National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science

Exotic Plant Management Team Program

2013 Annual Report

Natural Resource Report NPS/NRSS/BRMD/NRR—2014/781

ON THE COVER

Left column (from top): Treating Tree of Heaven on restoration site at Cumberland Gap National Historical Park, Building an exclosure fence to protect Virgin Islands National Park from grazing animals, Boot brush station at Pictured Rocks National Lakeshore trailhead helps to reduce the spread of invasive plants throughout the park and educate visitors about nonnative invasive plants, Mechanical treatment of Scotch broom at Point Reyes NS. **Middle column (from top):** Yosemite National Park weeds crew spraying yellow starthistle above Merced River, Matthew Duffy, Lake Mead EPMT drills holes into palm trees at Death Valley National Park prior to filling with herbicide, Data collection and herbicide application near Dingelstadt Glacier in Kenai Fjords National Park**. Right column (from top):** Casey Cate preparing to plant native woody plants at the George Washington Memorial Parkway, Spout Run Parkway site, Transporting weed workers in Amistad National Recreation Area, Great Lakes EPMT crewmembers hiking the Lake Superior shoreline of Long Island at the Apostle Islands National Lakeshore during purple loosestrife control.

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Mark Frey
Acting Invasive Plant Program Manager
National Park Service
1201 Oakridge Drive
Suite 200
Fort Collins, Colorado 80525

Rick App
Program Data Manager
National Park Service
1201 Oakridge Drive
Suite 200
Fort Collins, Colorado 80525

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The National Park Service, Natural Resource Stewardship and Science office in Fort Collins, Colorado, publishes a range of reports that address natural resource topics. These reports are of interest and applicability to a broad audience in the National Park Service and others in natural resource management, including scientists, conservation and environmental constituencies, and the public.

The Natural Resource Report Series is used to disseminate high-priority, current natural resource management information with managerial application. The series targets a general, diverse audience, and may contain NPS policy considerations or address sensitive issues of management applicability.

All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner. This report received informal peer review by subject-matter experts who were not directly involved in the collection, analysis, or reporting of the data.

Views, statements, findings, conclusions, recommendations, and data in this report do not necessarily reflect views and policies of the National Park Service, U.S. Department of the Interior. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. Government.

This report is available at the Biological Resource Management Division's Invasive Species website (http://www.nature.nps.gov/biology/invasivespecies/) and the Natural Resource Publications Management website (http://www.nature.nps.gov/publications/nrpm/). To receive this report in a format optimized for screen readers, please email irma@nps.gov.

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Background

Native communities of plants and animals and historical landscapes across the world are threatened by invasive plants. Invasive plant programs within the National Park Service (NPS) seek to prevent the introduction of invasive species, identify and remove new infestations, reduce the effects of existing infestations, and to restore native plant communities. The Exotic Plant Management Teams (EPMT) were formed in 2000 to assist parks and have become an integral part of the NPS response to a growing invasive species threat. The EPMT Program now consists of 17 teams that work throughout NPS. In 2013, the Teams served 284 park units.

Figure 1. Great Lakes EPMT using canoes to reach problem populations of invasive plants. EPMTs have the tools and training to efficiently tackle challenging invasive plant problems.

Each Team is headquartered at one or more host park facilities, and serves multiple parks over a wide geographic area. The activities and priorities for each Team are coordinated through a steering committee made up of representatives from the parks they serve. The Teams expand the park's ability to manage invasive plants by concentrating on large, technically challenging, and often-remote invasive plant infestations. In addition to treatment, the Teams play an important role in prevention, inventory, monitoring, restoration, and research.

Figure 2. Southeast Coast EPMT utilizing the vehicle wash at Cape Hatteras National Seashore to remove any exotic seeds/rhizomes. Preventing the spread of invasive species is the first step.

Project Examples

Detecting plants early and removing them quickly saves money and protects threatened

resources. In late 2012, oriental bittersweet (*Celastrus orbiculatus*) was discovered at the St. Croix National Scenic Riverway. Oriental bittersweet is an aggressive woody vine that destroys and smothers plants in other parts of the country, however, it was a new species for the park. Through a swift coordinated effort between NPS and Minnesota Departments of Agriculture and Transportation, the entire infestation of oriental bittersweet was treated. This is a prime example of how acting early reduces damage and future control costs.

If an invasive species is eliminated in an area and the impact on the environment is minimal, recovery can be rapid. In some cases, additional steps, including revegetation with locally adapted native plants, must be taken to restore the site. The Northern Great Plains EPMT partnered with Mount Rushmore National Monument and the Natural Resource Conservation Service to create a seed program for use in restoration projects at four parks.

Partnerships

Teams partner with other NPS programs, other agencies, tribes, and private landowners. Partnerships allow treatments across political boundaries, and can increase resource sharing. In 2013, the Crooked River Cooperative Weed Management Area (CWMA) was formed as a partnership between Cuyahoga Valley National Park and partners in northeastern Ohio. The Heartland EPMT and park staff secured a $400,000 award from the Great Lakes Restoration Initiative. Using equipment shared among CWMA members, EPMT and park staff put a compact track loader (CTL) with mulching attachment into action this year. The CTL allows one crew member to safely fell and mulch full-sized autumn olive (*Elaeagnus umbellata*) stems in less than five minutes - a significant time-savings.

Park contributions

In 2013, the EPMTs received $2 million in contributions, including funding and in-kind support from parks, regions, and Inventory and Monitoring networks. These contributions expand the positive impact of the EPMTs.

Safety

Crews often hike for long distances in remote areas, navigate rocky, steep, and uneven terrain, and carry heavy loads. Treatments may require the use of hazardous chemicals and dangerous equipment such as chainsaws, off-road vehicles, and helicopters. The EPMT Program emphasizes safety in all operations. The EPMTs have logged more than 1.3 million field hours with injury hours representing less than 0.01% of the total. This outstanding safety record is a testament to the dedication and expertise of all staff involved in making the EPMT Program a success. All Teams have exceptional safety records, but the Southeast EPMT celebrated a notable accomplishment in 2013: the completion of the 10th year of work without an accident or injury.

Table 1. EPMT Program Accomplishments in 2013[1]

Measure	Acres
Treated/Retreated	3,098
Inventoried	2,075,845
Monitored	72,619
Gross Infested Area (GIA)	86,656
Infested Area (IA)	3,476

For more information:
Pete Budde
Biological Resource Management Division
970-225-3559
peter_budde@nps.gov
www.nature.nps.gov/biology/invasivespecies/EPMT_teams.cfm

[1] Program accomplishments reflect the efforts of all EPMTs except Heartland Network and Southeast Coast, which are park base-funded teams.

Exotic Plant Management Teams Map

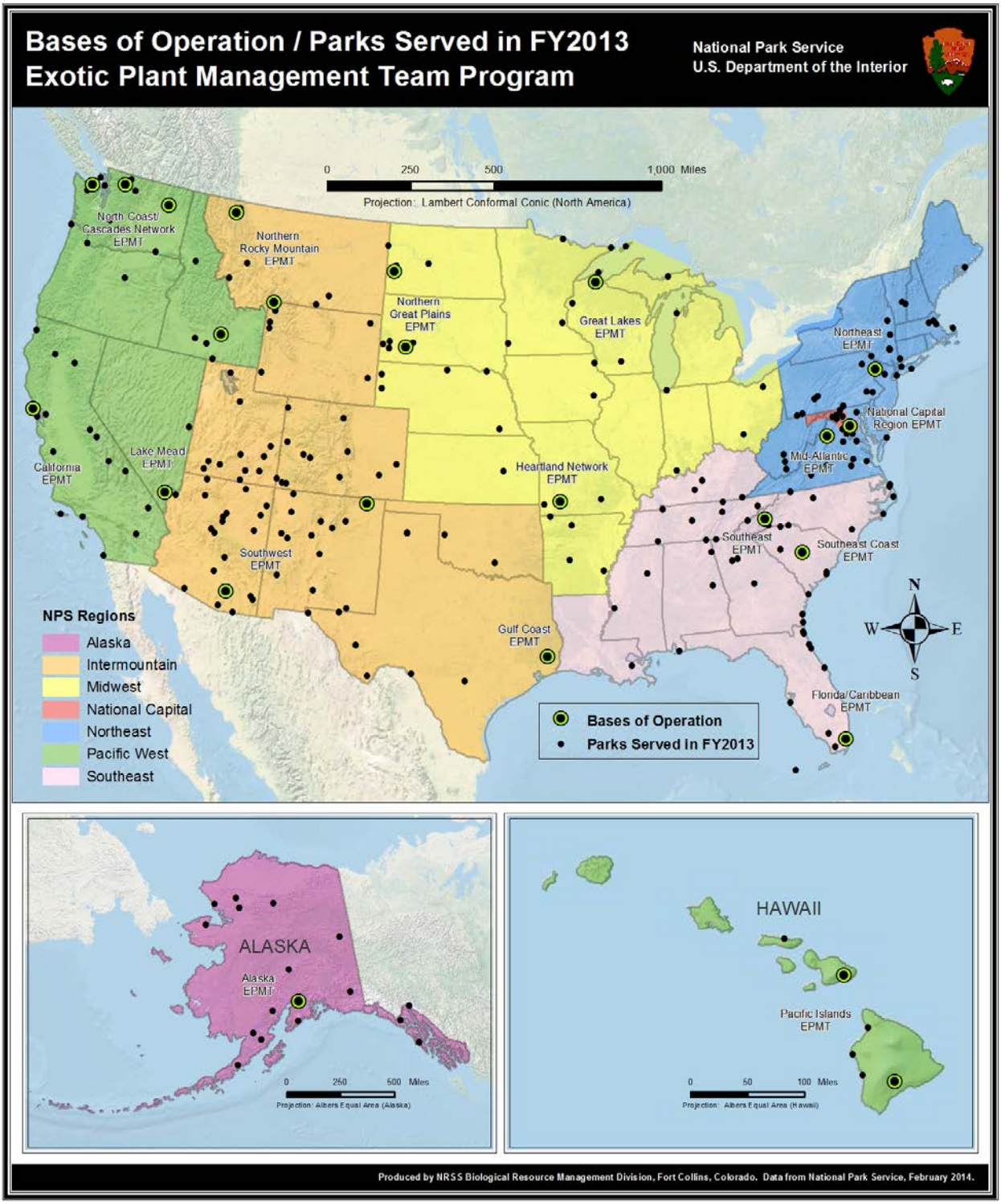
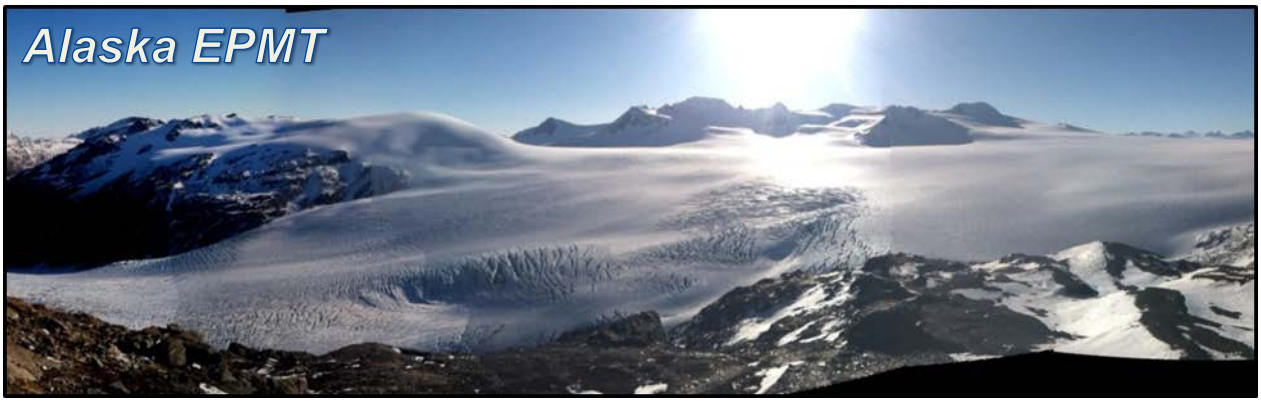


Figure 3. EPMTs provided invasive plant management expertise to parks in all seven NPS regions.



The Alaska Exotic Plant Management Team (EPMT) provides invasive plant management assistance to each of the 16 national parks in Alaska. These partner parks cover over 52 million acres of natural areas and wilderness, including coastal fjords, glacial valleys, tundra, and boreal forests.

Figure 4. Manual removal of invasive plants at Denali NP & PRES

The geography of Alaska means that most parks have little or no road access. Access for invasive plant management can be challenging, requiring backcountry or air travel to reach many parks. Recreational use is widely dispersed with access only by foot, boat, or aircraft. Remote airstrips, cabins, and concessionaires can provide avenues for invasive species introduction in wilderness sites where they are difficult to detect and manage.

2013 Program Highlights

2013 was a productive year for the Alaska EPMT. 1,746 acres were surveyed for non-native plants in eight parks. The efforts of over 4,933 youth crew and staff man-hours resulted in the treatment of 27 acres of invasive plants.

Heavy snowpack and late snowmelt delayed the phenology of target species in some areas and inhibited access in others. Snow covered some sites until early June.

New Site Surveys

In addition to continuing control efforts throughout the parks, inventories were conducted in several areas either not previously inventoried or infrequently visited by Alaska EPMT staff. First-time surveys of areas within and around Cape Krusenstern NM (in the western Arctic region of Alaska) and Anaktuvuk Pass (within Gates of the Arctic NP & PRES) were conducted. Remote landing strips were also surveyed in Wrangell-St. Elias NP &

PRES. Some of the sites were heavily infested with non-native vegetation demonstrating the vulnerability of potential infestation in remote areas accessed by aircraft. In 2013, the Alaska EPMT conducted its first surveys for elodea (*Elodea* spp.) in Wrangell-St. Elias NP & PRES. This non-native aquatic plant can rapidly become a monoculture, damaging sensitive aquatic ecosystems. Increased prevention measures and monitoring of these sites as well as the survey of new sites is imperative in order to inhibit establishment of invasive species in Alaska's remote wilderness areas.

Figure 5. Treating invasive plants at Kenai Fjords National Park

Restoration

Restoration efforts continue to increase in many parks in Alaska and have become a vital part of overall invasive plant management. In 2013, many acres were restored in Denali NP & PRES through planting native seeds collected via ongoing seed collection projects. Wrangell-St. Elias NP & PRES initiated a cooperative effort to collect native seed this year, and the team worked with the inhabitants of Kennicott in the heart of the park. Seed collection is part of a larger-scale restoration project.

Outreach and Education

Prevention is a key component to the success of invasive plant management in and around Alaska's national parks and efforts continued this year to provide outreach and education to local communities. In Denali NP & PRES, several informal, interpretive invasive plant presentations were conducted by Alaska EPMT staff at the Wilderness Access Center that reached many visitors and interpretive staff members. Invasive Plant Fact Sheet hand-outs were made available to visitors at various locations within the park. Kenai Fjords NP hosted their 10th annual Exit Glacier Road Community Weed Pull event that included several groups and volunteers and resulted in the removal of hundreds of pounds of invasive plants. The Skagway Community Weed Pull is organized by the Alaska EPMT in Klondike Gold Rush NHP. The event has proven to be an effective tool for controlling invasive plants and increasing public awareness. Wrangell-St. Elias NP & PRES partnered with the Copper River Watershed Project, the Bureau of Land Management (BLM), Ahtna Inc. (an Alaska Native Regional Corporation), the Wrangell Institute for Science and Environment and the Native Village of Kluti-Kaah to hold its first annual Glennallen Weed Smackdown event - 230 pounds of White Sweetclover were pulled and bagged during the event. These events provide an opportunity to connect with citizens concerned with the issue of invasive plants in Alaska.

Table 2. Alaska EPMT Accomplishments

Measure	Acres
Treated/Retreated	27
Inventoried	282
Monitored	1,464
Gross Infested Area (GIA)	1,746
Infested Area (IA)	146

The Southwest Exotic Plant Management Team (EPMT) is a new team formed in 2013, and serves 52 national parks in six Southwest states: Arizona, New Mexico, Colorado, Texas, Oklahoma, and Utah. The Southwest EPMT's primary mission is to provide planning, logistics, education, and field crews that support the control of invasive plant species, as well as the restoration of disturbed areas on National Park Service and adjacent lands throughout the southwestern United States. Although the Southwest EPMT's main office is in Tucson, Arizona, there will be a number of satellite parks that host crews throughout the field season. This is due to the vast area that the Southwest EPMT is tasked to serve. The location of these Teams may vary from year to year, depending on primary project locations and support of host parks. The following are the primary components of the Southwest EPMT's vision: 1) emphasize the restoration process over simple eradication, 2) support existing National Park Service crews and facilities, 3) provide opportunities for research and education, 4) effectiveness monitoring and adaptive management, and 5) seek out partnerships and alternative funding sources.

The Southwest EPMT is dedicated to forming strong bonds and developing long-term working relationships with a variety of state and federal agencies, conservation groups, youth groups, corporations, and international research and restoration organizations. In future years, the Southwest EPMT Liaison will work to bring these groups together and work on projects within the parks and on adjacent lands. All lands, regardless of who owns/manages them, are connected, therefore, it is important to work with neighbors. The power of operating together and augmenting efforts through coordinated actions increases everyone's chance of success. Cooperative agreements with the Forest Service and the US Fish and Wildlife Service have already been formed, and may be expanded. There may also be possible partnerships with various groups including the World Wildlife Fund, the Nature Conservancy, the American Conservation Experience, and with local universities.

2013 was a major year of transition for the Southwest EPMT. The Southwest EPMT field lead made some headway in a number of parks. He was able to plan training events, work days, and crews for work in 11 national parks in the eastern region of the area served. He incorporated Integrated Pest Management principles by performing inventory, monitoring, prevention, treatment, restoration, Early Detection / Rapid Response, and collaboration with local, regional, and national organizations.

Figure 6. The Boquillas Canyon prescribed burn in August 2012 in Big Bend NP

In 2013, representatives from the Southwest EPMT either visited or performed work in 18 of the 52 partner parks. Visits usually involved a half-day of meetings with park management, and usually a tour of areas in the parks where restoration work is needed or was performed in the near past, or planned for the future.

During 2013, Southwest EPMT also had help from the Lake Mead EPMT, which assisted with invasive plant control work at seven partner parks: Grand Canyon NP, Organ Pipe Cactus NM, Glen Canyon National Recreational Area, Montezuma Castle NM (at Montezuma Well), Tuzigoot NM, Mesa Verde NP, and Wupatki NM. They were funded with Southwest EPMT funds to provide interim support to partner parks while the new EPMT is established. Their accomplishments within Southwest EPMT partner parks are included in this report.

The Liaison facilitated funding of a number of park projects that were listed as priorities by regional Southwest EPMT managers. He was also able to secure cooperative agreements with the US Forest Service and the US Fish and Wildlife Service. During this time, he has brought together and organized equipment from past EPMTs in the region, he has visited with resource personnel at 25 of the 52 partner parks, and he has given presentations to a number of groups about the Southwest EPMT program. The Liaison has also spent time developing contacts with other agencies and putting together a comprehensive program design that will be used to guide the Team in years to come.

The focus of 2013 was getting the new team established and planning for 2014. In addition to these tasks the Southwest EPMT conducted some control and monitoring work for partner parks.

Figure 7. Fall effectiveness monitoring of past treatments on the Rio Grande River in Big Bend NP

Table 3. Southwest EPMT Accomplishments

Measure	Acres
Treated/Retreated	78
Inventoried	1,339
Monitored	0
Gross Infested Area (GIA)	1,115
Infested Area (IA)	137

The 17 partner parks served by the Northern Rocky Mountain Exotic Plant Management Team (EPMT) consist of more than 4.6 million acres spread across five states (Colorado, Idaho, Montana, Utah, and Wyoming) and two National Park Service regions—Intermountain and Pacific West. Encompassing high desert, forests, sub-alpine meadows, sagebrush-steppe, wetland and riparian areas, as well as unique thermal features, the area is immense and diverse.

The Northern Rocky Mountain EPMT is divided into small crews strategically based at parks throughout the area served to reduce travel time to partner parks. Since its inception in 2003, the Northern Rocky Mountain EPMT has assisted partner parks with protecting and improving the health of native habitats in these diverse areas. The Northern Rocky Mountain EPMT's goals emphasize the systematic, long-term management and control of invasive plant species. Much of the effort is focused on controlling state-listed noxious weeds, as well as providing rapid response to new invaders. The Northern Rocky Mountain EPMT employs scientifically-based Integrated Pest Management control measures, so that its actions on the ground are effective, efficient, and safe for the public and the environment.

In 2013, the Northern Rocky Mountain EPMT formally added two partner parks—Dinosaur National Monument (NM) and Rocky Mountain National Park (NP). These two parks add nearly 500,000 acres to the Northern Rocky Mountain EPMT area served, although they are not entirely new to the schedule. The Northern Rocky Mountain EPMT has been traveling to Dinosaur NM at the end of each field season since October 2008, assisting with control of Russian knapweed (*Acroptilon repens*), Russian olive (*Elaeagnus_angustifolia*), and tamarisk (*Tamarix ramosissima*). The Northern Rocky Mountain EPMT started assisting Rocky Mountain NP in October 2011. Treatments have included late-season treatments of leafy spurge and cheatgrass (*Bromus tectorum*) along trails leading into the backcountry, and a flush of musk thistle (*Carduus nutans*) and Canada thistle (*Cirsium arvense*) that erupted in an area that burned in the summer of 2012.

Working with New Partners

The Northern Rocky Mountain EPMT participated in the second annual "Spray Days"—an effort initiated by the Greater Yellowstone Coordinating Committee (GYCC). More than 70 professionals from county weed boards and federal agencies within the Greater Yellowstone Area came together to treat toadflax (*Linaria* spp.) and other invasive plants on federal, municipal, and private lands within Cooke City and Silver Gate, Montana, at the northeast entrance to Yellowstone NP. The events

have provided the opportunity to enlist the skills of a large group to address invasive plant problems at a landscape scale. After the successful event, the GYCC now hopes to make it an annual effort.

Figure 8. Treating musk thistle at Grand Teton NP

Successes Lead to New Projects

In 2011, The Northern Rocky Mountain EPMT started working in Bear Paw Battlefield—a 197-acre unit of the Nez Perce National Historic Park. Three years of treatments have reduced Canada thistle enough that this season the EPMT was able to focus on alfalfa (*Medicago* sp.) infestations spreading from neighboring property.

For several years, dyer's woad (*Isatis tinctoria*) has been the focus of early season work trips to Golden Spike National Historic Site. The population has been reduced within park boundaries enough to expand the treatment area into adjacent lands to eliminate the source of seeds. In addition, there was time to treat the newly arrived rush skeletonweed (*Chondrilla juncea*).

Russian knapweed at Dinosaur NM has been reduced more than 90% in Cub Creek, where treatments started in 2008. Based on the monitoring completed by the Northern Colorado Plateau Inventory and Monitoring Network in 2011, the overall population of Russian knapweed in the park has been reduced by more than 70%. In addition, Russian olive at Dinosaur NM has been controlled (less than 1% of the original population remains).

Figure 9. Assessing results after treating houndstongue and musk thistle for 3 years at Grand Teton NP

Since 2010 at Grand Teton NP, the Northern Rocky Mountain EPMT has been concentrating most of its time treating musk thistle and houndstongue (*Cynoglossum officinale*) in abandoned agricultural fields in the Three Rivers area. The original 100-acre field is now returning to native plant communities. This has allowed the Northern Rocky Mountain EPMT to expand this treatment area into adjacent sites and to start similar work in another former ranch that was deeded to the park.

Treatment tactics were selected based on the characteristics of the sites and the most effective methods. The successes of the Northern Rocky Mountains EPMT can be attributed to dedicated field staff that returned to sites for multiple years.

Table 4. Northern Rocky Mountain EPMT Accomplishments

Measure	Acres
Treated/Retreated	285
Inventoried	4,237
Monitored	16,555
Gross Infested Area (GIA)	17,364
Infested Area (IA)	303

The Great Lakes Exotic Plant Management Team (EPMT) provides support to10 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 includes diverse aquatic and terrestrial ecosystems.

For many years, most of the targeted invasive plants in the area have been escaped ornamental species. In more recent years, many species accidentally spread by visitors and park equipment have emerged as problems. The Great Lakes EPMT balances its activity to meet two different needs: 1) long-term, large-scale control and restoration, and 2) early detection and eradication of nascent populations.

Early Detections in Great Lakes Parks

Several partner parks contain areas relatively unimpacted by invasive plants. One way to help ensure these areas remain healthy is to identify and eliminate invasive species before they establish, spread, and become too costly to control or manage. By conducting frequent inventories at access points such as trail heads and roads, as well as at high-visitor-use areas such as campgrounds, many new invasive species can be found and targeted before they have a chance to spread.

Several new discoveries were made this year by the Great Lakes EPMT. For instance, common buckthorn (*Rhamnus cathartica*), a highly invasive shrub was documented for the first time at both Isle Royale National Park (NP) and Voyageurs NP. Common buckthorn has caused considerable resource damage at other partner parks by creating dense shrubby thickets and producing allelopathic chemicals that inhibit and suppress native plant growth. At both parks, the Great Lakes EPMT located and removed individual shrubs with high dispersal potential, saving resources from the damage caused by this plant. The Great Lakes EPMT and the parks are now on high alert for any additional plants that may be present.

In addition, winged pigweed (*Cycloloma atriplicifolium*), a tumble weed that disrupts critical habitat for federally endangered Piping Plovers (*Charadrius melodus*) at the Apostle Islands National Lakeshore (NL), was discovered this year at Pictured Rocks NL. Pictured Rocks NL houses piping plover populations as well as federally threatened Pitcher's thistle (*Cirsium pitcheri*). Locating and removing this population of winged pigweed will help to preserve habitat required for these rare species. Careful monitoring will be required to ensure that additional populations are not present and new invasive species do not emerge.

Figure 10. Winged pigweed being manually removed from critical habitat at Apostle Islands NL

While the Great Lakes EPMT works with partner parks to control existing populations of invasive plants, it is important to formulate rapid responses to new infestations that are discovered within and beyond the park borders. The more swiftly that control responses can be initiated, the more likely new invasive species can be controlled or removed from park lands.

In late 2012, Oriental bittersweet (*Celastrus orbiculatus*) was discovered at the St. Croix National Scenic River. Oriental bittersweet is a rapidly spreading climbing vine that can shade out and smother other species. Its sprawling tendencies add weight to host plants, causing limb breakage, uprooting, increased susceptibility to damage from high winds, and premature death. It has the ability to overtop entire forests. After discovering this species the park initiated a rapid response. The park quickly partnered with the Minnesota Departments of Agriculture (MDA) and Transportation (MDOT) to control plants threatening utility poles, power lines, and right-of-way visibility on adjacent land. In the summer of 2013, the Great Lakes EPMT mobilized to begin removing thick, tangled vines on National Park Service land. Through a swift and coordinated effort the entire infestation was treated, reducing further damage from the destructive vine. The partnership remains dedicated to making certain that the plant is completely eliminated.

Figure 11. Oriental bittersweet at St. Croix NSR girdling a tree

The Great Lakes EPMT strikes a careful balance between contributing to long-term, large-scale control and restoration and removal of early detection and eradication of nascent populations. A detailed understanding of the park resources, communication, and partnerships help ensure the team works as efficiently as possible to balance these needs.

Table 5. Great Lakes EPMT Accomplishments

Measure	Acres
Treated/Retreated	99
Inventoried	806
Monitored	242
Gross Infested Area (GIA)	806
Infested Area (IA)	111

The Heartland Network Exotic Plant Management Team (EPMT) is a collaborative partnership between 15 parks in the National Park Service's Midwest Region. The parks, located in eight states, support a range of plant communities including tallgrass prairie, Eastern deciduous forests, riparian woodlands, mixed shortleaf pine-oak-hickory forests, and a variety of wetlands from southeastern cypress-tupelo swamps to emergent wetlands along tributaries of Lake Erie. In addition to important natural resources, most of these parks also commemorate important historical events, locations, people, and cultural practices. The combination of cultural and natural resources requires the careful integration of invasive plant management into landscape management.

The Heartland EPMT focused energy on the project selection process. National Park Service management policies take a moderating and constructive view in debates regarding the control of invasive plants. We are working to identify and implement projects that we judge to be "prudent and feasible". There is, unfortunately, no litmus test or analysis to provide a definitive answer as to the prudence or feasibility of a project. Rather, we work to ensure the connection of our projects with larger park vegetation management goals; to assess the long-term costs of projects, to rely on evidence-based scientific data to support projects, and to be cognizant of inherent project uncertainty and human fallibility.

Figure 12. Conservation Corps of Iowa gridding at Homestead National Monument of America

The Heartland EPMT plays an important role in the management of isolated prairie remnants and restorations. Common invasive species in these prairies include woody native invasive species such as smooth sumac (*Rhus glabra*) and winged sumac (*Rhus copallinum*), and invasive forbs and grasses such as Chinese lespedeza (*Lespedeza cuneata*), musk thistle (*Carduus nutans*), bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), sweetclover (*Melilotus officinalis*), and Johnsongrass (*Sorghum halepense*). In 2013, the Heartland EPMT treated such plants in George Washington Carver National Monument (NM), Herbert Hoover NM, Homestead National Monument of America, Tallgrass Prairie National Preserve, and Wilson's

Creek National Battlefield. The projects required a variety of personnel and equipment including teams using backpack sprayers and equipment operators using tractor-mounted herbicide wicks or sprayers. These projects often substituted for prescribed fire during a year when burning was not possible. In other cases, chemical control accelerated a return to native grass- and forb-dominated vegetation.

Figure 13. Compact tractor loader to control autumn olive in Cuyahoga Valley NP

The Heartland EPMT is a park-focused program, and several projects demonstrated a strong connection with park resources during 2013. At Pea Ridge National Military Park, the Heartland EPMT funded the use of a brush mower and follow-up backpack treatments to remove invasive black locust (*Robinia pseudoacacia*) that were disrupting archaeological investigations. At Lincoln Boyhood National Memorial, EPMT staff continued to remove privet (*Ligustrum* spp.) and Japanese stiltgrass (*Microstegium vimineum*) from an area designated as a "pioneer forest". After mechanically removing European privet (*Ligustrum vulgare*) from old home sites, the Heartland EPMT then assisted Hot Springs National Park (NP) in planting and chemically maintaining native shortleaf pine (*Pinus echinata*) seedlings to establish a canopy to reduce further invasion on the site. At Buffalo National River, the Heartland EPMT cooperated with park staff using backpack sprayers to treat tree of heaven (*Ailanthus altissima*), which had invaded after an eastern red cedar (*Juniperus virginiana*) removal and prescribed fire project.

While the Heartland EPMT's efforts usually focus on specific park resources, a regional partnership at Cuyahoga Valley NP has boosted the EPMT's capacity to remove invasive species. In 2013, the Crooked River Cooperative Weed Management Area (CWMA) was formed as a partnership between Cuyahoga Valley NP and local partners in northeast Ohio. Heartland EPMT and park staff secured grants of more than $400,000 that were awarded to the CWMA by the Great Lakes Restoration Initiative. The CWMA is developing a governance structure, purchasing equipment, and hiring seasonal crews. Using equipment shared among CWMA members, EPMT and park staff put a compact track loader (CTL) with mulching attachment into action this year. The CTL allows one crew member to fell and mulch full-sized autumn olive (*Elaeagnus umbellata*) stems from within a protected cab in less than five minutes—an activity that would usually require a chainsaw, chipper, and 10–20 minutes. By helping to build the regional capacity to combat invasive species, Cuyahoga Valley NP has directly benefited from new equipment and a larger work force.

Table 6. Heartland Network EPMT Accomplishments

Measure	Acres
Treated/Retreated	73
Inventoried	60
Monitored	686
Gross Infested Area (GIA)	4,710
Infested Area (IA)	82

The Northern Great Plains Exotic Plant Management Team (EPMT) works with 14 partner parks in four states and two National Park Service regions. The goal of the Northern Great Plains EPMT is to help parks preserve native plant communities and historic landscapes by managing the spread of invasive species. The area served by the EPMT is large (approximately 452,000 acres) and the ecology is diverse. Some of the partner parks contain vast grasslands, some are part of the forested Black Hills, and others include parts of the Missouri, Niobrara, or Knife Rivers. Integrated Pest Management (IPM) strategies, including chemical, biological, mechanical, and cultural methods, are used to manage invasive plants. Education and training in IPM are also EPMT priorities. Almost every year, Northern Great Plains EPMT staff offer a week-long training session covering the principles and practices of IPM for park staff, partners, and EPMT seasonal employees.

Seed Increase Project with Mount Rushmore National Memorial

The Northern Great Plains EPMT led a project to increase the amount of local source-identified native seed for use in national parks throughout the Black Hills portion of the Northern Great Plains. The Northern Great Plains EPMT partnered with Mount Rushmore National Monument (NM) and the Natural Resource Conservation Service (NRCS) to increase locally collected seed and create a seed program for use in restoration projects at Mount Rushmore NM, Jewel Cave NM, Devils Tower NM, and Wind Cave National Park (NP). To facilitate this work, a four-year interagency agreement was signed between Mount Rushmore NM and the NRCS Plant Materials Center in Bismark, North Dakota.

Figure 14. Frank Szajko collecting seed at Devils Tower NM

The Northern Great Plains EPMT was able to collect seed of two species. Little bluestem (*Schizachyrium scoparium*) was collected by EPMT members with assistance from the Montana Conservation Corps at Devils Tower NM in September 2012. Big bluestem (*Andropogon gerardii*) was collected in October 2012 by Northern Great Plains EPMT members and the vegetation crew of the Northern Great Plains Inventory and Monitoring Network at Devils Tower NM. In future years, we hope to increase the number of species and the amount of seed collected. Our goal is to provide parks with high-quality, locally sourced seed for restoration and rehabilitation projects.

Figure 15. Clearing buckthorn in Wind Cave Canyon, Wind Cave NP

Wind Cave Canyon Rehabilitation Project

Northern Great Plains EPMT staff assisted with an exciting restoration project this year at Wind Cave NP. Wind Cave Canyon is the park's highest restoration priority. Work included herbicide treatment of invasive species and removal of non-native vegetation. Future work may include possible augmentation to the site with appropriate native plant materials. Wind Cave Canyon is a very important area of Wind Cave NP, where many facets of park management (natural resources, cultural resources, visitor use, and maintenance) meet and intertwine.

Buckthorn (*Rhamnus cathartica*) was the primary invasive species targeted at Wind Cave NP. The goal of this portion of the project was to reduce the amount of over-story present in the canyon to restore a natural light environment on the canyon floor. This project will be a multi-year endeavor and the Northern Great Plains EPMT is pleased to assist with this project to completion and to observe the continued transformation of Wind Cave Canyon.

The Northern Great Plains EPMT will continue to focus its efforts on invasive species control and restoration projects. Focus will remain on high-visitor-use areas, park boundaries, avenues of invasion (such as rivers, streams, railroads, and canals) and hard to reach wilderness areas. Maintenance of areas that have been treated in the past will continue to be a priority for the Northern Great Plains EPMT, and as time and funding allow, work will expand into new areas.

Table 7. Northern Great Plains EPMT Accomplishments

Measure	Acres
Treated/Retreated	248
Inventoried	2,380
Monitored	0
Gross Infested Area (GIA)	2,384
Infested Area (IA)	338

National Capital Region Exotic Plant Management Team (EPMT) supports the National Parks in and around Washington DC. From Rock Creek Park located in the center of the District of Columbia, to Catoctin Mountain Park in the foothills of the Appalachian Mountains, the National Capital Region parks protect a wide range of species and communities. In 2013, the National Capital Region EPMT also assisted Assateague Island National Seashore, the Appalachian National Scenic Trail, the National Conservation Training Center (managed by the US Fish and Wildlife Service), and the Virginia Department of Conservation and Recreation.

The National Capital Region EPMT works closely with our 12 partner parks and cooperative partners to develop annual work plans, inventory and monitor invasive plant infestations, train park employees and partners in best practices, coordinate treatment and restoration efforts, and share resources and information. Our goals are to use early detection and rapid response to prevent invasive plant populations from establishing, control invasive plants in ecologically sensitive areas, and restore native habitats by reestablishing native plants and natural processes.

Wisteria at Prince William Forest Park

Prince William Forest Park was first opened in 1936 to house children's "relief" camps during the Great Depression. Before it was a park, it was home to many families who lived on homesteads throughout the area. Chopawamsic is part of the old homesteads, and remnants of its prior use are still present throughout the site. The 19,000 acre park represents the largest example of Eastern Piedmont forest in the National Park System.

Figure 16. Prince William Forest Park Chopawamsic site after five years of cutting and treating vines; the last of the debris was piled and native species were seeded

The National Capital Region EPMT treated Unit 19 of the Chopawamsic Backcountry Area in 2009. The area was heavily infested with wisteria (*Wisteria sinensis*). The crew went through with chainsaws and cut "windows" (the vines were cut low at the ground and as high as possible in the tree) into the wisteria that was growing up into

trees. Some vines were very large and many were wrapped tightly around mature trees. A sprayer tank was used to treat any foliage near the ground. The process of cutting and spraying continued for two more years. In the fall of 2011, the crew used fire rakes to clear the area in preparation for seeding in the spring. In the spring of 2012, EPMT and Prince William staff seeded native grasses at the site. A few days after the seeding, the crew went through with backpack sprayers to treat any wisteria sprouts that were present. At that time, the crew also treated a large patch of Japanese stiltgrass (*Microstegium vimineum*) that was starting to encroach upon the recently seeded area. In all, the National Capital Region EPMT returned to Chopawamsic three times in 2012 and two times in 2013 to retreat wisteria sprouts. With continued monitoring and retreatments, this will be a successful restoration site.

Education and Outreach

In 2013, we enhanced our formal Invasive Plant Training days by adding additional sessions and instructors. In collaboration with the DC Cooperative Weed Management Area, we hosted training sessions at two locations: the National Conservation Training Center in Shepherdstown, WV, and Fort Dupont Park in Washington, DC. The trainings are meant to be a tool to review techniques for controlling invasive species for seasoned staff and to get new staff and interns up to speed. The trainings reach approximately 100 participants. We hosted Maintenance and Natural Resources staff from a wide range of partner parks, Arlington National Cemetery, and Fredericksburg & Spotsylvania National Military Park. We also had a healthy representation from partner organizations including various northern Virginia jurisdictions, DC-based non-profits, and other federal agencies. The audience was engaged in the topics presented, and discussions engendered a mutual sharing of knowledge and experiences beneficial to both the trainees and the National Capital Region EPMT.

Figure 17. Geoff Clark and Ana Chuquin presenting on safe use of herbicides at Rock Creek NP

A video recording of each session was made and can be viewed here: www.youtube.com/user/NCRNaturalResources

The National Capital Region EPMT has by far the smallest geographic area to treat and is based in a large urban area. These two characteristics mean reduced travel costs for each treatment and an opportunity to train a large number of park staff and partners at a very low cost. The National Capital Region EPMT capitalizes on these unique characteristics.

Table 8. National Capital Region EPMT Accomplishments

Measure	Acres
Treated/Retreated	99
Inventoried	354
Monitored	517
Gross Infested Area (GIA)	842
Infested Area (IA)	107

In 2013, the Mid-Atlantic Exotic Plant Management Team (EPMT) consisted of five personnel servicing 14 of the 18 national parks in Pennsylvania, Maryland, Virginia, and West Virginia. The goals of the Mid-Atlantic EPMT in 2013 were to effectively monitor, survey, and control invasive plant species, and prepare treated sites for future restoration efforts with native species. Two future goals became evident this year: 1) improved efforts are necessary to make significant strides towards control, and 2) restoration efforts must be undertaken in treated/controlled areas to slow the tide of increasing invasive infestations. Future efforts will focus on achieving these goals. The restoration of impaired natural and cultural resources is essential to our mission.

The Mid-Atlantic EPMT uses an Integrated Pest Management approach where prevention, early detection, continued response, and the least-toxic methods are emphasized. Manual, cultural, chemical, and prescribed fire control methods are used in an integrated approach to gain the most-effective control with the least-toxic effects. We are reaching our long-term goals by maintaining project continuity, training EPMT and partner park staffs, and educating diverse audiences concerning the long term mission of the Mid-Atlantic EPMT.

The Mid-Atlantic EPMT has been battling mile-a-minute vine (*Persicaria perfoliata*) at multiple parks since the Mid-Atlantic EPMT's inception in 2002. One of the most significant areas where the plant has invaded is on a portion of the Appalachian National Scenic Trail (NST) in northwestern Virginia. The infestation, covering twenty acres, has invaded a population of state-imperiled nodding trillium (*Trillium cernuum*). Monitoring began in late March, and all seedlings were quickly hand pulled within the nodding trillium population. Upon completion of the initial treatment, adjacent areas were gridded and inventoried for the presence of mile-a-minute vine, and any seedlings found were hand pulled and the location geospatially recorded. Frequent trips through April and May 2013 were made to continue monitoring this site.

Figure 18. Treating mile-a-minute seedlings at Appalachian NST in Virginia

Black swallow-wort (*Cynanchum louiseae*) was identified as an early detection target because it has proven to be an aggressive invader in areas where it has become established. In 2012, the Mid-Atlantic EPMT identified the first report of this species in Virginia - at George Washington Birthplace National Monument (NM). Monitoring for this species in 2013 showed that it had increased its footprint in the park, mostly along the shoreline. Ten to 15 small isolated populations were treated in 2013. A review of the literature shows that this species requires multiple treatments over several years to achieve control. Unfortunately, new Virginia populations were discovered in both Richmond National Battlefield Park (NBP) and Petersburg National Battlefield (NB). The Mid-Atlantic EPMT will continue to monitor and treat this species.

Figure 19. Treating Phragmites at George Washington's Birthplace NM

Common reed (*Phragmites australis*) is a large grass that invades and transforms wetlands by altering sediment dynamics and outcompeting shorter-stature plants. It has been reported as a problem at George Washington Birthplace NM for over a decade. It is found in tidal areas of the park where clumps of common reed often wash up into the park after storms. There are significant stands of common reed immediately adjacent to the park on privately owned land. After many years of treatment, the Mid-Atlantic EPMT has reduced the park populations substantially. The EPMT will continue to monitor for, and treat, common reed when found at George Washington Birthplace NM. The park will also reach out to adjacent private landowners to find a way to control common reed on adjacent lands.

Once control levels are reached park personnel will take over maintenance and monitoring. Restoration efforts will require sources of additional funding that may be hard to acquire. The MA-EPMT has submitted a proposal to the Disney Nature Impact Grant for funding a restoration effort at George Washington Birthplace NM. This restoration effort would plant native grasses and other species where the common reed has been controlled. This effort if funded will help with shoreline stabilization and will prevent the reestablishment of the common reed in these areas. Grant awards will be handed out in late April.

The Mid-Atlantic EPMT has made significant strides in controlling key populations in priority areas. The important next steps include making sure these treated areas recover so that future treatment needs are reduced or eliminated.

Table 9. Mid-Atlantic EPMT Accomplishments

Measure	Acres
Treated/Retreated	151
Inventoried	1,781
Monitored	8
Gross Infested Area (GIA)	1,762
Infested Area (IA)	191

The Northeast Exotic Plant Management Team (EPMT) has been serving 25 parks in the National Park Service's Northeast Region since August 2003. The parks encompass over 335,000 acres and are located in eight states, from Pennsylvania to Maine. The number of parks visited by the Northeast EPMT each year depends on park and regional priorities coupled with available resources. The Northeast EPMT provides a broad range of services to its partner parks, including on-site control work, inventory and monitoring, technical advice, training, outreach, assistance with revegetation, compliance, planning, and early detection / rapid response.

Early Detection / Rapid Response (EDRR) is an important tool for managing new occurrences of invasive plants before they become well established. Beyond EDRR, the Northeast EPMT concentrates on projects that are feasible, will have measurable effects at high-priority sites, and can be maintained by the park and/or its partners over time.

Several EDRR opportunities arose this year. One involved an invasive species new to the Northeast EPMT —Jupiter's distaff, or sticky salvia (*Salvia glutinosa*). The plant was found along the Appalachian Trail at one site in New York, and had spread from an adjacent private landowner's garden. Local citizens alerted the Appalachian National Scenic Trail of its presence. Unfortunately, the infestation was much larger than anticipated. The plant is a perennial and can spread both vegetatively and by seed, so a single infestation can grow to considerable size relatively quickly. This population grew along the trail. In order to halt its unintentional spread by hikers, the Northeast EPMT's control efforts began along the trail and progressed outward toward the infestation's margins.

Figure 20. The Appalachian National Scenic Trail winding through dense Jupiter's distaff In New York

Another EDRR species was found at the Fort Hill area of Cape Cod National Seashore. While treating a patch of common reed (*Phragmites australis*), the Northeast EPMT observed and promptly treated several populations of porcelain berry (*Ampelopsis brevipedunculata*). This was the park's first verified record of this species.

2012's Tropical Storm Sandy caused considerable damage to several coastal and near-coastal parks in the Northeast Region. Many invasive plant species were spread by the storm or during storm clean-up activities. Dealing with these after-effects of Sandy continues to require significant park and EPMT resources.

While searching for and treating wineberry (*Rubus phoenicolasius*)—an early detection species at the William Floyd Estate at Fire Island National Seashore—the Northeast EPMT found small patches of three other species new to the park: mile-a-minute weed (*Persicaria perfoliata*), leafy spurge (*Euphorbia esula*), and black swallow-wort (*Cynanchum louiseae*). The Northeast EPMT recorded and treated the incipient infestations, and hopefully prevented their establishment. This park was hit hard by Tropical Storm Sandy, so more discoveries of invasive species are expected.

Another Tropical Storm Sandy hitchhiker, the Asiatic sand sedge (*Carex kobomugi*), has spread to numerous new sites in Gateway National Recreation Area. Before Sandy, this sedge had been limited to beaches at the Sandy Hook Unit in New Jersey. One small patch in the Jamaica Bay Unit in New York had been eradicated by the Northeast EPMT several years ago. Tropical Storm Sandy spread the sedge over a wide area. New plants are easily hand-pulled but once established the sedge's extensive rhizome system makes hand-pulling impossible. The Northeast EPMT has been running herbicide trials at the Sandy Hook Unit for several years with mixed results, making EDRR by far the best approach for controlling this plant. Park staff has been doing extensive surveys of beach sites in all units of the park, resulting in discovery of several new infestations. When found, staff and volunteers hand-pull every plant.

Figure 21. Morristown NHP gap mapping with GPS

The forests of Morristown National Historical Park were pummeled by Tropical Storm Sandy. Many large trees were downed, opening up sizable gaps in the forest canopy. In January 2013, a group of regional and park employees, a university partner, and a volunteer met at the park to map the new canopy gaps. The group split into teams and spent several days mapping. The new data were added to existing maps to produce a post-Sandy forest canopy gap map. The data on forest gaps will inform a new deer and vegetation management plan being developed by the park.

Because the Northeast EPMT serves 25 parks over a large area, it must set priorities to ensure its services are effectively used and focused on strategically important projects. Tropical Storm Sandy also highlights the need to adapt operations to shifting conditions driven in part by climate change.

Table 10. Northeast EPMT Accomplishments

Measure	Acres
Treated/Retreated	101
Inventoried	1,044
Monitored	138
Gross Infested Area (GIA)	522
Infested Area (IA)	16

The California Exotic Plant Management Team (EPMT) serves 14 parks within the California Floristic Province. This region is one of 25 world biodiversity hotspots. Of 3,500 vascular plants found in California, over two-thirds of the species are found nowhere else in the world. Project sites range from the geothermal vents of Lassen Volcanic National Park (NP) to the Sierra Nevada Mountains in Yosemite NP. Within the national parks served by the California EPMT, over 290,000 of the 2.1 million acres are infested with invasive plants. This scenario demands that we dedicate significant energy to prioritizing treatments and promoting partnerships that facilitate strategically robust treatment efforts.

Although the California EPMT has treated 196 species since 2002, five particularly tenacious species—yellow star-thistle *(Centaurea solstitialis),* Scotch broom (*Cytisus scoparius*), Italian thistle (*Carduus pycnocephalus*), Harding grass (*Phalaris aquatica*), and bull thistle (*Cirsium vulgare*)—have accounted for 53% of our acres treated. Treatment priorities are determined by evaluating species containment and invasion potential, site vulnerability, and project feasibility. The California EPMT sponsors treatments of both rampant single-species infestations and dispersed multi-species infestations. Projects highlighted below are large-scale reduction efforts that have either brought populations to a maintenance control level (<1% of original infestation), or are close to doing so.

Figure 22. Prison inmates removing invasive species along a high traffic corridor at Santa Monica Mountains NRA

At Santa Monica Mountains National Recreation Area (NRA), yellow star-thistle, fennel (*Foeniculum vulgare*), and Harding grass are all aggressive ecosystem-altering invasive species that crowd out natives, alter hydrology and nutrient cycling, and increase fuel loads. Combined, these species invaded approximately 80 acres of valuable coastal sage scrub (a globally threatened habitat type), riparian, and native grassland habitats. All occur in highly visited hubs leading into pristine areas of the park. Control efforts focused on a few species in high-priority areas to protect interior locations. For example, in 2008,

yellow star-thistle infested 47 acres at Paramount Ranch, and the initial annual treatment took four staff two months to treat. In 2012 two staff treated the remaining populations in two days by spot-spraying. This year the dwindled infestations were treated in one day, by one person. After The EPMT treatment, the park planted 1,400 native shrubs, trees, and perennial grasses. An additional 25,000 plants are scheduled for planting in December 2013. To inform the restoration, studies on the legacy effects of Harding grass on soil biology and chemistry are being carried out.

Figure 23. Mechanical treatment of Scotch broom at Point Reyes NS included excavation

Point Reyes National Seashore (NS) has been treating Scotch broom for 30 years. It is a highly invasive shrub that transforms landscapes by altering soil chemistry and fire regimes and outcompeting native vegetation. In 2013, the California EPMT was able to converge on the core population, which is considered the historic source of local infestations. This Scotch broom population threatened habitat for three rare plant species and two federally listed wildlife species. Ninety-eight percent of the 575 acre site has been treated and left to cure. Dead plants served as fuel for a prescribed burn conducted in late 2013. Depending on the fire's intensity, the heat either killed the long-lived seedbank, or it will promote germination next spring. Stimulating mass germination allows for the consolidation of treatments to a few years, rather than the typically drawn-out follow-up needed for the 35-year seedbank. It is expected that it will take five years to bring Scotch broom to a maintenance control level across this large site.

In sum, the California EPMT is helping parks forge effective treatment strategies and strengthen partnerships. These relationships are incentivized by funding projects that make use of partnerships, many of which cross park boundaries and offer additional financial support. This year, both park- and California EPMT-leveraged contributions have augmented the project base with an additional $338,709 by engaging 18 partnerships and multiple grant programs. This funding increased treatment capacity by 70% and allowed the California EPMT to look at more ecosystem-scale operations. Expanding partnerships have made it possible to bring large, historically daunting populations to maintenance control levels. These efforts have increased the role of the National Park Service in the establishment of region-wide priorities. In times of fiscal reductions and climate change impacts, it is these partnerships that will be essential to sustaining our hard-fought progress.

Table 11. California EPMT Accomplishments

Measure	Acres
Treated/Retreated	175
Inventoried	1,438
Monitored	2,278
Gross Infested Area (GIA)	3,164
Infested Area (IA)	201

The Lake Mead Exotic Plant Management Team (EPMT) was established in 1996, serving as the prototype for what eventually developed into the National Park Service (NPS) EPMT Program. The Lake Mead EPMT has conducted on-the-ground projects with field crews in 37 national parks, 15 US Fish and Wildlife Service (USFWS) refuges, seven Bureau of Land Management (BLM) districts, four national forests, two Bureau of Indian Affairs units, one Bureau of Reclamation region, and several state and local entities throughout the Southwest, providing service to millions of acres of land. The Lake Mead EPMT has three primary goals: (1) provide expertise in the control of invasive plants in order to preserve, restore, and maintain native plant communities, (2) professionalize invasive plant management within NPS and its partners by developing staff expertise, and (3) improve efficiencies and effectiveness at a landscape scale through interagency cooperation and partnership development.

Partnerships are integral to the Lake Mead EPMT's success, leveraging each NPS base dollar with three additional dollars on an annual basis. These partnerships facilitate invasive plant management across agency boundaries and increase our capacity to serve national parks. For example, BLM funds are provided to the Lake Mead EPMT to control invasive plants adjacent to many national parks, and national forest funds are used to treat invasive plants adjacent to many national parks in Arizona. All of these funds total more than $1 million, supporting a 20-person field crew on a daily basis, and forming the largest EPMT in the nation.

The Southwest climate allows a year-round operation - maximizing the Lake Mead EPMT's ability to serve its various partners and control a diversity of invasive plants, thereby improving efficiency and flexibility in scheduling projects.

Figure 24. Tarl Norman drills holes into palm trunk to prepare for herbicide application at Joshua Tree NP

FY2013 Accomplishment Summary

Lake Mead EPMT served a record number of partners, including 21 national parks (in six states), and 13 national wildlife refuges (in three states). There were also projects implemented for nine other interagency

partners. Most projects involved 10- to 20-person crews working multiple days, and sometimes making multiple trips.

One of the Lake Mead EPMT's proudest accomplishments was conducting a rapid response to eradicate a newly detected grove of date palm (*Phoenix dactylifera*) in a remote area of Joshua Tree National Park (NP). Date palms can threaten natural spring oases and native palm populations. Date palm control is hazardous and difficult, requiring removal of sharp fronds with chainsaws prior to drilling into the core of the "tree trunk" to apply herbicide. In addition, the grove was situated in remote wilderness, requiring a several-mile hike into a narrow canyon, navigating over and around large boulders. Park Ranger staff assisted with the route navigation and safety rope placement. A 17-person crew was used to get the job done as safely and efficiently as possible. The Lake Mead EPMT accomplished the project in only two days, allowing time to assist the park with other invasive plant projects, including maintaining the park as tamarisk-free and eradicating fountain grass (*Cenchrus setaceus*). Without the Lake Mead EPMT's readiness, availability, and funding, Joshua Tree NP would not have been able to accomplish this project with in-park staff. Seeking alternative funding would have taken several years to accomplish.

Another invasive palm tree control project involved a burned-area emergency response at Death Valley NP following a May 2013 wildfire, fueled primarily by palm trees that threatened Scotty's Castle, a popular and heavily visited historic structure in the park. The Lake Mead EPMT assisted with obtaining immediate post fire funding to implement control of the palm trees prior to re-sprouting and setting seed. To meet these goals, the project needed to be implemented in the hottest time of year (late July - early August). A four-person EPMT crew treated over 200 large palm trees and 400 small trees in three days.

Figure 25. Casey Sandusky cuts palm fronds to prepare for drilling at Joshua Tree NP

Two agreements with the USFWS Region 2 Invasive Species Strike Team totaled $405,800 of project funding to the Lake Mead EPMT. One agreement covers five refuges in New Mexico and another agreement covers six refuges in Arizona. Refuge staff were pleased with the amount of invasive plants controlled by this cooperative, as well as the opportunity to learn new control techniques for Russian olive (*Elaeagnus angustifolia*).

After many years of detailed record keeping and high performance the Lake Mead EPMT is able to maintain an impressive array of partnerships. The partnerships continue to pay dividends in the form of increased institutional knowledge, year-round treatment options, and crew-size flexibility.

Table 12. Lake Mead EPMT Accomplishments

Measure	Acres
Treated/Retreated	178
Inventoried	31,681
Monitored	1,001
Gross Infested Area (GIA)	18,930
Infested Area (IA)	230

From the open range of the Palouse prairie in Idaho and Washington to the high desert of eastern Oregon, along the creeks and rivers fed by the glacial North Cascades and Olympic mountains, and in the rainforests and remnant prairies of the northwest coast, the North Coast / Cascades Network Exotic Plant Management Team provides professional invasive plant management services to its partner parks. The EPMT focuses on fostering projects that assist with the restoration of degraded park resources, preventing the spread of non-native species into fragile wilderness areas, and expanding ecosystem-level partnerships to combat invasive plant species with other stakeholders. The Team provides coverage for 12 to 14 parks across Idaho, Oregon, and Washington during any given field season. This range consists of three National Park Service Inventory and Monitoring networks, representing approximately 2.1 million acres of federal lands in the Pacific Northwest.

Despite service-wide budget cuts in 2013 that resulted in a 30 percent reduction of its workforce, the Team continued to assist its park partners in meeting management goals, forging new partnerships, and strengthening old ones. East of the Cascade Mountains, the team focused on the Early Detection / Rapid Response of several species in its partner parks. Thanks to a tip from the Stevens County Noxious Weed Control Board, the EPMT was alerted to several infestations of hoary alyssum (*Berteroa incana*) in the North District of Lake Roosevelt National Recreation Area (NRA). Hoary alyssum has a limited distribution in Washington State, with infestations currently reported in only six of 39 counties and is poisonous to livestock, representing a serious threat to the property value of neighboring agricultural land. Using a combination of late-summer and fall treatments, the EPMT was able to reduce 60 acres of hoary alyssum by approximately 95% in one year.

Figure 26. Using All Terrain Vehicles to treat patches of hoary alyssum at Lake Roosevelt NRA, outside Kettle Falls, WA.

The North Coast / Cascades Network EPMT also made efforts to eradicate another invasive plant that has an extremely limited distribution at Lake Roosevelt NRA—yellow starthistle (*Centaurea solstitialis*). Although common in California, where it

results in millions of dollars of losses to agriculture on an annual basis, yellow starthistle is only found in a small part of eastern Washington. The two populations at Lake Roosevelt NRA represent the northern-most documented infestations in the state. In 2013 crews were able to eradicate one population and make significant headway on the other. Yellow starthistle was also targeted at Whitman Mission National Historic Site, where it has rapidly overtaken the park's iconic monument hill. EPMT staff assisted the park in greatly reducing yellow starthistle populations in 2013. With several more years of efforts this infestation can be controlled.

The North Coast / Cascades Network EPMT also continued to focus on reducing the impacts of invasive annual grasses in 2013. On the steep valley walls above the community of Stehekin, located in the Lake Chelan NRA, crews completed their second year of treatment on cheatgrass (*Bromus tectorum*) which expanded rapidly after the Rainbow Bridge wildfire in 2010. Monitoring has demonstrated a significant reduction of cheatgrass and a significant recovery of native vegetation after two years. Without these efforts, cheatgrass populations would quickly outcompete native species, resulting in more frequent wildfires that would not only threaten the native ecosystem, but also the residents of the Stehekin Valley.

Invasive grasses were also a priority for the EPMT at both John Day Fossil Beds National Monument in eastern Oregon and Nez Perce National Historical Park in Idaho. Crews began treating isolated populations of medusahead rye grass (*Taeniatherum caput-medusae*) in an effort to preserve native grasslands invaded by this species after wildland fires. Without control, medusahead rye grass can out compete native perennial grasses, creating a thick thatch that will support neither native plants nor animals. If allowed to spread, medusahead rye grass could quickly ruin the productivity of adjacent rangelands and integrity of park resources. The EPMT plans to continue to refine efforts to control medusahead rye grass in 2014, and work toward the restoration of affected areas with its partner parks.

Figure 27. Treating satellite patches of medusahead rye grass in the Painted Hills unit of John Day Fossil Beds NM, near Mitchell, OR.

After twelve field seasons, the North Coast Cascades Network EPMT continues to provide a variety of invasive plant management services to its partner parks, while successfully collaborating with neighboring stakeholders to ensure that National Park Service lands continue unimpaired for future generations.

Table 13. North Coast / Cascades Network EPMT Accomplishments

Measure	Acres
Treated/Retreated	296
Inventoried	2,855
Monitored	1,001
Gross Infested Area (GIA)	2,584
Infested Area (IA)	236

In its thirteenth operational year, the Pacific Islands Exotic Plant Management Team (EPMT) provided critical guidance to six network parks, in a wide variety of habitats. In two of six National Park Units that we normally serve, we deferred work until 2014, as a result of logistic and budgetary limitations. In 2014, all units will be served.

Overall, 2013 was exceptionally successful for the Pacific Islands EPMT. At Haleakala National Park (NP) the team focused on the protection of iconic ecosystems from miconia (*Miconia calvescens*) and Pampas grass (*Cortaderia* spp). The team's close partnership with the Maui Invasive Species Committee (MISC) helped gain efficiencies and increase treatment impacts. Exceptionally favorable weather allowed the team to access and treat more pampas grass areas than expected. One priority infestation contained 16% fewer mature and 13% fewer immature plants than the previous year. Due to our success our treatments of mature plants dropped by 25 percent. It took all year to find and treat what we easily found in one month, 5 years ago.

Miconia control was also a success. The recent development of herbicide ballistic technology (HBT) reduces herbicide use to less than 1% of allowable rates, while maintaining 98% treatment efficacy. In cooperation with the University of Hawaii College of Tropical Agriculture and Human Resources and MISC, an accelerated intervention strategy began. Relative to past work on high priority incipient infestations, treatment effort increased 33%, resulting in 90% fewer plants. Recent projections indicate that we will achieve near undetectable levels of miconia in the accelerated treatment areas by 2016. Since the miconia seed-bank exceeds 20 years, this is still a long-term commitment. The trade-off of more time spent on high risk miconia infestations will be less time spent in other areas. These lower risk areas are not as close to the Park in the remainder of the 136,000 acre East Maui Watershed area. Eventually, the far-flung incipient infestations will coalesce to become mature monocultures, exacerbating the threat to Haleakala NP, making interdiction efforts impossible.

Figure 28. Recording field data during a pampas grass search, photos courtesy of MISC.

The Pacific Islands EPMT at Hawaii Volcanoes NP continued its critical contributions, while also collaborating with

Pu'u Honua O Honaunau NHP and Kaloko-Honokohau NHP. Cooperative crews controlled and monitored 134 problematic species in these parks.

For incipient species, early detection and aggressive targeting for eradication is the most cost effective strategy. On newly acquired NPS lands in Hawaii Volcanoes NP we provided critical detection, taxonomic, and control expertise. The Pacific Islands EPMT contributed 170 worker days treating 101 noxious incipient species, including intensive eradication effort for two localized species, Gorse (*Ulex europaeus*) and Singapore daisy (*Wedelia trilobata*). Additionally, we contained spread of padang cassia (*Cinnamomum burmanii*), known from only one site in Hawaii Volcanoes NP. We continued efforts with Koster's curse (*Clidemia hirta*), a Hawaii noxious weed. Other targets included the invasive tree glory bush (*Tibouchina urvilleana*) and the vine banana poka (*Passiflora tarminiana*).

Hawaii Volcanoes NP has identified high priority sites known as Special Ecological Areas (SEAs). Our work controlling invasive species in these high priority areas complements the focus on incipient populations. Our team removed 20 species from 12 SEA units in the park, notably collaborating to remove 5,237 faya trees (*Morella faya*) from one area. Other targets include some of the most invasive plants in Hawaii, such as kahili ginger (*Hedychium gardnerianum*), and Himalayan raspberry (*Rubus ellipticus*). Additionally, the Team recruited and led a volunteer workforce that contributed 270 worker days at Hawaii Volcanoes NP, primarily treating kahili ginger, invasive trees, and hazardous fuels.

Pacific Islands EPMT lends critical support to fountain grass (*Pennisetum setaceum*) removal in Hawaii Volcanoes NP and adjacent communities. It is an ecosystem transformer that colonizes young lava flows that otherwise serve as natural firebreaks, curtailing natural succession. In addition to ecological consequences, this growth habit alters viewscapes. We removed 736 individuals from outlier infestations. In newly-acquired Hawaii Volcanoes NP lands, the EPMT mapped and treated all plants. Only nine plants were found (and removed) in the Kahuku Unit of the Park. Cooperative work with volunteers and staff surveyed 156 miles of road in the Hawaiian Ocean View subdivision, removing 800 plants.

Figure 29. Collaborating crews searching for invasive fountain grass in coastal lowland habitat.

The Pacific Islands EPMT provides professional service, concentrating on strategic and targeted treatment methods and initial knockdown of weeds in management units. The EPMT uses technical rappelling skills, specialized helicopter use, and innovation as primary tools for success.

Table 14. Pacific Islands EPMT Accomplishments

Measure	Acres
Treated/Retreated	51
Inventoried	1,574
Monitored	49,069
Gross Infested Area (GIA)	10,579
Infested Area (IA)	125

The Florida / Caribbean Exotic Plant Management Team (EPMT) supports 15 national parks in Florida and the Caribbean through inventory, monitoring, control, education, and research. Control is accomplished through regional contractors, with smaller projects carried out by seasonal National Park Service (NPS) crews. Florida and the Caribbean have the dubious distinction of having one of the worst invasive species problems in the country, with over 1.5 million acres of conservation areas infested with invasive plants. These invasive plants have a detrimental effect on native plant communities by reducing native plant diversity and altering ecological processes such as fire behavior and surface water conveyance.

In 2013, the Florida / Caribbean EPMT steering committee, with representatives from Florida and Caribbean NPS parks, the US Army Corps of Engineers, US Fish and Wildlife Service, and the State of Florida selected six major invasive plant control projects to be accomplished through cost-efficient private contractors at: Everglades National Park (NP), Canaveral National Seashore, and Big Cypress National Preserve. In addition to contractor projects, the steering committee developed a treatment schedule for the seasonal treatment crew. In this year's annual report we will be highlighting the melaleuca (*Melaleuca quinquenervia*) and Australian pine (*Casuarina equisetifolia*) treatment projects in the East Everglades Expansion Area (EEEA) of Everglades NP, as well as the dry tropical forest exclosure construction in Virgin Islands NP.

Figure 30. A large section of the last remaining untreated Melaleuca stands removed at Everglades NP

The 109,000 acre EEEA was acquired by Everglades NP in 1989. At that time much of the EEEA was adversely affected by melaleuca and Australian pine. Both species are ranked as Category I invasive species by the Florida Exotic Pest Plant Council (FLEPPC). These species have caused habitat loss for native flora and fauna that are found in the freshwater slough and marl prairie communities. The Cape Sable Seaside Sparrow (*Ammodramus maritimus mirabilis*), an endangered species, inhabits the muhlenbergia (*Muhlenbergia sericea*) prairies in certain portions of the EEEA.

Melaleuca and Australian pine both invade these prairies and can cause habitat loss needed by the Cape Sable Seaside Sparrow.

Everglades NP, with the help of a number of cooperating agencies, has been treating invasive plants in the EEEA since 1989. Since 2002, approximately 107,000 acres (98%) have been treated at least once for melaleuca and Australian pine. However, complete recovery of areas affected by invasive plants requires retreatment.

This year's project ensured retreatment of previously targeted areas, as well as completion of initial treatment for the final 2,000 acres that had never been treated. The contractor used a helicopter, ATV/UTV, and trucks to transport 20-person field crews to the treatment sites. There, seedlings of all woody invasive plant species were pulled, and larger saplings were treated with herbicide.

Virgin Islands NP is located on the island of St. John, US Virgin Islands. The dry tropical forests within the park represent some of the best preserved and intact forest ecosystems in the entire Virgin Islands chain. Unfortunately, these forests are exposed to an onslaught of non-native ungulate browsing and grazing, while simultaneously invaded by highly aggressive non-native plant species. The primary invading plant species are lead tree (*Leucaena leucocephala*) and Guinea grass (*Megathyrsus maximus*). Fast-growing invasive plants are favored by ungulate browsing because the animals create disturbed areas. The main ungulate browsers in these areas are feral goats (*Capra hircus*) and non-native white-tailed deer (*Odocoileus virginianus*). Unchecked grazing and plant intrusion has greatly diminished the biodiversity of these remaining dry forest ecosystems.

A project was proposed to create a fenced exclosure to restrict grazing animals from reaching sensitive undisturbed vegetation. The area chosen was Nanny Point, a 1.8-acre peninsula located on the southeast side of St. John. Nanny Point's distinctive jutting coastline made it an ideal location to use a 250 foot fence to isolate the point. The fence is 6 feet tall and has a self-closing gate at the top of the hill to allow visitor access. Adjustments were made throughout the fence construction to adhere to existing terrain features. Additionally, any invasive plants found at the trailhead to Nanny Point and within were treated.

Figure 31. Building an exclosure fence to protect park from grazing animals at Virgin Islands NP

The Florida / Caribbean EPMT uses a combination of strategies to target a few large projects. This approach continues to lead to impressive results, including the treatment of the last remaining Melaleuca stands at Everglades NP.

Table 15. Florida / Caribbean EPMT Accomplishments

Measure	Acres
Treated/Retreated	868
Inventoried	2,020,952
Monitored	0
Gross Infested Area (GIA)	20,952
Infested Area (IA)	868

The Gulf Coast Exotic Plant Management Team (EPMT) spans the Gulf Coast region from Mexico to Florida and includes six partner parks and two non-partner parks. This is a region of warm year-round temperatures, high precipitation, and high plant diversity—both native and non-native. New species of invasive plants are discovered annually in our parks and the Gulf Coast EPMT makes every effort to control these new populations before they have a chance to spread to a larger area. The EPMT treats a range of habitats and a wide variety of species including Chinaberry tree (*Melia azedarach*), cogongrass (*Imperata cylindrica*) and Japanese climbing fern (*Lygodium japonicum*). The recent hurricane history in the region has provided ample opportunity for these species to gain a foothold in stressed native ecosystems.

Most of the forested ecosystems within the parks have the potential to naturally revegetate after invasive species are removed and once canopy closure has been achieved. Disturbed grasslands within the parks require active re-vegetation efforts. These sites often need decades to naturally revegetate with native species unless reseeding and weed control are practiced. The focus of our team in the coming years will be to replace these invasive species with suitable, adapted native species, both in an effort to restore native habitats and to prevent re-infestation of invasive species from surrounding populations and the remaining seed bank.

Figure 32. Chinese tallow seedlings after the Pipeline Burn Fire at the Big Thicket National Preserve

In 2013 the Gulf Coast EPMT initiated an interagency agreement between the National Park Service and US Fish and Wildlife Service serving Texas parks and wildlife refuges. By integrating control efforts across the landscapes and coordinating Early Detection / Rapid Response efforts, both agencies can increase efficiency. In addition, the agreement offers opportunities for American and international volunteers and employees from diverse backgrounds to take advantage of training and exposure to careers in natural resources management.

Additionally, the Gulf Coast EPMT is working in partnership with the Austin, Texas based American YouthWorks. This

organization operates a Service Learning Academy, a charter school for at-risk students. Students are eligible to participate in the Texas Conservation Corps (TxCC), an organization similar to the Civilian Conservation Corps of the 1930s which was responsible for many notable projects on National Park Service lands. TxCC members can volunteer for park work projects, including invasive species management, and are contracted by the parks and/or Gulf Coast EPMT on a fee-for-service basis. Volunteers receive a small monthly stipend and a college tuition stipend of $5,550 for each year of service.

The Gulf Coast EPMT has contracted the TxCC to implement the interagency agreement with the US Fish and Wildlife Service and a burned area restoration project for the Pipeline Burn Fire at the Big Thicket National Preserve. Restoration work **concentrated on the removal of Chinese tallow tree seedlings and saplings that had invaded post fire. The project was accomplished by funds leveraged from the National Park Service BAER (Burned Area Emergency Response) program.**

Figure 33. American YouthWorks Team at the Big Thicket National Preserve

Management efforts in future years will shift from a focus on control to an emphasis on restoration. Initial restoration efforts will focus on grassland habitats. Prairie restoration plans will soon be in place at several partner parks or proposed partner parks including San Antonio Mission National Historic Park (NHP), and Palo Alto Battlefield NHP. In addition, active planting and reforestation efforts may be pursued following this year's Chinese tallow tree removal project at the Big Thicket Pipeline Burn area. Equipment required to facilitate the shift to restoration has been purchased and will be followed by procurement plant materials, seed and supplies. This is an exciting new horizon for the Gulf Coast EPMT. The ultimate goal of the EPMT program is to restore native ecosystems. Given the extensive infestations and persistence of many invasive plants, site restoration may ultimately be required to achieve stability.

Table 16. Gulf Coast EPMT Accomplishments

Measure	Acres
Treated/Retreated	245
Inventoried	3,020
Monitored	346
Gross Infested Area (GIA)	1,817
Infested Area (IA)	271

The Southeast Exotic Plant Management Team (EPMT), established in 2003, provides support to 20 national parks located within the Cumberland Plateau, Appalachian Highland, and Piedmont physiographic provinces of the southeastern United States. These partner parks, ranging in size from 200 acres to 50,000 acres, typically exist as islands of natural communities, or lands protected in a specific historical state, surrounded by a disturbed landscape. This disturbance, coupled with a temperate climate similar to that found in portions of Asia, contributes greatly to the often devastating success of plants introduced, intentionally and accidentally, from Asian countries.

Figure 34. Treating tree of heaven on restoration site at Cumberland Gap NHP

Working from March thru December in 2013, the SE-EPMT treated 33 invasive exotic plant species infesting an area of 197 acres. Invasive plant management prescriptions were carried out in 16 of our partner parks. Park projects are first prioritized by severity of threat and park in kind support.

The most commonly treated species in 2013 were princess tree (*Paulownia tomentosa*), tree of heaven (*Ailanthus altissima*), Chinese privet (*Ligustrum sinense*), and multiflora rose (*Rosa multiflora*). The Southeast EPMT continues to employ an Integrated Pest Management strategy with control techniques ranging from hand-pulling of invasive herbs like garlic mustard (*Alliaria petiolata*), to the use of power tools and herbicides on woody species such as Bradford pear (*Pyrus calleryana*), to the use of propane torches on herbs like Asiatic dayflower (*Commelina communis*). By using a varied “toolbox” of control techniques and by operating 10 months out of the year, the Team is able to adapt operations to fit a particular season and environmental situation. With each year of monitoring and treatment, our partner parks are experiencing significant successes as evidenced by the natural reestablishment of native species on many sites. Consistent annual monitoring and spot treatment, as necessary, ensures years of effort are not lost. Once to maintenance level, the cost of control effort is greatly reduced. However, without follow-up on an annual or semiannual basis,

reestablishment of the original invasive species, or the establishment of a new problem species, is likely.

Figure 34. Treating Asiatic dayflower on sensitive granitic outcrops using propane torches in Carl Sandburg Home NHS

Opportunities to provide outreach to the general public, focused interest groups, and professional resource managers have continued to expand for the Southeast EPMT. During 2013, the Southeast EPMT provided classroom, hands-on training and/or assistance with invasive control projects to many groups including the Tennessee Exotic Pest Plant Council, Tennessee State Parks staff, The Nature Conservancy, and Warren Wilson College student volunteer program. Workshop topics included early detection species identification, safe and effective use of herbicides, treatment techniques, planning and prioritizing strategies, and prevention of spread and new introductions. In addition, the Southeast EPMT continued to provide training and support for partner park staff in order that they may carry out invasive plant maintenance and initiate new projects independent of the EPMT. The SE-EPMT provides technical assistance to their partner parks for development and implementation of invasive plant prescriptions as well as assistance in the development of NPS Servicewide Comprehensive Call project proposals and grant applications in an effort to obtain additional funding.

The Southeast EPMT has enjoyed several successes during 2013, but none more significant than the completion of the tenth year of scheduled work without an accident or injury. Because the Southeast EPMT uses a variety of power tools and numerous chemicals, and logs approximately 22,000 miles on the road each year, safety is the primary focus. This success is not taken for granted as new and better ways to insure safe operational strategies are constantly sought, reviewed, and revised. Examples for 2013 include a review and revision of Job Hazard Analyses (these are done on an annual rotational basis), implementation of post work activity safety briefings (in addition to the standard pre-work briefing), maintaining advanced chainsaw operation and safety certification (C-feller), Wilderness First Responder certification for the Team Leader, and implementing a vehicle and trailer pre-trip safety check-list to enhance safe travel.

Throughout 2013, the Southeast EPMT has continued to adapt to the needs of partner parks while stressing safe and efficient operations. As we persist in making headway in controlling the invasive plants currently present in our partner parks, prevention and Early Detection / Rapid Response to new introductions will play increasingly important roles in our long-term success.

Table 17. Southeast EPMT Accomplishments

Measure	Acres
Treated/Retreated	197
Inventoried	2,103
Monitored	0
Gross Infested Area (GIA)	2,090
Infested Area (IA)	197

The Southeast Coast Exotic Plant Management Team (EPMT) serves 15 partner park units across the Carolinas, Georgia, and Alabama. These parks range from protected seashores and forested wilderness to urban recreational areas and preserved cultural landscapes. The Southeast Coast EPMT is stationed at Congaree National Park (NP), one of the last remaining remnants of an intact old growth bottomland floodplain forest, and some of the only designated wilderness within the Southeast. The Southeast Coast EPMT was initiated as a pilot project in 2005, and does not receive national-level funding; the Southeast Coast EPMT was permanently funded with base increases to Congaree NP's operating budget in 2009 and 2010. Although the Southeast Coast EPMT is not funded by the national EPMT Program, it shares similar goals for invasive plant management.

The Southeast Coast EPMT served 13 partner parks and conducted invasive plant treatments at 10 of those units. The Southeast Coast EPMT has been scaled back to a seven-month season that includes intense field training of new hires and treatment activities. Congaree NP's SCA crew members, along with other Volunteers-In-Parks at Fort Pulaski National Monument (NM), Chattahoochee River National Recreation Area (NRA), Kennesaw Mountain National Battlefield Park, Ocmulgee NM, and Cape Hatteras National Seashore (NS) contributed 4,269 hours towards the EPMT's invasive plant management efforts.

Figure 35. Treating cut stumps of Chinese tallow at Ocmulgee NM

The volunteer and staff support, housing, travel per diem, field supplies (i.e. herbicide), and equipment contributions that the Team received from partner parks were critical resources that supported the EPMT's travel to parks to continue invasive plant

project investments that have been made over the past three years. The Southeast Coast EPMT removed Chinese privet (*Ligustrum sinense*) along the nature trail at Horseshoe Bend National Military Park, and visitors are now able to view the Tallapoosa River. At Cumberland Island NS successful treatments of the tungoil tree (*Vernicia fordii*) infestation allowed the EPMT to hand-pull new seedlings. Following a six-acre kudzu (*Pueraria montana)* treatment project at Chattahoochee River NRA, there has been a reduction in kudzu biomass, and native plant succession is occurring. The Southeast Coast EPMT continued to expand a Chinese tallow (*Triadica sebifera*) treatment area at Ocmulgee NM, where a seasonal employee has conducted maintenance treatments following the Southeast Coast EPMT's treatment work.

In addition to treating invasive plants, the Southeast Coast EPMT provided field training to park staff and volunteers on invasive plant treatment and data collection techniques in exchange for field assistance. Two of the EPMT crew members were able to extend their SCA internships for three months to remove invasive plants at Fort Pulaski NM. With Fort Pulaski NM funding, the EPMT administered the extensions so that the trained interns could work exclusively on invasive plant oriented projects, including the Southeast Region's first "Invasive Plant Bio-blitz" featured on InsideNPS.

To stay current on treatment techniques and to contribute to the effective control of invasive plants on nearby lands, EPMT staff were involved in the South Carolina Exotic Pest Plant Council (EPPC) Board of Directors in Outreach and Education efforts, the South Carolina Aquatic Plant Management Society, and Southeast EPPC Annual Meetings.

Figure 36. Before and after pictures of Kudzu at Chattahoochee River NRA

The EPMT collaborated with the local community to educate Heathwood Hall Episcopal School on invasive plants, and with Clemson University on a cogongrass (*Imperata cylindrica*) Early Detection / Rapid Response initiative by training Congaree NP staff to survey the park for absence data.

Table 18. Southeast Coast EPMT Accomplishments

Measure	Acres
Treated/Retreated	17
Inventoried	1616
Monitored	0
Gross Infested Area (GIA)	790
Infested Area (IA)	18

Appendix A – Program Participants

Alaska EPMT Program Participants

Leadership
Chris Overbaugh (Liaison), Tim Federal (Seasonal Data Manager)

Crew
Wendy Mahovlic, Peter Frank, David Krimmel, Morgan Gantz (CBG Intern), Daniel Watson (SCA Intern), Nicole Landry (SCA Intern), Aleksandra Voznitza (SCA Intern), Naramena McCray (SCA Intern), David Golden (SCA Intern), Shannon Apgar-Kurtz (SCA Intern).

Region/Network Support
Alaska Regional Office – Guy Adema, Joel Cusick, Angie Southwould.

Park Support
Denali National Park – Carl Roland
Gates of the Arctic National Park – Jeff Rasic
Glacier Bay National Park and Preserve – Lewis Sharman
Katmai National Park and Preserve – Whitney Rapp, Troy Hamon
Kenai Fjords National Park – Christina Kriedeman
Klondike Gold Rush National Historic Park – Theresa Thibault, Jessica Wilbarger
Western Arctic National Parklands – Peter Neitlich, Marci Johnson
Wrangell-St. Elias National Park and Preserve – Miranda Terwilliger, Eric Veach

Volunteers
Alaska Association of Conservation Districts, Alaska Sea Life Center, Need for Seed, Resurrection Bay Conservation Alliance, Skagway Public Library, Southeast Alaska Guidance Association

Steering Committee
Alaska Regional Office – Guy Adema
Denali National Park – Carl Roland
Kenai Fjords National Park – Sharon Kim
Gates of the Arctic National Park – Jeff Rasic
Western Arctic National Parklands – Frank Hays
Klondike Gold Rush National Historic Park – Theresa Thibault
Wrangell-St. Elias National Park and Preserve – Eric Veach

California EPMT Program Participants

Leadership
Bobbi Simpson (Liaison), John Swenson (Data manager)

Region/Network Support
Pacific West Regional Office – Jay Goldsmith (Natural Resources Specialist)

Steering Committee
Pacific West Region Office – Jay Goldsmith
Klamath Network – Stassia Samuels
Mediterranean Network – Irina Irvine
San Francisco Bay Area Network – Alison Forrestel
Sierra Nevada Network – Garrett Dickman

Partners
American Conservation Experience
Back Country Horseman
California Conservation Corps
California Department of Parks and Recreation
California Invasive Plant Council
Golden Gate National Parks Conservancy
Golden Gate Concession Franchise Association
Great Tree Tenders
Mariposa County
Mountains Restoration Trust
San Francisco Bay Inventory and Monitoring Group
Santa Monica Youth Corps
Shelterbelt Builders
Stanislaus National Forest
Student Conservation Association
US Forest Service
Yosemite Conservancy
Youth Conservation Corps

Florida / Caribbean EPMT Program Participants

Leadership
Tony Pernas (Liaison), Alan Shane McKinley (Crew Leader), Shea Bruscia (Data Manager)

Crew
Paul Rischmiller, Joaquin Alonso, Mary Rose

Region/Network Support
South Florida and Caribbean Inventory and Monitoring Network: Matt Patterson, Kevin Whelan, Brian Witcher, Judd Patterson, Jed Redwine, Brooke Shamblin, and Judd Patterson

Park Support
Big Cypress National Preserve – William Snyder, Jim Burch
Biscayne National Park – Shelby Moneysmith, Vanessa McDonough
Buck Island Reef National Monument – Ian Lundgren, Zandy Hillis-Starr
Canaveral National Seashore – John Stiner
DeSoto National Memorial – Jorge Acevedo
Dry Tortugas National Park – Tracy Ziegler, Kayla Nimmo
Everglades National Park – Hillary Cooley, Jonathan Taylor, Amanda Snodgrass
Fort Matanzas National Monument – Kurt Foote
Gulf Islands National Seashore – Mark Nicholas
Timucuan Ecological and Historic Preserve – Shauna Allen, Cicely Pontiflet
Virgin Islands National Park –Thomas Kelly, Kelly Altenhofen

Steering Committee
Big Cypress National Preserve – Jim Burch
Biscayne National Park – Vanessa McDonough
Buck Island Reef National Monument – Ian Lundgren
Canaveral National Seashore – John Stiner
Everglades National Park – Hillary Cooley
Florida Wildlife Conservation – Jackie Smith
Fort Matanzas National Monument – Kurt Foote
Gulf Islands National Seashore – Mark Nicholas
US Army Corps of Engineers – John Lane
US Fish & Wildlife Service – William Thomas
South Florida Water Management District – Leroy Rogers
Southeast Region – Chris Furqueron (IPM Coordinator)
Timucuan Ecological and Historic Preserve – Shauna Allen
Virgin Islands National Park – Kelly Altenhofen

Partners
Florida Wildlife Conservation – Dennis Giardina, Jackie Smith, Jennifer Ketterlin
Miami-Dade County – Jane Dozier, Dallas Hazelton, Jeff Fobb, Dustin Smith, Frank Ridgely
US Department of Agriculture – Jonathan Lewis, Josh Friers

Gulf Coast EPMT Program Participants

Leadership
Eric Worsham (Liaison), Chris Furqueron (Supervisor)

Crew
Texas Conservation Corps
American YouthWorks

Region/Network Support
Southeast Region Office – Chris Furqueron, supervisor (IPM Coordinator)
Intermountain Region Office – Myron Chase (IPM Coordinator), Mark Sturm (Biological Resources Program Manager)

Park Support
Host Park - Big Thicket National Preserve – Doug Neighbor (superintendent) Jalyn Cummings (Chief Resource Management)

Steering Committee
Big Thicket National Preserve –Doug Neighbor (superintendent) Jalyn Cummings (Chief Resource Management)
Gulf Islands National Seashore – Gary Hopkins (Biologist)
Jean Lafitte National Historic Park and Preserve – Dusty Pate (Natural Resource Program Manager)
Natchez Trace Parkway – Lisa McInnis (Natural Resource Management)

Palo Alto Battlefield National Historic Park – Rolando Garza (Integrated Resource Manager)
San Antonio Missions National Historic Park – Greg Mitchell (Biologist), Greg Smith (Chief RM/VP)
Vicksburg National Military Park – Virginia Dubowy (Natural Resource Program Manager)

Partners
Texas Conservation Corps, American YouthWorks
Colorado State University
Cutting Edge Forestry
Ladybird Johnson Wildflower Center
Rice University
Union Forestry
University of Texas
US Army Corps of Engineers
Interagency Agreements
Saul D. Petty, USFWS Invasive Species Coordinator for Texas & Oklahoma

Volunteers
AmeriCorps
American Youth Works
Texas Conservation Corps

Great Lakes EPMT Program Participants

Leadership
Carmen Chapin (Liaison), Tammy Keniry (Admin Assistance), Kelly Garrison (IT Support), Isaiah Messerly (Crew Leader), Rebecca Key (Data Manager)

Crew
Edward Price, Joseph Anderson, Oliver Liu

APIS park field crew
Lindsey Steinwachs

IATR park field crew
Mark Holden (Park IPM Coordinator), Fish and Wildlife Service staff, Multiple Volunteers

INDU park field crew
Laura Brennan (Lead), Kirk Yoder, Adam Dierkatz, Mark Montgomery

ISRO park field crew
William Schlager

MISS park field crew
Kelsey Hans, Neil Smarjesse, Multiple Volunteers

PIRO park field crew
Tom Vitale, Caitlyn Schoenfeld

Region Support
Carmen Thomson

Steering Committee
Apostle Islands National Lakeshore – Peggy Burkman
Grand Portage National Monument – Brandon Seitz
Ice Age National Trail – Mark Holden
Isle Royale National Park – Paul Brown
Indiana Dunes National Lakeshore – John Kwilosz
Mississippi River and Recreation Area – Nancy Duncan
Pictured Rocks National Lakeshore – Bruce Leutscher
St. Croix National Scenic Riverway – Jill Medland
Sleeping Bear Dunes National Lakeshore – Amanda Brushaber
Voyageurs National Park – John Snyder
NPS Midwest Regional Office – Julie Stumpf

Heartland EPMT Program Participants

Leadership
Mike DeBacker (Network Coordinator / Supervisory Ecologist), Gareth Rowell (Data Manager), Craig Young (Invasive Plant Program Leader)

Crew
Adam Throckmorton (Field Leader), Andrew Bishop (Field Leader), Jordan Bell (Field Project Technician), Chad Gross (Cartographer)

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

Partners
Conservation Corps of Iowa

Board of Directors
Cuyahoga Valley National Park – Paul Stoehrer (Superintendent, Acting)
George Washington Carver National Monument – Jim Heaney (Superintendent)
Herbert Hoover National Historic Site – Pete Swisher (Chair / Superintendent)
Lincoln Boyhood National Memorial – Kendell Thompson (Superintendent)
Pipestone National Monument – Glen Livermont (Superintendent)

Technical Committee
Arkansas Post National Memorial – Kirby McCallie
Buffalo National River – Caven Clark
Cuyahoga Valley National Park – Meg Plona
Effigy Mounds National Monument – Rodney Rovang
George Washington Carver National Monument – Lana Henry
Herbert Hoover National Historic Site – Mike Wilson
Homestead National Monument of America – Jesse Bolli
Hopewell Culture National Historical Park – Dafna Reiner
Hot Springs National Park – Steve Rudd
Lincoln Boyhood National Memorial – Mike Capps
Ozark National Scenic Riverways – Victoria Grant
Pea Ridge National Military Park – Kevin Eads
Pipestone National Monument – Seth Hendriks
Tallgrass National Preserve – Kristen Hase
Wilson's Creek National Battlefield – Gary Sullivan

Lake Mead EPMT Program Participants

Leadership
Curt Deuser (Liaison), Tarl Norman (Crew Supervisor), Sue Knowles (Administrative Assistant; shared position with LAKE RM), Scott Briggs (Budget Assistant; shared position with LAKE RM), Vanessa Truitt (Data Manager; shared position with LAKE RM), Timothy Federal (Data Manager), Dwayne Coleman (Squad Leader), and Samuel Smyrk (Squad Leader)

Crew
Joseph Castello, Dawn Hulton, Timothy Marsh, Christopher Penny, Kevin Reichling, Casey Sandusky, Bryon Lorenz, Matthew Duffy, Joseph Kelley, Alexander Heeren, Daniel Townsend, Michael Contrivo, Quintin Quigley, Bryan Orvis, Matthew Svoboda, Daniel Malooly, Aimee Ross, Anna Becker, Anthony Tocci, Lauren Pfund (Detailer)

Region Support
Jay Goldsmith (PWR) and Mark Sturm (IMR)

Lake Mead Support
Lila Walker (Administrative Officer) and Gary Warshefski (Deputy Superintendent)

Park Support
Arches NP – Clay Kark, Clay Allred, and Cheryl Decker
Joshua Tree NP – Josh Hoines, Katie Kain
Death Valley NP – Kelly Fuhrmann, Jane Cipra and Kirtsen Lund
Glen Canyon NRA – Lonnie Pilkington, John Spence, Chris Hughes
Bandelier NM – Brian Jacobs
Bryce Canyon NP – Katie Johnson
Capitol Reef NP – Dave Worthington, Gary Lenhart
Great Basin NP – Ben Roberts
Mesa Verde NP – George San Miguel
Mojave NP – Anne Kearns
Zion NP/Cedar Breaks NM – Brian Black
Lake Mead NRA – Alice Newton, Carrie Norman, Dara Scherpenisse
Parashant NM – Rosie Pepito and Raymond Klein
Pipe Spring NM – Amber Van Alfen
Grand Canyon NP – Lori Makarick, Mary-Beth Garmoe
Organ Pipe Cactus NM – Kate Connor
MOCA/MOWE/TUZI – Dennis Casper
Wupatki NM – Charles Schelz

Partners

Bureau of Land Management (BLM), Southern NV District – Lauren Brown and Sean McEldery
BLM, Ely District – Nancy Herms.
BLM, Kanab Utah Field Office – Carson Gubler
US Fish and Wildlife Service (USFWS) – Mark Kaib, BAER/BAR Coordinator,
USFWS Havasu NWR – Jennifer "Jay" Burtka.
USFWS Pahranagat NWR – Allison Manwaring and Amy Lavoie.
USFWS Desert NWR – Matt Flores.
USFWS Buenos Aires NWR – Dan Cohan.
USFWS Kofa NWR – Christa Weise.
USFWS Imperial NWR – Joseph Barnett.
USFWS Cibola NWR – Steve Rimer.
USFWS Bill Williams NWR – Kathleen Blair.
USFWS AZ ISST Coordiantor – Brenda Zaun.
USFWS Bitter Lake NWR – Jeff Sanchez.
USFWS Maxwell NWR and Las Vegas NWR – Phillip Garcia.
USFWS Sevilleta NWR – Jon Erz.
USFWS Bosque del Apache NWR and USFWS NM ISST Coordinator – Gina DelloRusso.
US Forest Service – Spring Mountains NRA – Marissa Anderson.
US Forest Service Coconino NF – Laura Moser
Bureau Of Reclamation – Lower Colorado River Region – Marc Maynard and Jason Kirby
Arizona Game and Fish Department – Verde River Preserve – Virginia Gouldsbury
Nevada Division of Wildlife – Mitch Urban
Clark County, NV – Muddy River Reserve – Liz Bickmore

Volunteers
Pat Riley (Shop Master)

Mid-Atlantic EPMT Program Participants

Leadership
Brian Lockwood (Liaison), Nathan Wender (Biological Science Technician)

Crew
Blake Hocker, Lee Moreland, Jon Mikolin

Region Support
Kristina Heister – Regional Chief of Natural Resources
Wayne Millington – Regional IPM Coordinator

Park Support
Appomattox Courthouse NHP – Brian Eick
Appalachian NST – Casey Reese
Booker T. Washington NM – Timothy Sims
Colonial NHP – Dorothy Geyer
Fredericksburg and Spotsylvania County Battlefields Memorial NMP – Gregg Kneipp
Gettysburg NMP and Eisenhower NHS – Zach Bolitho, Sara Koenig, and Randy Krichten
George Washington Birthplace NM and Thomas Stone NHS – John Storke
Hampton NHS – Paul Bitzel
Hopewell Furnace NHS and Valley Forge NHP – Kate Jensen
New River Gorge NR, Bluestone NSR, and Gauley River NRA – John Perez
Petersburg NB – Dave Shockley and Tim Blumenschine
Richmond NBP – Kristen Allen
Shenandoah NP – Jim Schaberl and Jake Hughes

Steering Committee
Appomattox Courthouse NHP – Brian Eick
Appalachian NST – Casey Reese
Booker T. Washington NM – Timothy Sims
Colonial NHP – Dorothy Geyer
Fredericksburg and Spotsylvania County Battlefields Memorial NMP – Gregg Kneipp
Gettysburg NMP and Eisenhower NHS – Zach Bolitho
George Washington Birthplace NM and Thomas Stone NHS – John Storke
Hampton NHS – Paul Bitzel
Hopewell Furnace NHS and Valley Forge NHP – Kate Jensen
New River Gorge NR, Bluestone NSR, and Gauley River NRA – John Perez
Petersburg NB – Dave Shockley
Richmond NBP – Kristen Allen
Shenandoah NP – Jim Schaberl
MA-EPMT Liaison – Brian Lockwood
NER Chief of Natural Resources – Kristina Heister
NER IPM Coordinator – Wayne Millington
Eastern Rivers and Mountains I&M Network Program Manager – Matt Marshall
Mid-Atlantic I&M Network Program Manager – Jim Comiskey
Northeast Coastal & Barrier Network Program Manager – Sara Stevens

Volunteers (hours contributed)
Gladys H. Oberle School (57), Mountain Laurel Montessori (18), Friends of the National Zoo (292), Diversified Minds School (0.25), Wakefield Day School (36).

North Coast / Cascades Network EPMT Program Participants

Leadership
Todd Neel (Liaison); Dan Campbell (Data Manager / GIS /Exotic Plant Management Specialist)

Crew
OLYM crew: Daniel Lucero (Lead), Gus Johnson, Cody Hagen
LARO crew: James VanGeystel (Acting Lead), Kathryn Ladig, Lauren Toth

Region/Network Support
Pacific West Region Office – Erv Gasser (IPM Coordinator); Jay Goldsmith (Natural Resources and Research)
Regina Rochefort (Network Science Advisor)

Park Support
Ebey's Landing National Historical Reserve – Craig Holmquist
Fort Vancouver National Historic Site – Tracy Fortmann
John Day Fossil Beds National Monument – Shirley Hoh
Lake Chelan National Recreation Area – Vicki Gempko
Lake Roosevelt National Recreation Area – Ken Hyde
Lewis and Clark National Park – Carla Cole, Chris Clatterbuck
Mount Rainier National Park – Lou Whiteaker, Julie Hover
Nez Perce National Historical Park – Jason Lyon, Jannis Jocious
North Cascades National Park / Ross Lake National Recreation Area – Jack Oelfke, Mignonne Bivin
Olympic National Park – Steve Acker
San Juan Island National Historic Park – Jerald Weaver
Whitman Mission National Historic Site – Randy Bilbeisi

National Capital Region EPMT Program Participants

Leadership
Mark Frey (Liaison), Ryan Tietjen (Team Leader), Vacant Clark (Data Manager)

Crew
Natasha Garcia Andersen, Colleen Corballis, Casey Cate, Emily Gilliland, Eddie Altemose, Jayson Allan

Region Support
National Capital Region Office – Carol Pollio (Chief of Natural Resources and Sciences)

Park Support
Antietam National Battlefield – Joe Calzarette
Appalachian National Scenic Trail – Casey Reese
Assateague Island National Seashore – Bill Hulslander, Jonathan Chase
Catocin Mountain Park – P. Scott Bell, Becky Loncosky. Lindsey Donaldson
Chesapeake and Ohio Canal National Historical Park – Michele Carter
George Washington Memorial Parkway – Brent Steury, Erik Oberg
Harpers Ferry National Historical Park – Mia Parsons, Dale Nisbet
Manassas National Battlefield Park – Bryan Gorsira, Courtney Asher
Monocacy National Battlefield– Andrew Banasik
National Capital Parks - East – Steve Syphax, Mikaila Milton
National Mall and Memorial Parks – Mary Willeford Bair
Prince William Forest Park – Paul Petersen, Eric Kelley
Rock Creek Park – Nick Bartolomeo, Ana Chuquin
Wolf Trap National Park for the Performing Arts – Phil Goetkin, Chris Schuster

Steering Committee

Antietam National Battlefield – Joe Calzarette
Catoctin Mountain Park – P. Scott Bell
Chesapeake and Ohio Canal National Historical Park – Michele Carter
George Washington Memorial Parkway – Brent Steury
Harpers Ferry National Historical Park – Dale Nisbet
Manassas National Battlefield Park – Bryan Gorsira
Monocacy National Battlefield– Andrew Banasik
National Capital Parks-East – Mikaila Milton
National Mall and Memorial Parks – Mary Willeford Bair
Prince William Forest Park – Paul Petersen
Rock Creek Park – Ana Chuquin
Wolf Trap National Park for the Performing Arts – Phil Goetkin
NCR-EPMT Liaison – Mark Frey
NCR Chief of Natural Resources and Science – Carol Pollio
NCR Integrated Pest Management Specialist – Jil Swearingen
NCR Research Coordinator – Diane Pavek
NCR Inventory & Monitoring Network Program Manager – Pat Campbell

Partners
Animal and Plant Health Inspection Service – Charlie Brown
United States Fish and Wildlife Service – Phil Pannill (NCTC Land Manager)
Virginia Department of Conservation and Recreation – Michael Lott (Crow's Nest Manager/Northern Region Steward)
The Maryland-National Capital Park and Planning Commission - Marc Imlay
Anacostia Watershed Society – Jorge Bogantes
DC Cooperative Weed Management Area – Damien Ossi, Laura Washington

Volunteers (hours contributed)
Lina Arcila (10), Chris Bischak (29), Jason Briefel (10), Stas Burgiel (11), Rose Calzontzi (3), Jaime Cleek (4), Christopher Clement (4), Colleen Corballis (8), Amanda Duprey (62), Sherrie Emerine (3), Laurel Gutenberg (13), Peggy Hammond (6), Lindsey Harriman (8), Eric Hazelton (3), Darcy Herman (54), Marlee Jenkins (4), Renee Johnson (12), Jocelyn Karsk (4), Sylvan Kaufman (8), Lauren Kelly (5), Alex Keys (203), Valerie Lamont (3), Maggie Lewis (6), Caitlin Linde (2), Stephanie Martin (7), Allison Mastalerz (5), Sara McClure (4), Pam Mcmillie (5), Marysa Milinichik (3), Laura Plaze (6), Mary Powell (10), Dan Riedan (37), Elizabeth Speith (2), Dave Sperry (6), Jessica Strickland (2), David Sutton (8), Teri Tate (16), Chris Traft (4), Letha Uzenski (12), Dan Voigt (32), David Walker (4), Rebecca White (22)

Northeast EPMT Program Participants

Leadership
Betsy Lyman (Liaison), Brian McDonnell (Team Leader)

Crew
Ryan Hodge, (data manager), Daniel Gatch

Region/Network Support
Wayne Millington (NER IPM Coordinator)
Kristina Heister (NER Chief, Natural Resources and Management)

Park Support
Allegheny Portage Railroad National Historic Site – Kathy Penrod (Natural Resource Specialist)
Appalachian National Scenic Trail – Casey Reese (Botanist)
Boston Harbor Islands National Recreation Area – Marc Albert (Natural Resource Specialist), Valerie Wilcox (Natural Resource Technician), Andrew Petit de Mange (Natural Resource Technician)
Cape Cod National Seashore – Stephen M. Smith (Plant Ecologist)
Delaware Water Gap National Recreation Area – Kara Deutsch (Chief, Natural Resources), Larry Hilaire (Wildlife Biologist), Jeff Shreiner (Ecologist)
Fire Island National Seashore – Mike Bilecki (Chief, Natural Resources), Jordan Raphael (Park Biologist)
Gateway National Recreation Area – Doug Adamo (Chief, Natural Resources), Jeanne McArthur-Heuser (Interpretive Park

Ranger), Jessica Browning (Biologist), Hanem Abouelezz (Biologist)
Morristown National Historical Park – Robert Masson (Natural Resource Specialist),
Roosevelt-Vanderbilt National Historic Sites – Dave Hayes (Natural Resource Specialist)
Saratoga Bational Historical Park – Chris Martin (Chief, Natural Resources), Linda White (Biologist), Cindy VanDerwerker (Maintenance Worker)
Upper Delaware Scenic and Recreational River – Don Hamilton (Chief, Natural Resources), Jamie Myers (Biologist)

Partners
Appalachian Trail Conservancy – Adam Brown (Conservation Resources Manager)
Marion Orlousky (Northern Resource Mgt. Coordinator)
NY-NJ Trail Conference – Frank Dogil (Appalachian National Scenic Trail trail club volunteer)
Georgian Court University – Louise Wootton (Professor; Gateway National Recreation Area partner)

Volunteers
Tom Witter (395 hours), Jon Bugan (56 hours), Doug Millard (28 hours)

Northern Great Plains EPMT Program Participants

Leadership
Brennan Hauk (Liaison), Angela Jarding (Data Manager), Mark Slovek (Crew Leader), Frank Szajko (Crew Leader), JP Farrar (Crew Leader)

Crew
Becky Guffey, John Shoup, Lee Vaughn, Jed Kammerer, Brandi Bowers, Josh Larson

Park Support
Agate Fossil Beds National Monument - James Hill
Badlands National Park - Milt Haar
Devils Tower National Monument – Rene Ohms
Fort Laramie National Historic Site – Steve Edwards
Fort Union Trading Post National Historic Site - Andy Banta
Jewel Cave National Monument – Mike Wiles
Knife River Indian Villages National Historic Site – Wendy Ross
Niobrara National Scenic River - Pamela Sprenkle
Missouri National Recreation River – Lisa Yager
Minuteman Missile National Historic Site – Duane Bubac
Mount Rushmore National Memorial – Bruce Weisman
Scotts Bluff National Monument – Bob Manasek
Theodore Roosevelt National Park – Bill Whitworth
Wind Cave National Park – Beth Burkhart

Steering Committee
Badlands National Park – Brian Kenner
Midwest Regional Office – Carmen Thomson
Northern Great Plains Network – Kara Paintner-Green, Dan Swanson
Theodore Roosevelt National Park – Bill Whitworth
Wind Cave National Park – Greg Schroeder

Northern Rocky Mountain EPMT Program Participants

Leadership
Sue Salmons (Liaison), Gary Ludwig (Team Leader), Michael E. (Mickey) Pierce (Crew Leader), Andrew Ringholz (Assistant Crew Lead)

Crew
Arley Cantwell, B. Pat Clark, Ashley Coletti, Ed Eberhardy, Heather Golden, R. Walter Householder

Regional Support
Intermountain Region: Myron Chase, IPM Specialist

Park Support
Bighorn Canyon National Recreation Area – Ryan Felkins, Bill Pickett

City of Rocks National Reserve – Trenton Durfee
Craters of the Moon National Monument & Preserve – Steven Bekedam, Gilbert Moreno, seasonal staff
Dinosaur National Monument – Tamara Naumann
Fossil Butte National Monument – Arvid Aase, Zoe Johnston, volunteers
Glacier National Park (host park) – Dawn LaFleur, Matt Kennedy, seasonal staff
Golden Spike National Historic Site – Tammy Benson
Grand Teton National Park & John D. Rockefeller Memorial Parkway – Jason Brengle
Grant-Kohrs Ranch National Historic Site – Jason Smith
Hagerman Fossil Beds National Monument & Minidoka Internment National Monument – Ray Vader
Little Bighorn Battlefield National Monument – Christopher Ziegler
Nez Perce National Historic Park – Jannis Jocius, Jimmer Stevenson (Big Hole National Battlefield), Stephanie Martin (Bear Paw Battlefield)
Rocky Mountain National Park – Jim Bromberg
Yellowstone National Park (host park) – Brian Teets, Troy Nedved, Eric Reinertson, seasonal staff

Steering Committee
Yellowstone National Park (Host Park) – Dan Reinhart
Glacier National Park (Host Park) – Dawn LaFleur
Craters of the Moon National Monument & Preserve – John Apel, Steve Bekedem
Bighorn Canyon National Recreation Area – Cassity Bromley
City of Rocks National Reserve – Kristen Bastis
Dinosaur National Monument – Tamara Naumann
Fossil Butte National Monument – Arvid Aase
Golden Spike National Historic Site – Tammy Benson
Grand Teton National Park & John D. Rockefeller Memorial Parkway – Kelly McCloskey, Jason Brengle
Grant-Kohrs Ranch National Historic Site – Chris Ford, Jason Smith
Hagerman Fossil Beds National Monument & Minidoka Internment National Monument – JoAnn Blalack
Little Bighorn Battlefield National Monument – Christopher Ziegler
Nez Perce National Historic Park – Jannis Jocius, Jason Lyon
Rocky Mountain National Park – Jim Cheatham

Southeast Coast EPMT Program Participants

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

Crew
David Solomon, Ryan Terlep, Abby-Gayle Prieur, Chris Sheldon, and Darrin Gobble (Student Conservation Association Interns)

Region/Network Support
Southeast Region Office - Chris Furqueron (Branch Chief - IPM, Invasives, and EPMT Programs),
Christopher Barrow (GIS Specialist/GPS Coordinator)
National Support - Exotic Plant Management Team Program Network

Park Support
Cape Hatteras National Seashore / Fort Raleigh National Historic Site / Wright Brothers National
Monument – Sara Strickland, Randy Swilling
Cape Lookout National Seashore – Pat Kenney, Michael Rikard
Chattahoochee River National Recreation Area – Allyson Read, Paula Capece
Congaree National Park – Theresa Yednock, Terri Hogan, Tracy Stakely
Cumberland Island National Seashore – Doug Hoffman, John Fry
Fort Frederica National Monument – Denise Spear, Chad Thomas
Fort Pulaski National Monument – Laura Rich-Acosta
Fort Sumter National Monument (Fort Moultrie) / Charles Pinckney National Historic Site – Rick Dorrance
Horseshoe Bend National Military Park – Jim Cahill, Roy Appulguise, Doyle Sapp

Kennesaw Mountain National Battlefield Park – Thomas Sparks, Mildred Pratt
Moores Creek National Battlefield – James Sutton, Ricardo Perez
Ocmulgee National Monument – Guy LaChine

Steering Committee
Tracy Stakely (Superintendent, Congaree National Park)
Pat Kenney (Superintendent, Cape Lookout National Seashore)
John Fry (Chief of Resource Management, Cumberland Island National Seashore)
Chris Furqueron (Branch Chief - IPM, Invasives, and EPMT Programs, SERO)
Paula Capece (Natural Resources Program Manager, Chattahoochee River National Recreation Area)
Ricardo Perez (Superintendent, Moores Creek National Battlefield)

Partners
Kennesaw Mountain Trail Club
Old-Growth Bottomland Forest Research and Education Center

Volunteers
Miriam Oudejans, Keith Bradley (Congaree National Park Volunteer-In-Parks Program)
Harry Carpenter, Doug Tasse, Scott Mackay (Kennesaw Mountain Trail Club)
Allen Huckabee (Ocmulgee National Monument)
Jessica Su, Tracey Brandt, and Alexander Magruder (Chattahoochee River National Recreation Area)
Andrew San Juan (Cape Hatteras National Seashore)

Southeast EPMT Program Participants

Leadership
Nancy Dagley (Liaison), Toby Obenauer (Crew Leader)

Crew
Daniel McLendon, David Houk, Sam Levine

Region/Network Support
Appalachian Highland Inventory and Monitoring Network: Robert Emmott, Nora Murdock, Patrick Flaherty
Cumberland Piedmont Inventory and Monitoring Network: Teresa Leibfreid, Steve Thomas, Sammi Jo Eubank, Kurt Helf

Park Support
Abraham Lincoln Birthplace NHS – Jenny Jones
Andrew Johnson NHS – Jim Small
Appalachian Trial Conservancy (NC) – John Odell
Blue Ridge Parkway – Bambi Teague
Big South Fork NRRA – Tom Blount
Carl Sandberg – Irene Van Hoff
Cowpens NB – Kathy McKay
Chickamauga/Chattanooga NMP – Jim Szyjkowski
Cumberland Gap NHP – Jenny Beeler
Fort Donelson NMP – Bill Barley
Great Smoky Mountains NP – Kristine Johnson
Guilford Courthouse NMP – Rose Ownby
Kings Mountain NMP – Chris Revels
Little River Canyon – Mary Shew
Mammoth Cave NP – Brice Leech
Ninety-Six NHS – open
Obed Wild and Scenic River – Justin Coffey
Russell Cave NM – Mary Shew
Shiloh NMP – Marcus Johnson
Stones River NB – Troy Evans

Steering Committee (Under development)
Kings Mountain NB – Chris Revels
Big South Fork NRRA & Obed Wild and Scenic River – Marie Kerr
Great Smoky Mountains NP – Kristine Johnson
Florida / Carribbena EPMT – Tony Pernas
US Fish & Wildlife Service –
US Forest Service –
Southeast Region – Chris Furqueron (IPM Coordinator)

Southwest EPMT Program Participants

Leadership
Charles Schelz (Liaison)

Crew
Patrick Wharton (Crew Lead at CAVO)

Regional/Network Support

Myron Chase (IMR IPM and Invasive Species Coordinator)
Sarah Wynn (Denver Service Center Revegetation Technical Advisor)
Kristine Taliga (NRCS Liaison, Revegetation Technical Advisor)
Tomyeanne Folts-Zettner (Biologist Southern Plains Network I&M Network
Intermountain Region Office – Mark Sturm (Biological Resource Program Manager); Myron Chase (IPM Coordinator); Pam Benjamin (Vegetation Ecologist); Sarah Wynn (Restoration Ecologist)
Chihuahuan Desert Inventory and Monitoring Network – Kirsten Gallo
Sonoran Desert Inventory and Monitoring Network – Andy Hubbard
Southern Colorado Plateau Inventory and Monitoring Network – Lisa Thomas
Southern Plains Inventory and Monitoring Network – Rob Bennet

Park Support

Amistad National Recreation Area – Kate Johnson
Bandelier National Monument – Brian Jacobs
Bent's Old Fort National Historic Site – Fran Pannebaker, Adam Heberle
Big Bend National Park/Rio Grande Wild and Scenic River – Joe Sirotnak
Canyon de Chelly National Monument – Mick Castillo
Capulin Volcano National Monument – Zach Cartmell
Carlsbad Caverns National Park – Kent Schwarzkopf
Chaco Culture National Historic Site – Jim Von Haden
El Malpais National Monument – David Hayes
Florissant Fossil Beds National Monument – Rick Wilson
Fort Davis National Historic Site – John Morlock, John Hiener
Fort Union National Historic Site – Charles Strickfadden
Glen Canyon National Recreation Area – Lonnie Pilkington, John Spence, Chris Hughes
Great Sand Dunes National Park and Preserve – Phyllis Bovin
Grand Canyon National Park – Melissa McMaster, Lori Makarick, Kristina Sorrell
Guadalupe Mountains National Park – Janet Coles
Mesa Verde National Park / Yucca House National Monument – George San Miguel
Organ Pipe Cactus National Monument – Rijk Morawe, Kate Conner
Pecos National Historic Park – Cheri Dorshak
Petrified Forest National Park – William Reitze, Patricia Thompson
Lake Meredith National Recreation Area/Alibates Flint Quarries National Monument – Arlene Wimer
Saguaro National Park – Scott Stonum, Dana Backer
Salinas Pueblo Missions National Monument – Marc Lafrancois
Sand Creek Massacre National Historic Site – Karl Zimmermann
Tumacacori National Historic Park – Jason Welborn
White Sands National Monument – David Bustos
Wupatki National Monument – Paul Whitefield

Steering Committee

Bandelier National Monument – Brian Jacobs
Big Bend National Park – Joe Sirotnak
Canyon de Chelly National Monument – Mick Castillo
Capulin Volcano National Monument – Zach Cartmell
Glen Canyon National Recreation Area –Chris Hughes
Saguaro National Park – Scott Stonum
Southeastern Arizona Group – Jason Matlejak
Tumacacori National Historic Park – Jason Welborn
White Sands National Monument – David Bustos

Partners

Dr. Kevin Grady – Northern Arizona University
Dr. Tom Whitham – Northern Arizona University
Dr. Ron Hiebert – Northern Arizona University
Dr. Karen Hickman - Oklahoma State University
Dr. John Walker- Texas AgriLife Research and Extension

San Andres National Wildlife Refuge
Texas A&M University
Texas Environmental Corps
World Wildlife Fund – Mark Briggs
Pro Natura, Mexico
Brenda Zaun (Arizona ISST Coordinator) - U.S. Fish and Wildlife Service
U.S. Forest Service
American Conservation Experience (ACE)

Appendix B – Plant Species Index (by scientific name)

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525

www.nature.nps.gov