CRISP

Catskill Regional Invasive Species Partnership

STRATEGIC PLAN 2018 - 2022

The Catskill Regional Invasive Species Partnership is hosted by the Catskill Center for Conservation and Development

Acknowledgments

This document summarizes the contributions of 63 invasive species experts and CRISP PRISM stakeholders in the Catskills Region. Consultant Meredith Richardson, CRISP Coordinator John Thompson, Field Projects Manager Dan Snider, and Communications Director Heather Phelps-Lipton all contributed and are gratefully acknowledged in the development of this Strategic Plan.

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Executive Summary

The Catskill Center for Conservation and Development hosts the Catskill Regional Invasive Species Partnership (CRISP) and is working with partners to address invasive species issues in the greater Catskills region. CRISP, established in 2005, is one of eight Partnerships for Regional Invasive Species Management (PRISM) in New York State.

The Catskills are an important destination for recreation and tourism. Outdoor recreational activities, such as hiking, fishing, and skiing. attract nearly 2.5 million visitors per year to the Catskills, contributing $115 million to the economy (Zweig 2012).

New York State recognizes that invasive species threaten New York State's biodiversity, economy and human health and defines invasive species as "a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health" (New York State Environmental Conservation Law Title 17, Article 9, 2008).

Invasive species also contribute to habitat degradation and loss of wildlife and plant species, a decrease in recreational opportunities, agricultural costs and impacts to people's wellness and livelihood (National Invasive Species Council. 2016. Management Plan: 2016–2018. Washington, DC).

CRISP's Vision is to protect the ecological integrity, water resources, recreational values and the economy from the devastating impacts of invasive species, working across a diverse landscape with both public and private landowners.

CRISP's Mission is to promote education, prevention, early detection and control of invasive species to limit their impact on the ecosystems and economies of the Catskills.

During 2017, the New York State Department of Environmental Conservation contracted with the Catskills Center for Conservation and Development to continue to host the Catskill Regional Invasive Species Partnership from 2018-2022.

One requirement of the contract is that CRISP develops and submits a Strategic Plan for the five-year period of the contract. Participatory methods based on behavioral science best practices, were used to gather and process data for the CRISP strategic plan so that the perspectives of all stakeholders including partners, support network organization representatives, donors, state government officials, relevant technical sectors and communities can be integrated into the plan.

Twenty-five individual key interviews and twelve focus group discussions were conducted throughout the entire Catskills Region and the resulting data was collated and analyzed to produce the following strategic objectives:

- **CRISP will take the lead in convening a group of agencies and organizations involved in addressing invasive species issues to develop and overarching invasive species management plan for the Catskills Region that combines the resources from all the involved agencies.**
- **The CRISP Steering Committee will aim to enhance the profile and impact of the CRISP partnership through public activities.**

- CRISP will increase the number of working groups to provide technical advice and support to the Coordinator.
- CRISP will develop and adopt the use of a simple monitoring, evaluation and learning system
- CRISP will aim to recruit and retain an increased number of volunteers each year.
- CRISP will increase capacity to perform Early Detection Rapid Response
- CRISP will train more stakeholders in best management control practices and to provide funding and/or training for land and property owners in underserved areas to treat high priority species themselves
- CRISP will build its capacity in site restoration
- CRISP will develop a strategy to increase its capacity to conduct education and outreach activities.
- CRISP will develop outreach materials and activities that target specific groups and areas and that present the negative impacts of IS and emphasizes the benefits of addressing these impacts.
- CRISP will develop outreach materials that present the negative impacts of IS while emphasizing the benefits of addressing these impacts.
- CRISP will continue to partner with agencies and an augmented number of universities in research activities. and that present the negative impacts of IS and emphasizes the benefits of addressing these impacts.

Background / Context

Invasive species are defined as “a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health” (New York State Environmental Conservation Law Title 17, Article 9, 2008). Invasive species contribute to habitat degradation and loss of wildlife and plant species, a decrease in recreational opportunities, agricultural costs and impacts to people’s wellness and livelihood (National Invasive Species Council. 2016. Management Plan: 2016–2018. Washington, DC.

Over the past eight years, the Catskill Center for Conservation and Development has successfully hosted the Catskill Regional Invasive Species Partnership (CRISP). CRISP is one of eight Partnerships for Invasive Species Management (PRISM) in New York State. The CRISP region covers 3.2 million acres, encompassing all of Otsego, Delaware and Schoharie Counties, most of Greene, Ulster, and Sullivan Counties, and a small section of Orange County. Outdoor recreational activities, such as hiking, fishing, and skiing. attract nearly 2.5 million visitors per year to the Catskills, contributing $115 million to the economy (Zweig 2012).

New York State Invasive Species Key Organizations

In New York State, a number of key organizations and groups have been formed to address the problem of invasive species at the State level. Title 17 of Environmental Conservation Law Title 17, Article 9 established the New York Invasive Species Council and Invasive Species Advisory Committee in 2008. More recently, New York State has regulated the sale of invasive species (Chapter 267 of the laws of 2012), addressed the spread of aquatic invasive species (Chapter 330 of the laws of 2014), and increased funding in the invasive species line of the State’s Environmental Protection Fund.

The Invasive Species Council coordinates the actions of the nine state agencies to address the environmental and economic impacts of invasive species. The Council is co-chaired by the Department of Environmental Conservation and the Department of Agriculture & Markets; and includes representatives from the Department of Transportation; Department of State; Department of Education; the Office of Parks, Recreation and Historic Preservation; the Thruway Authority; the Canal Corporation; and the Adirondack Park Agency.

The Invasive Species Advisory Committee (ISAC) is made up of twenty-five nongovernmental organizations, academic institutions, research entities, and trade organizations who provide guidance to the Invasive Species Council.

These programs all work collaboratively on different aspects of invasive species management to ultimately achieve a more effective prevention, detection, response and control strategy and to help protect native species, habitats, ecosystems, and economic resources.

The iMapInvasives Program is an online invasive species database operated by the New York State Natural Heritage Program. The iMaps staff provide training for hundreds of citizen scientists to identify and report tens of thousands of invasive species observations each year. iMaps also tracks location and other information for surveys, assessments and treatments.

New York Invasive Species Research Institute (NYISRI) coordinates research on invasive species to help understand and manage the impact of invasive species in New York State. NYISRI staff collaborate with the ISC and ISAC to identify research priorities and work with scientists to address those priorities and communicate findings to resource managers.

Partnerships for Regional Invasive Species Management (PRISMs): Eight regional PRISMs coordinate invasive species management functions including coordinating partner efforts, recruiting and training citizen scientists, providing education and outreach, establishing early detection monitoring networks and implementing direct eradication and control efforts. CRISP is one of these eight PRISMs.

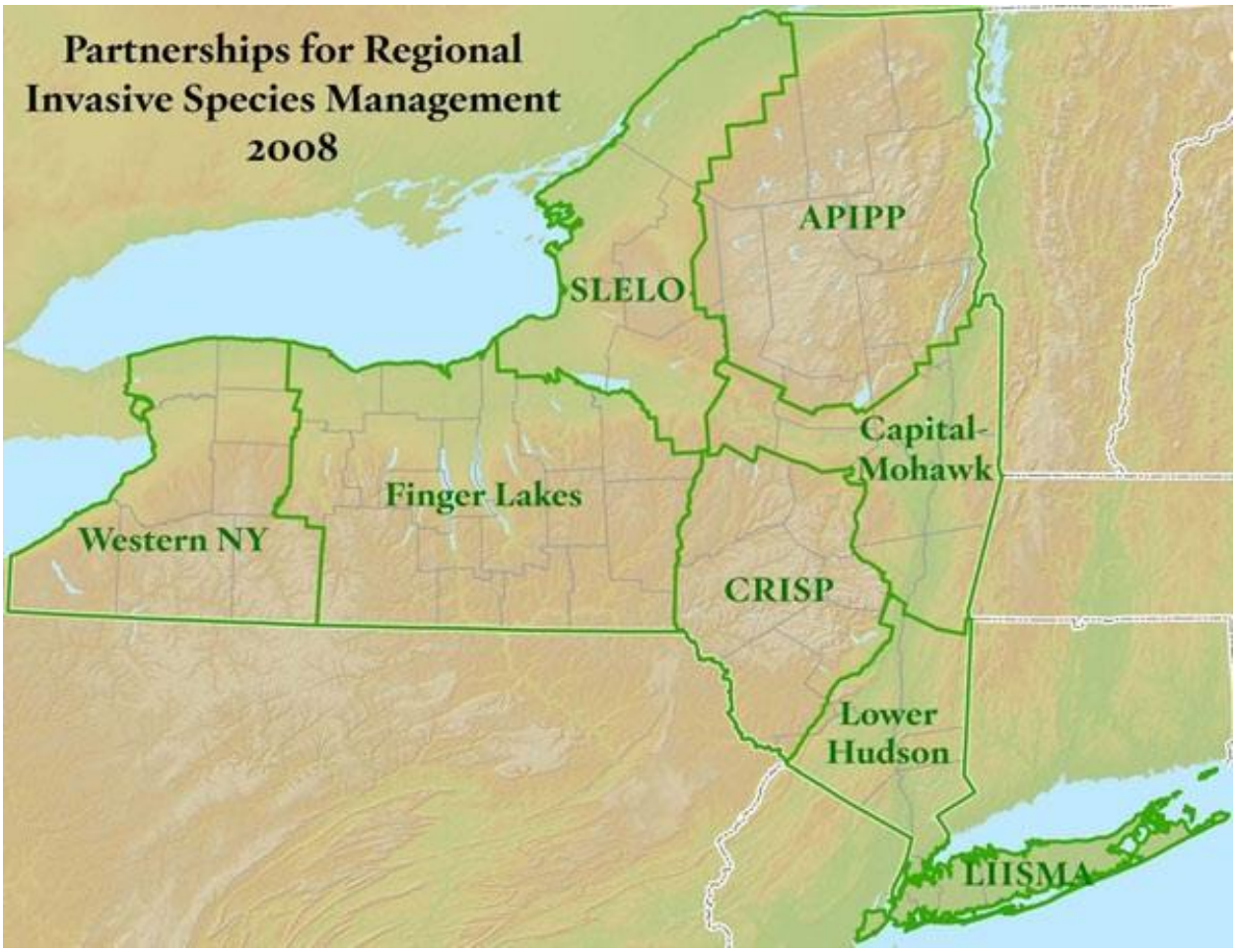

Figure 1 New York State Partnerships for Regional Invasive Species Management (PRISM's)

CRISP Region

The CRISP region includes the jurisdiction of seven counties and a total of 93 municipalities (refer to Appendix A). The CRISP region is primarily rural with a few small

cities. The largest city in the 3.3 million-acre region is Oneonta with an estimated population of 13,955 in 2016 (US Census Bureau 2017).

The Catskills are important area for the ecosystem services that they provide. Aquatic features of the CRISP region include six reservoirs of the New York City drinking water supply. Forestry and agriculture are also important in the region. Invasive species threaten the unique ecology, natural resources, and outdoor recreation-based economy of the Catskills. More forest pests occur in New York State than any other state in the country, making Catskill forests especially vulnerable.

About 14% of land in the CRISP region is held by three public entities. The New York State Department of Environmental Conservation holds 287,500 acres, protected as "forever wild" by Article XIV of the New York State Constitution; New York State Office of Parks Recreation and Historic Preservation manages 8,000 acres, and New York City Department of Environmental Protection manages 136,500 acres. The Catskill/Delaware Watersheds provide 90% of the drinking water supply to 9 million households.

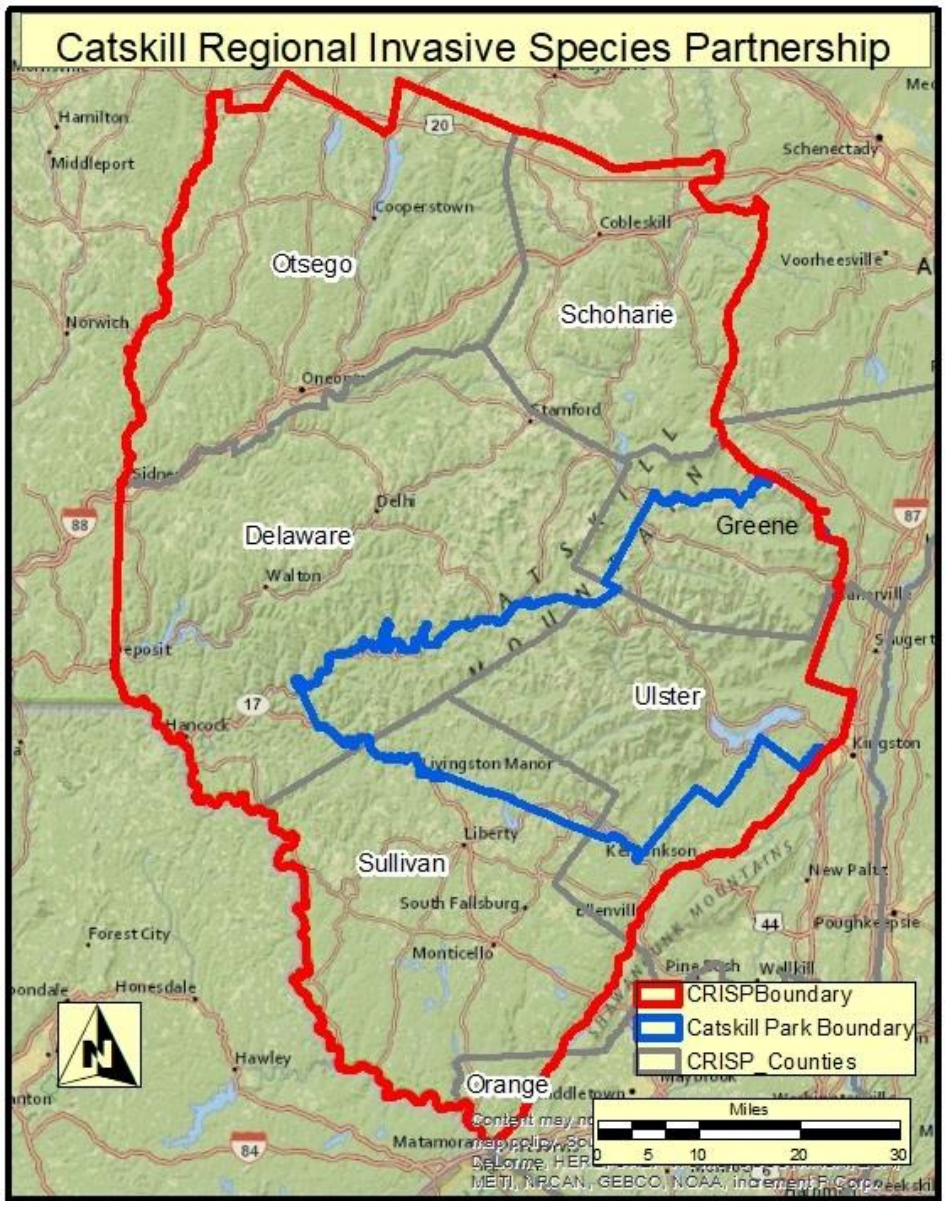

Figure 2. Catskill Regional Invasive Species Partnership (CRISP) region.

Most of the land in the CRISP region is forested. An analysis of National Land Cover Database 2011 land cover shows that the CRISP region is 74% forested, 15% is agricultural and only 4.4% is developed land.

Land Cover	**% Area**
Forest	74
Agricultural	15
Developed	4.4
Wetland	3.6
Water	1.6
Shrub/Grassland	1.5
Barren	0.2

The Catskills are highly valuable for their ecology and contain a diversity of ecological systems based on unique soils, elevation and microclimates. The forests of the Catskill Mountains support rare plants and animals. After more than a century of land protection, the Catskill Mountain region represents one of the greatest opportunities to preserve large un-fragmented forest systems in the High Allegheny Plateau ecoregion, some of the largest areas of un-fragmented forests in the state, and a globally significant core forest habitat. Forests range from northern hardwood forests to mountain spruce-fir forests that support rare forest-interior birds like Bicknell's Thrush, one of North America's rarest birds. By connecting lands conserved in the Catskill Park with land protected for the New York City watershed there is potential to protect forest systems large enough to safeguard species that depend on interior forest habitat.

Invasive Species Problem and Pathways

Invasive species are non-native species that can cause harm to the environment, the economy, and to human health. Invasive species pose an increasing threat to our future. Invasives come from around the world with the rate of invasion increasing with international trade of globalization. A wide variety of invasive species are problematic for natural ecosystems, managed forests; agriculture, infrastructure, landscaping, gardens, recreation and human health.

Forest Pests and Pathogens

New York State has more forest pests than any other state in the country (Liebhold et al. 2013). Because the CRISP region is heavily forested, forest pests have always been a major concern for partners.

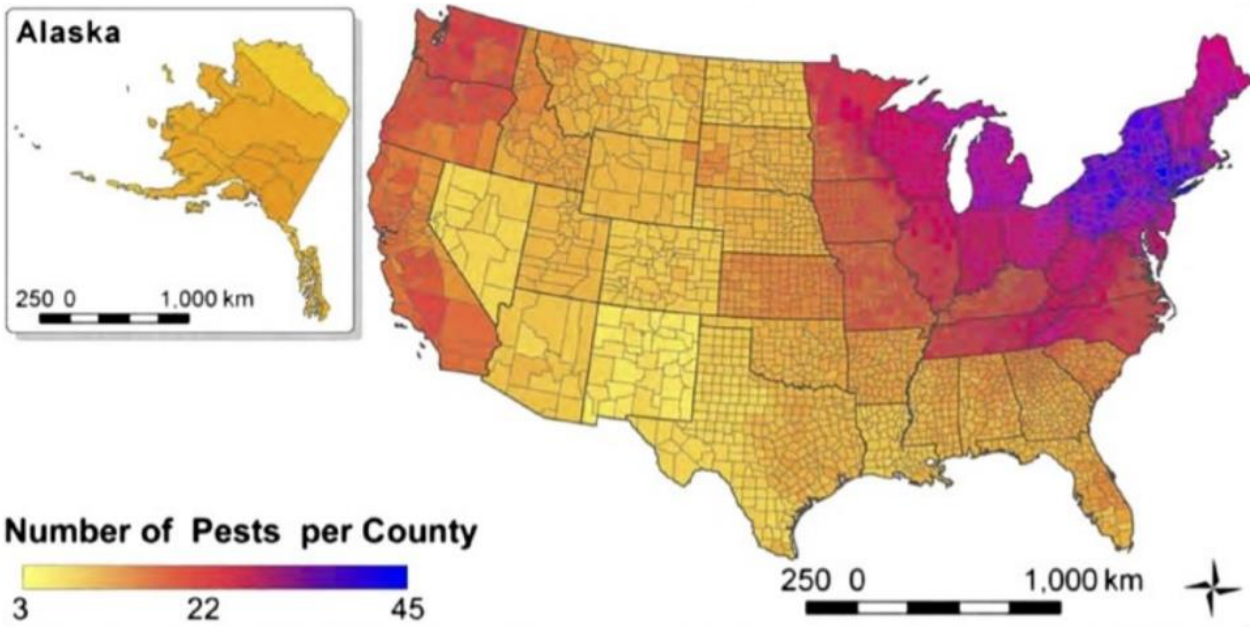

Figure 3. Number of Forest Pests per County (Liebhold et al. 2013).

Asian Long-horned Beetle (ALB) (*Anoplophora glabripennis*) was first discovered in Brooklyn in 1996, and though some infestations have been eradicated, it persists in New York City and Long Island. It invades most hardwood trees: maple, horse chestnut, ash, birch, elm, willow, and poplar. Beetle larvae tunneling girdles tree stems and branches and eventually kills the infested tree. If it were to spread across the U.S., it could cause multi-billion dollar losses for the lumber, maple syrup, nursery, and tourism industries. ALB probably travelled to the United States inside solid wood packing material from China.

Emerald Ash Borer (EAB) (*Agrilus planipennis*) was first found in this region in 2010 and has impacted ash trees across most of the CRISP region. Larval feeding disrupts nutrient and water flow to the upper canopy, resulting in leaf loss. Most trees die within 2 to 4 years of infestation. CRISP staff worked to train citizen scientists and help communities to prepare for EAB. CRISP worked with 20 communities to develop community ash tree inventories, monitored EAB biocontrol, and performed an isolated ash survey.

Hemlock Woolly Adelgid (HWA) (*Adelges tsugae*) is a small aphid-like insect native to Asia. HWA threatens the persistence of hemlock in the Catskills and was originally detected in the Catskills in the late 1980s and has since spread through many hemlock stands across the region. HWA feeding damages the canopy of the host tree and causes eventual mortality. HWA is regarded as the greatest threat to hemlock forests in the region, and has been found to infest most surveyed hemlock stands in the Catskill Mountains. CRISP has monitored HWA and hemlock health since 2014 and is using this data to participate in biocontrol releases to combat HWA.

Oak wilt (*Ceratocysis fagacearum*) is a fungal pathogen that infects the conductive tissue of oak trees. The fungus blocks the flow of water and nutrients from the roots to the crown of the tree. Susceptibility depends on the species of oak. Species in the red oak group may die within 1-5 weeks, while species in the white oak group may

persist for years. The fungus can spread naturally in two ways: above ground by beetles and below ground through root grafts.

Aquatic Invasive Species

Aquatic Invasive Species like hydrilla (Hydrilla verticillate) and zebra mussel (*Dreissena polymorpha*) have the potential to disrupt aquatic ecological communities, negatively impact water quality and limit recreation opportunities. Prevention and education programs, like the CRISP Watershed Steward Program, has been effective in addressing vectors for the movement of species between water bodies.

The Early Detection aquatic species that are the highest priority in CRISP are the following along with their status in CRISP (according to iMapInvasives):

Rank	Common Name	Scientific Name	Present in CRISP
1	Hydrilla	*Hydrilla verticillata*	No
2	Floating Primrose-willow	*Ludwigia peploides*	1 site
3	Common Frogbit	*Hydrocharis morsus-ranae*	No-found along boundary
4	Yellow Floatingheart	*Nymphoides peltata*	No-found along boundary
5	Brazilian waterweed	*Egeria densa*	No-found along boundary
6	Carolina fanwort	*Cabomba caroliniana*	2 sites

These plants have high invasivity rankings and are currently found in the CRISP PRISM or in an adjacent PRISM, approaching the CRISP region.

The carnivorous plant, Waterwheel (*Aldrovanda vesiculosa*), also ranks as a high priority species, because the only location that it exists in New York State is in the CRISP region. This plant has been observed to be highly invasive in other areas.

Terrestrial Invasive Plants

Terrestrial invasive plants threaten to disrupt ecological processes in forests, riparian areas and other important habitats in the CRISP region. A number of inventories have been performed and focus in recent years has been on high priority Early Detection species.

CRISP has designated the following terrestrial species as the highest priority Early Detection species:

Rank	Common Name	Scientific Name	Present in CRISP
1	Mile-A-Minute	*Persicaria perfoliata*	3 sites
2	Slender False Brome	*Brachypodium sylvatum*	No
3	Japanese Angelica Tree	*Aralia elata*	1 site
4	Japanese Tree Lilac	*Syringa reticulata*	2 sites
5	Himalayan Balsam	*Impatiens glandulifera*	5 sites

Invasive Species Pathways/Vectors

Invasive species are introduced into new environments in a number of different ways. Understanding the vector of movement, or pathway, by which invasive species enter into the CRISP region, and are moved within the region, is important in order to prevent spread or minimize additional introductions. Species are introduced either intentionally or accidentally. Because several invasive species may share methods of movement and transport, it is important to focus on controlling these pathways and develop methods to reduce the risk of species spreading by using these pathways.

Roads and Corridors

Roads and utility corridors that bisect the landscape move invasive species from one location to another. New construction of roadways and road maintenance can play a critical role in spreading invasives along roadsides and right-of-ways. Mowing and ditching equipment and processes can spread seeds. In addition, propagules can be transported on unclean equipment from one location to another.

> The construction of, and maintenance of, utility corridors can be a vector for transporting invasive species. Overhead and subsurface corridors require frequent maintenance which creates disturbed areas allowing invasives to become established.

Soil Transport and Land Development

The movement of fill or soil from one construction site to another can spread invasive plant propagules both within the region and from other regions into this area. Seeds of invasives can also be transported in untreated soil. Because of the ability of Japanese Knotweed to reproduce from tiny fragments of virtually every part of the plant, the plant is often brought to new areas in this way. These fragments can take root in areas and establish new populations in areas previously free of these plants.

Firewood

Forest pests and pathogens pose a major threat to the health of the forest ecosystems and economy in the region. Movement of firewood and other wood products is considered the primary vector. With the threat of the Asian Long-horned Beetle and Oak Wilt to our Catskill forests, educating the public and local communities is essential.

Wood Products

Unprocessed wood logs, timber, lumber and chips and wood packaging, such as pallets crates and spools) can be vectors for invasives. Asian Long-horned Beetle was introduced into the United States in wood packing material.

Boating and Fishing Gear

Recreational boating and fishing is a prominent pathway for the movement of aquatic invasive species, especially given the popularity of trout fishing in Catskill lakes, streams and reservoirs. Invasives can be transported on boats, on fishing equipment and waders.

Fishing and Bait

Aquatic invasives can be spread by "bait bucket introductions". Anglers likely introduced the Rusty Crayfish, native to the Midwest United States, via bait buckets. It since has spread throughout the Northeast.

Recreation

Seeds from invasive species can attach to hiking boots, clothing, tires, bumpers, wheel wells or the underside of vehicles and equipment used in recreational activities. These seeds can be transported long distances before falling off in a new location. Activities such hiking, hunting, ATV riding and other activities can be a significant mechanism for transporting terrestrial invasive species.

Nurseries and Landscaping

Historically, the nursery industry has brought invasive ornamental plants to new areas (e.g. Japanese barberry). Inadvertent introduction of invasive pests may also occur in the movement of plants and plant materials (e.g. Hemlock Woolly Adelgid). Invasive seeds can move in contaminated soil (e.g. Mile-A-Minute).

Stone

Invasive species can be transported either on the surface of the stone itself, or in packing material. The bluestone industry, centered in Delaware County, contributes $40 to $100 million annually to New York State's economy (Delaware County Agricultural and Farmland Protection Board, 2016). Spotted Lanternfly (*Lycorma delicatula*), may lay its eggs on quarried stone, that may be transported over long distances. Untreated wooden pallets, or other packing material, may harbor wood boring insects such as Asian Long-horned Beetle.

Commercial/Retail

Some aquatic invasives can be linked to commercial and retail industries such as the aquarium industry, retail sales in live fish markets and ornamental water garden plant sales. Exotic plants and animals may have been released into ponds, lakes or streams when the owner no longer wants to care for them or the fish outgrow their surroundings. Live fish markets have also been linked to the introduction of non-native fish species, including the snakehead and several varieties of carp.

Invasives may also be transported by the movement of commercial seeds, produce, and hay.

Natural Spread

Natural spread occurs via wind dispersal of various terrestrial plants. Streams carry plant materials and animals through a watershed. Some invasive insects may fly to disperse. Animals also carry seeds (e.g. birds transporting Hemlock Woolly Adelgid).

Other Stressors and Threats to the Region

Deer Over-browsing

Many of the forests of New York State suffer from lack of adequate regeneration of dominant tree canopy species and also lack many herbaceous plants and spring ephemerals on the forest floor. Due in large part to the biological legacy of high white-tailed deer (*Odocoileus virginianus*) populations, many forests—outside of higher elevations—lack the diversity of composition and structure of viable forests and are at risk of declining over the long-term.

There is an interaction and feedback between deer and invasive species. Because deer prefer many native species over invasives, they often help to tip competition toward invasive plants that are less palatable.

Climate Change

Due to their diverse topography and microhabitats, the Catskill Mountains are recognized as a landscape that will be resilient in a changing climate. It is important that the Catskills are connected to other large un-fragmented landscapes both in New York State and at a continental scale. Even though the landscape itself is resilient, some ecosystems of the Catskill Mountains are vulnerable to climate change, such as mountain spruce-fir forests. Loss of both forest cover and important habitats will not only impact the local biodiversity of Catskills, but also diminish the recreational and quality of life values of the landscape.

Climate change will influence the distribution and abundance of invasive species. Warmer and wetter climates will lead to increased intensity of extreme weather events and these events will create more disturbance, favoring invasion. Weather events that lead to flooding or high winds can cause widespread forest (and ecosystem) disturbance, which opens up more opportunities for invasion. Invasive plants often respond better than natives to early warming in the spring and can lead to range expansions. Increased CO_2 favors growth in some invasive plants over natives, because some invasives respond positively to more available CO_2 by growing faster and producing more propagules. Studies have shown that Canada thistle and other invasives may be more resistant to herbicides when grown in higher CO_2concentrations, making them harder to control. Ragweed plants can produce twice as much pollen at elevated levels of CO_2 as plants grown at lower levels of CO_2.

Atmospheric Nitrogen Deposition

High rates of nitrogen deposition occur in the Catskill Mountains. This excess nitrogen may impact the ecological processes and resilience of both forest and aquatic systems.

Catskill Regional Invasive Species Partnership Update

Since its inception in 2005, CRISP has evolved with a growing understanding of invasive species, recalibrated strategic priorities to address the most impactful threats, and has grown as networks have expanded and resources have become available.

During 2017, the New York State Department of Environmental Conservation contracted with the Catskill Center for Conservation and Development to continue to host the Catskill Regional Invasive Species Partnership from 2018-2022. The contact continues to support the positions of Coordinator and Field Projects Manager. Additional funding directed to invasive species monitoring and management was awarded to the Catskill Center in 2017 through a grant and a private donation.

Prevention

A major focus of CRISP resources focused on preventing the introduction of invasive species into the CRISP PRISM. Toward that end, CRISP subcontracted with SUNY Oneonta to provide a Watershed Stewards Program for the sixth consecutive year. In 2017, SUNY Oneonta training and outcomes were similar to previous years. SUNY Oneonta trained 36 Watershed Stewards in 2017 to interpret invasive species prevention and collect waterbody use data at high use access sites. Watershed Stewards provided information and boat inspections at Otsego Lake, Canadarago Lake, and along the Delaware River within the Upper Delaware River National Scenic and Recreation Area (a unit of the National Park Service).

A Watershed Stewards Program training session was held in April 2017 for eight stewards at Otsego Lake. A second training was offered in May for 10 additional stewards at Otsego Lake. In early June, a training day was held for the National Parks Service, where 19 stewards attended. In mid-June, a training session was held for five returning Canadarago Lake stewards. During the season Watershed Stewards piloted WISPA 1,2,3. In addition, in order to expand the program to more waterbodies, a training day was held in Sullivan County in June and six people representing four lakes attended.

A total of 3,688 surveys were submitted in 2017, with the majority from the Canadarago Lake and Cooperstown launches. Vector diagrams have been made depicting the trajectory of boaters entering the waterbodies. Overall, 169 potentially invasive plants and animals were found and prevented from leaving or entering CRISP waterbodies. Of the organisms found, pondweeds and milfoils were found on boats launching and retrieving, as was mud and debris. Elodea and eel grass were often pulled from boats leaving Canadarago Lake and Cooperstown. Zebra mussels were also found, dead in a few cases, and were brought to a boat-wash to be killed and removed. Fanwort and spiny water flea were reported from Canadarago Lake by a steward, but samples were not collected to confirm identification.

CRISP supported a native plant garden and interpretive signage at the Ashokan Center to educate visitors about the importance of selecting native alternatives to invasive garden and landscape plants.

Early Detection

Once an invasive species becomes established, the only remediation action possible is the partial mitigation of negative impacts of the invasive. The goal of Early Detection and Rapid Response (EDRR) efforts are to increase the likelihood that invasions will be eradicated before they become established. The CRISP high priority early detection species were selected because they could invade important habitats and spread within the region.

The high priority Early Detection Species list are the focal species for Early Detection trainings and these species will be the highest priorities for control within the PRISM. High priority EDRR species that were the focus of trainings in 2017 included, Mile-A-Minute, slender false brome, Japanese angelica tree, Japanese tree lilac, hydrilla, floating primrose-willow, common frogbit, yellow floatingheart, Brazilian waterweed, and Carolina fanwort. The fungal pathogen Oak Wilt (*Ceratocystis fagacearum*) was included in 2017 Early Detection trainings because of its spread in the State during 2016.

CRISP 2017 Early Detection and Rapid Response Trainings

Date	**Title**	**# People**
2/24	"Early Detection and iMapInvasives" Sullivan CCE Master Gardeners	6
3/23	"Tomorrow's Most Wanted: The Top 5 Terrestrial Plant Threats" John Burroughs Natural History Society	18
4/8	"EDRR Training" Schoharie CCE Master Gardeners	6
4/19	"EDRR Training" Otsego CCE Master Gardeners	6
4/22	"EDRR Training" Delaware CCE Master Gardeners	20
6/3	"Invasives ID & iMapInvasives Training	15
6/14	"EDRR Training" Ulster CCE Master Gardeners	4
6/22	"Oak Wilt and Early Detection"	1
7/17	"EDRR Training" Columbia Greene CCE Master Gardeners	8
8/5	Homeowner EDRR Training	6
9/12	Mile-A-Minute ID for Catskill Streamside Buffer Initiative Staff	5
12/6	"Intro to Invasives" Ulster CCE Master Gardeners	11
Total		**106**

Through a program established by DEC and SUNY College of Environmental Science and Forestry, a Catskill Invasive Species Campground Steward position was filled in 2016 and 2017. In 2017, Nicolas Echevarria was selected as the 2017 Catskill Invasive Species Campground Steward and worked for 14 weeks beginning on May 22nd. Nico's primary

project was to perform Early Detection surveys for high priority Early Detection plants and forest pests on the eight DEC Campgrounds in the Catskills region. Campgrounds are a high-risk area for invasive species infestation. Visitors traveling from outside our region can potentially work as vectors for invasive species movement.

CRISP received reports of new infestations of Mile-A-Minute and Himalayan Balsam in August 2017. The Mile-A-Minute was mapped into iMapInvasives and pulled in the CRISP region in Woodstock and new infestations just outside the CRISP region in Greenville and Saugerties. Trillium Invasive Species Management was hired to treat Mile-A-Minute in the Skinner's Falls area and in the Mt. Tremper area.

The Himalayan Balsam was mapped into iMapInvasives and infestations were pulled in Lanesville and Denning.

CRISP staff worked with DEC Forest Health Unit to monitor five traps for Southern Pine Beetle in the CRISP region.

CRISP developed an Early Detection Rapid Response plan for new invasive species in the region.

Control

CRISP works with other organizations on controlling invasive species infestations by using best management practices with goals of 1) **eradication** where all individuals and propagules can be eliminated from an area 2) **containment** where an infestation can be limited from spreading to un-infested areas and 3) **suppression** to reduce the density and protect targeted areas, but not necessarily remove the invasive from a region.

Working with the New York State Hemlock Initiative, CRISP staff has released HWA biocontrol, *Laricobius* nigrinus has been released on several sites and CRISP staff has monitored biocontrol release sites. Silver Flies (*Leucopis argenticollis* and *L. piniperda*) were released on NYC DEP property for the first time in 2017.

CRISP has convened annual meetings of experts (e.g. Hemlock Summit) for several years to share information on HWA and other hemlock pests. In 2016, working with the New York State Hemlock Initiative, CRISP convened a group of experts and stakeholders who developed the following goals for hemlock conservation in the CRISP region:

1. Protect and maintain genetic diversity of hemlocks across the landscape over the long-term.

2. Protect hemlock forests that provide important cultural and economic value, including historical, recreational, educational, and environmental benefits.

3. Preserve and protect hemlock stands in locations with cold water streams and brook trout habitat.

CRISP staff developed a GIS database and continues to update and analyze data to better understand the location and condition of hemlock forests.

CRISP staff regularly use the Invasive Plant Management Decision Analysis Tool (IPMDAT) to determine the feasibility of projects and resources required.

CRISP has been a participant in the NYS DEC's Giant Hogweed removal program since 2011 and has responded to and removed all reported Giant Hogweed plants in the CRISP region. In 2017, Giant Hogweed was surveyed at 11 sites and CRISP staff treated 703 plants. Six of those sites had no hogweed.

CRISP has supported partners to pursue targeted control projects. Over a five-year period, CRISP subcontracted with the Rondout-Neversink Stream Program to treat Japanese knotweed (Reynoutria japonica). Japanese knotweed only infested a few small populations along Chestnut and Rondout Creeks in Sullivan and Ulster Counties. All infestations were mapped and treated. Local highway crews were trained in identification and reporting procedures and educational signage was posted at town and county garages.

The CRISP program was awarded a Ashokan Watershed Stream Management Program Stream Management Incentive Program in 2017, for a pilot project to treat Japanese Knotweed on a private property in Oliverea. The Catskill Center subcontracted with Trillium ISM to do treatment on a 2,800 square feet area of Japanese knotweed along a headwater stream and provide trainings and outreach to nearby landowners on identification and management practices. SUNY ESF interns have worked with DEC to complete folding treatments of Japanese Knotweed on the Beaverkill Campground. This is the second year of treatment at that site.

In 2013 and 2014 CRISP assisted New York State Department of Agriculture and Markets and USDA-APHIS to release Emerald Ash Borer biocontrol and monitor release sites.

CRISP staff led six programs in 2017 on Best Management Practices (BMP's) to control established invasive species, reaching 63 landowners and industry professionals. These trainings focus on communicating up-to-date information on best management practices of each species, as well as detailed biological characteristics that might inform landowner management. The programs may also include information on the Invasive Plant Management Decision Analysis Tool (IPMDAT), to empower landowners to make management decisions with high likelihoods of success.

CRISP 2017 Control Programs and Trainings

Date	Title	# People
2/22	Riparian Buffer Working Group Meeting	29
4/6	"What is Japanese Knotweed?"	15
6/3	"Common Invasives Best Management Practices	8
7/12	2nd Annual Invasives Pull at Catskill Interpretive Center	4
7/14	Mile-A-Minute Survey and Removal	3
7/15	Restoration at Spillian	4
Total		**63**

Awareness

CRISP has endeavored to increase public awareness and understanding of invasive species especially focused on forest pests such as ALB and EAB through its Beetle Busters trainings, which trained over 450 people from 2012-2014.

In order to raise awareness about a high priority Early Detection Species, Mile-A-Minute, CRISP mailed information cards to 6,200 households in the towns of Cochecton and Woodstock and parts of the towns of Tusten and Olive. The mailing targeted landowners to identify and report Mile-A-Minute. Blogs, articles, press releases, listserv posts, and Facebook posts were written on Mile-A-Minute. Previous mailings have reached over 10,000 households, alerting landowners about EAB (8,000 fliers), ALB, Eurasian boar (*Sus scrofa*) and Mile-A-Minute.

YouTube videos were created and posted online on identification of invasives such as Swallow-wort and Eurasian watermilfoil and videos on biocontrol release.

In 2017 alone, CRISP staff conducted 20 programs and presentations reaching a total of 625 individual landowners, volunteers, and industry professionals with the goal of raising awareness of invasive species and prevention actions generally. Many of these events focus on species and habitats that are likely to be impacted by invasive species. Prevention and awareness-focused events also discuss achievable prevention activities such as the Don't Move Firewood campaign, and the Clean/Drain/Dry and Play/Clean/Go initiatives. All of these initiatives play an important role in preventing the spread of established invasive species and the introduction of novel invasive species. They also connect directly to activities that many private landowners engage in often, focusing on small behavior changes that offer large benefits.

CRISP 2017 Prevention/Awareness Programs and Events

Date	Title	# People
1/28	Minekill State Park Snowfest	48
2/16	"Biodiversity and Thorn Preserve BioBlitz" at Woodstock Transitions	29
3/13	Emerald Ash Borer at Town of Walton Town Board	12
3/25	"Forest Pest Update" Schoharie Watershed Summit	29
4/12	"EAB Update" to West Oneonta Town Board	14
4/29	Ashokan Watershed Conference	25
5/13	"Invasive Species ID"	8
6/21	"Evening Bird Walk at Catskill Center's Thorn Preserve"	6
7/8	Pakatakan Farmers Market Tabling	80
7/11	"Habitat and Hemlock Health Hike"	6

7/15	Minekill State Park Summerfest Tabling	47
7/28-29	Thorn Preserve BioBlitz	120
7/29	Catskill Forest Festival Tabling	100
8/26	Bee Walk	5
9/9	Streamside Stroll	3
10/7	"Alien Invaders in Burroughs' Backyard"	15
10/14	"Asian Longhorned Beetle"	2
10/15	"Asian Longhorned Beetle"	4
10/28	"The Biological Inheritance of Catskills Forests"	6
10/29	Columbia University Sustainable Development	30
Total		**625**

In addition to the programs led by CRISP staff, CRISP has subcontracted with Cornell Cooperative Extension for the past five years to provide outreach in counties throughout the CRISP region. At fairs, festivals and workshops, CCE documented the following: numbers of participants that were provided with invasive species information in 2017: Delaware County 3715 participants, Greene County 3554 participants, Otsego and Schoharie 2049, and Ulster 1575. Sullivan County CCE also provided programming on invasive species at fairs, festivals and other events, but did not provide numbers of attendees.

Science

In 2014, CRISP collaborated with The Nature Conservancy to survey 35 hemlock stands that were mapped within a 700,000-acre area (Zimmerman and Snider 2014). The study assessed the health of 35 hemlock sample stands and the distribution of HWA was recorded. CRISP staff and interns have continued to monitor 10 of those hemlock stands for four consecutive years.

CRISP staff trained interns and citizen scientists to use different survey methods to monitor hemlock stands. Methods were compared and an ODK (Open Data Kit) form was developed and shared with the various agencies performing hemlock studies through New York State to help develop citizen science training methods that can be shared throughout the state.

In 2017, A private donation supported the hiring of a Hemlock Health Intern, Skyler Susnick, an undergraduate from SUNY Geneseo. Skyler worked from July 10th to August 18th. Staff began to ground-truth old growth hemlock stands that were mapped by Michael Kudish.

CRISP held 9 training programs and reached 183 individuals in 2017. These training programs focused on a wide variety of subjects depending on audience. Some citizen

science trainings were provided to train volunteers to identify and report high priority Early Detection species as described above using the iMapInvasives database. Some trainings focused on teaching volunteers to report HWA phenology with a custom-tailored survey method, while others focused on the creation and dissemination of a statewide standardized data collection methodology for HWA density and hemlock health.

CRISP 2017 Citizen Science Trainings

Date	Title	# People
2/25	"HWA & iMapInvasives Training" Otsego CCE Master Gardeners & Master Forest Owners	18
4/3	"iMapInvasives Training" Student Conservation Association	18
4/20	HWA Conference	20
7/19	BioBlitz Citizen Science Training	4
7/22	BioBlitz Citizen Science Training	6
9/29	HWA Phenology Training	2
10/11	"Standardized Hemlock Data Collection Across NY State"	25
11/12	"Climate Change Salon Series: Local Forests"	30
11/15	"Standardized Hemlock Data Collection Across NY State"	60
Total		**183**

CRISP has supported a number of programs to improve the scientific understanding of the extent, ecological impact, and effective controls of invasive species in the Catskills. In 2016, a literature review of the ecological services and conservation values of hemlock-dominated forests, prepared by Ecological Research Institute, was shared with partners and other PRISMs, through the CRISP listserv and website and through direct email.

Partnership

Except when CRISP PRISM Partner meetings have been substituted by Partner field trips or under unusual circumstances, Partner meetings are generally held quarterly. CRISP Partner meetings were held in 2017 on February 8th, May 2nd, and September 5th. The Steering (formerly Executive) Committee meetings were held in the afternoons of February 8th, May 2nd, and September 5th. The CRISP Governance Policy (refer to Appendix B) was reviewed and updated by Partners and the Steering Committee (refer to Appendix C.)

Structure of CRISP PRISM

The CRISP PRISM is part of a network of PRISM's and state organizations and agencies. The CRISP PRISM is administered through a contract of the Catskill Center for Conservation and Development and DEC Invasive Species Coordination Unit. The Catskill Center Executive Director serves as a member of the CRISP Steering Committee. The CRISP host

organization provides financial oversight, as well as the authority to manage and implement grants, contracts and agreements that it has entered into on behalf of the CRISP organization.

The CRISP Steering Committee is made up of eleven to thirteen partner organizations and agencies who offer expertise to guide CRISP's strategic direction. The Committee leads the five-year strategic planning process, develops priority invasive species lists and identifies priority areas to ensure that strategic goals and major milestones are achieved. The Steering Committee provides strategic direction and coordination for working groups through the expertise and networks of the Committee members. The Steering Committee interacts with the CRISP Coordinator through both formal quarterly meetings and informal day-to-day communication. The Steering Committee may receive input from stakeholders on strategic issues as the issues develop.

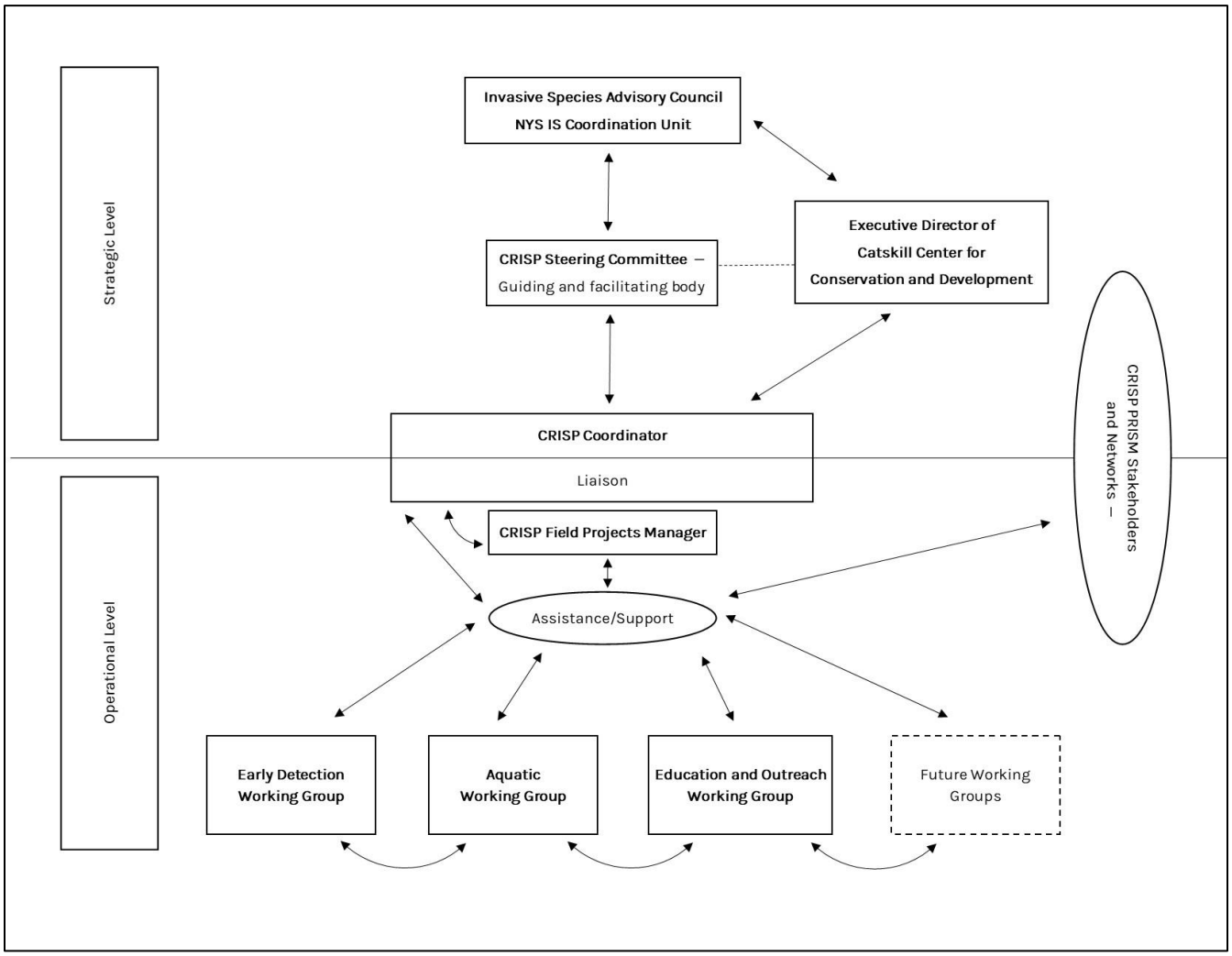

Figure 4 Organizational Structure of the CRISP PRISM

The CRISP Coordinator is required to work at both the strategic level and the operational level, ensuring that strategic goals are carried out in the tactical activities of the PRISM. In addition to working with the Steering Committee, the CRISP Coordinator is responsible for coordinating Partners and administering the implementation of the core functions of CRISP including planning regional invasive species management, developing early detection and rapid response capacity, recruiting, training and supervising volunteers,

citizen scientists and interns, implementing eradication projects and raising awareness about invasive species issues. The Coordinator is responsible for facilitating collaboration between Partners through meetings and cooperative projects. The Coordinator and the Field Projects Manager frequently interact with Partners, stakeholders and the public providing support and assistance on behalf of CRISP.

Working Groups will be formed to focus on implementing operational activities that will help meet the Strategic goals developed by the Steering Committee. Each Working Group will have a designated chair, who will work with the Coordinator to accomplish objectives established by the Steering Committee. Working Groups will also interact with each other, e.g. the Education and Outreach Working Group will develop programs based on the findings and needs of the Early Detection and Aquatic Working Groups. Future Working Groups may be developed as the need arises.

Strategic Planning Methodology

Participatory methods based on behavioral science best practices, were used to gather and process data for the CRISP Strategic Plan so that the perspectives of all stakeholders including partners, support network organization representatives, donors, state government officials, relevant technical sectors and communities can be integrated into the plan. This ensures that a wide range of unique perspectives are included and taken into consideration resulting in a richer and more utilitarian product. It also encourages the buy-in of stakeholders to the resulting plan, and commitment to its achievement, because they can see their inputs taken into consideration.

Twenty-five (25) individual interviews (refer to Appendix D), using an opinion survey, were conducted with stakeholders, technical experts and steering committee members whose experience and expertise are key to the operation and success of CRISP PRISM. Twelve two-hour focus group discussions (refer to Appendix E) were facilitated in all areas of the Catskill Region including at the Catskill Center for the CRISP Steering Committee and another for the staff of the New York State Department of Environmental Conservation in Kingston. The aim was to ensure geographic diversity of the perspectives presented.

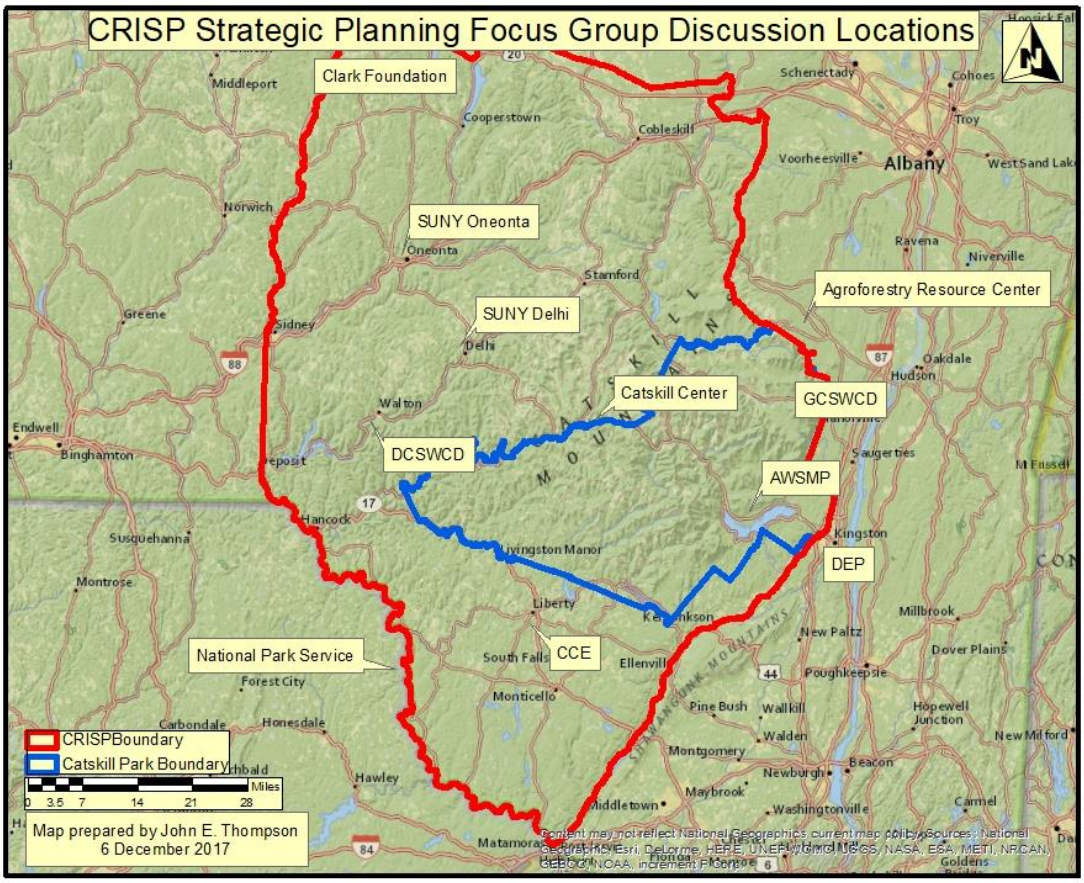

Figure 5 Locations of CRISP Strategic Planning Focus Group Discussions

The survey questions (refer to Appendix F) were developed with input from the Steering Commitee and the CRISP staff. With information from the document review, the survey data gathered (refer to Appendix G) were analyzed to identify the mutually agreed upon priorities for CRISP to address in the plan. Invasive species issues specific to each county or area of the region were identified in addition (refer to Appendix H).

The resulting draft strategic objectives were reviewed by the steering committee and modifications were integrated. On December 8, 2017 a final review of the draft of the Strategic Plan was held in which the Steering Committee members and CRISP staff reviewed the findings and recommendations of the draft plan and came to a consensus on any modifications. The Steering Committee was also responsible for the final review of the document before submission.

Strategic Objectives

Based on an extensive literature review and the collation and analysis of the data provided by key witnesses and focus group participants, the following Strategic Objectives were developed to address issues identified by the CRISP program and the respondents:
The frame of reference for identifying CRISP priority issues and developing strategic objectives to address them is the New York State Department of Environmental Conservation Scope of Work for the Catskills Center/CRISP PRISM contract #C009815 which defines the role of the PRISM.

PRISM Responsibility #1: Coordinate PRISM partner invasive species management activities, share information and resources and make structural enhancements.

Justification
The analysis of strategic planning data revealed that are multiple agencies, organizations, companies and partnerships, including the CRISP PRISM, are currently aiming to address invasive species issues in the Catskills Region.
The majority of respondents stated that it was difficult to know which institution was responsible for what and how to get appropriate information and advice from most organizations. There were also perceived to be redundancies and competing strategies, methodologies and priorities amongst these institutions.

The CRISP partnership was also perceived by the majority of respondents not to have a sufficient public profile and regional presence and not to be leveraging its expertise, resources and educational efforts to the extent that it could.

Strategic Objectives to Address Issues

Strategic Objective # 1.1 — Regional Invasive Species Management Plan - December 2019

CRISP as lead agency, will spearhead a group discussion and the drafting of an action plan to develop an overarching invasive species management plan for the Catskills Region by December, 2019. Amongst many other components to be decided on by the group as it implements the action plan, the Regional IS Management Plan (RISMP) would include a mechanism to combine resources from all involved agencies as well as standardized invasive species guidelines for the region. Once the RISMP is adopted, specific organizations such as CRISP would develop their future strategic and annual work plans in alignment with it.

The CRISP Steering Committee, the NYS Department of Environmental Conservation, NYC Department of Environmental Protection, land conservancies, county Soil and Water Conservation Districts, and Cornell Cooperative Extension, would constitute the initial group to discuss these issues and develop the action plan to produce the regional management plan but would be expected to include additional organizations as appropriate from inception.

Strategic Objective # 1.2 — Steering Committee Activities - Ongoing

In collaboration with the Coordinator, the CRISP Steering Committee will aim to enhance the profile and impact of the CRISP partnership through activities such as the following:

- Host and conduct an annual, public Invasive Species Question and Answer event
- Identify members to volunteer to share their expertise on panels and other public events
- Work with Lower Hudson PRISM to host and conduct a multi-state meeting with natural resource managers of the states and counties of New York, Pennsylvania, and New Jersey to share information on common invasive species issues.
- Invite DEC and DEP and other pertinent agencies to make presentations at quarterly meetings
- Improve remote participation mechanisms for meetings to be able to accommodate more participants

Strategic Objective # 1.3 — Working Groups Activated – June, 2018

CRISP currently has only one active working group to provide technical advice and support the CRISP Coordinator. The Aquatic Invasive Species Working Group, is currently assisting the Coordinator to address the specific local IS issues in the areas where they are reported.

Two more working groups, Education and Outreach, and Early Detection and Rapid Response, will be activated by the CRISP Coordinator as soon as possible and members will be recruited who are specialists in the pertinent IS sectors.

Additional working groups may be activated later by the Coordinator according to the needs of the program.

Strategic Objective # 1.4 — Monitoring, Evaluation and Learning System – Dec., 2018

In order to ensure that CRISP will be able to measure and apply information on the impact of its activities to its ongoing programs, the Coordinator will oversee the development of a simple monitoring, evaluation and learning (MEL) system. The system will evaluate the impact and sustainability of the responses or activities conducted to address IS issues. It will also capture lessons learned in doing so. This information will be available to be integrated into the CRISP annual plans and reports, IS adaptive management plans, and education and outreach materials.

PRISM Responsibility #2: Recruit and train volunteers to collect detection data on invasive species

Justification

CRISP has limited staff capacity and is planning to increase the number of volunteers to offset this. There is a great deal of competition for volunteers to collect data and/ or serve as stewards in the region and CRISP has had difficulty in retaining them as have other institutions. There is also a need for volunteers to have certain skill sets. For instance, watershed stewards are preferred who can enter

data on tablets into New York's aquatic invasive species database (WISPA Survey 1,2,3).

Strategic Objectives to Address Issue

Strategic Objective # 2.1 — Recruit and Retain Volunteers - Annually

CRISP staff will continue each year to recruit increased numbers of volunteer citizen scientists to collect data and serve as stewards in each county and the boundary areas of the region.

Volunteers are more likely to be retained if they are given specific responsibilities, opportunities to innovate, and if their performance is recognized and rewarded.

Volunteers will be provided with quality invasive species management (ISM) training in best management practices using an updated version of the current training curriculum. All CRISP curricula will be customized to provide different levels of training.

Qualified experts such as members of the working groups and technical experts will be familiarized with the curricula and recruited to conduct the training sessions. Certificates of achievement will be provided for each ISM training successfully completed.

Volunteers will be further encouraged to take pride and ownership of what they are doing by being provided with position descriptions and assigned to work in certain geographic and IS sector areas so that over time they become proficient in specific species management.

They will be provided with additional certificates according to their performance in data collection and management (e.g. quality assurance and control, iMapInvasives Certified Trainers Network). References, that can be used to support their entry to formal education or seasonal employment will be provided upon the completion of each volunteer cycle.

During strategic planning input collection, it was suggested that recruiting youth as volunteers is important. With outreach to teachers, troop leaders, government officials and other authorities to identify recruits from groups such as High School Conservation CORPs, college students, 4H, Girl and Boy Scouts, At Risk Youth and other youth groups. One such At Risk Youth group is currently working with CRISP and have confirmed that such groups are usually interested in community service and gaining new skills and knowledge whilst having basic IT skills and experience.

PRISM Responsibility # 3: Monitor for early detection of and response to invasive species issues

Justification

CRISP's Early Detection and Rapid Response EDRR process (refer to Appendix I) is widely known and respected by respondents including those in more underserved and remote and boundary areas. It is important that EDRR training be made

available to all areas of the CRISP PRISM to ensure that all areas are covered by the network.

Strategic Objectives to Address Issue

Strategic Objective # 3.1 — Training for Early Detection and Rapid Response – On-going

CRISP will aim to expand its EDRR to those areas of the region that are currently underserved. These areas include parts of Schoharie County and portions of Delaware, Sullivan Counties, especially along the boundaries with Pennsylvania and the Lower Hudson. CRISP will maintain and update the CRISP Priority Species list using local species information provided by those areas and other sources. CRISP will aim to train or hire sufficient supplementary personnel to address the additional needs specific to each area.

CRISP will strive to serve the full CRISP region by supplementing the numbers of experts available to provide early detection and rapid response services once the Early Detection and Rapid Response Working Group is re-activated and positions are filled, The CRISP Coordinator and Field Projects Manager will oversee training by support network experts (refer to Appendix J) and will hire or sub-contract for more licensed applicators to perform rapid response activities.

The training will utilize an updated version of CRISP's current EDRR training framework. During 2018 CRISP will also be exploring the use of the Incident Command System also known as Planning P (refer to Appendix K) to replace the current training framework.

PRISM Responsibility # 4: Manage invasive species infestations on private and public lands

Justification

Control projects are conducted and overseen by CRISP for invasive species using PRISM-specific invasive species management plans and best management practices for the specific sites and species. CRISP was recognized by respondents including state government agencies as performing very well in this sector. Some focus groups in the underserved areas that are not currently able to participate in control projects due to lack of CRISP staff requested this opportunity for their area.

Strategic Objectives to Address Issue

Strategic Objective # 4.1 — Management of Invasive Species – On-going

The Early Detection Rapid Response Working Group will develop a tiered list of invasives that identifies priorities for management in the CRISP region. Funding will be made available to organizations and landowners to treat high priority species provided there is a feasible plan for control.

CRISP's support network is made up of long term partners, working groups, and new organizations that have expressed interest in working with CRISP. Such network organizations with expertise in Best Management Practices (BMP) will be identified and asked to share and train others in those best practices.

More workshops will also be provided for groups of landowners, business owners or members of the public. This training will also be of a quality that it will enable the

recipients to receive certificates of completion. The MEL process will be integrated into all training programs as well.

PRISM Responsibility #5: Restore sites following invasive species management and control efforts

Justification

The strategic issue with site restoration is that CRISP staff have not had sufficient qualified personnel to conduct all restorations. For the same reason the underserved areas are not currently able to participate in control projects to the extent they would like although interested in doing so as well.

Strategic Objectives to Address Issue

Strategic Objective # 5.1 — Site Restoration Capacity - Ongoing

The Field Manager in collaboration with the Coordinator will determine sites where restoration is needed and will be responsible for procuring plant material and the recruitment, preparation and assignment of volunteers and technical specialists to conduct restorations in the additional sites. The Coordinator will convene a group of specialists to provide knowledge and expertise in site restoration to CRISP.

PRISM Responsibility # 6: Identify and meet CRISP PRISM education and outreach needs

Justification

The function, after the EDRR process, that was considered to be of the most strategic value to CRISP was that of education and outreach. The majority of respondents were very interested in CRISP and said they want a great deal more information about the program. in particular, they were interested in how to address issues of invasive species infestations themselves and requested more education and training opportunities. There was universal agreement that CRISP would benefit from being better known throughout the CRISP region with more education and outreach.

A survey, conducted by the St. Lawrence-Eastern Lake Ontario PRISM, of the cultural impacts of invasive species concluded that 92% of people surveyed say “invasive species currently affect their well-being” and 74% that “invasive species currently affect their livelihood”. Respondents reported that messaging that only indicates the negative impacts of invasive species and the magnitude of infestations quite often results in the conclusion that nothing can be done to address the issues and inaction. The consensus was that materials should not only give information on the negative impacts of invasive species but also information on the benefits of addressing the issues

Many innovative education and outreach suggestions were provided by respondents who also indicated populations that they believed did not know much about CRISP but would be interested in finding out about it e.g. trans-border populations and younger property and landowners who are new to the region.

They were also concerned about the lack of capacity on the part of CRISP staff to fully address the IS education and information needs of the entire Catskills region. They are very much aware that the capacity issue is due to lack of personnel in the team and not because of the level of expertise, experience and commitment of the existing staff.

Strategic Objectives to address issue

Strategic Objective # 6.1 — Increased capacity to conduct education and outreach activities

CRISP staff will work with the Catskill Center Communications Director to provide an improved social media presence and rebuild the CRISP website to have more effective messaging. The Communications Director will also ensure that the CRISP and CC websites are more regularly updated.

CRISP staff will focus Train-the-Trainer programs on boundary and underserved areas. Education specialist network members or volunteers will be assigned for each county and underserved areas to supplement CRISP's capacity.

Strategic Objective # 6.2 — Targeted Outreach – June, 2018

CRISP will develop a communications and outreach strategy to utilize specific media platforms that target groups according to the media options available to them and their communication preferences as identified in the survey. Once the Education and Outreach Working Group is activated and positions are filled, the developers of the communication and outreach plan could use the following survey information where relevant:

- CRISP continues to have a presence at fairs and festivals and will continue to work with CCE to provide education and outreach across the CRISP region. It will develop and post digital quarterly newsletters and press releases in order to reach the general public.

- Information will also be provided to municipal officials and libraries in the region for their information and to disseminate locally.

- CRISP could post its annual calendar of events, workshops, training and meetings using all media platforms to reach multiple audiences and target groups in the Catskills Region.

- Billboards, local radio programs and quarterly hard copy newsletters could be developed to target all CRISP stakeholders who live in zones with uncertain internet services (such as Tannersville, rural areas around Cooperstown and others).

- To engage more young people, CRISP could have a presence at youth gatherings and increase its focus in youth activities. Respondents suggested setting up tables at little league games, at boy and girl scouts camps, and other events for young children. Fun cell phone apps and various social

media platforms could be used to get messages and information out to youth audiences, newly arriving land and homeowners in the region, and the general public with regular access to the internet.

Strategic Objective # 6.3 — Positive Messaging

Specific CRISP messaging will be developed for all media platforms. The messaging will aim to address the issue that some invasive species information available to the public tends to emphasize the negative impacts of invasive species and discourages attempts to address the infestation or problem.

CRISP will develop one-page fact sheets to enable stakeholders to address IS issues themselves, and Facebook posts, brochures and notices as outreach materials some of which can be available at public and private lake accesses, to explain how to detect and respond rapidly to invasive species infestations.

Additionally, outreach materials will describe the well-being and livelihood benefits of controlling invasive species to encourage the general population and stakeholders to understand the need to change their own behavior in relation to these damaging species. This positive information will be included in all forms of information CRISP develops and distributes for its outreach and education materials and online.

Another outreach mechanism will be for CRISP to work with state government agencies to advocate for clear and supportive laws and regulations around invasive species in the Catskill region e.g. “Landowners finds that they have pulled all invasive plant material on their property, but the law says that they are not allowed to move it. What do they do”?

PRISM Responsibility #7: Support academic research as needed through citizen science

Justification
CRISP has trained some citizen scientists but has lacked a structured program to increase and retain research volunteers.

Strategic Objectives to address issue

Strategic Objective # 7.1 — Increased Research Capacity

CRISP will continue working with the New York State-contracted New York State Invasive Species Research Institute to find resources to design and conduct research on the impact of invasive species on water quality and the impact of climate change on invasive species impacts

CRISP is aiming to enter into agreements with universities and colleges, such as the SUNY Delhi, for STEM and other qualified students to design and conduct research as needed by the program.

The CRISP coordinator will attend the Catskill Environmental Research and Monitoring Conference and other local conferences to collaborate with scientists working on local issues.

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Appendices

A. Towns in CRISP Region by County

Coverage	Entire	Entire	Entire	Part	Part	Part	Part
Total Population	45,523	60,097	31,317	47,508	74,801	179,225	379,210
# Towns	**19**	**24**	**16**	**7**	**15**	**11**	**1**
	Andes	Burlington	Bleinheim	Ashland	Bethel	Denning	Deerpark (part)
	Bovina	Butternuts	Broome	Halcott	Callicoon	Hardenburgh	
	Colchester	Cherry Valley	Carlisle	Hunter	Cochecton	Hurley (part)	
	Delhi	Decatur	Cobleskill	Jewett	Delaware	Kingston (part)	
	Deposit	Edmeston	Conesville	Lexington	Fallsburg	Marbletown (part)	
	Franklin	Exeter	Esperance	Prattsville	Forestburgh	Olive	
	Hamden	Hartwick	Fulton	Windham	Fremont	Rochester (part)	
	Hancock	Laurens	Gilboa		Highland	Shandaken	
	Harpersfield	Maryland	Jefferson		Liberty	Ulster (part)	
	Kortright	Middlefield	Middleburgh		Lumberland	Wawarsing (part)	
	Masonville	Milford	Richmondville		Mamakating (part)	Woodstock	
	Meredith	Morris	Schoharie		Neversink		
	Middletown	New Lisbon	Bleinheim		Rockland		
	Roxbury	Oneonta	Broome		Thompson		
	Sidney	Otego	Carlisle		Tusten		
	Stamford	Otsego					
	Tompkins	Pittsfield					
	Walton	Plainfield					
		Richfield					
		Roseboom					
		Springfield					
		Unadilla					
		Worcester					
		Westford					

B. Governance Policy

Catskills Regional Invasive Species Partnership Governance Policy / Feb. 8, 2017

Background

The Catskills Regional Invasive Species Partnership (CRISP) was established in 2005 in order to address the issue of invasive species management within the Catskills region. Membership in CRISP has grown from a small core group of organizations into a partnership of more than 60 organizations. CRISP exists as one of eight Partnerships for Regional Invasive Species Management (PRISMs) of New York State, covering a geographic region comprising the Catskill Park, portions of Sullivan, Orange, Greene and Ulster County, and the entirety of Delaware, Otsego and Schoharie Counties. This governance document replaces a previous version dated September 2010.

I. Mission Statement:

To promote education, prevention, early detection and control of invasive species to limit their impact on the ecosystems and economies of the Catskills.

II. CRISP Partners

a. Partners may be individuals or organizations, public or private, which are supportive of the CRISP Mission Statement.

b. Partners must accept the definition of invasive species as described in Environmental Conservation Law, Article 9, Title 17 and further defined in New York Code 6 NYCRR Chapter V Part 575: *"Invasive species" means a species that is: (a) nonnative to the ecosystem under consideration; and (b) whose introduction causes or is likely to cause economic or environmental harem or harm to human health. The harm must significantly outweigh any benefits.*

c. Partnering organizations must designate a representative to participate in meetings or in CRISP sponsored activities at least once annually in order to remain recognized as a CRISP Partner.

d. Partners must provide their name, affiliation, and contact information to CRISP. Partners will be invited to quarterly general membership meetings, may serve in an advisory role, and will be kept informed of CRISP activities and progress.

e. Partners are expected to respond to CRISP inquiries and contribute regularly in service to CRISP. The Partners have a general stakeholder interest in the detection, management, control, biology and prevention of invasive species and to that end agree that it is to their mutual benefit and interest to work cooperatively to prevent the spread of invasive species across the Catskill region. The activities which the Partners may undertake to further their mutual interests regarding invasives species may include but are not limited to:
   - *Develop and/or implement invasive species management plans including early detection and rapid response*
   - *Protecting and restoring native biodiversity where impaired due to invasive species;*
   - *Recommending treatments for control or eradication;*
   - *Educating the public and other stakeholders;*
   - *Conducting research on invasive species;*
   - *Monitoring, reporting and collection of information on invasive species.*

III. CRISP Steering Committee:

a. In order to create the environment for efficient decision making it is necessary to identify 11-13 agencies, organizations, and partners representing a variety of organizations. This group will be composed of two components; nine "Core" individuals from core agencies and organizations and two to four individuals serving as "At-large" representatives of the other Partners as described below.

b. The Core component consists of nine individuals representing the core organizations and public agencies that have a vested interest in invasive species and the Catskill region. Representatives of the following organizations are recommended to fill these nine positions:

1. NYS Department of Environmental Conservation,
2. NYS Department of Agriculture & Markets,
3. NYC Department of Environmental Protection,
4. NYS Department of Transportation,
5. Catskill Center for Conservation and Development,
6. Watershed Agricultural Council,

7. The Nature Conservancy,
8. The Catskill Forest Association, and
9. Cornell Cooperative Extension.

c. Core members of the Steering Committee will be designated by their organization. Should the designated Steering Committee member be unable to attend, they should designate a substitute from their organizations? If two members of a single organization attend a Steering Committee, only one will be able to vote. Core members may serve as long as their organization recommends their continued appointment.

d. The At-large component will have a minimum of two and a maximum of four representatives. These representatives will be individuals or representatives of organizations within CRISP that are not included in the first component, such as local colleges or Soil and Water Conservation Districts.

e. At-large representatives will serve two-year terms, beginning in a January, which can be renewed. Normally At-large representatives will be selected out of the Partners, and voted on by the Steering Committee by simple majority. Individuals may self-nominate or be nominated by any Partner.

f. The CRISP Steering Committee will function through majority rule. The Steering Committee will meet quarterly, or as needed. Voting by telephone or other real-time electronic connection will be treated as in person.

g. Individual steering committee members shall recuse themselves from voting on any matter that may constitute a conflict of interest.

IV. Steering Committee Chair

a. The Chair will be the primary liaison with the CRISP Coordinator and the host organization, and will advise and support the Coordinator.

b. The Chair serves for a (renewable) 2-year term beginning in January, by simple majority vote of the members of the Steering Committee.

c. The Chair is responsible for calling the quarterly meetings of the Steering Committee, providing an Agenda at least one day prior to the meeting.

d. The Chair is responsible for organizing Ad hoc committees and oversight in strategic planning.

e. Should the membership of the Steering Committee drop to below 10 individuals during the year, the Chair may appoint a member to bring the number up to 10 for the remainder of that year.

f. A Vice Chair will be appointed by the Chair for circumstances when the Chair cannot serve, e.g. when Chair is up for renewal of term, absent or conflict of interest.

V. CRISP Steering Committee and Chair Responsibilities

a. The Steering Committee will discuss and provide comment on all subcontracts, grants, agreements, projects and work plans developed by or for the CRISP host organization which address CRISP goals. The Committee will strive to reach consensus. Any member of the Steering Committee can request a vote on issues before the Committee. If there is not a quorum at a meeting, then the vote will be done via email.
b. The Steering Committee members participate in the development of a Strategic Plan for managing invasive species over five years, ad hoc

Management Plans for specific invasive species, and an Annual Work Plan. These will have goals/objectives and actions that are aligned with the New York State Invasive Species Council and Advisory Committee.

c. The Chair transmits recommendations of the Steering Committee to the CRISP Coordinator. The Chair coordinates the Annual Work Plan with the Coordinator and Host Organization.

VI. CRISP Host Organization Authority and Responsibilities

a. The CRISP host organization retains the authority for financial oversight, as well as the authority to manage and implement grants, contracts and agreements that it has entered into on behalf of the CRISP organization.

b. The host organization will chair general meetings of the Partners and develop agendas as well as record and distribute minutes to CRISP Partners.

c. The host organization is responsible for preparation of the Strategic Plan in cooperation with the Steering Committee and partners at large.

d. The host will collaborate with the Chair and Coordinator on the Annual Work Plan, providing comment and evaluation.

e. The Host will provide a full time CRISP Coordinator and other CRISP staff.

VII. CRISP PROGRAM COORDINATOR.

a. The Program Coordinator will be responsible for coordinating Partners and coordinating the implementation of the core functions of CRISP including planning regional invasive species management, developing early detection and rapid response capacity, recruiting, training and supervising volunteers and interns, implementing eradication projects, raising awareness about invasive species issues, and supporting research through citizen science.

b. The Program Coordinator will also be responsible for facilitating meetings and preparing and distributing meeting summaries.

c. The Program Coordinator will correspond with the public and any interested Partner or organization on behalf of CRISP.

C. Steering Committee

Name	Position	Organization
Chris Zimmerman	Conservation Ecologist	The Nature Conservancy
Donna Vogler	Professor of Biology	SUNY Oneonta
Ethan Angell	Senior Horticulture Inspector	New York State Department of Agriculture and Markets
Ian Dunn	Forester 1	New York State Department of Environmental Conservation
Jeff Senterman	Executive Director	Catskill Center for Conservation and Development
Jessica Newbern	Biologist	National Park Service
Ryan Trapani	Director of Forest Services	Catskill Forest Association
Kris Gilbert	Senior Landscape Architect	New York State Department of Transportation
Marilyn Wyman	Issue Leader for Natural Resources and the Environment	Cornell Cooperative Extension of Greene County
Meredith Taylor	Invasive Species Biologist	New York City Department of Environmental Protection
Catherine Skalda	CSBI Coordinator	Delaware County Soil and Water Conservation District
Tom Pavlesich	Forestry Program Manager	Watershed Agricultural Council

D. Key Interviewees

Name	Position	Organization
Dan Snider	Field Project Manager	Catskill Center for Conservation and Development
John Thompson	CRISP Coordinator	Catskill Center for Conservation and Development
Meredith Taylor	Invasive Species Biologist	New York City Department of Environmental Protection
Chris Zimmerman	Conservation Ecologist	The Nature Conservancy
Tom Lewis	President of Trillium Invasive Species Mgt	Trillium Invasive Species Management
Mark Whitmore	Extension Associate	Cornell Department of Natural Resources
Kris Gilbert	Senior Landscape Architect	New York State Department of Transportation
Ian Dunn	Forester 1	New York State Department of Environmental Conservation
Marilyn Wyman	Issue Leader for Environmental + Natural Resources at CCE	Cornell Cooperative Extension of Greene County
Jessica Newbern	Biologist	National Park Service
Marc Wolf	Executive Director of Mountain Top Arboretum	Mountain Top Arboretum
Karen Rauter	Rondout and Neversink Stream Program Coordinator	Rondout-Neversink Stream Program
Ethan Angell	Senior Horticulture Inspector	New York State Department of Agriculture and Markets
Donna Vogler	Prof of Biology at SUNY Oneonta	SUNY Oneonta

Justin Perry	Chief of Bureau of Invasive Species and Ecosystem health	New York State Department of Environmental Conservation
Catherine Skalda	Catskill Stream Buffer Initiative Program Coordinator Delaware	Delaware County Soil and Water Conservation District
Bill Rudge	Natural Resrouces Supervisor	New York State Department of Environmental Conservation
Laura Weyeneth	Catskill Stream Buffer Initiative Program Coordinator Greene County	Green County Soil and Water Conservation District
Bobby Taylor	Catskill Stream Buffer Coordinator Ashokan Watershed	Ulster County Soil and Water Conservation District
Maraleen Manos-Jones	Affiliated w Monarch Groups + Scientists + Marbletown Environmental Committee	Hands of the Butterfly
Jeff Senterman	Executive Director	Catskill Center for Conservation and Development
Jack McShane	Landowner	N/A
Geoff Knapp	Retired CCE Sullivan County	N/A
Brandon Dennis	NYC Conservation Program Manager	USDA Natural Resource Conservation Service
Tom Pavlesich	Forestry Program Manager	Watershed Agricultural Council

E. Focus Group Discussions

Location	Name	Position	Organization
Agroforestry Resource Station	Jerry Carlson	Chief of Forest Health and Protection	New York State Department of Conservation
Agroforestry Resource Station	Sarah Travalio	Invasive Species Project Coordinator	New York State Department of Conservation Office of Parks, Recreation and Historic Preservation
Agroforestry Resource Station	Nick Dietschler	Hemlock Technician	New York State Hemlock Initiative
Agroforestry Resource Station	Radka Wildova		Ecological Research Institute
Agroforestry Resource Station	Jonathan Rosenthal		Ecological Research Institute
Ashokan Watershed Stream Management Program	Brent Gotsch	Watershed Educator	Cornell Cooperative Extension of Ulster County
Ashokan Watershed Stream Management Program	Bobby Taylor	Catskill Stream Buffer Coordinator Ashokan Watershed	Ulster County Soil and Water Conservation District
Mohican Farm	Jeff O'Handley	Program Director	Otsego County Conservation Association
Mohican Farm	Devin Merkley		Mohican Farm
Mohican Farm	Bob Sutherland	Manager	Mohican Farm
SUNY Oneonta – Morris	Paul Lord	Professor of Biology	SUNY Oneonta
SUNY Oneonta – Morris	Sarah Coney		SUNY Oneonta
SUNY Oneonta – Morris	Amanda Barber	Professor of Biology	Hartwick College
SUNY Oneonta – Morris	Catherine McGlynn	AIS Coordinator	NYS Invasive Species Unit
NYC Department of Environmental Protection	Sarah Hoskinson	Catskill Streams Buffer Initiative Coordinator	NYC DEP
NYC Department of Environmental Protection	Jim Goodrich		NYC DEP

Location	Name	Position	Organization
NYC Department of Environmental Protection	Don Kent	Water Ecologist	NYC DEP
NYC Department of Environmental Protection	Fred Gliesing	Senior Forester	NYC DEP
NYC Department of Environmental Protection	Mike Usai	Research Scientist III/Supervisor	NYC DEP
NYC Department of Environmental Protection	Chris Nadareski	Research Scientist III	NYC DEP
NYC Department of Environmental Protection	Erika Boetsch		NYC DEP
NYC Department of Environmental Protection	Stephanie Sorbellini		NYC DEP
NYC Department of Environmental Protection	Ira Stern	Environmental Planner	NYC DEP
NYC Department of Environmental Protection	Maria Tupper-Goebel	Wetland Scientist	NYC DEP
NYC Department of Environmental Protection	Deborah Levingtion		NYC DEP
National Park Service	Don Hamilton	Natural Resources Chief	National Park Service
National Park Service	Cindy Taylor	Stewardship Associate	Delaware Highlands Conservancy
National Park Service	Douglas Manning	Invasive Species Early Detection Coordinator	National Park Service
National Park Service	Jamie Myers	Biologist	National Park Service
National Park Service	Pete Golod	Resource Specialist	Upper Delaware Council
National Park Service	Sarah Coney		SUNY Oneonta
SUNY Delhi	David DeForest	Assistant Professor	SUNY Delhi
SUNY Delhi	Lisa Tessier	Assistant Professor	SUNY Delhi
SUNY Delhi	Jack Tessier	Professor	SUNY Delhi
Catskill Center	Jack McShane	Landowner	N/A
Greene County Soil and Water Conservation District	Nancy Allen	Landowner	N/A
Cornell Cooperative Extension Sullivan County	Geoff Knapp	Retired CCE Sullivan County	N/A
Delaware County Soil and Water Conservation District	Brandon Dennis	NYC Conservation Program Manager	Watershed Agricultural Council
NYC Department of Environmental Protection	Stephanie Sorbellini		NYC DEP
NYC Department of Environmental Protection	Ira Stern	Environmental Planner	NYC DEP

Location	Name	Position	Organization
NYC Department of Environmental Protection	Maria Tupper-Goebel	Wetland Scientist	NYC DEP
NYC Department of Environmental Protection	Deborah Levingtion		NYC DEP
National Park Service	Don Hamilton	Natural Resources Chief	National Park Service
National Park Service	Cindy Taylor	Stewardship Associate	Delaware Highlands Conservancy
National Park Service	Douglas Manning	Invasive Species Early Detection Coordinator	National Park Service
National Park Service	Jamie Myers	Biologist	National Park Service
National Park Service	Pete Golod	Resource Specialist	Upper Delaware Council
National Park Service	Sarah Coney		SUNY Oneonta
SUNY Delhi	David DeForest	Assistant Professor	SUNY Delhi
SUNY Delhi	Lisa Tessier	Assistant Professor	SUNY Delhi
SUNY Delhi	Jack Tessier	Professor	SUNY Delhi
Catskill Center	Jack McShane	Landowner	N/A
Greene County Soil and Water Conservation District	Nancy Allen	Landowner	N/A
Cornell Cooperative Extension Sullivan County	Geoff Knapp	Retired CCE Sullivan County	N/A
Delaware County Soil and Water Conservation District	Brandon Dennis	NYC Conservation Program Manager	Watershed Agricultural Council

F. CRISP PRISM Strategic Planning Opinion Survey

Name: **Date:** **Contact Information:**

What is the title of your position? Please briefly describe your role and major responsibility.

Follow-up questions:

- What type of organization do you work for?
- If you don't work for an organization, what is your work status –consultant, sole proprietor?
- What is your gender? This is required for recording purposes. For focus groups you will simply record the number of men and of women.

Male	Female	Prefer not to answer

- Briefly, what is your own background in relation to Invasive Species?
- What is your relationship to CRISP?
- If you are not very aware of what CRISP does, what could be done by the PRISM to get you more informed and involved?

How does your organization address issues of invasive species?

Follow up:

- What do you do specifically to address issues of invasive species?
- How do you or your organization determine the impact of the work that is done to address invasive species issues?

What are the priority invasive species issues in the Catskill Region that could be addressed by CRISP?

Follow up:

- What are priority issues in your county / area?

What is working well in CRISPs operations and should be retained or taken to the next level of scale under the 2017-2021 contract?

G. Results of Interviews and Focus Group Discussions

Q: What are the ways in which CRISP could get more people and institutions informed and involved?

3	More invasive species tabling events
3	Meet wide geographic needs and target regionally relevant issues
2	Look at other organization to help implementation (boy scouts/hiking clubs)
2	Educate schools and municipal groups, engage professors and teachers
2	Train core experts
2	iMap and other phone app training
2	Better job of mass outreach via electronic newsletter/social media/Instagram
2	Build capacity/get more employees
1	Dialogue with nursery and landscape association agencies
2	Engage students and 4H
1	One on one contact with stakeholders
1	More plant ID classes to increase education
1	Try to influence incoming landowners
1	Focus on real sites where landowners will take responsibility
1	More large education and outreach forums
1	Annual event in which the Steering Committee answers questions
1	Create more informational material (bookmarks/brochures/kitchen magnets)
1	Host online webinars
1	Send out a monthly newsletter and email blast
1	Make current work known through outreach
1	Billboards
1	Prioritize communication strategies that will produce the biggest bang for the buck
1	Host a multistate event
1	Host more targeted topic meetings with multiple speakers and promote them well in advance
1	More outreach in areas like Woodstock
1	Do more sector targeting
1	Build prevention capacity around borders of the Catskill region
1	Be a clearinghouse for stakeholder information
1	Better define what organizations and people do
1	PRISM working groups by topic (such as Education and Outreach)
1	National Invasive Species Council involvement
1	Attend and present at CERM every other year
1	Have more watershed stewards
1	Create position for a dedicated volunteer coordinator and outreach person
1	Have defined roles for volunteers and time lines
1	Create volunteer engagement with manual manipulation of vegetation
1	Fund research and host more ID classes
1	Create a messaging and communication strategy for CRISP

Q: How do you or your organization address invasive species issues?

3	Education work
3	Raise funds and keep previous grants going
3	Collaboration with other organizations
2	Mitigate the invasive species impacts that our other work in our organization has
2	Regulation of invasive species sale/spread/prevention
1	Raise awareness
1	Invasive species work in fisheries, forestry, stream and education
1	Outreach to hikers, hunters, and other recreational groups
1	Host volunteer days to remove invasive species
1	Master gardener training and updates
1	Schoharie watershed events
1	Cornell Cooperative Extension courses
1	4H ambassador program
1	Japanese knotweed work with highways
1	Direct management of invasive species
1	Law enforcement
1	Host annual watershed summit
1	Support academic work
1	Forest health (firewood)
1	Prevent plant pests
1	Hemlock work
1	Work on invasive species plans to mitigate them
1	Management and prioritizing how to do work
1	Leverage resources of the state to expand resources
1	Invasive species remote detection

Q: Are there geographic areas with a need of more CRISP activity?

9	North and West
3	Border with Lower Hudson
3	Remote or rural areas
3	High-population areas
2	Road ways
1	Border with PA
1	Areas at edge of Catskills
1	Waterways and watershed area

Q: What is working well and could be expanded or taken to scale?

5	Engage new audiences
5	Outreach collaboration with other organizations
5	Early Detection Rapid Response
3	Boat stewards

2	Education and outreach on strategic ussies
2	Giant hogweed
2	Expand to new forest pests
2	Hemlocks and hemlock woolly adelgid
2	Staff capacity
2	Outreach to colleges
2	Strategic planning
1	Aquatic species
1	Waterways and corridors
1	Prioritization
1	Survey for new species
1	Collaboration
1	Providing funding for partners
1	Treatment work
1	Research

Q: What could be done differently and how?

3	More programming and increased outreach	1	Avoid reinventing the wheel
2	Increase out outreach efficacy	1	Condensed meetings
2	Social media and website	1	Outreach collaboration with other organizations
2	Reach new people	1	Look to others to give guidance
2	More options for call-ins for meetings	1	Increase staff
2	Develop an in-house work force	1	More action on the ground
2	Streamline contracting process	1	Look to others to give guidance
2	Take on fewer big goals rather than many smaller goals	1	Get other organizations to incorporate our messaging
1	Preaching to the choir	1	Management training for staff
1	Be more active in communicating	1	Prioritizing targets and picking appropriate approach
1	Eat it to Beat it	1	Continue existing partnerships
1	Regular column in local paper	1	Engage school systems (1 county per year)
1	Communication Strategy	1	Center manages scenic byway, uses money to support olive day festival - misuse of funds?

Q: What are recent innovations and best practices you could suggest to CRISP?

3	Use GIS and mapping technology
2	Communication with current partners to maintain collaboration
2	More citizen science
2	Biocontrol
1	Modern principles of science communication
1	More tabling

1	Engaging communication with members
1	Bigger partnerships and more events to get partners together
1	New ways to network
1	Data science applications and predictive algorithms
1	Satellite remote sensing
1	Unmanned aerial surveys – drones
1	Protocol for clean gravel and soil
1	Better ways to clean terrestrial (Play|Clean|Go initiative)
1	Development of app for smartphones tied into iMap
1	Simple traps to detect new bugs
1	Suggest native replacements for after invasive removal
1	Strategic targeting for new pests and preventing pathogens
1	Scalable new pest information
1	Keep looking at other states to borrow prioritization schemes
1	Re-prioritize each year - targets move
1	Catskill Center is owner of CRISP - S.C. has sufficient interest
1	Find donor to fund in-house crew

H. Invasive Species Issues Identified

Interview answers:

13	Early Detection Rapid Response
6	Hemlock or Hemlock Woolly Adelgid
5	Asian Longhorned Beetle
4	Emerald Ash Borer
3	Japanese Knotweed
2	Aquatic species
1	Southern Pine Beetle
1	Balsam Woolly Adelgid
1	Tree Smart Trade
1	Beech Scale
1	Earth worms
1	Giant Hogweed
1	Common terrestrial invasives

Focus Group Discussion answers by County:

Delaware
Japanese knotweed – 2
Asian Longhorned Beetle - 2
Hemlock Woolly Adelgid - 2
Russian olive - 2
bush honeysuckle
Japanese barberry
Wild parsnip
Burning bush
Garlic mustard
Norway maple
Multiflora rose
Norway spruce
Purple loosestrife
Rock snot/Didymo
Emerald ash borer
Callery pear
Water chestnut
Japanese barberry
Mile a minute
Beech trees
Oak Wilt

Greene
Japanese knotweed
Emerald ash borer
Hemlock Woolly Adelgid

Schoharie
Hemlock woolly adelgid
Asian Longhorned beetle
Emerald ash borer

Otsego
Hemlock Woolly Adelgid – 2
Japanese knotweed - 2
Black swallowwort
Phragmites
Forest pests
Aquatic invasives
Emerald ash borer
Hydrilla
Spiny waterflea

Sullivan
Aquatic invasives
Japanese knotweed
Mile a minute

Ulster
Asian Longhorned Beetle – 3
Hemlock Woolly Adelgid - 3
Emerald ash borer - 2
Hydrilla
Southern Pine Beetle
Spotted Lanternfly
Crop pests
Mute swans
House sparrows
European Starlings
Early detection rapid response
Riparian
Mile a minute
Aquatic invasives

I. Catskill Regional Invasive Species Partnership Rapid Response Policy

The costs associated with mitigating the impacts of an invasive species or managing it in perpetuity far outweigh the costs of preventing it from becoming established or eradicating it before it becomes widespread. The Catskill Regional Invasive Species Partnership (CRISP) has several mechanisms for ensuring that species are detected early: iMapinvasives, a statewide database for invasive species observations, provides alerts for species that are approaching the region and the Early Detection Network operated by local Cornell Cooperative Extension associations provides trained experts to interface with the public to identify these species.

New reports of early detection invasive species, species with three or fewer known occurrences in the region, or occurrences of non-native species that have the potential to become invasive will be immediately directed to the CRISP Coordinator. The CRISP Coordinator will then initiate the appropriate rapid response protocol unless the species is of such a significant threat that a state or federal response is warranted.

The CRISP Coordinator would notify the appropriate agency staff (see Attached Contact List) if species such as Asian long-horned beetle, hydrilla, Eurasian boar, or northern snakehead were detected. This species list is dynamic and may be changed based on agency resources.

CRISP shall maintain the capacity to assist in or lead rapid response efforts at all times as a priority activity. This means that funding and staff time shall be able to be diverted to these efforts when warranted or a reserve fund shall be established.

Rapid Response Protocol for a Non-Native Species New to New York State

Once a potential invasive species has been identified:

Step 1. Confirm identification with at least one expert (See Attached Expert List)
Step 2. Using USDA Plants databases, Introduced, Invasive, and Noxious Plants list, Invasive.org, New York State's invasivity assessments and other similar resources, determine if the species is considered invasive or noxious in other states, provinces or countries. Consult DEC Invasive Species Unit Coordinator and assigned NY Invasive Species Research Institute personnel. If determined invasive, proceed to step 3. If not, develop monitoring protocol and timeline for initial and subsequent surveys.
Step 3. Contact iMapinvasives to have the species added to the database if it is not already listed.

Proceed to Step 2 below.

Rapid Response Protocol for an Early Detection Species

Once a known early detection invasive species has been identified:

Step 1. Confirm identification with at least one expert (See Separate Expert List)

Step 2. Initiate a Rapid Assessment
The CRISP Coordinator will lead the rapid assessment unless another agency, organization, or educational institution is in a better position to take the lead.

A. Hold an initial briefing for all partners participating in the Rapid Assessment (the person who made the initial discovery and relevant partners). Based on case-specific circumstances, discuss and determine appropriateness of press, outreach and involvement of other partners.
B. Contact the landowner or landowners regarding access for a survey and to inform them of the presence of a potentially damaging plant/animal. *If no contact can be made surveys may still occur from the road or other public access.
C. Consult with experts to prioritize and determine extent of area for survey. Extent surveyed shall be based on an individual species' dispersal mechanisms. Plants dispersed by animals or wind would require a more wide-scale survey. Aquatic species shall be surveyed for upstream and downstream of initial detections. Schedule surveys once access is granted and include timeframe for follow up assessments.
D. Assess the extent of the invasive species occurrence using the iMapinvasives survey protocol and enter data into the online database.
E. Report results to landowners, partners and the press if needed.

Step 3. Initiate Rapid Response Planning
The lead from the rapid assessment shall continue with the rapid response plan unless they are unable, in which case the CRISP Coordinator will take the lead.

A. Hold an initial briefing for all partners participating in the Rapid Assessment (the person who made the initial discovery and relevant agencies or organizations), as needed and identify any permits or permissions required. If permissions cannot be obtained, flag area and develop monitoring plan with timeline for surrounding areas.
B. Consult expert panel to determine best management practices and site restoration needs
C. Determine if the infestation is small, accessible and easy to remove. If yes, proceed to step 4 below.
D. If the infestation is not easily removed, the lead shall complete The Nature Conservancy's Invasive Plant Management and Decision Analysis Tool (IPMDAT) (Available on iMapinvasives). If it is determined that treatment is not feasible, monitor spread on an annual or semi-annual basis as appropriate or until resources become available.
E. If the infestation is caused by a species known to be not manageable at all (i.e Amynthas), monitor the spread, acquire baseline information, and engage in prevention outreach and policy changes where appropriate.
F. Estimate resources required to successfully eradicate the infestation including monitoring for the appropriate number of years and determine potential sources for needed resources including grants, fundraisers, and contributions from responsible parties and partners.

G. Hold a final briefing for all partners participating in the Rapid Assessment to outline the proposed course of treatment and identify implementation lead and participants. Plan for communications and designate media spokesperson where appropriate.

Step 4. Implement the Rapid Response

The lead for implementation shall be the landowner or primary agency or organization working with the landowner whenever possible. The CRISP Coordinator will lead the rapid response implementation when no other lead can be identified.

A. Organize a management team or contractor and define roles as needed.
B. Lead coordinates internal communication with the management team and plans for external communications with affected public throughout the process. Outreach shall include information about the species, what the public can do and answers to other common questions.

C. Permissions, permits, equipment, facilities and commitments from partners shall all be secured.

Step 5. Monitor and Evaluation

Collect and evaluate the treatment success and ecosystem recovery. Adapt actions accordingly.

A. Commence adaptive management. Adjust methods based on new information that comes to light throughout the process including control of any observed vectors or pathways for spread.
B. Site restoration plan developed including timeframe and plans for future monitoring.
C. Methods and results shall be summarized for CRISP annual reports and publicized widely at relevant conferences, in newsletters and through communications between other Partnerships for Regional Invasive Species Management.

J Support Network

Organization Name	Organization Name
3500 Club	New York Forest Owner Association
Adirondack Mountain Club	New York Invasive Species Research Institute
Ashokan Center	New York Natural Heritage Program
Ashokan Watershed Stream Management Program	New York State DEC Invasive Species Unit
Bevan Forestry	New York State Hemlock Initiative
Callicoon Creek Park Committee	New York State Department of Parks and Recreation and Historic Preservation
Cary Institute for Ecosystem Studies	Northern Catskill Audubon
Catskill Mountain Club	Olive Natural Heritage Society
Catskill Mountainkeeper	Open Space Institute
Catskill Native Plant Nursery	Otsego County Conservation Association
Catskill Watershed Corporation	Otsego Lake Association
Coldwell Banker Realtors	Otsego Land Trust
Cornell Cooperative Extension – Columbia & Greene Counties	Riverkeeper
Cornell Cooperative Extension – Delaware County	Rondout-Neversink Stream Program
Cornell Cooperative Extension – Otsego County	Schoharie Land Trust
Cornell Cooperative Extension – Schoharie County	Schoharie Soil and Water Conservation District
Cornell Cooperative Extension - Sullivan County	Spillian
Cornell Cooperative Extension – Ulster County	SUNY Cobleskill
Delaware County Planning Department	SUNY College of Environmental Science and Forestry
Delaware Highlands Conservancy	SUNY Delhi
Delaware River Basin Commission	SUNY ESF
Delaware-Otsego Audubon	SUNY New Paltz
Environmental Research Institute	SUNY Ulster
Fly Fishing Museum	Town Environmental Commissions
Friends of the Beaverkill	Trillium Invasive Species Management
Frost Valley YMCA	Trout Unlimited Ashokan-Pepacton Watershed Chapter
Greene County Schoharie Watershed Program	Trout Unlimited New York
Greene County Soil and Water Conservation District	Tuscarora Club
Hartwick College	Ulster County Department of the Environment
IMapInvasives	Ulster County Soil & Water Conservation District
John Burroughs Natural Heritage Society	Upper Delaware Council
Mid-Atlantic Regional Seed Bank	Upper Susquehanna Conservation Alliance
Mine Kill State Park	US Forest Service
Morgan Outdoors	USDA APHIS

Mountain Top Arboretum	USGS
Neversink Association	Woodstock Land Conservancy

K. Incident Command System (Planning P)

Planning Process (page 1 of 8)

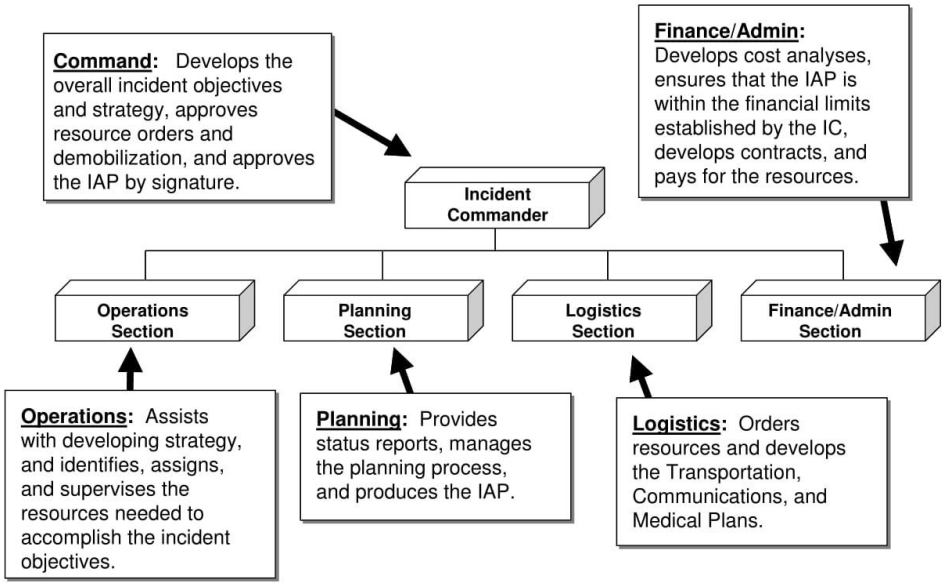
It was recognized early in the development of the ICS that the critical factor of adequate planning for incident operations was often overlooked or not given enough emphasis. This resulted in poor use of resources, inappropriate strategies and tactics, safety problems, higher incident costs, and lower effectiveness.

Those involved in the original ICS development felt that there was a need to develop a simple but thorough process for planning that could be utilized for both smaller, short-term incidents and events, and for longer, more complex incident planning. The planning process may begin with the scheduling of a planned event, the identification of a credible threat, or the initial response to an actual or impending event. The process continues with the implementation of the formalized steps and staffing required to develop a written Incident Action Plan (IAP).

The primary phases of the planning process are essentially the same for the Incident Commander who develops the initial plan, for the Incident Commander and Operations Section Chief revising the initial plan for extended operations, and for the incident management team developing a formal IAP, each following a similar process. During the initial stages of incident management, planners must develop a simple plan that can be communicated through concise verbal briefings. Frequently, this plan must be developed very quickly and with incomplete situation information. As the incident management effort evolves over time, additional lead time, staff, information systems, and technologies enable more detailed planning and cataloging of events and “lessons learned.”

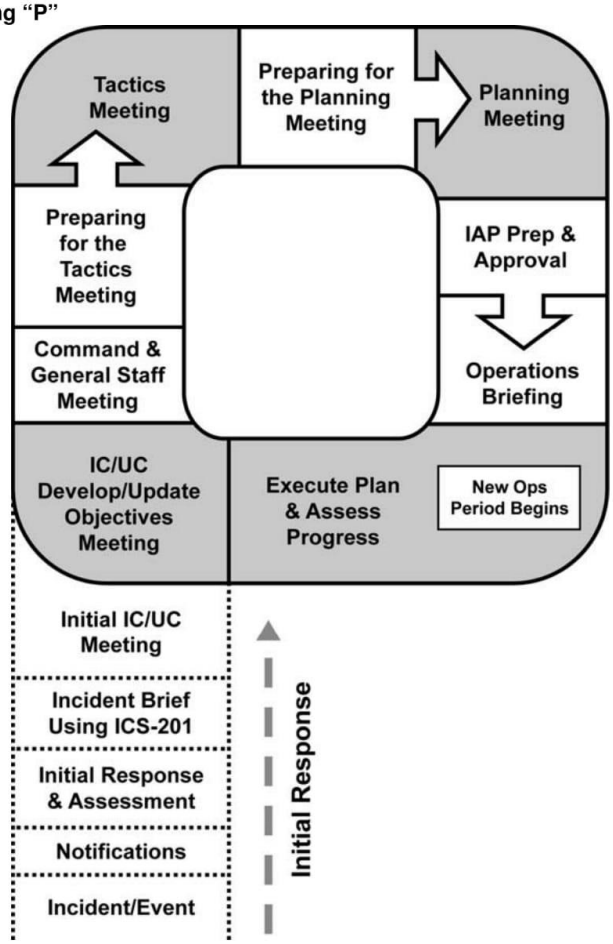
Planning involves:

- Evaluating the situation.
- Developing incident objectives.
- Selecting a strategy.
- Deciding which resources should be used to achieve the objectives in the safest, most efficient and cost-effective manner.



Caption: Organizational chart showing that Command develops the overall incident objectives and strategy, approves resource orders and demobilization, and approves the IAP by signature. Operations assists with developing strategy, and identifies, assigns, and supervises the resources needed to accomplish the incident objectives. Planning provides status reports, manages the planning process, and produces the IAP. Logistics orders resources and develops the Transportation, Communications, and Medical Plans. Finance/Administration develops cost analyses, ensures that the IAP is within the financial limits established by the Incident Commander, develops contracts, and pays for the resources.

The Planning "P"



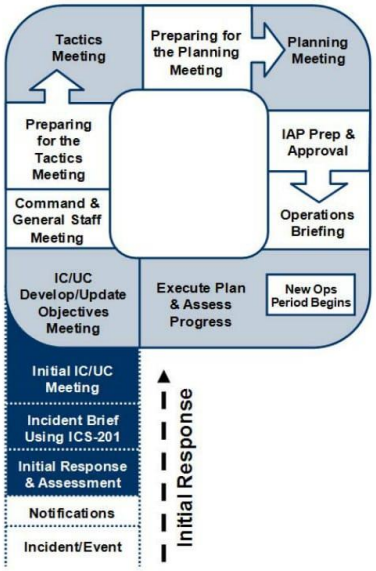
- The Planning "P" is a guide to the process and steps involved in planning for an incident. The leg of the "P" describes the initial response period: Once the incident/event begins, the steps are Notifications, Initial Response & Assessment, Incident Briefing Using ICS 201, and Initial Incident Command (IC)/Unified Command (UC) Meeting.
- At the top of the leg of the "P" is the beginning of the first operational planning period cycle. In this circular sequence, the steps are IC/UC Develop/Update Objectives Meeting, Command and General Staff Meeting, Preparing for the Tactics Meeting, Tactics Meeting, Preparing for the Planning Meeting, Planning Meeting, IAP Prep & Approval, and Operations Briefing.
- At this point a new operational period begins. The next step is Execute Plan & Assess Progress, after which the cycle begins again.

Source: draft NIMS document

Initial Response

Planning begins with a thorough size-up that provides information needed to make initial management decisions.

The ICS Form 201 provides Command Staff with information about the incident situation and the resources allocated to the incident. This form serves as a permanent record of the initial response to the incident and can be used for transfer of command.

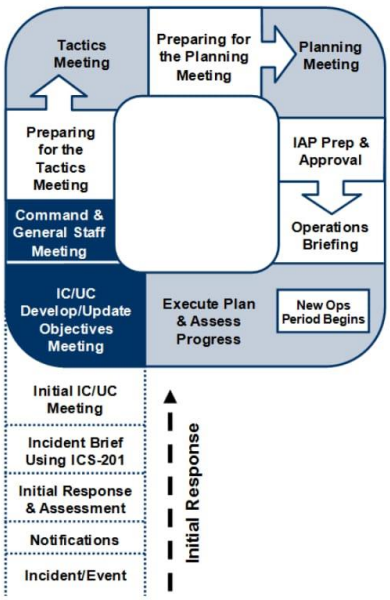


The Start of Each Planning Cycle

- **IC/UC Objectives Meeting:** The Incident Command/Unified Command establish incident objectives that cover the entire course of the incident. For complex incidents, it may take more than one operational period to accomplish the incident objectives.

  The cyclical planning process is designed to take the overall incident objectives and break them down into tactical assignments for each operational period. It is important that this initial overall approach to establishing incident objectives establish the course of the incident, rather than having incident objectives only address a single operational period.

- **Command and General Staff Meeting:** The Incident Command/Unified Command may meet with the Command and General Staff to gather input or to provide immediate direction that cannot wait until the planning process is completed. This meeting occurs as needed and should be as brief as possible.



Preparing for and Conducting the Tactics Meeting

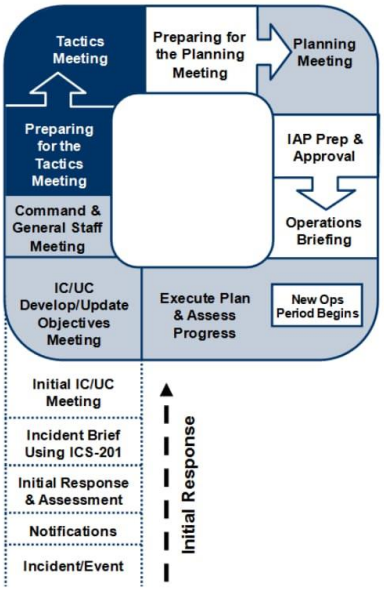
The purpose of the Tactics Meeting is to review the tactics developed by the Operations Section Chief. This includes the following:

- Determine how the selected strategy will be accomplished in order to achieve the incident objectives.
- Assign resources to implement the tactics.
- Identify methods for monitoring tactics and resources to determine if adjustments are required (e.g., different tactics, different resources, or new strategy).

The Operations Section Chief, Safety Officer, Logistics Section Chief, and Resources Unit Leader attend the Tactics Meeting. The Operations Section Chief leads the Tactics Meeting.

The ICS Forms 215, Operational Planning Worksheet, and 215A, Incident Safety Analysis, are used to document the Tactics Meeting.

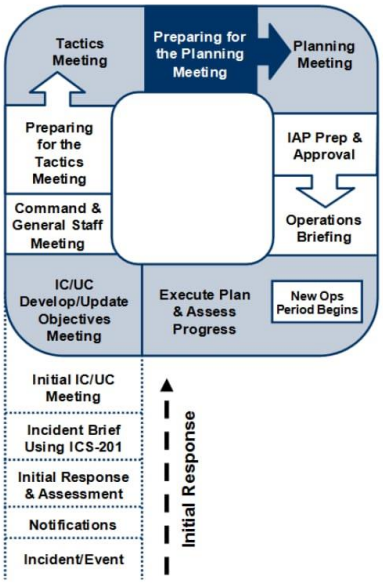
Resource assignments will be made for each of the specific work tasks. Resource assignments will consist of the kind, type, and numbers of resources available and needed to achieve the tactical operations desired for the operational period. If the required tactical resources will not be available, then an adjustment should be made to the tactical assignments being planned for the Operational Period. It is very important that tactical resource availability and other needed support be determined prior to spending a great deal of time working on strategies and tactical operations that realistically cannot be achieved.



Preparing for the Planning Meeting

Following the Tactics Meeting, preparations are made for the Planning Meeting, to include the following actions coordinated by the Planning Section:

- Review the ICS Form 215 developed in the Tactics Meeting.
- Review the ICS Form 215A, Incident Safety Analysis (prepared by the Safety Officer), based on the information in the ICS Form 215.
- Assess current operations effectiveness and resource efficiency.
- Gather information to support incident management decisions.

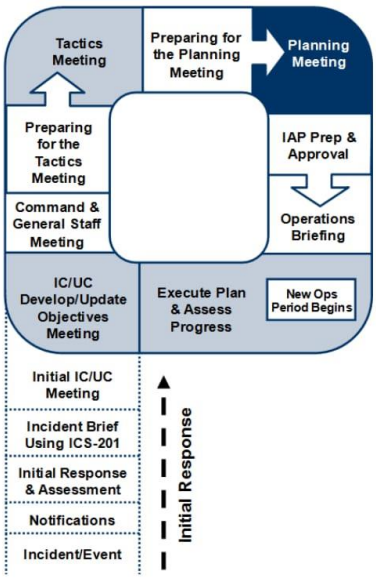


Planning Meeting

The Planning Meeting provides the opportunity for the Command and General Staff to review and validate the operational plan as proposed by the Operations Section Chief. Attendance is required for all Command and General Staff. Additional incident personnel may attend at the request of the Planning Section Chief or the Incident Commander. The Planning Section Chief conducts the Planning Meeting following a fixed agenda.

The Operations Section Chief delineates the amount and type of resources he or she will need to accomplish the plan. The Planning Section's "Resources Unit" will have to work with the Logistics Section to accommodate.

At the conclusion of the meeting, the Planning Section Staff will indicate when all elements of the plan and support documents are required to be submitted so the plan can be collated, duplicated, and made ready for the Operational Period Briefing.



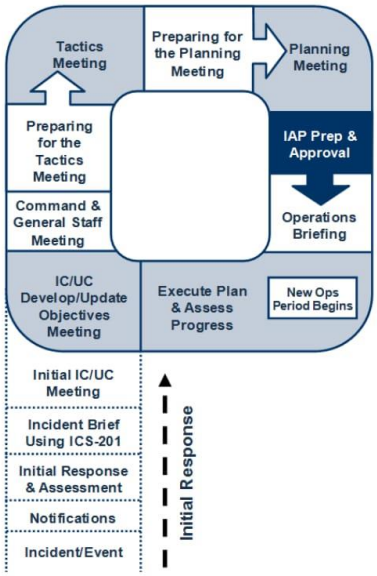
IAP Preparation and Approval

The next step in the Incident Action Planning Process is plan preparation and approval. The written plan is comprised of a series of standard forms and supporting documents that convey the Incident Commander's intent and the Operations Section direction for the accomplishment of the plan for that Operational Period.

For simple incidents of short duration, the Incident Action Plan (IAP) will be developed by the Incident Commander and communicated to subordinates in a verbal briefing. The planning associated with this level of complexity does not demand the formal planning meeting process as highlighted above.

Certain conditions result in the need for the Incident Commander to engage a more formal process. A written IAP should be considered whenever:

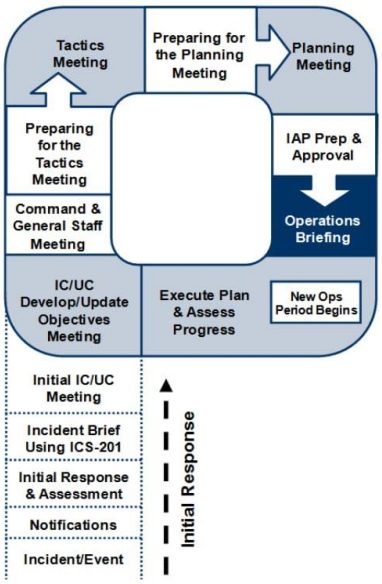
- Two or more jurisdictions are involved in the response.
- The incident continues into the next Operational Period.
- A number of ICS organizational elements are activated (typically when General Staff Sections are staffed).
- It is required by agency policy.
- A Hazmat incident is involved (required).



Operations Period Briefing

The Operations Period Briefing may be referred to as the Operational Briefing or the Shift Briefing. This briefing is conducted at the beginning of each Operational Period and presents the Incident Action Plan to supervisors of tactical resources.

Following the Operations Period Briefing supervisors will meet with their assigned resources for a detailed briefing on their respective assignments.



Execute Plan and Assess Progress

The Operations Section directs the implementation of the plan. The supervisory personnel within the Operations Section are responsible for implementation of the plan for the specific Operational Period.

The plan is evaluated at various stages in its development and implementation. The Operations Section Chief may make the appropriate adjustments during the Operational Period to ensure that the objectives are met and effectiveness is assured.