Louisiana Roadside Wildflower Establishment & Management Guidelines

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Objectives of the Wildflower Manual

1. To train LaDOTD personnel for Louisiana wildflower identification, to list the wildflower sites locations, to coordinate roadside vegetation management, and to educate everyone involved about roadside safety.

2. To document wildflower remnant sites that we have identified in the region.

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Chapter 1

Introduction to Wildflowers

Enhancement of highways, scenic byways, and welcome centers across the state of Louisiana is critical for tourism and eventual economic development of the state. Managing roadsides and welcome centers require a large amount of taxpayer's money each year. Using native plant materials in highway enhancement and beautification of welcome centers has become a promising alternative to lowering maintenance costs across the United States. Many DOT's are using more plant materials in their highway enhancement and beautification projects across the nation. Wildflower plantings along highways reduce the cost of highway maintenance, enhance soil and water conservation, preserve native species, increase wildlife habitats, and provide roadway beautification. Wildflowers attract tourists and promote economic growth.

Louisiana is blessed with a large number of beautiful wildflower plant species in its rural landscape. With modern development, land-use change, and the invasion by foreign plant species, the natural seed bank of Louisiana wildflower plants has diminished to remnants and may collapse or be lost in the future if some remedial measures are not taken immediately.

In order to identify wildflower remnants, collect and multiply wildflower seeds, and enhance highways in Louisiana, we have started a collaborative project for a wildflower seed bank, highway beautification, and tourism promotion in Louisiana. This project is a joint venture between the Louisiana Department of Transportation and Development (LaDOTD), the University of Louisiana at Lafayette (UL Lafayette), the University of Louisiana at Monroe (UL Monroe), and Southeastern Louisiana University (SLU) at Hammond, conjunction with various stakeholders including the Department of Culture and Tourism, USDA-NRCS, DNR and other volunteer organizations.

Several accessions to native wildflower seed collections have been accomplished, and seed increase plots have been established at UL Lafayette Cade Farm and UL Monroe Johnson Farm. Highway enhancement has been accomplished by planting native Louisiana wildflowers in the medians, and investigations on wildflower planting, germination, harvesting, processing, and seed storage have been initiated across the state.

This manual contains information and knowledge obtained from field experiences and observations, research efforts, and other sources in relation to Louisiana wildflowers and highway enhancement. We hope this manual will be very helpful for LaDOTD highway maintenance crews, LaDOTD personnel, researchers, and other individuals.

Chapter 2

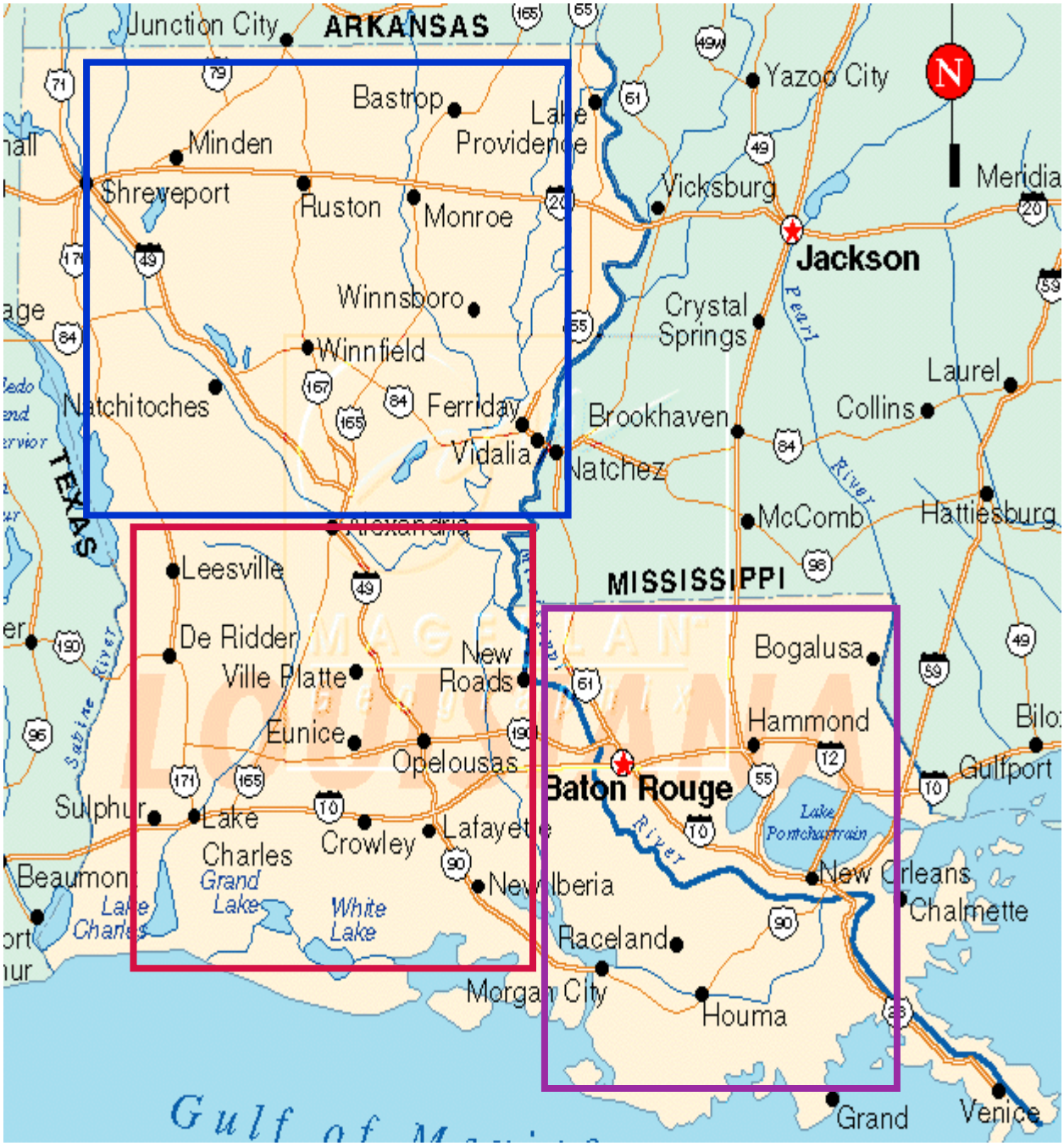
Plant Identification

The purpose of this section is to provide the Roadside Coordinator with basic plant identification techniques. When looking for a new site, a potential roadside wildflower site may be missed as a candidate, simply because the site was not in flower. It is easier to find native plants if one can identify them throughout their different stages of growth. If one is aware of when a particular wildflower blooms, the time to seek them out can be efficiently scheduled. Other important information gathered in plant identification is: presence of invasive weed species, flower color [visibility], blooming height, growth habit, and preferred habitat.

Plant identification is a valuable tool. When surveying roadsides for potential wildflower sites, a trained eye can spot valuable native wildflowers as well as potential noxious weeds. Noxious weeds are weeds which are very difficult to eradicate and one does not want these in wildflower sites. Grasses and sedges are in a different class than showy wildflowers and are a little easier to manage with chemicals. Broadleaf weeds are a little more difficult to manage chemically due to their closer taxonomic relationship to showy wildflowers.

This chapter will address the recognition of plants and not keying out of plants for identification. Our limited number of plants allows us to do this rather than learning a new vocabulary to key out plants with a plant, probably dichotomous, taxonomic key. The wildflowers on this project are limited to the twelve selected species and according to the eco-regions (Fig. 1).

Figure 1. Louisiana separated into 3 eco-regions as indicated on map.



The twelve species are the following:

Coreopsis lanceolata (Compositae)

Coreopsis tinctoria (Compositae)

Echinacea purpurea (Asteraceae)

Gaillardia pulchella (Asteraceae)

Liatris pycnostachya (Asteraceae)

Penstemon digitalis (Scrophulariaceae)

Ratibida pinnata (Asteraceae)

Rudbeckia amplexicaulis (Asteraceae)

Rudbeckia grandiflora (Asteraceae)

Rudbeckia hirta (Asteraceae)

Rudbeckia subtomentosa (Asteraceae)

Ruellia sp. (Acanthaceae)

Plant identification will be based on photographs in the seedling, growing, and mature stages of growth.

Coreopsis lanceolata

Photo credit Larry Allain

Seedling

Photo Credit Tom Sasek

Single Flower

Photo Credit Tom Sasek

Roadside Setting

Coreopsis lanceolata (Compositae)
Common name Lance Leaf Tick.
1 to 2 1/2 ft. tall.
Clumps and forms large colonies.
Annual which reseeds.
Sun to partial shade, shade.
Soils from sand to clay.
Acid to basic soil.

Coreopsis tinctoria

Photo credit Colette Anzalone

Seedling

Photo credit Tom Sasek

Single Flower

Photo credit Tom Sasek

Roadside Setting

Coreopsis tinctoria (Compositae)

Slender 1-2 ft. annual.

Widespread in the south.

Distributed in dry area to moist ditches.

Sun to partial shade.

Echinacea purpurea

Photo Credit Kristy Thompson

Seedling

Photo Credit Tom Sasek

Single Flower

Rudbeckia hirta

Photo Credit Kristy Thompson

Seedling

Photo Credit Tom Sasek

Single Flower

Gallardia pulchella

Photo Credit Kristy Thompson

Seedling

Photo Credit Tom Sasek

Single Flower

Liatris pychnostachya

Photo Credit Kristy Thompson

Seedling

Photo Credit Tom Sasek

Single Flower

Liatris spicata

Photo credit Kristy Thompson

Seedling

Photo Credit Tom Sasek

Single Flower

Photo Credit Tom Sasek

Roadside Setting

Liatris spicata (Asteraceae)

Prairie Blazing Star.

2 to 5 ft. plant and half is flower stalk.

Unique feature is flowers bloom from top of spike downward.

Penstemon digitalis

Photo Credit Larry Allain

Seedling

Photo Credit Tom Sasek

Single Flower

Ruellia pedunculata

Photo Credit Colette Anzalone

Seedling

Photo Credit Colette Anzalone

Single Flower

Rudbeckia amplexicaulis

Photo credit Kristy Thompson

Seedling

Photo credit Colette Anzalone

Single Flower

Photo credit Mark Simon

Roadside Setting

Rudbeckia amplexicaulis (Asteraceae)

or Dracopis amplexicaulis

Clasping Leaf Coneflower.

Rough coneflower.

2 1/2 to 5 ft. tall and may form colonies.

Perennial herb.

Sun, very drought tolerant.

Reseeds very easily.

Rudbeckia grandiflora

Photo Credit Tom Sasek

Seedling

Photo Credit Tom Sasek

Single Flower

Photo Credit Tom Sasek

Roadside Setting

Rudbeckia grandiflora (Asteraceae)

Clasping Leaf Coneflower.

Rough coneflower.

2 1/2 to 5 ft. tall and may form colonies.

Perennial herb.

Sun, very drought tolerant.

Reseeds very easily.

Figure 2. Season of bloom for selected wildflower species evaluated by personnel at UL Monroe, in north Louisiana.

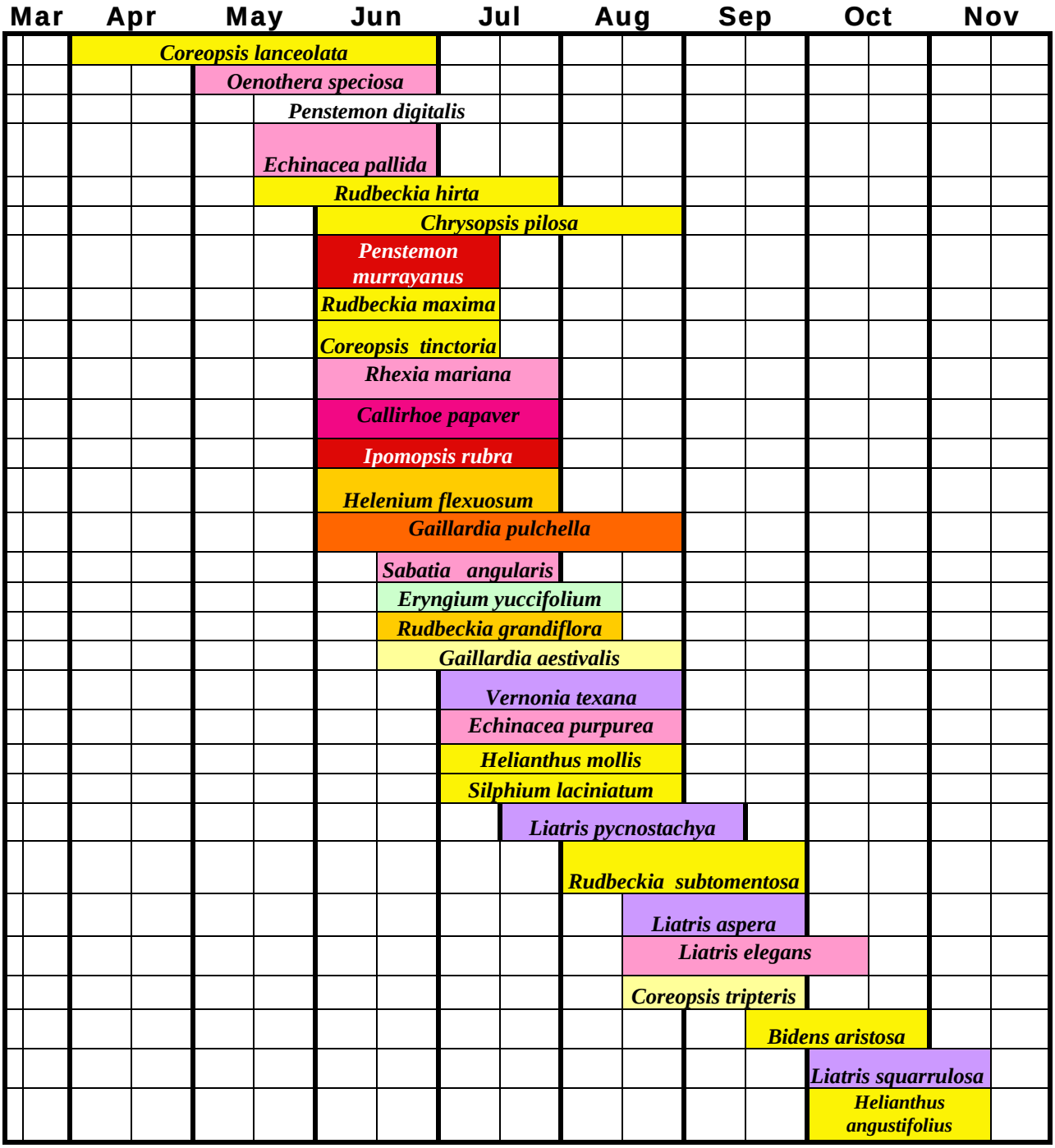


Figure 3. Blooming period of select wildflowers in southwestern Louisiana.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Blooming Period											
Clasping Leaf Coneflower Dracopsis amplexicaulis			XXX	XXX	XXXXX	XXXX						
Plains Coreopsis Coreopsis tinctoria				XXX	XXXXX	XXXX						
Evening Primrose			XXX	XXX	XXXXX	XXXX	XXXX					
Yellow Top	XXXX	XXX	XXX									XXX

Chapter 3

Roadside Planting of Wildflowers

Site Selection

The purpose of this section is to equip the Roadside Coordinator with the basic tools to select a wildflower planting site, conduct a plant inventory, and identify roadside plants. This information is crucial in determining whether or not the site should be planted with seed. In some cases, site assessment could indicate the presence of a significant population of native and [possibly] non-native plants. Basic plant identification and inventory skills are necessary in site selection.

There are many factors to be considered in the selection of a roadside native site where selected native plants/wildflowers will grow and reproduce. Among them, the first and the foremost is roadside safety. The second important factor to be considered is the future development such as road extension, broadening of the road and setting up an intersection of the roadway. Additional factors to be considered include ecological region, soil type, grade, etc.

Bare ground areas at recently constructed sites are less complex. Considerations are for the prevention of soil erosion and putting the right plants in the right places. Grassy sites require management practices that address the health of existing grasses [to prevent erosion] and simultaneously establish native roadside wildflower stands.

Plant identification and **plant inventories** are combined tasks since one needs to know plant species to accurately estimate their populations and coverage. A device referred to as a quarter meter throw ring (a square or 25 cm diameter ring) can be employed in the inventory task involving seedling counts. The throw ring is 25 centimeters by 25 centimeters consisting of four elbows and four 25 centimeter lengths of PVC pipe. It can be thrown randomly across a site to determine plant populations. When plants are at a mature stage they can be identified and populations estimated without the use of this device.

Soil sample collections and analysis determines the soils physical and chemical properties including soil texture, soil reaction [pH], and the available nutrients in the soil. Soil sampling and analysis helps in determining soil behavior affecting soil moisture and root development.

Topography is important as slopes tend to be dry and slope bottoms wet.

Whether to enhance or plant? Once an inventory is complete the decision to enhance or plant can be determined based on the field data.

There may be significant populations of native plants and possibly some "naturalized" plants appropriate for roadside planting that could be enhanced through management plans and maintenance practices.

There are essentially three locations where roadside wildflower sites may be established. They are the roadway medians, shoulders, and interchanges. Safety relating to sight distance issues, and mower and equipment accessibility must be considered.

Table 1. Plant identification and roadside inventory form.

Plant identification and roadside inventory form					
Site	Location	Plant ID	Topography	Soil	Enhance or plant
1					
2					
3					

Site Preparation

The purpose of this section is to provide a basic knowledge of the tools and techniques applied in roadside preparation operations.

Site selection should be agreed upon based on factors discussed in the previous section. Site preparation operations are scheduled prior to the seed planting date. Some preparations may begin months before the seed is actually planted. Factors such as soil type, weather conditions, seed dormancy, the presence of vegetation that prevents the seed germination, and early seedling development must all be taken into account and addressed before site preparation.

Soil Types

- Texture [Drainage and compaction affect root development.]
- Soil pH [Can the plant thrive in a given soil pH?]

Invasive Plants that Compete with Native Wildflowers

- Native grass plants
- Broadleaf plants
- Noxious invasive weeds

Seed Dormancy

- Many wildflower seed species require a period of dormancy before germination.

Pre-planting site preparations may require chemical applications and/or cultural practices such as:

- Herbicide applications
- Scheduled mowing
- Seedbed cultivation
- Thatch removal [based on the depth of existing thatch]
- Plot renovation to improve seed/soil contact [the use of disk or harrow to disturb the earth in a limited manner, usually less than two inches.]

Table 2. Chemical application plan matrix.

Chemical Application Plan Matrix					
Date	GPS Location	Target Plant Species	Chemical	Application Rate	Desired Result

Planting of Wildflowers

Obtaining the highest quality of native wildflower seeds is essential when planning the establishment of a roadside enhancement site. Large selections of seeds are available from seed companies nationwide; however, local seed sources should be used whenever possible. Louisiana ecotypes of wildflower species that are obtained from Louisiana stands will be more easily adaptable to the region being planted and therefore will grow best.

Photo Credit Mark Simon

Figure 4.
Typical drill planters will effectively plant wildflower seeds into existing living sod cover. Grass height must be lower than 10 inches to allow for natural decay of leaf clippings over winter.

Wildflower seeds may be planted in either the fall or the spring. When planting in the spring, a well prepared seedbed is generally required due to the grass competition at that time of year. Spring plantings in a prepared seedbed allows for immediate germination and subsequent growth. Spring plantings can also be accomplished by planting directly into existing sod. In this case, grasses will be sprouting in early spring and may easily out-compete with the wildflower seedlings. If spring planting into existing sod is chosen, spraying with a non-selective herbicide weeks in advance of drilling is suggested.

Fall plantings are generally incorporated into existing sod with a drill-type planter. Seeds are sown under the leaf clippings and will germinate when conditions become favorable. Problems associated with each of the planting times have been related to the removal of excessive grasses and weeds throughout the process. Seedlings will not thrive under excessive weed pressure. Fall and spring plantings may be sown by hand or with a broadcast-type seeder. Hydro-seeding may be done at any time of the year.

Planting dates and rates vary with species. *Coreopsis tinctoria* (Tickseed) and *Dracopis amplexicaulis* (Coneflower) may be seeded in the late fall. Summer annual grasses such as bahiagrass and bermudagrass will be going dormant in December. In highway medians it is good to plant into the sod with a drill planter prior to the last scheduled highway mowing. This will allow the seeds to be placed at ground level and then covered with leaf clippings from the mowing. A planting depth of 1/8 inch, or less, is ideal.

It is critical that the seed have ground contact otherwise it will not germinate. It is not necessary to cover the seed with soil. Hand spreading of wildflower seeds at higher seeding rates (4 to 6 pounds per acre), prior to the last mowing, will result in adequate stands of wildflowers. As leaf clippings deteriorate over time, seeds will begin to germinate. Seeding rates of 2 to 4 pounds per acre have yielded good results under optimum conditions. Optimum conditions for planting wildflower seeds for roadside establishment are well documented. Seeds will not germinate until ground temperatures are adequate.

Fall Planting

Planning for the fall plantings will require removal of excessive thatch from the plots. Spraying with a non-selective herbicide will eliminate all vegetation from the site. Spraying with a selective herbicide will suppress competitive grasses from the site. These steps must be performed days, or even weeks prior to planting, depending on herbicide selection.

Too much leaf clippings and vegetation which are left in the median from the mowing will delay, or may even prevent, the wildflower seeds from germinating. It is best to reduce the grass canopy to a height of 10 inches or less in the fall. This will allow for some deterioration over winter and allow sunlight to penetrate in the early spring, thus allowing the soil to warm up and wildflower seeds to germinate. In addition, adequate moisture levels must be present for successful germination.

Spring Planting

Planning for a spring planting will require considerably more soil preparation and considerably more attention to detail than for fall. Seeds must be planted in a prepared seedbed.

The soil must be tilled to remove grasses and expose bare soil. Disturbing the soil will inevitably expose weed seeds to the plot. Weed seeds that are dormant will be exposed to the same ideal planting conditions that are intended for wildflowers, thus, they will out-compete with wildflower seedlings.

There are no pre-emergence herbicides labeled for establishment of wildflowers; therefore, selective spraying becomes critical for successful establishment of wildflower stands that are planted in the spring. Some of the herbicides that can be applied in the spring include Select, Fusilade, and Poast.

Photo Credit Glen Comeaux

Figure 5.
Boom type spray rigs for herbicide application help in controlling weeds in wildflower plots.

Herbicide applications prior to planting may accelerate the process of leaf clippings removal and encourage early germination of seeds. Careful analysis of the spraying regime, the time of planting, expected weather extremes, and the erosion potential for each enhancement site, may render herbicide applications useless.

Photo Credit Mark Simon

Figure 6.
Varying conditions such as temperature, sunlight, and moisture will determine when the wildflower seeds germinate.

After roadside safety the next most crucial factor is planting date. Each specie grows at its optimum depending on the time of planting and often the site must be prepared well in advance. Once the planting date is set, plans should be made for pre -and post- planting operations.

Hand or machine broadcasting throws seed in an arch and some overlap ensures an even distribution of seed. The seed may be mixed with an inert ingredient such as sand, rice hulls, or fertilizer to dilute small seed for better spreading and distribution. Possibly a crop oil [as a sticking agent] could be sprayed over the seed and spreading medium to improve the dilution of the seed in the mix.

Field Note: 12' [width of broadcast arch] x 3630' [length of roadside] = 43,560 sq. ft. [1 acre]

Table 3. Seed Planting Guide Matrix.

Seed Planting Guide Matrix: Hand or Machine Broadcasting		
Seed Specie	No. Seed Per Pound	Broadcast Rate [lb/acre]

Hydroseeding/mulching employs a seed blower and a tank mix of water. Seed, and possibly a mulching material, are incorporated and blown onto the surface of a prepared seedbed. This technique is especially good when applying seed mixes on a prepared seed bed surface.

Field note: 1 acre = 43,560 sq. ft.

Table 4. Seed Planting Guide Matrix: Hydroseeding/Mulching.

Seed Planting Guide Matrix: Hydroseeding/Mulching		
Seed Specie	No. Seed Per Pound	Broadcast Rate [lb/acre]

Seed drills are towed tractor attachments that cut small trenches of earth at a given depth and insert seed into soil from hoppers. **Planting depth** is important when a seed drill is utilized at the planting site. Each plant specie has a suggested planting depth.

Field Note: 12' [Width seed drill] x 3630' [length of roadside] = 43,560 sq. ft. [1 acre]

Table 5. Seed Planting Guide Matrix: Seed Drills.

Seed Planting Guide Matrix: Seed Drills			
Seed Specie	No. Seed Per Pound	Seeding Rate [lb/acre]	Planting Depth

Table 6. Seed Planting Project Guide.

Seed Planting Project Guide	
Location:	
Plant Specie:	
Project Size: [Square feet/acre]	
Application Rate: [Pounds/acre]	
Establishment Technique: • Hand Broadcast • Machine Broadcast • Seed Drill [establish planting depth] • Hydroseeding	
Cost Estimate: [seed, equipment, fuel, chemicals, labor]	
Start Date: • Optimum seed germination date established. • Site preparation scheduled.	
Completion Date: • Initial maintenance scheduled.	
Expectations: • Time required for plants to achieve desired goal. [Years] • Estimated average lifespan of stand.	

The next section will include initial maintenance needs which require greater energy input in the first three years. Be very familiar with maintenance needs as those needs must be managed in a most timely fashion to ensure the success of the planting project.

The decision to enhance a site is determined by the plant specie and population of each specie. Site enhancement is largely dependent on the development of a management plan that guides maintenance operations. These issues will be covered in Roadside Site Management.

Recommendations for Herbicide Use

1. Bed Selection: Select sites known to have relatively low infestations of winter annual broadleaf weeds, such as chickweed, henbit, wild mustard, wild radish, Virginia pepperweed, and shepherd's purse. Avoid sites known to be infested with vetch or white clover unless a wildflower specie tolerant of Transline® will be planted. Avoid sites known to have curly dock.

2. Site Preparation: Thoroughly kill all established weeds before planting. If the bed contains considerable weed growth, the weeds should be killed well ahead of the bed preparation to allow time for vegetation to decompose. Glyphosate is a good choice to kill weeds.

3. Herbicide options are specie(s) specific. Select a specie of wildflower tolerant to one of the herbicides or herbicide combinations (Tables 7a, 7b, 8a, 8b). In most cases, Pendulum® plus Pennant Magnum® is preferred.

4. Accurately calibrate the sprayer. Avoid overlaps (double rates) when applying.

5. Apply the herbicide prior to seeding and incorporate as shallow and uniform as possible. Use a field cultivator with S-tines and baskets, or a power-driven tiller. If a field cultivator is used, one to two passes are recommended. Disks are not recommended for incorporation.

6. After seeding the wildflowers, control grassy weeds with post-emergence applications of Vantage (2.25 pt) or Envoy (17 fl oz). The predominant grassy specie will be Italian ryegrass. Apply when the ryegrass is short (less than 3 inches), usually in December or January. Avoid applying after a cold snap until about the fourth day.

7. After an annual wildflower specie blooms, do not allow weeds to produce seed. Avoid seed production by mowing the site followed by tilling. If the site is erodable, mow, then allow the weeds to grow again to about 6 inches and apply glyphosate. Beds with significant infestations of perennial species, especially curly dock, should be sacrificed to get the dock under control. Repeated tillage or multiple applications of glyphosate should be considered to control curly dock.

Table 7a. Suitability of herbicides applied pre-plant incorporated when establishing wildflowers.

Herbcide	Rate/ Acre	Corn Poppy	Californ-ia Poppy	Lance-leaved Coreo-psis	Plains Coreo-psis	Dames Rocket	Baby Blue Eyes	Wall - flower	Ox-eye Daisy	Black-eyed Susan	Sweet William	Batchelor Button	Catch fly
Pendulum	1.6 pt	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Pennant	1 pt	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Pendulum + Pennant	1.6 pt + 1 pt	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No
Plateau	2 fl oz	Yes	Yes	No	No	No	Yes	No	Yes	Yes	No	No	No
Enduance	1.0 lb	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No

Table 7b. Suitability of herbicides applied pre-plant incorporated when establishing wildflowers. Note: Rate change of Pendulum.

Herbicide	Rate/Acre	Rocket Larkspur	Toadflax	Bird's Eye	Shasta Daisy	Gloriosa Daisy	Clasping Leaf Coneflower	Mountain Garland
Pendulum	1 pt	Trial use only	Yes	No	Trial use only	Yes	Trial use only	No
Pennant	1 pt	Trial use only	Yes	Yes	Trial use only	Trial use only	Trial use only	No
Pendulum + Pennant	1 pt + 1 pt	Trial use only	No	No	Trial use only	Trial use only	Trial use only	No
Plateau	2 fl oz	No	No	Yes	Trial use only	No	No	No

Table 8a. Suitability of herbicides applied post emergent when establishing wildflowers. Note: Weeds must be less than 4 inches.

Herbicide	**Rate/ Acre**	**Adjuvant**	**Toad flax**	**Bird's Eye**	**Sweet Willm**	**Catch fly**	**Rocket Lark-spur**	**Plains Coreop-sis**	**Dame's Rocket**	**Baby Blue Eyes**	**Wall Flower**	**Mixed/ Corn Poppy**
Transline	4 oz	Surfactant	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Basagran	2 pt	Crop Oil	No	Yes	No	No	Yes	Yes	No	No	No	Yes
Quicksilver	1 oz	Surfactant						Trial Use Only	Trial Use Only			Trial Use Only

Table 8b. Suitability of herbicides applied pre-plant (sprayed on the surface of the soils) /pre-plant (mixed into the surface of the soils) when establishing *Cosmos* sp.

Herbicide	**Rate/Acre**	**Cosmos *bipinnatus***	**Sulpur Cosmos**	**Dwarf Cosmos**
Pendulum + Pennant	1-2 qt + 1-2 pt	Yes	Yes	Yes

Chapter 4

Roadside Vegetation Management

Herbicide applications for broadleaf weed control should be applied soon after the wildflower seeds have fallen. Once seedlings have germinated, it is generally too late to apply herbicides to control broadleaf weeds. This means that an application of broadleaf herbicide may be necessary in August and /or October. Broadleaf herbicide applications will not harm grass stands within a plot. In fact, a grass stand of bermudagrass, or other low-growing grass will benefit the plot as a ground cover until the spring.

Beginning in February and again in April, it may be necessary to apply herbicides to control bahiagrass, bermudagrass, annual ryegrass, or other grasses, to allow germination and growth of the desired wildflower species. Herbicide applications of Select, Fusilade, Poast, or other labeled grass herbicide products will suppress the growth of undesirable grasses until the wildflower seedlings have enough time to form a canopy above the grass base.

Mowing is essential to controlling weeds in wildflower stands. Regularly scheduled mowing may be required until the wildflower plants are 12 to 15 inches tall. Mowing heights are determined by the nature of specific wildflower species. Low growing species may be mowed shorter than tall growing species. Depending on the wildflower species, mowing until May 15th is beneficial to control weeds, allowing the wildflower seedlings to tiller out set lateral buds, and allowing the wildflower seedlings to canopy above the grasses at an optimum time in the season. Highway mowing protocols may require that mowing be delayed until after blooming and re-seeding of annual wildflowers.

The purpose of this section is to suggest management plans that schedule [timing] and specify maintenance tasks applied to roadside wildflower care. Early maintenance practices are crucial to the success of wildflower plantings and enhancement of existing native plants. Some factors that could contribute to less than successful plant projects are poor weather conditions, poor mowing practices, and poor weed control. The chances for success are greatly improved when a well thought out management plan is established, and the maintenance tasks are executed in a timely fashion as specified.

Table 9. Native Plant Enhancement Plan.

Mowing Schedule for Mature Seed Distribution Matrix				
DOTD District and Parish	Road ID	GPS Location/ Boundaries	Plant Species	Seed Maturity Mow Date

Soil Disruption Methods

- Disk shallow furrows.
- Dethatch prior to seed maturity.

Site Establishment Management Plan

- Eliminate invasive and noxious vegetation.
- ID the site with markers [GPS boundary map, contractor Standard Operating Procedure (SOP), etc.].

Chapter 5

Wildflower Harvesting, Processing, and Storage

Harvesting

In general, the blooming season of a wildflower species is several weeks to several months. Optimum weather conditions will yield optimum seeds for perpetuation of wildflower stands. It is important to remember that because of the long blooming period, there will be significant amounts of seed left in the field. This will ensure that ample amounts of seed are present on the site for natural re-planting of the existing wildflower stands.

Figure 7.
The optimum time of harvesting for the maximum seeds from a wildflower plot is when the percent of ripe seed is seventy percent (70%). This is determined by inspecting several seed pods while they are still attached to the stem during the blooming period.

Photo Credit Mark Simon

Inspection of seed must be done regularly during the blooming season in order to determine the best time to harvest them. Count out ten (10) seed pods from the same plant. Run the pods through your fingers to break open the pods into your hand. Some of the pods will be too dry and brittle, with no seeds present, while other pods will be too soft and green.

It is essential to allow the morning dew to evaporate from the plant before attempting to harvest. Seed strippers do not perform well when seeds, pods, and stems are wet. They stick to the harvesting equipment and do not flow adequately into the seed hopper. Seeds may be harvested by hand with pruning shears, or with hand-held clippers. Simply cut all of the plant tops, including the seed pods, and place the clippings into a nylon bag for transport.

Photo Credit Glean Comeaux

Figure 8.
These collections need to be removed from the bag, then dried and sorted prior to planting. Seed dormancy requirements may be up to twelve (12) weeks.

Photo Credit Mark Simon

Figure 9.
Other types of harvesters include the hand-held seed stripper and the pull-type seed stripper.

Figure 10.
Mechanical pull-type seed strippers are designed to harvest large plots of wildflowers.

Photo Credit Jim Foret

Harvest widths of four and six feet will harvest up to one acre per hour. The limiting factor with these types of harvesters is the downtime required to empty the hopper. The typical harvest amount from a one acre wildflower seed plot is ten to fifteen hoppers. One hopper full will fill a large leaf bag (3 ft. x 5 ft.). The volume of one hopper is 15 cu. ft.

Summer days in Louisiana are hot and humid during the months of June, July, and August. Heat indices of 100 degrees, or more, make harvesting wildflower seeds a legitimate health hazard. A long-sleeved shirt, long pants, socks, closed-toe shoes, a dust mask, and a large-brimmed hat should be worn while in the field. Also, sunscreen application and plenty of drinking water are essential.

Figure 11.
Proper safety equipment such as Personal Protective Equipment (PPE) and a dust mask are necessary for wildflower seed harvesting, cleaning, and processing. Adequate ventilation within the processing facility is essential so that dust from the processing of seeds is vented from the work space.

Photo Credit Mark Simon

Bulk materials that have been harvested must be cleaned of stems, leaves, and pods. This process is best accomplished under climate controlled conditions. Air conditioned room space is ideal; however, any clean, dry, and smooth surface area that is protected from the elements will suffice. The critical idea is to encourage natural desiccation of the seed pods in order that the seeds be released.

Figure 12.
The drying surface must be of nonpermeable materials such as concrete, tarp, plastic, blanket, or other similar product. Drying seeds directly on a dirt floor will not work. Seeds must be allowed to separate from the pods and then fall onto a collection surface. Moisture must not be allowed to collect near the drying space.

Photo Credit Mark Simon

Processing

The processing of seeds can be categorized into four steps: threshing, sorting, sifting, and screening. These steps are critical to obtaining quality pure seeds.
Seed materials which have been harvested must be reduced to as nearly a pure state as possible by detailed processing techniques. Pure seeds are preferred when using mechanical planters to establish roadsides and wildflower seed plots because they typically flow well through various types of seeders.

The entire process of threshing, sorting, sifting, and screening could take from 10 days to 3 months, depending on the type of seeds being collected, the drying conditions, and the facility limitations. It is important to remember that the faster the drying time, the higher the quality of seeds produced. Any delay in the drying process could allow fungi or mold to build up which could cause decay in the seeds.

Threshing

This first step takes the bulkiest material from the seed harvesting process and breaks the sticks, stems, and seed pods within the pile. Daily threshing from the first day of collection is very important due to the moisture content of the freshly harvested material. Typical plant moisture content may be as much as seventy percent. Large air- circulating fans positioned near the pile of material helps to remove moisture.

Photo Credit Glen Comeaux

Figure 13.
Regular threshing of the seed materials with a pitchfork will aerate the pile and allow moisture to escape.

Using a flat shovel to beat the stems will accelerate the release of the seeds from the pods. The process of threshing should be continued until the pile reaches a dry brittle state (less than 10% moisture). When this stage is reached, most of the seed will have been separated from the plants and will have fallen to the floor. Then the sorting of seed from chaff can begin.

Sorting

Sorting allows for the separation of stems, leaves, and some seed pods from the pile. Small seeds are allowed to fall through the stems onto the floor. Large bulky materials such as stems and leaves are collected in barrels and are used in the planting process. A small portion of the seeds will not sort to the floor level during the threshing. If they are planted they may germinate; therefore, any seeds and bulk materials that are discarded through the process of sorting are returned to the roadsides and/or production plots.

Figure 14.
The process of sorting is performed with pitchforks and barrels through the constant separation of smaller seed materials through the tines of the pitchfork while threshing.

Photo Credit Mark Simon

Sifting

Sifting takes the seed portion of the sorted materials and removes smaller stems by shaking and rubbing the pile over a ½ inch or ¼ inch hardware cloth. Limited raking over the porous surface will allow small particles to fall into a bucket or hopper. Too much raking will surely force all of the material through the holes. Rake only a few times back and forth to allow for small particles to fall through.

Screening

Screening is the most delicate of all tasks performed during seed processing. Once the seed materials reach a particle size that will flow through the sifting hopper, it may be mechanically screened. The mechanical process will separate seed materials into 4 or 5 different grades. Heavy seeds will be separated through various sized screens and the lighter seeds will simply be blown through the machine onto the floor behind the machine. It is not mandatory to screen seed materials through a mechanical screener. Hand screening of smaller volumes will yield good results.

Figure 15.
Small square hand test screener.

Photo Credit Mark Simon

Figure 16.
Eclipse 324 mechanical seed cleaner.

Photo Credit Mark Simon

Seed materials that have been screened by hand will comprise of greater than fifty percent seeds, and the remaining chaff will make up the bulk of the planting material. Hand spreading of this blend of seed and chaff will yield favorable stands of wildflowers.

Figure 17.
Screening techniques.

Photo Credit Mark Simon

Packaging

Good quality seed that has been harvested and processed should have an accompanying label/tag quantifying the amount of 'Pure Live Seed' contained in the package. The seed purity and date of harvest should also be noted.

Storage

Processed seeds must be stored under dry, cool conditions until the time of planting. Seeds will retain approximately 8% moisture when completely dried. If not properly stored, seeds will readily absorb moisture from the atmosphere.

Note: In the Seed Bank at the UL Lafayette Research Farm in Cade we are storing seed from the wildflowers *Coreopsis tinctoria*, and *Dracopsis amplexicaulis*. No reduction of germination effectiveness has been observed using this protocol.

Short term storage (less than one year):
Store in a dry and air conditioned room. Small mesh bags, 12" x 24", will normally hold about 10 lbs of seed.

Intermediate term storage (1-5 years**):**
Store in a cooler between 45° and 35°F. The cooler should be dehumidified to 50 to 60% percent relative humidity.

Long term storage (5-100 years):
Store in a freezer after reducing moisture content to 10% or less. Seal in a mylar bag that has been evacuated of all air. The temperature should be maintained at 0°F. This type of storage is appropriate for preservation of samples of remnant populations collected from native sites, and in other special cases.

Photo Credit Mark Simon

Figure 18. Cold Storage unit for long term storage.

Chapter 6

Roadside Safety

The high speed and volume of moving traffic on major highways puts workers planting wildflowers in a very precarious position and at a high risk of injury unless every precaution is taken. Obviously, a tractor and drill combination unit will be slow to cross the highway while traveling from one plant site to another. Traffic speeds of 70 mph do not allow much room for error when crossing a highway with slow moving equipment in tow. This has been a big problem in the past. Flagmen will be necessary to forewarn oncoming traffic of slow moving equipment ahead. Besides flagmen, road signs must be put in place to warn travelers of workers ahead. Sometimes even with adequate signs, lights, cones, flagmen, and other safety precautions in place, some drivers choose not to obey the caution signs and don't slow down. This makes for a very dangerous situation.

While in the median, equipment moving and planting operations are not a problem; however, on narrow sections of median, the speed of the traffic will cause concern for personal safety. Most planting of highway medians is accomplished during a regular work week when traffic is at its peak; however, planting on weekends is usually not very feasible.

Below is the LaDOTD right-of-way worker safety outline received from LaDOTD Safety Department.

LaDOTD right-of-way worker safety outline

I. Recommended Personal Protective Equipment:

A. Safety Vest
B. Plastic dot gloves
C. Safety glasses
D. Insect repellent
E. Water cooler/ice
F. Hats/caps
G. Long sleeve shirts
H. Closed–toe shoes
I. First Aid kit

II. Other Equipment Required:

A. Trash Bags
B. Ear Plugs
C. Duct tape
D. Lens wipes
E. Splinting material (newspaper, triangular bandage etc.)
F. Dry towels
G. Wet wipes
H. Nitrile gloves

III. Signs Required:

A. Warning signs with legend "MEN WORKING" or "ROAD WORK AHEAD"
B. Crash truck (DOTD) may be necessary in higher traffic zones while planting wildflowers in Highway medians.

IV. Recommended Safety Procedures:

A. Review work area protection procedures and traffic control requirements.
B. Park vehicles away from the work site and provide for safe entry and exit.
C. Always try to face oncoming traffic.
D. Use the required or recommended PPE.
E. Beware of hidden obstructions in grassy areas or uneven terrain.
F. Properly identify materials or objects before handling.
G. Allow ample space between workers. Don't bunch –up.
H. Have an adequate supply of water and watch for signs of heat exhaustion or heat stroke.
I. Caution volunteers not to cross the road while working.
J. Use correct lifting techniques.
K. Discourage any foolishness (horseplay) on the work site.

V. Record and map out flower planting areas accurately.

Note to DOTD

1. A card covering the intent of the Department explaining public safety, vegetation management, and wildflower conservation along with a contact number would be helpful.

2. According to **Mary Courville**

A situation may arise from either mis-information or lack of information. To satisfy requests or complaints about specific vegetation management and/or wildflower conservation, contact personnel should be listed for quick reference.

Chapter 7

Wildflower Distribution in Louisiana

The purpose of this section is to provide LaDOTD Roadside Coordinators with a current listing of wildflower sites across the state (Table 10). The sites are listed according to district and parish state roads, plant species, and blooming times. This information can also be distributed at welcome centers and can be displayed on the LaDOTD website. This listing should be updated as new information is obtained.

In addition of the benefit to tourists, this section can provide coordinators and planners with a reference source to aid in the further development of additional wildflower sites for maximum effect in strategic locations.

Table 10. Identified remnant sites for the select Louisiana wildflowers, and the drainage and shade characteristics of the locations.

Location Lat/Long	Wildflower Species (see pg 58)	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
La 15 S Chase 32^{O} 05' 19.5" N 91^{O} 41' 58.3" W	COTI	Moderate	Sun	May/Jun	Yes	2004
MSAC 30^{O} 05' 08.2" N 91^{O} 52' 2" W	DRAM Increase	Excellent	Sun	May/Jun	Yes	2004
La 31 N at Iberia Parish line 30^{O} 18' 0.6" N 92^{O} 02' 58.3" W	RUPE	Excellent	Sun	Jun/Oct	Yes	2005
La 121 W Lacamp to La 112 W Forest Hill 131^{O} 08' 06" N 92^{O} 41' 15.9" W	HEAN	Excellent	Sun	Sept/Nov	No	2005
La 82 W Grand Chenier to Ester 29^{O} 45' 26" N 92^{O} 55' 45.3" W	HILA LACA IPSA	Poor Excellent Poor Excellent Good	Sun Sun Sun	Apr/Nov Apr/Nov Apr/Nov	No No No	2006 2006 2006
Grand Chenier 29^{O} 45' 31.5" N 92^{O} 56' 07" W	GAPU	Excellent	Sun	Apr/Nov	No	2006
La94E Lafayette to La347N Breaux Bridge La686N to La31N Leonville to La741N to US190E Tucker to La1N Erwinville to La418N to La15N Simmesport 30^{O} 13' 58.1" N 91^{O} 58' 46.2" W	DRAM COTI	Excellent Excellent	Sun Sun	Apr/Jul Apr/Jul	No No	2006 2006

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
Ferriday at US84W to La28W to Libuse 31^{O} 37’ 48.1” N 91^{O} 33’ 31.4” W	DRAM COTI	Excellent Excellent	Sun Sun	Apr/Jul Apr/Jul	No No	2006 2006
Libuse 31^{O} 21’ 16.2” N 92^{O} 19’ 59.2” W	COLA	Excellent	Sun	Apr/Jul	No	2006
Alex to Forest Hill Via I-49S 31^{O} 13’ 44.2” N 92^{O} 27’ 53.1” W	TRPR OESP	Excellent Excellent	Sun Sun	Mar/Jun Mar/Jun	No No	2006 2006
La105 at Tech Verm Pump, S Melville 30^{O} 34’ 07.7” N 91^{O} 45’ 48.1” W	TRPT MIST	Excellent Excellent	Sun Sun	Apr/Jun Mar/Sep	Yes Yes	2006 2006
Melville 30^{O} 41’ 27.2” N 91^{O} 44’ 22” W	HEAM TRPR DRAM	Good Excellent	Sun Sun	Jun/Nov Jun/Nov Jun/Nov	No No	2006 2006
Mansura to Marksville 31^{O} 13’ 44.2” N 92^{O} 03’ 00.5” W	COTI	Excellent	Sun	Apr/Jul	No	2006
LeCompte 31^{O} 45’ 12.2” N 92^{O} 23’ 5.7” W	RUPE	Excellent	Sun	Apr/Oct	No	2006
US165 to N. Oberlin 30^{O} 13’ 54.8” N 92^{O} 59’ 55.7” W	VETE RHAI COTI DRAM HEAM	Excellent	Sun	Mar/Jul Apr/Sept Apr/Jul Apr/Jul Jun/Until Frost	Yes Yes No No No	2006 2006 2006 2006 2006

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
La182 at US90 Inter 30^{O} 07’ 47.4” N 91^{O} 56’ 36.6” W	OESP	Excellent	Sun	Mar/Jun	No	2006
La182 E Broussard to Cade 30^{O} 07’ 44.9” N 91^{O} 56’ 35” W	DRAM COTI IPSA RUPE OESP	Excellent Excellent	Sun Sun	May/Jun May/Jun Apr/Oct Apr/Oct Apr/Oct	No No No	2006 2006 2006
La14 at La676 30^{O} 18’ 1” N 92^{O} 02’ 58.3” W	RUPE	Excellent	Sun	May/Jun	No	2006
E. Delcambre 29^{O} 56’ 59.2” N 91^{O} 58’ 22.1” W	OESP RUPE	Excellent	Sun	Mar/Jun	No	2006
E. Erath La14 29^{O} 57’ 36.7” N 92^{O} 01’ 25.5” W	HILA COTI	Excellent to Poor	Sun	Apr/Nov	No	2006
W. Erath La14 29^{O} 57’ 47.2” N 92^{O} 02’ 39.7” W	HILA COTI	Excellent to Poor	Sun	Apr/Nov	No	2006
W. Nunez La14 29^{O} 59’ 28.6” N 92^{O} 13’ 30.0” W	RUPE	Excellent	Sun	May/Jun	No	2006
E. Kaplan La14 29^{O} 59’ 30.4” N 92^{O} 15’ 56.3” W	HILA SIGR RUPE	Excellent	Sun	Apr/Nov Apr/Jul May/Jul	No No No	2006 2006 2006

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
W. Kaplan La14 30^{O} 00’ 17.9” N 2^{O} 18’ 34.9” W	HILA SIGR RUPE	Excellent	Sun	Apr/Nov Apr/Jul May/Jul	No No No	2006 2006 2006
W. Kaplan to Holly Rd La14 30^{O} 00’ 24.2” N 92^{O} 19’ 37.1” W	HILA GALI POCO Prairie Remnant	Poor Excellent/Poor	Sun Sun	Apr/Nov Apr/Jun Apr/Nov Apr/Nov	No No No No	2006 2006 2006 2006
Wright 30^{O} 00’ 26.3” N 92^{O} 25’ 43.4” W	GALI	Excellent/Poor	Sun	Apr/Jun	No	2006
N. Sulphur to DeQuincy 30^{O} 17’ 56.2” N 93^{O} 21’ 47.8” W	COTI HILA RUHI	Excellent to Poor	Sun	May/Jun May/Nov Apr/Jul	No No No	2007 2007 2007
Phelps Cor N. DeQuincy 30^{O} 28’ 43.4” N 93^{O} 25’ 53.6” W	VETE RHAI HEAM	Excellent to Poor	Sun	Mar/Jul Apr/Sept Jun/Until Frost	No No No	2007 2007 2007
Phelps to Singer 30^{O} 32’ 36.9” 93^{O} 26’ 08.8” W	LISQ RUHI RHAI HEAM Prairie Rem	Poor/Good Poor/Good Poor/Good	Sun	Jul/Sept Apr/Jul Apr/Sept	No No No	2007 2007 2007
N. Singer 30^{O} 39’ 33.4” N 93^{O} 24’ 40.7” W	RUHI VETE ECPA SIGR HEAM	Excellent Excellent Excellent Excellent	Sun	Apr/Jul Mar/Jul May/Jun Apr/Jul Apr/Jul	No No No No	2007 2007 2007 2007
N. DeRidder Beckwith Christian School 30^{O} 52’ 58.3” N 93^{O} 17’ 05.9” W	VETE COTI RUPE RUHI	Excellent Excellent Excellent Excellent	Sun	Mar/Jul May/Jun Jun/Oct Apr/Jul	No No No No	2007 2007 2007 2007

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
Oberlin to US190 E to La97 to La368 E to Mowata 30^{O} 36’ 31.1” N 92^{O} 46’ 12.9” W	VETE	Excellent	Sun	Mar/Jul	No	2007
Cypress Island to Parks to St. Martinville 30^{O} 11’ 19.5” N 91^{O} 51’ 55.9” W	COTI	Good/Excellent	Sun	Apr/Jul	Yes	2007
I-10 W Lafayette to US165 30^{O} 14’ 55.2” N 92^{O} 02’ 36.7” W	OESP ERPH SEGL	Good/Excellent Good/Excellent Good/Excellent	Sun	Mar/Apr Mar/Apr Mar/Apr	No No No	2007 2007 2007
Carencro La182 at Live Oak School 30^{O} 17’ 06.8” N 92^{O} 03’ 01.1” W	RUPE	Excellent	Sun	Jun/Oct	Yes	2007
Broussard US90 at Morgan St. 30^{O} 09’ 09.9” N 91^{O} 57’ 27.9” W	OESP RUPE	Excellent Excellent	Sun	May/Apr Jun/Oct	Yes Yes	2007 2007
Ester La82 29^{O} 50’ 44.2” N 92^{O} 17’ 39.3” W	RUPE	Excellent	Sun	Jun/Oct	Yes	2007
La14 at La676 29^{O} 59’ 06.3” N 91^{O} 53’ 22.6” W	RUPE	Excellent	Sun	Jun/Oct	Yes	2007
La70 N, Stephensville 29^{O} 45’ 54.2” 91^{O} 10’ 33.2” W	RUPE	Excellent	Sun	Jun/Oct	Yes	2007

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
Cypress Island Road La353 30^{O} 13' 33.8" N 91^{O} 58' 02.9" W	HEAN	Excellent	Sun	Sep/Nov	Yes	2009
Terrace Road La96 30^{O} 07' 54.8" N 91^{O} 52' 39.9" W	HEAN	Excellent	Sun	Sep/Nov	Yes	2009
MSAC Conservancy 30^{O} 05' 40.0" N 91^{O} 52' 31.2" W	HEAN	Excellent	Sun	Sep/Nov	Yes	2009
La92 Cade 30^{O} 05' 51.8" N 91^{O} 53' 40.6" W	HEAN	Excellent	Sun	Sep/Nov	Yes	2009
I-10 Butte La Rose W/C 30^{O} 20' 32.9" N 91^{O} 43' 12.0" W	COTI DRAM	Excellent Excellent	Sun	Apr/Jul Apr/Jul	Yes Yes	2009 2009
W End Basin Bridge I-10 30^{O} 19' 24.2" N 91^{O} 47' 36.9" W	COTI	Excellent	Sun	Apr/Jul	Yes	2009
MSAC WJ Bernard Rd 30^{O} 05' 52.1" N 91^{O} 52' 18.5" W	DRAM	Excellent	Sun	Apr/Jul	Yes	2009
MSAC Conservancy DRAM Seed Source 30^{O} 05' 42.0" N 91^{O} 52' 30.6" W	DRAM	Excellent	Sun	Apr/Jul	Yes	2009

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
MSAC WJ Bernard Rd at Our Lady of the Lake Road 30^{O} 05’ 07.7” N 91^{O} 52’ 01.4” W	DRAM	Excellent	Sun	Apr/Jul	Yes	2009
Cecilia, Olide Tauzin Road 30^{O} 18’ 34.6” N 91^{O} 54’ 57.9” W	DRAM	Excellent	Sun	Apr/Jul	Yes	2009
Cecilia 30^{O} 19’ 19.7” N 91^{O} 51’ 53.3” W	DRAM	Excellent	Sun	Apr/Jul	Yes	2009
Arnaudville 30^{O} 21’ 08.4” N 91^{O} 53’ 31.3” W	DRAM	Excellent	Sun	Apr/Jul	Yes	2009
Estherwood US90 30^{O} 10’ 51.2” N 92^{O} 27’ 55.9” W	Prairie Remnant	Excellent Excellent	Sun	Apr/Jul	Yes	2009
Erath La14 29^{O} 57’ 36.7” N 92^{O} 01’ 25.5” W	HILA COTI	Excellent Excellent	Sun	Apr/Jul Apr/Jul	Yes Yes	2009 2009
Erath La14 29^{O} 57’ 47.2” N 92^{O} 02’ 39.7” W	COTI HILA	Excellent Excellent	Sun	Apr/Jul Apr/Jul	Yes Yes	2009 2009
Gueydan La14 30^{O} 00’ 26.2” N 92^{O} 28’ 26.5” W	Prairie Restoration	Excellent to Poor	Sun	Mar/Nov	Yes	2009
Rutherford Beach 29^{O} 45’ 31.8” N 93^{O} 07’ 27.4” W	Back Beach Wildflowers	Excellent	Sun	Mar/Nov	Yes	2009

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
Esther La14 29^{O} 51’ 45.0” N 92^{O} 10’ 37.6” W	COTI-Short Blooming	Excellent	Sun	Sep/Nov	Yes	2009
Eunice La13 Magnolia St at MLK 30^{O} 29’ 56.1” N 92^{O} 24’ 28.8” W	Cajun Prairie	Excellent to Poor	Sun	Mar/Nov	Yes	2009
Simmesport to Mansura La1 30^{O} 59’ 29.6” N 91^{O} 50’ 45.0” W	COTI	Excellent	Sun	Apr/Jul	Yes	2009
Crowley to Estherwood US90 30^{O} 11’ 11.9” N 92^{O} 25’ 30.8” W	Prairie Remnant	Excellent to Poor	Sun	Mar/Nov	Yes	2009
Mermentau US90 30^{O} 10’ 49.2” N 92^{O} 30’ 44.3” W	Prairie Remnant	Excellent to Poor	Sun	Mar/Nov	Yes	2009
Mermentau to Jennings US90 30^{O} 12’ 01.3” N 92^{O} 37’ 53.0” W	Prairie Remnant	Excellent to Poor	Sun	Mar/Nov	Yes	2009
McNeese Rd Ext 30^{O} 10’ 37.0” N 93^{O} 09’ 41.8” W	COTI-Short Fall Blooming Terry Barrett	Excellent	Sun	Sep/Nov	Yes	2009
DeRidder La27 31^{O} 08’ 37.0” N 92^{O} 45’ 13.3” W	HEAN Restoration	Excellent	Sun	Sep/Nov	Yes	2009
Kaplan to Gueydan 30^{O} 00’ 11.0” N 92^{O} 18’ 11.6” W	HILA GALI POCO	Excellent Excellent Excellent	Sun	Mar/Nov Mar/Nov Mar/Nov	Yes Yes Yes	2009 2009 2009

Location Lat/Long	Wildflower Species	Drainage Condition	Shade/sun	Estimated Bloom Time	Seed Collection	Year of Accession
DeRidder La27 31^{O} 08’ 37.0 92^{O} 45’ 13.3” W	HEAN	Excellent	Sun	Sep/Nov	Yes	2009
Holmwood to Creole La27 30^{O} 06’ 51.3” N 93^{O} 04’ 48.6” W	Coastal	Excellent	Sun	Mar/Nov	Yes	2009

Wildflower species

COTI	Coreopsis	*Coreopsis tinctoria*
DRAM	Clasping-leaf Coneflower	*Dracopis amplexicaulis*
LACA	Lantana	*Lantana camara*
HILA	Wooly-Rose Mallow	*Hibiscus lasiocarpos*
IPSA	Morning Glory	*Ipomoea sagittata*
GAPU	Indian Blanket	*Gallardia pulchella*
VIDA	Purple Vetch	*Vicia dasycarpa*
TRPR	Red Clover	*Trifolium pretense*
OESP	Showy Primrose	*Oenothera speciosa*
MIST	Sensitive Plant	*Mimosa strigalosa*
HEAM	Bitterweed	*Helenium amarum*
COLA	Tickseed Coreopsis	*Coreopsis lanciolata*
VETE	Moss Verbena	*Verbena tenuisecta*
RHAI	Meadow Beauty	*Rhexia alifanus*
RUHI	Blackeyed Susan	*Rudbeckia hirta*
LISQ	Blazing Star	*Liatris squarrosa*
ERPH	Daisy Fleabane	*Erigeron philadelpheus*
SEGL	Butterweed	*Senecio glabellus*
SIGR	Rosin Weed	*Silphium gracile*
GALI	Gaura	*Gaura lindheimeri*
POCO	Pickerel Weed	*Pontederia cordata*
ECPA	Pale Coneflower	*Echinaceae pallida*
RUPE	Ruellia	*Ruellia pedunculata*
HEAN	Fall Sunflower	*Helianthus Angustifolius*

Verified Locations of Native Wildflowers in Louisiana

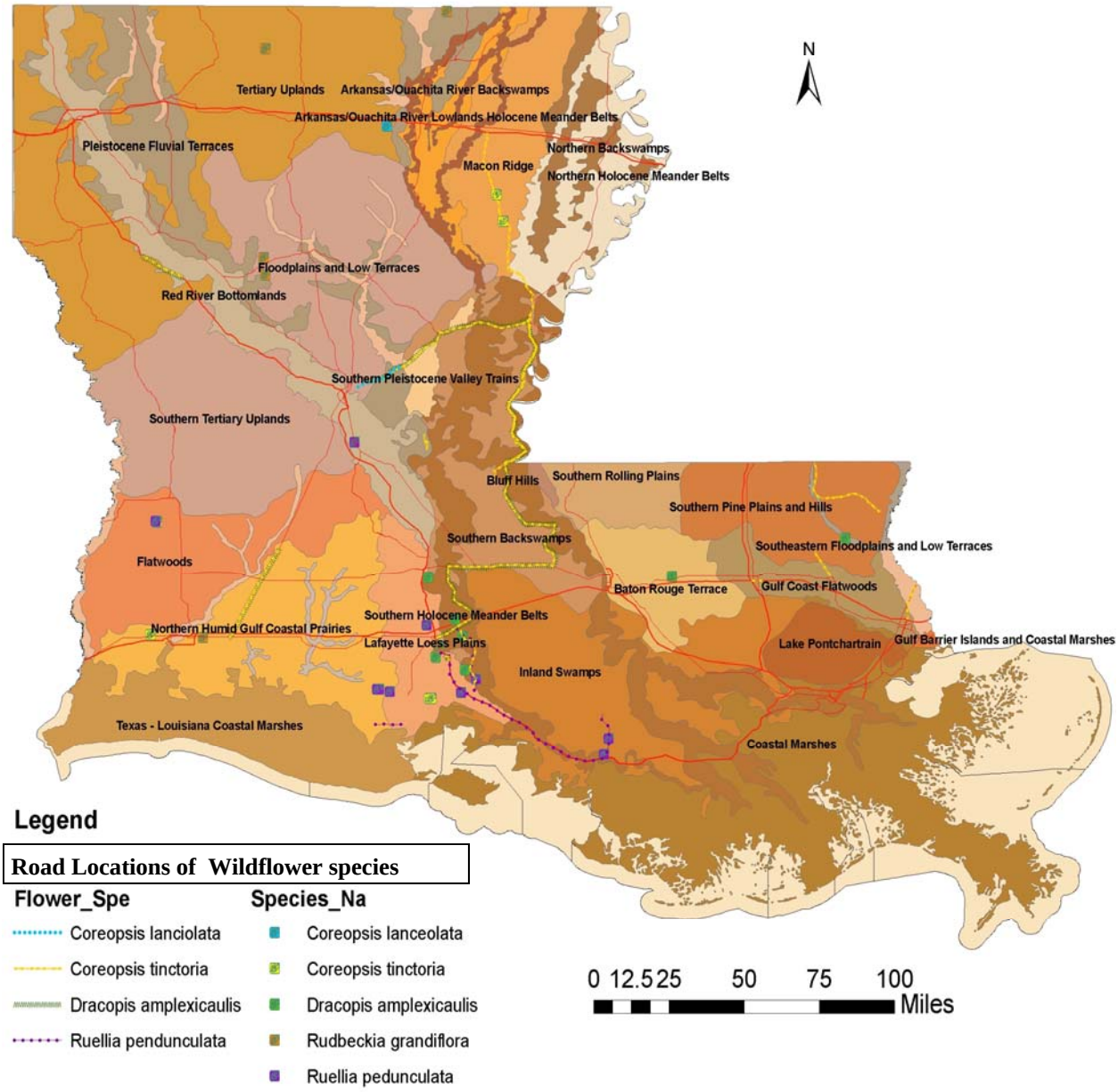


Figure 19. Distribution of native wildflowers in the state of Louisiana.
This map is produced with information collected from participants of the Wildflower Conservation Practices Workshop held August 2007 at LaDOTD District 3 headquarters in Lafayette, and our own field observations. The number of symbols indicated do not correspond to the extent of the total area under wild-flower growth at that location.

Photo Credit Colette Anzalone

Photo Credit Colette Anzalone