Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

EPMT Annual Report: FY 2017

Exotic Plant Management Teams.

Background

Management of invasive species, a National Park Service (NPS) and president's mandate via Executive Orders 13112 and 13751, is conducted by park staff and 17 Exotic Plant Management Teams (EPMT). These EPMTs are located across the U.S. and serve 287 park units, as well as many non-NPS partners. The EPMTs were formed in 2000 through the Natural Resource Challenge to assist parks in reducing the impact of invasive plants and restoring native plant communities. Over time, the EPMT program has become an integral part of the NPS response to a growing invasive species threat and a source of expertise in invasive plant management not otherwise available in most parks.

Science

EPMTs again provided resources to aid in invasive species research at the parks. The **Northeast EPMT** participated in studies sponsored by Bayer Environmental Sciences to determine the effectiveness of controlling Japanese stiltgrass (*Microstegium vimineum*) with the herbicide indaziflam at Morristown National Historic Park. Current results did not show indaziflam to be successful; however, another herbicide applied, pendamethalin, did appear to control the stiltgrass. The **Southwest EPMT** also continued to conduct research with parks and partners, including the University of Nevada, Las Vegas, Glen Canyon National Recreation Area, Pecos National Historical Park, Tuzigoot National Monument, and Guadelupe Mountains National Park to identify effectiveness of invasive plant treatments.

Restoration of Large Landscapes

Recognizing the importance of protecting resources across jurisdictions, the EPMTs continued to provide valuable input to invasive species management on large landscapes with their partners.

Along with the Bureau of Land Management and U.S. Geological Survey (USGS), **Lake Mead EPMT** implemented restoration in federally threatened desert tortoise (*Gopherus agassizii*) habitat in the Mojave Desert. Restoration will include revegetating 12 project sites across the Mojave Desert and controlling invasive nonnative grasses within and near those sites.

Both **Northern Great Plains** and **Northern Rocky Mountain EPMTs** are collaborating with the USGS, Northern Great Plains Inventory and Monitoring Network, Northern Great Plains Fire Management, and several NPS units to identify best management practices for controlling invasive annual grasses. Treatment research has been conducted at Scotts Bluff National Monument, and Badlands and Wind Cave National Parks. Further, seed materials and storage facilities are being identified.

The **North Coast-Cascades Network EPMT** has also been involved in large landscape restoration through vegetation restoration efforts in the Elwha River riparian zone. The removal of the Elwha River Dam in 2012 re-opened the river to salmon for the first time in over a century. Maintaining natural vegetation will be important for the health of the salmon population in the future.

NPS fire effects and USGS staff calibrating survey methods for annual brome abundance at Wind Cave National Park. NPS photo.

Alaska EPMT staff surveying at Reeves Field in Wrangell-St. Elias National Park. NPS photo.

Success Stories

In FY2017, the EPMTs celebrated many successes through Early Detection Rapid Response (EDRR) efforts, partnerships, and multi-year treatments.

EDRR proved effective this year. Southeast and Southeast Coast EPMTs' increasing EDRR efforts led to the eradication of six species that were new to parks. The Heartland EPMT worked with the Ozark Fire Ecology group on a project for detecting and eliminating invasive species after a prescribed burn at Hot Springs National Park. They were able to eradicate incipient populations before they became established.

Work conducted under partnerships were also fruitful. In cooperation with the Alaska Department of Transportation, the Alaska EPMT reduced the density of invasive plant infestations in rights-of-way near parks, including reducing bird vetch (*Vicia cracca*) by 74% near Denali National Park & Preserve and white sweet clover (*Melilotus albus*) by 60% near Wrangell-St. Elias National Park & Preserve. The North Coast-Cascades Network EPMT successfully partnered with the Quileute Nation and Clallam County to control knotweed (*Polygonum* spp.) along rivers in the Olympic Peninsula. Work at one site had been conducted since 2002, but this year the amount of follow-up work required was drastically reduced.

Finally, a number of teams successfully controlled invasive plant invasions. A California EPMT funded crew successfully brought invasive conifer levels down to maintenance level at Golden Gate National Recreation Area. The Florida/Caribbean EPMT saw results in multiple years of control at Biscayne National Park. Additionally, the Mid-Atlantic EPMT reduced an infestation of wavyleaf basketgrass (*Oplismenus hirtellus* ssp. *undulatifolius*) from eight to two acres at Thomas Stone National Historic Site. After ten years, the National Capital Region EPMT found zero giant hogweed (*Heracleum mantegazzianum*) individuals on lands adjacent to Rock Creek Park.

Safety

The EPMTs continued to exemplify safety in the field. Safety continued to be an important topic during monthly EPMT meetings, and teams ensured that their crews and others were well-trained and aware of safety issues. For instance, the Great Lakes EPMT provided utility terrain vehicle, chainsaw, and herbicide safety and

Safety (cont.)

application training to its partners. The Southeast EPMT provided all-terrain vehicle Safety Institute certification and safe power tool use and herbicide training to park staff and volunteers. The Pacific Islands EPMT routinely leads safety and operational briefings, employs Operational Leadership principles, and performs near miss reviews and risk assessments for project work.

Summarized Data for 2017

Measure	Acres
Treated	8,937
Inventoried/Monitored	169,057
Gross Infested Area	133,658
Net Infested Area	3,718
Youth Engagement	
Total Number of Youth Participants and Youth Employees	1,431
Total Hours for Youth Participants and Youth Employees	149,664

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Alaska EPMT Annual Report: FY 2017

Peter Frank surveys for non-native, invasive vegetation via ATV on a trail that cuts through Reeves Field in Wrangell-St. Elias National Park and Preserve. NPS Photo.

Background

The Alaska Exotic Plant Management Team (EPMT) provides invasive plant management assistance to 16 national parks in Alaska. These parks cover more than 52 million acres of high quality natural areas and wilderness, including coastal fjords, glacial valleys, tundra, and boreal forests. The majority of national parks in Alaska contain healthy, intact, native ecosystems with few invasive plants; 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. Recreation use is widely dispersed with access only 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, treat, and manage. Therefore, the Alaska EPMT program relies heavily on information, knowledge, and participation from park staff.

This year, the team conducted invasive plant surveys and control in seven park units: Alagnak Wild River, Denali National Park & Preserve (DENA), Glacier Bay National Park & Preserve, Katmai National Park & Preserve (KATM), Kenai Fjords National Park (KEFJ), Klondike Gold Rush National Historical Park and Wrangell-St. Elias National Park & Preserve (WRST). The team included the Liaison, Data Manager, two NPS Biological Science Technicians, and seven Student Conservation Association (SCA) interns stationed at five parks. Volunteers and SCA youth crews focused on specific projects and assisted the team.

Program Highlights

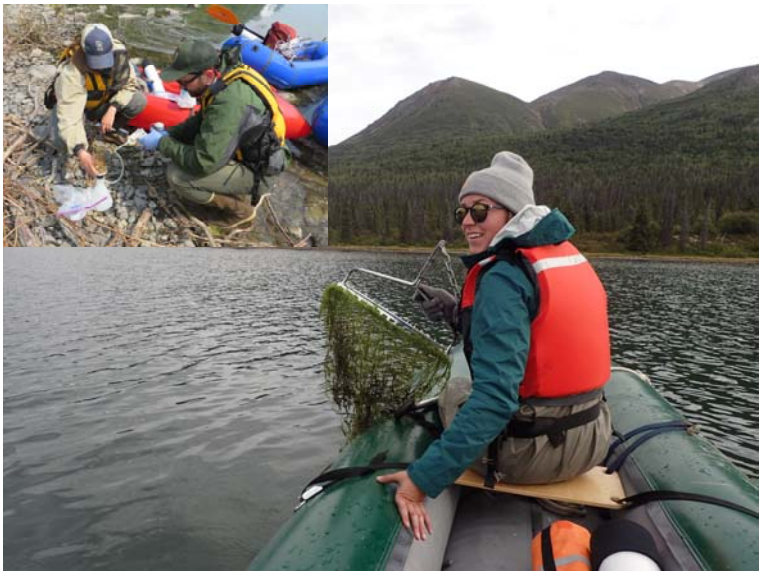
Partnership Efforts to Manage Invasive Plants

Many infestations of highly invasive plants lie just outside park boundaries. It is a priority to prevent these species from establishing in parks. Therefore, partnerships and cooperative efforts are essential. In cooperation with the Alaska Department of Transportation (DOT), the team conducted chemical control work for the second year in right-of-way areas adjacent to DENA and WRST.

The team conducted chemical treatments for the second year on several infestations of *Vicia cracca* (bird vetch) and initial chemical treatments on *Melilotus officinalis* (white sweet clover, synonym *Melilotus albus*) in DOT right-of-way areas adjacent to DENA. Overall, bird vetch infested area acreage and density was reduced by 74% (after the initial 2016 treatment), which allowed time to expand species targeted for treatment to include white sweet clover.

For the second year, the team partnered with the Copper River Watershed Project to control 12.5 gross infested acres of white sweet clover in right-of-way areas adjacent to the Slana section of WRST. Overall, white sweet clover infested acreage and density was reduced by 60% (after the initial 2016 treatment). To put this initial success in perspective, prior years' manual treatments, conducted annually, produced many thousands of pounds of plant material to be disposed of, required several hundred hours of work and achieved no success in reducing the density or spread of this species.

Crew spraying invasive plants on the Exit Glacier Outwash Plain in Kenai Fjords National Park. NPS Photo.



Rake-throw surveys for aquatic invasive plants in WRST. Insert: Water samples being processed to detect the presence/absence of *Elodea* spp. environmental DNA (eDNA) in KEFJ. NPS Photos.

Program Highlights (cont.)

Control Effort Successes in the Backcountry at KEFJ & KATM

The Outwash Plain site is located east of the terminus of Exit Glacier and south of Exit Creek in KEFJ. Here, nearly 18 gross infested acres of *Taraxacum officinale* (common dandelion) were first treated in 2011. Getting to the site can be very challenging, requiring wading through braided creek channels, hiking over glacial moraines and bushwhacking through thick alder, willow and cottonwood. Swift water and changing channelization can create dangerous crossing situations that have prohibited accessing the site in some years, leaving the plants untreated. In spite of these challenges, the crew has reduced the overall infestation density to 51 percent since the site was first treated.

The Fure's Cabin site is located within the Bay of Islands in KATM's backcountry. It is very remote and can only be accessed by boat or floatplane. The crew's ability to conduct several retreatments throughout the season for the last two years has contributed to the successful control of common dandelion at this site. Overall density of the infestation has been reduced by 55 percent since treatments began in 2011.

Summary of Accomplishments

Summary of Accomplishments

NPS staff, interns, volunteers, and youth crews surveyed approximately 410 acres and treated 14 net acres in six park units this year. Youth contributed more than 12,000 hours to EPMT projects. More than 100 volunteers assisted park staff in manual control efforts, native seed collection and outreach invasive plant pull events. Close to 6000 lbs. of invasive plant material were removed and 81 lbs. of native seed were collected for use in future restoration projects. A total of 22 fresh water bodies (13 in KATM, eight in WRST, and one in KEFJ) were surveyed via rake-throw for the presence of *Elodea* spp. with none found. *Elodea* spp. environmental DNA (eDNA) water samples were also collected and processed at these sites to provide a second level of detectability.

Summarized Data for 2017

Measure	Acres
Treated	14
Inventoried/Monitored	410
Gross Infested Area	265
Net Infested Area	31
Youth Engagement	
Total Number of Youth Participants and Youth Employees	62
Total Hours for Youth Participants and Youth Employees	12120

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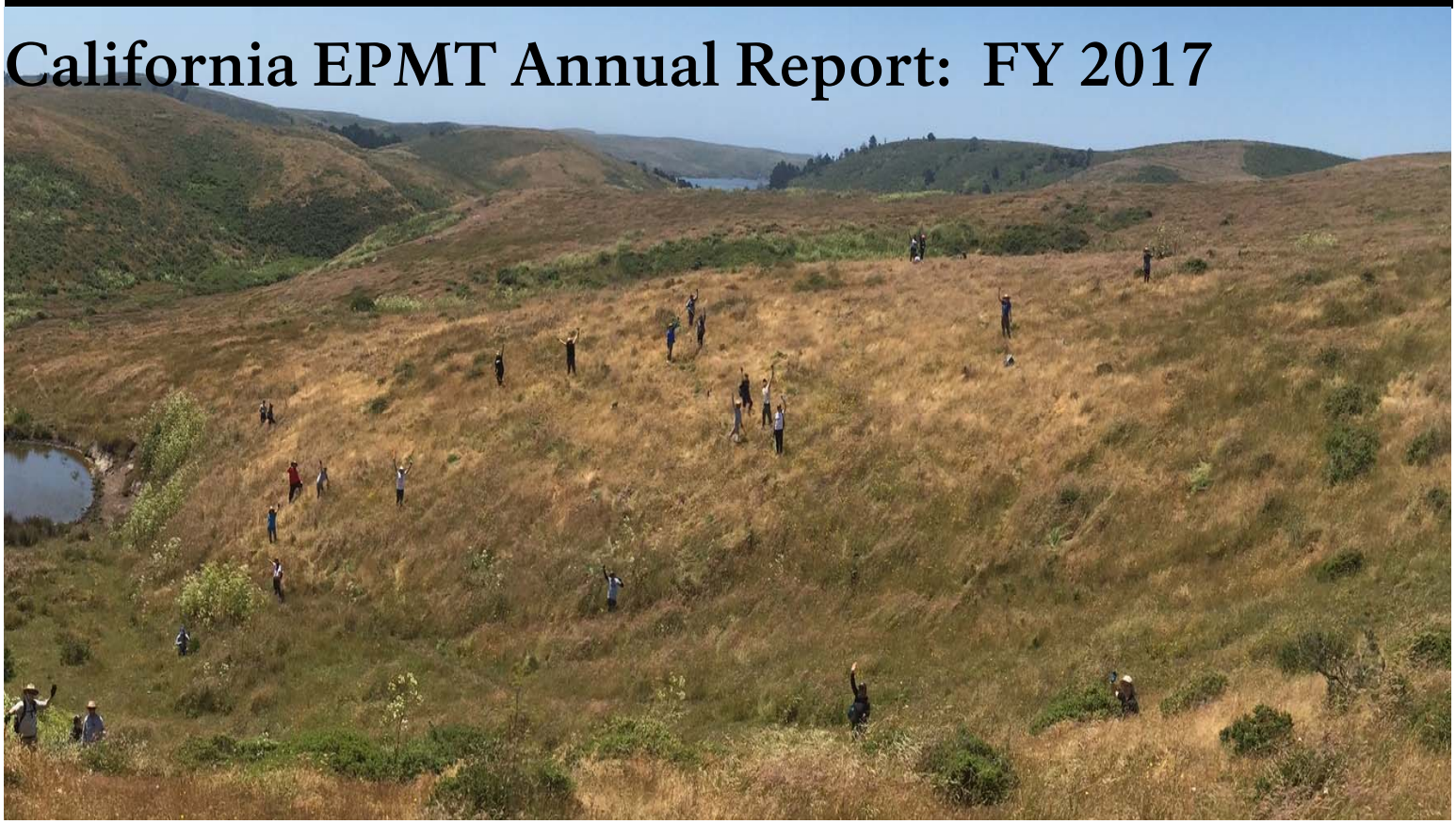
Natural Resource Stewardship and Science
Biological Resources Division

California EPMT Annual Report: FY 2017



Linking Individuals to their Natural Community (LINC) and Golden Gate National Parks Conservancy volunteering at Point Reyes National Seashore pulling broom seedlings. NPS Photo.

Background

The California Exotic Plant Management Team (EPMT) serves 14 parks that are located within the California Floristic Province. This region is one of 25 world biodiversity hotspots. Of 7,031 vascular plants found in California, one third are endemic species that are found nowhere else in the world (https://www.revolvy.com/main/index.php?s=California%20Floristic%20Province)! Invasive plants and their treatments are often complex, as project sites range from high altitude Yosemite National Park, to landscape scale projects at Redwoods National Park. The state spends at least $82 million annually for outreach, control, and monitoring of invasive plants (Cal-IPC: http://www.cal-ipc.org/holding-pen/cost/). The California EPMT program operates a grant program and provides project management and implementation, and technical assistance. This model fosters enhanced project management flexibility by allowing managers to opportunistically capitalize on the strengths of each park to carry out strategically effective treatments. Programmatic flexibility helps parks that have challenging treatment timing issues and outside practitioner expertise needs. Although this program is most known for its grant model, 17% of fiscal year (FY) 17 net acres were managed directly by EPMT staff at the host park, Point Reyes National Seashore, and much of the field work for the two projects was made possible with leveraged funding. This season's highlights feature two parks that had the lowest cost of treatment per acre and the largest gross acres of invasive plant cover.

Program Highlights

Confronting Post-Fire Landscape Changes at Lassen Volcanic NP

Lassen Volcanic National Park protects over 75,000 acres of wilderness with few invasive plant species. After the 2012 Reading Fire burned over 16,000 acres of the park, a Burned Area Rehabilitation (BAR) project included surveying areas that burned at high-severity. Three subsequent years of drought delayed the post fire bull thistle (*Cirsium vulgare*) response well beyond the scope of the existing BAR funding parameters. Bull thistle is a primary post fire and disturbance species and in this case was explosive in FY16-17. Timely and critical EPMT funding enabled the park to leverage drought mitigation funding in a partnership with the Red Bluff's Job Training Center. The park hired long-term unemployed and displaced workers, and trained them in restoration methods. With EPMT seed funding, leveraging, and their partnerships, the park successfully surveyed 548 acres, treated 84 acres, and mapped 38 new acres of infestation. Over the next five years, the park is planning to apply prescribed fire in the Reading Fire footprint. This holistic approach will include a focus on heavily reseeding treatment areas with native species, like coyote mint (*Monardella odoratissima*) to benefit pollinators, and grasses, like western needlegrass (*Achnatherum occidentale*) to stabilize degraded landscapes with perennial cover. Reseeding the area is expected to reverse the anticipated damage by wildfire and thistle invasion.

Mapping invasive plants after the Reading Fire at Lassen Volcanic National Park. NPS photo.

Non-native conifer removal at Golden Gate National Recreation Area. NPS photo.

Program Highlights (cont.)

Stopping the Spread of Invasive Conifers in Golden Gate National Recreation Area

Monterey pine (*Pinus radiata*) and Monterey cypress (*Hesperocyparis macrocarpa*) were once commonly planted within the Golden Gate National Recreation Area (GOGA). Left untreated, these invasive tree species can spread and grow rapidly in scrub and grassland habitats, reducing native species richness, altering plant community physiognomy, and impacting ecosystem processes. In Tennessee Valley, these species were beginning to invade intact habitats throughout the 2,000-acre parcel. EPMT support funded a six-person crew to rove the entire valley and neighboring subwatersheds, felling or girdling over 100 mature trees and removing hundreds of saplings. This effort has reduced these populations to a maintenance level that is now manageable by park staff and volunteers. In addition to bringing GOGA one step closer to parkwide control of these species, this project also served as a research site for a PhD student at UC-Berkeley. Results may help further understanding of the below-ground impacts of pine invasion, particularly their mycorrhizal fungal communities and potential to alter soil functions.

Summary of Accomplishments

Challenges this year included a vegetation rebound effect from this winter's heavy precipitation after several years of drought. Several high elevation parks were also not able to access sites because of the later than normal snow pack. Even with this reduced treatment window, 61 net acres were treated across 11 parks, thereby protecting over 1,026 park acres from high priority invasive plant species. EPMT projects were leveraged through grant and park match options, expanding project capacity by 201% over EPMT base funding. Significant headway was made on an important early detection Japanese knotweed (*Polygonum cuspidatum*) project this year. Japanese knotweed is ranked as the 10th most invasive plant in the world and can irreparably alter ecosystem processes and displace essential riparian habitat. By securing necessary stakeholder and interagency support the EPMT was able to participate in the protection of this threatened and endangered species critical habitat for species such as coho salmon, steelhead trout, California red-legged frogs, and California freshwater shrimp. With the cooperation of private and state partnerships upstream of the park, the goal is to extirpate this Lagunitas Creek population from Marin County by 2022. With 17 partnerships in FY17 the EPMT continues to pursue working strategically across boundaries through these strong partnerships that are essential to successful protection of precious national park resources.

Summarized Data for 2017

Measure	Acres
Treated	74
Inventoried/Monitored	4,539
Gross Infested Area	1,148
Net Infested Area	61
Youth Engagement	
Total Number of Youth Participants and Youth Employees	112
Total Hours for Youth Participants and Youth Employees	7,332

More Information

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Florida/Caribbean EPMT Annual Report: FY 2017

Taylor Slough, Everglades National Park. 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 Exotic Plant Management Team (FLC EPMT) supports 15 National Park Service units by expanding existing invasive plant management efforts including inventory and monitoring, control, education, restoration, and research. The FLC EPMT utilizes contracted crews from four private companies for large eradication projects within park units. Smaller projects are carried out by the team, parks, and volunteers. Due to the temperate, tropical, and sub-tropical climate zones found within the team's 2.68 million acre range, many of these invasive species create an enormous challenge. Just over 400,000 acres of those lands are infested with invasive species. Some common species that are targeted include: Brazilian peppertree (*Schinus terebinthifolius*), small-leaf climbing fern (*Lygodium microphyllum*), beach sheaok (*Casuarina equisetifolia*), cogongrass (*Imperata cylindrica*), lantana (*Lantana camara*), and punktree (*Melaleuca quinquenervia*).

An annual steering committee meeting is held to review and approve the strategic direction and financial plan of the team, rank projects, ensure the team provides useful information that is relevant to management, and develop a treatment schedule for the fiscal year. The ranking committee consists of representatives from the National Park Service Southeast Regional Office, the US Army Corps of Engineers (USACE), and the Florida Fish and Wildlife Conservation Commission (FWCC). These meetings are held at a different park unit each year.

Program Highlights

Lakeshore Nutrush (Scleria lacustris) Survey

The FLC EPMT partnered with FWCC, South Florida Water Management District, USACE, and Florida International University to test a survey protocol in Florida's Water Conservation Area 3B for lakeshore nutrush, a recently identified Early Detection Rapid Response (EDRR) species. This species has been found in southern and central Florida since 1988, but is increasingly becoming a nuisance in many of south Florida's natural areas. In 2009, the Florida Exotic Pest Plant Council named it a Category I Pest when it was recognized that it had the ability to alter the composition and structure of native wetland communities.

In order to thoroughly cover as much area as possible, volunteers were split into five teams of three with one driver and two spotters on each airboat. Each team surveyed 11-mile long transects, 500 meters apart just north of the Everglades National Park boundary where the species was reported. Finishing the first planned transect early, each team was given an additional transect further north in the region. A patch of lakeshore nutrush was found off of the most northern transect, much further north than it was expected to be found. Contracted crews were sent out to treat the infestation the following week. Additional interagency volunteer work days will continue to survey the area until eradication can be confirmed.

Infestation of *Scleria lacustris* found during the interagency survey. Photo: Ryan Brown.

Brian Lockwood basal barking *Casuarina equisetifolia* in Biscayne National Park. NPS Photo.

Program Highlights (cont.)

Biscayne National Park Mainland Team Treatments

The FLC EPMT's main treatment focus was in Biscayne National Park. While Biscayne staff have been focusing on treating the exotics on the spoil islands, the EPMT has been focusing on treating the mainland adjacent to these spoil islands. This combined effort will reduce the invasive plant infestations along the length of the western shore of Biscayne Bay.

Using data gathered from the South Florida and Caribbean Network's 2016 Biscayne National Park Corridors of Invasiveness project, the team was able to easily relocate infestations within the park to treat and retreat. Using that data, the efficacy of the initial treatments and growth of the untreated infestations were evident.

Toby Obenauer, crew leader of the Southeast EPMT, traveled to South Florida for a week to assist in treating the larger patches of Asian nakedwood (*Colubrina asiatica*), Brazilian peppertree, and punktree. He also aided in an additional survey of the larger islands within the park. The few invasives that were present on Soldier and Boca Chita Keys were eradicated and those islands are now considered to be free of invasive plants. Periodic surveys will need to be completed to confirm no new infestations emerge.

In September 2017, Hurricanes Irma and Maria impacted all of our parks. We will be monitoring the effects of these events for the next few years.

Summary of Accomplishments

In November 2016, FLC EPMT held its ranking meeting at Timucuan Ecological and Historic Preserve; five out of nine proposals presented by park representatives were funded. Additional projects in Big Cypress National Preserve and Everglades National Park were funded by contributions from the FWCC. These projects will begin in fiscal year 2018.

The team successfully assisted Miami Dade County in surveying Elliot Key in Biscayne National Park to locate the only known population of the state endangered vine, Marsh's Dutchman's pipe (*Aristolochia pentandra*). The location will be given to invasive plant treatment crews that will be working in the vicinity so that they can avoid it when treating in the area.

Summary of Accomplishments (cont.)

In February 2017, the team said goodbye to Chris Furqueron, the Southeast Region Integrated Pest Management coordinator since 1992. Chris was integral in the development of the FLC EPMT, and he will be greatly missed in his retirement.

Summarized Data for 2017

Measure	Acres
Treated	732
Inventoried/Monitored	793
Gross Infested Area	14,337
Net Infested Area	700
Youth Engagement	
Total Number of Youth Participants and Youth Employees	2
Total Hours for Youth Participants and Youth Employees	2,016

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Great Lakes EPMT Annual Report: FY 2017

Birch Island, Isle Royale National Park. NPS photo.

Background

The Great Lakes Exotic Plant Management Team (GL EPMT) provides support to eleven national parks 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 region claims 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 the impact of invasive species to those of cultural origin (ornamentals / intentionally planted). However, visitor use and necessary maintenance activities have introduced new 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 work toward site-specific management options. As a shared regional resource, the team either augments existing management efforts at parks or provides parks with management options.

Program Highlights

Early Detections at Isle Royale National Park

Early detection continues to be a key strategy in managing non-native invasive plants at Isle Royale National Park. With over 132,000 acres of relatively un-impacted remote wilderness situated on an island in Lake Superior, treatment of established invasive plant populations can be costly and logistically challenging. In order to prevent new invasive plant introductions the team performs yearly inventories at the park's mainland visitor center in Houghton, MI. The visitor center also serves as the main embarkation point for visitors to the island, making it a critical control point for new invasive plant introductions. Since 2010, the team has found eight invasive plant species that are new to the park. Yearly treatments of those species has eliminated all but three, greatly reducing their numbers and chances for spread to the island.

The team also conducts inventories and treatments of the island's campgrounds, trailheads, and maintenance areas. In 2009, the GL EPMT discovered wild parsnip (*Pastinaca sativa*) at the Daisy Farm campground, one of the park's most popular areas. Wild parsnip not only represents a concern for the island's natural resources, but it is a human health concern for visitors as its plant sap can burn the skin causing blistering and scars. Yearly treatment following the discovery has reduced wild parsnip from over 80 adult seed producing plants in 2009 to less than six rosettes this year. With continued vigilance there is a good chance the plant will be eradicated from the island.

Biological Technician (Saint Croix National Scenic Riverway) Michael Rhoades cutting buckthorn at the Ice Age National Scenic Trail Interpretive Site in Cross Plains, WI. NPS Photo.

Biologist (Mississippi National River & Recreation Area) Neil Smarjesse hand broadcasting native grasses and forbs during a dormant season savanna seeding at Ice Age National Scenic Trail. NPS Photo.

Program Highlights (cont.)

Battling Buckthorn Unites Partners for Restoration Success at the Ice Age Trail

Since 2009 the GL EPMT has battled common buckthorn (*Rhamnus cathartica*) at the Ice Age National Scenic Trails interpretive site in Cross Plains, WI. The interpretive site was once a mosaic of prairie and oak savanna before being invaded by buckthorn. Labor intensive buckthorn removal and restoration work has brought together partners such as Wisconsin Department of Natural Resources, US Fish and Wildlife Service, Conservation Corps of Minnesota and Iowa, and Ice Age Trail Volunteers with the goal of reclaiming and restoring the native plant communities across multijurisdictional boundaries. The project has also brought together multiple park units. Cooperation between park units to move the project forward while providing cross training opportunities to everyone involved has been truly amazing.

In early fiscal year (FY) 2017 the GL EPMT seeded six acres of oak savanna with native grasses and forbs to test seeding success. The successful demonstration has paved the way for a much larger seeding at this site in early FY19 as well as in other EPMT network parks.

Summary of Accomplishments

In FY 2017, the team completed projects at nine of the eleven Great Lakes partner parks treating over 45 acres of invasive plants. With assistance from the Heartland Network EPMT, Conservation Corps of Minnesota and Iowa (CCM&I) youth interns initiated their first field projects with the GL EPMT this season. CCM&I assisted in forwarding common buckthorn removal efforts by participating in three projects at two national parks (Ice Age National Scenic Trail and the Saint Croix National Scenic Riverway). A new agreement established this season will further expand invasive plant treatments and youth involvement to projects in FY18.

Additionally the team was able to expand training opportunities for its partners to include UTV training, chainsaw safety maintenance and operations (CSMO) courses, and herbicide safety and application. Over 50 people received herbicide safety and application training alone. In late FY 17, the team filled its vacant Liaison position with long time GL EPMT field crew leader, Isaiah Messerly.

Summarized Data for 2017

Measure	Acres
Treated	46
Inventoried/Monitored	52
Gross Infested Area	695
Net Infested Area	53
Youth Engagement	
Total Number of Youth Participants and Youth Employees	22
Total Hours for Youth Participants and Youth Employees	3,164

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National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Gulf Coast EPMT Annual Report: FY 2017

Barataria Preserve at Jean Lafitte National Historical Park and Preserve in Louisiana. NPS Photo.

Background

The Gulf Coast Exotic Plant Management Team (GC EPMT) supports eight National Park Service (NPS) units within the states of Louisiana, Mississippi, and Texas: Big Thicket National Preserve (BITH), Gulf Islands National Seashore (GUIS), Jean Lafitte National Historical Park and Preserve (JELA), Natchez Trace Parkway (NATR), Padre Island National Seashore (PAIS), Palo Alto Battlefield National Historical Park (PAAL), San Antonio Missions National Historical Park (SAAN), and Vicksburg National Military Park (VICK).

Chinese tallow (*Triadica sebifera*) is a primary threat to most Gulf Coast EPMT parks, including BITH, GUIS, JELA, SAAN, and VICK. Johnsongrass (*Sorghum halepense*) impacts PAAL, SAAN, JELA, and VICK, while buffelgrass (*Pennisetum ciliare*) impacts both PAAL and SAAN. Japanese climbing fern (*Lygodium japonicum*) is a threat to BITH and JELA. Kudzu (*Pueraria montana*) is the main invasive threat to NATR and VICK; Japanese honeysuckle (*Lonicera japonica*) also impacts these units, along with GUIS and SAAN. Water hyacinth (*Eichhornia crassipes*) impacts aquatic habitats at parks including BITH and JELA, while crested floating heart (*Nymphoides cristata*) has become an emerging aquatic threat to BITH.

Program Highlights

GC EPMT Leadership and Operations Base Change

Eric Worsham, former GC EPMT liaison, retired during December 2016. Dale McPherson served as acting liaison from March-June 2017 before accepting the role of new liaison in June 2017. Also, during fiscal year (FY) 2017, the GC EPMT operations base moved to the National Park Service (NPS) Southeast Regional Office located in Atlanta, GA.

Cooperative Agreement with University of Texas-Austin Ladybird Johnson Wildflower Center

In 2014, the Gulf Coast EPMT entered into a Cooperative Ecosystems Studies Unit (CESU) task agreement with the Ladybird Johnson Wildflower Center to identify and spatially delineate management area boundaries, gross infested areas, net infested areas, treatment areas, retreatment areas, inventoried areas, and monitored areas for invasive plant species within six Gulf Coast EPMT parks. During spring 2017, spatial mapping of JELA, the last of the six parks, was completed. Results from this project will be used to integrate spatial and tabular data, increase the potential for detailed reporting, and aid in future prioritization of target areas for invasive treatments.

Collection and bagging of water hyacinth from the historic acequia within San Antonio Missions National Historical Park in TX. NPS Photo.

Mechanical removal and cut treatment of Brazilian peppertree at the Resaca de la Palma unit of Palo Alto Battlefield National Historical Park in TX. NPS Photo.

Program Highlights (cont.)

Invasive Plant Treatments for Seven Gulf Coast Parks

Treatments were completed at seven of eight Gulf Coast EPMT parks using a contractor. Target species varied by park and included trifoliate orange (*Poncirus trifoliate*) at BITH, cogongrass (*Imperata cylindrica*) and torpedograss (*Panicum repens*) at GUIS, Japanese privet (*Ligustrum japonicum*) and Johnson grass at SAAN, kudzu at both VICK and NATR, Chinaberry tree (*Melia azedarach*) at both JELA and SAAN, and Brazilian peppertree (*Schinus terebinthifolius*) at PAAL. Treatments at PAAL were covered by a local news source.

Barataria Preserve at Jean Lafitte National Historical Park and Preserve in Louisiana. NPS Photo.

Summary of Accomplishments

The primary accomplishments for the Gulf Coast EPMT during this year included spatially mapping invasive plant infestations at one park and treating invasive plant infestations at seven parks. Dale McPherson was selected as the new GC EPMT liaison, based in Atlanta, GA.

Summarized Data for 2017

Measure	Acres
Treated	56
Inventoried/Monitored	0.00
Gross Infested Area	270
Net Infested Area	50
Youth Engagement	
Total Number of Youth Participants and Youth Employees	0
Total Hours for Youth Participants and Youth Employees	0

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Heartland Network EPMT Annual Report: FY 2017

Project to control tree-of-heaven (*Ailanthus altissima*) in Buffalo River National River, Arkansas. The project consists of 37 project areas over 162 acres. NPS photo.

Background

The Heartland Network Exotic Plant Management Team (HTLN EPMT) serves 15 national parks 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 HTLN EPMT exists solely to serve park managers and the resources that they are charged to protect. The EPMT follows the National Park Service's (NPS) constructive model of identifying "prudent and feasible" invasive plant control projects. Because there is, unfortunately, no single litmus test to assess the prudence or feasibility of a project, the EPMT 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

Tree-of-Heaven Control at Buffalo National River

The Buffalo National River protects 135 miles of free-flowing streams in the Ozark Mountains of Northern Arkansas. The park includes 88,385 acres, consisting predominantly of forest, that follow the river corridor.

These forests, which protect outstanding examples of natural areas, also include tree-of-heaven (*Ailanthus altissima*), an invasive tree that has become locally widespread. This tree, which germinates and grows in low-light conditions, can potentially alter forest composition in these forests.

For this reason, the HTLN EPMT removes tree-of-heaven from strategic locations to allow the forest to continue on a more natural successional pathway. Currently the project consists of 37 project sites that encompass 162 acres along the river. Many of these sites have been treated annually over a seven-year period. The first year of control involves felling large canopy trees. As a dioecious tree that regenerates effectively from seed, targeting female trees is critical. Treatment in subsequent years involves control of re-sprouting stems and newly-germinated seedlings.

The project continues to expand as we identify new sites. In 2017, the team initiated cutting and limited girdling in four new sites, totaling 8.7 acres. Staff will use the seven-year record of treatment to evaluate the time and cost required to control this forest-altering tree.

Pre-treatment photograph of princess tree following prescribed fire on Sugarloaf Mountain, Hot Springs National Park, Arkansas. NPS photo.

Post-treatment photograph of princess tree on Sugarloaf Mountain, Hot Springs National Park, Arkansas. Inset—Ouachita blazing star. NPS photos.

Program Highlights (cont.)

Princess Tree Control in Hot Springs National Park

Sugarloaf Mountain is an 84.4 acre stand of long undisturbed oak-hickory-pine forest. Larger shortleaf pine (*Pinus echinata*) trees in this stand are >300 years old. The site is a high priority conservation area for the park and the state. The site also provides habitat for the endemic Ouachita blazing star (*Liatris squarrosa* var. *compacta*). The blazing star is categorized as a locally vulnerable species, with only 20 -100 known occurrences in Arkansas.

Periodic fire is required to maintain shortleaf pine stands. For this reason, prescribed fires are occasionally set within the stand, while taking special measures to protect the old-growth trees. While fires are essential, they can also stimulate invasive plant populations. This occurred on Sugarloaf Mountain as princess tree (*Paulownia tomentosa*) germinated en masse following fire.

Following advice from the Ozark Fire Ecology group, HTLN EPMT staff scouted the site in April and designed a project that was conducted in July. EPMT, Hot Springs National Park, and Conservation Corps of Iowa staff used triclopyr with basal oil as a cut stump treatment. In this case, cooperation across NPS programs led to the success of this early detection-rapid response project.

Summary of Accomplishments

The EPMT field project manager and EPMT-supported Conservation Corps Iowa staff were honored to work with Department of Interior Secretary Ryan Zinke at Wilson's Creek Battlefield on a fence building project.

The EPMT portfolio of projects currently consists of 31 projects spanning 2,372 acres. In FY2017, the EPMT continued work on 8 of these projects that covered 715 acres.

The EPMT continued to strengthen its relationship with Conservation Corps Iowa. This year, the EPMT hosted 6 interns from March through October and 19 temporary crews throughout the year. This included supporting Effigy Mounds National Monument in implementing a Natural Resource Preservation Program funded landscape scale garlic mustard project.

Summarized Data for 2017

Measure	Acres
Treated	18
Inventoried/Monitored	0.00
Gross Infested Area	30,734
Net Infested Area	37
Youth Engagement	
Total Number of Youth Participants and Youth Employees	31
Total Hours for Youth Participants and Youth Employees	15,038

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Lake Mead EPMT Annual Report: FY 2017

Lake Mead EPMT member Melinda Hughes applying herbicide to post-fire restoration plots, BLM Red Rock National Conservation Area Scenic Fire Herbicide Plot. NPS Photo.

Background

The Lake Mead Exotic Plant Management Team (LAKE EPMT) was established in 1996 serving as the prototype model for what eventually developed into the National Park Service (NPS) EPMT program. The team has conducted on the ground projects with field crews in 37 NPS Units, 15 US Fish and Wildlfie Service (USFWS) Refuges, seven Bureau of Land Management (BLM) Districts, four National Forests, two Bureau of Indian Affairs Units, a Bureau of Reclamation (BOR) site, the Marine Corps Yuma Air Station, and sites managed by state and local entities. The Team's three 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 by developing partnerships to effectively manage invasive plant species on a landscape scale.

Partnerships are integral to the team's success, annually leveraging each NPS base dollar with three additional dollars. These partnerships facilitate invasive plant management across agency boundaries and increase the LAKE EPMT's capacity to serve NPS units. All of these funds total more than one million dollars annually and support up to a 20 person crew in the field throughout the year. The LAKE EPMT's geographic locality and many partnerships in the regional area also enable a year round operation that maximizes the Team's ability to serve its various partners and control a diversity of invasive plant species, improving efficiency and flexibility in scheduling projects.

Program Highlights

Restoration of Burned Area Habitat for the Mojave Desert Tortoise (Gopherus agassizii)

LAKE EPMT, with BLM, the US Geological Survey (USGS), and the Lake Mead National Recreation Area native plant nursery, is implementing post-fire vegetation restoration in Federally Threatened desert tortoise habitat following wildfires. The project's goals are to reestablish or augment native vegetation in habitat burned in 2005/6 and identify and refine effective techniques for restoring large disturbed areas of the Mojave Desert. Revegetation will include planting seedlings and sowing seeds on approximately 1,000 acres in 2.5 acre habitat islands at 12 project sites within burned areas in southern Nevada and managing invasive grasses on approximately 1,000 acres within and near these habitat islands. Treated areas should, over time, provide seed and other ecological benefits to several thousand adjacent acres. Treatment effectiveness, success of native plant establishment, management costs, treatment impacts on small rodents, and effects of re-introduced biological soil crust will be determined for a range of treatments and treatment combinations through monitoring of established plots over a five year period. This project builds upon similar collaborative projects that the EPMT, USGS, and BLM have conducted in the past on a smaller scale. In those past projects, project partners learned that herbicide application and directed seeding reduced invasive red brome (*Bromus rubens*) abundance and created short-term cover and food for tortoises.

LAKE EPMT members conduct broadcast treatments of Russian thistle at Manzanar National Historic Site, CA. NPS Photo.

LAKE EPMT members Anna Wheeler and Andy Pigg plant cottonwood tree after a wildfire at Havasu National Wildlife Refuge, AZ. NPS Photo.

Program Highlights (cont.)

Manzanar National Historic Site Broadcast Treatments and Great Basin National Park Post-Fire Treatments

The Team readily applied the expertise and techniques from the desert tortoise habitat restoration project to LAKE EPMT partner parks at Manzanar National Historic Site (MANZ), Great Basin National Park (GRBA), and Havasu National Wildlife Refuge (HNWR). MANZ has an ongoing battle with Russian thistle (*Salsola tragus*) that causes a nuisance to the park and its visitors and is an overwhelming management challenge for the park's small staff. The park requested LAKE EPMT's assistance to provide a longer-term, effective, and efficient solution to their thistle problem. Until this year, methods included labor intensive hoeing and post-emergent herbicide treatments. As a result, thistle continually emerged after rain events throughout the spring and summer months. The EPMT reviewed alternative herbicides, consulted weed scientists, and formulated a treatment prescription that included using a longer term pre-emergent herbicide with soil residual activity that is compatible with local on-site objectives while preventing damage to the desirable trees in the area. MANZ provided a tractor and operator while the LAKE EPMT provided additional technical assistance and applied treatments in more sensitive areas using backpack spray equipment. These treatments were effective and have nearly eliminated the inefficiencies of the previous control methods. The EPMT also assisted GRBA with post-fire brome grass control in the Strawberry Creek drainage which had recently burned. The park staff funded the LAKE EPMT, taking advantage of the Team's ability to conduct these types of post-fire invasive plant control operations using backpack equipment in remote areas. Another project involved planting hundreds of native trees after a tamarisk driven wildfire at HNWR, a long term partner funded by an agreement with post-fire rehabilitation monies.

Summary of Accomplishments

In fiscal year 2017, the LAKE EPMT conducted projects in 13 NPS Units, and for 10 external partners, including the BLM, USFWS, Bureau of Reclamation, US Forest Service, US Marine Corps, Southern Nevada Water Authority, and, through three partnership agreements with Clark County, NV.

Summarized Data for 2017

Measure	Acres
Treated	366
Inventoried/Monitored	11,379
Gross Infested Area	3,051
Net Infested Area	193
Youth Engagement	
Total Number of Youth Participants and Youth Employees	10
Total Hours for Youth Participants and Youth Employees	19,280

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Mid-Atlantic EPMT Annual Report: FY 2017

Mid-Atlantic EPMT staff treat invasive Canada thistle interspersed with native common milkweed at Hampton National Historic Site in Maryland. NPS photo.

Background

The Mid-Atlantic Exotic Plant Management Team (MA EPMT), stationed at Shenandoah National Park, began in 1999 as the Virginia Invasive Vegetation Management Team (VIVMT). The VIVMT supported nine National Park units located in Virginia. In 2003, to address the growing need for invasive plant management at a national level, the MA EPMT was established along with six additional EPMTs. The MA EPMT now provides invasive plant management support to twenty one units in Maryland, Pennsylvania, Virginia, and West Virginia. The goal of the MA EPMT is to incorporate integrated pest management strategies and best management practices to provide the most effective, efficient, but least toxic management solutions to control invasive plants and ensure the protection of its staff, park visitors, and the valuable resources within the team's partner parks.

In 2017, on-site control efforts were conducted at: Appalachian National Scenic Trail (APPA), Assateague Island National Seashore (ASIS), Booker T. Washington National Monument, Cedar Creek and Belle Grove National Historic Site (CEBE), Colonial National Historical Park (COLO), Fort McHenry National Monument and Historic Shrine (FOMC), Fredericksburg and Spotsylvania National Military Park, Gettysburg National Military Park, George Washington Birthplace National Monument, Hampton National Historic Site (HAMP), Hopewell Furnace National Historic Site, Petersburg National Battlefield, Richmond National Battlefield, Shenandoah National Park (SHEN), and Thomas Stone National Historic Site (THST).

Program Highlights

Wavyleaf Basketgrass Management

Wavyleaf basketgrass (WLBG) (*Oplismenus hirtellus* ssp. *undulatifolius*) continued to be a focus for the EPMT in 2017. The team is now treating WLBG at APPA, HAMP, THST, and SHEN.

In June, the team visited THST to survey an infestation of WLBG found in 2015 and treated in 2016. Inspection of the site in June revealed the density of WLBG had been greatly reduced from eight canopy acres to just over two acres. As expected, there were many WLBG seedlings sprouting from germinated seeds in the 2016 treated area. Treatment and monitoring will continue at the site for another three to five years and a noticeable reduction in seed germination is expected during this time frame.

The team spent over four weeks treating three sites at SHEN, totaling 140 gross acres. On the APPA, MA EPMT treated WLBG near Front Royal, VA to limit the potential for movement on the trail, which could serve as vector for spreading this aggressive invasive. HAMP was the most recent addition to the list of parks with WLBG, with five small patches located and hand pulled. The team will continue to monitor for WLBG other parks throughout the region.

MA EPMT staff utilize watercraft to access common reed infestations at George Washington Birthplace National Monument. NPS Photo.

Chinese fountaingrass infestation discovered at Hampton National Historic Site. NPS Photo.

Program Highlights (cont.)

New Parks

The MA EPMT began service to two additional parks in 2017. ASIS, most recently serviced by the National Capital Region EPMT (NCR EPMT), was visited in September and the NCR EPMT was there to pass the torch. During the visit, both teams joined ASIS staff to treat common reed (*Phragmites australis*), continuing an ongoing regime of control. CEBE was the second new park visited by the Team in 2017. In early May MA EPMT spent one week surveying parts of the 3000 acre park for non-native invasive plant infestations. Additional surveys and treatments are planned in 2018.

New Invasive Plants

MA EPMT added two new species of non-native invasive plants to their target list. Harlequin glorybower (*Clerodendrum trichotomum*) was found by park and EPMT staff at COLO. At FOMC, the team treated goldenrain tree (*Koelreuteria paniculata*). At HAMP, two new species were added to their park species list, Chinese fountaingrass (*Pennisetum alopecuroides*) and wavyleaf basketgrass.

Summary of Accomplishments

Fiscal year (FY) 2017 was another safe and successful year of invasive plant control operations. MA EPMT spent fifteen weeks traveling to 15 of its 21 park units surveying, monitoring, and treating non-native invasive plants. Throughout the season, a total of 50 different species were targeted for treatment. The team treated 660 acres during FY 2017.

The MA EPMT would like to acknowledge and thank Jonathan Mikolin for his excellent work and dedication to the team and his contributions to ecological restoration through non-native invasive plant management. Jonathan was with the MA EPMT for five seasons!

As always, thanks to James Akerson for his continued effort to promote volunteerism and youth engagement!

Summarized Data for 2017

Measure	Acres
Treated	271
Inventoried/Monitored	3,179
Gross Infested Area	1,507
Net Infested Area	228
Youth Engagement	
Total Number of Youth Participants and Youth Employees	172
Total Hours for Youth Participants and Youth Employees	3,800

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

National Capital Region EPMT Annual Report: FY 2017

National Capital Region EPMT staff and interns systematically search for and treat invasive plants in the Rock Creek Park Military Meadow area in Washington DC. NPS Photo.

Background

The National Capital Region Exotic Plant Management Team (NCR EPMT) supports parks from the center of the District of Columbia to the foothills of the Appalachian Mountains. In addition to National Capital Region parks, the NCR EPMT assists non-National Capital Region parks and non-NPS partners: Assateague Island National Seashore, the Appalachian National Scenic Trail, the U.S. Fish and Wildlife Service (at the National Conservation Training Center), and the Virginia Department of Conservation and Recreation (at Crow's Nest Natural Area Preserve).

The National Capital Region Exotic Plant Management Team:

1) Preserves habitats using Early Detection/Rapid Response;
2) Controls invasive plants impacting ecologically sensitive areas;
3) Restores native habitats by removing exotic pest plants and re-establishing native plants and natural processes; and
4) Prevents the spread of invasive species through training and careful stewardship of tools and equipment.

The NCR EPMT works closely with our partner parks and agencies to inventory and monitor invasive plants, train staff and volunteers, implement treatment and restoration efforts, and share resources and information.

Program Highlights

Hogweed Management at Rock Creek Park

After approximately ten years of treating a population of giant hogweed (*Heracleum mantegazzianum*) on embassy land adjacent to Rock Creek Park, the NCR EPMT found zero plants in 2017. Five years ago the team started treatments two or three times per year and began treatments earlier in the season. These changes resulted in declines in the number and cover of the plants each year with 2017 being the first year no plants were found. The team will continue to follow up in 2018 and 2019 but the team believes that this population has likely been eliminated.

On this project, the NCR EPMT collaborates with the US Department of Agriculture because giant hogweed is a Federal Noxious Weed and with the US State Department because they manage the land.

The site is adjacent to the Bahrainian embassy. It is likely that giant hogweed was planted as part of the landscaping of the area. The site is across the street from a portion of Rock Creek Park.

Giant hogweed can grow up to 15 feet tall and support leaves up to five feet across. Contact with the leaves or stem of the plant can cause skin rashes and blistering. It is native to the Caucuses and southwest Asia.

Giant hogweed. Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Shrub removal at meadows near Kenilworth Aquatic Gardens. Piled shrubs are in the foreground with cleared forest edge in the background. NPS Photo.

Program Highlights (cont.)

Kenilworth Meadows

Kenilworth Aquatic Gardens is a historic area in northeastern DC with a spectacular display of non-native water lilies and other aquatic plants. Other areas of the park provide recreation opportunities in a part of DC with an underserved population. An eight acre meadow is located between the woody marsh edge and recreational playing fields of Kenilworth Park. The park will plant additional native herbs in the fall, and will mow once per year to keep the woody plants suppressed.

National Capital Parks East manages the area and has recently increased the acreage of meadow by designating some of the mowed turf areas as meadows. To sustain the meadows, the park asked the NCR EPMT to remove invasive shrubs and trees in the designated meadows and along their boundary with the forest.

The park secured cyclic funding for a portion of the site and funded the NCR EPMT for five days of treatment in 2016. After a successful treatment season, the park expanded restoration of new meadow areas and secured additional cyclic funding. In 2017 the NCR EPMT spent 11 days removing woody plants. EPMT staff piled the woody debris and park staff used a chipper to remove the material.

Summary of Accomplishments

The NCR EPMT started field work in February 2017 and continued into October. Thanks to collaborations with park and non-park partners the EPMT was able to cover 6,420 acres in 2017. Starting in May, the crew size increased to six seasonal staff and four interns, increasing team flexibility and efficiently.

The 2017 season was the first full season for Aleksandra Vozntiza as the crew leader. Mark Frey was on a detail at the very beginning of the fiscal year; his position was filled by Liz Matthews during that time. For most of the 2017 field season, Mark was on a detail at the National Invasive Species Council Secretariat. His position was filled during this time by Joe Kish and Jim Pieper.

The team's work will start up again in early 2018. The NCR EPMT looks forward to supporting parks in the coming years.

Summarized Data for 2017

Measure	Acres
Treated	892
Inventoried/Monitored	27
Gross Infested Area	6,420
Net Infested Area	264
Youth Engagement	
Total Number of Youth Participants and Youth Employees	33
Total Hours for Youth Participants and Youth Employees	16,682

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Program Brief

National Park Service
U.S. Department of the Interior

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Biological Resources Division

North Coast-Cascades Network EPMT Annual Report: FY 2017

Jon Clevenger leaves a path of treated Reed Canary Grass (*Phalaris arundinacea*) in his wake at Ross Lake National Recreation Area, North Cascades Complex. NPS Photo.

Background

The North Coast-Cascades Network Exotic Plant Management Team (NCCN EPMT) manages a diverse array of exotic plants across the dramatic landscapes of the Pacific Northwest. From temperate rainforests of Olympic National Park and vast mountain lakes of North Cascades National Park, to oak savannahs of San Juan Island National Historical Park and picturesque agricultural fields of Ebey's Landing National Historical Reserve, NCCN EPMT assists partner parks across western Washington State and northwestern Oregon. Working across all of these biotypes presents a unique challenge; crew members must be prepared to adapt to temperatures ranging from the breezy 40's and 50's of coastal Washington's spring and autumn to the scorching 100° heat of protected river valleys in high summer.

The team works with partner parks and agencies to augment vegetation management across the network. Projects generally focus on preventing the spread of invasive plant species into sensitive wilderness, preparing disturbed areas for ecological restoration, or assisting in large-scale ecosystem management with partner organizations. The team's projects vary from long-term ecological restoration to Early-Detection Rapid-Response. NCCN EPMT's partner parks manage over 2.1 million acres of federally protected land.

With methods ranging from foliar application of selective herbicides on annual broadleaf species, pre-emergent treatment of non-native grasslands, or control of woody shrubs and trees with herbicide lances, NCCN EPMT is prepared to handle any noxious weed situation.

Program Highlights

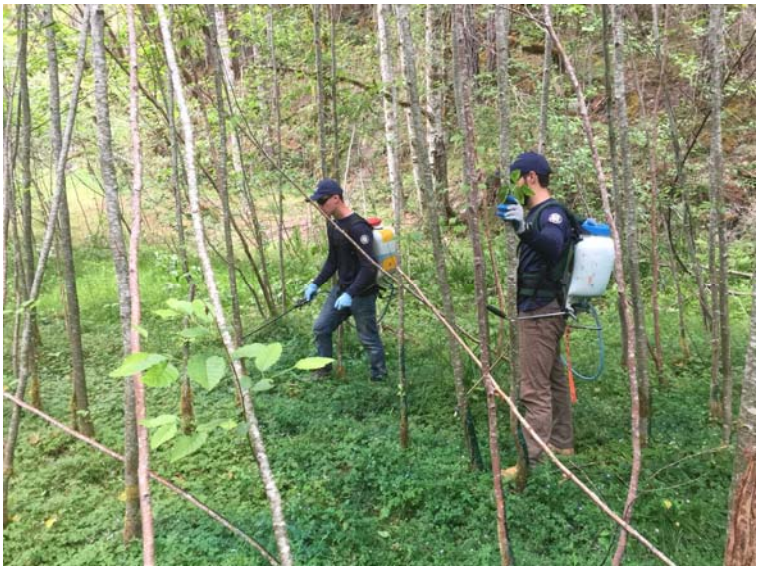
Riparian Knotweed Partnership with Quileute Tribe and Clallam County

NCCN EPMT partnered with the tribal government of the Quileute Nation and the local government of Clallam County (northwest Olympic Peninsula, Washington State) to prevent the spread of invasive knotweed (*Polygonum* spp.) on rivers of the Olympic Peninsula. Knotweed dramatically disrupts native riparian vegetation and has negative impacts on native salmon populations. These species can reduce available nutrient levels in streams and slow down stream flow, thereby warming temperatures and harming eggs and juvenile salmon.

One site in particular that is very challenging to work in because of dense undergrowth and a disproportionate number of wasps, has shown remarkable progress due to the continued efforts of this trans-jurisdictional partnership. The project has been ongoing since 2002 and has often required more than a week of work during the summer with a crew of more than eight people. The site was last treated in 2017 and required only half a day to fully treat due to the substantial reduction in knotweed population size. The partnership does not anticipate the necessity of retreatment in 2018.

NCCN EPMT also treated invasive knotweeds along the banks and islands of the Quillayute, Bogachiel, and Dickey Rivers and noted similar success rates in controlling populations.

Jim Knape, Clallam County Noxious Weed Control Board, explains the environmental dangers of Japanese knotweed (***Polygonum cuspidatum***). NPS Photo.



Two Washington Conservation Corps members carefully treat their way through massive patches of Robert geranium near the Elwha River. NPS Photo.

Program Highlights (cont.)

Elwha River Restoration

NCCN EPMT works closely with Olympic National Park staff to stem the flow of invasive Canada thistle (*Cirsium arvense*), Scotch broom (*Cytisus scoparius*), and Robert geranium (*Geranium robertianum*) in the Elwha River watershed. The Elwha River dam removal project is the biggest such removal of its kind in U.S. history and has re-opened 130 km of salmon habitat that had been rendered inaccessible for more than a century.

NCCN EPMT, Olympic revegetation staff, and Americorps members with the Washington Conservation Corps (WCC) surveyed and treated 417 acres of the former Lake Mills bed that has now become the Elwha River's riparian restoration zone. The team treated widespread populations of the species listed above and more across the lake bed and surrounding revegetated hillsides.

The team, along with a WCC crew, treated extensive populations of Canada thistle and Robert geranium in the Elwha River's Humes Ranch area in an attempt to hinder spread of invasive plant species downriver towards the Elwha restoration area. This year marked the beginning of a successful partnership with the WCC. NCCN EPMT will continue to partner with WCC in future years after the success of the 2017 season.

Summary of Accomplishments

FY 2017 saw the continuation of many vital NCCN EPMT projects. NCCN EPMT treated a total of 26 invasive species across more than 31 restoration sites within the region. NCCN EPMT continued its work in the burn zone of the Paradise Fire on Olympic National Park's Queets River and located significant new infestations of Canada thistle. The team performed an extensive survey of previously unmapped reed canary grass (*Phalaris arundinacea*) populations within Big Beaver Creek's riparian zone near Ross Lake in North Cascades National Park Complex, prompting the consideration of further survey and major treatment by North Cascades resource management staff. Long-uncontrollable populations of poison hemlock (*Conium maculatum*) at Ebey's Landing National Historical Preserve have finally been brought under control by the novel use of a pre-emergent herbicide.

Summarized Data for 2017

Measure	Acres
Treated	92
Inventoried/Monitored	303
Gross Infested Area	1,596
Net Infested Area	76
Youth Engagement	
Total Number of Youth Participants and Youth Employees	20
Total Hours for Youth Participants and Youth Employees	14,416

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Program Brief

National Park Service
U.S. Department of the Interior

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Biological Resources Division

Northeast EPMT Annual Report: FY 2017

NPS staff, interns, and volunteers from Boston Harbor Islands National Recreation Area, Frederick Law Olmsted National Historic Site (NHS), Longfellow House Washington's Headquarters NHS, Minute Man National Historical Park (MIMA), Northeast EPMT, and Saugus Iron Works NHS assembled at MIMA' s Noah Brooks Tavern following a joint work day. NPS Photo.

Background

The Northeast Exotic Plant Management Team (NE EPMT), duty stationed at Delaware Water Gap National Recreation Area (DEWA), was established in 2003 and serves 25 partner parks in eight states, from Pennsylvania to Maine, in the National Park Service's (NPS) Northeast Region.

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

Beginning In 2016, the NE EPMT adapted its approach to ensure that parks continue to receive high quality technical support and continuity of service from the team. In addition to site visits with a reduced crew, the team also provides small grants directly to parks through a competi-tive proposal and ranking process. As a result, six invasive plant manage-ment projects were funded at eight different parks. Additional treat-ment, training and technical support was provided by the NE EPMT to parks in the region.

Program Highlights

Invasive Plant Management Support, Minute Man National Historical Park

Minuteman National Historical Park (MIMA) was awarded a grant of $15,000 by the NE EPMT for invasive plant management for the 2017 field season. The park focused on control efforts in four areas including the Battle Road, which is the route of the first battle at the outset of the American Revolution on April 19, 1775.

The program focused on chemical, mechanical, and manual removal of 12 species of invasive plants. Chemical methods included foliar and stump treatments by licensed NPS and contract applicators. Contractors provided 80 hours of mechanical treatment with a variety of heavy equipment. Numerous volunteer groups and individuals provided 1,170 hours of manual removal.

The $15,000 grant was used to partially fund an American Conservation Experience intern, and to fund mechanical removal by four contractors. Including all other matching and supplemental funds, the park leveraged an additional $67,446 to support invasive plant management activities.

MIMA staff, Margie Coffin Brown and Geoff Grossman, and two MIMA interns, Lars Boyd and Lyndon Langthorne, made significant contributions to this effort. Similar future support will ensure continued success.

Indaziflam treatment plot, day of treatment, Morristown National Historical Park. NPS Photo.

Indaziflam treatment plot, 6 weeks after treatment. Grass visible is recently germinated stiltgrass, with May apple cluster at upper left, Morristown NHP. NPS Photo.

Program Highlights (cont.)

Pre-emergent herbicide efficacy trials

The NE EPMT is participating in a series of efficacy trials sponsored by Bayer Environmental Science. The goal is to determine the efficacy of indaziflam as a pre-emergent herbicide for Japanese stiltgrass (*Microstegium vimineum*) control. Indaziflam provides very good long term control of other annual grasses, notably cheat grass (*Bromus tectorum*). The first set of trial plots were established in early April 2017, at Morristown National Historical Park (NHP). Three 0.2 acre plots were established, one for each treatment: indaziflam, pendimethalin, and control.

Upon revisiting the plots in mid-May, no noticeable difference was observed between the indaziflam and control plots. The application of indaziflam did not appear to be successful. However, the pendimethalin plot approached 100% control of Japanese stiltgrass.

Because indaziflam has demonstrated long term control of some invasive plant species, a second trial, utilizing small plots, with four replicates of each treatment (indaziflam, pendamethalin, and a control) was initiated at Valley Forge NHP in October, 2017. These plots will be evaluated in spring 2018, and beyond.

Summary of Accomplishments

In 2017, the NE EPMT provided direct in-the-field vegetation management service to 10 Northeast Region parks, including two parks not served before: First State NHP and Flight 93 National Memorial. These site visits generally entailed providing chemical control of in-vasive plants beyond the capacity of the park to manage.

Through the grant process, the team also supported projects in eight parks. In addition to the grant highlighted at MIMA, other grants included bio-control work at Saratoga NHP, contracted management at Appalachian National Scenic Trail and Friendship Hill National Historic Site, funding an intern at Fire Island National Seashore, funding a temporary employee serving Boston Harbor Islands National Recreation Area, Saugus Iron Works and Frederick Law Olmsted, and purchasing revegetation plant stock for Gateway Na-tional Recreation Area. Approximately $82,000 was granted to sup-port those projects.

Summarized Data for 2017

Measure	Acres
Treated	59
Inventoried/Monitored	0.005
Gross Infested Area	2,013
Net Infested Area	194
Youth Engagement	
Total Number of Youth Participants and Youth Employees	8
Total Hours for Youth Participants and Youth Employees	1,600

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Northern Great Plains EPMT Annual Report: FY 2017

Erica Leicht treating invasive plants at Mt. Rushmore National Memorial. NPS Photo.

Background

The Northern Great Plains Exotic Plant Management Team (NGP EPMT) works with 14 partner parks in four states and two National Park Service (NPS) regions. The goal of the NGP EPMT is to help parks preserve native plant communities and historic landscapes by managing the spread of invasive plant species. The NGP EPMT also works with park personnel to accomplish restoration activities such as prescribed fire, native plant material development, and seeding to restore sites to the desired condition. The area served by the NGP EPMT is large, approximately 452,000 acres, and the ecology is diverse. Vast grasslands are found in some parks, others are part of the forested Black Hills, and some include parts of the Missouri, Niobrara or Knife Rivers. Integrated Pest Management (IPM) strategies including chemical, biological, mechanical, and cultural are used to manage invasive plants. Education and training in IPM are also EPMT priorities. Each year NG EPMT staff offer a week-long training session in the principles and practices of IPM for park staff, partners and EPMT seasonal employees.

Field crews for the NGP EPMT are based at either Badlands or Theodore Roosevelt National Park and travel to other parks in the network. Over the course of this year, NGP EPMT members completed field work at 12 of the partner parks. The Montana Conservation Corps and Minnesota Conservation Corps are also integrated into field crews to increase capacity and efficiency of operations. This allows the youth employed on the Conservation Corps crews to engage in important and substantive work to further the NPS mission.

Program Highlights

Adaptive Management of Annual Bromes in the Northern Great Plains

A collaborative effort between United States Geological Survey (USGS) researchers, Northern Great Plains Inventory and Monitoring Network, Northern Great Plains Fire Management, Northern Rocky Mountain EPMT, several NPS Units and NGP EPMT have continued a research project to identify best management practices for managing invasive annual grasses in the Northern Great Plains. Through this research, an adaptive management plan is being developed to assist parks in making appropriate science-based decisions for annual grass management in the Northern Great Plains.

This project involves several years of treatment actions at Scotts Bluff National Monument (NM) and Badlands and Wind Cave National Parks. It also includes components to increase availability of local source-identified native plant materials for restoration and best man-agement practices for their use in restoration. A secure long-term seed storage facility has been developed at Wind Cave National Park (NP) that will ensure viable seed remains available for restoration projects in the Northern Great Plains far into the future.

NPS fire effects and USGS staff calibrating survey methods for annual brome abundance at Wind Cave National Park. NPS Photo.

Jewel Cave National Monument (NM) and NGP EPMT crew members treating on the Black Hills National Forest and Jewel Cave NM boundary. NPS Photo.

Program Highlights (cont.)

Black Hills Invasive Plant Partnership

The NGP EPMT has joined forces with private landowners, state and local governments, conservation organizations, and federal partners to launch the Black Hills Invasive Plant Partnership. This partnership will enhance collaboration, cooperation, and each partner's efforts to manage invasive species in the Black Hills and surrounding areas. This large, diverse area covers two states (South Dakota and Wyoming) and includes five NPS units (Wind Cave NP, Devils Tower NM, Jewel Cave NM, Mt. Rushmore NM and Badlands NP). There are landscape scale invasive species problems that one entity alone cannot manage and the partnership aims to address those issues. Improved communication and shared knowledge between group members has already increased joint treatment planning and expanded public outreach campaigns to a wider audience.

Accomplishments thus far include a new priority management species list for the area. This list will improve early detection rapid response planning and information dissemination to land managers who may be unaware a new species of concern that may be in their area. Enabling quick coordination and pooling of treatment resources if a new species comes into the area is a major focus of the partnership. Public outreach campaigns that span multiple media and wide dissemination are planned in 2018.

Summary of Accomplishments

During the 2017 field season, the NGP EPMT deployed a new data collection system built around Arc Collector. This has allowed us to decrease hardware costs significantly and allowed for upgrade of collection devices at shorter intervals. Data management costs have also decreased even after assuming data management responsibilities for five partner parks. Thirteen of our partner parks have adopted this collection method and their park data can now easily be uploaded to the National Invasive Species Information Management System (NISIMS) database. Helicopter operations were continued in high priority areas at Theodore Roosevelt and Badlands NPs, facilitating timely and cost-effective treatment of invasive plants in areas too remote for conventional treatment activities. The team also assisted Fort Union Trading Post National Historic Site with a restoration project to maintain restored prairie and preserve the cultural landscape.

Summarized Data for 2017

Measure	Acres
Treated	2,861
Inventoried/Monitored	145,277
Gross Infested Area	1,522
Net Infested Area	352
Youth Engagement	
Total Number of Youth Participants and Youth Employees	68
Total Hours for Youth Participants and Youth Employees	9,276

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Northern Rocky Mountain EPMT Annual Report: FY 2017

Bighorn Canyon National Recreation Area. NPS Photo.

Background

The Northern Rocky Mountain Exotic Plant Management Team (NRM EPMT) serves seventeen parks across Colorado, Idaho, Montana, Utah, and Wyoming. Since its inception in 2003, the NRM EPMT program emphasizes the systematic, long-term management and control of invasive plant species. The Northern Rocky Mountains Region is vast and diverse encompassing high and low elevation sagebrush steppe, forests, sub-alpine meadows, and wetland and riparian areas. Many parks in this network are small (median size is 14,464 acres) and a number of them don't have staff members available to address even their highest priority invasive species.

The NRM EPMT is currently a 9-person crew strategically divided into three small crews based at two larger parks throughout the network. Nearly all 17 partner parks receive work annually from the NRM EPMT and 12 parks received multiple visits in 2017. Repeat visits are critical for most 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 EPMT 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, northern parks in Wyoming and Montana later in the summer.

Program Highlights

Holding the Line Against Leafy Spurge (Euphorbia esula) at Yellowstone National Park

In 2015, University of Idaho researchers finalized a model to define public lands of eastern Idaho that are highly susceptible to leafy spurge. Leafy spurge has invaded many of the area's wet meadows and agricultural fields.

Bechler Meadows, a popular horse packing area in the southwestern corner of Yellowstone National Park (NP), currently has no leafy spurge, but was found highly susceptible to the aggressive invasive plant spe-cies. In 2016, NPS crews surveyed 5 miles of the park boundary and U.S. Forest Service (USFS) roads leading to the Bechler Ranger Sta-tion. No leafy spurge was found within 1 mile of the park, but several dense, 1-acre roadside patches were found between 1 and 2 miles from the park. To prevent their spread, these patches were priori-tized for herbicide application in 2017.

The NRM EPMT received a USFS proposal and applied a single application of imazapic herbicide to the two largest roadside patches of leafy spurge nearest to the park boundary in September of 2017. Fall herbicide application of leafy spurge is a relatively new approach to the NRM EPMT program, so additional steps were taken to document treatment effectiveness. A photo point was set up to document the overall trend and several 1-m^2 monitoring plots were established to collect plant cover data prior to treatment.

NRM EPMT crew leader posing at a leafy spurge treatment near Yellowstone NP. Plants are turning red as they redirect resources to their root system. NPS Photo.

Members of the Northwest Youth Corps assisting with a treatment of cheatgrass as part of a rehabilitation effort at Craters of the Moon National Monument and Preserve. NPS Photo.

Program Highlights (cont.)

Invasive Plant Control and Rehabilitation at Two Idaho NPS Units

Several small wildfires burned approximately 200 total acres in two Idaho NPS units in 2014 and 2015. Cheatgrass (*Bromus tectorum*) has invaded these areas in response to freed resources. Staff from these parks, and the NRM EPMT program are implementing an aggressive strategy to reestablish native species. Park and EPMT staff, together, prioritized for small-scale invasive plant management and native plant rehabilitation on a 25-acre site at Craters of the Moon National Monument and Preserve and a 12-acre and a 2-acre site at Hagerman Fossil Beds National Monument.

In the summer of 2017, park staff and the NRM EPMT developed site restoration plans to define management objectives and establish milestones. This past October, a single herbicide application (see photo above) was made to all 39 priority acres using imazapic to reduce cheatgrass establishment. Cheatgrass is a poor competitor with established native vegetation, and a plant community that fully uses available site resources will be more resistant to weed reinvasion. Local sagebrush seeds were also collected and 5,000 bareroot plants will be grown by the U.S. Forest Service Lucky Peak Nursery in Boise, ID and outplanted in fall of 2018. Native grass seed will also be broadcasted in 2018. Only measured and deliberate management activities can have success. Park and NRM EPMT staff are confident that these areas will return to pre-disturbance conditions.

Summary of Accomplishments

The NRM EPMT made significant headway in all partner parks as nearly 2,300 infested acres were treated. A total of 56 species were targeted for management actions in 16 national parks. In total, over 7,500 person hours were spent treating invasive plants in parks served by the NRM EPMT.

The NRM EPMT 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 program expanded its partnerships in 2017, working and developing financial agreements with Montana, Utah, and Colorado Conservation Corps.

Summarized Data for 2017

Measure	Acres
Treated	2,300
Inventoried/Monitored	0.00
Gross Infested Area	54,755
Net Infested Area	159
Youth Engagement	
Total Number of Youth Participants and Youth Employees	44
Total Hours for Youth Participants and Youth Employees	6,450

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Program Brief

National Park Service
U.S. Department of the Interior

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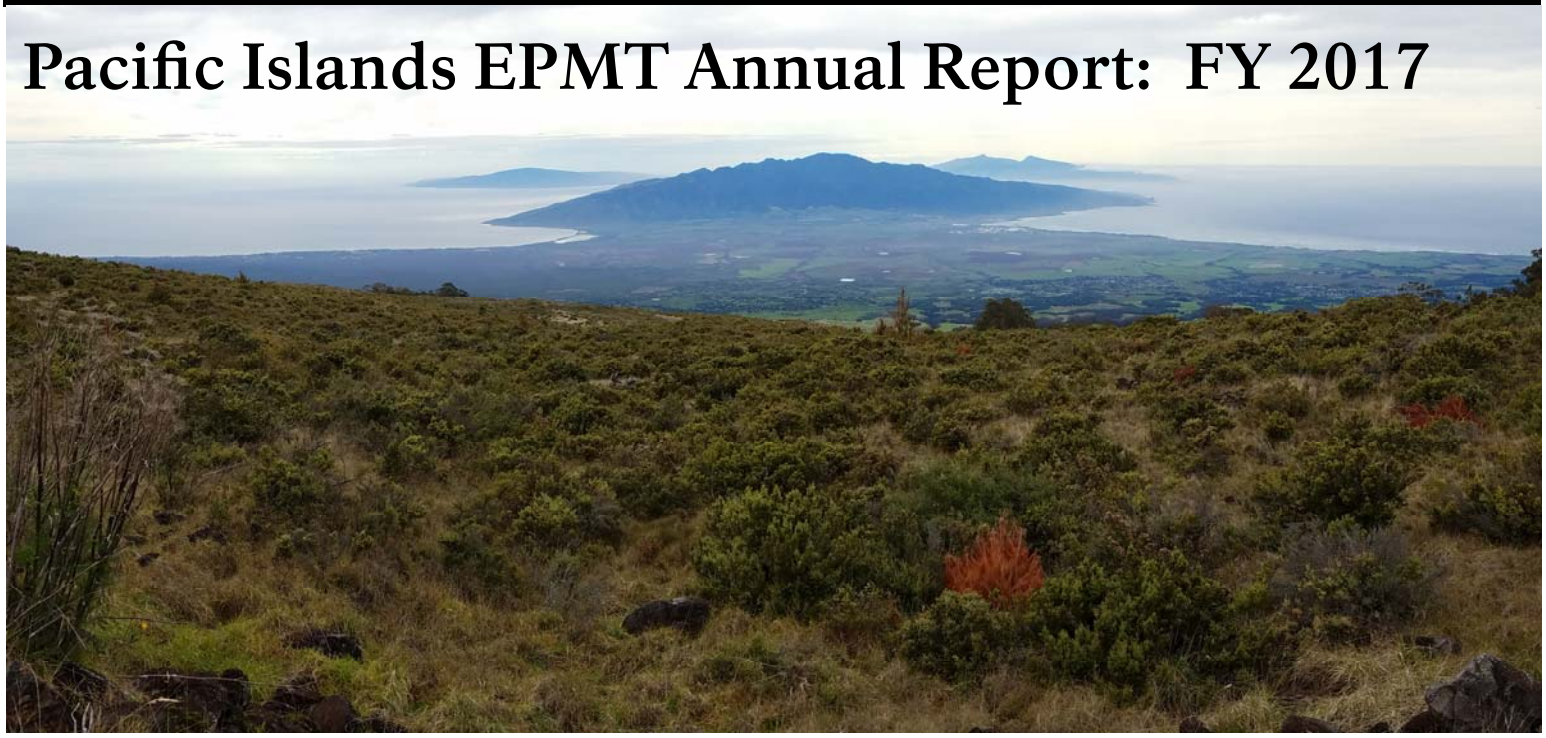
Biological Resources Division

Pacific Islands EPMT Annual Report: FY 2017



View from Haleakala National Park on Maui looking West toward Islands of Molokai and Lanai. NPS Photo.

Background

Native plant and animal diversity in the Hawaiian Islands is threatened by numerous invasive species. More than 85 species of invasive plants displace native vegetation and degrade the unique ecosystems composed of species that have coevolved in isolation on these islands in the middle of the Pacific Ocean. The Pacific Islands Exotic Plant Management Team (PI EPMT) focuses on managing threats to biodiverse Hawaiian ecosystems found nowhere else in the world, collaboratively serving six national park units and several cooperative land management organizations.

The EPMT concept has served the Pacific Island cluster effectively for over 17 years, spearheaded by two larger units: Hawaii Volcanoes (HAVO) and Haleakalā (HALE) National Parks. Smaller park units, Kalaupapa, Kaloko-Honokōhau, and Pu'uhonua o Hōnaunau National Historic Parks, and Pu'ukoholā National Historic Site, benefit from the leveraged resources of the EPMT, larger parks, and significant cooperators.

Because the Hawaiian Islands also contain the vast majority of the nation's endangered and threatened plant species, proactive and innovative management is critical to protect and preserve natural resources for future generations. Collaborative partnerships play a significant role in developing capacity. The PI EPMT employs three discrete strategies to achieve demonstrable results: 1) control incipient invasive species inside and outside parks, proactively mitigating potential adverse impacts; 2) control priority invasive plants in Special Ecological Areas within existing management units; and 3) serve as a technical support entity to parks and cooperators in the Pacific Ba-sin to protect and restore native ecosystems, foster cooperation amongst shareholders, and ensure public safety.

Program Highlights

Developing Capacity for Management, Science, and Stewardship through Collaboration, Youth, and Volunteers at HAVO

The EPMT continues functioning in an oversight and coordination role for volunteer projects and community development at HAVO. The HAVO based EPMT was essential for recruiting, training, and organizing volunteer work forces and encouraging visitor education and participation in resources stewardship on public lands. The interdivisional Stewardship at the Summit program, among others, spent over 272 worker days in the field through the efforts of 318 volunteers. Volunteers removed nearly 5,000 invasive shrubs, including kāhili ginger (*Hedychium gardnerianum*), which is among the world's most invasive plants and is a top target in Hawaii. Other notable community events included work with the Boy Scouts of America Troop 70, Road Scholars, and Ho'opono Services for the Blind. Additionally, EPMT staff joined other NPS programs to host an aquatic monitoring workshop and knowledge exchange with Colombian National Park Service staff, building capacity in both countries with a focus on invasive species and forest health projects.

Program Highlights (cont.)

Protecting Haleakala Crater from Invasive Pine Trees at HALE

Building on previous year's efforts, the PI EPMT continued control of landscape altering disruptive pine trees in Haleakalā Crater. A catastrophic wildfire on land adjacent to the park in 2007 released fire dependent seeds and produced thousands of progeny across the iconic alpine and subalpine landscape inside and outside

Specialized and complex helicopter operations serve a key role in accomplishing EPMT goals in the Pacific Islands. NPS photo.

PI EPMT personnel and Youth Rangers controlling invasive faya tree (*Morella faya*). Faya is one of the most disruptive plants at HAVO. NPS photo.

Program Highlights (cont.)

Protecting Haleakala Crater from Invasive Pine Trees at HALE (cont.)

of the park. A collaborative group including local, state, federal, university, and nonprofit entities made significant progress in removing pine trees from Haleakalā Crater.

Since this pine invasion is largely a single age cohort, this multi-year control effort will eradicate the incipient invasion by treating trees before they can mature and produce additional seed. In past years, nearly all ground-accessible trees were controlled; residual ground based maintenance treatment is ongoing. Infested inaccessible slopes have been the focus of innovative precision aerial control efforts, which has been continuously refined by EPMT staff and, under favorable weather conditions and working with partners, yielded control at a higher rate than anticipated in 2017. Over 1,200 individual pines across 3,000 acres in areas inaccessible by foot were treated. Comparable productivity in 2018 will allow the EPMT to shift some resources towards preventing additional ingress of pine tree propagules from adjacent partner lands.

Summary of Accomplishments

A safe work environment is critical for productive, efficient, and effective control of landscape altering invasive vegetation. A proactive, safety dominated culture has undoubtedly contributed to the Pacific Island Team's outstanding record. In 2017, the Team added another year with no serious injuries or lost time incidents.

On the Big Island, the EPMT worked with park staff, partners, and volunteers to amass a combined 1,103 worker days controlling 72 different species with no serious incidents. The Team routinely leads safety and operational briefings, employs Operational Leadership principles, and performs near miss reviews and risk assessments for project work. In 2017, the combined PI EPMT program logged nearly 100 hours of active flight time in helicopter missions, safely supporting missions to map and control invasive plants, deploy crews and camp supplies, and assist other park operations.

Summarized Data for 2017

Measure	Acres
Treated	267
Inventoried/Monitored	0.00
Gross Infested Area	5,704
Net Infested Area	465
Youth Engagement	
Total Number of Youth Participants and Youth Employees	492
Total Hours for Youth Participants and Youth Employees	8,194

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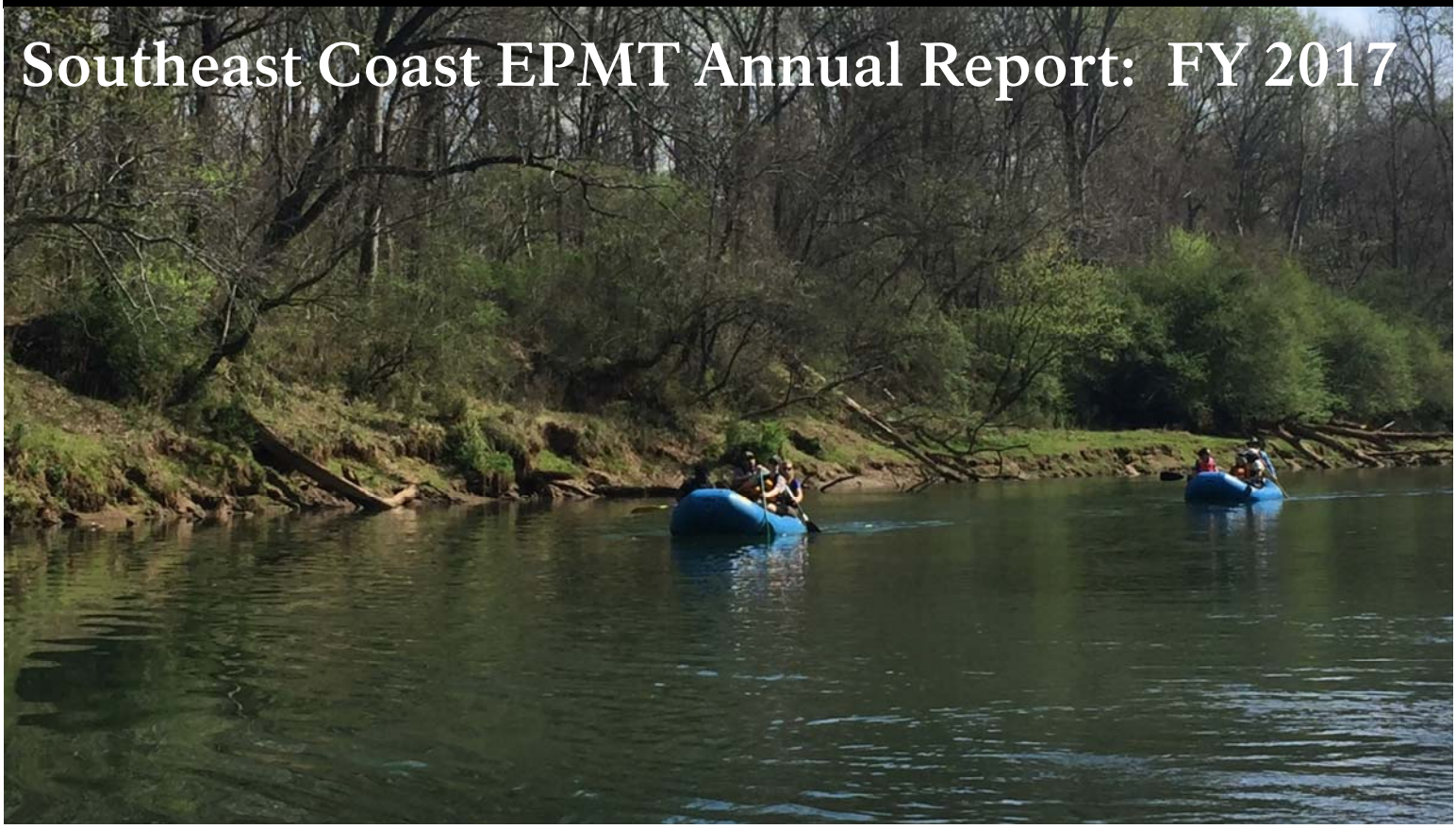
Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Southeast Coast EPMT Annual Report: FY 2017



Southeast Coast EPMT and park staff paddle the Chattahoochee River during orientation for youth interns the team shared with Chattahoochee River National Recreation Area in fiscal year 2017. NPS Photo.

Background

The Southeast Coast Exotic Plant Management Team (SEC EPMT) 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. The SEC EPMT is stationed at Congaree National Park (CONG), which encompasses one of the last remnants of intact old growth bottomland forest. Approximately 80% of CONG is also designated wilderness which is uncommon in the southeastern U.S.

The SEC EPMT was initiated 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 EPMTs, the SEC EPMT strives to achieve similar goals for invasive plant management. In fiscal year (FY) 2017, the SEC EPMT was led by Lauren Serra (liaison) and Amorita Brackett (field crew leader). The SEC EPMT crew was comprised of three Student Conservation Association youth interns. The crew, which served a ten-month term, was shared with partner park Chattahoochee River National Recreation Area (CHAT). The interns spent the first seven months as a travelling team based at CONG, then served three months at CHAT as a trained EPMT crew.

Program Highlights

Collaboration Among Parks

The EPMT, in concert with staff from parks both inside and outside of its network, distinguished this year's work through many exciting collaborative efforts. Field assistance, technical support, and training were among the significant contributions to invasive plant management in FY 2017. Collaborative efforts, led by the SEC EPMT and with the help of staff from CHAT, included invasive plant projects at Horseshoe Bend National Military Park (HOBE) and Kennesaw Mountain National Battlefield Park (KEMO). Other collaborations included continuing control of common reed (*Phragmites australis*) by SEC EPMT, Assateague Island National Seashore, and CHAT staff and providing recommendations for future treatments at Cape Hatteras National Seashore. Ocmulgee National Monument (OCMU) staff also travelled to CONG to assist with several invasive plant treatment projects.

In addition to increasing the acreage treated at parks, joint trips promoted sharing of skills among staff and facilitated invasive plant management training by the EPMT. KEMO staff provided chainsaw training to EPMT interns and chainsaw refresher training to EPMT staff. CHAT staff assisted OCMU with a native plant restoration project aimed at restoring a Chinese privet (*Ligustrum sinense*) management area. Overall collaborative efforts increased efficiency and minimized resources needed to complete tasks, in turn benefitting parks and the SEC EPMT program.

Assateague Island National Seashore, Chattahoochee River National Recreation Area, and SEC EPMT staff treat common reed (*Phragmites australis*) at Cape Hatteras National Seashore. NPS Photo.

Staff from Ocmulgee National Monument assist SEC EPMT with the treatment of sericea lespedeza (*Lespedeza cuneata*) at Congaree National Park. NPS Photo.

Program Highlights (cont.)

Restoration of Natural and Cultural Areas

The SEC EPMT managed both non-native invasive plant species and early successional native plant species to restore natural ecosystems and protect cultural resources at parks. At Fort Pulaski National Monument (FOPU), the SEC EPMT removed hardwood vegetation to restore marsh habitat in an area where maritime forest, growing on dredge spoil that comprises the island on which FOPU was built, was dying as a result of coastal flooding from sea-level rise and Hurricane Matthew. At Moores Creek National Battlefield the team continued a multi-year restoration project to remove dense stands of sweetgum (*Liquidambar styraciflua*) and non-native invasive plants to protect a rare pocosin ecosystem. The team also assisted with the ongoing treatment of sweetgum at CONG to facilitate longleaf pine restoration. While at CHAT, vegetation was removed to preserve the historic mill ruins at Sope Creek.

Summary of Accomplishments

In FY 2017, the SEC EPMT served 11 partner parks and treated 47 plant species. Early Detection and Rapid Response efforts included online reporting of new species occurrences (https://www.eddmaps.org/) and outreach to citizen scientists.

EPMT staff continued to develop and strengthen partnerships. Staff were active members of the South Carolina Exotic Pest Plant Council and the Phragmites Working Group in partnership with the North Carolina Coastal Federation and Cape Lookout National Seashore. Strong partnerships were maintained with the Kennesaw Mountain Trail Club and the SEC Inventory and Monitoring Network.

Safety, essential to team function, continues to be a focus for the SEC EPMT. The Liaison served on the EPMT Safety and CONG Safety and Wellness Committees. Staff were trained in Operational Leadership and the Field Crew Leader maintained Wilderness First Responder.

In-kind funding, in conjunction with field assistance from park staff and volunteers, travel per diem, park housing, supplies, equipment, and training contributions from network parks provided critical support for SEC EPMT program accomplishments.

Summarized Data for 2017

Measure	Acres
Treated	28
Inventoried/Monitored	1,787
Gross Infested Area	2,489
Net Infested Area	56
Youth Engagement	
Total Number of Youth Participants and Youth Employees	16
Total Hours for Youth Participants and Youth Employees	3,749.5

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Southeast EPMT Annual Report: FY 2017

Early Detection Rapid Response treatment of miscanthus, or Chinese silvergrass, (*Miscanthus sinensis*), Little River Canyon National Preserve, Alabama. NPS photo.

Background

In fiscal year 2017, the Southeast Exotic Plant Management Team (SE EPMT), based at the Blue Ridge Parkway, continued to partner with 20 National Park Service (NPS) units in the Southeast Region. Park units served by the SE EPMT encompass over 500,000 acres in seven states. All of these units are located within the Appalachian Highlands and the Cumberland Piedmont NPS Inventory &Monitoring Networks enabling these programs to share resources (i.e., data, staff).

The SE EPMT operations focus on four objectives: 1) to safely provide expertise in selective control of invasive plants in priority areas to preserve, restore and maintain resources utilizing Integrated Pest Management strategies, 2) to develop NPS staff and partner expertise in invasive plant management and restoration, 3) to cultivate partnerships across divisions and with stakeholders by cooperating to manage invasive plants on a landscape level, and 4) to promote an Early Detection, Rapid Response mindset internal and external to the NPS.

The invasive plant species of primary concern continue to be those that thrive in disturbed habitats and easily adapt to low light and moisture extremes. These include Chinese privet (*Ligustrum sinense*) and multiflora rose (*Rosa multiflora*) in open disturbed sites and Nepal grass (*Microstegium vimineum*) and Japanese honeysuckle (*Lonicera japonica*) in closed canopy woodlands. Invasive tree species include tree-of-heaven (*Ailanthus altissima*), mimosa (*Albizia julibrissin*), and princesstree (*Paulownia tomentosa*). Just under half the acres treated in fiscal year (FY) 2017 were dominated by these species.

Program Highlights

Early Detection and Rapid Response

The SE EPMT steadily increased the amount of field time dedicated to EDRR in FY 2017. Surveying and monitoring of likely entryways for new species capitalizes on the team's ability to effectively eradicate populations when they are small. Roads, trails, and waterways crossing park lands as well as construction and maintenance storage areas are examples of potential entryways. Identifying new invasions before they spread, enables the team to respond early and achieve eradication of these small, nascent infestations. Not only does well-informed surveillance more frequently result in eradication of infestations, it also greatly reduces costly long-term control efforts.

In FY 2017, new infestations of six species were eradicated. These were primarily species not previously known to the park unit in which they were found but may have occurred on adjacent lands. Species located during these efforts include miscanthus (*Miscanthus sinensis*), sacred bamboo (*Nandina domestica*), Oregon grape (*Mahonia* sp.), and Scotch broom (*Cytisus scoparius*). Expansion of EDRR in NPS livestock facilities and contracted construction material sources is planned for FY 2018.

Treatment of Chinese privet, Ninety-Six National Historic Site, SC. NPS photo.

Rappelling to remove princesstree, Cumberland Gap National Historic Park TN/KY/VA. NPS photo.

Program Highlights (cont.)

During the FY 2017 field season, the team continued work on two challenging projects. At Cumberland Gap National Historic Park, the SE EPMT focused on kudzu (*Pueraria montana*) control above and adjacent to historic cave sites and adjacent to active rail lines. This work, along with the removal of tree-of-heaven and princesstree from cliffs, requires access by rope using rappelling techniques.

At Ninety-Six National Historic Site the team has been tackling Chinese privet in bottomlands adjacent to Ninety-Six Creek since 2004. This site encompasses approximately 40 acres where privet formerly dominated the understory and has left behind a substantial seedbank. Initial treatments included privet removal with chainsaws and herbicide treatment of stumps. After the mature shrub component was removed, there was an explosion of seedlings that has continued each year since the project began. The team continues to methodically treat this site using foliar applications. Although, the area is now much closer to a native bottomland community, thousands of privet seedlings still carpet the forest floor. This site will remain in maintenance prescription well into the future due to the influx of seed from outside of the site.

Summary of Accomplishments

Accomplishments for FY 2017 include the completion of the team's 14th field season with no time lost due to accident or injury. The SE EPMT surveyed 727 acres and treated 322 acres. Twenty-nine species were treated in 16 partner parks. The team also provided field support for treatment of hemlock wooly adelgid in two park units.

As in previous years, the SE EPMT sought to develop partnerships for efficient control efforts and provide training for park staff and partners. The SE EPMT provided on the ground and classroom trainings to permanent and seasonal park staff and volunteers in plant identification, safe and effective herbicide use, ATV Safety Institute certification, and safe power tool operations. The team also conducted chemical storage inspections, maintenance of equipment, and hazardous tree assessments.

Summarized Data for 2017

Measure	Acres
Treated	632
Inventoried/Monitored	5
Gross Infested Area	5,378
Net Infested Area	593
Youth Engagement	
Total Number of Youth Participants and Youth Employees	8
Total Hours for Youth Participants and Youth Employees	3,882

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Program Brief

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
Biological Resources Division

Southwest EPMT Annual Report: FY 2017

Organ Pipe National Monument. NPS Photo.

Background

The Southwest Exotic Plant Management Team (SW EPMT) is ideally situated to play a central role in the restoration of disturbed native ecosystems and habitat throughout the Southwest.

The *SW EPMT's* vision is: ***to collaborate with park staff, with other programs within the National Park Service (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 team's primary mission is to provide planning, logistics, education, and field crews that support the control of invasive plant species and the restoration of disturbed areas to functioning ecosystems on 54 NPS units and adjacent lands in the Southwest (eight southern Colorado Parks will be transferred to the Northern Rocky Mountain EPMT in 2018).

The SW EPMT supports a number of programs related to the international issues of invasive plants, ecosystem fragmentation, and habitat restoration. Significant activities beyond treating invasives include research in control and restoration methods, the production of appropriate native plant materials, and collaboration with communities and partners. The SW EPMT works 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 our native flora and faunal heritage.

Program Highlights

Preservation of Tumamoc Hill

Tumamoc Hill is a unique resource to the Tucson community, of cultural significance to the Tohono O'odham Nation, as a living Desert Research Laboratory for over 100 years now managed by the University of Arizona and Pima County, and enjoyed by thousands of community members and visitors who walk the hill on any given day. Additional titles Tumamoc Hill can claim include: National Environmental Study Site, a National Historic Landmark, Arizona Natural Area, and it is on the National Register of Historic Places.

This special place, near the heart of downtown Tucson, is currently threatened by the invasion of buffelgrass (*Pennisetum ciliare*). Introduced from Africa, buffelgrass increases fuel loads and subsequent high intensity fires, which plants of the Sonoran Desert did not evolve with. In addition to threatening natural systems, buffelgrass poses a fire hazard to urban areas.

Through the Resilient Landscapes program, Saguaro National Park received funding to work with partners throughout Pima County to tackle the threat of buffelgrass. Some of this funding supported a Southwest Conservation Corps Ancestral Lands Youth Crew, which was trained and overseen by SW EPMT staff in their work on Tumamoc Hill. During their two week period, the crew and SW EPMT staff treated 40 acres of buffelgrass in some of the most rugged and remote portions of the Hill.

Buffelgrass treatment on Tumamoc Hill. NPS Photo.

Kochia treatment plots at Pecos National Historical Park. NPS Photo.

Program Highlights (cont.)

SW EPMT Partners with Parks and Researchers

One of the significant ways the EPMT can assist parks is in the coordination of research across multiple parks. While information on invasive plant management is readily available, the ultimate goal of restoring native vegetation and ecosystems can be much more complicated due to a lack of research.

To improve our treatment and restoration effectiveness, the SW EPMT has partnered with the University of Nevada, Las Vegas, and Glen Canyon National Recreation Area, Pecos National Historical Park, Tuzigoot National Monument, and Guadalupe Mountains National Park. The goal of this collaborative effort is to answer a series of questions on effectiveness of different treatments and the identification of native species which may best compete with exotics or restore treated areas.

Through these collaborative efforts and contributions of funding and/or staff time from parks, the SW EPMT is able to gain cost savings and efficiencies beyond that possible with team funding alone. Additionally, by gaining information across a wider range, lessons can be shared and applied at other parks or lands within the region. The SW EPMT will expand this model in 2018 by partnering with additional universities, USGS, BLM, and USFS.

Summary of Accomplishments

The Southwest Exotic Plant Management Team worked with 31 Park units to treat invasive plants over approximately 1,800 acres and participated in the active restora-tion of 14 acres. To help complete this work, the SW EPMT engaged 278 youth who contributed over 20,658 hours towards invasive plant management.

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

Summarized Data for 2017

Measure	Acres
Treated	228
Inventoried/Monitored	1,305
Gross Infested Area	1,772
Net Infested Area	205
Youth Engagement	
Total Number of Youth Participants and Youth Employees	331
Total Hours for Youth Participants and Youth Employees	22,664

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