



CHRISTOPHER C. GIBBS COLLEGE OF ARCHITECTURE
DIVISION OF PLANNING,
LANDSCAPE ARCHITECTURE & DESIGN
The UNIVERSITY of OKLAHOMA

Design in Bloom: Rain Garden Plant Palettes for Oklahoma

LA/CEES 4970/5970: Sustainable Stormwater Design

Elena Hobbs

Background

Class Research Objectives

- Design 15 rain garden plant palettes for a variety of aesthetic and functional purposes
- Select native and adaptive plant species that thrive in Oklahoma's varied conditions, ensuring sustainability and ecological harmony
- Create aesthetically pleasing garden designs that enhance community spaces and promote biodiversity

My Background

- Accelerated Master's Program at the University of Oklahoma for a B.S. in Environmental Design and a master's in Landscape Architecture



Introduction to Rain Gardens

What Are Rain Gardens?

Shallow, vegetated basins designed to capture and infiltrate rainwater from impervious surfaces like roofs and driveways

Why Use Rain Gardens?

Rain gardens manage stormwater and provide habitat for pollinators and other wildlife, serving as a practical and beautiful solution to urban water challenges



Rain Garden Zones

Zone 1: Bottom (Wet Zone)

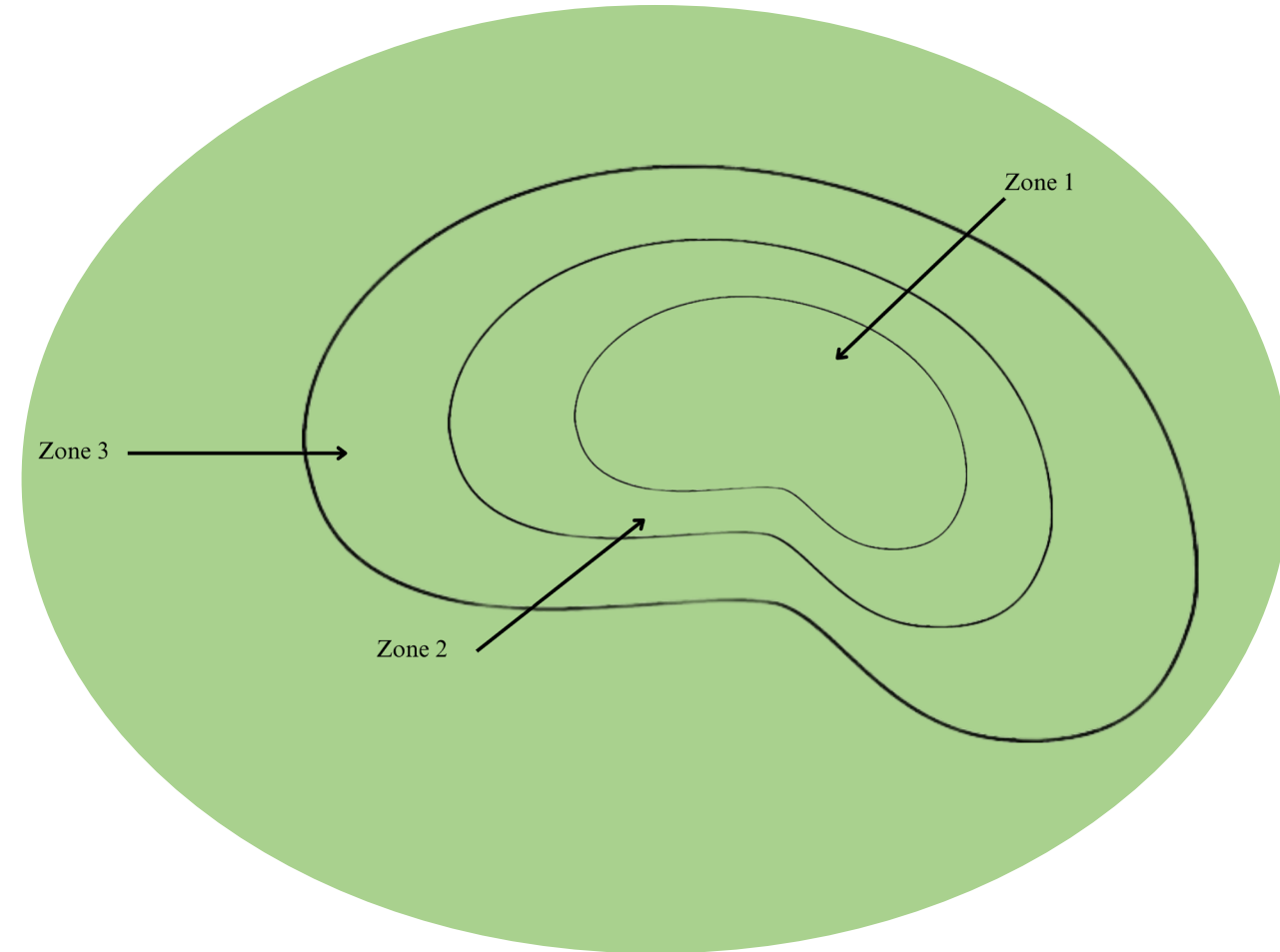
- **Location:** The deepest part of the basin
- **Moisture Characteristics:** Prone to temporary pooling during rainfall events; water should infiltrate within 24 hours

Zone 2: Side Slopes (Transition Zone)

- **Location:** The sloped areas between the bottom and the top edge of the garden
- **Moisture Characteristics:** Experience temporary moisture during rain events but drain more quickly than Zone 1

Zone 3: Top Edge (Dry Zone)

- **Location:** The perimeter or berm of the garden
- **Moisture Characteristics:** Receives the least moisture; soil remains relatively dry



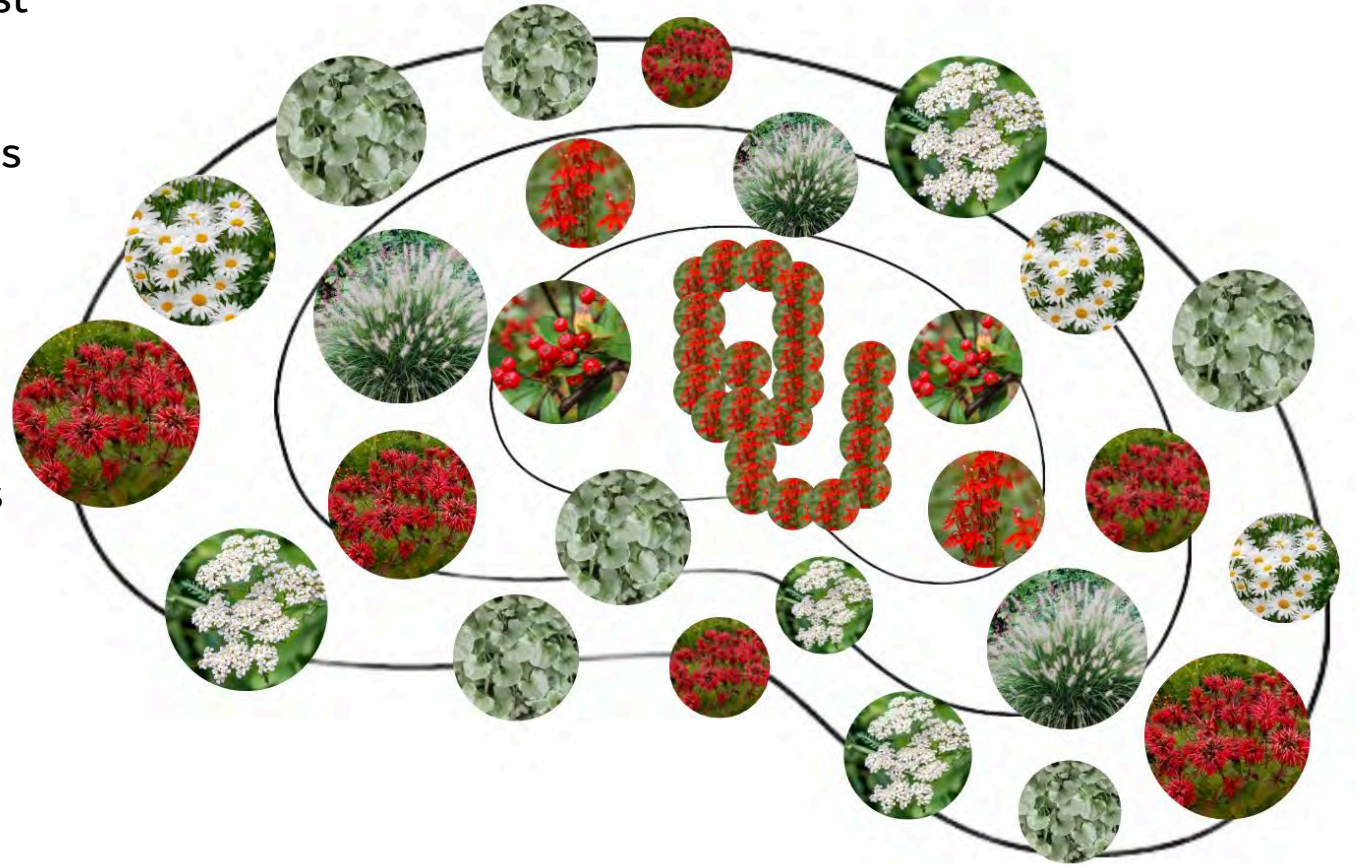
A lush garden bed featuring a color theme of purple, pink, and white. The plants include lavender, salvia, and various green foliage. The text "Color Themes" is overlaid in the center.

Color Themes

Crimson & Cream Dream

OU Color Theme

- **Cardinal Flower**
 - Bright red flowers attract pollinators
 - Prefers moist soils
- **Red Chokeberry**
 - Glossy red berries are edible (sometimes used in jams)
 - White flowers in spring
- **Dwarf Fountain Grass**
 - Feathery white plumes
 - Also adds autumn/winter interest
- **Silver Falls**
 - Cascading ground cover
 - Metallic silver tint adds visual interest
- **Shasta Daisy**
 - Bright white petals with gold centers
 - Prefers full sun
- **Scarlet Bee Balm**
 - Scarlet blooms attract pollinators
 - Historically used to make tea and salves
- **Common Yarrow**
 - Varied colors
 - Prefers drier soils





Monarda didyma, Scarlet Bee Balm



Achillea millefolium, Common Yarrow



Aronia arbutifolia,
Red Chokeberry



Leucanthemum x superbum,
Shasta Daisy



Dichondra argentea, Silver Falls



Lobelia cardinalis, Cardinal Flower

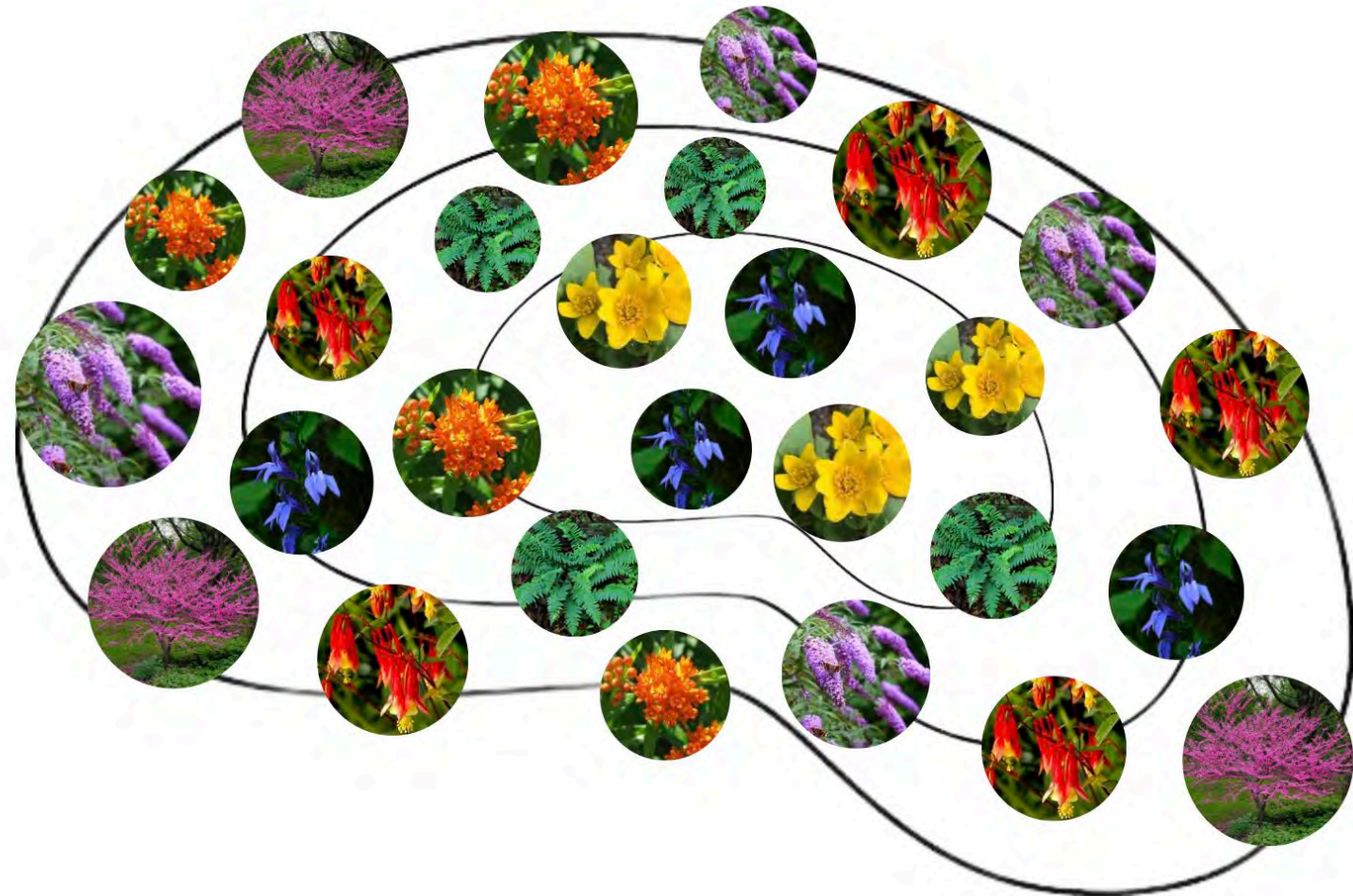


Pennisetum alopecuroides,
Dwarf Fountain Grass

Rainbow Connection

Color Wheel Garden

- **Yellow Marsh Marigold**
 - Bright yellow flowers
 - Good addition to the bowl as it prefers moist conditions
- **Red Columbine**
 - Bell-shaped red/yellow blooms attract pollinators, esp. hummingbirds
 - Foliage may add autumn color
- **Great Blue Lobelia**
 - Low maintenance Oklahoma native
 - Deep blue/purple flowers
- **Christmas Fern**
 - Year-round greenery
 - Dense roots stabilize soil, preventing erosion
- **Butterfly Milkweed**
 - Oklahoma native wildflower
 - Bright orange flowers attract butterflies
- **Butterfly Bush**
 - Purple/pink flowers are pollinator magnets
 - May need to monitor for spreading/aggressive growth
- **Eastern Redbud**
 - State tree of Oklahoma
 - Stunning pink/red blooms in the spring





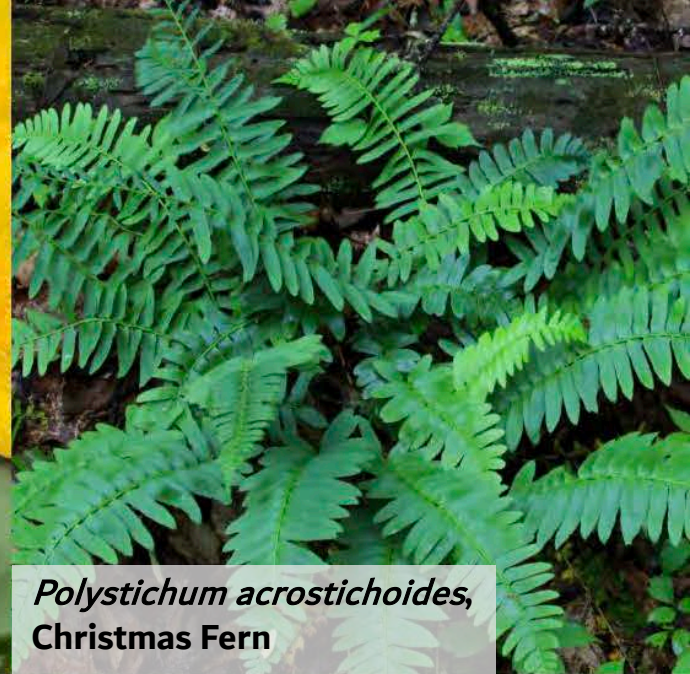
Aquilegia canadensis, Red Columbine



Asclepias tuberosa,
Butterfly Milkweed



Caltha palustris,
Yellow Marsh Marigold



Polystichum acrostichoides,
Christmas Fern



Lobelia siphilitica, Great Blue Lobelia



Buddleia davidii, Butterfly Bush

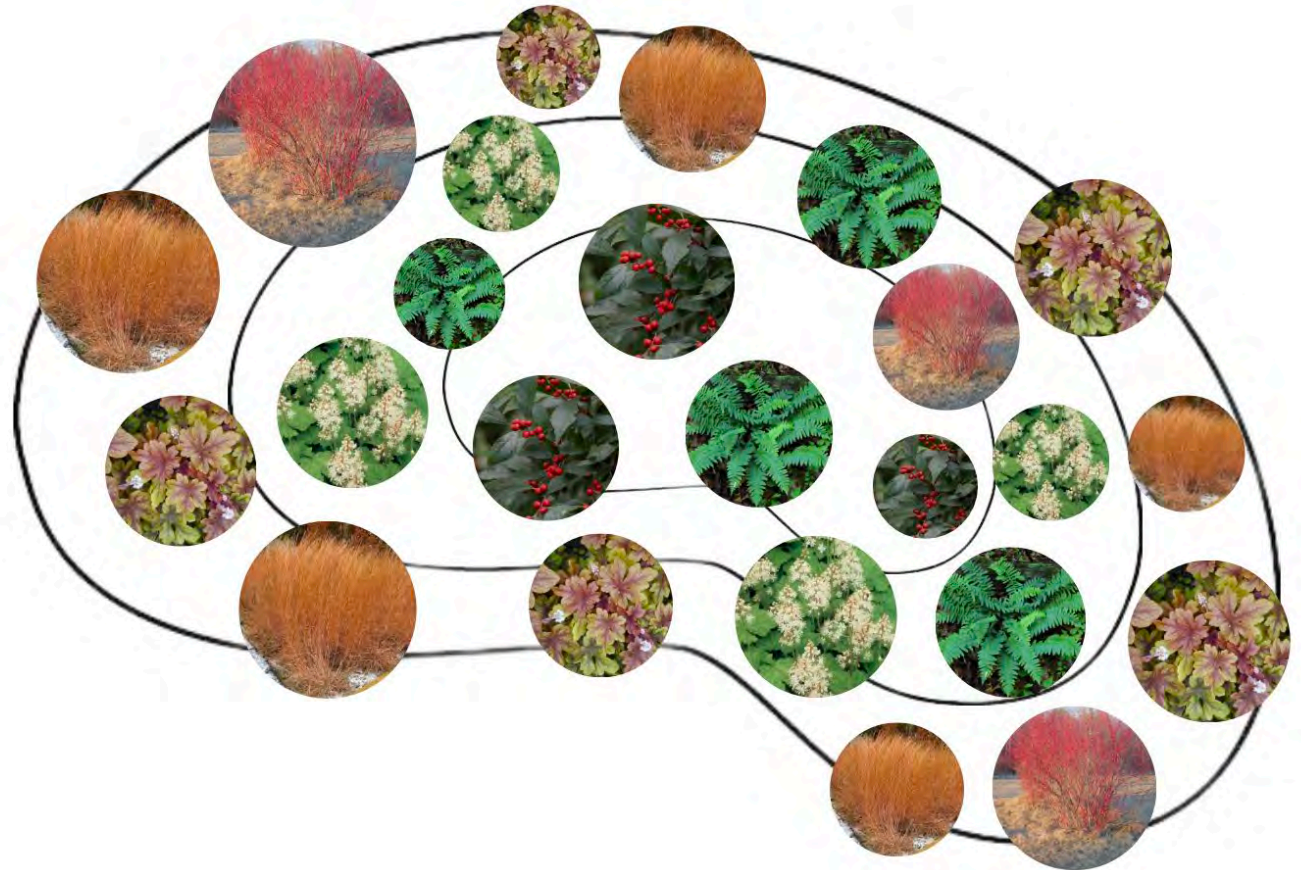


Cercis canadensis, Eastern Redbud

- **Christmas Fern**
 - Year-round greenery
 - Dense roots stabilize soil, preventing erosion.
- **Winterberry Holly**
 - Bright red berries and green foliage in winter
 - Minimal maintenance
- **Redosier Dogwood**
 - Bright red or yellow bark in winter
 - White flowers in spring
- **Coral Bells**
 - Colorful leaves in winter
 - Pink/red flowers in spring
- **Foam Flower**
 - Rust/bronze foliage in winter, excellent ground cover
 - White/pink flowers in spring
- **Little Bluestem**
 - Rust/purple color in winter
 - Provides shelter for wildlife

Winter Wonderland

Winter Color Garden





Schizachyrium scoparium, Little Bluestem



Heuchera sanguinea, Coral Bells



Tiarella cordifolia, Foam Flower



Polystichum acrostichoides, Christmas Fern



Ilex verticillata, Winterberry Holly



Cornus sericea, Redosier Dogwood

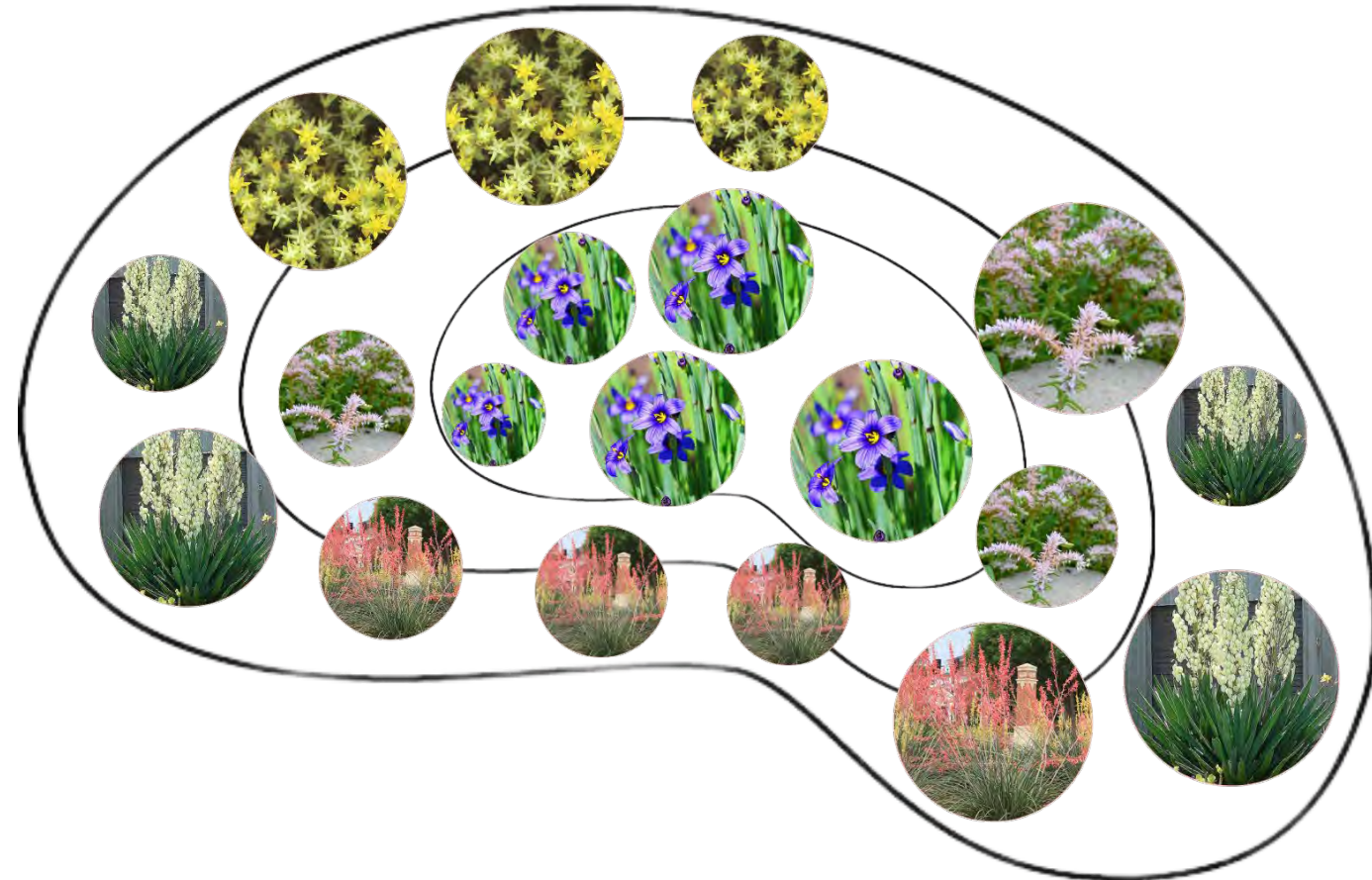


Plant Type Themes

Succulents and the Evergreens

Succulents/Evergreen Garden

- **Blue-Eyed Grass**
 - Clusters of violet-blue flowers in spring
 - Semi-evergreen
- **Variiegated Yucca**
 - Blooms a stalk in the spring with clusters of white flowers
 - Accent plant
- **False Red Yucca**
 - Vibrant light red flowers in summer
 - Mass planting is good for dramatic effect
- **Yellow Stonecrop**
 - Forms mats of tiny yellow flowers in spring
 - Used as cover plant near rocks
- **Widow's Cross**
 - Vivid pink and lime green flowers in spring
 - Ideal for rocky terrain



Sedum pulchellum, Widow's Cross



Sedum nuttallianum Raf., Yellow Stonecrop

Sisyrinchium angustifolium, Blue-Eyed Grass



Hesperaloe parviflora, False Red Yucca

Yucca filamentosa, Variegated Yucca



Thinking Big

Trees and Shrubs

- **American Linden**
 - High abundance in nectar for bees
 - Larval host to red-spotted purple butterfly
- **Waxmyrtle**
 - Shrub to evergreen in warm climates
 - Can make soap and candles
- **American Hornbeam**
 - Vibrant fall colors
 - Shelters birds
- **Great Blue Lobelia**
 - Ground attraction
 - Needs to be divided every 2-3 years
- **Willow Oak**
 - Tolerates flooding when matured
 - Keystone species





Tilia americana, American Linden



Morella cerifera, Waxmyrtle



Carpinus caroliniana, American Hornbeam



Lobelia siphilitica, Great Blue Lobelia



Quercus phellos, Willow Oak

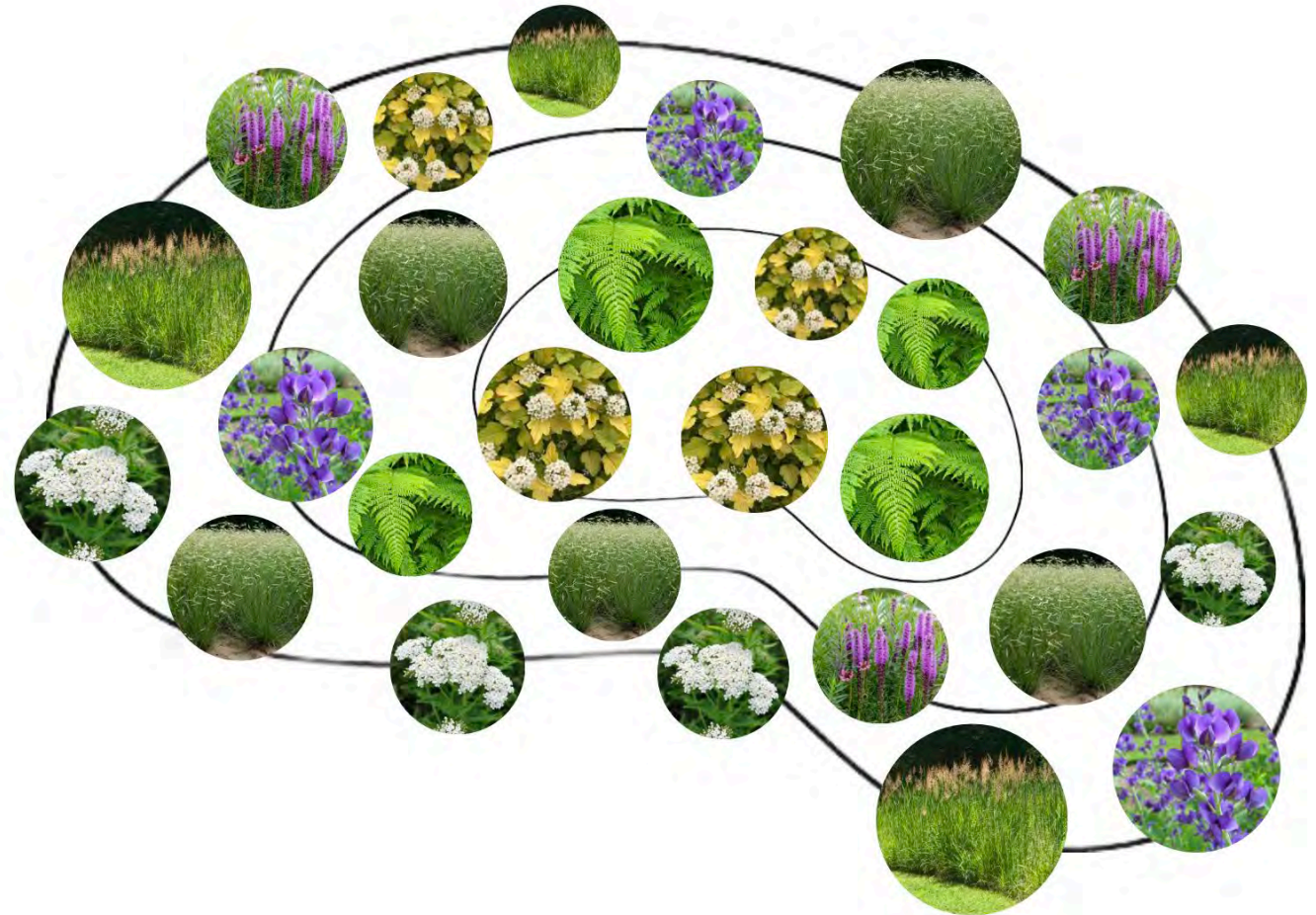
A vibrant garden scene featuring a gravel path lined with large, flat stones. The garden is filled with a variety of colorful flowers, including tall purple spikes, clusters of red and orange blossoms, and green foliage. The background shows a lush green lawn and a white fence. A semi-transparent white box with the text "Plant Preferences" is centered over the middle of the image.

Plant Preferences

- **Ninebark**
 - Pink/white flowers in spring
 - Bark peels in the winter, adding textural interest
- **Bracken Fern**
 - Provides ground cover in the bowl and slope
 - Hardy and tolerates drought better than many ferns
- **Sideoats Grama Grass**
 - Oklahoma native
 - High drought tolerance
- **Common Yarrow**
 - Varied colors
 - Prefers drier soils
- **Blue False Indigo**
 - Attracts pollinators
 - Produces a dye similar in color to indigo
- **Indian Grass**
 - State grass of Oklahoma
 - Blue/green in spring/summer, golden in autumn/winter
- **Blazing Star**
 - Showy spikes of purple flowers
 - Attracts pollinators and birds

Dry Dwellers

Drought Tolerant Plants





Physocarpus opulifolius,
Ninebark



Sorghastrum nutans, Indian Grass



Liatris spicata, Blazing Star



Pteridium aquilinum, Bracken Fern



Baptisia australis, Blue False Indigo



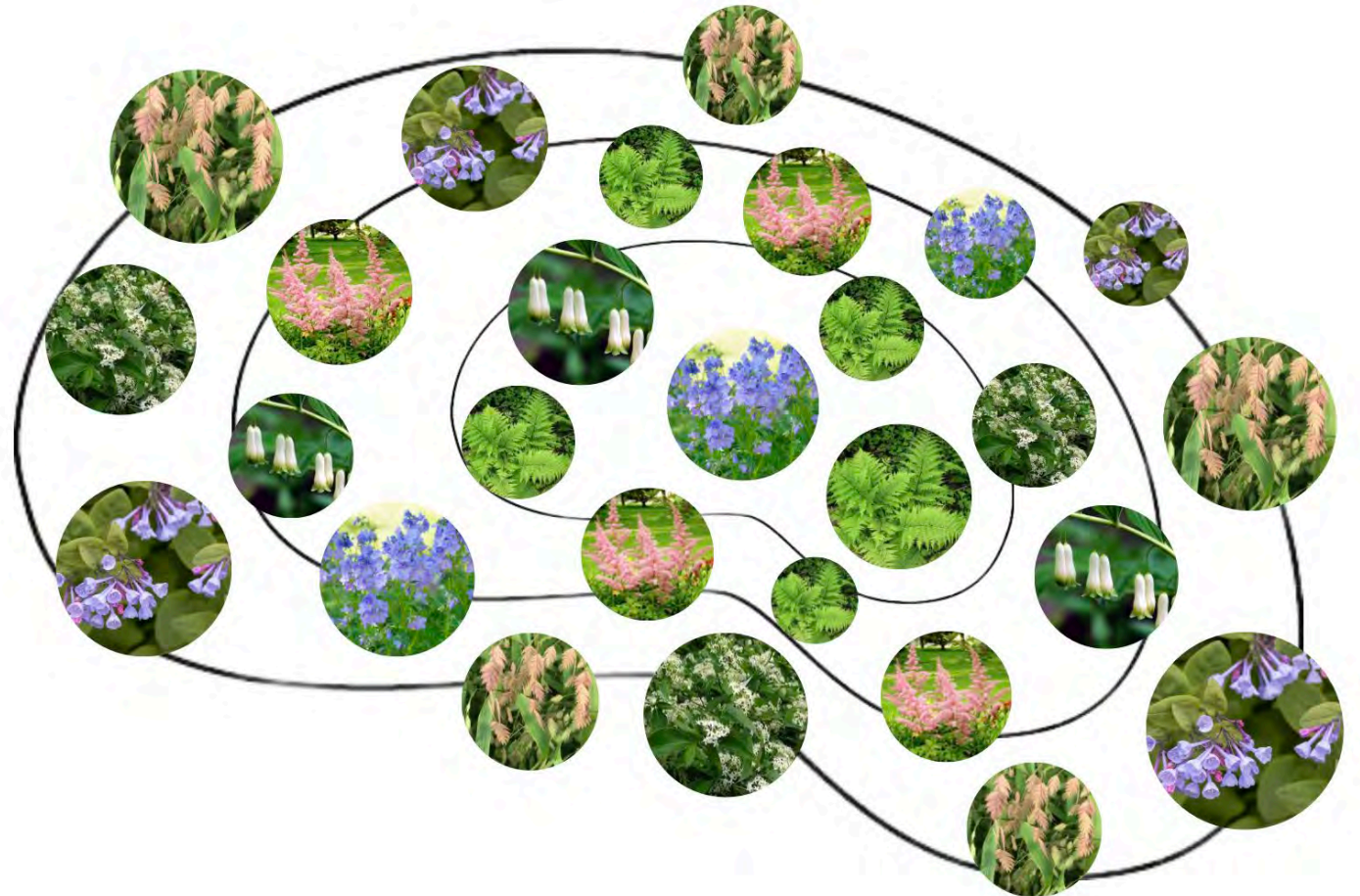
Achillea millefolium, Common Yarrow



Bouteloua curtipendula, Sideoats Grama Grass

Made in the Shade

Full Shade Garden



- **Jacob's Ladder**
 - Blue/purple flowers
 - Thrives in wet, shady conditions
- **Common Lady-Fern**
 - Hardy
 - Can tolerate drier soils than most ferns
- **Solomon's Seal**
 - Arching stems with bell-shaped blooms
 - Blue/black berries in autumn
- **Astilbe**
 - Many cultivars with varied colors
 - Pollinator magnet
- **Gray Dogwood**
 - Colorful leaves
 - Showy berries and flowers
- **Virginia Bluebells**
 - Pink to blue blooms
 - Pollinator magnet
- **Indian Woodoats**
 - Oklahoma native
 - Used for erosion control and water quality improvement



Polygonatum biflorum, Solomon's Seal



Astilbe spp., Astilbe



Mertensia virginica, Virginia Bluebells



Polemonium reptans, Jacob's Ladder



Athvrium filix-femina, Common Lady-Fern



Chasmanthium latifolium,
Indian Woodoats

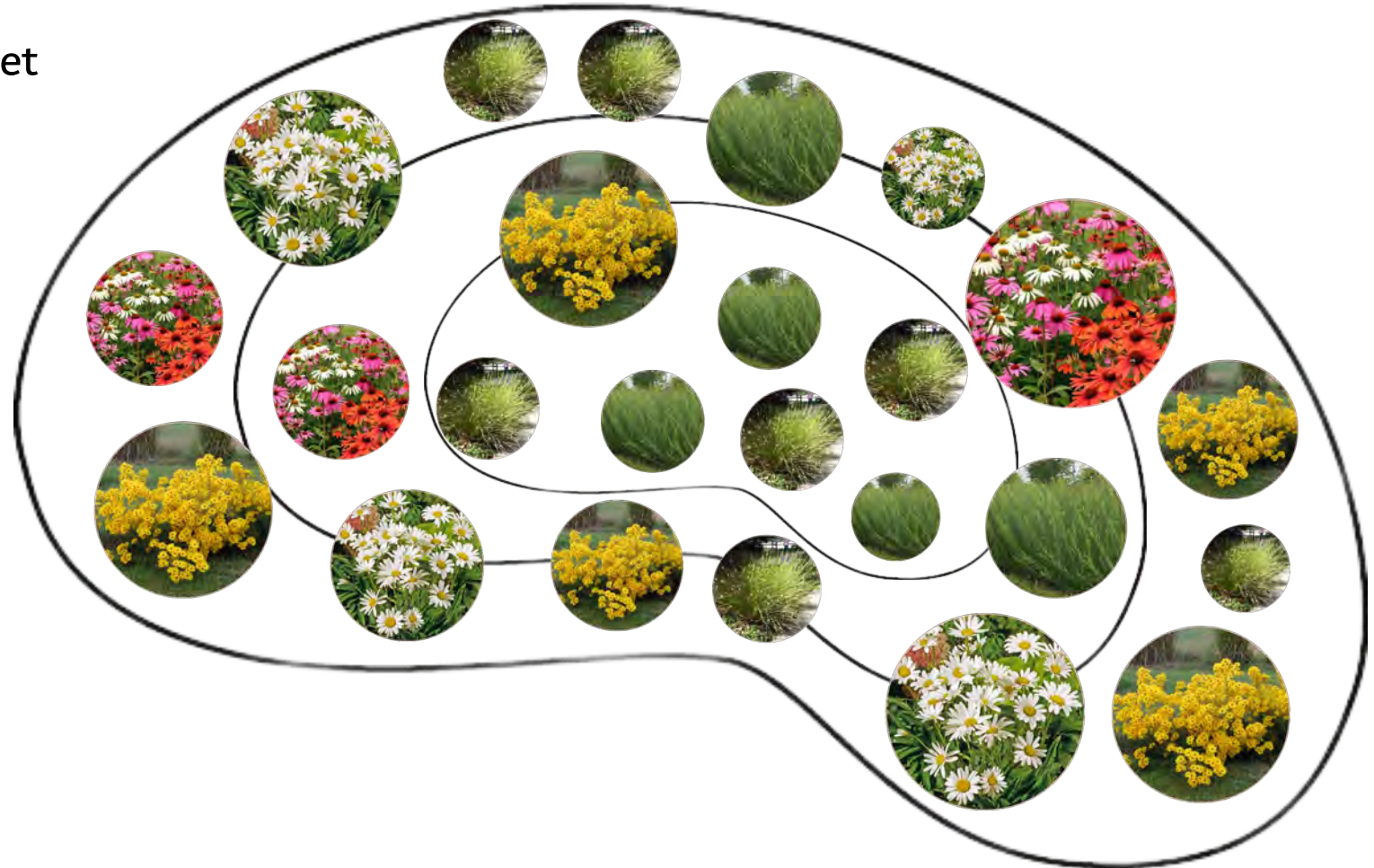


Cornus racemosa, Gray Dogwood

- **Common Rush**
 - Works well in wet landscapes
 - Provides shelter and habitat for wildlife
- **Basket/Streamco Willow**
 - Flexible stems can be used for basket weaving
 - Thrives in moist, full sun locations
- **Swamp Sunflower**
 - Sunny yellow blooms
 - Loved by many pollinators
- **Coneflower**
 - Tolerant of poor soils and drought
 - Attract pollinators and birds
- **Shasta Daisy**
 - Classic white and yellow blooms
 - Full sun is ideal for best flowering

Sunlit Symphony

Full Sun Garden





Leucanthemum x superbum, Shasta Daisy



Salix purpurea, Basket/Streamco Willow



Helianthus angustifolius, Swamp Sunflower



Juncus effusus, Common Rush



Echinacea spp., Coneflower

- **Purple Coneflower**
 - Vibrant purple flowers
 - Adaptable to various soil types, including sandy and loamy soils

- **Butterfly Milkweed**
 - Bright orange flowers attract butterflies
 - Adaptable to various soil types, including clay, loam, and sandy soil

- **Common Yarrow**
 - Varied colors
 - Prefers drier soils

- **Black-Eyed Susan**
 - Striking yellow petals with dark center
 - Adaptable to various soil types, including clay, loam, and sandy soils

- **Widows Cross Sedum**
 - Delicate pink flowers
 - Thrives in shallow, rocky soils

- **Threadleaf Coreopsis**
 - Produces bright yellow, daisy-like flowers
 - Is tolerant of poor, sandy, or rocky soils

The Gravel Grove

Rock as Mulch (Heat Tolerant) Garden





Echinacea purpurea, Purple Coneflower



Asclepias tuberosa, Butterfly Milkweed



Sedum pulchellum, Widows Cross Sedum



Coreopsis verticillata, Threadleaf Coreopsis



Achillea millefolium, Common Yarrow



Rudbeckia hirta, Black-Eyed Susan

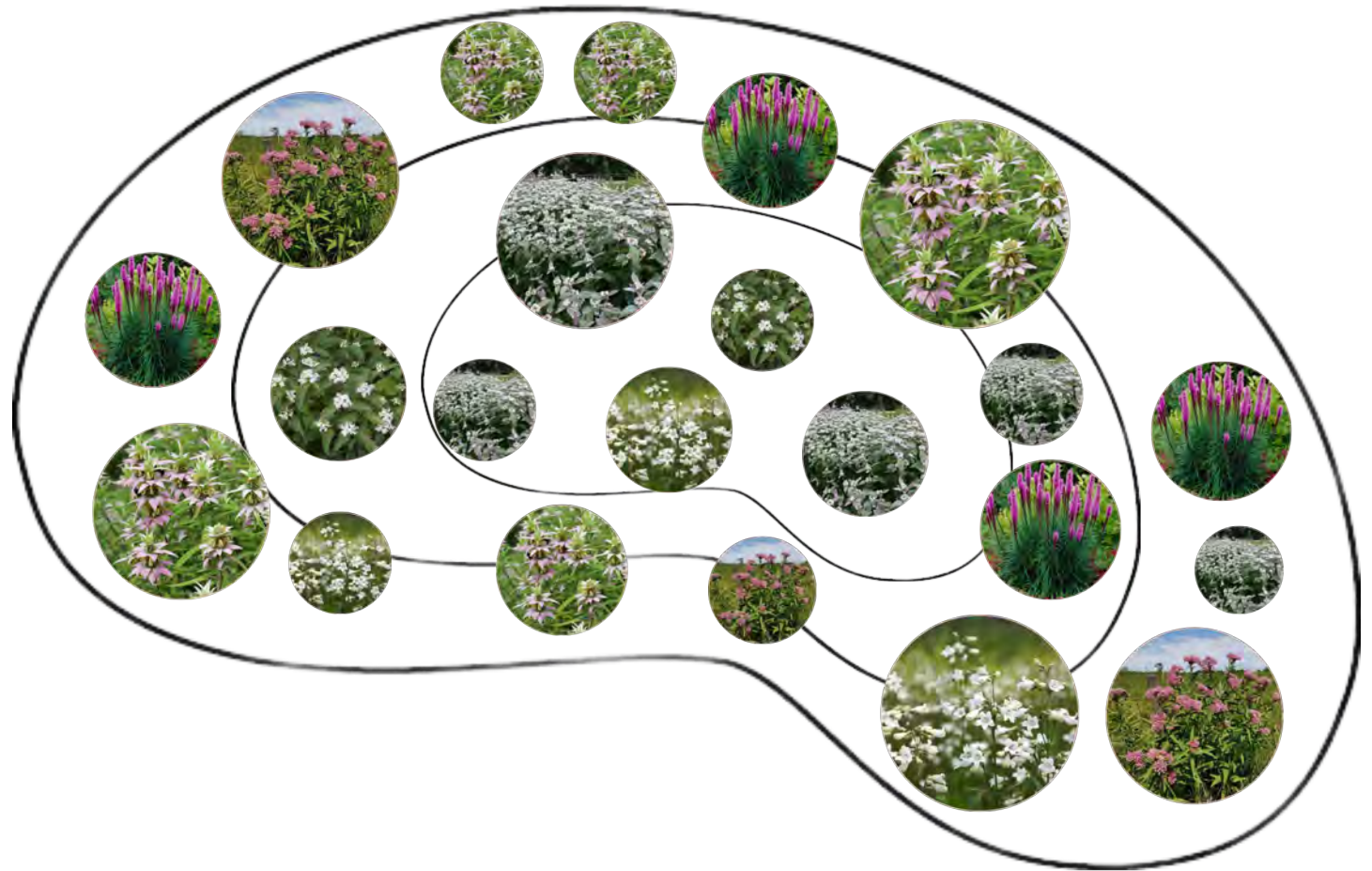
A close-up photograph of three pink coneflowers with bright orange centers. A large butterfly with yellow and black wings is perched on the top flower, and a bumblebee is on the middle flower. The background is a soft, out-of-focus green.

Plants With Purpose

Pollinator Paradise

Butterfly Garden

- **Foxglove Beardtongue**
 - Loved by pollinators like bees and hummingbirds
 - Provides shelter for a variety of insects
- **Clustered Mountain Mint**
 - Aromatic foliage
 - A favorite of butterflies and bees
- **Blazing Star**
 - Showy spikes of purple flowers
 - Attracts a wide variety of pollinators
- **Spotted Bee Balm**
 - Deer resistant
 - Loved by many pollinators (bees, butterflies, hummingbirds)
- **Swamp Milkweed**
 - Prefers moist environments
 - Monarch butterfly larval host





Liatris spicata, Blazing Star



Penstemon digitalis, Foxglove Beardtongue



Asclepias incarnata, Swamp Milkweed



Monarda punctata, Spotted Bee Balm



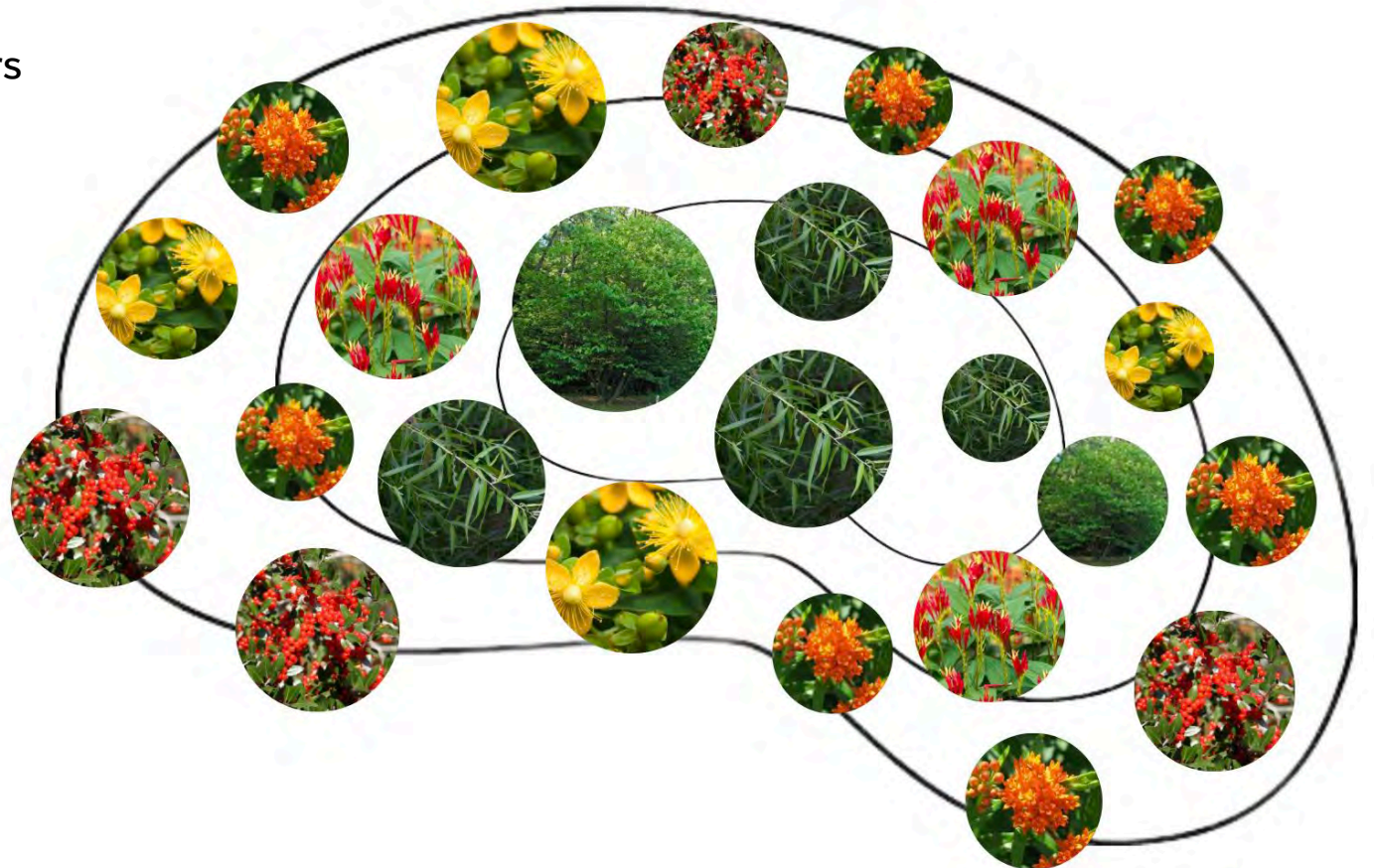
Pycnanthemum muticum, Clustered Mountain Mint

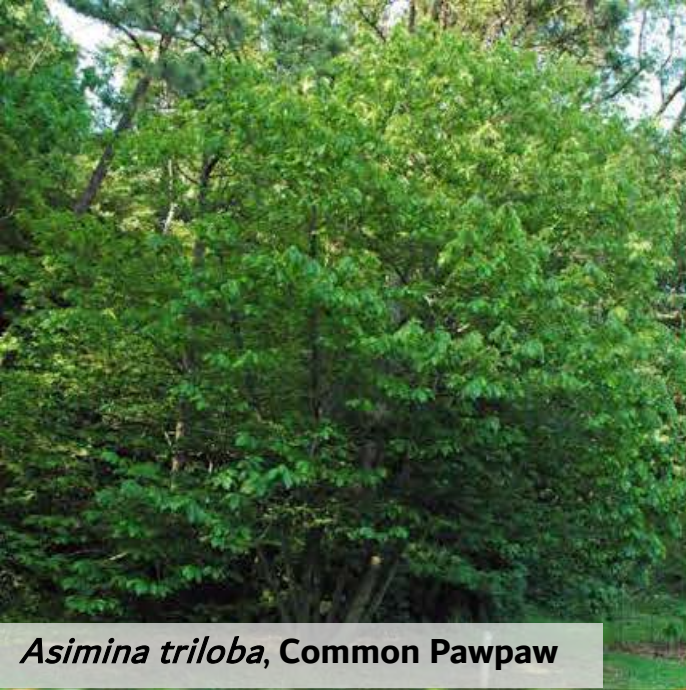
- **Common Pawpaw**
 - Cultivated for its sweet fruit, also called custard apple and false banana
 - Provides food for zebra swallowtail butterfly larvae
- **Black Willow**
 - Contains pain-killing compounds used in a variety of medicine
 - Used in construction of structures like brush arbors
- **Indian Pink**
 - Prefers shadier areas
 - Used to treat parasitic infections
- **St. John's Wort**
 - Yellow flowers are loved by pollinators
 - Widely used for a variety of medicinal purposes
- **Butterfly Milkweed**
 - Bright orange flowers attract butterflies
 - Roots used to treat respiratory and stomach issues
- **Yaupon Holly**
 - Green leaves and glossy red berries through winter
 - Natural caffeine producer, made into tea for energy and medicinal purposes

Traditional Treasures

Plants Significant to the Chickasaw Nation

Information gathered from the handbook *Culturally Significant Plants of the Chickasaw Homeland* via the Chickasaw Nation Heritage Preservation Division





Asimina triloba, Common Pawpaw



Spigelia marilandica, Indian Pink



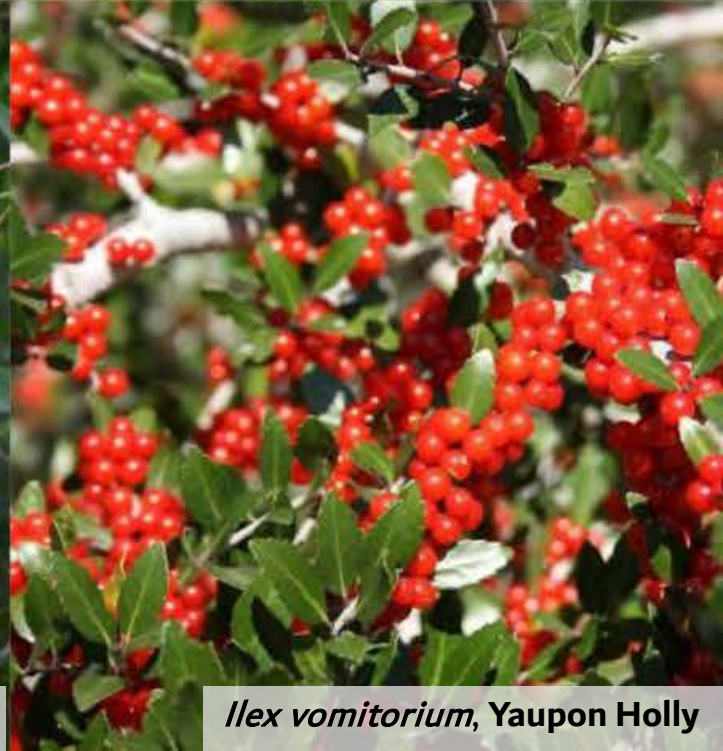
Hypericum prolificum, St. John's Wort



Asclepias tuberosa, Butterfly Milkweed



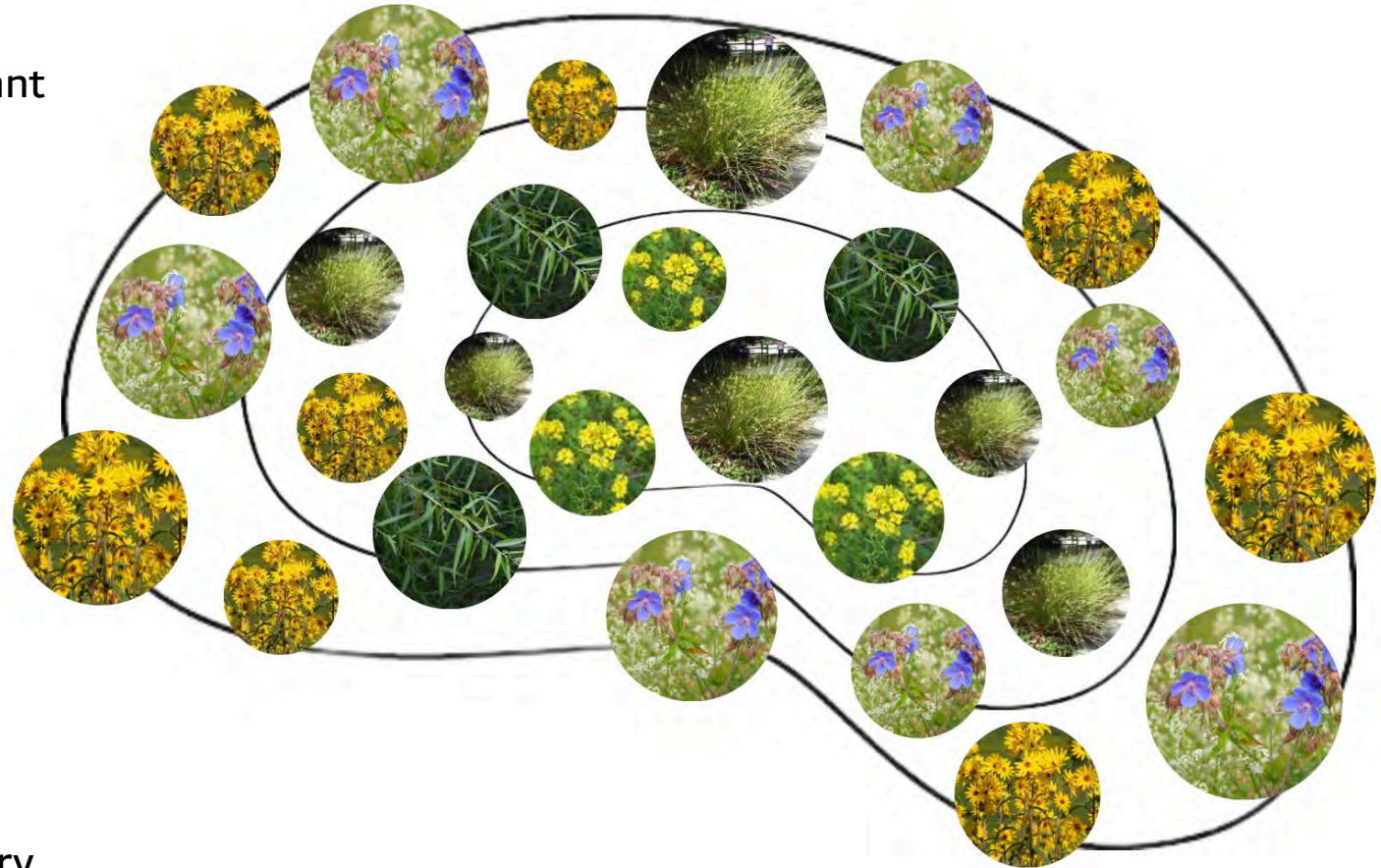
Salix nigra, Black Willow



Ilex vomitorium, Yaupon Holly

- **Brown Mustard**
 - Attractive bright yellow flowers
 - Removes lead and excess selenium
- **Black Willow**
 - Unique black bark and long, thin leaves
 - Removes perchlorate (groundwater contaminant harmful to human health)
- **Common Rush**
 - Oklahoma native grass
 - Removes ammonium, stabilizing microbial ecosystems
- **Wild Geranium**
 - Purple and pink flowers attract pollinators
 - Absorbs and stores lead
- **Maximillian Sunflower**
 - Sunny yellow blooms add visual interest
 - Traps many heavy metals (lead, copper, mercury, arsenic) in its root system

DIY Detoxify Phytoremediation Garden





Brassica juncea, Brown Mustard



Salix nigra, Black Willow



Juncus effusus, Common Rush



Geranium maculatum, Wild Geranium



Helianthus maximiliani, Maximilian Sunflower

- **Blackhaw Viburnum**
 - Can make jam from its fruit
 - Larval host to the hummingbird clearwing moth
- **Purple Coneflower**
 - Medicinal uses to combat cold
 - Needs to be divided every 4 years to prevent crowding
- **Elderberry**
 - Cooked berries make immune boosting syrup
 - Lemon scented flowers
- **Wild Bergamot**
 - Leaves used in tea and smell of mint and citrus when crushed
 - Blooms in the summer
- **Common Pawpaw**
 - Fruits taste of banana and mango and are used to make food and beverages
 - Ohio pawpaw festival
- **Muskingum Sedge**
 - Used to cover bare patches of the garden

Sweet n' Tea

Edible Selection



Note: Avoid sites with known pollutant/heavy metal runoff – Do not consume roots – Wash all plants thoroughly before consumption



Viburnum prunifolium, Blackhaw Viburnum



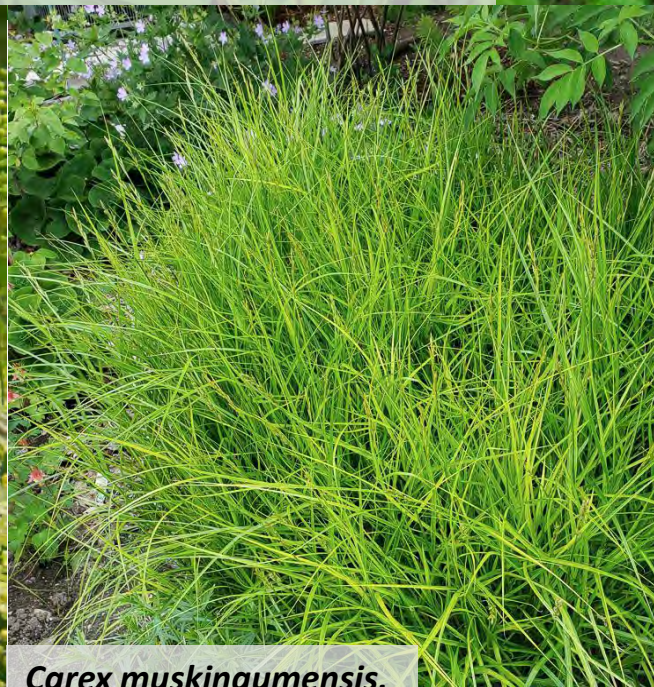
Echinacea purpurea, Purple Coneflower



Monarda fistulosa, Wild Bergamont



Sambucus canadensis, Elderberry



Carex muskingumensis,
Muskingum Sedge



Asimina triloba, Common Pawpaw

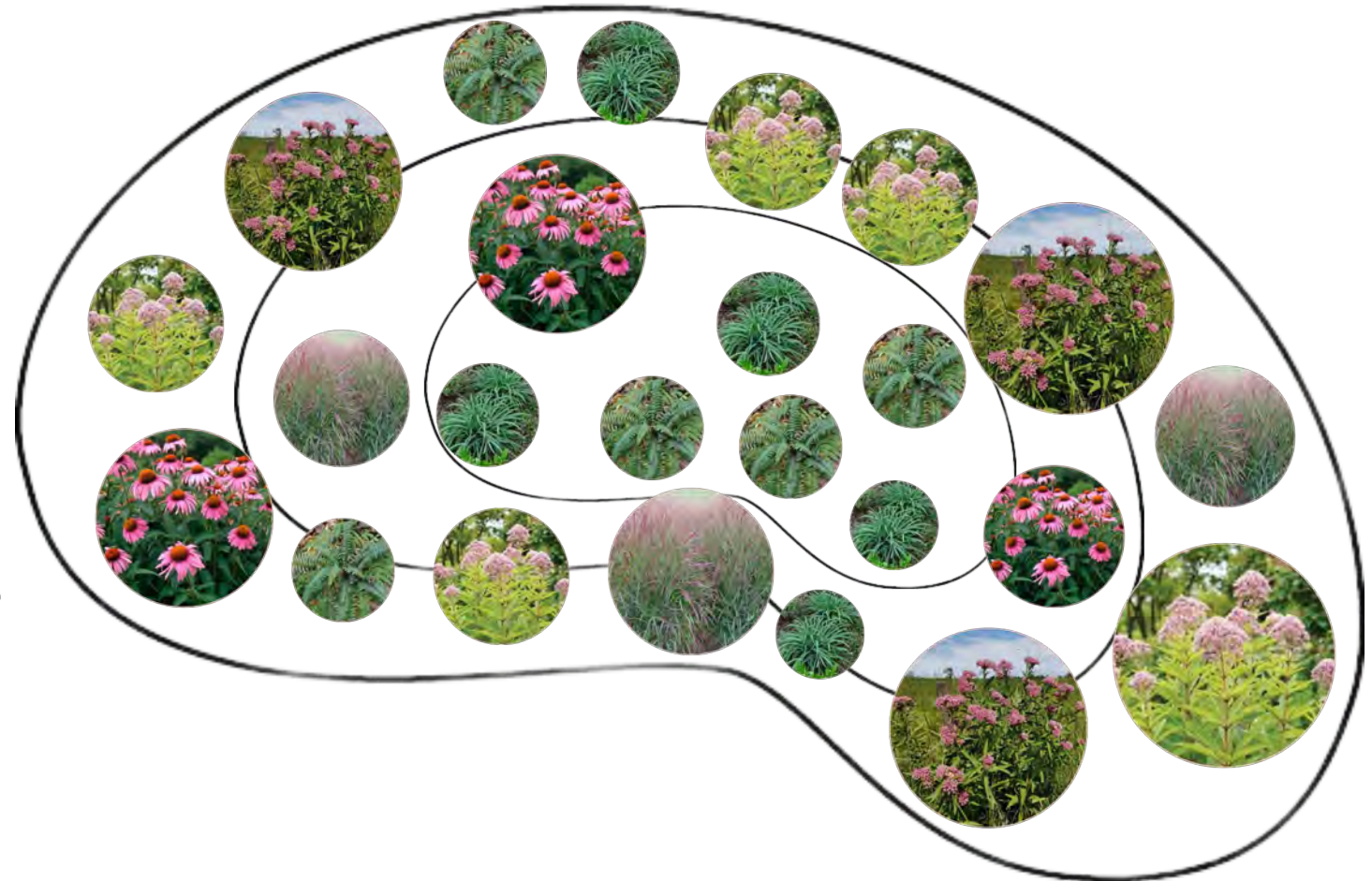
A vibrant garden scene featuring a variety of flowers. In the foreground, there are numerous purple and white coneflowers with prominent yellow and brown centers. Behind them, there are pink and red flowers, possibly gerberas or similar, and tall, thin grasses. The background is filled with more greenery and tall, golden-brown grasses. A semi-transparent white box with the text "Gardening Made Easy" is centered over the middle of the image.

Gardening Made Easy

The Lazy Gardener's Haven

Low-Maintenance Garden

- **Purple Coneflower**
 - Vibrant purple flowers
 - Attracts pollinators and provides food for birds
- **Christmas Fern**
 - Green year-round
 - Soil stabilization
- **Pennsylvania Sedge**
 - Forms dense colonies
 - Semi-evergreen foliage provides year-round interest
- **Swamp Milkweed**
 - Prefers moist environments
 - Loved by many pollinators (bees, butterflies, hummingbirds)
- **Switchgrass**
 - Adaptable to many soil types
 - Deep root system makes it hardy
- **Joe Pye Weed**
 - Fragrant pink/purple flowers
 - Tolerant of many soil types and light conditions





Polystichum acrostichoides, Christmas Fern



Asclepias incarnata, Swamp Milkweed



Panicum virgatum, Switchgrass



Echinacea purpurea, Purple Coneflower



Carex pensylvanica, Pennsylvania Sedge



Eutrochium maculatum, Joe Pye Weed

The Low-Cost Lagoon

Cost Efficient Garden

- **Switchgrass (\$4/oz - \$16/lb)**
 - Ornamental prairie grass
- **Black-Eyed Susan (\$4/oz - \$25/lb)**
 - Striking yellow petals with dark centers
- **Blue Flag Iris (\$3.50/packet - \$25/oz)**
 - Prefers moist environments
- **Cardinal Flower (\$3.50/packet - \$50/oz)**
 - Bright red blooms attract pollinators
- **New England Aster (\$5/packet - \$20/oz)**
 - Purple flowers add autumn color
- **Joe Pye Weed (\$4/packet - \$30/oz)**
 - Produces clusters of fragrant, pale pink to purple flowers



Thrifty Tips: Purchase seeds instead of mature plants – Explore local plant sales/nurseries – Swap plants with the local gardening community – Learn how to propagate



Rudbeckia hirta, Black-Eyed Susan



Eutrochium maculatum, Joe Pye Weed



Lobelia cardinalis, Cardinal Flower



Iris versicolor, Blue Flag Iris



Panicum virgatum, Switchgrass



Symphotrichum novae-angliae, New England Aster

Conclusion

- There are endless possibilities for unique, functional, and beautiful rain gardens
- For best results, consider:
 - Goals of your rain garden
 - Plant light and soil preferences
 - Plant siting (bowl, slope, or upland areas)
 - Maintenance needs
 - Aesthetic combinations
- Happy gardening!



Sources

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