

Great Swamp NWR Strike Team Invasives Report 2023

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Introduction

Over the last 11 months (November 2022–September 2023), Strike Team volunteers worked 569.5 hours eradicating various invasive plant species.

Two Fields, Two Outcomes

In December, 2017, the Strike Team discovered a severe infestation of common buckthorn in part of Field 68a. The area of infestation comprised about two acres of dense brushland near the White Oak Trail. We cut-stumped hundreds of trees that winter, eliminating the adult berry-producing plants. Of course there would be a seed bank (seeds accumulated in the soil), so we would need to treat new crops of common buckthorn in coming years. The field would have to be placed temporarily in “intensive care,” receiving treatment until the infestation was brought under control. The Refuge mowed the field the following winter, and the strike team completed two foliar passes—selectively treating common buckthorn seedlings and resprouts—in the summer of 2019. Given the severity of the infestation, we asked the Refuge to mow the field again that winter, which allowed the Strike Team to complete another foliar pass the following summer. At that point, we were confident that we had eliminated most of the seed bank, so the field could be returned to its normal mowing rotation and resume its role as brushland habitat. Last winter the field was mowed again (according to the Refuge’s regular schedule), and this summer the strike team returned to spot-treat any new common buckthorn. We were pleased to see that our treatment plan had worked: there were only a few resprouts and seedlings. Common buckthorn in Field 68a is under control and declining.



Field 68a (August 2023)

In the summer of 2017, the Strike Team discovered that most of Field 49 was severely infested by glossy buckthorn. This is a large field (more than 13 acres), and its brushy thickets were too dense to allow cut-stump treatment. The Refuge mowed the field the following winter, and the Strike Team completed its first foliar pass—selectively killing glossy buckthorn resprouts and seedlings—in the summer of 2018. Given the abundant seed bank, it was apparent that Field 49, like 68a, would need to be placed temporarily in “intensive care.” The Refuge mowed the field again that winter. Recognizing the severity of the glossy buckthorn problem, the Refuge also secured funding for American Conservation Experience (ACE) crews for the summer of 2019. During their time at Great Swamp, the ACE crews worked almost exclusively on glossy buckthorn under my supervision. Among other things, we completed two foliar passes of Field 49. The field was not mowed that winter, but the Strike Team managed to treat part of the field the following summer. Given the resurgence of adult berry-producing plants by early summer 2021, I requested that the more severely infested half of the field be mowed. After this rare mid-summer mowing, the Strike Team was able to treat the mowed section in September. The field was not mowed that winter and so could not be treated in 2022. Nor was the field mowed last winter, and by this summer glossy buckthorn again formed dense stands across much of the field. For the first time since 2017, adult plants produced a crop of berries that both replenished the seed bank and were dispersed to new locations. Glossy buckthorn in Field 49 is once more out of control and expanding.



Field 49 (July 2023)

Mowing and Burning

As the Strike Team has documented over the years, mowing brushy fields “supercharges” the glossy buckthorn invasion in two ways. First, mowing causes existing plants to sucker, so that a typical adult plant, instead of having one or two stems, grows 15 to 25 stems, each producing dozens of berries. Second, mowing allows sunlight to reach the ground, so seeds in the seed bank can germinate, creating dense nurseries of new seedlings. Together, these two dynamics fuel glossy buckthorn’s exponential expansion across brushy fields and into surrounding woods. We emphasize that mowing brushy fields is of course critical for preserving early-successional habitat for many swamp species.



Suckering glossy buckthorn after mowing



Suckered glossy buckthorn after mowing



Glossy buckthorn nursery after mowing

Similarly, the Strike Team has documented that prescribed burns stimulate glossy buckthorn. Instead of killing the plant, these burns cause it to regrow vigorously. This is true even for seedlings (< 10 in. tall) in dry fields under dry conditions. At least under certain weather conditions, prescribed burns also promote germination of glossy buckthorn seeds, leading to new crops of seedlings. We have also documented that prescribed burns stimulate other invasive species, including common buckhorn, autumn olive, bush honeysuckle, and

sapphire berry. Like glossy buckthorn, these plants regrow strongly after burns. Prescribed burns, we note, are an important management tool that can remove dead material and benefit some native plant species.



Glossy buckthorn after burn



Bush honeysuckle after burn



Autumn olive after burn



Common buckthorn after burn

One way to achieve the benefits of mowing and burning without losing key brushland habitat to invasives would be to schedule follow-up treatment of glossy buckthorn (and other priority species) whenever an infested brushy field is mowed or burned. Based on its years of experience working in Great Swamp's brushy fields, the Strike Team can accurately estimate the labor needed for follow-up treatment in each field. (Until this year, the Strike Team provided the labor for such follow-up treatments.) For example, an effective, thorough foliar treatment of Field 49 requires about 170 hours of labor, while the same foliar treatment of

Field 48 requires about 160 hours. Since each glossy buckthorn site needs to be treated every two years, about half the sites are treated in any given year, an annual workload of about 700 hours (not including time spent on other priority invasives). Once these calculations are made, planning for follow-up treatment of mowed/burned fields becomes straightforward. (Though it must be noted that foliar treatment cannot be carried out if vegetation is too short or too tall. See the chapter on glossy buckthorn below.)

Looking Ahead: Glossy Buckthorn . . . and Mile-a-Minute

When the Strike Team stepped away from its glossy buckthorn campaign this year, the overall situation looked good. We had

- developed and implemented a proven, comprehensive, year-round control plan,
- stopped the spread of glossy buckthorn in Great Swamp by eliminating tens of thousands of adult berry-producing plants,
- essentially eradicated glossy buckthorn from several forest sites that were once severely infested,
- controlled glossy buckthorn in the rest of the forest sites,
- controlled glossy buckthorn in brushy fields by treating all of them at least once and most of them several times, and
- eliminated much of the glossy buckthorn seed bank in forest sites and brushy fields.

The immediate future of certain fields looked especially bright. Because glossy buckthorn had invaded some fields (such as 62, 47b, 47c, 41b, and 59) relatively recently, it hadn't yet had a chance to lay down very abundant seed banks. By treating crops of seedlings in these fields, the Strike Team had already eliminated most of their seed banks. After another year or two of treatment, these fields could have been removed from "intensive care" and returned to their normal mowing schedules. Like Field 68a, they could have resumed their roles as healthy brushland habitat.

Instead, left untreated—and invigorated by prescribed burns and mowing—glossy buckthorn has now reestablished itself across much of the Management Area. This summer, for the first time in years, adult plants produced crops of berries that both replenished the seed bank and infested new locations. Glossy buckthorn has restarted its invasion of Great Swamp.

Almost since its inception, the Strike Team has treated mile-a-minute at various locations in Great Swamp. Until recently, we were able to keep these infestations under control, hand-pulling plants before they could produce berries and gradually reducing the seed bank. In 2021, we discovered a significant new invasion in a gas line right-of-way (ROW) near Pleasantville Road. Here, mile-a-minute was spilling out of a private residence into Great Swamp, overgrowing a Phragmites and cattail marsh. Using power tools, we cut approximately 1/10 acre of the vegetation to knee height so that, a month later, we could

return to foliar treat mile-a-minute resprouts. Last year, we were too busy with glossy buckthorn to carry out a follow-up operation. This year, the infestation is much worse and has moved deeper into the Refuge. (Compared to glossy buckthorn, mile-a-minute advances at lightning speed.) The Strike Team was unable to secure the tools needed to tackle the problem but treated the infestation as best we could. The site will remain a mile-a-minute hotspot for the foreseeable future.



Mile-a-minute in northern ROW

Glossy Buckthorn

Until this year, the Strike Team dedicated most of its labor to glossy buckthorn, which poses the greatest invasive threat to Great Swamp. Glossy buckthorn thrives in brushy fields and forest understory, forming monoculture infestations that eliminate native plant communities, thus destroying the habitats of native animals. Once monocultures are established, the plant spreads quickly via seed dispersal by birds. Because glossy buckthorn occurs in the Management Area, where it is invisible to the public, this small Eurasian tree does not get much attention.



Glossy buckthorn monoculture in forest understory



Glossy buckthorn monoculture in brushy field

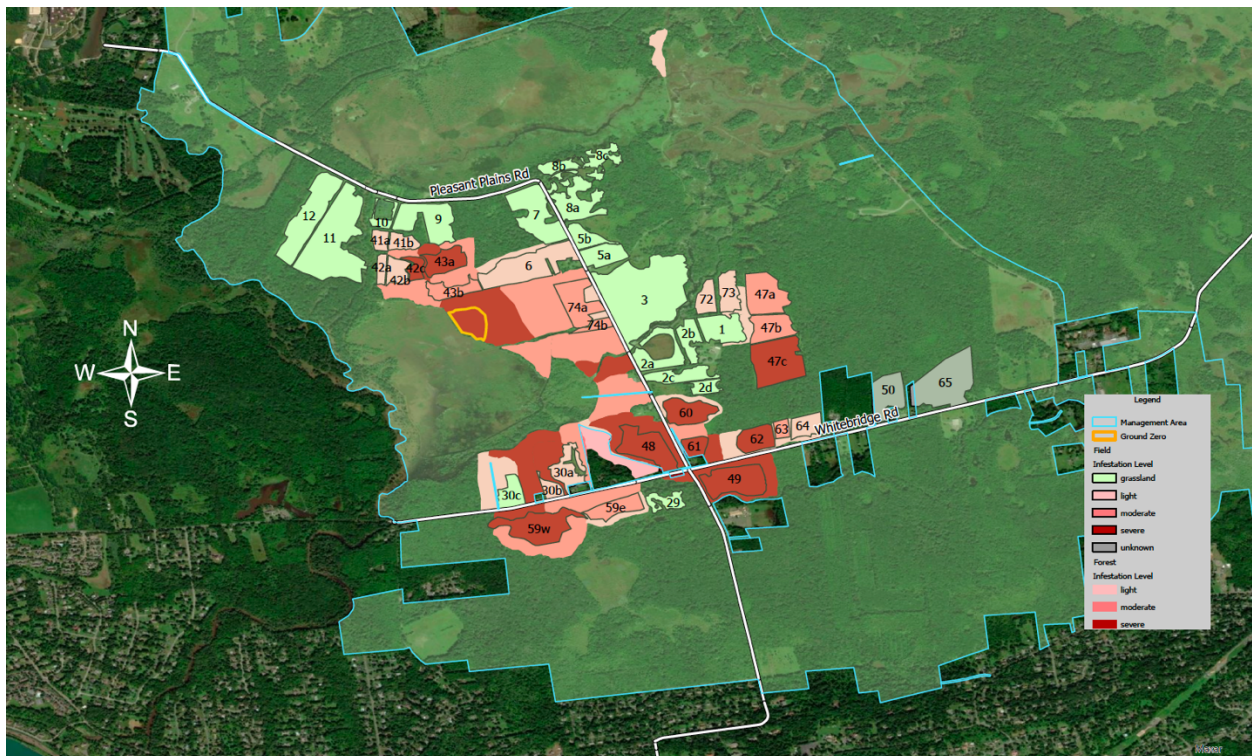
As with any invasive infestation, the Strike Team's first priority was to kill seed-producing plants to halt further invasion and replenishment of the seed bank. Most of this work happened in the winter, when we used cut-stump treatment to kill trees 5 to 20 feet tall. The next priority was the long process of "burning through the seed bank," which requires foliar treatment of resprouts and seedlings on a biennial basis. Depending on how long a site has been infested, the seed bank can keep producing new crops of glossy buckthorn for many years. There are no mechanical shortcuts, no easy answers. Both parts of the job—treating adult plants and treating new crops of seedlings—require intimate knowledge of the infested sites, plus hundreds of hours of labor, throughout the year, year after year. As we have seen, when the second task (treating seedlings) is left uncompleted for a couple of years, adult plants will quickly re-infest a site, and the invasion process restarts.

For effective foliar treatment of resprouts and seedlings, vegetation in fields must be 1 to 3 feet tall, with an ideal treatment height of about 2 feet. This allows a person to efficiently find and treat most glossy buckthorn plants with minimal collateral damage to surrounding native vegetation. (Shorter plants do not have enough leaf surface area to insure mortality after treatment. Taller vegetation hides glossy buckthorn, making the search process impractical, if not impossible, while greatly increasing collateral damage to native plants.)

Therefore, fields scheduled for summer treatment have to be mowed the previous winter or spring.

Overall, the glossy buckthorn infestation comprises too many sites and encompasses too much area for treatment in any one year, so the Strike Team adopted an alternating schedule, aiming to treat about half the sites one year, and the other half the following year. This schedule insured that plants would be treated before they could begin producing berries. Two years ago, the Refuge increased its mowing schedule, and the Strike Team could not keep up, so certain fields had to be abandoned. Last winter, the Refuge did not mow fields that were due (or overdue) for treatment, making their treatment this summer impossible. Given the Refuge's new priorities, the Strike Team had no choice but to end its glossy buckthorn campaign.

Glossy Buckthorn



(Map: Bob Muska)

Fields 41a-b

Background	This is the northern edge of the infestation centered in Fields 42c and 43a (see below). A couple of sections of 41b have significant infestations, but rest of the field has only scattered plants. 41a appears to be clear.
2021–22 winter	First scouted—dense brush; a couple of large plants treated; seed bank unknown. Mowed by Refuge.
2022 summer	First foliar treatment.
2023 summer	No treatment.

Fields 42a-c

Background	The Strike Team discovered this infestation during winter scouting. Most of 42c is severely infested (see 43a). Scattered plants and small populations occur in 42b, while 42a appears to be clear.
2021–22 winter	First scouted—dense brush. Dozens of large, seed-producing plants treated; seed bank unknown. Last day of winter cut-stump treatment: 1/19/22. Mowed: 2/28–3/1. Cut-stump effective after this approx. 1-month period of rest before mowing.
2022 summer	First foliar treatment.
2023 summer	No treatment.

Field 43a

Background	The Strike Team discovered this infestation during winter scouting. Most of the field is severely infested, especially the western and northern sections. Oldest suckered plants indicate two mowing cycles.
2021–22 winter	First scouted. Hundreds of large, seed-producing plants treated; seed bank will be abundant. Last day of winter cut-stump treatment: 2/1/22. Western strip mowed: 2/28–3/1. Cut-stump effective after this period of rest before mowing.
2022 summer	First and second foliar treatments of the western, mowed strip.
2022-23 winter	Eastern section mowed.
2023 summer	No treatment.

Woods North, East, and South of Fields 42c and 43a

Background	One section north of 43a is severely infested. Rest of woods are moderately infested.
2022 summer	First foliar treatment.
2023 summer	No treatment.

Field 43b

Background	Bad infestation on southern edge and western section under oak trees (where there were several nurseries) and in aspen grove. Seed bank unknown.
2021–22 winter	First scouted—dense brush. Dozens of large, seed-producing plants treated.
2022 summer	First foliar treatment.
2023 summer	No treatment.

Impenetrable Thicket and Woods East of Pool 3A

Background	The Impenetrable Thicket (IT) was ground zero for Great Swamp’s glossy buckthorn infestation. A few plants got started here about 2001; nurseries soon spread undetected through the forest understory. By the time Colin and I discovered this site in the winter of 2016–17, there were large areas of monoculture infestation, including stands of 20’ trees. The site is extensive (approximately 20 acres), the seed bank profuse.
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Cut-stumping glossy buckthorn near IT



Cut-stumped glossy buckthorn near IT

2016–17 winter	Thousands of 10’–20’ plants cut-stumped.
2017–18 winter	Thousands of 10’–20’ plants cut-stumped; Colin mows some monoculture areas.
2018 summer	Foliar treatment of mowed areas.
2019 summer	Dave mows much of the site.
2019 summer	ACE crew and I complete two foliar passes of the IT (but not the woods east and north of the IT).
2020	Major focus of the Strike Team: over 14 workdays, we complete a foliar pass of entire site.
2021	Not mowed or treated.

2022 summer Foliar treatment over 7 workdays.
2023 summer No treatment.

Fields 74a-b

Background These fields have been scouted and foliar treated a couple of times. Scattered plants throughout, especially near southern woodland square.

2021–22 winter Mowed.

2022 summer Foliar treated western edge of 74a (along woods).

2023 summer No treatment.

Woods North of Middle Brook

Background A large, complex site, with glossy buckthorn scattered throughout. Some sections were severely infested, with monocultures from 3' to 10' tall. The site is now biennial maintenance.

2011–2016 Strike Team cut-stumps and basal-barks small plants near the service road.

2019 spring ACE crew and I use saws and weed-whackers to cut tall stands and clear vegetation to allow foliar treatment of underlying nurseries.

2019 summer Strike Team completes two foliar passes.

2020 Foliar treatment.

2021 No treatment.

2022 summer Partial foliar treatment, focusing on woods along Middle Brook and service roads.

Summer 2023 No treatment.

Triangle Woods East of Pool 3B

Background Parts of the site were badly infested, with nurseries 3' to 6' tall, and large, seed-producing plants scattered throughout. The site is now biennial maintenance.

2011–2016 Strike Team cut-stumps and basal barks small plants near the service road.

2020 Foliar treatment.

2021 No treatment.

2022 summer Foliar treatment.

2023 summer No treatment.

Woods South of Middle Brook to Field 48

Background This is a large site with a complex pattern of infestation—seedling nurseries, older nurseries, tall seed-producing plants, and monocultures.

2017–18 winter Hundreds of large plants and trees cut-stumped, especially along Middle Brook and Black Brook

2019 summer ACE crew uses saws and weed-whackers to cut taller infestations and clear vegetation to allow foliar treatment of underlying nurseries.

2019 summer Strike Team completes a foliar treatment.

2020 No treatment.

2020–21 winter Dozens of large plants cut-stumped.

2021 summer Partial foliar treatment, but vegetation is becoming impassable in places.

2022 summer Site was scheduled for treatment but was not.

2023 summer No treatment.

Field 48

Background Most of the field is severely infested. The seed bank is profuse.

2016–17 winter First mowed.

2017 summer First foliar treatment.

2018 Foliar treatment.

2019 late summer Mowed.

2019 October ACE crew and I complete a foliar treatment.

2020 Not mowed or treated.

2021 midsummer Mowed.

2021 October Strike Team begins foliar treatment of northern section.

2022 summer Field was scheduled for a complete pass but got only a partial treatment (4 workdays).

2023 September Outside contractor treated a small number of plants in small section of the field; treatment appears ineffective.



Field 48 glossy buckthorn, four weeks after treatment by outside contractor

Woods Around Field 48

Background	Much of the site was badly infested, with nurseries from 1' to 5' tall and hundreds of large, berry-producing trees growing along Black Brook. Seed bank is profuse.
2017–18 winter	Large plants and trees cut-stumped.
2018	Foliar treatment of nurseries.
2019	Foliar treatment of nurseries (major infestations of winged euonymus and Japanese wisteria also treated).
2020	No treatment.
2021	Foliar treatment (including woods southwest of White Bridge/Pleasant Plains intersection).
2022 summer	No treatment.
2023 summer	No treatment.

Woods North of The Raptor Trust (TRT)

Background	This site is complex and difficult to traverse. Scattered plants throughout, but main infestation was a dense half-acre monoculture of 4'–8' plants. Now it's biennial maintenance.
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TRT site before treatment (2018)



TRT site after treatment (2022)

2017–18 winter	Main infestation discovered during scouting expedition.
2018 summer	Mowed by Colin.
2018 summer	Strike Team completes two foliar treatments.
2019	Two foliar treatments.
2020	Foliar treatment.
2020–21 winter	New infestation discovered north of the main one.
2021	Strike Team cannot find the new infestation because site is too overgrown.
2021–22 winter	Scouted; massive tree treated next to Black Brook.

2022 summer No treatment.
2023 summer No treatment.

Mudd Property

Background An extension of The Raptor Trust infestation (see above), this was a complex site, with monocultures, nurseries of various ages, and dozens of large, berry-producing plants. Now it's biennial maintenance.

2019 summer Infestation discovered while treating TRT site.

2019 summer Dave mows part of the site; I use weed-whacker to cut stands of tall plants.

2019 summer Strike team cut-stumps large plants around tree trunks, near a wetland, and along the stream; foliar treats everything else.

2020 Foliar treatment. Site is more extensive and severe than thought—extends south to White Bridge Road, especially in the forest strip near the wetland and stream.

2020–21 winter Two smaller infestations discovered north of the main one.

2021 Strike Team cannot find the new infestations because site is too overgrown.

2022 summer No treatment.

2022-23 winter Scouted; several large trees along creek treated.

2023 summer No treatment.

Field 59 and Surrounding Woods

Background This field should be considered two fields, eastern and western, separated by a wooded tract. Western field was badly infested, with scattered nurseries, monocultures, and many berry-producing trees. Seed bank here is profuse. Eastern field has some moderate infestations, but most is clear.

2018 Dozens of trees in western field cut-stumped, but vegetation is too dense to thoroughly scout.

2019 summer Western field partially mowed.

2019 fall Partial foliar treatment of western field.

2019–20 winter Western field completely mowed.

2020 summer Complete foliar treatment of western field and surrounding woods.

2020–21 winter Eastern field mowed.

2021 Foliar treatment of eastern field.

2021–22 winter Woods south of both fields scouted; dozens of large plants treated in woods south of the western field.

2022 summer Scheduled for complete treatment, but not mowed, so no treatment.

2023 summer No treatment.

Field 49

Background	The field is severely infested. Seed bank is profuse.
2017–18 winter	First mowed.
2018 summer	First foliar treatment.
2019 spring	Mowed.
2019 summer	ACE crews and I complete two foliar treatments.
2020	Field not mowed, but partial foliar treatment of small section in September.
2021 midsummer	Eastern half mowed.
2021 September	Foliar treatment of mowed section. Seed bank still abundant.
2022 summer	Field was scheduled for a complete foliar pass, which would have required mowing. No treatment.
2023 September	Outside contractor treats a small number of plants in small section of the field; treatment appears ineffective.



Field 49 glossy buckthorn, four weeks after treatment by outside contractor

Woods Around Field 49

Background	Much of the site was badly infested, with nurseries from 1' to 5'. Woods along eastern edge of field were severely infested, with dozens of tall, berry-producing trees and nurseries. Seed bank is profuse.
2018	Foliar treatment of nurseries in the western and northern strips.
2019 summer	ACE crew foliar treats some nurseries in northern strip; Strike Team completes systematic foliar treatment of western and northern strips (including major infestation of winged euonymus).
2020	No treatment.
2021	First foliar treatment of woods east of Field 49—seed bank is profuse here, with numerous nurseries and stands of large plants.
2022 summer	No treatment.

2022–23 winter Cut-stump treatment of eastern woods; dozens of 5' to 12' trees killed.
2023 summer No treatment.

Field 61

Background Eastern and central sections of the field are severely infested; other sections are moderately infested. The seed bank is profuse.

2018 Dozens of trees cut-stumped.

2019 summer Mowed.

2019 October First foliar treatment.

2020 Field not mowed, but Strike Team completes a foliar pass late in season (October).

2021 midsummer Mowed.

2021 fall Partial foliar treatment.

2022 summer Field wasn't mowed, but we completed a foliar pass.

2023 summer No treatment.

Woods Around Field 61

History Site is complex and difficult. Forest strip west of the field (along Pleasant Plains Road) has nurseries of various ages. In the eastern woods, there are numerous nurseries, some monocultures, and scattered large plants. Winged euonymus also occurs throughout.

2019 Foliar treatment.

2020 Foliar treatment of forest strip along Pleasant Plains Road (but not the eastern woods).

2021 No treatment.

2022 summer Partial foliar treatment.

2023 summer No treatment.

Fields 62, 63, and 64

Background These fields are in the flight path for birds leaving Fields 61 and 49, both heavily infested. Glossy buckthorn is found in all three fields in a declining gradient: bad to severe in Fields 62 and 63, moderate in Field 64. Seed bank is profuse.

2019 November Dozens of large plants (4' to 8') cut-stumped in Field 62, some of which were suckering, indicating that they'd been mowed at least once.

2019–20 winter? Field 62 mowed.

2020 No treatment.

2021 summer First foliar treatment of Field 62.

2021 fall Dozens of large plants cut-stumped in Fields 63 and 64.

2022 No treatment.

2023 summer No treatment.

Field 60

Background	The eastern and middle sections of the field are severely infested; other sections are badly infested. Seed bank is profuse.
2017–18 winter	Large plants cut-stumped. Many older plants have been mowed repeatedly, causing them to sucker dozens of small stems that cannot be effectively cut-stumped.
2019 summer	Mowed.
2019 October	First foliar treatment.
2020	Field not mowed, but Strike Team completes foliar treatment late in season (October).
2021	No treatment.
2022	No treatment. Scouted in late summer—infestation remains bad/severe.
2023 summer	No treatment.

Fields 72 and 73

Background	Not known to be infested but good glossy buckthorn habitat
2020–21 winter	Field 72 mowed.
2021 spring	Field 72 scouted and Field 73 partially scouted. One small plant found in Field 72.
2021–22	Field 73 mowed and scouted—no plants found.
2022	No treatment.
2023 summer	No treatment.

Field 47a

Background	The field is moderately infested, but is prime glossy buckthorn habitat and located next to two fields with bad infestations. The extent of the seed bank is unknown.
2021 spring	Partially scouted—scattered large plants and one nursery around tree islands, most near the southern edge (Field 47b).
2021–22 winter	Most of field has been mowed (when?). Scouted; scattered plants, some large, found and treated in northern and southern sections.
2022	No treatment.
2023 summer	No treatment.

Fields 47b and 47c

Background	Parts of both fields are badly infested, and the seed bank in these sections is profuse. Northern strip of 47c is severely infested. Much of Field 47c is wet.
2019–20 winter	Field 47c mowed.
2020–21 winter	Field 47b mowed.

2021 spring Both fields scouted—numerous stumps of large plants (from 1” to 2” diameter stems) in Field 47b. Plants had suckered, so they’d been mowed at least once.

2021 summer First foliar treatment of both fields.

2022 Fields not mowed, but we partially foliar treated northern strip of 47c.

2023 summer No treatment.

Service Road Near Pool 1

Background Site was discovered in 2018 after a Strike Team workday pulling water chestnut. The infestation lies mainly along the western edge of the road, extending about 40 yards into the woods. Scattered plants throughout, several nurseries of 2’–5’ plants, and dozens of berry-producing trees. Seed bank appears to be light. Site is now biennial maintenance.

2018 Nurseries foliar treated; large plants cut-stumped.

2019 Colin and I complete a foliar pass.

2020 No treatment.

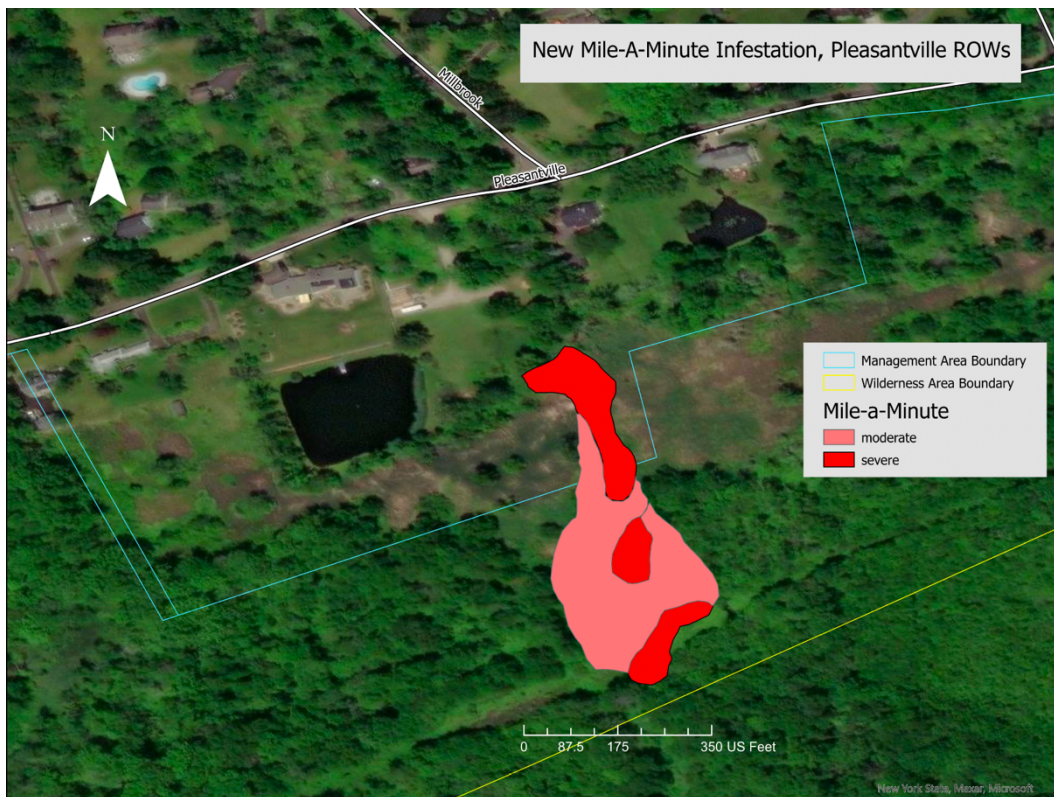
2021 No treatment.

2022-23 winter Site scouted—a few large plants were found and cut-stumped.

2023 summer No treatment.

Mile-A-Minute

Mile-a-minute (MAM) is the second greatest invasive threat to Great Swamp (after glossy buckthorn). The Strike Team has treated several infestations along the Pleasantville Road rights-of-way (ROW) for many years, largely keeping them under control. However, we now regularly encounter mile-a-minute infestations in brushy fields while treating other invasives. Most of these new occurrences are near The Raptor Trust, which has a longstanding infestation. Two summers ago, the Strike Team discovered a significant new invasion of plants (from a private property on Pleasantville Road) into cattail and Phragmites marsh on the northern ROW. As anyone who has visited Wallkill NWR can attest, if mile-a-minute secures a foothold in fields or ROW of Great Swamp, it will quickly overrun critical habitat and require prodigious amounts of labor to contain.



(Map: Bob Muska)

Pleasantville Road Rights-of-Way (ROW)

Background	The site is large and difficult—access is limited, vegetation is dense, and some wetlands and seeps are practically impassable during high water. The locations of infestations must be known in order to find them. There are scattered small infestations in the eastern section and three significant infestations in the western section. Early-season (May) hand-pulling treatment has proven highly effective, but midsummer follow-up is imperative.
2012–2016	Strike Team hand-pulls recurring patches in eastern section of northern ROW each summer.
2017	Colin reports two large infestations in the western section of southern ROW; Strike Team hand-pulls and foliar treats them.
2018	Two hand-pull passes.
2019 May	Western section hand-pulled.
2019 summer	Complete hand-pull treatment.
2020 May	Due to Covid shutdown, we cannot complete early-season treatment.
2020 June	Hand-pull treatment.
2021 May	Hand-pull treatment of eastern and western sections.
2021 July	Hand-pull pass of western section; Strike Team discovers new invasion into northern ROW. Phrag. and cattail marsh cut down to enable foliar treatment.



New MAM infestation overgrowing Phragmites



Cutting Phrag. to prepare for MAM treatment

2021 August	Foliar treatment of new infestation in northern ROW.
2022 May	Hand-pull treatment of eastern and western patches, but no time for midsummer follow-up.
2023 May	Hand-pull treatment of eastern and western patches.
2023 September	Partial foliar treatment of new infestation.



New MAM infestation (2023)



New MAM infestation (2023)

Pleasantville Road Private Properties

Background	At least two private properties are infested with mile-a-minute. Owners allow the Strike Team to hand-pull plants in their backyards and gain access to the northern ROW. The eastern property (near the small Refuge pullout) is moderately infested and under control. The western property (just west of Millbrook Road) is now severely infested. It's the source of the new invasion into the northern ROW.
2012–2016	Strike Team hand-pulls patches in backyard of eastern property.
2017	Strike Team hand-pulls patches in backyard of western property.
2018	Both backyards hand-pulled.
2019	ACE crew partially hand-pulls western backyard.
2020	No treatment.
2021	Complete hand-pull pass of eastern backyard, which looks good.
2021 July	Pervasive Invasive Team hand-pulls lower part of western backyard.
2022 May	Strike team completed a pass of eastern backyard, which is still under control. No treatment of western backyard, which is severely infested.
2023 May	Strike team completed treatment of eastern backyard, which is still under control. No treatment of western backyard, which is severely infested.

Pleasant Plains Road (West of North Gate)

Background	Several years ago, an outside contractor inadvertently infested road ditches with mile-a-minute. Strike Team members periodically pull plants from the ditches.
2023 summer	No plants found.

Fields 48, 49, 59, 61, etc., and The Raptor Trust

Background

While treating glossy buckthorn, the Strike Team has found and pulled significant patches of mile-a-minute in various fields. This is alarming because if not for our glossy buckthorn operation, the infestations would not have been discovered and Great Swamp would now have several out-of-control mile-a-minute infestations.

2022 May

Hand-pulled seedlings in Field 48 and TRT.

2022 summer

Hand-pulled adult plants in Fields 48 and 61.

2023 May-June

Hand-pull treatment in Fields 49, 59, and TRT.

Foliar treatment of infestation in Field 48.

2023 September

Outside contractor foliar treats new crop of plants in Field 48; treatment appears ineffective.



Field 48 mile-a-minute, four weeks after treatment by outside contractor

Water Chestnut

Pool 1

Background	When this infestation was discovered in the summer of 2016, dense monoculture mats covered large sections of the pool. It is now annual maintenance.
2016	Partial pass.
2017	Complete pass.
2018	Complete pass.
2019	Two complete passes.
2020	Two complete passes.



Pool 1 water chestnut (2020)



Pool 1 water chestnut (2020)

2021	Pool drawn down, so no treatment. Colin and I scouted miummer and pulled about 20 plants.
2022	Partial pass because water level too low to access all historic sites.
2023 June	Partial pass because water level too low to access all historic sites.
2023 August	Two complete passes after water level was raised.

Pool 2

Background	A few plants are usually found in this pool each year. One significant patch (northwest of the water control structure near North Gate) is only accessible in high water. The pool is annual maintenance.
2017	Complete pass.
2018	Complete pass.
2019	Complete pass.
2020	Dave drove the MarshMaster to the lower infestation, which I pulled.
2021	Colin and I partially scouted the pool midsummer and found no plants.

2022 No treatment.
2023 No treatment.

Pool OU3

Background This pool was badly infested, with patches of plants throughout and extensive monoculture mats. The pool is now annual maintenance.

2017 Complete pass.
2018 Complete pass.
2019 Two complete passes.
2020 Complete pass.
2021 Pool drawn down, so no treatment. Colin and I scouted midsummer and found no plants.
2022 Complete pass.
2023 Complete pass (1 plant).

Pool 3B

Background This pool had a few scattered plants and two small patches. Plants can only be spotted and pulled from the MarshMaster. The pool is now annual maintenance, depending on MarshMaster schedule for Phrag. treatment.

Common Buckthorn

White Oak Trail (Field 68a)

Background	Plants ranged from 1' to 12', with many berry-producing females. Scattered glossy buckthorn is found within the infestation. The site is now periodic maintenance, depending on mowing schedule.
2017–18 winter	Hundreds of plants cut-stumped.
2018–19 winter	Field mowed.
2019 summer	Two foliar treatments.
2019–20 winter	Infested section of field mowed.
2020 summer	Foliar treatment of infested section.
2021	No treatment.
2022	No treatment.
2022–23 winter	Field mowed.
2023 summer	Foliar treatment.

Impenetrable Thicket

Background	One section of the IT (near Pool 3A) was badly infested, with nurseries, a significant monoculture, and scattered large trees. Seed bank is substantial. (See notes for glossy buckthorn.) The site is now biennial maintenance.
2016–17 winter	Large plants cut-stumped.
2017–18 winter	Large plants cut-stumped.
2019 summer	Dave mows the site.
2019 summer	I complete two foliar passes.
2020	Foliar treatment.
2021	Large plants cut-stumped. New nurseries are developing.
2022 summer	Foliar treatment.
2023 summer	No treatment.

Marsden's Corner and Pleasant Plains Road

Background	The main infestation was severe—a dense monoculture of 4'–10' plants. (There was also a small patch of Japanese aralia.) Surrounding area was badly infested. Seed bank was profuse. The site is now biennial maintenance.
2017	Hundreds of plants cut-stumped.
2019–20 winter	Hundreds of plants cut-stumped.
2019–20 winter	Monoculture, nurseries, and surrounding vegetation cut and cleared to allow foliar treatment.
2020	First foliar treatment.

2021 Foliar treatment.
2022 No treatment.
2023 summer Foliar treatment

Overlook to North Bridge (Fields 9a, 10a)

Background Brushy strip along roadway is badly infested. Extent of infestation into fields is unknown because they're too thick to effectively scout. Seed bank is unknown.

2022 summer Dozens of adult plants cut-stumped.

2023 summer Large plants cut-stumped. Brushy strip along roadway foliar treated.

Porcelain Berry and Japanese Wisteria

Orange Trail (North End)

Background	This was a severe combination infestation of 1–2 acres on difficult terrain. Both plants were topping many trees and spreading into surrounding forest. Seed bank is profuse. (There was also a small patch of Japanese aralia.) Deep holes from old house foundations lie under the vegetation. Site is now annual maintenance. However, vegetation has regrown so much that treatment is becoming practically impossible.
2018–19 winter	Dozens of large vines cut-stumped from trees.
2019 spring	ACE crew uses saws and weed-whackers to cut vegetation so that Strike Team can traverse the site more safely.
2019 summer	Two foliar treatments.
2020	Two foliar treatments.
2021	One foliar pass.
2022 summer	Foliar treatment over 3 workdays.
2023 summer	Foliar treatment. Cut-stump treatment of vines climbing trees.

Japanese Aralia, Chocolate Vine, and Linden Viburnum

Old Nursery (Sassafras Place)

Background	Large, steep, and difficult, the site is covered with a hodgepodge of invasives, from Callery pear to bamboo to Japanese knotweed to yucca to Japanese maple. The greatest threats to Great Swamp habitats are Callery pear, Japanese aralia, chocolate vine, and linden viburnum. Without mechanical mowing, Callery pear is beyond control. The chocolate vine infestation was extensive and severe. For target species, the site is now biennial maintenance; however, site may no longer be accessible.
2012–19	Annual treatment of Callery pear, chocolate vine, Japanese aralia, and linden viburnum.
2020	Foliar treatment of chocolate vine. Basal-bark treatment of Japanese aralia and Linden viburnum.
2021	No treatment.
2022	No treatment.
2023	No treatment (Strike Team could not access the site).

European Water-Starwort

Primrose Brook Canal

Background

Fed by an old agricultural cistern, the canal flows year-round and provides habitat for an array of native aquatic species. It runs south about 150 yards, then veers west. A small offshoot canal cuts south to the ditch along the Pool 2 service road, which feeds into Great Brook. The upper part of the canal—approximately 75 yards, nearest the cistern—was severely infested, with dense monoculture mats across most of the surface. Another 75 yards were badly infested. The cistern is likely fed by a spring, which keeps water temperatures above freezing, which allows plants to grow year-round.



Primrose canal before treatment (2020)



European water-starwort monoculture

2020 March

Complete hand-pull treatment.

2020 June

Complete hand-pull treatment.

2020 July

Complete hand-pull treatment. Infestation is reduced by more than 90 percent.

2021 spring Lower section treated.



Treating Primrose canal



Primrose canal after treatment

2022 spring Upper section and cistern pool treated. Lower section, which was pulled last year, is relatively clear.

2022 spring Upper section and cistern treated. Significant new infestation discovered in the southern offshoot canal toward Pool 2 (Great Brook).

2023 spring Complete hand-pull treatment, including southern offshoot canal.

Autumn Olive

Various Fields and Roadways

Background

This plant is slowly spreading across the management area of Great Swamp, mainly along roads and field edges and near old homesteads, although the Strike Team does encounter it deeper in the Refuge. It seems to be most prevalent around the White Oak Trail, along Pleasant Plains Road (west of Marsden's Corner), and around fields near The Raptor Trust and Mudd property. We treated autumn olive opportunistically while working on glossy buckthorn, cut-stumping large plants in winter and foliar treating plants in summer.

2023

Cut-stumped and foliar treated hundreds of plants in various locations, especially along Pleasant Plains Road and near White Oak Trail (while treating common buckthorn).

Sapphire Berry

White Oak Trail

Background

In spring 2023 a small but dense infestation of this plant was discovered by Maggie Southwell and Mike Van Clef in woods near White Oak Trail. Trees from 5' to 10', resprouts (from a recent prescribed burn), and a seedling nursery.



Sapphire berry after burn

2023 summer

Cut-stumped adult plants.
Two foliar treatments.

Oriental Photinia, Linden Viburnum

Blue Trail

Background	Scattered populations of both species were discovered between Woodland Road trailhead and Red Trail. For several years, the Strike Team could not return for follow-up treatment because it was too busy with glossy buckthorn. In 2023, we scouted the historic sites and found that oriental photinia remains under control, while linden viburnum has begun to spread.
2016–19	Cut-stump treatment.
2023 summer	Cut-stump treatment.

Winged Euonymus

White Bridge Road

Background	This infestation extends from the east end of Field 49 to the west end of Field 59. Most of the infestation is south of White Bridge Road; however, it also extends north along Pleasant Plains Road, past Field 48. The infestation is large and severe, with extensive monocultures and many plants 8' to 12'. Seed bank is profuse. It could potentially invade many acres of woodland habitat. Except for the forest strips around Field 48 and Field 49, the infestation has not been regularly treated.
2019	Foliar treatment of forest strips south and east of Field 48. Foliar treatment of forest strips west and north of Field 49.
2020	T. Cullen and GWE team cut-stump several large plants along White Bridge Road.
2021	Foliar treatment of forest strips south and east of Field 48 (including woods SW of White Bridge/Pleasant Plains intersection).
2022	No treatment.
2023	No treatment.