



Sustainable Landscape Designs Utilizing Native Species to Increase Pollinator Habitats



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INTRODUCTION

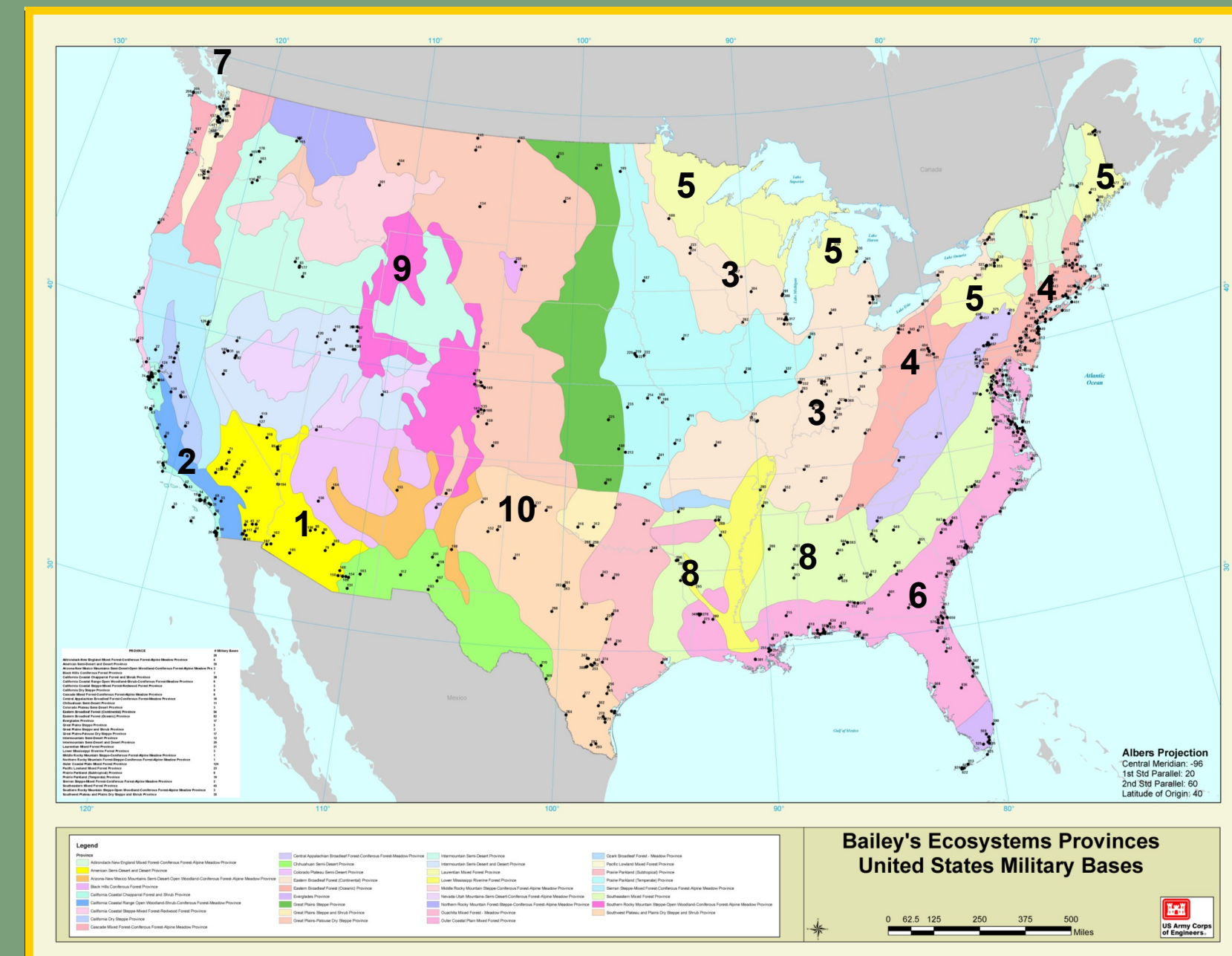
Pollination is an ecosystem service essential to reproduction of upwards of 80% of flowering plants, including many important food crops, as well as, endangered plants. Plant-pollinator relationships are one of the keystone indicators of healthy ecosystems and a sign of long-term plant health. Due to the rapid decline in pollinator populations and loss of biodiversity, it is critical to provide islands and corridors of native species habitats, creating micro-niches to provide safe havens for these imperiled species. The Department of Defense (DoD) can be part of the solution by using native plant species in installation landscaping to provide our native pollinators with appropriate habitat. Encouraging pollinators on military lands ensures long-term habitat sustainability. Many different pollinator groups, such as Bees, Butterflies, Moths, Beetles, Flies, Hummingbirds, and Bats are the focus of these land managers.

This guidebook, funded under the DoD LEGACY program, provides the DoD land managers with guidance on developing native plantings that provide food sources and shelter for pollinators; the plant lists are inclusive of plantings for all the different groups of pollinators. In addition to the planting designs, we have developed a short section to education both the DoD land manager and the installation populous on what can be done on military installations and in home gardens to increase pollinator habitats and food.

The guidebook, while a general document, does provide a quick reference to many planting options and other sources of information. Actions that both the DoD land manager can implement on their installation as well as home owners on their property — no matter the size of the area.

METHOD

One of the first actions was to determine which DoD installations were in each of the Ecoregion Provinces derived from USFS Bailey's work. A GIS map DoD installations across the Continental United States was overlaid on a map of Bailey's Ecoregions. We limited our search to the top ten provinces that had the most military installations present. Listed below are those ten selected for this LEGACY guidebook.



1. American Semi-desert and Desert Province
2. California Coastal Chaparral Forest & Shrub Province
3. Eastern Broadleaf Forest, Continental Province
4. Eastern Broadleaf Forest, Oceanic Province
5. Laurentian Mixed Forest Province
6. Outer Coastal Plain Mixed Forest Province
7. Pacific Lowland Mixed Forest Province
8. Southern Mixed Forest Province
9. Southern Rocky Mtn. Steppe/ Open Woodland, Coniferous Forest, and Alpine Meadow Province
10. South West Plateau & Plains Dry Steppe & Shrub Province

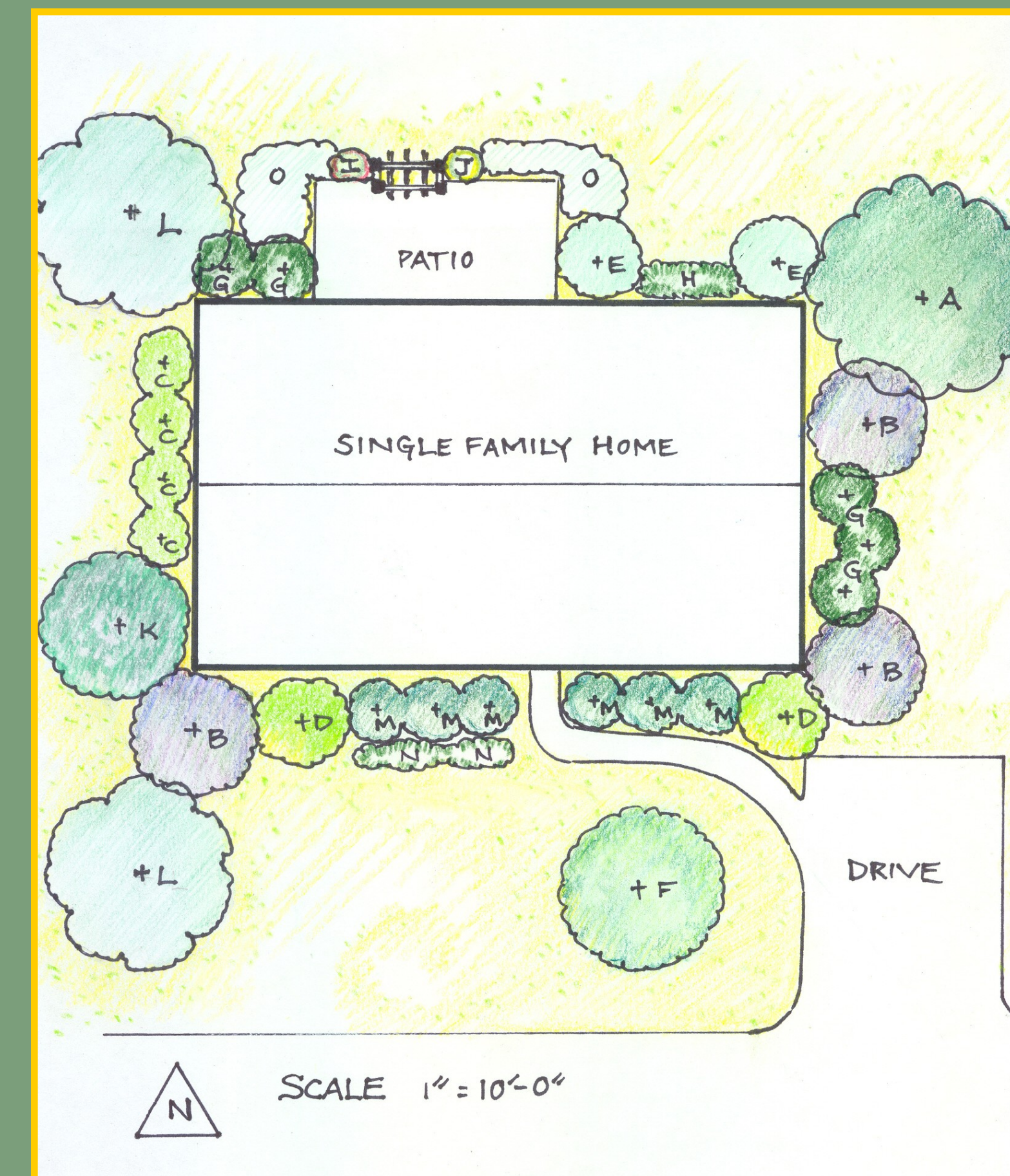
A residential and island landscape plan, and seed mix for each province are part of the guidebook. The residential landscape plan can be used in the cantonment areas. The island landscape plan is suitable for open space plantings. The Southeastern Mixed Forest Ecoregion Province was selected for this poster to depict the GIS analysis, and the associated landscape designs and seed mix.



Photographs Courtesy of US Forest Service

SOUTHEASTERN MIXED FOREST PROVINCE

RESIDENTIAL LANDSCAPE PLAN



PLANT KEY

Latin Name	Common Name	Flowering Period
A. <i>Magnolia grandiflora</i>	Southern Magnolia	May, June
B. <i>Rhododendron canescens</i>	Piedmont Azalea	June, July
C. <i>Ceanothus americanus</i>	New Jersey Tea	April, May
D. <i>Fothergilla major</i>	Witch Alder	April, May
E. <i>Philadelphus hirsutus</i>	Hairy Mock Orange	April, May
F. <i>Chionanthus virginicus</i>	Fringe Tree	April, May
G. <i>Rhododendron carolinianum</i>	Carolina rhododendron	May
H. <i>Crinum americana</i>	Swamp lily	June - Aug
I. <i>Lonicera sempervirens</i>	Coral Honeysuckle	April, July
J. <i>Gelsemium sempervirens</i>	Yellow Jessamine	March, April
K. <i>Magnolia virginiana</i>	Sweetbay Magnolia	April, May
L. <i>Cornus florida</i>	Flowering Dogwood	May
M. <i>Rosa virginiana</i>	Virginia Wild Rose	May - July
N. <i>Iris spp.</i>	Iris	May, June
O. Vegetables, Herbs, and Annual Flowers		

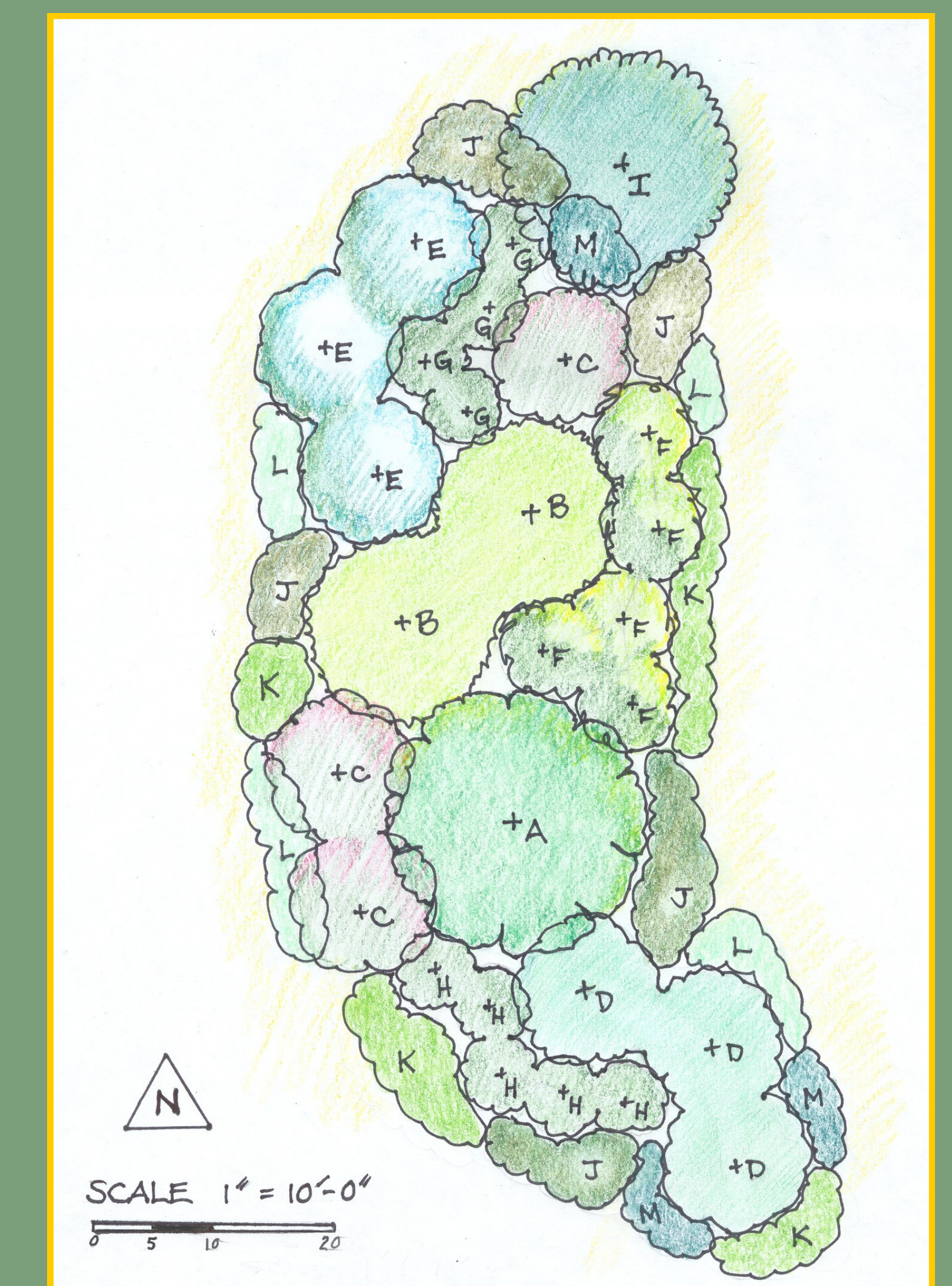
Notes: Plant Coral Honeysuckle and Yellow Jessamine on a trellis as an entry to the patio. Plant vegetable, herbs, and annual flowers to attract pollinators through-out the summer and fall gardening seasons.

PLANT KEY

Latin Name	Common Name	Flowering Period
A. <i>Magnolia grandiflora</i>	Southern Magnolia	May, June
B. <i>Cornus florida</i>	Flowering Dogwood	May
C. <i>Cercis canadensis</i>	Redbud	March, April
D. <i>Ilex decidua</i>	Possum Haw	April
E. <i>Magnolia virginiana</i>	Sweetbay Magnolia	June
F. <i>Azalea x "Conles"</i>	"Encore" Azalea	April & Sept.
G. <i>Rosa x hybrida</i>	"Knock out" Roses	March - Dec.
H. <i>Rosa virginiana</i>	Virginia Wild Rose	May - July
I. <i>Ilex virginiana</i>	American Holly	April - June
J. <i>Crinum americana</i>	Swamp lily	June, Aug.
K. <i>Iris spp.</i>	Iris	May, June
L. <i>Coreopsis verticillata</i>	Threadleaf Coreopsis	May - July
M. <i>Phlox amoena</i>	Hairy Phlox	April - June

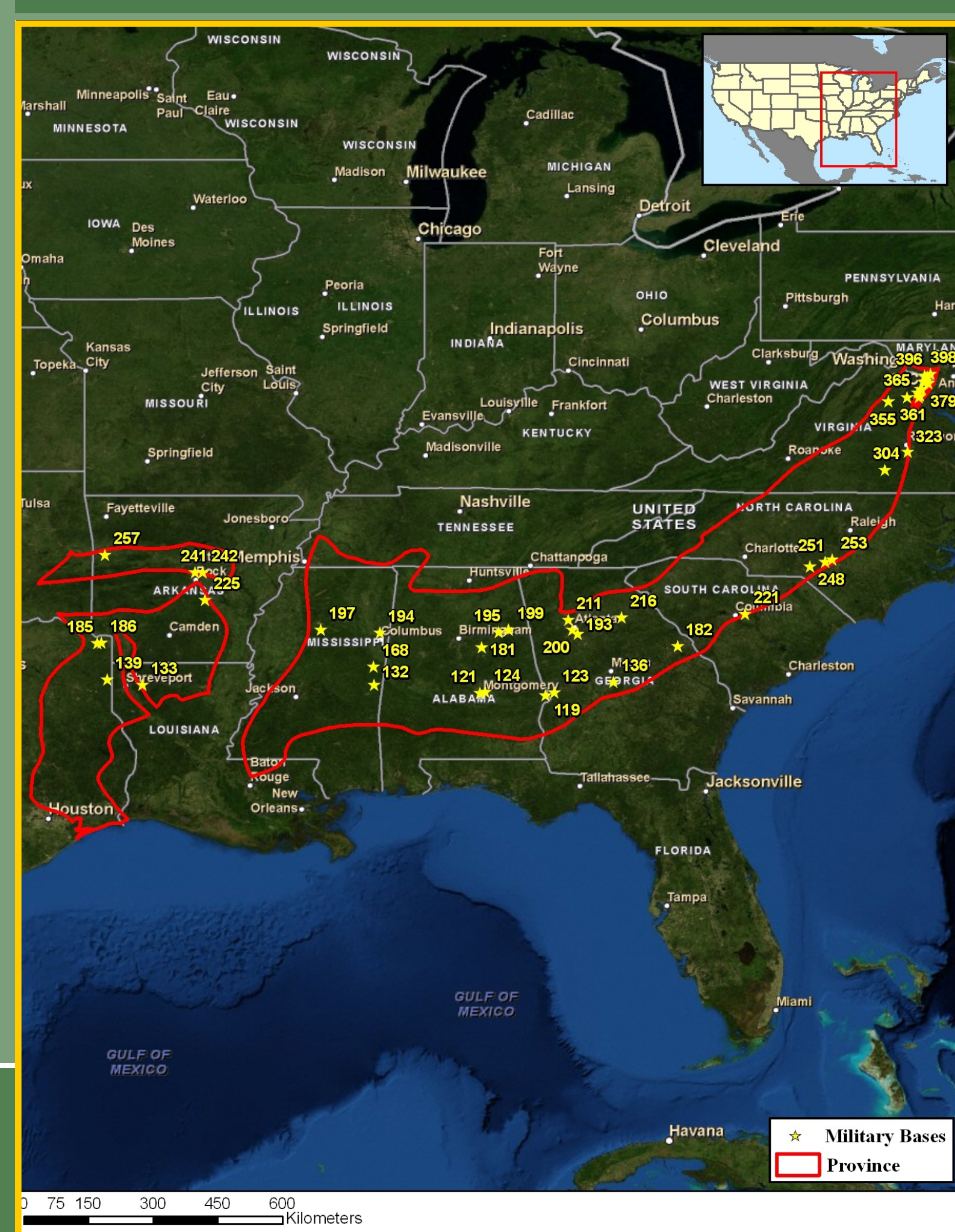
Notes: The dimension of this planting is approximately 100 feet by 40 feet; this could be suitably planted along a roadway, or as a planting adjacent to a building.

ISLAND LANDSCAPE PLAN



SCALE 1" = 10'-0"

SOUTHEASTERN MIXED FOREST PROVINCE



119	LAWSON ARMY AIR FIELD
121	MAXWELL AIR FORCE BASE
123	FORT BENNING MILITARY RESERVATION
124	GUNTER AIR FORCE STATION
132	US NAVAL AUXILIARY AIR STATION
133	LOUISIANA ARMY AMMUNITION PLANT
136	ROBINS AIR FORCE BASE
139	LONGHORN ARMY AMMUNITION PLANT
168	NAVAL AUXILIARY AIR STATION
181	ALABAMA ARMY AMMUNITION PLANT
182	FORT GORDON MILITARY RESERVATION
185	RED RIVER ARMY DEPOT
186	LONE STAR ARMY AMMUNITION PLANT
193	FORT GILLEM
194	COLUMBUS AIR FORCE BASE
195	ANNISTON ARMY DEPOT
200	FORT MCPHERSON
211	DOBBINS AIR FORCE BASE
221	FORT JACKSON MILITARY RESERVATION
225	PINE BLUFF ARSENAL
241	CAMP JOSEPH T ROBINSON
242	LITTLE ROCK AIR FORCE BASE
248	CAMP MACALL MILITARY RESERVATION
251	FORT BRAGG MILITARY RESERVATION (Joint base with Ft Bragg)
253	POPE AIR FORCE BASE (Joint base with Ft Bragg)
360	US NAVAL ORDNANCE STATION
381	QUANTICO MARINE CORPS BASE
383	NAVAL SURFACE WARFARE CENTER
370	FORT BELVOIR MILITARY RESERVATION
371	DAVISON AIRFIELD
379	BOLLING AIR FORCE BASE
381	ANACOSTIA NAVAL STATION
386	FORT MYER
394	WALTER REED ARMY MEDICAL CENTER
396	NATIONAL NAVAL MEDICAL CENTER
398	NAVAL SURFACE WEAPONS CENTER

Total Number of Installations: 34

HABITAT FEATURES

Here are a couple of habitat features that both homeowners and DoD land managers can implement into their landscapes: water sources, native bee nest boxes, butterfly puddling areas, and dead trees for perching and resting.



Open water for birds and , flowering plants for pollinators, and open muddy area for nest building.



Areas surrounded with flowering plants to attract pollinators.

Solar pump for water feature

Open water and small fountain to attract wildlife. Buried plastic pond liner and filled with rock = no mosquitoes. Large flat rock buried in rocks to provide bird bathing area. Bees like the large white sandstone. Hummingbirds like the fountain.



Butterfly puddling area: protected from wind, full sun, container with sand and mineral salts, kept moist.

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