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

Draft 11/22/04

Exotic Plant Management Team Annual Report- FY 2004

The mission of the Exotic Plant Management Teams is:

"To protect natural resources from the impacts caused by non-native invasive plant species, through prevention, control, restoration, and education. These goals are achieved through a framework of safe work practices, quality service to parks, positive partnerships, and a spirit of team harmony."

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Introduction

The national parks are home to complex communities of native plants and animals that have developed over millions of years. The delicate natural balance within these communities is threatened by the invasion of exotic plants. These exotic plants are able to reproduce rapidly because the animals and diseases that keep them in check in their home ranges are missing. For example, salt cedar is affecting the quality and quantity of water available for native species in western riparian systems; cheatgrass, an import from Eurasia, easily replaces the grasslands of the Northern Great Plains and adversely effects fire regimes. When the populations of native plants are reduced, the animals that depend upon them lack the food and shelter needed for survival.

Today, exotic plants infest approximately 2.6 million acres in the national park system, reducing the natural diversity of these special places. Drawing funds from the Natural Resource Challenge, the National Park Service Biological Resource Management Division (BRMD) established rapid response Exotic Plant Management Teams (EPMT) to control exotic plants. Modeled after the approach used in wildland fire fighting, EPMTs provide highly trained, mobile strike forces of plant management specialists who assist parks in the control of exotic plants.

In fiscal year (FY) 2004, Sixteen EPMTs were deployed to control harmful invasive plants. These field- or park-based teams are as follows:

(1) Florida Partnership and Caribbean EPMT (based at Everglades NP, Florida)
(2) National Capital Region EPMT (based at Rock Creek Park, Washington, DC)
(3) Chihuahuan Desert/ Southern Shortgrass Prairie EPMT (based at Carlsbad Caverns NP, New Mexico)
(4) Pacific Islands EPMT (based at Haleakala NP, Hawaii)
(5) Lake Mead EPMT (based at Lake Mead National Recreation Area, Arizona and Nevada)
(6) Northern Great Plains EPMT (based at Theodore Roosevelt National Park, North Dakota)
(7) California EPMT (based at Point Reyes National Seashore, California)
(8) Gulf Coast EPMT (based at Big Thicket National Park, Texas)
(9) Columbia Cascades EPMT (based at North Cascades and Olympic National Parks, Washington)
(10) Mid Atlantic Cooperative EPMT (based at Shenandoah NP)
(11) Northeast EPMT (based at Delaware Water Gap NRA)
(12) Northern Rockies EPMT (based at Yellowstone NP)
(13) Alaska EPMT (based at the Alaska Regional Office)
(14) Southeast EPMT (based at Blue Ridge Pky)
(15) Colorado Plateau (based at Petrified Forest NP)
(16) Great Lakes EPMT (based at the Great Lakes Network Office)

Each EPMT serves multiple parks within a broad geographic area. They work through steering committees to identify, develop, conduct, and evaluate exotic species removal projects and undertake appropriate native species restoration efforts. Each of the sixteen established teams has developed site-specific strategies for combating exotic plants that reflect the needs and resources of the more than 208 parks they serve.

The success of the EPMT derives from its ability to adapt to local conditions and needs. Each team employs the expertise of local experts and the capabilities of local agencies. Each sets its own work priorities based on the following factors: severity of threat to high-quality natural areas and rare species; extent of targeted infestation; probability of successful control and potential for restoration; opportunities for public involvement; and park commitment to follow-up monitoring, treatment and restoration.

EPMTs are part of the long-term control of invasive plants set by the Natural Resource Challenge. Actions by EPMTs also address GPRA goal IA1B "Containing exotic plant disturbances." They also satisfy agencies needs to implement Executive Order 13-12 on Invasive Species, which includes the Invasive Species Council National Management Plan.

Accomplishments

Update on a Successful Model for Control of Invasive Plants

EPMTs continue to make substantial gains in the control of harmful invasive plants on parklands. In FY 2004 specialized EPMTs have inventoried over 218,216 acres of land and found gross infestation of weeds on 107,136 acres. They have traversed these acres and treated harmful weeds to the benefit of natural resources. Since the teams inception in 2000 at least 12 exotic plant species that were previously identified have been controlled to a maintenance level in park units.

Partnerships enhance NPS-EPMT invasive plant control work. The NPS Partnership with the University of Florida and the US Department of Agriculture continues to address the Impacts of Invasive Non-Native Agricultural Plants in U.S. Virgin Islands Natural Areas. This project which has been extended to FY 06 resulted in more than 1000 acres being inventoried and/or treated in Virgin Islands NP. Technical assistance is also provided to our international partners Grenada, Puerto Rico, and Dominican Republic. A unique and beneficial partnership with the Student Conservation Corps fielding the student Invasive Species Project is a stellar success. The project is increasing park capacity to control invasive plants and providing invasive species management training to future professionals. Several EPMTs received grants to work with partners such Clark County, Nevada, the Rocky Mountain Elk Foundation for invasive weed control to restore parklands through the Secretary's Cooperative Conservation Initiative. Overall, nearly l.5 million dollars has been leveraged with NPS partners.

EPMTs are assisting federal partners as well. The US Fish and Wildlife Service is establishing mobile strike teams similar to EPMTs. The NPS detailed EPMT personnel to FWS and provided technical assistance from the Great Plains EPMT to initiate the FWS program at Charles M Russell National Wildlife Refuge.

Exotic Plant Management Teams participated in a conference sponsored by the US Departments of Interior and Agriculture, the National Invasive Species Council, the Tamarisk Coalition, and 13 other organizations and was called *Team Tamarisk: Cooperating for Results.* The outcome of the two-day workshop was a set of 12 guiding principals that can help to establish a framework for forging close working partnerships among states and federal agencies. See
http://www.invasivespecies.gov/teamtam/

The EPMTs conducted the first full scale deployment of 14 teams in cooperation with Arches National Park and the fire fuels program under the Incident Command System. The teams exceeded their treatment goal of acreage by 200% controlling l08 acres of harmful fire fuels, Russian olive and tamarisk. This deployment provided numerous opportunities for park resource management support. It was attended and studied by the academician that has published the use of the fire model for plant control. Staff and students from the Northern Colorado Plateau Ecosystem Study Unit conducted field tests of the new Restoration Ranking Assessment Tool. Film students from Montana State University filmed the entire event for education and training purposes. This major resource management accomplishment occurred with a perfect safety record.

Interest in the EPMT program continues to grow. The Teams have been the subject of numerous articles in print media including a feature article in National Parks magazine, the Washington Post, AP, New York Times and local newspapers throughout the country.

Adaptive management is a critical part of the EPMT response. As teams have grown, the need for increased capability to set park priorities for control and restoration has been recognized. As a result, a field study partnership with the Colorado Plateau Cooperative Ecosystem Study Unit (CESU) was initiated in FY 03 and field tested in MWR, PWR, NCR parks in FY 04. Field trial results of the tool appear productive and a web-based program has been submitted for funding for easier access for parks.

EPMTs utilize the Alien Plant Control and Monitoring (APCAM) database which was designed in collaboration with EPMTs for the purpose of ongoing monitoring and data analysis. In addition to collecting data related to the inventory, monitoring, and controlling of exotic plants, APCAM allows the team to store weather data, information on collected plant material, digital photographs, and information on spatial relationships. APCAM is additionally used for accurate and concise reporting. (See Appendix 1)

This is a critical time for management of invasive species in national parks. There is broad recognition from partners, visitors, and institutions that invasive species are a major threat to our natural heritage. Increased funding for invasive species management reflects this recognition as well as commitment. Control of invasive species in national parks is within our grasp if we stay the course.

The remainder of this report details parks and states served, accomplishment statistics, targeted weed species, and FY 2004 activities and achievements for each of the 16 EPMTs. Throughout the report exotic plants, invasive species, invasive plants, weeds, alien plants, etc. are used interchangeably to describe non-native invasive plants.

EPMT Program Highlights

- EPMT efforts for FY04

Inventoried acres	218,217
Gross infested acres	107,136
Infested acres	64,352
Treated acres	6,782
Monitored acres	2,901
Retreated acres	490
Restored acres	387
Time lost due to injury	25
Total person hours	92,776

- A successful partnership with the Student Conservation Corps is providing student volunteers to parks to increase capacity for invasive species management while training professionals for the future.

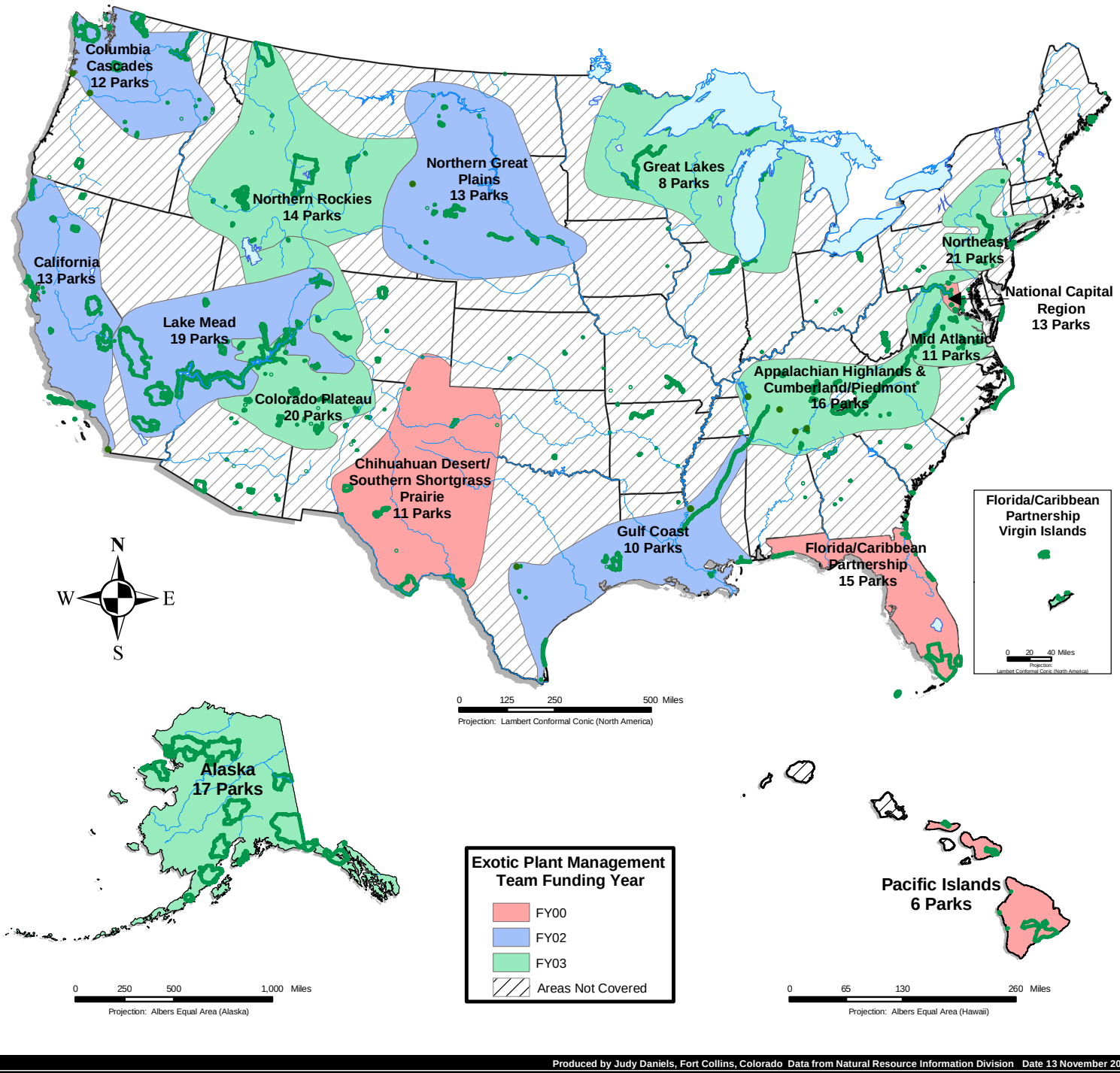
- EPMTs have received nearly 1.5 million dollars through partnerships to enhance invasive plant control.

- Exotic Plant Management Teams are working with the Departments of Interior and Agriculture, the National Invasive Species Council, the Tamarisk Coalition, and 13 other organizations in *Team Tamarisk: Cooperating for Results*, controlling tamarisk in an effective strategic manner in southwestern parks.

- 14 EPMT's were deployed to Arches NP to control over l00 acres of invasive fire fuels. The deployment was conducted with a perfect safety record using the Incident Command System. The Operations Coordinator for Santa Elena Canyon Flora and Fauna Protected Areas of the National Commission of National Protected Areas of Mexico worked with the teams all week to exchange best management practices for controlling tamarisk.

Biological Resource Management Division
Exotic Plant Management Teams

National Park Service
U.S. Department of the Interior



Produced by Judy Daniels, Fort Collins, Colorado Data from Natural Resource Information Division Date 13 November 2003

EPMT Mobilization

Arches National Park Exotic Plant Management Team Deployment – A successful partnership between, fire fuels, invasive and park resource management programs.

Arches National Park is taking deliberate and strategic action to address harmful invasive weeds and fire fuels that threaten natural resources. Toward that end, fourteen National Park Service (NPS) Exotic Plant Management Teams (EPMTs)including 70 weed warriors from parks around the United States were deployed in Arches NP March 9-l4, 2004. The team objective: to control invasive fire fuels tamarisk (salt cedar) and Russian olive in Courthouse Wash. This was the first ever large-scale deployment of EPMTs funded and supported by NPS fire fuels, EPMT and park resource management programs.

Given the magnitude of the project and the participation of numerous crews from across the country, the park initiated the use of the incident command system. This was the first use of the incident command system for an invasive plant management deployment in the NPS. Long before arrival of the first teams, an incident management team was put together using local park and EPMT staff. An incident action plan was developed to organize the project, and efficiently and safely manage the workload. The plan included a series of objectives such as; maintaining a safe work environment, control of over 100 acres of tamarisk and Russian olive, S 212 training, and international outreach. All the objectives were met or exceeded, with a no injuries a key reward.

Because of the NPS success in controlling invasive plants, there is strong interest in use of the NPS strike team model. The deployment provided an opportunity for information sharing with resource managers from other countries, federal and local agencies and academia. Miguel Mendoza, Operations Coordinator for Santa Elena Canyon Flora and Fauna Protected Areas of the National Commission of National Protected Areas of Mexico worked with the teams all week to exchange best management practices for controlling tamarisk. Jeff King with the US Fish and Wildlife Service (FWS) Region 6 viewed the teams' operation in anticipation of cooperative inventory and control efforts between the NPS and FWS in Arizona and Montana. Dr. Steve Dewey, the first academician to equate the fire model to invasive plant control spent several days with the teams, watching his model come to productive fruition. Dr. Ron Hiebert and several graduate students of the Colorado Plateau Cooperative Ecosystem Study Unit were on hand to field test the new restoration ranking tool in order to help park managers make decisions on restoration priorities. The entire event was filmed by students from Montana State University. This informational and celebratory film will be available for public viewing in the next year.

The NPS is the first land management agency to apply the fire model to fight invasive plants. This innovative approach was initially used at Lake Mead NRA. The success of the model lead to 16 teams being fielded since 2000. The teams are comprised of specialists in invasive plant identification and control. An integrated pest management approach is used to determine the least risk methodology of control. In the Courthouse Wash project a cut-stump treatment with natural regeneration was employed.

The Arches EPMT deployment was a rousing success. Natural recovery of willows and cottonwoods is expected. The teams doubled the size of the treatment anticipated. The tangible product of controlling 75 acres of tamarisk and Russian olive in just 7 days is but one of several products of this deployment. The positive effect the deployment had on unifying the national EPMT program and restoring Courthouse Wash cottonwood-willow habitat is a result the teams will carry with them for years to come. As one team member stated "this is extreme weed work". Whatever the weather, the scope of the problem, the species, the out of the way location; NPS EPMTs remain undaunted. They are committed daily to stopping invasive weeds and preserving our natural heritage.

Cutting, Swamping and Spraying Tamarisk in Courthouse Wash – Arches NP March 2004

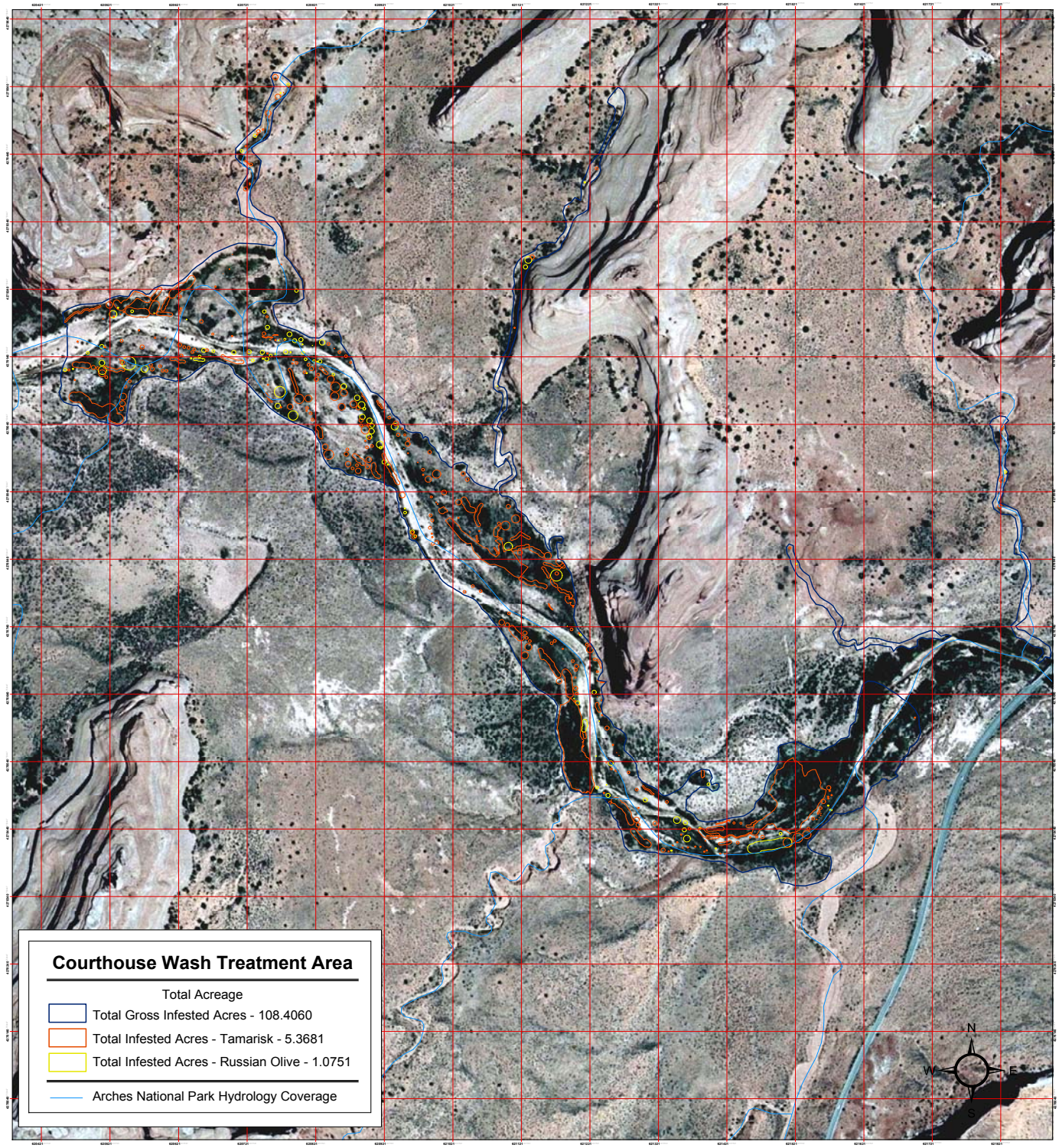
Crews hiking into Courthouse Wash, Arches NP to battle tamarisk and Russian olive March 2004

"The Tamarisk invasion in many of the western parks is affecting many of the very resources for which they were originally set aside. View sheds are being obscured, portions of streams and rivers are becoming inaccessible to hikers and boaters, and some flora & fauna, including T&E species, are being threatened from this exotic encroachment. Stream embankments along the Colorado and Green Rivers in Canyonlands National Park are being artificially heightened and narrowed resulting in increased erosion due to swifter flows in narrowing channels and a lack of fish spawning pools that would normally occur from high water spilling over and outside of natural stream channels. The Tamarisk bushes require high amounts of moisture adds to a lowering of the water table in many areas and valuable surface water available for animal life is depleted."

Quote from Deputy Superintendent Phil Brueck – Southeast Utah Group

Exotic Plant Management Teams Mobilization
Arches National Park - Courthouse Wash
Treatment Results 9 - 14 March 2004

National Park Service
U.S. Department of the Interior



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Source: ARCH Digital Orthophoto .84m res, EPMT GPS Datasets
Date: 22 March 2004
POC: Judy Daniels WASO/BRMD and Andrew Wisdom LAME

c:\EPMT_Moab\CourtHouseWash_Results_2.mxd

Projection: UTM Zone 12N WGS84

Alaska

Exotic Plant Management Team

Partner parks (Alaska): Alagnak NW&SR, Aleutian WWII NHA, 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	1209
Gross Infested Acres	504
Infested Acres	9
Treated Acres	.41
Monitored Acres	.00016
Retreated Acres	.00016
Restored Acres	0
Time Lost due to Injury	0

Sweetclover control with USFS and volunteers, Kenai Fjords NP/Chugach NF

Alaska's climate and isolation are less of a barrier to invasion by exotic plants every year. The state and its National Parks regularly see the introduction of new species, and those that are here expand their ranges rapidly. We confront this problem in Alaska through a coordinated Early Detection and Rapid Response program. Education, information-sharing, statewide cooperation, and field survey and control are the essential elements of the Alaska EPMT program.

In this second year of the EPMT, we inventoried eight park units for exotic plants by mapping 250 infestations of 50 species along with vast uninfested areas. 130 patches were controlled, accounting for 20 species in six parks. Two parks were found to have no exotic plants, and two others are reported to have none. The Alaska EPMT controlled many species this year at singular park locations to prevent their establishment and spread, and certain species were targeted at all locations. There are few infested acres in Alaskan parks, and so their GPS documentation and control protects vast acreages from invasion.

Through an interagency agreement with the US Geological Survey – Biological Resource Division, we have now gathered baseline information on exotic species in 13 of the 17 park units in Alaska. We have also developed and contributed to a statewide web-based tracking database for exotic plant arrivals and distributions with the US Forest Service and the University of Alaska Natural Heritage Program. Alaska's exotic plants have been ranked for threat through this partnership, including those in the parks (see table) and many more in the state. As important as these species are, we are preparing for the inevitable arrival of more notorious American weeds.

The Alaska EPMT grew this year to five employees assisting several parks each, working through the parks to address their needs. Hence, regional support for the program has grown tremendously. Volunteer events and educational presentations were held in four parks in 2004, gathering audiences of park staff, visitors, and local residents whose involvement is essential for the future. Through participation in the interagency Committee for Noxious and Invasive Plant Management, we are presenting the issue to the Alaskan people and working with researchers and managers to address it statewide.

Visiting weed scientists regularly remark on the unique opportunity Alaska has to prevent the problems they have seen elsewhere. We are pursuing this objective on multiple levels, all necessary for the long-term defense against species invasion. In coordination with our partners, the Alaska EPMT program promotes the preservation of vast native landscapes through the support of the Natural Resource Challenge.

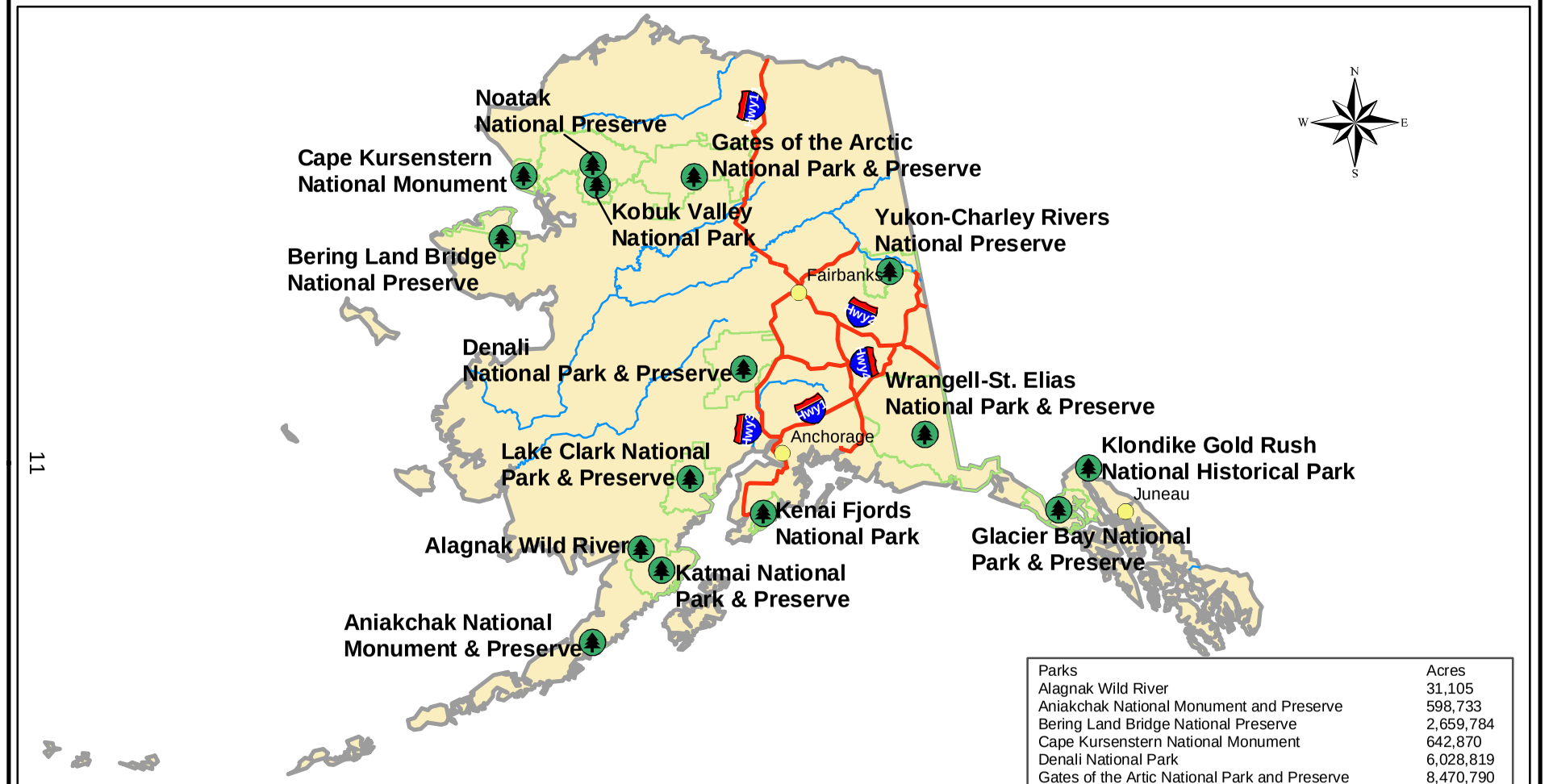
Target Weed Species

bird vetch
butter-and-eggs
common dandelion
common eyebright
European mountain ash
European stickseed
Japanese knotweed
narrowleaf hawksbeard
oxeye-daisy
white/yellow sweetclover

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
bird vetch (Vicia cracca)	0.01000	0.00999	0.00100	0.00100	0.00000	0.00000	2.77000
butter-and-eggs (Linaria vulgaris)	1.759000	1.758900	0.071189	0.004239	0.00000	0.00000	3.90440
common dandelion (Taraxacum officinale)	138.44300	136.44199	2.03525	0.000305	0.00000	0.00000	85.27477
common eyebright (Euphrasia nemorosa)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
European mountain ash (Sorbus aucuparia)	0.00100	0.00100	0.00010	0.00000	0.00000	0.00000	0.42857
European stickseed (Lappula squarrosa)	0.03200	0.03200	0.00032	0.00000	0.00016	0.00016	1.00000
Japanese knotweed (Polygonum cuspidatum)	0.00100	0.00100	0.00001	0.00000	0.00000	0.00000	0.42857
narrowleaf hawksbeard (Crepis tectorum)	2.30950	2.30950	0.09543	0.03149	0.00000	0.00000	30.35550
oxeye-daisy (Leucanthemum vulgare)	23.98100	24.18999	0.25975	0.01079	0.00000	0.00000	17.97020
white/yellow sweetclover (Melilotus ssp.)	10.09700	10.09700	0.38767	0.26721	0.00000	0.00000	55.57850
Top Ten Total	176.63350	174.84137	2.85072	0.31503	0.00016	0.00016	197.71051
other species	1032.36210	329.53613	6.47492	0.09173	0.00000	0.00000	248.13949
FY04 Totals	1208.99560	504.37750	9.32564	0.40677	0.00016	0.00016	445.85000

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 Monument and Preserve	598,733
Bering Land Bridge National Preserve	2,659,784
Cape Kursenstern National Monument	642,870
Denali National Park	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 Historic 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
Wrangell-St. Elias National Park and Preserve	13,133,197
Yukon-Charley Rivers National Preserve	2,519,662
Total Acreage	53,720,743

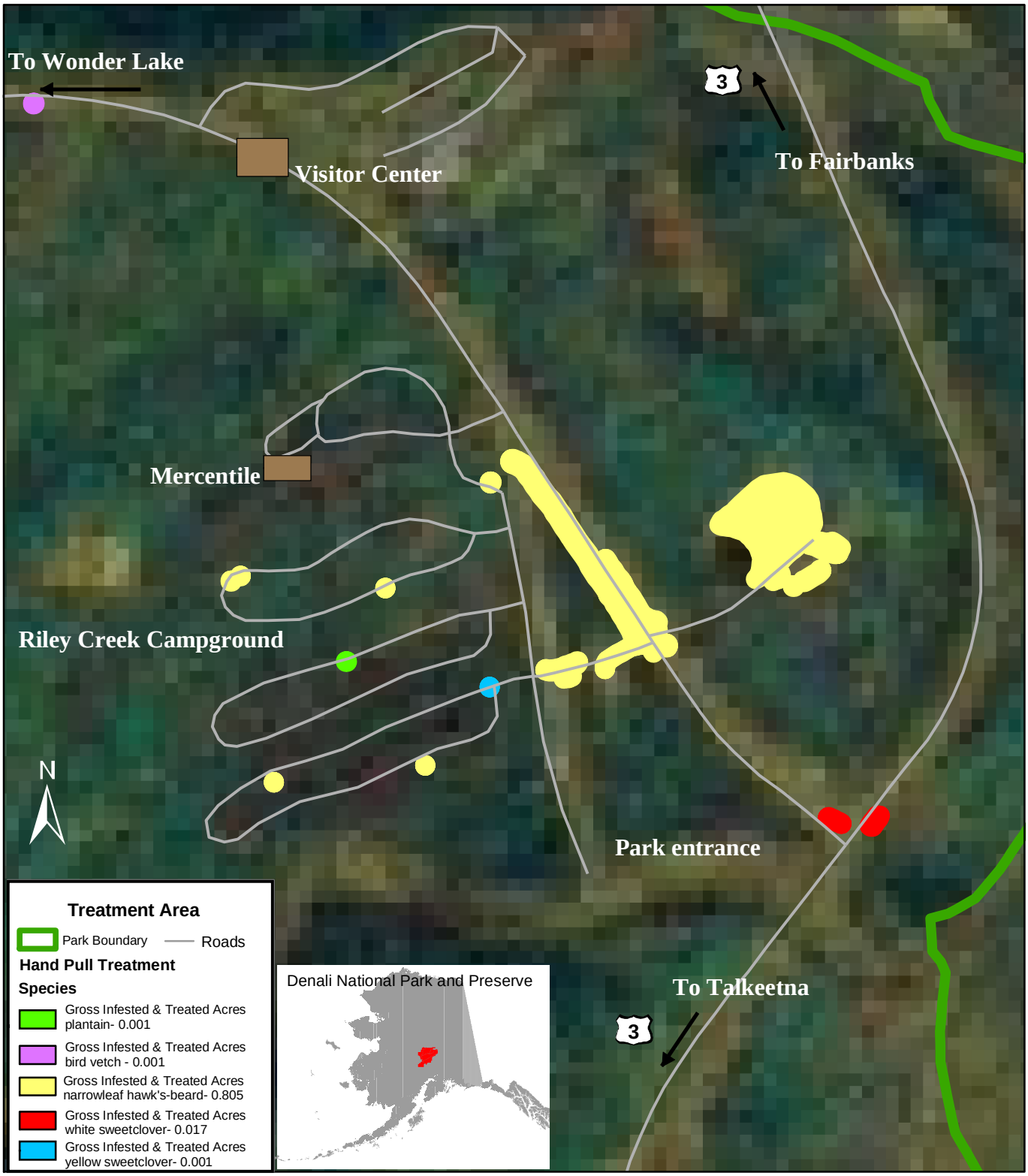
Source: ESRI and NRID
Date: 24 Nov 03

0 285,000 570,000 1,140,000 Meters

Calculations based on Alber Conical Equal Area projection

First Mile of Park Road
Denali National Park and Preserve
Alaska EPMT

National Park Service
U.S. Department of the Interior



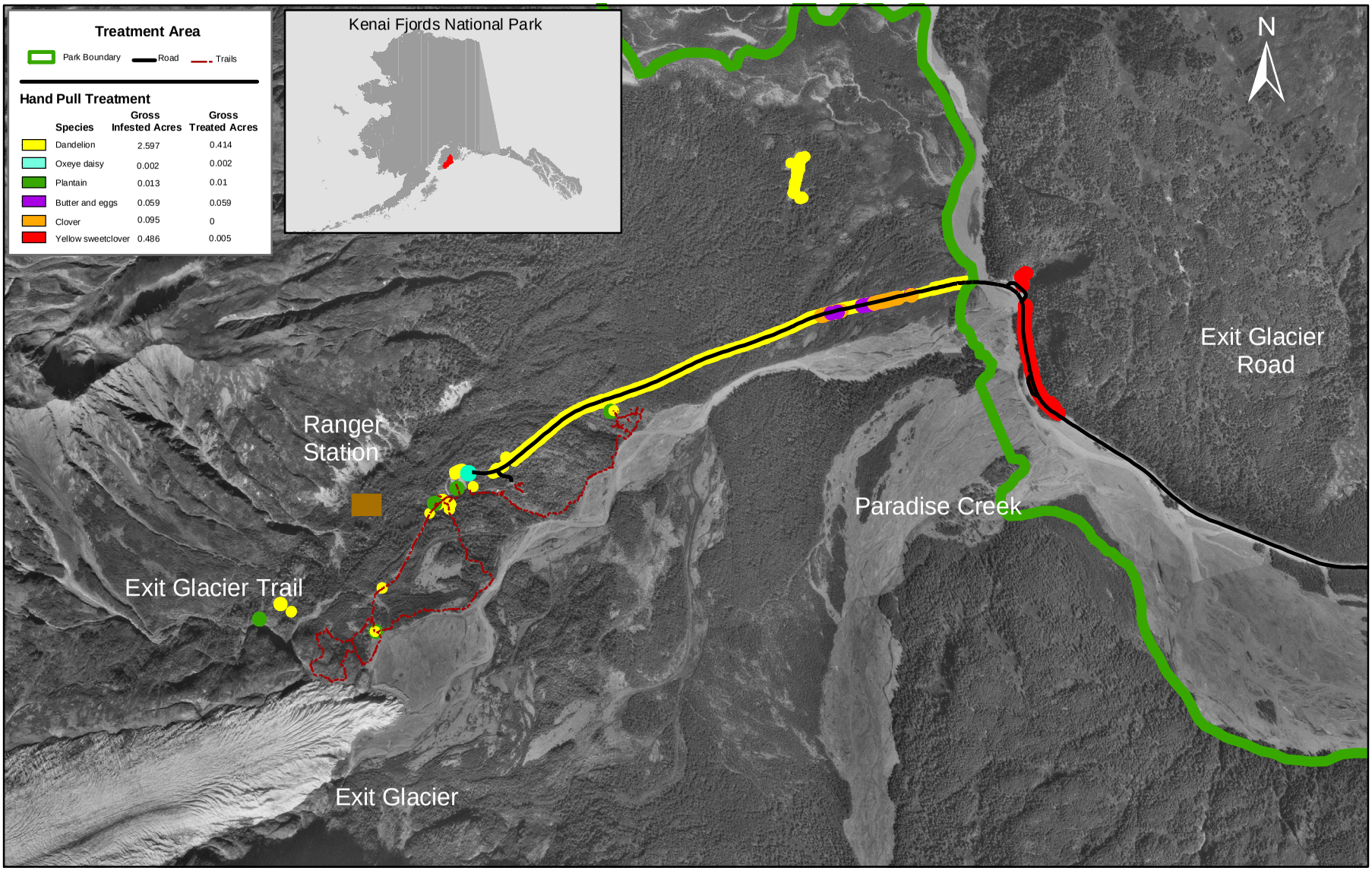
Source: USGS Healy C-4 (1:63,000), NPS Park Boundary, Alaska coverages collected with Trimble GPS Receiver
Date: 12 Nov 04

Scale - 1:7,000

Coordinate System - Albers_NAD_27

Exit Glacier -- Kenai Fjords National Park
Alaska EPMT

National Park Service
U.S. Department of the Interior



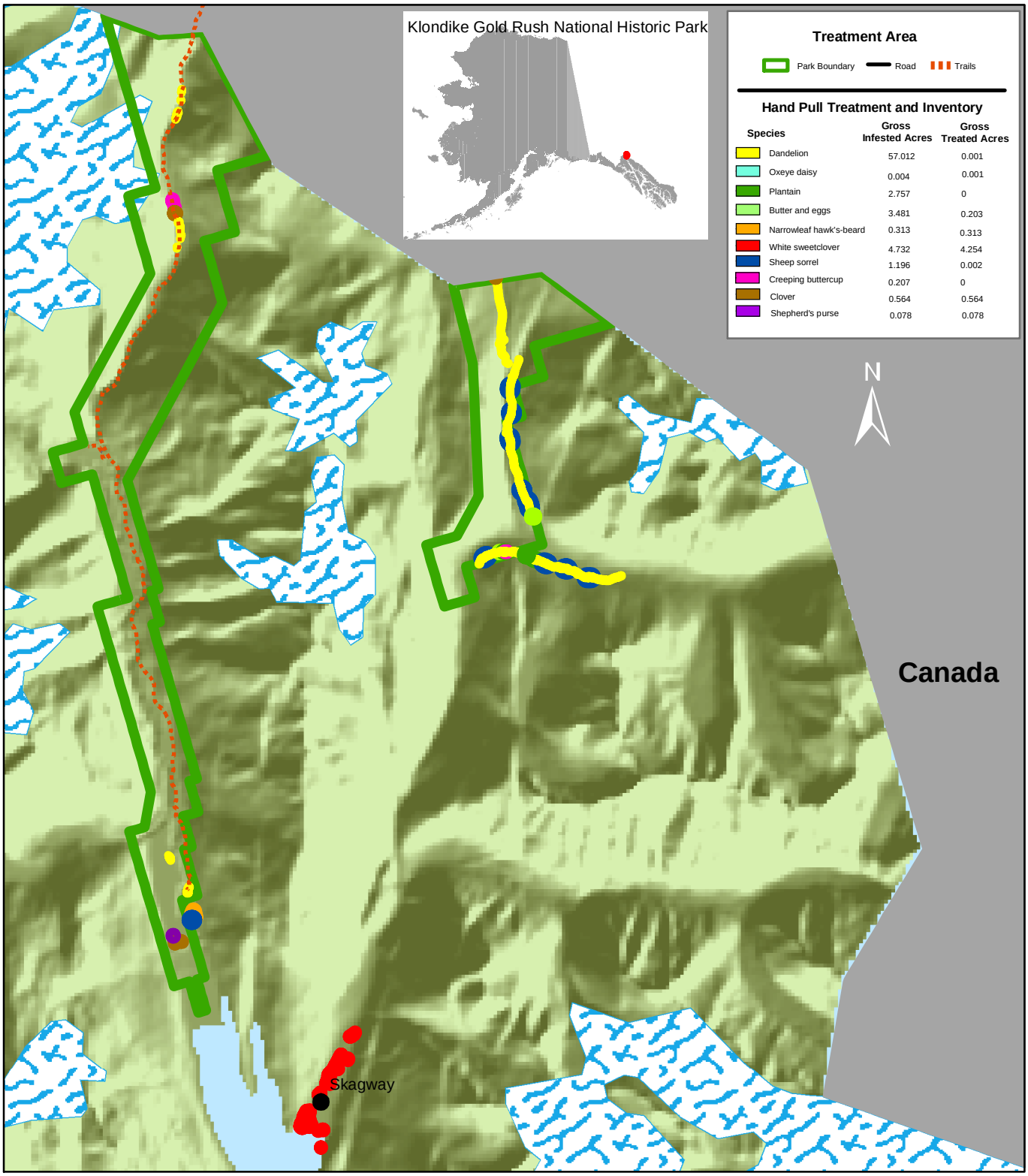
Source: USGS DOQQ Kenai Peninusla 1 meter res. 2000, NPS Park Boundary, Alaska coverages collected with a Trimble GPS receiver
Date: 12 Nov 04

Scale - 1:22,000

Coordinate System - Albers_NAD_27

Klondike Gold Rush National Historic Park
Alaska EPMT

National Park Service
U.S. Department of the Interior



Source: USGS Skagway B-1 & C-1 (1:63,000) , NPS Park Boundary, Aklask coverages collected with Trimble GPS Receiver"
Date: 12 Nov 04

Scale - 1:119,150

Coordinate System - Albers_NAD 27

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 NRA

Accomplishments

Inventoried Acres	3930
Gross Infested Acres	3658
Infested Acres	59
Treated Acres	54
Monitored Acres	8
Retreated Acres	2
Restored Acres	5
Controlled Acres	0
Time Lost Due to Injury	0

European beachgrass removal at Redwoods National Park

Fiscal year 2004 proved to be yet another exciting, challenging and successful year for the California EPMT. Efforts this year focused on partnering with different agencies, expanding the team using volunteers, and improving our data management and analysis.

The team was able to partner with the Student Conservation Association (SCA) to significantly expand the capacity of the team. This enabled the team to test the use of a satellite exotic plant team and the value of adding a data manager. This staffing modification allowed for more flexible and numerous treatments and efficient placement of personnel. The addition of a data manager has enabled us to begin synthesizing data as a tool for adaptive management.

The first assignment for the satellite SCA EPMT was a month-long stint at Sequoia and Kings Canyon National Parks. The 4-person crew was provided precise mapping that guided their methodical reduction efforts to bring fox glove, bull thistle, and mullein under control. The match of this team to the project level was ideal and provided the new crew members an opportunity to experience the inspiration of working to protect Kings Canyon and Grant Sequoia Grove. They inventoried and removed the target invasives from over 523 acres in this relatively short period of time. By supplementing the Sequoia-Kings National Park Invasive Species Program with this effort, their base-funded team was able to survey and control invasives on 2600 acres that were recently burned. Without this extra effort, one of the two projects would not have been possible.

In January 2004, the team's Steering Committee recommended the EPMT schedule time to accommodate rapid-response partnership efforts. This shift positioned the team such that we were able to respond to requests from Santa Monica National Recreation Area and Golden Gate National Recreation Area for emergency rehabilitation work on post-fire sites with high infestation potential. The Golden Gate Mt. Tam Fire burned 13 acres of eucalyptus within the "wildland-urban interface." As the fire crews felled the partially burned trees, the EPMT followed up with a focused cut-stump treatment. This partnership building on invasive species projects serves as a win-win for fire managers, invasive species managers, neighboring communities, and the resources. The park currently has efforts underway to restore this important area to native oak-grassland habitat.

In year three the team has found the program evolving on multiple fronts. As our expertise has grown, parks are seeking out our assistance to help develop long-term strategies for reduction. In a particularly challenging Himalayan blackberry population invading the highly prized Mirror Lake meadow in Yosemite National Park, we have been asked to assist the park with the development of a long-term management strategy and implementation.

Target Weed Species

bull thistle
kikuyu grass
bluegum eucalyptus
wooley mullein
foxglove
jubata (pampas) grass
salsify
perennial pepperweed
harding grass
sweet fennel

California EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
bull thistle (Cirsium vulgare)	883.67403	883.70140	7.73464	7.64732	0.00000	0.00000	803.74330
kikuyu grass (Pennisetum clandestinum)	7.005000	7.005000	6.012600	5.034800	0.00000	0.00000	48.50000
bluegum eucalyptus (Eucalyptus globulus)	48.14800	47.19999	6.09545	4.978490	0.37806	0.44640	636.03540
woolly mullein (Verbascum thapsus)	282.23680	285.14680	4.54486	4.52607	0.00000	0.00000	243.36999
foxglove (Digitalis purpurea)	174.03360	165.39160	4.13112	4.11031	0.00000	0.00000	306.19160
jubata (pampas) grass (Cortaderia jubata)	441.83936	241.39077	4.52776	3.80840	3.69660	0.71468	96.72330
salsify (Tragopogon dubius)	631.93400	631.93400	3.37937	3.37937	0.00000	0.00000	173.17830
perennial pepperweed (Lepidium latifolium)	4.70408	4.69850	2.88128	2.88128	0.00000	0.00000	135.25000
harding grass (Phalaris aquatica)	29.21600	18.16600	2.79174	2.60890	0.00000	0.00000	180.84490
sweet fennel (Foeniculum vulgare)	88.08660	88.08648	2.53838	2.37698	0.05999	0.10139	172.25630
Top Ten Total	2590.87747	2372.72054	44.63720	41.35192	4.13465	1.26247	2796.09309
other species	1339.69085	1285.69756	13.96085	12.54037	3.94165	0.65244	6631.29690
FY04 Totals	3930.56832	3658.41810	58.59805	53.89229	8.07630	1.91491	9427.38999

California Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

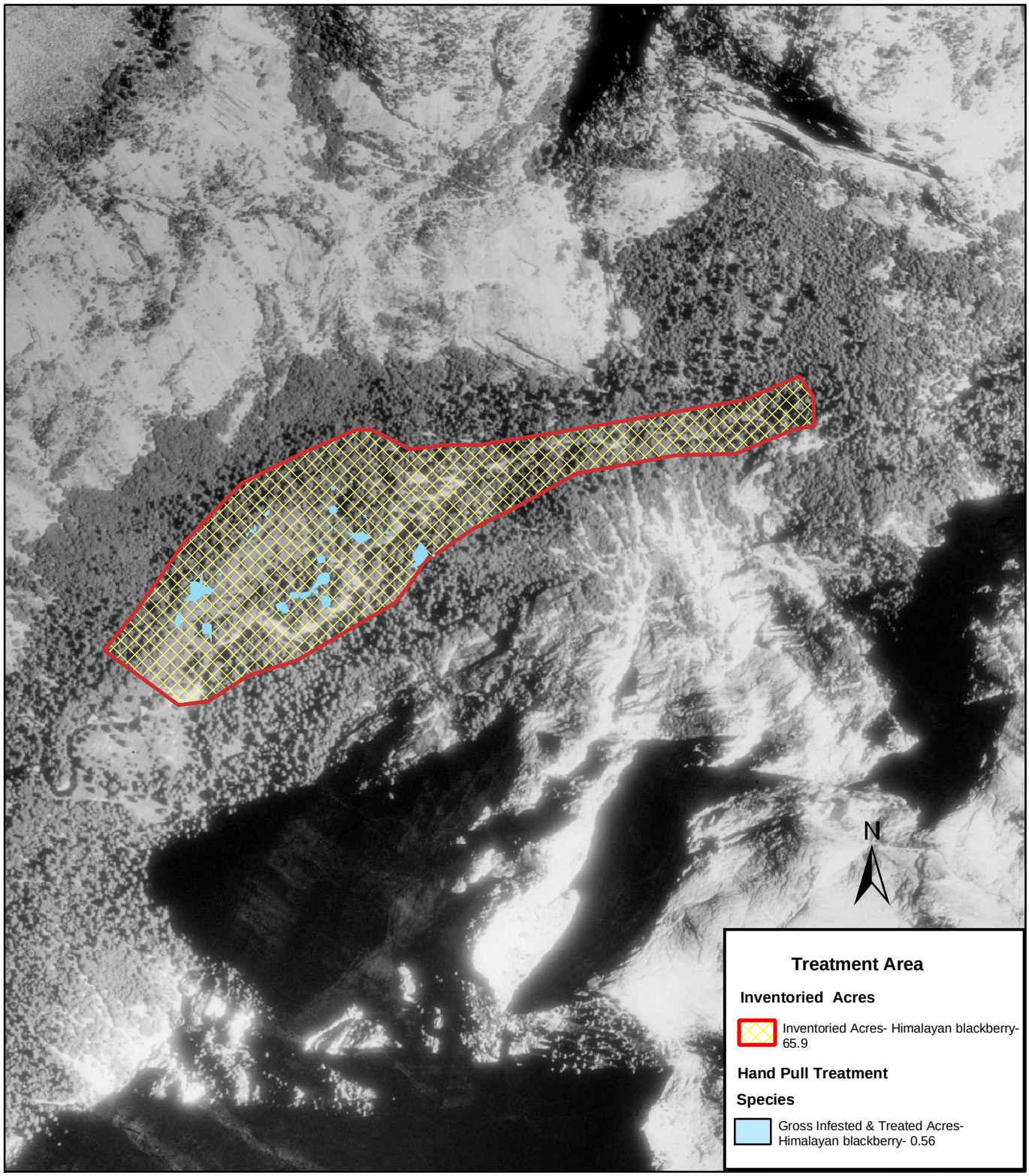
Parks	Acres
Cabrillo National Monument	158
Channel Islands National Park	242,286
Devils Postpile National Monument	786
Golden Gate National Recreation Area	75,873
John Muir National Historic Site	341
Lassen Volcanic National Park	106,169
Point Reyes National Seashore	66,200
Redwood National Park	114,565
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 NRID
Date: 24 Nov 03

Mirror Lake, Yosemite National Park
California EPMT

National Park Service
U.S. Department of the Interior



Source: USGS DOQQ Yosemite Falls,
CA coverages collected with Trimble GPS Receiver
Date: September 8-15, 2004

Scale - 1:10,804

Coordinate System - UTM_Zone 11N_NAD 83

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	1128
Gross Infested Acres	632
Infested Acres	56
Treated Acres	44
Monitored Acres	1.1
Retreated Acres	.38
Restored Acres	.28
Controlled Acres	0
Time Lost Due to Injury	0

Cutting the Last Tamarisk at Bent's Fort national Historic Site

The Chihuahuan Desert, Southern Shortgrass Prairie, Exotic Plant Management Team (CDSP-EPMT) culminated a successful year; eliminating two exotic plant species from two national parks.

Washita Battlefield National Monument is located near Cheyenne, Oklahoma along the Washita River. The main focus of exotic plant management for this park is to restore the landscape to a short-grass prairie setting typical of the mid-1800's time-period memorialized by the General Custer-Chief Black Kettle battle. During FY04, the last of several acres of salt cedar, and Russian olive trees were eliminated from the banks of the Washita River, allowing the native grass-seeding to take hold and slowly change the face of the landscape.

Bent's Old Fort National Historic Site is located near La Junta, Colorado. The main focus of the exotic plant management for this park is to restore the landscape to a short-grass prairie setting typical of the mid-1800's, during which time Charles Bent operated the fort as a trading post on the Santa Fe Trail. The fort is situated on the Arkansas River which bisects the park property. Over the last several years, salt cedar slowly invaded the native riparian plant community, which is comprised of cottonwoods, willows and various sedges and grasses. Salt cedar spread throughout the park and up until ten years ago, salt cedar covered more than 400 acres of the park. Four years ago, through the implementation of the EMPT program, the CDSP-EPMT was able to join forces with Bent's Fort and several other partners to systematically treat the remaining several hundred acres of salt cedar. Through the EPMT assistance an additional 200 acres of salt cedar were virtually eliminated from the park. The project was deemed a success! On June 4, 2004, Bent's Fort NHS hosted a dedication ceremony with several dignitaries on hand to commemorate the cutting of the "last tamarisk."

Target Weed Species

African rue
buffelgrass
Canadian thistle
horehound
Malta star thistle
Russian knapweed
Russian olive
Scotch thistle
tamarisk (salt cedar)
yellow sweetclover

Chihuahuan Desert/Southern Shortgrass Prairie EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
African rue (Peganum harmala)	0.55000	0.54999	0.03349	0.03349	0.00000	0.00000	9.00000
buffelgrass (Pennisetum ciliare var. ciliare)	8.45510	7.68730	1.08210	1.82100	0.00000	0.00000	235.00000
Canada thistle (Cirsium arvense)	0.160000	0.160000	0.046000	0.046000	0.00000	0.00000	22.95000
horehound (Marrubium vulgare)	176.38519	48.13700	1.40930	0.826500	0.15600	0.15599	209.12500
Malta star thistle (Centaurea melitensis)	101.00850	57.31982	2.78173	2.783170	0.75000	0.00000	256.76660
Russian knapweed (Acroptilon repens)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Russian olive (Elaeagnus angustifolia)	0.78150	0.78150	0.39398	0.17000	0.22398	0.22398	62.75000
scotch thistle (Onopordum acanthium)	1.67000	0.00999	0.00249	0.00250	0.00000	0.00000	128.00000
tamarisk (salt cedar) (Tamarix ramosissima)	372.31060	284.56470	37.87530	29.91080	0.00473	0.00473	3004.15000
yellow sweetclover (Melilotus officinalis)	52.99000	0.00000	0.00000	0.00000	0.00000	0.00000	10.37500
Top Ten Total	714.31089	399.21030	43.62439	35.59346	1.13471	0.38470	3938.11660
other species	413.44946	233.04371	12.27050	8.76471	0.00000	0.00001	1099.48330
FY04 Totals	1127.76035	632.25401	55.89489	44.35817	1.13471	0.38471	5037.59990

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 NRID
Date: 29 Oct 04

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	759
Gross Infested Acres	731
Infested Acres	131
Treated Acres	120
Monitored Acres	.5
Retreated Acres	.12
Restored Acres	0
Time Lost Due to Injury	0

CPPF and CREC pose with Director Fran Mainella and officers of the NPF in front of the Ute Raid Panel, Canyon De Chelly NM, September 2004.

The Colorado Plateau-Petrified Forest Exotic Plant Management Team (CPPF EPMT) used AmeriCorps crews to control weeds at eight parks this year. The AmeriCorps crews were from the Utah Conservation Crew, associated with Utah State University in Logan, and the Coconino County Rural Environmental Corps (CREC) from Flagstaff, Arizona. Crews controlled weeds in Grand Canyon, Zion, Capital Reef, Timpanogos Cave, Pipe Spring, Bryce Canyon, Canyon De Chelly, and Petrified Forest National Parks and Monuments. The CPPF EPMT Team Liaison and two acting Crew Supervisors along with both Petrified Forest and Lake Mead EPMT personnel supplemented and assisted the crews.

Crews worked on removing exotic thistles, mullein, Russian olive, tamarisk, dalmation toadflax, spotted knapweed, hound's tongue, salsify and sweet clover. Most of the work involved hand pulling.

Eleven staff members deployed at Canyon De Chelly, including Acting Crew Supervisor Kristin Dorman-Johnson, PEFO Historical Architect Amanda Zeman, three LAME EPMT staff and six CREC crewmembers. The team controlled tamarisk and Russian olive that was determined to be an imminent threat on the historical Ute Raid Panel in Canyon Del Muerto. Members of the National Park Foundation (NPF), attending a meeting at Canyon De Chelly, visited this significant project site. Teams had the opportunity to speak and work directly with NPS Director Fran Mainella, Deputy Director Randy Jones and NPF Vice-Chairman David Rockefeller, Jr.

The new CPPF Team Liaison, Diane M. DobosBubno, started at host park Petrified Forest in October 2003. Kristin Dorman-Johnson acted as Crew Supervisor, serving a 60-day special need hire beginning September 7, 2004. Gary Ludwig, crew supervisor at Glacier National Park, acted as Crew Supervisor on the March Grand Canyon river project.

Consultation and project planning assistance provided to parks that included site visits were to Mesa Verde, Capitol Reef and Canyon De Chelly. In addition, this year the Liaison completed detail with the Lake Mead EPMT Liaison and attended the Arches deployment.

Target Weed Species in FY04

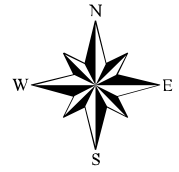
bull thistle
Canada thistle
Mullein
Russian olive
Russian thistle
scotch thistle
spotted knapweed
sweet clover
tamarisk (salt cedar)
western salsify

Colorado Plateau EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
bull thistle (Cirsium vulgare)	83.25000	83.25000	20.76250	20.76250	0.00000	0.00000	480.00000
Canada thistle (Cirsium arvense)	6.000000	6.000000	0.900000	0.900000	0.00000	0.00000	212.33300
woolly mullein (Verbascum thapsus)	83.25000	83.25000	20.76250	20.762500	0.00000	0.00000	480.00000
Russian olive (Elaeagnus angustifolia)	14.75000	14.75000	0.63750	0.63750	0.00000	0.00000	238.37500
Russian thistle (Salsola kali)	16.44900	16.44900	7.78870	0.22620	0.00000	0.00000	76.50000
scotch thistle (Onopordum acanthium)	83.00000	83.25000	20.76250	20.76250	0.00000	0.00000	480.00000
spotted knapweed (Centaurea ssp.)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
sweet clover (Melilotus ssp.)	6.00000	6.00000	1.80000	1.80000	0.00000	0.00000	212.33300
tamarisk (salt cedar) (Tamarix ramosissima)	274.66784	246.16784	16.62869	16.11322	0.50000	0.12469	1539.62500
western salsify (Tragopogon dubius)	6.00000	6.00000	1.50000	1.50000	0.00000	0.00000	212.33330
Top Ten Total	573.36684	545.11684	91.54239	83.46442	0.50000	0.12469	3931.49930
other species	185.26201	186.06200	40.02450	36.11252	0.00000	0.00000	281.00070
FY04 Totals	758.62885	731.17884	131.56689	119.57694	0.50000	0.12469	4212.50000

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
Bryce Canyon National Park	35,763
Canyon de Chelly National Monument	91,789
Chaco Culture National Historic Park	34,505
Colorado National Monument	20,194
Curecanti National Recreation Area	40,572
El Malpais National Monument	116,221
El Morro National Monument	1,030
Glen Canyon national Recreation Area	1,238,290
Hovenweep National Monument	797
Petrified Forest national Park	94,430
Rainbow Bridge National Monument	161
Sunset Crater Volcano National Monument	3,021
Timpanogos Cave National Monument	246
Walnut Canyon National Monument	3,631
Total Acreage	1,734,726

Source: ESRI and NRID
Date: 24 Nov 03

0 130,000 260,000 520,000 Meters

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Florida / Caribbean Partnership

Exotic Plant Management Team

Partner Parks and states: Gulf Islands NS, FL;Timucuan EHP, FL; Caroline NM, FL; Castillo De San Marcos NM, FL; Ft. Matanzas NM, FL; Canaveral NS, FL; Biscayne NP, FL; Everglades NP, FL; Big Cypress NP, FL; Dry Tortugas NP, FL; Virgin Islands NP, USVI; Christainsted NHS, USVI; Buck Island Reef NM, USVI; Salt River Bay NHP and EP, USVI

Accomplishments

Inventoried Acres	56,755
Gross Infested Acres	56,246
Infested Acres	55,642
Treated Acres	2446
Monitored Acres	0
Retreated Acres	0
Restored Acres	0
Controlled Acres	0
Time Lost Due to Injury	0

Treating Melaluca in Everglades National Park

Florida and Caribbean islands share the unique trait of being located in the tropical climate zone. Many invasive exotic plants are adapted and highly successful in this no-freeze zone and tend to have few limiting constraints. Species such as Melaleuca and Brazilian Pepper have the ability to displace or completely out-compete native plant species. Areas of coastal mangrove habitat, cypress domes, and marl prairies are threatened by these exotics in Florida. Caribbean habitats such as dry tropical forest and seasonal deciduous forest are equally threatened by tropical invasive exotic plants.

Since 2000, the EPMT program in Florida has been a ground breaking partnership with the State of Florida's Department of Environmental Protection (DEP) Upland Invasive Plant Management Program. The Upland Invasive Plant Management Program was established in 1997 to curb the spread of exotic pest plants on public conservation lands. Through this program, the state partners, with over 400 public land managers, work together to control and manage the spread of invasive exotic plants. Exotic plant control projects are selected through regional working groups with on the ground control provided by private contractors through service contracts. Under the DEP/NPS partnership, the NPS submits invasive exotic plant control projects to the DEP. The projects selected for funding are accomplished using private contractors and the associated costs are shared between the agencies.

In 2003, the Florida EPMT Partnership name was changed to include the Caribbean as a result of an expansion including the park units located in the U.S. Virgin Islands. This expansion was facilitated by a cooperative agreement with the University of Florida through a grant from the USDA Tropical and Subtropical Agricultural Research Program.

Some major accomplishments include:

- Cooperative agreement with the South Florida Water Management District (SFWMD) for mapping of exotic plants on 8 million acres of natural areas in south Florida.
- Secured four years of USDA-ARS funding through the SFWMD to map invasive plants in the Bahamas and survey all Caribbean regions for Melaleuca as part of the Area-wide Management Evaluation of Melaleuca quinquenervia (TAME) Project.
- Received $542,704 in Department of Interior Cooperative Cost Share funding for exotic plant control in FY 2003 in addition to $423,000 from FL DEP and $411,112 from EPMT.
- Initiating international partnerships to share technical information and conduct joint control projects throughout the Caribbean.

The Florida/Caribbean EPMT Partnership encompasses a large area containing 14 parks. The tropical and sub-tropical climate creates the need for perpetual monitoring and continued treatment and retreatment of these protected areas. The partnership methodology has been successfully employed throughout the region and has accomplished landscape-scale projects such as the eradication of most of the mature Melaleuca from the 729,000-acre Big Cypress National Preserve. The Florida/Caribbean EPMT partnership constantly adapts to successfully meet new challenges in regional invasive exotic plant control and management.

Target Weed Species

Australian pine
Brazilian pepper tree
Chinese tallow
guinea grass
leatherleaf
limeberry
mahoe (sea hibiscus)
melaleuca
old world climbing fern
wild tamarind

Florida / Caribbean Partnership EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres
Australian pine (Casuarina equisetifolia)	6243.00000	6242.99990	6242.99900	232.75997	0.00000	0.00000
Brazilian pepper tree (Schinus terebinthifolius var. raddianus)	3274.76000	3274.75990	2988.25990	402.88579	0.00000	0.00000
Chinese tallow (Triadica sebifera)	0.000000	0.000000	0.000000	0.000000	0.00000	0.00000
guinea grass (Urochloa maxima)	452.25000	303.25000	213.25000	82.068750	0.00000	0.00000
leatherleaf (Colubrina asiatica)	361.36000	361.36000	361.36000	62.860800	0.00000	0.00000
limeberry (Triphasia trifolia)	0.00000	0.00000	0.00000	0.000000	0.00000	0.00000
mahoe (sea hibiscus) (Hibiscus tiliaceus)	18.00000	18.00000	18.00000	1.62000	0.00000	0.00000
melaleuca (Melaleuca quinquenervia)	42438.00000	42438.00000	42438.00000	1273.14000	0.00000	0.00000
old world climbing fern (Lygodium microphyllum)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
wild tamarind (Cojoba arborea)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Top Ten Total	52787.37000	52638.36980	52261.86890	2055.33531	0.00000	0.00000
other species	3968.09000	3608.04007	3380.03110	390.17398	0.00000	0.00000
FY04 Totals	56755.46000	56246.40987	55641.90000	2445.50929	0.00000	0.00000

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 NRID
Date: 24 Nov 03

EPMT-2004-1, Canaveral National Seashore
Florida Caribbean Partnership EPMT

National Park Service
U.S. Department of the Interior

Source: USGS DOQQ Falls Cape 99,
FLC coverages collected with Trimble GPS Receiver
Date: 17 Nov 04

Scale - 1:34,400

Coordinate System - UTM_Zone 17N_NAD 83

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	334
Gross Infested Acres	77
Infested Acres	19
Treated Acres	15
Monitored Acres	0
Retreated Acres	.14
Restored Acres	0
Controlled Acres	0
Time Lost Due to Injury	0

Removal of Lyme Grass on North Manitou Island, Sleeping Bear Dunes National Lakeshore.

The Great Lakes Exotic Plant Management Team (GL-EPMT) serves eight partner 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 for Inventory and Monitoring (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.

In January 2004, during the second year of the GL-EPMT funding, a permanent Team Liaison was hired. A seasonal crew of four Student Conservation Association (SCA) interns began work in June. The team also shares a Data Manager and an Administrative Assistant with the I&M program.

With many ecoregions, habitat types, and levels of human impact in this network, the team faces different challenges at each park. In the pristine wilderness of Isle Royale National Park, the emphasis is on preventing seed input through installation of boot brushes on boat docks and early detection and rapid removal of plant populations consisting of a few individuals. This year at Voyageurs National Park, a park consisting largely of lakes and wetlands, the team combed the bays and inlets for residual populations of purple loosestrife. Work in Mississippi National River, an urban park, has focuses on cooperative efforts with the many city and county park units in the watershed. In Indiana Dunes National Lakeshore, a mosaic of public and private land near Chicago, IL and Gary IN which hosts over 100 non-native plant species, the focus is to prevent newly identified invaders, such as Lyme Grass, from establishing on the dunes.

The GL-EPMT has benefited from the SCA partnership and will continue to use SCA interns as it works toward long-term goals of control, monitoring, and restoration in this region.

Target Weed Species

baby's breath
common buckthorn
common reed
garlic mustard
hawkweed orange
Japanese honeysuckle
Japanese knotweed
leafy spurge
purple loosestrife
spotted knapweed

Great Lakes EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
baby's breath (Gypsophila paniculata)	3.14106	3.14106	0.47115	0.47115	0.00000	0.00000	72.00000
common buckthorn (Rhamnus cathartica)	12.85879	13.72050	3.31907	2.20012	0.00000	0.00000	182.33928
common reed (Phragmites australis)	10.900060	0.321600	0.026785	0.026115	0.00000	0.00000	8.22351
garlic mustard (Alliaria petiolata)	7.60438	6.18472	3.90632	3.902660	0.00000	0.00000	229.00000
hawkweed orange (Hieracium aurantiacum)	1.46456	0.22743	0.04056	0.040560	0.00000	0.00000	91.16666
Japanese honeysuckle (Lonicera japonica)	0.00000	0.00000	0.00000	0.000000	0.00000	0.00000	0.00000
Japanese knotweed (Polygonum cuspidatum)	1.16893	0.49349	0.30570	0.29856	0.00000	0.00000	16.83333
leafy spurge (Euphorbia esula)	3.79771	2.31403	0.70818	0.70818	0.00000	0.00000	65.75000
purple loosestrife (Lythrum salicaria)	13.12250	1.38912	0.10947	0.10947	0.00000	0.00000	142.69397
spotted knapweed (Centaurea biebersteinii)	33.38219	3.85899	1.14268	1.09694	0.00000	0.00000	253.86111
Top Ten Total	87.44018	31.65094	10.02992	8.85376	0.00000	0.00000	1061.86786
other species	246.75202	45.56314	8.94290	5.73137	0.00000	0.14407	1517.38214
FY04 Totals	334.19220	77.21408	18.97282	14.58513	0.00000	0.14407	2579.25000

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

0 85,000 170,000 340,000 510,000 Meters

Source: ESRI and NRID
Date: 24 Nov 03

Gulf Coast

Exotic Plant Management Team

Partner parks and states: Palo Alto Battlefield NHS, TX; Padre Island NS, TX; San Antonio Missions NHP, TX; Big Thicket NPr, TX; Jean Lafitte NHP and Pr, LA; Vicksburg NMP, MS; Natchez Trace Parkway, MS, Gulf Islands NS, MS.

Accomplishments

Inventoried Acres	24,725
Gross Infested Acres	15,977
Infested Acres	208
Treated Acres	131
Monitored Acres	85
Retreated Acres	17
Restored Acres	0
Controlled Acres	0
Time Lost Due to Injury	0

Gulf Coast Exotic Plant Management team working on a Kudzu control project at Vicksburg NMP in Vicksburg, MS.

This was the Gulf Coast Exotic Plant Management Team's (GC-EPMT) second full season. Fieldwork began in May, after two weeks of team training, and continued uninterrupted through the end of the fiscal year. This year's team was patterned after the successful FY03 team model with the addition of one new position.

The team's approach and strategy varied depending on the prevailing conditions at each of the eight partner parks. Growing season of each of the target species was the major controlling factor followed by the degree of infestation at each park. Small isolated populations of target species were given priority, followed by difficult to control species which will require multi-year control efforts. This strategy was employed to both stop new infestations before they became a major problem and ensure that the existing difficult infestations received initial treatments. To that end, in FY04 the GC-EPMT removed an isolated population of buffel grass at Padre Island National Seashore and started treatments on the majority of the known populations of kudzu in our region.

The team loves a challenge and invested a considerable percentage of this year's energy developing control methods for kudzu which is prevalent at two of the partner parks. Kudzu is a particularly persistent and difficult to control species in our area.

Targeted species for future control efforts in the gulf coast region include: 1) Chinese tallow which has become a major problem in the Big Thicket National Preserve and Jean Lafitte National Historic Park and poses a similar threat to the Gulf Island National Seashore, 2) Chinese privet and Japanese honeysuckle which are of greatest concern in the Big Thicket National Preserve and Gulf Island National Seashore, 3) Chinaberry which is of greatest concern in the San Antonio Missions National Historical Park, 4) cogon grass which is becoming an increasing problem at most of the GC-EPMT partner parks, particularly Gulf Islands National Seashore, and 5) kudzu which is the most prevalent exotic plant pest of the Natchez Trace Parkway and Vicksburg National Military Park.

The GC-EPMT has been involved in several outreach programs this year including students from Saint Michaels University and local elementary schools. Additionally, the GC-EPMT has joined into a research partnership with Rice University to develop "best management practices" for control of Chinese tallow tree in the Gulf Coastal Plan region.

Target Weed Species

Brazilian pepper
chinaberry
Chinese privet
Chinese tallow
cogon grass
giant reed
glossy privet
Japanese climbing fern
kudzu
saltcedar

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
Brazilian pepper (Schinus terebinthifolius var. raddianus)	0.00000	0.00000	0.00000	0.04387	0.00000	0.00000	50.00000
chinaberry (Melia azedarach)	2690.50000	2249.50000	17.82250	19.73312	22.50000	0.10125	363.33333
Chinese privet (Ligustrum sinense)	1029.000000	4.000000	0.045000	0.314625	0.00000	0.00000	35.25000
Chinese tallow (Triadica sebifera)	11943.70000	5324.00045	65.77844	7.995690	1.55555	0.23458	1316.41666
cogon grass (Imperata cylindrica)	0.00000	0.00000	0.00000	0.000000	0.00000	0.00000	0.00000
gaint reed (Arundo donax)	17.00000	5.00000	0.22500	1.451999	0.00000	0.00000	159.00000
glossy privet (Ligustrum lucidum)	52.50000	44.50000	7.85000	10.29563	22.50000	0.05000	226.66666
Japanese climbing fern (Lygodium japonicum)	6180.00000	6180.00000	7.27000	0.83500	0.00000	0.00000	240.00000
kudzu (Pueraria montana var. lobata)	86.00000	61.45999	53.23849	64.42408	33.39567	14.93655	1409.00000
tamarisk (salt cedar) (Tamarix ramosissima)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Top Ten Total	21998.70000	13868.46044	152.22943	105.09401	79.95122	15.32238	3799.66665
other species	2725.80000	2108.04956	55.67251	25.53627	4.84753	2.01000	549.83335
FY04 Totals	24724.50000	15976.51000	207.90194	130.63028	84.79875	17.33238	4349.50000

Gulf Coast Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

34

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

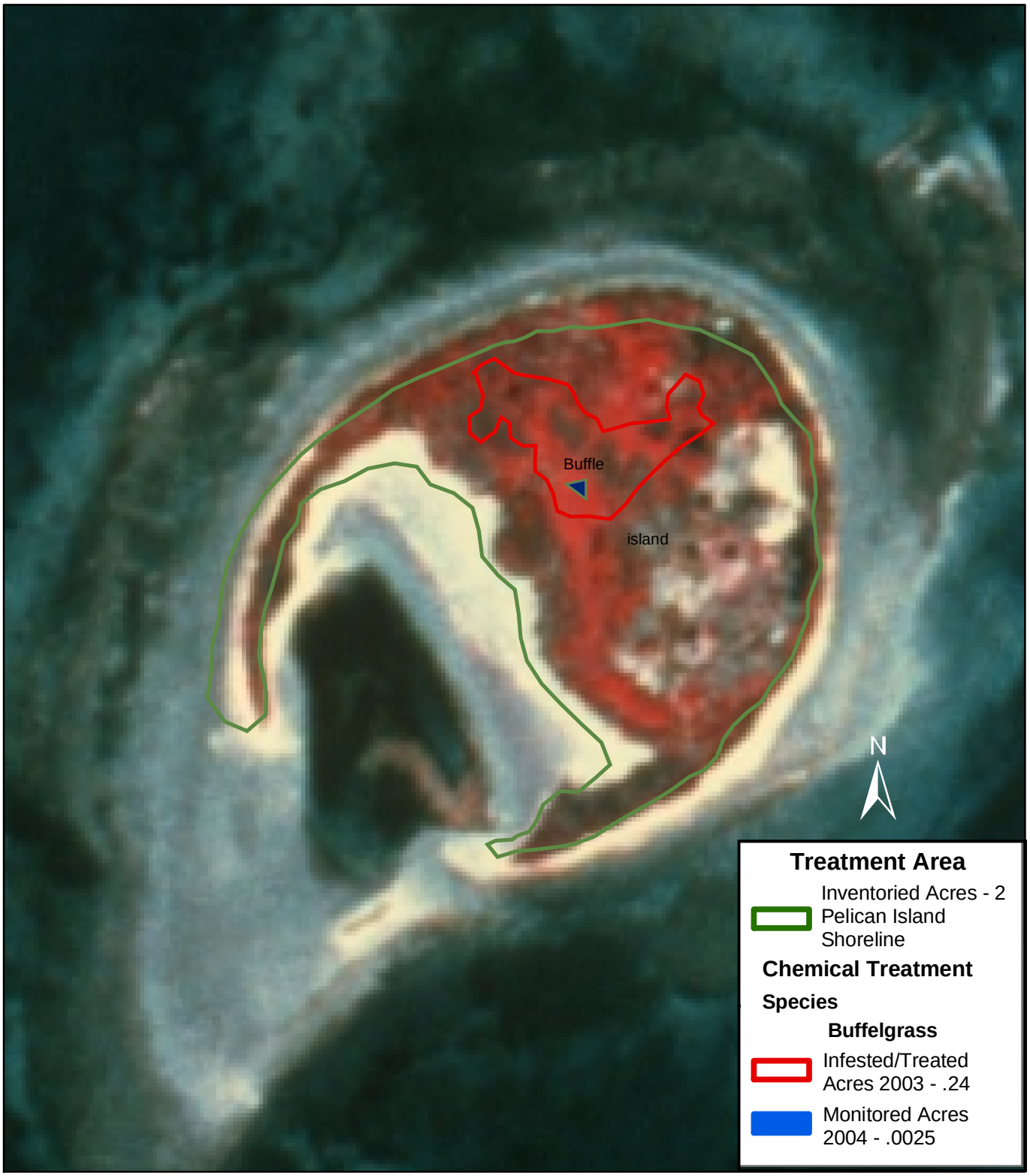
Source: ESRI and NRID
Date: 24 Nov 03

0 90,000 180,000 360,000 540,000 Meters

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Pelican Island- Padre Island National Seashore
Gulf Coast EPMT

National Park Service
U.S. Department of the Interior



Source: USGS DOQQ Pelican Island MrSID, NPS Park Boundary, GC coverages collected with Trimble GPS Receiver
Date: 29 Nov 03

Scale - 1:1,400

Coordinate System - UTM_Zone 14N_NAD 83

Lake Mead

Exotic Plant Management Team

Partner Parks and states: Arches NP, UT; Cedar Breaks NM, UT; Canyonlands NP, UT; Capitol Reef NP, UT; Death Valley NP, CA; Dinosaur NM, CO/UT; Grand Canyon NP, AZ; Great Basin NP, NV; Hovenweep NM, UT; Hubbell Trading Post NHS, AZ; Joshua Tree NP, CA; Manzanar NHS, CA; Mesa Verde NP, CO; Mojave NP, CA; Natural Bridges NM, UT; Parashant NM, AZ; Pipe Spring NM, AZ; Yucca House NM, CO; Zion NP, UT

Accomplishments

Inventoried Acres	4274
Gross Infested Acres	2724
Infested Acres	189
Treated Acres	136
Monitored Acres	1086
Retreated Acres	85
Restored Acres	0
Controlled Species	0
Time Lost Due to Injury	0

Removal of tamarisk reduces hazard fuels and allows for adjacent cottonwood trees to recover at Courthouse Wash, Arches National Park, Utah.

The Lake Mead Exotic Plant Management Team (EPMT) and its partners have continued to target weeds that invade riparian and wetland habitats. Riparian and spring-fed wetlands are the most unique and valuable habitats in the arid West. They provide rare water sources for wildlife and support diverse plant communities. These water dependent communities also act as evolutionary islands that support many rare and endemic species. Unfortunately, even these habitats that are in good functioning condition are not immune to weed invasion. It is especially important to maintain the biological integrity of these communities by removing weeds within the National Park Units.

Tamarisk or saltcedar is a widespread invader of riparian areas throughout the West. It consumes vast amounts of water and displaces native plant and animal communities that depend on the limited water for survival. Tamarisk and other exotic plants commonly form dense impenetrable thickets that exclude wildlife and add salts to the soil surface inhibiting native plant recruitment. Fortunately, controlling tamarisk and other riparian exotic species has proven to be an effective habitat restoration method.

The Lake Mead EPMT uses low impact, selective weed control methods that do not harm adjacent desirable vegetation. Native plants usually recover quickly following the removal of the weed plants without active revegetation. When necessary, the team has successfully transplanted hundreds of native trees after exotic plant control. Site recovery is facilitated by a reduction in competition and an increase in soil moisture from the removal of weed trees. Follow up site monitoring and re-treatment has primarily been conducted by local park staffs.

The Lake Mead EPMT obtains supplemental funding from other agencies and local entities. Partnerships have been developed to promote watershed based weed management. Partners include the Southern Nevada Water Authority, Bureau of Land Management, US Forest Service, US Fish and Wildlife Service and Clark County, NV. New partnerships are with the City of Henderson, NV and with the newly established USFWS Colorado River EPMT. Funds from these partners have enabled the Lake Mead EPMT to hire more crewmembers and work on a watershed basis surrounding Lake Mead National Recreation Area. Larger crews also accomplish more weed treatment while at partner park units within a limited time frame. The team also coordinated the first nation wide all EPMT deployment and training project at Arches NP in March

Target Weed Species

ailanthus (tree of heaven)
arundo (giant reed)
camelthorn
dandelion common
fountain grass
houndstongue common
perennial pepperweed
Russian knapweed
Russian olive
tamarisk (salt cedar)

Lake Mead EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
ailanthus / tree of heaven (*Ailanthus altissima*)	6.25700	6.17999	0.69500	0.07700	0.00000	0.00000	20.00000
arundo (gaint reed) (Arundo donax)	300.29185	300.29184	0.42684	0.10785	0.12674	0.14057	268.25000
camelthorn (Alhagi pseudalhagi)	916.200000	310.299990	37.699990	5.800000	0.00000	6.00000	700.00000
dandelion common (Taraxacum officinale)	0.00000	0.00000	0.00000	0.000000	0.17659	0.00000	28.00000
fountain grass (Pennisetum setaceum)	0.00000	44.19000	0.00000	0.000000	291.39290	29.59068	1471.00000
houndstongue common (Cynoglossum officinale)	55.82100	63.01200	1.81599	1.81600	20.49399	9.43485	90.87500
perennial pepperweed (Lepidium latifolium)	1263.22197	981.12396	6.06040	0.00297	708.82142	11.28635	1878.32500
Russian knapweed (Acroptilon repens)	0.14730	0.11999	0.14729	0.14730	0.54070	0.54070	51.55000
Russian olive (Elaeagnus angustifolia)	761.19500	229.29490	6.52512	6.40512	5.72700	0.31460	2517.58333
tamarisk (salt cedar) (Tamarix ramosissima)	733.16320	571.69790	45.71680	38.58680	15.98700	2.41590	12121.54990
Top Ten Total	4036.29732	2506.21057	99.08743	52.94304	1043.26634	59.72365	19147.13323
other species	237.59918	218.00163	90.05009	83.54884	42.75113	25.70684	1212.06667
FY04 Totals	4273.89650	2724.21220	189.13752	136.49188	1086.01747	85.43049	20359.19990

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
Canyonlands National Park	331,348
Capitol Reef National Park	241,510
Cedar Breaks National Monument	6,038
Death Valley National Park	3,371,001
Dinosaur National Monument	208,656
Grand Canyon National Park	76,351
Great Basin National Park	1,197,517
Hovenweep National Monument	797
Hubbell Trading Post National Historic Site	161
Joshua Tree National Park	790,689
Lake Mead National Recreation Area	1,255,905
Manzanar National Historic Site	806
Mesa Verde National Park	52,694
Mojave National Park	1,529,963
Natural Bridges National Monument	7,324
Parashant National Monument	97,387
Pipe Spring National Monument	40
Yucca House National Monument	31
Zion National Park	146,403
Total Acreage	9,390,359

Source: ESRI and NRID
Date: 24 Nov 03

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Mid-Atlantic Cooperative

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; Hopewell Furnace NHS, PA; Petersburg NB, VA; Richmond NBP, VA; Shenandoah NP, VA; Thomas Stone NHS, MD; Valley Forge NHP, PA

Accomplishments

Inventoried Acres	3480
Gross Infested Acres	3053
Infested Acres	483
Treated Acres	388
Monitored Acres	123
Retreated Acres	10
Restored Acres	0
Controlled Acres	0
Time Lost due to Injury	5 hours

A cooperating landowner (second from left) stands with the Mid-Atlantic EPMT near a bamboo site. The EPMT is made up of NPS staff, Student Conservation Association interns, and private contractors (not pictured).

The Mid-Atlantic Cooperative is made up of twelve national parks in Virginia, Maryland, and Pennsylvania. Hallmarks of its operations are inter-park cooperation and collaboration with outside agencies and neighbors.

The Mid-Atlantic Cooperative is assisting the Commonwealth of Virginia by allowing the Team Liaison to sit on the state's Invasive Species Advisory Committee with the commission to devise a state-wide invasive species watch list and draft a state-wide strategic invasive species plan.

The Cooperative is within a diverse and highly productive region spanning the coastal plains of Chesapeake Bay, the vigorous Piedmont, and the hills and valleys of the Blue Ridge Mountains. Biological diversity of the region is one of the greatest in North America. Exotic vegetation threatens to destroy native diversity and ecosystem health by displacing natives and changing the complex web of interactions with simplified monocultures. Protecting the natural legacy of the region is essential to assure that future generations enjoy its expanse and beauty.

The Cooperative uses an integrated pest management approach where 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.

Highlights for FY04. »Controlled over 25 invasive species in twelve national parks totaling 388 acres. **»**Collaborated with Shenandoah National Park and a park neighbor to control bamboo along a mutual boundary. **»**Expanded the Cooperative's functional capacity by utilizing Student Conservation Association interns, volunteers, and initiating a private sector contract with excellent success. **»**Added one new park to the cooperative by using funds they provided for exotic plant control. **»**Hosted a Congressional field tour on the subject of forest health issues in cooperation with the USDA-Forest Service. **»**Minimized lost time due to accidents (5.0 hours) by implementing a well documented safety program. **»**Increased public awareness of invasive species issues by participating in five newspaper and magazine articles, publishing eight articles in professional journals and newsletters, speaking at four public or professional meetings, and creating three articles posted to NPS websites.

Target Weed Species

(ordered by the acreage treated)

ailanthus / tree of heaven (*Ailanthus altissima*)
oriental bittersweet vine (*Celastrus orbiculatus*)
multiflora rose (*Rosa multiflora*)
privet bush (*Ligustrum sinense*)
Japanese honeysuckle vine (*Lonicera japonica*)
Japanese barberry (*Berberis thunbergii*)
Japanese stiltgrass (*Microstegium vimineum*)
johnson grass (*Sorghum halepense*)
bush honeysuckles (*Lonicera tatarica, L. maakii*)
garlic mustard (*Alliaria petiolata*)

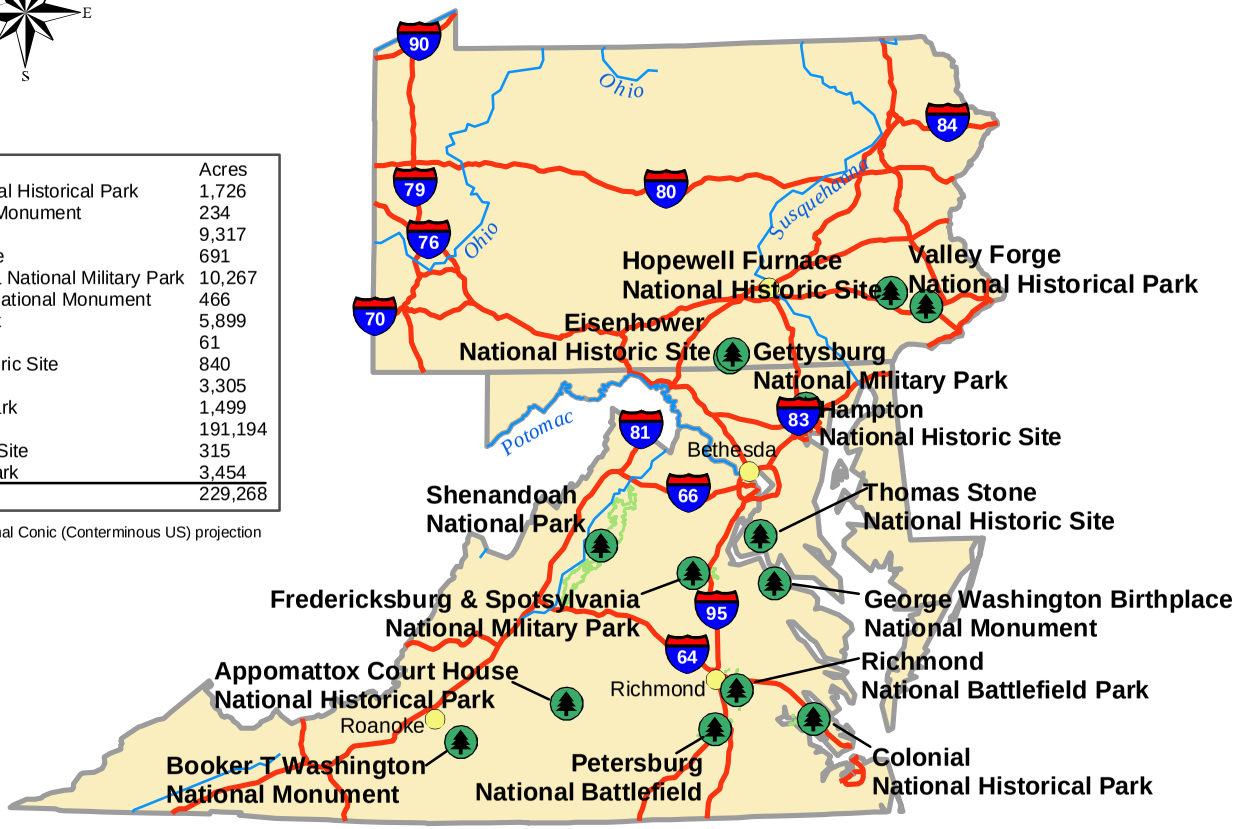
Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
ailanthus / tree of heaven (*Ailanthus altissima*)	1106.71264	910.49263	83.89757	63.37483	43.29685	2.48000	1370.12000
oriental bittersweet vine (*Celastrus orbiculatus*)	106.81000	80.94999	45.19260	42.56885	0.00000	0.00000	467.11250
multiflora rose (*Rosa multiflora*)	383.19000	315.22000	45.14465	45.13681	0.00000	0.00000	568.15059
privet bush (*Ligustrum sinense*)	459.54000	377.92999	39.84315	37.28992	10.37409	1.55399	844.22261
Japanese honeysuckle vine (*Lonicera japonica*)	120.79000	101.54000	39.89925	33.38099	18.11455	1.55999	302.01666
Japanese stiltgrass (*Microstegium vimineum*)	134.90000	156.89990	71.92439	39.35337	14.26050	0.00000	199.27738
johnson grass (*Sorghum halepense*)	212.35000	219.82000	21.18065	19.56215	7.94999	1.13699	201.52380
Japanese barberry (*Berberis thunbergii*)	226.74000	208.61000	28.85565	33.52590	15.80000	1.75749	243.13333
bush honeysuckles (*Lonicera tatarica, L. maakii*)	38.76000	29.53000	18.42950	18.42950	0.00000	0.00000	66.50000
garlic mustard (*Alliaria petiolata*)	26.89000	26.88999	11.71949	11.71949	0.00000	0.00000	21.82738
Top Ten Total	2816.68264	2427.88250	406.08690	344.34181	109.79598	8.48846	4283.88425
other species	663.71764	625.47276	76.70405	44.01251	12.83306	1.40204	1581.11575
FY04 Totals	3480.40028	3053.35526	482.79095	388.35432	122.62904	9.89050	5865.00000

Mid-Atlantic Cooperative 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 NRID
Date: 9 Nov 04

Meters
0 95,000 190,000 380,000

Gaines Mill, Richmond National Battlefield Park
Mid-Atlantic Cooperative EPMT

National Park Service
U.S. Department of the Interior

Meters
0 87.5 175 350

Source: USGS DOQQ Seven Pines VA, NES Park Boundary, MA coverages collected with a Trimble GPS receiver
Date: 19-22 April 04
Created: 8 Nov 04

Scale - 1:5,000

Coordinate System - UTM_Zone 17N_NAD 83

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 Capital Parks- Central, DC; National Capital Parks- East, DC; Prince William Forest Park, VA; Rock Creek Park, DC; Wolf Trap Farm Park for the Performing Arts, VA

Accomplishments

Inventoried Acres	13,633
Gross Infested Acres	6285
Infested Acres	2811
Treated Acres	582
Monitored Acres	1064
Retreated Acres	206
Restored Acres	0
Control Acres	0
Time Lost Due to Injury	0

Foliar spraying of Mile-a-Minute, Japanese Honeysuckle, and Porcelainberry vines at Kenilworth Marsh, National Capital Parks - East.

The National Capital Region (NCR) Exotic Plant Management Team continued to work collaboratively with park managers to treat invasive exotic plants affecting park ecosystems. In addition, the Team worked with several park partners to target invasive exotic plants in the biologically rich Potomac Gorge. The NCR Team worked with parks staff and large volunteer groups to tackle removal of Japanese Stiltgrass, Tree-of-Heaven and English Ivy from these lands along the Potomac River. This work is in areas with several species of locally rare plants and the treatment was conducted with the assistance of a contract botanist to locate and mark rare plant populations to assure they would not be negatively affected.

Other areas treated included freshwater, tidal wetlands where Common Reed inhibited a wetland restoration effort undertaken with the Anacostia community and National Capital Parks East. Control of the Common Reed in this wetland has allowed native wild rice to re-colonize the area. At Dyke Marsh Preserve, a similar tidal wetland in Fairfax County, Virginia, Common Reed eradication has also been almost completely accomplished.

The Team also partnered with Student Conservation Association (SCA) crews through the Cooperative Conservation Initiative, to map and treat invasive species at C&O Canal NHP, Prince William Forest Park and Harpers Ferry Historical Park. These contributions of SCA and park staff increased productivity through professional training and additional treated acres.

The NCR EPMT also assisted the United States Fish and Wildlife Service with staff training and invasive plant treatment at the National Conservation Training Center in West Virginia.

The NCR Team used its location as part of the interdisciplinary office of the NPS Center for Urban Ecology to work with Dr. Lisa Wenger at the University of Maryland to successfully compete for funds to design a tool for park managers to prioritize invasive plants in their parks. The tool will be used in concert with the existing ranking tool to help predict effects and costs of specific populations of invasive exotic plants in specific ecological communities. The funding for this project begins in 2006.

Target Weed Species

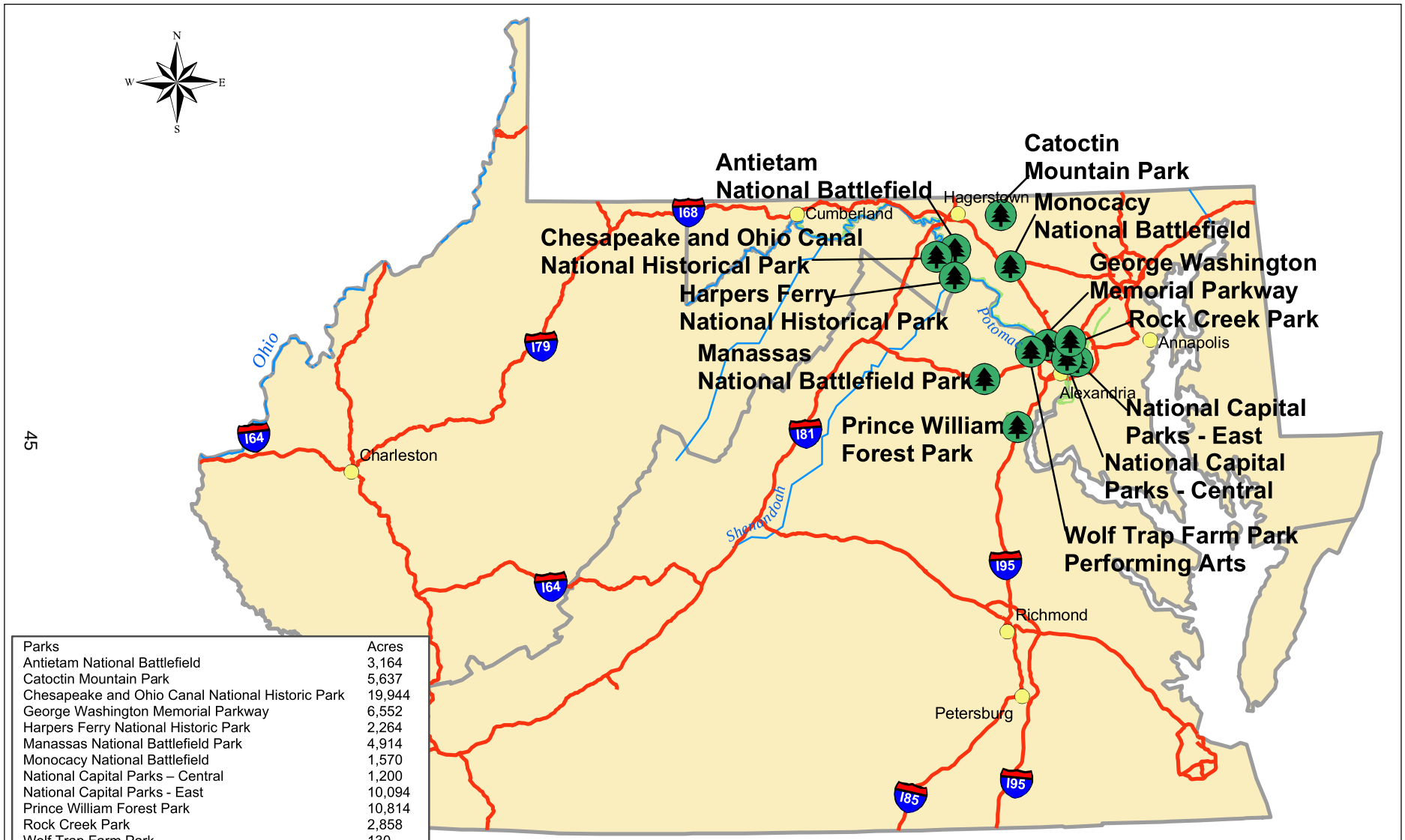
Chinese wisteria
common reed
English ivy
Japanese honeysuckle
Japanese knotweed
kudzu
lesser celandine
mile-a-minute vine
multiflora rose
tree-of-heaven

National Capital Region EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
Chinese wisteria (Wisteria sinensis)	0.00950	0.00950	0.00000	9.21629	20.55550	5.23892	201.05238
common reed (Phragmites australis)	10.00000	11.17400	0.26700	0.47560	5.32600	1.47950	56.87916
English ivy (Hedera helix)	171.283000	54.935520	43.418240	11.213070	0.59010	0.10750	197.67101
Japanese honeysuckle (Lonicera japonica)	734.93800	703.91100	489.94255	82.879810	66.52800	21.09109	348.90851
Japanese knotweed (Polygonum cuspidatum)	6554.11400	176.54891	96.70945	0.105730	1.92450	1.17246	1441.41666
kudzu (Pueraria lobata)	10.00000	10.75600	2.56700	0.919000	9.02900	4.26560	37.88749
lesser celandine (Ranunculus ficaria)	235.92500	235.92500	217.92800	2.502000	46.03900	35.90029	98.39333
mile-a-minute vine (Ipomoea cairica)	0.00000	0.00000	0.00000	0.06401	0.00000	0.00000	5.25634
multiflora rose (Rosa multiflora)	417.96200	388.71362	86.12170	53.08578	220.09200	38.63525	374.85377
tree-of-heaven (Ailanthus altissima)	248.44400	186.72871	62.75940	246.95765	159.13900	42.08141	907.25792
Top Ten Total	8382.67550	1768.70226	999.71334	407.41894	529.22310	149.97202	3669.57657
other species	5250.28080	4516.48666	1811.21163	175.06261	534.89886	56.33802	2645.24953
FY04 Totals	13,632.95630	6,285.18892	2,810.92497	582.48155	1,064.12196	206.31004	6314.82610

National Capital Region Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



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 Capital Parks – Central	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

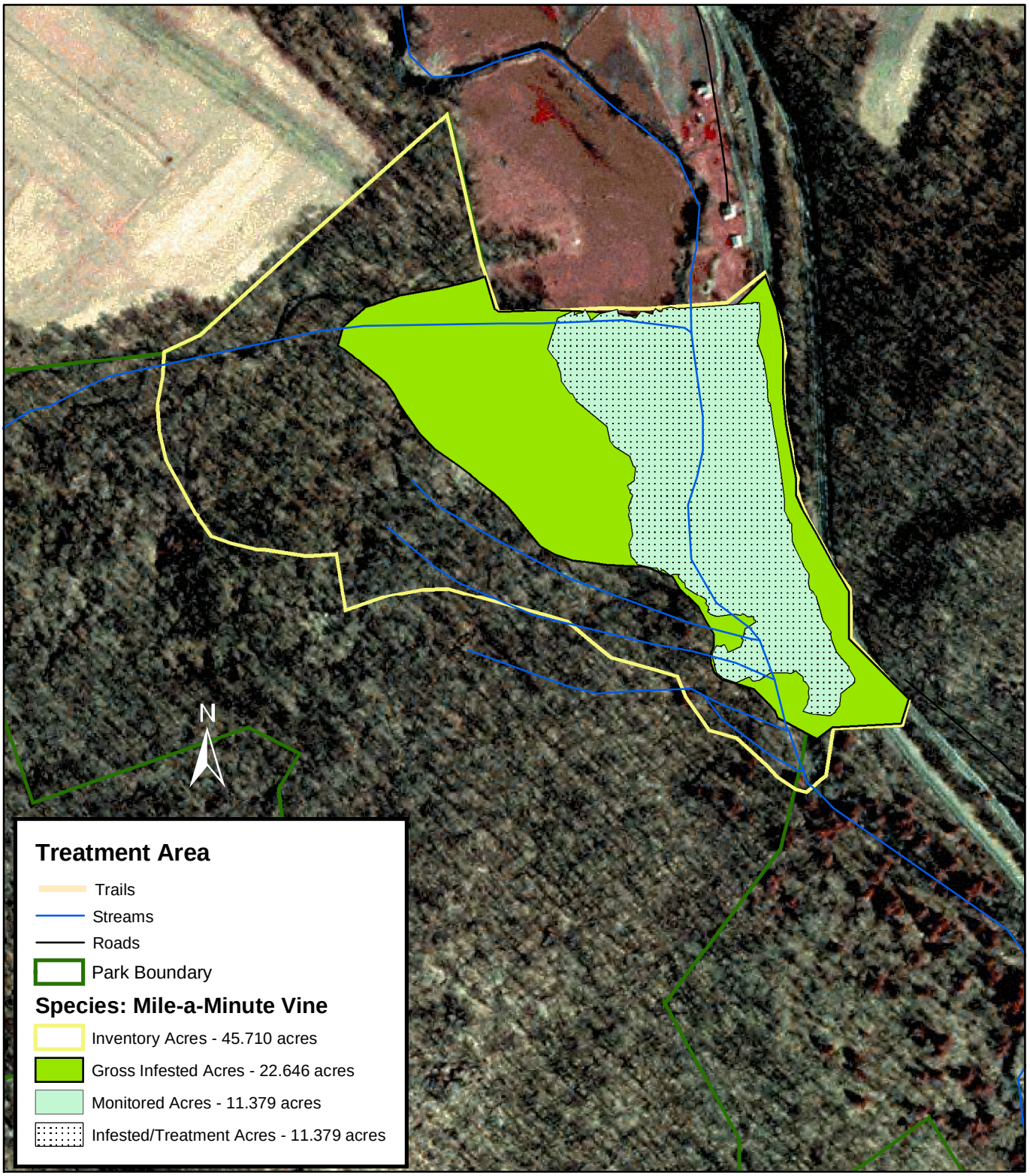
Calculations based on Lambert Conformal Conic (Conterminous US) projection

Source: ESRI and NRID
Date: 9 Nov 04

0 48,000 96,000 192,000 Meters

Lantz Marsh, Catoctin Mountain Park
National Capital Region EPMT

National Park Service
U.S. Department of the Interior



Source: USGS CDOQQ CATO, NCR Park Boundary,
NCREPMT coverages collected with Trimble GPS Receiver
Date: 10 Nov 04

Scale - 1:5,000

Coordinate System - UTM_Zone 18N_NAD 27

North Coast / Cascades Network

Exotic Plant Management Team

Partner parks and states: North Cascades NP, WA; Olympic NP, WA; Ebey's Landing NHR, WA; Fort Clatsop NM, 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 NRA, WA; Nez Perce NHP, ID; Whitman Mission NHS, WA

Accomplishments

Inventoried Acres	2160
Gross Infested Acres	1290
Infested Acres	342
Treated Acres	292
Monitored Acres	188
Retreated Acres	7
Restored Acres	0
Controlled Acres	0
Time Lost due to Injury	0

Crews participate with experimental knotweed control methods on Olympic Peninsula, Olympic National Park.

The North Coast/Cascades Network Exotic Plant Management Team (EPMT) has primarily focused on: 1) Aggressively inventorying and treating Japanese knotweed in riparian areas. 2) Containing Herb Robert to prevent it from invading undisturbed habitat. 3) Controlling monocultures of reed canarygrass, to prevent its spread into adjacent pristine aquatic resources.

Japanese knotweed has the ability to form dense monocultures in riparian areas and may affect the quality of fish spawning habitat through increased sedimentation and habitat invasion. Herb Robert, a relatively recent invader, has demonstrated the ability to invade undisturbed areas beneath the forest canopy forming dense monocultures and excluding other under-story species. Reed canarygrass forms dense monocultures in wetlands, along lakeshores, and in a variety of riparian environments. It out-competes native wetland vegetation, and may increase sedimentation and reduce the quality of available forage.

During the summer of 2004, the team participated in a Cooperative Conservation Initiative grant to control reed canarygrass and restore native wetland vegetation along the shoreline of Ross Lake in North Cascades National Park. The team also worked with landowners and Clallum County weed management staff to cooperatively control Japanese and Giant knotweed on tributaries to Lake Ozette in Olympic National Park. The team has additionally worked on cooperative projects with variety of other partners, including: The Nature Conservancy of Washington; Washington State Parks; Washington State Department of Corrections; Clallum, Ferry, Island, Lincoln, Skagit and Whatcom counties; the US Forest Service; Seattle City Light; the Elwha and Hoh tribes, and the NPS integrated Pest Management Program.

Team members also focused on the management of poison hemlock at Ebey's Landing National Historic Reserve, including the creation of a cooperative weed management area (CWMA) and integrated treatments including chemical and biological control. Additionally, team members have participated in treating prairie restoration research plots at San Juan Island National Historic Park, as well as providing rapid response to treat newly emerging Canada thistle infestations in prescribed burn units.

The team expanded its range by assisting with contract weed management work for Dalmatian Toadflax and Russian Knapweed at Lake Roosevelt National Recreation Area and in FY05 plans to help with implementing control strategies for Eurasian watermilfoil.

Target Weed Species

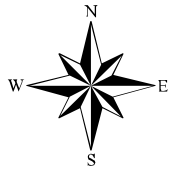
Canada thistle
dalmatian and yellow toad flax
English ivy
everlasting peavine
hawkweed(s)
herb robert (*Geranium robertianum*)
Japanese, giant, and Himalayan knotweed
knapweed(s)
reed canary grass
scotch broom

North Coast / Cascades Network EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
Canada thistle (Cirsium arvense)	175.95120	83.20134	5.18161	3.12782	0.45937	0.14118	422.26130
dalmatian and yellow toad flax (Linaria ssp.)	257.00000	257.00000	257.00000	257.00000	0.00000	0.00000	360.00000
English ivy (Hedera helix)	3.83000	8.94316	6.73081	0.15429	0.06617	0.04946	22.00000
everlasting peavine (Lathyrus latifolius)	40.209320	40.653610	9.135070	2.957710	0.00000	0.00000	104.29166
hawkweed(s) (Hieracium ssp.)	51.11000	38.78264	1.16253	0.289710	0.39540	0.32082	133.20833
herb robert (*Geranium robertianum*)	99.82124	52.17062	16.58441	4.807840	4.76699	0.16000	335.45833
Japanese, giant, and Himalayan knotweed (Polygonum ssp.)	225.80118	25.17907	3.42970	0.874620	0.66137	0.66003	664.45830
knapweed(s) (Centaurea ssp.)	345.00000	200.81423	4.66057	1.80317	80.96800	1.05699	428.71423
reed canary grass (Phalaris arundinacea)	13.02000	9.60057	5.21589	5.13150	0.00000	0.00000	117.00000
scotch broom (Cytisus scoparius)	159.88212	106.57314	10.68405	3.65557	6.66655	0.88868	266.90485
Top Ten Total	1371.62506	822.91838	319.78464	279.80223	93.98385	3.27715	2854.29700
other species	788.47030	467.45109	21.88639	12.35053	94.09823	3.61968	1297.25299
FY04 Totals	2160.09536	1290.36947	341.67103	292.15276	188.08208	6.89683	4151.54999

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

National Park Service
U.S. Department of the Interior



Parks	Acres
Edeby's landing National Historic Reserve	18,140
Fort Clatsop National Memorial	133
Fort Vancouver National Historic Site	220
John Day Fossil Beds National Monument	13,950
Lake Roosevelt national Recreational Area	106,343
Mount Rainier National Park	237,166
North Cascades Network	
Lake Chelan National Park Complex	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 Islands National Historic Park	1,754
Whitman Mission National Historic Site	97
Total Acreage	2,001,291

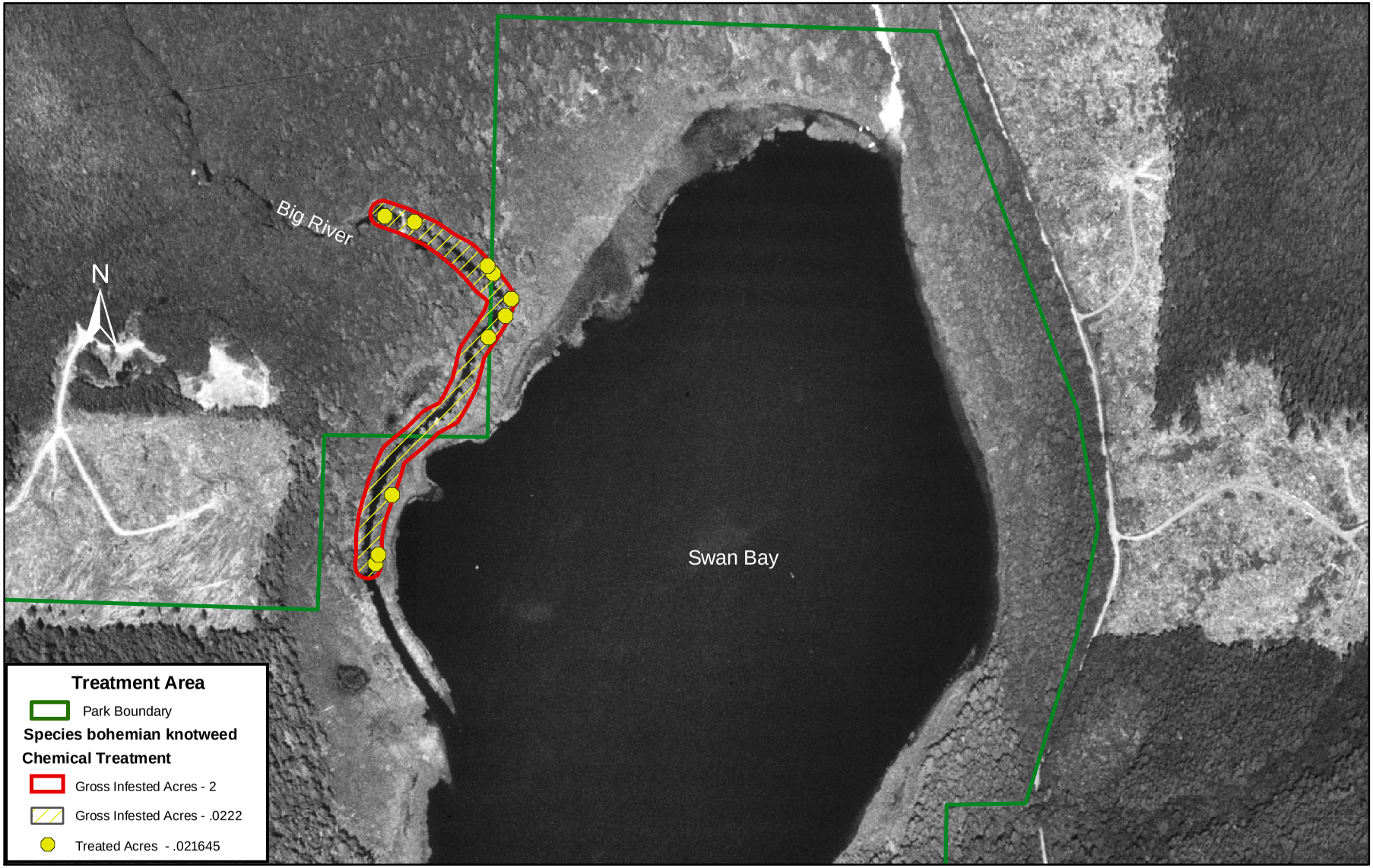
Source: ESRI and NRID
Date: 24 Nov 03

0 125,000 250,000 500,000 Meters

Calculations based on Lambert Conformal Conic (Conterminous US) projection

Big River, Mora District, Ozette Lake, Olympic National Park
North Coast/Cascades Network EPMT

National Park Service
U.S. Department of the Interior



0 95 190 380 Meters

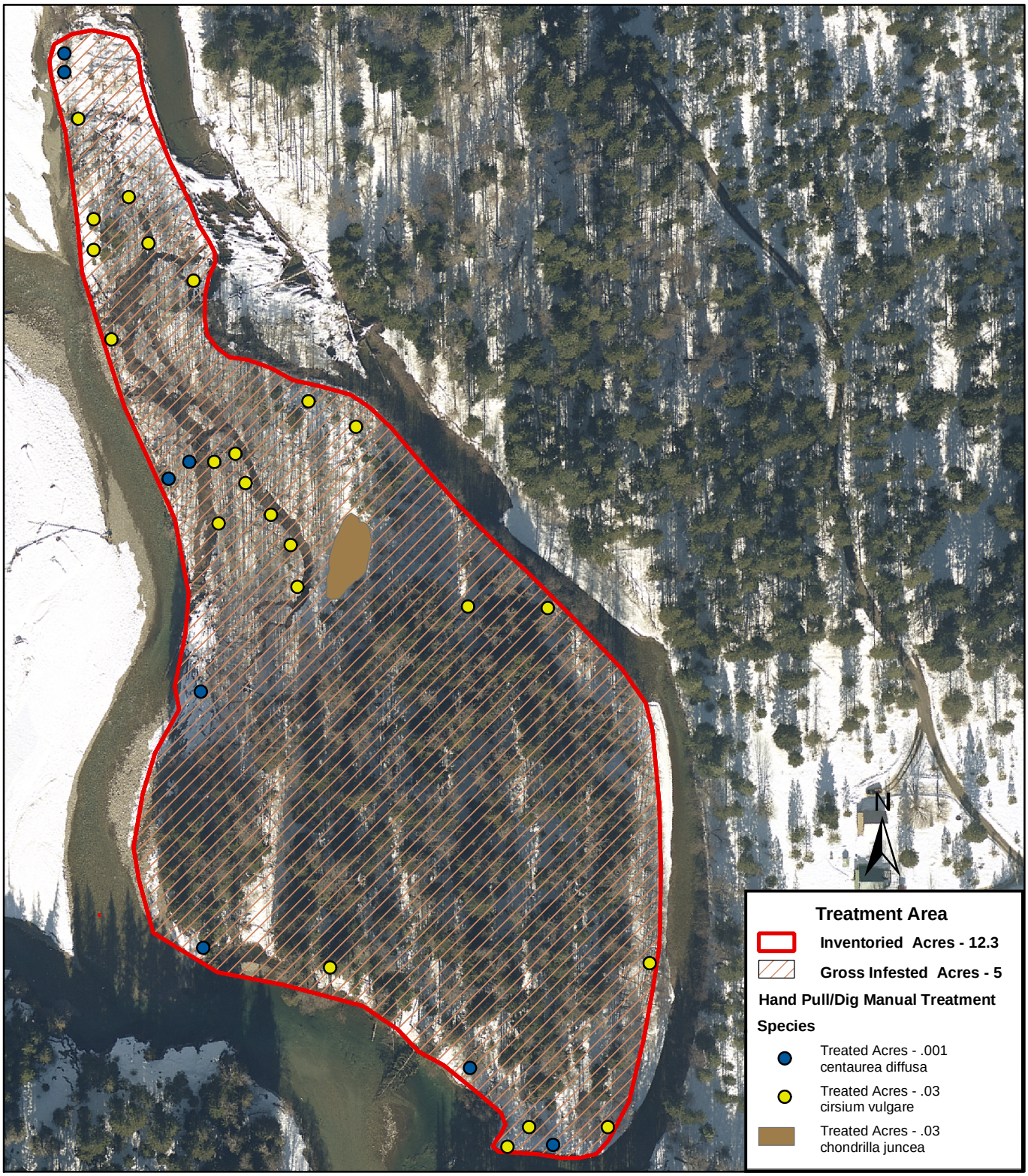
Scale - 1:6,800

Source: USGS DOQQ Dicky Lake NW, NRID Park Boundary, NCCN coverages collected with a Trimble GPS receiver
Date: 17 Nov 04

Coordinate System - UTM_Zone 10N_NAD 83

Stehekin Hell Island, North Cascades National Park
North Coast/Cascades Network EPMT

National Park Service
U.S. Department of the Interior



Source: NOCA Stehekin NE res 500ft
NCCN coverages collected with Trimble GPS Receiver
Date: 29 Nov 04

Scale - 1:2,181

Coordinate System - UTM_Zone 10N_NAD 27

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	846
Gross Infested Acres	825
Infested Acres	57
Treated Acres	22
Monitored Acres	13
Retreated Acres	.5
Restored Acres	0
Controlled Acres	0
Time Lost Due to Injury	0

Cape Cod National Seashore staff, NE EPMT and volunteers pulling out invading cheat grass as part of restoration of Province Lands Visitor Center.

The Northeast Exotic Plant Management Team (NE EPMT) was created in FY03 to assist parks in the northern portion of the Northeast Region, from Pennsylvania and New Jersey to Maine, in identifying and controlling invasive exotic plant infestations threatening to overwhelm their natural resources. FY04 was the team's first field season.

The team worked on-site at nine of its 23 partner parks: Cape Cod, Delaware Water Gap (EPMT's host park), Gateway, Minute Man, Morristown, Saratoga, Saugus Iron Works, Upper Delaware, and Weir Farm. NE EPMT also helped fund an invasive plant inventory at Boston Harbor Islands, and a Student Conservation Association (SCA) Conservation Corps of high school youth shared between Marsh-Billings-Rockefeller and Saint-Gaudens in August. The effectiveness of the various management activities at these parks will be monitored in the coming year(s).

The team's control strategies are based on integrated pest management principles and adapted to the situation and site. For example, common reed and knotweed infest many riparian areas in the North-east. If an infestation is in a wetland with sensitive native species, precision cut-and-drip herbicide applications are done. Otherwise, broadcast spray treatments can be used. At upland sites where autumn olive or buckthorn inhabits open fields, a tractor with attached tree cutter or bush hog provides quick and effective control. When these shrubby pests invade native forests or sensitive areas, then chainsaws and weed wrenches give more targeted control.

Outreach activities included a field demonstration of tree cutting equipment by NE EPMT and a local contractor; presentations at a PennDOT Roadside Vegetation Management seminar and the initial meeting of the New England Invasive Species Early Detection Pilot Project; short articles for various newsletters; and serving as a regional information resource on invasive non-native plants.

NE EPMT applied for an FY05 Cooperative Conservation Initiative grant to fund a 4-person SCA team to work at host park Delaware Water Gap and nearby parks. This would allow the EPMT to cover more distant parks. Plus, it would allow the EPMT to occasionally 'double team' a larger project.

Target Weed Species

autumn & Russian olives (*Elaeagnus* spp.)
black swallow-wort (*Vincetoxicum nigrum*)
bush honeysuckles (*Lonicera* spp.)
common & glossy buckthorns (*Rhamnus* spp.)
common reed (*Phragmites australis*)
Japanese barberry (*Berberis thunbergii*)
Japanese knotweed (*Fallopia japonica*)
oriental bittersweet (*Celastrus orbiculatus*)
spotted knapweed (*Centaurea biebersteinii*)
tree-of-heaven (*Ailanthus altissima*)

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
autumn & Russian olives (Elaeagnus spp.)	67.58134	67.58134	2.98621	1.58286	0.00000	0.00000	127.01250
black swallow-wort (Vincetoxicum nigrum)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
bush honeysuckles (Lonicera spp.)	72.109480	68.599480	2.762680	1.763810	1.68900	0.00000	420.62381
common & glossy buckthorns (Rhamnus spp.)	0.00000	0.00000	0.00000	0.000000	0.00000	0.00000	0.00000
common reed (Phragmites australis)	0.44530	0.44530	0.37596	0.268010	0.00000	0.00000	76.75000
Japanese barberry (Berberis thunbergii)	118.31123	114.80123	2.19658	1.154190	0.00000	0.00000	372.74404
Japanese knotweed (Fallopia japonica)	0.00000	0.00000	0.00000	0.000000	0.00000	0.00000	0.00000
oriental bittersweet (Celastrus orbiculatus)	31.14360	31.14360	0.64153	0.55243	0.00000	0.00000	52.62321
spotted knapweed (Centaurea biebersteinii)	36.45568	36.45568	0.80122	0.56311	3.43014	0.04483	58.71833
tree-of-heaven (Ailanthus altissima)	18.64356	18.64356	3.06365	1.46542	0.00000	0.00000	113.10564
Top Ten Total	344.69019	337.67019	12.82783	7.34983	5.11914	0.04483	1221.57753
other species	501.17884	487.56884	43.81978	14.62360	7.53274	0.43878	1804.62247
FY04 Totals	845.86903	825.23903	56.64761	21.97343	12.65188	0.48361	3026.20000

Northeast Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior

Parks	Acres
Acadia National Park	38,696
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	40,203
Delaware Water Gap National Recreation Area	69,495
Fire Island National Seashore	19,458
Fort Necessity National Battlefield	913
Friendship Hill National Historic Site	653
Gateway National Recreation Area	26,704
Johnstown Flood National Monument	169
Marsh-Billing-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	668
Sagamore Hill National Historic Site	72
Saint-Gaudens National Historic Site	142
Saugus Iron Works National Historic Site	11
Saratoga National Historic Park	2,858
Steamtown National Historic Park	54
Upper Delaware Scenic and Recreational River	37,455
Weir Farms National Historic Site	55
Total Acreage	323,917

Source: ESRI and NRID
Date: 9 Nov 04

0 95,000 190,000 380,000 Meters

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	70,393
Gross Infested Acres	5940
Infested Acres	3569
Treated Acres	2011
Monitored Acres	109
Retreated Acres	109
Restored Acres	.2
Controlled Acres	0
Time Lost Due to Injury	0

Preparing for a day of treatment at Theodore Roosevelt NP

Non-native plants pose a serious threat to the native plant communities and their natural processes in 14 northern Great Plains National Parks. One example is the introduction and spread of tamarisk (saltcedar) (*Tamarix ramosissima*) which has caused severe concern over a wide range of ecosystems. Although tamarisk originated in southwestern United States it has now made its way into North Dakota, South Dakota, Wyoming and Nebraska, threatening critical habitat for many species and parks, including Badlands National Park and the Platte River at Fort Laramie NHS and Scotts Bluff National Monument.

One of the worst invasive species the Northern Great Plains Exotic Plant Management Team (NGP-EPMT) is trying to control is Canada thistle (*Cirsium arvense*). Canada thistle is a herbaceous perennial invasive species that may be native to southeastern Europe and the eastern Mediterranean but it is now thought to be naturalized nearly worldwide. It is considered a noxious weed in at least 39 states and is estimated to infest approximately 12.4 million acres of which 8.15 million acres are rangeland. Park Service lands are not an exception to Canada thistle infestations. In 2004, the NGP-EPMT mapped and/or treated 4,477 infestations encompassing over 1,500 acres. Canada thistle is the only exotic plant that occurs in all 14 parks of the network. In all, the team mapped 13,887 infestations, treated 3,158 acres and inventoried over 70,000 acres.

The NGP-EPMT has been involved in several outreach programs this year. The team gave two presentations regarding the team's activities to all partner parks and host park personnel at the annual NEKOTA meeting in January, 2004. In developing the Northern Great Plains Exotic Plant Management Plan and Environmental Assessment, four public open houses were held to discuss the project, answer any questions the public may have, and solicit comments. The team was interviewed by personnel from the Natural Resource Information Division (NRID) of NPS to develop an educational module on invasive species using the program, Views of the National Parks. Furthermore, Latitude Magazine has planned to release an article in the winter issue titled "Theodore Roosevelt National Park Attacks Invaders". In addition, Public Works plans on releasing a scaled-down version of the article in April of 2005. The team also gave three presentations at the 57th Annual Society of Range Management Meeting in Salt Lake City, UT.

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, WASO-BRMD and support from the Natural Resource Challenge.

Target Weed Species

absinth wormwood
Canada thistle
cheatgrass
common mullein
leafy spurge
houndstongue
purple loosestrife
Russian knapweed
Russian olive
Tamarisk (salt cedar)

Northern Great Plains EPMT
Top Ten Species Breakdown

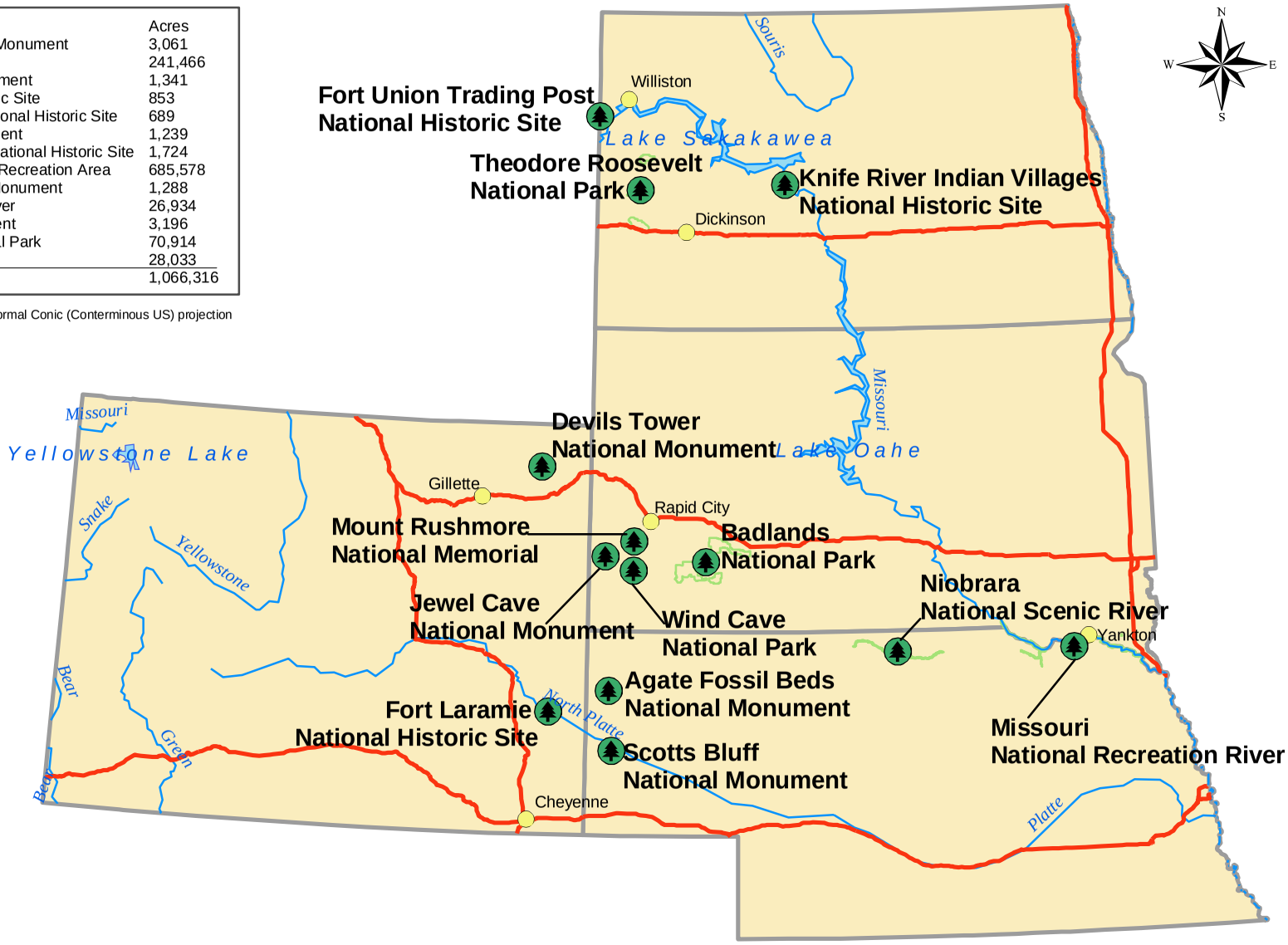
Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
absinth wormwood (Artemisia absinthium)	75.16967	452.93698	223.58210	4.53684	0.00000	0.00000	230.86428
Canada thistle (Cirsium arvense)	40967.97258	1573.06534	892.32316	465.12682	0.00000	0.00000	1989.68856
cheatgrass (Bromus tectorum)	0.000000	8.391940	4.326880	1.996750	0.00000	0.00000	379.50000
common mullein (Verbascum thapsus)	1138.94400	328.16894	114.33022	4.725530	0.00000	0.00000	537.83866
leafy spurge (Euphorbia esula)	9293.02661	2394.55037	1679.46846	1313.816930	0.00000	0.00000	1833.01660
houndstongue common (Cynoglossum officinale)	1497.07594	236.69249	62.69455	54.39997	0.00000	0.00000	403.07350
purple loosestrife (Lythrum salicaria)	2128.95923	358.90664	171.44374	0.00000	0.00000	0.00000	241.60000
Russian knapweed (Centaurea repens)	0.00000	5.36481	1.90101	1.46669	0.00000	0.00000	12.33330
Russian olive (Elaeagnus angustifolia)	568.97024	31.93181	17.31216	3.26069	0.05400	0.05400	1050.89090
tamarisk (salt cedar) (Tamarix ramosissima)	14714.77668	1.63404	0.58717	0.57893	0.00000	0.00000	306.05844
Top Ten Total	70384.89495	5391.64336	3167.96945	1849.90915	0.05400	0.05400	6984.86424
other species	8.05235	548.82162	401.17600	161.07350	109.37374	109.37373	2488.13576
FY04 Totals	70392.94730	5940.46498	3569.14545	2010.98265	109.42774	109.42773	9473.00000

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: 24 Nov 03

Northern Rocky Mountain

Exotic Plant Management Team

Partner parks and states: Bear Paw BG (Nez Perce NHP), MT; Big Hole NB, MT; Bighhorn 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	3605
Gross Infested Acres	2335
Infested Acres	252
Treated Acres	159
Monitored Acres	215
Retreated Acres	43
Restored Acres	0
Controlled Acres	0
Time Lost Due to Injury	20

Foliar spraying of leafy spurge in Craters of the Moon National Monument

The Northern Rocky Mountain Exotic Plant Management Team (EPMT) had an exciting and successful second year. The 15 partner parks, totaling about 4 million acres, remained divided into three satellite units. Each satellite consisted of a crew of three staff members, with seasonal employees at Yellowstone and Glacier National Park and Craters of the Moon National Monument.

The Yellowstone satellite EPMT crew, in addition to assisting within Yellowstone, focused on Grand Teton National Park; John D Rockefeller, JR Memorial Parkway; Little Bighorn Battlefield National Monument; and the north and south units of Bighorn Canyon National Recreation Area. The Glacier National Park satellite EPMT crew worked in Glacier National Park and assisted Grant-Kohrs Ranch National Historic Site, Big Hole National Battlefield, Little Bighorn Battlefield National Monument, the north unit of Bighorn Canyon National Recreation Area, and Bear Paw Battlefield. The Craters of the Moon satellite EPMT crew worked in Craters of the Moon National Monument, Hagerman Fossil Beds National Monument, Minidoka Internment National Historic Site, City of Rocks Natural Reserve, Fossil Butte National Monument, Yellowstone National Park and Golden Spike National Historic Site.

The new EPMT liaison stationed at Yellowstone National Park began in June. The liaison with the assistance of the two permanent crew leaders, one stationed at Craters of the Moon National Monument and one at Glacier National Park provided team leadership and weed management expertise. Additionally, needed equipment and supplies were purchased.

Along with a week of initial crew training at Yellowstone, the three satellite EPMT crews visited all partner parks at least once for a total of 50 crew weeks in the field treating weed infestations. Crews treated over a dozen different species in the 15 parks with high priority placed on treatment of new invading species. From May through September, crews inventoried and monitored more than 3,800 acres and treated 159 acres of the target species in the 15 parks.

In addition to assisting parks with exotic plant treatment and inventories, EPMT staff assisted with the NPS Inventory and Monitoring efforts, fostered development and participation by partner parks in cooperative weed management areas, and trained park staff in various phases of exotic plant operations.

Target Weed Species

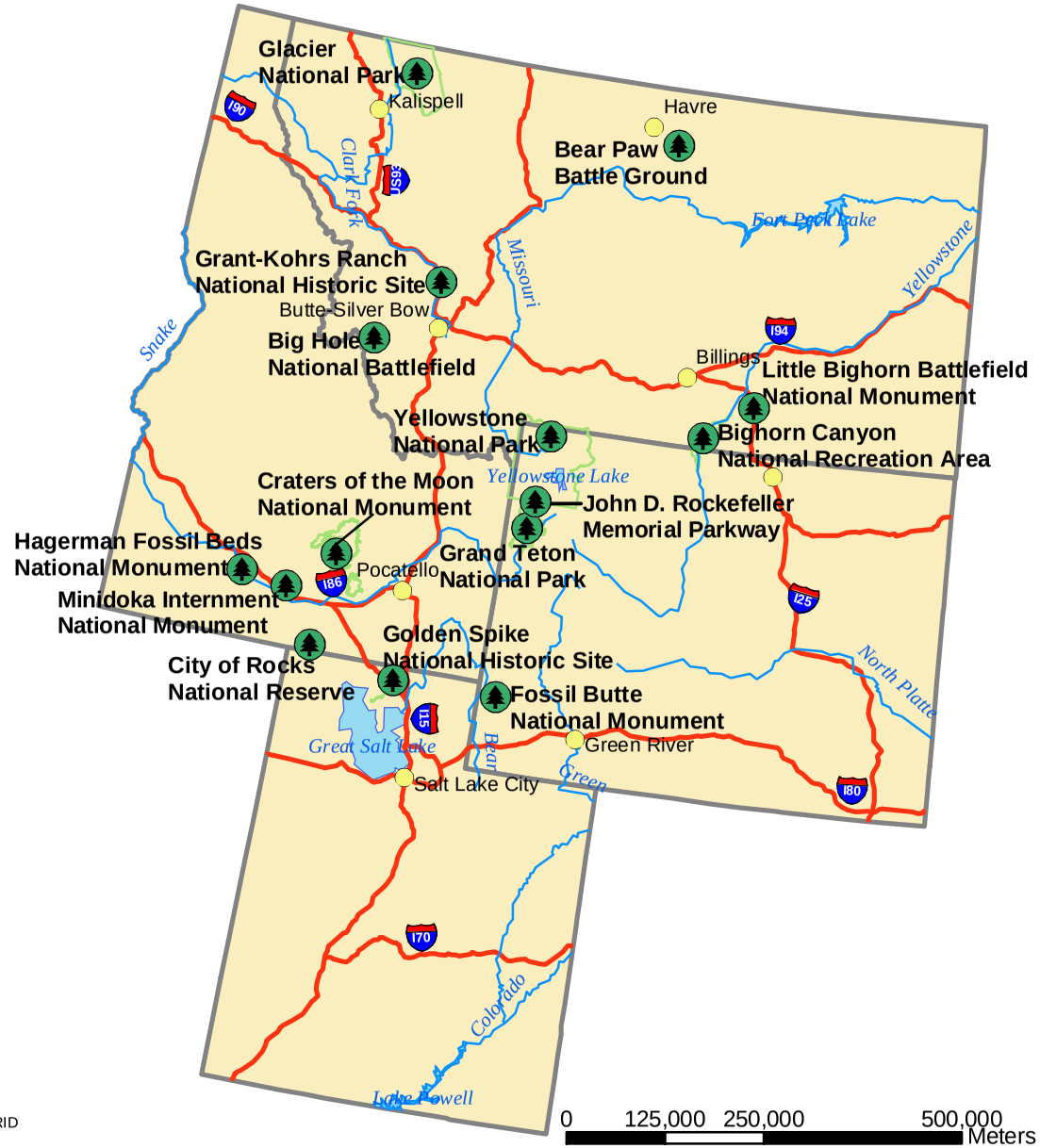
Canada thistle
dyer's woad
dalmatian toadflax
field bindweed
leafy spurge
orange hawkweed
oxeye daisy
Russian knapweed
yellow star thistle

Northern Rocky Mountains EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
Canada thistle (Cirsium arvense)	293.19912	536.40943	32.15146	25.80896	27.00000	2.04482	722.91065
cheatgrass (Bromus tectorum)	22.00000	16.39600	1.32920	1.00905	0.00000	0.00000	68.00000
dyer's woad (Isatis tinctoria)	6.100000	9.471450	1.208260	0.803232	0.00000	0.00000	6.41304
dalmatian toadflax (Linaria dalmatica ssp. dalmatica)	37.34435	25.61633	4.95440	0.270661	0.00000	0.01563	68.50000
field bindweed (Convolvulus arvensis)	40.67076	32.25692	10.21296	8.510510	0.00000	0.00373	123.41132
leafy spurge (Euphorbia esula)	787.10600	120.34334	11.83920	0.810450	4.97499	5.96999	148.63890
orange hawkweed (Hieracium aurantiacum)	7.14784	2.26885	0.54820	0.394100	0.00000	0.00000	115.50000
ox-eye daisy (Chrysanthemum leucanthemum)	13.35169	0.01147	0.00000	0.00376	10.65197	0.06793	58.46893
Russian knapweed (Acroptilon repens)	73.11196	1.36211	0.36869	0.23871	0.00000	0.00000	21.83240
yellow star thistle (Centaurea solstitialis)	73.08253	0.31922	0.06069	0.02638	0.00000	0.00000	0.00000
Top Ten Total	1353.11425	744.45512	62.67306	37.87581	42.62696	8.10210	1333.67524
other species	2251.74687	1591.01951	189.71679	121.46020	172.01884	34.73193	3726.07476
FY04 Totals	3604.86112	2335.47463	252.38985	159.33601	214.64580	42.83403	5059.75000

Northern Rocky Mountain Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



Parks	Acres
Bear Paw Battle Ground	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 National Monument	761
Minidoka Internment National Monument	75
Yellowstone National Park	2197338
Total Acreage	4,175,915

Source: ESRI and NRID
Date: 9 Nov 04

Calculations based on Lambert Conformal Conic (Conterminous US) projection

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	29,157
Gross Infested Acres	6385
Infested Acres	139
Treated Acres	106
Monitored Acres	9
Retreated Acres	9
Restored Acres	382
Controlled Acres	0
Time Lost Due to Injury	0

Clearing Koa haole in preparation for restoration efforts using collaborative EPMT and host park staff at Pu'u honua o Honaunau NHP

Invasive non-native plant invasions pose serious threats to isolated island ecosystems such as those found in Hawaii. In excess of 90% of the Hawaiian flora is endemic to the islands and, in many cases, occur only in a small area of a single island. Prior to human habitation, it is estimated that new species successfully colonized the archipelago once every 70,000 years. The rate of introduction has increased dramatically with western contact and contemporary global trade. These invaders are inundating Hawaiian natural areas and threaten the preservation of intact natural communities and Hawaiian cultural integrity.

In the early 1980's, Hawaii Volcanoes National Park (HAVO) pioneered a system of preserving its highest value natural areas through a network of Special Ecological Area's (SEA's). As the program expanded in acreage and over time, managers progressed from nearly pristine areas to areas requiring greater effort to manage invasive species and restore natural functions. The Pacific Islands Exotic Plant Management Team (PI-EPMT) has enabled HAVO to further expand numerous SEA projects in rainforest, dryland and mesic forest areas. One project included an expansion SEA in a previously wildfire impacted rainforest zone. In addition, the PI-EPMT has begun mapping invasive weeds and initiating proactive control of incipient threats to the newly acquired 116,0000 acre Kahuku Ranch portion of the park. In these various areas, the PI-EPMT has developed new control techniques, identified new infestations, and controlled a suite of habitat modifying weeds; such as Fountain grass, Faya tree, Mullein, Kahili ginger, Koa haole, Yellow Himalayan raspberry, Banana poka, Strawberry Guava, and Mesquite.

In the local tradition, larger parks periodically assist the smaller park units to initiate programs. The PI-EPMT partnered with the highly experienced HAVO staff and existing home park staff to accomplish control activities in preparation for restoration at Kaloko-Honokohau NHP, Pu'uhonua o Honaunau NHP, Pu'ukohola Heiau NHS, and at Kalaupapa NHP.

The team has continued to benefit from a close cooperative relationship with the Maui Invasive Species Committee (MISC) leveraging effort and funding from a wide variety of sources including: state and county agencies, private entities and assorted watershed partnerships and federal agencies. The relationship has enabled the PI-EPMT to more than triple its capacity to accomplish invasive species control and assessment projects on Maui while continuing to coordinate a multi-agency effort to contain the invasion of Miconia in east Maui.

Target Weed Species

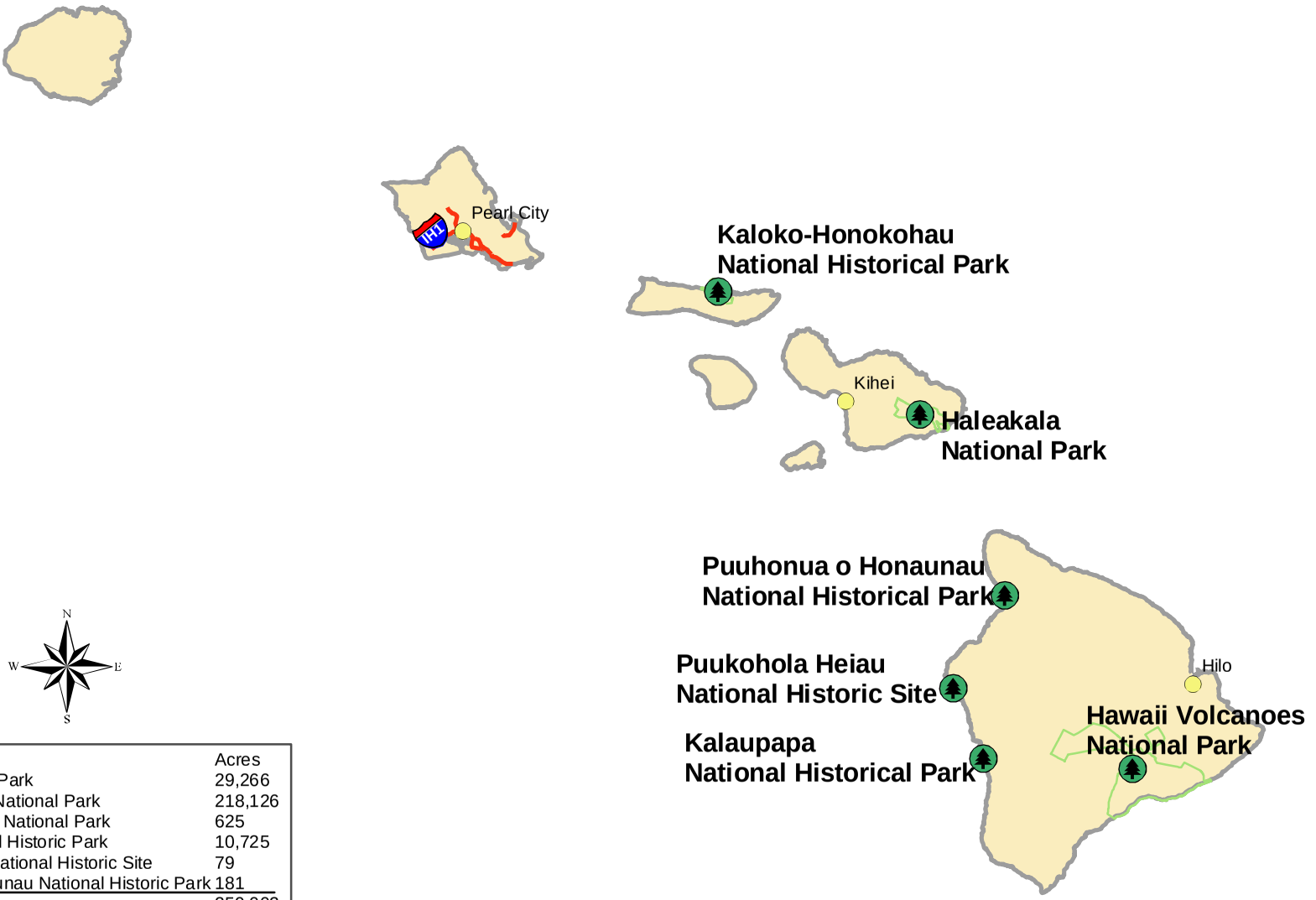
banana poka
fava tree
fountain grass
Kahili ginger
Koa haole
mesquite
miconia
mullein
strawberry guava
yellow Himalayan raspberry

Pacific Islands EPMT
Top Ten Species Breakdown

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
banana poka (Passiflora mollissima)	136.37000	136.36999	0.76577	0.62344	0.00000	0.02866	229.66666
fava tree (Morella faya)	7893.93000	781.40000	17.28310	12.25243	0.00000	0.79641	1656.25079
fountain grass (Pennisetum setaceum)	317.304850	234.640000	26.987900	5.047190	0.00000	0.00543	351.30000
Kahili ginger (Hedychium gardnerianum)	342.28500	342.28490	3.34834	2.215460	0.00000	0.54461	1373.56980
field bindweed (Convolvulus arvensis)	0.00000	0.00000	0.00000	0.000000	0.00000	0.00000	0.00000
Koa haole (Leucaena leucocephala)	3.16000	3.05399	2.10760	2.107600	0.00000	0.00000	197.94285
mesquite (Prosopis pallida)	3.15200	3.05399	0.37599	0.376000	0.00000	0.00000	197.94285
miconia (Miconia calvescens)	27.85224	0.00000	0.00000	0.20337	0.00000	0.00000	785.00000
mullein (Verbascum thapsus)	7153.50000	1898.09999	1.51005	0.39896	0.00000	0.11124	653.93330
yellow Himalayan raspberry (Rubus ellipticus)	358.79000	358.78999	0.57050	0.41797	0.00000	0.11811	517.58888
Top Ten Total	16236.34409	3757.69285	52.94925	23.64242	0.00000	1.60446	5963.19513
other species	12921.06530	2626.91214	85.80019	82.51077	8.77058	7.16612	3754.40487
FY04 Totals	29157.40939	6384.60499	138.74944	106.15319	8.77058	8.77058	9717.60000

Pacific Islands Exotic Plant Management Team
Host and Partner Parks

National Park Service
U.S. Department of the Interior



63

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: 24 Nov 03

0 40,000 80,000 160,000 Meters

Southeast

Exotic Plant Management Team

Partner parks and states: Blue Ridge Pkwy, NC, Big South Fork NRRA, TN; Cumberland Gap NHP, TN; Mammoth Cave NP, TN; Abraham Lincoln Birthplace NHS, TN; Carl Sandburg Home NHS, NC, Chattahoochee River NRA, GA; Chickamauga and Chattanooga NMP, GA, Cowpens NB, SC; Fort Donelson NB, TN; Guilford Courthouse NMP, NC; Kings Mountain NMP, SC; Little River Canyon NPr, AL, Ninety Six NHS, SC; Obed WSR, TN; Natchez Trace Parkway, TN; Russell Cave NMP, AL ; Stones River NB, TN

Accomplishments

Inventoried Acres	1827
Gross Infested Acres	471
Infested Acres	387
Treated Acres	276
Monitored Acres	0
Retreated Acres	.55
Restored Acres	0
Controlled Acres	0
Time Lost Due to Injury	0

SE-EPMT works to eradicate multiflora rose from endangered species habitat in the Obed Wild and Scenic River.

The Southeast Exotic Plant Management Team (SE-EPMT), based at the Blue Ridge Parkway in North Carolina, became fully staffed in February of 2004 and in March began serving 16 parks in North Carolina, South Carolina, Georgia, Alabama, Tennessee, Virginia and Kentucky. The team focus has been on developing a familiarity with the invasive plant problems in their assigned parks and working with the park Resource Managers to develop and implement appropriate management strategies.

In July of 2004 the SE-EPMT worked in the rugged Obed Wild and Scenic River gorge carefully removing multiflora rose from areas containing the federally protected Cumberland rosemary (Conradina verticillata). This park, located in Tennessee, boasts one of the richest floras in the southeast including, unfortunately, many invasives. In March and April at the Big South Fork National Recreation Area in Kentucky and Tennessee the team attempted to gain a foothold against garlic mustard; hand pulling over 20,000 plants threatening an area of rich riverine flora. Also in Kentucky, Cumberland Gap NHP provided an unexpected foe, the Callery pear (Pyrus calleryana). Work in this park had focused on tree of heaven and lespedeza when a thicket of Callery pear was found down slope of an old home site.

In 2004 the SE-EPMT partnered with the Tennessee and North Carolina Exotic Pest Plant Councils, The Nature Conservancy, and the Student Conservation Association on educational and eradication efforts. Developing partnerships and educational opportunities are key components to the success of the SE-EPMT in invasive, exotic plant management.

Target Weed Species

air potato
autumn olive
common Chinese privet
garlic mustard
Japanese honeysuckle
kudzu
multiflora rose
oriental bittersweet
princess tree
tree of heaven

Taxon	Inventoried Acres	Gross Infested Acres	Infested Acres	Treated Acres	Monitor Acres	Retreated Acres	Person Hours
air potato (Dioscorea bulbifera)	8.71000	1.25000	1.20000	0.95000	0.00000	0.00000	21.00000
autumn olive (Elaeagnus umbellata)	36.43000	1.20000	1.20000	1.20000	0.00000	0.00000	8.00000
common chinese privet (Ligustrum sinense)	115.380000	38.895990	32.715990	38.280000	0.00000	0.00000	205.04990
garlic mustard (Alliaria petiolata)	10.00000	3.50000	2.50000	0.000000	0.00000	0.00000	16.50000
Japanese honeysuckle (Lonicera japonica)	105.58000	42.20999	39.56999	34.085000	0.00000	0.00000	72.00000
kudzu (Pueraria montana var. lobata)	49.87000	18.88999	18.88999	18.640000	0.00000	0.25000	242.50000
multiflora rose (*Rosa multiflora*)	162.71000	48.70999	30.41999	17.61500	0.00000	0.00000	409.60000
oriental bittersweet (Celastrus orbiculatus)	167.68000	113.28500	89.22500	81.66500	0.00000	0.00000	384.60000
princess tree (Paulownia tomentosa)	122.36000	26.56999	11.06999	7.07000	0.00000	0.00000	78.60000
tree of heaven (*Ailanthus altissima*)	133.50000	42.43999	26.93999	3.64000	0.00000	0.00000	67.60000
Top Ten Total	912.22000	336.95094	253.73094	203.14500	0.00000	0.25000	1505.44990
other species	915.01800	134.06025	133.22026	72.46220	0.00000	0.30000	537.60009
FY04 Totals	1827.23800	471.01119	386.95120	275.60720	0.00000	0.55000	2043.04999

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
Russell Cave National Monument	318
Total Acreage	284,930

Meters
0 120,000 240,000 480,000

Source: ESRI and NRID
Date: 24 Nov 03

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.**