APPENDIX F

CRC Desirable Plant Species List – On-site

Desirable Pine Rockland Plant Species Currently Documented within CRC	
Scientific Name	**Common Name**
Abildgaardia ovata	Flatspike sedge
Acalypha chamaedrifolia	Three-seeded mercury
Aclepias tuberosa	Butterflyweed
Aeschynomene viscidula	Sticky joint-vetch
Agalinis fasciculata	Beach false foxglove
Andropogon longiberbis	Hairy bluestem
Andropogon ternarius	Splitbeard bluestem
Andropogon tracyi	Tracy's bluestem
Andropogon virginicus	Broomsedge bluestem
Anemia adiantifolia	Pine fern
Angadenia berteroi	Pineland golden trumpet
Aristda beyrichiana	Southern wiregrass
Aristida purpurascens var. tenuispica	Hillsborough threeawn
Ayenia euphrasiifolia	Eyebright ayenia
Bletia purpurea	Pinepink
Buchnera americana	American bluehearts
Bulbostylis ciliatifolia	Densetuft hairsedge
Cenchrus gracillimus	Slender sandbur
Centrosema virginianum	Spurred butterfly-pea
Chamaecrista deeringiana	Deering partridge-pea
Chamaecrista nictitans ssp. aspera	Hairy partridge-pea
Chamaesyce blodgettii	Limestone sandmat
Chamaesyce conferta	Everglades sandmat
Chamaesyce deltoidea ssp. deltoidea	Wedge sandmat
Chaptalia albicans	White sunbonnets
Chiococca parvifolia	Pineland snowberry
Cirsium horridulum	Purple thistle
Cnidoscolus stimulosus	Tread-softly
Commelina erecta	Whitemouth dayflower
Conoclinium coelestinum	Blue mistflower
Crossopetalum ilicifolium	Quailberry
Crotalaria rotundifolia	Rabbitbells
Croton glandulosus	Vente conmigo
Croton linearis	Pineland croton
Cynanchum blodgettii	Blodgett's swallowwort
Dalea carnea var. carnea	Whitetassels
Desmodiuim marilandicum	Smooth ticktrefoil
Dichanthelium aciculare	Needleleaf witch grass
Dichanthelium dichotomum	Cypress witch grass
Dichanthelium ovale	Eggleaf witch grass
Dichanthelium strigosum var. glabrescens	Roughhair witch grass
Dyschoriste angusta	Rockland twinflower
Echites umbellata	Devil's potato
Eragrostis elliottii	Elliott's lovegrass

Scientific Name	Common Name
Euphorbia polyphylla	Pineland euphorbia
Eustachys petraea	Common finger grass
Evolvulus sericeus	Silver dwarf morningglory
Flaveria linearis	Narrowleaf yellowtops
Galactia pinetorum	Pineland milkpea
Galactia volubilis	Eastern milkpea
Gaura angustifolia	Southern beeblossum
Habenaria quinqueseta	Longhorn false reinorchid
Heliotropium polyphyllum	Pineland heliotrope
Hieracium megacephalon	Coastal Plain hawkweed
Hypericum hypericoides	St. Andrew's-cross
Indigofera miniata var. floridana	Florida coastal indigo
Ipomoea microdactyla	Man-in-the-ground
Jacquemontia curtisii	Pineland clustervine
Lantana depressa var. depressa	Pineland shrubverbena
Lechea sessiliflora	Pineland pinweed
Liatris gracilis	Slender gayfeather
Liatris tenuifolia var. tenuifolia	Shortleaf gayfeather
Licania michauxii	Gopher apple
Mecardonia acuminata ssp. peninsularis	Axilflower
Melanthera parvifolia	Black anthers
Muhlenbergia capillaris	Muhlygrass
Neptunia pubescens	Tropical-puff
Opuntia humifusa	Pricklypear
Paspalum caespitosum	Blue paspalum
Passiflora suberosa	Corkystem passionflower
Pectis glaucescens	Tea-blinkum
Phyllanthus caroliniensis ssp. saxicola	Rock Carolina leafflower
Phyllanthus pentaphyllus var. floridanus	Florida five-petaled leafflower
Physalis walteri	Walter's groundcherry
Piloblephis rigida	Wild pennyroyal
Piriqueta caroliniana	Pitted stripeseed
Pityopsis graminifolia	Narrowleaf silkgrass
Pluchea baccharis	Rosy camphorweed
Polygala grandiflora	Candyweed
Polygala smallii	Small's milkwort
Psilotum nudum	Whisk-fern
Pteris bahamensis	Bahama ladderbrake
Pterocaulon pycnostachyum	Blackroot
Rhynchosia cinerea	Brownhair snoutbean
Rhynchosia reniformis	Dollarleaf
Rhynchospora colorata	Starrush whitetop
Rhynchospora divergens	Spreading beaksedge
Rhynchospora floridensis	Florida whitetop
Rhynchospora grayi	Gray's beaksedge

Scientific Name	Common Name
Ruellia succulenta	Thickleaf wild petunia
Sachsia polycephala	Bahama sachsia
Samolus ebracteatus	Water pimpernel
Schizachyrium gracile	Wire bluestem
Schizachyrium rhizomatum	Rhizomatous bluestem
Schizachyrium sanguineum	Crimson bluestem
Scleria ciliata var. ciliata	Fringed nutrush
Solidago leavenworthii	Giant goldenrod
Solidago odora var. chapmanii	Chapman's goldenrod
Sorghastrum secundum	Lopsided Indiangrass
Spermacoce prostrata	Prostrate false buttonweed
Spermacoce terminalis	Everglades Keys false buttonweed
Sporobolus junceus	Pineywoods dropseed
Stachytarpheta jamaicensis	Blue porterweed
Stillingia sylvatica	Queensdelight
Symphyotrichum adnatum	Clasping aster
Symphyotrichum concolor	Eastern silver aster
Tephrosia florida	Florida hoarypea
Thelypteris kunthii	Southern shield fern
Tragia saxicola	Florida Keys noseburn
Tragia urens	Wavyleaf noseburn
Vaccinium myrsinites	Shiny blueberry
Vernonia blodgettii	Florida ironweed
Waltheria indica	Sleepy morning

APPENDIX G

Habitat Functional Assessment Detailed Results – On-site

Functional Assessment Existing Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Acres	Habitat Value	Habitat Value Units
1	Developed	Cleared and sodded	>89%	<1%	0.00	0.00	0.00	0.20	0.00	0.07	14.77	0.03	0.45
2	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
3	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
4	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00
5	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
6	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00
7	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
8	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
9	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
10	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00
11	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00
12	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.3	0.00	0.00
13	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
14	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00
15	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
16	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
17	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
18	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
19	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
20	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
21	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
22	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
23	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00
24	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00
25	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00
26	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
27	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
28	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
29	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00

Functional Assessment Existing Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Acres	Habitat Value	Habitat Value Units
30	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.00	0.00
31	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
32	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00
33	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
34	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
35	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
36	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.00	0.00
37	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
38	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
39	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
40	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00
41	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
42	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
43	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
44	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
45	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
46	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
47	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
48	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
49	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
50	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
51	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
52	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.04	1.08	0.03	0.03
53	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.03	3.62	0.02	0.09
54	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.02	1.13	0.02	0.03
55	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.02	1.89	0.02	0.04
56	Disturbed Upland	Historically marl prairie, exotic dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.20	0.37	1.31	0.12	0.15

Functional Assessment Existing Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Acres	Habitat Value	Habitat Value Units
57	Disturbed Upland	Historically marl prairie, exotic dominated	75-89%	25-49%	0.20	0.60	0.00	0.20	0.20	0.16	2.69	0.24	0.66
58	Disturbed Upland	Scraped, ornamental lawn species with pine rockland species	75-89%	0%	0.20	0.00	0.00	0.60	0.00	0.08	1.76	0.11	0.20
59	Disturbed Upland	Historically marl prairie, exotic dominated	>89%	75-89%	0.00	0.20	0.00	0.20	0.00	0.15	5.05	0.08	0.42
60	Pine Rockland	Less than 50% Burma reed	5-24%	25-49%	0.80	0.60	0.60	0.80	0.80	0.64	6.52	0.71	4.60
61	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	0.80	1.00	0.80	0.80	0.80	0.49	2.16	0.79	1.71
62	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	0.80	1.00	0.80	1.00	0.80	0.35	3.31	0.79	2.62
63	Pine Rockland	Burma reed dominated	>89%	50-74%	0.00	0.40	0.40	0.40	0.20	0.19	1.83	0.25	0.45
64	Pine Rockland	Severly fire suppressed, dominated by Burma reed	75-89%	>89%	0.20	0.00	0.20	0.40	0.00	0.14	8.11	0.13	1.06
65	Pine Rockland	Burma reed dominated	50-74%	25-49%	0.40	0.60	0.60	0.80	0.40	0.59	2	0.54	1.08
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	0.40	0.60	0.60	0.80	0.40	0.47	3.91	0.52	2.04
67	Pine Rockland	Burma reed dominated	>89%	75-89%	0.00	0.20	0.40	0.40	0.20	0.41	4.54	0.24	1.10
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	0.80	0.60	0.60	0.60	0.80	0.38	5.76	0.65	3.73
69	Rockland Hammock	Rockland Hammock	75-89%	>89%	0.20	0.00	0.00	1.00	0.20	0.18	3.72	0.21	0.77
70	Pine Rockland	Historically scraped w/o canopy	25-49%	0%	0.60	0.00	0.00	0.60	0.60	0.01	6.9	0.30	2.08
71	Pine Rockland	Burma reed dominated	75-89%	25-49%	0.20	0.60	0.60	0.60	0.20	0.50	1.27	0.43	0.54
72	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	50-74%	0.40	0.40	0.40	0.60	0.40	0.33	2.2	0.41	0.90
73	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	50-74%	0.40	0.40	0.40	0.60	0.40	0.23	1.11	0.39	0.44
74	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	0.20	0.60	0.40	0.60	0.20	0.20	1.06	0.35	0.37
75	Pine Rockland	Historically scraped but with pine canopy	25-49%	25-49%	0.60	0.60	0.40	0.60	0.60	0.38	0.47	0.54	0.25

Functional Assessment Existing Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Acres	Habitat Value	Habitat Value Units
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	0.20	0.60	0.40	0.60	0.40	0.59	2.31	0.45	1.04
77	Pine Rockland	Less than 50% Burma reed	25-49%	<15%	0.60	1.00	0.80	0.20	0.80	0.14	1.18	0.64	0.76
78	Pine Rockland	Burma reed dominated	>89%	75-89%	0.00	0.20	0.20	0.40	0.20	0.33	2.71	0.20	0.54
79	Pine Rockland	Burma reed dominated	75-89%	25-49%	0.20	0.60	0.60	0.80	0.20	0.63	1.3	0.46	0.60
80	Developed	Monkey Cages	>89%	0%	0.00	0.00	0.00	0.20	0.00	0.27	4.01	0.06	0.24
81	Pine Rockland	Less than 50% Burma reed	25-49%	<15%	0.60	1.00	0.60	0.80	0.80	0.44	3.96	0.72	2.84
82	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	0.80	1.00	0.80	1.00	1.00	0.62	3.52	0.87	3.07
83	Pine Rockland	Burma reed dominated	>89%	25-49%	0.00	0.60	0.40	0.80	0.20	0.38	0.28	0.36	0.10
84	Pine Rockland	Burma reed dominated	75-89%	50-74%	0.20	0.40	0.40	0.80	0.20	0.15	0.97	0.32	0.31
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	0.40	0.60	0.40	0.60	0.20	0.47	2.37	0.43	1.02
86	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.03	0.34	0.02	0.01
87	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.03	0.67	0.02	0.02
88	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.01	0.02	0.02	0.00
89	Pine Rockland	Fire suppressed	25-49%	50-74%	0.60	0.40	0.20	0.40	0.60	0.20	1.9	0.42	0.80
90	Pine Rockland	Burma reed dominated	50-74%	50-74%	0.40	0.40	0.60	0.80	0.40	0.33	3.83	0.46	1.76
92	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
93	Developed	Cleared and sodded	>89%	0%	0.00	0.00	0.00	0.20	0.00	0.01	0.01	0.02	0.00
94	Pine Rockland	Burma reed dominated	>89%	75-89%	0.00	0.20	0.40	0.60	0.20	0.33	3.33	0.25	0.83
95	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	2.2	0.00	0.00
96	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00
97	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
98	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.3	0.00	0.00
99	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
100	Developed	Cleared and sodded	>89%	<1%	0.00	0.00	0.00	0.20	0.20	0.22	1.75	0.09	0.16
101	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.3	0.00	0.00

Functional Assessment Existing Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Acres	Habitat Value	Habitat Value Units
102	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.02	1.29	0.02	0.03
103	Pine Rockland	Less than 50% Burma reed	25-49%	15-24%	0.60	0.80	0.80	0.80	0.60	0.55	1.16	0.68	0.79
104	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.00	0.06	0.02	0.00
							Total Acreage				**137.90**	**Total Existing Functional Value**	**40.72**

Functional Assessment Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	ConnectFS	Lag Factor	Acres	Habitat Value	Habitat Value Units
1	Developed (S. Cor.)	Cleared and sodded	>89%	<1%	1.00	1.00	0.00	0.20	1.00	0.24	0.97	0.39	0.64	0.25
36	Developed	Impervious surface	N/A	N/A	1.00	1.00	1.00	0.20	1.00	0.63	0.93	0.11	0.80	0.09
59	Disturbed Upland	Historically marl prairie, exotic dominated	>89%	75-89%	1.00	1.00	1.00	0.20	1.00	0.38	0.97	0.13	0.80	0.10
60	Pine Rockland	Less than 50% Burma reed	5-24%	25-49%	1.00	1.00	1.00	1.00	1.00	0.80	0.90	1.70	0.87	1.48
60	Pine Rockland	Less than 50% Burma reed	5-24%	25-49%	1.00	1.00	1.00	1.00	1.00	0.80	0.93	2.14	0.90	1.93
61	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	1.00	1.00	1.00	1.00	1.00	0.81	0.93	2.01	0.90	1.82
61	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	1.00	1.00	1.00	1.00	1.00	0.81	0.97	0.13	0.94	0.12
62	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	1.00	1.00	1.00	1.00	1.00	0.55	0.97	3.26	0.90	2.95
62	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	1.00	1.00	1.00	1.00	1.00	0.55	0.97	0.03	0.90	0.03
62	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	1.00	1.00	1.00	1.00	1.00	0.55	0.97	0.01	0.90	0.01
64	Pine Rockland (S. Cor.)	Severly fire suppressed, dominated by Burma reed	75-89%	>89%	1.00	1.00	0.00	0.60	1.00	0.12	0.97	0.04	0.66	0.03
64	Pine Rockland (S. Cor.)	Severly fire suppressed, dominated by Burma reed	75-89%	>89%	1.00	1.00	1.00	0.60	1.00	0.12	0.97	0.06	0.80	0.05
64	Pine Rockland (S. Cor.)	Severly fire suppressed, dominated by Burma reed	75-89%	>89%	1.00	1.00	1.00	0.60	1.00	0.12	0.97	1.06	0.80	0.85
65	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.87	0.90	0.01	0.88	0.01
65	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.87	0.93	1.99	0.91	1.81
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.71	0.97	0.01	0.93	0.01
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.71	0.97	0.35	0.93	0.32
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.71	0.93	0.95	0.89	0.85
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.71	0.97	2.59	0.93	2.40
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	1.00	1.00	1.00	1.00	1.00	0.71	0.97	0.01	0.93	0.01
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.55	0.93	0.01	0.83	0.01
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.77	0.97	2.85	0.90	2.56
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.77	0.93	0.57	0.86	0.49
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.77	0.97	0.84	0.90	0.75
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.77	0.93	0.05	0.86	0.04
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.55	0.93	0.02	0.83	0.02
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.77	0.97	0.01	0.90	0.01
67	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.77	0.93	0.01	0.86	0.01
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.90	1.63	0.84	1.37
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.93	0.01	0.87	0.01
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.97	0.01	0.90	0.01
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.93	1.69	0.87	1.46

Functional Assessment Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	ConnectFS	Lag Factor	Acres	Habitat Value	Habitat Value Units
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.97	1.95	0.90	1.76
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.93	0.01	0.87	0.01
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.93	0.01	0.87	0.01
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.90	0.01	0.84	0.01
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	1.00	1.00	1.00	0.60	1.00	0.81	0.97	0.01	0.90	0.01
69	Rockland Hammock	Rockland Hammock	75-89%	>89%	1.00	0.00	0.00	1.00	1.00	0.00	0.97	3.72	0.49	1.80
70	Pine Rockland (S. Cor.)	Historically scraped w/o canopy	25-49%	0%	1.00	1.00	1.00	0.60	1.00	0.06	0.97	0.32	0.79	0.25
71	Pine Rockland	Burma reed dominated	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.88	0.93	0.01	0.88	0.01
71	Pine Rockland	Burma reed dominated	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.88	0.97	1.26	0.91	1.15
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.62	0.90	0.02	0.81	0.02
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.62	0.90	0.01	0.81	0.01
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.62	0.93	0.01	0.84	0.01
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.62	0.90	1.32	0.81	1.07
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.62	0.93	0.54	0.84	0.45
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	1.00	1.00	1.00	0.60	1.00	0.62	0.97	0.41	0.88	0.36
79	Pine Rockland	Burma reed dominated	75-89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.79	0.90	0.01	0.87	0.01
79	Pine Rockland	Burma reed dominated	75-89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.79	0.90	0.81	0.87	0.71
79	Pine Rockland	Burma reed dominated	75-89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.79	0.90	0.01	0.87	0.01
79	Pine Rockland	Burma reed dominated	75-89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.79	0.90	0.01	0.87	0.01
81	Pine Rockland	Less than 50% Burma reed	25-49%	<15%	1.00	1.00	1.00	1.00	1.00	0.54	0.93	1.97	0.87	1.71
82	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	1.00	1.00	1.00	1.00	1.00	0.88	0.90	2.89	0.88	2.55
83	Pine Rockland	Burma reed dominated	>89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.55	0.93	0.01	0.87	0.01
83	Pine Rockland	Burma reed dominated	>89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.55	0.93	0.24	0.87	0.21
83	Pine Rockland	Burma reed dominated	>89%	25-49%	1.00	1.00	1.00	1.00	1.00	0.55	0.93	0.01	0.87	0.01

Functional Assessment Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	ConnectFS	Lag Factor	Acres	Habitat Value	Habitat Value Units
84	Pine Rockland (S. Cor.)	Burma reed dominated	75-89%	50-74%	1.00	1.00	1.00	1.00	1.00	0.15	0.97	0.25	0.85	0.21
84	Pine Rockland (S. Cor.)	Burma reed dominated	75-89%	50-74%	1.00	1.00	1.00	1.00	1.00	0.15	0.97	0.01	0.85	0.01
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	1.00	1.00	1.00	0.60	1.00	0.94	0.90	0.62	0.86	0.53
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	1.00	1.00	1.00	0.60	1.00	0.94	0.97	0.19	0.92	0.18
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	1.00	1.00	1.00	0.60	1.00	0.94	0.93	1.52	0.88	1.34
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	1.00	1.00	1.00	0.60	1.00	0.94	0.97	0.02	0.92	0.02
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	1.00	1.00	1.00	0.60	1.00	0.94	0.97	0.01	0.92	0.01
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	1.00	1.00	1.00	0.60	1.00	0.94	0.93	0.01	0.88	0.01
89	Pine Rockland	Fire suppressed	25-49%	50-74%	1.00	1.00	1.00	0.60	1.00	0.55	0.97	0.05	0.87	0.04
89	Pine Rockland	Fire suppressed	25-49%	50-74%	1.00	1.00	1.00	0.60	1.00	0.55	0.97	1.08	0.87	0.93
90	Pine Rockland	Burma reed dominated	50-74%	50-74%	1.00	1.00	1.00	1.00	1.00	0.49	0.97	0.01	0.90	0.01
90	Pine Rockland	Burma reed dominated	50-74%	50-74%	1.00	1.00	1.00	1.00	1.00	0.49	0.97	3.13	0.90	2.80
90	Pine Rockland	Burma reed dominated	50-74%	50-74%	1.00	1.00	1.00	1.00	1.00	0.49	0.97	0.62	0.90	0.56
94	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.56	0.97	2.55	0.87	2.21
94	Pine Rockland	Burma reed dominated	>89%	75-89%	1.00	1.00	1.00	0.60	1.00	0.56	0.97	0.01	0.87	0.01
103	Pine Rockland	Less than 50% Burma reed	25-49%	15-24%	1.00	1.00	1.00	1.00	1.00	0.61	0.93	0.01	0.88	0.01
103	Pine Rockland	Less than 50% Burma reed	25-49%	15-24%	1.00	1.00	1.00	1.00	1.00	0.61	0.93	1.06	0.88	0.93
103	Pine Rockland	Less than 50% Burma reed	25-49%	15-24%	1.00	1.00	1.00	1.00	1.00	0.61	0.93	0.01	0.88	0.01
									Total Acraege Preserve Mitigation Areas			**51.41**	**Total Post Condition Habitat Value Units**	**43.82**

Functional Assessment Impacted Land Use Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Impact Acres	Habitat Value	Impact Habitat Value Units
1	Developed	Cleared and sodded	>89%	<1%	0.00	0.00	0.00	0.20	0.00	0.07	14.38	0.03	0.44
2	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
3	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
4	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00
5	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
6	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00
7	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
8	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
9	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
10	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00
11	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00
12	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00
13	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
14	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00
15	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
16	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
17	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
18	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
19	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
20	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
21	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
22	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
23	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00
24	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00
25	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00
26	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
27	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00

Functional Assessment Impacted Land Use Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Impact Acres	Habitat Value	Impact Habitat Value Units
28	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
29	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
30	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00
31	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
32	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00
33	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
34	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
35	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
36	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
37	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
38	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
39	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
40	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00
41	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
42	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
43	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
44	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
45	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
46	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
47	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
48	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
49	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
50	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
51	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
52	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.04	1.08	0.03	0.03
53	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.03	3.62	0.02	0.09
54	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.02	1.13	0.02	0.03
55	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.02	1.89	0.02	0.04
56	Disturbed Upland	Historically marl prairie, exotic dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.20	0.37	1.31	0.12	0.15

Functional Assessment Impacted Land Use Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Impact Acres	Habitat Value	Impact Habitat Value Units
57	Disturbed Upland	Historically marl prairie, exotic dominated	75-89%	25-49%	0.20	0.60	0.00	0.20	0.20	0.16	2.69	0.24	0.66
58	Disturbed Upland	Scraped, ornamental lawn species with pine rockland species	75-89%	0%	0.20	0.00	0.00	0.60	0.00	0.08	1.76	0.11	0.20
59	Disturbed Upland	Historically marl prairie, exotic dominated	>89%	75-89%	0.00	0.20	0.00	0.20	0.00	0.15	4.92	0.08	0.41
60	Pine Rockland	Less than 50% Burma reed	5-24%	25-49%	0.80	0.60	0.60	0.80	0.80	0.64	2.68	0.71	1.89
61	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	0.80	1.00	0.80	0.80	0.80	0.49	0.02	0.79	0.02
62	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	0.80	1.00	0.80	1.00	0.80	0.35	0.01	0.79	0.01
63	Pine Rockland	Burma reed dominated	>89%	50-74%	0.00	0.40	0.40	0.40	0.20	0.19	1.83	0.25	0.45
64	Pine Rockland	Severly fire suppressed, dominated by Burma reed	75-89%	>89%	0.20	0.00	0.20	0.40	0.00	0.14	6.95	0.13	0.91
65	Pine Rockland	Burma reed dominated	50-74%	25-49%	0.40	0.60	0.60	0.80	0.40	0.59	0.00	0.54	0.00
66	Pine Rockland	Burma reed dominated	50-74%	25-49%	0.40	0.60	0.60	0.80	0.40	0.47	0.00	0.52	0.00
67	Pine Rockland	Burma reed dominated	>89%	75-89%	0.00	0.20	0.40	0.40	0.20	0.41	0.18	0.24	0.04
68	Pine Rockland	Historically scraped but with pine canopy	5-24%	25-49%	0.80	0.60	0.60	0.60	0.80	0.38	0.43	0.64	0.28
69	Rockland Hammock	Rockland Hammock	75-89%	>89%	0.20	0.00	0.00	1.00	0.20	0.18	0.00	0.21	0.00
70	Pine Rockland	Historically scraped w/o canopy	25-49%	0%	0.60	0.00	0.00	0.60	0.60	0.01	6.58	0.30	1.98
71	Pine Rockland	Burma reed dominated	75-89%	25-49%	0.20	0.60	0.60	0.60	0.20	0.50	0.00	0.43	0.00
72	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	50-74%	0.40	0.40	0.40	0.60	0.40	0.33	2.20	0.41	0.90
73	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	50-74%	0.40	0.40	0.40	0.60	0.40	0.23	1.11	0.39	0.44
74	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	0.20	0.60	0.40	0.60	0.20	0.20	1.06	0.35	0.37
75	Pine Rockland	Historically scraped but with pine canopy	25-49%	25-49%	0.60	0.60	0.40	0.60	0.60	0.38	0.47	0.54	0.25

Functional Assessment Impacted Land Use Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Impact Acres	Habitat Value	Impact Habitat Value Units
76	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	75-89%	25-49%	0.20	0.60	0.40	0.60	0.40	0.59	0.00	0.45	0.00
77	Pine Rockland	Less than 50% Burma reed	25-49%	<15%	0.60	1.00	0.80	0.20	0.80	0.14	1.18	0.64	0.76
78	Pine Rockland	Burma reed dominated	>89%	75-89%	0.00	0.20	0.20	0.40	0.20	0.33	2.71	0.20	0.54
79	Pine Rockland	Burma reed dominated	75-89%	25-49%	0.20	0.60	0.60	0.80	0.20	0.63	0.46	0.46	0.21
80	Developed	Monkey Cages	>89%	0%	0.00	0.00	0.00	0.20	0.00	0.27	4.01	0.06	0.24
81	Pine Rockland	Less than 50% Burma reed	25-49%	<15%	0.60	1.00	0.60	0.80	0.80	0.44	1.99	0.72	1.42
82	Pine Rockland	Less than 50% Burma reed	5-24%	<15%	0.80	1.00	0.80	1.00	1.00	0.62	0.63	0.87	0.55
83	Pine Rockland	Burma reed dominated	>89%	25-49%	0.00	0.60	0.40	0.80	0.20	0.38	0.02	0.36	0.01
84	Pine Rockland	Burma reed dominated	75-89%	50-74%	0.20	0.40	0.40	0.80	0.20	0.15	0.71	0.32	0.23
85	Pine Rockland	Historically scraped but with pine canopy, dominated by Burma reed	50-74%	25-49%	0.40	0.60	0.40	0.60	0.20	0.47	0.00	0.43	0.00
86	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.03	0.34	0.02	0.01
87	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.03	0.67	0.02	0.02
88	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.01	0.02	0.02	0.00
89	Pine Rockland	Fire suppressed	25-49%	50-74%	0.60	0.40	0.20	0.40	0.60	0.20	0.77	0.42	0.32
90	Pine Rockland	Burma reed dominated	50-74%	50-74%	0.40	0.40	0.60	0.80	0.40	0.33	0.07	0.46	0.03
92	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
93	Developed	Cleared and sodded	>89%	0%	0.00	0.00	0.00	0.20	0.00	0.01	0.01	0.02	0.00
94	Pine Rockland	Burma reed dominated	>89%	75-89%	0.00	0.20	0.40	0.60	0.20	0.33	0.77	0.25	0.19
95	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00
96	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00
97	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
98	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00
99	Developed	Impervious surface (historic structure)	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
100	Developed	Cleared and sodded	>89%	<1%	0.00	0.00	0.00	0.20	0.20	0.22	1.75	0.09	0.16
101	Developed	Impervious surface	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00

Functional Assessment Impacted Land Use Post Conditions

Polygon Id	Land Use Category	Land Use Subcategory	Burma/Exotic Cover	Canopy Cover	ExoticFS	CanopyFS	FireFS	SoilFS	HerbFS	Avg Connect	Impact Acres	Habitat Value	Impact Habitat Value Units
102	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.02	1.29	0.02	0.03
103	Pine Rockland	Less than 50% Burma reed	25-49%	15-24%	0.60	0.80	0.80	0.80	0.60	0.55	0.08	0.68	0.05
104	Disturbed Upland	Exotic hardwood dominated	>89%	>89%	0.00	0.00	0.00	0.20	0.00	0.00	0.06	0.02	0.00
										Total Impact Acres	**86.49**	**Total Impact Habitat Value Units**	**14.37**

PRE-DEVELOPMENT ASSESSMENT

Polygon Id	Habitat Value
1	0.03
52	0.03
53	0.02
54	0.02
55	0.02
56	0.12
57	0.24
58	0.11
59	0.08
60	0.71
61	0.79
62	0.79
63	0.25
64	0.13
65	0.54
66	0.52
67	0.24
68	0.65
69	0.21
70	0.30
71	0.43
72	0.41
73	0.39
74	0.35
75	0.54
76	0.45
77	0.64

continued at top right

Polygon Id	Habitat Value
78	0.20
79	0.46
80	0.06
81	0.72
82	0.87
83	0.36
84	0.32
85	0.43
86	0.02
87	0.02
88	0.02
89	0.42
90	0.46
92	0.00
93	0.02
94	0.25
95	0.00
96	0.00
97	0.00
98	0.00
99	0.00
100	0.09
101	0.00
102	0.02
103	0.68
104	0.02

Figure 5-1xlsx

POST-DEVELOPMENT ASSESSMENT

Polygon ID	Habitat Value
1	0.25
36	0.09
59	0.10
60	3.41
61	1.94
62	2.98
64	0.93
65	1.82
66	3.59
67	3.89
68	4.64
69	1.80
70	0.25
71	1.16
76	1.92
79	0.73
81	1.71
82	2.55
83	0.23
84	0.22
85	2.09
89	0.98
90	3.37
94	2.22
103	0.95

CRC Functional Assessment Post Restoration 20160308 for exhibit.xlsx

NOTES
1. The Habitat Unit Polygons were created by Johnson Engineering ecologists.
2. Polygons categorized as impervious or historic structure are not displayed in the table. These polygons had a score of zero.
3. The aerial photographs shown were provided by FDOT and were taken in 2013.

\\ftms01\drawings\2014\20149839-000\ArcGIS\Figures\BSHB functional assessment pre and post.mxd Date: 8/18/2016 User: pml

Miami-Dade County, Florida

JOHNSON ENGINEERING

6941 SW 196TH AVE
SUITE 32
PEMBROKE PINES, FL 33332
PHONE (954) 626-0123
E.B. #642 & L.B. #642

CRC Functional Assessment - Pre and Post Habitat Values

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
August 2016	20149839-000		As Shown	Appendix G

APPENDIX H

Eastern Indigo Snake Standard Protection Measures

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

1. An eastern indigo snake protection/education plan shall be developed by the applicant or requestor for all construction personnel to follow. The plan shall be provided to the Service for review and approval at least 30 days prior to any clearing activities. The educational materials for the plan may consist of a combination of posters, videos, pamphlets, and lectures (*e.g.*, an observer trained to identify eastern indigo snakes could use the protection/education plan to instruct construction personnel before any clearing activities occur). Informational signs should be posted throughout the construction site and along any proposed access road to contain the following information:

    a. a description of the eastern indigo snake, its habits, and protection under Federal Law;
    b. instructions not to injure, harm, harass or kill this species;
    c. directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and,
    d. telephone numbers of pertinent agencies to be contacted if a dead eastern indigo snake is encountered. The dead specimen should be thoroughly soaked in water and then frozen.

2. If not currently authorized through an Incidental Take Statement in association with a Biological Opinion, only individuals who have been either authorized by a section 10(a)(1)(A) permit issued by the Service, or by the State of Florida through the Florida Fish Wildlife Conservation Commission (FWC) for such activities, are permitted to come in contact with an eastern indigo snake.

3. An eastern indigo snake monitoring report must be submitted to the appropriate Florida Field Office within 60 days of the conclusion of clearing phases. The report should be submitted whether or not eastern indigo snakes are observed. The report should contain the following information:

    a. any sightings of eastern indigo snakes and
    b. other obligations required by the Florida Fish and Wildlife Conservation Commission, as stipulated in the permit.

Revised February 12, 2004

APPENDIX H1

SWPPP Template

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN TEMPLATE

The following template may be used as a general guide for development of a Stormwater Pollution Prevention Plan (SWPPP) for construction activities. This template may not contain all applicable requirements for all construction sites. Please refer to the Department's Generic Permit for Stormwater Discharge from Large and Small Construction Activities, DEP Document 62-621.300(4)(a) to verify that you are meeting all permit requirements. Part V of the above referenced generic permit specifically lists requirements of the Stormwater Pollution Prevention Plan.

- The SWPPP shall be completed prior to the submittal of the Notice of Intent (NOI) to be covered under the Department's Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

- The SWPPP shall be amended whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for discharge of pollutants to surface waters of the state or a Municipal Separate Storm Sewer System (MS4). The SWPPP also shall be amended if it proves to be ineffective in significantly reducing pollutants from sources identified in Part V.D.1. of the permit. The SWPPP also shall be amended to indicate any new contractor and/or subcontractor that will implement any measure of the SWPPP. All amendments shall be signed, dated, and kept as attachments to the original SWPPP.

Stormwater Pollution Prevention Plan

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ _____

Name (Operator and/or Responsible Authority) Date

Project Name and location information:	

A site map must be developed and must contain, at a minimum, the following information:

1. Drainage patterns,
2. Approximate slopes after major grading activities,
3. Areas of soil disturbance,
4. Outline all areas that are not to be disturbed,
5. Location of all major structural and non-structural controls,
6. The location of expected stabilization practices,
7. Wetlands and surface waters, and
8. Locations where stormwater may discharge to a surface water or MS4.

Site Description

Describe the nature of the construction activity:	
Describe the intended sequence of major soil disturbing activities:	
Total area of the site:	Acres
Total area of the site to be disturbed:	Acres
Existing data describing the soil or quality of any stormwater discharge from the site:	
Estimate the drainage area size for each discharge point:	
Latitude and longitude of each discharge point and identify the receiving water or MS4 for each discharge point:	

Give a detailed description of all controls, Best Management Practices (BMPs) and measures that will be implemented at the construction site for each activity identified in the intended sequence of major soil disturbing activities section. Provide time frames in which the controls will be implemented. NOTE: All controls shall be consistent with performance standards for erosion and sediment control and stormwater treatment set forth in s. 62-40.432, F.A.C., the applicable Stormwater or Environmental Resource Permitting requirements of the Department or a Water Management District, and the guidelines contained in the Florida Development Manual: A Guide to Sound Land and Water Management (DEP, 1988) and any subsequent amendments.
Describe all temporary and permanent stabilization practices. Stabilization practices include temporary seeding, mulching, permanent seeding, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, vegetative preservations, etc.
Describe all structural controls to be implemented to divert stormwater flow from exposed soils and structural practices to store flows, retain sediment on-site or in any other way limit stormwater runoff. These controls include silt fences, earth dikes, diversions, swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, coagulating agents and temporary or permanent sediment basins.

Describe all sediment basins to be implemented for areas that will disturb 10 or more acres at one time. The sediment basins (or an equivalent alternative) should be able to provide 3,600 cubic feet of storage for each acre drained. Temporary sediment basins (or an equivalent alternative) are recommended for drainage areas under 10 acres.
Describe all permanent stormwater management controls such as, but not limited to, detention or retention systems or vegetated swales that will be installed during the construction process.

Describe in detail controls for the following potential pollutants

Waste disposal, this may include construction debris, chemicals, litter, and sanitary wastes:	
Offsite vehicle tracking from construction entrances/exits:	

The proper application rates of all fertilizers, herbicides and pesticides used at the construction site:	
The storage, application, generation and migration of all toxic substances:	
Other:	

Provide a detailed description of the maintenance plan for all structural and non-structural controls to assure that they remain in good and effective operating condition.

Inspections: Describe the inspection and inspection documentation procedures, as required by Part V.D.4. of the permit. Inspections must occur at least once a week and within 24 hours of the end of a storm event that is 0.50 inches or greater (see attached form).

Identify and describe all sources of non-stormwater discharges as allowed in Part IV.A.3. of the permit. Flows from fire fighting activities do not have to be listed or described.

This SWPPP must clearly identify, for each measure identified within the SWPPP, the contractor(s) or subcontractor(s) that will implement each measure. All contractor(s) and subcontractor(s) identified in the SWPPP must sign the following certification:

"I certify under penalty of law that I understand, and shall comply with, the terms and conditions of the State of Florida Generic Permit for Stormwater Discharge from Large and Small Construction Activities and this Stormwater Pollution Prevention Plan prepared thereunder."

Name	**Title**	**Company Name, Address and Phone Number**	**Date**

Stormwater Pollution Prevention Plan Inspection Report Form

Inspections must occur at least once a week and within 24 hours of the end of a storm event that is 0.50 inches or greater.

Project Name:_____ FDEP NPDES Stormwater Identification Number: FLR10_____

Location	Rain data	Type of control (see below)	Date installed / modified	Current Condition (see below)	Corrective Action / Other Remarks

Condition Code:

G = Good M = Marginal, needs maintenance or replacement soon P = Poor, needs immediate maintenance or replacement

C = Needs to be cleaned O = Other

Control Type Codes

1. Silt Fence	10. Storm drain inlet protection	19. Reinforced soil retaining system	28. Tree protection
2. Earth dikes	11. Vegetative buffer strip	20. Gabion	29. Detention pond
3. Structural diversion	12. Vegetative preservation area	21. Sediment Basin	30. Retention pond
4. Swale	13. Retention Pond	22. Temporary seed / sod	31. Waste disposal / housekeeping
5. Sediment Trap	14. Construction entrance stabilization	23. Permanent seed / sod	32. Dam
6. Check dam	15. Perimeter ditch	24. Mulch	33. Sand Bag
7. Subsurface drain	16. Curb and gutter	25. Hay Bales	34. Other
8. Pipe slope drain	17. Paved road surface	26. Geotextile	
9. Level spreaders	18. Rock outlet protection	27. Rip-rap	

Inspector Information:

_____ _____ _____

Name Qualification Date

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State of Florida Generic Permit for Stormwater Discharge from Large and Small Construction Activities if there are not any incidents of non-compliance identified above.

* * * * * *

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ _____

Name (Responsible Authority) Date

APPENDIX I

Dade County Native Plant Communities – Pine Rocklands

DADE COUNTY NATIVE PLANT COMMUNITIES

ROCKLANDS = AREAS 8 & 9

8. PINE ROCKLANDS

These are open woodlands of South Florida slash pine with an understory of palms, tropical shrubs, grasses, and wildflowers growing on outcrops of limestone. Under natural conditions this community is maintained by periodic fire. Soils over the limestone bedrock are generally thin, and composed of marl and/or siliceous sand. The pH is neutral to slightly alkaline, organic content is low, fertility is low to moderate, and salinity is generally low. Available water capacity is low to moderate. Primary locations in Dade County are from the south entrance of Everglades National Park north to the entrance of the Miami River.

TREE/SHRUB

Not Applicable

TREES

Pinus elliottii var. densa	South Florida Slash Pine

PALMS - CYCADS

Coccothrinax argentata	Silver Palm	*Serenoa repens*	Saw Palmetto
Sabal palmetto	Sabal Palm	*Zamia integrifolia (pumila)*	Coontie (cycad)

SHRUBS

Byrsonima lucida	Locustberry	*Psidium longipes*	Long-stalked Stopper
Cassia chapmanii	Bahama Cassia	*Randia aculeata*	White Indigo Berry
Croton linearis	Pineland Croton	*Rhus copallina var. leucantha*	Winged Sumac
Forestiera segregata var. pintetorum	Pineland Privet	*Tetrazygia bicolor*	Tetrazygia
Guettarda scabra	Roughleaf Velvetseed	*Trichostema suffrutescens*	Blue Curls
Lantana involucrata	Wild Sage		

GROUND COVERS - LOW GROWING PLANTS

Anemia adiantifolia	Pine Fern	*Jacquemontia curtissii*	Pineland Jacquemontia; Clustervine
Chiococca parviflora	Pineland Snowberry	*Licania michauxii*	Gopher Apple
Crossopetalum ilicifolium	Quailberry	*Pteris bahamensis*	Bahama Brake-fern
Ernodia littoralis var. angusta	Pineland Golden Creeper	*Verbena maritima*	Beach Verbena

8. PINE ROCKLANDS (Cont.)

GRASSES - RUSHES - SEDGES

Andropogon glomeratus var. *pumilus*	a Bushy Beardgrass	*Eustachys petraea*	West Indian Fingergrass
Andropogon longiberbis	Sand Broom Sedge	*Paspalum blodgettii*	Coral Paspalum
Andropogon ternarius var. *cabanisii*	Splitbeard Bluestem	*Paspalum caespitosum*	Blue Paspalum
Andropogon virginicus var. *virginicus*	Virginia Broom Sedge	*Paspalum setaceum* var. *cilatifolium*	Fringeleaf Paspalum
Aristida purpurascens var. *purpurascens*	Arrowfeather	*Schizachyrium gracile*	Slender Beardgrass
Dichanthelium ensifolium var. *uniciphyllum*	a Panicgrass	*Schizachyrium rhizomatum*	Florida Autumn Grass
Dichanthelium ovale	a Panicgrass	*Schizachyrium sanguineum* var. *sanguineum*	West Indian Bluestem
Dichanthelium strigosum var. *glabrescens*	a Panicgrass	*Setaria geniculata*	Knotroot Foxtail
Dichromena floridensis	Florida White-top Sedge	*Sorghastrum secundum*	Lop-sided Indiangrass
Eragrostus elliottii	Elliott's Love Grass	*Tripsacum floridanum*	Florida Gamagrass

VINES

Centrosema virginianum	Butterfly Pea	*Morinda royoc*	Cheeseplant; Indian Mulberry
Ipomoea microdactyla	Man-in-the-Ground	*Passiflora suberosa*	Corky-stemmed Passion Flower

WILDFLOWERS

Angadenia berterii	Pinelana Allamanda	*Dyschoriste angusta*	Dwarf Blue Twinflower
Asclepias tuberosa subsp. *rolfsii*	Rolf's Butterfly Weed	*Liatris gracilis*	a Blazing Star
Aster adnatus	an Aster	*Liatris tenuifolia* var. *quadriflora*	a Blazing Star
Chamaecrista deeringiana	Deering's Partridge Pea	*Piriqueta caroliniana* var. *caroliniana*	Hairy Piriqueta
Commelina erecta var. *angustifolia*	Thin-leaf Dayflower	*Solidago odora* var. *chapmanii*	Chapman's Goldenrod
Crotalaria pumila	Low Rattlebox	*Stillingia sylvatica* subsp. *tenuis*	Queen's Delight
Crotalaria rotundifolia var. *rotundifolia*	Rabbit Bells	*Tephrosia florida*	Florida Hoary Pea
Dichromena floridensis	Florida White-top Sedge	*Vernonia blodgettii*	Blodgett's Ironweed

DADE COUNTY NATIVE PLANT COMMUNITIES

9. ROCKLAND HAMMOCK

These broadleaf, mostly evergreen, closed forests are dominated by tropical tree species growing on outcrops of limestone. Under natural conditions this community is rarely subject to fire. Soils over the limestone bedrock are generally thin, composed of marl and/or siliceous sand and organic material. The pH is neutral to acid, organic content is high, primarily on the surface. Fertility is moderate to high, and salinity is generally low. The available water capacity is moderate to high. Primary locations in Dade County are at the south entrance of Everglades National Park north to the entrance of the Miami River.

PALMS - CYCADS		VINES	WILDFLOWERS
		Not Applicable	

		TREES	
Bursera simauruba	Gumbo Limbo	*Mastichodendron foetidissimum*	Mastic Tree
Celtis laevigata	Sugarberry; Hackberry	*Prunus myrtifolia*	West Indian Cherry
Ficus aurea	Strangler Fig	*Quercus virginiana*	Live Oak
Ficus citrifolia	Shortleaf Fig	*Simaruba glauca*	Paradise Tree
Lysiloma latisiliqua	Wild Tamarind		
		TREE/SHRUB	
Ardisia escallonioides	Marlberry	*Hamelia patens*	Firebush
Calyptranthes pallens	Spicewood	*Ilex krugiana*	Krug's Holly
Chrysophyllum oliviforme	Satinleaf	*Krugiodendron ferrum*	Black Ironwood
Citharexylum fruitcosum	Fiddlewood	*Morus rubra*	Red Mulberry
Coccoloba diversifolia	Pigeon Plum	*Myrcianthes fragrans var. simpsonii*	Simpson Stopper
Dipholis salicifolium	Willow Bustic	*Myrica cerifera*	Wax Myrtle
Drypetes lateriflora	Guiana Plum	*Myrsine guianensis*	Myrsine
Erythrina herbacea	Coral Bean	*Nectandra coriacea*	Lancewood
Eugenia axillaris	White Stopper	*Psychotria nervosa*	Shiny-leaf Wild Coffee
Exothea paniculata	Inkwood	*Randia aculeata*	White Indigo-Berry
Guapira longifolia	Long-leaf Blolly	*Trema micranthum*	Florida Trema
Guettarda elliptica	Everglades Velvetseed	*Zanthoxylum fagara*	Wild Lime

9. ROCKLAND HAMMOCK
(Cont.)

SHRUBS

Callicarpa americana	American Beautyberry	*Phychotria sulzneri*	Soft-leaf Wild Coffee
Cassia ligustrina	Privet Cassia	*Rivina humilis*	Rouge Plant

GROUND COVERS - LOW GROWING PLANTS

Thelypteris kunthii	a Wood Fern	*Thelypteris ovata*	a Wood Fern

GRASSES - RUSHES - SEDGES

Dichanthelium commutatum	Variable Panicgrass	*Oplismenus setarius*	Woodsgrass
Lasiacis divaricata	Bamboo Grass	*Tripsacum dactyloides*	Fakahatchee Grass; Eastern Gamagrass

APPENDIX J

CRC Fire Reintroduction and Prescribed Burn Plan – On-site
(“CRC Burn Plan”)

Appendix J

CORAL REEF COMMONS

Fire Reintroduction and Prescribed Burn Plan

Submitted to U.S Fish Wildlife Service and Miami-Dade County

Revised December 2016

Revised August 2016

Revised April 2016

Submitted October 2014

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1.0 INTRODUCTION

Prescribed burning is an important component of the On-site Preserves Management Plan, as discussed in Section 7.0 of the Coral Reef Commons Habitat Conservation Plan (CRC HCP), for the 45.24 acres of pine rocklands within the East and West Preserves. The following "Coral Reef Commons (CRC) Fire Reintroduction and Prescribed Burn Plan" (the "CRC Burn Plan") details the methods for fire reintroduction and implementation of the prescribed burn plan for these areas. The CRC Burn Plan was initially prepared in support of the overall Coral Reef Commons Habitat Conservation Plan (CRC HCP) submitted to the U.S. Fish and Wildlife Service (USFWS).

The 45.24 acres of pine rocklands include 39.64 acres designated as Natural Forest Community (NFC) Pine Rockland habitat by Miami-Dade County (MDC Code § 24-5). Because the CRC Burn Plan includes mechanical fuel and canopy reduction, pine thinning, and the creation of new firebreaks within the designated NFC Pine Rocklands, a NFC removal permit will be required by MDC. To address MDC NFC removal permit requirements, the CRC Burn Plan has been revised to identify prescribed burning activities within NFC Pine Rocklands. Section 6 of the CRC HCP includes the Best Management Practices (BMPs) that will be utilized for the prescribed burning activities. To educate the public on the importance of planned prescribed burns for the pine rockland portions of the On-site Preserves, the overall Conservation Program for the CRC Property includes community outreach and education and is discussed in Sections 6.0 and 7.0 of the HCP.

2.0 FIRE HISTORY IN THE RICHMOND AREA

Located in an urban setting, the pine rocklands within the CRC Property are part of a larger tract of pine rocklands known as the Richmond Pine Rockland Complex (Richmond Area). While conducting prescribed burns within an urban setting may be challenging, Miami-Dade County (MDC), in conjunction with the Florida Forest Service (FFS), has been demonstrated that the ability to conduct burns in an urban setting can be readily accomplished with adequate resources (MDC Public Comment Letter to USFWS 2/22/2016). This is evidenced by the increased burning within MDC's pine rockland preserves over the past few years through the assistance of grant funding (USFWS 2013; Information provided by MDC, 1/20/2015).

Any fire history on the CRC Property has been the result of wildfires. The northern third of the Richmond Area, including the CRC Property, experienced a crown-reducing incendiary fire in the 1950's that resulted in the mortality of most canopy trees. Another severe wildfire followed in this area in 1985. The disturbances in this area (such as hurricanes, scraping and wildfires), coupled with the proximity to urban land use, have resulted in this area being infested with Burma reed (*Neyraudia reynaudiana*). The presence of Burma reed increases the intensity and severity of wildfires (DERM 1994). In January of 2003, a wildfire occurred on-site and had to be brought under control by the State of Florida Division of Forestry (FFS) (PAMI 2004).

Table J2-1 lists the history of fire within the Richmond Area (Maschinski et al. 2013) and serves to demonstrate the feasibility of conducting prescribed burns in this area. Note that with increasing prescribed burns, the incidence of wildfires decreased.

Table J2-1. Fire history in Richmond Area

Date of Fire	Preserve Name	Estimated Acreage Burned	Type of Fire
1989	Larry & Penny Thompson Memorial Park	6	Wildfire
4/1/1993	Zoo Miami	62.5	Wildfire
9/1/1994	Larry & Penny Thompson Memorial Park	6.88	Wildfire
2/9/1995	Larry & Penny Thompson Memorial Park	2.2	Prescribed Burn
4/25/1995	Larry & Penny Thompson Memorial Park	4.3	Wildfire
6/1/1995	Larry & Penny Thompson Memorial Park	43.2	Wildfire
7/3/1995	Luis Martinez U.S. Army Reserve Station	75.07	Wildfire
7/5/1995	Luis Martinez U.S. Army Reserve Station	420.2	Wildfire
1/3/1996	Larry & Penny Thompson Memorial Park	0.6	Wildfire
2/12/1996	Larry & Penny Thompson Memorial Park	18.6	Wildfire
3/4/1996	Larry & Penny Thompson Memorial Park	1	Wildfire
3/21/1996	Larry & Penny Thompson Memorial Park	0.1	Wildfire
3/28/1996	Zoo Miami	156	Wildfire
3/28/1996	Zoo Miami	32	Wildfire
4/3/1996	Larry & Penny Thompson Memorial Park	0.42	Wildfire
4/22/1996	Larry & Penny Thompson Memorial Park	1.48	Wildfire
1/23/1997	Larry & Penny Thompson Memorial Park	13.3	Wildfire
4/2/1998	Larry & Penny Thompson Memorial Park	3.7	Wildfire
4/25/1998	Larry & Penny Thompson Memorial Park	2.7	Wildfire
12/10/1998	Luis Martinez U.S. Army Reserve Station	70	Prescribed Burn
1/14/1999	Larry & Penny Thompson Memorial Park	19.48	Prescribed Burn
2/12/1999	Larry & Penny Thompson Memorial Park	8.6	Prescribed Burn
3/18/1999	Larry & Penny Thompson Memorial Park	1	Wildfire
3/31/1999	Larry & Penny Thompson Memorial Park	34	Wildfire
4/22/2000	Larry & Penny Thompson Memorial Park	11	Wildfire
5/1/2000	Eachus Pineland	17	Wildfire
5/5/2000	Rockdale Pineland	3	Wildfire
5/27/2000	Larry & Penny Thompson Memorial Park	0.1	Wildfire
2/6/2001	Larry & Penny Thompson Memorial Park	9.5	Wildfire

Date of Fire	Preserve Name	Estimated Acreage Burned	Type of Fire
4/24/2001	Larry & Penny Thompson Memorial Park	3	Wildfire
6/5/2001	Zoo Miami	0.1	Wildfire
1/28/2002	Larry & Penny Thompson Memorial Park	2.1	Wildfire
3/5/2002	Larry & Penny Thompson Memorial Park	1.6	Wildfire
3/16/2002	Larry & Penny Thompson Memorial Park	0.3	Wildfire
4/20/2002	Larry & Penny Thompson Memorial Park	0.02	Wildfire
5/4/2002	Larry & Penny Thompson Memorial Park	0.02	Wildfire
10/18/2002	Larry & Penny Thompson Memorial Park	1.8	Wildfire
12/5/2002	Larry & Penny Thompson Memorial Park	0.1	Wildfire
12/19/2002	Larry & Penny Thompson Memorial Park	0.7	Wildfire
12/20/2002	Larry & Penny Thompson Memorial Park	1.5	Wildfire
1/24/2003	Larry & Penny Thompson Memorial Park	1.7	Wildfire
1/8/2004	Zoo Miami	93	Wildfire
4/1/2004	Larry & Penny Thompson Memorial Park	3.4	Wildfire
2/13/2005	Luis Martinez U.S. Army Reserve Station	6.5	Wildfire
1/5/2006	Larry & Penny Thompson Memorial Park	9.9	Wildfire
3/19/2006	Larry & Penny Thompson Memorial Park	50.5	Wildfire
5/21/2006	Larry & Penny Thompson Memorial Park	7.5	Wildfire
10/9/2006	Larry & Penny Thompson Memorial Park	10	Wildfire
1/9/2007	Zoo Miami	7.3	Prescribed Burn
1/12/2007	Zoo Miami	23.3	Prescribed Burn
10/23/2007	Zoo Miami	16.1	Prescribed Burn
3/31/2008	Rockdale Pineland	0.1	Wildfire
7/31/2008	Zoo Miami	9	Prescribed Burn
12/16/2008	Zoo Miami	5.1	Prescribed Burn
3/9/2009	Tamiami Pineland Complex Addition	21	Wildfire
12/6/2011	Larry & Penny Thompson Memorial Park	6.2	Prescribed Burn
12/12/2011	Larry & Penny Thompson Memorial Park	11.2	Prescribed Burn
6/17/2012	Larry & Penny Thompson Memorial Park	1	Wildfire
11/28/2012	Zoo Miami	4.7	Prescribed Burn

Date of Fire	Preserve Name	Estimated Acreage Burned	Type of Fire
12/4/2012	Zoo Miami	5	Prescribed Burn
3/21/2013	Larry & Penny Thompson Memorial Park	3.8	Wildfire
3/23/2013	Zoo Miami	2.2	Wildfire
5/6/2013	Larry & Penny Thompson Memorial Park	14.7	Wildfire
5/22/2013	Larry & Penny Thompson Memorial Park	2.7	Wildfire
6/9/2013	Larry & Penny Thompson Memorial Park	18.6	Wildfire
6/18/2013	Larry & Penny Thompson Memorial Park	6.5	Wildfire
2/16/2014	Larry & Penny Thompson Memorial Park	7.5	Wildfire
2/21/2014	Rockdale Pineland	17.7	Wildfire
3/4/2014	Larry & Penny Thompson	1.7	Wildfire
3/4/2014	Larry & Penny Thompson	3.7	Prescribed Burn
4/1/2014	Larry & Penny Thompson	2.9	Wildfire
11/6/2014	Zoo Miami	7	Prescribed Burn

2.1 Wildland-Urban Interface

The wildland-urban interface (WUI) describes the area where houses and urban development meet or intermingle with undeveloped wildland vegetation (Radeloff et al. 2005). Applying fire within a WUI area can present obvious concerns from the surrounding communities such as containment of fire and health concerns regarding smoke generated from burning. The WUI is described as the most serious issue facing managers working in pine rocklands (O'Brien et al. 2010).

It is also the most common issue encountered when implementing prescribed burns in pine rocklands within urban areas. Avoidance of these issues has resulted in the exclusion of prescribed fire from many pine rocklands. The exclusion of fire has resulted in the creation of another very serious and real danger, the buildup of hazardous fuels leading to potential uncontrolled wildfires that can have catastrophic results. It is therefore, not only a benefit to restoring pine rockland habitat, it is crucial to the safety of the surrounding community that hazardous fuels are managed through a carefully designed burn plan.

3.0 INITIAL WORK - PRESCRIBED FIRE PREPARATION

Much of the CRC Property has experienced fire suppression for decades which has resulted in a too dense canopy and high fuel loads. Intense fires from higher fuel loads can generate greater amounts of smoke and ash and increase public concern in urban areas (Menges and Gordon 2010). Fuel reduction techniques can have great utility in preparing a stand for reintroduction of prescribed fire (O'Brien et al. 2010). For the CRC Property, fuel load reduction techniques will include canopy thinning, both mechanical and by hand, mastication and/or mowing for understory reduction and firebreaks, and invasive plant management.

3.1 Mechanical Fuel and Canopy Reduction

Mechanical fuel load reduction is planned for reintroducing fire in portions of the On-site Preserve pine rocklands. Areas where mechanical fuel load reduction may occur include 39.64 acres of Natural Forest Community (NFC) Pine Rockland and 5.64 acres of non-NFC pine rocklands. Mechanical fuel load reduction may also be used as an interim measure to reduce future fuel loads when the requirements of a burn prescription are not appropriate. Typical mechanical treatments for fuel load reduction include roller-chopping, mastication and mowing. While roller-chopping is an effective technique for reducing shrubby understory, it should not be performed in rockland habitat due to potential damage to the limestone substrate (O'Brien et al. 2010). Mastication and mowing have successfully been used in pine rocklands to alter fuel structure, establish fire lines, and allow the reintroduction of fire without the ground disturbance of roller-chopping (Personal communication Nancy Finley, National Key Deer Refuge [NKDR] manager 1/12/15; O'Brien et al. 2010).

Mechanical treatments on the CRC Property for fuel load understory reduction will only involve mastication and mowing, and not include roller chopping. Because mastication and mowing can result in fuel accumulation, burning will be conducted before the chips and fine fuels dry out (O'Brien et al. 2010). Burning immediately following these mechanical treatments will also minimize the potential of listed plants being covered by masticated material. Raking can also be effective in removing fuels accumulated through these mechanical treatments; however, it is time intensive and not practical for larger areas but may be selectively used in certain areas to reduce hazardous fuel loads.

Canopy reduction will involve pine thinning. Areas where pine thinning may occur also include 39.64 acres of Natural Forest Community (NFC) Pine Rockland and 5.64 acres of non-NFC pine rocklands. Pines will be hand thinned where feasible but some areas may need to be mechanically harvested. Removed trees will be hauled offsite or piled for burning. All equipment utilized for mechanical fuel load/canopy reduction will be rubber-tracked or rubber tired vehicles, as they are able to spread the weight over a larger surface, resulting in less compaction and minimizing the crushing and break up of limestone seen with metal tracks (O'Brien et al. 2010).

3.2 Chemical Treatments for Fuel Load Reduction

Pine rocklands on the CRC Property have become severely degraded as result of fire suppression and the invasion of non-native species, particularly Burma reed, and hardwoods. Burma reed is listed by the Florida Exotic Pest Plant Council (FLEPPC) as a Category I species and produces dense stands of tall reeds "crowding out and smothering native vegetation" (Hammer 1998). The use of herbicides in controlling invasive plants and hardwood encroachment will be an important component in the reduction of fuel loads. Chemical treatments for invasive plant management are discussed in the Conservation Program (Sections 6.0 and 7.0 of HCP) and for Miami-Dade County, in the Miami-Dade County CRC Preserve Management Plan.

Combining thinning and invasive treatments has been shown to reduce hazardous fuels and decrease flame length and rate of spread. Following these activities and the prescribed burn, the rough will be greatly reduced, making follow-up herbicide application easier, less expensive and more effective (Brose and Wade 2002). Herbicides are known to provide greater long-term control of woody vegetation than prescribed burning alone, which results in a more open-canopy environment that is essential for the protected species that are endemic to pine rocklands (Brennan et al. 1998). In fact, the use of mechanical and herbicide treatments, prior to prescribed burning has been found to be a useful approach not only in reducing fuel loads but in expediting restoration goals and reintroducing fire to pine rocklands (Brose and Wade 2002; Menges and Gordon 2010; Wendelberger et al. 2008).

While there are considerable benefits to using chemical treatments as part of an integrated management approach, careful consideration needs to be given to how invasive plants may contribute to fire intensity of the site. In particular, Burma reed has several characteristics that pose a greater threat when employing chemical treatments and implementing prescribed burns. This plant has the ability to alter the fuel structure and load of an area, resulting in more intense burns (Rasha 2005). The seeds of Burma reed can catch fire and act to transport fire into the pine canopy as well as float into adjacent areas causing spot over fires (Rasha 2000). Mature Burma reed can reach over 8 feet tall, making the application of herbicide difficult without overspray and non-target damage (DERM 1994).

Mowing, cutting or burning of Burma reed prior to applying herbicides can reduce the cost of treatment, while increasing treatment effectiveness (Rasha 2005). In general, it is recommended that in areas with less than 30% coverage of Burma reed, prescribed burning may be employed prior to herbicide application. In areas with greater than 30% Burma reed, it is recommended that the "cut-flush" method is utilized, which involves the use of a metal bladed weed whacker or mowing, where feasible, followed by herbicide treatment. In both treatment approaches, the plants should be allowed approximately one foot of growth before chemical treatment. This equates to approximately 3-6 weeks after burn or cut, keeping in mind the plant can produce flowers 2-3 months after being cut and should not be allowed to do so (DERM 1994). If feasible, cut Burma reed should be collected, piled and burned in a safe location, as the cut reeds can add to fuel loads and fire intensity.

Previously identified locations of deltoid spurge and tiny polygala will be flagged prior to treatments and all treatment crews will be familiar with this species.

3.3 Water Availability

Adequate water will be available for prescribed burning. The CRC Property is being developed as a fire-wise community that will integrate prescribed fire management into the design. Fire hydrants will be strategically located along the On-site Preserves. Water will be readily accessible to reduce fire risks to the community and facilitate quick mop-up for efficient smoke management.

3.4 Firebreak Establishment

In general, when working in hazardous fuels, burns should be kept as small as feasible because smaller burns are easier to control and produce less smoke (O'Brien et al. 2010). Fourteen management units within the On-site Preserves were established based on existing and proposed geographic features, habitat types, and management needs. The size of the management units have been designed to minimize effects of land management activities (approximately 3-5 acres) to listed species, allow for the implementation of the prescribed burn plan and encourage a mosaic habitat. The boundaries of these units may be altered based on field conditions present at the time of establishment or maintenance but, in general, will be designed to maintain small management units. **Figure J3-1** depicts the management units for the On-site Preserves. **Figure J3-2** depicts the management units with NFCs overlaid.

Establishing firebreaks within pine rocklands can be challenging because of the limestone substrate. Permanent lines can be created using bulldozers, but this method results in structural alterations of the limestone that can be counter to restoration goals (O'Brien et al. 2010). Black lining, string trimmers, and hand raking/chopping have been shown to be viable alternatives in pine rocklands (O'Brien et al. 2010). The NKDR has successfully used mowing and mastication for establishing and maintaining firebreaks (Personal communication Nancy Finley, NKDR manager 1/12/15).

The CRC Property will have the following types of firebreaks: existing (e.g., roads, edge of pavement) and constructed (e.g., mowed, masticated, wet line or black line). Firebreaks will be a minimum width of 10 feet to allow vehicle access but may vary depending on fuel loads (Personal communication Gary Lewis, Florida Forest Service [FFS], 1/28/2015). Firebreaks will be a maximum width of 12 feet. Management units within all the On-site Preserves were designed to utilize existing features as firebreaks, which will keep construction of new firebreaks to a minimum. Based on communications with Gary Lewis (FFS) and Nancy Finley (USFWS), creating permanent firebreaks through plowing or dozing is not anticipated. Preference will be given for the use of non-permanent methods of establishing firebreaks such as mastication and mowing. As proposed now, firebreaks around all management units total 21,755 feet. Most the firebreaks are considered existing/paved (11,945 feet), which primarily consist of the existing or proposed development boundary along the outside of the On-site Preserves. Firebreaks within the

On-site Preserves total approximately 9,810 feet (**Figure J3-1**); of this approximately 5,397 feet will be new (created) firebreaks, 1,128 feet enhanced along a historically existing trail that has not been maintained, 2,661 feet of existing firebreaks that will be enhanced and 624 feet of an existing asphalt trail.

Within the NFC Pine Rockland areas (39.64 acres, see **Figure J3-2**), firebreaks total approximately 8,801 linear feet and include 4,856 feet of created firebreaks, 929 feet enhanced along a historically existing trail that has not been maintained, 2,392 feet of existing firebreaks that will be enhanced and the 624 feet of existing asphalt trail.

The created firebreaks have been designed to avoid known listed plant populations. The establishment of new firebreaks within the On-site Preserves also provides habitat for many of the listed species, including the Miami tiger beetle (MTB) (*Cicindela floridana*) and Bartram's scrub-hairstreak butterfly (*Strymon acis bartrami*). In conditions where additional precautions need to be established in order to maintain the firebreak integrity or increase the firebreak width, black lining or a wet line will be utilized, when practicable.

Pineland croton (*Croton linearis*) is an opportunistic plant that frequently colonizes disturbed open areas. It is likely pineland croton will colonize the proposed firebreaks and will be displaced during the maintenance of the firebreaks. Avoidance of pineland croton for firebreak maintenance is not practicable because this would require continued alteration of pine rockland habitat and result in less overall habitat value for covered species.

A summary of all the firebreaks for each management unit is provided in **Table J3-1**.

3.5 Covered Species Minimization

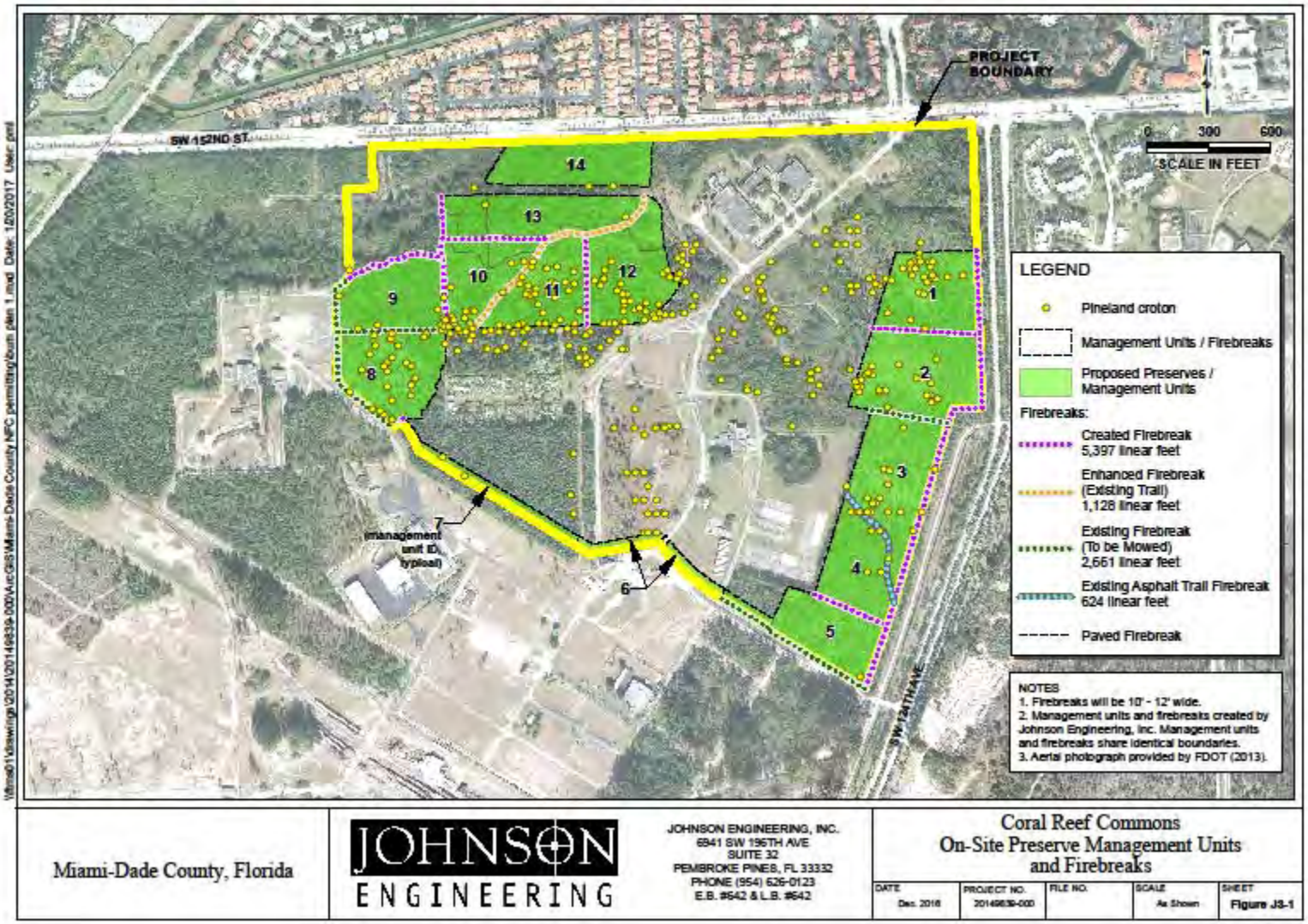
As discussed in Section 6.0 of the HCP, a Florida Bonneted Bat (FBB) roost survey will be conducted for portions of the preserve areas. If a roost is identified in the On-site Preserves during the pre-construction survey, the roost will be protected during management activities by hand removal of subcanopy or ladder fuels surrounding tree, raking and removal of fine fuels surrounding tree, limiting of chemical use around the tree, creating wetline around the tree, and other similar and appropriate methods for preservation of the roost, as identified in USFWS guidelines for Red Cockaded Woodpecker Cavity Tree Protection, Chapter 8k-5c and d (USFWS 2003).

To ensure viability and reproduction of pineland croton within the preserve areas, a wetline will be established around ½ acre portions of pineland croton patches during the initial prescribed burning in Management Units 1, 2, 8, 11 and 12. To minimize potential effects to the MTB, the majority of the burns will take place between October and December, outside of the flight period for this species.

Table J3-1. Summary of Management Units

					Firebreak			
Management Unit	**Predominant Habitat**	**Management Activities**	**Size (Acres)**	**Burn Size (Acres)**	**North**	**East**	**South**	**West**
1	Pine Rockland	B,C,M	4.11	4.11	Pavement	Create Mast./Mow	Create Mast./Mow	Pavement
2	Pine Rockland	B,C,M	5.44	5.44	Create Mast./Mow	Create Mast./Mow	Existing Firebreak-Mow	Pavement
3	Pine Rockland	B,C,M	5.21	5.21	Existing Firebreak-Mow	Create Mast./Mow	Existing Asphalt Trail	Pavement
4	Pine Rockland with Burma Reed	B,C,M	3.35	3.35	Existing Asphalt Trail	Create Mast./Mow	Create Mast./Mow	Pavement
5	Pine Rockland with Burma Reed	B,C,M	3.76	3.5	Create Mast./Mow	Create Mast./Mow	Existing Firebreak-Mow	Pavement
6	Pine Rockland Scraped w/o Canopy	G,C,M,P	0.81	NA	NA	NA	NA	NA
7	Pine Rockland - Severely Fire Suppressed	C,M	1.09	NA	NA	NA	NA	NA
8	Pine Rockland	B,C,M	4.35	4.35	Existing Firebreak-Mow	Pavement	Existing Firebreak-Mow	Existing Firebreak-Mow
9	Pine Rockland with Burma Reed	B,C,M	3.84	3.84	Pavement	Create Mast./Mow	Existing Firebreak-Mow	Existing Firebreak-Mow
10	Pine Rockland Scraped w/pine canopy	B,C,M	3.24	3.24	Create Mast./Mow	Enhance-Degraded Trail	Pavement	Create Mast./Mow
11	Pine Rockland Scraped w/pine canopy	B,C,M	3.61	3.61	Enhance-Degraded Trail	Create Mast./Mow	Pavement	Enhance-Degraded Trail
12	Pine Rockland Scraped w/pine canopy	B,C,M	4.56	4.45	Enhance-Degraded Trail	Pavement	Pavement	Create Mast./Mow
13	Pine Rockland with Burma Reed	B,C,M	4.27	4.14	Pavement	Enhance-Degraded Trail	Create Mast./Mow	Create Mast./Mow
14	Rockland Hammock/ Hist. Marl pr.	C	3.77	NA	NA	NA	NA	NA
B-Burn	G-Grade	**Total**	**51.41**	**45.24**				
P-Plant	M-Mech./Mast.							

Figure J3-1. Overall Coral Reef Commons Proposed Preserve Management Units and Firebreaks



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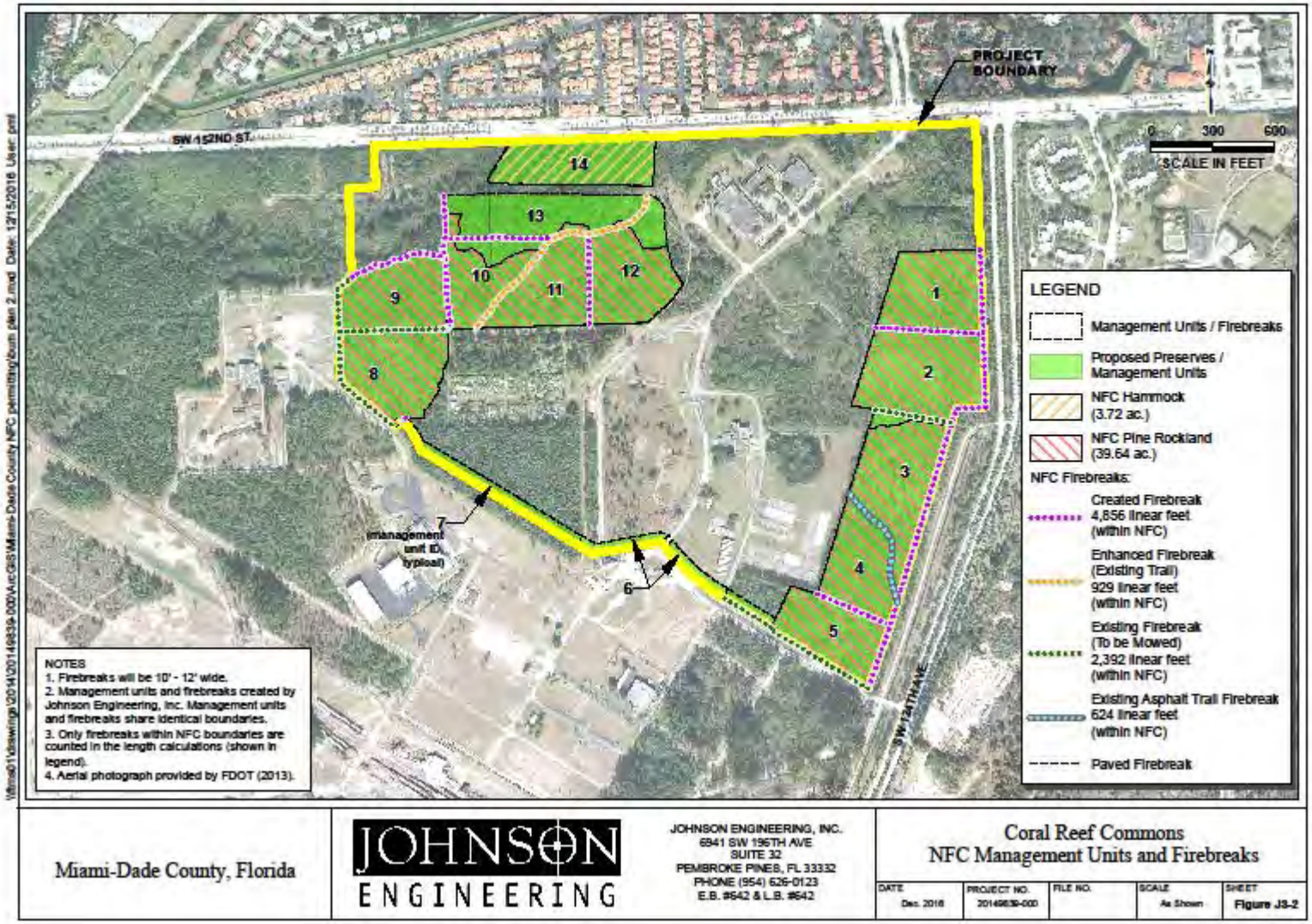
Coral Reef Commons
On-Site Preserve Management Units and Firebreaks

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Dec. 2016	2014/6839-000		As Shown	Figure J3-1

Figure J3-2. Preserve Management Units and Firebreaks with NFC Overlay



4.0 IMPLEMENTATION OF PRESCRIBED FIRE ON THE CRC PROPERTY

Given that many of Florida's ecosystems are fire dependent, legislation governs prescribed burning activities in MDC and the State of Florida. Chapter 14 of the MDC Code requires the Metro-Dade Fire Department to issue a permit prior to prescribe burning activities. One to ten days of notice must be provided to adjacent landowners. In October 1990, Florida passed the Prescribed Burning Act, codified as 590.026 in the Florida Statutes, in effort to encourage prescribed burning. It states that (1) a certified prescribed burn manager must be present, (2) a written prescribed plan must be prepared, (3) prescribed burning should be considered in the public interest and not constitute a nuisance, (4) prescribed burning is a property right. Furthermore, it states that if burning is conducted according to the act, the owner or his agent cannot be held liable for damage by fire or smoke unless negligence is proven.

Both Florida Statute 590.125 and Chapter 5I-2 of the Florida Administrative Code (FAC) grant the FFS the authority to regulate prescribed burning in Florida.

4.1 Objectives

Prescribed fire is the most important consideration in pine rockland management and should be administered every 3 to 7 years to maintain community structure and to prevent the community from succeeding to rockland hammock (FNAI 2010). These relatively shorter fire return intervals not only control hazardous fuel levels, they increase understory plant species diversity, and produce less smoke (O'Brien et al. 2010). Although hardwood species are a natural component of pine rocklands, without fire, they tend to increase in cover and reduce the amount of light penetrating the forest floor (Wade et al. 1980) and herbaceous diversity and cover (Robertson, Jr. 1953; Wade et al. 1980).

The lack of fire within the CRC Property pine rocklands has resulted in the progressive degradation of pine rockland habitat as it transitions to rockland hammock or other non-pyrogenic hardwood community, which is persistently colonized by exotic species. Lack of fire increases the probability of wildfire that can be destructive to the pineland, as well as smoke impacts and spot fire concerns, to the surrounding residences and major transportation corridors. Maintaining regular prescribed burning, implemented in alternate small burn units, will help alleviate these issues and meet burn objectives.

Prescribed burning is a common practice for pine rocklands within the Richmond Area, with fifteen prescribed burns listed in **Table J2-1** and regular future burns planned. To ensure successful implementation of the CRC Burn Plan, small burn units, ranging from 3-5 acres, will be utilized and community outreach and education will be conducted. All lessees, property owners, and/or tenants within the CRC Property will be required to sign documentation acknowledging fire management activities within the CRC Property and on adjacent properties in the Richmond Area. For areas outside of the CRC Property, homeowner associations of residential communities within 0.5 miles will be notified of prescribed burns on the CRC Property prior to burning. The goal for the CRC Burn Plan is to effectively manage the 45.24 acres of pine rocklands within the East and West Preserves for listed species through the introduction and implementation of prescribed fire. The objectives for the prescribed fire focus on the restoration of natural fire regimes for the protection and maintenance of naturally evolved biotic communities and landscapes, while

providing maximum protection of life and property. The following are the objectives of the CRC Burn Plan:

- Community outreach and education
- Reduce fuel load
- Reduce risk of incendiary fires
- Ensure a mosaic burn of vegetation cover to promote community diversity
- Maintain fire-dependent plant communities
- Foster biological diversity
- Maintain open canopy, sparse understory, and diverse herbaceous plant community
- Minimize exotic vegetation
- Control native hardwood encroachment
- Enhance habitat for state and federally listed species
- Increase public acceptance of prescribed burning
- Assist in achieving the success criteria identified in the Habitat Conservation Plan (HCP)

4.2 Burn Manager Duties

In accordance with Florida Statutes and MDC County Code, prescribed burning will be planned and carried out by a designated Certified Prescribed Burn Manager ("Burn Manager") (as licensed by the FFS) and experienced fire crews utilizing the FFS Prescribed Burn Plan form, referred to herein as the "prescription." Initial prescribed burns that will reintroduce fire to the On-site Preserves are anticipated to be conducted by the FFS (Personal communication Gary Lewis, FFS), while subsequent burns may be carried out by a private contractor experienced with prescribed burning in pine rocklands and south Florida. Prior to a burn event, the Burn Manager will inspect the site, which may be coordinated by the Preserve Biologist or the HCP Coordinator. The Burn Manager will use the best professional judgment in writing a prescription that will safely and effectively meet the Burn Plan objectives.

Each prescription will include the following at a minimum:

- purpose for the burn;
- brief description of the habitat type(s) to be burned;
- a map depicting the location of the burn, firebreak locations, potential hazard areas, and escape routes for the fire crew;
- acceptable range of weather conditions;
- acceptable range of soil and fuel moisture;
- a pre-burn inspection of burn unit, firebreaks, and any potential hazards (including power transmission lines, and existing manmade structures) within the burn unit;
- firing techniques;
- emergency action plan with actions for unexpected weather changes or fire behavior;
- management and/or contingency plan for smoke;
- personnel, equipment, and safety requirements;
- personnel assignments and responsibilities; and
- post-burn evaluation.

The Burn Manager will obtain all necessary permits and authorizations before implementation of the burn. The planning and application of prescribed burning will comply with all applicable federal, state, and local regulations.

The Burn Manager will take into account the following considerations when preparing the prescription:

4.2.1 Fire seasonality

Seasonal timing of prescribed burns within the CRC Property will be varied, to the greatest extent practicable, to ensure a diverse community structure and composition, and to best meet individual burn objectives. Fire seasonality can affect intensity of burns. In general, winter burning is more effective for safely reducing hazardous fuel levels (Maguire 1995; Wade et al. 1980). Winter burns, however are less effective in controlling invasive woody species when woody vegetation is dormant as energy reserves are being stored in the roots (DERM 1994). Alternatively, higher intensity summer burns are more likely to result in the mortality of shrubby hardwoods (Wade et al. 1980; Snyder 1986). The NKDR conducts their burns during the lightning season or summer to mimic historical fire regimes (Personal Communication Nancy Finley, NKDR manager 1/12/15); however, this season can be characterized by unstable or variable winds, which may increase risks associated with burning. When burning in pine rocklands situated in urban areas, conducting burns during October through December may be preferable due to prevalent wind direction at this time of year and remaining fuel moisture following the rainy season (Personal communication Gary Lewis, FFS, 1/28/2015). Therefore, for the initial prescribed burning reintroduction at the CRC Property, it is anticipated that burning will take place during the winter season, which is also outside the flight season for the MTB. Summer season burning may be considered for future prescribed burning, if practicable.

4.2.2 Weather and Fuel Considerations

Knowledge of weather and its effects on the behavior of fire is key to successful prescribed burning, and is mandatory for proper management of smoke produced by burning (Wades and Lunsford 1989). When developing the prescription, the Burn Manager will consider weather and fuel conditions, including, but not limited to: wind, relative humidity, temperature, rainfall and soil moisture, airmass stability, and atmospheric dispersion. The Burn Manager will be responsible for obtaining current weather forecasts from FFS, and other weather sources as necessary, prior to executing the prescribed burn. Preferred weather and fuel conditions will vary greatly based on specific burn objectives, season, fuel load, and firing technique. Target prescription parameters will be identified for each planned burn in the recommendations included in each monitoring report. These parameters may be modified by the Burn Manager prior to requesting a burn permit.

4.2.3 Firing Techniques

The Burn Manager will identify the firing techniques for each burn in the prescription. Choosing the appropriate firing technique is an important component in achieving burn objectives. Several other factors may influence the technique chosen for any given fire, such as fuels, weather, topography and smoke management (Wade and Lunsford 1989).

The primary firing techniques that may be used alone, or together, within the CRC Property are backing, strip-heading, flanking, and pile burns, which are described below.

4.2.3.1 Backing Fire

A backing fire is a fire set along a firebreak and allowed to burn into (against) the wind. They have a relatively slow rate of spread that is not significantly influenced by wind speed. Backing fires are typically the least intense with a narrow flaming zone, and short flame lengths (Wade and Lundsford 1989). The shorter flame length reduces crown scorch of adult trees (Maguire 1995). Although backing fires are sometimes perceived as having a longer residence time than heading fires, the residence time is often about the same because the deeper flame depth of a heading fire offsets its faster movement (Wade and Lundsford 1989). Residence time should be considered in terms of flame zone residence time (duration of flaming combustion at a given location) and fuelbed residence time (amount of time to consume fuel downward into the fuelbed) (Wade 2013). The shorter flame length of a backing fire means the heat energy is closer to the ground, enhancing the downward transfer of heat (decreasing fuelbed residence time) (Wade and Lunsford 1989), which may result in the overheating of mature trees' root systems (Maguire 1995). Although conducting the burn when a higher fuel moisture is present will require more effort to keep the fire lit, it will also reduce the damage to root systems (Wade and Lunsford 1989). The higher fuel moisture can also result in a desirable mosaic burn. Because energy is focused downward, backing fires are very effective in consuming hazardous fuels. This is largely the result of the consumption of the herbaceous understory and rough, and may not result in effective control of the wood subcanopy due to the shorter flame length (Wade 2013). A backfire produces only one-third of the emissions of a headfire under the same conditions because more of the fuel is consumed during the flaming phase of combustion rather than in the smoldering phase, which translates to less production of smoke (Wade 2013). Backing fires require a steady wind direction, which often results in their application during the winter months, when wind speeds are less variable. The use of smaller burn units can reduce some of the risks associated with changes in wind directions resulting in a backing fire becoming a headfire.

4.2.3.2 Heading Fire

Natural fires that historically influenced Florida ecosystems where wind-driven head fires (Maguire 1995). Heading fires are the most intense because of its faster rate of spread, wider flaming zone, and longer flames (Wade and Lunsford 1989). While heading fires can be intense, they often result in a mosaic burn pattern because of their quick movement and dependence on wind, allowing the fire to skip over the landscape. Strip-heading fire involves a series of lines of fire set progressively upwind of a firebreak in such a manner that no individual line of fire can develop high energy before it meets the firebreak or a burned area. A backing fire can be used in conjunction with a heading fire to establish a blackline, effectively securing the baseline. The meeting of two fires, however, can result in longer flame length and crown scorch. Heading fires are not as efficient in consuming fuels and can result in more smoldering, which equates to smoke, although they do provide good convective lift allowing for quick dispersion of smoke. Quick mop-up can further reduce smoke issues generated by this technique. Finally, due to higher intensity and risk

of escape, they should not be used in heavy rough (where fire intervals exceed 3 years) (Wade and Lunsford 1989).

4.2.3.3 Flanking Fire

The flanking firing technique involves setting lines of fire directly into the wind (with multiple torch people) or at a 45-degree angle (with two or fewer torch people) so that it spreads at right angles to the wind. The fire intensity is less intense than a heading fire but more intense than a backing fire. It may be used to secure the flanks of a strip-heading fire or to supplement a backing fire in areas of light fuel or under more humid weather conditions. It is useful in a small area when heading fires would be too intense. It can tolerate light to medium fuel loads but should not be conducted when fuel loads are at hazardous levels (Wade and Lunsford 1989).

4.2.3.4 Point Source Fire

Point source fires involve setting a line or grid of spot ignitions rather than laying down a continual ignition line. They can effectively reduce the intensity of a fire and can assist in creating a mosaic burn pattern. Spacing is key to the use of this method as igniting the spots too close to each other can result in converging fires, which rapidly increases the intensity of the fire. As in strip head firing, the downwind firebreak must be secured, most commonly by blacklining. Wind direction can be variable but stand wind or surface winds must be low (1-2mph), and fine fuel moisture should be above 15 percent (Wade and Lunsford 1989).

4.2.3.5 Pile burn

The objective of pile burning is to prolong fire residence time on a restricted area for the purpose of burning larger material. This technique is commonly used to dispose of logging or thinning debris. Care should be taken with the placement of piles because the debris is rarely consumed completely and what remains can inhibit regrowth of vegetation from under the pile, as well as restricting planting (Wade and Lunsford 1989). There are also local restrictions and setbacks on pile burning. Piles greater than 8 feet in diameter require authorization from the FFS, must have suppression equipment on hand, and need to meet additional setback requirements. The setbacks for non-residential clearing are 1,000 feet from any occupied building, 100 feet from any paved public road and 100 feet from any wildland (http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Resources/FAQs-for-Open-Burning-in-Florida, accessed 1/29/15). Pile burning can be problematic in that it produces large amounts of smoke due to prolonged smoldering from higher moisture content and lower oxygen levels. Reducing the amount of soil in a pile, keeping the piles small and allowing them to dry before burning can reduce the amount of smoke generated. Constructing the pile to allow air movement through it and igniting the center of the pile will allow the debris to be consumed quicker, producing less smoke (Wade and Lunsford 1989).

4.2.4 Smoke Management

Smoke management is an essential component of the burn prescription. The FFS authorization of a burn permit relies on a state-of-the-art weather forecasting model

regarding smoke dispersion conditions. This GIS model forecasts size and direction of the smoke dispersion plume, allowing FFS to predict impacts to smoke-sensitive areas. The Burn Manager will conduct his or her own evaluation of each prescribed burn to areas located within a 20-mile radius from the location of the burn by employing a Screening System, such as recommended in Wade and Lunsford (1989) or Forestry Smoke Screening Tool: Florida Forest Service- FDACS. Based on definitions contained within the state regulations, smoke sensitive areas are areas within which smoke could have an adverse impact for reasons of visibility, health or human welfare (NRCS 2003). Monitoring of the prescribed burn will continue until the potential for the fire to affect smoke sensitive areas or reignite and cause an uncontrolled fire is minimized to extent practicable. Keeping pine rocklands on a regular burn regime will reduce heavier fuels (the chief contributors to smoke events), so they do not accumulate as rapidly. As a result, smoke management is simplified because the duration of smoke events is shorter and "mop-up" is reduced (Maguire 1995).

Specific smoke management strategies that may be used on the CRC Property, to the extent practicable are as follows:

- Minimize fuel loads prior to burning through mechanical treatments;
- Reduce heavy fuels such as woody vegetation and downed trees, which cause heavy smoke output and increase fine fuels such as herbaceous grasses, which are easily combustible and produce less smoke;
- Burn when weather and fuel moisture conditions will minimize smoke production;
- Conduct burns when winds are blowing away from smoke sensitive areas;
- Burn when atmospheric dispersion index is 41 or greater (as defined by FFS);
- Utilize firing technique that will best minimize smoke while meeting burn objectives;
- Mop up immediately following flame front;
- Keep burn units approximately 3 to 5 acres;
- Mop up heavy fuels within 50 feet of control lines;
- Place smoke signals on public roads adjacent to burn areas;
- Mop up activities, when practicable, will avoid pooling water within these areas.

4.3 Burn Plan for the Management Units

The following is the general approach for reintroducing fire in the appropriate management unit. The prescription for all prescribed burns will contain more detail and will be determined by the Burn Manager at the time of the burn.

In each monitoring report, the Preserve Biologist will recommend land management activities and fuel reduction activities. Management units will be evaluated based on site conditions, previous land management activities, monitoring results, and restoration or burn objectives. The recommendations will identify and prioritize management actions for each management unit and develop an implementation schedule.

To reintroduce fire and reduce hazardous fuel buildup, this CRC Burn Plan proposes to implement fuel reduction treatment within all the management units during the first year. Construction of CRC Phase 1 is anticipated to take one year.

The first year of burning will commence immediately upon issuance of the HCP. The management units with the highest fuel loads will be burned first (Management Units 4, 5, 9, 10, and 13). These units are predominantly the most degraded units with closed canopies, and extensive invasive infestations. Because of their degraded condition, these units have little to no occurrence of listed species. Therefore, implementation of management activities within these units may be conducted simultaneously and in adjacent units, minimizing impacts to Covered Species.

The second year of burning will occur in all but two of the remaining unburned units (Management Units 1, 3, 8, and 12). Prescribed burning of the remaining two units will commence in the third year (Management Units 2 and 11). The one-year interval between burning events will allow for sufficient recovery of the previously burned management units.

Following the initial fire reintroduction to the management units, burns will occur in a mosaic pattern, with fire applied in alternating units. Long-term management of the On-site Preserves is anticipated to involve approximately 6-10 acres being burned a year, within 2-3 non-adjacent management units. After the initial burn, the hardwood reduction and fuel reduction activities described to occur prior to the initial burning may not be necessary. See **Table J4-1** for Years 1-5 burn schedule and **Figure J3-1** for Management Units.

Table J4-1. CRC Pine Rockland Burn Schedule – Years 1-5

Year 1 Management Units	Year 2 Management Units	Year 3 Management Units	Year 4 Management Units	Year 5 Management Units
4,5,9,10,13	1,3,8,12	2,11	*4,10,13	*1,8
18.07 acres	18.12 acres	15.22 acres	*10.73 acres	*8.46 acres

*Units and acres referenced subject to change based on ecological conditions

The following is the general approach for reintroducing fire within the appropriate management units. Table J3-1 provides a summary of the activities for each management unit. The exact annual work plan and implementation schedule will be determined prior to the commencement of restoration activities, while the exact prescription for all prescribed burns will be determined by the Burn Manager at the time of the burn.

4.3.1 Management Unit 1

Management Unit 1 is approximately 4.11 acres. The vegetation in Management Unit 1 is described as pine rockland with less than 50% Burma reed (Woodmansee 2014). It has a

pine canopy of 5-10% cover in the northern portion, with a variable Burma reed coverage of 25-40%. Further south into this unit, the pine canopy cover increases to 30%, while the Burma reed coverage decreases to less than 25%. The northern portion of the Unit has pineland croton, which disappears further south with the increasing pine canopy. A small population of deltoid spurge was identified in the northern and southern portions of this unit.

Firebreaks on the north and west side of Unit 1 will ultimately consist of pavement related to the development. The southern and eastern firebreaks will be created by selectively mechanically thinning pines, masticating the understory and closely mowing the remaining vegetation.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g., weedeater with metal blades). Cut stems will be bundled and hauled offsite or piled for burning (Leposky 2013). Previously identified locations of deltoid spurge will be flagged prior to treatments and all treatment crews will be familiar with this species. Additionally, immediately before the burn, the southern portion of the Unit will have the pine canopy selectively thinned so that canopy cover is approximately 15% or less. Pines will be hand thinned where feasible but some areas may need to be mechanically harvested. Dense understory will be selectively masticated to reduce fuel load where needed.

Due to the thinning occurring when residential units of the CRC Property are nearing completion, pines will not be pile burned but will most likely be transported offsite. Dense or overgrown understory (>5ft height) will be selectively masticated to reduce fuel load where needed.

This Unit will be burned between October and December during the second year of management activities, with a northerly, northeasterly or northwesterly wind. Firing technique will include a backing fire under higher fuel moisture conditions, lit by spot ignitions to allow for a non-uniform or mosaic burn (Personal communication Gary Lewis, FFS, 1/28/15). For the initial burn, wetlines will be established around an approximate ½ acre area in the north with pineland croton to ensure this area is not burned.

4.3.2 Management Unit 2

Management Unit 2 is approximately 5.44 acres. The vegetation in Management Unit 2 is described as pine rockland with less than 50% Burma reed (Woodmansee 2014). The pine canopy in the northern portion has approximately 30% cover, with Burma reed coverage approximately 25% or less. The central portion of the Unit contains pine canopy of 5% or less and 5-10% Burma reed cover. It is bound on the south by a narrow strip of denser pine (50% cover) and dense Burma reed (75%). The central portion of the Unit has a moderate amount of pineland croton along with a small population of deltoid spurge.

The firebreak on the west side of the Unit will ultimately consist of pavement related to the development. The southern firebreak is an existing firebreak that was historically scraped and will be maintained by mowing. The northern firebreak between Units 1 and 2 and the eastern fire break will be created by selectively mechanically thinning pines, masticating the understory and closely mowing the remaining vegetation.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g., weedeater with metal blades). Cut stems will be bundled and hauled offsite or piled for burning (Leposky 2013). Previously identified locations of deltoid spurge will be flagged prior to treatments and all treatment crews will be familiar with this species. Additionally, immediately before the burn, the southern portion of the Unit will have the pine canopy selectively thinned so that canopy cover is approximately 15% or less. Pines will be hand thinned where feasible but in some areas may need to be mechanically harvested. Dense understory will be selectively masticated to reduce fuel load where needed.

The management of Unit 2 will be similar to Unit 1, only it will be burned between October and December during the third year of management activities, with a northerly or northwesterly wind. Firing technique will include a backing fire under higher fuel moisture conditions, lit by spot ignitions to allow for a non-uniform or mosaic burn. For the initial burn, wetlines will be established around an approximate ½ acre area in the central portion of this Unit with pineland croton to ensure this area is not burned.

4.3.3 Management Unit 3

Management Unit 3 is 5.21 acres. The vegetation in Management Unit 3 consists of little over 2 acres of pine rockland with less than 50% Burma reed (Woodmansee 2014). The remaining 3 acres are classified as pine rockland dominated by Burma reed. The pine canopy in the northern portion has about a 50% cover, with Burma reed coverage approximately 50-75% with the exception of the western edge that has greater than 90% Burma reed coverage. The central portion of the Unit contains a pine canopy of 10-15% with 10% Burma reed cover, and scattered dense patches of Burma reed can be found in this area. The canopy in the southern portion of the Unit is dense with a 50-70% cover and Burma reed coverage at 50-75%. Some pineland croton and deltoid spurge occur within the central portion of this Unit.

The firebreak on the west side of the Unit will ultimately consist of pavement related to the development. The northern firebreak is an existing firebreak that was historically scraped and will be maintained by mowing. The southern firebreak is an existing asphalt trail, approximately 14 feet wide between Units 3 and 4. The eastern fire break will be created by selectively mechanically thinning pines, masticating the understory and closely mowing the remaining vegetation. Previously identified locations of deltoid spurge in close proximity to the asphalt trail will be flagged prior to treatments.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). Cut stems will be bundled and hauled offsite or piled for burning (Leposky 2013). Previously identified locations of remaining deltoid spurge in this Unit will be flagged prior to treatments and all treatment crews will be familiar with this species. Additionally, immediately before the burn, portions of this Unit will have the pine canopy selectively thinned so that canopy cover is approximately 15% or less. Pines will be hand thinned where feasible but in some areas may need to be mechanically harvested. Dense understory will be selectively masticated to reduce fuel load where needed.

The management of Unit 3 will be similar to Unit 1; it will be burned between October and December during the second year of management activities, with a northerly, northeasterly

or northwesterly wind. Firing technique will include a backing fire under higher fuel moisture conditions, lit by spot ignitions to allow for a non-uniform or mosaic burn.

4.3.4 Management Unit 4

Management Unit 4 is approximately 3.35 acres. The vegetation in Management Unit 4 is described as pine rockland dominated by Burma reed (Woodmansee 2014). The pine canopy is relatively dense at 50-70% cover although there are some small open patches in the canopy in a few spots. The Burma reed cover is also relatively dense at 50-75% cover with coverage increasing to 90% in some areas, particularly along the edge of the Unit. It has a few scattered pineland croton that are isolated and surrounded by dense understory vegetation.

Firebreaks on the west side of the unit will ultimately consist of pavement related to the development. The southern firebreak between Units 4 and 5 and the eastern fire break will be created by selectively mechanically thinning pines, masticating the understory and closely mowing the remaining vegetation. The northern firebreak consists of an asphalt trail, approximately 14 feet wide between Units 3 and 4. Previously identified locations of deltoid spurge in close proximity to the asphalt trail will be flagged prior to treatments.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The Burma reed will be collected and stacked for burning in the cleared area to the west of the Unit that consists of concrete pads. Previously identified locations of remaining deltoid spurge in this Unit will be flagged prior to treatments and all treatment crews will be familiar with this species. The area will also require pine thinning throughout most of the Unit. Pines will be hand thinned where feasible but due to the extent of work may need to be mechanically harvested. Debris from the thinning will be stacked in burn piles and/or transported off site. Depending on the condition of the understory following thinning activities remaining dense areas of understory may be selectively masticated to further reduce fuel load, where needed.

Burning will occur in the first year after issuance of the HCP and is anticipated to occur shortly after thinning. This allows remaining debris that could contribute to intensity of the fire to still maintain moisture, which will help to reduce the intensity of the fire. Burning will occur between October and December with an easterly wind. A backing fire will be lit along the western firebreak so that smoke is placed over the property.

4.3.5 Management Unit 5

Management Unit 5 is approximately 3.5 acres. The vegetation in Management Unit 5 is described as pine rockland habitat dominated by Burma reed (Woodmansee 2014). The pine canopy is slightly more open than Unit 4 with about 50% cover. The Burma reed cover remains dense at 50-75% cover with coverage increasing to 90% in some areas, particularly along the western edge of the Unit. One occurrence of pineland croton was documented along with a small population of deltoid spurge along the southeastern edge of the Unit.

Firebreaks on the west side of the Unit will ultimately consist of pavement related to the development. The northern firebreak, eastern and southern fire breaks will be created by selectively mechanically thinning pines, masticating the understory and closely mowing the remaining vegetation. The southern firebreak is an existing firebreak that was historically scraped and will be maintained by mowing.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The Burma reed will be collected and stacked for burning in the cleared area to the west that has been identified for burn piles. Pine thinning will be required throughout the Unit. Pines will be hand thinned where feasible but due to the extent of work may need to be mechanically harvested. Debris from the thinning will be stacked in burn piles and/or transported off site. Depending on the condition of the understory following thinning activities remaining dense areas of understory may be selectively masticated to further reduce fuel load, where needed.

Burning will occur in the first year after issuance of the HCP and is anticipated to occur shortly after thinning so that any remaining debris, which could contribute to intensity of the fire, will still maintain moisture. This will help to reduce the intensity of the fire. Burning will occur between October and December with an easterly wind. A backing fire will be lit along the western firebreak so that smoke is placed over the property.

4.3.6 Management Unit 6

Management Unit 6 is approximately 0.8 acre and will serve as wildlife corridor along the southern portion of the CRC Property. Management of Unit 6 will not involve prescribed burning due to its narrow size; therefore, the details of its management will not be discussed in the CRC Burn Plan. Details of management activities for this Unit can be found in the HCP and for MDC, in the CRC Preserve Management Plan.

4.3.7 Management Unit 7

Management Unit 7 is approximately 1.09 acres and like Unit 6 it will serve as a wildlife corridor along the southern portion of the CRC Property. Management of Unit 7 will not involve prescribed burning due to its narrow size; therefore, the details of its management will not be discussed in the CRC Burn Plan. Details of management activities for this Unit can be found in the HCP and for MDC, in the CRC Preserve Management Plan.

4.3.8 Management Unit 8

Management Unit 8 is 4.35 acres. The vegetation in Management Unit 8 is described as pine rockland with less than 50% Burma reed (Woodmansee 2014). The pine canopy has about a 25% cover with the exception of a few denser canopied areas (40%) on the east side of the Unit. Burma reed coverage is variable, most of the interior portion of Unit 8 has about a 25% cover or less, with the coverage creeping up to 50% around the edges of Unit 8. Unit 8 contains patches of pineland croton. It also contains several populations of tiny polygala in proximity to a few populations of deltoid spurge.

Firebreaks on the eastern side of the Unit will ultimately consist of pavement related to the development. The western, northern, and southern firebreaks are existing firebreaks that were historically scraped and will be maintained by mowing.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). Cut stems will be bundled and hauled offsite or piled for burning (Leposky 2013). Previously identified locations of deltoid spurge and tiny polygala will be flagged prior to treatments and all treatment crews will be familiar with these species. The pine canopy along the eastern side will be slightly thinned, where needed.

The management of Unit 8 will be similar to Units 1 and 3; it will be burned between October and December during the second year of management activities. Unit 8 will be burned with an easterly wind by setting a backing fire along the western firebreak. The burn will be conducted under higher fuel moisture conditions, and lit by spot ignitions to allow for a non-uniform or mosaic burn. For the initial burn, wetlines will be established around an approximate ½ acre area in the central portion of this Unit with pineland croton to ensure this area is not burned.

4.3.9 Management Unit 9

Management Unit 9 is approximately 3.84 acres. The vegetation in Management Unit 9 is described as pine rockland dominated by Burma reed (Woodmansee 2014). The pine canopy is denser than optimal pine rockland habitat at 50% cover in the southern area and gets progressively denser, exceeding 75% cover in the northern portion of Unit 9. The Burma reed coverage varies from 75% to 90% through the majority of the Unit. It has a few scattered pineland croton strictly found along the edges of the Unit where there is more light availability.

The eastern and northern firebreaks will be created by selectively mechanically thinning pines, masticating the understory and closely mowing the remaining vegetation. The southern and western firebreaks are existing firebreaks that were historically scraped and will be maintained by mowing.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The Burma reed will be collected and stacked for burning in the cleared area to the north of the Unit and in the cleared area to the southeast, which was previously monkey cages. Pine thinning will be required throughout the Unit, particularly in the northern portion. Pines will be hand thinned where feasible but may need to be mechanically harvested in some areas. Debris from the thinning will be stacked in burn piles and/or transported off site. Depending on the condition of the understory following thinning activities remaining dense areas of understory may be selectively masticated to further reduce fuel load, where needed.

Burning will occur in the first year after issuance of the HCP and is anticipated to occur shortly after thinning so that any remaining debris that could contribute to the intensity of the fire still maintains moisture, which will help to reduce fire intensity. A backing fire will be lit along the southern firebreak sometime in November or December after a cold

front has come through, and when a northerly wind is present, allowing smoke to be carried away from the road to the north.

4.3.10 Management Unit 10

Management Unit 10 is approximately 3.24 acres. The majority of the vegetation in Unit 10 is described as pine rockland – historically scraped but with pine canopy, with the exception of the northern portion of Unit 10, which is described as pine rockland dominated by Burma reed (Woodmansee 2014). The pine canopy is extremely dense in the northern portion of the Unit, exceeding 75% cover with the Burma reed at greater than 90% cover. The central and southern portion of the Unit has a more open canopy due to historical scraping and ranges between 25-50% cover. Burma reed coverage is less than 25% for significant portions of this area with the exception of a few patches that have about 75% cover in the central portion and along some edges. The relatively open canopy in the southern half has allowed some pineland croton to persist.

Firebreaks on the south side of the Unit will ultimately consist of pavement related to the development; currently an existing trail occurs in this location. Prior to burning, a wide firebreak (approximately 50 feet or greater) will be created. The western and northern firebreaks will be created by selectively thinning pines, masticating the understory and closely mowing the remaining vegetation. The eastern firebreak consists of a historic trail that has become overgrown; this will be enhanced by masticating and mowing the trail.

Prior to burning, the northern portion of the Unit will have extensive thinning, which may require mechanical harvesting due to the density of pines. Machinery will access the site from the northern boundary to prevent compaction of the substrate through the main portion of the site. Debris from the thinning will be stacked in burn piles and/or transported off site. Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The Burma reed will be collected and stacked for burning in the cleared areas identified for burn piles.

Burning will occur in the first year after issuance of the HCP and is anticipated to occur shortly after thinning so that any remaining debris that could contribute to intensity of the fire still maintain moisture, which will help to reduce the intensity of the fire. A backing fire will occur between October and December when a northerly or northeasterly wind is present, allowing smoke to be carried away from the road to the north. Ignition technique will use a spot fire to promote a mosaic burn.

4.3.11 Management Unit 11

Management Unit 11 is 3.61 acres. The vegetation in Management Unit 11 is described as pine rockland – historically scraped but with a pine canopy (Woodmansee 2014). The pine canopy in the northern portion is denser at about a 50-60% cover, with Burma reed coverage approximately 50-75%. The central portion is relatively open at just over 25% canopy cover and significantly less Burma reed at 10-25% cover. Burma reed coverage increases significantly in the southern portion ranging up to 75% cover. As with other units, the pineland croton distribution is largely dependent on the canopy and Burma reed coverage. Croton is primarily found in the central portion of the Unit where it is open with

the exception of some occurrences along the southern boundary where the edge effect allows light penetration and growth of croton.

The northern and western firebreaks will consist of a historic trail that has become overgrown and will be enhanced by masticating and mowing the trail. The firebreak on the south side of the Unit will consist of pavement related to the development. The eastern firebreak will have been created during the second year of burning, between Units 11 and 12.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The pine canopy will also be selectively thinned so that canopy cover is approximately 25%. Harvested pines and Burma reed will be transported off site.

The management of Unit 11 will be similar to Unit 10 but will be burned during the third year of management activities between October and December. Unit 11 will be burned under an easterly wind with a backing fire under higher fuel moisture conditions, lit by spot ignitions to allow for a non-uniform or mosaic burn. The easterly wind will allow the smoke to be carried away from residential units and the road. For the initial burn, wetlines will be established around an approximate ½ acre area in the central portion of this Unit with pineland croton to ensure this area is not burned.

4.3.12 Management Unit 12

Management Unit 12 is 4.45 acres in size. The vegetation in Management Unit 12 has been described as pine rockland – historically scraped but with a pine canopy. The pine canopy in the northern portion is denser at about a 50% cover, with Burma reed coverage exceeding 75% but decreases slightly to the south. In the central portion of this Unit is an area with approximately 25% canopy cover and Burma reed at 10-25% cover. Burma reed coverage returns, increasing significantly in the southern portion ranging up to 75% cover. As with other units, the pineland croton distribution is largely dependent on the canopy and Burma reed coverage.

The northern firebreak will consist of a historic trail that has become overgrown and will be enhanced by masticating and mowing the trail. Firebreaks on the south and east side of the Unit will consist of pavement related to the development. The western firebreak will be created between Units 11 and 12 by selectively thinning pines, masticating the understory and closely mowing the remaining vegetation.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The pine canopy will also be selectively thinned so that canopy cover is approximately 25% or less. Dense understory will be selectively masticated to reduce fuel load where needed.

The management of this Unit will be similar to Unit 10, but will be burned during the second year of management activities, between October and December. It will be burned under an easterly or northeasterly wind with a backing fire under higher fuel moisture conditions, lit by spot ignitions to allow for a non-uniform or mosaic burn. For the initial

burn, wetlines will be established around an approximate ½ acre area in the central portion of this Unit with pineland croton to ensure this area is not burned.

4.3.13 Management Unit 13

Management Unit 13 is approximately 4.14 acres. There is a fence line that horizontally bisects Unit 13. South of the fence line, the vegetation in Management Unit 13 has been described as pine rockland dominated by Burma reed, while north of the fence line, it has been described as pine rockland – fire suppressed (Woodmansee 2014). The pine canopy north of the fence has approximately 60% cover but gets progressively denser to the west and south across the fence, where it exceeds 75% cover. The Burma reed occurrence follows a similar pattern with 30-50% cover that quickly exceeds 90% cover to the west and south across the fence. Two isolated occurrences of pineland croton were documented within Unit 13.

Firebreaks on the north of the Unit will ultimately consist of pavement related to the development, however, at the time of the initial burning it may be undeveloped land. If needed, prior to burning, a wide firebreak (approximately 50 feet or greater) will be created outside of the preserve boundary. The eastern firebreak and part of the southern firebreak will consist of a historic trail that has become overgrown and will be enhanced by masticating and mowing. The western and southern firebreaks will be created by selectively thinning pines, masticating the understory and closely mowing the remaining vegetation.

Prior to burning, Burma reed will be cut using the appropriate hand tools (e.g. weedeater with metal blades). The Burma reed will be collected and stacked for burning in the areas designated for burn piles. Pine thinning will occur in Unit 13, and will likely require mechanical harvesting. Access to the Unit 13 will occur from the north or west, to avoid adjacent management units. Debris from the thinning will be stacked in burn piles and/or transported off site. It is likely the pine thinning will effectively reduce the understory and may not require additional mastication.

The management of Unit 13 will occur during the first year of burning and is anticipated to occur shortly after thinning so that any remaining debris still maintains moisture, which will help to reduce the intensity of the fire. Burning will occur between October and December with a northerly wind. A backing fire will be lit along the southern firebreak so that smoke is placed over the property and away from the road to the north.

4.3.14 Management Unit 14

Management Unit 14 is 3.77 acres. The vegetation of Unit 14 is described as rockland hammock. Although rockland hammocks often occur adjacent to fire-dependent pine rocklands, fire can damage these forested habitats by consuming the organic soils and killing the hardwood canopy (FNAI 2010). In 2014, Ram Coral Reef initiated management of Unit 14 consisting of mechanical and chemical treatments only, which will continue. Management of Unit 14 will not involve prescribed burning due to the habitat type; therefore, the details of its management will not be discussed in the CRC Burn Plan.

Details of management activities for this Unit can be found in the HCP and for MDC, in the CRC Preserve Management Plan.

4.4 Post-Burn Evaluation

The Burn Manager will conduct a post-burn evaluation within one week following each burn event. A post-burn evaluation is used to ensure the objectives of the burn were attained and gain information to be used in future burns (Wade and Lunsford 1989). The post-burn evaluation notes will be included in the On-site Preserves annual monitoring reports and in the next HCP Administrative Report.

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APPENDIX J1

Off-site Mitigation Area Mitigation Plan – Burn Plan and Financials – Off-Site

CORAL REEF COMMONS

Off-site Mitigation Area
Prescribed Burn Plan

Submitted May 2016
Revised August 31, 2016

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Attachment 1 University of Miami Richmond Campus Fire Cells

1.0 INTRODUCTION

The Conservation Program for the Coral Reef Commons (CRC) Habitat Conservation Plan (HCP) includes 50.96 acres of offsite mitigation (the "Off-site Mitigation Area") at the University of Miami ("UM") Richmond Campus. Prescribed burning is a component of the Off-site Mitigation Area Mitigation Plan. The Prescribed Burn Plan for the UM Richmond Campus ("Off-site Mitigation Area Burn Plan") will be implemented on 47.36 acres of the Off-site Mitigation Area. The remaining 3.6 acres (Cell 9) are not included in the Off-site Mitigation Area Burn Plan due to constraints with existing facilities on the UM Richmond Campus. The objective of the Off-site Mitigation Area Burn Plan is to implement prescribed burning for the 47.36 acres in a manner and frequency to enhance the habitat and provide substantial benefit to the Covered Species in the CRC HCP.

As background, approximately fifty-five acres of the pine rockland habitat within the UM Richmond Campus was previously protected through a recorded deed restriction and includes Parcel A (50.96 acres) and Parcel B (4.49 acres). Parcel A is the Off-site Mitigation Area. The deed restriction required a "Conservation Management Plan" for the UM Richmond Campus Parcel A to preserve the federally endangered deltoid spurge and is contingent upon the continued listing of the deltoid spurge.

The main goal of the existing UM Richmond Campus Conservation Management Plan is to control invasive plant species. Based on the "Year Thirteen Management Report" prepared by Biscayne Environmental, Inc. (see **Appendix K**), invasive plant species are being managed on Parcel A. The current Conservation Management Plan also states "Prescribed burning may be required every 3 to 5 years". However, burning is not mandated and is not occurring at the recommended frequency to maintain pine rocklands in a condition beneficial to the Covered Species in the CRC HCP.

2.0 FIRE HISTORY IN THE UM RICHMOND CAMPUS

Parcel A is divided up into eight fire control cells (cells 9-16) with established fire breaks. Fire control cells 11, 13, 15 and 16 are located entirely on Parcel A and fire control cells 9, 10, 12 and 14 overlap onto Parcel B. The last prescribed burn on Parcel A was conducted in 2003 in fire control cells 15 and 16, which combined represent approximately one third of Parcel A. Wildfires were recorded in August 2004 in cells 9-13 and in September 2006 within cell 15.

3.0 INITIAL WORK - PRESCRIBED FIRE PREPARATION

The Off-site Mitigation Area Burn Plan will be implemented for fire control cells 10-16. As evidenced by comparing 2004 and 2016 aerial imagery, the lack of regular fire on Parcel A has resulted in an increase in pine canopy cover. The lack of fire also increases the probability of wildfire that can be destructive to the pineland, as well as smoke impacts and spot fire concerns, to the surrounding residences and major transportation corridors.

3.1 Mechanical Fuel Reduction

Canopy reduction (pine thinning) and understory reduction will be required prior to implementing the prescribed burn. Pines will be hand thinned where feasible but in some areas may need to be mechanically harvested.

Mechanical treatments for fuel load understory reduction will only involve mastication and mowing, and not include roller chopping. Because mastication and mowing can result in fuel accumulation, burning will be conducted before the chips and fine fuels dry out (O'Brien et al. 2010). Raking can also be effective in removing fuels accumulated through these mechanical treatments; however, it is time intensive and not practical for larger areas but may be selectively used in certain areas to reduce hazardous fuel loads.

Pine thinning and mechanical treatments for fuel load reduction will be overseen by the Florida Forest Service (FFS) or an approved Burn Manager using standardized best management practices to protect the wildlife, the pine rocklands and to prevent environmental degradation.

Any equipment utilized for canopy reduction and understory reduction will be rubber-tracked or rubber tired vehicles, as they are able to spread the weight over a larger surface, resulting in less compaction and minimizing the crushing and break up of limestone seen with metal tracks (O'Brien et al. 2010).

3.2 Water Availability

The UM Richmond Burn Plan will be implemented by the FFS. FFS trucks are equipped with 300 to 800 gallon water tanks and foam capabilities. Water will be readily accessible to reduce fire risks to the community and facilitate quick mop-up for efficient smoke management.

3.3 Firebreak Establishment

The firebreaks for the 50.96-acre Off-site Mitigation Area have already been established and total approximately 20,173 feet within Parcel A. Maintenance of the firebreaks will be required prior to implementing the Off-site Mitigation Area Burn Plan. To avoid surface impacts, blacklining, string trimmers, or hand raking/chopping will be implemented to for the firebreak maintenance.

3.4 FBB Survey Minimization Measures and BMPs

A FBB roost survey will be conducted for the Off-site Mitigation Area. If a roost is identified during the pre-construction survey, the roost will be protected during management activities by hand removal of subcanopy or ladder fuels surrounding tree, raking and removal of fine fuels surrounding tree, limiting of chemical use around the tree, creating wetline around the tree, and other similar and appropriate methods for preservation of the roost, as identified in USFWS guidelines for Red Cockaded Woodpecker Cavity Tree Protection, Chapter 8k-5c and d (USFWS 2003).

3.5 Best Management Practices (BMPs)

The following BMPs will be implemented to minimize the effects of the Off-site Mitigation Area Burn Plan. BMPs for smoke management are included in Section 4.2.4.

A. The previously established fire control cells and associated firebreaks were designed to be small (approx. 3-14 acres) to promote mosaic style burning, minimize direct impact of burning on species, and assist in smoke management;

B. When feasible, hand removal for pines will be preferentially used over mechanical removal;

C. Roller-chopping will be a prohibited mechanical treatment method;

D. Debris from mechanical and hand thinning will be stacked in burn piles and/or transported off site;

E. Any equipment used for mechanical removal will utilize rubber tracked vehicles, if available, otherwise the use of rubber tired vehicles will be selected;

F. Mechanical equipment utilized will be the minimum size and weight necessary to perform the task will be preferentially selected;

G. All equipment will be properly inspected and maintained;

H. Mechanical equipment will not be stored within the offsite mitigation area;

I. Mechanical access will be through adjacent development and along firebreaks;

J. To minimize the introduction of exotic and nuisance plant species, decontamination of equipment will be conducted prior to conducting land management activities;

4.0 IMPLEMENTATION OF PRESCRIBED FIRE ON UM RICHMOND CAMPUS

Given that many of Florida's ecosystems are fire dependent, legislation governs prescribed burning activities in MDC and the State of Florida. Chapter 14 of the MDC Code requires the Metro-Dade Fire Department to issue a permit prior to prescribe burning activities. One to ten days of notice must be provided to adjacent landowners. In October 1990, Florida passed the Prescribed Burning Act, codified as 590.026 in the Florida Statutes, in an effort to encourage prescribed burning. It states that (1) a certified prescribed burn manager must be present, (2) a written prescribed plan must be prepared, (3) prescribed burning should be considered in the public interest and not constitute a nuisance, (4) prescribed burning is a property right. Furthermore, it states that if burning is conducted according to the act, the owner or his agent cannot be held liable for damage by fire or smoke unless negligence is proven.

Both Florida Statute 590.125 and Chapter 5I-2 of the Florida Administrative Code (FAC) grant the FFS the authority to regulate prescribed burning in Florida.

4.1 Objectives

Prescribed fire is the most important consideration in pine rockland management and should be administered every 3 to 7 years to maintain community structure and to prevent the community from succeeding to rockland hammock (FNAI 2010). These relatively shorter fire return intervals not only control hazardous fuel levels, they increase understory plant species diversity, and produce less smoke (O'Brien et al. 2010). Although hardwood species are a natural component of pine rocklands, without fire, they tend to increase in cover and reduce the amount of light penetrating the forest floor (Wade et al. 1980) and herbaceous diversity and cover (Robertson, Jr. 1953; Wade et al. 1980).

The lack of fire within portions of the UM Richmond Campus pine rocklands has resulted in a too dense pine canopy and understory. Lack of regular fire also increases the probability of wildfire that can be destructive to the pineland, as well as smoke impacts and spot fire concerns,

to the surrounding residences and major transportation corridors. Maintaining regular prescribed burning, implemented in alternate small fire control cells, will help alleviate these issues and meet burn objectives.

To ensure successful implementation of the Off-site Mitigation Area Burn Plan, previously established small fire control cells, ranging from 3-14 acres, will be utilized and community outreach and education will be conducted. For areas outside of the UM Richmond Campus, homeowner associations of residential communities within 0.5 miles will be notified of the prescribed burns prior to burning. The goal for the Off-site Mitigation Area Burn Plan is to effectively manage the 47.36 acres of pine rocklands for listed species through the implementation of prescribed fire. While not a permit requirement, the parameters contained in the success criteria in Table 7-3 of the HCP are the goals for managing the habitat. The objectives for the prescribed fire focus on natural fire regimes for the protection and maintenance of naturally evolved biotic communities and landscapes, while providing maximum protection of life and property. The following are the objectives of the Off-site Mitigation Area Burn Plan:

- Community outreach and education
- Reduce fuel load
- Reduce risk of incendiary fires
- Ensure a mosaic burn of vegetation cover to promote community diversity
- Maintain fire-dependent plant communities
- Foster biological diversity
- Maintain open canopy, sparse understory, and diverse herbaceous plant community
- Control native hardwood encroachment
- Enhance habitat for state and federally listed species
- Increase public acceptance of prescribed burning

4.2 Burn Manager Duties

In accordance with Florida Statutes and MDC Code, prescribed burning will be planned and carried out by a designated Certified Prescribed Burn Manager ("Burn Manager") (as licensed by the FFS) and experienced fire crews utilizing the FFS Prescribed Burn Plan form, referred to herein as the "prescription." Initial prescribed burns that will reintroduce fire to the site are anticipated to be conducted by the FFS, while subsequent burns may be carried out by a private contractor experienced with prescribed burning in pine rocklands and south Florida. Prior to a burn event, the Burn Manager will inspect the site. The Burn Manager will use the best professional judgment in writing a prescription that will safely and effectively meet the Off-site Mitigation Area Burn Plan objectives.

Each prescription will include the following at a minimum:

- Purpose for the burn;
- Brief description of the habitat type(s) to be burned;

- A map depicting the location of the burn, firebreak locations, potential hazard areas, and escape routes for the fire crew;
- Acceptable range of weather conditions;
- Acceptable range of soil and fuel moisture;
- A pre-burn inspection of fire control cell firebreaks, and any potential hazards (including power transmission lines, and existing manmade structures) within the fire control cell;
- Firing techniques;
- Emergency action plan with actions for unexpected weather changes or fire behavior;
- Management and/or contingency plan for smoke;
- Personnel, equipment, and safety requirements;
- Personnel assignments and responsibilities; and
- Post-burn evaluation.

The Burn Manager will obtain all necessary permits and authorizations before implementation of the burn. The planning and application of prescribed burning will comply with all applicable federal, state, and local regulations.

The Burn Manager will take into account the following considerations when preparing the prescription:

4.2.1 Fire Seasonality

Seasonal timing of prescribed burns will be varied, to the greatest extent practicable, to ensure a diverse community structure and composition, and to best meet individual burn objectives. Fire seasonality can affect intensity of burns. In general, winter burning is more effective for safely reducing hazardous fuel levels (Maguire 1995; Wade et al. 1980). Winter burns, however are less effective in controlling invasive woody species when woody vegetation is dormant as energy reserves are being stored in the roots (DERM 1994). Alternatively, higher intensity summer burns are more likely to result in the mortality of shrubby hardwoods (Wade et al. 1980; Snyder 1986). The NKDR conducts their burns during the lightning season or summer to mimic historical fire regimes (Personal Communication Nancy Finley, NKDR manager 1/12/15); however, this season can be characterized by unstable or variable winds, which may increase risks associated with burning. When burning in pine rocklands situated in urban areas, conducting burns during October through December may be preferable due to prevalent wind direction at this time of year and remaining fuel moisture following the rainy season (Personal communication Gary Lewis, FFS, 1/28/2015). Therefore, for the initial prescribed burning, it is anticipated that burning will take place during the winter season, which is also outside the flight season for the MTB. Summer season burning may be considered for future prescribed burning, if practicable.

4.2.2 Weather and Fuel Considerations

Knowledge of weather and its effects on the behavior of fire is key to successful prescribed burning, and is mandatory for proper management of smoke produced by burning (Wades and Lunsford 1989). When developing the prescription, the Burn Manager will consider weather and

fuel conditions, including, but not limited to: wind, relative humidity, temperature, rainfall and soil moisture, airmass stability, and atmospheric dispersion. The Burn Manager will be responsible for obtaining current weather forecasts from FFS, and other weather sources as necessary, prior to executing the prescribed burn. Preferred weather and fuel conditions will vary greatly based on specific burn objectives, season, fuel load, and firing technique. Target prescription parameters will be identified for each planned burn in the recommendations included in each monitoring report. These parameters may be modified by the Burn Manager prior to requesting a burn permit.

4.2.3 Firing Techniques

The Burn Manager will identify the firing techniques for each burn in the prescription. Choosing the appropriate firing technique is an important component in achieving burn objectives. Several other factors may influence the technique chosen for any given fire, such as fuels, weather, topography and smoke management (Wade and Lunsford 1989). The primary firing techniques that may be used alone, or together, within CRC are backing, strip-heading, flanking, and pile burns, which are described below.

4.2.3.1 Backing Fire

A backing fire is a fire set along a firebreak and allowed to burn into (against) the wind. They have a relatively slow rate of spread that is not significantly influenced by wind speed. Backing fires are typically the least intense with a narrow flaming zone, and short flame lengths (Wade and Lundsford 1989). The shorter flame length reduces crown scorch of adult trees (Maguire 1995). Although backing fires are sometimes perceived as having a longer residence time than heading fires, the residence time is often about the same because the deeper flame depth of a heading fire offsets its faster movement (Wade and Lundsford 1989). Residence time should be considered in terms of flame zone residence time (duration of flaming combustion at a given location) and fuelbed residence time (amount of time to consume fuel downward into the fuelbed) (Wade 2013). The shorter flame length of a backing fire means the heat energy is closer to the ground, enhancing the downward transfer of heat (decreasing fuelbed residence time) (Wade and Lunsford 1989), which may result in the overheating of mature trees' root systems (Maguire 1995). Although conducting the burn when a higher fuel moisture is present will require more effort to keep the fire lit, it will also reduce the damage to root systems (Wade and Lunsford 1989). The higher fuel moisture can also result in a desirable mosaic burn. Because energy is focused downward, backing fires are very effective in consuming hazardous fuels. This is largely the result of the consumption of the herbaceous understory and rough, and may not result in effective control of the wood subcanopy due to the shorter flame length (Wade 2013). A backfire produces only one-third of the emissions of a headfire under the same conditions because more of the fuel is consumed during the flaming phase of combustion rather than in the smoldering phase, which translates to less production of smoke (Wade 2013). Backing fires require a steady wind direction, which often results in their application during the winter months, when wind speeds are less variable. The use of smaller fire control cells can reduce some of the risks associated with changes in wind directions resulting in a backing fire becoming a headfire.

4.2.3.2 Heading Fire

Natural fires that historically influenced Florida ecosystems where wind-driven head fires (Maguire 1995). Heading fires are the most intense because of its faster rate of spread, wider

flaming zone, and longer flames (Wade and Lunsford 1989). While heading fires can be intense, they often result in a mosaic burn pattern because of their quick movement and dependence on wind, allowing the fire to skip over the landscape. Strip-heading fire involves a series of lines of fire set progressively upwind of a firebreak in such a manner that no individual line of fire can develop high energy before it meets the firebreak or a burned area. A backing fire can be used in conjunction with a heading fire to establish a blackline, effectively securing the baseline. The meeting of two fires, however, can result in longer flame length and crown scorch. Heading fires are not as efficient in consuming fuels and can result in more smoldering, which equates to smoke, although they do provide good convective lift allowing for quick dispersion of smoke. Quick mop-up can further reduce smoke issues generated by this technique. Finally, due to higher intensity and risk of escape, they should not be used in heavy rough (where fire intervals exceed 3 years) (Wade and Lunsford 1989).

4.2.3.3 Flanking Fire

The flanking firing technique involves setting lines of fire directly into the wind (with multiple torch people) or at a 45-degree angle (with two or fewer torch people) so that it spreads at right angles to the wind. The fire intensity is less intense than a heading fire but more intense than a backing fire. It may be used to secure the flanks of a strip-heading fire or to supplement a backing fire in areas of light fuel or under more humid weather conditions. It is useful in a small area when heading fires would be too intense. It can tolerate light to medium fuel loads but should not be conducted when fuel loads are at hazardous levels (Wade and Lunsford 1989).

4.2.3.4 Point Source Fire

Point source fires involve setting a line or grid of spot ignitions rather than laying down a continual ignition line. They can effectively reduce the intensity of a fire and can assist in creating a mosaic burn pattern. Spacing is key to the use of this method as igniting the spots too close to each other can result in converging fires, which rapidly increases the intensity of the fire. As in strip head firing, the downwind firebreak must be secured, most commonly by blacklining. Wind direction can be variable but stand wind or surface winds must be low (1-2 mph), and fine fuel moisture should be above 15 percent (Wade and Lunsford 1989).

4.2.3.5 Pile Burn

The objective of pile burning is to prolong fire residence time on a restricted area for the purpose of burning larger material. This technique is commonly used to dispose of logging or thinning debris. Care should be taken with the placement of piles because the debris is rarely consumed completely and what remains can inhibit regrowth of vegetation from under the pile, as well as restricting planting (Wade and Lunsford 1989). There are also local restrictions and setbacks on pile burning. Piles greater than 8 feet in diameter require authorization from the FFS, must have suppression equipment on hand, and need to meet additional setback requirements. The setbacks for non-residential clearing are 1,000 feet from any occupied building, 100 feet from any paved public road and 100 feet from any wildland (http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Resources/FAQs-for-Open-Burning-in-Florida, accessed 1/29/15). Pile burning can be problematic in that it produces large amounts of smoke due to prolonged smoldering from higher moisture content and lower oxygen levels. Reducing the amount of soil in a pile, keeping the piles small and allowing them to dry before burning can reduce the amount of smoke generated. Constructing the pile to allow air movement through it

and igniting the center of the pile will allow the debris to be consumed quicker, producing less smoke (Wade and Lunsford 1989).

4.2.4 Smoke Management

Smoke management is an essential component of the burn prescription. The FFS authorization of a burn permit relies on a state-of-the-art weather forecasting model regarding smoke dispersion conditions. This GIS model forecasts size and direction of the smoke dispersion plume, allowing FFS to predict impacts to smoke-sensitive areas. The Burn Manager will conduct his or her own evaluation of each prescribed burn to areas located within a 20-mile radius from the location of the burn by employing a Screening System, such as recommended in Wade and Lunsford (1989) or Forestry Smoke Screening Tool: Florida Forest Service- FDACS. Based on definitions contained within the state regulations, smoke sensitive areas are areas within which smoke could have an adverse impact for reasons of visibility, health or human welfare (Natural Resources Conservation Service 2003). Monitoring of the prescribed burn will continue until the potential for the fire to affect smoke sensitive areas or reignite and cause an uncontrolled fire is minimized to extent practicable. Keeping pine rocklands on a regular burn regime will reduce heavier fuels (the chief contributors to smoke events), so they do not accumulate as rapidly. As a result, smoke management is simplified because the duration of smoke events is shorter and "mop-up" is reduced (Maguire 1995).

Specific smoke management strategies may use, to the extent practicable, are as follows:

- Minimize fuel loads prior to burning through mechanical treatments;
- Reduce heavy fuels such as woody vegetation and downed trees, which cause heavy smoke output and increase fine fuels such as herbaceous grasses, which are easily combustible and produce less smoke;
- Burn when weather and fuel moisture conditions will minimize smoke production;
- Conduct burns when winds are blowing away from smoke sensitive areas;
- Burn when atmospheric dispersion index is 41 or greater (as defined by the Florida Forest Service);
- Utilize firing technique that will best minimize smoke while meeting burn objectives;
- Mop up immediately following flame front;
- Keep fire control cells approximately 3 to 16 acres;
- Mop up heavy fuels within 50 feet of control lines;
- Place smoke signals on public roads adjacent to burn areas;
- Mop up activities, when practicable, will avoid pooling water within these areas.

4.3 Burn Plan for the Fire Control Cells

The Burn Manager will coordinate with UM to recommend land management activities and fuel reduction activities. Fire control cells will be evaluated based on site conditions, previous land management activities, and burn objectives. The recommendations will identify and prioritize management actions for each management fire control cell and develop an implementation

schedule. Prior to each prescribed burn, a pre-burning meeting will be conducted at the facilities on the UM Richmond Campus to discuss the proposed burn plan activities and timing.

Prior to implementing the initial burn, this Off-site Mitigation Area Burn Plan proposes to implement canopy reduction (pine thinning) and understory reduction based on recommendations by FFS or an approved Burn Manager. The first year of burning will commence immediately upon issuance of the HCP and will include fire control cells 11, 14 and 16.

The second year of burning will occur in fire control cells 10 and 13, and the third year of burning will include fire control cells 12 and 15. See **Attachment 1** for fire control cells**.** The one-year interval between burning events will allow for sufficient recovery of the previously burned fire control cells.

Following the initial fire to the fire control cells, burns will occur in a mosaic pattern, with fire applied in alternating fire control cells. Long-term management of the site is anticipated to involve approximately 6-16 acres being burned a year, within 2-3 non-adjacent fire control cells. See **Table J1-4-1** for Years 1-5 burn schedule and **Attachment 1** for fire control cells.

Table J1-4-1. UM Richmond Burn Schedule – Years 1-5

Year 1 Fire Control Cells	Year 2 Fire Control Cells	Year 3 Fire Control Cells	Year 4 Fire Control Cells	Year 5 Fire Control Cells
11,14,16	10,13	12,15	*11,14	*13
17.39 acres	16.79 acres	13.18 acres	*14.39 acres	*13.85 acres

*Cells and acres referenced subject to change based on ecological conditions.

4.4 Post-Burn Evaluation

The Burn Manager will conduct a post-burn evaluation within one week following each burn event. A post-burn evaluation is used to ensure the objectives of the burn were attained and gain information to be used in future burns (Wade and Lunsford 1989). UM will report the post-burn evaluation notes to USFWS. In addition, a summary of the management activities conducted, management results and recommendations for the upcoming year's management activities will be submitted annually to the USFWS and FWC for the duration of the permit.

5.0 COST ESTIMATE

Although it is anticipated the FFS will conduct the prescribed burns within the Off-site Mitigation Area, to be conservative and incorporate potential adaptive management strategies discussed in Section 12.2 of the HCP, the following cost estimate assumes all of the work will be conducted by qualified private contractors.

Prior to implementing prescribed burning, pine thinning will be conducted on approximately 38 acres. According to the USDA Forest Service, "the cost of mechanical treatments can vary depending on the site, equipment used, and whether it is done in-house or contracted. In general, the per-acre cost can range from $100 to $500 per acre." (O'Brien et al. 2010). The cost estimate for the pine thinning assumes $500 per acre and is $14,000.

All of the 47.36 acres of included in this Off-site Mitigation Area Burn Plan will be burned during the first three years. Prescribed burning activities during the first year (Year 1) is anticipated to include 17.39 acres, 16.79 acres in Year 2, and 13.18 acres in Year 3. For Years 4 and 5, areas burned in Years 1 and 2 will be evaluated for potential additional burning. This Off-site Mitigation Area Burn Plan assumes 14.39 acres will be burned in Year 4 and 13.85 acres will be burned in Year 5.

In addition to the cost of prescribed burning, the cost estimate includes maintenance of firebreaks and potential cost of rental equipment. The estimated average cost for burning, maintenance of firebreaks and potential rental of equipment is $750 per acre. For Year 1, the combined cost of pine thinning and prescribed burning is approximately $27,000. The cost estimate for prescribed burning in Year 2 is approximately $13,000, Year 3 approximately $10,000, and approximately $10,500 for both Years 4 and 5. **Table J1-5-1** provides a summary of the annual costs for the Off-site Mitigation Area Burn Plan.

Table J1-5-1. UM Richmond Burn Plan Cost Estimate

Activity	**Annual Costs**				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Pine Thinning	$14,000	N/A	N/A	N/A	N/A
Prescribed Burning	$13,000	$13,000	$10,000	$10,500	$10,500
Total by Year	**$27,000**	**$13,000**	**$10,000**	**$10,500**	**$10,500**
				Total Cost	**$71,000**

Once the Off-site Mitigation Area has reached maintenance level, the long term maintenance costs are expected to be $1,700 per year.

6.0 REFERENCES

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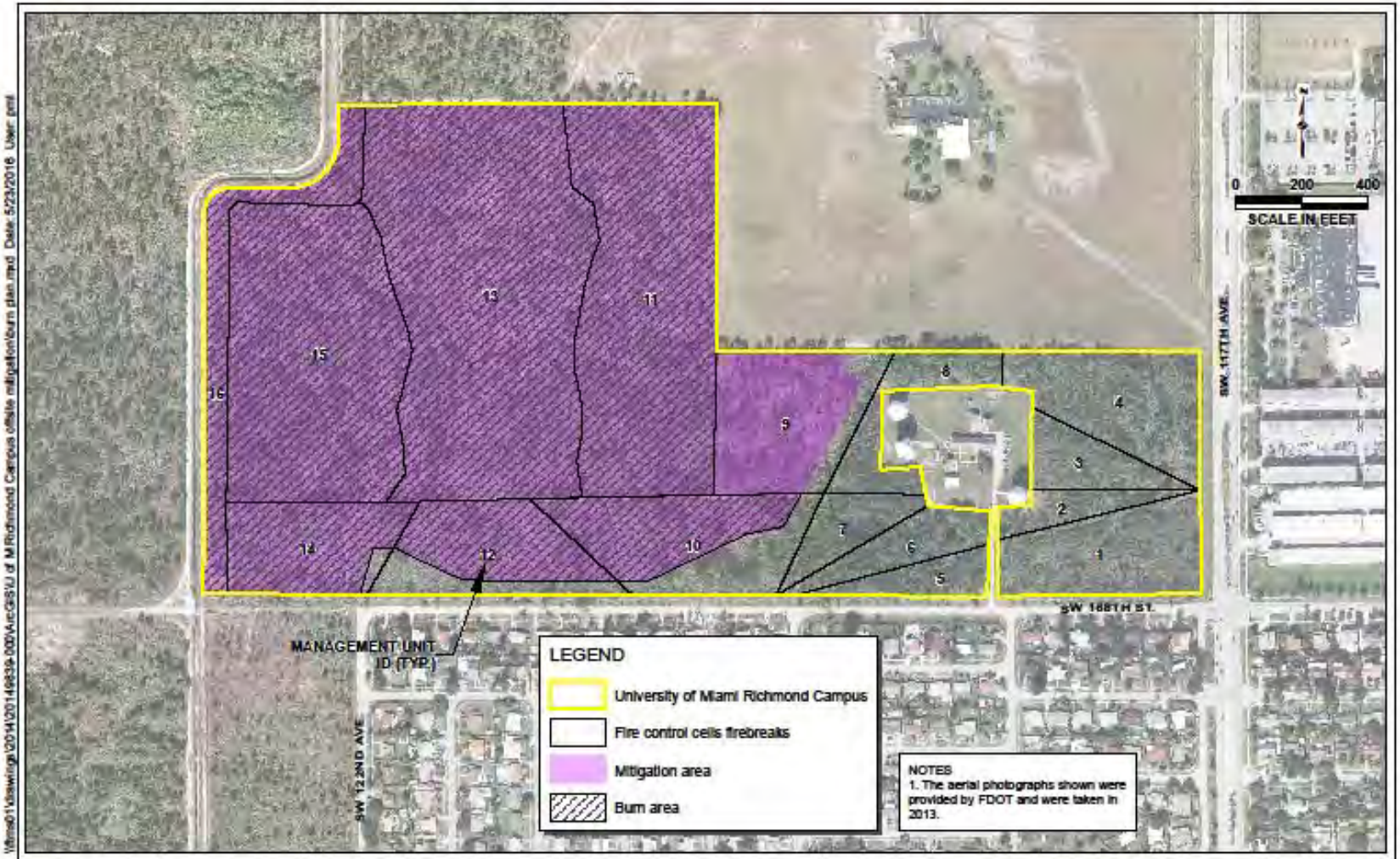
ATTACHMENT 1

University of Miami Richmond Campus Fire Cells



Coral Reef Commons
Miami-Dade County, Florida

JOHNSON ENGINEERING

6941 SW 196TH AVE
SUITE 32
PEMBROKE PINES, FL 33332
PHONE (954) 626-0123
E.B. #642 & L.B. #642

University of Miami Richmond Campus
Burn Units and Firebreaks

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
May 2016	20149639-000		As Shown	1

FINANCIAL STATEMENTS

Fiscal years ended MAY 31, 2015 and 2014

(With Independent Auditor's Report Thereon)

McGladrey

INDEPENDENT AUDITOR'S REPORT

To the Board of Trustees
University of Miami

Report on the Financial Statements

We have audited the accompanying financial statements of the University of Miami (the University) which comprise the statements of financial position as of May 31, 2015 and 2014, and the related statements of activities and cash flows for the years then ended and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the University of Miami as of May 31, 2015 and 2014, and the changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

McGladrey LLP

Fort Lauderdale, Florida
August 26, 2015

UNIVERSITY OF MIAMI
STATEMENTS OF FINANCIAL POSITION
As of May 31, 2015 and 2014
(in millions)

Assets		**May 2015**		May 2014
Cash and cash equivalents	**$**	**130.3**	$	85.5
Accounts and loans receivable, net		**410.7**		372.0
Contributions receivable, net		**158.3**		102.1
Other assets		**74.9**		83.7
Investments		**1,133.9**		1,153.2
Property and equipment, net		**1,664.1**		1,591.9
Trusts held by others		**49.1**		48.5
Total Assets	**$**	**3,621.3**	$	3,436.9
Liabilities				
Accounts payable and accrued expenses	**$**	**227.5**	$	174.5
Deferred revenues and other deposits		**107.1**		80.0
Accrued pension and postretirement benefit costs		**217.6**		244.9
Other liabilities		**178.2**		170.4
Actuarial liability of annuities payable		**8.8**		9.9
Liability for medical self-insurance		**97.2**		97.0
Government advances for student loans		**23.2**		22.5
Bonds and notes payable		**950.9**		904.1
Total Liabilities		**1,810.5**		1,703.3
Net Assets				
Unrestricted		**857.4**		874.1
Temporarily restricted		**474.9**		416.2
Permanently restricted		**478.5**		443.3
Total Net Assets		**1,810.8**		1,733.6
Total Liabilities and Net Assets	**$**	**3,621.3**	$	3,436.9

See accompanying notes to financial statements.

UNIVERSITY OF MIAMI
STATEMENTS OF ACTIVITIES
For the years ended May 31, 2015 and 2014
(in millions)

	May 2015	May 2014
Changes in unrestricted net assets		
Operating activities		
Operating revenues		
Tuition and fees, net	**$ 503.6**	$ 487.1
Grants and contracts, net	**475.8**	487.8
Net patient revenue - medical professional practice	**386.1**	394.4
Net patient revenue - hospitals and clinics	**1,054.7**	934.5
Gifts and trusts	**69.6**	67.5
Net assets released from restrictions	**22.3**	25.0
Endowment spending distribution	**34.9**	32.1
Investment return	**4.8**	6.4
Auxiliary enterprises, net	**117.3**	111.4
Other sources	**37.4**	29.1
Total operating revenues	**2,706.5**	2,575.3
Operating expenses		
Compensation and benefits	**1,599.7**	1,480.5
Supplies and services	**632.2**	620.8
Depreciation and amortization	**131.4**	125.1
Utilities and maintenance	**75.6**	75.0
Interest	**37.3**	39.5
Other	**207.9**	203.3
Total operating expenses	**2,684.1**	2,544.2
Change in unrestricted net assets from operating activities	**22.4**	31.1
Non-Operating activities		
Endowment, annuity and other investment return, net of distributions	**(.2)**	30.0
Gifts and trusts	**6.4**	.7
Net gain (loss) on sale and/or disposal of other assets and property and equipment	**7.4**	(1.5)
Net assets released from restrictions	**1.2**	12.3
Transfer to permanently restricted net assets	**(.5)**	(.7)
Change in unrestricted net assets from non-operating activities	**14.3**	40.8
Postretirement benefits related changes other than net periodic benefit cost	**(53.4)**	32.8
(Decrease) increase in unrestricted net assets	**(16.7)**	104.7
Changes in temporarily restricted net assets		
Endowment, annuity and other investment return, net of distributions	**(7.9)**	47.5
Gifts and trusts	**86.7**	36.9
Changes in value of annuities payable and trusts held by others	**.8**	(1.1)
Net assets released from restrictions	**(23.5)**	(37.3)
Endowment spending distribution	**2.6**	2.6
Increase in temporarily restricted net assets	**58.7**	48.6
Changes in permanently restricted net assets		
Endowment, annuity and other investment return	**.5**	2.2
Gifts and trusts	**34.2**	24.3
Transfer from unrestricted and temporarily restricted net assets	**.5**	.7
Increase in permanently restricted net assets	**35.2**	27.2
Increase in total net assets	**77.2**	180.5
Net Assets		
Beginning of year	**1,733.6**	1,553.1
End of year	**$ 1,810.8**	$ 1,733.6

See accompanying notes to financial statements.

UNIVERSITY OF MIAMI

STATEMENTS OF CASH FLOWS

For the years ended May 31, 2015 and 2014

(in millions)

	May 2015	May 2014
Cash flows from operating activities		
Increase in total net assets	**$ 77.2**	$ 180.5
Adjustments to reconcile increase in total net assets to net cash provided by operating activities		
Net realized and unrealized gains on investments and other assets	**(25.3)**	(109.1)
Gifts and trusts	**(110.3)**	(46.3)
Depreciation and amortization	**131.4**	125.1
Provision for doubtful accounts	**109.3**	91.0
Net gain on sale and/or disposal of other assets and property and equipment	**18.3**	1.5
Present value adjustment on annuities payable and trusts held by others	**(.1)**	(.2)
Amortization of debt premiums and discounts	**(2.2)**	(2.1)
Change in operating assets and liabilities		
Decrease (increase) in		
Accounts and loans receivable, net	**(151.9)**	(112.8)
Contributions receivable, net	**20.9**	24.6
Other assets	**(8.3)**	6.1
Increase (decrease) in		
Accounts payable and accrued expenses	**53.0**	(9.5)
Deferred revenues, annuities payable and other liabilities	**33.6**	(12.2)
Accrued pension and postretirement benefit costs	**(27.3)**	(56.2)
Medical self-insurance	**.2**	4.6
Government advances for student loans	**.7**	(.1)
Net cash provided by operating activities	**119.2**	84.9
Cash flows from investing activities		
Purchases of investments	**(498.3)**	(791.9)
Proceeds from the sales and maturities of investments and sales of property and equipment	**559.3**	844.2
Capital expenditures for property and equipment	**(205.3)**	(194.2)
Student and shared appreciation mortgage loans:		
New loans made	**(4.4)**	(4.2)
Principal collected	**8.3**	11.6
Net cash used in investing activities	**(140.4)**	(134.5)
Cash flows from financing activities		
Gifts for plant expansion and endowment	**17.0**	13.1
Proceeds from the issuance of debt	**127.2**	16.1
Payments to retire bonds and notes payable	**(78.2)**	(33.7)
Net cash provided by (used in) financing activities	**66.0**	(4.5)
Cash and cash equivalents		
Net increase (decrease)	**44.8**	(54.1)
Beginning of year	**85.5**	139.6
End of year	**$ 130.3**	$ 85.5

See accompanying notes to financial statements.

1. ORGANIZATION

The University of Miami (the University) is a private not-for-profit institution located in South Florida. Founded in 1925, the University owns and operates educational and research facilities as well as a health care system. Its mission is to educate and nurture students, to create knowledge through innovative research programs, to provide service to our community and beyond, and to pursue excellence in health care.

These financial statements include the accounts of the University's departments and facilities, including its hospitals and clinics. All significant intercompany accounts and transactions have been eliminated in the preparation of these statements.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES

Basis of Presentation

The financial statements of the University have been prepared on the accrual basis of accounting and in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP) for not-for-profit organizations.

The three net asset categories as reflected in the accompanying financial statements are as follows:

- **Unrestricted** - Net assets which are free of donor-imposed restrictions. It includes the University's investment in property and equipment and amounts designated by management for support of operations, programs, and facilities expansion. The University has determined that any donor-imposed restrictions for current or developing programs and activities are generally met within the operating cycle of the University and, therefore, the University's policy is to record these net assets as unrestricted. This category includes all revenues, expenses, gains and losses that are not changes in permanently or temporarily restricted net assets.

  Unrestricted non-operating activities reflect transactions of a long-term investment or capital nature, including net investment return and activities related to quasi endowment funds, not used to support current operations as well as contributions to be used for facilities and equipment.

- **Temporarily Restricted** - Net assets whose use by the University is limited by donor-imposed stipulations that either expire with the passage of time or that can be fulfilled or removed by actions of the University pursuant to those stipulations. These net assets are available for program purposes, i.e., education, research, public service, and scholarships, as well as for buildings and equipment.

- **Permanently Restricted** - Net assets whose use by the University is limited by donor-imposed stipulations that neither expire with the passage of time nor can be fulfilled or otherwise removed by actions of the University. These net assets are invested in perpetuity, the income from which is expended for program purposes, i.e., education, research, public service, and scholarships.

Use of Estimates

The preparation of the financial statements in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP) requires that management make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, and expenses during the reporting period as well as the disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

Income Taxes

The University is exempt from federal income taxes under Section 501(c) (3) of the Internal Revenue Code, except for unrelated business income tax which is insignificant. Accordingly, no provision for income taxes is made in the financial statements. At May 31, 2015, there were no uncertain tax positions. The University files tax returns with U.S. federal and other tax authorities for which the statute of limitations may go back to the year ended May 31, 2012.

Cash Equivalents

All highly liquid investments with a maturity of three months or less when purchased are considered to be cash equivalents.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

Investments

Investments are reported at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. See note 5 for fair value measurements. Realized gains and losses are recognized at date of disposition based on the difference between the net proceeds received and the purchased value of the investment sold, using the specific identification method. Unrealized gains and losses are recognized for the change in fair value between reporting periods. Interest and dividend income is recognized when earned.

The University's investments include various types of investment securities which are exposed to various risks such as interest rate, market, and credit risk. Due to the level of risk associated with certain investment securities and the level of uncertainty related to changes in the value of investment securities, it is possible that changes in risks in the near term could materially affect the amounts reported in the financial statements.

Revenue Recognition

Tuition and fees revenue is reported in the fiscal year in which educational programs are primarily conducted. Auxiliary revenue charges are directly related to the costs of the services provided. Revenue received before it is earned is deferred. Scholarships and fellowships awarded to students for tuition, fees, and room and board are based upon need and merit, and are netted against tuition and fees, and auxiliary enterprises revenue in the statements of activities as follows (in millions):

	2015	2014
Scholarships and fellowships:		
Institutionally funded	$ 186.7	$ 181.3
Externally funded - gifts and grants	11.5	9.2
Total amount netted against tuition and fees revenue	$ 198.2	$ 190.5
Amount netted against auxiliary enterprises revenue	$ 15.0	$ 13.8

Gifts of cash, property and marketable securities are recorded as revenue at fair value when received. Unconditional pledges (note 4) are recognized as revenue based on the estimated present value of the future cash flows, net of allowances, when the commitment is received. Pledges made and collected in the same reporting period are recorded when received in the appropriate net asset category. Conditional pledges are recorded as revenue only when donor stipulations are substantially met.

Grants and contracts revenue from sponsored grants and contracts, including facilities and administrative costs recovery, are recognized when allowable expenses are incurred under such agreements.

Medical professional practice, and hospitals and clinics revenue (net patient care revenue) are recorded based upon established billing rates less allowances for contractual adjustments, discounts, and allowances for doubtful accounts (bad debts). Revenues are recorded in the period the services are provided based upon the estimated amounts due from the patients and third-party payors, including federal and state agencies (under the Medicare and Medicaid programs), managed care health plans, commercial insurance companies, and employers. Estimates of contractual allowances represent the difference between established rates for services and amounts reimbursed by third-party payors based upon the payment terms specified in the related contractual agreements. Third-party payors' contractual payment terms are generally based upon predetermined rates per diagnosis, per diem rates or discounted fee-for-service rates.

Laws and regulations governing the Medicare and Medicaid programs are complex and subject to interpretation. As a result, there is at least a reasonable possibility that recorded estimates will change by a material amount. The estimated reimbursement amounts are adjusted in subsequent periods as cost reports are prepared and filed and as final settlements are determined. In the opinion of management, adequate provisions for adjustments that may result from such reviews and audits have been made through May 31, 2015, in the accompanying financial statements. The impact of such adjustments to operating revenues for the years ended May 31, 2015 and 2014 was a decrease of $.5 and $1.1 million, respectively.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

Auxiliary Enterprises

Auxiliary enterprises, including residence halls, food services, retail stores, and telecommunications, furnish services to students, faculty, and staff. Fee charges are directly related to the costs of services rendered and are recognized as revenue when the services or goods are delivered.

Annuities Payable and Trusts Held by Others

Certain gift annuities, charitable lead and remainder annuity trust agreements have been entered into with donors. Assets held under these agreements are valued at fair value based on either the present value of expected cash flows or the value of the University's share of the underlying assets. These assets are included in trusts held by others on the statements of financial position, except for gift annuities which are included in cash and cash equivalents and investments. Gift annuities included in cash and cash equivalents, and investments totaled $20.7 and $21.5 million at May 31, 2015 and 2014, respectively. Generally, revenue from gift annuities and trusts is recognized at the date the agreements are established net of liabilities for the present value of the estimated future payments to donors and/or other beneficiaries.

The liabilities are adjusted during the term of the trusts for changes in the value of the assets, accretion of the discount, and other changes in the estimates of future benefits.

The University is also the beneficiary of certain perpetual trusts which are also included in trusts held by others on the statements of financial position. The fair value of the trusts, which are based on either the present value of the estimated future cash receipts or the fair value of the assets held in the trust, are recognized as assets and gift and trust revenue as of the date the University is notified of the establishment of the trust. The carrying value of the assets is adjusted for changes in fair value.

Medical School

Faculty physicians, in addition to teaching and conducting research, engage in the practice of medicine, which generates patient care revenue. Revenues and expenses, including compensation and administrative operations from the practice of medicine, are reflected as University revenues and expenses. The net assets of patient care activities are designated for medical school programs.

The University and the Public Health Trust of Miami-Dade County, Florida (PHT), owner and operator of Jackson Memorial Hospital (JMH), have entered into an affiliation agreement related to their independent missions within the designated land and facilities that comprise the Jackson Memorial Medical Center. Pursuant to that agreement, the PHT provides clinical facilities for the teaching of the University's medical students. Medical education of its students is the sole responsibility of the University. In addition, the University has agreed to permit its faculty to apply for privileges at JMH to train and supervise JMH house staff (interns, residents, and fellows) and to treat hospital patients in their capacity as members of JMH's attending medical staff. All such treatment and training is the sole responsibility of the PHT in its capacity as the legal owner and operator of the Jackson Health System's public hospitals and clinics and its statutory teaching hospital (JMH). The affiliation agreement provides the terms for the mutual reimbursement of services provided.

Insurance

The University manages property and liability risks through a combination of commercial insurance policies and self-insurance.

The University is self-insured for medical professional liability and maintains commercial excess loss coverage within specified limits. Provisions for medical professional liability claims and related costs are based on several factors, including an annual actuarial study using a discount rate of 3.0% at May 31, 2015 and 2014.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

Property and Equipment

Property and equipment is stated at cost less accumulated depreciation and amortization. Depreciation is computed on a straight-line basis over the estimated useful lives of the related assets. Depreciation is not recorded on land, art objects and construction in progress. Leasehold improvements are amortized over the lesser of the lease term or the useful life.

Cost associated with the development and installation of internal-use software are accounted for in accordance with the Intangibles – Goodwill and Other, Internal Use Software subtopic of the FASB ASC. Accordingly, internal-use software costs are expensed or capitalized according to the provisions of the accounting standard. Capitalized software costs are included in construction in progress and equipment.

Facilities and Administrative Cost Recovery

The Federal government reimburses the University for facilities and administrative costs incurred in connection with research grants and contracts based on approved rates through 2015. Facilities and administrative cost recovery from government and private sources included in grants and contracts revenues totaled $64.0 and $65.7 million during the years ended May 31, 2015 and 2014, respectively.

Impairment of Long-Lived Assets

U.S. GAAP requires that long-lived assets held by an entity, including intangible assets, be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset group may not be recoverable. No asset impairments were recorded by the University in fiscal years 2015 and 2014.

Subsequent events

The University evaluated events and transactions occurring subsequent to May 31, 2015, through August 26, 2015, the date of issuance of the financial statements. During this period, there were no subsequent events requiring recognition in the financial statements except as disclosed in *note 10*.

Reclassifications

Certain amounts in the prior year's financial statements have been reclassified to conform to the current year's presentation.

3. ACCOUNTS AND LOANS RECEIVABLE

At May 31, accounts and loans receivable consist of the following (in millions):

	2015	2014
Accounts and loans receivable, net:		
Patient care	$ 247.9	$ 214.5
Grants, contracts and other	86.9	79.1
Shared appreciation mortgages	32.4	35.7
Student	14.9	13.8
Student loans, net	28.6	28.9
Total	$ 410.7	$ 372.0

3. ACCOUNTS AND LOANS RECEIVABLE (Continued)

Accounts and loans receivable, and student loans receivable are net of allowances for doubtful accounts of $127.2 and $.6 million, respectively, for 2015 and $120.8 and $.9 million, respectively, for 2014.

Shared appreciation mortgages were provided as part of a program to attract and retain excellent faculty and senior administrators through home mortgage financing assistance. Shared appreciation notes amounting to $34.9 and $38.2 million (gross of $2.5 million allowance for doubtful accounts) at May 31, 2015 and 2014, respectively, from University faculty and senior administrators are collateralized by second mortgages on residential properties. The program was suspended effective December 31, 2008 with limited exceptions.

Student loans are made primarily pursuant to federal programs and availability of funding. The related receivables have significant government restrictions as to marketability, interest rates, and repayment terms. Their fair value is not readily determinable.

4. CONTRIBUTIONS RECEIVABLE (PLEDGES)

Unconditional pledges are recorded at the present value of their future cash flows using a discount rate commensurate with the risk involved at the time the pledge is recorded. They are expected to be realized in the following periods at May 31, (in millions):

	2015	2014
In one year or less	$ 44.8	$ 29.7
Between one year and five years	99.8	56.0
More than five years	56.1	41.9
	200.7	127.6
Discount of $20.6 and allowance of doubtful pledges $21.8 for 2015 and $15.7 and $9.8 for 2014, respectively	(42.4)	(25.5)
Total	$ 158.3	$ 102.1

The methodology for calculating the allowance is based on the administration's review of individually significant outstanding pledges, analysis of the aging of payment schedules for all outstanding pledges, as well as other factors including current economic conditions.

5. FAIR VALUE OF FINANCIAL INSTRUMENTS

The valuation methodologies used for other investment instruments measured at fair value consisted of:

Variable Rate Swap Agreement

The University entered into an interest rate swap agreement on October 25, 2004 to manage the market risk associated with outstanding variable-rate debt. The swap agreement provides that the University receive a variable rate based on 3-month LIBOR and pay a fixed rate of 4.2% and matures on April 3, 2034. Parties to the interest rate swap agreement are subject to market risk for changes in interest rates as well as risk of credit loss in the event of nonperformance by the counterparty. The University deals only with high quality counterparties that meet rating criteria for financial stability and creditworthiness. The estimated cumulative fair value loss of the swap agreement was $4.4 and $4.1 million for the years ended May 31, 2015 and 2014, respectively, and is included in other investments, net in the tables that follow. Changes in the fair value, which for fiscal year 2015 and 2014 amounted to an unrealized gain (loss) of $(.3) and $.5 million, respectively, are recorded as non-operating activities in the statements of activities. The notional amount was $17.3 and $17.8 million for fiscal year 2015 and 2014, respectively.

5. FAIR VALUE OF FINANCIAL INSTRUMENTS (Continued)

Fair Value Measurements

Investments

The fair market value of investments at May 31, 2015 and 2014 amounted to $1,133.9 and $1,153.2 million, with a cost basis of $996.0 and $955.8 million, respectively. Short term investments consist primarily of commercial paper and U.S. Treasury securities with original maturities when purchased in excess of three months. Categories included in limited partnerships and limited liability companies and other investments, represent alternative investments which are valued at the net asset value of the entities as determined by the fund managers, which are generally categorized as level 2 and 3 within the fair value hierarchy, depending on valuation inputs. The majority of investments are combined in investment pools with each individual account subscribing to or disposing of shares on the basis of the fair value per share. At May 31, 2015 and 2014, the fair value of the University's primary investment pool (the Growth Pool) amounted to $1,003.7 and $980.0 million, with a cost basis of $871.8 and $787.8 million, respectively. The Growth Pool is managed by multiple investment managers with asset allocation per the University's investment policy. The total net unrealized gain (loss) on investments for the years ended May 31, 2015 and 2014 was $(59.5) and $68.6 million, respectively.

FASB ASC 820 provides the framework for measuring fair value. That framework provides a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The following describes the hierarchy of inputs used to measure fair value and the primary valuation methodologies used by the University for investments measured at fair value:

Level 1 — Valuations for assets and liabilities traded in active exchange markets, such as the New York Stock Exchange. Level 1 also includes U.S. Treasury and federal agency securities and federal agency mortgage-backed securities, which are traded by dealers or brokers in active markets. Inputs to the valuation methodologies include unadjusted quoted prices in active markets for identical assets or liabilities that are accessible at the measurement date.

Level 2 — Valuations for assets traded in less active dealer or broker markets. Inputs to the valuation methodologies include quoted prices from third party pricing services for identical or similar assets in active and/or inactive markets; inputs other than quoted prices that are observable for the asset or liability; or inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Level 3 — Valuations for assets that are derived from other valuation methodologies, including option pricing models, discounted cash flow models and similar techniques, and are not based on market exchange, dealer, or broker traded transactions. Inputs to the valuation methodologies incorporate certain assumptions and projections in determining the fair value assigned to such assets.

The level in the fair value hierarchy within which a fair value measurement in its entirety falls is based on the lowest level of any input that is significant to the fair value measurement. The University utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs. There have been no changes in the methodologies used at May 31, 2015.

5. FAIR VALUE OF FINANCIAL INSTRUMENTS (Continued)

Fair Value Measurements (continued)

Investments

The following tables set forth by level, within the fair value hierarchy, the University's assets at fair value (in millions):

	At May 31, 2015			
	Total	Level 1	Level 2	Level 3
Assets:				
Short term investments	$ 33.4	$ 14.0	$ 19.4	$ -
Corporate bonds	73.7	-	73.7	-
Debt securities:				
U.S. treasury & other government agencies	16.8	16.8	-	-
Issued by foreign government	.1	-	.1	-
Publicly traded stocks:				
Large-mid cap	77.9	77.9	-	-
Small cap	29.3	29.3	-	-
Mutual funds:				
Equities:				
Emerging markets	24.5	-	24.5	-
International	80.5	-	80.5	-
Large-mid cap	72.3	-	72.3	-
Small cap	33.9	-	33.9	-
Fixed income	63.2	-	63.2	-
Balanced	10.3	-	.9	9.4
Limited partnerships and limited liability companies:				
Equities:				
Emerging markets	51.5	-	51.5	-
International	136.7	-	136.7	-
Large-mid cap	103.6	-	103.6	-
Fixed income	79.7	-	43.6	36.1
Private equity	31.5	-	-	31.5
Other:				
Event arbitrage	66.3	-	-	66.3
Long-short composite	84.9	-	84.7	.2
Real assets related securities	46.2	-	45.5	.7
Real estate	20.0	-	-	20.0
Other investments	(2.4)	-	(2.4)	-
Total investments	1,133.9	138.0	831.7	164.2
Trusts held by others	49.1	-	-	49.1
Total assets	$ 1,183.0	$ 138.0	$ 831.7	$ 213.3

5. FAIR VALUE OF FINANCIAL INSTRUMENTS (Continued)

Fair Value Measurements (continued)

Investments

	At May 31, 2014			
	Total	Level 1	Level 2	Level 3
Assets:				
Short term investments	$ 25.5	$ -	$ 25.5	$ -
Corporate bonds	88.0	-	88.0	-
Debt securities:				
U.S. treasury & other government agencies	34.0	33.4	.6	-
Publicly traded stocks:				
Large-mid cap	112.8	112.8	-	-
Small cap	23.5	23.5	-	-
Mutual funds:				
Equities:				
Emerging markets	31.7	-	31.7	-
International	3.6	-	3.6	-
Large-mid cap	13.3	-	13.3	-
Small cap	32.0	-	32.0	-
Fixed income	55.8	-	55.8	-
Balanced	10.3	-	.8	9.5
Limited partnerships and limited liability companies:				
Equities:				
Emerging markets	37.3	-	37.3	-
International	181.8	-	181.8	-
Large-mid cap	88.3	-	88.3	-
Fixed income	97.0	-	46.9	50.1
Private equity	31.5	-	-	31.5
Other:				
Event arbitrage	81.4	-	-	81.4
Long-short composite	134.6	-	106.0	28.6
Real assets related securities	46.7	-	46.5	.2
Real estate	26.1	-	-	26.1
Other investments	(2.0)	-	(2.0)	-
Total investments	1,153.2	169.7	756.1	227.4
Trusts held by others	48.5	-	-	48.5
Total assets	$ 1,201.7	$ 169.7	$ 756.1	$ 275.9

5. FAIR VALUE OF FINANCIAL INSTRUMENTS (Continued)

Fair Value Measurements (continued)

Investments

The following tables set forth a summary of changes in the fair value of the University's level 3 assets which are valued at net asset value:

For the year ended May 31, 2015 (in millions):

	May 31, 2014	Purchases	Sales	Net Income Reinvested	Total net gains (losses) included in changes in net assets		Transfers in and/or out of level 3	May 31, 2015
					Realized	Unrealized		
Mutual funds - balanced	$ 9.5	-	(.3)	.2	.4	(.4)	-	$ 9.4
Limited partnerships and limited liability companies:								
Fixed income	50.1	-	(10.0)	1.6	(1.3)	(4.3)	-	36.1
Private equity	31.5	3.8	(8.0)	.2	5.0	(1.0)	-	31.5
Other:								
Event arbitrage	81.4	-	(15.7)	1.8	3.2	(4.4)	-	66.3
Long-short composite	28.6	-	(29.6)	(.9)	6.9	(4.8)	-	.2
Real assets related securities	.2	.6	-	(.1)	(.1)	.1	-	.7
Real estate	26.1	.4	(12.0)	.3	2.1	3.1	-	20.0
Total investments	227.4	4.8	(75.6)	3.1	16.2	(11.7)	-	164.2
Trusts held by others	48.5	-	-	-	-	.6	-	49.1
Total assets	$ 275.9	$ 4.8	$ (75.6)	$ 3.1	$ 16.2	$ (11.1)	$ -	$ 213.3

For the year ended May 31, 2014 (in millions):

	May 31, 2013	Purchases	Sales	Net Income Reinvested	Total net gains (losses) included in changes in net assets		Transfers in and/or out of level 3	May 31, 2014
					Realized	Unrealized		
Mutual funds - balanced	$ 8.8	-	(.3)	.3	.7		-	$ 9.5
Limited partnerships and limited liability companies:								
Fixed income	47.0	-	-	1.6	-	1.5	-	50.1
Private equity	38.4	3.5	(12.4)	.2	(4.2)	6.0	-	31.5
Other:								
Event arbitrage	81.2	-	(5.0)	1.9	2.2	1.1	-	81.4
Long-short composite	25.6	-	-	(1.1)	3.0	1.1	-	28.6
Real assets related securities	.5	-	(.3)	-	(.5)	.5	-	.2
Real estate	25.9	.7	(3.8)	(.1)	1.0	2.4	-	26.1
Total investments	227.4	4.2	(21.8)	2.8	2.2	12.6	-	227.4
Trusts held by others	46.1	-	-	-	-	2.4	-	48.5
Total assets	$ 273.5	$ 4.2	$ (21.8)	$ 2.8	$ 2.2	$ 15.0	$ -	$ 275.9

There were no other issuances and settlements for the years ended May 31, 2015 and 2014.

5. FAIR VALUE OF FINANCIAL INSTRUMENTS (Continued)

Fair Value Measurements (continued)

Investments

The total level 3 change in net unrealized gains (losses) for the years relating to those investments still held at May 31, 2015 and 2014 total $(11.7) and $12.6 million, respectively, and are reflected as part of investment return in the statements of activities. The total level 3 change in value related to trusts held by others at May 31, 2015 and 2014 total $.6 and $2.4 million, respectively, and are reflected as part of investment return and changes in value of annuities payable and trusts held by others in the statements of activities.

The following tables summarize the University's assets whose fair value is reported using net asset value per share (in millions):

	At May 31, 2015			
Assets:	Fair Value	Future Commitments	Redemption Frequency	Days Notice
Limited partnerships and limited liability companies:				
Equities:				
Emerging markets	$ 51.5	$ -	(M)	10-30 days
International	136.7	-	(M)	5-6 days
Large-mid cap	103.6	-	(Q)	60 days
Fixed income	79.7	-	(M), (A)	10-90 days
Private equity	31.5	13.3	*	N/A
Other:				
Event arbitrage	66.3	-	(Q)	65-90 days
Long-short composite	84.9	-	(Q), (A)	45-60 days
Real assets related securities	46.2	9.4	(M), (Q) *	10-60 days
Real estate	20.0	4.1	*	N/A
Other investments	(2.4)	-	N/A	N/A
Total investments	618.0	26.8		
Trusts held by others	49.1	-	N/A	N/A
Total assets	$ 667.1	$ 26.8		

	At May 31, 2014			
Assets:	Fair Value	Future Commitments	Redemption Frequency	Days Notice
Limited partnerships and limited liability companies:				
Equities:				
Emerging markets	$ 37.3	$ -	(M)	30 days
International	181.8	-	(M)	5-6 days
Large-mid cap	88.3	-	(Q)	60 days
Fixed income	97.0	-	(M), (A)	10-90 days
Private equity	31.5	16.9	*	N/A
Other:				
Event arbitrage	81.4	-	(Q)	65-90 days
Long-short composite	134.6	-	(M), (Q), (A)	45-90 days
Real assets related securities	46.7	10.0	(M), (Q) *	10-60 days
Real estate	26.1	4.3	*	N/A
Other investments	(2.0)	-	N/A	N/A
Total investments	722.7	31.2		
Trusts held by others	48.5	-	N/A	N/A
Total assets	$ 771.2	$ 31.2		

Redemption Frequency: (A) Annually, (Q) Quarterly, (M) Monthly.

(*) The expected liquidation date for these assets range from 2015 to 2028 and are based on a combination of the inception date of the fund and the expected life of the fund as outlined in the partnership agreement inclusive of the manager's ability to extend the fund's life.

5. FAIR VALUE OF FINANCIAL INSTRUMENTS (Continued)

Fair Value Measurements (continued)

The University's investment policy and strategy for its investments, as established by the Investment Committee (the Committee) of the Board and ratified by the Executive Committee of the Board, is to provide for growth of capital with a moderate level of volatility by investing assets based on its target allocations. The weighted average target allocations for University assets is 55.0% equity securities, 10.0% fixed income, and 35.0% other investments. Equity securities include investments in large-mid cap and small cap companies primarily located in the United States, as well as international companies similar to the S&P 500, Russell 2000 and MSCI Indexes. Fixed income securities include corporate bonds of companies from diversified industries, mortgage-backed securities, and U.S. treasuries similar to the Barclays Capital Aggregate and Citigroup World Gov't Bond Indexes. Other investments include private equity funds, real estate funds, and hedge funds similar to those of the HFRI Fund of Funds, S&P 500, DJ/UBS Commodity, and NCREIF Property Indexes. Investments periodically are rebalanced to meet established target allocations. In addition, the Committee reviews its investment policy and target allocations periodically and effects changes when required, to ensure that strategic objectives are achieved.

Investment Return

The University's endowment spending distribution policy is to distribute five percent of the three-year moving average fair market value of the endowment investment pool. This policy is designed to protect the purchasing power of the endowment and to minimize the effect of capital market fluctuations on operating budgets.

The components of total investment return as reflected in the statements of activities are as follows (in millions):

	2015	2014
Operating:		
Endowment spending distribution	$ 34.9	$ 32.1
Investment return	4.8	6.4
Total operating investment return	39.7	38.5
Non-Operating:		
Unrestricted:		
Endowment interest and dividend income, realized and unrealized gains (losses), net of endowment spending distribution	(2.9)	15.6
Other net realized and unrealized gains	2.7	14.4
Total unrestricted non-operating investment return	(.2)	30.0
Temporarily restricted:		
Investment return, net of endowment spending distribution	(7.9)	47.5
Endowment distributions reinvested	2.6	2.6
Permanently restricted investment return	.5	2.2
Total non-operating investment return	(5.0)	82.3
Total investment return	$ 34.7	$ 120.8

6. FAIR VALUE OF OTHER FINANCIAL INSTRUMENTS

The carrying amounts of cash and cash equivalents, patient, student and other receivables, accounts payable and accrued expenses approximate fair value due to the short maturity of these financial instruments. The carrying amounts of notes payable with variable interest rates approximate their fair value since the variable rates reflect current market rates for notes with similar maturities and credit quality. The fair value of bonds payable with fixed interest rates, which is classified as level 2 within the fair value hierarchy, is based on rates assumed to be currently available for bond issues with similar terms and average maturities. The estimated fair value of these bonds payable at May 31, 2015 and 2014 approximated $851.5 and $897.6 million, respectively. The carrying amounts of these bonds payable at May 31, 2015 and 2014 approximated $819.3 and $845.7 million, respectively.

7. PROPERTY AND EQUIPMENT

Property and equipment and related accumulated depreciation and amortization at May 31 consist of the following (in millions):

	Useful Lives	2015	2014
Land	-	$ 87.4	$ 86.6
Land improvements	20 years	111.0	109.7
Buildings and building improvements	8 to 50 years	1,800.2	1,743.5
Leasehold improvements	1 to 50 years	49.8	48.9
Construction in progress	-	136.9	76.8
Moveable equipment	3 to 20 years	714.9	654.7
Library materials	12 years	116.5	117.0
Art objects	-	55.7	55.0
		3,072.4	2,892.2
Accumulated depreciation and amortization		(1,408.3)	(1,300.3)
Total		$ 1,664.1	$ 1,591.9

Interest on borrowings is capitalized during construction, net of any project specific borrowings' investment income earned through the temporary investment of project borrowings. Net interest expense of $4.2 and $2.9 million was capitalized for the years ended May 31, 2015 and 2014, respectively.

8. ENDOWMENT

As required by accounting principles generally accepted in the United States of America, net assets associated with endowment funds, including funds designated by the Board to function as endowments, are classified and reported based on the existence or absence of donor-imposed restrictions.

Quasi endowment funds are resources segregated for long-term investment and include investment return on unrestricted investments, and other resources designated by the Board for future programs and operations.

Spending Policy

The University's endowment spending distribution policy in support of its programs is to distribute five percent of the three-year moving average fair market value of the endowment investment pool. New endowments must be received prior to December 31 in order to activate the spending distribution for the next fiscal year. In addition, no distribution is made from an endowment until its funding reaches, by December 31, the level stipulated by policy. Further, endowments to establish Chairs and Professorships have an additional delay of one year before distributions are made.

Return Objectives and Risk Parameters

The University has adopted investment and spending policies to protect the purchasing power of the endowment and to minimize the effect of capital market fluctuations on operating budgets.

The intent of the University's policy for its primary investment pool (the Growth Pool), as approved by the Board, is to achieve a rate of return equal to or greater than the respective benchmark, while assuming a moderate level of risk. To satisfy its long-term rate-of-return objectives, the University relies on a total return strategy in which investment returns are achieved through both capital appreciation (realized and unrealized) and current yield (interest and dividends). The University targets a diversified asset allocation that places a greater emphasis on equity based investments to achieve its long-term return objectives within prudent risk constraints. The current long-term return objective is to earn a return of at least the Consumer Price Index plus 5%, net of fees. Actual returns in any given year may vary from this amount.

8. ENDOWMENT (Continued)

Application of Relevant Law

On June 17, 2011, the State of Florida passed a version of the Uniform Prudent Management of Institutional Funds Act (UPMIFA). The effective date of the enacted version of UPMIFA in Florida (FL UPMIFA) was July 1, 2012. Accordingly the University was required to adopt the provisions of Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 958-205-50 (*Endowments of Not-for-Profit Organizations: Net Asset Classification of Funds Subject to an Enacted Version of the Uniform Prudent Management of Institutional Funds Act, and Enhanced Disclosures for All Endowment Funds)* on July 1, 2012. This standard provides guidance on the net asset classification of donor-restricted endowment funds for a nonprofit organization that is subject to an enacted version of the UPMIFA.

The Board's interpretation of its fiduciary responsibilities for donor-restricted endowments under FL UPMIFA is that it is required to use reasonable care and caution as would be exercised by a prudent investor, in considering the investment management and expenditures of endowment funds. In accordance with FL UPMIFA, the Board may expend so much of an endowment fund as the Board determines to be prudent for the uses and purposes for which the endowment fund is established, consistent with the goal of conserving the long-term purchasing power of the endowment fund.

FL UPMIFA specifies that unless stated otherwise in the gift instrument, donor-restricted assets in an endowment fund are restricted assets until appropriated for expenditure. Barring the existence of specific instructions in gift agreements for donor-restricted endowments, the University's policy is to report (a) the historical value for such endowments as permanently restricted net assets and (b) the net accumulated appreciation as temporarily restricted net assets. The amounts appropriated for expenditure are based on the endowment spending rate per unit and the number of units for each fund.

The unspent market appreciation of donor-restricted endowment funds is presented as temporarily restricted net assets until appropriated for expenditure by the University. When losses on the investments of a donor-restricted endowment fund exceed the net appreciation classified in temporarily restricted net assets, the excess loss reduces unrestricted net assets. Gains that restore the fair value of the assets of the endowment fund to the fund's required level (historic dollar value) are classified as an increase to the same class of net assets that was previously reduced for the excess loss - unrestricted net assets. After the fair value of the assets of the endowment fund equals the required level, gains are again available for expenditure, and those gains that are restricted by the donor are classified as increases in temporarily restricted net assets.

At May 31, 2015 and 2014, the net deficiency in the market value of certain endowment related assets which fell below the donor required level amounted to $.8 and $.5 million, respectively, and resulted from unfavorable market fluctuations that occurred shortly after the investment of new permanently restricted contributions, as well as continued appropriations for certain programs deemed prudent by the University.

8. ENDOWMENT (Continued)

Endowment net assets consist of the following (in millions):

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
At May 31, 2014:				
Donor-restricted endowment funds:				
At historical value	$ -	$ 28.7	$ 386.7	$ 415.4
Accumulated net (depreciation) appreciation	(.5)	263.8	-	263.3
Quasi endowment funds	186.7	-	-	186.7
Total	$ 186.2	$ 292.5	$ 386.7	$ 865.4
At May 31, 2015:				
Donor-restricted endowment funds:				
At historical value	$ -	$ 30.3	$ 416.1	$ 446.4
Accumulated net (depreciation) appreciation	(.8)	258.1	-	257.3
Quasi endowment funds	183.6	-	-	183.6
Total	$ 182.8	$ 288.4	$ 416.1	$ 887.3

Changes in endowment net assets for the fiscal years ended May 31, 2015 and 2014 consist of (in millions):

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Balance, May 31, 2013	$ 171.6	$ 243.9	$ 362.4	$ 777.9
Endowment investment return:				
Investment income	1.3	4.7	-	6.0
Net appreciation (realized and unrealized)	21.9	68.5	-	90.4
Total investment return	23.2	73.2	-	96.4
Gifts and Trusts	-	.4	23.6	24.0
Endowment spending distribution for programs	(7.7)	(27.1)	-	(34.8)
Endowment distributions reinvested	.1	2.6	-	2.7
Net transfers to quasi endowment funds	(1.0)	-	-	(1.0)
Other	-	(.5)	.7	.2
Balance, May 31, 2014	$ 186.2	$ 292.5	$ 386.7	$ 865.4
Endowment investment return:				
Investment income	1.1	4.5	-	5.6
Net appreciation (realized and unrealized)	4.0	17.2	-	21.2
Total investment return	5.1	21.7	-	26.8
Gifts and Trusts	-	1.8	28.9	30.7
Endowment spending distribution for programs	(8.1)	(29.5)	-	(37.6)
Endowment distributions reinvested	.1	2.6	-	2.7
Net transfers to quasi endowment funds	(.5)	-	-	(.5)
Other	-	(.7)	.5	(.2)
Balance, May 31, 2015	$ 182.8	$ 288.4	$ 416.1	$ 887.3

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS

The University has two non-contributory retirement plans, the Faculty Retirement Plan and the Employee Retirement Plan. These two plans were closed to employees hired after May 31, 2007. Effective June 1, 2007 a new retirement plan was established, the Retirement Savings Plan.

The University also sponsors an unfunded, defined benefit postretirement health plan that covers all full-time and part-time regular employees who elect coverage and satisfy the plan's eligibility requirements when they retire. The plan is contributory with retiree contributions established as a percentage of the total cost for retiree health care and for the health care of their dependents. The University pays all benefits on a current basis.

The Retirement Savings Plan (Savings Plan) is a defined contribution plan in which the University makes an automatic core contribution of 5% of pay with a dollar-for-dollar match on voluntary contributions up to an additional 5% of pay once the employee meets certain eligibility requirements. Eligible employees can begin making voluntary contributions to the Savings Plan at any time. Participation is limited to faculty and staff hired on or after June 1, 2007 or who elected, prior to June 1, 2007, to transfer to this plan from the Faculty Retirement Plan or from the Employee Retirement Plan. Core and matching contributions to the Savings Plan for 2015 and 2014 were $43.5 and $40.1 million, respectively.

The Retirement Savings Plan II (Savings Plan II) is a defined contribution plan the University established, effective January 1, 2008, that covers substantially all employees of the University of Miami Hospital (UMH). The plan is available to employees who meet certain eligibility requirements and requires that UMH match certain percentages of participants' contributions up to certain maximum levels. Eligible employees can begin making voluntary contributions to the Savings Plan II at any time. Core and matching contributions to the Savings Plan II were $6.5 and $6.6 million for the years ended May 31, 2015 and 2014, respectively.

Faculty Retirement Plan (Faculty Plan) is a defined contribution plan for eligible faculty hired between September 30, 1977 and May 31, 2007, and certain faculty hired on or before September 30, 1977, who ceased participation in the Employee Retirement Plan. Under the terms of the Faculty Plan, the University makes contributions to individual retirement accounts for each eligible faculty member. Payment from the retirement account commences when the faculty member has separated from service and elects to begin distributions in accordance with plan provisions.

Contributions to the Faculty Plan are based upon a combination of compensation, tenure status, length of service, and other factors and are funded as accrued. These contributions were $24.6 and $23.4 million for the years ended May 31, 2015 and 2014, respectively. In addition to the above noted plans, there are deferred compensation arrangements for certain employees, principally clinical faculty, the liability for which is included in other liabilities.

The Employee Retirement Plan (Employee Plan) is a defined benefit plan primarily for full-time non-faculty employees hired before June 1, 2007. Employee Plan assets are held by a Trustee. The benefit is based on the higher of two formulas: a formula based on years of service and the employee's compensation for the consecutive five year period of employment that produces the highest average; and a cash balance benefit formula determined each year based on compensation and investment earnings.

On March 22, 2013, the Employee Plan was amended to allow terminated vested employees with a cash balance or present value benefit under $30,000 a one-time opportunity, during a 60-day window from April 1, 2014 to May 31, 2014, to cash out their benefit without having to reach the normal retirement date. In addition, any participant with a cash balance under $5,000 who did not elect to participate in the window was automatically cashed out, and their benefits were rolled over to an IRA administered by a third party vendor. The amounts settled approximated $25.0 million, which was less than the sum of the service cost and the interest cost. Therefore, settlement accounting was not required.

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

On April 18, 2013, the Employee Plan was amended to allow a 100% lump sum distribution option to participants with a termination date on or after May 1, 2013. In addition, on April 29, 2014, the Employee Plan was amended to allow a 100% lump sum distribution option effective June 1, 2015, to vested employees who terminated on or before May 31, 2013.

On April 29, 2014, the Employee Plan was also amended to allow all terminated vested employees a one-time opportunity, during a 60-day window ending May 31, 2015, to cash out their benefit without having to reach the normal retirement date. The Employee Plan was amended on April 29, 2014 to transfer employees from the Employee Plan to the Savings Plan at time of long term disability approval effective June 1, 2014. The amounts settled approximated $43.5 million, which was less than the sum of the service cost and the interest cost. Therefore, settlement accounting was not required.

On June 2, 2014, the Employee Plan was amended to eliminate benefit accruals for participants who become eligible for disability benefits under the University's Long-Term Disability Plan on or after June 1, 2014. This amendment also extended the meaning of "spouse" to include a person of the same-sex or gender.

On April 30, 2015, the Employee Plan was amended to allow full lump sum payments for participants' whose pension starting date occurs on or after June 1, 2015. In addition, participants who had previously taken partial or hardship lump sum payments may elect to take any residual benefit as a lump sum.

The measurement date for the Employee Plan and postretirement health plan is May 31 for fiscal years 2015 and 2014.

The following benefit payments, which reflect expected future service, are expected to be paid, for the fiscal years ending May 31 (in millions):

	Pension Benefits	Postretirement Benefits
2016	$ 52.9	$ .3
2017	53.5	.3
2018	55.4	.3
2019	57.4	.4
2020	58.1	.4
2021-2025	304.6	2.6

The University expects to contribute $49.5 million to the Employee Plan and $.3 million to its postretirement health plan during the fiscal year ending May 31, 2016.

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

The tables that follow provide a reconciliation of the changes in the plans' projected benefit obligations, fair value of assets and funded status (in millions):

	Pension Benefits		Postretirement Benefits	
	2015	2014	2015	2014
Change in Benefit Obligation				
Benefit obligation at beginning of year	$ 909.6	$ 918.6	$ 6.2	$ 6.9
Service cost – benefits attributed to employee service during period and administrative expenses	18.9	18.9	.5	.5
Interest costs accrued to measure benefit obligation at present value	38.4	41.6	.3	.3
Plan participant contributions	-	-	.7	.6
Actuarial loss (gain)	61.3	11.0	.3	(1.5)
Benefits paid and administrative expenses	(73.8)	(69.5)	(.7)	(.6)
Plan amendments	(26.1)	(11.0)	-	-
Benefit obligation at end of year	928.3	909.6	7.3	6.2
Change in Plan Assets				
Employee Plan assets at fair value at beginning of year	670.9	624.4	-	-
Investment return on Employee Plan assets	21.4	66.0	-	-
Benefits paid and Employee Plan expenses	(73.8)	(69.5)	(.7)	(.6)
Employer contributions	99.5	50.0	-	-
Plan participant contributions	-	-	.7	.6
Employee Plan assets at fair value at end of year	718.0	670.9	-	-
Funded status				
Accrued pension and postretirement benefit costs recognized on the statements of financial position	$ (210.3)	$ (238.7)	$ (7.3)	$ (6.2)
Amounts recognized in unrestricted net assets consist of:				
Net actuarial loss	$ 351.8	$ 277.2	$ .3	$ -
Prior service credit	(41.8)	(20.1)	(.5)	(.6)
	$ 310.0	$ 257.1	$ (.2)	$ (.6)

At May 31, 2015 and 2014, the accumulated benefit obligation of the Employee Plan was $884.9 and $868.0 million, respectively, $166.9 and $197.1 million, respectively, in excess of Employee Plan assets.

The following table provides the components of net periodic pension cost for the plans (in millions):

	Pension Benefits		Postretirement Benefits	
	2015	2014	2015	2014
Service cost:				
Benefits attributed to employee service during periods and administrative expenses	$ 18.9	$ 18.9	$ .6	$ .5
Interest costs accrued to measure benefit obligation at present value	38.4	41.6	.3	.3
Expected return on Employee Plan assets	(51.5)	(50.1)	-	-
Amortization of prior service cost/(credit) - includes changes in pension formula and cost of Employee Plan amendments	(4.5)	(1.7)	(.1)	(.1)
Recognized net actuarial loss	16.8	17.3	-	-
Net periodic benefit cost	$ 18.1	$ 26.0	$ .8	$ .7

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

The net actuarial loss and prior service credit expected to be recognized in net periodic benefit cost over the next fiscal year are as follows (in millions):

	Pension Benefits	Postretirement Benefits
Net actuarial loss	$ 23.9	$ -
Prior service credit	(4.5)	(.1)

An 8.25% annual rate of increase in the per capita cost of covered health care benefits was assumed for 2015. The rate is assumed to decrease each year until reaching the ultimate of 5.1% in 2092. Assumed health care cost trend rates have an effect on the amounts reported for the health care plan. A load factor was applied to the trend rates to reflect the impact of excise tax in 2017 and beyond. A 1% change in assumed health care cost trend rates would have the following effect (in millions):

	1% Increase	1% Decrease
Effect on total of service and interest cost components of net periodic postretirement health care benefit cost	$ .1	$ (.1)
Effect on the health care component of the accumulated postretirement benefit obligation	1.0	(.8)

The following weighted-average assumptions were used for the above calculations:

	Pension Benefits		Postretirement Benefits	
	2015	2014	2015	2014
Discount rate for benefit obligation	4.25%	4.55%	4.20%	4.40%
Discount rate for net periodic benefit cost	4.55%	4.80%	4.40%	4.70%
Expected return on Employee Plan assets	7.80%	8.13%	N/A	N/A
Rate of compensation increase	3.70%/4.20%	3.70%/4.20%	N/A	N/A

The rate of compensation increase assumption related to the net periodic benefit cost is 3.70% for fiscal year 2015 to 2016, and 4.20% thereafter. To develop the expected long-term rate of return for the Employee Plan assets, the University considered the historical returns of the major market indicators relating to the target asset allocation, as well as the current economic and financial market conditions.

The University has elected to adopt mortality tables issued in October 2014 by the Society of Actuaries. The mortality assumptions selected are the non-collar adjusted RP-2014 sex distinct pre- and post-annuitant mortality tables. These rates have been projected to 2014 using one-dimensional Scale BB. These tables represent recent mortality experience for a large US population dataset that is reasonably representative of the population covered under the Plan. Mortality improvement is also assumed beyond the valuation date because recent experience evidenced by Social Security beneficiaries indicates that longevity has continued to improve. For years after 2014, generational improvement is projected using scale MP-2014, modified to converge to a .75% long term rate of mortality improvement in 2022 for ages 65-84, lesser improvement rates are used at older ages. The impact of the change in mortality assumption is a liability increase of $35.8 million at May 31, 2015.

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

Employee Plan Assets

The investment policy and strategy, as established by the University, is to provide for growth of capital with a moderate level of volatility by investing in various asset classes. The University has adopted a dynamic glide path asset allocation. Each asset class is tied to a dynamic asset allocation using suitable market indices to represent each class.

The current glide path asset allocation of Employee Plan assets for a funded ratio of at least but no more than 85% is as follows: 25% Fixed income; 50.5% Total Equities; and 24.5% other investments. Equity securities include registered mutual funds, unregistered limited partnerships, and 103-12 investment entities which invest in large-mid cap, small cap and emerging companies primarily located in the United States, as well as international and emerging markets companies whose benchmarks are tied to the S&P 500, Russell 2000 and MSCI Indexes. Fixed income securities include collective investment funds which invest in corporate bonds of companies from diversified industries, mortgage-backed securities, and U.S. treasuries whose benchmarks are tied to Barclay's Capital U.S. Credit Index, Barclay's Capital U.S. Long Gov't Credit Index, and Barclay's Capital Strips 15+ Yr Index. Other Investments include investments in hedge funds, private equity funds, long-short composites, real estate, event arbitrage and common collective trusts investing in real assets related securities similar to those of the HFRI Fund of Funds, S&P 500, Bloomberg Commodity Index, and NCREIF Property Index. The University rebalances its investments periodically to meet the glide path allocations. The University also reviews its investment policy periodically to determine if the policy or allocations require change. See note 5 for fair value measurement narrative disclosures.

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

Employee Plan Assets (continued)

The Employee Plan's investments, by level, within the fair value hierarchy are as follows (in millions):

	At May 31, 2015			
	Total	Level 1	Level 2	Level 3
Common stocks:				
Large-mid cap	$ 44.5	$ 44.5	$ -	$ -
Small cap	21.1	21.1	-	-
Registered mutual funds:				
Equities:				
Emerging markets	16.4	-	16.4	-
International	43.5	-	43.5	-
Large-mid cap	43.2	-	43.2	-
Unregistered limited partnerships and limited liability companies:				
Equities:				
Emerging markets	23.2	-	23.2	-
Large-mid cap	65.4	-	65.4	-
Private equity	12.1	-	-	12.1
Other:				
Event arbitrage	36.1	-	-	36.1
Long-short composite	34.8	-	34.8	-
Real estate	12.0	-	-	12.0
Real assets related securities	8.9	-	8.9	-
Money market accounts	18.1	18.1	-	-
Common collective trusts:				
Fixed income entities	187.1	-	187.1	-
Real assets related securities	17.2	-	17.2	-
103-12 Investment entities:				
Equities:				
International	81.4	-	81.4	-
Small cap	31.6	-	31.6	-
Fixed income	6.9	-	-	6.9
Other investments:				
Private equity	4.2	-	-	4.2
Long-short composite	.1	-	-	.1
Fixed income	10.2	-	-	10.2
Real assets related securities	.1	-	-	.1
Total	$ 718.1	$ 83.7	$ 552.7	$ 81.7

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

Employee Plan Assets (continued)

	At May 31, 2014			
	Total	Level 1	Level 2	Level 3
Common stocks:				
Large-mid cap	$ 72.8	$ 72.8	$ -	$ -
Small cap	17.7	17.7	-	-
Registered mutual funds:				
Equities - emerging markets	15.7	-	15.7	-
Fixed Income	62.3	-	62.3	-
Unregistered limited partnerships and limited liability companies:				
Equities:				
Emerging markets	12.5	-	12.5	-
Large-mid cap	55.8	-	55.8	-
Private equity	12.7	-	-	12.7
Other:				
Event arbitrage	43.2	-	-	43.2
Long-short composite	60.5	-	36.7	23.8
Real estate	15.9	-	-	15.9
Real assets related securities	11.0	-	11.0	-
Money market accounts	4.7	4.7	-	-
Common collective trusts:				
Real assets related securities	20.6	-	20.6	-
103-12 Investment entities:				
Equities:				
International	100.1	-	100.1	-
Small cap	29.3	-	29.3	-
Fixed income	103.2	-	93.5	9.7
Other investments:				
Private equity	2.7	-	-	2.7
Long-short composite	15.7	-	15.6	.1
Fixed income	11.9	-	-	11.9
Real assets related securities	.1	-	-	.1
Total	$ 668.4	$ 95.2	$ 453.1	$ 120.1

9. PENSION AND OTHER POSTRETIREMENT BENEFIT PLANS (Continued)

Employee Plan Assets (continued)

The following tables set forth a summary of changes in the fair value of the Employee Plan's Level 3 investments which are valued at net asset value.

	For the year ended May 31, 2015 (in millions)						
				Total net gains (losses) included in changes in net assets			
	May 31, 2014	Purchases	Sales	Realized	Unrealized	Transfers in and/or out of level 3	May 31, 2015
Unregistered limited partnerships and limited liability companies:							
Private equity	$ 12.7	.6	(3.2)	1.3	.7	-	$ 12.1
Other:							
Event arbitrage	43.2	1.5	(7.3)	.8	(2.1)	-	36.1
Long-short composite	23.8	(.7)	(24.7)	4.1	(2.5)	-	-
Real estate	15.9	.5	(7.2)	.4	2.4	-	12.0
103-12 Investment entities:							
Fixed income	9.7	.8	(3.0)	(.4)	(.2)	-	6.9
Other investments:							
Private equity	2.7	1.2	(.1)	(.1)	.5	-	4.2
Long-short composite	.1	-	-	-	-	-	.1
Fixed income	11.9	-	-	-	(1.7)	-	10.2
Real assets related securities	.1	-	-	(.1)	.1	-	.1
Total	$ 120.1	$ 3.9	$ (45.5)	$ 6.0	$ (2.8)	$ -	$ 81.7

	For the year ended May 31, 2014 (in millions)						
				Total net gains (losses) included in changes in net assets			
	May 31, 2013	Purchases	Sales	Realized	Unrealized	Transfers in and/or out of level 3	May 31, 2014
Unregistered limited partnerships and limited liability companies:							
Private equity	$ 15.8	1.1	(3.8)	(2.4)	2.0	-	$ 12.7
Other:							
Event arbitrage	34.7	6.7	-	.6	1.2	-	43.2
Long-short composite	11.9	9.3		2.0	.6	-	23.8
Real estate	15.2	.6	(2.2)	.5	1.8	-	15.9
103-12 Investment entities:							
Fixed income	9.0	.7	-	-	-	-	9.7
Other investments:							
Private equity	3.0	.9	(1.5)	.6	(.3)	-	2.7
Long-short composite	.1	-	-	-	-	-	.1
Fixed income	11.2	-	-	-	.7	-	11.9
Real assets related securities	.3	-	(.2)	(.3)	.3	-	.1
Total	$ 101.2	$ 19.3	$ (7.7)	$ 1.0	$ 6.3	$ -	$ 120.1

There were no issuances or settlements for the years ended May 31, 2015 and 2014.

The total level 3 change in net unrealized gains (losses) for the years relating to those investments still held at May 31, 2015 and 2014 total ($2.8) and $6.3 million, respectively, and are included in net appreciation (depreciation) in fair value of investments in the Employee Plan's statements of changes in net assets available for benefits.

10. BONDS AND NOTES PAYABLE

Bonds and notes payable at May 31 consist of the following (in millions):

	Series	Final Maturity	2015 Interest Rate	2015	2014
Miami-Dade County, Florida Educational Facilities Authority	2007A to 2012B	2016 to 2042	1.29% to 6.1%	$ 788.9	$ 812.4
Notes payable to banks and others	-	2016 to 2030	2.0% to 2.38%	27.8	37.2
Notes payable to banks and others	-	2016 to 2020	Variable	109.5	27.6
Par amount of bonds and notes payable				926.2	877.2
Net unamortized premium				24.7	26.9
Total				$ 950.9	$ 904.1

The annual maturities for bonds and notes payable at May 31, 2015 are as follows (in millions):

2016	$ 107.7
2017	37.4
2018	36.0
2019	35.5
2020	47.9
Thereafter	661.7
Total	$ 926.2

In December 2013, the University borrowed $10.0 million from a bank to fund the Employees' Retirement Plan. The loan has a fixed interest rate of 2.15% per annum, and has a maturity date of December 31, 2017. The outstanding balance at May 31, 2015 was $6.9 million. This loan was paid off in August 2015.

Effective June 30, 2012, the University renewed its revolving credit facility. This line of credit has a variable interest equal to the LIBOR rate for dollar deposits with a one-month maturity plus 0.65% per annum through June 29, 2014. Effective June 30, 2014, this line of credit was renewed with a maximum credit capacity of $100.0 million and a variable interest equal to the LIBOR rate for dollar deposits with a one-month maturity plus 0.65% per annum. The outstanding balance under this line at May 31, 2015 and May 31, 2014 was $93.0 and $0 million, respectively. The agreement terminates on December 31, 2015. This loan was paid off in August 2015.

Effective December 31, 2014, the University renewed its line of credit arrangement which carries a maximum possible balance of $150.0 million. This line of credit has a variable interest rate equal to the LIBOR Daily Floating Rate plus 0.65% per annum, and has a maturity date of December 31, 2015. The outstanding balance under this line of credit at May 31, 2015 and 2014 was $0.0 and $10.4 million, respectively. This loan was paid off in August 2015.

In December 2014, the University borrowed $16.8 million from a bank to refinance an existing note. The loan has a variable interest rate equal to LIBOR Floating Rate plus .80% per annum, and has a maturity date of December 16, 2019. The outstanding balance at May 31, 2015 was $16.5 million.

10. BONDS AND NOTES PAYABLE (Continued)

Effective August 4, 2015, the University entered into a $600.0 million senior credit facility with a syndicate of lenders, including a new revolving credit facility of $500.0 million and a new Term Loan A of $100.0 million. The $250.0 million Tranche A line of credit has a variable interest rate equal to the LIBOR Daily Floating Rate plus 0.70% per annum, and has a maturity date of August 4, 2018. The $250.0 million Tranche B line of credit has a variable interest rate equal to the LIBOR Daily Floating Rate plus 1.00% per annum, and has a maturity date of August 4, 2020. The Term Loan A has a variable interest rate equal to LIBOR Daily Floating Rate plus 0.80% per annum, and has a maturity date of August 4, 2020. The pricing for all three tranches are based on a pricing grid based on the University's credit ratings.

Total interest paid on all bonds and notes was $43.8 and $44.0 million for the years ended May 31, 2015 and 2014, respectively. All of the bonds and notes payable listed in the table above are unsecured.

11. NET ASSETS

Unrestricted net assets consist of the following at May 31 (in millions):	2015	2014
Designated for operations, programs, facilities expansion and student loans	$ 130.5	$ 139.8
Cumulative pension and postretirement benefits related changes other than net periodic benefit cost	(309.9)	(256.5)
Invested in plant facilities	854.0	804.6
Endowment and similar funds	182.8	186.2
Total unrestricted net assets	$ 857.4	$ 874.1

Temporarily restricted net assets consist of the following at May 31 (in millions):	2015	2014
Gifts for programs and facilities expansion	$ 29.6	$ 18.1
Contributions (pledges) and trusts	145.0	94.0
Life income and annuity funds	11.9	11.6
Endowment and similar funds	288.4	292.5
Total temporarily restricted net assets	$ 474.9	$ 416.2

Permanently restricted net assets consist of the following at May 31 (in millions):	2015	2014
Contributions (pledges) and trusts	$ 62.4	$ 56.6
Endowment and similar funds	416.1	386.7
Total permanently restricted net assets	$ 478.5	$ 443.3

12. GIFTS AND TRUSTS

The University's Advancement Office (Advancement) reports total gifts and trusts based on the Management Reporting Standards issued by the Council for Advancement and Support of Education (CASE). Gifts, trusts, and pledges (gifts and trusts) reported for financial statement purposes are recorded on the accrual basis.

12. GIFTS AND TRUSTS (Continued)

The table below summarizes gifts and trusts received for the years ended May 31, 2015 and 2014, reported in the statements of activities as well as the CASE standards as reported by Advancement (in millions):

	2015	2014
Unrestricted gifts and trusts in support of programs	$ 69.6	$ 67.5
Unrestricted gifts and trusts for plant expansion	6.4	.7
Temporarily restricted gifts and trusts for programs and plant expansion	86.7	36.9
Permanently restricted endowment gifts and trusts	34.2	24.3
Total gifts and trusts, per statements of activities	196.9	129.4
Increases (decreases) to reflect gifts and trusts per CASE standards (unaudited):		
Pledges, net	(56.2)	1.5
Non-government grants, included in grants and contracts revenue	50.6	46.9
Differences in valuation/recording:		
Funds held in trust by others	(4.2)	5.3
Annuity	.7	.3
Timing	4.0	(4.4)
Gift-in-kind recorded under CASE standards only	2.1	6.4
Donations to supporting organizations recorded under CASE standards only	-	1.9
Total gifts and trusts as reported by Advancement	$ 193.9	$ 187.3

13. FUNCTIONAL EXPENSES

Operating expenses are reported in the statements of activities in natural categories. Functional expenses for fiscal years 2015 and 2014 are shown below (in millions):

	2015	2014
Instruction	$ 509.1	$ 479.6
Research	208.8	211.2
Public service	136.4	151.9
Patient care	1,276.5	1,196.5
Auxiliary enterprises	171.7	163.2
Academic support	144.2	136.3
Student services	45.7	43.0
Institutional support	191.7	162.5
Total	$ 2,684.1	$ 2,544.2

Facilities related expenses have been allocated across applicable functional expense categories in the statements of activities based on space usage (in millions):

	2015	2014
Depreciation and amortization	$ 131.4	$ 125.1
Interest	37.3	39.5
Operations and maintenance	132.1	123.6
Total	$ 300.8	$ 288.2

14. COMMITMENTS AND CONTINGENCIES

The University had contractual obligations of approximately $119.6 million at May 31, 2015 for various construction projects and purchases of equipment. The University has also entered into professional service agreements with Hospital Corporation of America, Inc. (HCA, Inc.) and various HCA, Inc. affiliates. Future minimum commitments under these agreements range from $3.1 to $10.9 million per year over the next five years, totaling $25.8 million.

The University, in its normal operations, is a defendant in various legal actions. Additionally, amounts received and expended under various federal and state programs are subject to audit by governmental agencies. Management is of the opinion that the outcome of these matters would not have a material effect on the University's financial position or results of operations.

The University leases certain real property. These leases are classified as operating leases and have lease terms ranging up to sixty-eight years. Total lease expense for the years ended May 31, 2015 and 2014 was $32.0 and $31.9 million, respectively. Future minimum lease payments under noncancelable operating leases at May 31, 2015 are as follows (in millions):

2016	$ 13.6
2017	9.5
2018	8.1
2019	7.0
2020	5.6
Thereafter	157.3
Total	$ 201.1

APPENDIX K

UM Richmond Campus Year Thirteen Management Report prepared by Biscayne Environmental, Inc.

Biscayne Environmental, Inc.

YEAR THIRTEEN MANAGEMENT REPORT

UNIVERSITY OF MIAMI, RSMAS CAMPUS
AT
RICHMOND PINELANDS

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YEAR THIRTEEN MANAGEMENT REPORT
UNIVERSITY OF MIAMI, RSMAS CAMPUS
AT
RICHMOND PINELANDS

Prepared for:
University of Miami

May 12, 2014

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Project No. 2001-18

BACKGROUND

During the 2013-2014 site management year, Biscayne Environmental Inc. (BEI) performed a thirteenth year of oversight and vegetation management activities at the University of Miami (UM) Navy Observatory Property at the Richmond Campus. These vegetation management and exotic treatment activities were required for a total of ±76 acres consisting primarily of a pineland natural forest community (Figure 1). The main goal of the site management program is to control the spread and growth of nuisance exotic plant species using accepted management techniques in order to maintain the integrity of the pineland.

Year Thirteen site management activities were conducted from June 2013 through May 2014. Year Thirteen vegetation management activities were essentially a continuation of the activities of Year Twelve, and involved physical removal and chemical treatment of nuisance exotic vegetation on a regular schedule as well as maintenance of firebreaks and fire roads.

SUMMARY OF YEAR THIRTEEN ACTIVITIES

The site was re-evaluated in June 2013 to assess the success the Year Twelve vegetation management activities and to identify areas requiring additional prioritized treatment for Year Thirteen. Overall, the site conditions reflected that the program of cutting and spraying of exotic species including Burma reed,

Brazilian pepper, earleaf acacia, umbrella tree, Australian pine, lead tree, and mother-in-law tongue had reduced the presence of these species to minimal numbers throughout the site.

In Year Thirteen, spot control of exotics was continued, with Lake and Wetland Management, Inc. acting as the exotic management subcontractor. Lake and Wetland Management personnel followed an accepted management technique for management of exotic grass species by cutting and then spraying new growth with the herbicide glyphosate. For exotic woody species such as bishofia (bishopwood, *Bischofia javanica*) and Brazilian pepper (*Schinus terebinthifolius*), stems were cut and stubs treated with triclopyr (Garlon). Maintenance visits were performed throughout the management year to control exotics.

Fire break maintenance was performed by Unico on an as-needed basis.

As of the start of Year Thirteen, prescribed burning had been conducted in fire control cells 1-4 on the eastern end of the preserve (October - December 2009), cells 7 & 8 (June 2003), and cells 15 & 16 (August 2003). Fuel loads were reduced in fire control cells 9-13 by a wildfire that occurred during August 2004, and again in fire control cell 15 by a wildfire that occurred in September 2006. No prescribed burns were conducted during Year Thirteen.

MANAGEMENT RESULTS

The site was regularly inspected during Year Thirteen to assess the effectiveness of the management activities. Overall, the first thirteen years of exotic treatment have been highly successful. Very few clumps of Burma reed continued to persist on the property. Occurrences of exotics such as lead tree, Brazilian pepper, lantana, woman's tongue, and Burma reed were located throughout the site and treated appropriately.

The controlled burn conducted in early October 2009 in fire control cell 4 on the eastern portion of the property impacted the pine canopy, resulting in the loss of several smaller trees soon after the burn. Some canopy mortality also occurred in subsequent years, but during Year Thirteen, no additional mortality was observed.

The canopy in the eastern portion of cell 1 exhibits substantial mortality as a consequence of the hot controlled burn in December, 2009 and the subsequent pine bark beetle infestation. However, no active bark beetle infestations were observed in this area during Year Thirteen. The shrubby vegetation on the forest floor appears to have recovered from the controlled burn and is growing vigorously. The situation in this area will continue to be monitored closely during Year Fourteen.

Cells 2 and 3 appear to have suffered limited overall impact from the controlled burns of late 2009.

No active pine bark beetle infestations were found during Year Thirteen.

The on-site inspections once again revealed that pines are reproducing successfully, as evidenced by numerous saplings growing through the ground cover in some of the western cells.

RECOMMENDATIONS

The following are recommendations and suggestions for Year Fourteen of management:

- Continue fire break maintenance on a bi-annual basis or more frequently as needed.
- Continue exotic plant management as needed.
- Evaluate Fire Control Cells 5-8 for prescribed burning.
- Monitor for pine bark beetle activity; manage any infestations as appropriate.

FIGURES

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Project:	UM RSMAS Campus at Richmond Pinelands				
Sheet Name:	Aerial Photograph		2013 image courtesy CSTARS		
Prepared For:	University of Miami				
STR/County:	SW 117th Avenue & 168th Street				
Project No.:	2001-18	Date: 1/16/2013	Scale: NTS	**Figure 1**	

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Project:	UM RSMAS Campus at Richmond Pinelands
Sheet Name:	Fire Control Cells — Image 2004 courtesy Google Earth
Prepared For:	University of Miami
STR/County:	SW 117th Avenue & 168th Street
Project No.:	2001-18 — Date: 11/27/2007 — Scale: NTS — **Figure 2**

SITE PHOTOGRAPHS

Photo 1 View looking north showing vegetation in Cell 9 (right) and Cell 11 (left) approximately 2 years after the August 2004 fire.

Photo 2 Current view looking north showing vegetation in Cell 9 (right) and Cell 11 (left).

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Project:	UM RSMAS Campus at Richmond Pinelands				
Sheet Name:	Site Photographs				
Prepared For:	University of Miami				
Location:	SW 117th Avenue & 168th Street				
Project No.:	2001-18	Date:	5/9/2014	Scale: NTS	**Sheet 1**

Photo 3 View showing recovering burn area 7 months after September 2006 wildfire in fire control cell 15.

Photo 4 Current view showing Sep 2006 burn area in fire control cell 15.

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Project No.:	2001-18	Date:	5/9/2014	Scale: NTS	**Sheet 2**

Photo 5 View looking southeast between Cell 10 and Cell 12 showing ground vegetation free of invasive exotic species.

Photo 6 View looking west showing Cell 8 on the north side of the antenna enclosure. This area was burned in 2005.

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Photo 7 View looking southwest at Cell 4 showing bracken fern sprouting approximately 3 weeks after the October 5, 2009 controlled burn.

Photo 8 Current view looking southwest at Cell 4.Some canopy tree mortality was experienced due to the October 5, 2009 controlled burn.

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Project No.:	2001-18	Date:	5/9/2014	Scale: NTS	**Sheet 4**

Photo 9 View looking southwest at Cell 1 eight months after the December 2009 controlled burn. Some fire-related canopy mortality is evident.

Photo 10 View looking southwest at Cell 1. No additional canopy tree mortality has occurred since 2011.

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