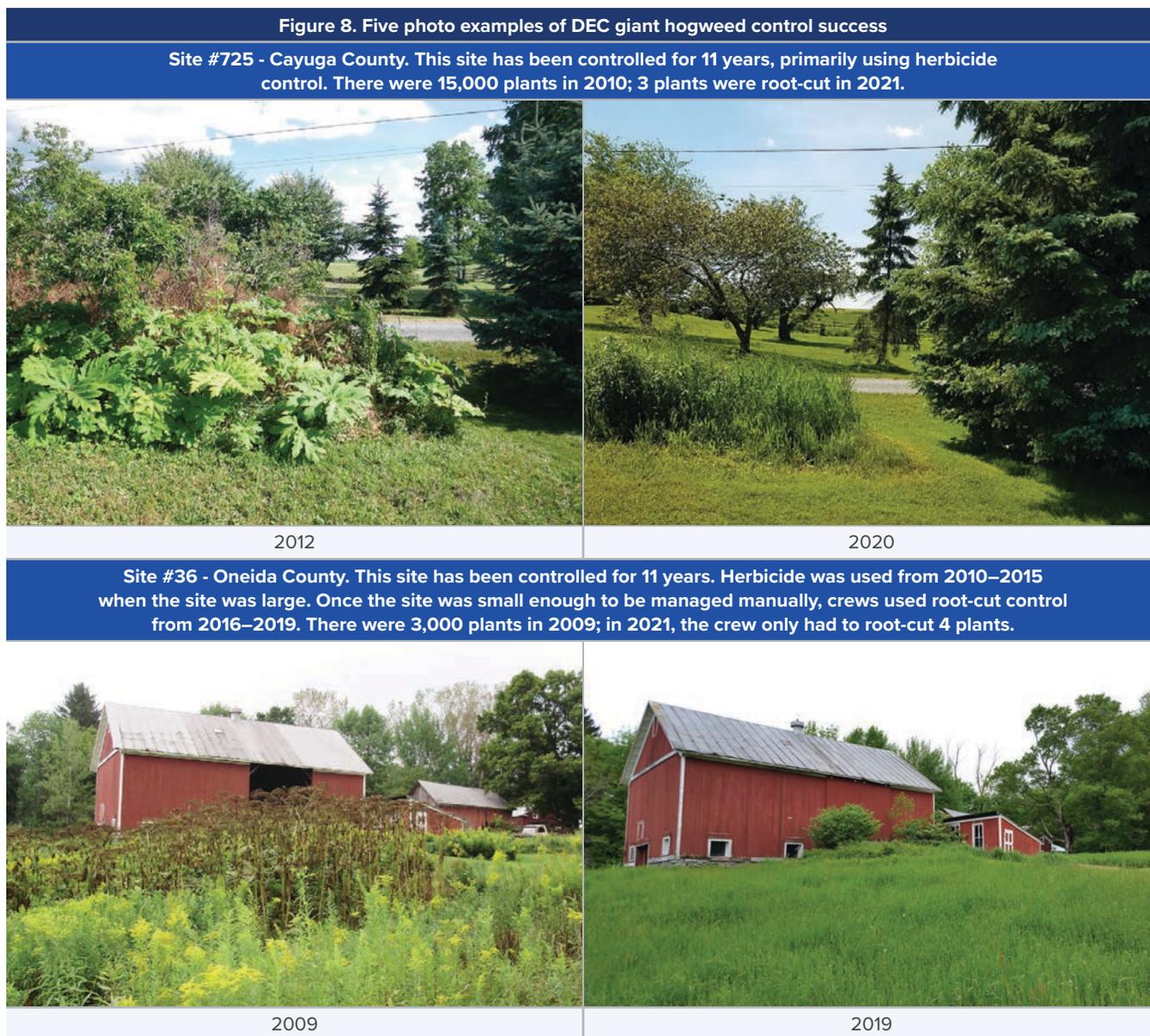


Figure 8. Five photo examples of DEC giant hogweed control success

Site #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 2021, only 72 plants were root-cut.



Site #354 - Niagara County. The green points on the series of maps below represent GH plants controlled along this streamside site between 2012 and 2021. Although the site started with more than 4,000 plants, only 42 had to be root-cut in 2021.



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

Site #343 - Niagara County. This site has been controlled since 2008. DEC crews used herbicide starting in 2009 and then switched to root-cutting in 2015. Over 1,000 plants were present in 2008; 1 plant was root-cut in 2021.



2008

2021

Table 3. Sites Per Size Class Per Year

Plants Per Site	0	1–99	100–399	400–999	1,000+	Unknown	Total Number of Sites	Total Active Sites*
2021 season	1,466	911	162	89	94	4	2,726	1,797
2020 season	1,476	848	163	91	84	4	2,666	1,896
2019 season	1,285	937	175	104	91	5	2,597	1,871
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

* Active sites include all sites with plants and sites currently being monitored (one or two years of no plants found).

Table 4. Sites Per Size Class by County (2021 field data)

County	Sites w/o Plants	Sites w/ 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	1,000+ Plants	Unknown # of Plants
Albany	1	0	1								
Allegany	8	7	4	4	4	1			2		
Broome	21	11	15	6	7	2		2			
Cattaraugus	47	38	35	12	14	7	1	5	3	8	
Cayuga	57	55	29	28	23	9	8	6		9	
Chautauqua	26	13	16	10	11	2					
Chemung	2	2		2	1	1					
Chenango	11	7	6	5	3	3				1	
Columbia	1	0	1								
Cortland	3	1	1	2	1						
Delaware	1	2	1		1	1					
Dutchess	3	5	3		2	1			1	1	
Erie	208	266	132	76	164	43	7	18	20	14	
Essex	2	2	2		2						
Franklin	0	1			1						
Fulton	0	1				1					
Genesee	33	37	16	17	19	5	3	2	4	4	
Greene	0	1			1						
Hamilton	0	1			1						
Herkimer	6	3	6		3						
Jefferson	11	1	6	5		1					
Lewis	47	12	27	20	6	5	1				
Livingston	104	107	73	31	52	21	7	9	11	6	1
Madison	8	11	4	4	6	2	1		2		
Monroe	127	95	81	46	52	15	7	10	5	6	
Nassau	3	0	2	1							
Niagara	63	38	45	18	18	11	2	1	5	1	
Oneida	54	80	31	23	37	17	6	2	8	10	
Onondaga	13	4	10	3	3	1					
Ontario	49	17	37	12	15	1		1			
Orange	6	1	4	2	1						
Orleans	44	35	31	13	17	3	1	1	10	3	
Oswego	43	29	30	13	13	10	2			3	1
Otsego	5	5	2	3	3	1	1				
Putnam	17	5	12	5	3	2					

Table 4. Sites Per Size Class by County (2021 field data)

County	Sites w/o Plants	Sites w/ 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	1,000+ Plants	Unknown # of Plants
Rensselaer	2	0	1	1							
Richmond	0	1			1						
Saratoga	0	3			3						
Schenectady	3	2	1	2		1			1		
Schuyler	19	32	10	9	18	8	2	1	2	1	
Seneca	1	0		1							
Steuben	117	110	70	47	65	21	9	4	4	6	1
Suffolk	12	2	8	4	2						
Sullivan	4	1	3	1			1				
Tioga	5	0	2	3							
Tompkins	39	41	27	12	16	9	6	2	3	5	
Ulster	4	1	4		1						
Washington	1	1		1	1						
Wayne	126	123	67	59	54	26	11	12	6	14	
Westchester	2	0	2								
Wyoming	62	37	36	26	14	11	4	4	2	1	1
Yates	45	13	35	10	8	2		2		1	
Grand Total	1466	1260	929	537	667	244	80	82	89	94	4

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 2021 field season, we surveyed 930 sites previously treated for GH infestation and found no plants; 186 of the sites had no plants for 3 consecutive years, allowing us to designate them as eradicated. This brings

the total number of eradicated sites to 929. Of all sites that had been previously treated for infestation, 54% (1,466 sites) had no plants in 2021.

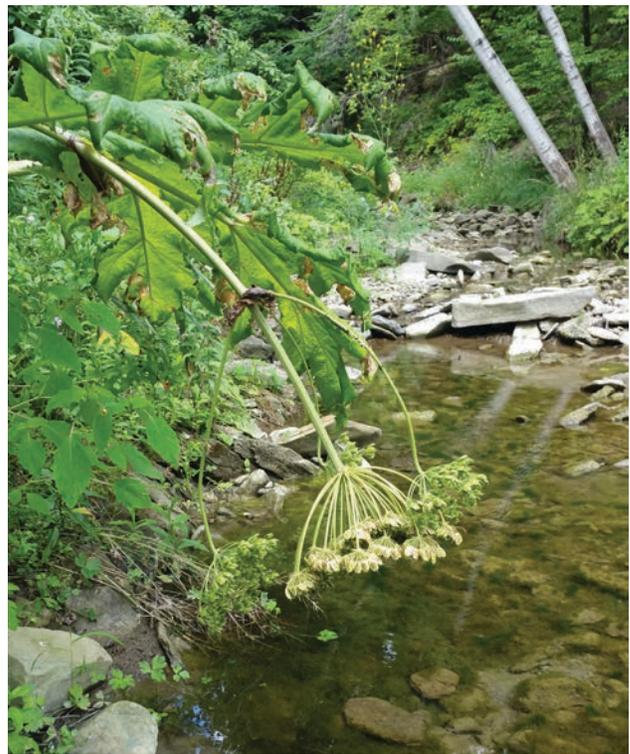
Of the 642 visited sites that started the 2021 field season as monitor sites (no plants found the previous year, but not yet an eradicated site), 70% (451 sites) remained free of GH. Crews did not visit 64 monitor sites in 2021 primarily due to no contact or permission from the landowner.

Ninety percent of monitor sites where plants were found (172 of 191 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.

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 453 times. Eighty-five percent of these 453 sites originally had fewer than 20 plants. Small sites are easiest to eradicate due to having either no seed bank or a small seed bank.

After no plants are found for three consecutive years, the site is deemed eradicated and is no longer surveyed yearly. As an added precaution, in case seeds germinate later from a seed bank or new seeds spread to the site from another source (e.g., an upstream site), we revisit eradicated sites two additional times: three years and six years later. Landowners are also provided with information to contact us should they notice new plants in the future.

In 2021, we surveyed 335 sites last surveyed in 2015, 2016, 2018, and 2019 and found and controlled plants at 23 of these 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.



Seeds can spread downstream.

Outreach and Communications

Our program has a strong outreach component. We provide information to the public and to partner organizations on how to identify and safely and effectively control GH. The 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 giant hogweed information on DEC's website, which is accessed by people from around the world. We have also assisted agencies in other states and Canada in planning their own GH programs.

DEC's Giant Hogweed Information Line

DEC's GH information line staff answered 263 calls and 503 emails from the public in 2021. Thirty-two (32) new GH sites were confirmed from information line reports. Reports of possible GH locations made up 89% of the total 766 calls and emails. The remaining 11% were from people looking for information about GH or other invasive species, not to report possible GH sites.

Of the public calls and emails regarding possible GH sites, 36% were confirmed by information line staff as correctly identified, and 64% were determined to be look-alike plants, not GH. The most common look-alike plants reported were cow parsnip, angelica, wild parsnip, elderberry, and wild lettuce.

Of the portion of calls and emails where the person had correctly identified GH, 26% were for new sites and 74% were for established/known sites.

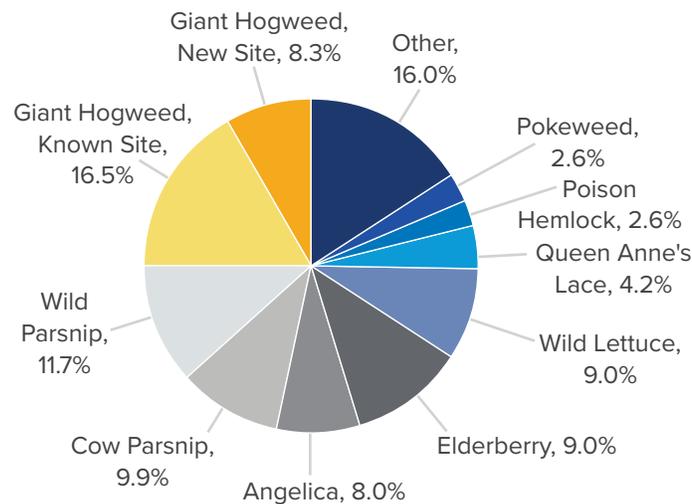


Figure 9. Most common plants reported to the information line

Staff told callers about DEC's GH webpage, and if they were interested, sent them a GH brochure and control guide. We also sent those 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 that callers sent via cellphone 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 and master gardeners, or PRISM staff were able to verify the sites in their counties for us.

Giant Hogweed Maps

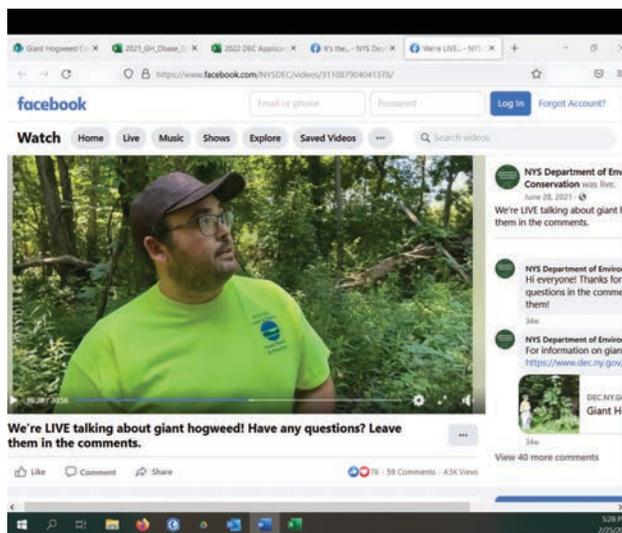
We posted updated maps on DEC's website, www.dec.ny.gov/animals/39809.html, that reflect 2021 field data of known GH locations, as well as locations where GH is no longer present in New York State (Figure 6 and Figure 7). We also passed along GH site information to the New York State invasive species database, *iMapInvasives*, to update GH data on its website (www.nyimainvasives.org).

Webpages



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 241,944 times in 2021 and have visited them 3,830,609 times since their inception.

Social Media



DEC's Office of Communication Services staff help spread the word about GH. Social media is used during GH's blooming season to educate the public and request that they report new sites. We use photos to capture readers' attention, and posts contain a variety of information about the plant.

Each post generates questions and comments that provide additional opportunities to educate the public. Three GH Facebook posts resulted in 364,898 total views. One Facebook Live video resulted in 11,500 views. One GH Instagram post resulted in 30,866 views. Three GH tweets resulted in 28,859 total views.

Giant Hogweed Poster, Brochure, and Control Methods Guide



We use DEC's GH brochure, poster, and control methods guide to educate the public about GH in New York. The GH brochure and poster help people learn to identify the plant, to avoid touching it, and to report GH locations to DEC so we can help control it. The control methods guide offers more detailed information about how to safely control GH. In 2021, program staff and partners distributed more than 2,243 brochures, posters, and control guides to interested people and organizations.

These outreach documents are available on our website; to request paper copies, contact the GH Program.

- Poster: www.dec.ny.gov/docs/lands_forests_pdf/ghposter18x24.pdf
- Brochure: www.dec.ny.gov/docs/lands_forests_pdf/ghbrochure.pdf
- Control Guide: www.dec.ny.gov/docs/lands_forests_pdf/ghcontrol.pdf

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 them 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 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 2021, APIPP, Capital Region PRISM, CRISP, Lower Hudson PRISM, SLELO, and OCSWCD conducted outreach, surveys, and control for some or all of the GH sites within their boundaries.

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

- Finger Lakes PRISM, in conjunction with the Finger Lakes Institute, hired two staff to work with the GH control program using funding received through a cooperative agreement with the USDA Natural Resources Conservation Service.
- The Western NY PRISM assisted with 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. 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.

Conclusion

Unlike many invasive species, we can potentially eradicate giant hogweed 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. To date, DEC and partner agency efforts have eliminated GH from 929 of the 2,726 known sites. An additional 537 sites had no GH plants in 2021, which means that overall, a total of 1,466 sites (54%) had no GH plants in 2021.

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 of our program's giant hogweed eradication efforts.



DEC staff person controlling a very tall giant hogweed plant.



Greater public awareness has led to us finding more small infestations at earlier stages.

Appendix A

History of New York's Giant Hogweed Program

Starting in 1998, the USDA, New York State's Department of Agriculture and Markets (AGM), and the Cornell Cooperative Extension surveyed for giant hogweed 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, AGM 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, DEC applied for and received a 2ee exemption letter allowing us to use the herbicide Rodeo for GH control. Under the 2ee exemption, in special circumstances, a pesticide can be applied to a target pest that is not specified on the pesticide label.

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 2012–2021, state funds were used to hire 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 2016–2021 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, as did the Capital Region PRISM in 2015. From 2016 to 2021, the Finger Lakes PRISM, in conjunction with the Finger Lakes Institute, hired two to 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 Table 6 show GH Program accomplishments from 2006 to 2021.

Table 5. DEC Giant Hogweed Program Control and Surveying Accomplishment

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
2021	698	17,550	340	234,311	931	55
2020	553	11,344	245	51,952	495	69
2019	771	27,129	425	431,325	888	115
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
2021	263	503	241,944
2020	365	523	201,473
2019	944	654	239,773
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

Table 7. Giant Hogweed Program Stream Survey Accomplishments

Stream Surveyed	# of Tax Parcels Surveyed 2018–2021	Miles Surveyed 2018–2021	# of Sites (Tax Parcels) with GH Plants Found 2018–2021
Buffalo Creek	142	18.8	50
Canadice Lake Outlet	2	1.4	0
Cazenovia Creek	110	7.2	3
Conesus Lake tributaries	48	7.6	11
Eighteen Mile Creek	87	7.9	25
Genesee River	1	2.8	0
Monroe County streams	95	4.5	5
Oatka Creek	102	15.9	12
Salt Creek	16	4.5	4
Springwater Creek	8	1.5	5
Grand Total	611	72.1	115

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
- NYSDEC Invasive Species Coordination Unit
- NYS Department of Health

Appendix C

Additional Giant Hogweed Data

Table 8. Sites Per Size Class by DEC Region (2021 Field Data)

DEC Region	Sites w/o Plants	Sites w/ 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	1,000+ Plants	Unknown # of Plants
1	15	2	10	5	2						
2	0	1			1						
3	36	13	28	8	7	3	1		1	1	
4	13	10	7	6	5	3	1		1		
5	3	9	2	1	8	1					
6	118	94	70	48	46	22	7	2	8	9	
7	200	163	124	76	73	37	17	10	6	19	1
8	667	571	420	247	301	104	40	42	41	41	2
9	414	397	268	146	224	74	14	28	32	24	1
Grand Total	1466	1260	929	537	667	244	80	82	89	94	4

Table 9. Sites Per Size Class by PRISM (2021 Field Data)

PRISM	Sites w/o Plants	Sites w/ 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	1,000+ Plants	Unknown # of Plants
APIPP	6	6	6		6						
Capital Region	10	9	6	4	6	2			1		
CRISP	12	9	8	4	5	2	2				
Finger Lakes	746	630	467	279	324	122	51	49	33	49	2
Long Island	15	3	10	5	3						
Lower Hudson	30	11	23	7	6	3			1	1	
SLELO	156	121	94	62	56	32	9	2	8	13	1
Western NY	491	471	315	176	261	83	18	31	46	31	1
Grand Total	1466	1260	929	537	667	244	80	82	89	94	4

Table 10. Sites Per Size Class for 2011–2021

Year	Sites w/o Plants	Sites w/ 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	1,000+ Plants	Unknown # of Plants
2021	1466	1260	929	537	667	244	80	82	89	94	4
2020	1476	1190	770	706	597	251	79	84	91	84	4
2019	1285	1312	727	558	684	253	90	85	104	91	5
2018	1071	1413	623	448	719	286	110	90	93	109	6
2017	904	1349	498	406	645	255	94	114	104	135	2
2016	823	1293	387	436	627	265	99	92	73	127	10
2015	639	1309	277	362	586	286	105	98	100	124	10
2014	501	1259	239	262	516	277	116	98	116	108	28
2013	348	1188	149	199	419	255	119	101	132	143	19
2012	339	1010	97	242	317	246	83	89	105	135	35
2011	219	947	55	164	310	220	88	79	81	138	31

Table 11. Sites and Plants Controlled by DEC/Partner Agencies 2012–2021

Year	Sites Controlled by DEC/Partner Agency	Plants Controlled by DEC/Partner Agency
2021	1,038	252,348
2020	790	63,396
2019	1,189	459,169
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 12. Average Plant Number and Control Time at Root-Cut and Herbicide Sites 2012–2021

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)
2021	25	727	45	102
2020	19	219	37	35
2019	36	1,140	51	103
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

*Excluding sites that also had 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 recolonize 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 sites 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



DEC prioritizes control of GH at sites located near children.

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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