

NRPP Project # 214
Summary Report for fiscal year 2000
Exotic Plant Management Activities
Appalachian Cluster Small Parks

Abstract:

The control and management of invasive exotic plant species is a pervasive and growing problem for managers of natural areas throughout the United States and in many other areas of the world. Invasive exotic plants, often loosely grouped together with less invasive plants under the designation “weeds”, require the expenditure of hundreds of thousands of dollars each year for management activities that include personnel costs, equipment purchases, biological and chemical controls, public education efforts and the research and development needed to address problem areas. Losses to agricultural production have been estimated in millions of dollars. Total expenditures nationally have been estimated in billions of dollars. The National Park Service, through its mandate to protect and preserve our nations precious natural, historical and cultural resources for future generations, is at the forefront of the effort to reduce and eliminate these invasive pests from NPS areas and to provide encouragement to others concerned with the protection of natural areas.

In 1996 and 1997, funding was allocated from the Southeastern Regional Natural Resource Fund to provide assistance to smaller NPS Parks in the Appalachian Cluster for the management of invasive exotic plants. In 1999 funding was allocated from the National Resource Preservation Program to continue this work in fiscal year 2000. This report summarizes the efforts of 12 NPS Units to control invasive exotic plants in FY 2000.



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INTRODUCTION

This project is a continuation of the FY '96 & '97 Southeast Region funded exotic plant management program for smaller parks in the Appalachian Cluster. Kristine Johnson, Supervisory Forester, Great Smoky Mountains National Park (GRSM), manages the project. In April 2000 Joe Rogers, Forestry Technician at GRSM, assumed duties as project coordinator for training and logistical support.

FY '96 & '97 activities focused on 1) assessing each Park's needs, in general and for the current season, 2) making on-site visits to locate and document areas with invasive exotic species, 3) assistance with planning and prioritization of treatments, 4) providing training in species recognition, control methods and safety, 5) purchase of equipment and supplies 6) acquisition of vendor services for treatments through contract and purchase and 7) funding exotic plant control activities by NPS staff and YCC. These previous years' management activities were continued in 2000, to varying degree depending on individual Park's needs.

In addition to J. Rogers GS-6 position, a GS-5 technician was funded to work primarily at Kings Mountain NMP (KIMO) and Cowpens National Battlefield (COWP). GRSM seasonal technicians assisted with working trips to Chickamauga/Chattanooga National Military Park (CHCH), Carl Sandburg Home National Historic Site (CARL) and Guilford Courthouse National Military Park (GUCO). Twelve Parks in the Appalachian Cluster were visited in a six-month period.



FY 2000 Activities

Preliminary activities in April consisted of reviewing the records at GRSM pertaining to Small Parks Exotic Plant Management. Site visits were made to each park concurrently with training and treatment activities as follows.

- 1) Activities began on May 8, 2000 with a training and treatment trip to KIMO and COWP, both located in South Carolina.
- 2) A trip for site review and discussion was made to CARL, located in North Carolina, on May 25, 2000, by Kristine Johnson and Joe Rogers. J. Rogers and two GS-5 Forestry Technicians assigned to the GRSM vegetation management crew made an additional trip to CARL for training and treatments from July 24 through July 27.
- 3) In June of 2000 for training and site assessment, trips were made to Abraham Lincoln Birthplace National Historic Site (ABLI) in Kentucky from June 19 to June 22, and to CHCH, located in Georgia and Tennessee, from June 26 to June 29.
- 4) J. Rogers and two Forestry Technicians from GRSM, and an additional Forestry Technician assigned to KIMO, journeyed to GUCO on July 17 to spend the week conducting training and treatment activities.
- 5) On August 3, Joe Rogers visited Obed Wild and Scenic River National Recreation Area (OBED) to meet with Park staff at headquarters in Wartburg, Tn., review some areas of the Park and discuss treatment options, equipment, supply needs and other issues. The following week a survey for exotic plant populations within the Clear Creek Gorge section of OBED was arranged with Tennessee Mountain Management of Seymour, Tn.
- 6) On August 14, J. Rogers visited Russell Cave National Monument (RUCA) and several Park areas were reviewed. Training and discussion of management options were conducted. The following day (August 15), similar activities were conducted at Little River National Preserve (LIRI). Both of these Parks are located in northeastern Alabama and share a resource management specialist.
- 7) On August 16 and 17, J. Rogers met with the staff at Ninety Six National Historic Site (NISI) for planning and training.
- 8) Fort Donelson National Battlefield was visited on September 5th and 6th. Training in species identification and pesticide use was provided. Several Park areas were reviewed and management options discussed.



- 9) K. Johnson and J. Rogers visited Stones River National Battlefield on September 7th. Problem areas were reviewed along with areas of successful treatments. Future management activities were discussed and planning developed for further treatment of areas by purchase or contract.
- 10) On September 22 an order for services was purchased from Certified Services of Cleveland, Tn., for initial treatments to selected areas of the Lookout Mountain District and selected areas of the CHCH battlefield. The completed work encompassed 4.5 acres. Earlier than expected frost precluded scheduled treatments of kudzu and these efforts were directed to other invasive plant species.



EXPENDITURES

The following table summarizes FY 2000 expenditures in Appalachian Cluster Small Parks from 5471-A020-NNI.

PARK	TRAVEL EXPENDITURES ¹	EQUIPMENT PURCHASES ²	CHEMICAL PURCHASES ²	SALARY EXPENDITURES*	PURCHASED SERVICES**
ABLI	\$419.8	\$1172.54	\$0	\$3781.68	\$0
CARL	1017.17	1540.17	932.80	0	0
CHCH	728.59	1785.45	449.60	0	2250.00
COWP	52.50	953.06	1310.18	5885.00	0
FODO	332.89	1359.55	891.00	0	0
GUCO	1498.92	1352.59	0	0	0
KIMO	52.50	1903.97	2047.68	5885.00	0
LIRI	131.45	1151.13	0	0	0
NISI	337.89	1511.39	1087.29	0	0
OBED	54.15	877.43	0	0	2492.92
RUCA	131.45	1171.43	44.00	0	0
STRI	52.49	2023.38	1956.38	0	3900.00
GRSM	1059.19	1233.00	-----	23604.04	-----
OT ³	-----	-----	-----	1578.35	-----
TOTALS	\$5868.99	\$18035.09	\$8718.93	\$40734.07	\$8642.92

1- figure does not include employee salaries; travel figure for GRSM is travel expenditures related to Small Parks to areas/functions not at the Parks.

2- includes shipping costs; figures for GRSM represents equipment and chemicals to be distributed in FY 2001.

3- Overtime Hours paid from account

*- For all Small Parks, this column represents salary expenditures for seasonal personnel at the respective Park; for GRSM, the figure represents salary of personnel paid from the account, exclusive of overtime hours.

** - from independent vendors.



CHART 1

FY 2000 Expenditures

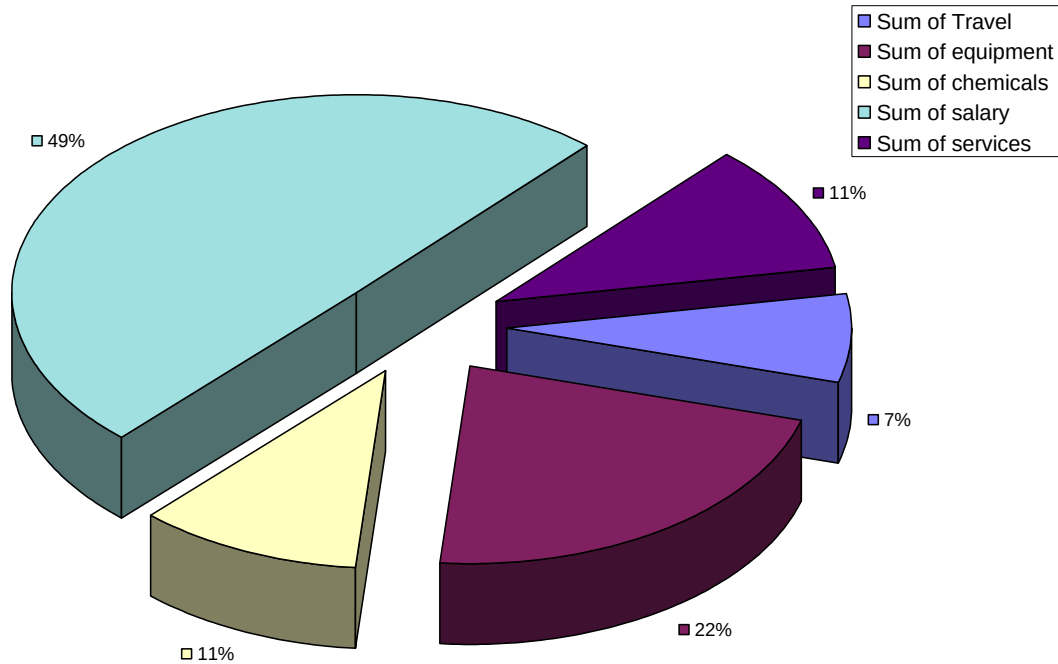


CHART 2

Expenditures Exclusive of Salary

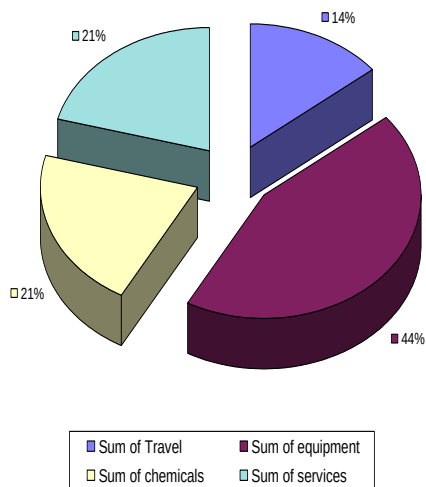
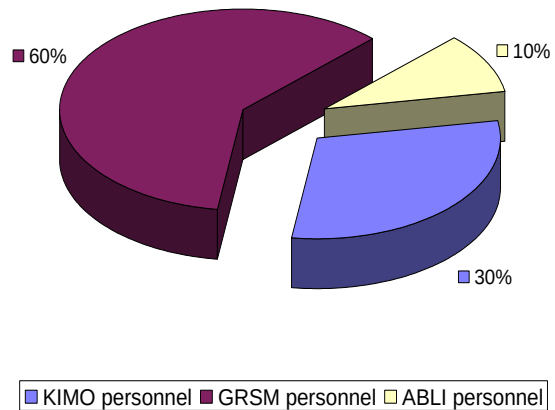


CHART 3

Salary Expenditures





Summary of Park Reports

ABLI

ABLI reported an estimated treatment of fourteen acres infested with invasive exotic plant species during FY 2000. Exotic species controlled in these fourteen acres were *Berberis thunbergii*, *Celastrus orbiculatus*, *Ligustrum vulgare*, *Lonicera japonica*, *Microstegium vimineum* and *Rosa multiflora*. Considering the staffing limitations at ABLI this represents a significant achievement. Project funds paid for a WG seasonal work leader for YCC and a YCC student for exotic plant management. A seasonal employee from ABLI came to GRSM for several days of training with the GRSM exotics crew. The most needed resource for exotic plant management at ABLI at present is personnel for treatments. In the event that the Knob Creek area becomes a section of ABLI, the associated need for personnel will be increased for all Park functions. Current inventories of equipment and supplies are adequate for the near future.

CARL

CARL reported that during FY 2000 they have identified and mapped problem areas of exotic infestations, acquired equipment and supplies for exotics management, and treatments were performed by technicians detailed from GRSM. Additionally, there have been efforts toward public education of the exotic plant problem at CARL (in the form of an interview of GRSM personnel during treatment activities by Harrison Metzger of the Hendersonville, NC newspaper *Times-News*). For this Park, public education prior to aggressive treatment activities will be necessary in order to gain public acceptance of activities. Future needs will be acquisition of seasonal personnel for treatment activities, associated training of personnel and further efforts toward public education of the problem. In addition, the Project Coordinator at GRSM is investigating the potential for release of the Milfoil Weevil (*Euhrychiopsis lecontei*), a North American endemic aquatic insect, for the bio-control of Eurasian Watermilfoil (*Myriophyllum spicatum* L.) or other species of exotic milfoil in Park lakes. At present, this activity is investigation only.

CHCH

CHCH reported continued eradication of *Pueraria montana* at the Reeds Bridge site, where treatments have been ongoing for approximately ten years. The site has been successfully brought to near eradication, with only spot retreatments needed in the future. Additionally, a 0.1-acre kudzu site adjacent to the CHCH boundary was treated (with permission from the City of Ft. Oglethorpe and adjacent property owners) to prevent encroachment within the Park. Privet (*Ligustrum vulgare*) eradication occurred concurrently with a major historic scene restoration project covering approximately eight acres of battlefield, restoring the area to 1863 open field appearance. This project did not require funding from the Small Parks account, but resprouting is to be expected in this area and will require treatments in the future to maintain gains. Additional privet control consisted of treating resprouting in a 0.1-acre section of previously restored battlefield and treatments to selected battlefield areas by Certified Services of Cleveland, TN.



Lookout Mountain Unit (LOM)

Treatments to control *Ailanthus altissima* occurred on LOM by Park personnel in April, May and June of 2000. These activities occurred near Cravens House at an approximately 2.5-acre site (size estimate by J. Rogers from visual inspection). Further treatments of this site occurred August 25 and 26 by GRSM technicians detailed to LOM. Treatment of exotic plants at LOM was arranged with Certified Services of Cleveland, Tn., to focus primarily on kudzu. Due to the earlier than normal arrival of colder weather, treatments of kudzu were postponed and other invasive exotic species (including privet, English Ivy, *Vinca minor* and Japanese honeysuckle) were the object of these initial dormant season treatment activities.

Orchard Knob Unit

In late spring of 2000 treatments were applied to control privet at the Orchard Knob area in downtown Chattanooga. Treatments were herbicide applications to freshly cut privet stems. The area treated covers approximately 7.5 acres.

COWP

Treatments of nine species of invasive exotic plants covering an estimated area of 11.62 acres were reported for COWP. Treatments were performed by Kenny Bochniak, GS-5 Forestry Technician stationed at KIMO with help from SCA's. GRSM provided refresher training, safety equipment, chemicals, and application equipment. FY 2001 estimates of areas for treatments total fifteen to seventeen acres of the same exotic species as in FY 2000. Anticipated needs will be training or refresher training for FY 2001 seasonal employees, replacement of utilized chemical, parts/replacement or repair of equipment as necessary, funding for a seasonal Forestry Technician similar to FY 2000 funding and for an SCA intern during part of the season if funding is available.

FODO

Fort Donelson Chief Ranger Robert Wallace reported acquisition of equipment and supplies (from NRPP funding) "that will reduce the amount of FTE's and increase safety to the exotic program." Treatments of privet regrowth are planned as a dormant season activity for the autumn of 2000 (in FY 2001) and in the winter of 2001. The visit to FODO by GRSM personnel on September 5 & 6 helped to identify areas for exotic plant control and in determining ways to incorporate exotics management into vista management activities. Species of exotic plants and native plants of similar appearance were identified that were previously unfamiliar to FODO staff, and in some cases had not been previously listed as being present. FODO has awarded a contract (outside of Small Parks funding) to Austin Peay State University for the development of a Park herbarium, with contract stipulations that require identification of exotic plant populations and locations. The information gained will be useful for prioritizing future exotic plant control strategies.

GUCO

GUCO staff reported identification of nine major sites of invasive exotic plant populations, seven of which received treatments in FY 2000. Training was provided by GRSM personnel along with a one week session of treatments. An estimated total of 20 acres were treated by GUCO and GRSM personnel. Equipment needs were identified and equipment supplied using NRPP Small Parks funding. Anticipated needs for FY 2001 are



mostly for chemical supplies. Staffing restrictions continue to complicate exotics management at GUCO, and staff have indicated interest in cooperative sharing of one or two seasonal employees with another Park for exotics management (similar to the arrangement for FY 2000 at KIMO/COWP).

KIMO

KIMO reported treatment of approximately 6.42 acres of areas infested with invasive exotic plants including twelve species. GRSM provided refresher training, safety equipment, chemicals, and application equipment. FY 2001 estimates of areas for treatments total four and one half to five acres of the same exotic species as in FY 2000. Anticipated needs will be training or refresher training for FY 2001 seasonal employees, replacement of utilized chemical, parts replacement or repair of equipment as necessary, funding for a seasonal Forestry Technician similar to FY 2000 funding and for an SCA intern during part of the season if funding is available. The application of prescribed fire at KIMO has helped to identify locations of some invasive exotics (climbing vine species and evergreen/semi-evergreen species were easier to locate when growth resumed after the burn) and may have provided some reduction of populations of invasive exotic plants.

LIRI

LIRI reported acquisition of needed equipment and supplies, ongoing survey and mapping activities to document locations of exotic plant populations, training events by GRSM personnel and treatments to privet covering approximately 650 square feet during FY 2000. Limited staffing and the competition for time with other tasks have complicated exotics management and limited treatments. They have also identified a number of needs that can be fulfilled with NRPP funding in FY 2001. Plans are being developed for potential survey of the Little River Gorge areas in FY 2001 similar to the survey performed at OBED in FY 2000.

NISI

FY 2000 activities at NISI included training for maintenance and administrative staff (provided by GRSM personnel), purchases of hand tools, spraying equipment, safety equipment and chemicals for treatments. Kenny Bochniak (seasonal GS-5 Forestry Technician at KIMO) was detailed on three occasions to NISI for treatments of kudzu and wisteria, and reported treatments of nine acres of kudzu and two acres of wisteria with assistance from NISI staff. Discussions were initiated with a relatively local vendor (Earth Designs of Pickens, SC) for potential treatment activities but proved to be unsuccessful due to time constraints and expense. These discussions may continue in FY 2001. Selected areas of NISI could benefit from applications of prescribed fire where possible, which would also help to reduce populations of some invasive exotic plants.



OBED

OBED has a new Unit Manager, Kristin Stoehr. She reported thorough review of documentation of previous work at OBED, training activities by GRSM personnel, and the survey for exotic plants of the Clear Creek section of the Park by Tennessee Mountain Management personnel. Some equipment purchases were made, and a more complete compliment of equipment and supplies for invasive exotic plant management will be provided in FY 2001. The results of the TMM survey will be used for planning treatments of the area in FY 2001. The survey identified twenty-eight distinct sites within the Clear Creek Gorge that have populations of invasive exotic plants. Planning for FY 2001 will include treatments to these sites along with the potential for survey of other OBED areas. Future surveys will seek to include treatments to smaller populations concurrently with the survey. A GPRA goal was included in OBED's 2001-2005 Strategic Management Plan to address exotic plant management.

RUCA

RUCA has reported acquisition of needed equipment and supplies, ongoing survey and mapping activities to document locations of exotic plant populations, training by GRSM personnel and treatments to privet and kudzu covering approximately 400 square feet during FY 2000. Limited staffing and the competition for time with other tasks have complicated exotics management and limited treatments. They have also identified a number of needs that can be fulfilled with NRPP funding in FY 2001.

STRI

STRI has reported significant gains in exotic plant control and eradication for FY 2000. These activities have included purchased services from independent vendors to remove invasive exotics, control of exotic plant populations on protected earthworks and revegetation with native grasses, the removal of large amounts of privet and bush honeysuckle from historic battlefield areas, the treatment of thousands of musk thistle and an "ongoing war" with Johnson Grass. On Park Day (April 22, 2000) and National Public Lands Day (September 30, 2000), STRI employees and volunteers worked together to remove musk thistle, privet and Japanese honeysuckle from two Park areas. On September 7, 2000, GRSM personnel provided refresher training and reviewed sites with STRI personnel to plan for FY 2001 activities.



Discussion of Season's Activities

Training was provided to each Park according to their respective needs. Many elements of the necessary complement of equipment for exotic plant management were purchased and delivered to the Parks, either in the form of purchase of new equipment or re-supply of previously purchased equipment that needed replacement or repair. Expendable supplies, such as chemicals and safety equipment, were purchased and delivered. Each Park was provided with an approved storage cabinet for open containers of chemicals. Salaries for seasonal employees and YCC personnel were provided to some Parks and augmented at others. Plant surveys were arranged utilizing student labor and commercial vendors. Trips were made to several Parks for treatment events by GRSM technicians, and a technician assigned to KIMO and COWP was detailed to GUCO to work with GRSM technicians, and later to NISI on three occasions where he worked independently and with NISI staff to treat invasive species. A technician from ABLI came to GRSM for a three-day intensive training session working with GRSM exotic vegetation crew. Services were purchased from known vendors for treatments at CHCH/LOM and STRI. The development of a more comprehensive manual of training information related to exotic plant management was initiated and continues, the results of which will be provided to each Park on completion.

The need for acquisition of pesticide applicator's certification for personnel not in possession of the certification was stressed. Efforts are ongoing to obtain necessary certifications for at least one permanent employee for each Park. The availability of commercial vendors/contractors for surveys and treatments was researched and professional collaborations pursued. One new vendor source for plant surveys was identified and employed. A new source for treatments by vendor was identified and discussions are ongoing for potential treatments to occur in FY 2001. A number of new sources for both durable equipment and expendable supplies were identified and some utilized in FY 2000.

New and promising technologies for the control of invasive exotic plants were investigated and contact made with associated researchers. Contacts were made with staff from three Universities related to research and potential for obtaining student labor for future projects. These Universities are located in North Carolina, South Carolina and Louisiana. The Inventory and Monitoring Branch of GRSM provided funding to survey a *Wisteria floribunda* site at GUCO (which was performed by a student at Guilford College) to investigate differences in biodiversity within the site and in the immediate area outside the site. GRSM staff assisted Dr. Jerome Grant of the University of Tennessee who is preparing IPM plans for several southeastern parks under separate funding. Dr. Grant's plans are to be sufficiently generic for adaptation to other parks.

Information was provided to Teresa Leibfreid, Mammoth Cave (MACA) I&M Data Manager, for entry into the NPSpecies database regarding invasive exotic plants found in Small Parks supported by the project. These efforts toward the development of professional contacts are ongoing and will continue into the FY 2001 season.



Recommendations

Based on insight gained during the FY 2000 season, the following recommendations may be made for FY '01 & '02.

1. Permanent personnel involved in exotic plant management in each of the Parks should continue to develop plant identification skill related to invasive exotic plants and the native plants within their respective Park that closely resemble target exotics. A number of resources exist to facilitate this effort including Internet based research, coursework and/or textbooks available through local colleges and universities, reference books and plant taxonomy keys available through bookstores or online purchase, and the resources available at GRSM which can be accessed by contacting the Project Coordinator. For some species it will be necessary to become proficient in identification to species level since native species exist within the same genus as the exotic.
2. Each Park should ensure that at least one permanent staff involved in the management of invasive exotic plants obtain certification as a Commercial Pesticide Applicator in accordance with their respective State's Pesticide Regulation Program. Other participants are encouraged should more than one person be available to be certified. In each Park, the person primarily responsible for exotics management should obtain certification and strive to develop the necessary skill to train others in the proper and safe use of pesticides and in plant species identification. Information regarding State Pesticide Applicator Certification may be obtained by contacting:
 - a. the local Agricultural Extension Agent
 - b. the Agricultural Extension Division of major State Universities or
 - c. the Project Coordinator at GRSM.

It should be noted that Private Pesticide Applicator Certification is not the same as Commercial Certification, the latter being the desired type for applications to Federal Lands.

3. Parks that have not done so previously should develop an Integrated Pest Management Plan (IPM Plan). The person at each Park of primary responsibility for pest management should attend Regional IPM Training at their earliest opportunity, or a refresher if this training has been attended previously.
3. Parks that have not done so previously should develop an "in house" Exotic Plant Management Plan. Such a plan would include exotic species present at the respective Park and native species of similar appearance (that could be confused with the exotic) with color photographs or digital media to aide in identification, information on present and historic locations of invasive exotic plant infestations and their relative extent, potential control methods for the management of invasive exotic plant species, and goals in the form of a prospective timetable for reduction of invasive exotic plant species.



CONCLUSIONS

The management of invasive exotic plant species is often an extremely difficult, expensive and frustrating task. It is not an insurmountable one. With regard to the 12 Appalachian Cluster Small Parks supported by this project there are a number of themes that have recurred and tended to complicate exotic plant management activities. These are listed as follows, roughly in order of importance.

1. Staffing limitations often preclude or severely limit management activities. Since each of the Parks has a variety of exotic plant species present, with a variety of growth characteristics, there is need for management activities at different times throughout the year. At times these “treatment windows” will occur during periods of high visitor use or during periods of furlough for seasonal personnel. The competition between required tasks for the remaining personnel with exotics management has often either precluded treatments or severely limited effectiveness. There is need at most of the Parks for increases in staffing, either seasonal, term or permanent, to allow for more aggressive control activities, at least until exotic plant populations are well under control.
2. Limitations related to education and experience have often restricted management activities. Many of the managers responsible for the exotic plant program at their respective Parks have educational backgrounds in fields other than biological sciences, such as in history, sociology or law enforcement. The result is that often many of them have to obtain the necessary skills in plant identification, chemical usage and other related issues as they can find time, which often only occurs after other work related tasks have been accomplished. Each of the respective Park managers are encouraged to increase their level of proficiency in the skills needed relative to exotic plant management. Suggestions for this type of professional development include establishing contacts with the natural science divisions of local colleges or universities, review of reference materials related to natural sciences (such as textbooks, periodicals, field guides for species identification or available internet based information sources), or the attendance of available NPS training courses. The Project Coordinator at GRSM may be contacted at any time and Park managers are encouraged to use this resource for information.
3. Housing limitations have resulted in reduced effectiveness at some Parks. In some areas, the cost of housing outside of Park areas has precluded otherwise interested prospective seasonal employees from submitting applications. The strategy employed at KIMO and COWP could be effective for other Parks as well, where the Park with available seasonal housing is the “base of operations” for seasonal personnel who then travel between Parks of relatively close geographic proximity for treatment activities. Another potential strategy would be the establishment of relationships with local colleges and universities to rent vacant dormitory space during periods of low enrollment or seasonal breaks.



4. Cultural or historical issues have sometimes limited exotic plant control. In some Parks, the presentation of cultural resources or historical periods have limited or precluded eradication of some invasive exotic species. This situation should be avoided whenever possible. In most cases an exotic plant can be replaced with a native plant of similar appearance, which is the desired strategy. The subsequent interpretation of the change would then include the specific reasons for the change (protection of the natural environment) and how the change was accomplished (what native plants were used, and how the exotic was eliminated).
5. The use of invasive exotic plants for landscaping must be discontinued (refer to Federal Executive Order 13112: Invasive Species, dated February 3, 1999). In a few cases, invasive exotic plants have been used as landscape plantings around buildings and in planting beds near parking lots. Examples are plantings of *Berberis thunbergii* at CHCH/LOM and ABLI, and of *Hedera helix* at GUCO. In some cases exotic plantings are found near leased or rented buildings (OBED and LIRI have examples of this). Permission from respective land or facility owners should be obtained to remove these plants. Although these individual plantings are small in extent they represent a continuing source of seed that may be distributed through various vectors to adjacent Park areas. Often these plantings have been the result of the recommendations of NPS landscape architects. Information related to Executive Order 13112 should be (and likely has been) provided to all Federal personnel that recommend landscape plantings and invasive exotic plant species eliminated from their lists of recommended plantings.



APPENDIX



Joe Dumnyhan and James Eikenberry remove *Ailanthus altissima* from behind a historic structure at Carl Sandburg Home National Historic Site.



Sometimes you are required to evict the local residents.



The picture above is of a portion of Little River Canyon National Preserve. This type of terrain, which is very similar to that found at Obed Wild and Scenic River, presents challenging problems for the management of invasive exotic plants. Among these problems are relatively inaccessible and sometimes hazardous terrain, steep slopes and waterways that can increase movement of exotic plant seed, areas containing threatened or endangered species and geologic landforms (such as karst) that limit the types and amounts of control measures used.



The pictures below are of NPS personnel conducting eradication treatments of invasive exotic plants at Guilford Courthouse National Military Park.



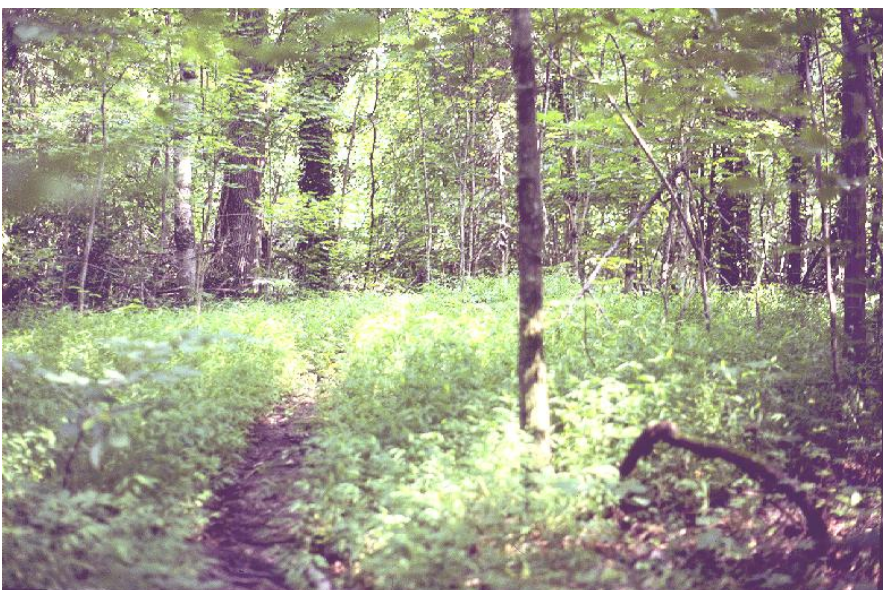
Cherie Cordell removes mature *Elaeagnus umbellata*.



Mike Mancusi cuts *Wisteria floribunda* vines from trees using hand tools and treats with herbicide. Note protective equipment including safety glasses and nitrile gloves.



The above photograph was taken at NISI. Note the *Lonicera japonica* vines climbing trees on both sides, and the dead *Carduus nutans* stems still containing seed heads in the center of the photograph. The forest floor groundcover is almost entirely *Microstegium vimineum*. Staffing limitations and competition with other tasks have allowed the musk thistle to be missed, thereby providing a ready seed source for the next growing season. Much of the impact of invasive exotic plants could be reduced in this area by the proper application of prescribed fire, which can cut climbing vines and reduce the load of exotic seed in the soil while also reducing the fuel load of the area.



The photograph to the left depicts a section of GUCO where *Microstegium vimineum* has become the dominant herbaceous groundcover. This is typical of similar areas in many Small Parks.



Below are more pictures from GUCO.



Kenny Bochniak foliar sprays young *Wisteria floribunda* plants.



Other less threatening exotic organisms were not removed.



After a hot day in the “exotics trenches” it can be beneficial to hold meetings and plan future activities. Above, employees from GRSM, KIMO and GUCO hold just such a meeting and plan for the next day.