



Department of Defense Legacy Resource Management Program

PROJECT NUMBER 09-334

Logistical and Technical Support for the North Carolina Sandhills Weed Management Area: Sharing DoD Invasive Plant Species Management Strategies with Installation Neighbors

Tracy Rush, NCSWMA

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SUMMARY FOR LEGACY PROJECT NUMBER 09-334

Funding from the Department of Defense Legacy Resource Program allowed the North Carolina Sandhills Weed Management Area (NCSWMA) to inventory and control invasive plant populations on lands in the vicinity of the military installations in the Sandhills region. This project assisted the NCSWMA in implementing regional invasive plant management strategies, including preventing the establishment of new invasive plants; inventory, control and monitoring of existing invasive plant populations; increasing public awareness of invasive plant issues and facilitating cooperation with land managers and landowners throughout the Sandhills region to control invasive plants. Through Legacy Project 09-334, the NCSWMA was able to accomplish the following:

SURVEY:

The NCSWMA surveyed 32+ properties for a total of 14,708 acres (Table 1). These properties include:

- North Carolina State Parks
- The Nature Conservancy Preserves
- Sandhills Area Land Trust parcels
- Sandhills Game Lands parcels (NC Wildlife Resources Commission)
- Private Conservation Land

MAPPING:

Over 1,600 occurrences of 34 different invasive plants were mapped using a Garmin GPS unit (Figure 1 and Table 2).

- 52% of these occurrences were Chinese Privet (*Ligustrum sinense*) and Japanese honeysuckle (*Lonicera japonica*).
- 20% of these occurrences were “wildlife-related” (planted for food or cover):
 - Chinese Lespedeza (*Lespedeza cuneata*) = 6.6%
 - Shrubby Lespedeza (*Lespedeza bicolor*) = 4.7%
 - Multiflora Rose (*Rosa multiflora*) = 4.7%
 - Weeping Lovegrass (*Eragrostis curvula*) = 4.3%
- Remaining 28% of occurrences were considered Early Detection and Rapid Response (EDRR) species, the most common of which were (in order):
 - Chinaberry (*Melia azedarach*) = 7.6%
 - Chinese Wisteria (*Wisteria sinensis*) = 3.7%
 - Mimosa (*Albizia julibrissin*) = 3.3%

DATA:

- A data sheet was filled out for each occurrence mapped.
- All data were entered into a large spreadsheet including treatment data.
- This data was then linked to the GPS data creating a database of all 1600 occurrences.
- An Arcview layer was then created from the database.

- Invasive species maps were created for each property surveyed.

CONTROL:

Approximately 350 occurrences (22% of all occurrences mapped) were treated and some occurrences were treated several times (Table 3).

- 60% of all occurrences treated were EDRR species.
- Chinese privet and Japanese honeysuckle were treated if the occurrences were isolated or if the occurrences were immediately adjacent to EDRR species.
- Maps were created showing which occurrences have been treated on each property.

EDUCATION AND OUTREACH:

- NC Sandhills Weed Management Area meetings were held in November and February to update all of the partners.
- A brochure for the general public has been developed and is being distributed.
- Handouts have been created and distributed including:
 - Lists of native trees, shrubs, grasses and herbaceous plants that can be used instead of invasive plants.
 - A “Do Not Plant” list of invasive landscaping plants.
- The website has been updated with new photos and information (www.ncswma.org).
- Several Powerpoint presentations have been developed and speaking engagements are being conducted:
 - Seven Lakes Garden Club – November 12, 2009
 - Regional Land Use Advisory Commission – November 19, 2009
 - North Carolina Exotic Pest Plant Council Annual Meeting – December 2, 2009
 - Garden Club of the Sandhills – January 13, 2010
 - Pinehurst Conservation Commission Spring Workshop – February 27, 2010
- Invasive species meetings and conferences are being attended to network with other professionals and learn new survey, mapping and treatment techniques:
 - Southeast Exotic Pest Plant Council Annual Meeting – May 2009
 - North Carolina Exotic Pest Plant Council Annual Meeting – December 2009
 - Strategic Management of Invasive Species in the Southeastern United States – December 2009

FUNDING:

- Future funding is being aggressively sought. Numerous grant applications have been submitted to various corporations and foundations:
 - National Fish and Wildlife Foundation Grant – Declined
 - Others Applied for:
 - DuPont - Declined
 - Monsanto - Declined
 - Unimin Mine - Declined
 - Goodyear Tire and Rubber Company - Declined
 - Progress Energy – Declined
 - Bayer CropScience - Pending
 - Wachovia Foundation- Pending
 - Waste Management – Pending
 - Dow AgroSciences – Accepted: Donated 50 gallons of herbicide for the 2010 field season.

- Over \$31,000 in In-Kind contributions has been secured for 2010-2011.

ADDITIONAL INFORMATION:

- A new population of the endangered plant, Michaux's sumac (*Rhus michauxii*), was located during the invasive plant surveys in 2009.

Table 1: Properties Surveyed by the NC Sandhills Weed Management Area in 2009.

Property Surveyed	Landowner	Total Acres	Acres Surveyed	Invasive Occurrences
Blue Farm (partial)	Private	3433	1700	37
Bowling-Crowley	TNC	230	230	115
Boyd Tract	State Parks	157	157	46
Calloway Forest (partial)	TNC	2677	1300	38
Camp Mu Sha Ni	Private	825	825	35
Carrington Tract	WRC	737	737	80
Carvers Creek State Park	State Parks	1140	1140	18
Clark II	State Parks	1263	1263	24
FIA Drowning Creek	WRC	529	529	1
Fort Bragg	DOD			8
Haskell CE	Private - CE	636	636	60
HC Investments	SALT	72	72	40
Herrera/Manness CE	Private - CE	40	40	1
Highland Trails	SALT	0.9	0.9	3
Johnson CE	Private - CE	542	542	2
Johnson-Blake	SALT	3	3	2
Lee Tract	TNC	137	137	5
Long Valley Farm	TNC	1414	1414	417
McPhaul	TNC	58	58	8
NCDOT Right-of-Way	NCDOT			6
Nicholson Creek	WRC	945	945	159
Nicks Creek Greenway	Southern Pines			19
Paint Hill	State Parks	220	220	18
Parsons Tract	WRC	327	327	61
Pine Hill	TNC	286	286	24
Pinehurst Greenway Trail	Pinehurst			25
Powell CE	Private - CE	146		1
Quewhiffle Creek	TNC	236	236	26
RAB	TNC	64	64	6
Rassie Wicker Park	Pinehurst			18
Reservoir Park	Southern Pines			20
Ritch Tract	WRC	430	430	13
River Bend	SALT	135	135	2
River Oaks	SALT	142	142	41
Robertson Tract	TNC	45	45	24
Sandavis	SALT	0.8	0.8	10
Sandhills Game Lands	NCWRC			14
Troutman Farms	Private	580	580	122
Unknown/Other				20
Weymouth Woods	State Parks	514	514	40
	TOTAL	17964.7	14708.7	1609

Table 2: Invasive Species Mapped (34 Different Species) by the NC Sandhills Weed Management Area

Scientific Name	Common Name	Number of Occurrences	Percentage of Total Mapped	Occurrences Treated	Percentage of Total Treated
<i>Ailanthus altissima</i>	tree of heaven	24	1.50	10	2.80
<i>Albizia julibrissin</i>	mimosa, silk tree	53	3.30	37	10.60
<i>Artemisia vulgaris</i>	mugwort	2	0.12	0	0.00
<i>Arundo donax</i>	giant reed	1	0.06	0	0.00
<i>Celastrus orbiculatus</i>	Oriental bittersweet	1	0.06	1	0.28
<i>Elaeagnus umbellata</i>	autumn olive	6	0.40	2	0.57
<i>Eragrostis curvula</i>	weeping lovegrass	70	4.30	4	1.14
<i>Euonymus fortunei</i>	wintercreeper	2	0.12	0	0.00
<i>Festuca elatior</i>	tall fescue	14	0.90	0	0.00
<i>Glechoma hederacea</i>	gill-over-the-ground	3	0.20	3	0.85
<i>Hedera helix</i>	English ivy	8	0.50	1	0.28
<i>Ipomoea sp.</i>	morning glory	3	0.20	0	0.00
<i>Lespedeza bicolor</i>	shrubby bushclover	75	4.70	17	4.80
<i>Lespedeza cuneata</i>	Chinese lespedeza	107	6.60	2	0.57
<i>Ligustrum sinense</i>	Chinese privet	421	26.20	47	13.40
<i>Ligustrum sp.</i>	ornamental privet	1	0.06	0	0.00
<i>Lonicera japonica</i>	Japanese honeysuckle	413	25.70	48	13.70
<i>Lonicera sp.</i>	bush honeysuckle	4	0.24	0	0.00
<i>Melia azedarach</i>	chinaberry	122	7.60	83	23.70
<i>Microstegium vimineum</i>	Japanese stilt grass	26	1.60	3	0.85
<i>Miscanthus sinensis</i>	zebra grass	2	0.12	1	0.28
<i>Morus alba</i>	white mulberry	3	0.20	0	0.00
<i>Murdannia keisak</i>	marsh dewflower	21	1.30	1	0.28
<i>Nandina domestica</i>	sacred bamboo	10	0.62	2	0.57
<i>Paulownia tomentosa</i>	princesstree	9	0.56	6	1.70
<i>Phyllostachys aurea</i>	bamboo	1	0.06	0	0.00
<i>Polygonum cuspidatum</i>	Japanese knotweed	5	0.31	2	0.57
<i>Pueraria montana</i>	kudzu vine	17	1.05	12	3.40
<i>Pyrus calleryana</i>	Bradford pear	27	1.70	18	5.14
<i>Rosa multiflora</i>	multiflora rose	75	4.70	22	6.30
<i>Senna obtusifolia</i>	sicklepod	6	0.40	0	0.00
<i>Sorghum halepense</i>	johnsongrass	11	0.68	0	0.00
<i>Vinca major</i>	periwinkle	1	0.06	1	0.28
<i>Wisteria spp</i>	wisteria	59	3.70	27	7.70
TOTAL		1609		350	

NC Sandhills Conservation Area - Invasive Plant Locations

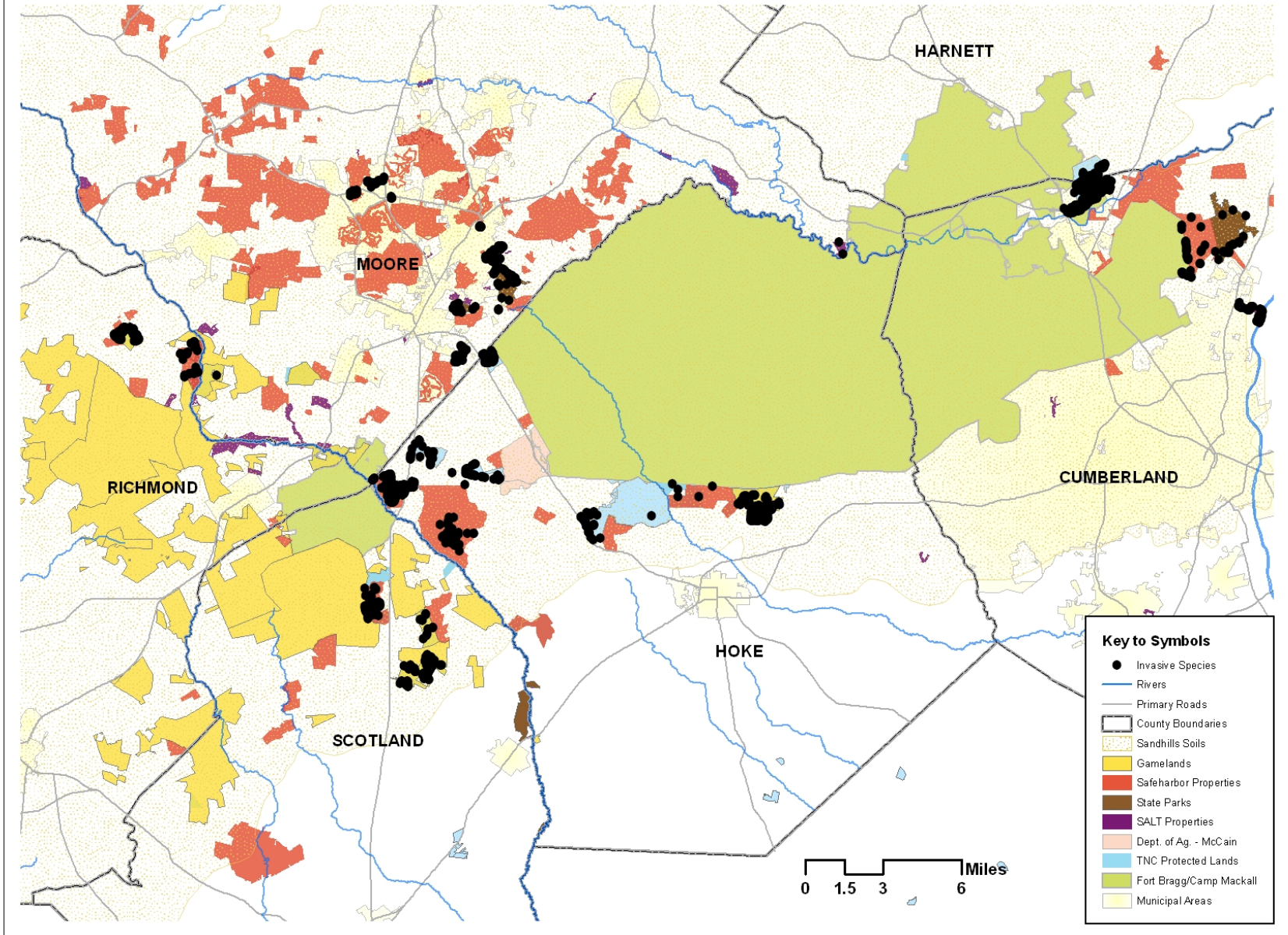


Figure 1. Map showing location of invasive plants mapped by the NC Sandhills Weed Management Area during 2009.

Table 3: Number of invasive species occurrences treated by property in 2009 by the NCSWMA.

Property	Landowner	Invasive Occurrences	Occurrences Treated 1	Occurrences Re-Treated 2	Occurrences Re-Treated 3	Occurrences Re-Treated 4
Blue Farm	Private	37	16			
Bowling-Crowley	TNC	115	78	8	3	2
Boyd Tract	State Parks	46	0			
Calloway Forest	TNC	38	6	1		
Camp Mu Sha Ni	Private	35	14	2		
Carrington Tract	NCWRC	80	16			
Carvers Creek State Park	State Parks	18	8	1		
Clark II	State Parks	24	4	2		
FIA Drowning Creek	NCWRC	1	0			
Fort Bragg	DOD	8	1			
Haskell CE	Private - CE	60	22	4	2	
HC Investments	SALT	40	0			
Herrera/Manness CE	Private - CE	1	0			
Highland Trails	SALT	3	3			
Johnson CE	Private - CE	2	0			
Johnson-Blake	SALT	2	2			
Lee Tract	TNC	5	1			
Long Valley Farm	TNC	417	107	14	4	
McPhaul	TNC	8	1			
NCDOT Right-of-Way	NCDOT	6	0			
Nicholson Creek	NCWRC	159	10	3	1	
Nicks Creek Greenway	Southern Pines	19	0			
Paint Hill	State Parks	18	0			
Parsons Tract	NCWRC	61	13	6	1	
Pine Hill	TNC	24	0			
Pinehurst Greenway Trail	Pinehurst	25	0			
Powell CE	Private - CE	1	0			
Quewhiffle Creek	TNC	26	2	1		
RAB	TNC	6	3			
Rassie Wicker Park	Pinehurst	18	0			
Reservoir Park	Southern Pines	20	0			
Ritch Tract	NCWRC	13	2			
River Bend	SALT	2	2	2		
River Oaks	SALT	41	4			
Robertson Tract	TNC	24	1			
Sandavis	SALT	10	0			
Sandhills Game Lands	NCWRC	14	7	1		
Troutman Farms	Private	122	22	4		
Unknown		20	1			
Weymouth Woods	State Parks	40	4			
	TOTAL	1609	350	49	11	2