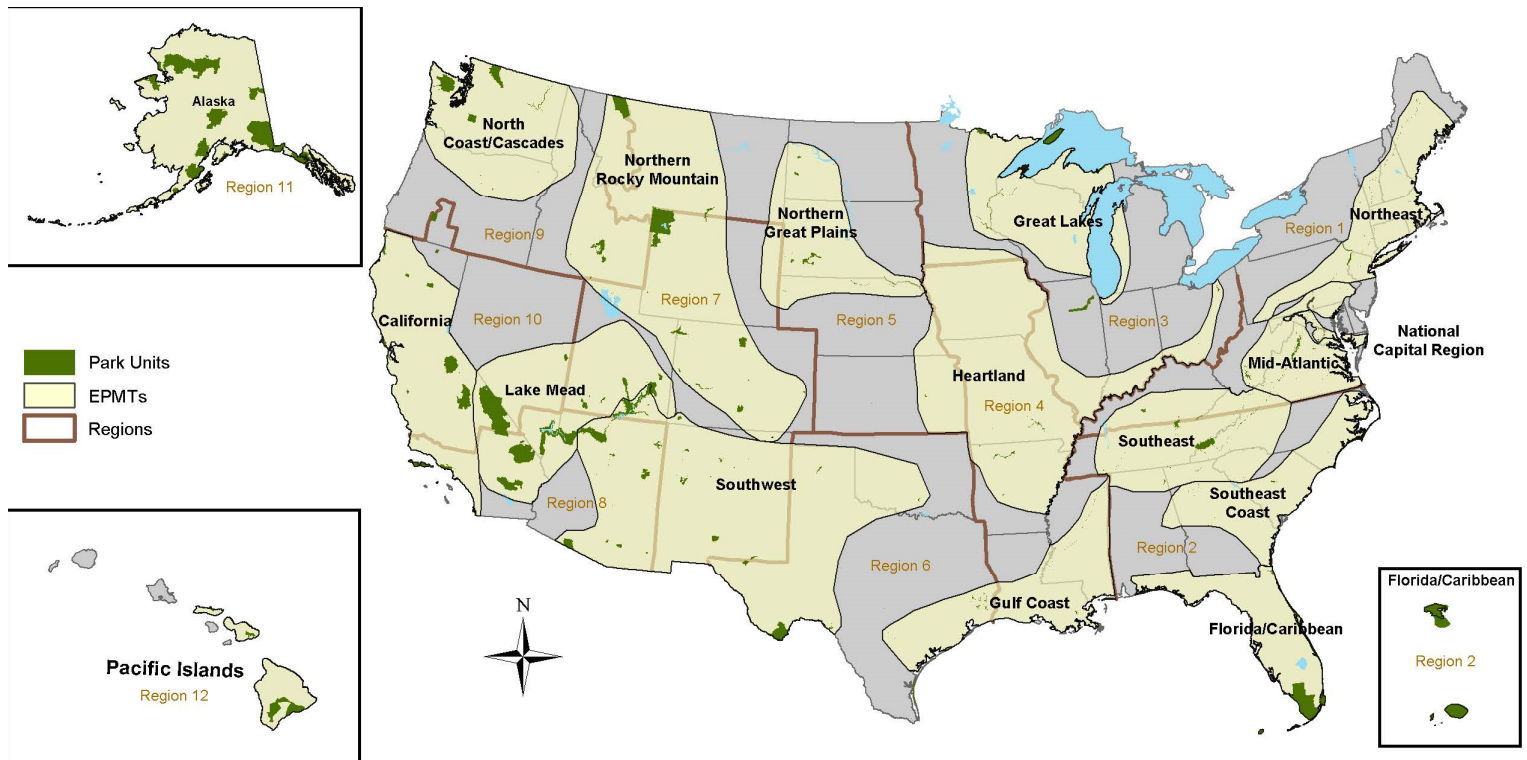




IPMT Annual Report: FY 2019



Map of Invasive Plant Management Team (IPMT) boundaries across the US and territories. Each team's name appears within the polygon that includes the parks they serve.

Background

Park staff and 17 Invasive Plant Management Teams (IPMT) conduct invasive species management on National Park Service (NPS) lands as mandated by the NPS and US Department of the Interior (DOI). The national NPS Invasive Plant Program (IPP) oversees fifteen of the IPMTs. The Heartland Inventory and Monitoring Network and DOI Region 2 oversee the other two teams. The IPMTs are located across the US and serve 287 park units as well as many non-NPS partners. The IPMT program was created in 2000 through the Natural Resource Challenge to assist parks in reducing the impact of invasive plants and restoring native plant communities. This program is now an integral part of the NPS response to a growing invasive species threat including as a source of expertise in invasive plant management not otherwise available in most parks.

Since the program's inception, team liaisons have consistently demonstrated innovation, flexibility, and efficiency in managing their programs. Teams provide substantial on-the-ground invasive species management support (4,600 acres treated and approximately 52,406 acres inventoried in fiscal year (FY) 2019 and much more. They spearhead prevention and early detection and rapid response actions to prevent or eradicate incipient populations of invasive species dramatically reducing future costs. Teams initiate and lead restoration efforts to increase resiliency and reduce susceptibility to future invasions of native plant communities. They protect cultural landscapes and significant ethnographic resources.

The teams also effectively leverage IPMT program dollars through resourceful, productive, and mutually beneficial partnerships with

Background (cont.)

contributions to teams valued at more than \$3.3 million in FY 2019. Teams engage youth on a substantial scale with over 1,400 youth participants contributing more than 100,000 hours in 2019. They also provide a range of valuable training opportunities to park staff, engage the public and future stewards of our national parks through creative and effective outreach and education activities and initiatives, and develop creative solutions to utilize limited IPMT funds to assist parks.

The IPMTs' innovation, flexibility, and efficiency facilitates their contributions to the protection and preservation of the natural and cultural resources entrusted to the NPS for this and future generations.



IPMT
Invasive Plant
Management Team



IPMT
Invasive Plant
Management Team

The Exotic Plant Management Team (EPMT) program became the Invasive Plant Management Team (IPMT) program in FY 2019. This change more closely aligns the program with [Executive Order 13751](#), Safeguarding the Nation from the Impacts of Invasive Species. The Executive Order includes the legal Federal definition of invasive species that the NPS follows. To facilitate the recognition of the name change, the IPMT program developed a new logo to include in the outreach and educational materials it produces (see logo above).



What the IPMTs Protect: Cannon holding invasives at bay, Saratoga National Historical Park, Northeast IPMT. NPS Photo.

What the IPMTs Protect

The NPS IPMTs are proactive and innovative in their approaches to invasive plant management to protect resources. These resources span the entire US and its territories, and many are recognized as globally important having garnered designations and recognitions including international biosphere reserves, designated wilderness, biodiversity hotspots, and Important Bird and Biodiversity Areas.

The IPMTs strive to protect a range of natural resources and native ecosystems. IPMT territory covers coastal, wetland, and riparian native plant and animal communities including on the east, Gulf, and west coasts, the dunes along the shores of Lake Michigan, west coast rainforest valleys, riparian woodlands, southeastern old-growth bottomland forest, and a variety of wetland types. Teams cover terrestrial communities such as boreal forests, high and low elevation sagebrush steppe, sub-alpine meadows, cave features, tallgrass prairies, eastern deciduous forests, and mixed shortleaf pine-oak-hickory forests. The teams' invasive plant management work also protects a range of species of concern and the habitat they require to survive including sea turtles, snowy plovers, least terns, and Coho salmon, as well as multiple rare, significant, and globally threatened ecosystems.

The IPMTs' work also protects and preserves cultural resources and historic sites and features. Many parks commemorate important historical events, locations, people, and cultural practices, which requires integrating invasive plant management into cultural landscapes. They include historic battlefields, archeological sites, earthworks, scenic byways, and ethnographic and cultural landscapes.

Science, Technology, and Innovation

IPMTs provide resources and support for invasive species management research and technology development. They are also often on the front line testing new and innovative tools and technology to increase their efficiency and effectiveness.

The [Southwest IPMT](#), other NPS staff, a US Fish and Wildlife Service scientist, and restoration ecologists from Borderlands Restoration Network collaborate to research the effects of invasive grass treatment on the rare subshrub species beardless chinchweed (*Pectis imberbis*) at Coronado National Memorial. This species is threatened by dense stands of invasive grasses such as Lehmann lovegrass (*Eragrostis lehmanniana*). This research supports improved restoration outcomes by identifying effective treatments while protecting this rare species.



Science, Technology, and Innovation: Fire management near the visitor center at Agate Fossil Beds National Monument to inform adaptive management, ABAM partnership, October 2019. NPS Photo.

Science, Technology, and Innovation (cont.)

The Annual Brome Adaptive Management collaborative helps Northern Great Plains (NGP) parks make science-based decisions and test their effectiveness to manage invasive annual grasses using a predictive model. Collaborators include the US Geological Survey, NGP Inventory and Monitoring Network, NGP Fire Management, [Northern Rocky Mountain](#) and [NGP IPMTs](#), and seven NPS units. To date, partners have collected pre-treatment and one year of post-treatment monitoring data to inform the predictive model.

Land managers incorporate Unmanned Aerial System drones into invasive plant management efforts. The [Southeast Coast IPMT](#), Cape Hatteras National Seashore staff, and the North Carolina Department of Transportation worked together to mitigate wetlands lost to a new bridge through drone treatment and mapping of 70 acres of common reed (*Phragmites australis*).

Detection of invasive species early in an invasion is challenging. To aid this process, the [Pacific Islands IPMT](#) collaborated with the University of Hawai'i Hilo Spatial Data and Analysis Lab on a helicopter-mounted detection system for a suite of invasive species. The approach has improved the detection of four invasive plant species and trees infected by the pathogen that causes Rapid 'Ōhi'a Death.

Prevention and Early Detection and Rapid Response

Prevention and early detection and rapid response (EDRR) are the most effective means to control invasive species. Teams proactively manage invasive species to prevent their spread into uninfested areas and act quickly to eradicate new populations.

The spotted lanternfly (*Lycorma delicatula*), native to China, is an invasive insect that is dispersing quickly in the eastern US. Tree-of-heaven (*Ailanthus altissima*), also native to China, is the spotted lanternfly's preferred host tree. The [National Capital Area IPMT](#) works with its partners to manage tree-of-heaven to prevent or slow the spread of the spotted lanternfly.

The Boulder City Conservation Easement in the Eldorado Valley of NV is set aside to preserve the threatened desert tortoise. Buffelgrass (*Cenchrus ciliaris*) invaded a recent powerline right of way along the border of the Easement. The [Lake Mead \(LAKE\) IPMT](#) eradicated the buffelgrass through a successful EDRR partnership effort among the Clark County Desert Conservation Program, the LAKE IPMT, and the Bureau of Land Management.



Restoration: Shade structure at Salt River Bay National Historical Park and Ecological Preserve, Florida/Caribbean IPMT. NPS photo.

Restoration

IPMTs' often focus their restoration efforts on natural resources. Over decades, the [Great Lakes \(GL\) IPMT](#) treated high priority invasives at Saint Croix National Scenic Riverway's Arcola area, one of the Riverway's most heavily visited sites and among the most susceptible to invasive plant infestations. After years of work to remove acres of invasive species like garlic mustard (*Alliaria petiolata*) and common buckthorn (*Rhamnus cathartica*) the IPMT transformed the site from 160 infested acres to a mosaic of native prairie and oak savanna. To preserve one of the many unique plant communities at New River Gorge National River (NERI), the [Mid-Atlantic \(MA\) IPMT](#) and NERI staff carefully removed encroaching woody invasive plants from a site with 24 state listed rare plant species. The 1948 construction of the Bluestone Dam ended natural flooding resulting in a closed canopy forest and invasive shrub encroachment. The MA IPMT and NERI staff treated the invasive species in the midst of rare plant populations using methods to best protect these rare species.

IPMTs' restoration work often improves both natural and cultural resources. The [Florida/Caribbean IPMT](#) funded a three-phase restoration project at the Salt River National Historical Park and Ecological Preserve in the Virgin Islands to address severe invasive plant infestations caused by agricultural and residential development. Work included treating 12 invasive plant species and planting native plants that were collected and grown on St. Croix, Virgin Islands. The [Gulf Coast IPMT](#) collaborated on restoration at Palo Alto Battlefield National Historical Park in response to a severe infestation of Brazilian peppertree (*Schinus terebinthifolia*). Work included retreatment of Brazilian peppertree and treatments in new areas. Volunteers planted one dozen native plant species contributed by The Nature Conservancy. In addition to the plantings, native plants have begun to naturally revegetate the previously infested area. The [North Coast-Cascades Network \(NCCN\) IPMT](#) partners with San Juan Island National Historical Park (SAJH) resource management staff to control a suite of invasive plants. The island hosts unique assemblages of relatively dry coastal prairie that are home to culturally significant species like blue camas (*Camassia* spp.) and to the critically endangered Island Marble butterfly (*Euchloe ausonides insularis*) which was long thought to be extinct. The NCCN IPMT worked alongside SAJH staff and an Earth Corps youth crew to manually remove Canada thistle (*Cirsium arvense*), bull thistle (*C. vulgare*), and spurge laurel (*Daphne laureola*) prior to seeding native plant species over 80 acres among the hills and fields at historic American and English Camps effectively restoring both the cultural and natural landscapes.



IPMT Successes: Cheatgrass (*Bromus tectorum*) survey and treatments at Terminal Geyser in Lassen Volcanic National Park, California IPMT. NPS Photo.

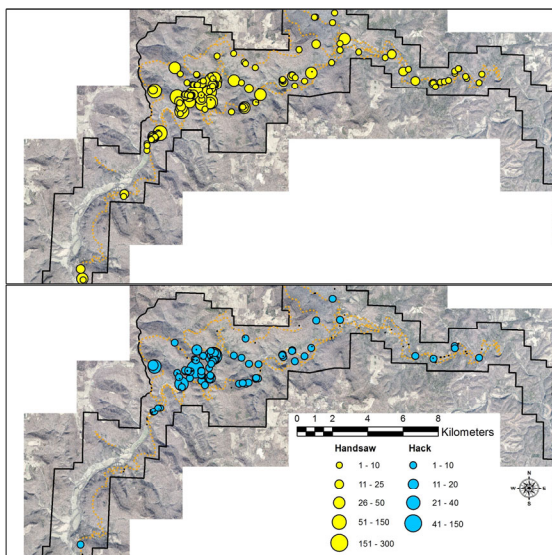
IPMT Successes

Controlling invasive plant species poses significant challenges to land managers. However, the IPMTs continue to make progress protecting NPS natural and cultural resources and have garnered significant successes in their efforts to manage invasive plants.

Beginning in 2011, the [Heartland \(HTLN\) IPMT](#) focused on tree-of-heaven (*Ailanthus altissima*) within the Buffalo National River. More than nine years of documented, repeated treatment in 39 project areas show that sustained herbicide controls are highly effective in managing this species, including local eradication in some cases. The HTLN IPMT evaluated the potential to scale up these successful efforts. NPS staff and partners from Conservation Corps Iowa and Watershed Conservation Corps surveyed 116 miles of trails in the park including a section that traverses Ponca wilderness areas. Results suggest that tree-of-heaven is concentrated in the Ponca Wilderness. Based on these data, and results from previous successes, the HTLN IPMT will continue to design long-term projects aimed at eradicating tree-of-heaven from additional sites in the park.

Hydrothermal areas are rare and often botanically unique. In Lassen Volcanic National Park, cheatgrass (*Bromus tectorum*) infested two hydrothermal areas through disturbance from heavy visitation. The park must manage cheatgrass in these sites because it degrades habitat for the endangered California geyser panicum (*Panicum acuminatum* var. *thermale*). The [California \(CA\) IPMT](#) is making significant progress at these important sites. Although mitigation work has proven to be challenging in two remote wilderness sites, progress in managing cheatgrass is evident. When treatments began six years ago, crews hiked in 50 gallons of water for herbicide applications while in FY 2019, the same sites were maintained with just 1.5 gallons of herbicide and water solution for spot-treatment paired with some hand pulling near individual geyser panicum plants.

Although the common dandelion (*Taraxacum officinale*) is widespread throughout the lower 48 states, it is a relatively new invader to Alaska and a high priority species. The [Alaska \(AK\) IPMT](#) is making substantial progress in controlling this species. Since treatments began in 2011, the AK IPMT reduced the overall density of this early invader at Fure's Cabin in the remote backcountry of Katmai National Park and Preserve by 80%, the Dinglestadt Glacier infestation by 99%, and the Herman Leirer Roadside infestations by 96%. In Kenai Fjords National Park, the AK IPMT continues to reduce infestation densities at all annually treated sites and has, in fact, eradicated the infestation at one site locally known as the 'Nike Stripe'.



Successes: Tree-of-heaven survey results for Buffalo National River. The number of stems requiring cutting (yellow) or hacking (blue) are shown above.

Safety

The IPMTs exemplify safety in the field with no reported lost time injuries or near misses in FY 2019 in spite of the challenging conditions within which they work (i.e., working in remote areas over rugged terrain). However, some injuries occurred that required minor first aid responses and follow up mitigation measures such as tailgate safety debriefings and changes in operations. For example, a [LAKE IPMT](#) member was re-assigned after a likely allergic reaction to a native species, salt grass (*Distichlis spicata*), within the original work site. IPMTs also reported insect bites, insect stings, and exposure to heat. To mitigate heat stress, the [GL IPMT](#) required the crew to follow break schedules laid out in their health and safety plan and provided hydrating drinks during the work day.

IPMTs model a culture of safety. Liaisons and crew leads assure that crew members are trained in all aspects of safety within their operations. Training includes truck and trailer operation, NPS Chainsaw Safety Maintenance and Operations (CSMO), Operational Leadership, herbicide application, hazard communication, and utility and all terrain vehicle operation. Before deploying, IPMTs conduct pre-deployment briefs, follow pre-deployment checklists, develop site safety and operational plans, review Job Hazard Analyses for each task, and develop General Assessments of Risk for each project.

IPMTs provide training and safety support to parks. As in past years, the [Southeast \(SE\) IPMT](#) provided training sessions in CSMO, herbicide application, and utility terrain vehicle operator's certification to park staff. The SE IPMT also assisted three parks with environmental audit preparations. The [Northeast \(NE\) IPMT](#) provides park staff with relevant yet hard to find training in herbicide application safety and methodology. The NE IPMT staff held pesticide certification trainings for team members, park staff, volunteers, and other applicators that included basic information (e.g., calculations for proper herbicide mixing, proper spraying techniques) as well as more advanced material.

A standing IPMT Safety Committee continued for the sixth year. This committee, composed of IPMT, park, and regional staff, provides invaluable support to the IPMTs by taking actions and providing recommendations that help to substantially mitigate program safety concerns. The committee that served the program in FY 2019 addressed training needs within the NPS with a focus on providing resources on modes of action for commonly used herbicides and the continued development of a matrix of personal protective equipment requirements for various invasive plant management activities.



Safety: Grand Portage National Monument employee Brandon Seitz trains staff in NPS Chainsaw Safety Maintenance and Operations with the GL IPMT. NPS photo.

IPP Notable Items to Report

Some changes are underway for the IPP and IPMT. The overall program is undergoing a budget scenario planning process to propose solutions to continue to meet NPS invasive plant management needs under a range of budget scenarios. A task force composed of representatives from across the NPS convened in July 2019. This group's mission is to make recommendations on ways to increase efficiencies, incorporate strategically wise practices, and adjust management actions. Notably, two long serving IPMT liaisons, Bobbi Simpson of the CA IPMT and Nancy Dagley of the SE IPMT, retired in FY 2019. They made substantial contributions to the management of invasive plants within the NPS during their tenures.

Summarized Data for 2019

Gross Infested Acres (by species): Subset of Surveyed Acres where an individual target species was found, regardless of infestation level (e.g. an acre with 5% infestation counts the same as an acre with 95% infestation).

Net Infested Acres (by species): Density-adjusted surveyed area infested by each species. (e.g. a 0.5 acre area with 35% cover will count as 0.175 acres).

Measure	Acres
Treated	4,599.69
Inventoried/Monitored	52,405.59
Gross Infested Area	157,227.54
Net Infested Area	3,551.48
Youth Engagement	
Total Number of Youth Participants and Youth Employees	1,417
Total Hours for Youth Participants and Youth Employees	100,144

More Information

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Alaska IPMT Annual Report: FY 2019



Kenai Fjords National Park Invasive Plant Management Team (IPMT) technician, Sierra Sampson, uses a Trimble GPS unit to collect data during a survey for invasive plants in the Abra Cove area of Aialik Bay on the park's coast. NPS Photo.

Background

The Alaska Invasive Plant Management Team (AK IPMT) provides assistance to 16 units of the National Park Service (NPS) in Alaska. These units cover more than 52 million acres of high quality natural areas and wilderness, including coastal fjords, glacial valleys, tundra, and boreal forests. Most national parks in Alaska protect healthy, intact, native ecosystems; however, invasive plant species are making their way into areas used by people.

The geography of Alaska makes invasive plant management challenging, requiring back country or air travel to reach many parks. Recreational use is widely dispersed with access by boat, backpacking, or aircraft. Remote airstrips, trails, cabins, and concessionaire activities can provide avenues for invasive species introduction into wilderness areas where they are difficult to detect and manage. Therefore, the Alaska IPMT program relies heavily on information, knowledge, and participation from park staff.

This year, the team conducted invasive plant survey and control projects in three park units: Denali National Park and Preserve (DNA), Katmai National Park and Preserve (KATM) and Kenai Fjords National Park (KEFJ). The team included the liaison, data manager, and a biological science technician stationed at KEFJ, four Student Conservation Association (SCA) interns stationed at three parks, and two Youth Conservation Corps interns stationed at KEFJ. Volunteers also helped the Alaska IPMT and parks to successfully complete a range of projects.

Program Highlights

Aquatic Invasive Plant Surveys, Collaboration with Partners

In fiscal year (FY) 2018, botanists from the University of Alaska Anchorage (UAA) collaborated with the NPS to develop a statistically robust protocol to survey lakes for aquatic invasive plants. The UAA developed a similar protocol for river systems in the following year. State and federal partners joined the project in FY 2019 and expanded surveys to sites beyond NPS boundaries, including two *Elodea*-infested rivers within Chugach National Forest and a lake on state land where *Elodea* spp. was discovered. That occurrence was quickly assessed and treated. Partners surveyed three lakes in Gates of the Arctic National Park and Preserve, collected water samples, filtered samples on site, and sent them to the US Geological Survey (USGS) Molecular Laboratory in Anchorage for analysis to determine the presence of *Elodea* spp. using species specific environmental DNA (eDNA) markers. To date, 87 waterbodies within five parks have been surveyed with no evidence of *Elodea* spp. found.

For the seventh year in a row, interns and park staff used an intuitive meander survey for aquatic invasive plants, focusing on *Elodea* spp., within lakes with high risk of infestation. This year, interns and staff surveyed five lakes, one river, and one river outlet in KATM and Addison Lake in KEFJ. The team did not find any aquatic invasive plants during surveys of these waterbodies. In addition to survey, the NPS collected water samples and sent them to the USGS lab for analysis.



The University of Alaska Anchorage (UAA) staff uses a rake to survey for aquatic invasive plants in Gates of the Arctic National Park and Preserve. UAA Photo.



Elodea spp. environmental DNA (eDNA) water samples taken at Addison Lake, Kenai Fjords National Park. NPS Photo.

Program Highlights (cont.)

Treatment Success and Expansion of Right of Way Sites Adjacent to Denali National Park and Preserve (DENA)

Fiscal year 2019 marked the fourth season of control work conducted in Department of Transportation (DOT) Rights of Way sites adjacent to DENA. Target plants include bird vetch (*Vicia cracca*) and white sweet-clover (*Melilotus albus*). As a result of annual and same-season retreatments, the NPS has eradicated, or nearly so, eleven bird vetch infestations and six white sweet-clover infestations. These were isolated infestations on roadsides in close proximity to the park entrance. Treatments expanded this year to infestations on roadsides farther from the park entrance. The NPS treated four new white sweet-clover sites this year, moving the leading edge of infestation farther away from the park.

The benefits far outweigh the difficulties of planning and implementing treatment in these areas. Treatments conducted on easily accessible front country roadsides resulted in early detection, rapid response, and same-season retreatments. The success of this project provides an example for other parks. Potential future work along DOT sites in other parks includes Klondike Highway Canada thistle (*Cirsium arvense*) infestations adjacent to Klondike Gold Rush National Historical Park and Herman Leirer Road oxeye daisy (*Leucanthemum vulgare*) infestations adjacent to KEFJ.

Summary of Accomplishments

In FY 2019, NPS staff, interns, volunteers, and youth crews surveyed nearly 300 acres and treated 6.51 acres in three parks. 181 volunteers removed nearly 1,200 pounds of invasive plants during three weed-pull events. KATM's crew hosted an invasive plants education booth at the park's annual 'Fishtival'. In DENA, the AK IPMT support-ed revegetation or reseeding at developed areas and roadside restoration sites over 1.15 acres, and collected nearly 20 pounds of native seed for use in future restoration projects.

Since treatments began in 2011, the AK IPM reduced the overall density of common dandelion (*Taraxacum officinale*) at Fure's Cabin in the remote backcountry of KATM by 80%. In KEFJ, infestation densities of common dandelion continue to decline at all annually treated sites. Through annual efforts, the team reduced the Dingles-tadt Glacier infestation by 99% and the Herman Leirer Roadside infestations by 96% and eradicated the 'Nike Stripe' infestation.

Summarized Data for 2019

Measure	Acres
Treated	6.5
Inventoried/Monitored	260
Gross Infested Area	398
Net Infested Area	6.54
Youth Engagement	
Total Number of Youth Participants and Youth Employees	193
Total Hours for Youth Participants and Youth Employees	7280

More Information

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California IPMT Annual Report: FY 2019



Cheatgrass survey and treatments at Terminal Geyser in Lassen Volcanic National Park. NPS Photo.

Background

The California Invasive Plant Management Team (CA IPMT) serves 14 parks within the California Floristic Province. This province is one of 25 global biodiversity hotspots. In the state of California approximately \$82 million is spent annually to protect habitat and other values through outreach, control, and monitoring of invasive plants (Cal-IPC: <http://www.cal-ipc.org/holding-pen/cost/>). The National Park Service also preserves habitat for many of California's unique species including habitat in the steep, rugged and remote terrain found between sea level and 14,500' in elevation.

The CA IPMT model is tailored to help partner parks overcome a variety of challenges by funding projects through a grant funding process that augments local invasive plant management capacity, and by providing technical assistance. This enables partners to leverage local resources and implement priority projects when and where it is most appropriate. This reduces crew-timing complications and minimizes travel and program overhead.

This season's highlights feature two invasive plant management projects in sensitive habitats degraded by the incursion of invasive plants. Working with herbicides to protect California state-listed rare, threatened, or endangered plants requires care, skill and persistence. The projects also illustrate some of the special logistical challenges parks face, and how projects sometimes need to be recalibrated to adjust for unexpected environmental and administrative challenges e.g. wildfires, hiring.

Program Highlights

Expanding the boundary

In 2016 Yosemite National Park completed acquisition of the 400-acre Ackerson meadow complex. This meadow complex includes habitat for several sensitive plant and wildlife species and has been grazed for generations. Drainage ditches made wetter portions of the complex suitable for grazing but the altered hydrology and disturbance also facilitated the establishment and spread of several highly invasive, non-native grasses including cheat grass (*Bromus tectorum*), medusahead (*Taeniatherum caput-medusae*), and velvetgrass (*Holcus lanatus*). Yosemite leveraged IPMT funding with support from the San Francisco Public Utilities Commission to enable a crew to completely inventory and partially treat the meadow complex in fiscal year (FY) 2019. Treatment work with truck-mounted and backpack sprayers was delicate where invasive plants grew intermixed with two rare California endemic monkeyflower species, *Mimulus filicaulis* and *M. pulchellus* (recently reclassified as *Erythranthe filicaulis* and *Diplacus pulchellus* respectively), that are restricted to only a few Sierra Nevada counties. The project focused on the treatment of medusahead, a high priority invasive species that is still infrequent within Yosemite National Park. Crews treated 8.65 acres of medusahead and 5.03 acres of velvetgrass, much more than initial estimates indicated. Due to staffing issues and impacts related to the Ferguson fire crews unfortunately missed the fall treatment window for cheatgrass.



The rare yellow-lip pansy monkeyflower (*Mimulus pulchellus*) foreground left, photo right) loses ground to invasive velvetgrass (*Holcus lanatus*) in Yosemite National Park. NPS Photo.



Cheatgrass (*Bromus tectorum*) invades habitat of the geysers panicum (*Panicum acuminatum* var. *thermale*) (foreground left, right), an endangered California endemic plant at Lassen Volcanic National Park. NPS Photo.

Program Highlights (cont.)

Holding important ground

Hydrothermal areas are rare and often botanically interesting. Disturbance from heavy visitation can lead to the introduction of invasive species in these sensitive sites. In Lassen Volcanic National Park, cheatgrass was introduced to two hydrothermal areas long before it was widespread elsewhere. While cheatgrass is now so widespread it can no longer be managed in many areas, this is not an option at Lassen where it is degrading habitat for the endangered California geyser panicum (*Panicum acuminatum* var. *thermale*). Mitigation work, which began more than a decade ago, is ongoing but it has proven to be challenging in two remote Wilderness sites. Here, hydrothermally warmed at 6000' elevation, cheatgrass germinates in the winter and begins flowering in late March when roads are not yet possible. When treatments began, crews hiked in 50 gallons of water and stored it onsite because local stream water is too acidic to use. In FY 2019, six years later, the same sites were maintained with just 1.5 gallons of herbicide and water solution for spot-treatment and six days of hand pulling, much of it near individual geyser panicum plants.

Summary of Accomplishments

FY 2019 was a challenging year for partner parks with very early-season treatment windows. Delays in hiring from the government shutdown resulted in missed treatments at some of the California partner parks. Late in the season, once again, impacts from wildfires (e.g., area closures and evacuations) resulted in missed treatment windows at other partner parks. CA IPMT will continue to navigate this delicate balance in the future.

In FY 2019, the CA IPMT surveyed 7,675 acres for invasive plants and treated 105 acres. As a measure of the wide reach of the CA IPMT program, more than 40 staff and additional volunteers, and Student Conservation Association and other interns collected inventory data and conducted treatments.

The IPMT liaison Bobbi Simpson developed and strengthened partnerships among network parks, among programs and agencies internally and externally, and celebrated her retirement after more than 15 years of steadfast leadership.

Summarized Data for 2019

Measure	Acres
Treated	104.774
Inventoried/Monitored	7,674.942
Gross Infested Area	14,126.32
Net Infested Area	179.046
Youth Engagement	
Total Number of Youth Participants and Youth Employees	
Total Hours for Youth Participants and Youth Employees	

More Information

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Florida/Caribbean IPMT Annual Report: FY 2019



DeSoto National Memorial Sign. NPS Photo.

Background

Invasive plants have a destructive effect on native plant communities by reducing native plant diversity and altering ecological processes such as fire behavior and ecosystem function. The Florida and Caribbean Invasive Plant Management Team (FLC IPMT) supports 15 National Park Service (NPS) units in Florida and the Caribbean by expanding existing invasive plant control efforts including inventory and monitoring, control, education, restoration, and research. The FLC IPMT contracts crews from four private companies for large eradication projects. The FLC IPMT, park staff, and volunteers implement smaller projects. Large and small projects alike create challenges due to the climate and extent of infestations. There are temperate, tropical, and sub-tropical climate zones within the FLC IPMT's 2.68 million acre range, and invasive plant species infest over 400,000 acres. The species that are targeted for control include Brazilian peppertree (*Schinus terebinthifolius*), Old World climbing fern (*Lygodium microphyllum*), Australian pine (*Casuarina equisetifolia*), Burma reed (*Neyraudia reynaudiana*), and punktree (*Melaleuca quinquenervia*).

A steering committee meets annually to review and approve the FLC IPMT strategic direction and financial plan, rank projects, ensure that the FLC IPMT provides information that is relevant to management, and develop a treatment schedule for the fiscal year. The committee consists of representatives from the Unified Interior Region 2 (NPS Legacy Southeast Region) the US Army Corps of Engineers, and the Florida Fish and Wildlife Conservation Commission (FWCC). These meetings are held at a different park unit each year.

Program Highlights

DeSoto National Memorial (DESO) Team Treatments and Species Survey

DESO is one of the smallest parks served by the FLC IPMT with just 30 acres of coastal and maritime hammock. Because DESO was the FLC IPMT's only park that did not have a floristic inventory, the IPMT enlisted the South Florida and Caribbean Inventory and Monitoring Network to complete a plant inventory of the park. Surveys were made on three separate occasions to develop a list of all plant species in the park, resulting in the identification of 181 unique species.

During the inventory, the FLC IPMT treated invasive plants as they were encountered. Predominant invasive species include Brazilian peppertree, seaside mahoe (*Thespesia populnea*), carrotwood (*Cupaniopsis anacardioides*), and beach naupaka (*Scaevola taccada*). The majority of invasive plant populations at DESO are at a maintenance levels, requiring only periodic inspections and treatments to keep this park predominantly free of invasive plants. A population of arrowhead vine (*Syngonium podophyllum*) located around the administrative building is unmanaged but slated for treatment by the FLC IPMT and volunteers in the near future. While surveying, the IPMT shared identification techniques and photographs of the most highly invasive plants with park staff. With this new information, park staff updated the list of invasive plants that they share with the public.



Treating Singapore daisy (*Sphagneticola trilobata*) at DeSoto National Memorial. NPS Photo.



Shade structure at Salt River Bay National Historical Park and Ecological Preserve. NPS Photo.

Program Highlights (cont.)

Salt River Bay National Historical Park and Ecological Preserve (SARI) Restoration

SARI, acquired by the NPS in 1992, was severely impacted by invasive plants due to agricultural and residential development. Invasive plant control and restoration planting began in 2012. In 2016, the IPMT funded a proposal for a three-phase restoration project that was concluded in fiscal year 2019. Contractors systematically treated 12 invasive plant species including lead tree (*Leucaena leucocephala*), guinea grass (*Megathyrsus maximus*), yellow elder (*Tecoma stans*) and India almond (*Terminalia catappa*), the most invasive species in the park. By employing the most effective method to control guinea grass, repeatedly mowing and spraying the new growth, the guinea grass biomass was dramatically reduced.

In conjunction with these treatments, contractors planted native plant species that were collected and grown on St. Croix. A timed irrigation system was built to bring water to this remote area and experimental shade structures were built to reduce the exposure of newly planted trees to excessive sun. This project has exceeded expectations for overall restoration. SARI received additional FLC IPMT funding in 2019 to continue this important restoration work.

Summary of Accomplishments

In December 2018, the FLC IPMT held its ranking meeting and all five proposals presented by park representatives were funded. Additional projects in Big Cypress National Preserve, Canaveral National Seashore, and Everglades National Park were funded by contributions from the FWCC.

The FLC IPMT collaborated with Everglades National Park and Southeast Coast IPMT staff to remove the final two seaside mahoe individuals in the parade grounds of Dry Tortugas National Park. These trees were massive in size and it took a seven-person crew three days to cut and chip them.

Additionally, the FLC IPMT data manager helped the Southeast Coast IPMT set up data collection using ArcCollector on a tablet. This will streamline the FLC IPMT's data collection and reporting process.

Summarized Data for 2019

Measure	Acres
Treated	827.72
Inventoried/Monitored	16,156.08
Gross Infested Area	57,614.05
Net Infested Area	1,327.28
Youth Engagement	
Total Number of Youth Participants and Youth Employees	4
Total Hours for Youth Participants and Youth Employees	2,174

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Great Lakes IPMT Annual Report: FY 2019



Great Lakes Invasive Plant Management Team targeting garlic mustard (*Alliaria petiolata*) at the Saint Croix National Scenic Riverway. NPS Photo.

Background

The Great Lakes Invasive Plant Management Team (GL IPMT) provides support to twelve national park units across four states in the western Great Lakes Region. From the dunes along the shores of Lake Michigan, west to the scenic riverways of Wisconsin and Minnesota, and north to the boreal forests along the Canadian border, this is an area with diverse aquatic and terrestrial ecosystems. The region contains multiple rare, significant, and globally threatened ecosystems. It is also home to an international biosphere reserve.

Geographical and environmental conditions have mostly limited invasive species to those of cultural origin (ornamental and intentionally planted species). However, visitor use and maintenance activities have also introduced invasive species.

The team balances its activity to meet two vastly different needs: (1) long-term, large-scale control and restoration, and (2) early detection and eradication of nascent populations. To meet those needs, the team provides parks with focused regional expertise and skilled control work. Discipline-specific knowledge and a network of partners allow the team to anticipate threats to individual parks and implement site-specific management strategies. As a shared regional resource, the team either augments existing management efforts or provides parks with management options.

Program Highlights

Great Lakes IPMT Partners with New Park for Invasive Plant Control

The North Country National Scenic Trail (NOCO) is the longest trail in the National Trails System. The National Park Service (NPS) administers NOCO, but depends heavily on support from a network of dedicated volunteers and partners. In 2017 the trail celebrated its first federal land acquisition with an 80 acre parcel located in Augusta, MI. The parcel is in Michigan's critically imperiled prairie/oak savanna ecosystem. The GL IPMT conducted a survey for invasive plants in the spring of 2018. Several acres were found to be well prepared for immediate revegetation, having previously been used for row-crop agriculture. Areas not used for agriculture were degraded by woody non-native invasive plants such as autumn olive (*Elaeagnus umbellata*) and common buckthorn (*Rhamnus cathartica*).

Due to the park's invasive plant management needs, NOCO was officially added as a partner park in March of 2019. The park is an important advocate for the team, and the GL IPMT provides the park with options for invasive plant control and restoration. On-site control work began in August of 2019 with the removal of woody non-native invasive plants. Staff from the Mississippi National River and Recreation Area traveled with the GL IPMT to help remove the woody invasives. The additional hard work and expertise demonstrated the value of cooperation between parks, which is critical to successful invasive plant management in the Great Lakes region.



Mississippi National River and Recreation Area Biological Science Technicians assisting with chipping cut brush at the North Country National Scenic Trail in Augusta, MI. NPS Photo.



GL IPMT planting prairie seeds at Arcola day use area, Saint Croix National Scenic Riverway. NPS Photo.

Program Highlights (cont.)

Large Scale Restoration Success at the Saint Croix National Scenic Riverway

For over a decade the GL IPMT has been treating a variety of high priority invasive plant species at the Saint Croix National Scenic Riverway's Arcola day use area near Stillwater, Minnesota. Arcola is used for hiking, bird watching, and hunting and it is one of the Riverways most heavily visited sites. Proximity to urban areas and heavy use made it susceptible to invasive plant infestation and resulted in acres of garlic mustard (*Alliaria petiolata*), bishop's goutweed (*Aegopodium podagraria*), and common buckthorn. After years of hard work the site has been dramatically transformed. What was once 160 acres of tangled invasive plants is now a mosaic of native prairie and oak savanna. Continued revegetation efforts are underway.

The GL IPMT provided technical expertise to park staff and contractors, and supervised numerous youth crews throughout the Arcola project. The team also completed difficult or technically-complex on-site control work. Early adoption of the NPS's new chainsaw policy qualified the team to further the project by assisting with tree thinning prior to revegetation.

Summary of Accomplishments

In fiscal year 2019, the GL IPMT's network of parks grew with the addition of the North Country National Scenic Trail. The park was officially added in March and the team began on-site control work in August. In addition to work at NOCO, 16 other high priority projects were completed in 10 of the 12 partner parks. The team continued to partner with the Conservation Corps of Minnesota and Iowa through the individual placement program and field spike crews. With their help, the team was able to complete projects that would not otherwise have been completed. The individual placement program, that expands the capacity and reach of the partner agency through the work of the Individual Placement Corps member, has been so successful that the National Park Foundation provided a grant to continue the partnership. In August, the team welcomed former Southeast IPMT and GL IPMT alumni Stephen Mull as the team's new field crew leader.

Summarized Data for 2019

Measure	Acres
Treated	76.291
Inventoried/Monitored	48.262
Gross Infested Area	749.335
Net Infested Area	79.126
Youth Engagement	
Total Number of Youth Participants and Youth Employees	27
Total Hours for Youth Participants and Youth Employees	2,174

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Gulf Coast IPMT Annual Report: FY 2019



Texas pricklypoppy (*Argemone aurantiaca*) field at Rancho de las Cabras unit of San Antonio Missions National Historical Park in Texas. NPS photos.

Background

The Gulf Coast Invasive Plant Management Team (GC IPMT) supports eight National Park Service (NPS) units within five states: Alabama, Louisiana, Mississippi, Tennessee, and Texas. These parks are in two different NPS regions (Interior Unified Regions 2 and 6) and are spread along 760 miles of the Gulf Coast.

The GC IPMT support invasive plant control work across all partner parks through contracts. Additionally, the team relies on partnerships to identify and geospatially map priority infestations within its partner parks. The GC IPMT liaison oversees contracts and cooperative task agreements, and the Florida and Caribbean IPMT data manager provides data management support to the team.

The GC IPMT's target invasive plant species occur in both terrestrial and aquatic habitats. High priority invasive plant species in many terrestrial sites within partner parks include Chinese tallow (*Triadica sebifera*) and Brazilian peppertree (*Schinus terebinthifolius*). In terrestrial habitats within NPS units along the Gulf Coast, Johnsongrass (*Sorghum halepense*), buffelgrass (*Cenchrus ciliaris*), and kudzu (*Pueraria montana*) pose a significant threat to park resources. Many aquatic sites are already invaded by common water hyacinth (*Eichhornia crassipes*) while crested floatingheart (*Nymphoides cristata*) has become an emerging aquatic threat to native plant and animal communities and to recreation at Big Thicket National Preserve.

Program Highlights

Non-native Invasive Plant Treatments for Five Gulf Coast Parks

To increase operational efficiency, only a portion of the NPS park units served by the GC IPMT receive invasive plant treatments in a given year. This reduces time spent travelling between parks and allows for more treatment time at the parks served. During FY 2019, the GC IPMT funded surveys and treatments across 276 acres at five partner parks. In addition to treating large established populations of invasive plant species, the IPMT conducted searches for the early detection species trifoliate orange (*Poncirus trifoliata*) at Vicksburg National Military Park. IPMT staff did not detect any trifoliate orange within the areas surveyed.

Multi-year Habitat Restoration Partnership

The area adjacent to the resaca (oxbow lake, former channel of the Rio Grande) at the Resaca de la Palma National Battlefield unit of Palo Alto Battlefield National Historical Park (PAAL) is severely infested by Brazilian peppertree. While work to control the species and restore native vegetation to the area has been successful, this work is part of an on-going, multi-year cooperative effort.

American Conservation Experience assisted PAAL with initial Brazilian peppertree treatments in FY 2016. The GC IPMT supported re-treatments and new treatments of the area in FY 2017.



Initial Brazilian peppertree treatments, as part of an ongoing native revegetation at the Resaca de la Palma National Battlefield unit of Palo Alto Battlefield National Historical Park in Texas. NPS photos.



Ongoing native revegetation at the Resaca de la Palma National Battlefield unit of Palo Alto Battlefield National Historical Park in Texas. NPS photos.

Program Highlights (cont.)

Multi-year Habitat Restoration Partnership (cont.)

Through a partnership for restoration, the Nature Conservancy supplied the park with twelve species of native plants. Volunteers assisted with two different planting events during November FY 2016 and November FY 2018, planting tree and shrub species that included Texas sabal palm (*Sabal mexicana*), Brasil (*Condalia hookeri*), tepejuae (*Leucaena pulverulenta*), anacua (*Ehretia anacua*), and snake-eyes (*Phaulothamnus spinescens*). A local news source covered the results of this successful project.

In addition to the restoration plantings, native plants have begun to naturally emerge within the previously infested area. One native plant species, retama (*Parkinsonia aculeate*), has been outcompeting other native species. During FY 2019, the GC IPMT treated and re-treated Brazilian peppertree populations and thinned retama to reduce competition with the other native species.

The ultimate goal of this project is full control of Brazilian peppertree and complete native revegetation within the boundaries of Resaca de la Palma Battlefield.

Summary of Accomplishments

The GC IPMT continues to increase efficiency by visiting partner parks only every other year. Parks served by the team in FY 2019 include Big Thicket National Preserve, Padre Island National Seashore, Palo Alto Battlefield National Historical Park, and San Antonio Missions National Historical Park in Texas and Vicksburg National Military Park in Mississippi. During FY 2019, the team's liaison oversaw 2,085 labor hours of surveys and treatments, covering more than 275 acres, at five partner parks. The GC IPMT is responsible for treatment of over 12 target species including trees, shrubs, and grasses.

Summarized Data for 2019

Measure	Acres
Treated	79.13
Inventoried/Monitored	0
Gross Infested Area	431.589
Net Infested Area	77.854
Youth Engagement	
Total Number of Youth Participants and Youth Employees	*
Total Hours for Youth Participants and Youth Employees	*

* Volunteer youth engagement in IPMT projects is reported by parks.

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Heartland Network IPMT Annual Report: FY 2019



Conservation Corps Iowa members training for work with National Park Service. National Park Service staff cooperate with Conservation Corps staff as part of this annual training. Photo by Adam Gomez.

Background

The Heartland Network Invasive Plant Management Team (IPMT) serves 16 national park units in eight states of the Midwest and mid-South. The parks include an array of plant communities ranging from unplowed and restored tallgrass prairie in the Flint Hills of Kansas and Sioux quartzite outcrops in Minnesota; eastern deciduous forests from northeastern Iowa and northeastern Ohio to southwest Missouri and southern Indiana; Midwestern riparian woodlands; mixed shortleaf pine-oak-hickory forests in the Ozark and Ouachita Mountains; and a variety of wetlands from southeastern cypress-tupelo swamps to emergent wetlands along tributaries to Lake Erie. The majority of these parks commemorate important historical events, locations, people, and cultural practices, which requires integrating invasive plant management into cultural and natural landscapes.

The Heartland Network IPMT exists solely to serve park managers and the resources that they are charged to protect. The IPMT follows the National Park Service's (NPS) constructive model of identifying "prudent and feasible" invasive plant control projects. The IPMT works to ensure the connection of invasive plant management and restoration projects with larger park vegetation management goals; to assess the long-term costs of projects; and to rely on evidence-based scientific data to support projects.

Program Highlights

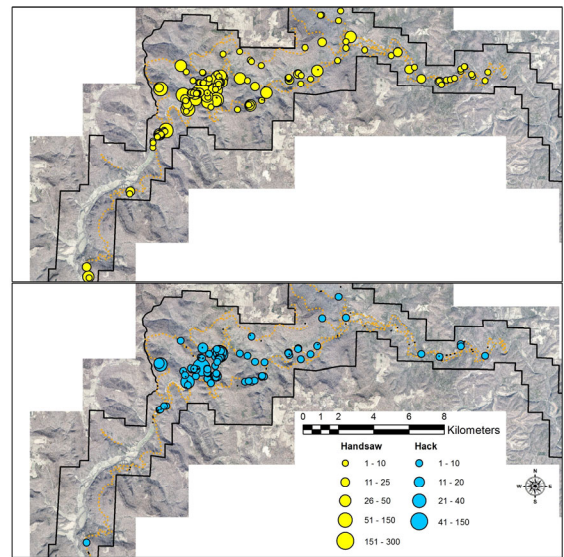
Making progress against Japanese stiltgrass

Japanese stiltgrass (*Microstegium vimineum*) is able to rapidly invade natural areas, including national park units. NPS data supporting this premise are discouraging. The frequency of Japanese stiltgrass occurrence increased from 0% to 10% at Cuyahoga Valley National Park between 2007 and 2016. At Pea Ridge National Military Park, the frequency increased from 14% to 57% between 2006 and 2018. The speed and extent of Japanese stiltgrass movement will likely preclude treatment at scale within many national parks.

Strategic control of Japanese stiltgrass is, however, likely in well-selected project areas. At Arkansas Post National Memorial, the plant's preferred habitat along stream corridors may naturally restrict spread. Efforts by the Heartland IPMT to identify and treat this species within these habitats using a foliar herbicide are encouraging. The team has treated Japanese stiltgrass continuously since 2013. Staff initially observed an increase in frequency from 3% in 2006 and 2011 to 12% in 2015. In 2019, however, frequency decreased to 7%. Over this period, the time required to implement this treatment was approximately nine person-days. While the plant is unfortunately extending beyond stream edges into drier forest, early and sustained treatment of this plant appears to have checked its advance. As an annual plant with a viable seedbank, the Heartland IPMT will continue to apply treatments annually to sustain the progress that the team has made.



Conservation Corps Iowa team member surveying for tree-of-heaven in Buffalo National River. Photo by Levi Mendoza.



Tree-of-heaven survey results for Buffalo National River, Boxley Valley to Pruitt Landing section. The number of stems requiring cutting (yellow) or hacking (blue) are shown above.

Program Highlights (cont.)

Tree-of-Heaven Survey in the Buffalo National River

Beginning in 2011, the Heartland IPMT began to focus on tree-of-heaven (*Ailanthus altissima*) within the Buffalo National River. Over nine years of documented, repeated treatment in 39 project areas (181.2 acres) shows that sustained herbicide controls are highly effective in reducing tree-of-heaven populations, with some examples of local eradication. While control measures largely consisted of whole tree felling, the Heartland IPMT also verified the effectiveness of hack-and-squirt methods for large diameter stems.

With this background work in mind, the IPMT wanted to evaluate the potential to scale these efforts. In 2019, NPS staff and partners from Conservation Corps Iowa and Watershed Conservation Corps surveyed almost all trails, 116 miles in total, from the Boxley Trailhead to Pruitt Landing, a section that includes Ponca wilderness areas. The team identified trees that could be sawed by hand and stump treated as well as larger stems that require the hack-and-squirt method (see figure).

Survey results suggest that tree-of-heaven is concentrated in the Ponca Wilderness with only light infestation in Boxley Valley. Based on these data, and results from previous efforts, the IPMT will continue to design long-term projects aimed at eradicating tree-of-heaven from additional sites in the park.

Summary of Accomplishments

The Heartland IPMT's portfolio of projects currently consists of 28 projects spanning over 2,883 acres. In fiscal year 2019, the team continued work on 19 of those projects that covered 979 acres. In addition to the survey at Buffalo National River, IPMT staff fully surveyed Arkansas Post National Memorial, Hopewell Culture National Historical Park, and Lincoln Boyhood National Memorial for invasive plants.

The IPMT continued to strengthen its on-going relationship with Conservation Corps Iowa. The Heartland IPMT liaison was recognized as a 21st Conservation Service Corps Champion based on long-term involvement with young adult corps. To that end, the IPMT also continued to support the Watershed Conservation Corps, a conservation corps start-up focused on the Ozarks region of Missouri.

Summarized Data for 2019

Measure	Acres
Treated	14.296
Inventoried/Monitored	0
Gross Infested Area	17,350.46
Net Infested Area	6.124
Youth Engagement	
Total Number of Youth Participants and Youth Employees	1
Total Hours for Youth Participants and Youth Employees	10,580

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Lake Mead IPMT Annual Report: FY 2019



Lake Mead IPMT member Andrew Barnes cuts invading tamarisk at a Multiple Species Conservation Program restoration site in Arizona at the Cibola National Wildlife Refuge. NPS Photo.

Background

The Lake Mead Invasive Plant Management Team (LAKE IPMT), established in 1996, was the model for the National Park Service (NPS) IPMT program. The team has conducted on-the-ground projects with field crews in 37 NPS units, 15 US Fish and Wildlife Service refuges, eight Bureau of Land Management (BLM) districts, four National Forests, two Bureau of Indian Affairs units, Bureau of Reclamation (BOR), Marine Corps Yuma Air Station, Southern Nevada Water Authority, Clark County Nevada and other sites managed by state and local entities throughout the Southwest.

The team's primary goals are to **1)** provide expertise in the control of invasive plants in priority areas to preserve, restore, and maintain native plant communities, **2)** professionalize invasive plant management within the NPS and partner organizations by developing staff expertise, and **3)** improve government efficiencies through interagency cooperation to effectively manage invasive plant species on a landscape scale.

Partnerships are integral to the team's success, annually leveraging three additional dollars for each NPS base dollar and providing over one million dollars per year. These funds support a field crew of up to 20 individuals. Partnerships facilitate invasive plant management across agency boundaries and increase the LAKE IPMT's capacity to serve NPS units. The team's geographic location and its many regional partnerships allow for year-round operations and maximize LAKE IPMT's ability to serve a variety of partners and control a diversity of invasive plant species.

Program Highlights

New Partnerships

The LAKE IPMT began a multi-year partnership with the Lower Colorado River Multiple Species Conservation Program (LCR MSCP) and the BOR in 2018. The LCR MSCP is a partnership of Federal and non-Federal stakeholders focused on balancing water resources use and conservation of native species and their habitats in compliance with the Endangered Species Act (ESA). This is a long term program to conserve at least 26 species along the river from Lake Mead to the Southerly International Boundary with Mexico by implementing a habitat conservation plan. The LCR MSCP is creating more than 8,000 acres of quality habitat including cottonwood-willow forests, honey mesquite forests, marsh and backwaters. The team maintains native vegetation at habitat creation sites by controlling tamarisk (*Tamarix* spp.) and other invasive plant species. In 2018-2019 work focused on and near the Cibola National Wildlife Refuge. As part of this project, the LAKE IPMT controlled 385 acres of invasive plants in fiscal year (FY) 2019 across five sites, treating mostly tamarisk and fountain grass (*Cenchrus setaceus*).

A new partnership agreement was established with the BLM Elko District in Nevada to treat multiple noxious weed species in various locations. This agreement aids the BLM in its integrated weed management objectives, enhances native plant populations within project areas, supports wetland and upland restoration, and strengthens relationships between various federal, state, and private entities.



LAKE IPMT members conduct knapweed control in Coconino National Forest. NPS Photo.



Nick Prasser, LAKE IPMT, controlling buffelgrass at Organ Pipe Cactus National Monument. NPS Photo.

Program Highlights (cont.)

New Partnerships (cont.)

The Coconino National Forest in Arizona substantially increased funding to the team’s existing agreement to cover 2,000 additional project acres within the Four Forest Restoration Initiative project area. Within this area, the LAKE IPMT treats scattered and isolated populations of various noxious weed species.

Buffelgrass Early Detection and Rapid Response

The IPMT has had multiple successes in controlling buffelgrass (*Cenchrus ciliaris*; synonym *Pennisetum ciliare*). The team eradicated the first 13 buffelgrass clumps observed in the Eldorado Valley of Nevada along the border of the Boulder City Conservation Easement, an area set aside for the preservation of the threatened desert tortoise. Plants had established during a recent powerline right of way project. Successful early detection and rapid response was the result of a partnership between the Clark County Desert Conservation Program, the LAKE IPMT, and the BLM.

Another successful buffelgrass control effort involved partnering to control some large, remote populations within Organ Pipe Cactus National Monument. The park funded the LAKE IPMT to get these isolated populations under control in order to prevent them from spreading throughout the park. In 2019 the team controlled three distinct populations that covered 35 acres.

The third successful buffelgrass control effort focused on a large and spreading population in the Gila Mountains within the Yuma Marine Corp Air Station, Arizona. From 2015 to 2019 several miles of buffelgrass populations scattered throughout a remote canyon were successfully controlled, preventing the species from advancing throughout the military installation.

Summary of Accomplishments

In FY 2019, LAKE IPMT conducted projects in 10 NPS units and in units managed by 11 agency partners, including BLM, BOR, US Forest Service, and US Marine Corps, and accomplished work through three partnership agreements with Clark County, NV.

Summarized Data for 2019

Measure	Acres
Treated	494.68
Inventoried/Monitored	2,646.2
Gross Infested Area	7,407.04
Net Infested Area	5.19
Youth Engagement	
Total Number of Youth Participants and Youth Employees	21
Total Hours for Youth Participants and Youth Employees	28,240

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Mid-Atlantic IPMT Annual Report: FY 2019



Sand dunes at Assateague Island National Seashore. NPS Photo.

Background

The Mid-Atlantic Invasive Plant Management Team (MA IPMT), stationed at Shenandoah National Park (SHEN), began in 1999 as the Virginia Invasive Vegetation Management Team (VIVMT). The VIVMT supported nine National Park Service (NPS) units located in Virginia. In 2003, to meet a growing need for invasive plant management at the national level, the MA IPMT was established along with six other teams. The team now provides invasive plant management support to 21 NPS units in Maryland, Pennsylvania, Virginia, and West Virginia, and to partner lands adjacent to some parks. The parks served by the team range in size from 47 acres (Fort McHenry National Monument and Historic Site) to over 193,000 acres (SHEN), and include wilderness, natural areas, and suburban and urban environments. They are located from the Appalachian Mountains, through the Piedmont, to the Coastal Plain. The majority have relatively small acreages with mandates to preserve and interpret culturally significant sites. Yet these small sites provide unique opportunities to enhance visitor experiences through natural resource preservation. The MA IPMT uses integrated pest management strategies and best management practices to provide the most effective and efficient, but least toxic, solutions to control non-native invasive plants and protect the staff, visitors, and valuable resources within the parks. The team works with each park to help achieve their long-term natural resource management goals, and to act quickly when early detection and rapid response is required. In addition to yearly visits for control work, the team advises parks as needed throughout the year.

Program Highlights

Rare Plant Preservation and Habitat Improvement

The New River is among the oldest rivers on the continent, and the park, New River National River (NERI), which encompasses over 70,000 acres of land along the river for which it is named, is rich in cultural and natural history, and offers an abundance of scenic and recreational opportunities. The park is globally significant as a large, unfragmented, mature and maturing forest with rich native biodiversity, including endangered mammals, rare plants, birds, amphibians, and rare plant communities.

In an effort to preserve one of the many unique plant communities at NERI, MA IPMT and NERI staff spent several days carefully removing encroaching invasive plants from a site known to have a very high concentration of rare plants. Twenty-four state listed rare plant species have been identified at this site. The abundance is partially attributed to disturbance and deposition by frequent flooding that occurred before the Bluestone Dam was constructed in 1948. A lack of regular flooding following dam construction allowed the forest to mature and change into one with a more closed canopy than would historically occur. The result is less open space and light for rare plants adapted to full sun or partial shade. Invasive shrub encroachment exacerbates the problem by shading and outcompeting the rare herbaceous plants.



New River Gorge National River (NERI) campground presents multiple challenges for NERI management trying to preserve rare plant species. NPS Photo.



Meadow treatment at Valley Forge National Historical Park. NPS Photo.

Program Highlights (cont.)

Rare Plant Preservation and Habitat Improvement (cont.)

The highest concentration of rare plants is located within and around a primitive campground. In addition to stress from invasive plants and forest encroachment, visitor use and maintenance activities are impacting the open space within the campground and the longevity and survival of the plant species in and near the site.

Currently only a handful of the non native plants are threatening the rare plant populations. The main species targeted for treatment were Chinese lespedeza (*Lespedeza cuneata*), autumn olive (*Elaeagnus umbellata*), Japanese knotweed (*Fallopia japonica*), and tree-of-heaven (*Ailanthus altissima*). Special care was taken when treating invasive species in the midst of rare plant populations. This included covering rare species to protect them from spray drift when lespedeza was treated, and the use of cut and stem methods for very targeted treatment of invasive plants. The NERI fire and natural resource staff helped MA IPMT personnel remove autumn olive and tree-of-heaven from within and around the perimeter of the rare plant habitat.

Summary of Accomplishments

In 2019, the MA IPMT provided direct field support to 19 NPS units and four non-park partners. Work included invasive plant control, plant surveys, invasive plant monitoring, and restoration planning and implementation. The MA IPMT and Cedar Creek and Belle Grove National Historical Park near Middletown, VA began a cooperative project to convert hay fields dominated by invasive plants into native meadows. Two treatments were conducted to reduce invasive species cover, and an initial planting is planned for early fall, 2019. The team also provided training in pesticide safety and application techniques to park staff and interns. In support of Assateague Island National Seashore the MA IPMT provided funding for a Student Conservation Association crew that spent three months treating multiple invasive species throughout the park. By the end of the season they were able to successfully treat forty acres of common reed (*Phragmites australis*).

Summarized Data for 2019

Measure	Acres
Treated	266.611
Inventoried/Monitored	1,677.718
Gross Infested Area	1,367.808
Net Infested Area	265.921
Youth Engagement	
Total Number of Youth Participants and Youth Employees	11
Total Hours for Youth Participants and Youth Employees	2,215

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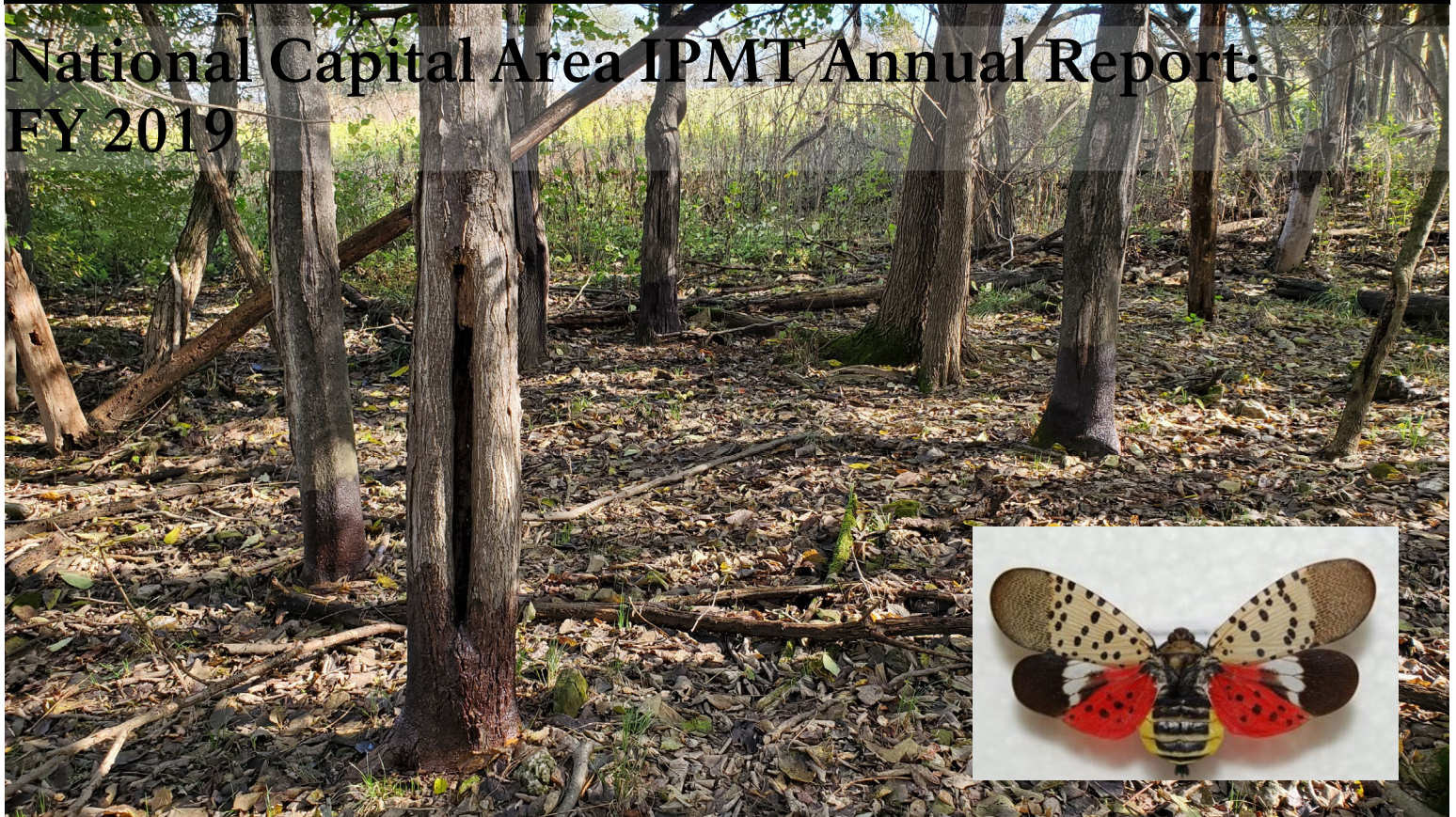
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National Capital Area IPMT Annual Report: FY 2019



Outer Image: Basal bark treatment of tree of heaven (*Ailanthus altissima*). NPS Photo. Inner Image: Spotted lanternfly (*Lycorma delicatula*). Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org. Licensed under a [Creative Commons Attribution 3.0 License](https://creativecommons.org/licenses/by/3.0/).

Background

The National Capital Area Invasive Plant Management Team (NCA IPMT) supports units of the National Park Service (NPS) from the center of the District of Columbia to the foothills of the Appalachian Mountains. In addition to National Capital Area (NCA) parks, the NCA IPMT assists non-NCA parks and non-NPS partners: the Appalachian National Scenic Trail, the US Fish and Wildlife Service's National Conservation Training Center (NCTC), and the Virginia Department of Conservation and Recreation's Crow's Nest Natural Area Preserve.

The NCA IPMT:

- 1) Preserves habitats using early detection/rapid response,
- 2) Controls invasive plants impacting ecologically sensitive areas,
- 3) Restores native habitats by removing invasive plants and reestablishing native plants and natural processes,
- 4) Prevents the spread of invasive species through training and careful stewardship of tools and equipment, and
- 5) Works closely with partner parks and agencies to inventory and monitor invasive plants, train staff and volunteers, implement treatment and restoration efforts, and share resources and information.

The NCA IPMT serves 14 parks scattered throughout Virginia, Maryland, West Virginia and the District of Columbia.

Program Highlights

Preventing the Spread of the Spotted Lanternfly

The spotted lanternfly (*Lycorma delicatula*) is an invasive insect posing a threat to native plant species and agricultural crops. It reduces plant vigor by sucking sap from stems and trunks. Native to China and Southeastern Asia, it was introduced to eastern PA and is dispersing quickly with sightings as far south as Frederick County, VA.

The NCA IPMT works with its partner parks and local partners to manage tree of heaven (*Ailanthus altissima*) to prevent or slow the spread of the spotted lanternfly. Tree of heaven, also native to China and a widespread invasive species throughout the United States, is the spotted lanternfly's host tree.

In fiscal year (FY) 2019, the team conducted basal bark treatments of tree of heaven over more than 125 acres of forest in partner parks and with partners at Crow's Nest (VA) and the NCTC (WV). Treatments are key to preventing the spotted lanternfly from expanding its range. When this species invades, individuals spawn quickly, threatening a range of plants species and becoming difficult to eradicate.

In addition to threatening natural resources, tree of heaven also endangers parks' cultural resources. It grows through foundations, structures, and archeological sites causing irreversible damage. By treating these trees, the team is stopping the spread of a dangerous invasive insect and protecting cultural and natural resources entrusted to NPS.



Hemlock trees being treated against the hemlock woolly adelgid (*Adelges tsugae*) in Catocin Mountain Park. NPS Photo.



NCA employees put their CSMO training to work, using saws to remove autumn olive (*Elaeagnus umbellata*) in Catocin Mountain Park. NPS Photo.

Program Highlights (cont.)

Hemlock Woolly Adelgid Treatment

Once a towering canopy tree, eastern hemlock trees (*Tsuga canadensis*) are threatened by an introduced invader—the hemlock woolly adelgid (*Adelges tsugae*). The adelgid sucks sap from shoots and branches, killing needles and sending hemlock trees into a slow decline. This also makes hemlocks more sensitive to outside stressors.

Treatment methods include soil, foliar, and stem injection; however injections of the systemic insecticide (imicloprid) is the preferred method in Catocin as most of the treated trees occur along stream-banks and in floodplain forests. The insects that feed on trees injected with the imicloprid consume the pesticide and die.

NCA IPMT members collaborated with the Maryland Department of Agriculture to learn the stem injection method. While studies have shown imidacloprid to last up to seven years in hemlock trees, the team had the opportunity to speak with an employee of the US Forest Service who had treated some of the same trees fifteen years ago. Hopes are high that, some fifteen years from the treatment, the same trees will be still standing and ushering in a new hemlock renaissance in their understory.

Summary of Accomplishments

In FY 2019, the NCA IPMT fostered a new connection with Conservation Legacy's Appalachian Conservation Corps (ACC). Through ACC, the team hired six interns during the season. This effort helped ease early-season hiring difficulties and provided professional development opportunities for future stewards of public lands.

Working with partner parks and non-NPS partners, the team treated nearly 888 acres from February to November. The team undertook a fun new project this season —removing autumn olive (*Elaeagnus umbellata*) and Japanese barberry (*Berberis thunbergii*) from an old campground in Catocin Mountain Park. Over the course of a week-long work trip and two separate trips earlier in the season the team was able to make a headway on reclaiming the area.

Summarized Data for 2019

Measure	Acres
Treated	887.64
Inventoried/Monitored	60.39
Gross Infested Area	2,240.41
Net Infested Area	212.54
Youth Engagement	
Total Number of Youth Participants and Youth Employees	29
Total Hours for Youth Participants and Youth Employees	10,690

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North Coast-Cascades Network IPMT Annual Report: FY 2019



Technician Dave Riddell squares up against a formidable stand of Japanese knotweed (*Fallopia japonica*). Photo credit Collin McAvinchey, NPS.

Background

From the towering peaks of North Cascades National Park Complex, west to the rainforest valleys of Olympic National Park, and south to the ecologically rich coastlines of Lewis & Clark National Historical Park, the North Coast-Cascades Network Invasive Plant Management Team (NCCN IPMT) provides invasive plant mitigation for network partners. The NCCN IPMT also provides invasive plant control services to Ebey's Landing National Historic Reserve, Mount Rainier National Park, and San Juan Islands National Historical Park (SAJH).

The NCCN IPMT uses an ecosystem-based approach for invasive plant control. Team members have helped design riparian restoration projects, collected native conifer seeds for propagation, and managed a range of invasive plant species in a variety of environments. The NCCN IPMT specializes in large-scale, comprehensive invasive plant control and is particularly effective at treating populations in hard-to-reach areas including the backcountry of its partner parks.

The NCCN IPMT, where relevant, uses new technologies to meet conservation goals, conducts research, and works closely with industry specialists to ensure that its methods and tools are current, effective, and as environmentally friendly as possible. For example, the team is integrating winter applications of carefully calibrated pre-emergent herbicides to combat some invasive species that germinate over long periods. These species previously required multiple treatments over the course of a season.

Program Highlights

Japanese Knotweed in the Stehekin Valley

The NCCN IPMT has a history of partnering with natural resource management staff at Lake Chelan National Recreation Area to treat Japanese knotweed (*Fallopia japonica*) along the banks and within the watershed of the Stehekin Valley. The Stehekin River is a complex array of braiding side channels and wooded islands, draining from the North Cascade Mountains into rugged Lake Chelan in central Washington state. The river is the lifeblood of the town of Stehekin, a community of approximately 80 year-round residents that is accessible only by boat or plane.

There was a gap of several years in the treatment of Japanese knotweed on the Stehekin River prior to 2019. This lapse in treatment concerned park managers. The infestations likely increased in density during this time. The NCCN IPMT, North Cascades National Park Complex resource management staff, and a crew of Washington Conservation Corps (WCC) youth successfully surveyed and treated the drainage in August 2019. National Park Service (NPS) staff and WCC members retreated all previously known locations of Japanese knotweed and identified, mapped, and treated new areas. These partners treated a total of 1,630 stems of Japanese knotweed with an aquatic-friendly herbicide and surfactant. NPS staff and WCC surveyed and treated approximately 500 acres in eight days. The NCCN IPMT plans to monitor the infestation and retreat as needed.



NCCN IPMT staff work alongside Earth Corps volunteers at San Juan Island National Historical Park's American Camp. NPS Photo.



NCCN IPMT staff perform search-and-destroy treatment for rush skeletonweed (*Chondrilla juncea*) at the historic Buckner Orchard in Lake Chelan National Recreation Area. NPS Photo.

Program Highlights (cont.)

Invasive Plant Control at San Juan Island National Historical Park

The NCCN IPMT has long partnered with resource management staff to control a suite of weeds at SAJH. The park manages several historic areas on San Juan Island that commemorate border disputes between the United States and the United Kingdom. The island hosts unique assemblages of relatively dry coastal prairie that are home to culturally significant species like blue camas (*Camassia* spp.) and to the critically endangered Island Marble butterfly (*Euchloe ausonides insulanus*), which was long thought to be extinct. The American Camp site, where the NCCN IPMT has worked with SAJH staff, is the only known remaining habitat for this butterfly.

In fiscal year 2019, the NCCN IPMT worked alongside SAJH staff and an Earth Corps youth crew. Team members performed manual removal of Canada thistle (*Cirsium arvense*), bull thistle (*C. vulgare*), and spurge laurel (*Daphne laureola*) prior to seeding native plant species over 80 acres among the hills and fields at historic American and English Camps.

The sites, and the uncommon array of species, remain threatened by encroaching Himalayan blackberry (*Rubus bifrons*), Canada thistle, and other invasive species. The NCCN IPMT is working closely with SAJH staff to develop treatment plans that will meet the cultural and biological needs of the area.

Summary of Accomplishments

In fiscal year 2019, the NCCN IPMT made progress on a number of projects that contribute to the successful control of several invasive plant populations that have proven challenging to manage. At Ross Lake National Recreation Area, the IPMT conducted a feasibility trip into the backcountry to map and assess options for treating reed canary grass in an important wetland. Team members controlled invasive plant populations across the region, including Japanese knotweed at North Cascades and Olympic National Parks, scotch broom (*Cytisus scoparius*) at Lewis & Clark National Historical Park, and poison hemlock (*Conium maculatum*) at Ebey's Landing National Historical Reserve. Most importantly, the NCCN IPMT maintained and enhanced working relationships with project partners to further combat the spread of invasive plants in the North Coast-Cascades region.

Summarized Data for 2019

Measure	Acres
Treated	327.079
Inventoried/Monitored	0.001
Gross Infested Area	5,110
Net Infested Area	143.148
Youth Engagement	
Total Number of Youth Participants and Youth Employees	22
Total Hours for Youth Participants and Youth Employees	10,690

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Northeast IPMT Annual Report: FY 2019



Left: Training demonstration of spray mist produced with a flat fan nozzle at a high pressure leading to drift. Lesson, lower the pressure to reduce drift. Right: A training attendee practices foliar applications with a backpack sprayer (with water only) at Delaware Water Gap National Recreation Area. NPS Photos.

Background

The Northeast Invasive Plant Management Team (NE IPMT), duty stationed at Delaware Water Gap National Recreation Area (DEWA), was established in 2003 and serves 25 partner National Park units in eight states, from Pennsylvania to Maine, in Region 1 of the Department of the Interior.

The parks served by the NE IPMT range in size from nine acres to over 100,000 acres. The majority of the parks have relatively small acreages with mandates to preserve and interpret culturally significant sites, including National Battlefields and National Historic Sites. The NE IPMT works with parks to define and rank invasive species priorities and to establish management goals that are achievable, cost-effective, and produce measurable results over time.

The NE IPMT is flexible in its approach to providing service to parks under a range of conditions including reduced staffing. Beginning in 2016, the NE IPMT adapted its approach to ensure that parks continue to receive high quality technical support and continuity of service. In addition to site visits with a reduced crew, the NE IPMT provides small grants directly to parks through a competitive proposal and ranking process. The team also provides treatment, training, and technical support to many parks in the region.

Program Highlights

Passing on Knowledge through Formal Training

After going through the integrated pest management process to identify the most appropriate control method, herbicide application may still be selected from the IPMT toolbox as the right tool for the job. However, finding relevant training opportunities in herbicide application safety and methodology can be difficult. Therefore, IPMT staff hold pesticide certification trainings for team members, park staff, volunteers, and other applicators.

In fiscal year (FY) 2019, the NE IPMT conducted three, two-day training sessions, at three different sites. These sessions were approved for pesticide license recertification credits in six states. Morning sessions were held in the classroom, and the afternoon sessions were devoted to demonstrating and practicing lessons learned during the morning. Day one focused on the basics: math calculations for proper mixing; application of herbicides including proper spraying techniques; and personal protection equipment needed for a range of applications. The second day was more advanced, and introduced the use of specialized equipment for precise applications and calibration of sprayers. The NE IPMT hopes to offer courses for recertification credits again in FY 2020.



NE IPMT applies foliar treatment to common reed (*Phragmites australis*) at Cape Cod National Seashore's Herring Pond. NPS Photo.



Carefully and selectively treated *Phragmites australis* along a freshwater pond, surrounded by desirable wetland vegetation. NPS Photo.

Program Highlights (cont.)

Reconnecting with a Partner Park

Kettle ponds are the remnants of huge ice blocks left by the ebb and flow of the glaciers that formed Cape Cod thousands of years ago. The ponds' unique features include low concentrations of nutrients, crystal clear water, and low pH. Acid precipitation and invasive plants are two significant threats to these natural features.

There are more than 20 kettle ponds in Cape Cod National Seashore's (CACO) glacial outwash plains. One of the NE IPMT's longstanding projects in CACO has been to control common reed (*Phragmites australis*) infestations in several Seashore kettle ponds, using the common herbicide glyphosate. Public concern over the use of glyphosate at CACO prompted a three year hiatus in the team's work and resulted in an increase in common reed. However, in FY 2019 the team resumed treatment of common reed in six kettle ponds. Sensitive to public concerns, the team switched to the herbicide imazapyr. The new herbicide is effective on common reed and reduces the total amount of herbicide used by half as compared to glyphosate.

Summary of Accomplishments

In FY 2019, the NE IPMT provided direct in-the-field vegetation management service to nine Region 1 parks. These site visits generally involved chemical control of invasive plants beyond what the park could manage. The team also provided formal training for park staff and others at three sites.

Through the grant process the team distributed approximately \$82,000 to support invasive plant projects in seven parks. Notable projects include: seasonal staff and interns were hired at two parks; equipment was procured for one park; a contract for invasive plant control was awarded to the Appalachian National Scenic Trail; and an existing cooperative agreement with the non-profit New Jersey Invasive Species Strike Team was funded. Many of the parks were able to leverage several times the value of the NE IPMT grant, which contributed to the grant program's success.

Summarized Data for 2019

Measure	Acres
Treated	330.61
Inventoried/Monitored	21
Gross Infested Area	4,796.98
Net Infested Area	566.7
Youth Engagement	
Total Number of Youth Participants and Youth Employees	455
Total Hours for Youth Participants and Youth Employees	10,445

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Northern Great Plains IPMT Annual Report: FY 2019



The Carnegie prescribed burn around the visitor center at Agate Fossil Beds National Monument in October 2019. NPS Photo.

Background

The Northern Great Plains Invasive Plant Management Team (NGP IPMT) works with 14 partner parks in four states and two National Park Service (NPS) regions. The goal of the NGP IPMT is to help parks preserve native plant communities and historic landscapes by managing the spread of invasive plant species. The team also works with park personnel to accomplish restoration activities such as implementing prescribed fires, developing native plant materials, and seeding sites to restore desired resource conditions. The area served by the NGP IPMT is approximately 452,000 acres and is ecologically diverse, with vast grasslands, forests, and integral river systems. Integrated pest management (IPM) strategies used to manage invasive plants include chemical, biological, mechanical, and cultural methods. Education and training in IPM are priorities of the team. Each year NGP IPMT staff offer a week-long training session in the principles and practices of IPM for park staff, partners, and NGP IPMT seasonal employees.

Field crews for the NGP IPMT are based at either Badlands National Park or Theodore Roosevelt National Park and travel to other parks in the network. Over the course of this year, NGP IPMT members completed field work at 11 parks. The IPMT also integrated members of the Montana Conservation Corps into the field crews to increase capacity and efficiency of operations. This allowed youth on the Conservation Corps crews to engage in important and substantive work to further the NPS mission.

Program Highlights

Collaborating to Control Invasive Plant Species

Members of the NGP IPMT and Northern Great Plains Inventory and Monitoring Network (NGPN) worked with the NGP Fire Management program to conduct a prescribed burn in the Carnegie Unit at Agate Fossil Beds in October of 2019. Burn objectives were:

1. Increase the cover of native grasses by at least 20% within two growing seasons
2. Decrease the cover of non-native herbs by at least 20% within two growing seasons
3. Decrease fuel loading in the flood plain area by 30-50% one year post burn

The results of the prescribed burn will not be evaluated until the 2020 field season, however NGP fire expects to see annual brome (*Bromus tectorum*) and yellow flag iris (*Iris pseudacorus*) cover reduced at year one and year two post-fire. The impact of the fire on Canada thistle (*Cirsium arvense*) will depend on the amount present pre-burn, burn intensity, and moisture conditions since the burn.

Results of this work will also inform a collaborative research project to identify the best practices for managing invasive species in the Northern Great Plains. Collaborators include the US Geological Survey, NGPN, NGP Fire Management, Northern Rocky Mountain IPMT, several NPS units, and the NGP IPMT.



Karl Bodmer's painting of Fort Union, 1833.



Montana Conservation Corps members at Badlands National Park in 2019. NPS Photo.

Program Highlights (cont.)

Invasive Plant Management, Fort Union Trading Post National Historic Site

Fort Union Trading Post National Historic Site (FOUS) commemorates the significant role Fort Union played as a fur trading post on the Upper Missouri River. The park has a long history of vegetation disturbance that creates unique challenges and opportunities for invasive plant management and native plant restoration.

The Bodmer Unit is named for artist Karl Bodmer who captured Fort Union in an iconic painting during the summer of 1833. FOUS references this painting as evidence of the historical condition of the natural resources within the park. Restoring the cultural landscape while re-establishing healthy native plant communities will improve park visitors' experience at Fort Union.

NGP IPMT and FOUS staff have worked together annually since 2002 to control leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), and musk thistle (*Carduus nutans*) in the Bodmer Unit. New herbicides have increased efficacy of the chemical treatments, reduced the work hours necessary to apply multiple treatments, and are moving the landscape closer to its historic condition.

Summary of Accomplishments

During the 2019 field season, partnerships with the Montana Conservation Corps continued to increase the number of personnel helping parks manage invasive species. Conservation Corps crews include crews trained specifically in invasive species management.

Aerial application of herbicide by helicopter is a cost-effective treatment, particularly for remote park areas. NGP IPMT funds continue to support this work in high priority areas at Theodore Roosevelt, Wind Cave, and Badlands National Parks. Aerial spraying allowed for treatment of invasive plants in areas that are too remote for timely and cost-efficient treatment using conventional methods.

The regional seed storage facility at Wind Cave is now completed and includes a seed freezer and climate-controlled space ready for use by partners.

Summarized Data for 2019

Measure	Acres
Treated	346.67
Inventoried/Monitored	4,057.3
* Gross Infested Area	0.641
* Net Infested Area	0.182
Youth Engagement	
Total Number of Youth Participants and Youth Employees	*
Total Hours for Youth Participants and Youth Employees	*

* Youth hours reported by parks

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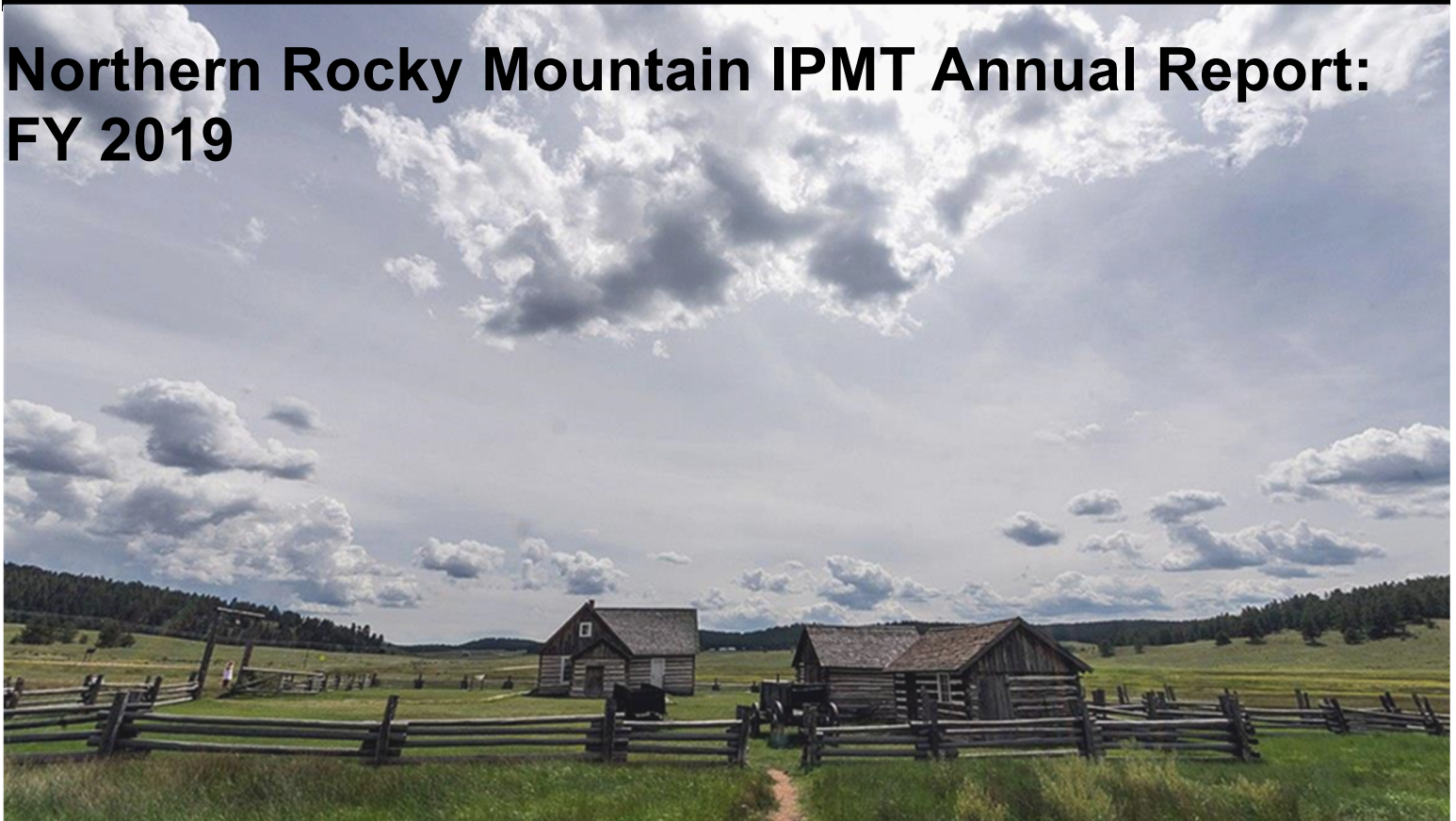
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Northern Rocky Mountain IPMT Annual Report: FY 2019



Hornbek Homestead at Florissant Fossil Beds National Monument. Public Photo.

Background

The Northern Rocky Mountain Invasive Plant Management Team (NRM IPMT) program serves 25 parks in Colorado, Idaho, Montana, northern New Mexico, Utah, and western Wyoming. The Northern Rocky Mountains Region is vast and diverse encompassing high and low elevation sagebrush steppe, forests, subalpine meadows, high deserts, and wetland and riparian areas. Many parks in this network are relatively small (median size is 20,000 acres) and a number of them lack staff expertise available to address even their highest priority invasive species. Since its inception in 2003, the NRM IPMT has supported the parks in its network by emphasizing the systematic, long-term management and control of invasive plant species.

The NRM IPMT is currently a nine person crew strategically divided into three smaller crews based at two larger parks and one small park within the team's network. The program also partners with other work crews to address distant parks. In 2019, the team worked in 20 of the program's 25 partner parks, with multiple visits to 12 parks. Repeat visits are critical for many project areas to ensure all invasive plants are located and removed. Much of the team's effort is focused on controlling state listed noxious weeds, as well as providing rapid response to new and/or particularly problematic invaders. The NRM IPMT program relies heavily on the region's seasonal dichotomy, working lower elevation parks in Utah and Idaho early in the growing season and higher elevation parks in Colorado, Wyoming, and Montana later in the summer. Crews continue into the early fall to address perennial invasive plants as they enter dormancy.

Program Highlights

Pilot Study to Address Invasive Grasses at Little Bighorn Battlefield National Monument

Little Bighorn Battlefield National Monument (LIBI) is increasingly dominated by invasive annual grasses, particularly Japanese (*Bromus japonicus*) and cheatgrass (*B. tectorum*) and recently introduced ventenata grass (*Ventenata dubia*). Starting in 2017, the U.S. Geological Survey (USGS) and eight NPS units in the Northern Great Plains, including LIBI, formed a working group (Annual Brome Adaptive Management or ABAM) and have been developing a decision making tool, a model that will provide feedback on the results of various management actions to help park managers address these grasses.

Fiscal year 2020 was the first year that data was collected to input into the new decision making tool. To support collaborative learning of successful treatment approaches, the park and the NRM IPMT program conducted a pilot herbicide trial at LIBI that will provide site specific data to inform the model. Dr. Peter Rice at the University of Montana conducted a trial using indaziflam (Esplanade®) herbicide, a pregermination product exhibiting longer term control of invasive annual grasses. This work includes measuring pretreatment conditions, herbicide-treating five test plots with three different treatments (control, herbicide @ 3 oz/ac, and herbicide @ 5 oz/ac), and re-monitoring in 2020 to determine treatment effectiveness. This work informs parks on what treatment approaches are most successful and cost-effective throughout this region.



New Northern Rocky Mountain (NRM) IPMT crew leader Molly Murphy (left) working with park staff and an American Conservation Experience crew to remove invasive tumble mustard prior to seed set from a restoration site at Colorado NM. NPS Photo.



NRM IPMT crew members and MCC interns carrying equipment to a work site to remove Russian olive at Bighorn Canyon NRA. NPS Photo.

Program Highlights (cont.)

Increasing Partnerships with Youth Conservation Corps

In June, the NRM IPMT program hired a third crew leader, Molly Murphy, based at Colorado National Monument. This increases the capacity of the IPMT to work with various youth conservation corps to address invasive plant projects throughout parks in Colorado and northern New Mexico. In fiscal year (FY) 2019, Molly worked with youth programs including American Conservation Experience, Utah Conservation Corps, and the Southwest Conservation Corps to address projects at six national park units. These youth programs provide teams of six to eight individuals to help successfully conduct large projects in a short amount of time.

For the first time, the NRM IPMT also made use of the Montana Conservation Corps (MCC) Internship Program by hiring two conservation interns. In 2019, this program placed approximately 70 interns throughout Montana and Idaho. The NRM IPMT benefited from this program because these 22-week interns have experience equivalent to that of NPS seasonal biological technicians, require less funding to support them, are training through the MCC program, and they have more flexible work schedules. This partnership was very successful and NRM IPMT will be utilized again in 2020.

Summary of Accomplishments

In FY 2019, the NRM IPMT treated 38 species across 127 infested acres in 20 National Parks. In total, the IPMT spent more than 4,900 person hours treating predominantly state listed noxious weeds in parks served by the program.

The NRM IPMT continues to strike a balance between contributing to long-term, large-scale control, early detection and removal of nascent populations, and opportunistic restoration of native species. The NRM IPMT organizes several steering committee meetings each year to review and approve the strategic direction and financial plan of the team, ensure the team provides information that is relevant to management, and develop an invasive plant treatment schedule for the fiscal year.

Summarized Data for 2019

Measure	Acres
Treated	133.33
Inventoried/Monitored	0
Gross Infested Area	40,114.36
Net Infested Area	126.74
Youth Engagement	
Total Number of Youth Participants and Youth Employees	63
Total Hours for Youth Participants and Youth Employees	7,240

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Pacific Islands IPMT Annual Report: FY 2019



Native Hawaiian 'Ōhi'a tree, Hawai'i Volcanoes National Park, Kahuku Unit. NPS Photo.

Background

Invasive species are the greatest immediate threat to the ecology of the Pacific Islands and partnerships are vital to protect fragile native ecosystems from invasive species. The Pacific Islands Invasive Plant Management Team (PI IPMT) has been a leader in collaborative conservation in Hawai'i by leveraging connections across a network of Pacific Island national parks. Scientists and managers continue to develop new tools to meet the evolving threats posed by invasives and promote native ecosystem resiliency. For example, PI IPMT ecologists work at Hawai'i Volcanoes National Park (HAVO) with researchers and partners from the USDA Forest Service, Hawai'i County, Hawai'i State Department of Agriculture, and the University of Hawai'i at Hilo to detect and prevent the spread of Rapid 'Ōhi'a Death (ROD) with remote sensing and biosecurity tools. Meanwhile, biologists at Haleakalā National Park are working with collaborators at other parks within the Department of the Interior Regions 8, 9, 10, and 12, and PI IPMT network parks to modernize GIS and GPS workflows and enable collaborators to collect high-quality invasive data to inform management decisions for the next 20 years. Aerial precision spray equipment developed by the PI IPMT and shared with collaborators has revolutionized incipient species targeting with minimal impact to wilderness landscapes while protecting ground crews from highly dangerous terrain. These innovations also benefit smaller parks like Kalaupapa, Kaloko-Honokōhau, and Pu'uuhonua O Hōnaunau National Historical Parks, where PI IPMT collaborators work with park staff to help identify and eradicate incipient invasive threats.

Program Highlights

Developing an Advanced Imaging System to Enhance Early Detection and Response to Invasive Threats: Remote Sensing and Artificial Intelligence

A key challenge to managing invasive species is detection at early stages of invasion. Use of remote sensing approaches, combined with emergent technologies such as Artificial Intelligence (AI) promises to improve efficiencies and outcomes.

The University of Hawai'i Hilo Spatial Data and Analysis Lab and the PI IPMT collaborated to develop and continue to refine a helicopter-mounted detection system for a suite of invasive species. The system captures 3,000 acres/hour of imagery with a spatial resolution of 5 centimeters. Once collected, lab analysts review imagery, identify targets, and build image reference libraries. Continuously developing AI systems will further automate and streamline processing of detection information.

To date, the approach has improved the detection of four invasive plant species including two grasses (Guinea grass, *Megathyrsus maximus* and fountangrass, *Cenchrus setaceus*), one smothering vine (banana poka, *Passiflora tarminiana*), and one ecosystem-altering tree (faya tree, *Morella faya*). Additionally, it can detect infected trees symptomatic for the lethal fungal pathogen that causes ROD. Future work aims to improve spatial resolution, broaden the species suite, and expand the predictive capabilities of AI.



Pacific Islands IPMT and Hawai'i Volcanoes National Park staff systematically sweep to control invasive banana poka vines (*Passiflora tarminiana*) after the Keauhou Fire as part of the rehabilitation and restoration process. NPS Photo, D.



High resolution images, human training, and machine learning improve work flows. This image of a detected target, the invasive Faya Tree (*Morella faya*) at Hawai'i Volcanoes National Park. NPS Photo.

Program Highlights (cont.)

Keauhou Wildfire: Rehabilitation and Restoration at HAVO

In August 2018, a human caused fire ignited adjacent to the national park on a day with unprecedented low humidity and high fire danger. It spread quickly and burned nearly 3,000 acres of grasslands, shrubland, and regenerating native Koa and 'Ōhi'a forests.

Aggressive invasive plants adapted to disturbance such as fire quickly colonized the areas taking advantage of light gaps and other newly available resources. Among the top-tier invaders, the most worrisome for park managers was banana poka (*Passiflora tarminiana*), a vine species capable of completely smothering vegetation, permanently altering forests and aborting natural recovery.

Partners engaged in this effort immediately developed post-burn plans to rehabilitate and restore the landscape. Actions included intensive ground and air surveys, and treatments began on three to six month intervals to control banana poka and other priority invasive plants. PI IPMT and HAVO staff are continuing treatment with support from the National Park Service Burned Area Response and other programs. The first full year of treatments completed in 2019 resulted in 64,339 plants removed, three additional complete aerial survey cycles, and missions to shuttle supplies or equipment for remote infestation control.

Summary of Accomplishments

The PI IPMT maintained a strong safety record while engaging in dozens of specialized missions throughout the year. The IPMT led staff from two parks, applying aerial precision treatments to invasive pine trees in Haleakalā Crater. Remote sensing comparing time-lapsed imagery mosaics confirmed that over 90% of the original infestation on steep inaccessible cliff walls is now successfully under control. Additionally, the IPMT supported research and conservation efforts for the threatened Haleakalā silversword through collaboration. Youth, guided by this type of science, restored over 2,000 silverswords to Pu'u 'Ula'ula on Haleakalā. Finally, technical support allowed the team to add value to the network of island parks by facilitating restoration of lowland mesic forests, supporting training and staff development, increasing capacity for invasive plant management, and streamlining workflows.

Summarized Data for 2019

Measure	Acres
Treated	318.43
Inventoried/Monitored	12,471.67
Gross Infested Area	0
Net Infested Area	0
Youth Engagement	
Total Number of Youth Participants and Youth Employees	650
Total Hours for Youth Participants and Youth Employees	7,045

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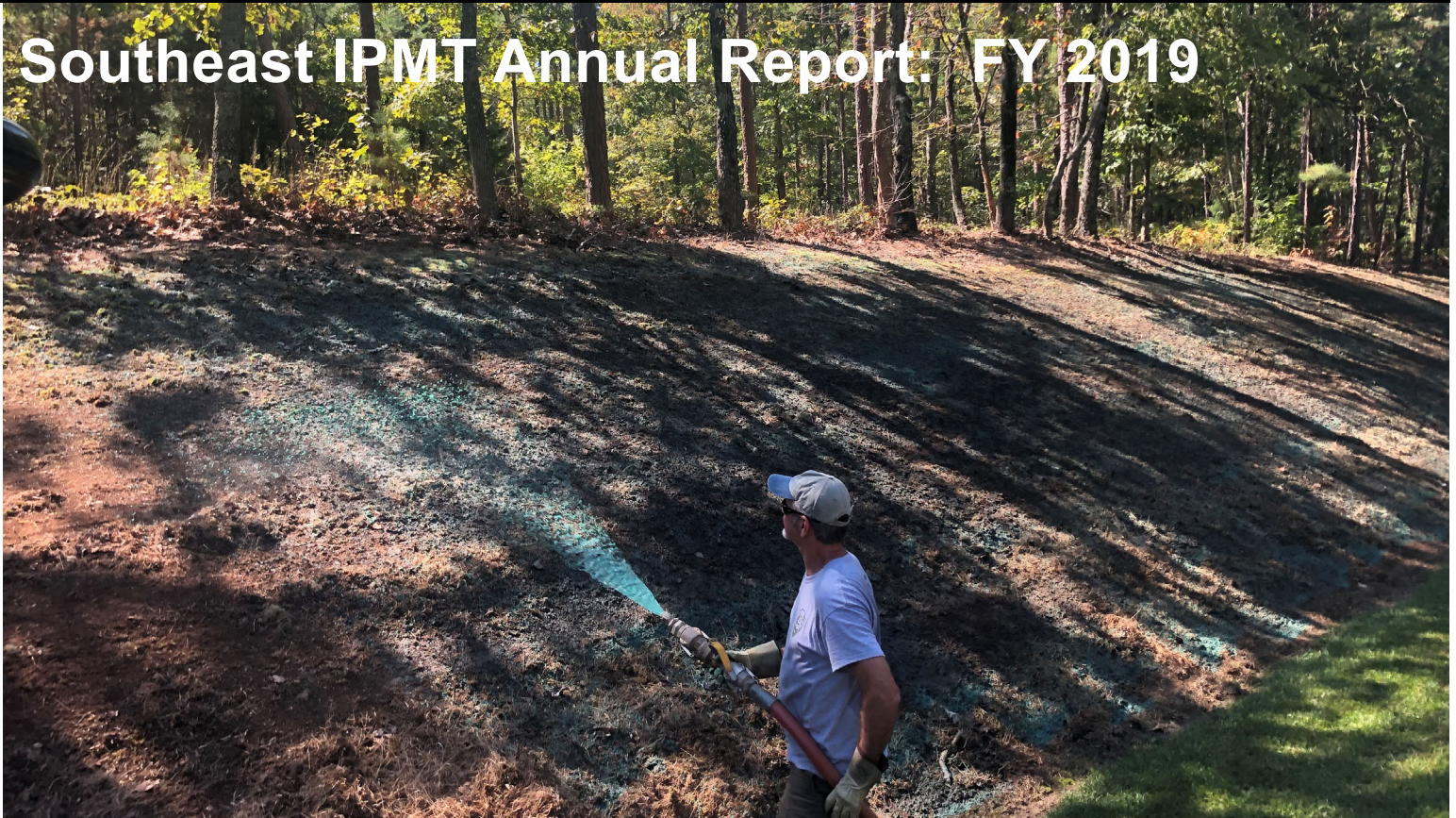
Stacey Torigoe
Biologist, Vegetation Management Crew Lead

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Haleakalā National Park
P.O. Box 369
Makawao, HI 96788



Southeast IPMT Annual Report: FY 2019



Southeast Invasive Plant Management Team member using a seed spreader to restore native habitat at Kings Mountain National Military Park. NPS Photo.

Background

The Southeast Invasive Plant Management Team (SE IPMT), which is in its 16th year of operation, provides support to 20 national park units located across seven states in the Southeast Region. The team controls, monitors, and surveys for invasive plants in 13 of those partner parks and provides technical assistance and training to 11 of those partner parks and one non partner park. The parks served by the SE IPMT lie within the Cumberland Plateau, Appalachian Highlands, and Piedmont physiographic provinces and include unique habitats and cultural resources. Many of these National Park Service (NPS) lands protect federal- and state-listed plant and animal species or significant cultural resources that are frequently threatened by invasive plants. The SE IPMT implements an integrated and adaptive resource management strategy, using all available tools, to meet the parks' long term management goals and comply with state and federal regulations.

The SE IPMT functions as a self-contained, mobile strike team comprised of a team leader and two to four team members. To foster future land management professionals, the SE IPMT includes student interns as team members, providing them hands-on experience in natural resource management as well an introduction to general NPS operations.

Program Highlights

Collaboration with Florida/Caribbean IPMT (FLC IPMT) at Dry Tortugas and Biscayne National Parks

The SE IPMT collaborated with the FLC IPMT on a project at Dry Tortugas National Park (DRTO) to remove two massive, invasive 100 year old seaside mahoes (*Thespesia populnea*) growing in the parade grounds in the interior of the historic fort. This was a truly collaborative effort that included other partners: Everglades National Park (EVER) Fire Management staff and the EVER/DRTO botanist. All project partners worked together to fell, chip, and mulch the trees then spread the mulch on the parade grounds and around native vegetation inside the fort. It took the crew of eight approximately 80 hours to complete the work. During this project, the SE IPMT and partners also treated other invasive plant species including silky sesban (*Sesbania sericea*) which is invading the dunes surrounding the fort and is interspersed among state threatened and endangered native dune plants such as sea lavender *Tournefortia gnaphalodes* and bay cedar (*Suaeda linearis*).

The team also worked to reduce invasive vegetation at Convoy Point, Soldier Key, the Ragged Keys, and Boca Chita at Biscayne National Park in August. The main targets were latherleaf (*Colubrina asiatica*) and Brazilian peppertree (*Schinus terebinthifolius*).



Inspection of seaside mahoe to be treated in the parade grounds of Dry Tortugas National Park. NPS Photo.



Vista of newly acquired lands at Camp Nelson National Monument. NPS Photo.

Program Highlights (cont.)

Site visit to Camp Nelson National Monument

In fiscal year 2019 the SE IPMT conducted a vegetation survey at Camp Nelson National Monument (CANE). The NPS added CANE in 2018 for its cultural significance as a Union training site for freed slaves during the Civil War. The site is currently grazed by cattle and is heavily disturbed. The survey revealed numerous invasive plant species that invade disturbed areas. Species found during the survey include Johnsongrass (*Sorghum halepense*), bush honeysuckle (*Lonicera* spp.), and tree-of-heaven (*Ailanthus altissima*). During the survey, SE IPMT staff also noted that forested areas within the park are approximately 70% infested by invasive vegetation. Vegetation surveys like this help parks to prioritize species and sites for future invasive plant management.

This park is not currently a SE IPMT partner park. However, Mammoth Cave National Park (MACA), which may become responsible for the management of CANE, is a SE IPMT partner park. If MACA manages CANE in the future, the SE IPMT will add this park to the list of parks that are served by the SE IPMT.

Summary of Accomplishments

As in past years, the SE IPMT supported partner and non-partner parks through various means. In addition to inventory and treatment of invasive plants, the team continued to help two parks treat hemlock wooly adelgid, an invasive forest pathogen that is decimating eastern hemlock forests. They conducted eight training sessions for parks in 2019 including NPS Chainsaw Operations and Safety, herbicide application, and utility terrain and all terrain vehicle operator's certification. The team assisted three network parks with environmental audit preparations, assuring that parks were in compliance for safety inspections. This work included the clean up and inventory of the herbicide storage and equipment area at Fort Donelson National Battlefield. Most importantly, the SE IPMT marked its 16th year of safe operation with no time lost due to accident or injury.

Summarized Data for 2019

Measure	Acres
Treated	232
Inventoried/Monitored	57.28
Gross Infested Area	2,934
Net Infested Area	221.6
Youth Engagement	
Total Number of Youth Participants and Youth Employees	13
Total Hours for Youth Participants and Youth Employees	1,275

More Information

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Liaison (Acting)

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Southeast Coast IPMT Annual Report: FY 2019



Amidst the tidal marsh and maritime forest of Fort Frederica National Monument (FOFR) are remnants of the abandoned British settlement and military installation. Shells line the foundations where the town of Frederica once stood. NPS Photo.

Background

The Southeast Coast Invasive Plant Management Team (SEC IPMT) serves 15 park units in North and South Carolina, Georgia, and Alabama. Network parks range from protected seashores and forested wilderness to urban recreational areas and preserved cultural landscapes. Along the coast are the National Seashores from the lighthouses of Cape Hatteras (CAHA) to the wild horses of Cumberland Island, with historic battle sites in between, including those of the Revolutionary War and the Civil War. Inland, the SEC IPMT serves parks like Chattahoochee River National Recreation Area (CHAT) in the Atlanta metro to the prehistoric settlements at Ocmulgee Mounds National Historical Park (OCMU). Congaree National Park (CONG), which encompasses one of the last remnants of intact old growth bottomland forest and is approximately 80% designated wilderness, hosts the SEC IPMT.

The SEC IPMT began as a pilot project in 2005 and by 2010 was permanently funded through CONG's base operating budget. Although funded differently than the majority of IPMTs, the SEC IPMT strives to achieve similar goals for invasive plant management. Lauren Serra (liaison) directed the SEC IPMT in fiscal year 2019 and Amorita Brackett led the crew in the field. Dr. Serra also detailed into the Southeast IPMT (SE IPMT) liaison for 120 days. Four American Conservation Experience youth interns served as field crew members. The crew also worked with CHAT during their term and also assisted OCMU, CAHA, and Fort Pulaski National Monument (FOPU) for extended trips.

Program Highlights

Innovative Technology—Drones, iNaturalist

The SEC IPMT provided technical guidance to CAHA for five years as the park planned the aerial treatment of common reed (*Phragmites australis*) with the North Carolina Department of Transportation (NC DOT) in mitigation for wetlands lost to a new bridge. The NC DOT used an Unmanned Aerial System (UAS) drone to treat 70 acres of common reed near the Bodie Island lighthouse from October 2018 through September 2019. Two pilots supported the UAS project, one to operate the heavy lift drone that sprayed the herbicide, and the other to spatially document the area treated by GPS. Partners in CAHA's innovative drone project presented the work at the joint North Carolina Invasive Plant Council and South Carolina Exotic Pest Plant Council (SC EPPC) annual meeting.

The SEC team presented a technical session on drones during a monthly IPMT meeting. The crew also attended the Innovations in Invasive Species Management Conference and learned more about drones to survey for common reed in the Adirondacks including a population that SEC IPMT reported to The Nature Conservancy using iNaturalist. Despite this species being widespread, new populations that arise are appropriate for early detection and rapid response (EDRR) efforts like the population the SEC IPMT reported for inland Georgia. The use of iNaturalist has served as a tool for reporting "Species on the Move" that are new to parks, like Bradford pear (*Pyrus calleryana*) at CONG.



North Carolina Department of Transportation treats common reed (*Phragmites australis*) aerially by drone at Cape Hatteras National Seashore. NPS Photo.



SEC IPMT held South Carolina's first Weed Wrangle with the Palmetto Garden Club and park volunteers to handpull beefsteak (*Perilla frutescens*) at Congaree National Park. NPS Photo.

Program Highlights (cont.)

Partnerships—Weed Wrangle, EDRR, Rare Plants

The SEC IPMT collaborates with a range of partners for improved invasive plant control and resource management.

External partners - CONG hosted the first Weed Wrangle South Carolina in concert with the Palmetto Garden Club, volunteers, and SC EPPC. Led by SEC IPMT and CONG staff, the group hand-pulled 200 pounds of beefsteak (*Perilla frutescens*).

Cross program partners - The Fire Effects Monitoring Program in the Appalachian/Piedmont/Coastal Fire Management Zone and the Southeast Coast Network Inventory and Monitoring (SECN I&M) program collaborated with SEC IPMT to share vegetation data, an EDRR watch list, and updates to NPSpecies lists for parks.

Park partners - The field crew leader coordinated an EDRR for cogongrass (*Imperata cylindrica*) with the Georgia Forestry Commission at FOFR. Kings Mountain National Military Park provided chain-saw and wildland fire training to the SEC IPMT. The team assisted the park in restoration of a rare aster species and associated grass-land habitat.

Summary of Accomplishments

The SEC IPMT served 15 partner parks, treated more than 50 plant species, and served one non-partner park, Jimmy Carter National Historic Site. The team partnered with the Florida/Caribbean (FLC) and SE IPMTs to help them complete projects on four of their partner parks. Safety is paramount, to this end the liaison served as vice chair of CONG's Safety, Environmental, and Wellness Committee. The crew also held regular tailgate safety meetings and kept up to date on pesticide licenses. The field crew leader completed yearly reviews of Job Hazard Analyses and Safety Data Sheets, and maintained Wilderness First Responder certification. Funding, field assistance from park staff and volunteers, travel per diem, park housing, supplies, equipment, technical support, and training contributions were instrumental to the team's invasive plant management accomplishments. Joint trips increased the acreage treated at parks, promoted sharing of skills among staff, and facilitated training. North Carolina State University and the FLC IPMT provided data management support.

Summarized Data for 2019

Measure	Acres
Treated	107.15
Inventoried/Monitored	1,805.37
Gross Infested Area	3,398.01
Net Infested Area	186.92
Youth Engagement	
Total Number of Youth Participants and Youth Employees	15
Total Hours for Youth Participants and Youth Employees	4,618

More Information

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Amorita Brackett Field Crew Leader	(803) 647-3985 amorita_brackett@nps.gov



Southwest IPMT Annual Report: FY 2019



Glen Canyon National Recreation Area, Arizona. NPS Photo.

Background

The Southwest Invasive Plant Management Team (SW IPMT) of the National Park Service (NPS) serves 45 NPS units and adjacent land owners in five states throughout the southwest.

The SW IPMT's mission is: **to collaborate with park staff, with other programs within the NPS, and with park neighbors, local communities and organizations, and other state and federal agencies, to restore the native ecosystems of our parks and surrounding lands.** The SW IPMT assists parks and partners by serving as a regional resource to combat the invasion of non-native plant species and support the restoration of disturbed areas to functioning healthy ecosystems.

The SW IPMT supports a number of programs related to the international issues of invasive plants, ecosystem fragmentation, and habitat restoration. Significant activities beyond treating invasive plant species include research in control and restoration methods, the production of appropriate native plant materials, and collaboration with communities and partners. The SW IPMT is working with and supports a diverse coalition of universities, land management agencies, non-profit, and conservation groups to restore native plant biodiversity and the ecosystems that sustain the native flora and faunal heritage.

Program Highlights

Continuing the Emphasis of Research for Improved Restoration

Beardless chinchweed (*Pectis imberbis*) is a very rare native perennial subshrub that has a limited geographic range in southeastern Arizona. Coronado National Memorial has by far the largest population of beardless chinchweed known to exist. This year the SW IPMT partnered with local NPS staff, a US Fish and Wildlife Service scientist, and restoration ecologists from Borderlands Restoration Network to study the effects of invasive grass treatment on sub-populations of beardless chinchweed at Coronado National Memorial. Beardless chinchweed typically grows in low to moderately dense stands of native grass and could easily be threatened by dense stands of invasive grass species such as Lehmann lovegrass (*Eragrostis lehmanniana*), weeping lovegrass (*Eragrostis curvula*) and rose Natal grass (*Melinis repens*). The level of infestation of these grasses near beardless chinchweed plants at Coronado National Memorial is significant but low enough that effective control is possible especially after several consecutive years of follow-up treatments. The partnership's general strategy is to use manual treatment of the grass species near beardless chinchweed individuals and chemical treatment of large stands of invasive grasses farther from beardless chinchweed individuals.



American Conservation Experience crew receives instruction for treating invasive thistles at Valles Caldera National Preserve. NPS Photo.



Study plots established to monitor rare plant populations in conjunction with

Program Highlights (cont.)

Chinaberry Treatment on the Devils River

The Devils River is the most pristine and unspoiled river in the Texas. Its crystal blue water feeds directly into the Amistad Reservoir where it joins forces with flow of the Rio Grande. On the far reaches of park property, a Chinaberry (*Melia azedarach*) population was originally treated by the SW IPMT in fiscal year (FY) 2018. In FY 2019, the crew returned to the site to ensure the success of the treatment.

Chinaberry was of particular concern to the park due to its ability to create dense thickets and crowd out native species. The trees allelopathic effects and poisonous nature only increased the desire of park personnel to remove the population entirely. Fortunately the isolated population had not spread down river and into the reservoir. In FY 2018 the SW IPMT crew thoroughly surveyed and treated one acre invaded by Chinaberry trees, allowing the crew to return in FY 2019 to survey a total of 24 acres along the river for any resprouts or undocumented populations. The initial treatment was 100% successful, and the crew was able to treat several saplings during the FY 2019 trip. Regular follow up treatment solidifies the success of invasive plant management and allows space for native vegetation to recolonize formerly invaded ecosystems.

Summary of Accomplishments

The Southwest Invasive Plant Management Team worked with 19 Park units to treat 106 infested acres and participated in the active restoration of 4.1 acres. To help complete this work, the SW IPMT engaged 102 youth who contributed approximately 6,664 hours towards invasive plant management.

The SW IPMT coordinated extensively with numerous federal, state, and local agencies as well as universities, non-profit organizations, and private landowners in order to promote a cross-jurisdictional approach to invasive plant management and restoration activities.

Summarized Data for 2019

Measure	Acres
Treated	46.79
Inventoried/Monitored	708
Gross Infested Area	105.56
Net Infested Area	3.43
Youth Engagement	
Total Number of Youth Participants and Youth Employees	102
Total Hours for Youth Participants and Youth Employees	6,664

More Information

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Crew Leader

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FY2019 Invasive Plant Management Team – Program Participants

Alaska IPMT

Leadership

Chris Overbaugh (Liaison)
Peter Frank (Data Manager)
Joel Reynolds (Supervisor)

Crew (Interns based at parks)

SCA interns: Jacqueline Hogg,
Lillian Setters, Shayla Ramos &
Airk Furseth.
YCC: Marisa Phasomsap & Clay Peterson

Region/Network Support

Joel Reynolds, Joel Cusick,
Angie Southwold. Angela Holeton

Park Support

Denali NPP - Wendy Mahovlic
Katmai NPP - Kelsey Griffin, Robert
Peterson & Tammy Carmack
Kenai Fjords NP - Christina Kriedeman and
Sierra Sampson

Partners

Alaska Association of Conservation
Districts, Soil & Water Districts
Various statewide CWMAs
SCA
Chugach National Forest
USFWS
DOT - Fairbanks Division

Volunteers

Student Conservation Association, Andres
Santini-Laabes, Kirby Delgado, Claire
Wilber, Tyler Young, Deb Boettcher, Nicole
Kovacs, Stephanie Palmer, Colleen
Marinucci, Sue Salmons and many more

Steering Committee

Alaska Regional Office – Joel Reynolds
Central Alaska Park Representative – Carl
Roland
Southwest Alaska Park Representative –
Sharon Kim
Arctic Parks Representative – Dave
Swanson
I&M Program Manager – Mike Bower

California IPMT

Leadership

Bobbi Simpson (Liaison), Gordon White
(Supervisor)

Crew

Park Staff
Golden Gate National Recreation Area,
Whiskeytown National Recreation
Area, Lassen Volcanic National Park,
Pinnacles National Park
Santa Monica Mountains National
Recreation Area,
Sequoia and Kings Canyon National
Parks, Yosemite National Park,, and
Point Reyes National Seashore
Association)
Timothy Federal, Nikk Novero, Tara Larson,
and Sarah Reed

Region/Network Support

Pacific West Regional Office – Jay
Goldsmith (Chief, Resource
Management), Irina Irvine (Ocean and
Coastal Resources Program Manager)

Park Support

Host Park – Point Reyes National
Seashore, Cicely Muldoon
(Superintendent)

Partners and Cooperators

Cabrillo National Monument Conservancy
Cabrillo National Monument Foundation
California Invasive Plant Council
Geoscientists-in-parks
Golden Gate National Parks Conservancy
Mountains Restoration Trust
Pinnacles National Park Foundation
Point Reyes National Seashore Association
Santa Monica Mtns Fund
Student Conservation Association
Susanville Indian Rancheria
University of California at Davis via
Cooperative Ecosystems Studies Unit
Yosemite Conservancy
Youth Conservation Corps

Volunteers

American Conservation Corps
Point Reyes National Seashore Association
Student Conservation Association
Golden Gate National Parks Conservancy
Yosemite Conservancy
Youth Conservation Corps

Steering Committee

Golden Gate National Parks, Alison
Forrestel (Vegetation Chief)
Redwoods National Park, Stassia Samuels
(Plant Ecologist)
Yosemite National Park, Garrett Dickman
(Botanist)
Pacific West Region, Irina Irvine (Ocean
and Coastal Resources Program
Manager)
CalPMT, Bobbi Simpson (Liaison)

Florida / Caribbean IPMT

Leadership

Brian Lockwood (Liaison),
Shea Bruscia (Data Manager)

Region/Network Support

Southeast Region – Mark Frey - Branch
Chief SNRMD
South Florida and Caribbean Inventory and
Monitoring Network – Brooke Shamblin,
Mario Londono, Judd Patterson

Park Support

Big Cypress National Preserve – Tony
Pernas, William Snyder
Biscayne National Park – Shelby
Moneysmith, Vanessa McDonough
Buck Island Reef National
Monument/Christiansted National
Historic Site/Salt River National Historic
Park and Ecological Reserve – Zandy
Hillis-Starr, Clayton Pollock
Canaveral National Seashore – Kristen
Kneifl
DeSoto National Memorial – Nathan
Souder, Kristen Kneifl
Dry Tortugas National Park – Kayla Nimmo,
Meaghan Johnson
Everglades National Park – Hillary Cooley,
Jonathan Taylor, Bryan Falk
Fort Matanzas National Monument, Castillo
de San Marcos – Kurt Foote
Gulf Islands National Seashore – Mark
Nicholas, Joe Ingram, Jon Brandon
Timucuan Ecological and Historic Preserve,
Fort Caroline – Daniel Tardona, Liz
Struhar, Lauren Serra, Steven Kidd
Virgin Islands National Park – Thomas Kelly

Partners and Cooperators

Florida Fish and Wildlife Conservation –
Linda King, Dennis Giardina, Jackie
Smith
Miami-Dade County – Dallas Hazelton,
Gwen Burzycki
US Army Corps of Engineers – Jon Lane,
Jessica Spencer
South Florida Water Management District –
LeRoy Rodgers, Christen Mason,
Christina Stylianos, Manny Porras

Steering Committee

Big Cypress National Preserve – Tamara
Whittington
Biscayne National Park – Margaret Goodro
Buck Island Reef National Monument/
Christiansted National Historic Site/Salt
River National Historic Park and
Ecological Reserve – Joel Tutein
Canaveral National Seashore – Myrna
Palfrey
Desoto National Memorial – Nathan Souder

Everglades National Park/Dry Tortugas
National Park – Pedro Ramos
Fort Matanzas National Monument/Castillo
de San Marcos National Monument –
Gordie Wilson
Gulf Islands National Seashore – Daniel
Brown
Timucuan Ecological and Historic
Preserve/Fort Caroline National
Memorial – Chris Hughes
Virgin Islands National Park – Randy
Llanana

Great Lakes IPMT

Leadership

Isaiah Messerly (Liaison), Stephen Mull
(Crew Leader), Rebecca Key (Data
Manager), Tammy Keniry (Admin Officer),
Kelly Garrison (IT Support)

Region/Network Support

Midwest Region Office – Carmen Thomson
(GL-IPMT Supervisor)

Field Crew

Biological Technicians: Sarah Jasienowski,
Daniel Weipert
Conservation Corps of MN. and IA: Anna
Sertz, Ariana Severson

Park Field Crews

Apostle Islands National Lakeshore – Alice
Ahlfeld
Isle Royale National Park - Jennifer
Gendelman
Mississippi National River and Recreation
Area – Neil Smarjesse, Bridgette Timm,
Chris Macke
Saint Croix National Scenic Riverway –
Michael Rhoades, George Johnson,
Ryan Weigel
Sleeping Bear Dunes National Lakeshore -
Andrew Harmon

Park Support

See Steering Committee section
Additional Contacts: Dan Watson (IATR),
Pam Schuler (IATR), Neil Smarjesse
(MISS), Scott Weyenberg (SACN), Chris
Loudenslager (NOCO)

Partners and Cooperators

Conservation Corps of Minnesota and Iowa
Northwood Cooperative Weed Management
Area
St. Croix Red Cedar Cooperative Weed
Management Area
Grand Portage Reservation Tribal Council

Steering Committee

Bob DeGross, Superintendent, Voyageurs
National Park
David Horne, Superintendent, Pictured
Rocks National Lakeshore
John Anfinson, Superintendent, Mississippi
National River and Recreation Area
Julie Galonska, Superintendent, Saint Croix
National Scenic Riverway

Technical Committee

Apostle Islands National Lakeshore – Peggy
Burkman
Grand Portage National Monument –
Brandon Seitz
Ice Age National Scenic Trail – Dan Watson
Isle Royale National Park – Lynette Potvin
Indiana Dunes National Park – John
Kwilosz
Keweenaw National Historical Park - Steve
Delong
Mississippi River and Recreation Area –
Neil Smarjesse
North Country National Scenic Trail - Chris
Loudenslager
Pictured Rocks National Lakeshore – Bruce
Leutscher
St. Croix National Scenic Riverway – Scott
Weyenberg
Sleeping Bear Dunes National Lakeshore –
Julia Gehring
Voyageurs National Park – John Snyder

Gulf Coast IPMT

Leadership

Dale McPherson (Liaison),
Shea Bruscia (Florida / Caribbean IPMT
Data Manager)

Region/Network Support

Southeast Region – Mark Frey (Branch
Chief, Division of Science and Natural

Resources Management), Darrell Echols (Division Chief, Division of Science and Natural Resources Management), Christopher Barrow (Regional GIS Coordinator), Celinda Hicks and Demetria Smith-Wilson (Contracting Officers)
Gulf Coast Inventory and Monitoring Network – Martha Segura (Network Coordinator)

Park Support

Big Thicket National Preserve – Herbert Young, Andrew Bennett
Gulf Islands National Seashore – Erin Plitsch, Kelly Irick
Jean LaFitte National Historical Park and Preserve – Dusty Pate, Dave Fox, Gayan DeSilva
Natchez Trace Parkway – Deanna Boensch, Lisa McInnis
Palo Alto Battlefield National Historical Park – Rolando Garza
Padre Island National Seashore – Shelley Todd, Charles Sassine
San Antonio Missions National Historical Park – Greg Mitchell
Vicksburg National Military Park – Chuck Beightol, Rachel Davidson

Heartland IPMT

Leadership

Carmen Thomson (Regional I&M Program Manager), Mike DeBacker (Network Coordinator/Supervisory Ecologist), Gareth Rowell (Data Management Program Leader), Craig Young (Terrestrial Program Leader)

Crew

Jordan Bell (Project Coordinator), Jessica Salesman (Project Coordinator), Chad Gross (Cartographer/Data Manager)

Partners and Cooperators

Conservation Corps of Iowa

Region/Network Support

Midwest Region – Carmen Thomson (I&M Program Manager)

Board of Directors

Cuyahoga Valley National Park – Craig Kenkel (Superintendent)
George Washington Carver National Monument – Jim Heaney (Superintendent)
Herbert Hoover National Historic Site – Pete Swisher (Superintendent, Chair)
Homestead National Monument of America – Mark Engler (Superintendent)
Pea Ridge National Military Park – Kevin Eads (Superintendent)
Midwest Regional Office – Carmen Thomson (Regional I&M Program Manager)
Heartland Network – Mike DeBacker (HTLN Program Coordinator)

Technical Committee

Arkansas Post National Memorial – Kirby McCallie
Buffalo National River – Caven Clark
Cuyahoga Valley National Park – Meg Plona
Effigy Mounds National Monument – Rodney Rovang
George Washington Carver National Monument – Chris Reed
Herbert Hoover National Historic Site – Mike Wilson
Homestead National Monument of America – Jesse Bolli
Hopewell Culture National Historical Park – Bret Ruby
Hot Springs National Park – Shelley Todd
Lincoln Boyhood National Memorial – Mike Capps
Ozark National Scenic Riverways – Victoria Grant
Pea Ridge National Military Park – Nolan Moore
Pipestone National Monument – Seth Hendriks
Tallgrass National Preserve – Kristen Hase
Wilson's Creek National Battlefield – Gary Sullivan

Lake Mead IPMT

Leadership

Curt Deuser (Liaison), Tarl Norman (Crew Supervisor), Rachel Skoza (Data Manager), Andy Pigg (Crew Leader), Darrin Gobble (Crew Leader)

Crew

Anna Wheeler, Brandon Blackburn, Jessica McCulloch, Jamie Shurnitski, Corbin Gentzler, Mike Hittle, Matt D'Ambrosi, Katharine Lynch, Nick Prasser, James Roberts, Wayne Heideman, Andrew Barnes, Jason Harris, Hannah Andrascik, Joseph Ingram, Matthew Gorentz, Emily Cochran, John Myers, Lillian Setters, Maegan Stephenson, Grady Workman, Andrea Gibbens

Region Support

Pacific West Region Office – Jay Goldsmith, Denise Louie
Inter-Mountain Region Office – Mike Wrigley

Lake Mead NRA Host Park Support

Lila Klein (Acting Chief of Resource Management and Visitor Services), Sue Knowles (Administrative Assistant), Tammy Morris (Acting Administrative Officer), Scott Briggs (Budget Officer), Patrick Gubbins and Beth Ransel (Deputy Superintendent), Lizette Richardson and Margaret Goodro (Supt)

Park Support

Arches National Park and Canyonlands National Park (Southeast Utah Group): Liz Ballenger, Kelli Quinn
Joshua Tree National Park: Neil Frakes and Jane Rodgers
Death Valley National Park: Josh Hoines, Kirtsen Lund, Ali Ainsworth and Carol Fields
Bryce Canyon National Park: Eric Vasquez
Capitol Reef National Park: Sandra Borthwick and Terry Fisk
Great Basin National Park: Ben Roberts, Meg Horner, Julie Long
Mojave National Park: Andrew Kaiser and Debra Hughes

Zion National Park: David Firmage and Laura Schrage

Lake Mead NRA: Carrie Norman and Kelly Wallace

Parashant National Monument: Jennifer Fox

Pipe Spring National Monument: Brian Black

Manzanar National Historic Site: Jeff Burton, Dave Goto, Daron Hayes

Tule Springs Fossil Beds National Monument: Erin Eichenberg and Diane Keith

Organ Pipe Cactus NM: Jeanne Taylor

Partners and Cooperators

Bureau of Land Management - Southern NV District: JJ Smith, Sean McEldery, Tyler Hecht, and Tyler Warner

Battle Mountain District: Anna O'Brien and Brock Uhlig; Elko District: Sam Cisney; Cal Ridgecrest District: Alex Neibergs, Marty Dicks

US Fish and Wildlife Service - Desert NWR: Amy Sprunger; Cibola NWR: Ryan Munes.

US Forest Service - Spring Mountains NRA: Corrin Floyd; Coconino NF: Julia Camp and Katherine Landry

Bureau of Reclamation - Lower Colorado River Region: Bill Martin, Brandon Barrow, Andrew Trouette and Heidi McMaster. LCR MSCP Program: Jessica Stegmeier and John Swatzell.

Clark County, Nevada Desert Conservation Program - Muddy River Reserve: Caryn Wright; Boulder City Conservation Easement: John Brekke, Stefanie Ferrazzano

Clark County Wetlands Park and Nature Preserve – Liz Bickmore

Marine Corps Yuma Air Station - Bobby Law, Del Maslen, Richard Cerka, Randy English

University of Arizona - Jim Malusa and Max Li (Research Botanist)

Nevada Department of Wildlife - Anthony Miller

California Department of Wildlife - Aaron Johnson

Southern Nevada Water Authority - Nick Rice and Jason Eckberg.

Volunteers

Lamar and Daryl, fleet management

Mid-Atlantic IPMT

Leadership

Kate Jensen (Liaison), Nathan Wender (Crew Leader)

Crew

John Whitmoyer, Casey Allen, Michael Martin

Region Support

Northeast Regional Office – Casey Reese, Supervisor (Regional IPM Coordinator), Carmen Chapin (Chief Natural Resource Management)

Park Support

Host Park – Shenandoah National Park – Jennifer Flynn (Superintendent), Jim Schaberl (Chief, Natural and Cultural Resources), Jake Hughes (Biologist – Invasive Plants/Restoration), Solim Garcia (IT), Cary Wood (IT)
Appomattox Courthouse National Historical Park – Brian Eick
Appalachian National Scenic Trail – James Von Haden
Assateague Island National Seashore – Bill Hulslander, Jonathan Chase
Booker T. Washington National Monument – Timothy Sims
Cedar Creek and Belle Grove National Historical Park – Karen Beck-Herzog
Colonial National Historical Park – Dorothy Geyer
Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park – Gregg Kneipp
Gettysburg National Military Park and Eisenhower National Historic site – Zach Bolitho, Randy Krichten
George Washington Birthplace National Monument and Thomas Stone National Historic Site – Melissa Cobern, Tim Sveum

Hampton National Historic Site and Fort McHenry National Monument and Historic Shrine – Tina Capetta, Elizabeth Derr

Hopewell Furnace National Historic Site and Valley Forge National Historical Park – Amy Ruhe, Kate Jensen

New River Gorge National River, Bluestone National Scenic River, and Gauley River National Recreation Area – Bryan Wender

Petersburg National Battlefield – Tim Blumenschine

Richmond National Battlefield Park – Kristen Allen

Partners and Cooperators

Appalachian Trail Conservancy
Blue Ridge PRISM
Smithsonian Conservation Biology Institute
Jim Latane
Lawrence Latane
Potomac Appalachian Trail Club
Town of Elkton, VA

Volunteers

James Akerson
Blue Ridge PRISM

Steering Committee

Appomattox Courthouse National Historical Park – Brian Eick
Appalachian National Scenic Trail – James Von Haden
Booker T. Washington National Monument – Timothy Sims
Colonial National Historical Park – Dorothy Geyer
Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park – Gregg Kneipp
Gettysburg National Military Park and Eisenhower National Historic Site – Zach Bolitho
George Washington Birthplace NM and Thomas Stone National Historic Site – Melissa Cobern, Amy Muraca
Hampton National Historic Site – Tina Capetta, Elizabeth Derr

Hopewell Furnace National Historic Site and
Valley Forge National Historical Park –
Amy Ruhe, Kate Jensen
New River Gorge National River, Bluestone
National Scenic River, and Gauley River
National Recreation Area – Bryan
Wender, Lizzie Watts
Petersburg National Battlefield – Timothy
Blumenschine
Richmond National Battlefield Park –
Kristen Allen
Shenandoah National Park – Jim Schaberl

National Capital Area IPMT

Leadership

Mark Frey (Liaison), Alex Voznitza (Team
Leader/ Acting Liaison), Vacant (Data
Manager)

Crew

Allison Hay (Squad Leader), Nathan Finney
(Squad Leader), Wayne Heideman
(Squad Leader), Caroline Kittle, Tim
McNeil, Cara Giordano, Eric Brown,
Bonne Clark, Kyle Connelly, Nicole
Keefner, Clint Slocum, Jennifer Duvall,
Sornesarwanh Phongwarinr

Region Support

National Capital Region Office – Pat
Campbell (Chief of Natural Resources
and Science)
National Capital Region Office - Diane
Pavek (Research and T&E Coordinator)
National Capital Region Office - Elizabeth
Matthews (Regional I&M Program
Manager)

Park Support

Antietam National Battlefield – Joe
Calzarette (Natural Resources Program
Manager)
Appalachian National Scenic Trail – Jim
Von Haden (Integrated Resources
Program Manager)
Catoctin Mountain Park – Lindsey
Donaldson (Chief, Resources
Management), Becky Loncosky
(Biologist)

Chesapeake and Ohio Canal National
Historical Andrew Landsman (Natural
Resources Program Manager)
George Washington Memorial Parkway –
Brent Steury (Natural Resources
Program Manager), Mireya Stirzaker
(Biologist)
Harpers Ferry National Historical Park – Mia
Parsons (Chief, Resource Management),
Eric Kelley (Natural Resource Specialist),
Darlene Hassler-Godwin (Archeologist)
Manassas National Battlefield Park – Bryan
Gorsira (Natural Resources Program
Manager)
Monocacy National Battlefield– Andrew
Banasik (Natural Resources Program
Manager), Kaitlyn Parness (Biological
Science Technician)
National Capital Parks - East – Mike
Comisso (Chief, Resource
Management), Mikaila Milton (Biologist)
National Mall and Memorial Parks – Leslie
Frattaroli (Natural Resource Specialist)
Prince William Forest Park – Ken Ferebee
(Acting Chief, Resource Management),
Gregg Kneipp (Acting Chief, Resource
Management)
Rock Creek Park – Nick Bartolomeo (Chief,
Resource Management), Ana Chuquin
(Botanist)
Wolf Trap National Park for the Performing
Arts – Steve Hay (Facility Manager),
Walter McMurry (Gardener Supervisor)

Partners and Cooperators

Animal and Plant Health Inspection Service
– Matt Travis (APHIS State Program
Director)
Appalachian Trail Conservancy – Michele
Miller (Resource Program Manager) and
Marian Orlousky (Northern Resource
Management Coordinator)
United States Fish and Wildlife Service –
Phil Pannill (NCTC Land Manager)
Virginia Department of Conservation and
Recreation – Michael Lott (Crow's Nest
Manager/Northern Region Steward)
Anacostia Watershed Society – Jorge
Bogantes Montero (Natural Resource
Specialist)

NCR PRISM – Damien Ossi (Wildlife Biologist)

Volunteers (hours contributed)

Catalina Estrada (8), Allison Mastalerz (8), Katie Winkler (8), Jeff Corbin (8), Nicole Dutcher (4), Jesse Fujikawa (8), Tom Reyes (4), Dave Sperry (4), Lauren Kelly (5), Peggy Hammond (8), Connie Cowan (4), Lisa Arcila (4), Alex Zelles (4), Sylvan Kaufman (4), Alex Ashby (12), Chris Traft (4), Mary Randolph (4), Keith Coombs (4), Eric Walberg (5), Mary Nell Bryant (4), Laura Plaze (8), Rebecca White (4), Lindsay Ringer (4), Andrea Maquire (8), Sara McClure (4), Darcy Herman (12), Stephanie Martin (12), Lisa Stelzner (4), Chris Bischak (8), Jerod Myers (8), Steph Frederick (8), Letha Uzenski (8)

Steering Committee

Antietam National Battlefield – Joe Calzarette
Catoclin Mountain Park –Becky Loncosky
Chesapeake and Ohio Canal National Historical Park – Andrew Landsman
George Washington Memorial Parkway – Mireya Stirzaker
Harpers Ferry National Historical Park – Eric Kelley
Manassas National Battlefield Park – Bryan Gorsira
Monocacy National Battlefield– Andrew Banasik
National Capital Parks-East – Mike Comisso
National Mall and Memorial Parks – Leslie Fratarolli
Piscataway Park – Christine Smith
Prince William Forest Park – Gregg Kneipp
Rock Creek Park – Nick Bartolomeo
Wolf Trap National Park for the Performing Arts – George Liffert
NCR-IPMT Liaison – Mark Frey
Acting NCR - IPMT Liaison - Alex Voznitza
NCR Chief of Natural Resources and Science – Pat Campbell
NCR Integrated Pest Management Specialist – Dorothy Borowy
NCR Research Coordinator – Diane Pavek

NCR Inventory & Monitoring Network - Program Manager – Elizabeth Matthews

North Coast / Cascades Network IPMT

Leadership

Cheryl Decker (Liaison),
Sophie Wilhoit (Crew Lead and acting Data Manager),
Collin McAvinchey (Crew Lead)

Crew

David Riddell, Christine Davis, Miles Berkey (biotech seasonals)

Region/Network Support

Pacific West Region Office – Denise Louie, Irina Irvine

Park Support

Host Parks: North Cascades National Park – Karen Taylor-Goodrich (Superintendent), Jack Oelfke (Chief Resource Management); Olympic National Park – Sarah Creachbaum (Superintendent), Louise Johnson (Chief Resource Management); Ebey's Landing National Historical Reserve--Roy Zipp (Area Manager)

Partners and Cooperators

Clallum County Noxious Weed Control
Island County Noxious Weed Control
San Juan County Noxious Weed Control
Skagit County Noxious Weed Control
Olympic Peninsula knotweed working group (CWMA)
Skagit CWMA
Washington State Extension Service
The Nature Conservancy, Mt Vernon office
Whidbey Island Poison Hemlock working group
Trust Board of Ebey's Landing National Historical Reserve
Washington State Parks
Pacific Northwest Invasive Plant Council
Skagit Fisheries Enhancement Group
Quinault Nation
Washington Conservation Corps
Earth Corps
Pacific Rim Institute

Center for Natural Lands Management
North Sound Prairie Working Group

Steering Committee

Olympic National Park – Janet Coles,
Louise Johnson
North Cascades National Park – Mignonne
Bivin, Jack Oelfke
Mount Rainier National Park – Beth Fallon,
Kim Popeck
Lewis and Clark National Historical Park –
Carla Cole, Chris Clatterbuck
Ebey's Landing National Historical Reserve
– Roy Zipp
San Juan Island National Historical Park –
Elexis Freddy, Sara Dolan
Fort Vancouver National Historic Site –
Tracy Fortman

Northeast IPMT

Leadership

Casey Reese (NER IPM Coordinator), Brian
McDonnell (Liaison)

Crew

Michelle Stevens (Biotech Seasonal,
Samantha Fischbein, (Biotech
Seasonal, BOHA)

Region/Network Support

Northeast Regional Office – Casey Reese,
(NER IPM Coordinator); Carmen Chapin,
(NER Chief of Natural Resources)

Park Support

Allegheny Portage Railroad National
Historic Site – Doug Snaveley (JOFL
Maintenance) Brenda Wasler, (Natural
Resource Manager WEPA)
Boston Harbor Islands National Recreation
Area – Marc Albert, Andrew Petit de
Mange,
Cape Cod National Seashore – Stephen M.
Smith
Delaware Water Gap National Recreation
Area, host park – Larry Hilaire, Tom
Witter (DEWA VIP)
Fire Island National Seashore – Jordan
Raphael

First State NHP - Alan McLoughlin, Sonja
Werth
Flight 93 NM - Stephen Clark, Doug
Snaveley, Brenda Wasler
Frederick Law Olmsted National Historic
Site - Elliott Doughty
Gateway National Recreation Area – Doug
Adamo, Patricia Rafferty, Dana Filippini,
George Frame, Jeanne McArthur-Heuser
Home of Franklin D. Roosevelt National
Historic Site - Dave Hayes
Minuteman NHP - Margie Coffin-Brown,
Thomas Prior (intern)
Morristown National Historical Park –
Robert Masson
Sagamore Hill NHS - Scott Gurney, Kelly
Furhmann
Saratoga NHP - Chris Martin, Linda White,
Cindy VanDerwerker, Jeff Wells
Upper Delaware Scenic and Recreational
River – Don Hamilton, Jessica Newbern

Partners and Cooperators

Appalachian National Scenic Trail – Marian
Orlousky (Appalachian Trail
Conservancy (ATC)), Linda Rohleder
(New York-New Jersey Trail Conference
(also ATC))
Morristown National Historical Park - New
Jersey Invasive Species Strike Team

Northern Great Plains IPMT

Leadership

Brennan Hauk (Liaison), Carmen Thomson
(Supervisor)

Crew

Mark Slovek, Lee Vaughan, Anna Wheeler,
Megan Davenport, Zach Hoyer,
Montana Conservation Corps, Minnesota
Conservation Corps

Region/Network Support

Midwest Region Office – Carmen Thomson,
supervisor (I&M Program Manager)

Park Support

Host Parks - Badlands National Park and
Theodore Roosevelt National Park

Partners and Cooperators

Northern Great Plains I&M Network
Colorado State University
NRCS Bismark Plant Materials Center –
Wayne Duckwitz
USGS
Northern Great Plains Fire Management

Volunteers

Montana Conservation Corps
Minnesota Conservation Corps

Steering Committee

Badlands National Park – Eddie Childers
(Wildlife Biologist)
Ft. Union Trading Post National Historic Site
–Andy Banta (Superintendent)
Midwest Region I&M-IPMT Program
Manager – Carmen Thomson (I&M
Program Manager)
Niobrara National Scenic River – Steve
Thede (Superintendent)
Theodore Roosevelt National Park – Blake
McCann (Natural Resource Program
Manager)
Northern Great Plains Fire Management –
Dan Swanson (Fire Ecologist)
Wind Cave National Park – Greg Schroeder
(Natural Resource Program Manager)

Northern Rocky Mountain IPMT

Leadership

Steven Bekedam (Liaison), Molly Murphy
(Colorado National Monument Team
Leader), Gary Ludwig (Glacier National
Park Team Leader), Andrew Ringholz
(Yellowstone National Park Team
Leader)

Crew

Arley Canfield (GLAC biotech), Tyler Jack
(GLAC biotech), Russell Hicks (YELL
biotech), Dillon Gruver (MCC intern),
Shaina Nicassio (MCC intern)

Regional Support

Regional Office – John Mack (Biological
Resources Lead), Julie Ziruolo (Program
Administrative Assistant), Deborah
England (Budget Analyst)

Park Support

Host Parks - Colorado National Monument,
Glacier National Park, and Yellowstone
National Park
Bear Paw National Battlefield – Heidi Tamm
(Natural Resources Program Manager)
Bent's Old Fort NHS - Adam Heberlie
(Biological Science Technician)
Bighole National Battlefield – Jimmer
Stevenson (Maintenance Foreman)
Bighorn Canyon National Recreation Area –
Ryan Felkins (Natural Resource
Manager)
Black Canyon of the Gunnison NP –
Danguole Bockus (Park Biologist)
Capulin Volcano NM – Adam Heberlie
(Biological Science Technician)
City of Rocks National Reserve – Tara
McClure-Cannon (Chief, Integrated
Resource Management)
Colorado National Monument – Laura Jones
(Chief, Integrated Resource
Management)
Craters of the Moon National Monument
and Preserve – Linda Manning (Chief,
Integrated Resource Management), 6
members of the CRMO vegetation crew
Curecanti National Recreation Area –
Danguole Bockus (Park Biologist)
Dinosaur National Monument – Emily
Spencer (Park Biotech),
Florissant Fossil Beds National Monument –
Seth Maile (Lead Park Ranger)
Fossil Butte National Monument – Arvid
Aase (Archaeologist)
Glacier National Park – Dawn LaFleur (IPM
Biologist), Matt Kennedy (GLAC Crew
Leader), Debbie Gilk (Administrative
Assistant)
Golden Spike National Historic Site – Leslie
Crossland (Park Superintendent)
Grant-Kohrs Ranch National Historic Site –
Jason F. Smith (Natural Resource
Specialist)
Grand Teton National Park – Jason
McDannold (GRTE Invasive Plant Lead)
Great Sand Dunes National Park Hagerman
– Dewane Mosher (Park Biologist)
Fossil Beds National Monument – Linda
Manning (Chief, Integrated Resource
Management)

FY2019 Invasive Plant Management Team – Program Participants, cont.

John D. Rockefeller Memorial Parkway –
Jason McDannold (GRTE Invasive Plant
Lead)

Little Bighorn National Battlefield – Wayne
Challoner (Park Superintendent),
Mariane Doane (Biologist)

Minidoka National Historic Site – Linda
Manning (Chief, Integrated Resource
Management)

Rocky Mountain National Park – Jim
Bromberg (Vegetation Ecologist), 5
members of ROMO vegetation crew

Sand Creek Massacre National Historic Site
– Adam Heberlie (Biological Science
Technician)

Yellowstone National Park – Roy Renkin
(Vegetation Ecologist), Sue Mills (Natural
Resource Specialist), Alana Darr
(Administrative Assistant), Brian Teets
(North District Crew Leader), Vince
Nagashima (Lake District Crew Leader)

Partners and Cooperators

American Conservation Experience –
Jordan Rolfe

Box Elder County (UT) Cooperative Weed
Management Area – Steve Johnson,
weed superintendent

Montana Conservation Corps – Chris
Nesset, Dillon Pride

Southwest Conservation Corps – Anna
Hendricks, Dylan Lang

University of Montana, Dr. Peter Rice
(retired)

US Forest Service, Custer Gallatin NF –
Sheri Renck

Utah Conservation Corps – Greta
Langenheim

Wyoming Game and Fish Department -
Jerry Altermatt

Steering Committee

Bear Paw National Battlefield – Heidi Tamm

Bent's Old Fort NHS - Adam Heberlie
Bighole National Battlefield – Jimmer
Stevenson

Bighorn Canyon National Recreation Area –
Ryan Felkins

Black Canyon of the Gunnison NP –
Danguole Bockus

Capulin Volcano National Monument –
Adam Heberlie

City of Rocks National Reserve – Tara
McClure-Cannon

Colorado National Monument – Laura Jones

Craters of the Moon National Monument
and

Preserve – Linda Manning

Curecanti National Recreation Area –
Danguole Bockus

Dinosaur National Monument – Emily
Spencer

Florissant Fossil Beds NM – Seth Maile

Fossil Butte National Monument – Arvid
Aase Glacier National Park – Dawn
LaFleur

Golden Spike National Historic Site – Leslie
Crossland

Grand Teton National Park – Jason
McDannold

Grant-Kohrs Ranch National Historic Site –
Jason Smith

Great Sand Dunes NP and Preserve –
Dewane Mosher

Hagerman Fossil Beds National Monument
– Linda Manning

John D. Rockefeller Memorial Parkway –
Jason McDannold

Little Bighorn Battlefield National Monument
– Wayne Challoner

Minidoka National Historic Site – Linda
Manning

Rocky Mountain National Park – Jim
Bromberg

Sand Creek Massacre National Historic Site
– Adam Heberlie

Yellowstone National Park – Sue Mills

NRM IPMT Liaison – Steven Bokedam

Regional Biological Resources Program
Lead – John Mack

Pacific Islands IPMT

Leadership

Jeremy Gooding (Liaison), Steve Robertson
(Chief, Integrated Resources
Management Division, Haleakalā
National Park), Dr. Rhonda Loh (Acting
Superintendent, Hawai'i Volcanoes
National Park), David Benitez (Ecologist,
Hawai'i Volcanoes National Park),

Woody Mallinson (Natural Resource Program Manager, Haleakalā National Park)

Field Crews (Parks and Partners)

Hawai'i Volcanoes National Park Natural Resources Management: Jon Maka'ike and Dwayne Montoya-Aiona, Crew Leads and the RM Crew

Haleakalā National Park Vegetation Management: Stacey Torigoe, Biologist. Michelle Osgood, Horticulturalist. Jon Marshall, Data Manager Maui Program Student Conservation Association (SCA): Leila Morrison, Allie Brunet-Giambalvo, Andrew DellaVilla

Partner Parks - Resource Management Staff and Leads at Kalaupapa National Historical Park, Kaloko-Honokōhau National Historic Park, & Pu'uhonua o Hōnaunau National Historic Park

Big Island Invasive Species Committee (BIISC) Field Crews

Region/Network Support

Pacific West Regional Office – Denise Louie (Acting Chief, Natural Resources), Brent Johnson (Vegetation Ecologist & IPM Coordinator)

Pacific Islands Office – Melia Lane-Kamahele (Manager)

Park Support

Haleakalā National Park – Jenna Fish
Hawai'i Volcanoes National Park – Malia Banashek

Partners and Cooperators

Partner Parks - Haleakalā National Park (Host), Hawai'i Volcanoes National Park, Kalaupapa National Historical Park, Kaloko-Honokōhau National Historic Park, Pu'uhonua o Hōnaunau National Historic Park, Pu'ukoholā National Historic Site

University of Hawai'i, Hilo (UHH) – Dr. Ryan Perroy, Associate Professor, Geography and Environmental Science

University of Hawai'i, Mānoa (UHM) – Dr. Clifford Morden, Professor, Botany and Center for Conservation Research and Training

University of Florida (UFL) – Dr. James Leary, Assistant Professor, Center for Aquatic and Invasive Plants

KUPU – See: <https://www.kupuhawaii.org/>
Leeward Haleakalā Watershed Restoration Partnership (LHWRP) – See: <http://lhwrp.org/>

Plant Extinction Prevention Program (PEPP), Hawai'i – Hank Oppenheimer (Maui Nui PEPP Coordinator)

Maui Invasive Species Committee (MISC) & Molokai-Maui Invasive Species Committee (MoMISC) Partners & Affiliates – See: <https://mauiinvasive.org/>
East Maui Watershed Partnership (EMWP)- Hawai'i Department of Land and Natural Resources, Haleakalā Ranch, County of Maui Department of Water Supply, The Nature Conservancy Hawai'i, East Maui Irrigation, University of Hawai'i PCSU, Haleakalā National Park

Three Mountain Alliance – University of Hawai'i PCSU, Hawai'i Department of Public Safety, Hawai'i Department of Land and Natural Resources, Kamehameha Schools, National Park Service, The Nature Conservancy, US Fish and Wildlife Service, USDA Forest Service, US Geological Survey, USDA Natural Resources Conservation Service

Volunteers

VIPs (Dave Stimson, Allie Giambalvo, Leila Morrison)

Friends of Hawai'i Volcanoes National Park, Hawai'i Ocean View Community Association (OVCA), Paul and Jane Field Friends of Haleakalā National Park, Ron Nagata Ohana, AmeriCorps

VIPs (Dave Stimson, Allie Giambalvo, Leila Morrison)

Steering Committees

Maui Nui (Islands of Maui, Molokai, Lanai, & Kahoolawe) - Liaison Pacific Islands IPMT, Resources Management Chief Haleakalā National Park, Active Members of Maui Invasive Species Committee, Manager Molokai Invasive Species Committee, Resources Management Chief Kalaupapa National Historical Park, relevant subject experts as appropriate

Island of Hawai'i (Big Island): Resources Management Chief, Park Ecologist, and Pest Control Workers from Hawai'i Volcanoes National Park, Resources Management Chief Kaloko-Honokōhau and Pu'uuhonua o Hōnaunau National Historical Parks, Staff at Pu'ukoholā National Historic Site, relevant subject experts as appropriate

Southeast IPMT

Leadership

Nancy Dagley (Liaison), Lauren Serra (Acting Liaison), Toby Obenauer (Crew Leader)

Crew

Daniel Beatty, David Arcuri, Dylan Lockwood

Region/Network Support

Southeast Region Office – Mark Frey, Darrell Echols (Science and Natural Resources), Brian Lockwood, Shea Bruscia (FLC-IPMT)

Park Support

Abraham Lincoln Birthplace National Historical Park – Jennifer Jones
Andrew Johnson National Historic Site – Vacant
Big South Fork National River & Recreation Area – Marie Tackett
Blue Ridge Parkway – Bambi Teague
Carl Sandburg Home National Historic Site – Irene Van Hoff
Chickamauga & Chattanooga National Military Park – Jim Szykowski

Cowpens National Battlefield – Sarah Cunningham
Cumberland Gap National Historical Park – Jenny Beeler
Fort Donelson National Battlefield – David Hamby
Guilford Courthouse National Military Park – Vicki Boyce
Great Smoky Mountains National Park – Kris Johnson
Kings Mountain National Military Park – Sarah Cunningham
Little River Canyon National Preserve – Mary Shew
Mammoth Cave National Park – Tim Pinion, Brice Leech
Ninety Six National Historic Site – Sarah Cunningham
Obed Wild & Scenic River – Marie Tackett
Russell Cave National Monument – Mary Shew
Shiloh National Military Park – Marcus Johnson
Stones River National Battlefield – Brenda Waters

Partners and Cooperators

Appalachian Trail Conservancy
American Conservation Experience
North Carolina Exotic Pest Plant Council
South Carolina Exotic Pest Plant Council
SC Cogongrass Taskforce
SE Exotic Pest Plant Council
South Carolina Native Plant Society
North Carolina Native Plant Society
Appalachian Highlands I&M Network
Cumberland Piedmont I&M Network
North Carolina Forestry Commission
USDA National Forests of NC
USDA APHIS Columbia SC
Federal Highways Administration
Steering Committee
Big South Fork National River & Recreation Area/Obed – Marie Tackett
Chickamauga & Chattanooga National Military Park – Jim Szykowski
Cumberland Gap National Historical Park – Jenny Beeler
Little River Canyon National Preserve/Russell Cave – Mary Shew

Southeast Coast IPMT

Leadership

Lauren Serra (Liaison), Amorita Brackett
(Crew Leader)

Crew

Jennifer Ward, Connor Rogers, Rebecca
Ravago, Nathan Henry, Karleigh
Kershner, Hayden Casey (American
Conservation Experience Interns)

Region/Network Support

Southeast Region Office – Mark Frey,
Darrell Echols (Science and Natural
Resources), Christopher Barrow (GIS
Coordinator/ Geographer), Nancy
Dagley, Toby Obenauer (SE-IPMT),
Brian Lockwood, Shea Bruscia (FLC-
IPMT)

SECN Inventory & Monitoring Division -
Brian Gregory (Program
Manager/Aquatic Ecologist), Forbes
Boyles (Botanist)

Appalachian/Piedmont Fire Management
Zone – Wylie Paxton, Rob Klein, Chris
Corgan

BRD's Invasive Plant Program

Park Support

Host Park Congaree National Park – K Lynn
Berry (Superintendent), Liz Struhar
(Chief, Resource Management), Theresa
Yednock (Biological Science
Technician), Laura Tyler (Administrative
Officer), Alice DaRosa (Administrative
Support Assistant), John Torrence and
Leona McManus (Maintenance),
Jonathan Manchester and Greg
Cunningham (Interpretive Park Ranger),
Kellie Weidinger (Americorps Stewards),
Sean Kelsay (SCA Intern), ACE Crew
(Resource Management)

Cape Hatteras National Seashore/Fort
Raleigh National Historic Site/Wright
Brothers National Monument – Dave
Hallac (Superintendent), Tracy Ziegler
(Chief of Resource Management and
Science), Stacey Sigler (Safety, Health
and Wellness Program Manager),
Sabrina Henry (Environmental Protection

Specialist), Konrad Losch (GIS Program
Manager), William P Thompson
(Biological Science Technician
Cape Lookout National Seashore – Jeffrey
West (Superintendent), Jon Altman
(Biologist)

Chattahoochee River National Recreation
Area - Deanna Greco (Chief, Planning
and Resource Management), Allyson
Read (Biologist)

Cumberland Island National Seashore –
Doug Hoffman (Biologist), John Fry
(Chief, Resource Management), Jim
Osborne (Boat Operator)

Fort Frederica National Monument –
Michael Seibert (Chief, Resource
Management), Steve Theus (Site
Manager)

Fort Pulaski National Monument – Melissa
Memory (Superintendent), Candice
Wyatt (Biological Science Technician),
Emily Harte (Chief of Facilities and
Resource Management), Ivan Lum
(Maintenance)

Fort Sumter National Monument (Fort
Moultrie)/Charles Pinckney National
Historic Site – Tracy Stakely
(Superintendent), Benjamin Byrnes
(Chief Ranger, Visitor & Resource
Protection)

Horseshoe Bend National Military Park –
Barbara Tagger (Superintendent),
Tammie Renicker (Administrative
Officer), Eric Frey (Park Ranger), Brian
Robinson and Steve Crowder
(Maintenance)

Kennesaw Mountain National Battlefield
Park – Nancy Walther (Superintendent),
Carlos Hurston (Facility Manager)

Moore's Creek National Battlefield –
Matthew Woods (Superintendent),
Michael Glenn and Isabelle Barnhill
(Maintenance)

Ocmulgee Mounds National Historical Park
– Jim David (Superintendent), Kevin
Wyrick (Chief, Operations), Allen
Huckabee (Biotech)

Out-Of-Network Park Support

Kings Mountain National Battlefield - Alex Scronce (Forestry Technician), Chris Revels (Chief Ranger)

Partners and Cooperators

University of Georgia – Nancy O'Hare (SEC-EPMT Data Manager)
American Conservation Experience - Peter Woodruff, Zoe Gordon, Madison Douthitt
Old-Growth Bottomland Forest Research and Education Center - David Shelley (Director)
Kennesaw Mountain Trail Club
South Carolina Exotic Pest Plant Council - David Jenkins (President)
South Carolina Native Plant Society Upstate Chapter - Eva Pratt, Janie Marlow, Dan Whitten
South Carolina Association of Naturalists
North Carolina Invasive Plant Council
North Carolina Department of Transportation
North Carolina Coastal Federation, Phragmites Task Force
North Carolina Department of Environment and Natural Resources - Rob Emens (NC Aquatic Weed Society)
Georgia Forestry Commission - Chip Bates, Bill Harvey, Mark McClure (Forest Health)
TNC Adirondacks - Zachary Simek
Garden Club of America, Palmetto Garden Club

Volunteers

Chattahoochee River National Recreation Area – Dave Pollic, Lori Backer, Lyn (Cheryl) Watts, Ashley Turner
Congaree National Park - Keith A. Bradley (Botanist), Dane and Holly Cole, Jim Boylston, Hank Sully, Glenda Swearingen, Ft Jackson, Palmetto Garden Club
Kennesaw Mountain National Battlefield Park – Danny Leigh and Harry Carpenter (Kennesaw Mountain Trail Club)
Ocmulgee National Monument – Ron Hoppel, Christina McCullars

Steering Committee

Chattahoochee River National Recreation Area – Deanna Greco
Congaree National Park – K Lynn Berry
Cumberland Island National Seashore – John Fry
Fort Pulaski National Monument – Melissa Memory
Moore's Creek National Battlefield – Matthew Woods

Southwest IPMT

Leadership

Jason Martin (Liaison),
Jeanine Foley (Crew Leader/GIS),
Chris Davis (Crew Leader/GIS),
Marcus Jernigan (Botanist/GIS)

Crew

American Conservation Experience,
Southwest Conservation Corps
(Conservation Legacy and Ancestral Lands Programs), Sky Island Alliance,
Borderlands Restoration,

Regional/Network Support

Intermountain Region Office John Mack, supervisor (Natural Resources Division, Biological Resource Program Manager), John Nelson (IPM Coordinator)

Park Support

Host Park 1 – Desert Research Learning Center/Sonoran Desert Inventory and Monitoring Program – Andy Hubbard (Program Manager)
Host Park 2 – Valles Caldera National Preserve - Jorge Silva-Banuelos (Superintendent), Robert Parmenter (Chief Science and Resource Management)

Partners and Cooperators

US National Park Service, Inventory and Monitoring Program (Federal)
American Conservation Experience
Arizona Youth Conservation Corps
Sky Island Alliance (Arizona, New Mexico, NGO)
University of Nevada, Las Vegas

FY2019 Invasive Plant Management Team – Program Participants, cont.

Borderlands Restoration, L3C (Arizona)
Cuenca Los Ojos (Mexico)
University of Arizona Cooperative Extension
Institute for Applied Ecology–Southwest
Program (NGO)
Madrean Archipelago Plant Propagation
Center (MAPP)
Natural Resources Conservation Service,
Los Lunas PMC (New Mexico)
Natural Resources Conservation Service,
Tucson PMC (Arizona)
Santa Ana Pueblo Nursery
US Fish and Wildlife Service (Federal)
US Forest Service, Coronado National
Forest (Federal)
US Forest Service, Region 3 (Federal)
US Bureau of Land Management (Federal)
US National Park Service, Desert Research
Learning Center (Federal)
The Xerces Society (National, NGO)
Fred Phillips Consulting (Flagstaff, AZ)
Yuma Crossing Natural Heritage
Corporation

Volunteer

AmeriCorps, American Conservation
Experience, Arizona Youth Conservation
Corps, Sky Island Alliance, Borderlands
Restoration

Steering Committee

Carlsbad Caverns National Park – Rodney
Horrocks
Mesa Verde National Park – Tova Spector
Montezuma Castle National Monument –
Tina Greenawalt
El Malpais/El Morro National Monuments –
Eric Weaver
Washita Battlefield National Historic Site –
Dick Zahm
Saguaro National Park – Jeff Conn
Petrified Forest National Park – Bill Parker
Aztec Ruins National Monument – Dana
Hawkins
Intermountain Region Office – John Mack
National Invasive Plant Management Team
– Terri Hogan