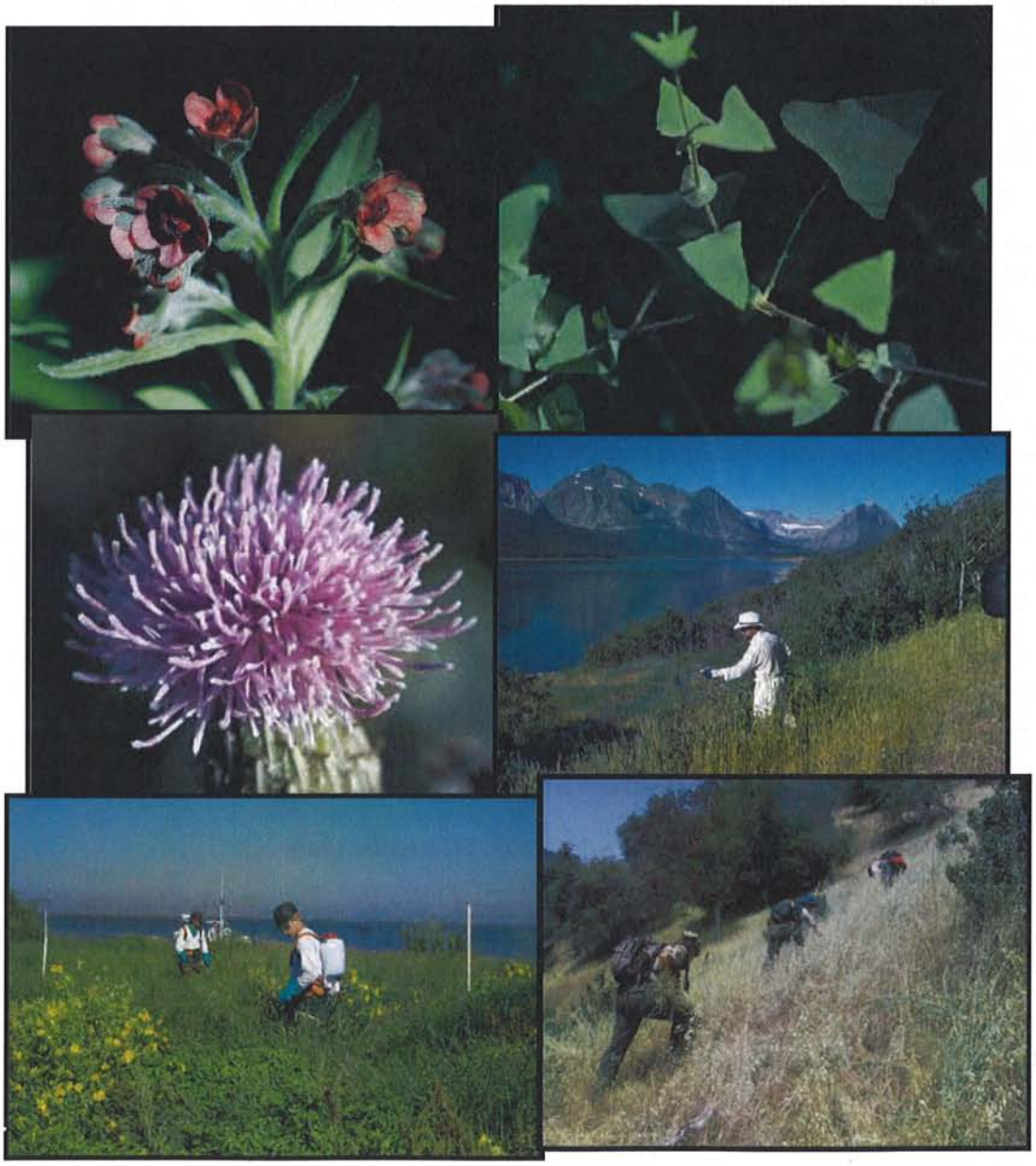
National Park Service
U.S. Department of the Interior
Natural Resource Program Center
Biological Resources Management Division

Exotic Plant Management Team 2005 Annual Report



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Introduction

Invasive species pose a profound threat to natural systems. In some areas, exotic plants are over whelming native plant communities, reducing biodiversity, changing ecosystem function and modifying habitat for a multitude of dependent organisms. It is estimated that 2.6 million acres in the national park system are currently infested with invasive plants.

The importance of biological invasions was recognized by Executive Order 13112 – Invasive Species in 1999. This concern for invasive species is also recognized in the 2001 NPS Management Policies, (4.1.4; 4.1.5; 4.4.1.1). It is the goal of the National Park Service invasive species program to implement the executive order, manage the sources of new infestations, reduce the effects of existing infestations and restore native plant communities.

The Exotic Plant Management Teams (EPMT) are an integral part of the invasive species program for the National Park Service. The teams are funded by the National Resource Challenge through the Biological Resource Management Division. They were established to provide a framework and a first response to exotic plant invasions within NPS. This model has since been duplicated by US Fish and Wildlife Service for the refuge system. In 2005, the 16 EPMT partnered with over 200 parks to treat, control, inventory and monitor invasive plants. The teams are headquartered in a park unit and then operate over a wide geographic area, serving multiple parks. Accomplishments for the invasive plant program and the EPMT are reported in GPRA through Goal 1a1b, Invasive Plants.

Kudzu at Vicksburg Battlefield

Following is a list of the EPMT and where they are headquartered:

1) Alaska EPMT based in the Alaska regional office serving parks throughout Alaska.
2) California EPMT based at Point Reyes National Seashore
3) Chihuahua Desert/Southern Shortgrass Prairie EPMT based at Carlsbad Caverns National Park
4) Colorado Plateau based at Petrified Forest National Park
5) Columbian Cascades EPMT based at North Cascades and Olympic National Parks
6) Florida Partnership and Caribbean EPMT based at Everglades National Park
7) Great Lakes EPMT based at the Great Lakes Inventory and Monitoring Network Office
8) Gulf Coast EPMT based at Big Thicket National Park
9) Lake Mead EPMT based at Lake Mead National Recreation Area
10) Mid Atlantic Cooperative EPMT based at Shenandoah National Park
11) National Capitol Region EPMT based at Rock Creek Park
12) Northeast EPMT based at Delaware Water Gap National Recreation Area
13) Northern Great Plains EPMT based at Theodore Roosevelt National Park
14) Northern Rockies Based at Yellowstone National Park
15) Pacific Islands EPMT based at Haleakala National Park
16) Southeast EPMT based at Blue Ridge Parkway

Each team is uniquely organized, reflecting the needs of the regions, parks and invasive plants in the area. Each team is lead by a Team Liaison. Activities of the EPMT are guided by a steering committee made up of representatives of the partner parks they serve. The steering committee assists in selecting projects and setting priorities. The teams tend to concentrate on new infestations, infestations in remote locations and in assisting parks with treatment of large infestations. The teams have a growing role of providing technical guidance on invasive plants and plant community restoration to their partner parks and other parks in region.

Managing invasive plants is a complex ecological problem requiring skill and knowledge spanning several disciplines; plant ecology, weed science, and ecological restoration. Many exotic plant species dominate plant communities, change the fire regime and modify soil environments.

Japanese Stiltgrass

Understanding the invasive plants and the environments they occupy and create is essential to controlling the invasive plant and then restoring the native plants. An increasing role for the EPMT liaison is in providing technical assistance to on all aspects of invasive plant management to partner parks and regions.

2005 Accomplishments

Management of invasive plants is a combination of prevention, inventory, control, monitoring, restoration and research. The EPMT assist parks in all aspects of managing invasive species with a focus on plant control, but also play an important role in all aspects of invasive species management. Team accomplishments again increased in 2005. Acres treated, retreated and inventoried exceed accomplishments in 2004.

Inventoried Acres	2,561,000
Gross infested Acres	64,013
Infested Acres	10,622
Acres Treated and Retreated	9,963
Acres Restored	238
Monitored Acres	19,665

In 2005 the EPMT treated 9,946 acres. The number of acres and the cost of treating those acres is influenced by a number of factors including; treatment method, species to be controlled, distance to the infestation, ease of access, density of the infestation and the composition of the plant community and whether site restoration will be required. The EPMT use a variety of control methods including hand pulling, biological controls, mechanical and application of herbicides. A highlight of each team's yearly activities is contained in the following pages.

- Part of the motivation for forming the EPMT was to assist smaller parks with limited natural resource staffs with invasive plant control. The Southeast EPMT received

this note. *Hey guys. Just wanted to drop you a line and let you know how thankful we are for the excellent job you did while here at GUCO. Speaking for this "small park", I must say that the EPMT concept is just what the doctor ordered to assist us with our issues/needs. You are a marvelous asset to the NPS. Great crew and very professional. Thanks again and look forward to working with you again, Stephen C. Ware, Chief Ranger, Guilford Courthouse National Military Park.*

- Caribbean EPMT control activities resulted in eradicate of Brazilian Pepper from Virgin Islands National Park.

- In 2004 all the EPMTs met in Arches NP in a joint project to control salt cedar. Cooperation between the teams continued in 2005. Several teams combined resources to control several hundred acres of Buffelgrass at Saguaro National Monument. The Mid Atlantic and National Capital region EMPTS also joined forces at Valley Forge National Historical Park on a plant control project.

- Protecting rare and endangered habitats are a high priority for the teams. The Great Lakes EPMT treated invasive plant treatments within the globally rare wetland panne areas, at Indiana Dunes. With labor and funding from the GL-EPMT, treatment occurred in all of the pannes this past year.

- The Northern Great Plains Exotic Plant Management Plan (EPMP) and Environmental Assessment (EA) were completed in 2005. The NPS Northern Great Plains (NGP) Exotic Plant Management Team (EPMT), park staffs and Consultants worked nearly two years to develop the plan. The intent of this plan is to manage exotic plants to reduce effects on native plant communities, other natural and cultural resources within these parks.

- In 2005, the Southeast EPMT increased the total acres treated from 275 in 2004 to over 500 in 2005. Total acres inventoried increased from 1,875 in 2004 to over 3,000 in 2005. The team continued to focus their control activities in riparian and upland mesic habitats. Many of the sites harbor unique natural communities supporting state and federally protected species.

Program Highlights

Prevention and Education

Prevention for invasive species is preventing or limiting the introduction or spread of invasive plants. Many species are spread through identifiable pathways and vectors. Most exotic plants are inducted and spread by humans, vehicles, equipment, clothing and through planting. The EPMTs are working with parks and concessionaires to implement practices that will reduce and mitigate these activities. The EPMTs are also working with parks to provide public education and outreach to reduce introduction and spread of invasive species from visitors.

- Invasive plants are still uncommon in Alaska parks. The Alaska EPMT is working to identify new infestations and remove them before they become widespread in the state. In conjunction with other agencies the Alaska team published a manual of invasive plants to assist land managers and the public in identify potential invasive plants.

- Each of the teams is working with host parks to create educational materials for distribution to park visitors.

- Each of the teams is working with local groups such as 4H, scout and schools on raising awareness for invasive species.

- The National Capital Region EPMT provided outreach and education to policy makers, private, local, state and federal land managers through a booth at National Invasive Weed Awareness Week.

- The Northeast EPMT sponsored and had displays at the Mid-Atlantic Exotic Pest Plant Council's Invasive Plants Conference; presented a poster display at the New England Invasive Plant Summit in MA; and a presentation for Pike County (PA) Master Gardeners, who are now including invasive plants in their training program. Each of the teams had similar displays at state and regional weed associations.

Inventory and Monitoring

The teams closely coordinate with local Inventory and Monitoring (I&M) networks. The Great Lakes EPMT is co-located with the area I&M network facilitating cooperation and coordination. The teams assist the network and parks in the inventory and monitoring of invasive plant populations, efficacy of treatments and changes to plant communities due to invasive plants or the treatments intended to control them.

Mapping in the Virgin Islands

- In 2005 over 2.5 million acres were inventoried for invasive species. The Florida EPMT was instrumental in an interagency cooperative project mapping project. The result was more than 50,000,000 acres inventoried for invasive plants in central and south Florida, using systematic reconnaissance flights...

- Implement standardized definitions and protocols for the inventory of invasive plants through the APCAM database (Alien Plant Control and Management).

- Over 19,600 acres were monitored during the year. These are sites that have previously been inventoried and or treated.

Coordination and Cooperation

Cooperation and collaboration has long been recognized as a fundamental component of managing invasive species. Invasive species do not recognize property lines, political jurisdictions or agency boundaries. The EPMT are active participants in local and regional organizations and cooperative efforts. In 2005 more the teams received more than $2.5 million in cooperative funding.

- The Alaska EPMT has been a leader in the State of Alaska organizing interagency steering committees, preparing publication on the invasive species of Alaska and participating in state wide inventory efforts. The team is part of a state wide effort to control and contain the few weed species in the state and prevent the introduction of new species

- In order to improve efficiency, other federal agencies, state and local entities have developed partnerships with the Lake Mead EPMT to manage effectively weeds across watersheds and agency boundaries. The Lake Mead EPMT conducts interagency weed control projects for over five million acres of federal and county land in Southern Nevada.

- The Mid-Atlantic Cooperative assisted the Commonwealth of Virginia by participating on the state's Invasive Species Advisory Committee to devise a state-wide invasive species strategic management plan.

- The EPMT participate in Cooperative Weed Management Areas across the country. These local cooperatives facilitate management of invasive plants across jurisdictions and property boundaries. In the North Cascades EPMT the Ebey's Landing Cooperative Weed Management Area was organized.

- Cooperative agreements with the South Florida Water Management District and University of Florida continue to provide benefits for both the NPS and the State of Florida.

- The Pacific Islands EPMT has continued to serve as the coordinating entity for an interagency program to control Miconia on the island of Maui. The EPMT works closely with the Maui Invasive Species Committee (MISC), utilizing funds from a variety of sources, including State and County agencies, private entities, watershed partnership groups, and federal agencies. Utilizing these partner groups with common goals, the Pacific Islands EPMT has achieved in excess of a five-fold increase in work capacity on the Island of Maui.

Partnership with the Student Conservation Association

For the second year a close the Student Conservation Association (SCA) and NPS EPMT have formed a close partnership. SCA has formed a group dedicated to deploying teams for fighting invasive plants, called the Invasive Species Project Teams. In 2005, a total of six teams SCA were deployed, Pecos, Gulf Coast, Hawaii and Harpers Ferry during the winter months and teams at Redwood, Great Lakes and North Cascades during the summer months. An additional team was shared by the National Capital Region and the Mid Atlantic EPMTS. The SCA teams provided an invaluable contribution to management of invasive plants in the Park Service. In many instances the EPMT and the SCA teams worked side by side on challenging control projects. SCA interns come from a variety of backgrounds but share a common dedication to natural resources. Working on SCA teams provides interns with valuable experience in managing natural resources.

- **NPS-Exotic Plant Management Teams (EPMTs) collaborated with the Student Conservation Association (SCA) to build student corps to assist EPMTs in controlling invasive plants. As a result of the success of the NPS with SCA, the Fish and Wildlife Service is now fielding SCA teams, thus building human capital throughout land management agencies in invasive species management. The SCA teams treated 1,340 acres providing 25,340 volunteer hours.**

Hurricane Assistance

During the severe hurricane season of 2005, the EPMTs assisted in recovery efforts. The Florida Team Virgin Islands Team leader Dan Clark served at the Coast Guard (CG) Incident Management Team at the CG Atlantic Area Office in Portsmouth, Virginia. Members of the Gulf Coast EPMT were stationed at the Southeast Louisiana Refuges Headquarters in Lacombe, LA, the Gulf Islands National Seashore in Ocean Springs, MS, and the Big Thicket National Preserve. Over five hundred hours of work were dedicated to the relief effort in the Gulf Coast region by the team. Two Gulf Coast partner parks were severely affected by the storms and required substantial work to achieve minimal operating capabilities. The Gulf Coast Team is still working from temporary quarters.

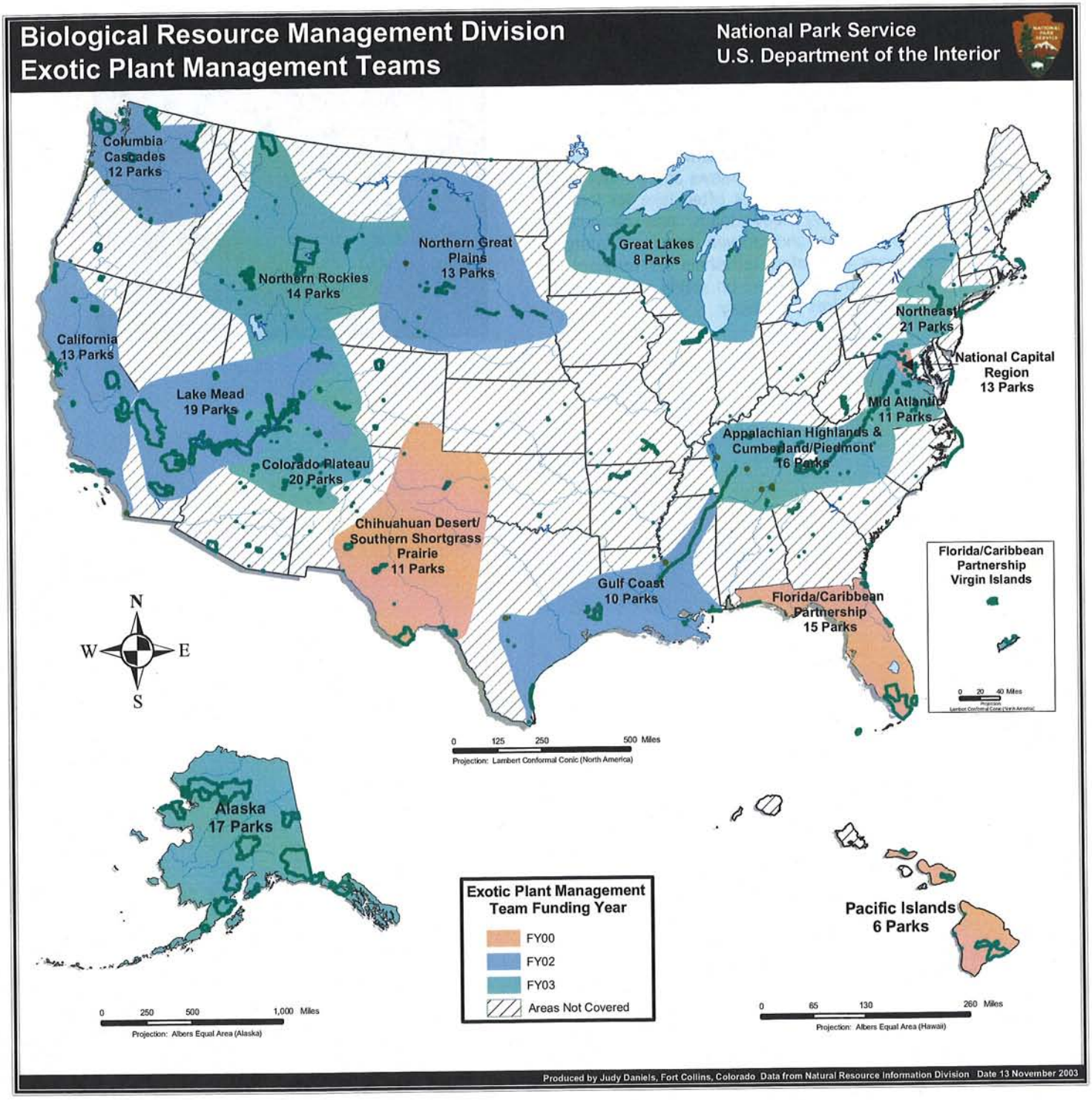
The Southeast Saw Crew removed hazardous trees at the Gulf Islands National Seashore campground to create a useable area to house displaced NPS and Coast Guard employees and their families.

The EPMT Teams from across the country contributed personnel and resources to the recovery effort. The mechanical skills, training, mobility, and experience working in difficult conditions made EPMTs extremely valuable to relief efforts.

The hurricanes will have lasting ecological effects. The physical disturbance and openings in the canopy will allow inroads from exotic plant species. Local EPMT are already working closely with parks to inventorying damage, predict areas where invasives may increase and planning treatment efforts.

Safety

The EPMTs place a great emphasis on safety and safety training. Much of the work involves difficult, strenuous activity. Treatment may require potentially hazardous equipment, such as chainsaws and the use of herbicides. Crews must often hike for long distances, carry heavy loads, and navigate remote, steep and uneven terrain. Safety meetings and safety refreshers are frequent. In 2005, this emphasis on safety resulted in not a single loss time injury.


Biological Resource Management Division
Exotic Plant Management Teams
National Park Service
U.S. Department of the Interior
Columbia Cascades 12 Parks
Northern Great Plains 13 Parks
Great Lakes 8 Parks
Northern Rockies 14 Parks
Northeast 21 Parks
California 13 Parks
National Capital Region 13 Parks
Lake Mead 19 Parks
Mid Atlantic 11 Parks
Appalachian Highlands & Cumberland/Piedmont 16 Parks
Colorado Plateau 20 Parks
Chihuahuan Desert/ Southern Shortgrass Prairie 11 Parks
Gulf Coast 10 Parks
Florida/Caribbean Partnership 15 Parks
Florida/Caribbean Partnership Virgin Islands
N
W
E
S
0 125 250 500 Miles
Projection: Lambert Conformal Conic (North America)
0 20 40 Miles
Alaska 17 Parks
0 250 500 1,000 Miles
Projection: Albers Equal Area (Alaska)
Exotic Plant Management Team Funding Year
FY00
FY02
FY03
Areas Not Covered
Pacific Islands 6 Parks
0 65 130 260 Miles
Projection: Albers Equal Area (Hawaii)
Produced by Judy Daniels, Fort Collins, Colorado Data from Natural Resource Information Division Date 13 November 2003

Alaska

Exotic Plant Management Team

Partner parks (Alaska): Alagnak NW&SR, Aniakchak NM&Pr, Bering Land Bridge NPr, Cape Krusenstern NM, Denali NP&Pr, Gates of the Arctic NP&Pr, Glacier Bay NP&Pr, Katmai NP&Pr, Kenai Fjords NP, Klondike Gold Rush NHP, Kobuk Valley NP, Lake Clark NP&Pr, Noatak NPr, Sitka NHP, Wrangell- St. Elias NP&Pr, Yukon- Charley Rivers NPr

Accomplishments

Inventoried Acres	1,515
Gross Infested Acres	1,634
Infested Acres	58
Treated Acres	.7
Monitored Acres	3
Retreated Acres	.2
Restored Acres	0

Forestry interns control sweetclover along the Parks Highway, Denali NP&Pr.

In its third year, the Alaska EPMT (AK-EPMT) has become a model early detection and rapid response program for Alaska and its National Parks. Thanks to increased staff, our education and outreach efforts have burgeoned, as have the quantity and quality of our data. Eight field employees worked in 10 parks, mapping over a thousand invasive plant infestations, eradicating small patches, and organizing volunteer events to control larger ones. In the past year, Alaska and its parks have seen the introduction of many new species while legacy species are spreading rapidly. The EMPT is growing and maturing in response to this growing threat in Alaska.

The most highly visited Alaska parks were the focus of this year's fieldwork. Three parks received their first assessment by the EPMT, while seven others were serviced EPMT supported employees at each park. This is a different model from that of other EPMT teams. To provide the level of protection necessary against this growing problem, we work with the parks to jointly hire technicians to be on the ground all summer. Volunteers provide the resources to remove large infestations found by EPMT staff.

The team participated in fifteen educational presentations and an original computer display which demonstrated the need for prevention statewide. New educational materials sent the message home with park employees, local residents, partners, and visitors.

The EPMT provides many benefits to Alaska beyond its parklands. We are working successfully with landowners near each park to foster local invasive plant management programs. We contributed to the first discussion of the link between wildfire and invasive plants in Alaska. In cooperation with the US Forest Service and the Alaska Natural Heritage Program, we have systematically ranked 75 species for their invasiveness threat and provided an early season workshop for their identification. In cooperation with partners in Alaska a new book, entitled "Invasive Plants of Alaska" was prepared. It is a critically needed resource. We have also participated in the reorganization of the statewide invasive plant working group and planning of its annual conference. The Alaska EPMT optimizes resources through an integrated, collaborative approach to maintaining Alaska's unique position: ahead of the invasive species curve.

Special Emphasis Species

bird vetch
cheatgrass
Canada/bull thistle
common dandelion
European mountain-ash
garlic mustard
narrowleaf hawksbeard
orange hawkweed
ornamental jewelweed
oxeye daisy
perennial sowthistle
purple loosestrife
quackgrass
reed canarygrass
spotted knapweed
tansy ragwort
white/yellow sweetclover
yellow toadflax

Alaska

Exotic Plant Management Team

Coal Creek Wildfire Survey

Very little is known about the relationship between wildfire and invasive plants in Alaska with large areas burning every year. Unlike other areas in the United States, invasive plants are just now being introduced and spreading throughout the state. Funded by the Burned Area Emergency Stabilization and Rehabilitation Program, the EPMT and a member of the Wildland Fire Program surveyed and controlled invasive plants in the Coal Creek and Woodchopper Creek watersheds of Yukon-Charley Rivers National Preserve in 2005. Focusing on the 2004 fire perimeter, we found no species colonizing burned areas, but another visit next year will be necessary for certainty. In two primary areas where five species of invasive plants were found in 2002, 10 species were mapped in 2005. Two species – smooth brome grass and narrowleaf hawksbeard – were entirely controlled, due to their threat to the region. The others were precisely mapped to provide thorough background information for managing one of Alaska's most remote and historical NPS units.

Penny Bauder uses a GPS unit to inventory invasive plants along the Yukon River shoreline, Yukon-Charley Rivers NPr.

Glacier Bay Program Expansion

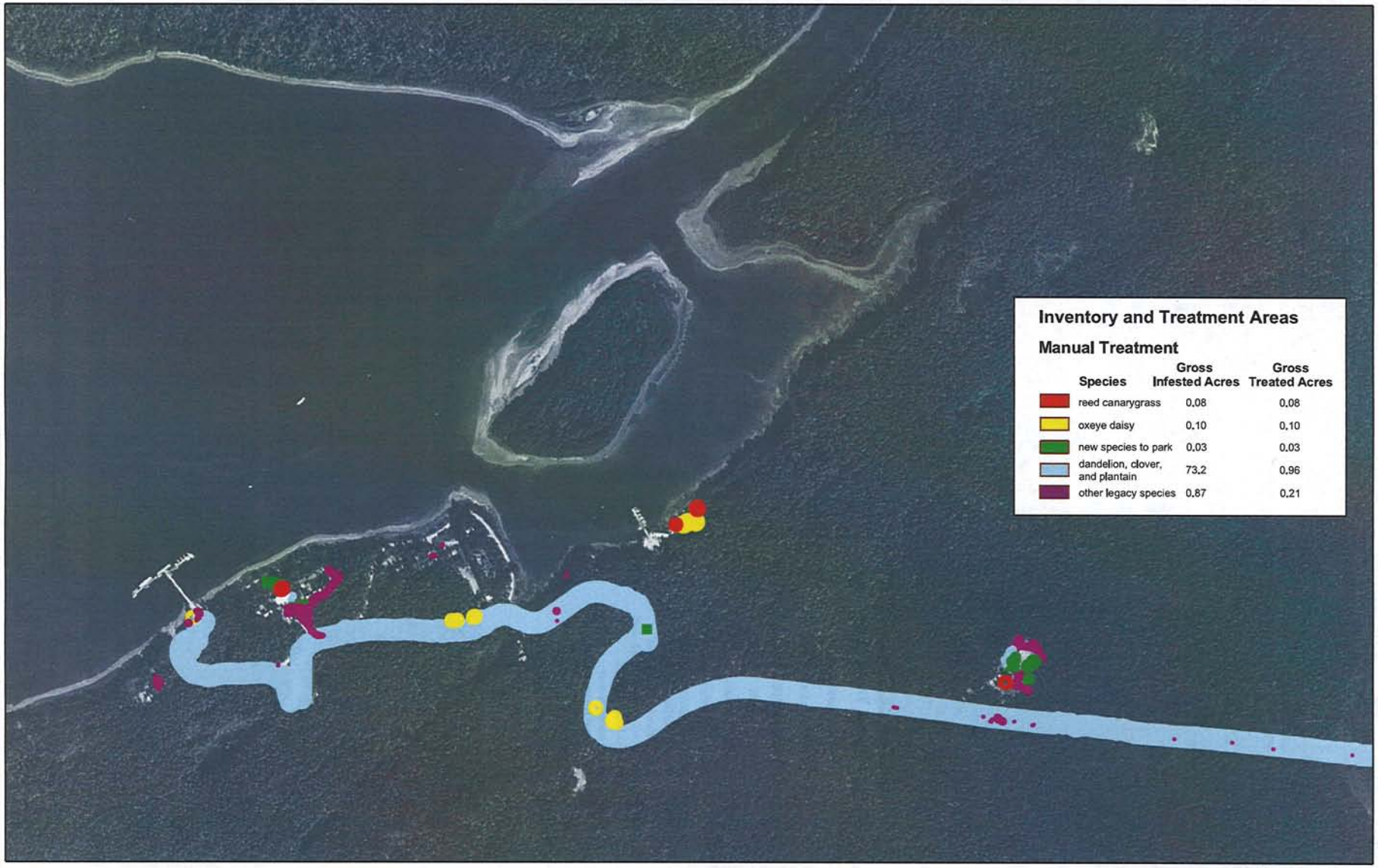
This year's EPMT effort in Glacier Bay National Park and Preserve grew by leaps and bounds over the initial EPMT assessment of 2004. A new employee and volunteers performed extensive inventory and control work this summer. Over 3,300 pounds of invasive plant materials were removed from the few locations in the park where invasive plants are currently found.

Removal of exotic plants is critical for Glacier Bay with the mission to provide a natural laboratory for post-glacial plant succession. This post-glacial succession could be significantly altered by exotic species. The AK-EPMT also benefits the adjacent Tongass National Forest and communities in Southeast Alaska by building knowledge about species distribution, control effectiveness, and local collaboration. A novel outreach program informed local Gustavus residents about the threat posed to their unique community by invasive plants. At the cusp of an invasive species problem, the Alaska EPMT and the Glacier Bay staff are dedicating sufficient resources to commence a long-term management program.

Whitney Rapp hosts an invasive plant arrangement contest at the Independence Day celebration in Gustavus, Glacier Bay NP&Pr.

Bartlett Cove, Glacier Bay National Park and Preserve
Alaska EPMT

National Park Service
U.S. Department of the Interior



Source: NPS DOQQ (Juneau-B6NW)
AKEPMT coverages collected with a Trimble GPS receiver
Date: 14 Oct 05

0 0.25 0.5 1 Miles

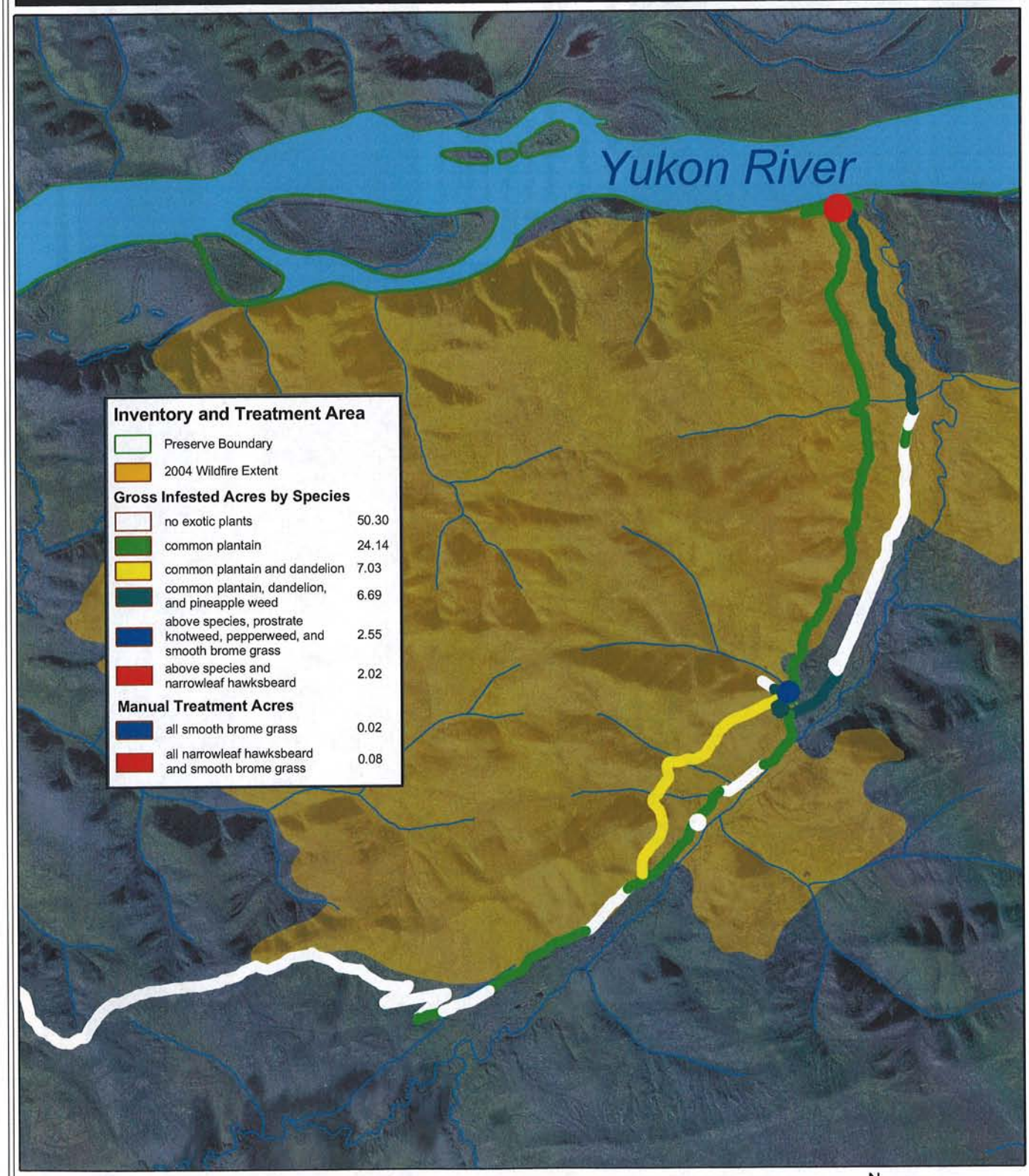
Scale - 1:12,500

N

Coordinate System - UTM Zone 8N, NAD 83

Coal Creek, Yukon-Charley Rivers National Preserve
Alaska EPMT

National Park Service
U.S. Department of the Interior



Source: NPS DOQQ (Charley-B5), NPS Park Boundary,
BLM Wildfire Extent, NPS Streams
AKEPMT coverages collected with a Trimble GPS receiver
Date: 14 Oct 05

0 0.5 1 2 Miles

Scale - 1:60,000

N

Coordinate System - Alaska Albers Equal Area Conic, NAD 27

Alaska Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Alagnak Wild River	31,105
Aniakchak National Wild & Scenic River	598,733
Bering Land Bridge National Preserve	2,659,784
Cape Krusenstern National Preserve	642,870
Denali National Park and Preserve	6,028,819
Gates of the Artic National Park and Preserve	8,470,790
Glacier Bay National Park and Preserve	2,635,625
Katmai National Park and Preserve	4,040,936
Kenai Fjords National Park	625,919
Klondike Gold Rush National Historical Park	11,861
Kobuk Valley National Park	1,751,646
Lake Clark National Park and Preserve	4,001,151
Noatak National Preserve	6,568,645
Sitka National Historical Park	108
Wragell-St. Elias National Park and Preserve	13,133,197
Yukon-Charley Rivers National Preserve	2,519,662
Total Acreage	53,720,851

Meters
0 260,000 520,000 1,040,000

Source: ESRI and NPS
Date: 16 Sep 05

Calculations based on Albers Equal-Area Conic (Alaskan) projection

California

Exotic Plant Management Team

Partner Parks: Point Reyes NS, Yosemite NP, Sequoia and Kings Canyon NP, Cabrillo NM, Channel Islands NP, Devils Postpile NM, Golden Gate NRA, John Muir NHS, Lassen Volcanic NP, Redwood NP, Santa Monica Mountains NRA, and Whiskeytown NR

Accomplishments

Inventoried Acres	8,699
Gross Infested Acres	3,552
Infested Acres	120
Treated Acres	98
Monitored Acres	1,506
Retreated Acres	13
Restored Acres	1

Through partnership with the Student Conservation Association the CA-EPMT grew four-fold in 2005

The California Exotic Plant Management Team (CA-EPMT) expanded to four teams, serving 12 parks ranging the entire length of the California coast. This region constitutes 60% of the west coast of the United States and has been determined by The Nature Conservancy to be a "global biodiversity hotspot". The CA-EPMT treated 80 species over a nine month period. Projects ranged from sea level along the shore of Channel Islands National Park, to the high Sierra wilderness in Devil's Postpile National Monument (8,000').

This was a successful fourth year with an emphasis on maximizing services to parks. The primary ways we were able increase services was through expanding the size of the team, diversifying treatment services for parks, and enhanced collection and processing of data. Through additional grant funding we were able to quadruple our base field capacity – creating a total of four teams. This expanded capacity allowed for a more flexible approach to serving parks. Three satellite Student Conservation Association teams were able to stay in parks for longer periods of time creating more management flexibility and reduced travel costs. Greater numbers of field practitioners also allowed greater scheduling latitude. We were able to maximize park benefits by matching the availability and skill level of the team to the specific project needs. This provided parks with great field time allotment than had occurred in the past. External partnerships include an early-detection spotted knapweed (*Centaurea maculosa*) survey with the California Department of Food Agriculture along the boundary of Lassen Volcanic National Park, and a multi-EPMT, African grasses control project at Saguaro National Park (*Pennisetum cilare* and *P. setaceum*). The addition of a Data Manager enhanced the progress of the team by enabling a division of labor. All data management and cartographic production duties were shifted to one person, allowing the expanded field teams to dedicate more time to on-site treatment.

Collaboration with the California Invasive Plant Council and the California Interagency Noxious Weed Coordinating Committee has established greater ties with external entities. Through these networks we foresee expanded capacity to enhance efficiencies through a coordination of efforts, and look forward to a productive 2006 season.

Special Emphasis Species

bluegum eucalyptus
bull thistle
French broom
Harding grass
Italian thistle
lambsquarters
olive
perennial pepperweed
pampas grass
reed canary grass
Scotch broom
sticky snakeroot

California

Exotic Plant Management Team

Italian Stone Pine Control (CHIS)

This season, invasive Italian stone pine (*Pinus pinea*) on Channel Islands National Park (CHIS) again met a formidable opponent, the California Exotic Plant Management Team (CA-EPMT). The CA-EPMT has treated Italian stone pine on the islands previously and made great strides towards getting this species to a maintenance level. Eradication of Italian stone pine on CHIS is unlikely because of its historic and cultural significance. Partnering with our Student Conservation Association team, CHIS National Park staff botanist Sarah Chaney, and Channel Islands Restoration, we treated the last remaining feral populations of Italian stone pine on Santa Cruz Island. Treatment of this population had been all but abandoned due to the difficulty in accessing individual trees due to the extremely dense understory of native vegetation steep and rocky terrain. To address this remaining population, we divided into teams of two, one person equipped with a chainsaw and another equipped to apply a drill/fill herbicide treatment. The larger trees were treated with herbicide, while smaller individuals were felled with chainsaws. The thicket of vegetation made it virtually impossible to find trees, so we spotted targets from adjacent slopes and guided others to them. With our unique skills and perseverance, we accomplished what was thought to be impossible.

Jen Gordan felling Italian stone pine on Santa Cruz Island, CHIS NP.

Santa Cruz Island Olive Removal

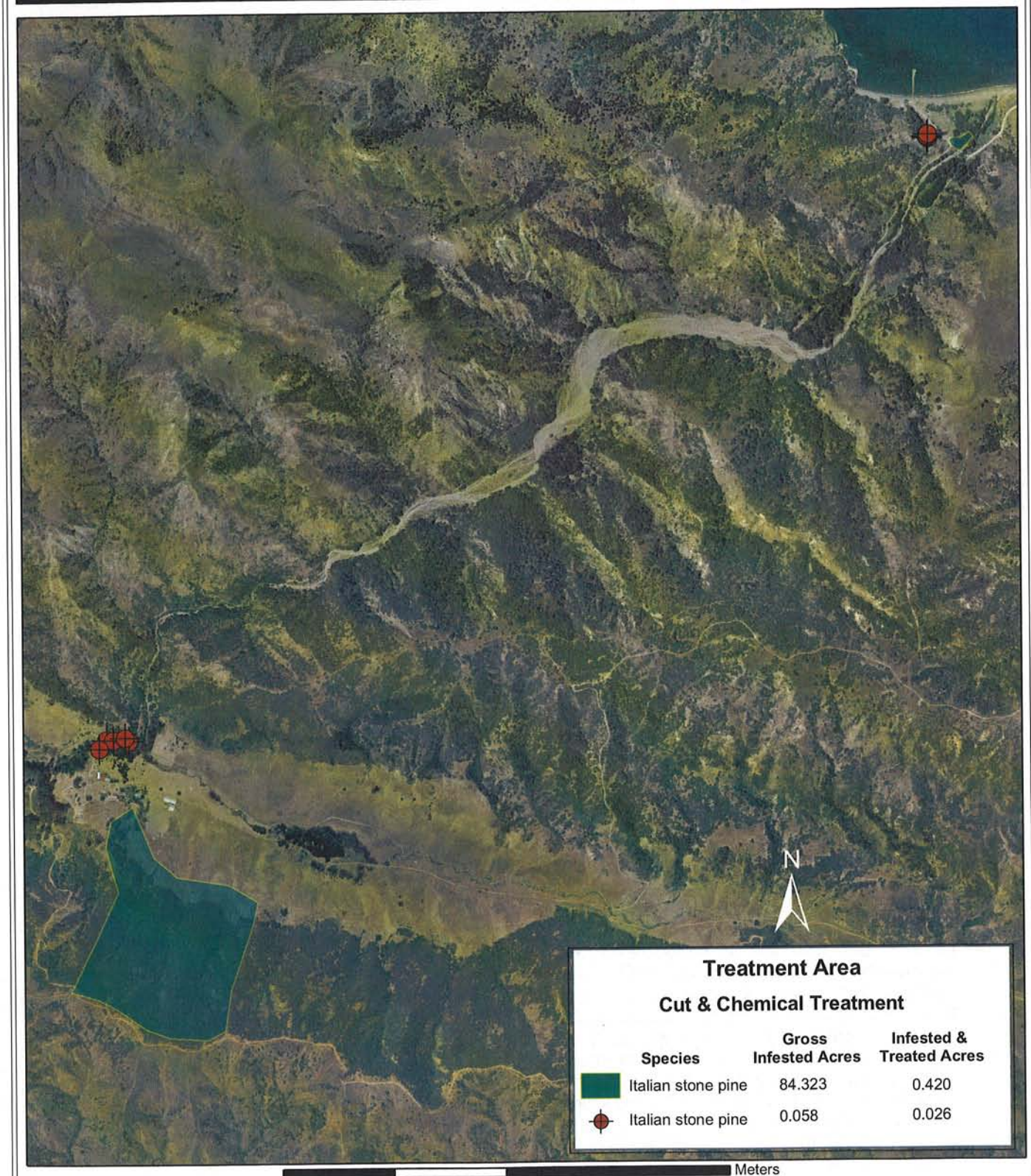
A project highlight for the Marathon SCA CA-EPMT involved the removal of invasive olive trees (*Olea europaea*) from the eastern portion of Santa Cruz Island (Channel Islands National Park). The treatment area encompassed a 1,000-acre tract adjacent to an historic (early 1900s) domestic olive grove of approximately 600 trees. The five-person team, along with CHIS-SCA, James Roberts, carried out a month-long project that resulted in the removal of 3,577 olive trees. Each tree removed was documented by recording its precise location using a handheld GPS unit, and its overall height and maximum burl diameter. Height and burl diameter are being used together as a surrogate measure of the approximate age. This information will enable CHIS to estimate how fast and far the plants are spreading from the source olive tree population, and to estimate the projected cost required to contain the grove at its current size. Several grove management strategies are being considered, all with the goal of reducing both seed formation and dispersal from the grove, while still retaining some of the grove's contribution to the historic landscape.

Katie McMahan removing olive tree from Santa Cruz Island.

This project was completed without vehicle access. The team backpacked their supplies for the entire month across the steep terrain to their backcountry base camp.

Italian Stone Pine Control, Channel Islands NP
California EPMT

National Park Service
U.S. Department of the Interior



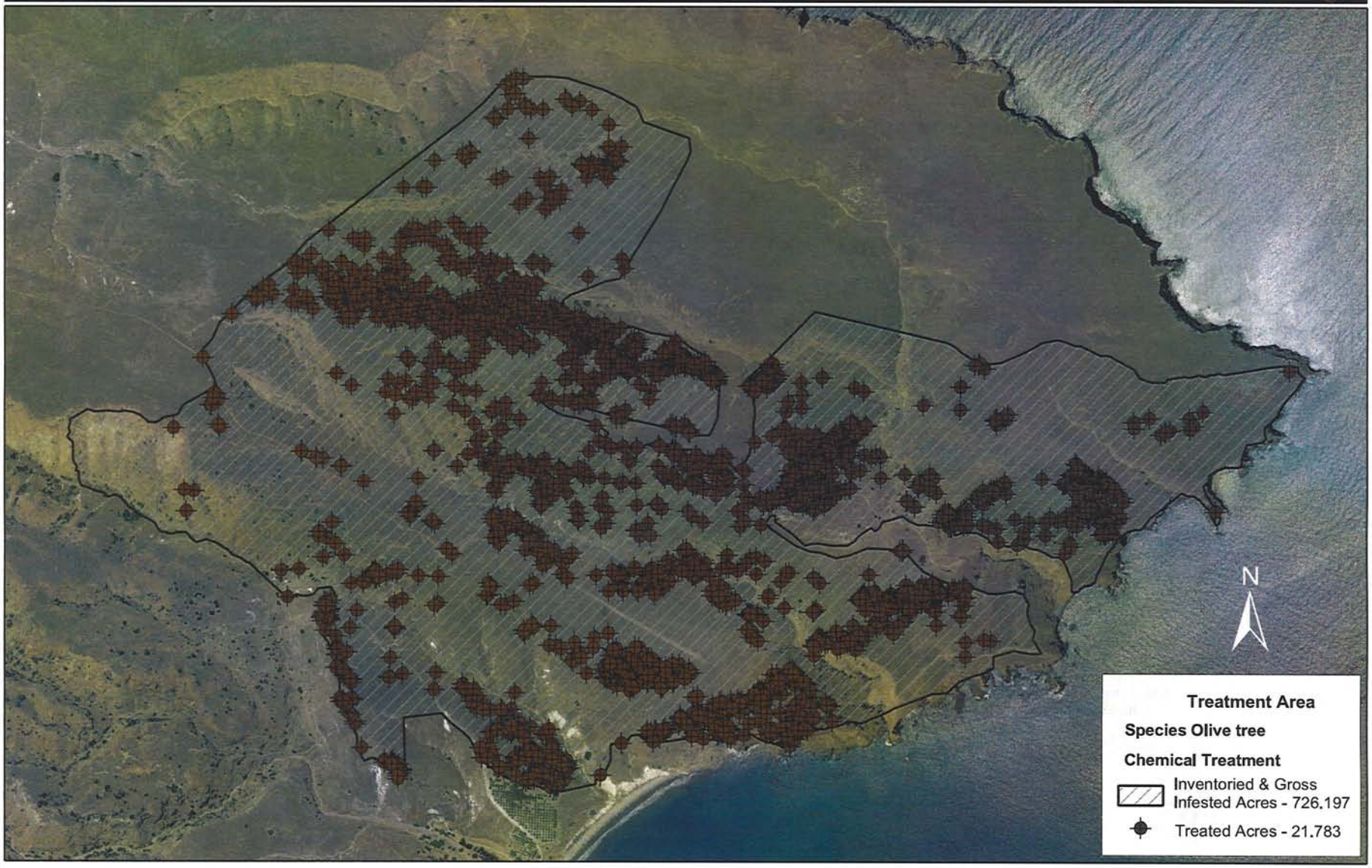
Source: Airphoto USA, Channel Islands NP
CA coverages collected with Trimble GPS Receiver
Project Date: July 26-30, 2005
Date: 2 Nov 05

Scale - 1:20,916

Coordinate System - UTM_Zone 11N_NAD 27

Santa Cruz Island, Channel Islands National Park
California EPMT

National Park Service
U.S. Department of the Interior



Source: Airphoto USA Channel Islands NP
CA coverages collected with a Trimble GPS receiver
Project Date: April 4 - May 3, 2005
Date: 2 Nov 05

0 250 500 1,000 Meters

Scale - 1:15,043

Coordinate System - UTM_Zone 11N_NAD 27

California Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Cabrillo National Monument	158
Channel Islands National Park	242,286
Devils Postpile National Monument	786
Golden Gate National Recreation Area	75,873
John Muir National Historic Site	341
Lassen Volcanic National Park	106,169
Point Reyes National Seashore	66,200
Redwood National Park	114,565
Santa Monica Mountains National Recreation Area	152,361
Sequoia and Kings Canyon National Park	856,023
Whiskeytown-Shasta-Trinity National Recreation Area	41,785
Yosemite National Park	740,984
Total Acreage	2,397,531

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NPS
Date: 19 Sep 05

Chihuahuan Desert/Southern Shortgrass Prairie

Exotic Plant Management Team

Partner parks and states: Bent's Old Fort NHS, CO; White Sands NM, NM; Carlsbad Caverns NP,NM; Washita Battlefield NHS, OK; Big Bend NP, TX; Amistad NRA, TX; Alibates Flint Quarries NM, TX; Capulin Volcano NM, NM; Fort Davis NHS, TX; Lake Meredith NRA, TX; Guadalupe Mountains NP, TX

Accomplishments

Inventoried Acres	1,470
Gross Infested Acres	347
Infested Acres	347
Treated Acres	40
Monitored Acres	212
Retreated Acres	2
Restored Acres	.3

Treating salt cedar at White Sands , NM

The Chihuahuan Desert/Southern Shortgrass Prairie Exotic Plant Management Team (CDSP-EPMT) serves 11 partner parks spread across a 500 mile radius of the desert southwest.

A steering committee made up of representatives from each of the 11 member parks, meets annually to discuss project proposals for exotic plant treatments for their parks. Seasonal plant characteristics, park recommendations, climate factors, and integrated plant management methods are considered in the development of the annual work schedule. A total of 25 projects are identified, prioritized and organized into a concise work plan, which outlines the type of treatment, the location of treatment, tools, supplies and personnel that are needed. Included in the annual schedule, a two-week period is factored in to provide assistance to neighboring parks that do not have EPMT to help them. CDSP-EPMT has assisted four parks in this manner and the projects were a great success.

The CDSP-EPMT conducts outreach and awareness training continually to member parks, to schools, and to the public. This past spring, the EPMT conducted training on exotic plants (weeds) for third and fourth grade students from the local area. The presentation, which was entitled "Journey to Understanding Weeds," was part of the Park Kids Summer Recreation program hosted by Carlsbad Caverns National Park. The team also presented an exhibit at the New Mexico Vegetation Management Association annual conference held in Albuquerque, New Mexico. The exhibit presented various methods of weed control and several before and after photos of projects. As part of our annual program, the team provides awareness training of the impacts to our natural resources from exotic plants to the public, through the Carlsbad Caverns visitor center. The EPMT assists the Natural Resources Conservation Service, Los Lunas station, with plant identification, plant phenology information, and seed collection assistance at Carlsbad Caverns National Park

Some highlights for 2005 are: the restoration of Garton Pond Wildlife Area at White Sands National Monument, New Mexico; treatment of several hundred acres of Buffelgrass at Saguaro National Park, Arizona; eradication of the last remaining stand of invasive salt cedar from Padre Island National Seashore, and; culminated the second successful season utilizing the Student Conservation Association interns in a remote setting at Pecos National Historic Park, New Mexico.

Special Emphasis Species

salt cedar
Russian olive
Siberian elm
Malta starthistle
Russian knapweed
Canada thistle
wooly mullein
Scotch thistle
buffelgrass
horehound
johnsongrass
African rue
yellow sweetclover

Chihuahuan Desert/Southern Shortgrass Prairie

Exotic Plant Management Team

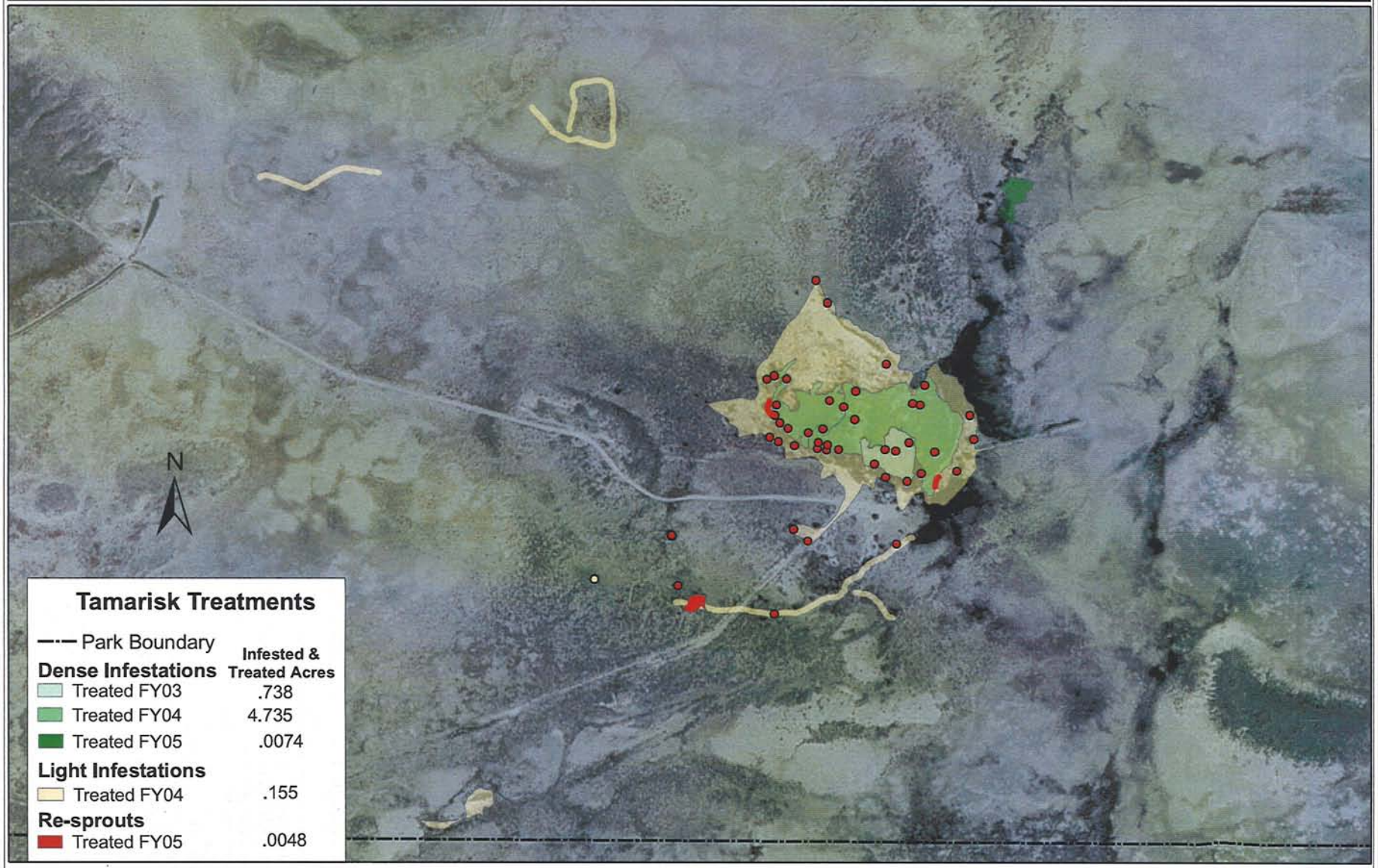
Garton Pond Restoration

Restoration of Garton Pond at White Sands National Monument, New Mexico

The CDSP-EPMT has conducted several treatments on this 10 acre reservoir working to restore the habitat to a wildlife sanctuary. The site was historically used as a watering point for livestock. In the early 1970's White Sands National Monument became the owner of this portion of the White Sands Missile Range and utilized the pond to conduct wildlife tours for the local schools. Several wildlife species including migratory birds, reptiles, and large mammals frequented this oasis. By the early 1990's salt cedar had completely engulfed the pond and reduced the water table until no standing water was observed. Native cottonwood and willow trees eventually died out. Without water, most of the wildlife moved away. Through the efforts of the EPMT and White Sands NP resource specialists, the salt cedar trees have all been removed and their roots treated with herbicides to prevent resprouting. Preliminary observations indicate some standing water beginning to accumulate, foster hope that wildlife will return.

Garton Pond
Chihuahuan Desert Southern Shortgrass Prairie EPMT

National Park Service
U.S. Department of the Interior



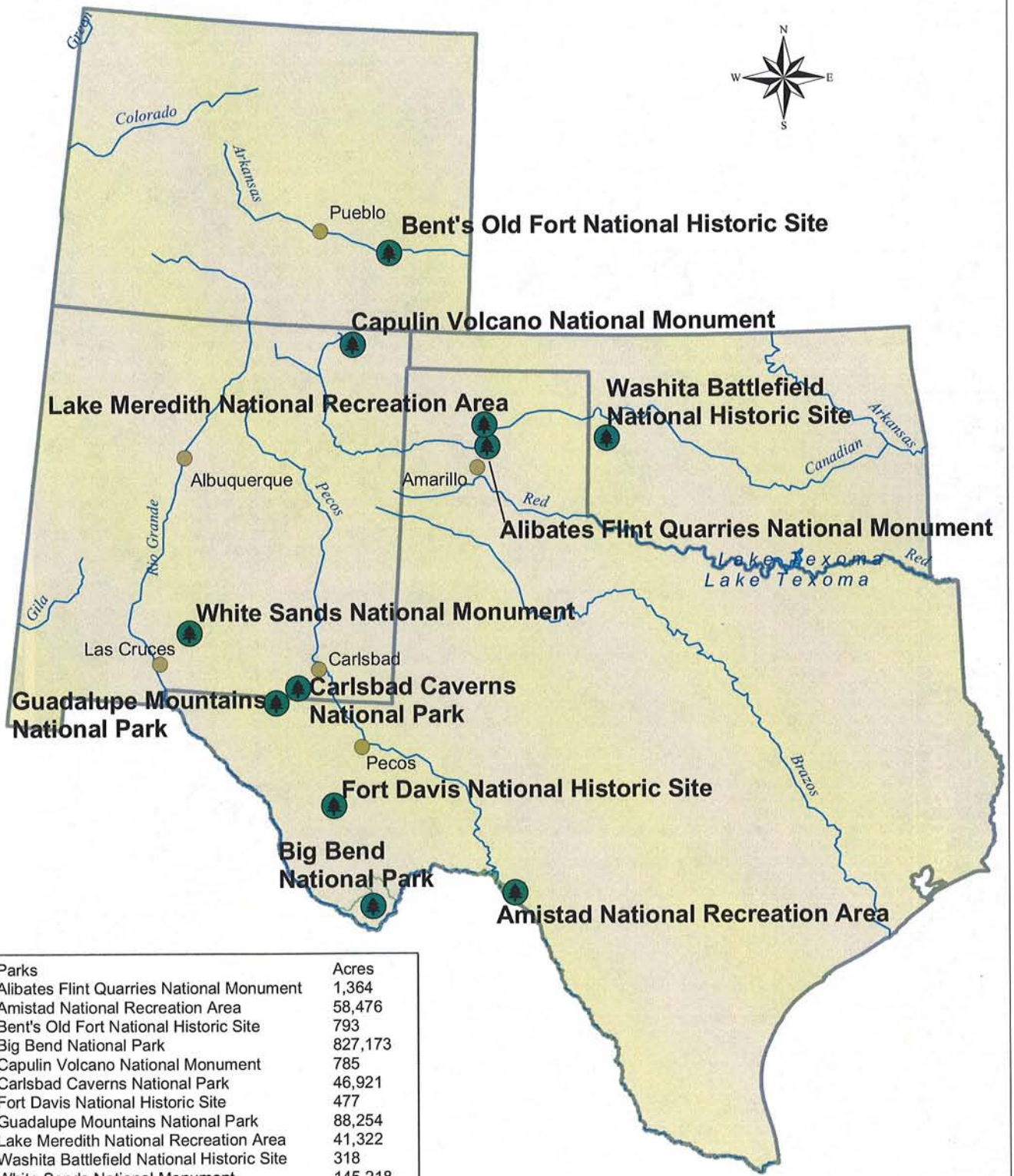
Source: USGS DOQQ GARTONLAKSE, NRID Park Boundary, CDSP coverages collected with a Trimble GPS receiver
Date: 08 OCT 05

Meters
0 50 100 200
Scale - 1:7,500

Coordinate System - UTM_Zone 13N_NAD 83

Chihuahuan Desert/Southern Shortgrass Prairie Exotic Plant Management Team Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Alibates Flint Quarries National Monument	1,364
Amistad National Recreation Area	58,476
Bent's Old Fort National Historic Site	793
Big Bend National Park	827,173
Capulin Volcano National Monument	785
Carlsbad Caverns National Park	46,921
Fort Davis National Historic Site	477
Guadalupe Mountains National Park	88,254
Lake Meredith National Recreation Area	41,322
Washita Battlefield National Historic Site	318
White Sands National Monument	145,218
Total Acreage	1,211,101

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NPS
Date: 7 Nov 05

Colorado Plateau-Petrified Forest

Exotic Plant Management Team

Host Park: Petrified Forest NP with Partner Parks: Arches NP, Aztec Ruins NM, Bandelier NM, Black Canyon of the Gunnison NP, Bryce Canyon NP, Canyon De Chelly NM, Canyonlands NP, Capitol Reef NP, Cedar Breaks NM, Chaco Culture NHP, Colorado NM, Curecanti NRA, Dinosaur NM, El Malpais NM, El Morro NM. Arizona:, Glen Canyon NRA, Grand Canyon NP, Hovenweep NM, Hubbell Trading Post NHS, Mesa Verde NP, Natural Bridges NM, Pipe Spring NM, Rainbow Bridge NM, Sunset Crater Volcano NM, Timpanogos Cave NM, Walnut Canyon NM, Wupatki NM., Yucca House NM and Zion NP.

Accomplishments

Inventoried Acres	1,156
Gross Infested Acres	1,150
Infested Acres	105
Treated Acres	76
Monitored Acres	0
Retreated Acres	0
Restored Acres	3

Ravenna grass [*Saccharum ravennae*] at Glen Canyon NRA with Utah Conservation Corps Members.

The Colorado Plateau-Petrified Forest Exotic Plant Management Team (CPPF EPMT) used AmeriCorps Public Land Corps crews to control weeds at seven parks this year. The AmeriCorps crews were from the Utah Conservation Crew, associated with Utah State University in Logan, the Coconino County Rural Environmental Corps (CREC) from Flagstaff, Arizona, and three Colorado-based crews, namely Western Colorado Conservation Crew. Crews controlled invasive plants in Grand Canyon, Zion, Pipe Spring, Cedar Breaks, Bryce Canyon, Black Canyon of the Gunnison, Glen Canyon, and Dinosaur National Parks and Monuments. The CPPF-EPMT now consists of a Team Liaison with one Crew Supervisor. A Crew Leader, announced in FY05, is expected to join the team by November 2005. In October and November 2003, Kristin Dorman-Johnson acted as Crew Supervisor, completing a 60-day special assignment assisting in training volunteers and leading projects in the field.

Crews worked on removing Russian olive, tamarisk (salt cedar), Himalayan blackberry, dalmation toadflax, spotted knapweed, hound's tongue, salsify and sweet clover.

Black Canyon of the Gunnison was one of the two most challenging projects for this year. High temperatures prevented the use of herbicides in July and August across the Colorado Plateau. The crew changed location to Black Canyon of the Gunnison to avoid the high heat. Control sites were in a remote area along a steep and sometimes treacherous trail. . The park assisted with accessing the site by transferring supplies and equipment with a helicopter.

At Petrified Forest National Park, exotic species were removed from around cultural and archaeological sites.

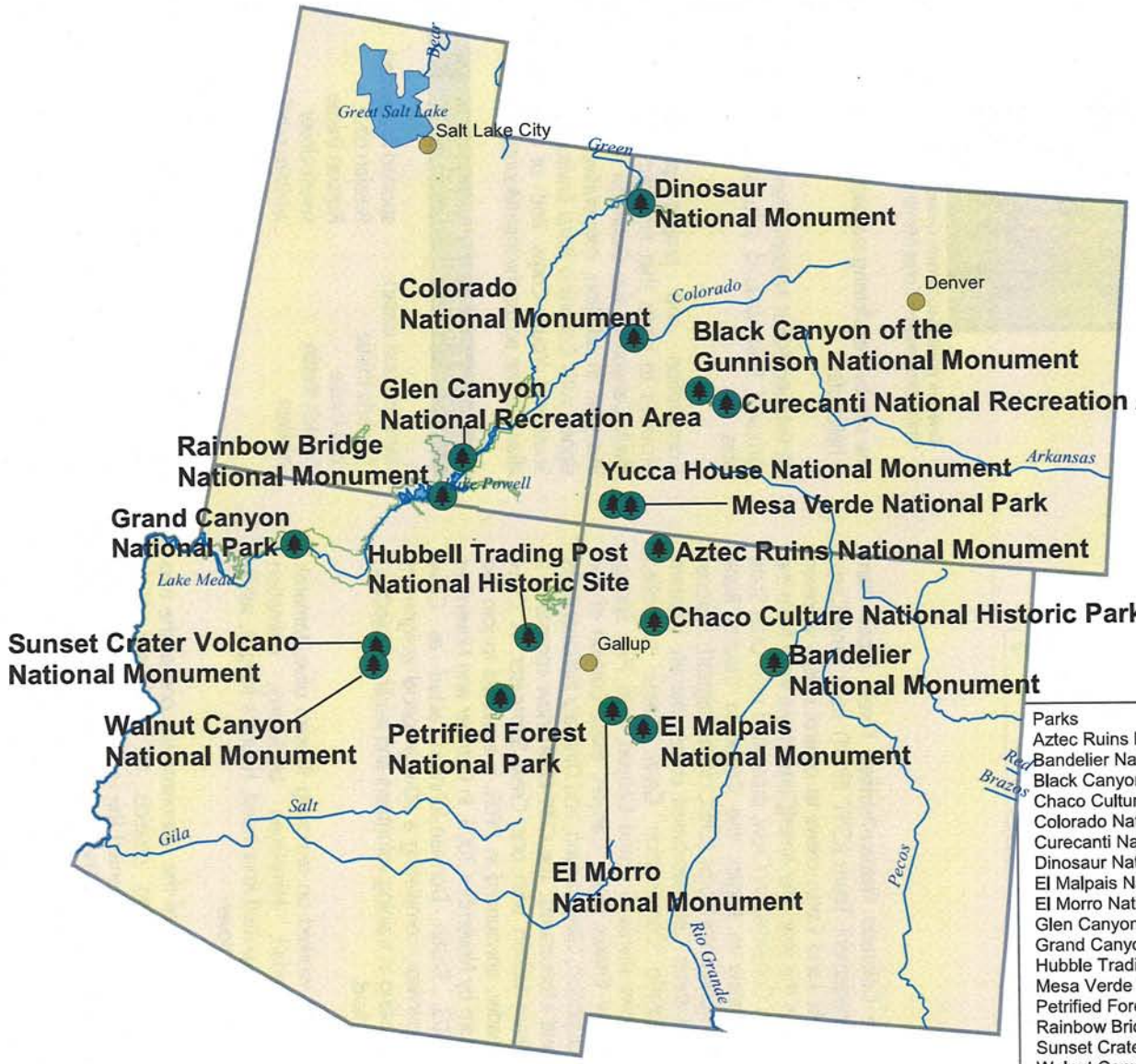
Consultation and project planning assistance provided to parks that included site visits were to Black Canyon of the Gunnison and Chaco Culture this year. In addition, cooperative agreements were signed with Coconino Rural Environment Corps and Southwest Youth Corps. Both of these agreements allow for use across the InterMountain Region.

Special Emphasis Species

tamarisk (salt cedar)
Canada thistle
bull thistle
Scotch thistle
mullein
spotted knapweed
Russian olive
Russian thistle
sweet clover
western salsify

Colorado Plateau Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Aztec Ruins National Monument	317
Bandelier National Monument	32,661
Black Canyon of the Gunnison National Monument	21,098
Chaco Culture National Historic Park	34,505
Colorado National Monument	20,194
Curecanti National Recreation Area	40,572
Dinosaur National Monument	208,661
El Malpais National Monument	116,221
El Morro National Monument	1,030
Glen Canyon National Recreation Area	1,238,290
Grand Canyon National Park	1,197,558
Hubble Trading Post National Historical Site	159
Mesa Verde National Park	52,695
Petrified Forest National Park	94,430
Rainbow Bridge National Monument	161
Sunset Crater Volcano National Monument	3,021
Walnut Canyon National Monument	3,631
Yucca House National Monument	35
Total Acreage	3,065,239

Meters
0 125,000 250,000 500,000

Source: ESRI and NPS
Date: 21 Sep 05

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Florida/Caribbean Partnership

Exotic Plant Management Team

Partner Parks and states: Biscayne NP, FL; Big Cypress NP, FL; Canaveral NS, FL; Castillo de San Marcos NM, FL; DeSoto NM, FL; Dry Tortugas NP, FL; Everglades NP, FL; Fort Caroline NM, FL; Fort Matanzas NM, FL; Gulf Islands NS, FL; Timucuan EHP, FL; Buck Island Reef NM, USVI; Christiansted NM, USVI; Salt River Bay NHP & EHP, USVI; Virgin Islands NP, USVI.

Accomplishments

Inventoried Acres	50,517,600
Gross Infested Acres	13,426
Infested Acres	3,565
Treated Acres	3,550
Monitored Acres	0
Retreated Acres	0
Restored Acres	0

Contract crews cutting *Melaleuca quinquenervia* in Big Cypress NP

Tropical and sub-tropical climates make Florida and many Caribbean islands particularly prone to exotic plant invasions. Natural and anthropomorphic habitat disturbances combined with a large number of species introduced intentionally for ornamental and agricultural purposes, and unintentionally, are also major invasive exotic plant contributing factors. In Florida, exotics infest over 1,500,000 acres of the state's natural areas and have rapidly dominated native plant communities, minimized biological diversity, disrupted natural processes such as fire regimes and water flow, and changed the landscape both visually and ecologically. Over 400,000 acres of approximately 2,000,000 acres of National Park Service (NPS) lands in Florida are infested with exotic pest plants.

The Florida and Caribbean EPMT (FLC-EPMT) supports National Park Service units in Florida and the Caribbean by augmenting existing exotic plant control efforts including inventory and monitoring, control, education and research. The FLC-EPMT is a partnership with the Florida Department of Environmental Protection's (FDEP) Bureau of Invasive Plant Management as well as many other government and NGO's working toward the control and management of invasive exotic plants. The FLC-EPMT consists of resource managers from each partner park and representatives from the FDEP. These resource managers identify and prioritize exotic plant control projects and function as the team's steering committee. Exotic Plant Control is done through Indefinite Delivery/Quantities contracts either NPS or FDEP, although small parks maintenance control projects are done by the FLC-EPMT small parks hit squad. The liaison stationed in Homestead, Florida and the leader stationed in the US Virgin Islands serve as contracting officer representatives (COR) to assure project implementation, provide technical recommendations, oversight, coordination and direction for the team.

Major 2005 FLC-EPMT accomplishments include Systematic Reconnaissance Flights in central and south Florida to inventory and map exotic plants on 12.6 million acres, the eradication of Brazilian pepper in Virgin Islands NP and Australian pine in Salt River Bay NHP & EHP, and continued cooperative agreements with the South Florida Water Management District and University of Florida.

During 2005, both the FLC-EPMT Liaison and Leader directly supported hurricane recovery operations in the Southeast by deploying to Gulf Islands NS and the US Coast Guard Atlantic Area respectively.

Special Emphasis Species

African Guinea grass
Australian pine
Brazilian pepper
Chinese tallow
genip
lather leaf
limeberry
mahoe (sea hibiscus)
melaleuca
Old World climbing fern
tan tan

Florida/Caribbean Partnership

Exotic Plant Management Team

Special Emphasis Species

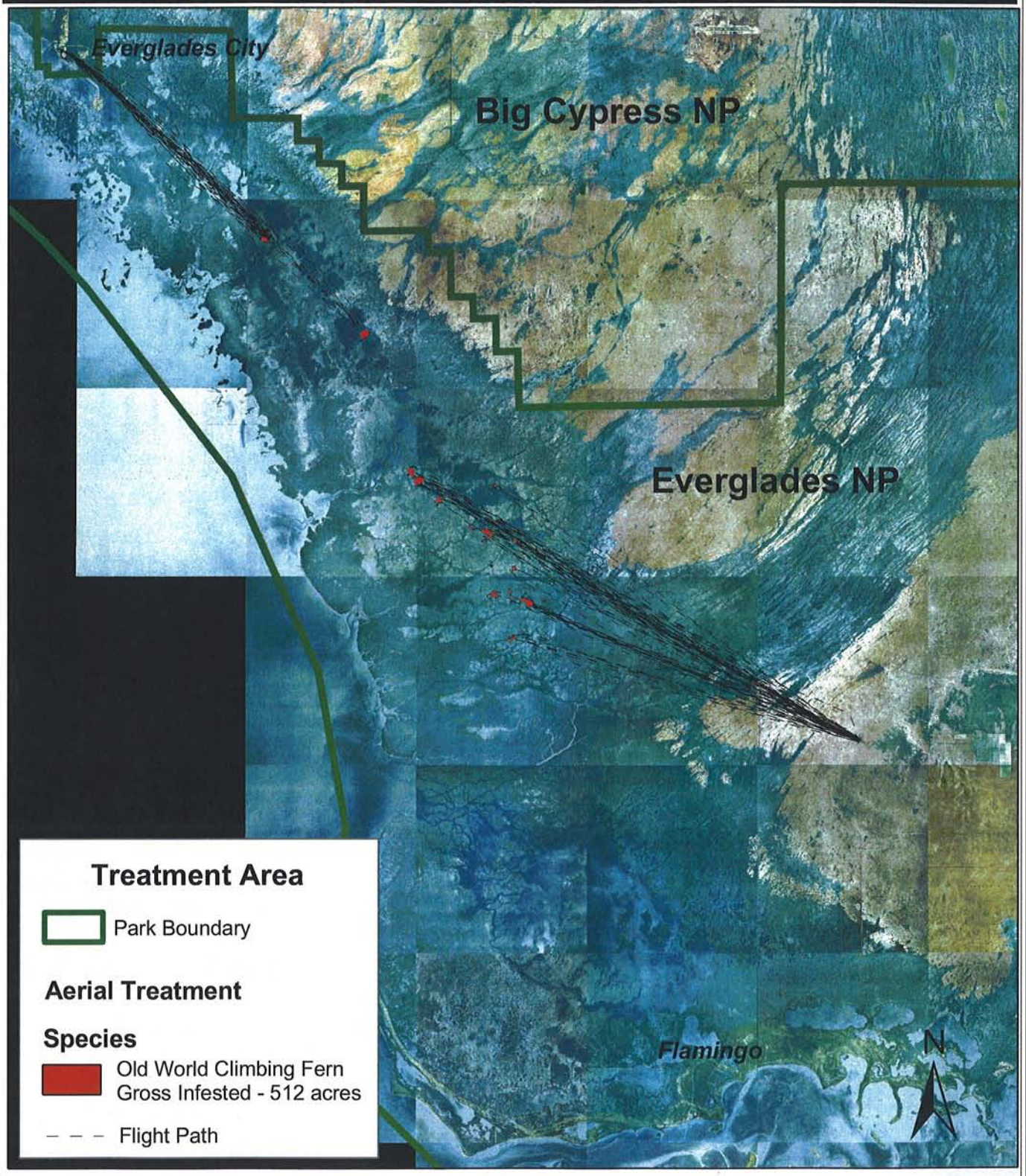
Old World Climbing Fern *(Lygodium microphyllum)* is currently one of the most invasive plants found in Florida and threatens the fragile Everglades ecosystem. A native of Africa, Australia, Asia, and Melanesia it became naturalized in south Florida in 1965 and by 2003, occupied over 150,000 acres in the state, including over 10,000 acres in EVER.

The rapid expansion of Old World Climbing Fern in Florida is due to its tremendous reproductive mechanism. Each fertile fern leaf has the potential to produce over 20,000 spores which are released and dispersed by wind.

The largest populations of Old World Climbing Fern in Everglades occur along the coastal marshes in extremely remote locations. The inaccessibility of these areas by ground crews (no roads, swampy terrain, and copious insects) has required the NPS to use aerial application to manage the population. Through the use of selective herbicides the acreage of Old World Climbing Fern in EVER has been reduced substantially. In 2005, the FLC-EPMT contracted a private company to provide material and services to treat 512 acres of Old World Climbing Fern. Northern populations were accessed using the Everglades City airport, and southern populations were accessed by a helipad along the main park road.

Old World Climbing Fern - Aerial Treatment, Everglades NP
Florida and Caribbean EPMT

National Park Service
U.S. Department of the Interior



Source: USGS Orthophotos, EVER Park Boundary, Treatment polygons and flight lines collected with AgNav DGPS system.
Project Date: May 2005
Date: 2 Nov 05

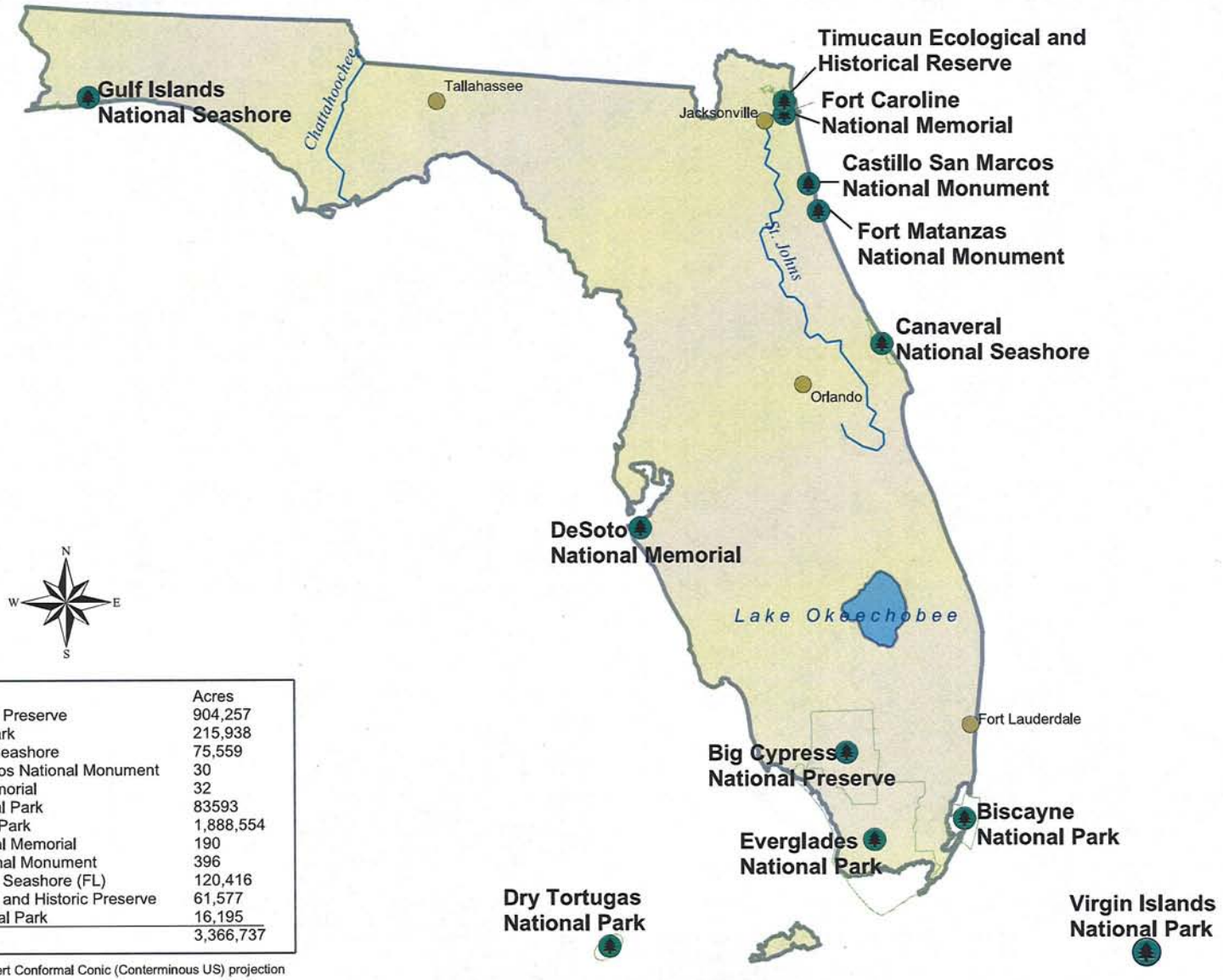
0 8,000 16,000 32,000 Meters

Scale - 1:414,000

Coordinate System - UTM_Zone 17N_NAD 83

Florida Caribbean Partnership Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Big Cypress National Preserve	904,257
Biscayne National Park	215,938
Canaveral National Seashore	75,559
Castillo de San Marcos National Monument	30
DeSoto National Memorial	32
Dry Tortugas National Park	83593
Everglades National Park	1,888,554
Fort Caroline National Memorial	190
Fort Matanzas National Monument	396
Gulf Islands National Seashore (FL)	120,416
Timucuan Ecological and Historic Preserve	61,577
Virgin Islands National Park	16,195
Total Acreage	3,366,737

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NPS
Date: 19 Sep 05

Great Lakes

Exotic Plant Management Team

Partner parks and states: Apostle Islands National Lakeshore, WI; Indiana Dunes National Lakeshore, IN; Isle Royale National Park, MI; Mississippi National River and Recreation Area, MN; Pictured Rocks National Lakeshore, MI; Sleeping Bear Dunes National Lakeshore, MI; St. Croix National Riverway, WI; and Voyageurs National Park, MN.

Accomplishments

Inventoried Acres	4,194
Gross Infested Acres	52
Infested Acres	12
Treated Acres	12
Monitored Acres	0
Retreated Acres	0
Restored Acres	0

Foliar control of Mountain bluet (Centaurea) at Isle Royale NP.

The Great Lakes Exotic Plant Management Team (GL-EPMT) serves eight National Parks located in four states in the western Great Lakes Region. These parks, extending from the boreal forest of northern Minnesota to the sand dunes of southern Lake Michigan, also work in association with the Great Lakes Network Inventory and Monitoring Program (I&M). Co-location of the GL-EPMT and I&M Network in Ashland, WI provides the opportunity for the two programs to work closely together, taking advantage of shared positions and functions.

Partnerships continue to play an increasing role in weed management within the parks. The GL-EPMT has benefited from a second year of cooperation with the Student Conservation Association (SCA). A crew of four SCA individuals inventoried plants and treated exotic species at Sleeping Bear Dunes and Indiana Dunes National Lakeshores. Additionally, control work by the GL-EPMT at a local Fish and Wildlife (FWS) Refuge provided important early season training for both NPS and FWS crews. Work at the Mississippi National Riverway and Recreation Area, an urban management area, continued in cooperation with several city and county parks in the watershed.

With many habitat types and levels of human impact, the team faces different challenges at each park. In the wilderness areas of Apostle Island National Lakeshore and Isle Royale National Park, the emphasis is on preventing new invasions and aggressively treating emerging weed populations. In Voyageurs National Park, where Canada thistle is rapidly moving along roadways to the park's interior, alternate treatments such as mowing are needed. Parks that have large populations of invasive plants throughout the park, such as St. Croix National Riverway and Pictured Rocks National Lakeshore, require treatment across large areas and need long-term plans for continued control.

In some cases, critical habitats were targeted for weed control. Wetland panne areas, such as those at Indiana Dunes, are globally rare. With labor and funding from the GL-EPMT, treatment occurred in all of the pannes this past year. At Sleeping Bear Dunes National Lakeshore, the SCA crew surveyed over 5,000 acres for baby's breath, a severe threat specific to dunes areas around Lake Michigan.

Special Emphasis Species

Baby's Breath
Black Locust
Buckthorn
Burdock
Canada Thistle
Common Reed
Common Tansy
Creeping Bellflower
Crown Vetch
Garlic Mustard
Hawkweed
Honeysuckles
Japanese Knotweed
Leafy Spurge
Lyme Grass
Mountain Bluet
Purple Loosestrife
Sheep Sorrel
Spotted Knapweed
Tree of Heaven

Great Lakes

Exotic Plant Management Team

Baby's Breath Mapping

Sleeping Bear Dunes National Lakeshore has an emerging population of baby's breath (*Gypsophila paniculata*). Baby's breath can potentially invade 5,348 acres of bluff, dune, and shoreline in the park, threatening vegetation unique to these habitats.

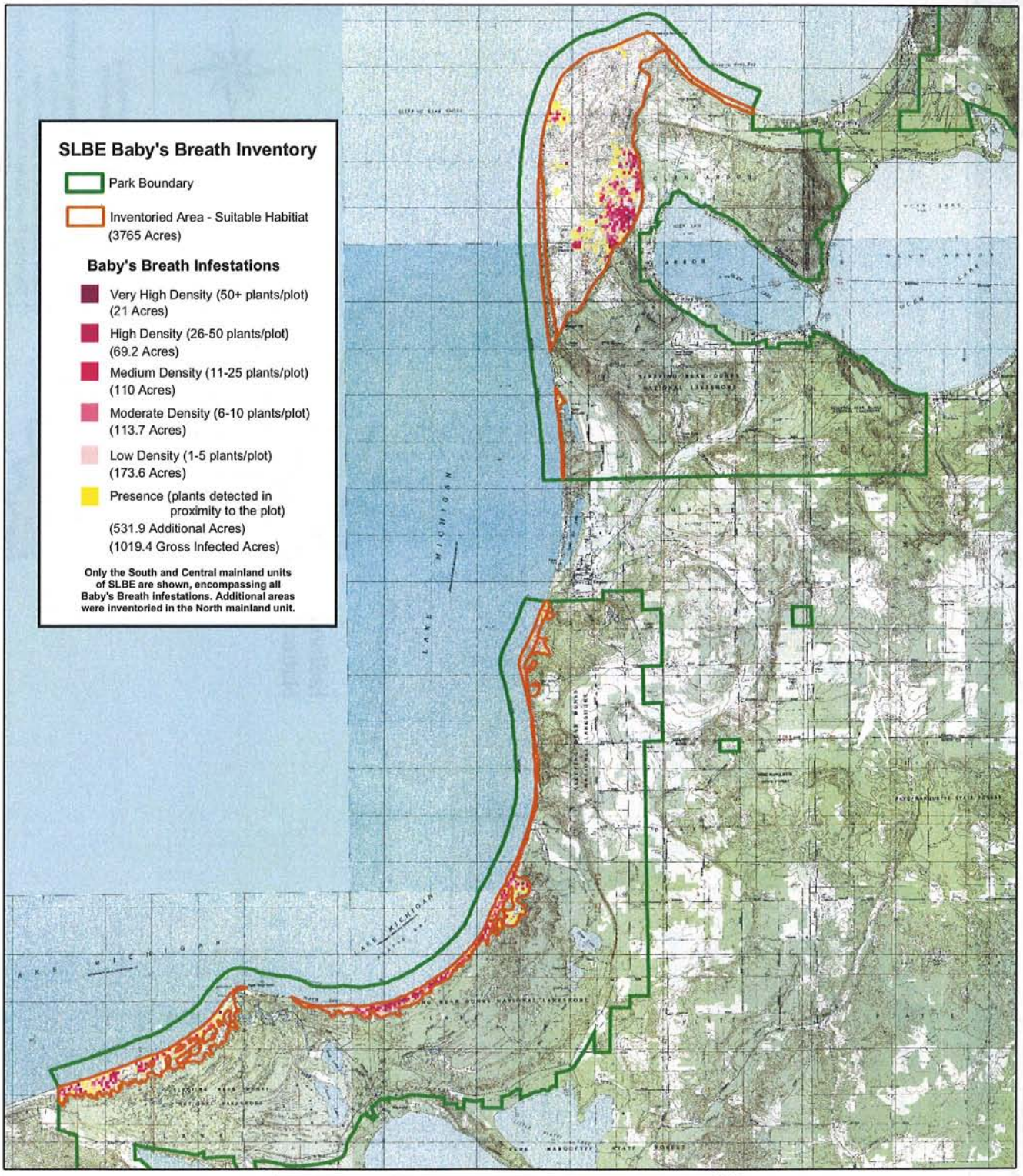
The Great Lakes EPMT Student Conservation Association crew surveyed the Lakeshore during July and August of 2005 to assess the abundance and distribution of baby's breath. This project is the preliminary step in developing a management plan for this invasive species.

A 50 meter sample grid was digitally overlaid on these vegetation types and programmed into a GPS unit. At each sample point information including baby's breath and total vegetation cover were electronically recorded in a 2 meter radius. As a quality control measure the crew noted whether or not the point recorded was representative of surrounding vegetation.

The crew successfully completed the survey, which included 5,995 data points. Preliminary analysis of the data suggests that there are extensive infestations of baby's breath in Platte Bay and on the shore south of Platte Point. Additional populations exist near the Sleeping Bear Dune itself. Initial post-survey assessments indicate that most patches were captured in the sampling design except those in narrow parcels of park property

Baby's Breath Inventory at Sleeping Bear Dunes Natl. Lakeshore
Great Lakes EPMT

National Park Service
U.S. Department of the Interior



Source: USGS 7.5' DRG's, SLBE Park Boundary, SLBE Gypsophila locations collected with Trimble GeoXT GPS Receivers
Date: 12 Oct 05

Scale - 1:124,840

Coordinate System - UTM_Zone 16N_NAD 83

Great Lakes Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Apostle Islands National Lakeshore	69,327
Indiana Dunes National Lakeshore	17,266
Isle Royale National Park	557,742
Mississippi National River and Recreation Area	53,804
Picture Rocks National Lakeshore	68,650
Saint Croix National Scenic River	98,007
Sleeping Bear Dunes National Lakeshore	70,101
Voyageurs National Park	204,426
Total Acreage	1,139,323

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NPS
Date: 19 Sep 05

Gulf Coast

Exotic Plant Management Team

Partner Parks and states: Big Thicket National Preserve, Beaumont, Texas (Host Park); San Antonio Missions National Historical Park, San Antonio, Texas; Lyndon B Johnson National Historical Park, Johnson City, Texas (Satellite Facility); Jean Lafitte national Historical Park and Preserve, New Orleans, Louisiana; Gulf Islands National Seashore, Ocean Springs, Mississippi; Vicksburg National Military Park, Vicksburg, Mississippi; Natchez Trace Parkway, Tupelo, Mississippi

Accomplishments

Inventoried Acres	4,142
Gross Infested Acres	2,297
Infested Acres	173
Treated Acres	22
Monitored Acres	805
Retreated Acres	19
Restored Acres	0

The Gulf Coast EPMT are poised to cut down every Chinese tallow tree behind them

The Gulf Coast Exotic Plant Management Team (GC-EPMT) is situated in a region of relatively warm year round temperatures, high precipitation, and high plant diversity, including a high diversity of exotic vegetation. As a result, we employ a strategy of early detection and early eradication. New species of exotic vegetation are discovered annually in our parks and we make every effort to eradicate those new exotic populations before they have a chance to spread to a larger area. Exotic species that have become well established in our parks are addressed by a strategy of containment to avoid further spreading into undisturbed native plant communities.

Exotic species of concern vary by geography but include Chinaberry tree, Japanese privet, giant cane and Johnson grass in our western upland parks. Coastal park concerns include Chinese tallow tree (particularly after hurricanes Katrina and Rita), Japanese climbing fern, cogon grass, Chinese privet, mimosa tree and Japanese honeysuckle. Parks in the interior humid south are primary concerned with Kudzu but include populations of the species present in the coastal parks. Control techniques thus far have concentrated on chemical methods utilizing an understanding of each species ecology and growth habits. Biological controls for the species in our region are not yet well developed and mechanical methods have not proven effective.

Partnerships with the Big Thicket Association, Student Conservation Association (SCA), Rice University, Texas Parks and Wildlife Department, and other National Park Service units within our area have helped to supplement our efforts and improve our efficiency. These partnerships have also aided in our outreach efforts, generating interest in our work from outside parties.

Notable advances from this year's effort include the early detection and eradication of the only known population of Tung Oil tree in the Big Thicket National Preserve, as well as, the only known wild growing population in the state of Texas. Other advances include projects at National Park Service units outside of the partner park network that have greatly increased our efficiency by providing staging areas to perform work at our partner parks and allowed the addition of a satellite team to reduce travel costs.

Hurricanes Katrina and Rita caused significant impact to activities in 2005 season. There was little or no exotic plant work in parks affected by hurricane Katrina. Fifty percent of our staff was diverted to the hurricane recovery rather than exotic plant management. Hurricane Rita also affected productivity. We are anticipating that disturbances from these two hurricanes will have long term effects, including an increase of exotic vegetation.

Special Emphasis Species

Chinaberry tree
Chinese tallow tree
Japanese climbing fern
Japanese privet
kudzu

Gulf Coast

Exotic Plant Management Team

Melrose Inventory

An inventory of exotic plants was conducted at Melrose House, Natchez Historical Park during July and August of 2005. The inventory documented the locations and estimated infestation size. Three important exotic infestations and one new exotic infestation were inventoried and mapped using GPS. The maps will help us devise a strategy and work plan for the control of exotic invasive plants at Melrose House.

An accurate inventory of the Kudzu problem at Melrose confirmed our previous estimate of, "Man, that's a lot of Kudzu".

Neches Bottom Project

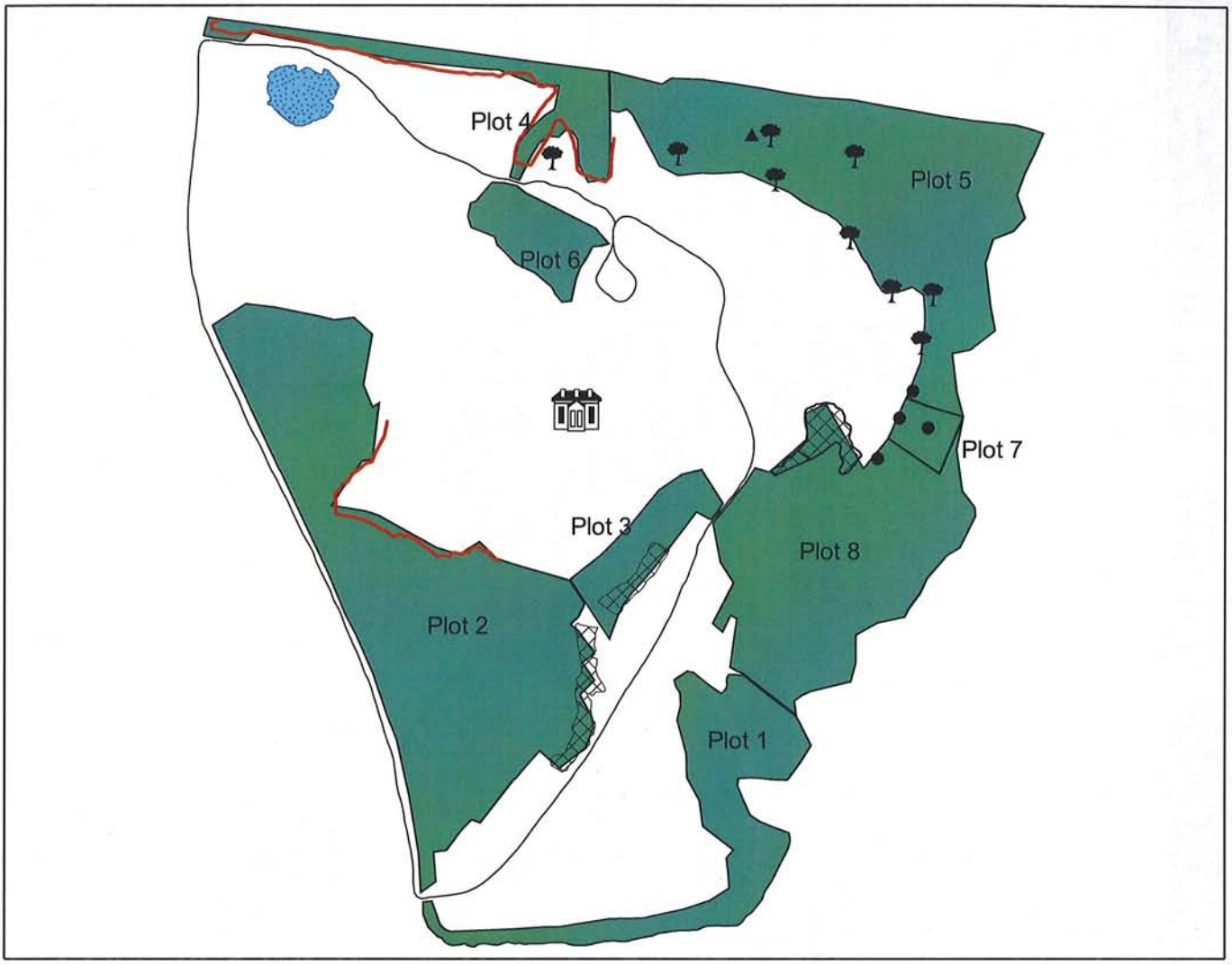
The Big Thicket National Preserve, Rice University, and the Gulf Coast EPMT have been evaluating the feasibility of controlling Chinese tallow at the ecosystem level. The removal of adult, seed bearing tallow trees had been conducted during 2000, 2001, and 2002. In 2005, a monitor and re-treatment of remaining tallow trees in 8-32 acre research plots was preformed.

This project has been an important partnership built towards a better understanding of the Big Thicket's most invasive plant species. Furthermore, while aiding Rice University in their research, the Gulf Coast EPMT has been able to achieve a significant GPRA goal. Ultimately though, the information gathered from this project will lend itself to a better understanding of how to more effectively manage this exotic pest.

Our EPMTs trudge through muck for scientific advancement.

Melrose, Natchez National Historic Park
Gulf Coast EPMT

National Park Service
U.S. Department of the Interior



Melrose Legend

- Melrose House
- Road
- Cypress Pond

Melrose Survey Overview

Plot 1: Paper mulberry and Chinese privet
Plot 2: Climbing fern and Chinese tallow tree
Plot 3: Climbing fern and Chinese privet
Plot 4: Chinese wisteria and Tung oil tree
Plot 5: Chinese tallow tree and Paper mulberry
Plot 6: Chinaberry tree and Japanese parasol tree
Plot 7: Kudzu and Chinese privet
Plot 8: Kudzu and Chinese privet

Melrose Treatments

- Kudzu
- Climbing Fern
- Chinese Tallow
- Line Treatment
- Area Treatment

Meters
0 80 160 320

Source: GCEPMT coverages collected with Trimble GeoXT GPS Receiver
Date: 20 Oct 05

Scale - 1:5,500

Coordinate System - UTM_Zone 15N_NAD 83

Gulf Coast Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Big Thicket National Preserve	89,795
Gulf Islands National Seashore (MS)	55,261
Jean Lafitte National Historic Park and Preserve	18,856
Lyndon B. Johnson National Historic Site	1,694
Natchez Trace Parkway (MS)	31,420
Padre Island National Seashore	133,569
San Antonio Missions National Historic Park	837
Vicksburg National Military Park	1,604
Total Acreage	333,036

Source: ESRI and NPS
Date: 19 Sep 05

0 175,000 350,000 525,000 Meters

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Lake Mead

Exotic Plant Management Team

Partner Parks and States: Arches NP, UT; Bryce Canyon NP, UT; Canyonlands NP, UT; Canyon de Chelly NM, AZ; Capitol Reef NP, UT; Cedar Breaks NM, UT; Death Valley NP, CA; Great Basin NP, NV; Hovenweep NM, UT; Joshua Tree NP, CA; Lake Mead NRA, NV; Manzanar NHS, CA; Mojave NP, CA; Natural Bridges NM, UT; Parashant NM, AZ; Pipe Spring NM, AZ; Timpanogos Cave NM, UT; Yucca House NM, CO; Zion NP, UT.

Accomplishments

Inventoried Acres	4,809
Gross Infested Acres	2,527
Infested Acres	187
Treated Acres	177
Monitored Acres	3,714
Retreated Acres	14
Restored Acres	34

Lake Mead EPMT removing tamarisk and Russian olive with Navajo Crews at Canyon de Chelly National Monument, Arizona

The Lake Mead EPMT emphasizes weed control within spring fed wetlands and riparian habitats. Using low impact and selective tamarisk and Russian olive control methods in these sensitive habitats with trained professional crews continues to be an effective approach. Tamarisk or saltcedar is a widespread invader of riparian areas throughout the West which consumes vast amounts of water and displaces native plant communities. Long term monitoring for more than 15 years has proven that tamarisk control consistently produces >90% mortality after initial treatments and minimal follow-up treatments are necessary to maintain tamarisk free sites. The strategy of the team is to systematically remove exotic invasive species from every high priority drainage within each partner park and to collaborate with adjacent land agencies to effectively manage weeds beyond park boundaries using a watershed approach.

Cooperative conservation and collaboration is the foundation of the Lake Mead EPMT. In order to improve efficiency, other federal agencies, state and local entities have developed partnerships with the Lake Mead EPMT to effectively manage weeds across watersheds and agency boundaries. The Lake Mead EPMT conducts interagency weed control projects for 5 million acres of federal and county land in Southern Nevada. These partners include the Southern Nevada Water Authority, Clark County Wetlands Park and Nature Preserve, Bureau of Land Management, US Forest Service, US Fish and Wildlife Service, City of Henderson, NV and the Bureau of Reclamation. These partnerships not only facilitate effective weed management across boundaries but also reduce infrastructure and overhead costs incurred by each agency compared to building a program on their own. The result of this partnering is more money being spent on the ground controlling weeds. Funding to facilitate these partnerships comes from multiple sources including Clark County, Nevada and the Southern Nevada Public Lands Management Act. These additional funds enable the Lake Mead EPMT to increase the number of field crews and thus the team's capacity to accomplish more weed control treatment acres while at partner NPS units. Other highlights include training Navajo Nation crews while controlling tamarisk at Canyon de Chelly NM in order to develop their capacity to provide long term tamarisk control within the park and on their reservation.

Special Emphasis Species

annual brome grasses
arundo
athel
bull Thistle
camelthorn
dandelion
five hook bassia
fountain grass
mullein
musk thistle
palm trees
perennial pepperweed
Russian knapweed
Russian olive
sahara mustard
salt cedar/tamarisk
tree of heaven
tree tobacco

Lake Mead
Exotic Plant Management Team

Tamarisk Project Completed

In January of 2005 the Lake Mead EPMT and the a Nevada Conservation Corp completed the tamarisk control project at the remote Horse Canyon in the Needles District of Canyonlands National Park, Utah. In three separate project trips between 2003 and 2005 the Lake Mead EPMT has treated 50 acres of tamarisk that covered a 200 acre area of Horse Canyon. Although tamarisk was well established it had not completely dominated the plant community yet and there remains plenty of native vegetation to re-colonize naturally without the competition of tamarisk. In 2006 the EPMT will start tamarisk control at the next park priority area at Canyonlands NP.

Lake Mead EPMT partners with Nevada Conservation Corp to increase treatment acres.

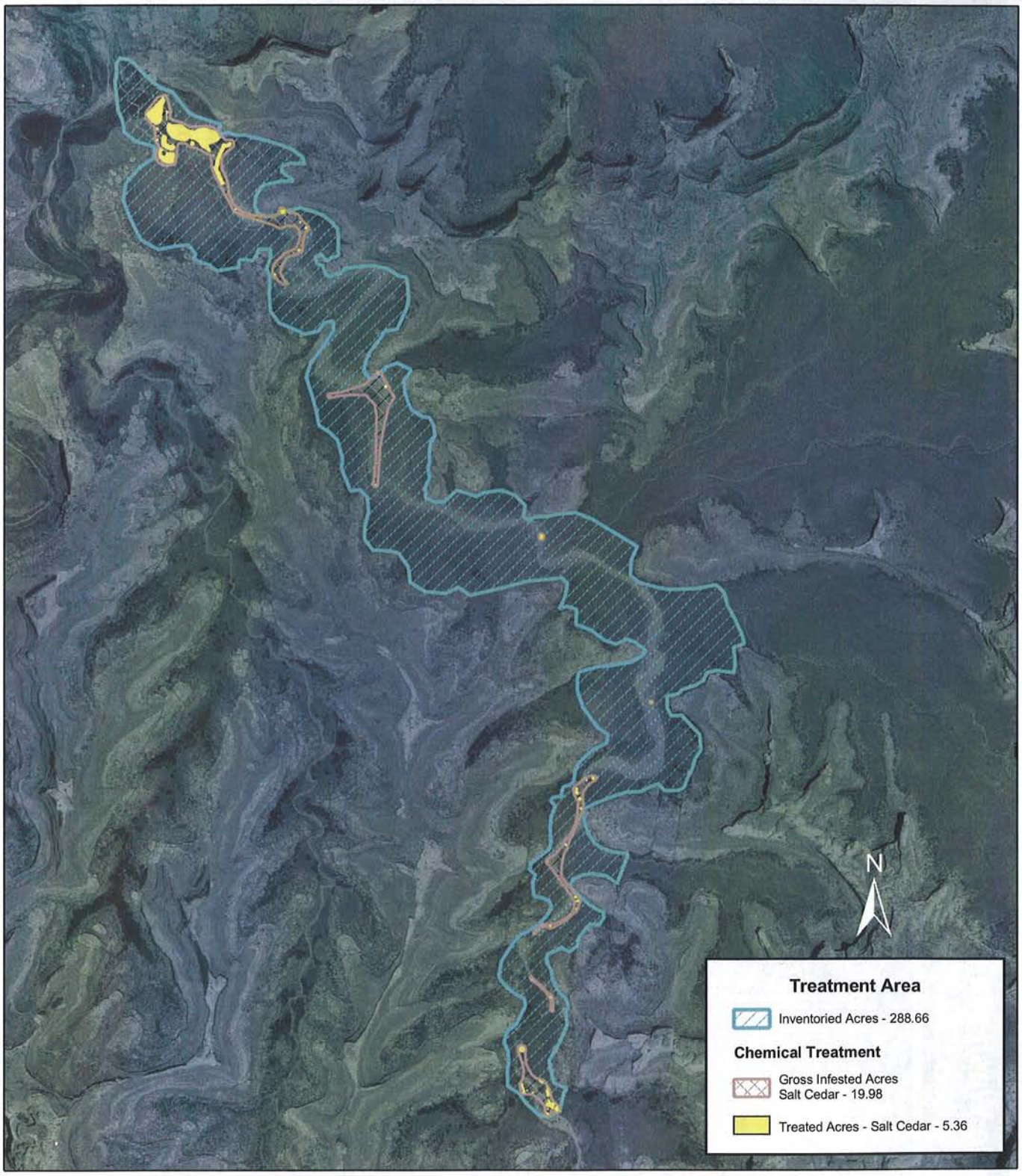
EPMT Combines Forces With Navajos

In April 2005 the Lake Mead EPMT initiated a long term tamarisk and Russian olive removal project in Chinle Wash at Canyon de Chelly National Monument. The EPMT worked side by side and helped train a 21 person Navajo crew. The trees were cut down, limbed, bucked, and stacked along the roadside for the local community to collect for firewood. The park is coordinating research to evaluate two different exotic tree removal treatments to determine the best method of restoring degraded stream channels and desirable vegetation. The park staff is working with the Navajo Nation and the Lake Mead EPMT to develop long term capacity to continue tamarisk and Russian olive removal throughout the canyons in the park and the reservation. The removal of tamarisk will help replenish the town's water supply and reduce the threat of wildfire.

EPMT trains Navajos to control tamarisk so local community can develop their own capacity to control tamarisk which threatens their water supply. The removal of tamarisk will also reduce the threat of wildfire from ravaging their community.

Horse Canyon, Canyonlands National Park
Lake Mead EPMT

National Park Service
U.S. Department of the Interior



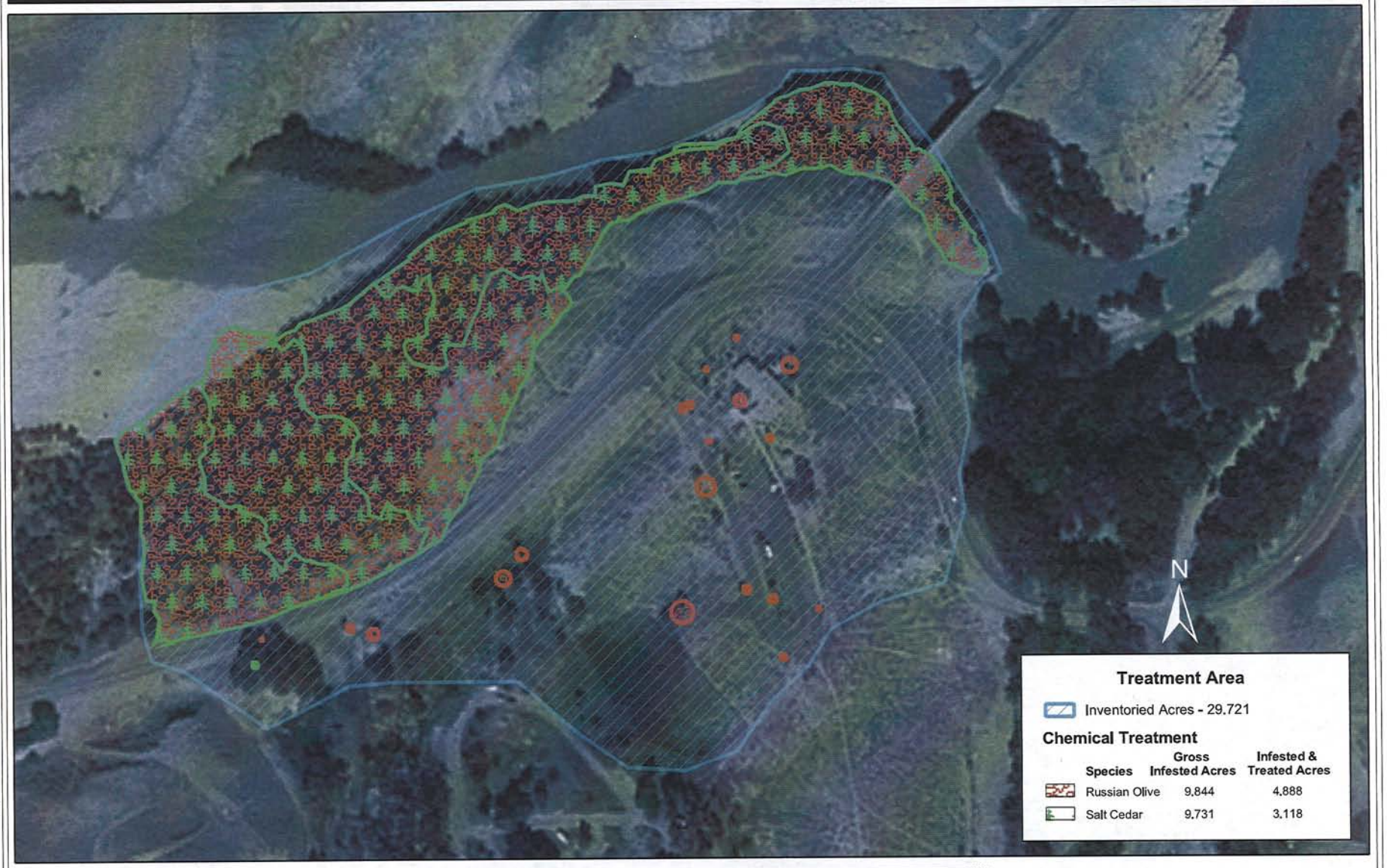
Source: USGS DOQQ South Six Shooter Peak NW,
CDSP coverages collected with Trimble GeoXM GPS Receiver
Date: 22 Sept 05

Scale - 1:18,713

Coordinate System - UTM_Zone 12N_NAD 83

Chinle Wash, Canyon de Chelly NM
Lake Mead EPMT

National Park Service
U.S. Department of the Interior



Source: USGS DOQQ Chinle SE,
NGP coverages collected with a Trimble GPS receiver
Date: 13 Oct 05

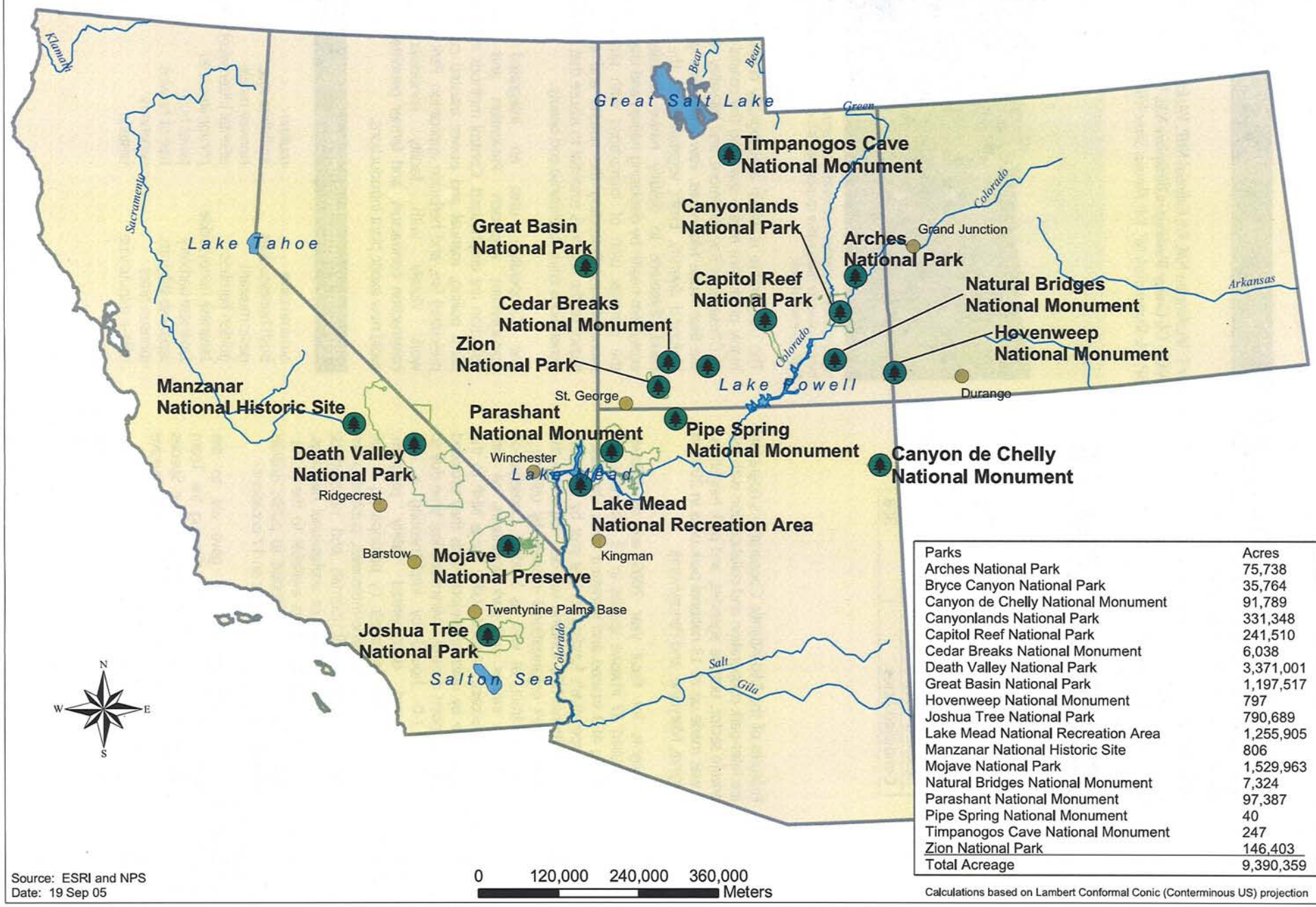
0 65 130 260 Meters

Scale - 1:3,352

Coordinate System - UTM_Zone 12N_NAD 83

Lake Mead Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Arches National Park	75,738
Bryce Canyon National Park	35,764
Canyon de Chelly National Monument	91,789
Canyonlands National Park	331,348
Capitol Reef National Park	241,510
Cedar Breaks National Monument	6,038
Death Valley National Park	3,371,001
Great Basin National Park	1,197,517
Hovenweep National Monument	797
Joshua Tree National Park	790,689
Lake Mead National Recreation Area	1,255,905
Manzanar National Historic Site	806
Mojave National Park	1,529,963
Natural Bridges National Monument	7,324
Parashant National Monument	97,387
Pipe Spring National Monument	40
Timpanogos Cave National Monument	247
Zion National Park	146,403
Total Acreage	9,390,359

Source: ESRI and NPS
Date: 19 Sep 05

0 120,000 240,000 360,000 Meters

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Mid-Atlantic

Exotic Plant Management Team

Partner Parks and states: Appomattox Court House NHP, VA; Booker T. Washington NM, VA; Colonial NHP, VA; Eisenhower NHS, PA; Fredericksburg and Spotsylvania County Battlefields Memorial NMP, VA; George Washington Birthplace NM, VA; Gettysburg NM Park, PA; Hampton NHS, MD; Petersburg NB, VA; Richmond NBP, VA; Shenandoah NP, VA; Thomas Stone NHS, MD; and Valley Forge NHP, PA.

Accomplishments

Inventoried Acres	9,061
Gross Infested Acres	7,537
Infested Acres	652
Treated Acres	387
Monitored Acres	822
Retreated Acres	61
Restored Acres	0
Controlled Acres	398

Highly invasive Phragmites reed invades wetlands and degrades wildlife habitat values for many native species. Here it is controlled at Colonial NHP. (Åkerson photo)

Features of the Mid-Atlantic Cooperative's operation are inter-park cooperation and collaboration with the private sector, outside agencies, and park neighbors. It was made up of 13 national park units in 2005 in Virginia, Maryland, and Pennsylvania.

Highlights for fiscal year 2005 are as follows. Controlled 37 invasive species in 13 national parks totaling 469 treated and retreated acres. Increased the Cooperative's funding for the year by accessing two additional NPS funding sources. Expanded the Cooperative's organizational capacity by utilizing a private contract, as well as Student Conservation Association interns and park volunteers, all with excellent success. Added Valley Forge NHP to the cooperative by utilizing project funds they provided for exotic plant control. Minimized lost time due to accidents (-0- hours) by implementing a well practiced and documented safety program. Increased public awareness by participating in five newspaper and magazine interviews, publishing five articles in professional journals and newsletters, speaking at seven public or professional meetings, and creating eleven reports available to the public. Additionally, the team responded to public queries for information and school talks on 17 occasions.

The Mid-Atlantic Cooperative gave aid to the Commonwealth of Virginia by allowing the Team Liaison to participate on the state's Invasive Species Advisory Committee to devise a state-wide invasive species strategic management plan.

The Cooperative is within a biologically diverse and highly productive region spanning the coastal plains of Chesapeake Bay, Piedmont, and hill-valley zone of the Blue Ridge Mountains. Few areas have greater biological diversity. Exotic vegetation, on the other hand, threatens to destroy native diversity and ecosystem health by displacing natives and changing the complex web of interactions with simplified monocultures. Protecting the natural and cultural legacy of the region is essential to assure that future generations enjoy its expanse and beauty.

The Cooperative uses an integrated pest management approach. Prevention and early detection are emphasized. Control methods include hand pulling, manual and power assisted cutting, prescribed fire, and herbicide application. Park staffs work closely with facility concessionaires, construction contractors, and farmer permittees to avoid new exotic plant introductions.

Special Emphasis Species

autumn olive
bush honeysuckles
garlic mustard
golden bamboo
Japanese honeysuckle
Japanese barberry
Japanese stiltgrass
johnson grass
mile-a-minute vine
mullein
multiflora rose
Norway maple
oriental bittersweet vine
phragmites reed
privet bush
tree of heaven
wineberry
wisteria

Mid-Atlantic & Northeast

Exotic Plant Management Teams

Convergence at Valley Forge

The Mid-Atlantic Exotic Plant Management Team (EPMT) and the Northeast EPMT, gathered at Valley Forge National Historical Park to work cooperatively at a site south of the Schuylkill River. The purpose of the two-day gathering in September 2005 was to compare notes and procedures while controlling invasives together. Topics of discussion included safety procedures and documentation; species control methodologies, treatment priority setting, GPS and inventory procedures, and public outreach. Park employees were involved with control activity and project documentation.

The gathering resulted in the inventory and treatment of 21.8 acres including tree of heaven, Oriental bittersweet, Japanese barberry, privet, Japanese honeysuckle, and multiflora rose. The teams benefited from improved understanding of each other's program, each one gaining from the other's good ideas.

Caption: The combined work team included staffs from Valley Forge (VF), Mid-Atlantic EPMT (MA), and Northeast EPMT (NE). From left-to-right are (kneeling) Matthew Overstreet (MA); (second row) Briana Potts (SCA-NE), Betsy Lyman (NE), Dale Meyerhoeffer (MA), and Meghan Carfioli (VF); and (back row) Kelly Garrison (NE), Brian McDonnell (NE), James Åkerson (MA), Norman Forder (MA), and Lloyd Lisk (SCA-NE). Not pictured is Ernestine White (VF).

Pitzer Woodlot at Gettysburg National Military Park
Mid-Atlantic EPMT

National Park Service\US. Dep

Meters 0 87.5 175 350

N

1:6,700

2004 Activity

- Boundary of Gettysburg National Military Park
- Area Inventoried: 43.25 Acres
- Gross Infested & Treatment Coverage: 38.5 Acres

2005 Activity

- Area Inventoried 2004 43.25 Acres
- Area Monitored, Controlled Acres: 19.07 Acres
- New Inventory & Gross Infested: 2.43 Acres
- Area Monitored and Retreated: 2.95 Acres
- Vinca minor Inventory: 1.65 Acres
- Vinca minor Gross Infested: 0.98 Acres

False-color infrared aerial photo mosaic courtesy of National Park Service, US Department of the Interior, April 2003
Park Boundary courtesy of National Park Service, Water Resources Division, April 1999
Coverages collected with Trimble GPS Receiver, 03 Mar 2004 through 12 April 2005
Created 10/17/2005 by Kate Jensen

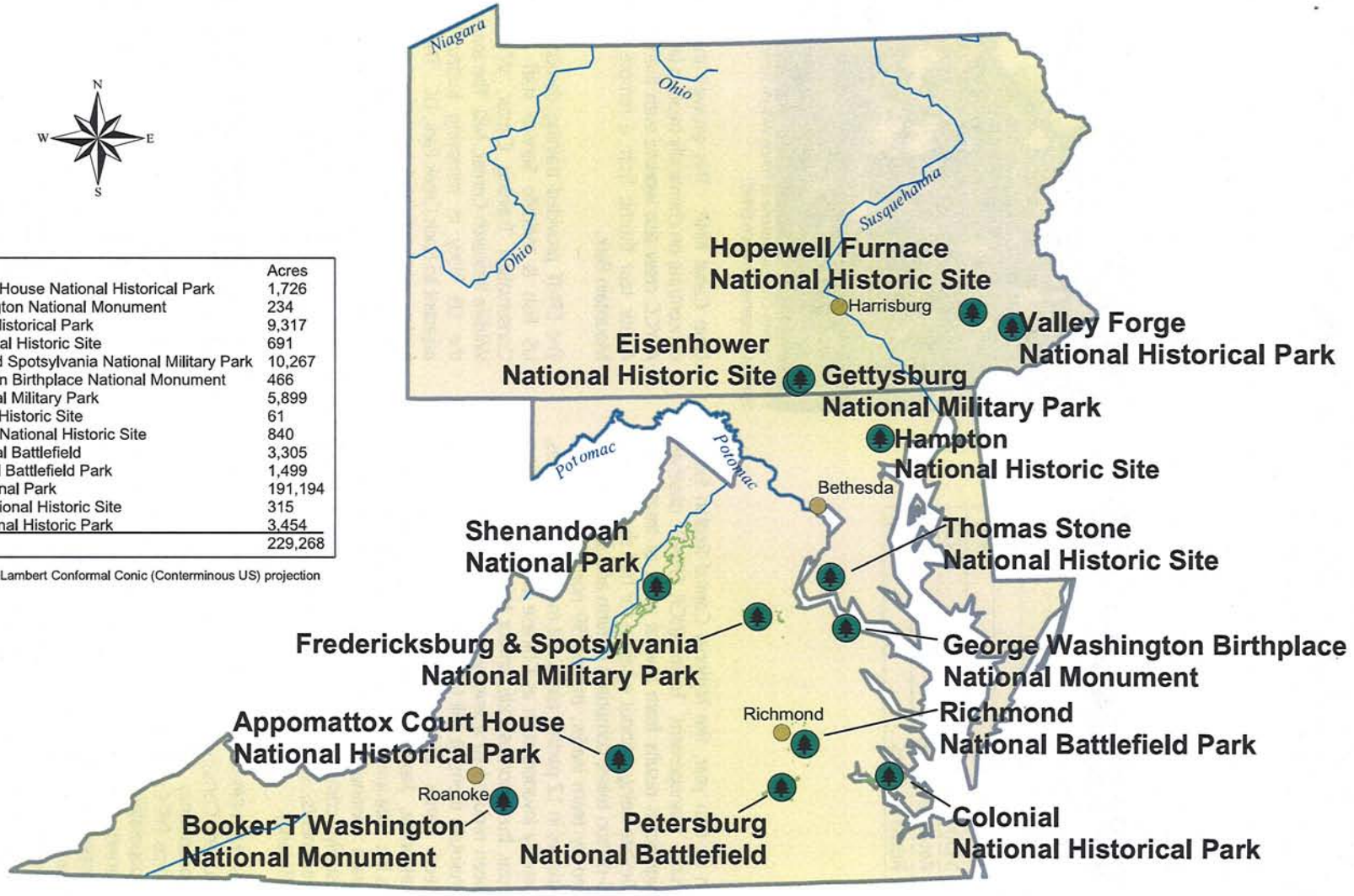
UTM_Zone 18N_NAD 83

Mid-Atlantic Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Appomattox Court House National Historical Park	1,726
Booker T. Washington National Monument	234
Colonial National Historical Park	9,317
Eisenhower National Historic Site	691
Fredericksburg and Spotsylvania National Military Park	10,267
George Washington Birthplace National Monument	466
Gettysburg National Military Park	5,899
Hampton National Historic Site	61
Hopewell Furnace National Historic Site	840
Petersburg National Battlefield	3,305
Richmond National Battlefield Park	1,499
Shenandoah National Park	191,194
Thomas Stone National Historic Site	315
Valley Forge National Historic Park	3,454
Total Acreage	229,268

Calculations based on Lambert Conformal Conic (Conterminous US) projection



Source: ESRI and NPS
Date: 19 Sep 05

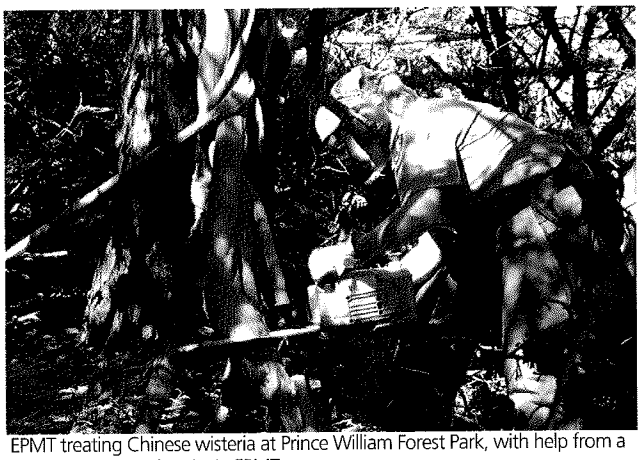
National Capital Region

Exotic Plant Management Team

Partner parks and states: Antietam NB, MD; Appalachian NST, VA, WV, PA; Catoctin Mountain Park, MD; Chesapeake & Ohio Canal NHP, MD, WV, DC; George Washington Memorial Parkway, VA; Harpers Ferry NHP, MD, VA, WV; Manassas NB, VA; Monocacy NB, MD; National Mall & Memorial Parks, DC; National Capital Parks- East, DC, MD; Prince William Forest Park, VA; Rock Creek Park, DC; Wolf Trap Farm Park for the Performing Arts, VA

Accomplishments

Inventoried Acres	3,479
Gross Infested Acres	2,791
Infested Acres	137
Treated Acres	177
Monitored Acres	1,733
Retreated Acres	142
Restored Acres	0



EPMT treating Chinese wisteria at Prince William Forest Park, with help from a Student Conservation Ass'n EPMT.

In its fifth year, the National Capital Region Exotic Plant Management Team (NCR_EPMT) observed significant results from several years of treatments. Despite being without a liaison for half the year, the 5-person team, comprised of term and seasonal staff led by team leader, treated 59 non-native invasive species in 12 partner parks. At many treatment sites, woody invaders such as Chinese wisteria, multiflora rose, bush honeysuckle, and/or tree-of-heaven have been reduced to a level where park staff can now maintain them. It will take more time to deplete the seed banks of herbaceous species like lesser celandine, Japanese stiltgrass, Asiatic tear thumb (a.k.a. mile-a-minute weed) and Canada thistle. The team continues to seek new treatment methods, usually combinations of manual and chemical treatments, which will safely optimize results and efficiency.

The NCR-EPMT continued its partnerships with the Student Conservation Association (SCA), the Nature Conservancy (TNC), and the Youth Conservation Corps (YCC). One SCA crew, funded through the Cooperative Conservation Initiative, mapped and started treating 102 acres of tree-of-heaven in Harper's Ferry NHP. A SCA EPMT crew, which NCR shared with the Mid-Atlantic EPMT, treated thistle and other field herbs at a grassland restoration site in Manassas NB, as well as wisteria and Japanese knotweed at Prince William Forest Park. In the Potomac Gorge, TNC volunteers manually pulled exotic plants, especially around rare plants in George Washington Memorial Parkway and Chesapeake & Ohio Canal NHP. This allowed the NCR-EPMT to concentrate on chemically treating larger infestations. A YCC crew also worked with the EPMT to remove Asiatic tear thumb from a remote site in Catoctin Mountain Park.

The EPMT provided training demonstrations to the US Fish & Wildlife Service staff at the National Conservation Training Center, WV and Patuxent Wildlife Research Center, MD. The team also assisted the US Navy in removing kudzu from a slope adjacent to Rock Creek Park, DC. The team provided further outreach and education to policy makers, private, local, state and federal land managers through a booth at National Invasive Weed Awareness Week, two garden club talks, two talks at professional seminars, and more than 100 phone calls, e-mails and site visits.

Special Emphasis Species

asiatic tear thumb
Canada thistle
Chinese wisteria
English ivy
Japanese barberry
Japanese honeysuckle
Japanese knotweed
Japanese stilt-grass
kudzu
lesser celandine
multiflora rose
tree-of-heaven

National Capital Region

Exotic Plant Management Team

Recovery of Hurricane Blow-downs

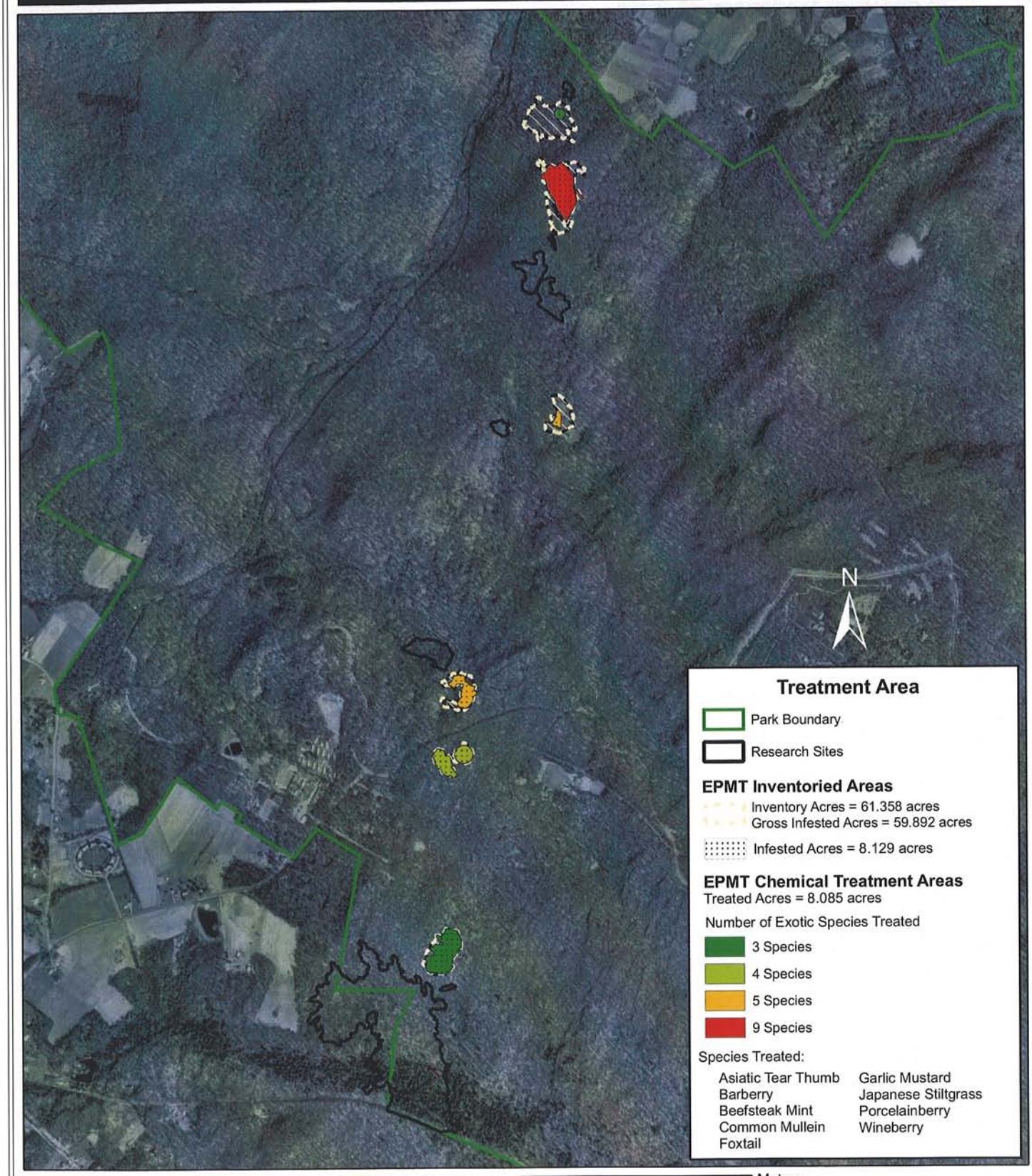
When Hurricane Isabel blew through the mid-Atlantic States in September, 2003, it uprooted hundreds of trees. The canopy openings (blow-downs) created by this disturbance have provided opportunities for non-native invasive plants (exotics) to become established in new areas. At least fifteen such blow-downs were created in Catoctin Mountain Park (CATO) in northern Maryland, ranging in size from 0.15 acres to 36 acres, affecting more than 67 acres total.

Under Principal Investigator Dr. Doug Boucher from Hood College, the Maryland Department of Natural Resources, U. S. Forest Service Northeastern Research Station, CATO staff, and the NCR-EPMT are jointly researching the recovery of these blow-downs. In particular, "Team Isabel" wants to document the effects of exotics on the recovery of native systems. After initial censuses of all native and non-native plants in 14 blow-downs, the EPMT treated all exotics in seven of the sites; the other sites were left untreated as control plots. Censuses and treatments will continue for at least two more years to determine native tree regeneration and to prevent the exotics from becoming established. For the NCR-EPMT, this project allows rapid response to new invasions, as well as a chance to participate in important research.

Japanese stiltgrass and other non-native plants invade canopy openings in Eastern Deciduous Forests in Catoctin Mountain Park.

Hurricane Blow-downs, Catoctin Mountain Park
National Capital Region EPMT

National Park Service
U.S. Department of the Interior



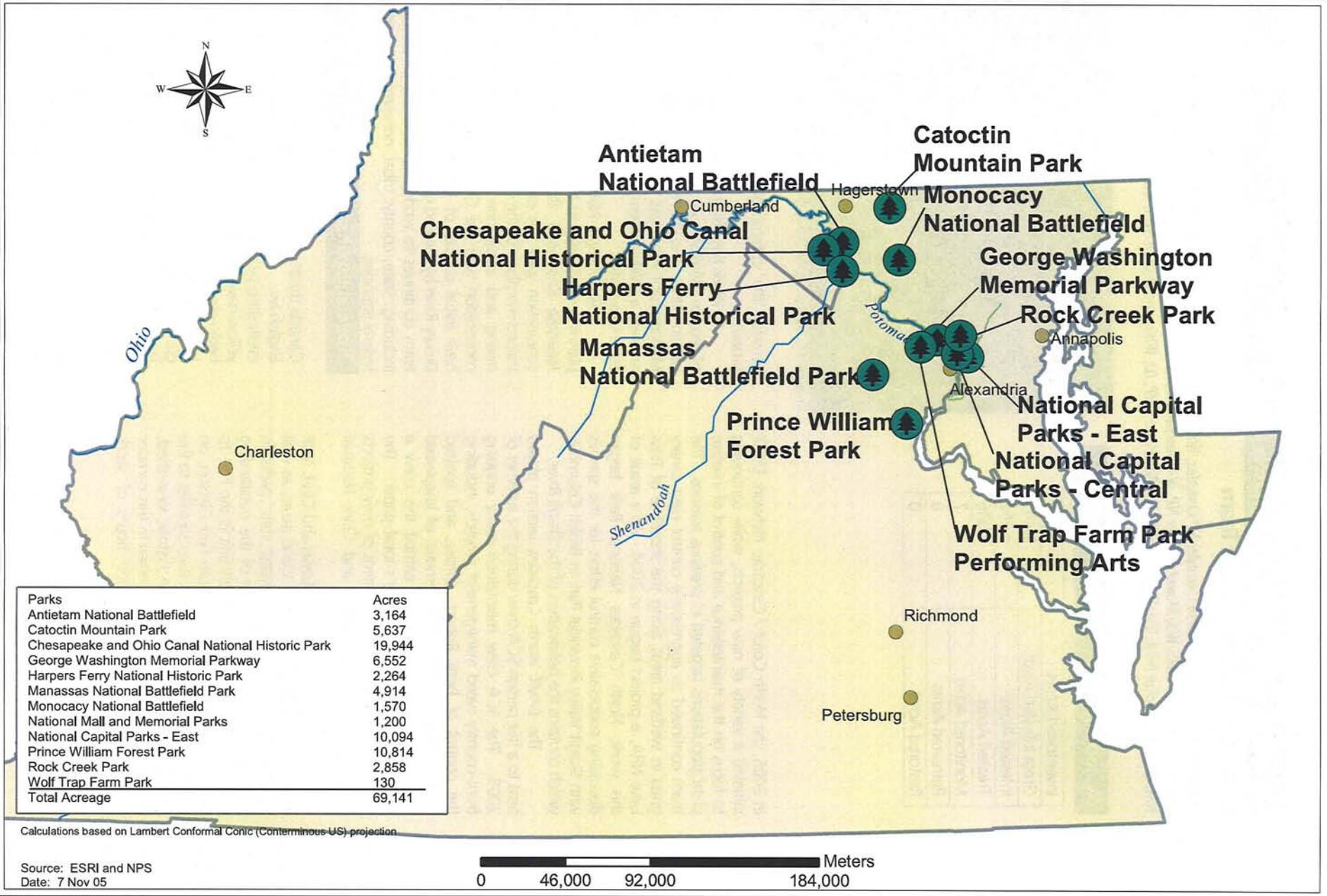
Source: USGS DOQQ Blue Ridge Summit & Smithsburg, Catoctin Mountain Park Boundary, EPMT & National Capital Region coverages collected with Trimble GPS Receiver
Date: 13 Oct 05

Scale - 1:17,000

Coordinate System - UTM_Zone 18N_NAD 27

National Capital Region Exotic Plant Management Team
Host and Partner Parks

National Park Service\US. Depa



Parks	Acres
Antietam National Battlefield	3,164
Catoctin Mountain Park	5,637
Chesapeake and Ohio Canal National Historic Park	19,944
George Washington Memorial Parkway	6,552
Harpers Ferry National Historic Park	2,264
Manassas National Battlefield Park	4,914
Monocacy National Battlefield	1,570
National Mall and Memorial Parks	1,200
National Capital Parks - East	10,094
Prince William Forest Park	10,814
Rock Creek Park	2,858
Wolf Trap Farm Park	130
Total Acreage	69,141

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NPS
Date: 7 Nov 05

0 46,000 92,000 184,000 Meters

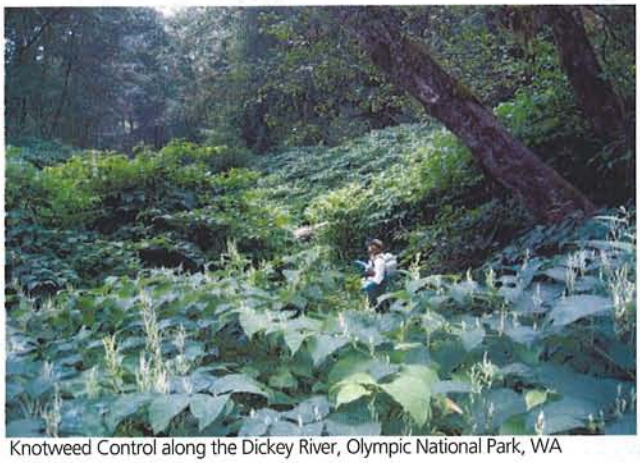
North Coast / Cascades Network

Exotic Plant Management Team

Partner Parks and states: North Cascades NP Complex, WA; Olympic NP, WA; Ebey's Landing NHR, WA; Lewis and Clark NHP, OR; Fort Vancouver NHS, WA; Mount Rainier NP, WA; San Juan Island NHP, WA; Lake Roosevelt NRA, WA, John Day Fossil Beds NM, OR; Lake Chelan NRA, WA; Ross Lake NP, WA; Nez Perce NHP, ID; Whitman Mission NHS, WA

Accomplishments

Inventoried Acres	3,060
Gross Infested Acres	2,451
Infested Acres	1,982
Treated Acres	1,955
Monitored Acres	7
Retreated Acres	0
Restored Acres	0



Knotweed Control along the Dickey River, Olympic National Park, WA

In 2005, the North Coast / Cascades Network EPMT initiated a variety of new projects, while continuing to focus on the maintenance and control of invasive plant populations targeted in previous seasons. The team continued to aggressively control reed canary grass in wetland areas along the shoreline of Ross Lake NRA, a project begun in 2004. As a result of this work, North Cascades National Park began discussing cooperative control effort for this species with Skagit Valley Provincial Park in British Columbia, which contains the headwaters of the Skagit River.

The EPMT North Cascades section played host to a five person SCA crew during the summer of 2005. The SCA crew maintained many ongoing front-country weed management projects, including the control of herb Robert, diffuse, and spotted knapweed populations. The removal of knapweed from cliffs along Diablo Lake earned this crew a feature article in Skagit County's local paper. The crew assisted with the development of new projects at the recently created Lewis and Clark National Historical Park.

Part of the creation of Lewis and Clark NHP involved the acquisition of over 1,000 acres, as well as, the co-management of several state parks in Oregon and Washington. One of the outstanding features of this new co-managed unit is the Fort to Sea trail, which takes visitors from Fort Clatsop, on the banks of the Lewis and Clark River six miles to the Pacific Ocean. To enhance the historic view-shed, and protect native plant communities in this corridor the EPMT contributed over 500 hours of work towards the control of English holly and Scot's broom.

Work has also continued toward the control of poison hemlock in visitor use areas at Ebey's Landing NHR. The Ebey's Landing Cooperative Weed Management Area was finalized and the EPMT also received a CWMA seed money grant from Montana State University.

At Olympic National Park, several years of planning culminated in the treatment of 25 acres of Japanese Knotweed along the Dickey River. In conjunction with this project, EPMT crew-members trained members of the Quileute Indian Nation in the mixing and application of aquatic herbicides. In cooperation with the Quileute, the team hopes to have initial control of knotweed along the entire Dickey River by the end of the 2005 field season. The team continues to work with a variety of partners, including: state, county, tribal, non-profit, and other federal agencies.

Special Emphasis Species

Canada thistle
English Ivy
everlasting peavine
yellow hawkweed
herb robert
Japanese knotweed
giant Knotweed
Himalayan knotweed
poison hemlock
Himalayan blackberry
scot's broom
reed canary grass
common tansy
tansy ragwort
English holly
spotted knapweed
diffuse knapweed
St. Johnswort
foxglove
ox-eye daisy

North Coast / Cascades Network

Exotic Plant Management Team

Dickey River Knotweed Control

Management and control of knotweed populations along the Dickey River have been a priority for this EPMT since it's inception in 2002. Due to concerns over the potential impact of herbicide applications on threatened salmon runs, compliance for this project was not completed until the 2005 field season. This season, with the agreement of The U.S. Fish and Wildlife Service, and NOAA fisheries, the EPMT was able to complete the treatment of approximately 25 acres of mixed Japanese, Giant, and Bohemian knotweed along the main stem and spawning channels of the Dickey River.

Japanese knotweed is a rhizomatous, creeping perennial, which is spread by shoot and rhizome fragments during annual flood events. Along coastal rivers in the Pacific Northwest, knotweed monocultures prevent the normal recruitment of native shrubs and trees near the edges of streams, destroying native riparian communities, and potentially affecting the spawning habitat of anadramous fish species.

In a joint effort with Clallum County, the Quileute Indian Nation, and the Merrill and Ring Timber Company the National Park Service is attempting to restore the natural state of the Dickey River and protect anadramous fish by controlling knotweed populations along the Dickey River. During the 2005 field season the EPMT spent 195 person hours on NPS lands from the Pacific Ocean to the Park Boundary (approximately six river miles) in support of this effort.

Yellowing leaves mark treated knotweed populations, Dickey River, Olympic N.P.

Fort to Sea Trail

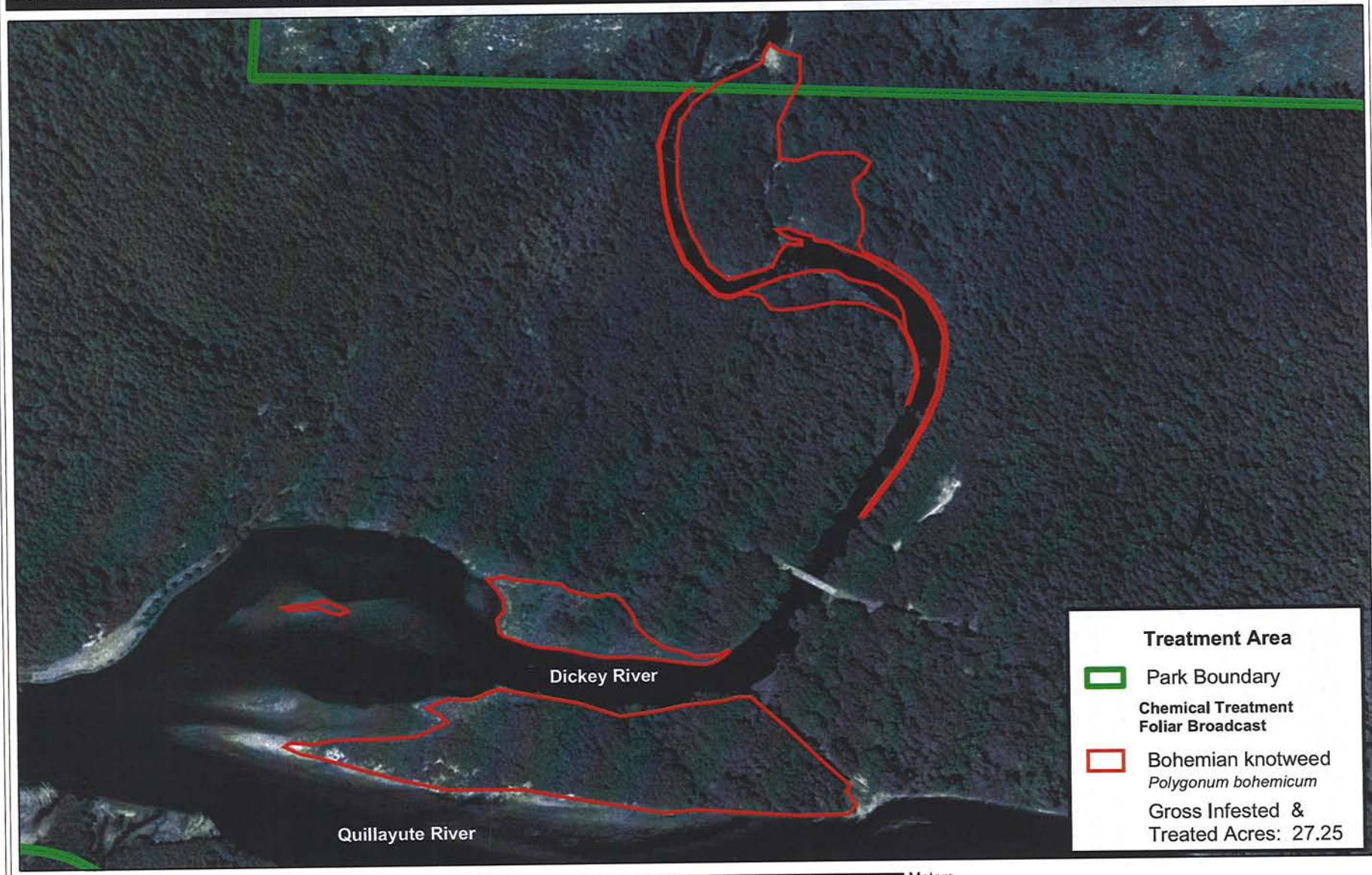
The Fort to Sea Trail is a keystone of the newly created Lewis and Clark National and State Historic Park. This trail recreates the route potentially traveled by members of Lewis and Clark's Corp of Discovery from Fort Clatsop to the Pacific Ocean. In partnership with Oregon State Parks, LEWI has recently taken over co-management of approximately 140 acres that represent the terminus of the trail at Sunset Beach. This part of the trail traverses a shore-pine woodland and grassy back dune area on its way to the Pacific.

In an effort to improve the view shed, and help restore the historic scene, the EPMT and SCA crew spent close to 550 person-hours both mechanically and chemically removing Scot's broom and English holly. The crew treated close to 50 acres of dense Scot's broom and 34 acres of English holly. This initial control should bring these populations down to levels that can be managed on a yearly basis by local National and State park personnel, and drastically improve the visitor experience on the trail.

Cut-stump control of Scot's broom along the Fort to Sea Trail.

Dickey River, Olympic National Park
North Coast - Cascades Network EPMT

National Park Service
U.S. Department of the Interior



Source: USGS DOQQ Quillayute Praire SW,
NCCN coverages collected with a Trimble GPS receiver
Date: 05 Oct 05

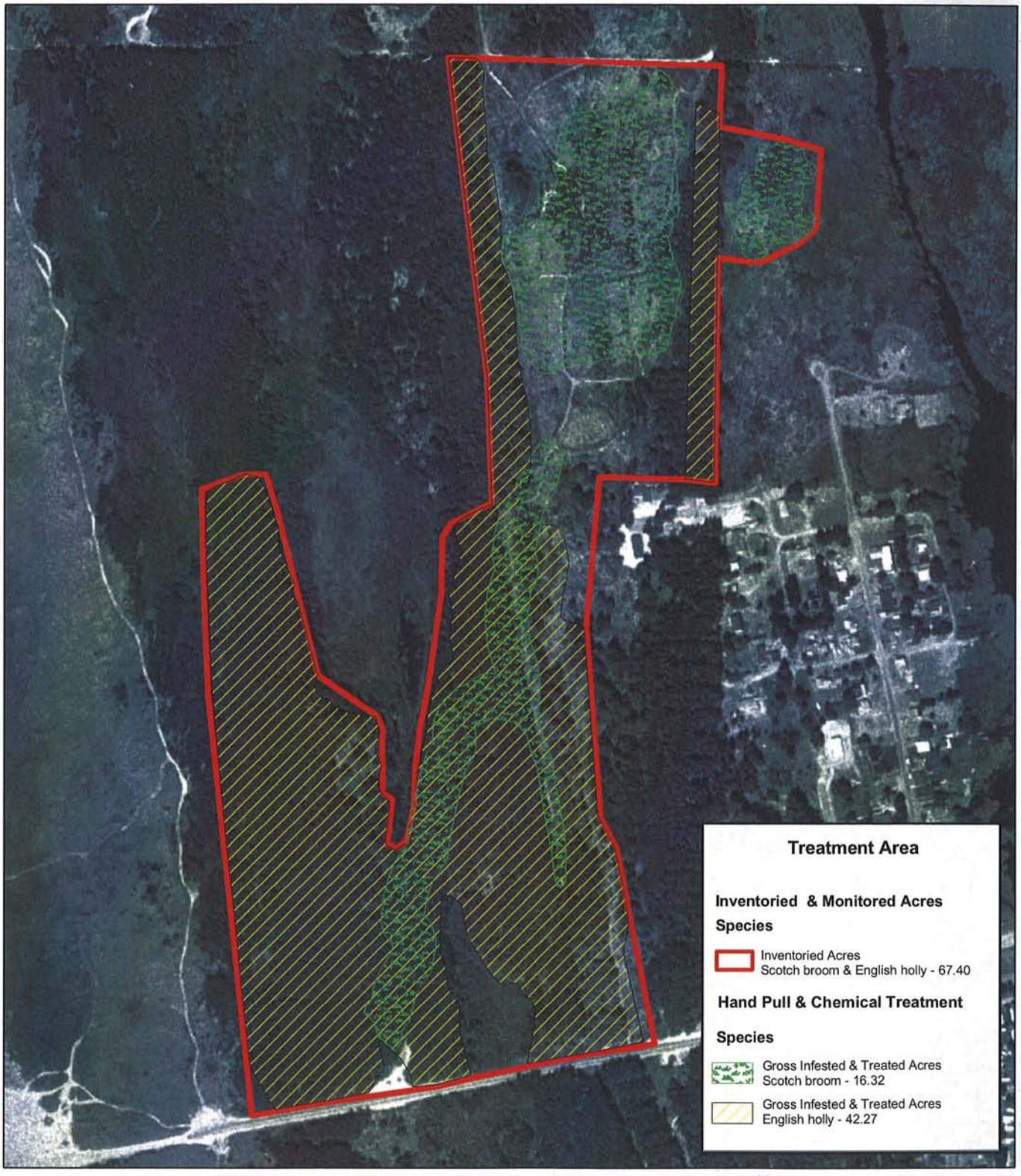
0 120 240 480 Meters

Scale - 1:12,500

Coordinate System - UTM_Zone 10N_NAD 83

Seaside, Lewis & Clark National Historic Park
North Coast-Cascades Network EPMT

National Park Service
U.S. Department of the Interior



0 125 250 500 Meters

N

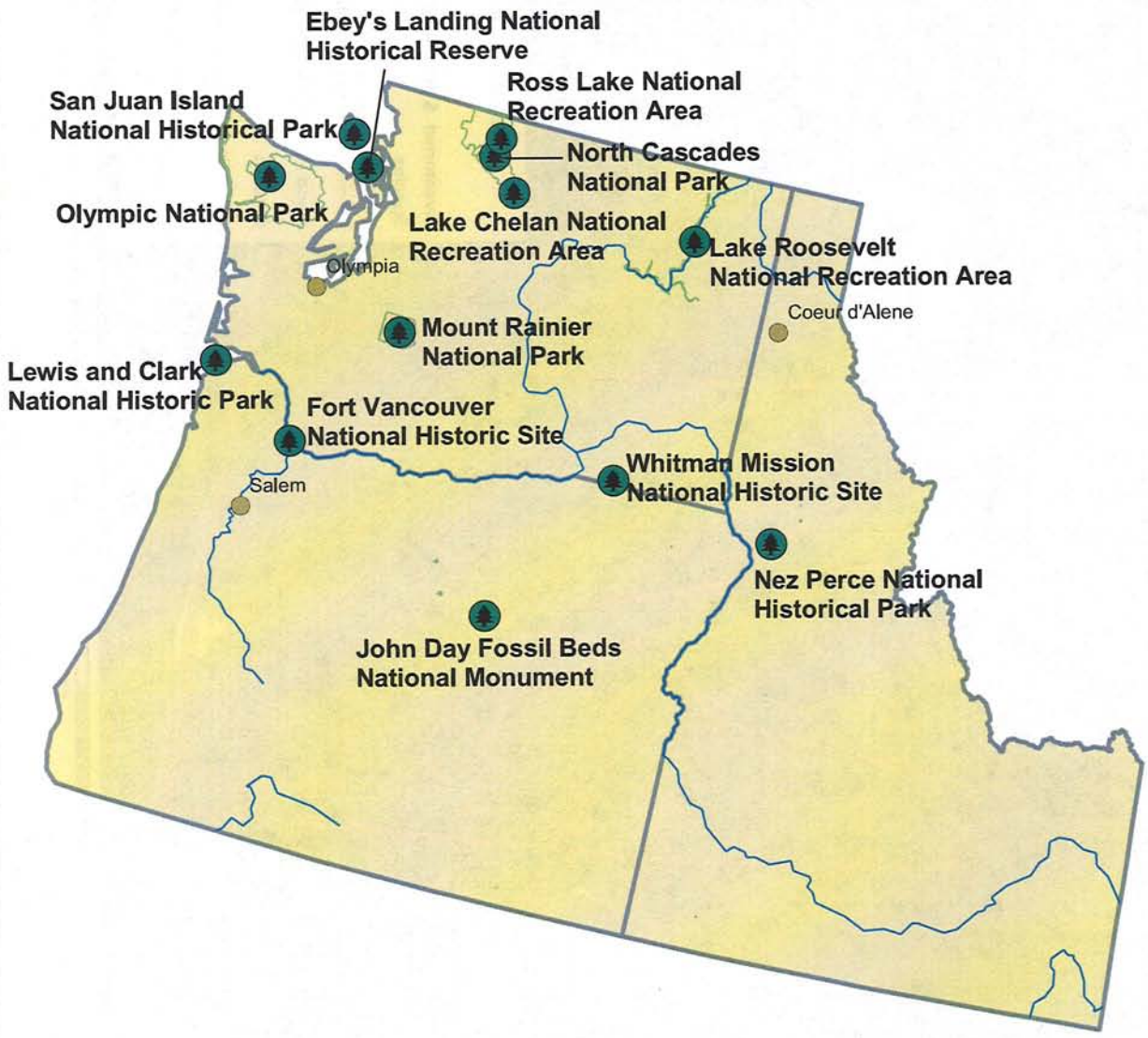
Source: USGS DOQQ Gearhart_NE
NCCN coverages collected with a Trimble GPS receiver
Date: 12 Oct 05

Scale - 1:5,272

Coordinate System - "UTM_Zone 10N_NAD 83"

North Coast / Cascade Network Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Ebey's Landing National Historical Reserve	18,140
Fort Vancouver National Historic Site	220
John Day Fossil Beds National Monument	13,950
Lake Roosevelt National Recreational Area	106,343
Lewis and Clark National Historic Park	133
Mount Rainier National Park	237,166
North Cascades National Park Complex	0
Lake Chelan National Recreation Area	64,153
North Cascades National Park	510,539
Ross Lake National Park	119,175
Nez Perce National Historic Park	3,268
Olympic National Park	926,353
San Juan Island National Historic Park	1,754
Whitman Mission National Historic Site	97
Total Acreage	2,001,291

Source: ESRI and NPS
Date: 20 Sep 05

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Northeast

Exotic Plant Management Team

Partner parks and states: Acadia National Park, ME; Allegheny Portage Railroad National Historic Site (NHS), PA; Appalachian National Scenic Trail, CT, MA, ME, NH, NJ, NY, PA & VT; Boston Harbor Islands National Recreation Area (NRA), MA; Cape Cod National Seashore, MA; Delaware Water Gap NRA, PA & NJ; Fire Island National Seashore, NY; Fort Necessity National Battlefield, PA; Friendship Hill NHS, PA; Gateway NRA, NY & NJ; Marsh- Billings- Rockefeller National Historical Park (NHP), VT; Marin Van Buren NHS, NY; Minute Man NHP, MA; Johnstown Flood National Memorial, PA; Morristown NHP, NJ; Roosevelt- Vanderbilt National Historic Sites, NY; Sagamore Hill NHS, NY; Saint- Gaudens NHS, NH; Saratoga NHP, NY; Saugus Iron Works NHS, MA; Steamtown NHS, PA; Upper Delaware Scenic & Recreational River, PA & NY; Weir Farm NHS. CT

Accomplishments

Inventoried Acres	7,321
Gross Infested Acres	5,248
Infested Acres	134
Treated Acres	112
Monitored Acres	10
Retreated Acres	1
Restored Acres	0

One for all & all for one! NE EPMT crew cross wands after spraying invasive plants at Weir Farm. Much of the park has now been treated at least once

The Northeast Exotic Plant Management Team (NE EPMT) was created in 2003 to assists parks in the northern portion of the Northeast Region, from Pennsylvania & New Jersey to Maine, in identifying & controlling invasive exotic plants threatening native ecosystem s. 2005 is the Team's second field season.

This year, the Team worked at 12 partner parks: Acadia, Appalachian Trail, Cape Cod, Delaware Water Gap, Gateway, Minute Man, Morristown, Roosevelt-Vanderbilt, Saratoga, Saugus Iron Works, Upper Delaware, & Weir Farm. Technical assistance was given to the other member parks. The Team also worked at Assateague Island, which will be served by the National Capital Region EPMT (NCR EPMT) hereafter. All parks participating parks contributed to the team's efforts with staff time, materials and equipment.

Contracts were used to facilitate coverage of partner parks. A contractor was hired to clear autumn olive at Delaware Water Gap and maintain important bird habitat. The Delaware Water Gap fields will serve as a demonstration site, showcasing work that the park, in partnership with the Team, is doing to combat invasive plants and enhance wildlife habitat. A second contract was used to work at the four western Pennsylvania parks.

The Mid-Atlantic EPMT (MA EPMT) and NE EPMT joined forces at Valley Forge, a MA EPMT partner park. Both EPMTs and parks profited from the experience & hope to collaborate again next year.

Outreach activities included a presentation on the Team's work at the George Wright Society Conference; sponsorship & poster display at the Mid-Atlantic Exotic Pest Plant Council's Invasive Plants Conference in PA; poster display at the New England Invasive Plant Summit in MA; and a presentation for Pike County (PA) Master Gardeners, who are now including invasive plants in their training program.

This second season showed increased efficiencies and productivity in the team. Outreach activities increased, inventorying methods and control efforts improved. Most of the sites treated last year showed 90%+ decrease in the exotic plant cover.

Special Emphasis Species

Asian sand sedge
black locust
bush honeysuckles
common reed
Japanese barberry
Japanese knotweed
Norway maple
mile-a-minute weed
purple loosestrife
autumn & Russian olive
black swallow-wort
common & glossy buckthorn
garlic mustard
Japanese hops
Japanese stiltgrass
oriental bittersweet
multiflora rose
Siebold's viburnum

Northeast

Exotic Plant Management Team

Great Meadow, Acadia NP

Great Meadow is a 20-acre low-lying area found within the Sieur de Monts area of Mt. Desert Island. It is amalgam of old fields, mixed forest, and wetland.

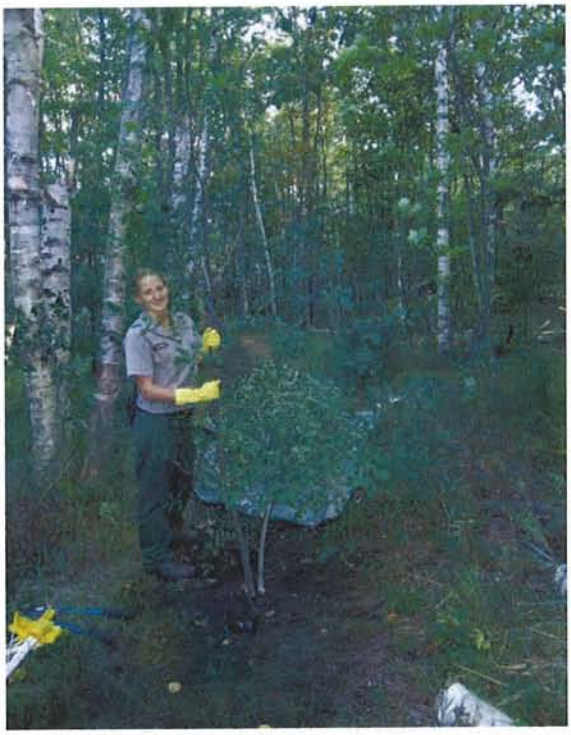
In the past, this area had been ditched, drained and farmed. In the early 1900's, two trails were put through it. It was also the site of an air strip and bottle factory. In 1947 an extensive area of eastern Mt. Desert Island that burned during a wildfire. All these disturbances, which are commonly seen on "natural lands" in the Northeast, have shaped native plant communities and helped invasive exotic plants gain a toehold. The Park feels the fire especially served as a catalyst for invasion. Currently, the area is used for hiking and is maintained as a "natural area."

Great Meadow has the largest infestation of high priority invasive plants in the park. The park has identified the following goals for the area: 1) reduce cover of Japanese barberry; 2) reduce abundance and prevent further spread of glossy buckthorn, and; 3) test efficacy of treatment methods for all targeted plants, particularly glossy buckthorn and Japanese barberry, the two top invaders of Great Meadow. This is the first major eradication project for these species in Acadia NP.

As the accompanying map illustrates, the Great Meadow has a wetland at its center. The Amur maple infestation was centered in one area near the road. Glossy buckthorn is found throughout the site, forming a ring around the wetland core.

The strategy for buckhorn is to contain the population, blocking its spread to other parts of the park. Two types of herbicide treatments were used in 2005, cut and paint stump and foliar spray.

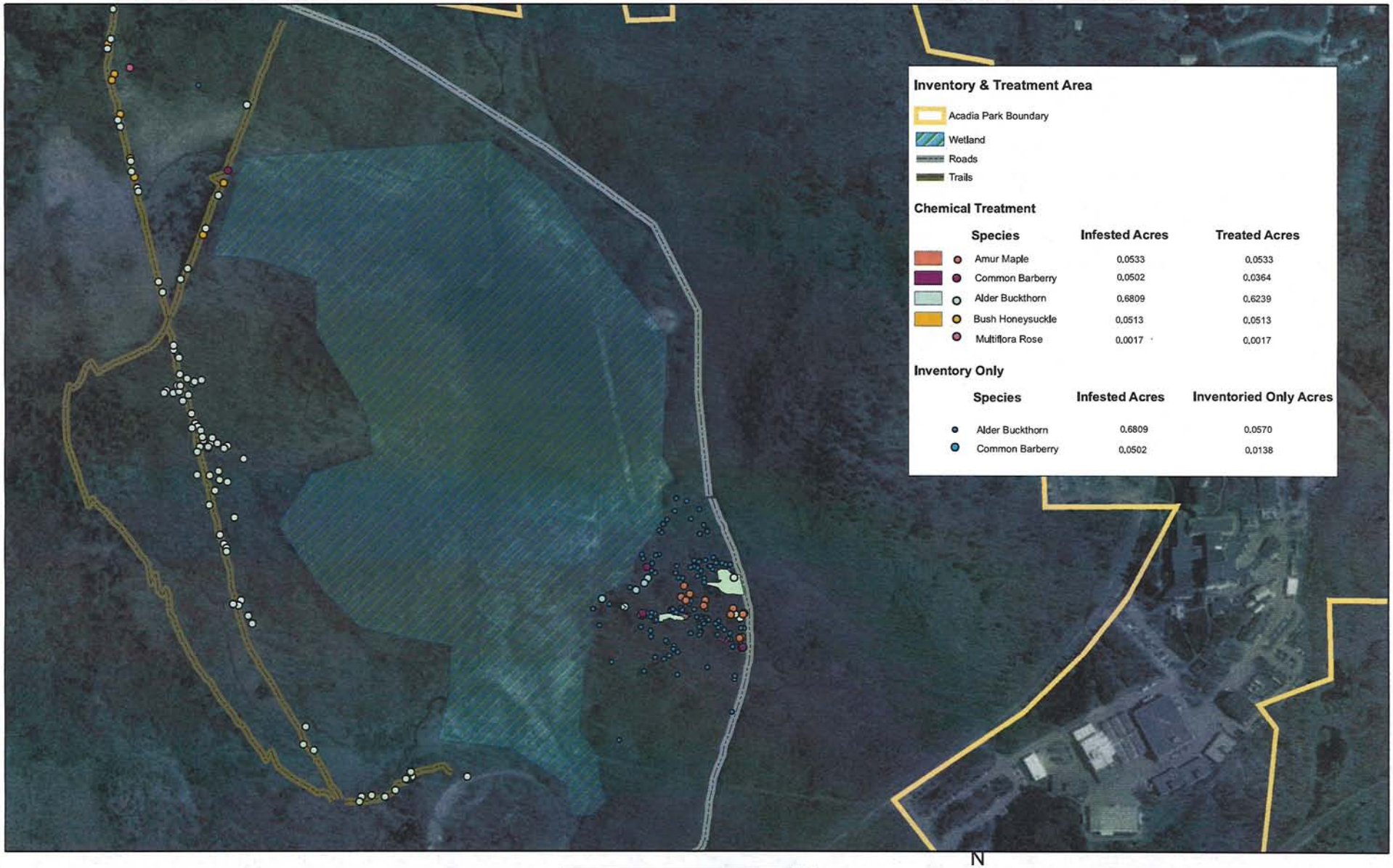
To insure that the control efforts are working, the park has established a quantitative monitoring plan to gauge success over the next few years.



Acadia National Park staff member hauling away cut glossy buckthorn along one of the trails in the Great Meadow area.

Acadia National Park
Park Loop Road, Sieur de Monts
Northeast EPMT

National Park Service
U.S. Department of the Interior



Source: USGS DOQQ Seal Harbor, NPS Park Boundary,
NE coverages collected with a Trimble GPS receiver
Date: 2 Nov 05

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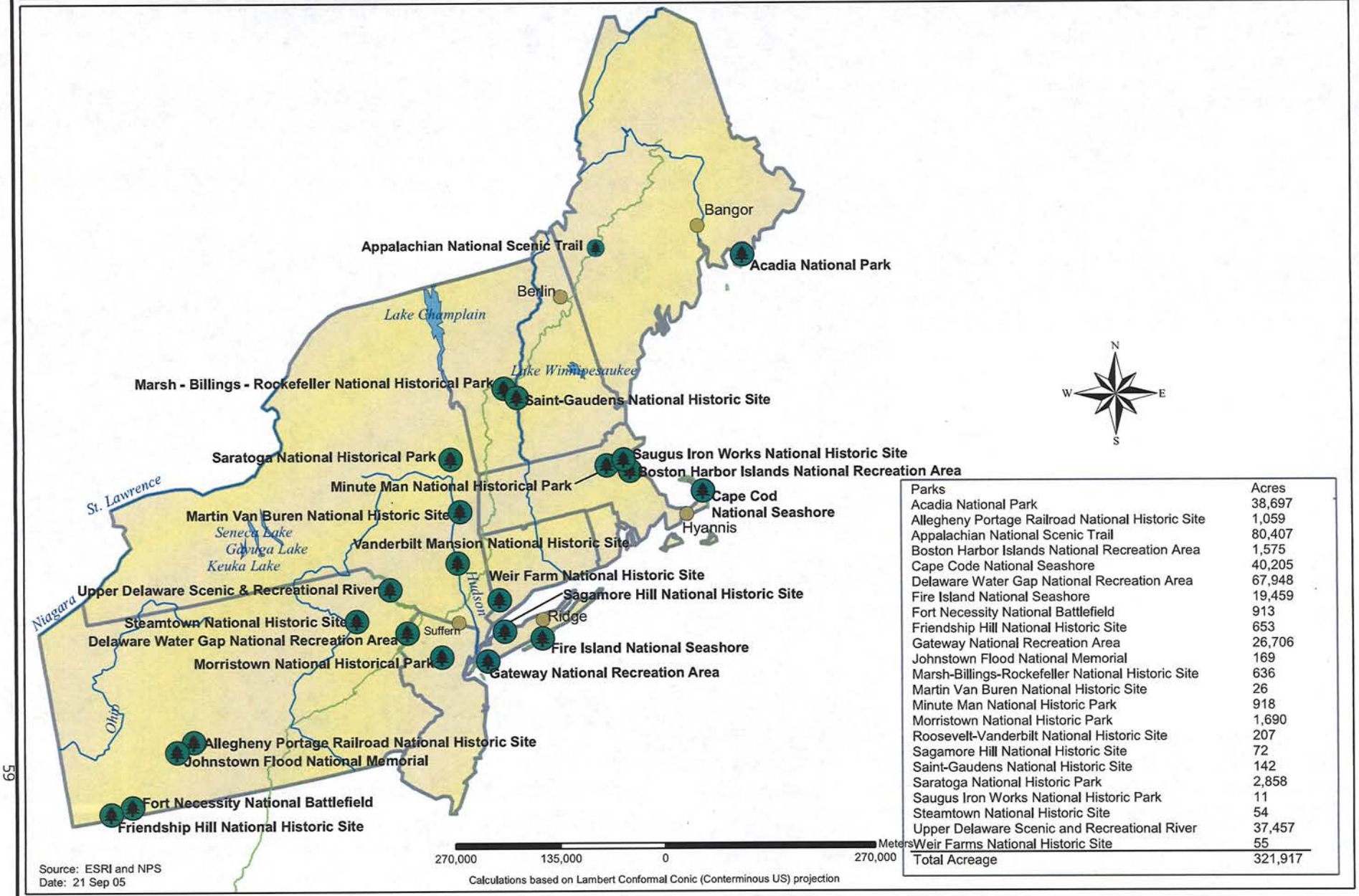
Coordinate System - UTM_Zone 19N_NAD 83

Northeast Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Acadia National Park	38,697
Allegheny Portage Railroad National Historic Site	1,059
Appalachian National Scenic Trail	80,407
Boston Harbor Islands National Recreation Area	1,575
Cape Code National Seashore	40,205
Delaware Water Gap National Recreation Area	67,948
Fire Island National Seashore	19,459
Fort Necessity National Battlefield	913
Friendship Hill National Historic Site	653
Gateway National Recreation Area	26,706
Johnstown Flood National Memorial	169
Marsh-Billings-Rockefeller National Historic Site	636
Martin Van Buren National Historic Site	26
Minute Man National Historic Park	918
Morristown National Historic Park	1,690
Roosevelt-Vanderbilt National Historic Site	207
Sagamore Hill National Historic Site	72
Saint-Gaudens National Historic Site	142
Saratoga National Historic Park	2,858
Saugus Iron Works National Historic Park	11
Steamtown National Historic Site	54
Upper Delaware Scenic and Recreational River	37,457
Weir Farms National Historic Site	55
Total Acreage	321,917

Source: ESRI and NPS
Date: 21 Sep 05

Calculations based on Lambert Conformal Conic (Conterminous US) projection

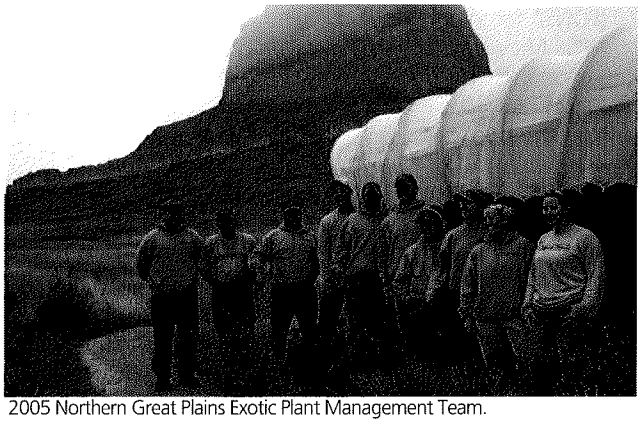
Northern Great Plains

Exotic Plant Management Team

Partner Parks and states: Agate Fossil Beds NM, NE; Badlands NP,SD; Devils Tower NM, WY; Fort Laramie NHS, WY; Fort Union Trading Post NHS, ND; Jewel Cave NM, SD; Knife River Indian Villages NHS, ND; Minuteman Missile NHS, SD; Missouri National Recreational River, NE/SD; Mount Rushmore NM, SD; Niobrara National Scenic River, NE; Scotts Bluff NM, NE; Theodore Roosevelt NP, ND; Wind Cave NP, SD.

Accomplishments

Inventoried Acres	32,657
Gross Infested Acres	2,419
Infested Acres	1,869
Treated Acres	1,817
Monitored Acres	0
Retreated Acres	41
Restored Acres	109



2005 Northern Great Plains Exotic Plant Management Team.

The Northern Great Plains Exotic Plant Management Team () has multiple goals, all of which revolve around controlling the spread of invasive species and restoring areas to native plant communities. The team emphasizes and uses Integrated Pest Management techniques for systematic long-term management and control of invasive species.

In the spring of 2005, the region received substantial rainfall, some areas 185% above normal. Unfortunately, species like leafy spurge flourish under those conditions. For example, at Theodore Roosevelt National Park the team treated 145 leafy spurge infestations during June and July. Of those 145 infestations, 94 of those were new infestations that have never been treated before. This was common occurrence throughout many of the parks.

The NGP-EPMT continued to treat Canada thistle, the most problematic invasive species in the network. Canada thistle seeds can remain viable in the soil for up to 21 years making it a very persistent invasive species in all 14 parks in the network.

The team also cut down and sprayed 41 tamarisk and 864 Russian olive trees at Scotts Bluff NM. Although this task and many other projects were challenging and physically demanding the team had no lost time injuries throughout the year.

Once again, the NGP-EPMT was involved in several outreach programs. The team gave two presentations regarding activities to all partner parks and host park personnel at the annual NEKOTA meeting in February, 2005. The team was interviewed by personnel from the Star Herald in Scotts Bluff, NE and produced two articles on the NGP-EPMT about work being conducted that year. Furthermore, Latitude Magazine released an article in the spring 2005 issue titled "Purging Spurge in Roosevelt National Park Making a Difference". The team gave two presentations at the interagency Invasive Species Workshop in Bismarck, ND titled "National Parks Service – Exotic Plant Management Teams" and "Weed Management in National Parks of the shortgrass prairie".

The team's accomplishments to date have relied on strong support at each park. Once again, the NGP-EPMT is grateful for all of the services that have been provided from all divisions at each park, I&M program, Fire Effects Program, Midwest Regional Office and WASO-BRMD.

Special Emphasis Species

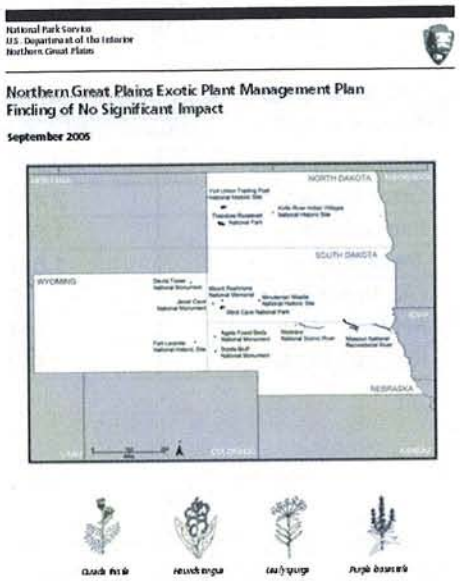
absinth wormwood
black henbane
bull thistle
Canada thistle
cheatgrass
common burdock
common mullein
crested wheatgrass
eastern red cedar
houndstongue
leafy spurge
musk thistle
perennial sowthistle
purple loosestrife
Russian knapweed
Russian olive
scotch thistle
spotted knapweed
smooth bromegrass
tamarisk

Northern Great Plains

Exotic Plant Management Team

Northern Great Plains Exotic Plant Management Plan

The National Park Service (NPS) has completed the Northern Great Plains Exotic Plant Management Plan (EPMP) and Environmental Assessment (EA) by issuing a Finding of No Significant Impact (FONSI) for Integrated Pest Management, the preferred alternative. NPS Midwest Regional Director Ernest Quintana and Acting Intermountain Regional Director Mike Snyder approved the FONSI based on the EA and as recommended by the parks' superintendents.


National Park Service
U.S. Department of the Interior
Northern Great Plains

Northern Great Plains Exotic Plant Management Plan
Finding of No Significant Impact

September 2005

The NPS Northern Great Plains (NGP) Exotic Plant Management Team (EPMT), park staffs and Consultants worked nearly two years in developing the plan. The intent of this plan is to manage exotic plants to reduce their negative effects on native plant communities and other natural and cultural resources within these parks. Each exotic plant's natural history is evaluated before developing management strategies. The treatment options in this plan include cultural, manual/mechanical, biological control, chemical, and prescribed fire. Individual treatments or combinations of these treatments will be implemented, as appropriate, by the NGP- EPMT and individual park teams to control exotic plants in the 13 parks covered by the decision. The NGP EPMP contains best management practices that are designed to minimize potential impacts to other park resources.

Restoration Project at KNRI

On June 17, Superintendent Cheryl Schreier, Knife River Indian Villages National Historic Site, announced the seeded of over 110 acres with native grasses, forbs and legumes. Previously these areas were dominated by three exotic plants, smooth brome, crested wheatgrass and Kentucky bluegrass. Schreier said, "This project is a tremendous accomplishment that will provide visitors with a more accurate presentation of Knife River's 19th century landscape. Knife River Indian Villages greatly appreciates the hard work and planning the Northern Great Plains Exotic Plant Management Team put into this project." The project started in April 2004 with a prescribed fire, followed by two herbicide applications in May and September 2004. Selected areas were retreated with herbicide in May and seeded in June 2005. To ensure a healthy native plant community these areas will be hayed in 2006, 2007 and 2008. Prescribed fire will be used to reduce fuel loads and allow the native species to become part of the natural landscape. The project was a collaborative effort among various NPS programs and park personnel including the NGP-EPMT, Fire Effects Monitoring Crew, USDA/NRCS Plant Materials Center in Bismarck, ND and Pheasants

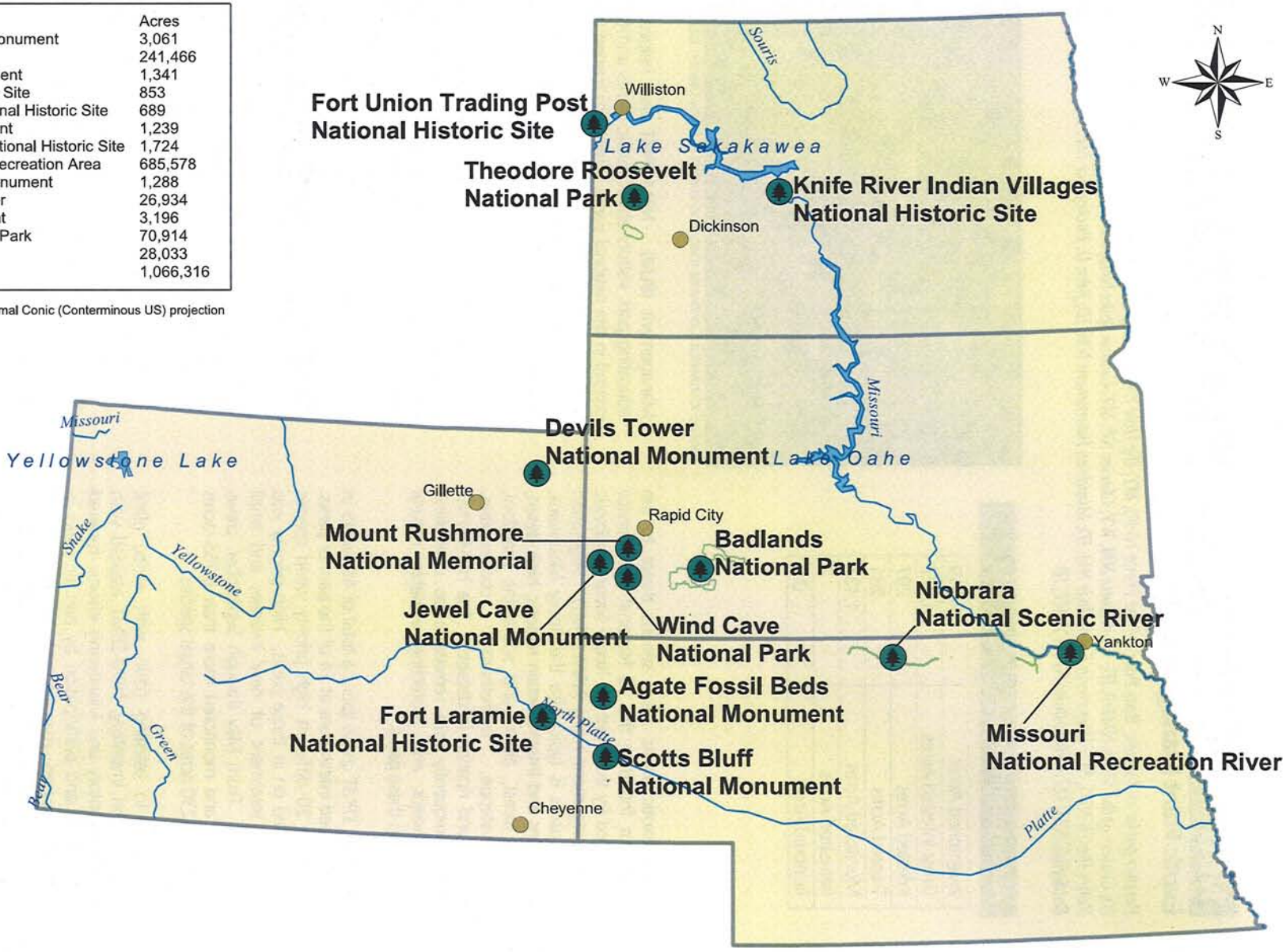
Forever. The main objective of the EPMT is to restore several prioritized areas to native prairie using a mixture of native grasses, forbs and legumes. Although these areas have been seeded to native species, intensive management will still be required to achieve optimum results.

Northern Great Plains Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Agate Fossil Beds National Monument	3,061
Badlands National Park	241,466
Devils Tower National Monument	1,341
Fort Laramie National Historic Site	853
Fort Union Trading Post National Historic Site	689
Jewel Cave National Monument	1,239
Knife River Indian Villages National Historic Site	1,724
Missouri National River and Recreation Area	685,578
Mount Rushmore National Monument	1,288
Niobrara National Scenic River	26,934
Scottsbluff National Monument	3,196
Theodore Roosevelt National Park	70,914
Wind Cave National Park	28,033
Total Acreage	1,066,316

Calculations based on Lambert Conformal Conic (Conterminous US) projection



Source: ESRI and NRID
Date: 7 Nov 05

79

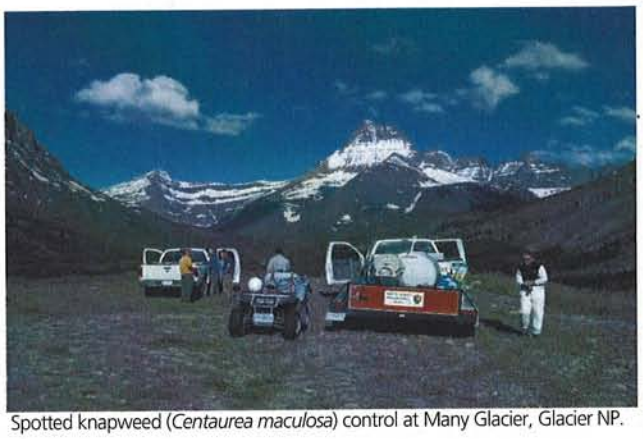
Northern Rocky Mountain

Exotic Plant Management Team

Partner parks and states: Bear Paw B (Nez Perce NHP), MT; Big Hole NB, MT; Bighorn Canyon NRA, MT, WY; City of Rocks NPr, ID; Craters of the Moon NM&P, ID; Fossil Butte NM, WY; Glacier NP, MT; Golden Spike NHS, UT; Grand Teton NP, WY; Grant-Kohrs Ranch NHS, MT; Hagerman Fossil Beds NM, ID; Minidoka Internment NM, ID; John D. Rockefeller MP, WY; Little Bighorn Battlefield NM, MT; Yellowstone NP, WY, MT, ID

Accomplishments

Inventoried Acres	7,319
Gross Infested Acres	4,337
Infested Acres	297
Treated Acres	231
Monitored Acres	1,437
Retreated Acres	7
Restored Acres	0.2



Spotted knapweed (*Centaurea maculosa*) control at Many Glacier, Glacier NP.

Invasive exotic plants are a serious threat to the ecosystems found in the 15 National Park Service units served by the Northern Rocky Mountain Exotic Plant Management Team (NRM-EPMT). Vegetation in these parks is typical fro the Rocky Mountains, Great Plains and Intermountain regions; high desert, montane forest, alpine and sub-alpine meadow, sagebrush-steppe, hydrothermal communities, wetland, and riparian landscapes. The NRM-EPMT traveled frequently into remote areas controlling invasive weeds and protecting valuable natural resources in these parks.

In FY2005, EPMT crews spent a total of 48 weeks in treating weed infestations at 14 of the partner parks. More than 20 different high priority weed species were focused on in those parks. High priority was placed on treatment of new invaders and small infestations. From May through September, crews inventoried and monitored more than 8,755 acres and treated 230 acres of the target species.

In addition to assisting parks with exotic plant treatment and inventory, NRM-EPMT assisted with the NPS Inventory and Monitoring efforts; fostered development and participation by partner parks in cooperative weed management areas (CWMA); participated and presented at the week long Weed Awareness Week held at and sponsored by Craters of the Moon NM&P and the Bureau of Land Management (BLM). NRM-EPMT also helped in educating park visitors about exotic plants and their control in the national parks. The team trained park staff in various exotic plant operations; and, cooperated and participated in the Minidoka Cooperative Weed Management Area 'desert' survey for rush skeletonweed on NPS and BLM land.

Partner parks provided strong support for the team. The NRM-EPMT appreciates all the services and cooperation that have been provided from all divisions at each park, I&M program, Intermountain and Pacific West Regional Offices, WASO-BRMD and support from the Natural Resource Challenge.

Special Emphasis Species

babysbreath
dalmatian toadflax
diffuse knapweed
dyer's woad
hoary cress
houndstongue
leafy spurge
orange hawkweed
oxeye daisy
perennial pepperweed
purple loosestrife
rush skeletonweed
Russian knapweed
St. Johnswort
saltcedar
spotted knapweed
sulfur cinquefoil
yellow starthistle
yellow toadflax
yellow hawkweeds

Northern Rocky Mountain

Exotic Plant Management Team

Big Prairie - Glacier NP

Located in the northwest corner of Glacier National Park, Big Prairie encompasses an area of approximately 175 acres dominated by grasses and forbs, approximately100 acres are infested with five populations of noxious weeds. These five weed infestations were inventoried on August 30, 2005 and are displayed on the Big Prairie map, which follows. Approximately 21 acres of leafy spurge, 13 acres of yellow toadflax, 2.5 acres of sulfur cinquefoil, 0.26 acres of spotted knapweed, and 0.15 acres of Canada thistle were mapped.

In July 2003, a cooperative effort between the Glacier IPM crew and the NRM-EPMT began with the treatment of 40.8 acres of leafy spurge. In fall 2004, cooperative efforts continued with treatment of 6 acres of leafy spurge and 7 acres of sulfur cinquefoil.

In September of 2005, the team treated 13 acres of leafy spurge, 2.4 acres of sulfur cinquefoil, 14 acres of yellow toadflax, 0.25 acres of spotted knapweed, and 0.15 acres of Canada thistle. Monitoring this year indicates treatments from the two previous years are reducing the leafy spurge and sulfur cinquefoil populations. Leafy spurge occupies 21 acres with approximately 90% of that having been subject to at least one previous treatment. Sulfur cinquefoil infestations have decreased from 7.5 acres in 2004 to 2.5 acres in 2005. Yellow toadflax received initial treatment this year. Canada thistle and spotted knapweed infestations are small and decreasing in density.

Herbicide treatment at Big Prairie, Glacier NP.

Future plans for Big Prairie involve continued fall herbicide treatments on the main infestations, and early summer treatment of outlying populations. Native grasses and forbs are being monitored for any signs of stress or population changes in response to our herbicide treatments.

Orange Hawkweed - Yellowstone NP

Orange hawkweed (*Hieracium aurantiacum*) is an invasive perennial plant that spreads rapidly by stolons, rhizomes, and/or seed. In Yellowstone National Park, this weed is currently confined to a few, scattered patches. With consistent effort, eradication may be possible in the future.

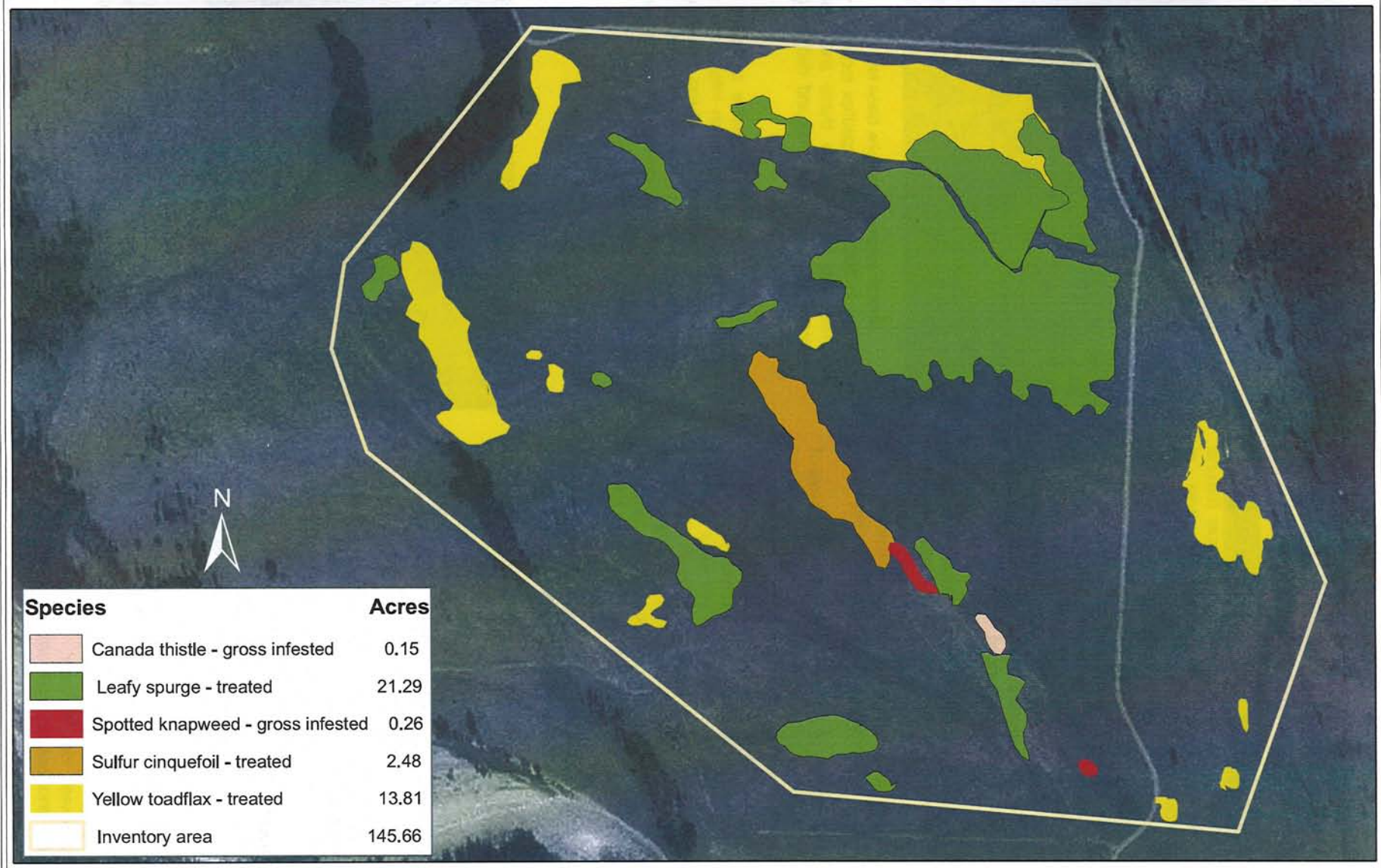
One patch is located in the north-central part of Yellowstone N.P., near Petrified Tree and is shown on the following Orange Hawkweed map. This orange hawkweed infestation is scattered in most areas and moderately dense in a few isolated areas across the hillside. Terrain is uneven and amongst burnt lodgepole pines, standing and deadfall, from the 1988 fire.

In the past, this infestation has been treated intermittently. On June 29 and 30, the NRM EMPT Yellowstone crew inventoried and treated this infestation. Approximately 50% of the orange hawkweed was in flower. Currently, the infested area encompasses 6.01 acres of which nearly 0.5 acres were treated using the herbicide Curtail. A total of 16.65 acres were inventoried and 70 person hours were spent on this project. We plan to continue monitoring and treating this infestation annually.

Backpack spraying orange hawkweed at Petrified Tree.

Big Prairie - Glacier NP
Northern Rocky Mountain EPMT

National Park Service
U.S. Department of the Interior



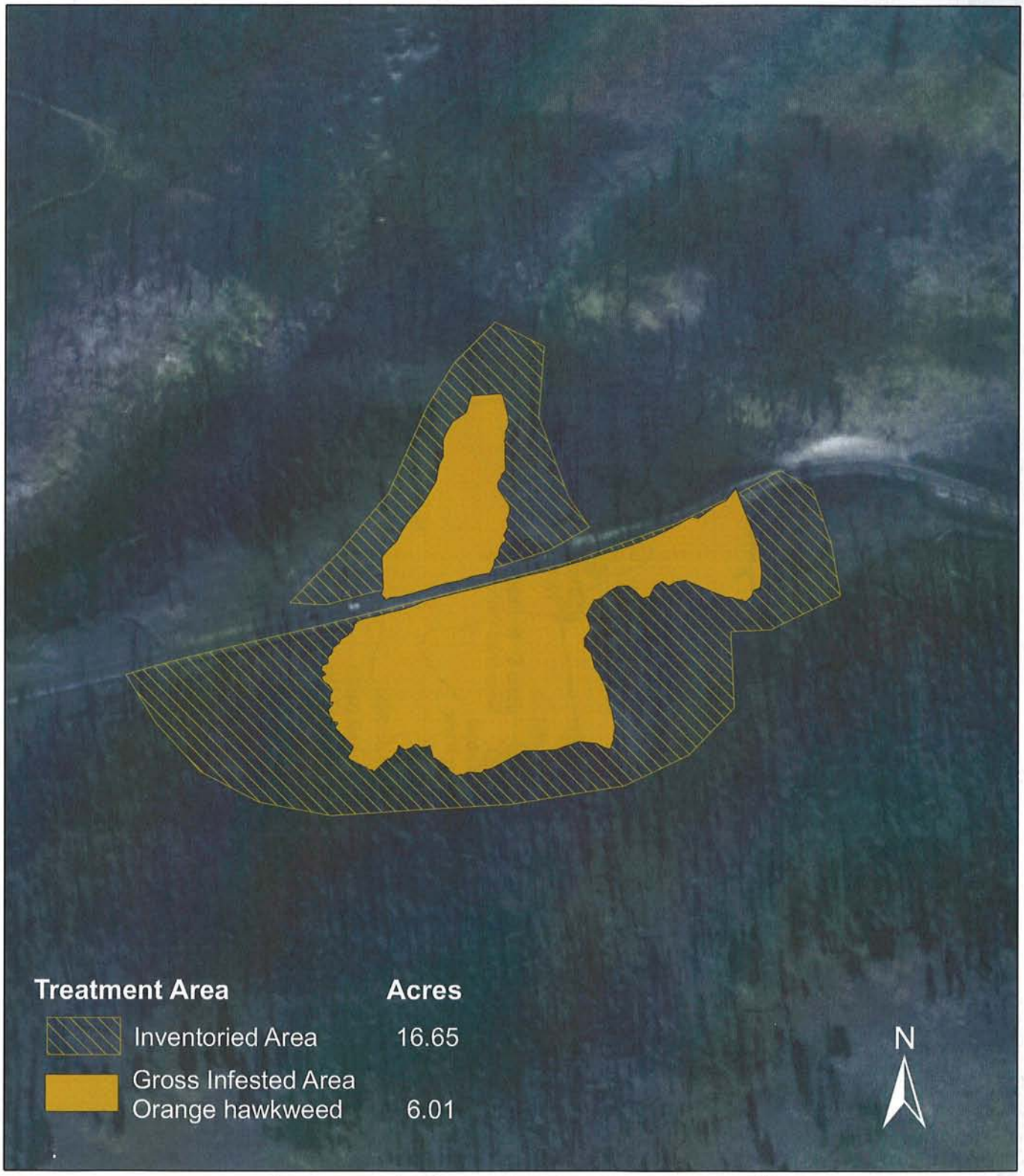
Source: USGS DOQQ Polebridge NW, MT
NRM-EPMT coverages collected with a Trimble GPS receiver
Date: 18 Oct 05

Meters
0 90 180 360
Scale - 1:5,802

Coordinate System - UTM_Zone 11N_NAD 83

Petrified Tree- Yellowstone National Park
NRM Yellowstone EPMT

National Park Service
U.S. Department of the Interior



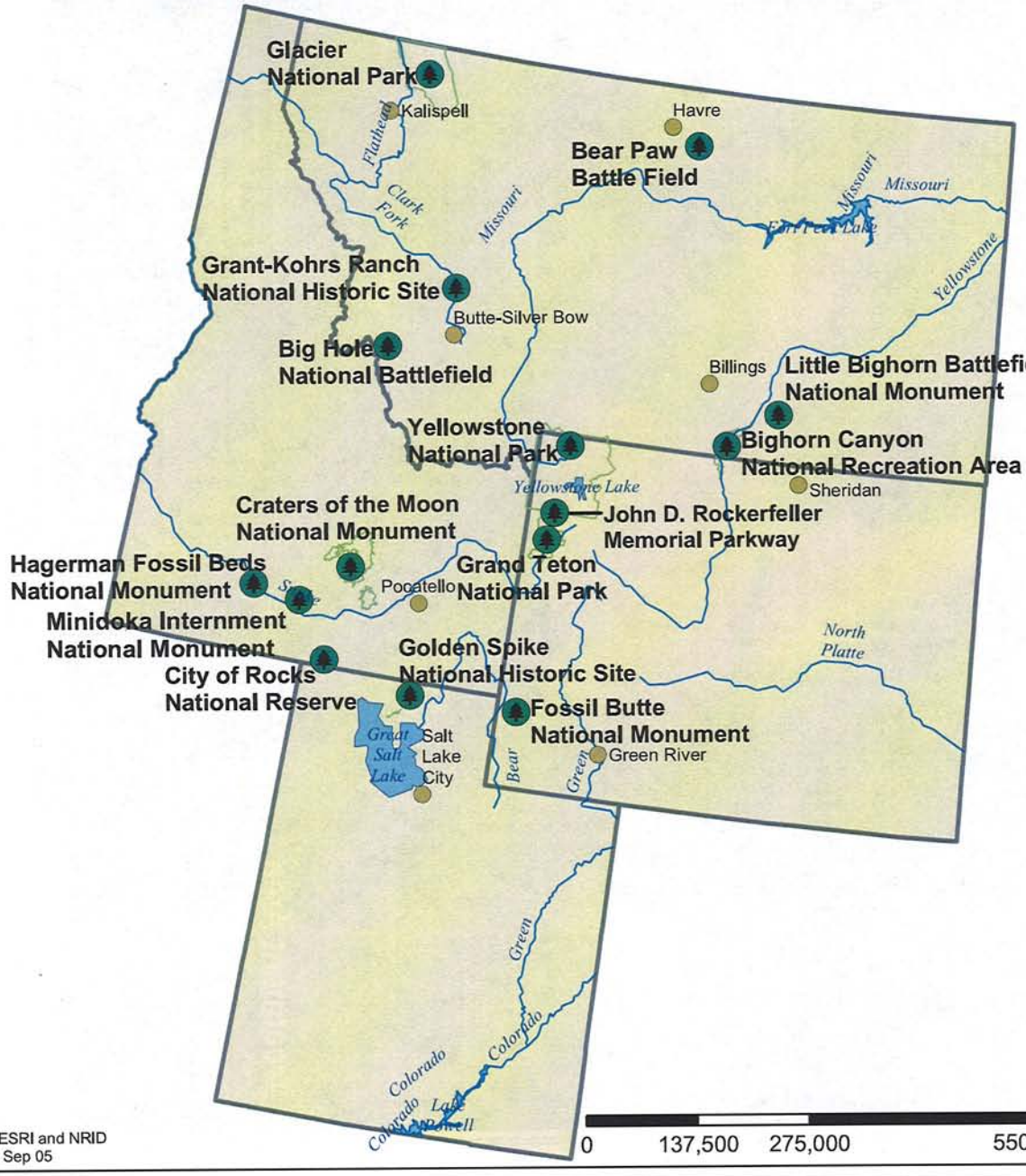
Source: USGS DOQQ Tower Junction SES, coverages collected with Trimble GPS Receiver
Date: 14 Oct 05

Scale - 1:3,046

Coordinate System - UTM_Zone 12N_NAD 83

Northern Rockies Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Bear Paw Battle Field	197
Big Hole National Battlefield	673
Big Horn Canyon National Recreation Area	119,605
City of Rocks National Reserve	14,464
Craters of the Moon National Monument	467,063
Fossil Butte National Monument	8,213
Glacier National Park	1,026,689
Golden Spike National Historic Site	2,644
Grand Teton National Park	308,654
Grant-Kohrs Ranch National Historic Site	1,617
Hagerman Fossil Beds National Monument	4,288
John D. Rockefeller Memorial Parkway	23,634
Little Bighorn Battlefield	761
Minidoka Internment National Monument	75
Yellowstone National Park	2,197,338
Total Acreage	4,175,915

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NRID
Date: 21 Sep 05

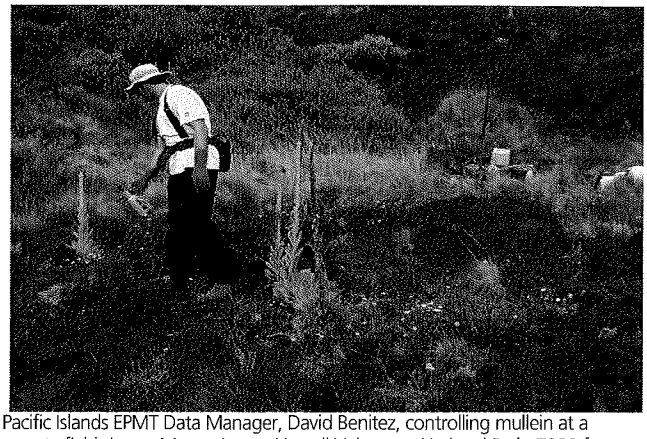
Pacific Islands

Exotic Plant Management Team

Partner parks and states (All located in Hawaii proper): Haleakala NP; Hawai'i Volcanoes NP; Kalaupapa NHP; Kaloko-Honokohau NHP; Pu'uhonua o Honaunau NHP; Pu'ukohola Heiau NHS

Accomplishments

Inventoried Acres	52,664
Gross Infested Acres	13,236
Infested Acres	137
Treated Acres	100
Monitored Acres	9,561
Retreated Acres	68
Restored Acres	89



Pacific Islands EPMT Data Manager, David Benitez, controlling mullein at a remote field site on Mauna Loa at Hawaii Volcanoes National Park, 7000 feet elevation.

Native ecosystems in the Hawaiian Island parks are gravely threatened by exotic plant species. Over 60 alien plant species within the Hawaiian parks displace native vegetation and form single species stands over extensive areas. At risk in the parks are native ecosystems displaying remarkable examples of adaptive radiation and other evolutionary processes. Over six percent of the native vascular plants are listed as Threatened or Endangered.

Non-native plants are the single most pervasive threat to the integrity of native ecosystems in the Pacific Islands. The seriousness of the threat results from their ability to displace native vegetation and associated communities of invertebrates and vertebrates, and to modify ecosystem processes.

In excess of 90% of the Hawaiian flora is endemic to the islands. In the past year, the Pacific Islands EPMT has continued to significantly increase the Hawaiian park's capacity to protect native communities from invasive plant threats.

The Pacific Islands EPMT (PI-EPMT) has continued to serve as the coordinating entity for an interagency program to control Miconia on the island of Maui. The EPMT works closely with the Maui Invasive Species Committee (MISC), utilizing funds from a variety of sources, including State and County agencies, private entities, watershed partnership groups, and federal agencies. Utilizing these partner groups with common goals, the Pacific Islands EPMT has achieved in excess of a five-fold increase in work capacity on the Island of Maui.

The PI-EPMT continues to partner with the Hawaii Volcanoes National Park (HAVO) along with the home park staff at four smaller units; three on the leeward side of the Big Island and one the Island of Molokai to initiate control activities and begin restoration projects. In an effort to supplement EPMT projects at the smaller parks, the PI-EPMT successfully fielded a 5 person Student Conservation Association (SCA).

Finally, the Pacific Islands EPMT has maintained its encouraging safety record with no lost time due to injuries. Additionally, the PI-EPMT has played a critical role in developing decontamination protocols for the Pacific Islands to prevent unintentional spread of problem species by utilizing a common-sense approach to integrated pest management and weed risk assessment.

Special Emphasis Species

Australian tree fern
banana poka
faya tree
Florida blackberry
fountain grass
giant reed
gorse
ivy gourd
kahili ginger
koa haole
mesquite
miconia
mullein
pampas grass
strawberry guava
yellow Himalayan raspberry

Pacific Islands

Exotic Plant Management Team

Student Conservation Association

The PI-EPMT hosted a Student Conservation Association (SCA) crew beginning in May 2005. The project will be ongoing through November 2005.

Following an initial one month intensive training program at HAVO, the SCA crew initiated control work at three park units on the leeward side of the Big Island, including: Kaloko-Honokohau NHP (KAHO); Pu'uhonua o Honaunau NHP (PUHO), and; Pu'ukohola Heiau NHS (PUHE).

At PUHO, the group removed in excess of 30 acres of ivy gourd from high density infestations and assisted with control of woody and herbaceous weeds around cultural features to facilitate native plant restoration and enhance the visitor cultural experience.

At KAHO the SCA group removed in excess of 3000 ivy gourd plants to protect coastal strand vegetation from being smothered by the noxious vine.

At PUHE the SCA group cleared several hundred Mesquite trees that threaten resources by adding to heavy fuel loads, restricting native species

regeneration, disturbing cultural sites, and negatively impacting historic ground water levels.

In early September 2005, the SCA group began working at Kalaupapa NHP (KALA). Their ongoing projects include protecting native coastal strand vegetation from weed invasion and restoration of extirpated native species throughout portions of the windward coast of Molokai.

Hawaii Volcanoes - Highlights

The PI-EPMT continued to work closely with staff at Hawaii Volcanoes National Park (HAVO) to expand their capacity to control invasive weeds threatening diverse natural areas within the park. The following are some of the highlights from the past year:

Fountain grass is an introduced fire promoting grass that increases fire frequency and size, transforming forests and woodlands of fire-intolerant native species to exotic dominated savannas. The PI-EPMT began controlling fountain grass in the newly acquired 116,000 acre Kahuku Ranch portion of HAVO. The team completed the initial knockdown and first maintenance revisit for an outlying 3 acre infestation.

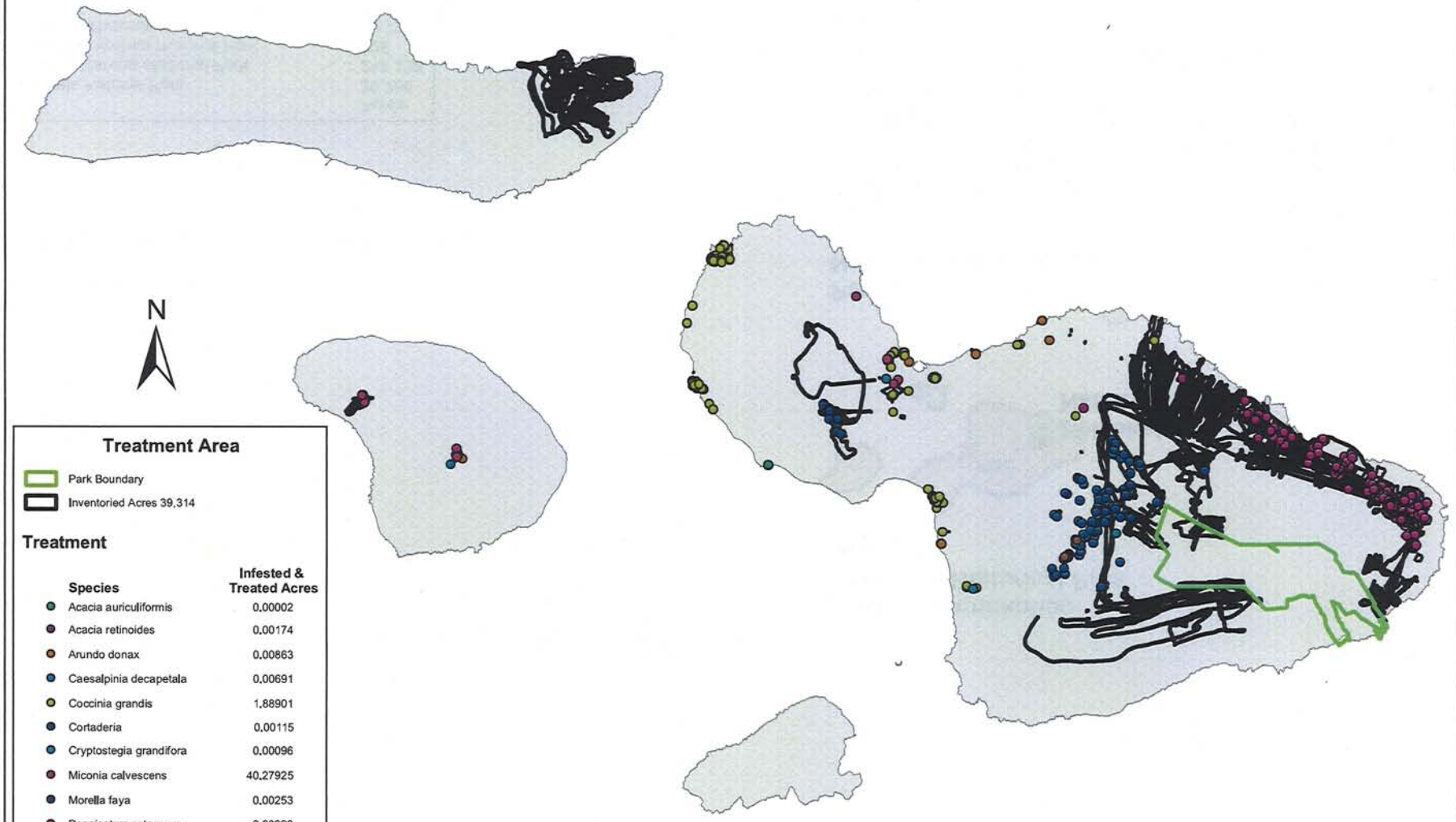
The PI-EPMT upgraded and improved the herbicide facilities at HAVO to establish a safer and more efficient location for mixing and disposing of herbicides that are critical to effectively battling weed threats.

Another exotic weed, Faya tree, increases nitrogen inputs up to four-fold where it invades, facilitating

the establishment of nitrophilic alien species, and thereby disrupting the natural development of plant communities on younger substrates. The PI-EPMT controlled Faya tree at Kipuka Kahue, a 288 acre Special Ecological Area on the edge of the invasion front, removing 3,904 mature and 293 juvenile plants. The work area is currently being expanded.

Maui Program
Pacific Islands EPMT with Maui Invasive Species Committee

National Park Service
U.S. Department of the Interior

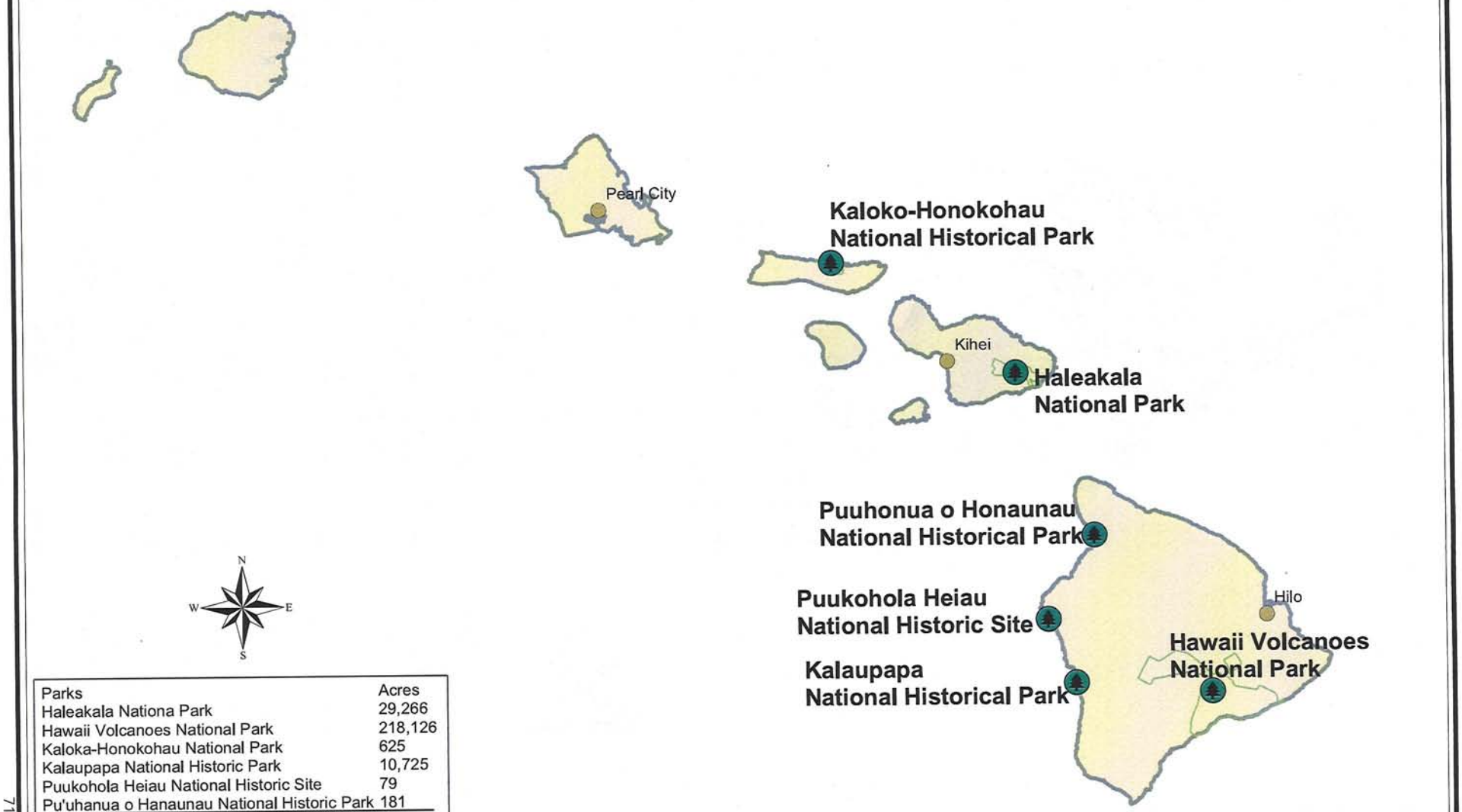


Source: most PI coverages collected with a Trimble GPS receiver"
Date: 24 Oct 05

Coordinate System - UTM_Zone 4N_NAD 83

Pacific Islands Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Haleakala Nationa Park	29,266
Hawaii Volcanoes National Park	218,126
Kaloka-Honokohau National Park	625
Kalaupapa National Historic Park	10,725
Puukohola Heiau National Historic Site	79
Pu'uhanua o Hanaunau National Historic Park	181
Total Acreage	259,002

Calculations based on Albers Equal Area Conic (Hawaii) projection

Source: ESRI and NRID
Date: 7 Nov 05

Southeast

Exotic Plant Management Team

Partner Parks and states: Abraham Lincoln Birthplace NHS KY, Big South Fork NRRA KY- TN, Blue Ridge Parkway NC- VA, Carl Sandberg NHP NC, Cowpens NB SC, Chickamauga and Chattanooga NMP TN- GA, Cumberland Gap NHP TN- VA- KY, Fort Donelson NB TN, Guilford Courthouse NMP NC, Kings Mountain NMP SC , Little River Canyon NP AL, Mammoth Cave NP KY, Ninety- Six NHS SC, Obed Wild and Scenic River TN, Russell Cave NM AL, and Stones River NB TN.

Accomplishments

Inventoried Acres	4,643
Gross Infested Acres	1,049
Infested Acres	851
Treated Acres	789
Monitored Acres	6
Retreated Acres	57
Restored Acres	0

SE-EPMT utilizes cut-stump treatment on Tree-of- Heaven (*Ailanthus altissima*) an aggressive invasive tree in most southeastern parks.

The Southeast Exotic Plant Management Team (SE-EPMT), based at the Blue Ridge Parkway in North Carolina, provides exotic plant management and technical support to 16 partner parks in seven southeastern states. These parks are located in the Appalachian Highlands and the Cumberland Piedmont Inventory and Monitoring Networks. The SE-EPMT partner parks range from approximately 200 acres to over 50,000 and occupy nine physiographic provinces.

In 2005 SE-EPMT increased the total acres treated from 275 in 2004 to over 500 in 2005. Total acres inventoried increased from 1875 in 2004 to over 3000 in 2005. The SE-EPMT has continued to focus their control activities in riparian and upland mesic habitats. Many of the sites harbor unique natural communities supporting state and federally protected species.

Most of the invasive exotic plants the SE-EPMT encounters in this region are the result of intentional introductions as escapees from ornamental, agricultural, and right-of-way plantings on sites adjoining partner parks. Often these plants have become established along road and utility rights-of-way. More troublesome are the invasive plants that can thrive in low light conditions such as privet, stilt-grass, garlic mustard and knotweed. The SE-EPMT will continue to work year-round using an integrated pest management approach to address these invasions.

In addition to invasive plant control the SE-EPMT has significantly improved training efficiency. Because the SE-EPMT utilizes six month SCA interns on a staggered schedule, training is conducted continuously. By acquiring the certifications and course work necessary to conduct much of our training in-house, the cost and time required for off-site training has been greatly reduced. In addition, this training is also offered to park staff further enhancing their skills in exotic plant control.

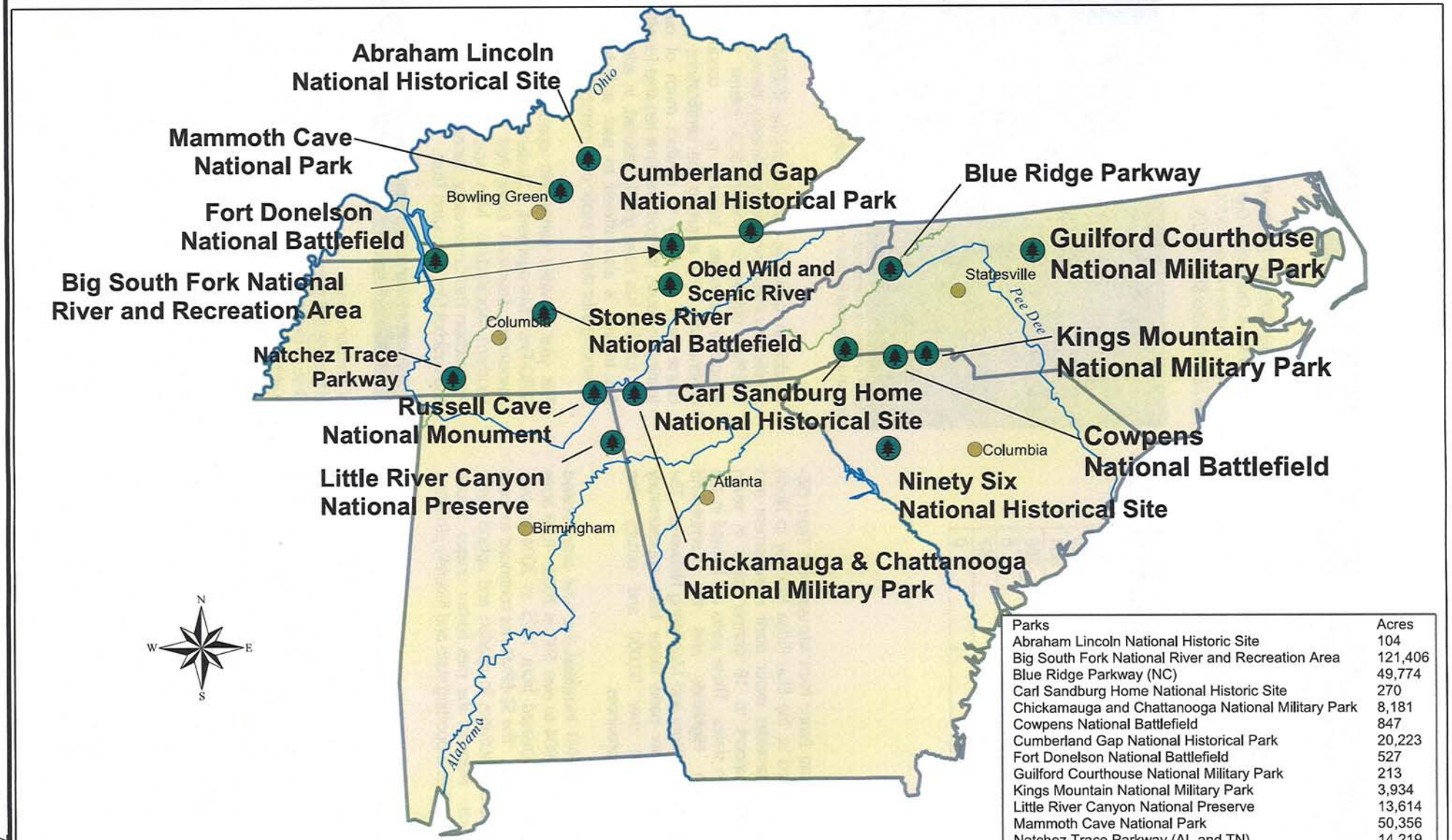
This year provided partnership opportunities with SERO-Fire Management, Student Conservation Association, Southeast Exotic Pest Plant Councils, Southern Appalachian Man and the Biosphere, Appalachian Trail Conservancy, Tennessee State Parks and Lookout Mountain Land Trust.

Special Emphasis Species

Common privet
Japanese stilt grass
tree of heaven
garlic mustard
air potato
kudzu
cogon grass
giant hog weed
multiflora rose
Japanese honeysuckle
princess tree
oriental bittersweet
autumn olive
Japanese climbing fern
mile-a-minute weed

Southeast Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Abraham Lincoln National Historic Site	104
Big South Fork National River and Recreation Area	121,406
Blue Ridge Parkway (NC)	49,774
Carl Sandburg Home National Historic Site	270
Chickamauga and Chattanooga National Military Park	8,181
Cowpens National Battlefield	847
Cumberland Gap National Historical Park	20,223
Fort Donelson National Battlefield	527
Guilford Courthouse National Military Park	213
Kings Mountain National Military Park	3,934
Little River Canyon National Preserve	13,614
Mammoth Cave National Park	50,356
Natchez Trace Parkway (AL and TN)	14,219
Ninety Six National Historic Site	944
Obed Wild and Scenic River	5,280
Russell Cave National Monument	318
Stone River National Park	707
Total Acreage	290,917

0 175,000 350,000 525,000 Meters

Source: ESRI and NPS
Date: 7 Nov 05

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Appendix 1

The Alien Plant Control and Monitoring (APCAM) Database Overview

Purpose

The Alien Plant Control and Monitoring Database (APCAM) adheres to the institutional standards developed by Exotic Plant Management Teams for collecting inventory, control, and monitoring data on invasive vascular taxa.

Specifics

Exotic Plant Management Team members designed APCAM using the NPS Natural Resources Information Division's Database Template. The fields governed by North American Weed Management Association (NAWMA), in conjunction with the Weed Mapping and Database Development Guidelines for the National Park Service are abridged in the data dictionary. The Federal Geographic Data Committee's (FGDC) minimums for physical and geo spatial metadata are satisfied and standard taxonomic naming conventions are invoked from NPSpecies and the Plant Taxonomic Database. In addition, APCAM enlists the pesticide/herbicide naming conventions and reporting protocols established by NPS's Pesticide Use Proposals (PUPs) database. Ancillary data regarding weather, biological controls, collected plant material, digital photographs, and spatial relationships are included in APCAM. Current regulated status reports consist of six acreage categories by species, person hours and herbicide totals.

Contents

Data Entry Modules
- Abiotic
- APCAM
- Associated Species
- Biological Control Collection
- Biotic
- Disturbances
- Controlled Species
- Location ID/Event ID
- Photos
- Plants Collected
- Restoration
- Trip Reports
- Values At Risk
- Weather

Reports

Acres
- Inventoried Acres/Species
- Gross Infested Acres Treated
- Treated Acres per Species
- Inventoried Acres per Species
- Monitored Acres per Species
- Retreated Acres per Species
- Restored Acres per Species
- Controlled Acres per Species

Person Hours
- Person Hours per Team
- Person Hours for Preparation and Travel
- Person Hours by Activity

Summary
- Trip Report Summary
- Location ID Summary

Herbicides
- Herbicide Totals
- IPM Herbicide

Appendix 2

Acreage Definitions for APCAM Data Collection

Inventoried Area

Any area covered during the course of weed management / control activities. An area may be considered "inventoried" regardless of the presence / absence of target week species. Inventoried area is obtained by GPSing the perimeter, GPSing perimeter points or digitized on screen using landform references.

Gross Infested Area

The gross infested area is defined as the general perimeter of the infestation. Gross infested areas contain the target species and the spaces between populations or individuals. A gross infested area is described by a polygon, or a line feature (i.e. riparian course, roadway) which is buffered to account for the maximum distribution of individuals within the inventoried area.

Infested Area

Actual area occupied by weed species within the gross infested area, which does not contain the spaces between individuals and populations. The total infest area (with the gross infested area) may be comprised of multiple infested areas, described by polygons, buffered points, buffered lines, or be calculated as the result of a stem count in which each individual is assigned a coverage multiplier.

Treated Area

Treated area is either the infested area or subset of an infested area which has received treatment action. Treatment area is calculated using the same standards as infested area.

Monitored Area

Any area revisited for the purposes inventory or to assess treatment efficacy: gross infested, infested, or treated area. Area may be done by sweep (as in inventoried) or permanent monitoring points set in "infested" areas. Monitored areas (acreages) may reflect more than one monitoring visit/ year due to the potential for multiple generations in a season, and the need to monitor for re-treatment.

Retreated Area

Actual area of re-treatment (of original treated area) is comprised of a subset of, or the entire original treatment area.

*** All of these terms apply to single species measurements. When there is more than one weed species in an area, the above measurements need to be applied to each species (population) individually.**