University of Central Florida
Weed Management Plan

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Landscape and Natural Resources

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1. INTRODUCTION

A. Description and purpose of site

The University of Central Florida (UCF) Landscape and Natural Resources (LNR) Land Management Program manages approximately 800 acres of natural land that is located within the Little Econlockhatchee River Basin, part of the St. John's River watershed. The site contains basin marsh, basin swamp, baygall, depression marsh, dome swamp, floodplain swamp, mesic flatwoods, mesic hammock, retention ponds, ruderal areas, sandhill, scrub, scrubby flatwoods, sinkhole lakes, strand swamps, wet flatwoods, wet prairie, and xeric hammock. Historically, the University of Central Florida was managed as a cattle ranch, where frequent low intensity fires mixed with grazing were the common management practices. Between 1950 & 1970 a series of fire breaks were installed around the campus and a few still remain in the natural spaces. Several listed species of flora and fauna that are found on this site are: Garberia, Giant Wild Pine, Pineland Butterfly Pea, Titusville Balm, Blue Butterwort, Yellow Butterwort, Pine Lily, Giant Orchid, Rose Pogonia, Leafless Beaked Orchid, Hooded Pitcher Plant, Sherman's Fox Squirrel, American Alligator, Florida Pine Snake, Gopher Tortoise, Bald Eagle, Osprey, Limpkin, Little Blue Heron, Snowy Egret, Tricolored Heron, Wood Stork, Southern American Kestrel, Florida Sandhill Crane, and White Ibis.. The University of Central Florida LNR Land Management Program is committed to the stewardship of this property and the conservation of the natural flora and fauna of the site. The natural areas also provide research opportunities and environmental education experiences for the community.

Management goals of the natural areas of the University are as follows: (1) to preserve and restore existing natural habitats for ecological, conservation, and educational purposes, and (2) to use the existing natural habitats as reintroduction sites for listed and endangered species.

B. Description of how certain plant species interfere with management goals.

Invasive species are known to have a wide range of effects on ecosystems, primarily disturbing the ecosystem's structure and function. Many invasive species have proven extremely difficult or impossible to eradicate and costly to control once established. Thus, stringent measures to avoid unwanted species are justified both ecologically and economically. The University has 47 known species of exotic plants on site of which 22 species are listed as Category I, 10 species as Category II, and the remaining are not categorized by FLEPPC. Existence of these species on the site greatly interferes with the management goals of the University.

C. Inventory of plant species that interfere with management goals

Binomial Name	Common Name	Catergory	Pop. Status
Ardisia crenate	Coral Ardisia	I	Decreasing
Asparagus densiflorus	Asparagus Fern	I	Decreasing
Cinnamomum camphora	Camphor Tree	I	Decreasing
Colocasia esculenta	Taro	I	Decreasing
Dioscorea bulbifera	Air Potato	I	Decreasing
Eichhornia crassipes	Water Hyacinth	I	Stable
Eugenia uniflora	Surinam Cherry	I	Decreasing
Hydrilla verticillata	Hydrilla	I	Stable
Imperata cylindrica	Cogon Grass	I	Increasing
Lantana camara.	Lantana	I	Increasing
Ligustrum sinense	Chinese Privet	I	Stable
Lionicera japonica	Japanese Honeysuckle	I	Stable
Ludwigia peruviana	Peruvian Primrose	I	Stable
Lygodium microphyllum	Old World Climbing Fern	I	Increasing
Melia azedarach	Chinaberry	I	Increasing
Nandina domestica	Heavenly Bamboo	I	Decreasing
Nephrolepis cordifolia	Boston Fern	I	Stable
Paederia foetida	Skunk Vine	I	Increasing
Panicum repens	Torpedo Grass	I	Stable
Sapium sebiferum	Chinese Tallow	I	Decreasing
Schinus terebinthifolius	Brazilian Pepper	I	Increasing
Urochloa mutica	Paragrass	I	Decreasing
Begonia cucullata	Wax Begonia	II	Stable
Syagrus romanzoffiana	Queen Palm	II	Stable
Rhynchelytrum repens	Natal Grass	II	Increasing
Panicum maximum	Guniea Grass	II	Increasing
Ricinus communis	Castor Bean	II	Increasing
Solanum viarum	Tropical Soda Apple	II	Stable
Sesbania punicea	Purple Sesban	II	Decreasing
Urena lobata	Caesar's Weed	II	Stable
Sphagneticola trilobata	Wedelia	II	Stable
Xanthosoma sagittifolium	Elephant Ear	II	Decreasing
Alpinia sp.	Ginger		Stable
Asclepias curassavica	Scarlet Milkweed		Decreasing
Bambusa spp.	Bamboo		Stable
Canna x generalis	Garden Canna		Stable
Carica papaya	Papaya		Decreasing
Crotalaria spp.	Rattlebox		Stable
Enterolobium contortisiliquum	Earpod Tree		Increasing
Gladiolus sp.	Gladiolus		Stable
Gloriosa superba	Flame Lilly		Stable
Indigofera hirsuta	Hairy Indigo		Stable
Ipomoea sp.	Morning Glory		Decreasing
Momordica charantia	Balsam Apple		Decreasing
Musa sp.	Banana		Stable
Nephrolepis biserrata	Fishtail Fern		Stable
Zingiber sp.	Ginger		Stable

2. OVERVIEW OF WEED MANAGEMENT PLAN

A. General Management Philosophy

The Weed Management Plan contributes to the natural area management and restoration programs within the UCF LNR Land Management Program. Rather than simply eliminating weeds, the focus is on the species and communities wanted in place of the weed species. Monitoring the spread and impact of invasive plants is also a critical component of the weed management plan.

Preventative programs will be implemented to keep the site free of species that are not yet established, but which are known to be pests elsewhere in the region. Priorities will be set for control or elimination of weeds that have already established themselves on the site according to their actual and potential impacts on the native species and communities, particularly on our conservation targets. Action will be taken only when careful consideration indicates leaving the weed unchecked will result in more damage than controlling it with the available methods.

To implement our Weed Management Plan, an adaptive management strategy will be used that includes:

1. Establishing and recording the goals for the site.
2. Identifying species that prevent us from reaching these goals and assigning them priorities based on the severity of their impacts.
3. Evaluating methods for controlling or otherwise diminishing the impacts of each species and, if necessary, re-ordering priorities based on likely impacts of the target and non-target species.
4. Developing weed control plans based on the information collected.
5. Implementing the results of our management actions.
6. Evaluating the effectiveness of our methods in light of the site goals, and using this information to modify and improve control priorities, methods, and plans.
7. Repeating the cycle by establishing new/modified goals.

Priorities will be set in the hope of minimizing the total, long-term workload. Therefore, actions will prevent new infestations and assign highest priority to the existing infestations that are the fastest growing, most disruptive, and affect the most highly valued areas of the site. The difficulty of controlling infestations will be considered, giving higher priority to infestations that are most likely to be controlled with available technology and resources.

I. Current extent of the species

Ranking categories are assigned to species in order to: 1) prevent the establishment of new weed species; 2) eliminate small, rapidly-growing infestations; 3) prevent large infestation from expanding; and 4) reduce or eliminate large infestations.

A =Species present as new populations or outliers of larger infestations, especially if they are expanding rapidly.
B = Species present in large infestations that continue to expand.
C = Species present in large infestations that are stable or decreasing.
D = Species present in small infestations that are stable or decreasing.

Rank	Binomial Name	Common Name	Catergory	Pop. Status
D	*Ardisia crenate*	Coral Ardisia	I	Decreasing
D	*Asparagus densiflorus*	Asparagus Fern	I	Decreasing
A	*Cinnamomum camphora*	Camphor Tree	I	Decreasing
B	*Colocasia esculenta*	Taro	I	Decreasing
B	*Dioscorea bulbifera*	Air Potato	I	Decreasing
D	*Eichhornia crassipes*	Water Hyacinth	I	Stable
D	*Eugenia uniflora*	Surinam Cherry	I	Decreasing
C	*Hydrilla verticillata*	Hydrilla	I	Stable
A	*Imperata cylindrica*	Cogon Grass	I	Increasing
A	*Lantana camara.*	Lantana	I	Increasing
D	*Ligustrum sinense*	Chinese Privet	I	Stable
D	*Lionicera japonica*	Japanese Honeysuckle	I	Stable
D	*Ludwigia peruviana*	Peruvian Primrose	I	Stable
A	*Lygodium microphyllum*	Old World Climbing Fern	I	Increasing
B	*Melia azedarach*	Chinaberry	I	Increasing
D	*Nandina domestica*	Heavenly Bamboo	I	Decreasing
D	*Nephrolepis cordifolia*	Boston Fern	I	Stable
A	*Paederia foetida*	Skunk Vine	I	Increasing
C	*Panicum repens*	Torpedo Grass	I	Stable
A	*Sapium sebiferum*	Chinese Tallow	I	Decreasing
A	*Schinus terebinthifolius*	Brazilian Pepper	I	Increasing
D	*Urochloa mutica*	Paragrass	I	Decreasing
D	*Begonia cucullata*	Wax Begonia	II	Stable
D	*Syagrus romanzoffiana*	Queen Palm	II	Stable
A	*Rhynchelytrum repens*	Natal Grass	II	Increasing
B	*Panicum maximum*	Guniea Grass	II	Increasing
C	*Ricinus communis*	Castor Bean	II	Increasing
A	*Solanum viarum*	Tropical Soda Apple	II	Stable
C	*Sesbania punicea*	Purple Sesban	II	Decreasing
C	*Urena lobata*	Caesar's Weed	II	Stable
D	*Sphagneticola trilobata*	Wedelia	II	Stable
D	*Xanthosoma sagittifolium*	Elephant Ear	II	Decreasing
D	*Alpinia sp.*	Ginger		Stable
D	*Asclepias curassavica*	Scarlet Milkweed		Decreasing
D	*Bambusa spp.*	Bamboo		Stable

D	*Canna x generalis*	Garden Canna		Stable
D	*Carica papaya*	Papaya		Decreasing
D	*Crotalaria spp.*	Rattlebox		Stable
A	*Enterolobium contortisiliquum*	Earpod Tree		Increasing
D	*Gladiolus sp.*	Gladiolus		Stable
D	*Gloriosa superba*	Flame Lilly		Stable
D	*Indigofera hirsuta*	Hairy Indigo		Stable
D	*Ipomoea sp.*	Morning Glory		Decreasing
D	*Momordica charantia*	Balsam Apple		Decreasing
D	*Musa sp.*	Banana		Stable
D	*Nephrolepis biserrata*	Fishtail Fern		Stable
D	*Zingiber sp.*	Ginger		Stable

II. Current and potential impacts of the species:

Impact ranking categories are based on the habitat management goals of the University.
A = Species that alter ecosystem processes such as fire frequency, sedimentation, nutrient cycling, or other ecosystem processes. These are species that alter conditions so radically that few native plants and animals can persist.
B = Species that out compete natives and dominate otherwise undisturbed native communities.
C = Species that do not out-compete dominant natives but:

a. prevent or depress recruitment or regeneration of native species.
b. reduce or eliminate resources used by native animals
c. promote populations of invasive non-native animals by providing them with resources otherwise unavailable in the area.

NR = Species not ranked in this section. Potential impact unknown or considered low.

Rank	Binomial Name	Common Name	Catergory	Pop. Status
C	*Ardisia crenate*	Coral Ardisia	I	Decreasing
NR	*Asparagus densiflorus*	Asparagus Fern	I	Decreasing
B	*Cinnamomum camphora*	Camphor Tree	I	Decreasing
A	*Colocasia esculenta*	Taro	I	Decreasing
A	*Dioscorea bulbifera*	Air Potato	I	Decreasing
A	*Eichhornia crassipes*	Water Hyacinth	I	Stable
NR	*Eugenia uniflora*	Surinam Cherry	I	Decreasing
A	*Hydrilla verticillata*	Hydrilla	I	Stable
A	*Imperata cylindrica*	Cogon Grass	I	Increasing
B	*Lantana camara.*	Lantana	I	Increasing
NR	*Ligustrum sinense*	Chinese Privet	I	Stable
NR	*Lionicera japonica*	Japanese Honeysuckle	I	Stable
B	*Ludwigia peruviana*	Peruvian Primrose	I	Stable
A	*Lygodium microphyllum*	Old World Climbing Fern	I	Increasing
B	*Melia azedarach*	Chinaberry	I	Increasing
NR	*Nandina domestica*	Heavenly Bamboo	I	Decreasing
B	*Nephrolepis cordifolia*	Boston Fern	I	Stable
A	*Paederia foetida*	Skunk Vine	I	Increasing

A	*Panicum repens*	Torpedo Grass	I	Stable
B	*Sapium sebiferum*	Chinese Tallow	I	Decreasing
A	*Schinus terebinthifolius*	Brazilian Pepper	I	Increasing
NR	*Urochloa mutica*	Paragrass	I	Decreasing
NR	*Begonia cucullata*	Wax Begonia	II	Stable
NR	*Syagrus romanzoffiana*	Queen Palm	II	Stable
B	*Rhynchelytrum repens*	Natal Grass	II	Increasing
A	*Panicum maximum*	Guniea Grass	II	Increasing
C	*Ricinus communis*	Castor Bean	II	Increasing
C	*Solanum viarum*	Tropical Soda Apple	II	Stable
C	*Sesbania punicea*	Purple Sesban	II	Decreasing
C	*Urena lobata*	Caesar's Weed	II	Stable
B	*Sphagneticola trilobata*	Wedelia	II	Stable
NR	*Xanthosoma sagittifolium*	Elephant Ear	II	Decreasing
C	*Alpinia sp.*	Ginger		Stable
NR	*Asclepias curassavica*	Scarlet Milkweed		Decreasing
A	*Bambusa spp.*	Bamboo		Stable
NR	*Canna x generalis*	Garden Canna		Stable
NR	*Carica papaya*	Papaya		Decreasing
C	*Crotalaria spp.*	Rattlebox		Stable
B	*Enterolobium contortisiliquum*	Earpod Tree		Increasing
NR	*Gladiolus sp.*	Gladiolus		Stable
C	*Gloriosa superba*	Flame Lilly		Stable
C	*Indigofera hirsuta*	Hairy Indigo		Stable
NR	*Ipomoea sp.*	Morning Glory		Decreasing
NR	*Momordica charantia*	Balsam Apple		Decreasing
NR	*Musa sp.*	Banana		Stable
C	*Nephrolepis biserrata*	Fishtail Fern		Stable
C	*Zingiber sp.*	Ginger		Stable

III. Value of the habitat/areas the species infest or could infest:

Ranking categories are based on the ecological, historical, or economical value of the primary habitats infested.

A = Infestations that occur in the most highly valued habitat or areas of the site.

B = Infestations that occur in less highly valued portions of site.

Rank	Binomial Name	Common Name	Catergory	Pop. Status
A	*Ardisia crenate*	Coral Ardisia	I	Decreasing
B	*Asparagus densiflorus*	Asparagus Fern	I	Decreasing
A	*Cinnamomum camphora*	Camphor Tree	I	Decreasing
B	*Colocasia esculenta*	Taro	I	Decreasing
A	*Dioscorea bulbifera*	Air Potato	I	Decreasing
B	*Eichhornia crassipes*	Water Hyacinth	I	Stable
B	*Eugenia uniflora*	Surinam Cherry	I	Decreasing
B	*Hydrilla verticillata*	Hydrilla	I	Stable
A	*Imperata cylindrica*	Cogon Grass	I	Increasing

A	*Lantana camara.*	Lantana	I	Increasing
B	*Ligustrum sinense*	Chinese Privet	I	Stable
A	*Lionicera japonica*	Japanese Honeysuckle	I	Stable
B	*Ludwigia peruviana*	Peruvian Primrose	I	Stable
A	*Lygodium microphyllum*	Old World Climbing Fern	I	Increasing
A	*Melia azedarach*	Chinaberry	I	Increasing
B	*Nandina domestica*	Heavenly Bamboo	I	Decreasing
A	*Nephrolepis cordifolia*	Boston Fern	I	Stable
A	*Paederia foetida*	Skunk Vine	I	Increasing
A	*Panicum repens*	Torpedo Grass	I	Stable
A	*Sapium sebiferum*	Chinese Tallow	I	Decreasing
A	*Schinus terebinthifolius*	Brazilian Pepper	I	Increasing
B	*Urochloa mutica*	Paragrass	I	Decreasing
A	*Begonia cucullata*	Wax Begonia	II	Stable
A	*Syagrus romanzoffiana*	Queen Palm	II	Stable
A	*Rhynchelytrum repens*	Natal Grass	II	Increasing
A	*Panicum maximum*	Guniea Grass	II	Increasing
B	*Ricinus communis*	Castor Bean	II	Increasing
A	*Solanum viarum*	Tropical Soda Apple	II	Stable
B	*Sesbania punicea*	Purple Sesban	II	Decreasing
B	*Urena lobata*	Caesar's Weed	II	Stable
A	*Sphagneticola trilobata*	Wedelia	II	Stable
A	*Xanthosoma sagittifolium*	Elephant Ear	II	Decreasing
A	*Alpinia sp.*	Ginger		Stable
B	*Asclepias curassavica*	Scarlet Milkweed		Decreasing
A	*Bambusa spp.*	Bamboo		Stable
B	*Canna x generalis*	Garden Canna		Stable
B	*Carica papaya*	Papaya		Decreasing
B	*Crotalaria spp.*	Rattlebox		Stable
A	*Enterolobium contortisiliquum*	Earpod Tree		Increasing
B	*Gladiolus sp.*	Gladiolus		Stable
A	*Gloriosa superba*	Flame Lilly		Stable
B	*Indigofera hirsuta*	Hairy Indigo		Stable
B	*Ipomoea sp.*	Morning Glory		Decreasing
B	*Momordica charantia*	Balsam Apple		Decreasing
B	*Musa sp.*	Banana		Stable
A	*Nephrolepis biserrata*	Fishtail Fern		Stable
A	*Zingiber sp.*	Ginger		Stable

IV. Difficulty of controlling and establishing replacements species:

A= Species likely to be controlled or eliminated with available technology and resources and which desirable native species will replace with little further input.
B = Species likely to be controlled but will not be replaced by desirable natives without an active restoration program requiring substantial resources.
C = Species difficult to control will likely result in substantial damage to other, desirable species.
D = Species unlikely to be controlled with available technology and resources.

E = Species is not in need of control measures, but should be monitored.

Rank	Binomial Name	Common Name	Catergory	Pop. Status
A	*Ardisia crenate*	Coral Ardisia	I	Decreasing
A	*Asparagus densiflorus*	Asparagus Fern	I	Decreasing
A	*Cinnamomum camphora*	Camphor Tree	I	Decreasing
C	*Colocasia esculenta*	Taro	I	Decreasing
C	*Dioscorea bulbifera*	Air Potato	I	Decreasing
C	*Eichhornia crassipes*	Water Hyacinth	I	Stable
A	*Eugenia uniflora*	Surinam Cherry	I	Decreasing
C	*Hydrilla verticillata*	Hydrilla	I	Stable
C	*Imperata cylindrica*	Cogon Grass	I	Increasing
A	*Lantana camara.*	Lantana	I	Increasing
A	*Ligustrum sinense*	Chinese Privet	I	Stable
A	*Lionicera japonica*	Japanese Honeysuckle	I	Stable
B	*Ludwigia peruviana*	Peruvian Primrose	I	Stable
C	*Lygodium microphyllum*	Old World Climbing Fern	I	Increasing
A	*Melia azedarach*	Chinaberry	I	Increasing
A	*Nandina domestica*	Heavenly Bamboo	I	Decreasing
B	*Nephrolepis cordifolia*	Boston Fern	I	Stable
C	*Paederia foetida*	Skunk Vine	I	Increasing
C	*Panicum repens*	Torpedo Grass	I	Stable
B	*Sapium sebiferum*	Chinese Tallow	I	Decreasing
C	*Schinus terebinthifolius*	Brazilian Pepper	I	Increasing
E	*Urochloa mutica*	Paragrass	I	Decreasing
A	*Begonia cucullata*	Wax Begonia	II	Stable
A	*Syagrus romanzoffiana*	Queen Palm	II	Stable
A	*Rhynchelytrum repens*	Natal Grass	II	Increasing
C	*Panicum maximum*	Guniea Grass	II	Increasing
A	*Ricinus communis*	Castor Bean	II	Increasing
A	*Solanum viarum*	Tropical Soda Apple	II	Stable
A	*Sesbania punicea*	Purple Sesban	II	Decreasing
A	*Urena lobata*	Caesar's Weed	II	Stable
A	*Sphagneticola trilobata*	Wedelia	II	Stable
A	*Xanthosoma sagittifolium*	Elephant Ear	II	Decreasing
A	*Alpinia sp.*	Ginger		Stable
A	*Asclepias curassavica*	Scarlet Milkweed		Decreasing
C	*Bambusa spp.*	Bamboo		Stable
A	*Canna x generalis*	Garden Canna		Stable
A	*Carica papaya*	Papaya		Decreasing
A	*Crotalaria spp.*	Rattlebox		Stable
C	*Enterolobium contortisiliquum*	Earpod Tree		Increasing
A	*Gladiolus sp.*	Gladiolus		Stable
A	*Gloriosa superba*	Flame Lilly		Stable
A	*Indigofera hirsuta*	Hairy Indigo		Stable
A	*Ipomoea sp.*	Morning Glory		Decreasing
A	*Momordica charantia*	Balsam Apple		Decreasing

A	*Musa sp.*	Banana		Stable
B	*Nephrolepis biserrata*	Fishtail Fern		Stable
A	*Zingiber sp.*	Ginger		Stable

V. Prioritized Species and Treatment

Under this category, we have prioritized species in order of importance based off of the current extent of the species, current and potential impacts of the species, and value of the habitats/areas that the species infests or may infest.

A= Species is considered to be a very high priority.
B= Species is considered to be a high priority.
C= Species is considered to be a moderate priority.
D= Species is considered to be a minor pest.

Rank	Binomial Name	Common Name	Category	Treatment
C	*Ardisia crenate*	Coral Ardisia	I	hand pulling/foliar and stump applications/ prescribed burning
D	*Asparagus densiflorus*	Asparagus Fern	I	hand pulling/foliar applications/prescribed burning
A	*Cinnamomum camphora*	Camphor Tree	I	foliar, basal bark, girdle, stump applications/ prescribed burning
B	*Colocasia esculenta*	Taro	I	foliar applications
A	*Dioscorea bulbifera*	Air Potato	I	hand pulling/foliar applications/prescribed burning
C	*Eichhornia crassipes*	Water Hyacinth	I	foliar applications
D	*Eugenia uniflora*	Surinam Cherry	I	foliar, basal bark, girdle, stump applications/ prescribed burning
C	*Hydrilla verticillata*	Hydrilla	I	biocontrol
A	*Imperata cylindrica*	Cogon Grass	I	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
A	*Lantana camara.*	Lantana	I	foliar applications/ prescribed burning
D	*Ligustrum sinense*	Chinese Privet	I	foliar and stump applications/ prescribed burning
C	*Lionicera japonica*	Japanese Honeysuckle	I	foliar and stump applications/ prescribed burning
C	*Ludwigia peruviana*	Peruvian Primrose	I	foliar and stump applications/ prescribed burning
A	*Lygodium microphyllum*	Old World Climbing Fern	I	hand pulling/foliar applications/prescribed burning
A	*Melia azedarach*	Chinaberry	I	foliar, basal bark, girdle, stump applications/ prescribed burning
D	*Nandina domestica*	Heavenly Bamboo	I	hand pulling/foliar and stump applications/ prescribed burning
B	*Nephrolepis cordifolia*	Boston Fern	I	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
A	*Paederia foetida*	Skunk Vine	I	hand pulling/foliar applications/prescribed burning
B	*Panicum repens*	Torpedo Grass	I	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
A	*Sapium sebiferum*	Chinese Tallow	I	foliar, basal bark, girdle, stump applications/ prescribed burning
A	*Schinus terebinthifolius*	Brazilian Pepper	I	foliar, basal bark, girdle, stump applications/ prescribed burning
D	*Urochloa mutica*	Paragrass	I	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
C	*Begonia cucullata*	Wax Begonia	II	hand pulling/foliar applications/prescribed burning
A	*Panicum maximum*	Guniea Grass	II	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
A	*Rhynchelytrum repens*	Natal Grass	II	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
D	*Ricinus communis*	Castor Bean	II	mowing, brush-cutting, weed eating/foliar and stump applications/ prescribed burning
D	*Sesbania punicea*	Purple Sesban	II	foliar and stump applications/ prescribed burning
B	*Solanum viarum*	Tropical Soda Apple	II	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
B	*Sphagneticola trilobata*	Wedelia	II	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
C	*Syagrus romanzoffiana*	Queen Palm	II	stump applications/ prescribed burning
D	*Urena lobata*	Caesar's Weed	II	mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
C	*Xanthosoma sagittifolium*	Elephant Ear	II	foliar and stump applications/ prescribed burning

C	*Alpinia sp.*	Ginger		mowing, brush-cutting, weed eating/foliar and stump applications/ prescribed burning
D	*Asclepias curassavica*	Scarlet Milkweed		mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
B	*Bambusa spp.*	Bamboo		foliar and stump applications/ prescribed burning
D	*Canna x generalis*	Garden Canna		mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
D	*Carica papaya*	Papaya		foliar and stump applications/ prescribed burning
D	*Crotalaria spp.*	Rattlebox		mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
A	*Enterolobium contortisiliquum*	Earpod Tree		foliar, basal bark, girdle, stump applications/ prescribed burning
D	*Gladiolus sp.*	Gladiolus		mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
C	*Gloriosa superba*	Flame Lilly		hand pulling/foliar applications/prescribed burning
D	*Indigofera hirsuta*	Hairy Indigo		mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
D	*Ipomoea sp.*	Morning Glory		hand pulling/foliar applications/prescribed burning
D	*Momordica charantia*	Balsam Apple		hand pulling/foliar applications/prescribed burning
D	*Musa sp.*	Banana		foliar and stump applications/ prescribed burning
D	*Nephrolepis biserrata*	Fishtail Fern		mowing, brush-cutting, weed eating/foliar applications/ prescribed burning
D	*Zingiber sp.*	Ginger		mowing, brush-cutting, weed eating/foliar and stump applications/ prescribed burning

B. Inventory and Monitoring

Invasive plant inventories and monitoring play an important role in assessing and managing invasive species and can be used to achieve different outcomes. Inventorying and monitoring results can be used to demonstrate where management actions are effectively and successfully meeting invasive plant management objectives, and to more quickly detect and modify actions that are ineffective[i]. Inventory and monitoring techniques will consist of documenting type, populations*, quantity, percent cover, acreage of infestation, FLEPPC category and the location of invasive species (using a handheld GPS unit). Inventory and monitoring will take place annually in March. Monitoring guidelines are outlined in UCF's Land Management Plan.

*Population- A population is defined as set of individuals that are within 3 meters of each other.

C. Summary of Specific Actions Planned

The five principal approaches to control invasive plants on UCF Conservation Lands are: (1) physical/mechanical, (2) chemical, (3) prescribed burning, (4) biocontrol, and (5) restoration. Treatments that suppress or retard the growth of invasive plants, while presenting the least risk to university visitors, students, and staff, native flora and fauna, and the environment, are preferable to those that have more toxic or broad-spectrum effects. Physical, mechanical and biological control agents usually fit this description, as does the careful application of approved herbicides.

I. Physical/Mechanical Controls

Physical and mechanical techniques such as hand pulling and cutting may be used to control some invasive plants, particularly if the population is relatively small. These techniques can be extremely specific, minimizing damage to desirable plants and animals, but they are generally labor and time intensive. Physical and mechanical

techniques are generally favored for small infestations and are often used in combination with other techniques. Hand pulling may be a good alternative in sites where herbicides or other methods cannot be used[ii].

Girdling

Girdling is often used to control trees or shrubs that have a single trunk. It involves cutting away a strip of bark several centimeters wide all the way around the trunk. The removed strip must be cut deep enough into the trunk to remove the vascular cambium, or inner bark, the thin layer of living tissue that moves sugars and other carbohydrates between areas of production (leaves), storage (roots), and growing points. This inner cambium layer also produces new wood and bark. Girdling typically requires less labor than cutting and removal, it is inexpensive, and it kills only the targeted plant. This method also leaves no residue except the standing trunks. In addition, a dead standing tree (snag) can provide valuable wildlife habitat, and if left to decay, allows the nutrients of the tree to be returned to the system, rather than being removed and deposited elsewhere[ii].

Mowing, Brush-Cutting, Weed Eating

Mowing and cutting has been shown to reduce seed production and restrict weed growth, thereby maintaining current invasive species population.

II. Herbicides

Herbicides are pesticides designed to kill plants. They are a vital component of most control programs and are used extensively for invasive exotic plant management. Herbicides, however, must be carefully selected so that they best meet the goals of efficacy, economy, and environmental protection[iii].

These factors are considered when selecting a herbicide:

- Only wetland approved herbicides will be used in wetland areas.
- The herbicide formulation must be effective on the target weed, without significantly harming surrounding non-target species.
- When considering cost, the lower-cost herbicide should be used if the herbicides are of equal efficacy. However, the cost per acre, and not the cost per gallon, should be considered.
- When spraying herbicide it must be applied as a spot treatment rather than a broadcast treatment, when possible.
- Surface and groundwater contamination should be prevented by avoiding the use of persistent, soil-mobile herbicides.

As a general standard, herbicides are applied under these conditions:

- When energy reserves in the weeds are low so they are more susceptible to herbicides and the chemical is more efficiently translocated throughout the plant.
- When there are some fully expanded "soft" leaves, this allows better penetration of the foliar herbicide because the cuticle is thin in this stage of growth.
- When the weeds are young, smaller and not woody, thus requiring less herbicide and fewer treatments.
- When it is not raining or windy (or predicted to be in the next few hours), so that herbicide is not washed away after application, spread to non-target species or into nearby streams or ponds.

Foliar Applications

In a foliar application, the herbicide is diluted with water and applied to the leaves with aerial or ground based equipment. Foliar applications can either be directed, to minimize damage to non-target vegetation, or broadcast. Broadcast applications are used when damage to non-target vegetation is minimal or where a selective herbicide is used[iv]. When treating invasive grass species, at minimum a 1 meter buffer is sprayed around the target species.

Basal Bark Applications

In a basal bark application, a 6 to 12 inch band of herbicide is applied, commonly with a backpack sprayer, directly to the trunk of the target plant, approximately one foot above the ground. The width of the sprayed band depends on the size of the plant and the species' susceptibility to the herbicide[ii]. The herbicide is absorbed through the bark and translocated throughout the plant.

Girdle Applications

In a girdle application, cuts are made into the cambium completely around the circumference of the tree or with no more than three-inch intervals between cut edges. Continuous cuts are sometimes used for difficult to control species and large trees. Herbicide is applied to each cut until the exposed area is thoroughly wet[v].

Stump Treatments

In a stump treatment, after cutting and removing large trees or brush, a herbicide is sprayed or painted onto the cut surface.

III. Fire

Prescribed Burning

Prescribed burning is used to promote desired vegetation and species. Fire is sometimes necessary to prompt the germination of some plants, including a number of rare and endangered species. However, fire can also sharply reduce the abundance of some species. The weather, topography, and available fuel will determine the temperature and intensity of the prescribed burn, and this, along with the timing of the treatment, largely determines how the burn impacts the vegetation and the abundance of particular species. The most effective fires for controlling invasive plant species are typically those administered just before they flower or seed, or at the young seedling/sapling stage. Most successful weed control efforts that result from burning are due to the restoration of historical (natural) fire regimes, which had been disrupted by land use changes, urban development, and fire suppression practices[ii]. UCF's Prescribed Fire Plan has taken the timing and frequency into account to minimize the spread of invasive species and to promote native vegetation.

Prescribed Burning and Herbicides

Some invasive species have underground storage organs that sprout vigorously after fire, and/or seeds whose germination is stimulated by fire. Some of these species may not be possible to control with fire, but some can be controlled with repeated burns and others may be especially vulnerable to herbicides immediately following a burn[ii].

IV. Biocontrol

Biocontrol, the use of living organisms as pest control agents, is now an important alternative to the use of chemical pesticides and therefore a potential means of reducing pesticide use and its undesirable effects on human health and the environment[vi]. Biocontrol agents can establish self populations and distribute themselves throughout the target weed's range, including areas difficult or impossible to access by humans, without further intervention. Benefits of biocontrol agents are that the control of the weed is permanent, the cost of the weed control is relatively low, and biological controls are nonpolluting, energy-efficient, biodegradable, and leave no toxic residues. Another benefit of biocontrol is that the expense is incurred at the beginning of the program rather than on a continuing basis. Currently, UCF is only using biocontrol agents to treat hydrilla and air potato.

V. Restoration

Restoration actions will focus on achieving two goals: natural regeneration/revegetation and enhancement. Since UCF's natural lands have an immense native seed bank, replanting and seeding will be done with seeds collected from nearby native populations. Seeding will be done once large populations of invasives are removed, or during treatment if the native species is thought to outcompete the non-native population.

VI. Summary

Physical/mechanical, herbicides, prescribed burning, and biocontrol are generally more effective when used in combination with one another, but not all control methods are appropriate for each species. Many species will react positively to certain controls, resulting in an increase in population size and therefore it is vital to know the target weed species' ecology, pathology, systematics, and other contributing factors in order to choose the control method that yields the greatest chance for success, resulting in a saving of time, money, and the spread of invasive plants.

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