



INVASIVE SPECIES MANAGEMENT

CATSKILLS

2022 Annual Report



CRISP Team (L-R): Sarah Coney, Dan Snider-Nerp and Kate Cooper at Ashokan Rail Trail

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Figure 1. Sierra Stickney, with plant rake, at Mongaup Lake 7/14/22.

Executive Summary

The Catskill Center for Conservation and Development began a new five-year contract in 2022, with New York State Department of Environmental Conservation (NYS DEC), to operate the Catskill Regional Invasive Species Partnership to continue to perform invasive species management in the Catskills region. Due to the new contract, additional CRISP year round staff, an Aquatic Invasive Species Manager and a Volunteer and Outreach Coordinator were hired, and four seasonal strike team technicians were hired. These additional staff helped to expand CRISP's efforts in 2022. The CRISP Team surveyed 3,694 acres of uplands and water bodies, nearly 8X the area surveyed in 2021. The area managed expanded to 130.4 acres, more than 10X the area CRISP managed in 2021. Two new invasive species were found in CRISP in 2022, hardy kiwi and beech leaf disease.

CRISP did collaborative strategic planning with New York City Department of Environmental Protection (NYC DEP). Stakeholder input identified high priority

actions that CRISP, NYC DEP, and NYS DEC should take to better manage invasive species in the CRISP region.

In 2022, CRISP supported the Canadarago Lake Improvement Association Watershed Stewards Program, Otsego County Conservation Association for invasives response and education, Cornell Cooperative Extension of Columbia and Greene Counties for outreach and education, Ecological Research Institute for the Monitoring and Managing Ash Project, Buck Environmental Solutions for rapid response for Japanese angelica tree, SUNY Oneonta for Clean, Drain, Treat kits and Mattys Landscaping for maintaining hemlock insectary and native planting.

CRISP created a new logo, with Trampoline Advertising and Design Company.

The CRISP Steering Committee developed a “Cooperation Agreement” that formalizes the working relationship of organizations on the Steering Committee. In addition, the Steering Committee updated its Governance Policy.

The CRISP Watershed Stewards Program inspected 10,277 watercraft in 2022 at 26 sites. A total of 642 potentially invasive plants and animals were found and prevented from leaving or entering CRISP water bodies, including hydrilla and spiny waterflea.

Acknowledgments

The bulk of the Catskill Regional Invasive Species Partnership funding was provided from the Environmental Protection Fund as administered by the New York State Department of Environmental Conservation. Additional funding was provided by the New York City Department of Environmental Protection for strategic planning and for invasive species management on the Ashokan Rail Trail.

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Figure 2. AIS Pull, Otsego County Conservation Association.

Introduction

Hosted by the Catskill Center, the Catskill Regional Invasive Species Partnership (CRISP) has coordinated and collaborated with state, regional, and local governmental, for-profit, and nonprofit entities including other Partnerships for Regional Invasive Species Management (PRISM) across the state, the New York State Department of Environmental Conservation (DEC), Invasive Species Coordination Section, the New York Invasive Species Research Institute, and the New York State Hemlock Initiative among many others. New York State Department of Environmental Conservation selected the Catskill Center for Conservation and Development to continue to host CRISP through an RFP process conducted in 2021. In January 2022, the Catskill Center entered another five-year (2022-2026) contract to administer the CRISP program.

The Catskill Center began 2022, by announcing in January the availability of two full-time positions: a full time Aquatic Invasive Species Manager position and a full time Volunteer and Outreach Coordinator (half-time supported through CRISP). After two thorough searches, Sarah Coney was hired as Aquatic Invasive Species Manager and Kate Cooper was hired as Volunteer and Outreach Coordinator. Sarah began work on March 21st and Kate started on April 18th.

John Thompson's title was changed to CRISP Director and Dan Snider-Nerp's job title was changed to Terrestrial Invasive Species Manager.

In expanding its capacities, CRISP purchased equipment to outfit both an aquatic and terrestrial strike team, expand its volunteer program and expand outreach to the public (Appendix A).

Strategic Planning for invasive species management was done jointly with New York City Department of Environmental Protection. The CRISP Steering Committee decided to gather stakeholder input through a process called "Group Concept Mapping" (GCM). This methodology generates insights into the perspectives and priorities that exist among stakeholders. Bryan Dailey was hired, by the Catskill Center, to lead the GCM process. The process provided insights into the makeup of the stakeholder group, the invasive species topics they see as priorities, how the priorities compare in terms of importance and feasibility, and who the participants feel should take the lead on implementing each priority. The resulting report is attached (Appendix B).

CRISP developed a new logo, with Trampoline Advertising and Design Company, at the beginning of the year and began updating digital and print materials to incorporate the new logo. The new logo reflects both the natural and cultural



Figure 3. Ashokan Rail Trail Vista 3 Volunteer Crew 6/12/22

history or the Catskills by featuring a fire tower, mountains, hemlocks by a stream, and supporting hands holding up the landscape.

Strategic Planning

CRISP staff and the CRISP Steering Committee worked with New York City Department of Environmental Protection (NYC DEP) to begin a process of collaborative planning for invasive species management. Meredith Taylor, CRISP Steering Committee Chair, and John Thompson worked with Bryan Dailey, of Cornell University, to perform a stakeholder input process called Group Concept Mapping (GCM). Group Concept Mapping was the method used by the New York Invasive Species Research Institute to summarize input from multiple stakeholders to identify research priorities for New York State invasive species management. This methodology was selected to gather priority ideas for management from CRISP stakeholders and NYC DEP employees involved in invasive species management.

The goals of the joint CRISP/NYC DEP strategic planning for invasive species management were to gain input from a large number of stakeholders to perform the following:

1. Identify invasive species management priorities in the CRISP region,
2. Rank the invasive species management priorities by importance,
3. Rank the invasive species management priorities by feasibility, and
4. Determine the organization that should be responsible for each priority.

The GCM project was initiated in 2021 and completed in 2022. To begin the project, an email list of 143 email addresses was assembled from CRISP and NYC DEP stakeholders. Links were sent to these email addresses and the CRISP listserv (which totaled 287 email addresses) to notify stakeholders that input was being sought to contribute to invasive species management planning in the CRISP region. In addition, the same information and a link to contribute were posted on the CRISP website. The initial email included the following text:

Catskill Regional Invasive Species Partnership (CRISP) is working with partners to address invasive species issues in the greater Catskills region (<https://www.catskillinvasives.com/updates>). New York City Department of Environmental Protection (NYC DEP) has an invasive species program to protect the upstate water supply from invasive species threats to water quality and infrastructure. CRISP and NYC DEP are working together on a group concept mapping project to guide strategic planning specifically for invasive species management for the next 5 years. To assist us in this effort, we are looking for input from a variety of stakeholders with expertise in a broad range of geographic and taxonomic areas. When responding, please keep in mind that we are

expecting ideas related to invasive species applied management goals (as opposed to general education or research goals).

You will find a link below to start the process. The first phase is brainstorming, where we invite you to contribute your ideas.

The brainstorming phase of this Group Concept Mapping Project was a request for each stakeholder to complete the prompt: “One specific invasive species priority in the CRISP Region in the next five years is...”

The first activity of brainstorming generated 161 ideas by stakeholders. These ideas were submitted through 84 contributions. Because the activity was done anonymously, we do not know the exact number of participants and some stakeholders may have contributed more than once. Common themes submitted included early detection, rapid response, education, and outreach. There were also several specific species that were submitted multiple times, including beech leaf disease, jumping worm, spotted lanternfly, and hemlock woolly adelgid.

GCM activities began in December 2021 and were completed in 2022, including a summary report by Bryan Dailey ([2022 CRISP Stakeholder Input Report](#)).

The result of the rankings for activities assigned to CRISP included increasing capacity to perform early detection and rapid response, addressing emerging invasives, expanding trainings for management, increasing collaboration with Partners and municipalities (Table 1).

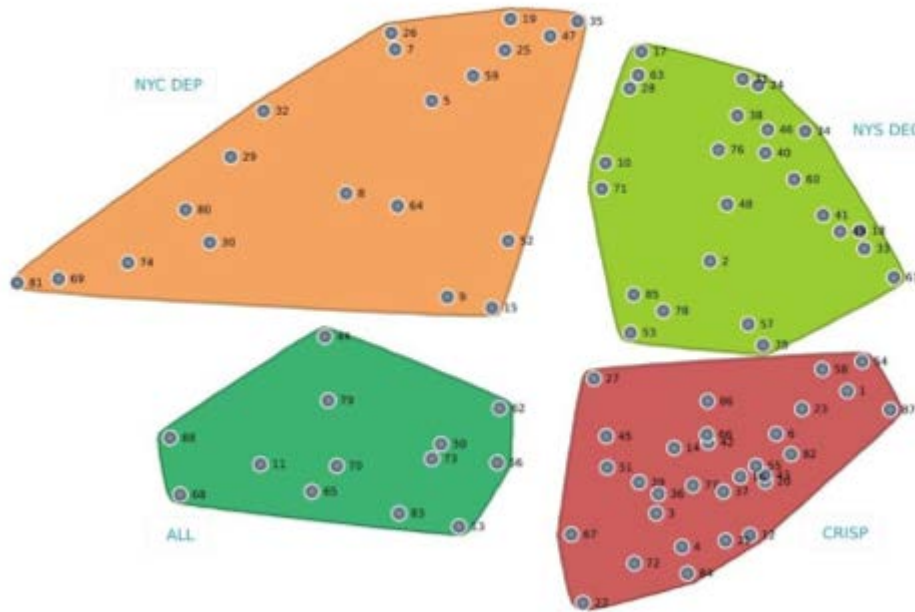
Table 1. Mean ranking of top statements assigned to CRISP, ranked by a combination of importance and feasibility.

Statement #	Statement	Importance Mean	Feasibility Mean	Combined Mean
42	Collaborate with neighboring PRISMs to manage species that may be moving in from the border areas	4.33	4	8.33
36	Increase management capacity through training students, citizen scientists, volunteers, landowners, and forest owners	4.11	4.03	8.14
1	Increase capacity to perform early detection and rapid response	4.38	3.73	8.11
86	Create a quick and easy way for landowners/stakeholders to ask questions and get answers and feedback to specific invasive species management topics via the web page	3.98	4.09	8.07

43	Work with local governments to build invasive species prevention and management into their planning and review processes	4.36	3.67	8.02
87	Finalize an invasive species management and monitoring protocol	3.91	4.09	8
4	Prioritize mitigation of threats to Catskills ecosystems and forest ecosystem processes (i.e. forest regeneration)	4.09	3.91	8
12	Increase outreach on spread prevention to Catskill recreationists and hikers	3.86	4.09	7.95
16	Investigate and implement the most effective education and outreach strategies	3.98	3.94	7.92
39	Coordinate with local colleges and universities to investigate research needs and facilitate invasive species field learning labs/volunteer days for students in environmental fields	3.89	4	7.89
58	Develop/adopt best management practices for spread prevention on construction equipment and fill following the SLELO PRISM model	3.95	3.94	7.89
82	Coordinate activities between partners so there is minimal redundancy in management strategies to maximize the funding available for specific monitoring and research proposals	4.15	3.73	7.88
67	Develop uniform approaches to data collection by field crews	3.88	3.97	7.84
51	Develop the next generation of invasive species professionals through meaningful internships that provide hands on experience in the Catskills	3.85	3.91	7.76
72	Develop a procedure for objectively ranking invasives in order to triage the limited resources	3.82	3.91	7.73

Through Group Concept Mapping, each activity was sorted to determine which organization should be responsible for implementing it. Three organizations were identified as primarily responsible for performing invasive species management in the CRISP region: CRISP, NYS DEC and NYC DEP. In addition, some activities were designated as needing all organizations to collaboratively take the lead on. The clusters are shown in Figure 4.

Figure 4. Cluster map of activities sorted by lead organization.



Prevention

The New York State Invasive Species Comprehensive Management Plan (2018) states that “prevention is the first line of defense against would-be invaders and is the preferred management strategy.” Consequently, a major emphasis of CRISP efforts and resources have focused on preventing the introduction of invasive species into the CRISP region. Watershed Steward Programs (WSP) around the state and in the CRISP PRISM focus on preventing the spread of AIS to new bodies of water while also helping to educate the public about their threat and what the public can do to prevent the spread of AIS. The program has

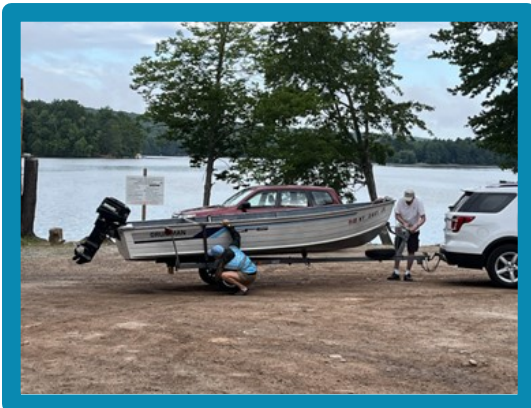


Figure 5. CRISP Watershed Steward at Swinging Bridge

been largely successful and has helped stop multiple introductions of Tier 1 and 2 species to the CRISP PRISM. The CRISP Watershed Steward Program is now administered by SUNY Oneonta through a five-year contract with NYS DEC (and not through a subcontract with CRISP, as was the case from 2012 through 2021). CRISP did once again subcontract with the Canadarago Lake Improvement

Association, to help support the Canadarago Lake Watershed Steward Program. During

the 2022 season, 7,723 surveys were submitted by the CRISP WSP, an increase from 2021. Canadarago Lake completed 25% of the surveys and was the top contributor of data. Otsego Lake’s Lakefront launch submitted 1,140 surveys in 2022, only 160 less than in 2021. Most sites were staffed by one steward consistently throughout the summer (Table 21) while others were on a rotation or only worked for special events.

Table 2. CRISP AIS sites staffed in 2022.

Sites	Number of Stewards
NYSDEC Signed Sites	
North-South Lake	1
Crumhorn	1
Greens Lake	0.5
Swinging Bridge Reservoir	1
White Lake DEC	1
East Sidney Lake	0.5
Portlandville	1
BasherKill	0.5
Narrowsburg	1
Bainbridge	Special event
Lake Superior	0.5
Franklinton Vlaie Wildlife Management Area	1
Barking Dog (Deposit)	0.5
Unadilla	0.5
Sidney	0.5
Non-NYSDEC Sites	
Canadarago Lake	1
Otsego Lake, Fish Road	2
Otsego Lake, Lake Street	2
Brookwood Point, Otsego Lake	0.5

Training was provided with a combination of online and in-person training (following safety protocols and a limited number of people). In-person training was offered to groups of four individuals at a time. The first WSP training session was held in late May. The training session consisted of NYS DEC and Canadarago Lake Stewards.

Each steward was provided flashlights and mirrors and were given the updated CRISP field manual (in book form) for the WSP and as flash drives (for the stewards). CRISP WSP T-shirts were provided along with packets containing relevant information and rack cards. Stewards were also provided tables, chairs, and umbrellas to display rack cards and specimen samples. Spray bottles were handed out to all stewards, along with rakes and pool skimmers for clearing the boat launch. Stewards were provided PPE and 10% bleach solution to follow safety guidelines and sanitize their stations. Tablets were provided to all stewards. All tablets were returned at the end of the season.

A total of 26 sites, including 22 NYS DEC accesses, had Steward coverage in 2022. Coverage of launches in Sullivan County was increased in 2022 and the WSP will strive to remain at similar coverage levels or improve.

The Village of Cooperstown was able to fund and hire one full-time steward for the Lake Front public launch. Between the Village steward and the NYS DEC stewards, Lake Front and the adjoining Fish Road launch were well covered this season.

Quagga mussels (*Dreissena bugensis*) were first found in Otsego lake in 2020 during an ekman dredge. Since their discovery multiple SCUBA surveys have shown that they are numerous and are seemingly outcompeting their congeners, the zebra mussel (*Dreissena polymorpha*). A study is ongoing by Professor Kiyoko Yokota, of SUNY Oneonta, to determine their impact. Stewards trained for 2023 will be made aware of this new threat and encouraged to power wash and tag all boats leaving Otsego Lake. 2022 was the 1st year quagga mussels were documented outside of Otsego Lake, however, they were found in a man-made lake created by damming a portion of the mainstem Susquehanna River, approximately 17 miles downstream of Otsego Lake. Visual surveys were conducted by snorkel and by SCUBA in nearby waterbodies but no quagga mussels were found outside the mainstem of the Susquehanna.

As in 2021, kayaks and canoes make up almost half of all total watercraft surveyed in the CRISP PRISM. Of the 10,277 watercraft inspected, 4269 were kayaks and 709 were canoes. Motorboats were close behind at 4,000 being surveyed in 2022. The majority of boaters, when questioned about primary activity, responded with 'recreation' (5033) followed by fishing (2557).

Only 80% of boaters were familiar with stewards, likely as a result of the WSP's continued efforts to maximize first encounters. However, boaters took fewer prevention measures prior to launching in 2022 only 58% in 2022 vs. 71% in 2021. Most boaters either dried their boat, drained standing water, or inspected the craft prior to launching. About half of boaters were returning visitors at their waterbodies or had not launched in the past two weeks. The CRISP Region had a 95% compliance rate, slightly lower than last year.

Overall, 642 potentially invasive plants and animals were found and prevented from leaving or entering CRISP water bodies. Pondweeds (*Potamogeton* sp.) and milfoils (*Myriophyllum* sp.) were commonly found on boats launching and retrieving, as was mud and debris. Waterweed (*Elodea* sp.) and water celery (*Vallisneria americana*) were often pulled from boats leaving Canadarago and Otsego Lakes. Zebra mussels (*Dreissena polymorpha*) were found and brought to a boat-wash to be killed and removed. Hydrilla was found on trailers in two locations in 2022, Canadarago and Swinging Bridge, after launch. Surveys will be conducted in 2023 to assess if hydrilla was successfully introduced. On July 1, Spiny waterflea were identified on a launching boat at Otsego Lake, the boat was then power washed and all fishing gear decontaminated with KCl. Canadarago, Portlandville, and several other launches encountered water chestnut (*Trapa natans*) several times in the 2022 season. Canadarago Lake pulled four plants just downstream of the launch and continues to pull plants in the outlet to Oaks Creek. All other reported invasives were known to the waterbody.

Early Detection Rapid Response and Control

This year, due to the increase in staffing in the new CRISP contract, CRISP expanded its capacity to perform rapid response and control with additional year-round and seasonal invasive species staff. In 2022, the Catskill Center hired a new Aquatics Invasive Species Manager, and a total of four seasonal survey and control field staff. **Total area**

Spiny Waterflea

(*Bythotrephes longimanus*)

Spiny Waterflea was found by CRISP Watershed Steward, Steve Eichler, on a boat trailer at Otsego Lake. Eichler stated, "those water fleas were in clumps, like I've seen on Lake Ontario. He just towed his boat directly from Ontario to Otsego. They get all dried up and look like spit wads."

Spiny Waterfleas feed voraciously on zooplankton. At times, they have eliminated native zooplankton from food webs, causing serious fish population declines.



Spiny Waterflea. Gary Montz, Bugwood.org



Dried Waterflea. Steve Eichler.

surveyed by the CRISP Team was 3,694 acres. Total surveyed acres for the Terrestrial Strike Team in 2022 were 598.3 acres, up from 466.3 acres in 2021 across 108 sites. The Aquatic Strike Team surveyed 3095.7 acres in 2022.

The goal of Early Detection and Rapid Response (EDRR) efforts are to increase likelihood that invasions will be detected and eradicated before they become established. Invasive species were prioritized to target those very high impact species that exist in low enough populations where eradication is feasible (Table 3). Increased surveys and reports through iMapInvasives resulted in a number of new invasives, and new populations being discovered in CRISP. Each of these reports was followed up on, except in the few instances where permission to access a property was not obtained. Hardy kiwi (*Actinidia arguta*), an aggressively invasive vine, was reported as an invasive for the first time in CRISP, in the Town of Hamden. The hardy kiwi population has spread from cultivated plants. Beech leaf disease, associated with the nematode (*Litylenchus crenatae mccannii*) was reported in CRISP for the first time. Symptoms of beech leaf disease were observed at both Crystal Lake Wild Forest, in western Sullivan County, and near Spring Glen, in eastern Sullivan County. CRISP staff also found new populations of quagga mussel in Otsego County, European frogbit in Otsego and Sullivan Counties, and mile-a-minute in Sullivan County. Rapid response was performed on giant hogweed, mile-a-minute, black jetbead, Japanese angelica tree, Japanese hop, hardy kiwi and European frogbit.

In 2022, all but one of CRISP's 7 assigned giant hogweed sites for the year showed no plant growth, with the lone site showing a 64% reduction in stem count since the initial survey.

The Terrestrial Strike Team managed a total of 10.42 acres of invasives and 3.88 acres of Tier 2 species in 2022, down from 12.41 total acres in 2021, despite adding several new terrestrial infestation locations to CRISP's summer season.

One objective of the Terrestrial Strike Team's work included continued monitoring and management of target invasives at the state campgrounds, work which consistently began across the region in 2019 with the Catskills campground strike team. Devil's Tombstone and Kenneth Wilson were the only two campgrounds found to have Asian bittersweet (*Celastrus orbiculatus*) this year, and population acreages were down by 70% and 95% respectively since initial 2019 surveys. Mud Pond/Trout Pond, North/South Lake, Beaverkill, and Little Pond were the only campgrounds found to have Japanese barberry (*Berberis thunbergii*) this year, and population acreages were down by 90%, 99.6%, 77%, and 92% respectively since initial surveys in 2019.

The Aquatic Strike Team focused primarily on baseline surveys of waterbodies in 2022 and surveyed 3095.7 acres and 55.6 miles of waterbodies. The Aquatic Strike Team's control efforts protected over 120 acres of lakes, ponds and rivers.

Highlights of the Aquatic Strike Team's work included documenting several new tier 2 infestations in the CRISP PRISM, including Carolina fanwort, European frogbit, yellow floating heart, quagga mussels, and banded mysterysnails. Several new water chestnut sites were mapped and management began. The AIS team managed a total of 111.6 acres of water chestnut in 2022 at seven sites. Three sites have been managed over several years and have shown marked improvement, dropping from 'dense' to 'sparse' at two sites and eradication is likely.



Figure 6. Frogbit with flowers.

CRISP has continued to manage all known mile-a-minute sites in the region, with 5 of 10 sites showing significant reduction since initial survey. Three of the mile-a-minute sites were discovered in 2021, and one in 2022. At the largest mile-a-minute site in the region near Charlotte Creek, CRISP staff and volunteers managed 1.85 acres of a 3.8 acre infestation.

CRISP has also continued to manage all known European frogbit in the PRISM and with the help of the Otsego County Conservation Association frogbit was continually managed at the Clarke Pond site and was not detected in Otsego Lake. However, three new infestations were found in Sullivan, Orange, and Otsego Counties in 2022. All plants were pulled in Martin Lake, Orange County and the AIS team will continue to monitor the site. The other two new infestations are significant, and eradication is unlikely given the habitat and amount of frogbit at each site.

Buck Environmental Solutions performed treatment of Japanese angelica tree at one site on private land in Woodstock.

CRISP staff and the Early Detection Working Group reviewed and finalized an updated Tiered List for invasive species in the CRISP region. The complete Tiered List can be found on the CRISP website (www.catskillinvasives.com) and the iMapInvasives New York website (www.nyimapisives.org). The Tier 2 species

sub-list of the Tiered List is used each year to target species infestations for early detection surveys and rapid response management.

Each very high, or high, impact invasive species was assigned to the following tiers :

- ‘Tiers 2-4’: species with a ‘high’ or ‘very high’ NYS Ecological Impact rank or a ‘very high negative’ or ‘significant negative’ NYS socio-economic impacts rank. Those with the lowest 33% population counts are designated Tier 2, the middle 33% Tier 3, and the upper 33% Tier 4.
- ‘Tier 1a’ - species within a 100-mile buffer of the PRISM that are not already present within the PRISM.
- ‘Untiered in PRISM’- Contains any species present in the PRISM that has neither a high ecological nor socio-economic impact.
- ‘Untiered in Buffer’ - species within a 100-mile buffer of the PRISM that are not already present within the PRISM.

The Tier 2 Species List (Table 3) list those species that were targeted for early detection surveys. In some instances, landowner permissions were not obtained, so surveys could not be performed. In other cases, populations were not visited in 2022 due to staff limitations.

Table 3. 2022 CRISP Tier 2 Invasive Species.

Scientific name	Common name
<i>Acer pseudoplatanus</i>	sycamore maple
<i>Akebia quinata</i>	chocolate vine
<i>Aldrovanda vesiculosa</i>	waterwheel plant
<i>Aralia elata</i>	Japanese angelica tree
<i>Cabomba caroliniana</i>	fanwort
<i>Channa argus</i>	Northern snakehead

<i>Clematis terniflora</i>	Japanese virgin's-bower
<i>Corbicula fluminea</i>	Asian clam
<i>Daphne mezereum</i>	daphne
<i>Dreissena bugensis</i>	quagga mussel
<i>Eichhornia crassipes</i>	water hyacinth
<i>Euonymus fortunei</i>	winter creeper
<i>Heracleum mantegazzianum</i>	giant hogweed
<i>Humulus japonicus</i>	Japanese hop
<i>Hydrocharis morsusranae</i>	European frogbit
<i>Kolkwitzia amabilis</i>	beautybush
<i>Lamiastrum galeobdolon</i>	yellow arch-angel
<i>Lilioceris lili</i>	lily leaf beetle, scarlet lily beetle, red lily beetle
<i>Lycorma delicatula</i>	Spotted lanternfly
<i>Miscanthus sinensis</i>	Chinese silvergrass
<i>Najas minor</i>	brittle water nymph
<i>Nymphoides peltata</i>	yellow floating-heart

<i>Osmerus mordax</i>	rainbow smelt
<i>Paulownia tomentosa</i>	princess-tree
<i>Perilla frutescens</i>	Beefsteak plant
<i>Persicaria perfoliata</i>	mile-a-minute weed, mile-a-minute vine
<i>Petasites hybridus</i>	Pestilence wort
<i>Pistia stratiotes</i>	Water lettuce
<i>Pyrus calleryana</i>	Callery pear
<i>Rhodotypos scandens</i>	black jetbead
<i>Syringa reticulata</i>	Japanese tree lilac
<i>Vincetoxicum rossicum</i>	European swallow-wort, pale swallow-wort, dog strangling vine
<i>Viviparus georgianus</i>	Banded mysterysnail

The Early Detection Working Group will review the priority invasive species list annually, recategorizing species based on updated population information and the best information available.

Restoration

CRISP continued maintaining 2 acres of ecological restoration sites in 2022 at the Catskill Center’s Catskills Visitor Center and the Thorn Preserve. Management of water chestnut in Thorn pond began in 2022 and continued management and plans to restore an additional 0.5 acres of wet meadow at the Thorn Preserve will start in 2023.

The Catskill Center partnered with the Parks Project to organize a volunteer workday to remove invasive species and collect native seeds at the Catskill Visitors Center in Mount Tremper. CRISP staff led the workday on August 20 to prepare the site for the establishment of a pollinator garden.

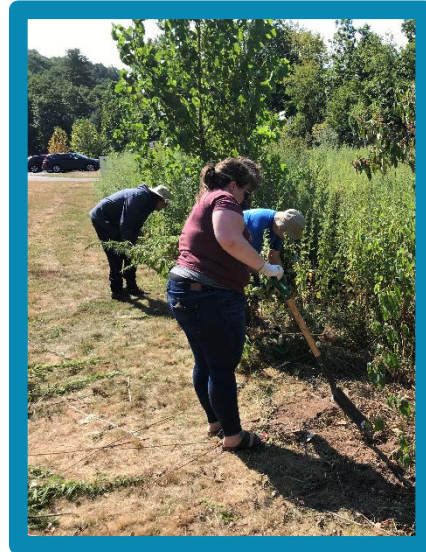


Figure 7. Invasive Species Removal at Catskills Visitor Center on 8/20.

Awareness

In 2022, CRISP led a total of 45 events for 1097 participants. Trainings were offered for identification, reporting, early detection, control, and prevention of invasive species and for community science training (Table 4). Other programs raised awareness about spotted lanternfly, beech leaf disease, jumping worms, and other emerging species (Table 5). Programming was offered both remotely and in-person. The most popular program was the “Wild Wonders: Celebrating the Native Plants of the Catskills” panel webinar, with 281 participants. Because beech leaf disease was discovered in CRISP for the first time this summer (in two locations in Sullivan County), most programs included information about beech leaf disease.



Figure 8. Beech leaf disease.

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Table 4. CRISP 2022 Trainings.

Date	Title	# of Participants
4/23	Lesser Celandine ID and Removal	2
5/9	Catskill Stewards IS & iMaps Training	5
5/7	Invasive Species ID and Workday	3
5/14	Invasive Species ID and Workday	4
5/21	Invasive Species ID and Workday	2
5/24 - 5/26	WSP Steward Hands on Training (Plant and Animal ID)	22
5/25	SCA iMap Training	9
6/4	ISAW iMap Training	1
6/4	Invasive Species ID and Workday	4
6/8	ART Invasive Species Workday	4
6/12	Invasive Species ID and Workday	6
6/26	Invasive Species ID and Workday	6
7/10	Invasive Species ID and Workday	6
7/15	Intro to CRISP & iMapInvasives	17
7/16	Goodyear Water Chestnut Pull w/OCCA	5
7/23	CLIA Annual Picnic	10
7/23	Board IS Pull - Restoration Maintenance	2
7/30	Silver Lake AIS Pull	4
8/13	Water Chestnut Pull	12
8/13	Invasive Species ID and Workday	4
8/20	Goodyear Water Chestnut Pull w/OCCA	5
8/20	Invasives Pull & Native Plant Seed Collection	7
9/10	Invasive Species ID and Workday	4
10/13	iMap Training	6
10/29	iMap and iNaturalist training	8
12/12	CRISP and iMap Training	28
Total	26	186

Table 5. CRISP 2022 Awareness Programs and Events

Date	Title	# of Participants
1/25	"Uninvited" Watch Party	62
2/15	Wild Wonders: Celebrating the Native Plants of the Catskills Panel	281

2/23	CRISP Update for Riparian Buffer Working Group	44
3/18	Water Quality Symposium	47
5/3	5th Grade AIS Presentation	37
5/7	ART Invasive Species Walk	2
5/11	CRISP Partners Virtual Meeting	18
5/14 - 5/15	Rotary Paddle Event	16
5/24	Spotted Lanternfly in the Catskills: Virtual Panel	18
6/8	Clean, Drain, Dry Seminar	3
7/24	Phoenicia Farmers Market	4
9/24	Cauliflower Festival	136
10/2	I SPY Invasive Species	3
10/5	CRISP Partners Meeting & Field Trip	10
10/15	Scarecrow Festival	55
10/27	Invasive Species on the Horizon - CERM Conference	100
10/31	CRISP & Invasive Species	7
12/14	Jumping Worm Webinar	51
Total	18	894

CRISP staff shared all events through its Facebook page (www.facebook.com/catskillinvasives/). The number of likes of the CRISP Facebook page increased by 27% during the year to 938 (the makeup of people that like our page is 59% women and 41% men). The number of followers increased from 776 to 1,026, a 32% increase. Engagement with our posts increased by 345% over 2021! A post about northern snakehead “Frankenfish,” was our most popular post of 2022, with 17,707 views and interactions.

Science

The Catskill Science Collaborative Fellowship of Marissa Kordal (SUNY Cortland), “Understanding the single and combined effects of co-occurring stressors: white-tailed deer, invasive earthworms, and invasive plants.” was completed in 2022. Dr. Andrea Davalos (SUNY Cortland) gave a webinar on the results of the project for 51 people on 12/14.

CRISP began monitoring hemlock stands in 2014 to assess Hemlock Woolly Adelgid, and other pests, and assess the health of the stands. Ten of these stands were re-surveyed this year. At each stand, data was collected on 30-45

hemlock trees. Hemlock health was assessed and hemlock woolly adelgid density data was collected at each tree.

Partnership

CRISP Partner meetings were held virtually on 5/11 and in-person on 10/5. The 5/11 meeting focused on Partners collaborating on events for 2022 Invasive Species Awareness Week. This meeting was recorded and posted on the CRISP website and is available for subsequent viewing:

<https://www.catskillinvasives.com/crisp-presentations> . The 10/5 Partners meeting, held at Mountain Top Arboretum in Tannersville was notable for being the first in-person CRISP meeting since the onset of the COVID-19 pandemic. The meeting was followed by a wonderful tour of the Arboretum by Marc Wolf, Executive Director.

Meredith Taylor began her full term as Steering Committee Chair in 2022. The present membership of the CRISP Steering Committee is shown in Table 6. Steering Committee Meetings were held on Microsoft Teams on 2/3, 3/23, 6/1, 8/4, and 12/6 and an in-person meeting was held at Mountain Top Arboretum on 10/5. Topics of discussion included strategic planning and Group Concept Mapping, developing a Partners Agreement, updating the Governance Policy, RFP awards and subcontractor funds, and many other topics. The Committee reviewed agreements other PRISMs have with their Partners and drafted a “Cooperation Agreement” that was reviewed by the administration and legal departments of organizations that make up the Steering Committee.



Figure 9. CRISP Partners Meeting Tour at Mountain Top Arboretum, 10/5/22.

Table 6. CRISP 2021 Steering Committee

Name	Position	Organization
Meredith Taylor	Invasive Species Biologist	New York City Department of Environmental Protection
Ethan Angell	Senior Horticulture Inspector	New York State Department of Agriculture and Markets
Ian Dunn	Forester 1	New York State Department of Environmental Conservation
Kris Gilbert	Senior Landscape Architect	New York State Department of Transportation
John McNaught	Forest Program Manager	Catskill Forest Association

Name	Position	Organization
Tom Pavlesich	Forestry Program Manager	Watershed Agricultural Council
Jeff Senterman	Executive Director	Catskill Center for Conservation and Development
Catherine Skalda	CSBI Coordinator	Delaware County Soil and Water Conservation District
Donna Vogler	Professor of Biology	SUNY Oneonta
Marc Wolf	Executive Director	Mountain Top Arboretum
Connor Young	Environment and Natural Resources Team Leader	Cornell Cooperative Extension of Greene County
Chris Zimmerman	Conservation Ecologist	The Nature Conservancy

The CRISP listserv was used frequently by CRISP staff, New York Invasive Species Research Institute, NYS DEC, and other partners to share information, promote events and share the latest findings on invasive species. The CRISP listserv continues to grow, adding 34 new members in 2022, a 12% increase, and now reaches a total of 309 individuals.

The Early Detection Working Group met to update the CRISP Priority Species List. The Education and Outreach Working Group met during the year to plan online programming and prepare for New York State Invasive Species Awareness Week.

A Request for Proposals was released on March 15th with a deadline of April 15th.

The highest priorities for funding included:

1.) Stop emerging invasive species infestations through Rapid Response.

All proposed control projects must outline project steps as defined in the CRISP Engagement Policy. Eradication and containment projects focused on Tier 2 Species (see CRISP Invasive Species Categorization) are preferred over suppression efforts. Proposals that address species other than Tier 2 Species will be considered but need justification on the feasibility of containment.



Figure 10. Otsego County Conservation Association Volunteer Frogbit Pull.

2.) Surveys for Early Detection Species. Surveys for Tier 1 or Tier 2 Species beyond what is documented in iMapInvasives and EDDMapS. Surveys for Tier 1 Species; in areas where an introduction pathway exists. A survey methodology

will be defined to determine Highly Probable Areas that could support target species.

3.) **Raise public awareness of Tier 1 Early Detection/Prevention Species** to address introduction pathways of forest pests, pathogens or species approaching the region. Programs that focus on Prevention or Early Detection, or have broad application, will be preferred.

4.) **Improve the scientific understanding of the extent, ecological impact, and effective controls of invasive species in the CRISP region.**

5.) **Develop or enhance a structured Community Science Program** that engages and retains participants. A program that trains volunteers to become community scientists collecting significant information on invasive species, offers levels of training and recognition for participants are preferred.

Based on previous agreements and on the ranking of the RFP proposals by the subcommittee, the following projects were selected for funding in 2022:

- Canadarago Lake Improvement Association, “Aquatic Invasive Species Prevention Program”
- Cornell Cooperative Extension Columbia-Greene, “CRISP Education and Outreach”
- Matty’s Landscaping, for maintenance of Hemlock Insectary and Native Planting at Thorn Preserve
- Otsego County Conservation Association, “Invasives Intervention and Education”
- SUNY Oneonta, “Clean Drain Treat Kits Outreach”

The Catskill Center performed invasive species management along the Ashokan Rail Trail (ART) corridor. A number of Catskill Center staff participated in the 2022 ART Invasive Species Management Project, including the Catskill Regional Invasive Species Partnership Director, Volunteer and Outreach Coordinator, Terrestrial Invasive Species Manager, Aquatic Invasive Species Manager, and four members of the CRISP seasonal invasive species strike teams. The programming began with an introductory invasive species walk on Saturday, May 7.

Over the nine workdays of 2022, 40 volunteers contribute 160 hours of volunteer time. Seven invasive species have been pulled at 18 scenic vistas, over about ¼ acre.

During the workdays, volunteers were taught how to identify each of the invasive species in the vistas and how to best manage them. In addition, volunteers were trained to enter invasive species observations in iMapInvasives. At each workday, the Catskill Regional Invasive Species Partnership provided tools: pick mattocks, spades, loppers, pruners, etc.

Removals focused on vines and shrubs that could block the scenic views from ART vistas. Invasive species removed included Asian bittersweet, bush honeysuckle (*Lonicera* spp.), multiflora rose (*Rosa multiflora*), Japanese barberry, border privet (*Ligustrum obtusifolium*), autumn olive (*Elaeagnus umbellata*) and Japanese knotweed (*Reynoutria japonica* var. *japonica*).

CRISP staff subcontracted with Trampoline Advertising and Design Company, located in Glens Falls. A working group was formed to work with Trampoline to develop a new logo for CRISP. John Thompson, Catherine Skalda (Delaware County Soil and Water Conservation District, Catskill Streams Buffer Initiative Coordinator), Marc Wolf (Mountain Top Arboretum, Executive Director), and Allison Dunne (Catskill Center, Communications Manager) served on the working group. The new CRISP logo features a fire tower, mountains, hemlocks by a stream, and supporting hands holding up the landscape:



The new logo replaced the old logo in all digital outlets and is being added to CRISP print materials as they are being reprinted.

Appendix A. Equipment List Purchased through PRISM Funds

Equipment	Quantity
Lenovo Laptops	2
Office Chairs	3
Kayaks	3
Paddles	3
PFD	1
Kayak Racks	2
Cross Bar	1
Rakes	2
Pelican case	2
Clips	10
Pump Sprayer	2
Standing Kayak Rack	1
Lock	1
Chain	20
GPS	4
Sampling Rake	1
Secchi Disk	1
River Boots	9
Thermometer	1
IoLight	1
MacBook Air	1
First Aid Kits	2
Pop-up Tents	3
Foldable Chairs for tabling	4
Presentation Easels	3
Metal Shelving Unit	1
Heavy Duty Plastic Shelves	3
Pesticide Safety Storage Units	2
Gravity Eye Wash Station	1
Spill Mats and Chem Storage	2
SOS Beacon	1
Mud/Snow Un-Stuck Treads	1
Collapsible Equipment Cart	2
5 lb. Pick Mattock	5
2 ½ lb. Pick Mattock	6
Lopper	4
Pruners	3
Drain Spade	3
Drill	1
Binoculars	2

Appendix B. iMapInvasives 2022 Summary for CRISP

Table 1. Top ten species reported statewide and by the CRISP PRISM with confirmed presence detection from 4Dec21 – 9Dec22.

Presence Detected				
	Statewide		CRISP	
1	Eurasian Watermilfoil	5,343	Oriental Bittersweet	235
2	Curly Pondweed	2,227	Japanese Barberry	211
3	Starry Stonewort	1,799	Mile-a-minute-weed	147
4	Water Chestnut	1,484	Japanese Knotweed	103
5	Common Carp	1,325	Hemlock Woolly Adelgid	89
6	European Common Reed	1,157	Multiflora Rose	39
7	Sea Lamprey	973	Water Chestnut	32
8	Japanese Knotweed	862	Curly Pondweed	28
9	Carolina Fanwort	812	Japanese Tree Lilac	27
10	Broadleaf Watermilfoil	757	Winged Spindletree	27

Table 2. Top ten species not-detected statewide and by the CRISP PRISM from 4Dec21 – 9Dec22.

Not-Detected				
	Statewide		CRISP	
1	Garlic Mustard	873	Japanese Knotweed	57
2	Hydrilla	759	Spotted Lanternfly	55
3	European Common Reed	734	Oriental Bittersweet	51
4	Beech leaf disease nematode	519	Beech leaf disease nematode	47
5	Longhorn Tick	347	Japanese Barberry	47
6	Hemlock Woolly Adelgid	323	Tree-of-Heaven	41
7	Spotted Lanternfly	265	Giant Hogweed	32
8	Japanese Knotweed	256	Longhorn Tick	20
9	Carolina Fanwort	252	Hemlock Woolly Adelgid	19
10	Common Water-hyacinth	200	Water Chestnut	12

Table 3. Top ten treated species reported statewide and by the CRISP PRISM from 4Dec21 – 9Dec22.

Treatment				
	Statewide		CRISP	
1	Japanese Knotweed	151	Japanese Barberry	38
2	Water Chestnut	140	Oriental Bittersweet	18
3	Garlic Mustard	80	Water Chestnut	10
4	Sticky Sage	42	Mile-a-Minute	5
5	Japanese Barberry	41	Black Jet-Bead	2
6	Common Reed	39	European frogbit	2
7	Japanese Stiltgrass	37		

8	Scotch Broom	25
9	Castor-Aralia	24
10	Tree-of-Heaven	23

Table 4. Number of unique species reported statewide and by the CRISP PRISM with confirmed presence detection from 4Dec21 – 9Dec22.

	Statewide	CRISP
Number of Species Reported	240	86

Table 5. Presence, not-detected, searched area, & acres of searched areas statewide and by the CRISP PRISM from 4Dec21 – 9Dec22. The acres of searched areas were calculated from GIS.

	Presence		Not-Detected Records	Searched Areas	Acres of Searched Areas
	Confirmed	Unconfirmed			
Statewide	27,731	2,076	20,867	24,750	101,075
CRISP	1,149	233	543	1,041	2,975

Table 6. Presence and not-detected records by data entry method from 4Dec21 – 9Dec22. Data includes confirmed and unconfirmed detections.

	Presence					Not Detected				
	Online	Mobile App	Bulk Upload	NS Survey123	Custom Jurisdiction Apps	Online	Mobile App	Bulk Upload	NS Survey123	Custom Jurisdiction Apps
Statewide	2,258	8,601	11,203	2,049	9,239	1,424	11,863	3,003	58	2,792
CRISP	149	599	506	0	242	120	187	129	0	102

Table 7. Reasons for not detecting from 4Dec21 – 9Dec22.

	Statewide	CRISP
Presumed eliminated due to treatment	1,801	5
Habitat No Longer Exists	6	0
Low Detectability (wrong timing, season, low abundance, etc.)	23	3
Species has never been detected here previously	1,075	62
<i>Not defined</i>	18,046	472