Wildlife Habitat Planting

Conservation Practice Standard 420, Practice Specifications

SCOPE

This specification serves as a guide for selecting and implementing the **Wildlife Habitat Planting** practice. This document contains a list of considerations for the applicant and the NRCS requirements and constraints of this practice. This document will be given to all producers who apply for NRCS financial and technical assistance to conduct **Wildlife Habitat Planting.**

DEFINITION

Establishing wildlife habitat by planting herbaceous vegetation or shrubs.

Photo 1. Male Caribbean Carpenter bee (Xylocopa mordax). Photo taken by Gail Karlsson at USVI.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Improve degraded wildlife habitat for the target wildlife species or guild
- Establish wildlife habitat that resembles the historic, desired, and reference native plant community.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where inadequate wildlife habitat is identified as a primary resource concern and a plant community inventory or wildlife habitat evaluation indicates a benefit in altering the current vegetative conditions (species diversity, richness, structure, and pattern) by establishing herbaceous plants or shrubs.

BACKGROUND

Pollinators are a diverse component of on-farm wildlife and are critical for plant reproduction. More than 80 percent of plants either require or benefit from pollinators to produce seeds or fruit. Wildlife as diverse as songbirds and bats depend upon insect-pollinated plants. High-quality pollinator habitat supports abundant insects that provide food for bird species, as well as important biological control agents for many crop pests. In agricultural systems, 35 percent of global agricultural production, including more than 100 crop species, is either somewhat or completely dependent upon pollinators (USDA-NRCS, 2014).

In the past, native bees and feral honeybees could meet all of farmer's pollination needs for chards, melons, vegetables, and other insect-pollinated crops. These farms were relatively small and close to areas of natural habitat that harbored adequate numbers of pollinators to accomplish the task that now requires imported colonies of honeybees. Nearby natural areas also served as a ready source of new pollinators that could re-colonize farms and provide pollination service if insecticide applications killed resident bees. Now, many agricultural landscapes are more extensive and lack sufficient habitat to support native pollinators. (Xerces Society, 2016). Other pollinators include birds and bats which depend on forest structure for shelter. In addition, forest structure within the landscape attracts insectivorous birds and bats which may control insect pest within farms.

Pollinators, including honeybees and native bees, also visit crops and orchards such as coffee and soybeans for pollen or nectar, even though these crops are not dependent directly on bees for production. Since pesticide use on all crops may drift onto adjacent habitat, all agricultural producers play an important role in pollinator protection and conservation, not just growers of fruits and vegetables (USDA-NRCS, 2014).

The National Academy of Sciences developed a report in 2006 named "*Status of Pollinators in North America.*" The article highlights the decline of honeybees and native bees across North America, the reasons, and consequences of this decline, and makes recommendation on conservation actions. In addition, native pollinators may be important for endemic and endangered plant species (e.g., *Solanum conocarpum*, *Solanum drymophilum*, *Ottoschulzia rhodoxylon*, *Zanthoxylum thomasianum*, *Varronia bellonis* and *Varronia rupicola*). Providing protected habitats for pollinators on the farm is one way to increase the numbers of native pollinators.

Wildlife Habitat Planting is a conservation practice that provides habitat for pollinators and other beneficial organisms. To accomplish the goals of this conservation practice, a variety of

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NRCS practices can be employed to provide and enhance wildlife habitat. Depending on landowner objectives and project design, **Wildlife Habitat Planting** for pollinators also will reduce soil erosion and sedimentation, improve soil, water, or air quality, or help manage plant pests by removing weeds that harbor insects pest or by increasing habitat for natural enemies and beneficial invertebrates as a component of an integrated pest management plan.

Steps to use this Practice Specification

1. Identify objectives: what are the goals or results you expect achieve?

2. Identify the current conditions of the habitat, the missing components (food, cover, water, and spatial requirements) and the target species.

3. Use the target wildlife species (e.g., a bat, a hummingbird, a bee specie, or a group of species, etc.) to create, protect or enhance the habitat to guarantee their life cycles, providing air, food, cover, water, and spatial requirements. Not all elements may apply to every habitat type. The data provided in this document include specific information regarding several requirements or characteristics for numerous Caribbean Area pollinator species as well vegetation recommendations to provide habitat for wildlife. This information can be used to develop recommendations or to conduct an on-farm inventory.

GENERAL CONSIDERATIONS

Consider the following items when managing an area for wildlife habitat planting:

- Purpose of the project, including identification of the wildlife, and pollinator species or groups of species to be supported and the habitat needs that can be met on the managed property.
- Surrounding landscape and its relationship to the project location; farms located adjacent to or near State forests, National Wildlife Refuges (USFWS), National Park lands (NPS), National Forest (USDA), secondary forests, private reserves, or waterbodies may require establishment of a buffer zone or transitional zone.
- Site conditions such as soils, available water sources, water quality and quantity, and existing vegetation; all habitats will be planned and managed according to soil capabilities.
- The use of chemicals in the farm production.
- The potential use of ecological services in place of mechanical or chemical treatments to achieve management goals (e.g., services provided by grazers).
- The effects of management on plants and plant diversity, including the potential for invasion by undesirable or invasive species.
- The effects of management actions on compliance with federal and state hunting regulations (e.g., baiting).

PLANNING CONSIDERATIONS:

1. Planning Criteria: A planning criterion is a quantitative or qualitative method to assess the existing condition of the natural resources on a site to determine whether additional treatment is needed to address **Terrestrial habitat for wildlife and invertebrates** resource concerns.

2. Planning Consideration: A planning consideration is a description of potential actions or activities that should be considered to help address an identified resource concern or to address unintended consequences of an action.

We recommend using one of the following tools for a basic assessment:

a) Generalized Caribbean Wildlife Habitat Evaluation Index (WHEI) wetland
b) Stream Visual Assessment Protocol_2
c) Specialist (e.g., biologist) report or management plan. For example: a report developed by the NRCS Caribbean Area Biologist, a Management Plan created by a partner under the US Forest Service Stewardship Program, or a Conservation Planning Activity for Forest, Pollinator or Fish and Wildlife developed by a Technical Service Provider

Other considerations or questions that are important to consider:

a) Do the conservation **practice or management activities** that are in place **meet species or guild-specific habitat model thresholds**? or
b) Are the availability of **food, cover or water** in the quantity and quality to **support habitat requirements for the species of interest**? or
c) Is the **connectivity of habitat components** adequate to **support stable populations** of the targeted species?

Planning alternatives for wildlife will be based on a habitat appraisal. NRCS recommends use of the Caribbean Area Wildlife Habitat Evaluation Index (WHEI). These guides evaluate habitat for overall wildlife species diversity. When a habitat appraisal for a particular wildlife species is desired, consult the NRCS State Biologist.

WILDLIFE SPECIES INFORMATION

Use the information in this section as guidance to identify and evaluate wildlife species requirements, habitats, and distribution and for planning to improve or establish habitat.

Pollinators

A. Bees

The word pollinator brings to mind honeybees. However, pollinators may also include butterflies, moths, wasps, flies, beetles, ants, bats and even some birds.

A pollinator habitat enhancement includes the improvement, restoration, enhancement, or expansion of flower-rich and forest structure habitat that supports native and/or managed pollinators. This action provides pollen, nectar, shelter, and nesting sites. It is also very important to protect the pollinator (particularly insects) from pesticides. For this reason, when recommending this conservation practice focus on the fundamentals: forage, nesting sites and protection from pesticides. Follow these three rules:

(1) Diversity;
(2) Variety of flowers (different sizes, colors and shapes); and
(3) Blooming across the entire year.

Appendix 1 includes detailed information regarding bees and their relationship with several crops. Appendix 2 includes recommended plants to provide habitat to support bees.

Provide woody structures such as downed tree structures to make an artificial nesting site. Soil removed from drainage ditches can be piled to create potential bee ground-nesting habitat. See Structure for Wildlife (Practice Code 649) conservation practice standard and implementation requirement at the Electronic Field Office Technical Guide (eFOTG) for more information.

Photos of nests of Caribbean Carperten bee (Xylocopa mordax).

B. Birds

Some bird species found in Puerto Rico and the U.S. Virgin Islands are pollinators. Hummingbirds like the *Anthracothorax viridis* (Green Mango) and *Chlorostilbon maugaeus* (Puerto Rican Emerald), and indirectly the songbird *Coereba flaveola* (Bananaquit), can serve as pollinators for some native trees, shrubs and other flowering plants. Other birds may provide ecological services for agricultural activities such as pest control and invasive species control. Intensive agricultural production can also threaten bird species. When planning to attract birds to the farm, consider the following activities:

- Plant a variety of flowering shrubs and herbaceous plants to provide year-round food and shelter for birds.
- Prune shrubs to promote healthier plants that provide more flowers and fruits to benefit wildlife.

- Promote agroforestry conservation practices.
- Provide wildlife escape ramps in water troughs.
- Avoid using agricultural chemicals in or around bird habitat.
- Install buffers, hedgerows, and similar plant structures.

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C. Bats

Bats are beneficial to agricultural activities. Bat species can provide pollination and pest management services. More detailed information regarding bats is found in Appendix 8 of the practice specification for conservation practice Upland Wildlife Habitat Management (Code 645). One recommendation for bat conservation is to provide wildlife habitat planting as well as artificial nesting sites. See Structure for Wildlife (Practice Code 649) documentation at eFOTG.

PLANT SPECIES SELECTION FOR WILDLIFE HABITAT PLANTING

Many herbaceous and shrub species provide an excellent source of food for wildlife. Proper selection of plant material can meet both the aesthetic needs of the landowner and provide the necessary habitat structure for wildlife.

Encourage the use of native plants that occur in the area. It is extremely important to recommend native species that provide shelter and food for a diversity of wildlife. Native plants are adaptable to local soil, rainfall and temperature conditions; are resistant to many insects and diseases; have minimal irrigation requirements; flourish without fertilization; promote local biological diversity (e.g., pollinators); and are unlikely to become weedy. In addition, native and endemic plant species are particularly adapted to Hurricanes, making the habitat more resilient to such atmospheric events. However, non-native (non-invasive) species may be used when cost and/or availability are limiting factors. NRCS also recommends that any planting of native material is accompanied by a plan to remove weedy exotics from the area to support the viability of the practice.

The best wildlife habitat contains a diversity of flowering plants. Pollinator diversity increases with increasing plant diversity. A variety of flower shapes supports more pollinators and other beneficial insects. Pollinators vary in size and have different tongue lengths (or morphological adaptations); consequently, they will feed on differently-shaped flowers. There is a rough correlation between the depth of the flower tube and the length of the tongue of the pollinator that visits them. Some very open flowers have nectar and pollen that is readily accessible to insects of all sizes, including pollinators with short tongues. Other flowers have pollen or nectar that is harder to reach and are preferred by robust bees – such as the Carpenter bee – that push between petals. Other plants species (e.g., Solanaceae) are dependent on buzz pollination and thus, relies on native bees (e.g., *Xylocopa mordax*) for their pollination.

Plant species selection should be limited to perennial plants that provide pollen and nectar rich

forage resources for pollinators. For greatest benefit, foraging habitat for wildlife should contain a wide variety of plants that provide differently colored and shaped flowers and require minimal maintenance once they are established.

The inclusion of bunch grasses at a low percentage is appropriate. Forbs may be plug planted rather than planted from seed when appropriate. Native heliconia are highly recommended to be included where conditions are appropriate. Woody shrubs may also be added to wildlife habitat planting. For more information on planting shrubs for pollinators, refer to Practice Specifications for Hedgerow Planting (Practice Code 422), available at the eFOTG.

Appendix 3 provides specific pollinator-friendly plant species to implement a wildlife habitat planting. The list consists of herbaceous and shrub species. Trees are not allowed under this conservation practice. Refer to Tree/shrub Establishment (Practice Code 612) or Hedgerow Planting (Practice Code 422) conservation practice standards available in eFOTG.

SITE SELECTION

Site selection for pollinator habitat should take the following into consideration:

- **Pesticide Drift:** Habitat must be protected from pesticides (especially insecticides and bee-toxic fungicides and herbicides). Only sites with no to very low risk for pesticide drift should be established as new habitat. This includes some pesticides approved for use on organic farms. See photo 2.
- **Accessibility:** New habitat should be accessible to equipment for planting and maintenance operations.
- **Sunlight:** Most wildflowers and native shrubs grow best in full sunlight.
- **Slope:** Steep or highly erodible sites should not be disturbed. To re-vegetate such sites, consider Critical Area Planting (Practice Code 342) or other suitable Practice Standards.
- **Weed Pressure:** Areas with high weed pressure will take more time and effort to prepare for planting. It is also important to note the primary weed composition. Knowing the most abundant weed species on site, their reproductive methods, and

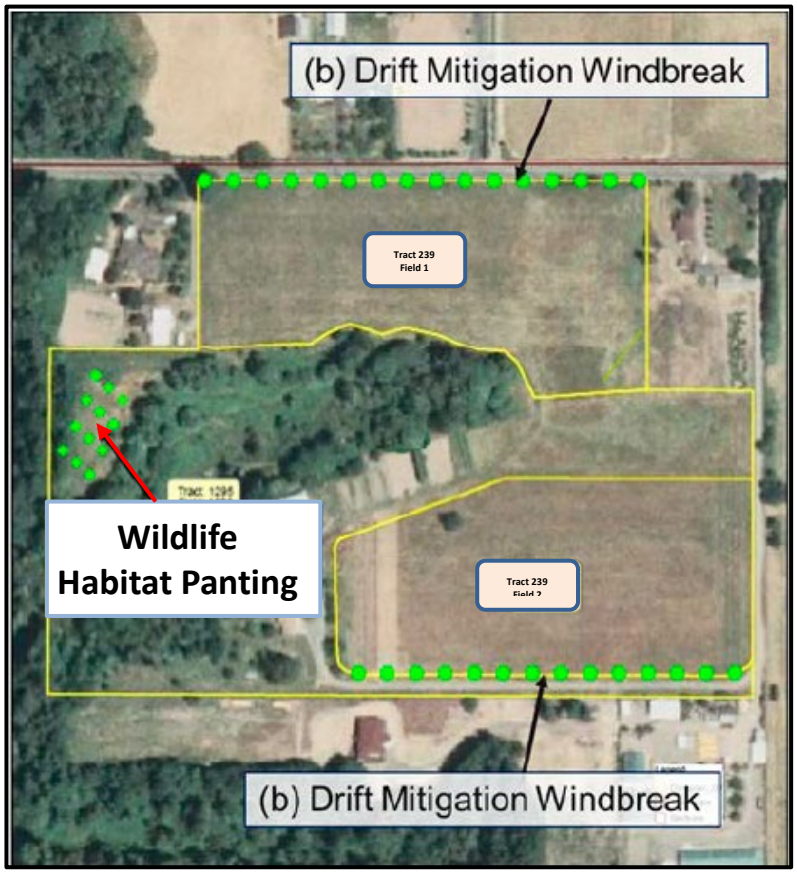

Photo 2. Aerial photo showing the location for a wildlife habitat planting. Taken from USDA-NRCS, 2014).

whether they are grass or broadleaf, perennial or annual, and woody or herbaceous will help significantly in planning for site preparation and follow up weed management during establishment.

- **Site History:** Factors such as past plant cover (e.g., weeds, crops, grass sod, and/or native plants), use of pre-emergent herbicides or other chemicals, and soil compaction can affect plant establishment. It is also important to know if sites may have poor drainage or may flood, as such conditions make habitat establishment more difficult or require a plant mix adapted to the site.
- **Soils and Habitat:** Some plants listed in Appendix 3 of this document are tolerant of many soil conditions and types, however all plants establish better when matched with appropriate conditions.
- **Irrigation:** To establish plants from plugs, pots, or bare root will require irrigation.
- **Other Functions:** The site may offer opportunities to serve other functions, such as runoff prevention, stream bank stabilization, or erosion control. Those factors can influence plant choice and/or design.

SITE PREPARATION

Site preparation is one of the most important and often inadequately addressed components of project success. It is also a process that may require more than one effort to reduce competition from invasive, noxious, or undesirable non-native plants prior to planting (refer to Conservation Practice Standard 595 Pest Management Conservation System). In particular, site preparation should focus on the removal of perennial and aggressive weeds (there are more options to address less aggressive annual or biennial weeds after planting). Previously cropped lands (those that have been cultivated for several years) usually have fewer weeds, but weed pressure still needs to be addressed. More effort and time spent eradicating undesirable plants prior to planting will result in higher success rates in establishing the targeted plant community.

Mowing and Solarization

Basic Instructions:

- Mow, rake or lightly harrow and smooth the site in the spring (raking off debris, if necessary).
- After smoothing the site, irrigate thoroughly and lay UV stabilized plastic (such as high tunnel plastic), burying the edges to prevent airflow between the plastic and the soil. Weigh down the center of the plastic if necessary to prevent the wind from lifting it. Use greenhouse repair tape for any rips that occur during the season.
- Remove the plastic before the rainy season and the area beneath the plastic is recolonized by nearby rhizomatous weeds.
- Immediately plant pollinator seed mix and/or install transplants.

NOTE: Do not till. Avoid any ground disturbance that may bring up additional weed seed. An additional year of site preparation is recommended if weed pressure is particularly high.

PLANTING METHODS

Recommended planting methods are site-specific. Pre-project site conditions, especially weed competition, may affect planting success and should be addressed prior to planting. Factors such as equipment availability, weed pressure, and cost should be taken into consideration when choosing a planting method. Installing and maintaining habitat should fit into general farm management practices as much as possible.

Planting seeds if available, rather than plugs, can be a less expensive way to establish wildflowers. Seeding requires **more intensive** site preparation to reduce weed pressure because weed control options are limited when the wildflowers start to germinate.

Hand Broadcasting (Throwing Seed)

Basic Instructions:

- Remove as much stubble as possible prior to seeding, creating a smooth, lightly packed seedbed clear of vegetation residue. The soil surface can be **lightly** hand-raked or harrowed to break-up crusted surfaces.
- For small sites (e.g., less than 2 acres), seed can be hand broadcast (similar to scattering poultry feed). When hand broadcasting, divide the seed into at least two batches. Sow each batch separately. To ensure that seed is evenly distributed, scatter the first batch over the site while walking in parallel passes across the site, and then walk in passes perpendicular to the previous passes to scatter the second batch.
- Regardless of how it is broadcast, do not cover the seed with soil after planting. A water-filled turf grass roller or a cultipacker should be used to press the seed into the soil surface. Natural precipitation or light overhead irrigation can also help ensure good seed-soil contact. Floating row-cover can be used if necessary to protect seeds and small seedlings against predation.
- Provide protection to the seeds if birds consumption is a concern. For the Caribbean Area, the success of this method will depend on the exclusion of birds or other organisms that look for seeds in the ground like chickens, sparrows, and other granivorous.

Transplanting Forbs and Woody Plants (Hand Planting)

NRCS Caribbean Area recommends this method of implementation for Wildlife Habitat Planting (Practice Code 420). Some benefits of using this method are: Provides mature nectar and pollen resources more quickly, does not require specialized planting equipment, preferred for plants with limited seed availability that are expensive or difficult to establish from seed, and transplants can be established on weedy sites more easily with adequate mulching.

Basic Instructions:

- Standard shovels are usually adequate for transplanting most container stock. However, dibble sticks or mechanical transplanters are sometimes helpful for plug-planting.

- Plant size at maturity should be considered when planting. Most woody shrubs can be spaced on 4' to 6' centers (depending upon size at maturity), with most herbaceous plants spaced closer on 3' to 5' centers. It is helpful to measure the planting areas before purchasing transplants, and to stage the transplants in the planting area prior to installing them in the ground.
- Transplanting can occur any time the ground can be worked but should be timed to avoid prolonged periods of hot, dry, or windy weather. Regardless of when planting occurs, transplants should be irrigated thoroughly immediately after planting. Holes for plants can be dug and pre-irrigated prior to planting as well. Follow-up irrigation is dependent upon weather and specific site conditions, but generally even native and drought tolerant plants should be irrigated with at least 1" of water per week (except during natural rain events), for the first two years after establishment. Long, deep watering is best to encourage deep root system development. Drip irrigation is useful, and other methods that allow for deep watering can be successful. It is advisable to irrigate at the base of plants and avoid overhead irrigation that would encourage weed growth. Once plants are established, irrigation should be removed or greatly decreased.
- Most of the plants in the Appendix are adapted to a variety of soil conditions and do not need any specific amendments. However, in areas where the soil is compacted, degraded, or depleted, compost should be used during planting. Compost should be free from weed seeds, aged properly, and mixed thoroughly with soil **in the holes** during planting.
- Plant guards may be needed to protect plants from above ground browsing or antler damage by deer, pigs or other animals. Newly planted areas should be clearly marked to protect them from herbicides or other disturbances.
- Mulching is recommended to reduce weed competition and to retain moisture during the establishment phase. Recommended materials include wood chips, bark dust, or other regionally appropriate mulch materials that contain no viable seeds. Mulch is intended to remain on the surface and not be incorporated into the soil. Refer to Mulching Conservation Practice (Code 484) specifications.

Post Planting Establishment Requirements

Weed control is critical in the first and second years after planting. If the site is well prepared, then less effort will be required for weeding after project installation. Maintenance practices must be adequate to control noxious and invasive species and may involve tools such as mowing, or hand hoeing. Weeds should be prevented from to going to seed in, or adjacent to, the project area during the first two (and possibly three) years after planting to help ensure long-term success. Familiarity with the life cycle of weeds will facilitate appropriate timing of management activities. Since young wildflower and weed seedlings may look alike, care should be taken to properly identify weeds before removal.

Common weed management strategies include:

- **Managing Irrigation:** Most wildflowers established from seed thrive with little or no supplemental irrigation. Keeping irrigation to a minimum helps native wildflowers out-compete non-native weedy species that sometimes have higher soil moisture requirements. Similarly, when irrigation is needed for transplants, it should be supplied at the base of the transplant when possible (through drip irrigation, for example) to avoid watering nearby weeds.
- **Mowing / String Trimming:** Mowing or string trimming can be utilized to keep weedy species from shading out other plants, and to prevent them from going to seed. Mowing is especially useful when establishing wildflower plots of perennial species. When planted with perennial seed mixes, sites can be mowed occasionally (at 8 inches or higher) during the first year after planting to prevent annual and biennial weeds from flowering and producing seed. Perennial wildflowers are slow to establish from seed and are usually not harmed by incidental mowing in the first year after planting. Mowing and string trimming can also be useful around woody transplants to manage nearby weeds.
- **Hand Weeding:** Hand-weeding (including hoeing) can be effective in small areas with moderate weed pressure. Hand-weeding will likely be necessary in forb plots to eliminate broadleaf weeds during the first few seasons.

OPERATION AND MAINTENANCE

Manage herbivores as needed. As soon as possible after establishment, remove tree guards or other materials that could impede plant growth. In most cases, irrigation can be removed from transplants by the end of the second year after planting. Continue to protect habitat from pesticides and herbicides. Occasional hand weeding may be necessary to control noxious weeds. Maintain the long-term plant diversity of pollinator habitat by re-seeding or re-planting as necessary.

Wildflower plantings generally need to be managed over time to maintain open, early successional characteristics. The actual management will depend on the size and location of the habitat. Possible management tools/techniques include mowing or hand tools. If mowing is used, be sure all equipment is clean and free of weed seed. Do not mow during critical wildlife nesting seasons (consult your state wildlife biologist for specific guidance). After establishment, no more than 30% of the habitat area should be mowed in any one year to ensure sufficient undisturbed refuge areas for pollinators and other wildlife.

Finally, note that some common farm-management practices can cause harm to bees and other beneficial insects. Insecticides are especially problematic, including some insecticides approved for organic farms. Therefore, if insecticide spraying is to occur on the farm, it is critical that the Wildlife Habitat Planting area is outside of the sprayed area and/or protected from application and drift.

Appendix 1: Bees that pollinate crops in the Caribbean Area.

CROP	POLLINATOR BEE SPECIES				
	Ceratina guarnacciana	*Exomalopsis spp.*	*Megachile lanata*	*Melissodes trifasciata*	*Xylocopa mordax*
Avocado Aguacate					x
Eggplant Berenjena		x			x
Pumpkin Calabaza			x	x	x
Pigeon pea Gandul			x		x
Lemon Limon					x
Watermelon Melon		x			x
Pepper Pimiento	x	x		x	
Tomato Tomate					x

Appendix 2: Example of some vegetation for wildflowers.

PLANT NAME	POLLINATOR BEE SPECIES			
	Exomalopsis spp.	*Megachile*	*Melissodes trifasciata*	*Xylocopa mordax*
Amaranthus dubius	x			
Asystasia gangetica (nonnative to the Caribbean)	x			
Centrosema virginianum				x
Euphorbia prostrata	x			
Cleome gynandra (nonnative to the Caribbean)	x			
Cleome viscosa (nonnative to the Caribbean)	x			
Euphorbia heterophylla	x			
Girasol (*Helianthus annuus)* (cultivated)				x
Jantar (*Sesbania aegyptica*) (nonnative to the Caribbean)		x		
Kallstroemia maxima	x			
***Lantana* spp.**				x
Ludwigia octovalvis	x			
Macroptilium lathyroides			x	x
Malvastrum coromandelianum	x			
Melochia pyramidata	x		x	
Merremia quinquefolia	x			
Other leguminous plants		x		
Prosopsis juliflors		x		

Appendix 3: Vegetation recommended for Wildlife Habitat Planting.

SCIENTIFIC NAME	NOMBRE COMÚN ESPAÑOL	ENGLISH COMMON NAME	TYPE	STATUS FOR PR AND USVI
Ageratina resiniflua			Shrub	Endemic to PR / Not in the USVI
Ardisia obovata	Bádula, Mameyuelo	Breakbill	Shrub	Native
Asclepias currasavica	Algodoncillo, Platanillo, Platanillo matizado, Yerba de mariposas	Bastard ipeca, Bloodflower, Red milkweed, Kittie mcwanie	Herb	Native
Asclepias nivea	Algodoncillo blanco, Platanillo, Platanillo blanco		Herb	Native
Badiera penaea			Shrub	Native to PR / Not in the USVI
Bidens alba var. radiata	Margarita, Romerillo	Sheperd's needle	Herb	Native
Bonellia umbellata	Chirriador		Shrub	Endemic Greater Antilles / Not in USVI
Borrichia arborescens	Clavelón de playa	Sea ox-eye	Shrub	Native
Bourreria virgata	Hoja menuda, Palo de vaca, Roble de guayo		Shrub	Endemic Greater Antilles / Not in USVI
Casearia decandra	Palo blanco, Caracolillo, Cerezo, Corcho blanco		Shrub	Native
Centrosema plumieri	Flor de cochitas		Vine	Native / Not in the USVI
Centrosema pubescens	Flor de cochitas, Flor de pito	Butterfly pea	Vine	Native / Not in the USVI
Centrosema virginianum	Conchita de Virginia, Flor de cochitas	Wist vine	Vine	Native
Cestrum citrifolium	Dama de noche, Galán del monte		Shrub	Endemic West Indies / Not in the USVI
Chamaecrista portoricensis	Retama	Puerto Rico sensitive pea	Shrub	Endemic Greater Antilles / Not in USVI
Chromolaena geraniifolia			Shrub	Endemic to PR / Not in the USVI
Chromolaena sinuata	Coral, Manto, Maravedi, Palo de paloma, Pico de paloma		Shrub	Endemic to the West Indies
Clidemia eggersii	Camasey, Camasey colorado, Camasey de paloma		Shrub	Endemic to Greater Antilles / Not in the USVI
Coccoloba microstachya	Uverillo, Uvillo		Shrub	Endemic to Greater Antilles
Coccoloba uvifera	Uva de Playa, Uvero	Sea grape	Shrub	Native
Corchorus hirsutus	Malvavisco	Jack-switch	Shrub	Native

Critonia portoricensis	Guerrero		Shrub	Endemic to PR / Not in the USVI
Croton flavens	Adormidera, Guayacancillo	Sage, Soldier whip, Yellow balsam	Shrub	Native
Duranta erecta	Azota-caballo, Cuentas de oro, Lila, Lluvia	Sky flower, Golden Dew Drop	Shrub	Native
Erithalis fruticosa	Jayajabico, Manglillo	Black torch, Tea	Shrub	Native
Ernodea littoralis		Beach-creeper, Golden-creeper, Cough bush	Shrub	Native
Eugenia ligustrina	Palo de muleta, Palo de murta	Birch berry, Privet stopper	Shrub	Native
Faramea occidentalis	Cafeíllo, Café cimarron	False coffee	Shrub	Native
Garcinia hessii	Hinca-barriga	Lemon sap tree	Shrub	Endemic to PR / Not in the USVI
Gesneria pedunculosa	Arbol de Navidad		Shrub	Endemic to PR / Not in the USVI
Gossypium hirsutum	Algodón del país, Algodón silvestre	Native cotton, Wild cotton	Shrub	Native
Guarea glabra	Guaraguaillo		Shrub	Native to PR / Not in the USVI
Gundlachia corymbosa	Sereno	Horse bush, Tea	Shrub	Endemic to West Indies / Not in USVI
Hamelia patens	Bálsamo, Doña Julia, Pata de pájaro		Shrub	Native
Heliconia caribaea	Botecitos, Guineo Cimarron	Indian plantain, Lobster claw	Herb	Endemic to West Indies / Not in USVI
Jacquinia berteroi	Mercocha		Shrub	Endemic to West Indies
Koanophyllon dolicholepis	Oreganillo		Shrub	Endemic to PR / Not in the USVI
Lantana involucrata L.	Cariaquillo, Santa María	Wild-sage, Button sage	Shrub	Native
Lepidaploa glabra *(Vernonia albicaulis)*	Santa Maria		Shrub	Endemic to West Indies / Not in USVI
Lepidaploa sericea *(Vernonia sericea)*	Escobilla, Huye que te cojo,	Long shoot	Shrub	Endemic Greater Antilles / Not in USVI
Ludwigia octovalvis	Cangá, Yerba cangá, Yerba de clavo	Primrose yellow, Primrose willow	Shrub	Native
Machaonia portoricensis	Alfilerillo, Roseta		Shrub	Endemic to PR / Not in the USVI
Malpighia coccigera	Árbol de la dicha, Azota-caballo		Shrub	Native
Melochia pyramidata	Bretónica piramidal	Pyramid flower	Herb	Native
Miconia impetiolaris	Camasey de costilla		Shrub	Native / Not in the USVI
Miconia prasina	Camasey		Shrub	Native / Not in the USVI

Miconia racemosa	Camasey de felpa		Shrub	Native / Not in the USVI
Mosiera xerophytica *(Eugenia xerophytica)*	Guayabacón		Shrub	Native
Mouriri helleri	Mamaeyuelo, Palo prieto		Shrub	Endemic to PR
Myrcia citrifolia	Limoncillo del monte		Shrub	Native
Neurolaena lobata	Sepi		Herb	Native
Piptocoma antillana		Antilles velvet shrub	Shrub	Endemic to PR
Pluchea carolinensis	Salvia	Sweet scent	Shrub	Native
Poitea florida	Retama, San José	Wattapana	Shrub	Native
Poitea punicea	Caracolillo		Shrub	Native
Psychotria nervosa	Bálsamo		Shrub	Native
Rauvolfia viridis		Bitter bush	Shrub	Native
Renealmia jamaicensis var. puberula	Narciso colorado		Herb	Endemic to Greater Antilles
Rondeletia inermis	Cordobancillo		Shrub	Endemic to PR
Samyda dodecandra	Guayabilla		Shrub	Native
Scaevola plumieri	Borbón, Coralillo	Inkberry	Shrub	Native
Schaefferia frutescens	Cadeíllo, Jibá	Florida box wood	Shrub	Native
Senna polyphylla	Hediondilla, Retama prieta		Shrub	Native
Simarouba tulae	Aceitillo falso		Shrub	Endemic to PR
Suriana marítima	Guitarán, Temporana	Bay cedar	Shrub	Native
Tetrazygia crotonifolia		Hillside clover ash	Shrub	Endemic Greater Antilles / Not in USVI
Tithonia diversifolia	Girasol mexicano, Girasol pequeño	Mexican sunflower	Herb	Naturalized
Tournefortia filiflora	Nigua		Shrub	Endemic to West Indies
Verbesina alata	Capitaneja, Manzanilla cimarrona		Herb	Endemic to West Indies
Waltheria indica	Basora prieta, Malvavisco	Marsh Mallow	Shrub	Native
Wedelia calycina *(Wedelia lanceolata)*	Margarita de las rocas		Shrub	Native

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