Habitat Management Control of Invasive Species at NAS Key West

Final Report

Cooperative Agreement: W9126G-12-2-0031

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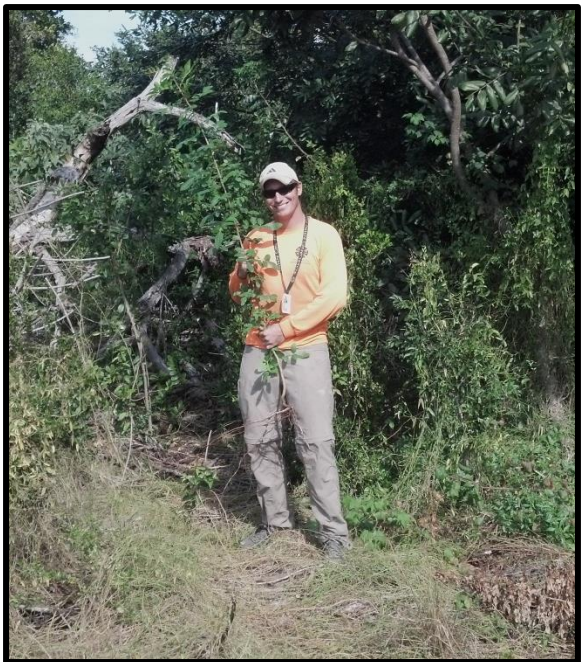

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Introduction

To abide by the standards set forth in the Sikes Act, the Navy has collaborated with The Institute for Regional Conservation (IRC) to develop and implement the Naval Air Station (NAS) Key West Integrated Natural Resource Management Plan (INRMP) for the management, enhancement and protection of natural resources on Navy lands. NAS Key West is comprised of 14 properties throughout the Lower Florida Keys with a combined area of 6,249 acres. These lands are inhabited by endangered Lower Keys Marsh Rabbit (*Sylvilagus palustris hefneri*) as well as a plethora of other floral and faunal species that comprise several imperiled ecosystems found across the Navy's 14 properties. IRC and the Navy entered into this cooperative agreement to manage and restore these resources. This report will outline the methods utilized and treatment data obtained through the completion of this project.

Methods

Under this cooperative agreement, IRC completed one task contributing to the management and restoration of the natural resources found on NAS Key West. The project commenced on 1 September 2012 and was finalized 31 December 2013.

The primary task for this Cooperative Agreement was the eradication of invasive exotic plants from 46.9 acres of NAS Key West properties to improve native habitats for listed species such as Blodgett's Wild Mercury (*Argythamnia blodgettii)* and Wild Dilly (*Mailkara jaimiqui)*. This acreage was spread across 11 sites located on two properties: Boca Chica Airfield (Figure 1) and Trumbo Point (Figure 2). As the sites varied in both species composition and proximity to development the methods utilized to control the invasive plants also differed greatly by location. All invasive plants in sites A, D, E, F and I were all basal treatments and left standing dead. Sites G, H and J were also basal treatment sites however; these sites were also infested with seaside mahoe (*Thespesia populnea*). On these sites, the seaside mahoe was cut and the stump was treated with herbicide. In areas close to development, site B and K, all invasive plants were cut and the stumps treated. On site B, all cut vegetation was removed off site and diposed of at a Monroe County transfer station. On site K all vegetation was chipped and left on site. Site C was infested with Sansevieria (*Sansevieria hyacinthoides*) which was hand pulled and bagged. All bagged vegetation was removed off site and disposed of in a base dumpster. On this site all invasive vegetation was cut, the stumps treated and the vegetation was removed off the site.

In addition to the aforementioned factors, our treatment methods were governed by our knowledge of the effectiveness of chemicals and techniques in relation to plant species and their affect in the environment. Treatment methods utilized included hand pulling, cut stump, basal bark, girdling, and foliar spray. These methods were employed in conjunction with the use of three herbicides: RoundUp mixed with water (3%), Garlon 3a mixed with water (50%), and Garlon 4 mixed with oil (20% & 30%). All herbicides are mixed with spray pattern indicators

to help prevent non target damage. In all sites, an attempt was made to utilize as little herbicide as necessary and to prevent the loss or damage of any native species through spray drift or vegetation removal.

Treatment Data

IRC kept accurate records of all pertinent data throughout the treatment process which includes the number and species of treated plants, type and amount used of unmixed herbicide, as well as the treatment methods utilized (Table 1). In addition, ArcGIS maps were created to provide a spatial representation of the completed treatment regime. This can be found on the accompanying CD.

Conclusion & Recommendations

All sites were successfully treated. Site A has had multiple treatments and the number of exotic plants found during this treatment was greatly reduced from previous numbers. Site B should be easily maintained as there were few exotics present and the area is cosmetically maintained. During this round of treatments on site C all cut vegetation was removed from the site and disposed of at an offsite county transfer station. Follow up treatments of this site shows a great reduction in the number of new recruits. Sites D, E and F have all be reduced to maintenance as no large infestations remain on these sites. Sites G and H will need multiple retreatments as the infestations of seaside mahoe (*Thespesia populnea*) and lather leaf (*Colubrina asiatica*) have substantial seed banks and will continue to produce many new recruits. Site J and I have been treated, but also have an established seed bank and will require follow up monitoring and treatments. However, the recruitment of seedlings does not seem to be as prolific as sites G and H. Site K has a high potential for re-infestation due to the remaining Australian pine (*Casuarina* spp.) seed bank.

IRC recommends continued monitoring and treatment of all sites with the priority given to sites G, H and C. Continued treatments will work to reduce the seed bank and prevent future infestations. Monitoring of the site will allow for the identification of new exotics or secondary invaders that take advantage of the recent disturbance. Any area adjacent to a water source should be of special concern as many invasive plants produce floating seeds which are easily spread.

Appendix

Table 1. Treatment Data showing areas treated, invasive plant species, quantity treated, type of herbicides and solutions used for specific species and control methods. Quantities of herbicides reported are mixed solutions.

Site	Invasive	# of Plants Treated	Garlon 4 20% Gallons	Garlon 4 30% Gallons	Garlon 3A 50% Gallons	RoundUp 3% Gallons	Control Method
A	*Casuarina* spp.	372	0.377				Basal/ Hand Pull
A	*Schinus terebinthifolius*	332	0.277				Basal/ Hand Pull
A	*Scaevola taccada*	2					Hand Pull
A	*Sansevieria hyacinthoides*	3	0.124				Cut Stump
A	*Swientenia mahagoni*	5	0.034				Basal
A	*Tradescantia spathacea*	10					Hand Pull
B	*Schinus terebinthifolius*	43	0.034				Cut Stump
B	*Leucaena leucocephala*	300		0.238			Cut Stump Hand Pull
C	*Sansevieria hyacinthoides*	7,916	0.367				Cut Stump Hand Pull
D	*Schinus terebinthifolius*	119	0.647				Basal/ Hand Pull
E	*Casuarina* spp.	12	0.041				Basal
E	*Scaevola taccada*	1	0.013				Basal
F	*Scaevola taccada*	1					Hand Pull
F	*Casuarina* spp.	1					Hand Pull

G	*Schinus terebinthifolius*	397	1.059				Basal/ Hand Pull
Site	**Invasive**	**# of Plants Treated**	**Garlon 4** 20% Gallons	**Garlon 4** 30% Gallons	**Garlon 3A** 50% Gallons	**RoundUp** 3% Gallons	**Control Method**
G	*Colubrina asiatica*	514	0.353				Basal/ Hand Pull
G	*Sansevieria hyacinthoides*	60	0.185				Cut Stump
G	*Thespesia populnea*	1			0.005		Cut Stump
H	*Thespesia populnea*	1,136			0.887		Cut Stump Hand pull
H	*Schinus terebinthifolius*	102	0.403				Basal/ Hand Pull
H	*Colubrina asiatica*	587	0.860				Basal/ Hand Pull
I	*Casuarina* spp.	92	0.403				Basal/ Hand Pull
I	*Schinus terebinthifolius*	1	0.001				Basal
J	*Casuarina* spp.	20	0.053				Basal
J	*Schinus terebinthifolus*	500	0.106				Basal/ Hand Pull
J	*Washingtonia robusta*	2	0.002				Cut Stump
K	*Casuarina* Spp.	3,059	7.950				Cut Stump Hand Pull
K	*Schinus terebinthifolius*	121	0.320				Basal/ Hand Pull
K	*Washingtonia robusta*	6	0.016				Cut Stump

K	*Pheonix reclinata*	1	0.001				Cut Stump
K	*Scaevola taccada*	11	0.032				Basal
K	*Sansevieria hyacinthoides*	32	0.085				Cut Stump

Figure 1. Boca Chica Treatment Sites

Boca Chica Airfield

Figure 2. Trumbo Point Treatment Sites

Trumbo Point