Marana, Arizona
April 2008

Community Food Bank
The Drachman Institute is the research and public service unit of the College of Architecture and Landscape Architecture at the University of Arizona dedicated to the environmentally sensitive and resource-conscious development of neighborhoods and communities. It is our contention that good quality and innovative architectural design and technology, sensible community planning, and a landscape architecture that fosters beautiful and healthy private and public space is the cornerstone of this work. We engage our students, our staff, our faculty, and our citizens in a collaborative, research-based outreach enterprise to make our communities healthier, safer, more equitable and more beautiful places to live.
The goals we set out to accomplish on the Food Bank Marana Farm project included:

- Create a low maintenance design for the project area
- Build upon the existing features on the site
- Design two new buildings
- Improve the pedestrian access in and around the farm

Following our initial meeting on February 07, 2008 with the Marana Food Bank representative to discuss the scope of the project, we conducted a site visit. Based on the information provided to us by the Marana Food Bank representative, a program for the project was developed. A comprehensive site analysis was presented to the client in meeting on February 26, 2008. During this meeting we were provided with feedback from those in attendance. A series of conceptual design ideas were presented to the client on March 27, 2008. During this meeting the client added feedback to help us to refine the conceptual ideas for the project. The refined conceptual ideas were then used to formulate the final conceptual design presented in this document.

This document includes our design process including analysis, conceptualization, and design synthesis. The Conceptual Master Site Plan incorporates all the design ideas to improve the existing Food Bank Farm at Marana as well as the new proposed buildings.
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On April 19, 2007, the Community Food Bank submitted a Community Proposal for Technical Assistance to the Drachman Institute of the University of Arizona. Requested assistance included development of a master plan, conceptual ideas and building design for Community Food Bank Farm in Marana, Arizona. The existing site is part of Heritage Park and is a partnership among the Community Food Bank, Town of Marana, the State of Arizona, community volunteers, schools and farmers.

The long-term goal of the project is to create trails to connect the residential neighborhoods to the Santa Cruz River trails and Heritage Park as well as for the community to have events such as a farmers market every week. The construction of two buildings one for storage and other for the farm manager residence. The Drachman Institute has conducted an assessment and analysis of the farm and incorporated feedback from Community Food Bank representatives into design recommendations reflected in this document.
This trail commemorates the route taken by De Anza in 1775-76 when he lead a group of colonists from what is now Horcasitas, Sonora, Mexico to San Francisco, California, USA.

The first image above shows the trail from lower right to upper left that De Anza followed through Sonora Mexico, Arizona, and California.

The second image shows the path as it follows the Santa Cruz River through the city of Tucson.

The trail passes between the west bank of the Santa Cruz River and Silverbell Rd. as seen in the second image. Because of its location, it does not affect directly the farm site, but some of the ideas developed for the "de Anza" trail could be implemented along the trail on the east bank of the river next to the farm.
SANTA CRUZ RIVER THROUGH TIME

1942 – 1981 Santa Cruz River at Mission Rd.

Santa Cruz River during the floods of 1983

Santa Cruz River next to the site during the floods of 1983
The terrain where the site is located is fairly flat as can be seen in the sections below the aerial view. The red lines in the aerial view are the contour lines two feet in elevation from each other. The site is marked by the green triangle. Next to the sections at the bottom of the page is a three dimensional representation of the site.
The only waterway next to the site is the Santa Cruz River running south to north. The land bordering the river to the north has been used traditionally for agriculture, making the site an ideal place to grow produce.
The county has created a trail along the north edge of the Santa Cruz River, shown in yellow lines, which works as bank protection as well as a levy in case of flooding. This location gives direct access to the trail and connection to Heritage Park southeast from the site.
Because of the proximity of the site to the Santa Cruz River the southern edge lays within the boundaries riparian zone. As part of the connection of the farm to the river, this edge will be maintained as a riparian area in the Conceptual Master Plan for the farm.
As part of the Conservation Land the site is within two zones: the Biological Core Management area in green and the Important Riparian area shown in blue.
The site for the farm is within a small lot zone bordered by residential areas on the east and north and by the river to the south west zone.
Several subdivisions are located north and east of the site, but Gladden Farms, directly north of the site, is closest to be able to participate in the site activities.
ARRIVAL

Arriving by car on Gladden Farms Drive, driving south toward the farm entrance.

View from across the street on Gladden Farms Drive.

Driveway from the street to the parking area in front of the horse barn.

Shade structure at the entrance of the site.

Driveway by the utility building at the entrance of the farm.
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VIEWS FROM THE FARM

View of the Catalina Mountains to the east.

View of the Santa Cruz River to the south.

View of the Samaniego Hills to the north west.

View of the housing developments to the north.
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VIEWS WITHIN THE FARM

Crop field, greenhouse, and horse barn.

Boundary between the Heritage building and the farm.

Parking and horse barn.

Riparian area on the southeast of the site.

Old irrigation channels on the east and north boundaries of the property.
EXISTING BUILDINGS ON SITE

Heritage art buildings.

Horse barn.

Different views of the art buildings.

Swatches of material pallet within the farm.
Miscellaneous shots taken around the farm. They give a unique sense of place to the site.
ARCHITECTURE AND LANDSCAPE ARCHITECTURE PROGRAMS

Architecture Program

Utility Shed Elements:
- Tractor storage
- Produce washing area – includes tables and sinks
- Exterior covered area for refrigerated Mobile Mini

Live/Work Unit Elements:
- Small office
- Service kitchen with adjacent exterior gathering space
- Studio style residence for a single person
- Additional storage

Design proposals will include:
- A matching material palette to the existing buildings
- Continued use of outdoor shaded areas (porches, etc)
- Natural ventilation techniques
- Rainwater harvesting in cisterns
- Gray water use suggestions
- Placement of solar water heater(s)
- Solar panels – tax credit incentives (GreenWatts program) or donation by Tucson Electric Power Company

Landscape Architecture Program

- Main Entry feature to farm
- ADA accessible garden pathways
- Covered outdoor classroom for 20 people – possibly with no walls
- Additional greenhouse
- All roads buffered/“bordered” with native vegetation
- Path on north may cut through site to connect with river trail
- Southwest field becomes traditional Yaqui planting area, possible mud roof structure, possible “horno”
- Fence will go between ditch and poles east side, 20’ buffer
- Learning demonstration gardens (home, garden, farm scales)
- A plant list
Initial meeting and site visit on February 07, 2008. After the initial site visit the Drachman group met with Dana Helfer, the Food Production Manager at the Farm. She discussed elements of the program with the Drachman group, including all of those listed on the previous page. Ms. Helfer also communicated that she would get the group copies of the previous Master Plan, and an AutoCad drawing of the irrigation plan. She expressed excitement and enthusiasm in the work the group would be doing.

Presentation of Site Analysis to Farm group on February 26, 2008. Kristen Hershberger and Dana Helfer attended at the Drachman conference room in the college building. Clarifications were made on the size of buffers around the fields and the width of the center strip. Clarification on the specifications for the requirements of the proposed structures was also given. Inclusion of a lath house by the greenhouses was also requested.

A series of conceptual design ideas were presented to the client on March 27, 2008. Dana Helfer and Kristen Hershberger attended the meeting. Feedback was very positive on the conceptual work completed. Clarification on the type of fence that would surround the property was given. It was also the desire of Ms. Helfer to use only Velvet Mesquites and Palo Verdes along the perimeter path. It was pointed out that some plants were planted along the northern edge of the center strip; it was discussed that this would not affect the planting plan as it was a flexible plan. It was also communicated that a clear roadway for tractor use would be required east-west through the center strip and also requested that a tractor access be included to access the lower fields.
Based on the information gathered from the site analysis of the farm and the input from the Marana Food Bank representatives during the meeting on March 27, 2008, we created a conceptual layout. This conceptual layout was used to generate the program used by our team to create the Conceptual Master Plan for the farm.
The conceptual master plan addresses the landscape program for the site at a large scale. Pedestrian trails on the four boundaries of the first section of the farm are lined with native Mesquite trees and allow the residents of the neighborhoods north of the site access to the trail along the Santa Cruz River bank and Heritage Park. Location of the green houses, lath house, and new utility building including the open classroom is to the west of the main gate to the farm. Location of the new Residence Unit within the farm boundaries is on the north east corner close to the existing buildings. Design of the central strip or median between the fields showcases learning demonstration gardens lined with different species of Palo Verde trees. Connections to the Santa Cruz River trail feature access gates as well as bulletin boards to inform visitors about the different activities and events on the farm.
The details on the bottom of the page show enlargements of some of the specific conceptual design ideas within the Master Plan.

1. The pedestrian crossing in the center of the middle strip/median marks the vehicular traffic lane with tractor tire treads in the center of the crossing and bollards at the edge of the road.
2. Similar to the crossing in the center of the middle strip/median the access to the lower fields marks the crossing on the trail with tractor treads and bollards at the edge of the road.
3. The connection to the trail along the Santa Cruz River has a bulletin board, gate, and Palo Verde trees to mark the access to the farm.
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3D VIEWS OF CONCEPTUAL MASTER PLAN

1. Passing through the gate toward the utility shed and open classroom.
2. Arriving at the site from Gladden Farms Drive.
3. Main gate to the farm.
4. Passing through the gate toward the utility shed and open classroom.
3D VIEWS OF CONCEPTUAL MASTER PLAN

Road between the garden center strip/median and crop area.

Garden area in the center strip/median between the crop areas.

View from the center strip/median north toward the greenhouse and the utility shed.
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3D VIEWS OF CONCEPTUAL MASTER PLAN

View of the connection with the pedestrian walkway northwest of the site looking east.

View of the pedestrian walkway on the north boundary looking west.

View of the residence unit along the pedestrian walkway on the north boundary.

View of the connection with the pedestrian walkway northwest of the site looking east.
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3D VIEWS OF CONCEPTUAL MASTER PLAN

View of the residence unit from the west side.

View of the residence unit from the south side.

View of the residence from the Heritage Art building going through the connecting gate.

View of the residence unit from the west side.
All of the conceptual ideas created for the Marana Food Bank Farm are based on existing elements and materials found throughout the site. The main gate to the farm reflects the mountains in the background. The farm has long distance views that frame the site and create a frame for its identity. The adobe pedestals become markers at every point throughout the site where there is an entrance and/or gate. The horse fence surrounding the property divides the public access areas from the ones that need to be secure.
In the middle strip/median between the fields of the farm, there are several gardens to demonstrate alternatives for visitors to use in their own gardens at home. This shows one of the gardens planted along the pedestrian walkway between the Palo Verdes lining the middle strip.

Planting plan view of one of the gardens.
This residential component is divided into two portions. The East portion is a small studio and work space for a short term resident such as an intern to live and work. This half can be built independently with the West section built as an addition later on. The West portion is a two bedroom one bath living space for a farm manager and his or her family.

Live/Work Unit (432sqft)
- The front room facing out to the farm is the work space. This room is provided with ample sun light and has views out over the farm as well as back to the other (existing) work spaces.
- The large patio on the East side serves as a connection to and a gathering place for all of the employees.
- The living space is open and flexible and can accommodate a disabled person.

2 Bedroom 1 Bath Unit (630sqft)
- The living room and eat in kitchen are not divided by a wall so the entire space feels larger. The separation is provided by a breakfast bar which supplies another eating/working surface
- Small hall provides privacy for the entrance to the bedrooms and bathroom
- Extra storage is provided outside and inside

Both Units
- Ample outdoor space is provided to enhance the dwelling units.
- All of the plumbing is located along a “T” shaped path in order to cut down on the cost of instillation and maintenance.
Cross-ventilation is the best way to keep the interior of a building cool and filled with fresh air. In order to cross-ventilate, two operable windows are provided on opposite or adjacent walls in every room. In addition to windows, all doors can be opened to assist with ventilation.

All of the rain water that falls on the roof of the residence is harvested in two cisterns. One cistern services the small live/work unit and another one services the 2-bedroom unit. This dual collection system allows for the live/work unit to harvest water before the 2-bedroom unit is built. The location of the cisterns on opposite corners of the building also allow for vegetation located on all sides of the residence to be irrigated with this collected rain water.
The elevations of the building show how the materials, styles and proportions of the existing buildings are incorporated into the design of the new building:
- Adobe block is used for the wall construction
- A stone-faced band wraps around the lower portion of the building
- The proportion and shape of the windows
- The construction of the patio roof

The East Elevation is the view of the residence from the existing work space.

The 3D view shows the solar water heaters placed on the roof. These are a very low cost way to save a little energy by using the heat from the sun to heat up a black tank of water.
The overhangs are sized to provide full shade between the equinoxes and full sun at the winter solstice to utilize solar gain as a passive heating strategy.

**Equinox**
- The windows are still fully in shade.
- The sunlight just hits the bottom edge of the building.

**Winter Solstice**
- The sunlight is able to penetrate into the interior through the windows and heat up the concrete slab floor providing passive heat to the inside.
- The wall is also heated by the sun-light and will transmit some heat to the inside.

**Summer Solstice**
- The windows are fully shaded.
- The walls are fully shaded so they will not transmit heat to the interior.
- The paved surface around the building is also shaded to minimize reflected heat as well as radiant heat.
The Utility Shed provides storage and work space:
- On the West side is a large garage door opening into a storage space.
- On the East side is an open area for produce washing.
- Between the storage and washing space is a walkway which can provide ventilation through the doorways.
- The outdoor class room is attached to the back of the wash area.
- The 9'x15' space is allotted for the refrigerated mobile mini for produce storage.
- The roof extends to cover both the outdoor classroom as well as the mobile mini.
- The rainwater from the roof is collected in a cistern which can be used in addition to the graywater from the sinks to irrigate the surrounding vegetation.
The Utility Shed utilizes the materials from the existing buildings in the same way as the residence.

The South and North Elevations show the butterfly roof which accentuates the fact that rain water is being harvested off the roof. The cistern to collect this water is located adjacent to the outdoor classroom to be used as a demonstration to visitors.

The South Elevation faces the rest of the farm and shows the garage door which allows the entrance of large farm machinery such as a tractor.

The East and West Elevations show the extension of the roof over the outdoor classroom and the mobile mini as well as the vents at the top of the wall. These vents will allow the hot air to escape from the building because they are located at the highest points of the wall just under the roof. The roof extends past the top of the wall in order to shield these vents from the rain and sun.
The water from the sinks in the Utility Shed can be used to water:

- All types of trees (including fruit and nut trees)
- All undergrowth that is not harvested for crop
- Root crops as long as it is alternated with fresh water
- Crops such as tomatoes where the edible parts are not in contact with the graywater

Do not use graywater on:
- Young seedlings unless alternated with fresh water
- Potted plants
- Acid-loving plants such as azaleas, begonias, gardenias, hibiscus, camellias and ferns

Further information can be found at Watercasa.org

Suggested use: a direct graywater system from the sinks out to the trees surrounding the Utility Shed and Outdoor Classroom.

Graywater Guidelines

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ENERGY ALTERNATIVES

Direct graywater system

Indirect graywater system

Wind Power Possibilities

USDA program

Section 9006 of the Renewable Energy and Energy Efficiency Improvement Program:
- Farmers, ranchers, and rural small businesses have new opportunities to install energy efficiency upgrades and new renewable energy systems.
- $36 million in overall funding available
- Grant and loan guarantee programs
- For grants, the USDA is making $15.9 million available for 2008. The USDA has established two grant cycles this year, with application deadlines of April 15th and June 16th. Applications not funded in the first cycle will be reconsidered in the second cycle.
- Grant applicants have the option to submit applications online from www.grants.gov and submit their application electronically.

Further information can be found at Farmenergy.org

Sample price range for a small wind turbine: $600 to $2,000 (under 500w)
The Marana Community Food Bank Farm conceptual master plan addresses the program set forth by the Farm employees. This document will assist the Marana Community Food Bank in the acquisition of funding to complete this shared vision. Included are:

- A pedestrian trail on the farm boundaries that allows the residents of the neighborhoods north of the site access to the trail along the Santa Cruz River bank and Heritage Park.
- The location of the green houses, lath house and new Utility building including the open classroom west of the main gate to the farm.
- The location of the new Residence Unit within the farm boundaries on the north east corner close to the existing buildings.
- Demonstration gardens in the center strip/median between the farm fields.
- Community connections by creating access to the Santa Cruz River trail and use of bulletin boards to inform the public about the different activities and events occurring on the farm.
- Conceptual ideas that are based in existing elements and materials found throughout the site.
- A main gate to the farm reflecting the mountains in the background.
- Security by the inclusion of a horse fence surrounding the property.
- Phasing opportunities by design of the residence allowing the East portion to be built independently from the West portion as funding allows.
- A small studio and work space for a short term resident such as an intern to live and work.
- A two bedroom one bath living space for a farm manager and his or her family.
- Rain water harvesting in cisterns on the proposed structures that will be used to irrigate the surrounding vegetation.
- A Utility Shed that provides storage, work space, an outdoor classroom, and space for a refrigerated mobile mini for storing produce.

The Drachman Institute would like to thank Ms. Helfer and Ms. Hersherberger for their valuable input and enthusiasm during the course of this project.
PLANT LISTS

Key to symbols:

Water use (WU)
1 – Very low, irrigate every 3-4 weeks during the growing season after establishment
2 – Low, irrigate every 2-3 weeks during the growing season after establishment
3 – Moderate, irrigate weekly during the growing season after establishment
* Average annual rainfall for Tucson is 11-12”; in low rainfall years the plants on the list may need additional irrigation to maintain good appearance and plant health.

Irrigation: most plants require regular irrigation during the first 2-3 year establishment period

Growing Season (GS):
Wi winter – apply water September through March; less frequently in off season
Su summer – apply water March through September; less frequently in off season

Plant Type (PT): Flower Color:
A accent plant S shrub Includes annotations for fall color, berries
C cactus Sc succulent
Gc groundcover T tree H: Mature plant height measured in feet
Gr ornamental grass V vine W: Mature canopy size measured in feet
An annual P perennial

Allergenicity (AL): Cold Hardiness: if plants do not suffer any a strongly allergenic damage at 20º F or below they are considered b moderately allergenic cold hardy and do not have a code in the column c weakly allergenic

(sh) semi-hardy - some dieback in a hard frost (mid 20’s F)
(t) tender - severely damaged or killed in a hard frost; when temperatures drop to 32º F or below

Note: the timing of the freeze, duration of the freeze, the temperatures the next day and the second night temperatures will affect how severely damaged the plant will be.

Native Plants are listed under Origin using the following symbols:
CD Chihuahuan Desert- includes north central and NW Mexico, SW Texas, southern New Mexico and extreme SE Arizona
SD Sonoran Desert – includes arid and semi-arid areas of NW Mexico, SE California and most of Arizona south of the Mogollon Rim

Note: Chihuahuan and Sonoran Desert Regions annotated by Matt Johnson, Native Plant Society.

Special Considerations:
Toxic: may be harmful if eaten. Call Arizona Poison Control Center at 626-6016
Invasive (INV): may spread and intrude into natural areas
Spreads in Cultivated Areas (SCA): may spread by seed or sucker in urban or cultivated areas, and in disturbed soils
<table>
<thead>
<tr>
<th>Latin Name, Common Name, Color and Season of Bloom, Plant Type, Height, Width, Growing Season, Area of Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Farm – Buildings</strong></td>
</tr>
<tr>
<td><strong>Anisacanthus quadrifidus &amp; varieties</strong> Flame Anisacanthus Orange, Red Summer to Fall S 5 5 Su CD</td>
</tr>
<tr>
<td><strong>Antigonon leptopus Queen’s Wreath Pink, White, Red Summer and Fall V 20 20 Su 1 TD</strong></td>
</tr>
<tr>
<td><strong>Asclepias subulata Desert Milkweed Pale Yellow, White Late-Spring to Fall P 3 3 Su Yes sh SD</strong></td>
</tr>
<tr>
<td><strong>Baileya multiradiata Desert Marigold Yellow spring through Fall P 1 1 Wi Yes SD, CD</strong></td>
</tr>
<tr>
<td><strong>Buddleia marrubifolia Wooly Butterfly Bush Orange Spring and Summer S 5 5 Su CD</strong></td>
</tr>
<tr>
<td><strong>Bulbine frutescens and cultivars Shrubby Bulbine Yellow to Orange Fall to Spring Sc 2 2 Wi sh S. Africa</strong></td>
</tr>
<tr>
<td><strong>Caesalpinia pulcherrima Red Bird of Paradise Red, Orange Summer S 6-8 6 Su Yes sh Caribb.</strong></td>
</tr>
<tr>
<td><strong>Calliandra californica Baja Fairy Duster Red Spring through Fall S 6 6 Su sh SD</strong></td>
</tr>
<tr>
<td><strong>Calliandra eriophylla Fairy Duster, False Mesquite Pink Spring S 3 4 Su SD</strong></td>
</tr>
<tr>
<td><strong>Calliandra peninsularis Red Calliandra, Baja FairyDuster2 Red Winter to Spring S 6 6 Su sh SD</strong></td>
</tr>
<tr>
<td><strong>Cassia artemisioides (Senna) Wormwood Senna,Feathery Cassia2 Yellow Late Winter to Spring S 5 5 Wi sh Austr.</strong></td>
</tr>
<tr>
<td><strong>Celtis reticulata Netleaf or WesternHackberryGreenish March through Summer30 30 Su a SD, CD</strong></td>
</tr>
<tr>
<td><strong>Ceratonia siliqua Carob, St. John’s Bread Pink Spring T 40 40 Su sh Medit.</strong></td>
</tr>
<tr>
<td><strong>Chilopsis linearis and cultivars Desert Willow White, Lavender,Pink3 Late-Spring to Fall T,S 30 30 Su Yes SD,CD</strong></td>
</tr>
<tr>
<td><strong>Cordia parvifolia Littleleaf Cordia White Spring to Fall S 8 10 Su CD</strong></td>
</tr>
<tr>
<td><strong>Dasylirion wheeleri Sotol, Desert Spoon Tan on erect stems Mid to late Summer A 4 5 Su SD,CD</strong></td>
</tr>
<tr>
<td><strong>Dodonaea viscosa &amp; varieties Hopbush Green, inconspicuosus2 Spring to Fall S 15 12 Su SD, CD</strong></td>
</tr>
<tr>
<td><strong>Encelia farinosa Brittlebush Yellow Early Spring S 3 3 Wi c sh SD</strong></td>
</tr>
<tr>
<td><strong>Eremophilma maculata ‘valentine’ Valentine Emu Bush Red Early to late Spring S 5 6 Austr.</strong></td>
</tr>
<tr>
<td><strong>Encelia farinosa Brittlebush California Poppy Orange, Pale-yellow, occasionally White3 Late-Spring An 2 2 Wi SD</strong></td>
</tr>
<tr>
<td><strong>Euphorbia rigida (biglandulosa) Gopher Plant Cartreuse Winter to Spring A,Sc 2 3 Wi Yes Africa</strong></td>
</tr>
<tr>
<td><strong>Eysenhardtia orthocarpa Kidneywood White Summer T 10 10 Su CD, SD</strong></td>
</tr>
<tr>
<td><strong>Glandularia gooddingii(Verbena)Goodding Lavender, Pink Spring P 1.5 3 Wi, Sp1 SD</strong></td>
</tr>
<tr>
<td><strong>Hesperaloe rupestris Night Flowering Hesperaloe White and Green Spring to Fall A 3 3 Su SD</strong></td>
</tr>
<tr>
<td><strong>Hesperaloe parviflora daviesii Red Yucca, Yellow Yucca Pink, Red, Yellow Spring and Summer A 3 3 Su 4 CD</strong></td>
</tr>
<tr>
<td><strong>Justicia californica and cultivars(Beloperone)2 Chuparosa Red Spring S 3 4 Su sh SD</strong></td>
</tr>
<tr>
<td><strong>Justicia candelicans Red Jacobinia Red, orange Fall to Spring S 5 3 Su sh SD</strong></td>
</tr>
<tr>
<td><strong>Larraea tridentata (divaricata) Creosote Bush, Greasewood Yellow Early Spring to Fall S 8 8 Su SD, CD</strong></td>
</tr>
<tr>
<td><strong>Melampodium leucanthum Blackfoot Daisy White Early Spring to Fall Gc 2 2 Su Yes Yes SD,CD</strong></td>
</tr>
<tr>
<td><strong>Muhlenbergia capillaris Regal Mist Pink Fall Gr 3 3 Su U.S.</strong></td>
</tr>
<tr>
<td><strong>Muhlenbergia emersleyi Bullgrass Purple dries to tan Fall Gr 4 4 Su a SD</strong></td>
</tr>
<tr>
<td><strong>Muhlenbergia rigens Deer Grass Tan Summer to Fall Gr 4 4 Su a SD</strong></td>
</tr>
<tr>
<td><strong>Nolina bigelovii Beargrass Cream Summer A 6 4 Su a SD</strong></td>
</tr>
<tr>
<td><strong>Nolina parishii Parry’s Beargrass A 5 5 Su sh SD</strong></td>
</tr>
<tr>
<td><strong>Olneya tesota Desert Ironwood, Tesota Lavender-Pink Late Spring to earlySummer1 T 30 25 Su sh SD, CD</strong></td>
</tr>
<tr>
<td><strong>Parkinsonia praecoxx(Cercidium)Palo Brea Yellow Spring T 30 25 Su b sh SD</strong></td>
</tr>
<tr>
<td><strong>Parkinsonia floridana (Cercidiumfloridum)Blue Palo Verde Yellow Early Spring T 30 30 Su b Yes Yes SD</strong></td>
</tr>
<tr>
<td><strong>Parkinsonia hybrid “DesertMuseum” Desert Museum Palo Verde Yellow Spring to Summer T 30 30 Su b SD, CD</strong></td>
</tr>
<tr>
<td><strong>Parkinsonia microphylla(Cercidium microphyllum)Littleleaf or Foothill Palo Verde yellow Late Spring T 20 20 Su b SD</strong></td>
</tr>
<tr>
<td><strong>Parkinsonia x sonora(Cercidium)Sonoran Palo Verde Yellow Spring T 20 20 Su b SD</strong></td>
</tr>
<tr>
<td><strong>Pedilanthus macrocarpus Slipper Flower, Lady’sSlipper, CandelliaRed-Pink Spring and Fall A,Sc 3 3 Su Yes SD</strong></td>
</tr>
<tr>
<td><strong>Penstemon barbatus Beardtongue Penstemon Red Summer to early Fall P 1 1 Wi SD,CD</strong></td>
</tr>
<tr>
<td>Plant Name</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Penstemon eatoni</td>
</tr>
<tr>
<td>Penstemon parryi</td>
</tr>
<tr>
<td>Penstemon pseudospectabilis</td>
</tr>
<tr>
<td>Penstemon subulatus</td>
</tr>
<tr>
<td>Phacelia campanularia</td>
</tr>
<tr>
<td>Prosopis pubescens</td>
</tr>
<tr>
<td>Prosopis velutina (juliflora)</td>
</tr>
<tr>
<td>Psilostrophe cooperi</td>
</tr>
<tr>
<td>Psilostrophe tagetina</td>
</tr>
<tr>
<td>Punica granatum &amp; varieties</td>
</tr>
<tr>
<td>Ruella californica</td>
</tr>
<tr>
<td>Ruella peninsularis</td>
</tr>
<tr>
<td>Salvia clevelandii</td>
</tr>
<tr>
<td>Senna wislizenii (Cassia)</td>
</tr>
<tr>
<td>Sphaeralcea ambigua &amp; varieties</td>
</tr>
<tr>
<td>Tecoma stans v. angustata</td>
</tr>
<tr>
<td>Vauquelinia californica &amp; varieties</td>
</tr>
<tr>
<td>Vitex agnus-castus</td>
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</tbody>
</table>

Riparian

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Name</th>
<th>Bloom Season</th>
<th>Bloom Color</th>
<th>Height</th>
<th>Spread</th>
<th>USDA Zones</th>
<th>Bloom Duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambrosia deltoidea (Franseria)</td>
<td>Triangle-leaf Bursage</td>
<td>Inconspicuous</td>
<td>Mid-Winter to Spring</td>
<td>S 2 2</td>
<td>Wi</td>
<td>a</td>
<td>SD,CD</td>
<td>Yes</td>
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<tr>
<td>Atriplex canescens</td>
<td>Four-Wing Saltbush</td>
<td>Inconspicuous</td>
<td>Spring to Summer</td>
<td>S 4 8</td>
<td>Su</td>
<td>a SD,CD</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Caesalpinia (Poinciana)</td>
<td>Mexican Bird of Paradise</td>
<td>Yellow</td>
<td>Spring to Summer</td>
<td>S 15 10</td>
<td>Su</td>
<td>Yes</td>
<td>Yes</td>
<td>SD,CD</td>
</tr>
<tr>
<td>Calliandra eriophylla</td>
<td>Fairy Duster</td>
<td>False Mesquite Pink</td>
<td>Spring</td>
<td>S 3 4</td>
<td>Su</td>
<td>a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Celtis pallida</td>
<td>Spiny or Desert Hackberry</td>
<td>Greenish-yellow</td>
<td>Spring to Summer</td>
<td>S 16 10</td>
<td>Su</td>
<td>a SD,CD</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Chilopsis linearis and cultivars</td>
<td>Desert Willow</td>
<td>White, Lavender, Pink</td>
<td>Late-Spring to Fall</td>
<td>T,S 30 30</td>
<td>Su</td>
<td>Yes</td>
<td>Yes</td>
<td>SD,CD</td>
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<tr>
<td>Datura wrightii</td>
<td>Sacred Datura, Jimson Weed</td>
<td>White</td>
<td>Late Spring to Fall</td>
<td>T,S 2 2</td>
<td>Wi</td>
<td>a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Larrea tridentata (divaricata)</td>
<td>Creosote Bush</td>
<td>Yellow</td>
<td>Spring to Fall</td>
<td>S 8 8</td>
<td>Su</td>
<td>SD,CD</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Lotus rigidus</td>
<td>Desert Deerweed</td>
<td>Yellow and Orange</td>
<td>Spring</td>
<td>Ge,C 1.5</td>
<td>2</td>
<td>Wi</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Lycium fremontii</td>
<td>Wolfberry, Tomatillo</td>
<td>White-Lavender, Red</td>
<td>Followed by Redberries</td>
<td>Spring 10</td>
<td>8</td>
<td>Su</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Macfadyena unguis-cati</td>
<td>Cat’s Claw Vine</td>
<td>Yellow</td>
<td>Spring</td>
<td>V 30 30</td>
<td>Su</td>
<td>Yes</td>
<td>Yes</td>
<td>U.S.</td>
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<tr>
<td>Sambucus nigra spp.</td>
<td>Cerulea(S.mexicana)</td>
<td>Mexican Elderberry</td>
<td>Creamy White</td>
<td>Winter to Spring</td>
<td>T 30 20</td>
<td>Wi</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Sphaeralcea ambigua &amp; varieties</td>
<td>Globe Mallow</td>
<td>Orange, White, Red, Purple</td>
<td>Spring to Summer</td>
<td>P 3 3</td>
<td>Wi</td>
<td>SD,CD</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Cactus Garden

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Name</th>
<th>Bloom Season</th>
<th>Bloom Color</th>
<th>Height</th>
<th>Spread</th>
<th>USDA Zones</th>
<th>Bloom Duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agave americana &amp; varieties</td>
<td>Century Plant</td>
<td>Once</td>
<td>Yellow</td>
<td>A,Sc 7 8</td>
<td>Su</td>
<td>CD</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Agave bovicornuta</td>
<td>Cow’s Horn</td>
<td>Agave Yellow</td>
<td>Spring to Summer</td>
<td>A,Sc 3 4</td>
<td>Su</td>
<td>sh Mex</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Agave colorata</td>
<td>Mescal Ceniza</td>
<td>Blue Century Plant</td>
<td>Yellow</td>
<td>A,Sc 3 3</td>
<td>Su</td>
<td>CD</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Agave geyneriflorasolitary</td>
<td>Twin-flowered Agave Yellow</td>
<td>Tinged or withered</td>
<td>Once</td>
<td>A,Sc 3 3</td>
<td>Su</td>
<td>sh Mex</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Agave vilmoriniana</td>
<td>Octopus Agave</td>
<td>Yellow</td>
<td>Once</td>
<td>Spring</td>
<td>A,Sc 4 6</td>
<td>Su</td>
<td>sh SD</td>
<td>Yes</td>
</tr>
<tr>
<td>Echinocereus spp.</td>
<td>Hedgehog, Rainbow Cactus</td>
<td>Varies by species</td>
<td>Red, Yellow, Pink, Purple</td>
<td>Spring to Summer</td>
<td>C 2 2</td>
<td>Su</td>
<td>a CD,SD</td>
<td>Yes</td>
</tr>
<tr>
<td>Fouquieria splendens</td>
<td>Ocotillo</td>
<td>Red</td>
<td>Mid-Spring</td>
<td>A 15 8</td>
<td>Su</td>
<td>SD,CD</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Mamillaria spp. Pincushion, Fishhook Cactus Cream, Yellow, Red, Pink Varies Spring to Summer 1 C 0.5 0.5 Su CD, SD
Opuntia basilaris Beavertail Prickly Pear Hot Pink Mid Spring C 2 4 Su SD
Opuntia bigelovii Teddy Bear Cholla Green Early Spring C 6 3 Su SD
Opuntia engelmannii Engelmann’s Prickly Pear Orange, Yellow Spring C 5 6 Sw US, Mex.
Opuntia ficus-indica Indian Fig Yellow Spring C 10-15 Su sh Mex.
Opuntia versicolor Staghorn Cholla Orange, Red, Yellow 1 Spring C 10 6 Su SD
Opuntia violacea macrocentra Long Spine Prickly Pear Yellow, Red Spring to early Summer 1 C 2 3 Su SD
Opuntia violacea ‘Santa Rita’ Santa Rita Prickly Pear Yellow Spring C 4 4 Su AZ
Yucca elata Soaptree Yucca White Late Spring to Summer A 20 8 Su SD, CD

Natives

Asclepias subulata Desert Milkweed Pale Yellow, White Late-Spring to Fall P 3 3 Su Yes sh SD
Baileya multiradiata Desert Marigold Yellow Spring through Fall P 1 1 Wi Yes SD, CD
Anisacanthus quadridus & varieties Flame Anisacanthus Orange, Red Summer to Fall S 5 5 Su CD
Calliandra eriophylla Fairy Duster, False Mesquite Pink Spring S 3 4 Su SD
Cordia parvifolia Littleleaf Cordia White Spring to Fall S 8 10 Su SD, CD
Encelia farinosa Brittlebush Yellow Early Spring S 3 3 Wi c sh SD
Eschscholtzia californica California Poppy Orange, Pale -yellow, occasionally White3 Late-Spring An 2 2 Wi SD
Eysenhardtiaorthocarpa Kidneywood White Summer T 10 10 Su CD, SD
Glandularia gooddingii(Verbena) Goodding Verbena Lavender, Pink Spring P 1.5 3 Wi, Sp1 SD
Hesperaloe nocturna Night Flowering Hesperaloe White and Green Spring to Fall A 3 3 Su SD
Justicia californica and cultivars( Beloperone) 2 Chuparosa Red Spring S 3 4 Su sh SD
Justice canadica Red Jacobinia Red, orange Fall to Spring S 5 3 Su sh SD
Larrea tridentata (divaricata) Creosote Bush, Greasewood Yellow Early Spring to Fall S 8 8 Su SD, CD
Muhlenbergia emersleyi Bullgrass Purple dries to tan Fall Gr 4 4 Su a SD
Muhlenbergia rigens Deer grass Tan Summer to Fall Gr 4 4 Su a a SD
Nolina bigelovii Beargrass Cream Summer A 6 4 Su SD
Nolina parryi Parry’s Beargrass A 5 5 Su SD
Pedilanthus macrorcarpus Slipper Flower, Lady’s Slipper, Candelilla Red-Pink Spring and Fall A, Sc 3 3 Su Yes SD
Penstemon barbatus Beardtongue Penstemon Red Summer to early Fall P 1 1 Wi SD, CD
Penstemon eatoni Firecracker Penstemon Red Late Winter to Early Spring P 1 1 Wi SD
Penstemon parryi Parry Penstemon Pink, Red Early Spring P 1 1 Wi Yes SD
Penstemon pseudospectabilis Canyon Penstemon, Mohave Beartongue Rose-purple Spring to mid-Summer P 1 1 Wi SD
Penstemon subulatus Little Beardtongue Red Spring P 1 1 Wi SD
Phacelia campanularia Desert Bluebells, Desert Canterbury Bells Blue Early Spring An 1 1 Wi SD
Ruellia peninsularis Baja Ruellia Blue, purple Spring to Summer S 4 4 Su sh SD
Sphaeralcea ambigua & varieties Mallow Orange, White, Red, Purple Lavender Early Spring and Fall P 3 3 Wi SD
Tecoma stans v. angustata AZ Yellow Bells Yellow Late Spring to Fall S 10 8 Su sh SD, CD
Simmondsia chinensis & varieties, Jojoba, Goat Nut Greenconspicuous Spring S 8 8 Wi a SD
Vauquelinia californica & varieties Arizona Rosewood White Spring to Summer T, S 25 15 Su SD
REFERENCES

HISTORIC DATA

DEMOGRAPHIC AND CLIMATE DATA

GIS DATA
Pima County Department of Transportation Geographic Information Service
http://www.dot.pima.gov/gis/maps/mapguide/

MARANA FOOD BANK WEBSITE
http://communityfoodbank.com/community-food-security-center/marana-farm/

ENERGY DATA
Graywater resource - http://www.watercasa.org/
Wind Power resource - http://www.farmenergy.org/

PLANT LISTS
http://www.azwater.gov/dwr/Content/Find_by_Program/Drought_and_Conservation/LowWaterPlantLists/default.htm

PLANT IMAGES
http://www.flickr.com/