

Assateague Island National Seashore Alien Plant Management Program Report 2004 - 2005



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Summary:

Assateague Island National Seashore (ASIS) conducted monitoring and management activities during 2004 and 2005 as part of its alien plant management program. The alien species that were discovered and documented, monitored and/or treated on ASIS during 2004 and 2005 were *Ailanthus altissima*, *Alnus glutinosa*, *Artemisia stelleriana*, *Carex kobomugi*, *Clematis terniflora*, *Eleagnus umbellata*, *Eragrostis curvula*, *Lonicera japonica*, *Lythrum salicaria*, *Miscanthus sinensis*, *Pinus thunbergii* and *Rosa multiflora*. During 2005 ASIS received some much appreciated assistance from the NPS Northeast Region's Exotic Plant Management Team who helped monitor and treat infestations of *Clematis terniflora*, *Rosa multiflora*, *Eragrostis curvula* and *Ailanthus altissima*. Finally, during 2005, all ASIS alien plant management program data were consolidated.

Introduction:

An alien plant management program (APMP) was begun in 1999 at Assateague Island National Seashore (ASIS). Previous work related to this program is documented in two additional reports, McIntyre et al (2001) and Weller and Sturm (2003). A heavy workload and staffing limitations unfortunately caused the ASIS APMP to essentially be put on hold during 2003, during which time only minimal monitoring was conducted and no herbicide applications were performed. The ASIS APMP resumed alien plant monitoring and management activities during 2004 and this report documents activities related to this program that were conducted during 2004 and 2005.

During both 2004 and 2005 known alien plant infestation sites continued to be monitored and treated. In addition island-wide surveys were conducted, during which additional alien plant infestations were discovered, documented and when possible, treated. The alien species that were monitored and/or treated on ASIS during 2004 and 2005 were *Ailanthus altissima*, *Alnus glutinosa*, *Artemisia stelleriana*, *Carex kobomugi*, *Clematis terniflora*, *Eleagnus umbellata*, *Eragrostis curvula*, *Lonicera japonica*, *Lythrum salicaria*, *Miscanthus sinensis*, *Pinus thunbergii* and *Rosa multiflora*.

During 2005 ASIS received some much appreciated assistance from the NPS Northeast Region's Exotic Plant Management Team (NER EPMT). The NER EPMT helped monitor and treat infestations of *Clematis terniflora*, *Rosa multiflora* and *Eragrostis curvula* and *Ailanthus altissima*.

ASIS staff also conducted an inventory of alien plant species around the park's headquarters area and on the adjacent lands to the south owned by the State of Maryland. This took place as part of a tentative cooperative arrangement between the NPS and Maryland's Department of Natural Resources.

Finally, during 2005, ASIS staff consolidated all APMP data. This consolidation is a continuation of work begun in 2003 (Weller and Sturm). All alien plant monitoring and treatment locations were compiled into a database and species codes were assigned to all sites. This updated database organizes program data and allows newly discovered alien plant locations to be documented chronologically and systematically. Future alien plant management program activities at ASIS will continue to be documented in this database.

Herbicide use during 2004 is presented in table 1 and the treatments associated with the use of these herbicides and worker hours are included in table 2. Monitoring of the 2004 treatment areas was conducted during spring 2005 since 2004 treatments were conducted at the end of the growing season. The alien plant species that were monitored or treated during 2004 are *Ailanthus altissima*, *Alnus glutinosa*, *Artemisia stelleriana*, *Carex kobomugi*, *Lythrum salicaria*, *Clematis terniflora*, *Lonicera japonica*, *Eragrostis curvula*, *Rosa multiflora*, and *Miscanthus sinensis*.

During 2005 *Ailanthus altissima*, *Carex kobomugi*, *Lythrum salicaria*, *Clematis terniflora*, *Lonicera japonica*, *Eragrostis curvula*, *Rosa multiflora*, and *Miscanthus sinensis* were monitored and/or treated as part of the ASIS APMP. Once again herbicide use during 2005 is presented in table 1 and the treatments associated with the use of these herbicides and worker hours are included in table 2. Searching and monitoring efforts conducted in 2005 are summarized in table 3. Sites treated in 2005 were monitored for early effectiveness but have not yet been monitored for regrowth. Therefore, monitoring of currently active infestation sites (meaning those sites where an invasive alien species has been found to be present within the past three years) will be conducted during spring 2006, see table 5. Total worker hours of the ASIS APMP for 2005 are presented in table 4. This table also includes the time that the NER EPMT spent assisting ASIS APMP in 2005. The treatment information from 2005 is referenced by infestation site in

table 5. Finally, the anticipated monitoring and treatment needs of the ASIS APMP during 2006 are presented in table 5 as well.

Methods:

ASIS Alien Plant Management Program Design 2004-2005:

Since the last APMP report (Weller and Sturm, 2003) ASIS has adopted the Alien Plant Ranking System (APRS), which is a cooperative effort among the National Park Service, Northern Arizona University, Ripon College, University of Minnesota, and the U.S. Geological Survey. APRS is a computer program that helps managers prioritize decisions concerning invasive non-native plants and is used as an analytic tool to:

1. Identify harmless non-native plants from invasive, harmful non-native (alien) plants.
2. Identify alien plant species that if left untreated may negatively impact a site in the future.
3. Assess treatment options for each targeted alien plant species so that control costs can be weighted against the weed's impact.

The APMP has and will continue to follow the alien species guidelines found at the NPS inventory and monitoring website (<http://science.nature.nps.gov/im/monitor/index.cfm>). Additionally, the APMP has and will continue to refer to the Bureau of Land Management's (BLM) Technical Reference 1730-1: Measuring and Monitoring Plant Populations and the Nature Conservancy Weed Handbook for guidance on monitoring and treating targeted alien plant populations.

Safety measures taken by ASIS during plant eradications

Herbicide mixtures used at the National Seashore include a non-toxic marker dye. The dye assures that proper coverage of the herbicide is administered on the foliage of targeted species. It also assures that the applicator will see any possible contamination on his/her Tyvek suit. Proper protective equipment (PPE) will always be essential to the management of exotic plant species at ASIS.

The lead technician responsible for coordinating and implementing the expanded APMP completed a herbicide applicator training course, run by the State of Maryland, during 2005 and as a result has been officially permitted to conduct and oversee the herbicide treatments described in this report. Employee safety is important to ASIS, especially when having to work with potentially hazardous materials, therefore making sure that all permits are current and up to date is an essential, annual, required component of the ASIS APMP.

Alien Plant Inventory and Monitoring

Island searches for invasive alien plants were conducted during 2004 and 2005. The results of these searches are summarized below and in tables 1, 2 and 5 and the general island locations and time required for these searches are presented in tables 3 and 4. Searchers used a Pathfinder Pro XL Global Positioning System or Garmin GPSmap76 handheld unit to record GPS data. When possible invasive plants with an area greater than one square meter were mapped using GPS data that displayed the perimeter of their area of occurrence. Those species with an area less than one square meter were mapped with a single point to indicate their position.

Descriptive data were recorded for each monitored or newly discovered infestation which included the following attributes: species, abundance (light, moderate, or heavy), Length (longest axis, m), Width (shortest axis, m), Height (m), # individuals, phenology and comments. These data were frequently recorded as visual estimates, since actual measurements were often not possible in thick brush and would have slowed the search (or monitoring) effort considerably. The collected data were used to estimate the size (m²) of individual infestations. A written summary of the ASIS APMP 2004 and 2005 monitoring and management activities is presented below by species.

The alien species found during the park headquarters/ State of Maryland property searches included *Miscanthus sinensis*, *Rosa multiflora*, *Lonicera japonica* and *Eleagnus umbellata*. In regards to these searches, the criteria for the invasive alien plant species inclusion were:

1. The species was already identified as being of management concern on Assateague Island.
2. The species was on the invasive non-native (alien) plant species list presented by the Maryland Department of Natural Resources Wildlife & Heritage Service.
(<http://www.dnr.state.md.us/wildlife/ieplists.html>)
3. The abundance of a candidate alien species warranted management consideration.

ASIS has begun treatment of *E. umbellata* at this site (Elum Site 2), see the *Eleagnus umbellata* written section and tables 1, 2 and 5.

Results

Ailanthus altissima

Since 2000, *Ailanthus altissima* (Aial) has been managed by both chemical and physical treatments. Prior to 2005 larger trees (= 4 inches dbh) were treated by girdling while saplings were broken off and in both cases the exposed xylem of the remnant stems were immediately hand sprayed with 0.7% triclopyr triethylamine salt (Brush-Be-Gone™).

On April 22, 2004 *Ailanthus* site Aial3 was monitored and found to have three resprouts ranging from 210 to 440 cm in height. Then on September 11, 2004 the site was revisited with the intent of treating these resprouts. Only two remained, the other having withered in the previous four months, these were treated with a cut stump treatment using a 3% triclopyr (Garlon 3A) solution in water. Additionally, on April 19, 2004 *Ailanthus* sites Aial1 and Aial2 were monitored. Aial1 was observed to have two resprouting stumps with suckers of 45cm and 129cm and three seedlings were observed with heights of 48cm, 60cm and 62cm. On September 11, 2004 a return trip was made to treat the site; by then 7 seedlings less than 1m tall were found and pulled and 4 larger saplings or resprouts were treated with a cut stump treatment of 3% triclopyr (Garlon 3A) solution in water. Aial2 had no observable regeneration or recruitment.

It is believed that the resprouting observed at 2 of the sites may be the result of cutting the stumps too high above the ground. The stumps cut in 2004 were cut less than 10 cm above the ground surface in order to reduce the likelihood of future resprouting. No seed was observed to have been set at any of the Aial sites in 2004.

On April 21st 2005 the Aial3 site was visited and no living material was observed. On July 11th the North end sites were visited. Aial1 had (4) small seedlings which were manually pulled up at the time. Aial2 had no living material to be found.

A sizable *Ailanthus altissima* infestation (Aial4) of 39 trees and 39 seedlings was discovered on April 19, 2005 at the former location of the Green Run Hotel, which is located on the north side of the gut in front of Green Run cabin. This infestation was treated by ASIS personnel and the Northeast Region's Exotic Plant Management Team (NER EPMT) during the week of May 2, 2005. The trees and seedlings were sprayed with a basal application of 25% Triclopyr (Garlon 4) in basoil. The effectiveness of this initial treatment at this site was revisited on September 7, 2005 and no leaves were observed to have emerged from the 39 large trees. Many hundreds of new seedlings had emerged, as expected, beneath these trees and therefore the site will require additional treatment in 2006.

Alnus glutinosa:

A single tree was discovered during alien plant searches in April 2005. Its location was recorded and a return visit in spring of 2006 is planned to treat this single tree.

Artemisia stelleriana:

A small infestation was discovered in August 2004. The infestation is located near the 5.75 Km post on the north end of the island. It is estimated that this infestation occupied less than 500 meters squared in 2005. This infestation will be mapped and treated in 2006 with a foliar application of 3% Triclopyr (Garlon 3A) solution in water.

Carex kobomugi:

Each year during August an island wide (both Maryland and Virginia) survey is conducted for *Amaranthus pumilus*, a plant species federally listed as threatened. During these surveys observers also watch for *Carex kobomugi* (Cako) occurrences. The current limited number of Cako occurrences on ASIS is likely attributable to the management actions undertaken for this species from 1999 to the present.

Since its initial discovery on ASIS, known Cako sites have regularly been monitored and treated. Methods for Cako removal on ASIS include foliar application of glyphosate herbicide (2% Roundup™) with a pump sprayer and/or hand digging. Typically, herbicide has been used to destroy large colonies (>5 ramets) and hand digging to remove small (<5 ramets) colonies (Weller and Sturm, 2003). During treatment, any pieces of root that has not been removed has the capacity to resprout, therefore care is taken to remove the entire root system when hand digging. McIntyre, et al (2001) found that one summer application of glyphosate herbicide (2% Roundup™) was an effective method at treating Cako infested areas.

On April 19, 2004 Cako sites where plants had been documented during the previous three years were revisited and monitored for possible recruitment with no plants being found.

On August 18, 2005 30 of the 34 recorded Cako sites were monitored for possible recruitment, Cako sites 21, 30, 31 and 32 were not monitored. Cako13 was found to have an infestation of 50 plants occupying an area of 10m². Cako19 had some dead and difficult to identify plants that may have been Cako. Cako19 will be monitored again during 2006. Cako27 had an infestation of 15 plants occupying approximately 4m². Two additional Cako sites (Cako35 and Cako36) were fortuitously discovered during the 2005 field season. At the time of their discovery Cako35 and 36 totaled approximately >1m² and 10m² respectively. All active Cako sites will be targeted for treatment during 2006 using a summer application of glyphosate herbicide (2% Roundup™).

Clematis terniflora:

By late fall the leaves of many plant species have already senesced making *Clematis terniflora* (Clte) leaves and vines more visible. Therefore on November 16, 2004 Clte Site 1 was revisited and the area of this infestation was estimated to be 730m², up from an estimated 100 m² in 2000, when it was last monitored. Clte Site 1 is located behind the canoe rental shed at the western end of Bayside Campground. On November 16 and 17, 2004 Clte Site 1 was treated with a 3% solution of Triclopyr as recommended by the product labeling.

The effectiveness of the November 2004 treatment was monitored during spring 2005 and found to be effective for the larger plants that had grown high upon other native shrubs at this location. Of concern was the possibility of adversely affecting the native plants that also occupied treated areas. *Clematis terniflora* vines had grown, interwoven, among *Ilex opaca*, *Vitis rotundifolia* and *Smilax rotundifolia* and these non-target plants had been unavoidably hit by overspray during treatment. The spring 2005 monitoring revealed that these non-target plants appeared not to have been affected. Because the native vegetation had already lost its leaves, Clte was able to be effectively targeted during this time of year.

There were however, many hundreds of seedlings beneath the shrubs at this site that required further treatment. During the week of May 2nd, 2005 ASIS employees and NER EPMT treated the site again with a 3% solution of Triclopyr (Garlon 3A) in water throughout the area that had now grown much larger since the year 2000. The effectiveness of this second treatment was monitored on 11/28/05 and found to be very effective. All seedlings along the ground had perished leaving only 3 vines that had grown up into a shrub at the site. Further treatments and monitoring will occur at this site in 2006.

Eleagnus umbellata:

A single *Eleagnus umbellata* (Elum) tree was discovered within the Bayside campground at ASIS in 2004 (Elum Site 1) and was subsequently treated with a cut stump treatment using 3% solution of Triclopyr in water (Brush b gone premix) in November of 2004. This site was monitored during 2005 and treatment appears to have been successful.

Additionally, 149 separate Elum infestations were identified during the 2005 surveys of the park headquarters area and the adjacent State of Maryland owned property (Elum Site 2). These Elum infestations were treated with a 25% solution of Garlon 4 in diesel fuel. It is probable that additional Elum infestations will be found and treated at this site during 2006.

Eragrostis curvula:

During 2003, and again in 2004, areas infested with weeping lovegrass (*Eragrostis curvula*, Ercu) were recorded in order to monitor the rate of expansion by this species. Two new Ercu infestation sites were also recorded during 2004. One was located just west of the entrance to the ORV zone and the other was a small population of several ramets that was found approximately 100 meters to the east of the canoe rental shed located on Bayside Campground peninsula. As a result the rate of expansion of Ercu was found to be generally slow, with a detectable dispersal rate from occupied areas being less than the error rates for the Trimble GPS units being used. However from 2003 to 2005 the total area infested by weeping lovegrass increased from 0.26 hectares to 1.02 hectares respectively. The 2005 area estimate includes 33 new, isolated populations of 10m² or less.

On May 26, 2004 three 20m x 20m plots were installed parallel to Bayberry Drive in order to more closely monitor the encroachment of Ercu into currently unoccupied areas. The plots were selected because they had few Ercu plants within them but were located adjacent to larger Ercu populations. Each plot was mapped and photo documented. Instructors and undergraduate students from Salisbury State University (SSU) initially intended to monitor these three plots on an annual basis as a means of teaching field vegetation monitoring techniques to students. On November 6, 2004 these plots were monitored, however unfortunately the sampling methodology that was taught, systematic line-transect sampling at 5 m intervals, was not well suited for documenting the apparent slow rate of encroachment of Ercu within the plots. This project has been discontinued primarily due to a lack of coordination that satisfactorily addresses park monitoring needs.

Given Ercu's slow, but steady colonization into new areas it was targeted for treatment in 2005. During the first week of May 2005 both ASIS and NER EPMT personnel conducted experimental pretreatment preparations that would be tested for the control of this species. In preparation for a subsequent herbicide application they cut Ercu tussocks to ground level and raked the cut material away from the trimmed tussocks in order to encourage new growth to emerge unobstructed from the remaining living material. Weedwackers with cutting blades were found to be most effective at cutting the frequently sizable tussocks. The tussocks resprouted during the following few weeks and this new living material were then treated with a 3% solution of Glyphosate (Glypro) in water. The combined weed wacking/ herbicide application treatment was largely successful, however continued monitoring and treatments will be required during 2006 in some Ercu infested areas.

Lythrum salicaria:

Lythrum salicaria (Lysa) was first discovered on ASIS in August of 2000 and immediate action was taken to deter its further establishment on the island. The flowering heads of plants were cut and sealed in plastic bags and the stems were spot treated with glyphosate (McIntyre, et al 2001). No plants were found at this site in the summer of 2001. During late September 2002 (5) stems were discovered that had already flowered and produced seed at this site. These 5 stems were carefully hand dug and bagged in the manner previously described (Weller and Sturm 2003). Throughout the 2004 and 2005 growing season the Lysa1 site was frequently monitored for possible new recruits, and none were observed. The site will continue to be monitored in 2006.

Lonicera japonica:

There are currently six active *Lonicera japonica* (Loja) sites at ASIS. Alien species surveys conducted in 2003 resulted in the discovery of four Loja infestations sites. These infestations were documented as Loja Site 1: located along the access road to Valentines cabin. Loja Site 2: located on the Bayside Campground peninsula. Loja Site 3: located along Bayberry Drive within Assateague State Park. Loja Site 4: located along the Shell Road and the trail leading to the handicapped accessible duck blind that begins at the Shell Road parking area. In 2004, the total area occupied by these infestations were

estimated to be: Loja Site 1 - 2576 m², Loja Site 2 - 6,397 m² and Loja Site 4 - 501 m², which combined total 9,474m², or 0.95 hectares. Since Loja Site 3 is located entirely within Assateague State Park, it is not included in the combined total. The Loja Site 2 data that were collected on April 23, 2004 were entered into the Natural Resources Exotic Plant database during 2005.

Loja Site 1 was known to be more expansive than the initial 2004 assessment revealed. This is primarily because the Loja present at this site occurs at low to moderate abundances over a wide area that was not thoroughly surveyed during 2004 due to time constraints. Therefore in 2005 further surveys of Loja Site 1 revealed additional Loja infestations which were often found to be interspersed among equally frequent occurrences of native honeysuckle (*Lonicera sempervirens*) and muscadine grape (*Vitis rotundifolia*). New Loja infestation locations were mapped at this site for future consideration and management action.

Because this species has leaf cover that is persistent through the winter season, it is easily seen in contrast to its associates during the early spring monitoring interval. Therefore, as in years past, during April 2005 additional searches for alien species were conducted throughout ASIS. Several new infestations totaling 10,052 m² were discovered by these searches. These included Loja Site 5 a single plant discovered at the Ocean City inlet that was subsequently treated on December 27, 2005 with a cut stump treatment followed by application of a 25% solution of Garlon 4 in diesel fuel. Loja Site 2 was expanded to include many additional Loja infestations along the roadways in ASIS' developed area. Loja Site 2 now includes sites along Bayberry Drive, Ferry Landing and the Bayside campground road. Also the April 2005 searches lead to the discovery of another sizable Loja infestation site (Loja Site 6), which is located between Km 17 and 19.

To date Loja management efforts at ASIS have primarily focused on documenting the expanse and abundance of individual infestation sites. During 2006 Loja control measures will be initiated with help from the National Capital Region's Exotic Plant Management Team (NCR EPMT). Because these infestations will be difficult to treat, given Loja's frequent tendency to be interwoven among a dense array of non-target species, it is anticipated that successful elimination of this species will be an ongoing component of the ASIS Alien Plant Management Program for many years to come.

Miscanthus sinensis:

On September 24, 2004 a population of *Miscanthus sinensis* (Misi site 1) occupying an area 1720m², was treated with a 2% solution of Glyphosate (Roundup). At the time of treatment, the Misi had young flowers, as well as immature and mature seeds. Seed heads were cut from Misi to reduce the likelihood of future seed recruitment. The cut seed heads were placed in a trash bag and then properly disposed of off island.

Future applications of herbicide to Misi will be administered in spring. This will result in less herbicide being needed since less plant surface area will need to be covered. Then late in the growing season, monitoring and retreatment will be conducted in order to assure the highest level of effectiveness. The Misi population was monitored three weeks after the 2004 treatments at which time a noticeable disruption of photosynthesis was observed and the majority of the treated plants exhibited a highly chlorotic appearance as compared to nearby non-target vegetation. The April 2005 exotic plant searches lead to the discovery of 2 additional clumps of this species (Misi Sites 2 and 3) in remote parts of the North End of ASIS. Each of these sites measured <1m².

Pinus thunbergii:

During April 2005 a known population of *Pinus thunbergii* (Pith) was documented near the Virginia State line (Pith Site 1). The area occupied by this population totaled 511m². ASIS anticipates being able to eliminate this population using cut stump herbicide treatments during 2006.

Rosa multiflora:

During 2003 four *Rosa multiflora* (Romu) infested sites were documented within the ASIS developed area. During April 2004 the documented Romu sites were surveyed more thoroughly and a total of 24 individual Romu infestations were recorded with an estimated combined area of 340m². The

April 2004 data associated with monitoring the Romu infestations along Bayside Campground was entered into the Natural Resources Exotic Plant database.

During April 2005, all recorded Romu locations were revisited in order to verify positive identification. During this survey 21 additional Romu plants were located and mapped and it was determined that one plant had been misidentified during a prior survey. All Romu locations were targeted for treatment by the ASIS and NER EPMT personnel during May 2005. Forty-four plants, which occupied a total of 4940 m², were treated. The treatment of this species was accomplished with a truck fitted with large reservoir tank and long hose with adjustable high flow nozzle to deliver a 3% foliar application of Triclopyr (Garlon 3A) in water to these often sizable plants. The Romu treatments appear to have been largely successful, however continued monitoring and follow-up treatments are likely to be required during 2006.

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Table 1: 2004 and 2005 ASIS APMP Alien Plant Species Infestation and Treatment Information

Year	Species	# Active Sites	Tot Est Size Infestation	Est % Treated	Rx Date(s)	Product	Prod Amount (liters)	% Conc.	Active Ingredient	Solvent	Rx Team
2004	<i>Ailanthus altissima</i>	2	1 m ²	100	9/11	Brush b Gone	0.0054	3	Triclopyr	Water	ASIS
	<i>Artemisia stelleriana</i>	1	<500 m ²	0							
	<i>Carex kobomugi</i>	0	0 m ²	0							
	<i>Clematis terniflora</i>	1	730 m ²	100	11/16, 17	Brush b Gone	0.3122	3	Triclopyr	Water	ASIS
	<i>Eleagnus umbellata</i>	1	20 m ²	100	11/16	Brush b Gone	0.004	3	Triclopyr	Water	ASIS
	<i>Eragrostis curvula</i>	1	2600 m ²	0							
	<i>Lonicera japonica</i>	4	9500 m ²	0							
	<i>Lythrum salicaria</i>	1	0 m ²	0							
	<i>Miscanthus sinensis</i>	1	1720 m ²	100	9/24	Roundup	0.24	2	Glyphosate	Water	ASIS
	<i>Rosa multiflora</i>	4	340 m ²	0							
2005	<i>Ailanthus altissima</i>	3	650 m ²	100	5/2	Garlon 4	2.612	25	Triclopyr	Diesel	NE EPMT
	<i>Artemisia stelleriana</i>	1	<500 m ²	0							
	<i>Carex kobomugi</i>	5	110 m ²	0							
	<i>Clematis terniflora</i>	1	730 m ²	100	5/2	Garlon 3A	0.3	3	Triclopyr	Water	NE EPMT
	<i>Eleagnus umbellata</i>	2	2500 m ²	100	12/1,21,27	Garlon 4	5.39	25	Triclopyr	Diesel	ASIS
	<i>Eragrostis curvula</i>	1	11,000 m ²	100	5/16,17,18	Glypro	11.4	3	Glyphosate	Water	ASIS
	<i>Lonicera japonica</i>	5	19530 m ²	>1	12/27	Garlon 4	0.01	25	Triclopyr	Diesel	ASIS
	<i>Lythrum salicaria</i>	1	0 m ²	0							
	<i>Miscanthus sinensis</i>	3	1720 m ²	0							
	<i>Pinus thunbergii</i>	1	510 m ²	0							
	<i>Rosa multiflora</i>	1	4940 m ²	100	5/2	Garlon 3A	1.52	3	Triclopyr	Water	NE EPMT

Table 2: 2004 and 2005 ASIS APMP Alien Plant Species Treatment Time Log

Year	Species	Date	RX	Worker(s)	Hours	Total Rx Hours
2004	<i>Ailanthus altissima</i>	9/11	11 sdlds pulled, 4 cut stump	1	2.5	2.5
	<i>Ailanthus altissima</i>	9/11	2 cut stump	1	2	2
	<i>Miscanthus sinensis</i>	9/24	Foliar spray	1	5	5
	<i>Clematis terniflora</i>	11/16	Stem/ Foliar spray	1	3.5	3.5
	<i>Eleagnus umbellata</i>	11/16	Cut stump	1	0.5	0.5
	<i>Clematis terniflora</i>	11/17	Stem/ Foliar spray	1	4	4
				Total Hours =		17.5
2005	<i>Ailanthus altissima</i>	5/2	39 trees&39 sdlds basal Rx	3	8	24
		7/11	4 seedlings pulled	1	2	2
	<i>Rosa multiflora</i>	5/2	44 shrubs treated	4	6	24
	<i>Clematis terniflora</i>	5/2	Rx all seedlings and remaining	2	1	2
	<i>Eragrostis curvula</i>	5/16	103 Liters of 3% Glypro mix	2	9	18
		5/17	175.1 Liters of 3% Glypro mix	2	9	18
		5/18	113.3 Liters of 3% Glypro mix	2	9	18
	<i>Eleagnus umbellata</i>	11/28	1 Cut stump	1	0.25	0.25
		12/1	88 basal bark Rx	2	6	12
		12/21	50 basal bark Rx	2	6	12
		12/27	11 basal bark Rx	1	2	2
	<i>Lonicera japonica</i>	12/27	cut stump 25% Triclopyr	1	1	1
			Total Hours =		133.25	

Table 3: 2005 ASIS APMP Searching and Monitoring Worker Hours

Action	Location	Date	Hours
Searching	Green Run	4/19	24
	MD-VA line		
	Paradise Hotel		
	Green Run	4/20	8
	Paradise Hotel		
	North end	4/21	16
	North end	4/22	32
	Km 17-19	4/26	24
	North end	4/28	8
	Boneyard		
	Bunting's		
	Hungerford cabin		
Monitoring	Aial Site 3	4/21	4
	Misi Site 1	4/22	2
	Clte Site 1	4/1	0.5
	Ercu Site 1	6/16	1.5
	Aial Site 1	7/11	1.5
	Lysa Site 1	8/1	0.5
	Cako Mult Sites	8/18	16
	Aial Site 4	9/7	2
	Clte Site 1	11/28	0.25
	Elum Site 1	11/28	0.25
Subtotal			140.5

Table 4: 2005 ASIS APMP Total Worker Hours

Action	Hours
Searching and Monitoring Hours	140.5
Treatment Hours	133.25
Data Processing and Report writing	120
Total Hours =	393.75

Table 5: 2005 ASIS APMP Treatment Information by Infestation Site and Anticipated Monitoring and Treatment Needs for 2006.

Species	Infestation Site	2005 Size	2005 RX	2006 Monitor / (Re)treat	Last Year Observed	Monitoring / Rx Responsibility
<i>Ailanthus altissima</i>	Aial Site 1	4 Seedlings	Hand pulled	Yes	2005	ASIS
	Aial Site 2	None observed	NA	Yes	2005	ASIS
	Aial Site 3	None observed	NA	Yes	2004	ASIS
	Aial Site 4	39 trees and 39 saplings	basal 25% Triclopyr	Yes	2005	ASIS
<i>Artemisia stelleriana</i>	Arst Site 1	<500 m ² , large colony	None	Yes	2005	ASIS
<i>Carex kobomugi</i>	Cako Site 13	50 plants, 10m ²	None	Yes	2005	ASIS
	Cako Site 19	Few plants, <1m ²	None	Yes	2005	ASIS
	Cako Site 27	15 plants, 4m ²	None	Yes	2005	ASIS
	Cako Site 35	>1 ²	None	Yes	2005	ASIS
	Cako Site 36	10m ²	None	Yes	2005	ASIS
	Cako Site 21	Unknown	None	Yes	2003	ASIS
	Cako Site 30	Unknown	None	Yes	2003	ASIS
	Cako Site 31	Unknown	None	Yes	2003	ASIS
	Cako Site 32	Unknown	None	Yes	2003	ASIS
<i>Clematis terniflora</i>	Clte Site 1	730m ²	3% Triclopyr	Yes	2005	ASIS
<i>Eleagnus umbellata</i>	Elum Site 1	1 tree	cut stump 3% Triclopyr	Yes	2005	ASIS
	Elum Site 2	149 Trees	basal 25% Triclopyr	Yes	2005	ASIS
<i>Eragrostis curvula</i>	Ercu Site 1	1.02 hectares	35 glyphosate	Yes	2005	NCR EPMT/ASIS
<i>Lonicera japonica</i>	Loja Site 1	2580 m ² (2004 est.)	None	Yes	2005	NCR EPMT/ASIS
	Loja Site 2	6,400 m ² (2004 est.)	None	Yes	2005	NCR EPMT/ASIS
	Loja Site 3	State Park	NA	No	2003	NA (in State Park)
	Loja Site 4	501 m ² (2004 est.)	None	Yes	2005	NCR EPMT/ASIS
	Loja Site 5	1 small plant	cut stump 25% Triclopyr	Yes	2005	ASIS
	Loja Site 6	10,052 m ²	None	Yes	2005	NCR EPMT/ASIS
<i>Lythrum salicaria</i>	Lysa Site 1	None observed	NA	Yes	2002	ASIS
<i>Miscanthus sinensis</i>	Misi Site 1	1720m ² (2004 est.)	(2004 2% glyphosate)	Yes	2005	ASIS
	Misi Site 2	1 clump	None	Yes	2005	ASIS
	Misi Site 3	1 clump	None	Yes	2005	ASIS
<i>Pinus thunbergii</i>	Pith Site 1	511m ² (2005 est.)	None	Yes	2005	NCR EPMT/ASIS
<i>Rosa multiflora</i>	Romu Site 1	44 shrubs	3% Triclopyr	Yes	2005	NCR EPMT/ASIS