

Hargreaves Associates

Phone
828-298-2426

41 Hemphill Knoll
Asheville, NC 28803

Spiraea virginiana Monitoring & Management NCDENR Contract No. WO8003 Year Three Annual Summary August 31, 2010

The basis of this contract was to survey the Cheoah River corridor for invasive plant species and to perform control activities at specified priority areas (within 100' of all *Spiraea virginiana* populations) and into other areas as time permitted. Due to the necessary completion of the Environmental Assessment allowing use of chemical, control work did not begin until the initial cut stump treatment in June 2009. Since the 2007 survey, many existing infestations had matured and expanded and new ones continue to develop.

Initial control work has been completed within the priority zones with the exception of the Kudzu at Site#1, which was treated only on the island containing *Spiraea* subpopulation 1-1 and within and 40' upriver from *Spiraea* subpopulation 1-2. Given the nature of kudzu and its root location under boulders, without on-going treatment it is only temporarily suppressed.

As each site is unique, so is each species of invasive plant, requiring different methods, timing, and levels of treatment for effective control. Much depends on the plant's physiology and stored energy. While some species, such as Chinese Privet and Mimosa, and small new infestations generally can be controlled with only one treatment, other species and well established infestations often require multiple treatments. Vines are usually the most difficult to control due to their extensive root systems and ability to root along runners. Cut stump treatment with 50% Garlon 3A was conducted at each site and foliar treatment with 5% Garlon 3A was used as needed, as well as seedlings being hand pulled at each visit and seed removed when possible.

Full control of some existing infestations has not been reached. An extension of time has been requested and received, moving the end date of this contract from August 31st to October 31st, to be able to recheck each site and do follow-up treatment where necessary. Of continued concern within the *Spiraea* zones are:

- Kudzu at Site#1 is only temporarily suppressed.
- Oriental Bittersweet at Site#16 has an extensive root system where it is intermixed with *Spiraea* making control a delicate process. Follow up monitoring is necessary. Bittersweet is also established under boulders at Site#5 (though the *Spiraea* itself is gone-most likely washed down river-the site was worked due to its location at Yellow Creek on Alcoa land) and is also encroaching on Site#9 and from private land close to Site#14.

- Chinese Yam at Site#2 required several treatments to obtain control and may recur.
- Japanese Honeysuckle was treated only where it directly impacted Spiraea and reoccurs at Sites 10-1, 15 & 12-3.
- Princess Tree at Sites 5, 6, 8, & 11, cut down by an unknown source, have been producing root sprouts. Trees that were properly treated are not producing root sprouts.
- Current seed bank and outside influence will continue to affect the entire corridor. Follow-up monitoring is strongly recommended for all areas.

Once stimulus dollars were obtained for invasive plant control on USFS land along the Cheoah River corridor, Alcoa property became the focus beyond the Spiraea buffer zones. The Yellow Creek and upper penstock areas have had initial control. The lower penstock area has been only partially treated. Mature invasive plants have been removed between the penstock and the USFS boundary to the west. From the penstock east is still highly infested.

Total control time and chemical used:

| | | | |
|----------------------------|-------------|---------------------|------------------------|
| Spiraea virginiana sites | 198.5 hours | 81oz. 50% triclopyr | 20.25gal. 5% triclopyr |
| Oriental bittersweet sites | 15.5 hours | 10oz. 50% | 0 |
| Other areas treated | 7 hours | 3.5oz. 50% | 1.1 gal. 5% |
| Travel time | 56 hours | | |
| Chemical pickup | 3.5 hours | | |
| Recon, review, hand pull | 71.5 hours | | |

Detailed information including waypoint numbers, descriptions, treatment dates, amount of time and chemical usage per site is available.

| | | |
|----------------------------|--------------|-----------------|
| Total contract amount | | <u>\$22,500</u> |
| Billings (all paid) | | |
| 10/30/07 survey | 6,400 | |
| 2/22/08 planning meeting | 500 | |
| 11/7/08 yr.1 summary | 500 | |
| 2/5/09 revisions | 500 | |
| 1/4/10 2009 control | <u>6,200</u> | |
| Total billed as of 8/31/10 | | 14,100 |
| 2010 control | | 6,900 |
| 2010 yr.3 summary | | 500 |
| October 2010 recheck | | <u>1,000</u> |
| | | <u>\$22,500</u> |

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2010 Cheoah Summary Addendum 10-20-10

During the week of 9/27/10 I reviewed each of the priority *Spiraea virginiana* buffer zones and several of the non-priority areas that received invasive control management under this contract. I was pleased to see such a drastic reduction in the level of exotic infestation within such a short amount of time. Other than the continuing regeneration of Kudzu (site#1) and Japanese Honeysuckle (sites 1,10,12,15&16) and the likelihood of more root sprouts from improperly cut Princess Tree, the prior infestations within the *Spiraea* zones appear to be under control. There was no sign of re-infestation at the non-priority sites shown as controlled in the 8/31/10 summary. Of course, future monitoring and early detection/rapid response is critical to keep these areas free of exotic invasive plants.

| Follow up control performed week of 9/27/10 | | | |
|---|------------|----------------|---|
| <u>Site#</u> | <u>WP#</u> | <u>Species</u> | |
| 1 | 114 | Kudzu | Light regrowth removed at both 1-1 and 1-2 and worked the embankment from the river to facilitate foliar treatment safety for the ARRA crew |
| | | Honeysuckle | Some treated during Kudzu control |
| 2 | 158 | Ch. Yam | Only two small seedlings |
| | 159 | Princess | Two seedlings |
| 3 | 803 | Bittersweet | One plant |
| 9 | 136 | Princess | One root sprout |
| 10 | 225 | Honeysuckle | Cut stump by 10-1 |
| | 237 | Privet | Handpull seedlings |
| | 238 | Privet | Handpull seedlings |
| | 239 | Mimosa | Cut stump heavy root sprouts and handpull several seedlings |
| 11 | 257 | Mimosa | Cut stump two young trees |
| | 262 | Princess | Basal new root sprouts |
| | 265 | Princess | North of foot bridge, basal multiple sprouts |
| 12 | 271 | Privet | Handpull seedlings |
| | 915 | Honeysuckle | Handpull near 12-3 |
| 13 | 365 | Mimosa | Cut stump one young tree |
| | 365 | Privet | Handpull seedlings |
| 14 | 346 | Privet | Handpull many seedlings and cut stump several on islands near bridge |
| 16 | 181 | Bittersweet | Found and handpulled only 8 or 10 small plants |

Invasive Plants Treated Outside Spiraea Virginiana Zones

| <u>WP#</u> | <u>Species</u> | <u>Method</u> | <u>Date & hours</u> | <u>Amt. of chem.</u> | <u>Reason</u> | <u>Results as of 8-31-10</u> |
|------------|------------------|---------------|-------------------------|----------------------|--|------------------------------|
| 215 | Kudzu | cut root | 8/6/08,1/2hour | none | test | controlled |
| 912 | Kudzu | cut root | 10/8/09,1/2hour | none | isolated plants | 80% controlled |
| 912 | Kudzu | foliar | 7/23/10, 5 min. | 1 oz. | to complete | controlled |
| 154 | Bittersweet | cutstump | 7/2/09, 2hours | 1 oz. | to prevent seed | seed not produced |
| 203 | Bittersweet | cutstump | 7/2/09, 1.5hours | 1 oz. | to prevent seed | seed not produced |
| 211 | Bittersweet | cutstump | 6/29/09, 1 hour | 1 oz. | to prevent seed | seed not produced |
| 212 | Bittersweet | cutstump | 6/29&7/1/09, 4hours | 2 oz. | to prevent seed | seed not produced |
| 137 | Bittersweet | cutstump | 6/30/09, 3hours | 2 oz. | to prevent seed | seed not produced |
| 352 | Bittersweet | cutstump | 7/2/09, 4hours | 3 oz. | to prevent seed | seed not produced |
| 182 | Lonicera maackii | cutstump | 6/21/10, 15 min. | .1 oz. | isolated species | controlled |
| 901 | Multi. Rose | cutstump | 10/20/09, 45 min. | .5 oz. | hvy seed, Alcoa-Y.C. | 75% controlled |
| 901 | Multi. Rose | foliar | 5/19/10, 30 min. | 1 gal. | to complete | controlled |
| none | Mimosa,several | cutstump | 6/19/10, 15 min. | .25 oz. | by #901, Alcoa-Y.C. | controlled |
| 905 | Chinese yam | foliar | 5/20/10, 5 min. | .5 oz. | isolated, Alcoa-L.P. | controlled |
| 512 | Jap. Honeysuckle | cutstump | 8/25/10, 4hours | 2.5oz. | seed bearing, Alcoa-L.P., along old roadbed | mature plants removed |
| 513 | Multi. Rose | | | | | |
| 514 | Multi. Rose | | | | | |
| 515 | Jap. Honeysuckle | | | | | |
| 518 | Privet | | | | | |
| 519 | Multi. Rose | | | | | |

Chemical Control Activity within *Spiraea virginiana* Zones through 8-31-10

| Site totals | | | | Infestations | | | | 2009 dates | 2010 dates | | Comments |
|-------------|-------|---------|---------|--------------|-------------|------|---------------------------|------------|---------------------------------------|-------------------|---|
| site# | hours | 50% | 5% | WP# | species | seed | description | cut stump | cut stump | foliar | |
| 1 | 58 | 22oz. | 0 | 114* | kudzu | | covering site | 24-Apr | 6/22,23,24,25 & 7/14,16,20,21&8/24 | | temporary suppression, 21 additional volunteer hours |
| | | | | 181* | jap.honey | | hvy mix in kudzu | | 7/14&21 | | treated only by 1-2 |
| | | | | 602 | privet | | large tree form | 19-Oct | | | |
| 2 | 7.5 | .75oz. | 1gal. | 156 | multi.rose | | small riverside | 25-Jun | | | |
| | | | | 157 | mimosa | | small riverside | 25-Jun | | | |
| | | | | 158* | ch.yam | x | heavily entwined | | 6/23&7/14 | 5/20,6/23,7/14&22 | appears controlled 8/24/10 |
| | | | | 159* | princess | x | large multiple stem | | | | girdled |
| | | | | 191 | ch.yam | x | younger infestation | 19-Oct | | 5/20,6/23,7/14 | greatly expanded, controlled |
| 3 | 4 | 1oz. | .5gal. | 902 | ch.yam | | new infestation | | | 20-May | caught early |
| | | | | 127 | privet | | in Spiraea & both sides | 29-Jun | | | |
| | | | | 127 | multi.rose | | spotty in privet | 29-Jun | | 20-May | |
| | | | | 166 | multi.rose | x | heavy roadside thicket | 30-Jun | | 20-May | |
| 4 | 1 | .25oz. | 0 | 803* | bittersweet | | small new infestation | 29-Jun | | | |
| | | | | 914 | mimosa | | one small tree | | 23-Jun | | |
| | | | | 914 | multi.rose | | new, river edge | | 23-Jun | | |
| 5 | 4.5 | 1.5oz. | 1gal. | 129 | princess | x | four large trees cut down | | 7/22&8/24 | 22-Jul | root sprouts |
| | | | | 130 | bittersweet | | still young&light | | 22-Jul | 5/19&7/22 | spread beneath boulders |
| | | | | 130 | multi.rose | | few small plants | | | 5/19&7/22 | |
| | | | | 130 | privet | | small scattered | | | 19-May | |
| | | | | 902 | princess | | two new seedlings | | | 19-Jun | |
| 6 | 1.5 | .25oz. | 0 | 205 | princess | x | one large tree cut down | | | | no rootsprouts yet |
| | | | | 205 | privet | | small scattered | 23-Jul | | | |
| 7 | 2 | 1.25oz. | 0 | 206 | princess | x | one large tree | | 14-Jul | | hack&squirt |
| | | | | 209 | mimosa | | medium multi | 23-Jul | | | |
| | | | | 617 | privet | x | tree size | 23-Jul | | | |
| | | | | 618 | privet | | two plants | 23-Jul | | | |
| 8 | 12 | 7.5oz. | 1.5gal. | 213 | princess | x | three(of six) large trees | | 6/17, 8/24sprouts | | hack&squirt,2 cut&1girdled |
| | | | | 218 | multi.rose | x | small roadside | 26-Jun | | 19-May | |
| | | | | 219 | multi.rose | x | large roadside | 6/26,7/24 | | 19-May | |
| | | | | 802 | multi.rose | | floodplain sprawl | 24-Jul | | 22-Jul | 5/19&7/22 |
| 9 | 6.5 | 2.25oz | 0 | 136* | princess | x | four large trees girdled | | 22-Jul | | girdle missed arm |
| | | | | 137 | bittersweet | | spread into buffer | 24-Jun | | 18-Jun | |
| | | | | 234 | mimosa | | small | 24-Jun | | | |
| | | | | 235 | mimosa | | small | 24-Jun | | | |
| | | | | 800 | bittersweet | | new infestation | 24-Jun | | | |
| | | | | 801 | ch.yam | | new infestation | 24-Jun | | | |
| | | | | 907 | multi.rose | | river edge cutback | | | 18-Jun | |

Chemical Control Activity within Spiraea virginiana Zones through 8-31-10

| Site totals | | | | Infestations | | | | 2009 dates | 2010 dates | | Comments |
|-------------|-------|------|---------|--------------|-------------|------|--------------------------|-------------|------------|-----------|-----------------------------|
| site# | hours | 50% | 5% | WP# | species | seed | description | cut stump | cut stump | foliar | |
| 10 | 19 | 8oz. | 5.5gal | 225 | privet | x | heavy roadside cutbacks | 23-Jun | | | |
| | | | | 225* | jap.honey | x | 150' of steep&narrow | | 18-Jun | 3/31&7/22 | reoccurring |
| | | | | 236 | multi.rose | x | road to river | 23-Jun | | 20-May | |
| | | | | 237* | privet | x | heavy mix with MR | 9-Oct | | | |
| | | | | 237 | multi.rose | x | heavy mix with CP | 9-Oct | 18-Jun | 20-May | |
| | | | | 238* | privet | x | heavy above river | 23-Jun | | | |
| | | | | 239 | princess | x | large river edge | | 18-Jun | | hack&squirt |
| | | | | 239* | mimosa | x | large & sickly | | 18-Jun | | hack&squirt, died fast |
| | | | | 239 | multi.rose | x | roadside and understory | 24-Jun | | 20-May | |
| | | | | 903 | multi.rose | x | river edge cutback | | | 20-May | |
| 11 | 14 | 9oz. | 2gal. | 253 | multi.rose | x | large heavy thicket | 25-Jun | | 19-May | |
| | | | | 254 | multi.rose | | floodplain sprawl | 25-Jun | 22-Jul | 19-May | |
| | | | | 255 | mimosa | | small multi tree | 24-Jun | | | |
| | | | | 255 | privet | | small scattered | 24-Jun | | | |
| | | | | 256 | privet | | small scattered | 24-Jun | | | |
| | | | | 257* | mimosa | x | one large, several small | 24-Jun | | | |
| | | | | 260 | privet | x | 4"cal.tree& many small | 24-Jun | | | |
| | | | | 262* | princess | x | 2 large trees, cut down | | 7/22&8/24 | 19-May | root sprouts |
| | | | | 627 | multi.rose | x | spread downhill | 25-Jun | | 19-May | |
| | | | | 628 | multi.rose | x | large heavy thicket | 25-Jun | | 19-May | |
| | | | | 629 | mimosa | | young multiple | 24-Jun | | | |
| | | | | 916 | CP,OB,mim. | | new scattered plants | | 19-Jun | | |
| new 11 | | | | 910 | princess | | 3 small | | 18-Jun | | |
| | | | | 911 | bittersweet | | younger infestation | | 18-Jun | 18-Jun | |
| 12 | 9.5 | 5oz. | .25gal. | 268 | privet | x | few large, many small | 10/6&7 | | | |
| | | | | 269 | princess | x | three trees | | 19-Jun | | hack&squirt |
| | | | | 271* | privet | x | cutbacks most of 800' | 7/28,10/6&7 | 19-Jun | | |
| | | | | 273 | mimosa | | small riverside | 6-Oct | | | |
| | | | | 275 | mimosa | | small | 6-Oct | | | |
| | | | | 630 | privet | x | large multiple stem | 28-Jul | | | |
| | | | | 913 | ch.yam | | new under 12-4 | | 19-Jun | | |
| | | | | 915* | jap.honey | | new at 12-3 | | 7/23&8/24 | 23-Jul | hornets, could not complete |

Chemical Control Activity within Spiraea virginiana Zones through 8-31-10

| Site totals | | | | Infestations | | | | 2009 dates | 2010 dates | | Comments |
|-------------|-------------|---------|-----------------------|--------------|-------------|-----------|------------------------|---------------|---------------------|----------------|------------------------|
| site# | hours | 50% | 5% | WP# | species | seed | description | cut stump | cut stump | foliar | |
| 13 | 6 | 1.25oz. | 0 | 365* | mimosa | | small scattered | 25-Jun | 17-Jun | | |
| | | | | 365* | privet | x | 4 large plants | 25-Jun | | | |
| | | | | 802 | privet | | many young plants | 25-Jun | 17-Jun | | much handpull |
| 14 | 19 | 8oz. | 0 | 346* | privet | x | heavy mix throughout | 10/6,19,20,21 | | | |
| | | | | 346 | multi.rose | | spotty in privet | 10/6,19,20,21 | | | |
| | | | | 346 | mimosa | | spotty in privet | 10/6,19,20,21 | | | |
| 15 | 6 | 2oz. | 3gal. | 509 | jap.honey | | heavily entwined | | 3/24,6/18,7/14,8/25 | 24-Mar | reinfesting |
| | | | | 510 | privet | | spotty & mowed | 7-Oct | | 24-Mar | |
| | | | | 906 | multi.rose | x | large river edge | | 18-Jun | | |
| 16 | 28 | 11oz. | 5.5gal | 527 | bittersweet | x | hvy. Infest. downriver | 8-Oct | | 20-May | |
| | | | | 528 | privet | | woods above Spiraea | 7/24&10/8 | | | |
| | | | | 528 | multi.rose | | woods above Spiraea | 7/24&10/8 | | 20-May | |
| | | | | 529 | bittersweet | | mixed in Spiraea | 7/22&10/8 | 7/15&8/25 | | extensive root sprouts |
| | | | | 529 | jap.honey | | mixed in Spiraea | 7/22&10/8 | 3/24,7/15&8/25 | 24-Mar | |
| | | | | 530 | multi.rose | | one plant | 24-Jul | | | |
| | | | | 531 | jap.honey | | mixed in vegetation | 24-Jul | | 3/24&7/15 | |
| | | | | 532* | bittersweet | | along river edge | 24-Jul | 25-Aug | 5/20&8/25 | |
| | | | | 532 | jap.honey | | along river edge | | 25-Aug | 3/24,5/20&8/25 | |
| | | | | 533 | princess | x | directly above 16-2 | | 15-Jul | | hack&squirt |
| | | | | 534 | jap.honey | x | heavy into canopy | 24-Jul | | 3/24&5/20 | |
| | | | | 535 | multi.rose | | surrounding 16-2 | 24-Jul | 15-Jul | 5/20&7/15 | |
| | | | | 535 | privet | | surrounding 16-2 | 24-Jul | | 20-May | |
| | | | | 535 | bittersweet | | surrounding 16-2 | 24-Jul | 7/15&8/25 | 5/20&7/15 | |
| | | | | 535 | jap.honey | | surrounding 16-2 | 24-Jul | 25-Aug | 3/24&7/15 | |
| 536 | bittersweet | x | large vines in canopy | 24-Jul | 15-Jul | 5/20&7/15 | | | | | |
| 537 | privet | | spotty road to river | 24-Jul | | | | | | | |
| 537 | jap.honey | | spotty road to river | | | 3/24&5/20 | | | | | |
| 538 | multi.rose | | linear thicket | 24-Jul | | 20-May | | | | | |
| 539 | multi.rose | | scattered | 24-Jul | | 5/20&7/15 | | | | | |
| 539 | jap.honey | | scattered | | | 20-May | | | | | |

*Additional follow-up control performed during week of 9-27-10.