



APPENDIX F

BUCK ISLAND REEF NATIONAL MONUMENT

Appendix F: Buck Island Reef National Monument

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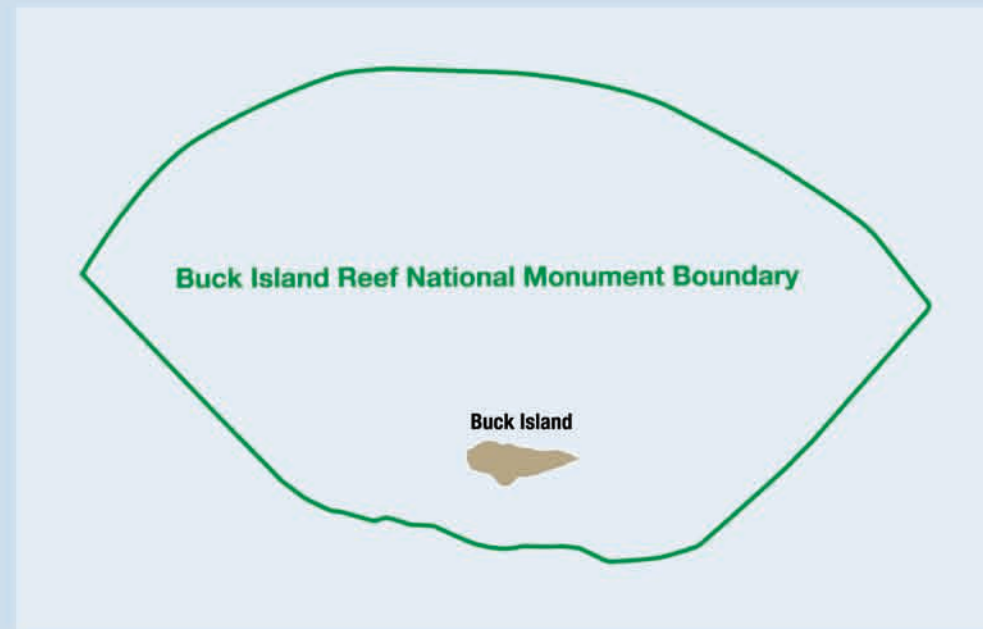
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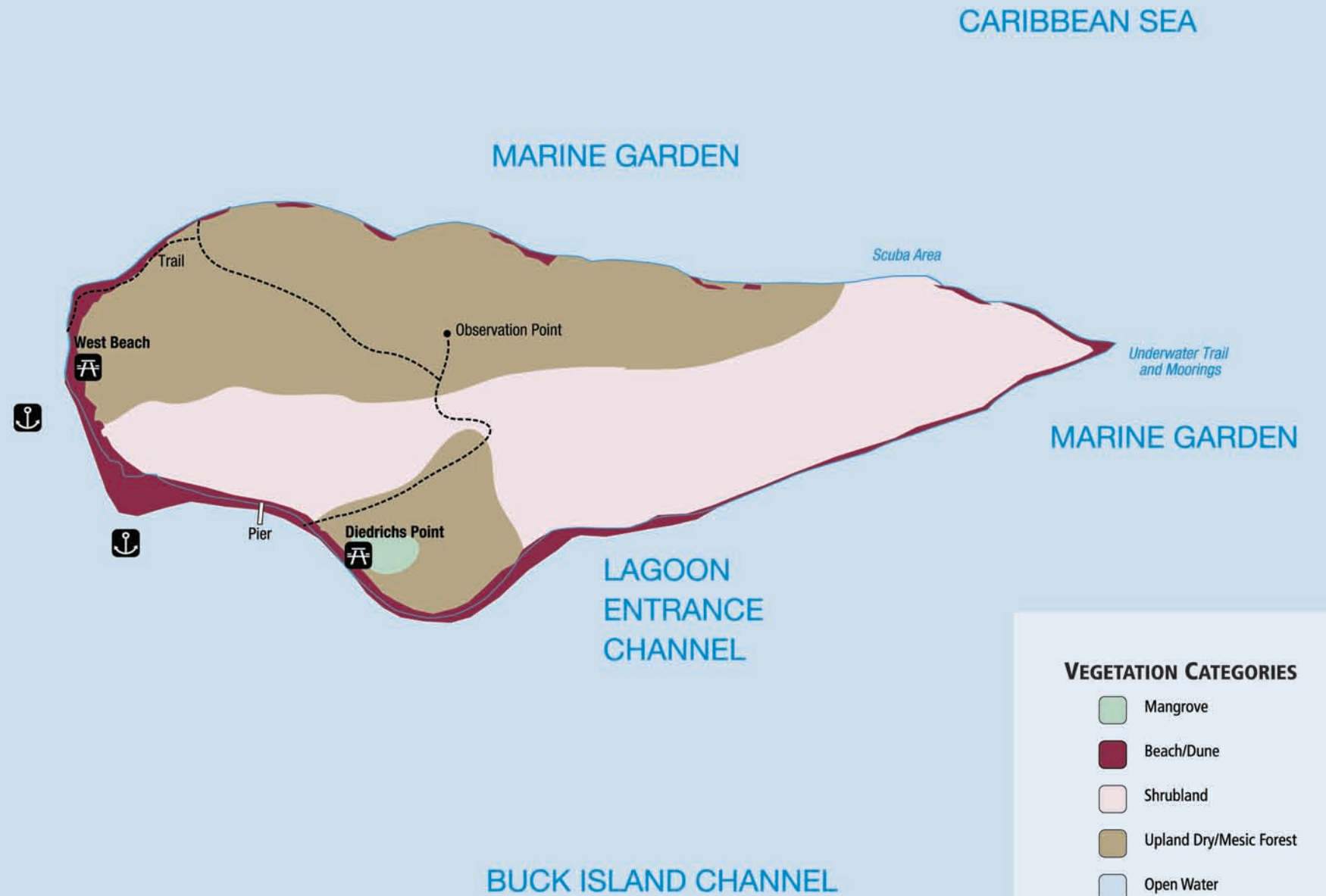
SUMMARY DESCRIPTION OF VEGETATION CATEGORIES REFERENCED IN APPENDIX

Vegetation Category	Vegetation Subcategories
Mangrove	Mangrove fringe, mangrove forest and woodland, and mangrove shrubland.
Beach / Dune	Beach and dune areas.
Shrubland	Sclerophyllous evergreen shrublands, mixed dry shrublands, gallery shrublands, thicket scrub, coastal scrub, thorn scrub, and coastal hedge. In the Virgin Island parks it includes gallery shrublands, mixed, dry shrublands, and coastal hedge.
Upland Dry / Mesic Forest	Tropical hardwood hammocks, pine flatwoods, south Florida rocklands, mixed hardwood/pine forests, coastal hammock, xeric oak scrub, oak-saw palmetto scrub, drought-deciduous forests, semi-deciduous forests, gallery semi-deciduous forests, semi-evergreen forests, evergreen woodlands, gallery semi-deciduous woodlands, semi-deciduous woodlands, drought-deciduous woodlands, upland moist forests, and gallery moist forests.

Buck Island Reef National Monument



WESTERN REEF



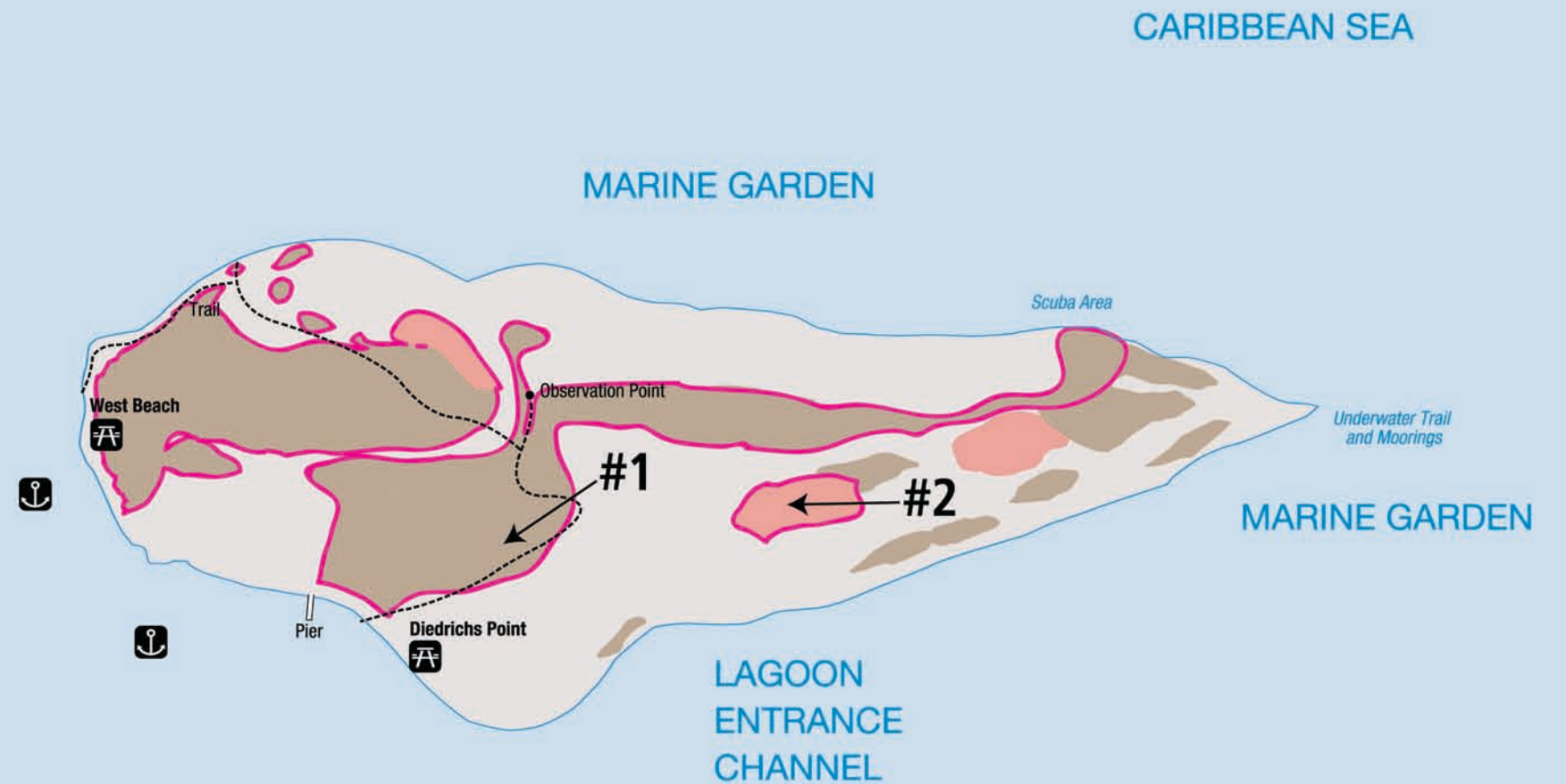
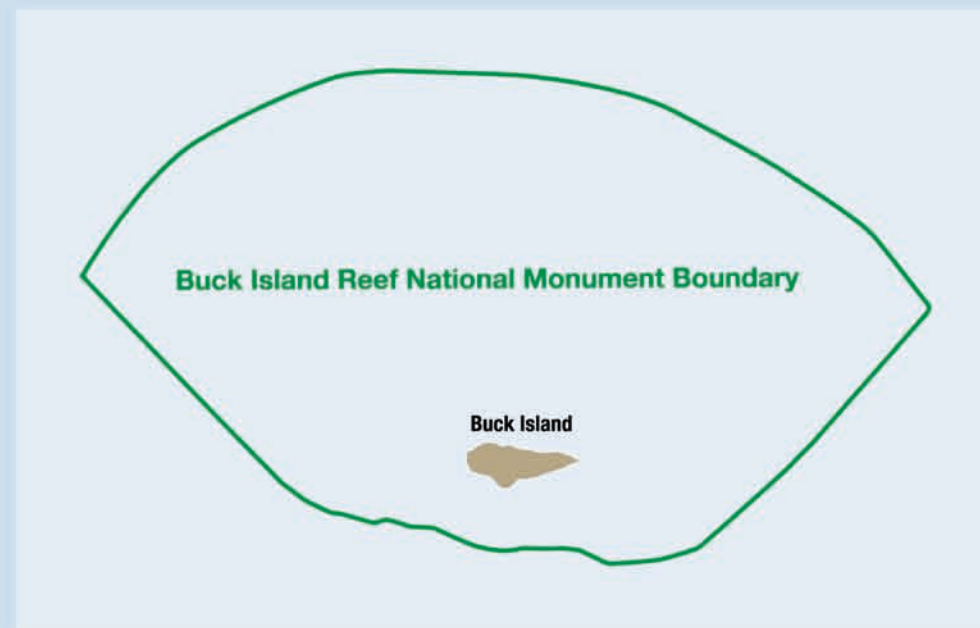
VEGETATION CATEGORIES

- Mangrove
- Beach/Dune
- Shrubland
- Upland Dry/Mesic Forest
- Open Water
- ⚓ Anchorage
- ⛺ Picnic Area
- Hiking Trail



910-20011	910
EPMP	September 2006

Buck Island Reef National Monument



TREATMENT AREAS

- Areas Appropriate for Active Restoration
- Treatment Area #1
- Treatment Area #2
-  Anchorage
-  Picnic Area
- Hiking Trail



910-20010	910
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APPENDIX F: BUCK ISLAND REEF NATIONAL MONUMENT

**TABLE F-1: ACRES WITHIN VEGETATION CATEGORIES THAT
COULD POTENTIALLY BE RESTORED UNDER ALTERNATIVES A, B, AND C^a**

Vegetation Category	Alternative A	Alternative B	Alternative C	
	Potential Acres Passively Restored	Potential Acres Passively Restored	Potential Acres Passively Restored	Potential Acres Actively Restored
Buck Island Reef National Monument				
Mangrove	0	0	0	0
Shrubland	30	30	20	10
Upland Dry / Mesic Forest	45	45	0	45
Beach / Dune	<1	<1	<1	0
Total	75	75	20	55

a. Although treatments would occur under alternative A to control exotic plant species, it is assumed that within the life of the plan all acres may not be restored. Under alternatives B and C, it is assumed all acres would be restored due to re-treatment of exotic plant species under an optimal re-treatment schedule (see the "Alternatives" Chapter, Alternative B, Maintaining Treated Sites section).

Key to Table F-2 below

- Gross infested acres of exotic plants within Buck Island Reef National Monument were based on data provided by EPMT staff.
- Initial treatment methods for each area under alternatives A, B and C were based on data provided by EPMT staff (see the "Alternatives" Chapter, Alternative A, Initial Treatment section and the Alternative B, Treatment Method Decision Tool section). As all areas have been treated and are re-treated under an optimal treatment schedule the methods of initial treatment are assumed to be the same for all alternatives.
- R-treatment methods under alternatives A, B, and C were based on data provided by park staff. As all areas have been treated and are re-treated under an optimal treatment schedule the methods of re-treatment are the same for all alternatives. (see the "Alternatives" Chapter, Alternative B, Maintaining Treated Sites section and the Alternative B, Maintaining Treated Sites section).
- Herbicides applied under alternatives A, B, and C are based on prior treatment data provided by EPMT in the APCAM database.
- The potential herbicide use under alternative A was calculated based on the average use of each herbicide within the parks in the past 5 years as provided in the APCAM database. The average application rate of glyphosate was 0.14 undiluted gallons and triclopyr was 0.91 undiluted gallons. To determine the range of potential herbicide use for treatment areas under alternative A, the average application rate was multiplied by the gross infested acres. This same calculation was used to calculate the range of potential herbicide use under alternatives B and C. For further explanation, see the "Environmental Consequences" Chapter, General Methodology, Treatment and Re-treatment of Exotic Plants section.
- Under alternatives A and B all treatment areas would be restored passively. Under alternative C, areas within the park where active restoration could take place was based on a decision framework described in the "Environmental Consequences" Chapter, Alternative C, Proposed Restoration Program.



**TABLE F-2: BUCK ISLAND REEF NATIONAL MONUMENT
ALTERNATIVE SUMMARY TABLE OF TREATMENT AREAS WITHIN THE PARK**

Treatment Area ID	Priority for Treatment	Exotic Species	Gross Infested (acres) ^a	Initial Treatment Methods ^b	Re-treatment Method ^c	Herbicides ^d	Total Initial Herbicide Applied to Treatment Area (undiluted gal.) ^e	Vegetation Category	Sensitive Resources	Restoration ^f
Alternative A and B										
1	NA	Aloe vera Boerhavia erecta Bromelia penguin Leucaena leucocephala Melicoccus bijugatus Tamarindus indica Tecoma stans Thespesia populnea	68	Basal bark leave Foliar ground leave Hand pulling	Foliar ground leave Hand pulling	Glyphosate Triclopyr	10–62	Beach / Dune Upland / Mesic Forest Shrubland	Brown pelican Visitor use areas Cultural resources	Passive
2	NA	Guinea grass	7	Foliar ground leave	Foliar ground leave	Glyphosate	1	Upland / Mesic Forest Shrubland	None in infested areas	Passive
Alternative C										
1	1	Aloe vera Boerhavia erecta Bromelia penguin Leucaena leucocephala Melicoccus bijugatus Tamarindus indica Tecoma stans Thespesia populnea	68	Basal bark leave Foliar ground leave Hand pulling	Foliar ground leave Hand pulling	Glyphosate Triclopyr	10–62	Beach / Dune Upland / Mesic Forest Shrubland	Brown pelican Visitor use areas Cultural resources	Active Passive
2	2	Guinea grass	7	Foliar ground leave	Foliar ground leave	Glyphosate	1	Upland / Mesic Forest Shrubland	None in infested areas	Active Passive

**TABLE F-3: BUCK ISLAND REEF NATIONAL MONUMENT
AMOUNT OF HERBICIDE TO BE APPLIED OVER TIME UNDER ALTERNATIVES A AND B**

Vegetation Category	Total Acres to be Initially Treated	Potential Minimum Application of Herbicide (gallons)^a	Potential Maximum Application of Herbicide (gallons)^b
Mangrove	—	—	—
Shrubland	30	1	27
Upland Dry / Mesic Forest	45	2	41
Beach / Dune	—	—	—
Total	75	3	68

a. Potential minimum application of herbicide is calculated by taking the average minimum concentration of herbicide that could be applied (0.05 undiluted gallons/acre) multiplied by the acres to be treated. See the “Environmental Consequences” Chapter, General Methodology, Treatment and Re-treatment of Exotic Plants section for a discussion on the average rate of herbicide application.

b. Potential maximum application of herbicide is calculated by taking the average maximum concentration of herbicide that could be applied (0.91 undiluted gallons/acre) multiplied by the acres to be treated.



TABLE F-4: BUCK ISLAND REEF NATIONAL MONUMENT
AMOUNT OF HERBICIDE TO BE APPLIED OVER TIME UNDER ALTERNATIVES A AND B^{a,b}

Vegetation Category	Initial Treatment	Potential Minimum Application of Herbicide (gallons/acre)											
		Number of Months											
		6	12	18	24	30	36	42	48	54	60	66	72
Mangrove	—	—	—	—	—	—	—	—	—	—	—	—	—
Shrubland	1	1	<1	0	0	0	0	0	0	0	0	0	0
Upland Dry / Mesic Forest	2	1	1	<1	0	0	0	0	0	0	0	0	0
Beach / Dune	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	3	2	1	<1	0	0	0	0	0	0	0	0	0
		Potential Maximum Application of Herbicide (gallons/acre)											
Mangrove	—	—	—	—	—	—	—	—	—	—	—	—	—
Shrubland	27	14	7	3	2	1	<1	0	0	0	0	0	0
Upland Dry / Mesic Forest	41	20	10	5	3	1	1	<1	0	0	0	0	0
Beach / Dune	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	68	34	17	9	4	2	1	<1	0	0	0	0	0

a. It was assumed that re-treatment on average every 6 months would result in 50% less the number of stems that would need to be treated and therefore only 50% of the prior herbicide use would be applied. See the “Environmental Consequences” Chapter, General Methodology, Treatment and Re-treatment of Exotic Plants section.

b. Note that Buck Island Reef National Monument is currently under an optimal re-treatment schedule and therefore the amount of potential herbicide applied is same for these alternatives.

**TABLE F-5: BUCK ISLAND REEF NATIONAL MONUMENT
POTENTIAL MINIMUM AMOUNT OF HERBICIDE TO BE APPLIED OVER TIME UNDER ALTERNATIVE C**

Vegetation Category	Potential minimum application of herbicide (gallons) for initial treatment	Potential minimum application of herbicide (gallons) for re-treatment ^a	Potential Minimum Application of Herbicide (gallons/acre) ^b											
			Number of Months											
			6	12	18	24	30	36	42	48	54	60	66	72
Mangrove	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shrubland	1	1	<1	0	0	0	0	0	0	0	0	0	0	0
Upland Dry / Mesic Forest	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Beach / Dune	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	3	1	<1	0	0	0	0	0	0	0	0	0	0	0

a. It was assumed for the analysis that only those acres that would be allowed to passively restore would continue to be re-treated with herbicides.

b. It was assumed that re-treatment on average every 6 months would result in 50% less the number of stems that would need to be treated and therefore only 50 percent of the prior herbicide use would be applied. See the "Environmental Consequences" Chapter, General Methodology, Treatment and Re-treatment of Exotic Plants section.



**TABLE F-6: BUCK ISLAND REEF NATIONAL MONUMENT
POTENTIAL MAXIMUM AMOUNT OF HERBICIDE TO BE APPLIED OVER TIME UNDER ALTERNATIVE C**

Vegetation Category	Potential minimum application of herbicide (gallons) for initial treatment	Potential minimum application of herbicide (gallons) for re-treatment ^a	Potential Minimum Application of Herbicide (gallons/acre) ^b											
			Number of Months											
			6	12	18	24	30	36	42	48	54	60	66	72
Mangrove	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shrubland	27	18	9	4	2	1	1	<1	0	0	0	0	0	0
Upland Dry / Mesic Forest	41	0	0	0	0	0	0	0	0	0	0	0	0	0
Beach / Dune	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	68	18	9	4	2	1	1	<1	0	0	0	0	0	0

a. It was assumed for the analysis that only those acres that would be allowed to passively restore would continue to be re-treated with herbicides.

b. It was assumed that re-treatment on average every 6 months would result in 50% less the number of stems that would need to be treated and therefore only 50% of the prior herbicide use would be applied. See the “Environmental Consequences” Chapter, General Methodology, Treatment and Re-treatment of Exotic Plants section.

**TABLE F-7: BUCK ISLAND REEF NATIONAL MONUMENT
DISTRIBUTION OF APPROPRIATE TREATMENT METHODS BY VEGETATION CATEGORY UNDER ALTERNATIVES A AND B**

Buck Island Reef National Monument ^a	Total Acres within Park	Total Potential Acres Infested within Park	Initial Treatment Methods ^a	Re-treatment Methods ^a
			Basal Bark, Foliar Ground and Leave, Manual Pulling	Foliar Ground and Leave, Manual Pulling
Mangrove	1	0	0	0
Shrubland	75	30	30	30
Upland Dry / Mesic Forest	103	45	45	45
Beach / Dune	11	<1	<1	<1
Total	190	75	75	75

a. All areas infested have been treated and are re-treated under an optimal treatment schedule under alternatives A and B, therefore, it is assumed that the methods used for initial treatment and re-treatment under alternative A would be the same for alternative B.



**TABLE F-8: BUCK ISLAND REEF NATIONAL MONUMENT
DISTRIBUTION OF APPROPRIATE TREATMENT METHODS BY VEGETATION CATEGORY UNDER ALTERNATIVE C**

Buck Island Reef National Monument	Total acres within park	Total Potential Acres Infested within Park	Initial Treatment Methods ^a	Re-treatment Methods ^b
			Basal Bark, Foliar Ground and Leave, Manual Pulling	Foliar Ground and Leave, Manual Pulling
Mangroves	1	0	0	0
Shrublands	75	30	30	20
Upland Dry/Mesic Forest	103	45	45	0
Sand/Beaches	11	<1	<1	0
Total	190	75	75	20

a. All areas infested have been treated and are re-treated under an optimal treatment schedule under alternatives A, B and C, therefore, the methods used for initial treatment and re-treatment under alternative C are the same as described for alternatives A and B.

b. The acres to be re-treated are those that would be allowed to passively restore and are not subject to active restoration (see table F-1 for acres actively and passively restored).