2012 Vegetation Monitoring Program Observation Monitoring Sites and Livestock Grazing Summary for the KERN WATER BANK

SUBMITTED TO:
KERN WATER BANK AUTHORITY

PREPARED BY:
svb
south valley biology consulting llc

May 31, 2013
2012 VEGETATION MONITORING PROGRAM
OBSERVATION MONITORING SITES AND LIVESTOCK GRAZING SUMMARY
for the
KERN WATER BANK

Submitted to:

Kern Water Bank Authority
1620 Mill Rock Way, Suite 500
Bakersfield, CA 93311

Prepared by:

South Valley Biology Consulting LLC
6510 Montagna Drive
Bakersfield, CA 93306

May 31, 2013
The Kern Water Bank (KWB) vegetation monitoring program consists of eight permanently established vegetation monitoring sites (OMS), each one located in a representative habitat on the KWB (e.g., canal, ditch, pond, uplands, old farm lands, and conservation lands). The locations of monitoring sites have been unchanged since their establishment in the late 1990’s. Their locations are indicated in Figure 1. The primary purpose of monitoring these sites is to provide a qualitative evaluation and documentation of the dynamic nature of the vegetation on the KWB. Data collected and observations made at the monitoring sites are used to help guide vegetation management decisions, particularly in regards to livestock grazing strategies, and to facilitate the application of successful adaptive management strategies for the KWB.

All eight of the vegetation monitoring sites are visited each quarter by two biologists. The biologists collect data such as the observed plant and animal species, basic weather conditions, general vegetation conditions, and other pertinent information. Lastly, photographs from all four cardinal directions (North, East, West, and South) are taken to provide a visual representation of the conditions encountered at each site. This approach has resulted in many years of successive photographic data that show the dynamic nature of the KWB.

Rainfall during the 2012 rain year (October 1, 2011 - September 30, 2012) for the KWB was approximately 4.95 inches (76% of normal). The low rainfall had a dramatic effect on the vegetation conditions in 2012. However, perhaps even more stunning was the effect on the vegetation from the timing of the rainfall. There was a relatively small amount of rainfall early in the season (0.55 inches in October 2011, and 0.76 inches in November 2011). Then, no rain in December 2011 coupled with several frosty nights killed much of the early germinating plants. January and February 2012 were also relatively dry and cool with a combined precipitation of only 0.73 inches. This left essentially all of the KWB devoid of any green growth except for the recharge basins and canals (Photograph 1).

A few brief, but relatively wet, storms in March and April of 2012 brought nearly 3 inches of rain. This late season precipitation did not appear to help the native vegetation; however, the invasive exotic Russian thistle (Salsola tragus) exploded throughout the KWB (Photographs 2 - 4). By the end of the year, large areas of the KWB recharge areas were dominated by dense Russian thistle stands. The conservation lands were similarly invaded by this species, but not to the same extent (Photograph 5).

When it was becoming evident in early March that we were having significant Russian thistle germination, cattle were allowed to remain in the Strand and West Areas in an effort to combat the rapidly growing plants (Photograph 6). Although the grazing had some positive effect, grazing alone did not significantly reduce the Russian thistle.
Dense, Russian thistle stands were a common sight throughout many areas of the southern San Joaquin Valley in 2012.

The challenge to control Russian thistle explosions on the KWB is a very difficult one indeed. There will always be years when conditions are going to favor this species. In retrospect, 2012 was one of the most prolific years of Russian thistle that we have witnessed. It is important to learn from this “perfect storm” that led to such favorable conditions for Russian thistle and be able to anticipate as much as possible when such a season may be repeating. This is no easy task, given the size and complexity of the KWB, and the sometimes competing management goals that must be met. However, each year we experience something different and we attempt to learn from these experiences. Because Russian thistle is such a problem for KWB operations, and dense stands of the plant dramatically diminish the habitat value for wildlife, controlling this invasive weed on the KWB is always a top priority. Given what was experienced in 2012 and what has been observed in prior years, the following approaches may be more effective at controlling Russian thistle:

• Earlier turnout of cattle, and a higher number of head remaining for longer duration than what has been implemented in the past
• Consider grazing year-round in the most problematic areas within the recharge area on the KWB
• Draw down the head count when conditions warrant, such as later in the season during a recovery cycle, but still leaving a smaller “maintenance herd” in place
• Consider conducting the mowing/chopping program earlier in the season, before the plants are able to produce viable seed, especially in the most troublesome areas within the KWB recharge area

It is unlikely that cattle can effect any significant rapid change when a Russian thistle explosion is occurring. However, over a period of time cattle can probably improve conditions and help to lessen the explosion of plants. At the KWB, this has to be balanced with other management objectives and goals, as there are also negative impacts associated with cattle grazing. A few of these impacts are excessive soil compaction that may lead to decreased water infiltration in the recharge basins and more difficult burrowing for small mammals within the compatible habitat sectors, excessive damage to vegetation in the areas around water sources where cattle tend to concentrate, and the possibility of overgrazing areas that are not currently Russian thistle trouble areas.

Mowing/chopping operations have been used historically to help with Russian thistle control. However, this technique has been employed largely after the plants have matured. Therefore, although the area is opened up by cutting the plants back to near ground level, there is probably a significant amount of seed that remain. Mowing earlier in the season when the plants are smaller and have not yet matured may diminish the amount of seed that is produced. However, ground nesting birds such as burrowing owl (Athene cunicularea), California horned lark (Eremmophila alpestris), western
meadowlark (*Sturnella neglecta*), killdeer (*Charadrius vociferus*), and several others are known to nest on the KWB. As a result, mowing that is conducted earlier in the season may not be a suitable choice in areas where nesting ground birds are present. Still, there would likely be sizable areas within Russian thistle zones where no ground nesting would be occurring.

The 2013 season does not appear to be anything like what was experienced in 2012. However, there are still large areas where last year’s plants are still attached and ready to be carried away to spread their seed. The KWB Authority has been gathering huge numbers of the Russian thistle drifts along the fences, in the ditches, canals, and other areas, in an effort to reduce the potential for wildfires, remove clogged water conveyances, and enable wildlife movements (Photographs 7 and 8). With continued efforts, it is expected that recovery from the 2012 Russian thistle season will continue, and that hopefully, we might be in a better position to anticipate and react in the future, should there be a repeat of the conditions that led to such a proliferation of this noxious weed.
Photograph 1. Compatible habitat sector on March 26, 2012. Very little new green growth is visible. Most of what was growing was Russian thistle plants.

Photograph 2. Same area as shown in Photograph 1 on June 6, 2012. Russian thistle plants are growing rapidly as a result of the rains in March and April.
Photograph 3. Same area as shown in Photographs 1 and 2 on August 28, 2012. Mature Russian thistle plants dominate the landscape. Very few other plants are present. Unfortunately, large sections of the KWB experienced similar conditions.

Photograph 4. Same area as shown in Photographs 1-3 on December 4, 2012. By the end of the year, many places on the KWB were dominated by these conditions; dense, senesced Russian thistle plants with very little other vegetation present.
Photograph 5. Conservation bank lands in the South Area on December 4, 2012. Russian thistle dominates the landscape, but to a much lesser extent than what was observed within the recharge areas.

Photograph 7. Canal bottom choked with Russian thistle and other weedy vegetation in mid December 2012.

Photograph 8. Same location as shown in Photograph 7 in early March, 2013 after mowing. Area is now open and wildlife can move through the area.
KERN WATER BANK 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION
LOCATION: OMS-1
SECTION: 3
TOWNSHIP/RANGE: 30S/25E
COORDINATES (CA5-NAD83): 6181490, 2313744
NUMBER OF ACRES: 40
VEGETATION TYPE: EMERGENT WETLAND SPECIES PRESENT
SITE TYPE: POND BASIN/POND LITTORAL ZONES

SURVEY INFORMATION AND PHOTOGRAPHS

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Survey Date</th>
<th>Time</th>
<th>Monitor(s)</th>
<th>Rainfall to Date</th>
<th>Wind Direction</th>
<th>Wind Velocity</th>
<th>Temperature</th>
<th>Humidity</th>
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<tbody>
<tr>
<td>1ST QUARTER</td>
<td>03/26/2012</td>
<td>10:55 AM</td>
<td>J. JONES, J. KANG</td>
<td>3.31 IN</td>
<td>N/A</td>
<td>0 MPH</td>
<td>64 F</td>
<td>41%</td>
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<td>DENSE VEGETATION IN BASIN</td>
<td>CALIFORNIA GROUND SQUIRREL, CALIFORNIA QUAIL, WHITE-CROWNED SPARROW</td>
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<td>AMMANNIA SP., BROMUS DIANDRUS, B. RUBENS, ELEOCHARIS MACROSTACHYA, HORDEUM MURINUM SSP. LEPORINUM, LEYMUS TRITICOIDES, MELILOTUS INDICA, RUMEX CRISPUS, SALIX GOODDINGII, XANTHIUM STRUMARIUM</td>
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<td>2ND QUARTER</td>
<td>06/06/2012</td>
<td>10:00 AM</td>
<td>J. JONES, Z. BRISCO</td>
<td>4.93 IN</td>
<td>N</td>
<td>5 MPH</td>
<td>68 F</td>
<td>40%</td>
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<td>CALIFORNIA GROUND SQUIRREL, CLIFF SWALLOW, MOURNING DOVE, RAVEN</td>
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<td>3RD QUARTER</td>
<td>08/28/2012</td>
<td>8:00 AM</td>
<td>J. JONES, A. VASQUEZ</td>
<td>4.95 IN</td>
<td>N/A</td>
<td>0 MPH</td>
<td>77 F</td>
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<td>GREAT HORNED OWL, MOURNING DOVE</td>
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<td>AMMANNIA ROBUSTA, CONYZA CANADENSIS, CONYZA COULTERI, ELEOCHARIS MACROSTACHYA, HELIANTHUS ANNUUS, POLYPOGON MONSPELIENSIS, RUMEX CRISPUS, SALIX GOODDINGII, SISYMBRIUM RIO, TYPHA LATIFOLIA, XANTHIUM STRUMARIUM</td>
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<td>4TH QUARTER</td>
<td>12/04/2012</td>
<td>1:20 PM</td>
<td>J. JONES</td>
<td>0.12 IN</td>
<td>N</td>
<td>4 MPH</td>
<td>69 F</td>
<td>62%</td>
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<td>BLACK PHOEBE, CALIFORNIA GROUND SQUIRREL, COOPER'S HAWK, MOURNING DOVE, REDTAIL HAWK</td>
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<td>AMMANNIA SP., BROMUS RUBENS, CONYZA COULTERI, ELEOCHARIS MACROSTACHYA, JUNCUS BALTICUS, LEYMUS TRITICOIDES, POLYPOGON MONSPELIENSIS, RUMEX CRISPUS, SALIX GOODDINGII, TYPHA LATIFOLIA</td>
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KWB 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATION OMS-1
## Location Information

**Location:** OMS-2  
**Section:** 9  
**Township/Range:** 30S/25E  
**Coordinates (CA5-NAD83):** 6177540, 2308574  
**Number of Acres:** >1  
**Vegetation Type:** Emergent wetland species present/mostly dominated by annual grasses and weeds  
**Site Type:** Ditch bank/ditch bottom

## Survey Information and Photographs

### 1st Quarter

**Survey Date:** 03/26/2012  
**Time:** 11:25 AM  
**Monitor(s):** J. Jones, J. Kang  
**Rainfall to Date:** 3.31 in  
**Wind Direction:** N/A  
**Wind Velocity:** 0 MPH  
**Temperature:** 65 F  
**Humidity:** 43%  

**Notes:** Ditch bottom is bare and moist, vegetation is on upper banks, old tumbleweed drifts scattered in portions of ditch

**Wildlife Present:**  
**Plants Present:** Hirschfeldia incana, Hordeum murinum ssp. leporinum, Juncus balticus, Leymus triticoides, Melilotus indica, Salix Gooddingii, Sisymbrium irio

### 2nd Quarter

**Survey Date:** 06/06/2012  
**Time:** 10:40 AM  
**Monitor(s):** J. Jones, Z. Brisco  
**Rainfall to Date:** 4.93 in  
**Wind Direction:** N  
**Wind Velocity:** 5 MPH  
**Temperature:** 69 F  
**Humidity:** 38%  

**Notes:** Wildlife present: California whiptail, loggerhead shrike, mourning dove, redtail hawk  
**Plants Present:** Atriplex serenana, Bassia hyssopifolia, Chenopodium alba, Helianthus annuus, Heliotropium curassavicum, Hirschfeldia incana, Leymus triticoides, Rumex crispus, Salix Gooddingii, Salsola Tragus

### 3rd Quarter

**Survey Date:** 08/28/2012  
**Time:** 8:30 AM  
**Monitor(s):** J. Jones, A. Vasquez  
**Rainfall to Date:** 4.95 in  
**Wind Direction:** NW  
**Wind Velocity:** 5 MPH  
**Temperature:** 77 F  
**Humidity:** 38%  

**Notes:** Photos slightly off due to wasp nest  
**Wildlife Present:**  
**Plants Present:** Bassia hyssopifolia, Helianthus annuus, Heliotropium curassavicum, Leymus triticoides, Salix Gooddingii, Salsola Tragus, Xanthium strumarium

### 4th Quarter

**Survey Date:** 12/04/2012  
**Time:** 1:35 PM  
**Monitor(s):** J. Jones  
**Rainfall to Date:** 0.12 in  
**Wind Direction:** N  
**Wind Velocity:** 2 MPH  
**Temperature:** 68 F  
**Humidity:** 60%  

**Notes:** Mostly bare ground and Russian thistle, kangaroo rat burrows  
**Wildlife Present:** Loggerhead shrike  
**Plants Present:** Salsola Tragus, Schismus Arabicus
### Survey Information and Photographs

#### 1st Quarter
**Survey Date:** 03/26/2012  
**Time:** 11:10 AM  
**Monitor(s):** J. Jones, J. Kang  
**Rainfall to Date:** 3.31 in  
**Wind Direction:** NW  
**Wind Velocity:** 3 MPH  
**Temperature:** 64 F  
**Humidity:** 41%  
**Notes:** Mostly bare ground with trampled dead stalks from last season. Some active kangaroo rat burrows  
**Wildlife Present:** Redtail Hawk  
**Plants Present:** *Amsinckia Menziesii*, *Bromus Rubens*, *Erodium Cicutarium*, *Hirschfeldia Incana*, *Hordeum Murinum ssp. Leporinum*, *Schismus Arabicus*, *Sisymbrium Irio*

![North](image1) ![East](image2) ![South](image3) ![West](image4)

#### 2nd Quarter
**Survey Date:** 06/06/2012  
**Time:** 10:30 AM  
**Monitor(s):** J. Jones, Z. Brisco  
**Rainfall to Date:** 4.93 in  
**Wind Direction:** N  
**Wind Velocity:** 10 MPH  
**Temperature:** 70 F  
**Humidity:** 32%  
**Notes:** Schismus is dominant grass due to precip pattern this season, kangaroo rat burrows  
**Wildlife Present:** Mourning Dove, Raven  
**Plants Present:** *Atriplex Serenana*, *Hirschfeldia Incana*, *Salsola Tragus*, *Schismus Arabicus*, *Sisymbrium Irio*

![North](image5) ![East](image6) ![South](image7) ![West](image8)

#### 3rd Quarter
**Survey Date:** 08/28/2012  
**Time:** 8:20 AM  
**Monitor(s):** J. Jones, A. Vasquez  
**Rainfall to Date:** 4.95 in  
**Wind Direction:** N  
**Wind Velocity:** 2 MPH  
**Temperature:** 78 F  
**Humidity:** 35%  
**Notes:** Dense mature Russian thistle stands, cattle grazing, photos slightly off due to wasp nest  
**Wildlife Present:** Loggerhead Shrike  
**Plants Present:** *Atriplex Serenana*, *Bromus Rubens*, *Salix Gooddingii*, *Salsola Tragus*, *Schismus Arabicus*, *Sisymbrium Irio*

![North](image9) ![East](image10) ![South](image11) ![West](image12)

#### 4th Quarter
**Survey Date:** 12/04/2012  
**Time:** 1:48 PM  
**Monitor(s):** J. Jones  
**Rainfall to Date:** 0.12 in  
**Wind Direction:** N  
**Wind Velocity:** 5 MPH  
**Temperature:** 69 F  
**Humidity:** 55%  
**Notes:** Wildlife present: Black-shouldered kite, loggerhead shrike  
**Plants Present:** *Bassia Hyssopifolia*, *Helianthus Annuus*, *Leymus Triticeoides*, *Salix Gooddingii*, *Salsola Tragus*, *Xanthium Strumarium*
KERN WATER BANK 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION
LOCATION: OMS-4
SECTION: 11
TOWNSHIP/RANGE: 30S/25E
COORDINATES (CA5-NAD83): 6186254, 2311943
NUMBER OF ACRES: 10
VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/NON-NATIVE PLANTS
SITE TYPE: DITCH BANK/DITCH BOTTOM

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER
SURVEY DATE: 03/26/2012
TIME: 1:00 PM
MONITOR(S): J. JONES, J. KANG
RAINFALL TO DATE: 3.31 IN
WIND DIRECTION: N
WIND VELOCITY: 3 MPH
TEMPERATURE: 66 F
HUMIDITY: 37%
NOTES: GERMINATING TUMBLEWEEDS IN DITCH BOTTOM, MOST OTHER PLANTS ON UPPER BANKS
WILDLIFE PRESENT:
PLANTS PRESENT: BROMUS RUBENS, ELEOCHARIS MACROSTACHYA, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORIUM, MELILOTUS INDICA, POLYGONUM LAPIPATHIFOLIUM, RUMEX CRISPUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO, XANTHIUM STRUMARIUM

2ND QUARTER
SURVEY DATE: 06/06/2012
TIME: 11:35 AM
MONITOR(S): J. JONES, Z. BRISCO
RAINFALL TO DATE: 4.93 IN
WIND DIRECTION: N
WIND VELOCITY: 5 MPH
TEMPERATURE: 72 F
HUMIDITY: 35%
NOTES: DENSE RUDERAL VEGEATION
WILDLIFE PRESENT:
PLANTS PRESENT: BASSIA HYSSOPIFOLIA, BROMUS DIANDRUS, B. RUBENS, CONYZA CANADENSIS, HIRSCHFELDIA INCANA, LACTUCA SERRIOLA, MELILOTUS INDICA, POLYGONUM LAPIPATHIFOLIUM, POLYPOGON MONSPELIENSIS, RUMEX CRISPUS, SALSOLO TRAGUS

3RD QUARTER
SURVEY DATE: 08/28/2012
TIME: 9:25 PM
MONITOR(S): J. JONES, A. VASQUEZ
RAINFALL TO DATE: 4.95 IN
WIND DIRECTION: NW
WIND VELOCITY: 5 MPH
TEMPERATURE: 81 F
HUMIDITY: 39%
NOTES: WILDLIFE PRESENT:
PLANTS PRESENT: ATRIPLEX SERENANA, CONYZA CANADENSIS, HELIANTHUS ANNUUS, HIRSCHFELDIA INCANA, MALVA PARVIFLORA, POLYPOGON MONSPELIENSIS, RUMEX CRISPUS, SALSOLO TRAGUS, SCHISMUS ARABICUS

4TH QUARTER
SURVEY DATE: 12/04/2012
TIME: 1:00 PM
MONITOR(S): J. JONES
RAINFALL TO DATE: 0.12 IN
WIND DIRECTION: N
WIND VELOCITY: 3 MPH
TEMPERATURE: 70 F
HUMIDITY: 61%
NOTES: BANKS HAVE BEEN MOWED
WILDLIFE PRESENT:
PLANTS PRESENT: HIRSCHFELDIA INCANA, RUMEX CRISPUS, SALSOLO TRAGUS
KERN WATER BANK 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION
LOCATION: OMS-5
SECTION: 7
TOWNSHIP/RANGE: 30S/26E
COORDINATES (CA5-NAD83): 6194387, 2306947
NUMBER OF ACRES: 50
VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/NON-NATIVE PLANTS/RUDERAL VEGETATION
SITE TYPE: UPLAND-OLD FARM FIELDS

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER
SURVEY DATE: 03/26/2012
TIME: 10:14 AM
MONITOR(S): J. JONES, J. KANG
RAINFALL TO DATE: 3.31 IN
WIND DIRECTION: W
WIND VELOCITY: 5 MPH
TEMPERATURE: 57 F
HUMIDITY: 50%

NOTES: ONLY GERMINATING PLANTS, NO MATURE PLANTS, LARGELY BARE GROUND, NO TUMBLEWEEDS
WILDLIFE PRESENT: RAVEN
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, HIRSCHFELDIA INCANA, PECTOCARYA PENICILLATA

2ND QUARTER
SURVEY DATE: 06/06/2012
TIME: 12:00 PM
MONITOR(S): J. JONES, Z. BRISCO
RAINFALL TO DATE: 4.93 IN
WIND DIRECTION: N
WIND VELOCITY: 5 MPH
TEMPERATURE: 76 F
HUMIDITY: 31%

NOTES: KANGAROO RAT BURROWS, SPARSE VEGETATION, SCHISMUS DOMINANT GRASS
WILDLIFE PRESENT: CROWS
PLANTS PRESENT: BROMUS RUBENS, HIRSCHFELDIA INCANA, SALSOLA TRAGUS, SCHISMUS ARABICUS

3RD QUARTER
SURVEY DATE: 08/28/2012
TIME: 9:45 AM
MONITOR(S): J. JONES, A. VASQUEZ
RAINFALL TO DATE: 4.95 IN
WIND DIRECTION: NW
WIND VELOCITY: 5 MPH
TEMPERATURE: 82 F
HUMIDITY: 37%

NOTES: FEW KANGAROO RAT BURROWS
WILDLIFE PRESENT: CALIFORNIA GROUND SQUIRREL, SIDE-BLOTCHED LIZARD, TURKEY VULTURE
PLANTS PRESENT: BROMUS RUBENS, HIRSCHFELDIA INCANA, SALSOLA TRAGUS, SCHISMUS ARABICUS

4TH QUARTER
SURVEY DATE: 11/26/2012
TIME: 12:45 PM
MONITOR(S): J. JONES
RAINFALL TO DATE: 0.12 IN
WIND DIRECTION: W
WIND VELOCITY: 2 MPH
TEMPERATURE: 69 F
HUMIDITY: 49%

NOTES: BARE GROUND AND RUSSIAN THISTLE, FEW SCATTERED KANGAROO RAT BURROWS
WILDLIFE PRESENT:
PLANTS PRESENT: SALSOLA TRAGUS, SCHISMUS ARABICUS

KERN WATER BANK AUTHORITY
**KERN WATER BANK 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS**

**LOCATION INFORMATION**

LOCATION: OMS-6  
SECTION: 36  
TOWNSHIP/RANGE: 30S/25E  
COORDINATES (CA5-NAD83): 6192992, 2287399  
NUMBER OF ACRES: 160  
VEGETATION TYPE: MIXED ANNUAL GRASSLAND WITH SCATTERED SHRUBS/SCATTERED SHRUBS-BARE SOIL  
SITE TYPE: UPLAND-SENSITIVE HABITAT

**SURVEY INFORMATION AND PHOTOGRAPHS**

<table>
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<tr>
<th>QUARTER</th>
<th>SURVEY DATE</th>
<th>TIME</th>
<th>MONITOR(S)</th>
<th>RAINFALL TO DATE</th>
<th>WIND DIRECTION</th>
<th>WIND VELOCITY</th>
<th>TEMPERATURE</th>
<th>HUMIDITY</th>
<th>NOTES</th>
<th>WILDLIFE PRESENT</th>
<th>PLANTS PRESENT</th>
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</thead>
</table>
| 1ST QUARTER   | 03/26/2012          | 9:28 AM          | J. KANG          | 3.31 IN          | NW              | 1 MPH         | 53 F        | 41%      | KANGAROO RAT BURROWS  
                |                     |                  |                  |                  |                 |              |            |          | WILDLIFE PRESENT: RAVENS, WHITE-CROWNED SPARROWS  
                |                     |                  |                  |                  |                 |              |            |          | PLANTS PRESENT: ATRIPLEX POLYCARPA, BROMUS RUBENS, PROSOPIS GLANDULOSA, SCHISMUS ARABICUS |
| 2ND QUARTER   | 06/06/2012          | 1:15 PM          | J. JONES, Z. BRISCO | 4.93 IN          | NW              | 5 MPH         | 78 F        | 23%      | SPARSE VEGETATIVE COVER, SCHISMUS CO-DOMINATING WITH BROMUS RUBENS, SOME ACTIVE KANGAROO RAT BURROWS  
                |                     |                  |                  |                  |                 |              |            |          | WILDLIFE PRESENT:  
                |                     |                  |                  |                  |                 |              |            |          | PLANTS PRESENT: ATRIPLEX POLYCARPA, BROMUS HORDEACEUS, B. RUBENS, PROSOPIS GLANDULOSA, SCHISMUS ARABICUS |
| 3RD QUARTER   | 08/28/2012          | 7:30 AM          | J. JONES, A. VASQUEZ | 4.95 IN          | N/A             | 0 MPH         | 69 F        | 47%      | MOSTLY BARE AREAS IN BETWEEN SHRUBS  
                |                     |                  |                  |                  |                 |              |            |          | WILDLIFE PRESENT:  
                |                     |                  |                  |                  |                 |              |            |          | PLANTS PRESENT: ATRIPLEX POLYCARPA, BROMUS RUBENS, PROSOPIS GLANDULOSA, SCHISMUS ARABICUS |
| 4TH QUARTER   | 11/26/2012          | 10:15 AM         | J. JONES          | 0.12 IN          | N/A             | 0 MPH         | 66 F        | 59%      | FEW KANGAROO RAT BURROWS, SHRUBS LOOK WATER STRESSED  
                |                     |                  |                  |                  |                 |              |            |          | WILDLIFE PRESENT: WHITE-CROWNED SPARROWS  
                |                     |                  |                  |                  |                 |              |            |          | PLANTS PRESENT: ATRIPLEX POLYCARPA, BROMUS RUBENS, PROSOPIS GLANDULOSA |

**KERN WATER BANK AUTHORITY**
KERN WATER BANK 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION
LOCATION: OMS-7  
SECTION: 34  
TOWNSHIP/RANGE: 30S/25E  
COORDINATES (CA5-NAD83): 612246, 2290740  
NUMBER OF ACRES: 160  
VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS  
SITE TYPE: UPLAND-SENSITIVE HABITAT/UPLAND-OLD FARM FIELDS

SURVEY INFORMATION AND PHOTOGRAPHS

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<tr>
<th>QUARTER</th>
<th>SURVEY DATE</th>
<th>TIME</th>
<th>MONITOR(S)</th>
<th>RAINFALL TO DATE</th>
<th>WIND DIRECTION</th>
<th>WIND VELOCITY</th>
<th>TEMPERATURE</th>
<th>HUMIDITY</th>
<th>NOTES</th>
<th>WILDLIFE PRESENT</th>
<th>PLANTS PRESENT</th>
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<tbody>
<tr>
<td>1ST</td>
<td>03/26/2012</td>
<td>9:43 AM</td>
<td>J. KANG</td>
<td>3.31 IN</td>
<td>NW</td>
<td>5 MPH</td>
<td>54 F</td>
<td>39%</td>
<td>ACTIVE KANGAROO RAT BURROWS</td>
<td>CROW, REDTAIL HAWK</td>
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<td>AMSINCKIA MENZIESII, BROMUS RUBENS, SCHISMUS ARABICUS, SISYMBRIUM IRIO</td>
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<tr>
<td>2ND</td>
<td>06/06/2012</td>
<td>12:20 PM</td>
<td>J. JONES, Z. BRISCO</td>
<td>4.93 IN</td>
<td>N</td>
<td>10 MPH</td>
<td>76 F</td>
<td>28%</td>
<td>ACTIVE KANGAROO RAT BURROWS, SHISMUS DOMINANT GRASS</td>
<td>CROW, REDTAIL HAWK</td>
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<td>ATRIPLEX SERENANA, BROMUS RUBENS, HORDEUM MURINUM SSP. LEPORINUM, LACTUCA SERRIOLA, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO</td>
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<tr>
<td>3RD</td>
<td>08/28/2012</td>
<td>7:00 AM</td>
<td>J. JONES, A. VASQUEZ</td>
<td>4.95 IN</td>
<td>N/A</td>
<td>0 MPH</td>
<td>66 F</td>
<td>50%</td>
<td>ACTIVE KANGAROO RAT BURROWS, LARGE MATURE RUSSIAN THISTLE THROUGHGOUT AREA</td>
<td>WESTERN MEADOWLARK</td>
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<td>AMSINCKIA MENZIESII, BROMUS RUBENS, HORDEUM MURINUM SSP. LEPORINUM, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO</td>
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<tr>
<td>4TH</td>
<td>11/26/2012</td>
<td>11:15 AM</td>
<td>J. JONES</td>
<td>0.12 IN</td>
<td>W</td>
<td>2 MPH</td>
<td>67 F</td>
<td>51%</td>
<td>DENSE RUSSIAN THISTLE, SCHISMUS SP. IS HIGHLY DOMINANT GRASS</td>
<td>WESTERN MEADOWLARK</td>
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<td>BROMUS DIANDRUS, SALSOLA TRAGUS, SCHISMUS ARABICUS</td>
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</table>
## KERN WATER BANK 2012 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

### LOCATION INFORMATION

**LOCATION:** OMS-8  
**SECTION:** 16  
**TOWNSHIP/RANGE:** 30S/25E  
**COORDINATES (CA5-NAD83):** 6173009, 2307209  
**NUMBER OF ACRES:** 40  
**VEGETATION TYPE:** MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/NON-NATIVE PLANTS  
**SITE TYPE:** POND BASIN

### SURVEY INFORMATION AND PHOTOGRAPHS

#### 1ST QUARTER

**SURVEY DATE:** 03/26/2012  
**TIME:** 11:45 AM  
**MONITOR(S):** J. JONES, J. KANG  
**RAINFALL TO DATE:** 3.31 IN  
**WIND DIRECTION:** N  
**WIND VELOCITY:** 2 MPH  
**TEMPERATURE:** 57 F  
**HUMIDITY:** 36%  
**NOTES:** NEW CATTAIL GROWTH, CATTLE GRAZING ON CATTAILS  
**WILDLIFE PRESENT:** KILLDEAR  
**PLANTS PRESENT:** ELEOCHARIS MACROSTACHYA, JUNCUS BALTICUS, LACTUCA SERRIOLA, LUDWIGI PELOIDES, MARSELIA SP., MELILOTUS INDICA, POLYGONUM LAPPATHIFOLIUM, RUMEX CRISPUS, SALIX GOODDINGII, SISYMBRIUM IRIO, TYPHA LATIFOLIA

#### 2ND QUARTER

**SURVEY DATE:** 06/06/2012  
**TIME:** 11:00 AM  
**MONITOR(S):** J. JONES, Z. BRISCO  
**RAINFALL TO DATE:** 4.93 IN  
**WIND DIRECTION:** N  
**WIND VELOCITY:** 5 MPH  
**TEMPERATURE:** 71 F  
**HUMIDITY:** 35%  
**NOTES:**  
**WILDLIFE PRESENT:**  
**PLANTS PRESENT:** ACROPTILON REPENS, AMARANTHUS BLITEDEOUS, ATRIPLEX SERENANA, CONYZA COULTERI, HELIANTHUS ANNUUS, HIRSCHFELDIA INCANA, LYTHRUM CALIFORNICUM, PHYLA NODIFLORA, POLYGONUM LAPPATHIFOLIUM, RUMEX CRISPUS, SALIX GOODDINGII, SISYMBRIUM IRIO, TYPHA LATIFOLICA

#### 3RD QUARTER

**SURVEY DATE:** 08/28/2012  
**TIME:** 8:50 AM  
**MONITOR(S):** J. JONES, A. VASQUEZ  
**RAINFALL TO DATE:** 4.95 IN  
**WIND DIRECTION:** NW  
**WIND VELOCITY:** 5 MPH  
**TEMPERATURE:** 77 F  
**HUMIDITY:** 36%  
**NOTES:** CATTLE HAVE GRAZED ON CATTAILS, NO SMALL MAMMAL BURROWS, GOPHER MOUNDS  
**WILDLIFE PRESENT:** KESTREL, MOURNING DOVES, ROADRUNNER  
**PLANTS PRESENT:** ATRIPLEX SERENANA, CONYZA CANADENSIS, C. COULTERI, HELIANTHUS ANNUUS, HIRSCHFELDIA INCANA, LACTUCA SALINA, LYTHRUM CALIFORNICUM, MALVILLA LEPROSA, PHYLA NODIFLORA, SALIX GOODDINGII, TYPHA LATIFOLIC

#### 4TH QUARTER

**SURVEY DATE:** 12/04/2012  
**TIME:** 2:15 PM  
**MONITOR(S):** J. JONES  
**RAINFALL TO DATE:** 0.12 IN  
**WIND DIRECTION:** N  
**WIND VELOCITY:** 5 MPH  
**TEMPERATURE:** 69 F  
**HUMIDITY:** 49%  
**NOTES:**  
**WILDLIFE PRESENT:** RED-TAIL HAWK  
**PLANTS PRESENT:** CONYZA CANADENSIS, C. COULTERI, HELIANTHUS ANNUUS, HIRSCHFELDIA INCANA, LACTUCA SALINA, LYTHRUM CALIFORNICUM, MALVA PARVIFLORA, PHYLA NODIFLORA, SALIX GOODDINGII, SALSOLA TRAGUS, TYPHA LATIFOLIA