Final Report
Pound Ridge Hardy Kiwi Control Project

Prepared for
The Lower Hudson Partnership for Invasive Species Management

Prepared by
Trillium Invasive Species Management, INC

This document summarizes the deliverables completed as part of the 2014 project to control a patch of *Actinidia arguta* in the Town of Pound Ridge, NY. Conception and execution of the project was made possible through a partnership between; The Invasives Project-Pound Ridge, The Pound Ridge Land Conservancy and Trillium Invasive Species Management, INC.

This project was contracted by the Lower Hudson Partnership for Regional Invasive Species Management (PRISM) using funds from the Environmental Protection Fund as administered by the New York State Department of Environmental Conservation

Project Narrative:

A. Justification of project and its importance -

Hardy Kiwi (*Actinidia arguta)* is an ED/RR species (see attached commentary by Steve Young). It is a perennial vine native to Japan, Korea, Northern China, and Russian Siberia. It produces a small fruit resembling the kiwifruit. To the best of our knowledge, an outcome of the project is that one municipality would be free of Hardy Kiwi.

Further, managing this species would protect the nearby wetland and its buffer zone.

B. Breadth of application/ Regional implications -

Hardy Kiwi was identified in this area one year ago. The localized mature infestation is on private property and reproducing vegetatively. An immediate application of the project is to protect a nearby conservation preserve (Isaacson Preserve).

As an older stand, the infestation has the potential to begin reproducing with fruit (see Steve Young's comments about the unusual reproductive potential of this plant). Large animals favor the kiwi fruit, carrying it and dispersing it further. The preventative applications of this project are extensive.

From a regional perspective, this project will serve to provide education and outreach to a neighboring community on the existence of hardy kiwi and control methods. Several significant stands, some of which are reproducing with fruit, have been identified in the neighboring community of Bedford. This local initiative can serve as a model for nearby Bedford and an introduction to the services available through the LHPRISM. Channels of communication about invasive species (especially vines) have been established between the conservation boards of Pound Ridge, its initiative The Invasives Project, and Bedford. The Bedford Conservation Board Bedford will be apprised of the work being done in Pound Ridge, how the problem was identified and can be addressed. A copy of the proposal will be provided to Bedford and information about approaching homeowners. The Bedford Conservation board will be encouraged to address the Hardy Kiwi infestations in their community.

C. Detailed scope of work –

Priority Objectives[1] of the LHPRISM addressed by this proposal:

3.1 Have the capacity/ability to rapidly respond to new introductions

While the stand of Hardy Kiwi is mature, our understanding regarding this species is new. This proposal is unfolding as a model for rapid response involving an early detection species, private landowners, and communication between two communities.

4.6 Engage with LH PRISM partnering organizations to determine needs for IS education to municipalities and utilities

Hardy Kiwi has been found in the LH PRISM in two municipalities (correspondences with Steve Young): Pound Ridge and Bedford. Three partners have engaged to develop this proposal. A need to educate a neighboring community (Bedford) has been identified and a process initiated with the Bedford Conservation Board.

[1] Priority Objectives were developed by partners of the LHPRISM to focus implementation of action plans; visit http://www.nynjtc.org/LHPRISM for more info on the 2014 Action Plans and http://lhprism.org/content/strategy for the 2015 Action Plan

5.1. Significant pathways and targeted audiences are identified and prioritized

Steve Young is investigating the spread of Hardy Kiwi in this area. He encouraged this proposal and has initiated conversations with the Bedford Conservation Board.

6.1 Gather and organize information relevant to the management of invasive species from Partners, within the New York state PRISM regions, and outside PRISM regions.

Development of this management plan has included input from Steve Young at LIISMA and Tom Lautzenheiser from Mass Audubon.

6.2 Share information relevant to the management of invasive species from Partners, within the NYS PRISM regions, and outside PRISM regions.

To develop the proposed management plan, Tom Lewis has discussed management of Hardy KIWI with the Long Island Prism and with MASS Audubon. Results of the control will be shared with both parties.

There is engagement outside of the PRISM regions. Steve Young has funded a study at SUNY ESF to study infestations in Lenox, MA (see comment by S. Young). Genetic material was collected by C.Sears for this study. Results are not available at this time.

Outcomes of this project will be shared with LHPRISM partners.

Partner Contributions -

<u>The Invasives Project</u>

The Invasives Project-Pound Ridge (an initiative of the town Conservation Board) will provide <u>project coordination</u> at the local level. The site is located on private property. While the infestation may be located on the lots owned by Theresa Oleson, the proximity to the Singer is so close that it warrants the support of both land owners. The site is on a narrow country road and requires the support of the town DOT and Police Department. Permission to park on Aquarion Water Company property will support the project. <u>Education</u> via a press release with before/after photographs in the paper that serves Pound Ridge and Bedford will be the responsibility of TIP. Finally, <u>outreach</u> to Bedford Conservation Board will be coordinated by TIP. The intent of a presentation to the Bedford board would be to extend the control of this species to another municipality.

<u>Pound Ridge Land Conservancy</u>

The Conservancy will provide annual monitoring of the site for three years following treatment, 2016-2018. Documentation of monitoring will be communicated to LHPRISM and all other Hardy Kiwi project stakeholders.

<u>Trillium Invasive Species Management, INC</u>

Trillium ISM will provide mapping of the project, photo documentation, control plan development, control implementation and development of a final report. Initial mapping, initial map creation (see attachment), proposal co-generation (with TIP), communication with NYS DEC and control plan development are being performed by Trillium ISM as a match to LH-PRISM funding.

Initial mapping of the patch provided accurate location of the project site. When the site was checked with the NYS DEC environmental mapper, two data layers intersected with the site.
The project site is in a wetland checkzone for NYS DEC wetland D-9. A DEC wetland delineator met Thomas Lewis on site on 4/22/2014 to delineate the wetland boundary. The project site was determined to be 225' from the project site. Therefore no freshwater wetland permit is necessary.

The project is also within a rare plant and rare animal layer indicating a bog turtle siting. The project plan and map was been sent to NYS DEC permits for jurisdictional determination, no permits were required by NYS DEC.

Deliverables and Timeline:

2014 - Actinidia patch elimination performed by Trillium ISM, INC

Late spring to early summer - Cut-stem application of glyphosate on all invasive vine stems in the project area (*Actinidia arguta* and *Celastrus orbiculatus*). *Berberis thunbergii* will receive manual control (physical removal).

Late summer to early fall – Foliar application of glyphosate on all re-sprouts of *Actinidia arguta*. Many re-sprouts are expected as it appears the parent vines toppled original structural hosts years ago and fell into a rock wall that it has since infested. *Microstegium vimeneum* will receive mechanical control (mowing).

Fall - Final Report

A summary of the project containing photo documentation, map of the project area and a summary of the projects results and considerations for adaption of management plan for future *Actinidia arguta* control sites.

2015 – Follow-up Monitoring

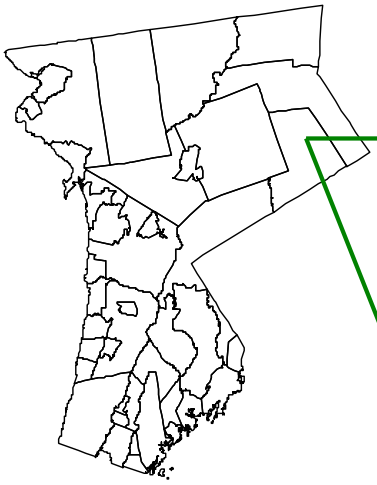
Typical plant elimination projects require multiple years of control efforts and monitoring to ensure success. Additionally, communications with the central/western regional scientist of Mass Audubon who has been exercising control of Hardy kiwi indicate that control efforts will likely extend into a second year.

This project plan recommends that, with satisfactory progress made during 2014, monitoring will continue for several years with the understanding that herbicide application is likely to be required in 2015. The first year of monitoring should be performed by Trillium ISM, INC so that any re-sprouting can be treated with a foliar application of herbicide.

Monitoring from 2016-2018 will be performed by The Pound Ridge Land Conservancy.

Project Map

Hardy Kiwi (Actinidia arguta) Infestation
229 Trinity Pass Road, Pound Ridge NY



Westchester County, Town of Pound Ridge
2600 square foot Hardy Kiwi patch
April 2014

Initial Control Treatment Summary

On June 26 and 27 2014 Trillium Invasive Species Management, INC implemented the first phase of control of the Hardy Kiwi patch in Pound Ridge, NY as per the Scope of Work in Appendix A of the Contract.

All *Actinidia arguta* foliage and woody debris from ground level to a height of approximately five feet was removed and piled on site. The root system was then exposed for treatment. All above ground stems and root sections were cut-stump treated with glyphosate, using Roundup Weed and Grass Killer (EPA Reg. No. 71995-25) undiluted in a sponge applicator. Approximately 5 ounces of product were used.

Follow-Up Treatment Summary

On September 05 2014 Trillium Invasive Species Management, INC implemented the second phase of control of the Hardy Kiwi patch in Pound Ridge, NY as per the Scope of Work in Appendix A of the Contract.

The patch contained many re-sprouts from root sections that were ~3”-8” in height and several re-sprouts that were ~two feet in height. All but one re-sprout appeared to exhibit symptoms of herbicide impact, evidenced by yellowing of leaves. One stem was growing up into a maple tree on the western edge of the patch and it is most likely this stem was missed in the initial control efforts in June of this year. All *Actinidia arguta* growth was exposed and sprayed with a 4% solution of glyphosate using Roundup Weed and Grass Killer (EPA Reg. No. 71995-25). Two ounces of product were used.

Orange flags in the pictures represent points of re-growth.

Follow up monitoring and transition meeting, 9/10/14

On this date Thomas Lewis and Carolynn Sears (representative of The Invasives Project – Pound Ridge) met with Albert Gunnison, a representative of the Pound Ridge Land Conservancy. This meeting was intended to familiarize Albert with the site as he will be monitoring the site for re-growth in 2015-2018

It was noted at the meeting that brush piles should continue to be monitored for growth in addition to the patch area.

One stem was found during this visit that had not been treated with a foliar treatment, this stem was manually removed at that time.

Also on this date Carolynn Sears and Thomas Lewis met with the Bedford Conservation Board and delivered an educational presentation. The Town of Bedford is home to several large, fruit bearing patches of Hardy Kiwi in need of control.

Summary and considerations for future projects[2]

It was expected that the profuse sap produced by the vine when cut would interfere with herbicide uptake. While several plants did re-grow foliage post initial treatment, not all did. Suggesting that sap may not interfere with herbicide uptake. It may be more likely that the proximity of application points was too close to the soil to easily keep the cuts clean and adsorption by soil particles reduced the amount of herbicide available for uptake.

Cutting vines at the base of trees is fairly simple, however the propensity for this plant to root at nodes allows it to travel along fence rows and open areas where the underlying structure (such as a stone wall or a fence, as opposed to a tree) makes Actinidia grow more bush like. In this situation, removal of growth to expose main stems for treatment is very labor intensive. In areas where feasible, it may be advantageous to mechanically mulch the area in the season prior to treatment. This may then be followed with a foliar herbicide application or a cut-stump application if re-sprouting is not too vigorous. In the case of the Bedford sites, much of the infestations are along fence rows. Mechanically mulching along these fences, followed by a late summer foliar application may be the least labor intensive method of control.

This control effort primarily relied on a Stihl FS130 with a brush blade to cut away at the foliage and expose the main stems. This aspect may be made more expedient using a hedge type trimming tool and a pole saw.

Cuttings that were piled did not appear to re-root or produce new growth as of the last site visit.

Follow-up treatment and monitoring is a characteristic of any successful invasive species elimination project and this project site is likely to require follow-up control efforts and monitoring in subsequent years. In the case of this project, a LHPRISM partner has agreed to conduct monitoring and the LHPRISM is likely to fund any required follow-up control efforts. However, future projects may not enjoy the same level of commitment from partners, or may not have other partners local to the project site that can then easily accept the annual duties required by starting an elimination project. It would be most efficient if a method could be developed that would allow project durations of greater than one year. This would ensure project continuity and allow liability and performance guarantees to lie in the hands of one entity.

[2] An assembly of *Actinidia arguta* patches has been reported to iMap by Karalyn Lamb on 12/14/2014 and 1/11/2015 in and around the Brinton Audubon Sanctuary in the Town of Cortlandt. Control has been initiated on some patches and the managers are considering applying for PRISM funding to complete management efforts.

Supporting Documents Appendix

1. Letter of Commitment – The Invasives Project - Pound Ridge
2. Letter of Commitment – The Pond Ridge Land Conservancy
3. Letter of Support – Pound Ridge Conservation Board
4. Letter of Support – Steve Young, Coordinator, Long Island Invasive Species Management Area (LIISMA); Chief Botanist NY Natural Heritage Program
5. Letter of Interest – Conservation Board of Bedford

Letter of Commitment

As co-director of The Invasives Project-Pound Ridge I am committed to the proposal submitted to manage the Hardy Kiwi at Trinity Pass, Pound Ridge. I will help coordinate the project at the local level, write a press release, and address the issue of Hardy Kiwi with the Bedford Conservation Board.

As an initiative of three organizations The Invasives Project-Pound Ridge is unusual. The Letter of Support from the Pound Ridge Conservation Board, as the organization most concerned about the Hardy Kiwi infestation, is included. (The Henry Morgenthau Preserve and Bedford Audubon Society are apprised of TIP activities through a monthly report.)

THE POUND RIDGE LAND CONSERVANCY

May 1, 2014

LII PRISM Steering Committee,

The Pound Ridge Land Conservancy supports the proposal to manage the Hardy Kiwi stand at 229 Trinity Pass, Pound Ridge. If the proposal is funded and the Hardy Kiwi is treated as proposed (2014), the site will be monitored for regrowth in 2015 by Thomas Lewis and by the PRLC in 2016, 2017, and 2018. The conditions at the site will be reported to Thomas Lewis (Volhardt), Carolyne Sears (The Invasives Project-PR), and Linda Robledo (LIPRISM).

Sincerely,

Kristin Mangel
Land Steward/Educator for the Pound Ridge Land Conservancy
136 Old Post Road
Pound Ridge NY 10576

THE PRESERVES

Conservation Board

MEMO TO: Lower Hudson PRISM

FROM: Pound Ridge Conservation Board

DATE: April 18, 2014

SUBJECT: Hardy Kiwi in Pound Ridge Proposal

The Pound Ridge Conservation Board supports the grant application of The Invasives Project - Pound Ridge (TIP-PR) to address Hardy Kiwi in Pound Ridge. TIP-PR will provide local coordination of the project plus education and outreach efforts.

Gail Jankus
Chair, Pound Ridge Conservation Board

ATTACHMENT: LETTER OF SUPPORT
From: Steve Young <smyoung@gw.dec.state.ny.us>
Subject: Hardy kiwi
Date: March 26, 2014 3:03:15 PM EDT
To: Linda Rohleder <lrohleder@nynjtc.org>
Cc: Carolynn Sears <carolynnsears@me.com>

Hi Linda,

Carrie Sears asked me to provide you some background on the hardy kiwi in Pound Ridge.

Until recently, when the Massachusetts Audubon Society brought to our attention that hardy kiwi can escape and cover many acres of forest, we didn't know the invasive nature of this vine. Since then it has come to light that there are a growing number of infestations in the Northeast that are being controlled. There are infestations now known from Maine, Massachusetts, Connecticut, New York, and New Jersey. In New York we have four locations where the plant seems to be spreading through the forest, two on Long Island and two areas in Westchester County; Bedford and Pound Ridge. We haven't done many additional surveys for the plant because it is a new phenomenon and because it is fairly difficult to survey since it looks so much like Asian bittersweet. In the meantime, because there are so few known infestations in New York, and we know that it can wreak havoc in forest communities, it is a classic early detection and rapid response situation where we have the opportunity to eradicate it while the known populations are small.

At the same time we have funded a professor and two graduate students at SUNY ESF to study the infestations in Lenox, Massachusetts and Bedford in order to find out more about how this plant is becoming invasive and the resulting effects that it has on the forest environment. One of the main questions we would like answered is how the species is moving around naturally. The plants are almost always dioecious so one would presume that there would be no fruit to move around unless there were both male and female plants at a site. However, there can be hermaphroditic flowers with both male and female flower parts and we don't know exactly how the plants we have seen producing fruit are

becoming fertile. It may also be that single sex plants can become hermaphroditic over time, we just don't know yet.

On Long Island, LIISMA has funded an eradication project this year for one of the kiwi infestations in Nassau County. The project will be using the Long Island Botanical Society and a local high school to monitor the control to determine how successful it is. We should be working diligently now to survey for and control these wild infestations before they become a major problem like Asian bittersweet. I would suggest that the Lower Hudson PRISM strongly consider controlling the hardy kiwi in Pound Ridge as it is still relatively small and could be eradicated. I would also suggest that more surveys be done in the area for the vine to make sure it has not spread from that one.

Thanks for your attention to this,

Steve

Steve Young
Coordinator, Long Island Invasive Species Management Area (LIISMA)
Chief Botanist
NY Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

518-402-8951
518-402-8925 FAX
smyoung@gw.dec.state.ny.us
websites: www.nynhp.org
www.liisma.org

The New York Natural Heritage Program is a partnership between the New York State Department of Environmental Conservation and the State University of New York College of Environmental Science and Forestry.

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April 30, 2014

To: Lower Hudson PRISM
From: Town of Bedford Conservation Board
Re.: Hardy Kiwi

To Whom It May Concern:

Through Steve Young of the NYS DEC, the Bedford Conservation Board has been made aware there are several sites of Hardy Kiwi in our community, specifically along RT 172 near the Mt Kisco border with Bedford.

The Bedford Conservation Board would be in support of the work being done in Pound Ridge on investigating the impact of this potentially invasive species. We further would support the Pound Ridge Conservation Board in their efforts to gain funding, presenting to the public their efforts to manage and monitor the stand of hardy kiwi in their community, and bring this issue to the attention of Pound Ridge homeowners. Our board would invite homeowners in our community to attend the presentation.

If you require any further information, please contact me through our town.

Simon Skolnik

Chair
Bedford Conservation Board

cc: Carolynn Sears

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