

# Kern Water Bank Authority

## Habitat Conservation Plan/ Natural Community Conservation Plan

### 2016 Compliance Report and 2017 Management Plan

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View SW from Pond S1, March 1, 2017



*May, 2017*

Black-necked Stilt (*Himantopus mexicanus*)



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## Executive Summary

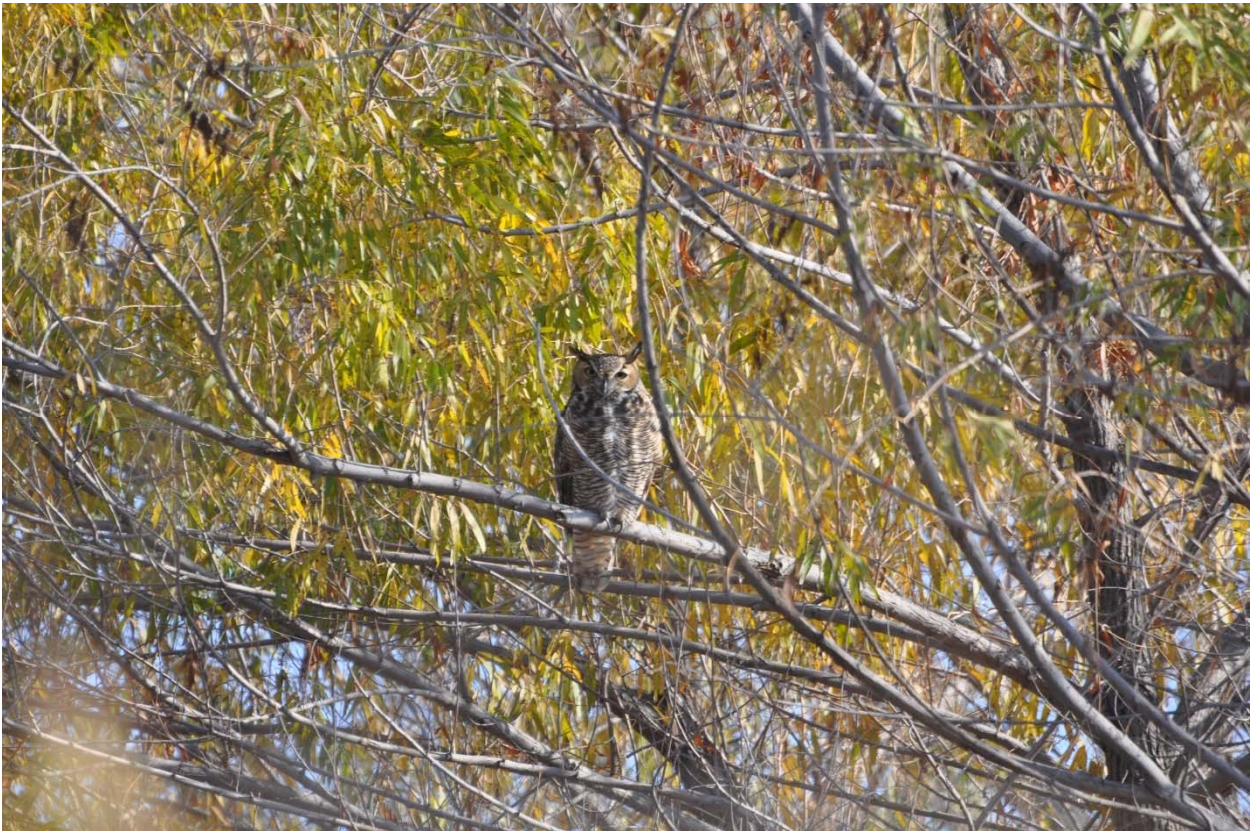
The Kern Water Bank (KWB) occupies approximately 20,000 acres in the southern San Joaquin Valley. It is operated under a Habitat Conservation Plan/Natural Community Conservation Plan (HCP) which prescribes reporting and planning requirements, adaptive management methodologies, and avoidance and mitigation measures.

The KWB is well located to provide significant benefits to wildlife in the southern San Joaquin Valley. The water banking activities of the Kern Water Bank have re-established a thriving intermittent wetland habitat along the Pacific Flyway that is ideal for water birds, and the areas outside of the ponds provide excellent upland habitat for raptors, other migratory birds, terrestrial wildlife, and rare and endangered plants. An ornithological study completed during the fall and winter of 2011 indicated 66 different species of water birds were present with populations reaching 35,000 individuals. The study concluded that: “Overall, in terms of bird abundance, species diversity, acreage, location and habitat diversity, [the KWB] is one of the most important freshwater wetlands in California, especially when compared to other privately managed wetlands.” Significant recharge activities in 2107 are expected to yield similar benefits.

Upland habitat has also been re-established on lands once farmed using the adaptive management methods prescribed in the HCP. These lands support many special-status species, including Tipton kangaroo rats, burrowing owls, tricolored blackbirds, and San Joaquin woolly threads. The careful implementation of adaptive management techniques has significantly improved upland habitat value – follow-up ornithological studies indicate that even when ponds are dry, the KWB is an important area of upland habitat in terms of bird abundance, species diversity, and habitat diversity. Overall, the KWB has become a very important wildlife resource of regional significance.

This report documents water banking activities in 2016, provides a management plan for 2017, summarizes Conservation Bank transactions, and describes other HCP compliance measures.

Great Horned Owl (*Bubo virginianus*)



## 1.0 Introduction

The Kern Water Bank (KWB) occupies approximately 20,000 acres in the southern San Joaquin Valley of California (Figure 1). The Water Bank is operated by the Kern Water Bank Authority (KWBA) under a Habitat Conservation Plan/Natural Community Conservation Plan (HCP) executed on October 2, 1997. The HCP provides for the overall management of Water Bank lands with the stated purpose of “accomplish[ing] both water conservation and environmental objectives. The primary water conservation objective is the storage of water in the aquifer during times of surplus for recovery during times of shortage. The primary environmental objective is to set aside large areas of the KWB for threatened, endangered, and sensitive species and to implement a program to protect and enhance the habitat.” The keystone of the HCP is balanced achievement of both goals, and issuance of “incidental take permits” by USFWS and “management authorizations” by CDFW applied to specific activities and use of the KWB.

Since the implementation of the HCP, KWBA has complied with its’ preservation, construction and operational, monitoring, adaptive management, and reporting requirements. The Implementation Agreement (IA) requires the submittal of an Annual Report of the previous year’s activities and a Management Plan describing the coming year’s activities. Specifically, the Annual Report is to provide the following information:<sup>1</sup>

- 1) Summary of all activities that have taken place on the Kern Water Bank in the previous year, including construction, operation and maintenance of water recharge and water extraction facilities;
- 2) Summary of all Take that has occurred within the previous year, including Take of Covered Species and Covered Habitat;
- 3) Summary of all mitigation measures implemented in the previous year;
- 4) Results of completed studies;
- 5) Status of ongoing activities;
- 6) Results from the implementation of monitoring programs;
- 7) Results from the implementation of avoidance and minimization measures;

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<sup>1</sup> Implementation Agreement, Section 3.3.4.

- 8) Report regarding the status of the Viability Fund;
- 9) Copy of KWBA’s annual financial report; and
- 10) Certification by KWBA officer that the information in the report is “true, accurate and complete.”

The Management Plan is to describe the operational activities contemplated for the KWB during the next year, including construction, maintenance and repair of the infrastructure, and a description of the adaptive management activities to be carried out.<sup>2</sup>

In addition to the reporting requirement in the IA, the Conservation Bank Agreement (CBA) requires the submittal of an annual report detailing Conservation Bank transactions.

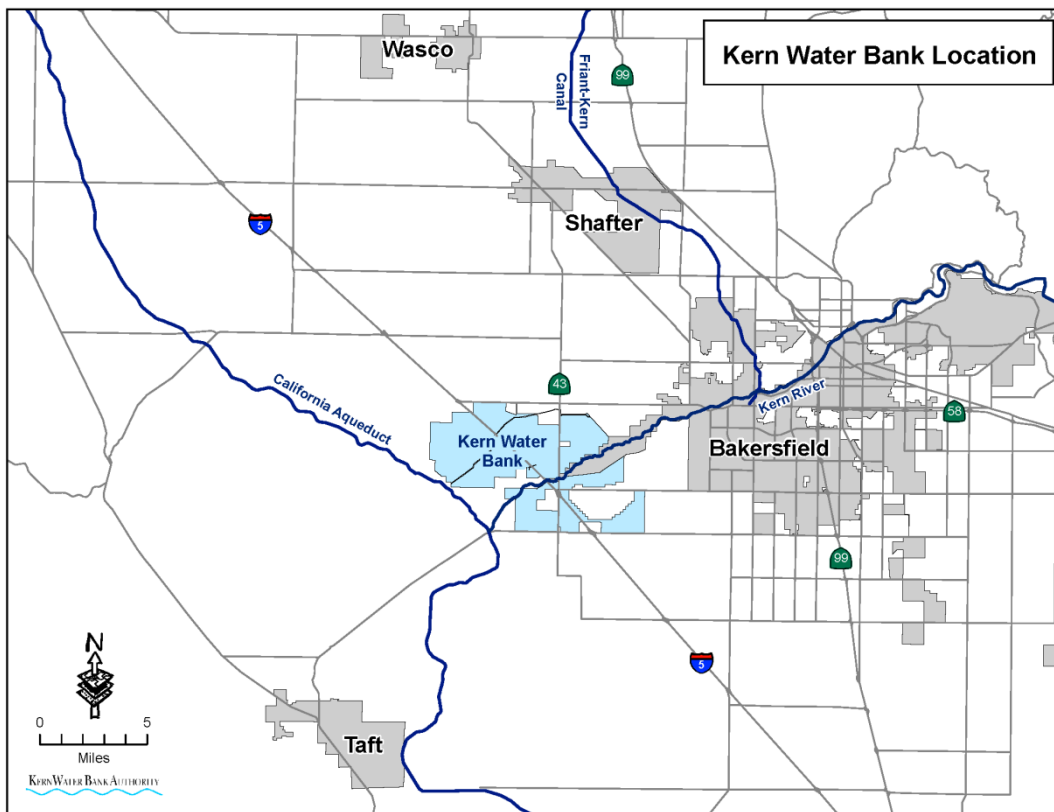


Figure 1. Kern Water Bank location.

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<sup>2</sup> Implementation Agreement, Section 3.3.5.



This report is intended to meet the reporting requirements of the IA and CBA. It consists of eight sections:

- Section 1 is this introduction, which reviews the objectives of the HCP and describes the basis for the report;
- Section 2 includes a summary of activities completed in the 2016 reporting year (May 1, 2016 – April 30, 2017) and the status of ongoing activities;
- Section 3 provides a summary of take, a summary of mitigation measures implemented during the reporting year, and the results of avoidance and minimization measures;
- Section 4 discusses adaptive management and the results of monitoring programs and completed studies;
- Section 5 is the Conservation Bank Report for the calendar year 2016;
- Section 6 is the Management Plan;
- Section 7 discusses the Viability Fund and the annual financial report for the calendar year 2016; and
- Section 8 is the certification regarding the accuracy of the report.



Greater Roadrunner (*Geococcyx californianus*)



Common Raven (*Corvus corax*)



## **2.0 Summary of 2016 Activities**

Activities in 2016 were primarily focused on recovery operations through early May, finalizing the equipping of three replacement wells, installing a pump in the Kern Water Bank Canal, upgrading SCADA equipment, and maintenance and ongoing repairs of existing wells and recharge facilities. Security measures included daily patrols. These activities are discussed below.

### **2.1 Water Banking Operations and Maintenance Activities**

Precipitation levels in the 2015/2016 season provided some relief from the severe drought conditions that had existed over the last four years resulting in a State Water Project allocation of 60%. Recovery operations were conducted for the first few days of January 2016 but were suspended until March due to repair activities on the California Aqueduct. Recovery operations then continued from March through May 2, until they were again suspended at the request of participants. During that time, approximately 25,500 acre-feet of stored water was recovered. No recovery or recharge operations for the Kern Water Bank participants occurred for the remainder of the year. The KWB canal was used to deliver water to the West Kern project from October through early December. The KWB M7 pond was used to facilitate this delivery for a portion of the program.

Maintenance activities focused on supporting recovery operations and preparing for potential recharge operations in 2017. With respect to recovery operations, 21 existing wells were repaired and/or rehabilitated, and conveyance facilities were cleared of obstructions as needed. Given the potential for recharge operations in 2017, canals and ditches continued to be cleared of vegetation and sediment and fine-grained deposits on the bottom of pond M9 were removed and placed on a pond berm. These activities were conducted on existing facilities and none resulted in new habitat disturbance.

### **2.2 Construction Activities**

Construction activities in 2016 included:

- Installation of equipment and pipelines for the three replacement wells drilled in 2015;
- Continuing an upgrade to the SCADA system and installing security cameras;

- Installation of a pump in the KWB canal to lift water into the C6 and C7 ponds; and
- Graveling roads.

The pipelines resulted in 5 acres of temporary disturbance. The balance of these activities were all conducted on existing facilities on previously disturbed lands. A summary of all project disturbance is shown on Table 1. It should be noted that the temporary disturbance which resulted from the installation of well pipelines in 2013, as well as the disturbance described for the West Kern pipeline in the 2012 Annual Report, has been replaced with habitat, and the pipeline alignments are indistinguishable from adjoining lands.

### 2.3 Security

Security patrols are conducted daily on KWB lands. The purpose of the patrols is to protect the property from trespassers, poachers, and thieves. None of the copper thefts that plagued the KWB in 2013 and 2014 occurred. Minor security issues included illegal dumping and trespassing.

Table 1. Habitat Disturbance Summary in Acres.

<b><i>Recharge Basins</i></b>		
	HCP Estimated Disturbance	Actual Disturbance as of 12/31/15
Recharge Basins <sup>1</sup>	5,900	4,998
<b><i>Permanently Disturbed Areas</i></b>		
	HCP Estimated Disturbance	Actual Disturbance as of 12/31/16
Recovery Facilities	66	39
Conveyance Facilities	397	195
Kern River Reverse Flow	18	0
Roads	0	23
Total	481	257
<b><i>Temporary Disturbed Areas</i></b>		
	HCP Estimated Disturbance	Current Disturbance as of 12/31/15
Canal Construction	73	0
Pipelines	218	5
Total	291	5

<sup>1</sup> Does not include emergency basins in the farming area.

## 2.4 Third Party Activities

Third party activities that occurred on the property in 2016 included:

- Miscellaneous oil-well maintenance activities by Central Resources.
- PG&E conducted field reviews for the possible installation of power lines for the Central California Power Connect Project.

KWBA is unaware of any take associated with these activities.



### **3.0 Take, Mitigation Measures, and Avoidance and Minimization**

The installation of pipelines for the three replacement wells resulted in 5 acres of temporary habitat disturbance in the Compatible Habitat Sector. No take of covered species occurred because of these activities. The amount of total project disturbance is listed in Table 1. The temporary disturbance areas are expected to revert to habitat in the near future.

Mitigation measures for the minimization of impacts are prescribed in the IA<sup>3</sup>. They include: the use of a biological monitor, specific construction practices, practices for ongoing activities, notification requirements regarding listed animals, and special requirements for actions which might threaten fully protected species. All of the requirements are provided in Appendix A for reference.

The specific measures implemented in 2016 (and more fully described in Appendix A) for the activities described in Section 2.0 included:

- Use of a biological monitor prior to construction and maintenance activities that would disturb habitat;
- Oversight of construction and maintenance activities by KWBA personnel;
- Delineation of disturbance areas prior and during construction;
- Construction site review to ensure that no animals including kit foxes are trapped in pipes, culverts, or other like structures;
- Employee orientation in which endangered species concerns were explained;
- Equipment storage in non-habitat areas;
- Limiting traffic to existing roads and speeds of no more than 25 mph;
- Proper disposal of food-related trash and scraps;
- Prohibiting dogs (except for hunting) from the property; and
- Use of herbicides only in accordance with the Vegetation Management Plan.

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<sup>3</sup> Implementation Agreement, Exhibit H, Minimization of Impacts Requirements.

## **4.0 Adaptive Management, Monitoring Programs and Studies**

The HCP's Vegetation Management Plan (VMP) describes vegetation management and restoration practices for the long-term adaptive habitat management and enhancement of Kern Water Bank lands. The priorities of the adaptive management program are protection of sensitive habitat areas and control of exotic pest plants; the primary tools of the program are livestock grazing, mowing, and burning.

Section IV.B.1. of the HCP requires rare plant surveys and monitoring of San Joaquin kit fox and Tipton kangaroo rat populations. The plant surveys are to be conducted at least every other year; the population monitoring is to be conducted annually. KWBA has also developed additional surveys and monitoring not required or described in the HCP which includes an ongoing ornithological study and the development of an observation monitoring grid. These topics are discussed in more detail below.

### **4.1 Adaptive Management and Vegetation Monitoring**

The primary tools available under the VMP, livestock grazing, mowing, and prescribed burning, are used to varying degrees in response to ever-changing conditions on KWB lands.

Herbicide use for exotic pest plant control is also provided for in the VMP. South Valley Biology (SVB) oversees much of the adaptive management measures undertaken throughout the year on the KWB and also documents conditions at the Observation Monitoring Sites (see report in Appendix B).

#### **4.1.1 Livestock Grazing**

The primary goal of the grazing program is to minimize tumbleweeds and manage excessive growth. Tumbleweeds are an exotic pest which crowd out native species and create significant maintenance problems after wind storms. Cattle will graze on young palatable plants and in some cases trample older plants helping to minimize this problem.

Excessive growth of other plants can exacerbate mosquito problems and diminish habitat value for some species. Mosquitos prefer to breed in vegetation choked portions of ponds rather than in open water. Heavy vegetation can also make it difficult to reach areas for abatement purposes. Grazing helps to minimize vegetation in pond bottoms before recharge events and along pond

margins during recharge events, thereby diminishing areas favorable to mosquito breeding and providing access for abatement.

Heavy vegetation can also diminish habitat value for many species. Long-term studies of carefully managed grazing programs have indicated reducing herbaceous cover to about 500 lbs per acre Residual Dry Matter (RDM) is beneficial to many native vertebrate species. This RDM value has been an informal goal of the grazing program on the KWB.

Precipitation in the winter of 2015-2016 approached average conditions, and over 17,700 acres were grazed at some time. Cattle numbers by area and month are shown with the graphs on Figure 2. The 2016 grazing program is discussed in detail in Appendix B.

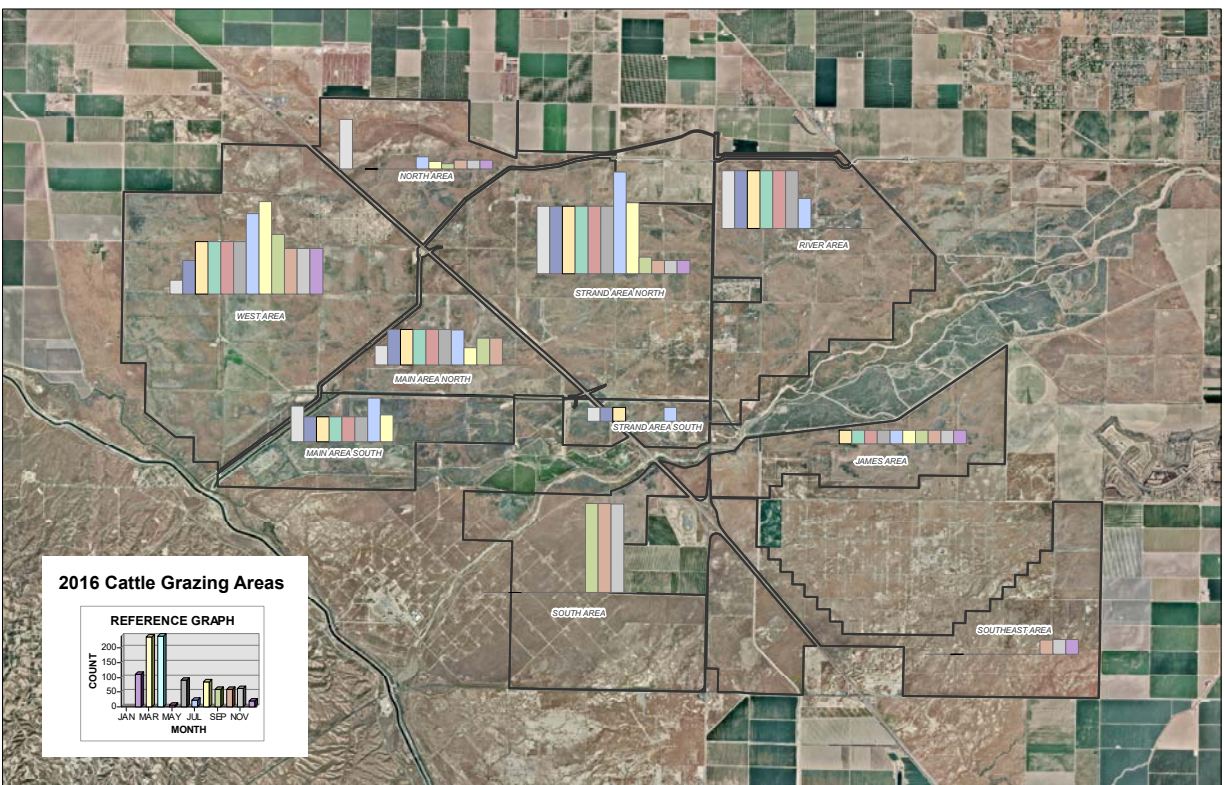


Figure 2. Areas grazed by cattle in 2016.

#### 4.1.2 Mowing

Mowing was conducted primarily along existing roads and canals to manage plant encroachment and in areas covered by tumbleweed drifts or in pond bottoms choked with stands of dead cattails



(Figure 3). The drifts of dead tumbleweeds prevent the germination of desirable native plants and can create significant maintenance issues when they blow into canals. The dead cattails can provide breeding sites for mosquitoes when ponds are filled. Canal mowing was only used sparingly so that plant cover remained in place during nesting seasons and so that cover was available for animals using the canals as a water source. Approximately 280 acres were mowed in 2016.

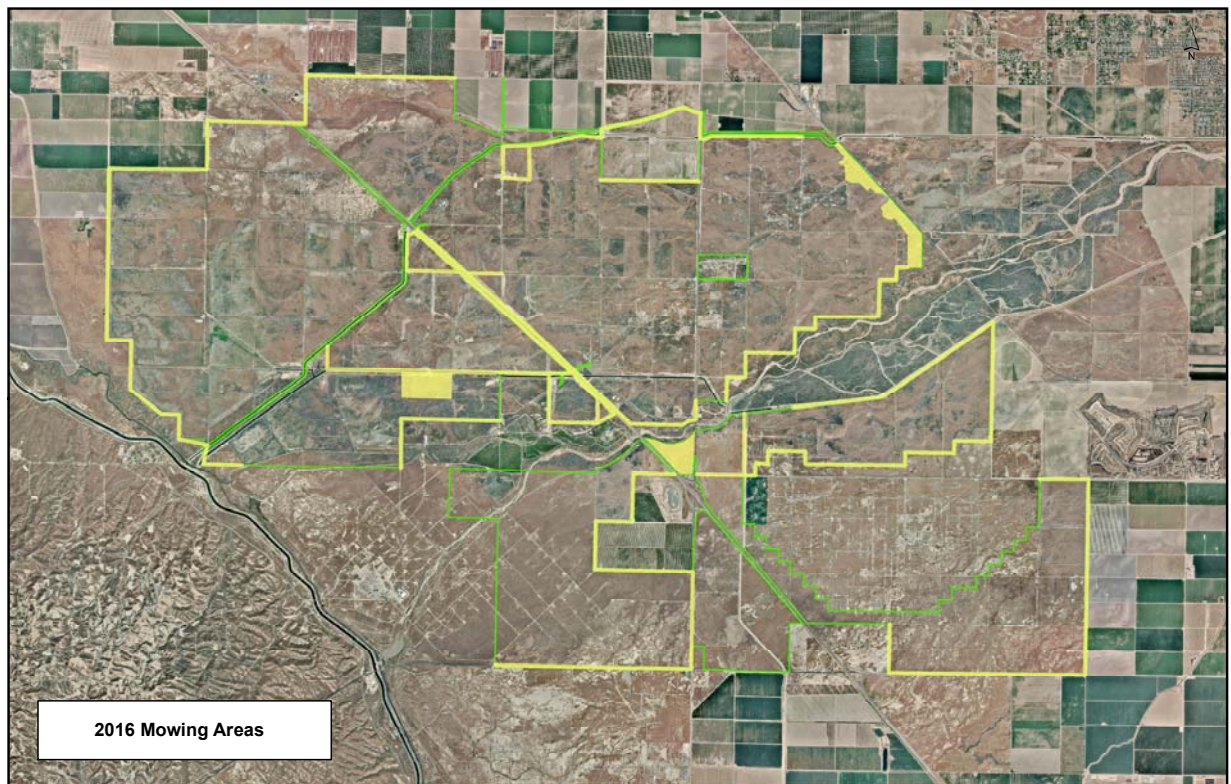


Figure 3. Areas mowed in 2016.

#### **4.1.3 Burning**

Burning (under a permit from the San Joaquin Valley Unified Air Pollution Control District) was conducted to eliminate drifts of dead tumbleweeds in the areas shown in Figure 4. As described above, the dead tumbleweeds crowd out desirable native plants and create significant maintenance issues. They can also create fire hazards when they pile up along fences near public highways. Approximately 290 acres were burned in 2016.

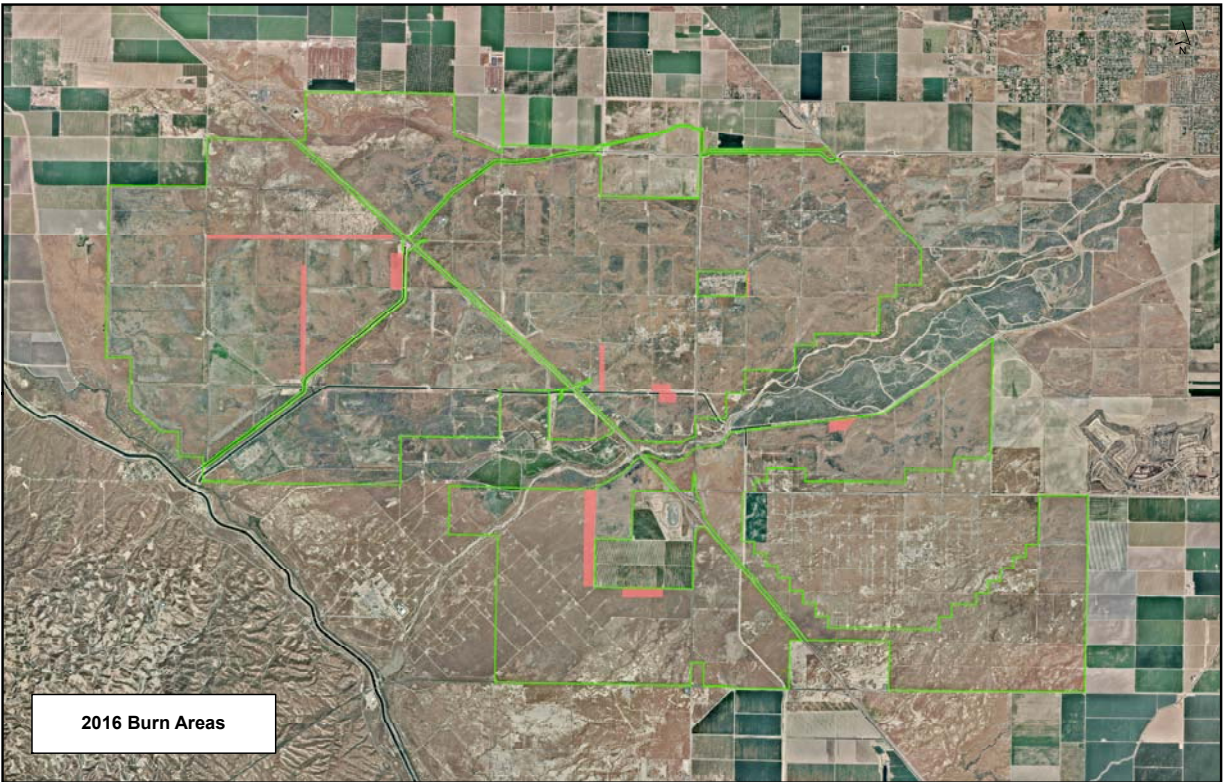


Figure 4. Areas burned in 2016.

#### 4.1.4 Herbicide Use

Herbicides (Diuron and Round-Up) were used to control weeds at well sites, along roads and fences, and at water control structures (Figure 5).

#### 4.1.5 Other Control Methods

Yellow starthistle was identified in the spring of 2017 on a few acres in the northwest corner of Section 12, T30S/R24E. This plant is a rapid colonizer which rapidly depletes soil moisture for desirable native species.<sup>4</sup> Shortly after the plants were discovered, they were either sprayed with herbicide or removed by hand. Previous infestations were found in the same area in 2012.

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<sup>4</sup> UC ANR Publication 7402.

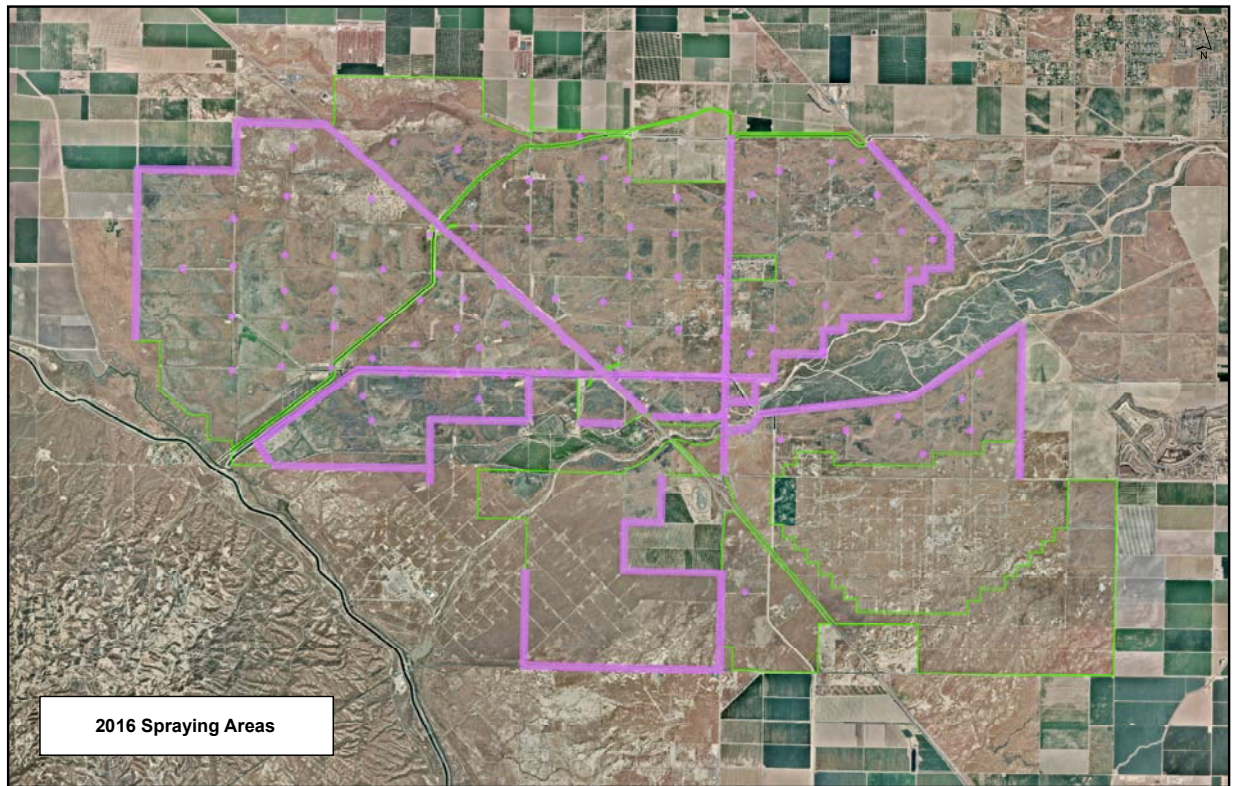


Figure 5. Areas sprayed in 2016.

#### **4.1.6 Observation Monitoring Site Program**

In 1999, KWBA conceived of and developed an observation monitoring program. This is a voluntary program not required by the HCP/NCCP. Eight sites, referred to as Observation Monitoring Sites (OMS) and representing different aspects of KWB habitat (e.g., canal, ditch, pond, uplands, conservation bank), were selected for surveys and the development of photographic records. Quarterly, staff and/or consultants have observed each site and collected data on weather conditions, general vegetation conditions, and any other pertinent information. Also, photographs were taken looking north, east, south, and west, to be compared with prior and future images to identify changes. KWBA will continue the quarterly OMS program, building a photographic record and informational database, which will help provide insight for adaptive management of different sectors of the KWB. The OMS report is provided in Appendix B.

#### **4.2 Ornithological Studies**

The Kern Water Bank Authority has commissioned ornithological surveys since 2011 to help document the benefits KWB lands provide to the region. This is another voluntary program not

required by the HCP/NCCP. Surveys conducted during the wet winter and spring of 2011/2012 and 2016/2017 have documented substantial benefits to water birds provided by KWB recharge programs, whereas surveys conducted during the intervening dry years have documented significant benefits to upland birds and raptors. All told, these surveys have identified 209 species of birds on KWB lands.

#### **4.2.1 Water Bird Surveys**

Prior to the development of Kern County's water infrastructure, much of the area was intermittently flooded by the Kern River and other minor streams. This flooding supported extensive wetlands, marshes, and Kern and Buena Vista Lakes, all along the Pacific Flyway. Numerous canals and Isabella Dam were constructed during the 20<sup>th</sup> century to capture and regulate waters for beneficial uses. However, this redirection also resulted in a reduction in wetland and marsh habitats by as much as 90%.<sup>5</sup> The development of the Kern Water Bank (and other banking projects in Kern County) has re-established thousands of acres of intermittent wetlands in the region and provide much-needed habitat for migrating water birds.

Sterling Wildlife Biology was contracted to complete bird surveys from October 2011 through mid-April 2012, a particularly wet winter (see report in Appendix C). The water bird surveys were conducted by observing recharge ponds, upland bird surveys were conducted by walking transects at specific locations, and raptor surveys were conducted by recording sightings along roads. The results can be summarized as follows:

- For the October through February period, overall water bird numbers ranged from approximately 20,000 to 35,000 individuals. Numbers declined after this as recharge operations ceased in early February 2012;
- 66 native water bird species were identified;
- Average species richness (number of species per pond) was 11 for the October 2011 through mid-February 2012 period;
- At their maximums, the grebe population reached nearly 900 birds, the gull population

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<sup>5</sup> Hundley, Norris, Jr., *The Great Thirst, Californians and Water, A History*, University of California Press, Berkeley, CA.

exceeded 2,100 birds, dabbling ducks reached nearly 15,000 birds, diving ducks exceeded 5,500 birds, herons and egrets exceeded 1,400 birds, and shorebirds reached nearly 10,000 birds;

- For individual species, at their maximums, the American coot population exceeded 12,000 birds, the white-faced ibis population exceeded 3,300 birds, the double-crested cormorant population exceeded 1,000 birds, and the American white pelican population reached nearly 3,000 birds;

Sterling concludes that: “Overall, in terms of bird abundance, species diversity, acreage, location and habitat diversity, [the KWB] is one of the most important freshwater wetlands in California, especially when compared to other privately managed wetlands.” The full report is located in Appendix C.

Recharge operations began again in January 2017, and by the middle of March, nearly all of the ponds were full. These conditions created “exceptional conditions for most waterbirds.”

Breeding populations include Forster’s terns, Clark’s and western grebes, and several duck species. Of particular note is a large breeding colony of several hundred pairs of white-faced ibis in pond M1. A detailed report is provided in Appendix D.

#### **4.2.2 Upland and Raptor Surveys**

Further ornithological studies were initiated in August 2012 to document bird use of the project area absent recharge activities during the winter, spring migration and the start of the breeding seasons. Upland bird surveys were conducted on 9 fixed transects, whereas raptor surveys were conducted by driving most water bank roads. A detailed report through May 2016 is provided in Appendix D. The results of the surveys can be summarized as follows:

- One hundred and twelve species of birds were identified during the upland surveys;
- Upland species richness did not vary significantly through time, but populations did;
- A comprehensive survey for raptors and loggerhead shrikes (*Lanius ludovicianus*) on the entire project area indicated the presence of high numbers of raptors including red-tailed hawks (*Buteo jamaicensis*) and loggerhead shrikes through the winter of 2013. Raptor and loggerhead shrike numbers declined significantly during the winter of 2014/2015

likely due to severe drought conditions affecting prey populations. Loggerhead shrike populations rebounded during the spring of 2015 and raptor populations rebounded somewhat in the fall of 2015;

- The surveys documented many species of raptors using upland habitat, including: American kestrels, bald eagles, Cooper’s hawks, ferruginous hawks, golden eagles, merlins, northern harriers, osprey, peregrine falcons, prairie falcons, red-shouldered hawks, red-tailed hawks, sharp-shinned hawks, Swainson’s hawks, turkey vultures, and white-tailed kites;
- Twenty-five special-status bird species have been identified during the raptor and upland bird surveys since the project began; and
- Rare birds identified during the surveys included a black-throated sparrow, a clay-colored sparrow, eight Brewer’s sparrows which were wintering on the water bank, sage thrashers, a chesnut-collared longspur, an eastern phoebe, Cassin’s kingbirds, a purple martin, and Lucy’s and Virginia’s warblers.

Sterling states that: “The Kern Water Bank has exceptional habitats for birds and many rare birds will likely be found and documented in the future dependent upon survey efforts... The bird use of property managed by the Kern Water Bank Authority is clearly very high in accordance to the large acreages of upland habitats. Overall, in terms of bird abundance, species diversity, acreage, location and habitat diversity, it is an important area of upland habitat, especially when compared to surrounding agricultural lands.”

### **4.3 Sensitive Species Monitoring**

As discussed above, the HCP requires rare plant surveys and the monitoring of San Joaquin kit fox and Tipton kangaroo rat populations. South Valley Biology Consulting LLC (SVB) was contracted to conduct these activities in 2016 (see report in Appendix E). Some key points from their report are presented below.

SVB utilized three methods to complete sensitive species monitoring:

- Nighttime spotlighting surveys to determine San Joaquin kit fox populations;
- Small mammal trapping to determine Tipton kangaroo rat populations; and

- Site surveys for special-status plant species.

No San Joaquin kit fox were identified during the surveys. Other mammals that were identified during the surveys included: coyotes, bobcats, desert cottontails, black-tailed jackrabbits, and kangaroo rats. Raptors included barn owls and burrowing owls. As discussed in more detail in the report in Appendix E, the cessation of drought conditions in 2016 appear to have increased the populations of predator species.

Small mammal trapping was conducted on two grids. One grid is located north of the Kern River in Sensitive Habitat (the “Strand” grid) and the other is located south of the Kern River in the Conservation Bank Area (the “Southeast” grid). Six and forty-seven Tipton kangaroo rats were captured at the Strand grid and Southeast grid, respectively. The 53 captures represent the highest total ever captured at the KWB. The captures also represent a dramatic turn-around from the previous year, when no Tipton kangaroo rats were captured. Other animals captured included Heermann’s kangaroo rats, San Joaquin pocket mice and deer mice.

Special-status plants identified on the KWB in 2016 included San Joaquin woolly threads (federally endangered), Hoover’s woolly star, Kern mallow, and recurved larkspur. All populations were robust.

The SVB report provides a detailed discussion of factors that may have contributed to the changes seen in the populations of both wildlife and plants (Appendix E).

#### **4.4 Miscellaneous Studies**

The California Department of Fish and Wildlife conducted a portion of their Ecological Biodiversity Monitoring project on the KWB. The objective of the study was to collect occupancy data on terrestrial wildlife species. The study ran from mid-April 2016 to mid-May 2016. Wildlife cameras and passive acoustic recorders were placed at several locations throughout the area. The cameras operated continuously for 4 weeks and the acoustic recorders operated during pre-set times for a week. Field technicians visited the sites three times to place or remove equipment. They also conducted a vegetation assessment survey, a bird point count survey, and a 100m transect visual encounter survey during each visit.

The Bureau of Land Management in conjunction with UC Berkley collected tissue samples from San Joaquin woolly thread plants on the KWB in September 2016. They are conducting a population genetics study with UC Berkeley of the species to guide recovery actions for the species, primarily in areas north of the KWB. A preliminary report for the project is in Appendix F.



American Avocet (*Recurvirostra americana*)



## 5.0 Conservation Bank Report

The Kern Water Bank Authority Conservation Bank was established concurrently with the HCP by the Conservation Bank Agreement (CBA). The CBA provides for 3,267 Conservation Credits (Credits) representing one-acre each. These Credits are provided by the KWBA as mitigation for impacts to Covered Species in the Permit Area as authorized by USFWS and CDFW. The Agreement requires that KWBA file an Annual Report to the CDFW Agencies each year documenting:

- The number of Credits available, sold, used, eliminated, and suspended, both cumulatively and in the preceding year;
- The name and address of each party purchasing Credits and the number of Credits that were sold, optioned, or transferred in the preceding year;
- A map showing the portion of the KWB Conservation Bank for which KWBA has delivered a Conservation Easement to the Department, and the portion of the KWB Conservation Bank unencumbered by a Conservation Easement; and
- Copies of the annual reports submitted by the Included Parties.

No conservation credit transactions occurred in 2016. To date 1,321 of the 3,267 credits have been sold. Figure 6 shows the portions of the Conservation Bank encumbered by Conservation Easements.



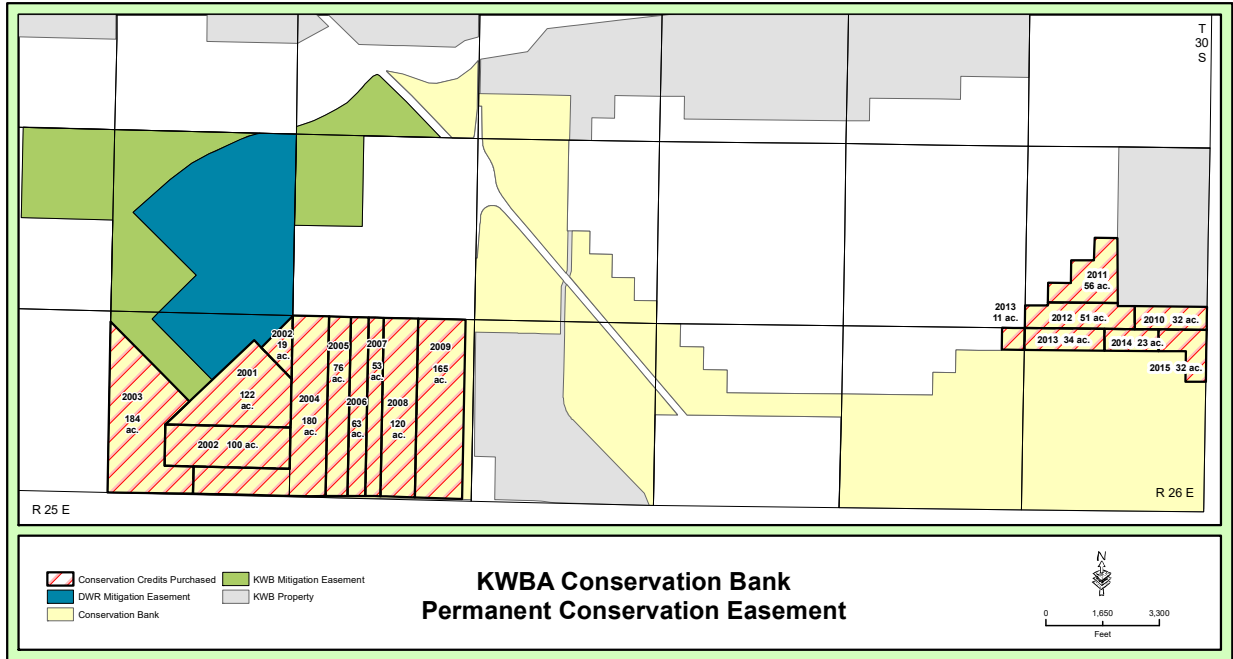


Figure 6. Conservation Bank Easements.



## **6.0 Management Plan**

The Management Plan is to describe the operational activities contemplated for the Kern Water Bank during the next year, including construction, maintenance and repair of the infrastructure, and a description of the adaptive management activities to be carried out.<sup>6</sup>

### **6.1 Water Bank Operations and Construction**

Record setting precipitation levels in the 2016/2017 season have resulted in significant volumes of surface water available for recharge. Recharge operations began January 10, 2017, and an estimated 227,000 acre-feet have been recharged though April 30. It is expected that recharge operations will continue through the end of the year and as much as 500,000 acre-feet of water may be recharged. These recharge operations entail routine berm maintenance, canal maintenance, and pump repairs as needed. These activities are conducted on existing facilities, and no new habitat disturbance occurred or is contemplated.

In addition to the activities associated with recovery operations, the KWBA is contemplating several projects in the near future. They may include:

- Recharge basin construction;
- Rehabilitation of three wells; and
- Installation of two replacement wells.

In all cases, the appropriate Minimization of Impacts Requirements described in detail in Appendix A will be carried out.

### **6.2 Vegetation Management**

KWBA expects to continue to graze portions of the KWB lands again in 2017 in response to precipitation in the winter of 2016-2017 which exceeded average conditions (Figure 7).

Mowing, burning (when permissible), and herbicide applications will also be used where appropriate.

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<sup>6</sup> Implementation Agreement, Section 3.3.5.

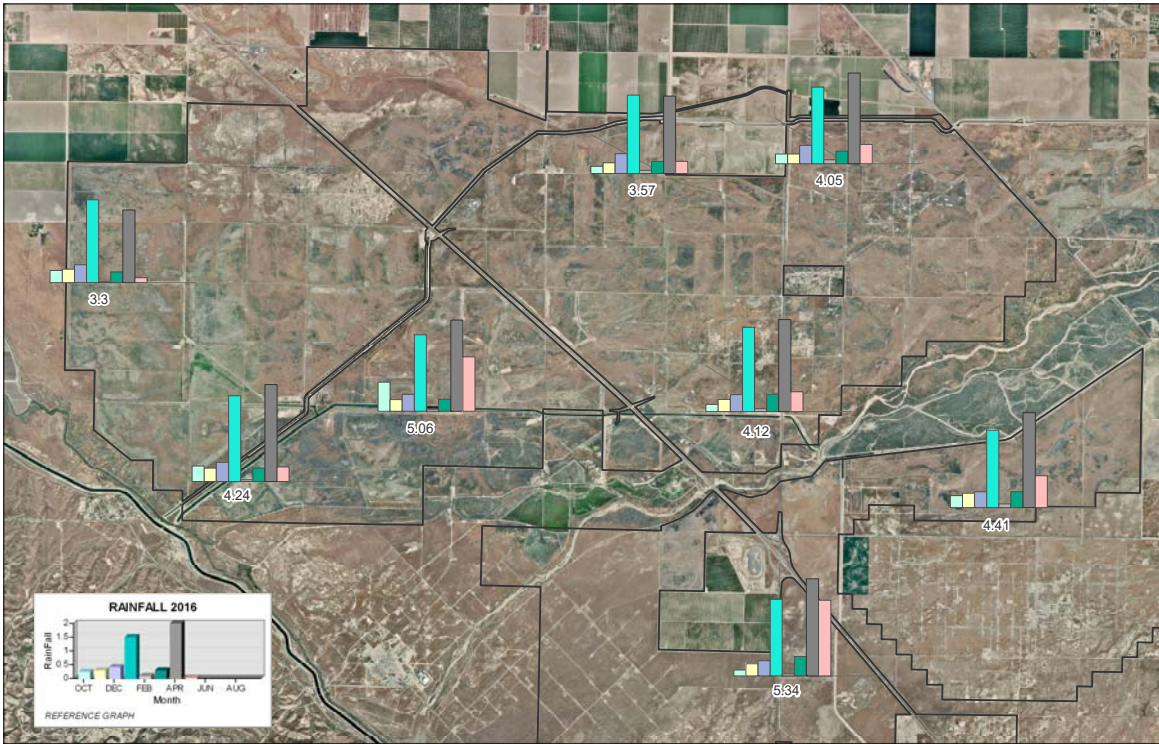


Figure 7. Rainfall in the 2015-2016 water year.

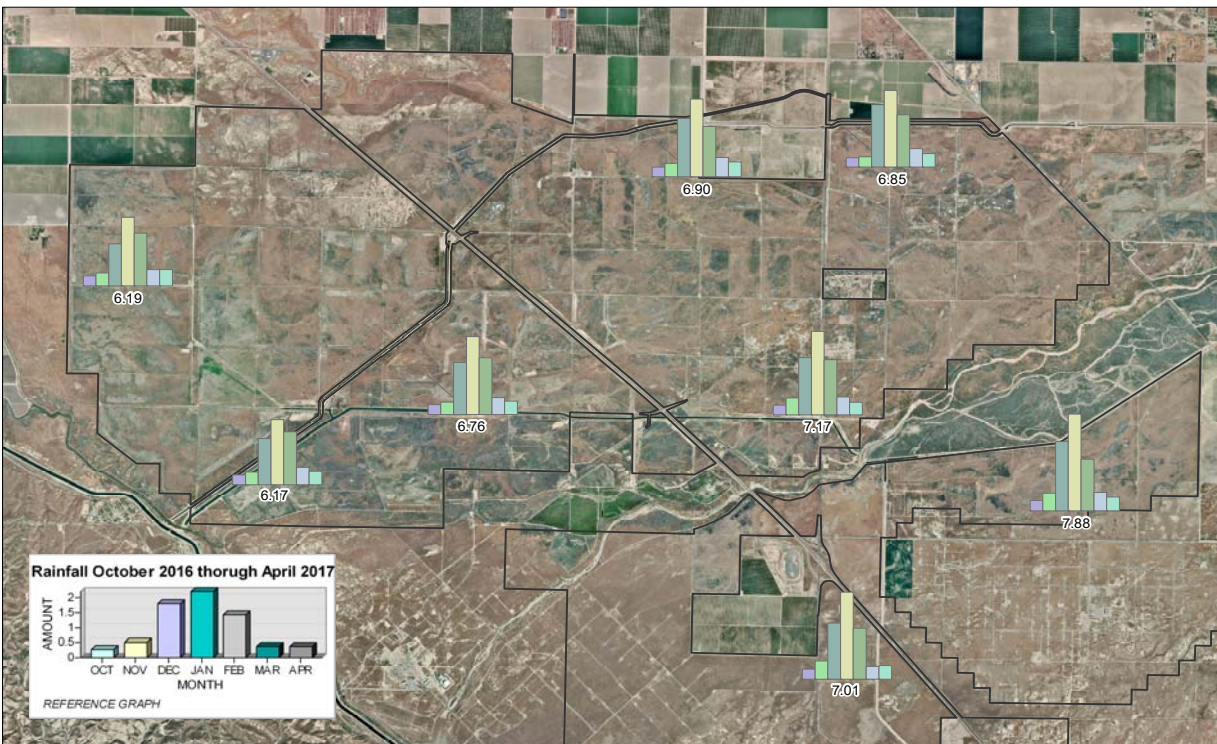


Figure 8. Rainfall for the 2016-2017 winter season.

## 7.0 Viability Fund Status and Financial Report

The IA<sup>7</sup> establishes the Kern Water Bank Species Viability fund in the amount of \$50,000. The County of Kern Auditor-Controller's Office reported that, as of December 31, 2016, the balance in the Viability Fund was \$53,652.08. This sum represents the principal balance of \$50,000 plus \$3,652.08 in accrued interest.

A copy of the "Kern Water Bank Authority Financial Statements - December 31, 2016 and 2015" is included in Appendix G of this report. The independent accounting firms of Barbich Hooper, King, Dill & Hoffman and Daniells, Phillips, Vaughan & Bock prepared the financial statements and auditor's report, respectively. Total assets on December 31, 2016 were \$65,860,117, current liabilities were \$3,677,020, and long-term liabilities (debt) were \$14,169,769.



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<sup>7</sup> Implementation Agreement, Section 3.3.2

Clark's Grebes (*Aechmophorus clarkii*)



Western Grebes (*Aechmophorus occidentalis*)



## 8.0 Certification

Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate and complete.

Kern Water Bank Authority

By: 

William D. Phillimore,  
Chairman, Board of Directors

Date: July 7, 2017



Nesting Gadwalls (*Anas strepera*)

Cattle Egret (*Bubulcus ibis*)





## 9.0 Contact Information and Distribution List

The contact person for the KWBA is:

Jonathan Parker  
 Kern Water Bank Authority  
 1620 Mill Rock Way, Suite 500  
 Bakersfield, CA 93311  
 661-398-4900

Table 2. Report Distribution List

Binder	Download	Name	Address
1	1	Patricia Cole San Joaquin Branch Chief	USFWS 2800 Cottage Way #W2605 Sacramento CA 95825
0	1	Julie Vance Regional Manager	CDFW 1234 East Shaw Avenue Fresno, CA 93710
1	1	Craig Bailey	CDFW 1234 East Shaw Avenue Fresno, CA 93710
0	1	Dave Hacker	CDFW 3196 S. Higuera St. Ste. A San Luis Obispo, CA 93401
0	1	Justin Sloan	USFWS 1130 E. Shaw Ave, Suite 206 Fresno, CA 93710
0	1	Ernest Conant	Young Wooldridge 1800 - 30 <sup>th</sup> Street, 4 <sup>th</sup> Floor Bakersfield, CA 93301
0	1	Robert Thornton	Nossaman, Guthner, Knox, Elliott Lakeshore Towers #1800 18101 Van Karman Avenue Irvine, CA 92623-9772
0	1	Steve Jackson	Dudley Ridge Water District
0	1	David Beard	KCWA Improvement District 4
0	1	Wilmar Boschman	Semitropic Water Storage District
0	1	Dennis Atkinson	Tejon-Castac Water District
0	1	William Phillimore	Westside Mutual Water Co.
0	1	Scott Hamilton	Westside Mutual Water Co.
0	1	Robert Kunde	Wheeler-Ridge Maricopa Water Storage District
0	1	William Taube	Wheeler-Ridge Maricopa Water Storage District
1	1	Jim Jones	South Valley Biology 6510 Montagna Drive Bakersfield, CA 93306

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## Appendix A

### Exhibit H to Implementation Agreement - Minimization of Impacts Requirements



American Bittern (*Botaurus lentiginosus*)

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## Exhibit H to Implementation Agreement

### Minimization of Impacts Requirements

#### 1. Biological Monitor

A qualified biologist shall monitor all ground-disturbing activities prior and during construction in the Sensitive Habit Sector and will oversee measures undertaken to reduce Incidental Take of Covered Species.

#### 2. Construction Practices

##### a. KWBA Oversight

During construction a representative of the company with the authority to assure compliance with these Required Management obligations, and adequately trained to understand the obligations imposed hereby and to notice the presence of Covered Species shall be present on the construction site at all times that construction work is ongoing.

##### b. Delineation of Disturbance Areas Prior and during construction

KWBA shall clearly delineate disturbance area boundaries by stakes, flagging, or by reference to terrain features, as directed by the Department and the Service, to minimize degradation or loss of adjacent wildlife habitats during operation.

##### c. Signage

Prior and during construction, KWBA shall post signs and/or place fencing around construction sites to restrict access of vehicles and equipment unrelated to site operations.

##### d. Resource Agency Notification

At least 20 working days prior to initiating ground disturbance for project facilities in designated salvage/relocation areas, KWBA shall notify the Fresno Field Office of the Department and the Sacramento Field Office of the Service of their intention to begin construction activities at a specific location and on a specific date. The Agencies will have 10 working days to notify the KWBA of their intention to salvage or relocate Covered Species in the construction area. If KWBA is notified, they will wait an additional five days to allow the salvage/relocation to take place.

##### e. Salvage and Relocation

KWBA will allow time and access to the Service and/or the Department, or their designees, to relocate Covered Species, at the Resource Agencies' expense, from construction areas prior to disturbance of areas that have been identified by the Resource Agencies as having known populations of the Covered Species they wish to salvage or relocate.

#### f. Construction Site Review

All construction pipes, culverts, or similar structures with a diameter of three inches or greater that are stored at a construction site on the Kern Water Bank for one or more overnight periods shall be thoroughly inspected for trapped kit foxes and other animals before the subject pipe is subsequently buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight shall be capped. If during construction a kit fox or other animal is discovered inside a pipe, that section of pipe will not be moved or, if necessary, will be moved only once to remove it from the path of construction activity until the animal has escaped.

#### g. Employee Orientation

An employee orientation program for construction crews, and others who will work on-site during construction, shall be conducted and shall consist of a brief consultation in which persons knowledgeable in endangered species biology and legislative protection explain endangered species concerns. The education program shall include a discussion of the biology of the Covered Species, the habitat needs of these species, their status under FESA and CESA, and measures being taken for the protection of these species and their habitats as a part of the project. The orientation program will be conducted on a as needed basis prior to any new employees commencing work on the Kern Water Bank. Every two years or at the beginning of construction for the Supply/Recovery canal a refresher course will be conducted for employees previously trained. A fact sheet conveying this information shall also be prepared for distribution to all employees. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be filed at KWBA's offices and shall be accessible by the Department and the Service.

#### h. Standards for Construction of Concrete Canals

Concrete lined canals will have a side slope of 1.5 to 1 or less and the sides will have a concrete finish which will assist in the escape of animals. If canals are determined by the Department or the Service to be substantial impediments to kit fox movement, plank or pipe crossings will be provided across concrete canals in areas identified by the Resource Agencies as having high kit fox activity.

#### i. Standards for Construction of Earthen Canals

Earthen canals will have a side slope of 1.5 to 1 or less. With the exception of the supply/recovery canal, interconnected earthen canals may be as wide as 40 feet. If canals are determined by the Department or the Service to be substantial impediments to kit fox movement, plank or pipe crossings will be provided across the canals in areas identified by the Resource Agencies as having high kit fox activity.

### 3. On-Going Practices

#### a. Equipment Storage

All equipment storage and parking during site development and operation shall be confined to the construction site or to previously disturbed off-site areas that are not habitat for covered species.

#### b. Traffic Control

KWBA's project representative shall establish and issue traffic restraints and signs to minimize temporary disturbances. All construction related vehicle traffic shall be restricted to established roads, construction areas, storage areas, and staging and parking areas. Project related vehicles shall observe a 25 MPH speed limit in all project areas except on county roads and state and federal highways.

#### c. Food Control

All food-related trash items such as wrappers, cans, bottles, and food scraps generated both during construction and during subsequent facility operation shall be disposed of in closed containers and shall be regularly removed from the site. Food items may attract kit foxes onto a project site, consequently exposing such animals to increased risk of injury or mortality.

#### d. Dog Control

To prevent harassment or mortality of kit foxes or destruction of kit fox dens or predation on this species, no domestic dogs or cats, other than hunting dogs, shall be permitted on-site.

#### e. Pesticide Use

Use of rodenticides and herbicides on the site shall be permitted only in accordance with the Vegetation Management Plan approved by the Department and the Service or if such use is otherwise approved by the Department and the Service on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of Covered Species utilizing adjacent habitats, and the depletion of prey upon which kit foxes depend.

#### 4. Project Representatives

KWBA shall designate a specific individual as a contact representative between KWBA, the Service, and the Department to oversee compliance with protection measures detailed in this Exhibit. KWBA shall provide written notification of the contact representative to the Department and the Service within 30 days of issuance of the Section 10(a) Permit and Section 2081/2835 Management Authorization. Written notification shall also be provided by KWBA to the Department and the Service in the event that the designee is changed.

#### 5. Notification Regarding Dead, Injured or Entrapped Listed Animals

Any employee who kills or injures a San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, San Joaquin antelope squirrel, or other Covered Species listed as a threatened or endangered animal under FE SA or CESA, or who finds any such animal either dead, injured, or entrapped shall report the incident immediately to KWBA's representative who shall, in turn, report the incident or finding to the Service and the Department. In the event that such observations are of entrapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape unimpeded. In the event that such observations are of injured or dead animals, KWBA shall immediately notify the Service

and the Department by telephone or other expedient means. KWBA shall then provide formal notification to the Service, and the Department, in writing, within three working days of the finding of any such animal( s). Written notification shall include the date, time, location, and circumstances of the incident. The Service contact for this information shall be the Chief, Endangered Species Division, Sacramento Field Office. The Department contact shall be the Environmental Services Supervisor at the San Joaquin Valley-Southern Sierra Region Headquarters. The Service or the Department will be notified if any other animal which is otherwise a Covered Species is found dead or injured.

#### 6. Construction of Supply/Recovery Canal

Within sixty days prior to the construction of the supply/recovery canal within the zone marked within the Map of the Kern Water Bank, KWBA shall conduct a limited survey within the area of the Kern Water Bank which will be affected by that construction, with the sole goal of identifying potential San Joaquin kit fox dens and/or burrows occupied by burrowing owls. KWBA shall contact the Service and the Department pursuant to the salvage procedures set forth above if any kit fox dens are found.

#### 7. Fully-Protected Species

KWBA, the Service and the Department recognize that certain species found on the Kern Water Bank, including the blunt-nosed leopard lizard, have certain special statutory protections ("Fully-Protected Species") pursuant to sections 3511, 4700,5050 and 5515 of the California Fish and Game Code (the "Fully Protected Species Statutes"). The Department agrees that compliance by KWBA with the following procedures shall constitute compliance with the Fully Protected Species Statutes: (A) KWBA will review with the Resource Agencies all actions which risk causing the Take of a Fully-Protected Species prior to engaging in any such action. (B) KWBA will review the project site, adjacent area and existing survey information to determine the likelihood of the presence of Fully-Protected Species. (C) If the review indicates the presence of Fully-Protected Species in the project site or adjacent area, KWBA will engage in project-specific measures to assure that no Take of such Fully-Protected Species occurs. Measures include monitoring, avoidance, hand excavation and relocation, trapping, enclosures, inspection of trenches, project timing, and modification of project site disturbance areas. Any relocation, trapping or other activity which would be considered a "take" of the species under CESA shall be done either by the Service or at the direction of the Service by individuals who possess their own incidental take permits for scientific purposes from the Service.



## Appendix B

### 2016 Vegetation Monitoring Program Observation Monitoring Sites and Livestock Grazing Summary for the Kern Water Bank



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**2016 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

June 27, 2017

2016 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

June 27, 2017

# **Vegetation Monitoring Program Observation Monitoring Sites and Livestock Grazing Summary**

## **INTRODUCTION**

The Kern Water Bank (KWB) vegetation monitoring program consists of eight permanently established vegetation Observation 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 shown 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 in an attempt to help improve and maintain habitat quality, control invasive plants, and to facilitate the application of successful adaptive management strategies for the KWB.

## **METHODS**

All eight of the vegetation monitoring sites are visited each quarter by one or 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 help to illustrate the dynamic nature of the KWB. The data collected from each observation monitoring site is provided as Attachment 1.

## **RESULTS AND DISCUSSION**

Rainfall during the 2016 rain year (October 1, 2015 – September 30, 2016) for the KWB was approximately 5.51 inches. That was similar to the 5.33 inches that fell during the prior 2015 rain year. Although 5.51 inches is still a little below the long-term average of 6.12 inches for the Bakersfield area, it equates to approximately 90% of the long-term average. After experiencing four successive years of drought from 2011 through 2014, 2015 brought abundant growth of vegetation on all parts of the KWB. However, although the total rainfall amount in 2016 was slightly higher than the 2015 rain year's total, there was a noted difference in the timing of the rainfall in 2016 that appeared to affect the growth of vegetation. In 2015, a total of 2.67 inches of rain had fallen during October, November, and December, while just 1.33 inches fell during the same period in 2016. December 2015 was especially wet with 2.02 inches falling in that month. As a result, herbaceous growth was much denser earlier in the season in 2015 than what was observed in 2016. Photographs 1 through 4 help illustrate this condition.

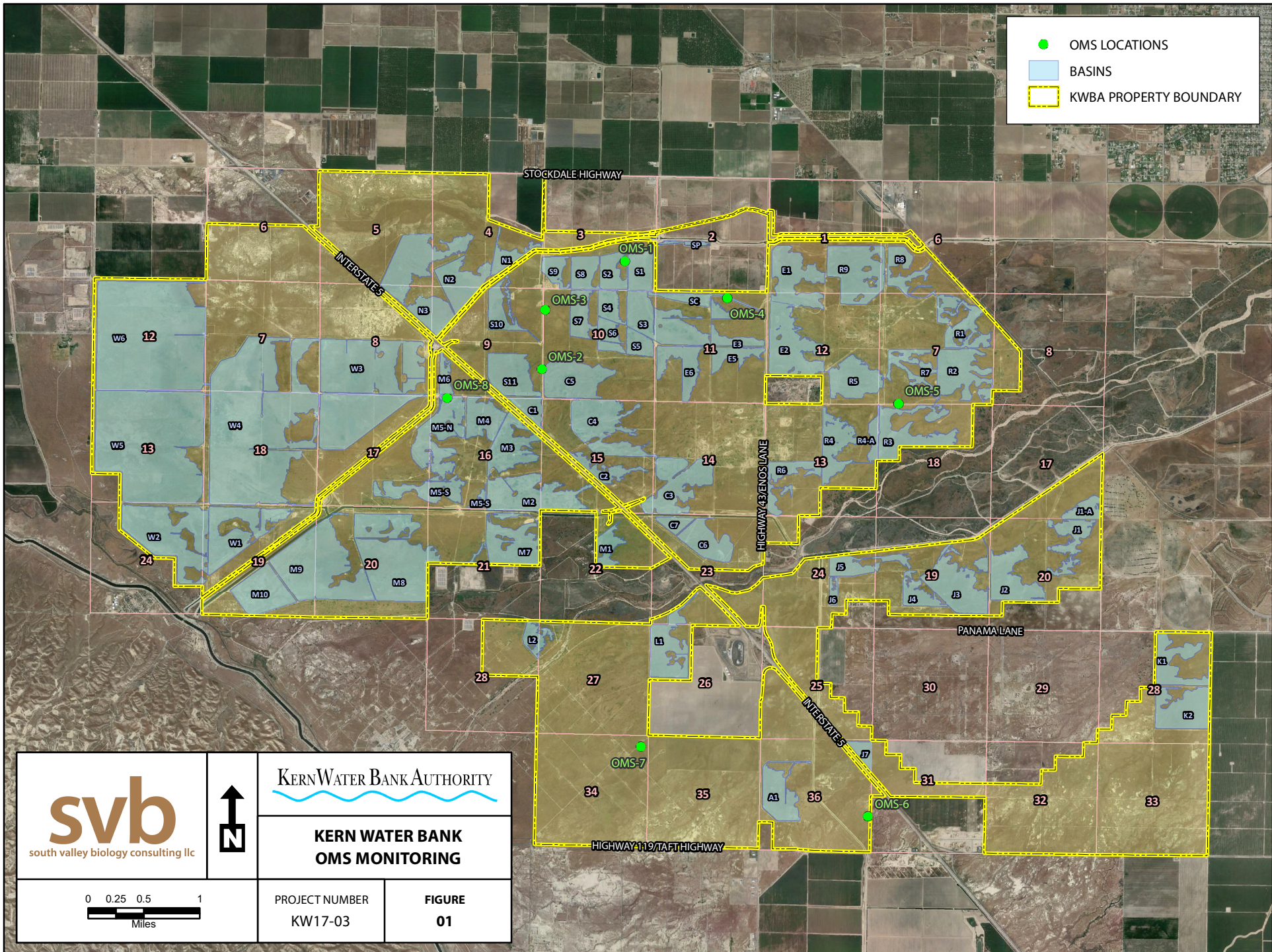
Figure 2 provides a graphic representation of the number of cattle, expressed as Animal Units (AU, defined as one adult cow and her calf) that were present during each month in 2016. Most areas started with at least some cattle remaining from the 2015 season in anticipation of heavy early-season growth. Cattle AU remained relatively constant or with only minor adjustments being made until about mid-June. Later season rains in April and May 2016 led to a significant outbreak of Russian thistle (*Salsola tragus*) over many areas of the KWB, especially the historically problematic Main, Strand, and West Areas. By late June 2016, it was apparent that the Russian thistle growth was going to be pretty substantial. As a result, cattle numbers were increased beginning in July 2016 in all areas that exhibited heavy infestations. It was hoped that the increase in cattle would lessen the infestations, and cattle were observed on many occasions actively eating even the larger, mature plants. However, although the cattle were eating Russian thistle, they were still preferring the more palatable grasses and other herbaceous plants. This resulted in a decision being made to draw down the cattle numbers starting in mid-August to guard against too much removal of remaining Residual Dry Matter (RDM). The draw down continued into September and October in the Strand and West Areas, then a small maintenance herd was left in these two areas, while cattle were completely removed from the Main Area at the end of October. The decision to increase cattle to combat actively growing Russian thistle should be carefully considered in the future, as although cattle clearly will graze on mature Russian thistle plants, it is probably not likely that the grazing had any significant beneficial effects at lessening the infestation and may have resulted in unnecessary thinning of the more desirable grasses and other beneficial herbaceous plants.

Grazing was delayed in the South Area in 2016 until September. Although, the vegetation was tall in the South Area, it was not overly dense and was actually fairly open and provided reasonably good habitat for kangaroo rats and other small mammals, as witnessed by the numerous active kangaroo rat burrows. However, the late rains sparked the same outbreak of Russian thistle as was seen over most of the other Areas on the KWB in 2016 (Photograph 7). Cattle were turned out in early September to see if they could aid in lessening the infestation. Although cattle were observed grazing mature Russian thistle plants on many occasions, they did not appear to make any significant difference in the infestation and instead paid much more attention to the other more palatable grasses and herbaceous plants (Photograph 8). All cattle were removed from the South Area in early December.

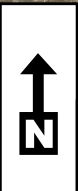
The River and James Areas have historically been much less prone to heavy infestations, save for a few places within the River Area, but overall, both these Areas tend to require management more targeted at preventing/removing excess build-up of thatch. Photographs 9 and 10 help illustrate conditions in the River Area during the second and third quarters, respectively in 2016. For the most part, cattle were turned out in relatively small numbers in the River and James Areas. They remained steady for several months and then were removed mostly all at once when desirable conditions were met.

In conclusion, the 2015 – 2016 rain year brought near normal precipitation (5.51 inches) in terms of total amount of rainfall. However, only 1.33 inches of rain fell from October

through December and the bulk of the rain fell in January and later, with nearly an inch falling in April alone. This pattern of rainfall, especially the April and May storms appeared to benefit Russian thistle, allowing this plant to dominate the landscape in several portions of the KWB. Although cattle were used in an attempt to lessen the infestations, there really was no significant benefit seen. In 2017, ground water recharge operations resumed with abundant water delivery to KWB. Cattle turnout has been delayed until the full extent of groundwater recharge is achieved. This has resulted in abundant growth of herbaceous plants. Russian thistle is known to be a poor competitor in many instances when there is a dense canopy of other plants established. Delaying grazing until later in the season after other annual plants have become densely established may prove to be a more effective strategy at helping to control Russian thistle infestations. The 2017 observation monitoring stations surveys will document the vegetation conditions throughout the season.



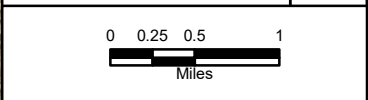
- OMS LOCATIONS
- BASINS
- KWBA PROPERTY BOUNDARY



KERN WATER BANK AUTHORITY

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**KERN WATER BANK  
OMS MONITORING**



PROJECT NUMBER  
KW17-03

FIGURE  
**01**



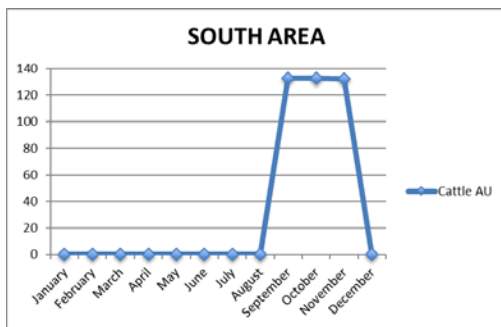
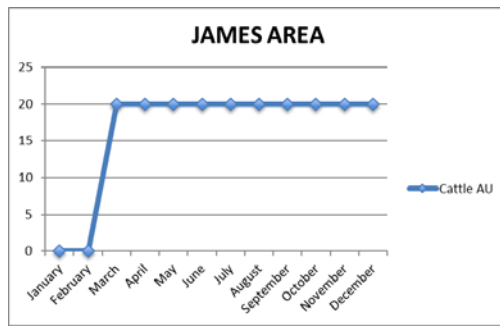
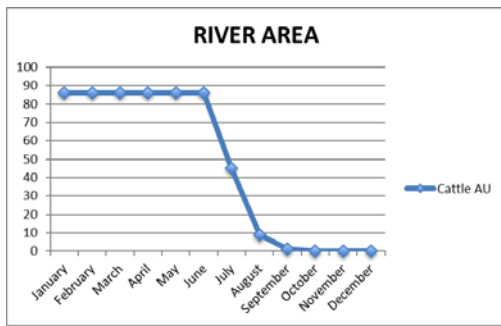
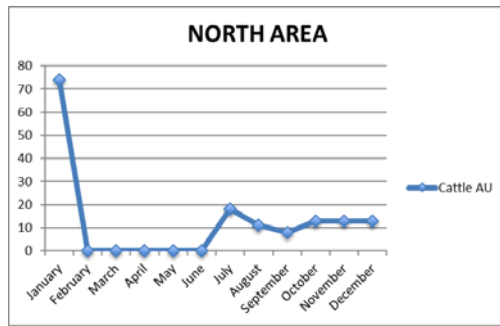
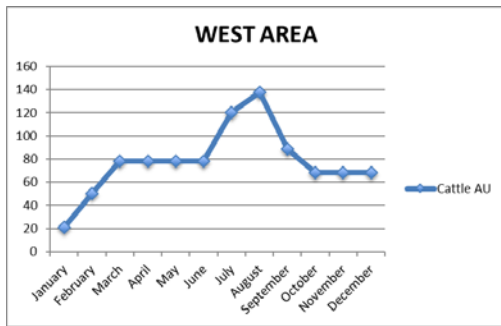
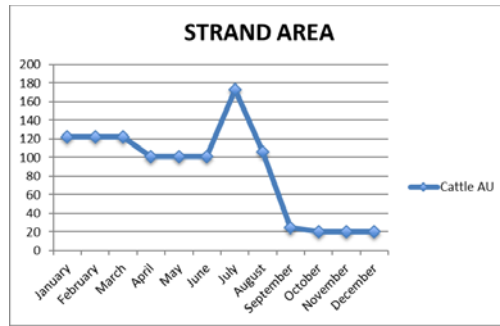
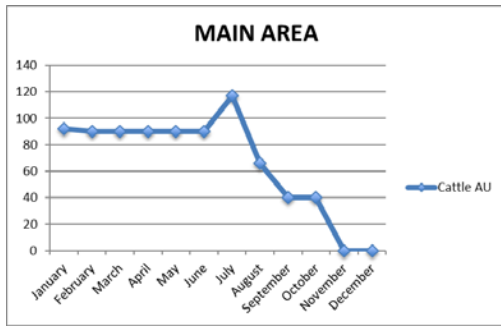


Figure 2. Charts showing the number of cattle, expressed as an Animal Unit (AU) which is one adult cow and one calf, that were present in each area by month in 2016.



Photograph 1.

Vegetation conditions at OMS 1 on March 9, 201. Note the very scant dense growth of vegetation, with many plants in full bloom.



Photograph 2.

Same area as above as it appeared on March 4, 2016. Note the difference in density and development of vegetation relative to Photograph 1.



Photograph 3.

Vegetation conditions at OMS 4 on March 9, 2015. Illustrates the dense growth likely as a result of the abundant early season rain as similarly indicated in Photograph 1.



Photograph 4.

Same area as shown in Photograph 3 on March 4, 2016. Just as the comparison of Photographs 1 and 2 to one another, Photographs 3 and 4 illustrate a similar condition likely resulting from the timing of the precipitation.



Photograph 5.

Vegetation conditions at same area as Photographs 3 and 4 on June 9, 2015. Rainfall was nearly identical in total amount by this time in 2015 and 2016. It is believed the heavy rainfall in December 2015 led to more growth than what occurred in 2016.



Photograph 6.

Same area as Photograph 5 on September 13, 2016. In contrast to 2015, more rain fell during the months of April and May in 2016. This was likely the reason for a significant Russian thistle bloom that began in May of 2016.



Photograph 7.

South Area on September 13, 2016. Area shows significant Russian thistle growth. Cattle were turned out to attempt to help lessen the infestation.



Photograph 8.

Same area as shown in Photograph 7 on November 14, 2016. Although cattle did graze on the mature Russian thistle, they did not do so in any significant manner and paid much more attention to the other herbaceous plants.



Photograph 9.  
River Area on May 11, 2016. No trace of Russian thistle infestation is present.



Photograph 10.  
Same area as shown in Photograph 9 on September 13, 2016 after cattle were removed. There are abundant active kangaroo rat burrows present and no trace of Russian thistle infestation.

## **ATTACHMENT 1**

Kern Water Bank 2016 Observation Monitoring Site Program Observations

# KERN WATER BANK 2016 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

<b>1ST QUARTER</b>	SURVEY DATE: 03/04/2016 TIME: 10:00 AM MONITOR(S): J. JONES, Z. BRISCO RAINFALL TO DATE: 3.46 IN WIND DIRECTION: N WIND VELOCITY: 1 MPH TEMPERATURE: 76 F HUMIDITY: 35.5%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>
	NOTES: WILDLIFE PRESENT: WESTERN MEADOWLARK PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, CALANDRINIA CILIATA, CAPSELLA BURSA-PASTORIS, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORINUM, JUNCUS BALTICUS, MALVA PARVIFLORA, SALIX GOODDINGII, SCHISMUS ARABICUS, SISYMBRIUM IRIO.				

<b>2ND QUARTER</b>	SURVEY DATE: 05/11/2016 TIME: 01:50 PM MONITOR(S): J. JONES RAINFALL TO DATE: 4.88 IN WIND DIRECTION: NW WIND VELOCITY: 6.4 MPH TEMPERATURE: 89.1 F HUMIDITY: 30.1%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>
	NOTES: VERY FEW RUSSIAN THISTLE PLANTS. WILDLIFE PRESENT: NORTHERN MOCKINGBIRD, CALIFORNIA GROUND SQUIRREL. PLANTS PRESENT: BROMUS RUBENS, CHENOPODIUM ALBUM, CYPERUS SP., ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORINUM, MALVA PARVIFLORA, POLYGONUM ARENASTRUM, RUMEX CRISPUS, SALIX GOODDINGII, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.				

<b>3RD QUARTER</b>	SURVEY DATE: 09/13/2016 TIME: 01:36 PM MONITOR(S): J. JONES RAINFALL TO DATE: 5.43 IN WIND DIRECTION: NE WIND VELOCITY: 3.2 MPH TEMPERATURE: 78.1 F HUMIDITY: 31.7%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>
	NOTES: NUMEROUS SMALL MAMMAL BURROWS AND DIGS. WILDLIFE PRESENT: MOURNING DOVE, AMERICAN BADGER (TRACKS AND DIGS). PLANTS PRESENT: AMARANTHUS SP., ATRIPLEX SERENANA, MONOLEPIS NUTTALIANA, SALIX GOODDINGII, SALSOLA TRAGUS, SISYMBRIUM IRIO.				

<b>4TH QUARTER</b>	SURVEY DATE: 11/28/2016 TIME: 02:38 PM MONITOR(S): J. JONES RAINFALL TO DATE: 6.05 IN WIND DIRECTION: -- WIND VELOCITY: CALM MPH TEMPERATURE: 61.3 F HUMIDITY: 49.1%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>
	NOTES: ERODIUM AND OTHERS ARE GERMINATING, GROUND IS MOSTLY BARE. WILDLIFE PRESENT: COTTONTAIL, RAVEN. PLANTS PRESENT: ATRIPLEX SERENANA, ERODIUM CICTARIUM, SALIX GOODDINGII, SALSOLA TRAGUS.				

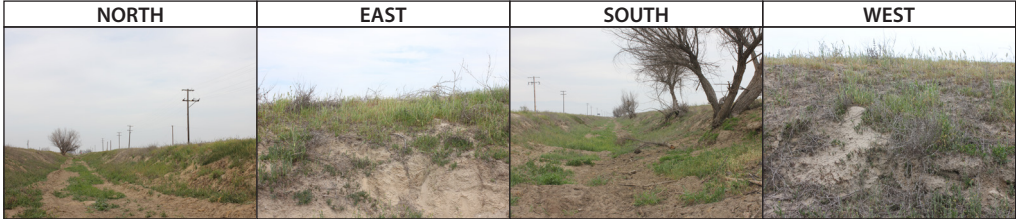
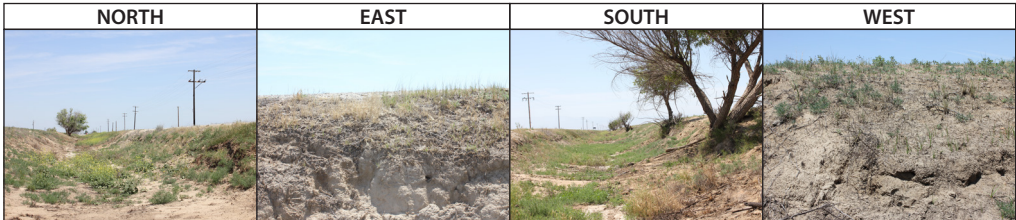
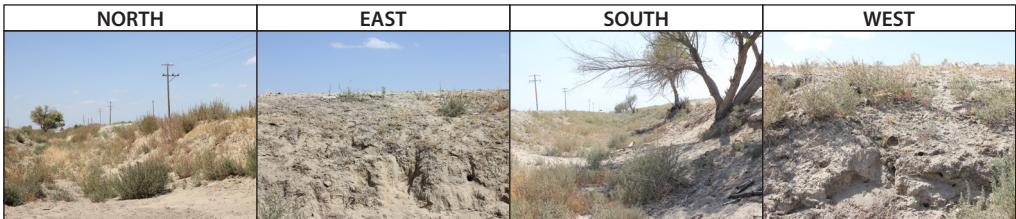
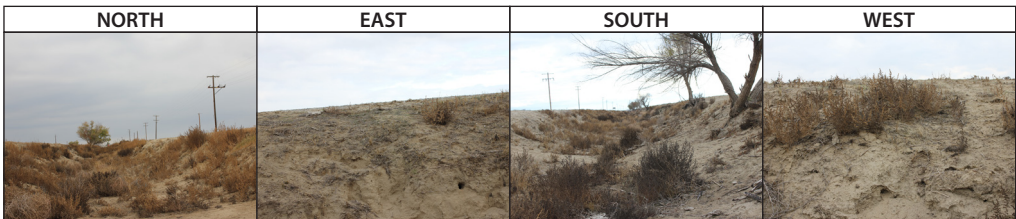


# KERN WATER BANK 2016 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

## 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	<p> <b>SURVEY DATE:</b> 03/04/2016  <b>TIME:</b> 01:34 PM  <b>MONITOR(S):</b> J. JONES, Z. BRISCO  <b>RAINFALL TO DATE:</b> 3.46 IN  <b>WIND DIRECTION:</b> N  <b>WIND VELOCITY:</b> 3.5 MPH  <b>TEMPERATURE:</b> 75.7 F  <b>HUMIDITY:</b> 38.5%                 </p> <p> <b>NOTES:</b>  <b>WILDLIFE PRESENT:</b>  <b>PLANTS PRESENT:</b> AMSINCKIA MENZIESII, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORINUM, LEPIDIUM NITIDUM, MALVA PARVIFLORA, MELILOTUS INDICA, SALIX GOODDINGII, SCHISMUS ARABICUS, SISYMBRIUM IRIO.                 </p>	NORTH	EAST	SOUTH	WEST
					
2ND QUARTER	<p> <b>SURVEY DATE:</b> 05/11/2016  <b>TIME:</b> 11:25 AM  <b>MONITOR(S):</b> J. JONES  <b>RAINFALL TO DATE:</b> 4.88 IN  <b>WIND DIRECTION:</b> NW  <b>WIND VELOCITY:</b> 7.5 MPH  <b>TEMPERATURE:</b> 84.1 F  <b>HUMIDITY:</b> 40.1%                 </p> <p> <b>NOTES:</b> ABUNDANT RUSSIAN THISTLE PLANTS GROWING FROM RECENT RAINS. CATTLE ARE ACTIVELY FEEDING ON PLANTS BUT THERE ARE MANY PLANTS.  <b>WILDLIFE PRESENT:</b>  <b>PLANTS PRESENT:</b> ERODIUM CICUTARIUM, HELIOTROPIUM CURASSAVICUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORINUM, LEYMUS TRITICOIDES, MALVA PARVIFLORA, SALIX GOODDINGII, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.                 </p>	NORTH	EAST	SOUTH	WEST
					
3RD QUARTER	<p> <b>SURVEY DATE:</b> 09/13/2016  <b>TIME:</b> 02:08 PM  <b>MONITOR(S):</b> J. JONES  <b>RAINFALL TO DATE:</b> 5.43 IN  <b>WIND DIRECTION:</b> NW  <b>WIND VELOCITY:</b> 2.1 MPH  <b>TEMPERATURE:</b> 79.7 F  <b>HUMIDITY:</b> 29.8%                 </p> <p> <b>NOTES:</b>  <b>WILDLIFE PRESENT:</b> RAVEN.  <b>PLANTS PRESENT:</b> AMARANTHUS SP., BASSIA HYSSOPIFOLIA, HELIANTHUS ANNUUS, HELIOTROPIUM CURASSAVICUM, HIRSCHFELDIA INCANA, SALIX GOODDINGII, SALSOLA TRAGUS.                 </p>	NORTH	EAST	SOUTH	WEST
					
4TH QUARTER	<p> <b>SURVEY DATE:</b> 11/28/2016  <b>TIME:</b> 03:08 PM  <b>MONITOR(S):</b> J. JONES  <b>RAINFALL TO DATE:</b> 6.053 IN  <b>WIND DIRECTION:</b> E  <b>WIND VELOCITY:</b> 2.2 MPH  <b>TEMPERATURE:</b> 57.1 F  <b>HUMIDITY:</b> 56.2%                 </p> <p> <b>NOTES:</b> SEVERAL BURROWS IN BANKS (MICE/ KANGAROO RAT).  <b>WILDLIFE PRESENT:</b> LOGGERHEAD SHRIKE.  <b>PLANTS PRESENT:</b> HELIOTROPIUM CURASSAVICUM, LEYMUS TRITICOIDES, SALIX GOODDINGII, SALSOLA TRAGUS.                 </p>	NORTH	EAST	SOUTH	WEST
					

# KERN WATER BANK 2016 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

## LOCATION INFORMATION

**LOCATION:** OMS-3  
**SECTION:** 10  
**TOWNSHIP/RANGE:** 30S/25E  
**COORDINATES (CA5-NAD83):** 6177656, 2311449  
**NUMBER OF ACRES:** 80  
**VEGETATION TYPE:** MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/DOMINATED BY RUSSIAN THISTLE AND/OR PRICKLY LETTUCE  
**SITE TYPE:** UPLAND-OLD FARM FIELD

## SURVEY INFORMATION AND PHOTOGRAPHS

<b>1ST QUARTER</b>	<b>SURVEY DATE:</b> 03/04/2016 <b>TIME:</b> 01:55 PM <b>MONITOR(S):</b> J. JONES, Z. BRISCO <b>RAINFALL TO DATE:</b> 3.46 IN <b>WIND DIRECTION:</b> N <b>WIND VELOCITY:</b> 1.8 MPH <b>TEMPERATURE:</b> 73.8 F <b>HUMIDITY:</b> 38.4%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** ACTIVE KANGAROO RAT BURROWS.  
**WILDLIFE PRESENT:** GREAT EGRET.  
**PLANTS PRESENT:** AMSINCKIA MENZIESII, CAPSELLA BURSA-PASTORIS, ERODIUM CICUTARIUM, GUILLENIA CALIFORNICA, HORDEUM MURINUM SSP. LEPORINUM, LASTHENIA CALIFORNICA, SCHISMUS ARABICUS, SENECIO VULGARIS, SISYMBRIUM IRIO.

<b>2ND QUARTER</b>	<b>SURVEY DATE:</b> 05/11/2016 <b>TIME:</b> 01:35 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 4.88 IN <b>WIND DIRECTION:</b> NW <b>WIND VELOCITY:</b> 2 MPH <b>TEMPERATURE:</b> 88.5 F <b>HUMIDITY:</b> 31.1%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** VERY FEW RUSSIAN THISTLE PLANTS. NUMEROUS ACTIVE KANGAROO RAT BURROWS.  
**WILDLIFE PRESENT:** RAVEN, RED-TAILED HAWK, SIDE-BLOTCHED LIZARD.  
**PLANTS PRESENT:** CHENOPODIUM ALBUM, MELILOTUS INDICA, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.

<b>3RD QUARTER</b>	<b>SURVEY DATE:</b> 09/13/2016 <b>TIME:</b> 01:55 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 5.43 IN <b>WIND DIRECTION:</b> W <b>WIND VELOCITY:</b> 1.8 MPH <b>TEMPERATURE:</b> 78.8 F <b>HUMIDITY:</b> 36%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** AREA IS DOMINATED BY RUSSIAN THISTLE. CATTLE ARE GRAZING ON SOME OF THE PLANTS, BUT MOST OTHER HERBACEOUS COVER HAS BEEN GRAZED. REMOVE CATTLE SOON. THERE ARE SEVERAL ACTIVE KANGAROO RAT BURROWS IN THIS AREA.  
**WILDLIFE PRESENT:**  
**PLANTS PRESENT:** SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.

<b>4TH QUARTER</b>	<b>SURVEY DATE:</b> 11/28/2016 <b>TIME:</b> 02:48 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 6.05 IN <b>WIND DIRECTION:</b> W <b>WIND VELOCITY:</b> 1.5 MPH <b>TEMPERATURE:</b> 60.3 F <b>HUMIDITY:</b> 53.8%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** GROUND IS MOSTLY BARE. ACTIVE KANGAROO RAT BURROWS PRESENT.  
**WILDLIFE PRESENT:**  
**PLANTS PRESENT:** ATRIPLEX SERENANA, SALSOLA TRAGUS.

# KERN WATER BANK 2016 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

<b>1ST QUARTER</b>	<b>SURVEY DATE:</b> 03/04/2016 <b>TIME:</b> 02:18 PM <b>MONITOR(S):</b> J. JONES, Z. BRISCO <b>RAINFALL TO DATE:</b> 3.46 IN <b>WIND DIRECTION:</b> N <b>WIND VELOCITY:</b> 2.4 MPH <b>TEMPERATURE:</b> 74 F <b>HUMIDITY:</b> 38.2%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:**  
**WILDLIFE PRESENT:**  
**PLANTS PRESENT:** AMARANTHUS SP., AMSINCKIA MENZIESII, BROMUS RUBENS, CALANDRINIA CILIATA, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORINUM, SCHISMUS ARABICUS, SENECIO VULGARIS, SISYMBRIUM IRIO.

<b>2ND QUARTER</b>	<b>SURVEY DATE:</b> 05/11/2016 <b>TIME:</b> 02:06 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 4.88 IN <b>WIND DIRECTION:</b> NW <b>WIND VELOCITY:</b> 8.4 MPH <b>TEMPERATURE:</b> 90.5 F <b>HUMIDITY:</b> 28.1%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** RUSSIAN THISTLE IS PLENTIFUL AS 6"-12" PLANTS. CATTLE ARE GRAZING, BUT APPEAR TO BE EATING OTHER SPECIES OF VEGETATION RIGHT NOW.  
**WILDLIFE PRESENT:** WESTERN KINGBIRD.  
**PLANTS PRESENT:** AMARANTHUS SP., ATRIPLEX ARGENTEA, BROMUS RUBENS, CHENOPODIUM ALBUM, ERODIUM CICUTARIUM, HELIOTROPIUM CURASSAVICUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSP. LEPORINUM, MALVA PARVIFLORA, SALSOLA TRAGUS, SISYMBRIUM IRIO.

<b>3RD QUARTER</b>	<b>SURVEY DATE:</b> 09/13/2016 <b>TIME:</b> 01:15 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 5.43 IN <b>WIND DIRECTION:</b> N <b>WIND VELOCITY:</b> 1.5 MPH <b>TEMPERATURE:</b> 76.1 F <b>HUMIDITY:</b> 34.2%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** ACTIVE KANGAROO BURROWS. STILL SUBSTANTIAL RUSSIAN THISTLE PLANTS IN THIS AREA.  
**WILDLIFE PRESENT:** RAVEN, SIDE-BLOTCH LIZARD.  
**PLANTS PRESENT:** AMARANTHUS SP., ATRIPLEX SERENANA, BASSIA HYSSOPIFOLIA, HELIOTROPIUM CURASSAVICUM, SALSOLA TRAGUS.

<b>4TH QUARTER</b>	<b>SURVEY DATE:</b> 11/28/2016 <b>TIME:</b> 02:15 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 6.05 IN <b>WIND DIRECTION:</b> -- <b>WIND VELOCITY:</b> CLAM MPH <b>TEMPERATURE:</b> 65.4 F <b>HUMIDITY:</b> 47.6%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** ACTIVE KANGAROO RAT BURROWS PRESENT. PORTION OF AREA HAS RECENTLY BEEN MOWED. GROUND IS MOSTLY BARE.  
**WILDLIFE PRESENT:** BREWER'S BLACKBIRD.  
**PLANTS PRESENT:** SALIX GOODDINGII.

# KERN WATER BANK 2016 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

<b>1ST QUARTER</b>	<b>SURVEY DATE:</b> 03/04/2016 <b>TIME:</b> 01:10 PM <b>MONITOR(S):</b> J. JONES, Z. BRISCO <b>RAINFALL TO DATE:</b> 3.46 IN <b>WIND DIRECTION:</b> N <b>WIND VELOCITY:</b> 4 MPH <b>TEMPERATURE:</b> 76.7 F <b>HUMIDITY:</b> 37.1%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** SEVERAL ACTIVE KANGAROO RAT BURROWS. SITE LOOKS GOOD, NO SIGN OF RUSSIAN THISTLE.  
**WILDLIFE PRESENT:** AMERICAN KESTREL.  
**PLANTS PRESENT:** AMSINCKIA MENZIESII, EREMALCHE PARRYI SSP. PARRYI, ERODIUM CICUTARIUM, GUILLENIA CALIFORNICA, HORDEUM MURINUM SSP. LEPORINUM, SCHISMUS ARABICUS, SENECIO VULGARIS, SISYMBRIUM IRIO.

<b>2ND QUARTER</b>	<b>SURVEY DATE:</b> 05/24/2016 <b>TIME:</b> 02:15 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 4.88 IN <b>WIND DIRECTION:</b> NW <b>WIND VELOCITY:</b> 3.8 MPH <b>TEMPERATURE:</b> 78.1 F <b>HUMIDITY:</b> 30.9%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** MANY ACTIVE KANGAROO RAT BURROWS. AREA LOOKS VERY GOOD, VERY FEW RUSSIAN THISTLE.  
**WILDLIFE PRESENT:** LOGGERHEAD SHRIKE.  
**PLANTS PRESENT:** AMARANTHUS SP., BROMUS SSP. RUBENS, CHENOPODIUM ALBUM, DATURA WRIGHTII, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, PROSOPIS GLANDULOSA VAR. TORREYANA, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.

<b>3RD QUARTER</b>	<b>SURVEY DATE:</b> 09/13/2016 <b>TIME:</b> 11:32 AM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 5.43 IN <b>WIND DIRECTION:</b> N <b>WIND VELOCITY:</b> 3.2 MPH <b>TEMPERATURE:</b> 66.2 F <b>HUMIDITY:</b> 43.5%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** NUMEROUS ACTIVE KANGAROO RAT BURROWS. CATTLE REMOVED FROM AREA LAST WEEK.  
**WILDLIFE PRESENT:** AMERICAN KESTREL.  
**PLANTS PRESENT:** BROMUS RUBENS, PROSOPIS GLANDULOSA VAR. TORREYANA, SALSOLA TRAGUS, SCHISMUS ARABICUS.

<b>4TH QUARTER</b>	<b>SURVEY DATE:</b> 11/28/2016 <b>TIME:</b> 01:28 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 6.05 IN <b>WIND DIRECTION:</b> -- <b>WIND VELOCITY:</b> CLAM MPH <b>TEMPERATURE:</b> 63.7 F <b>HUMIDITY:</b> 45.7%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

**NOTES:** ERODIUM IS GERMINATING.  
**WILDLIFE PRESENT:** LOGGERHEAD SHRIKE.  
**PLANTS PRESENT:** DATURA WRIGHTII, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, SALSOLA TRAGUS, SCHISMUS ARABICUS.

# KERN WATER BANK 2016 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


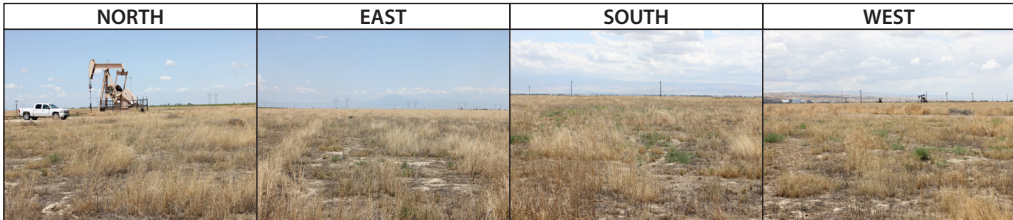
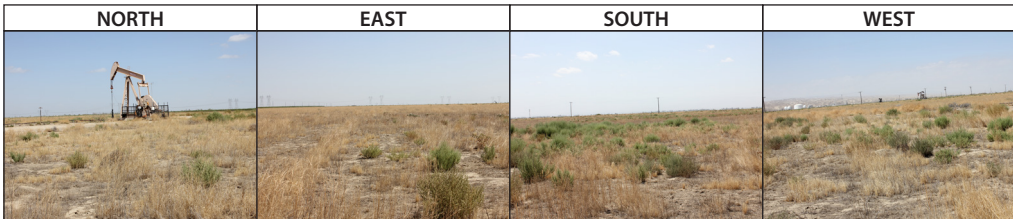
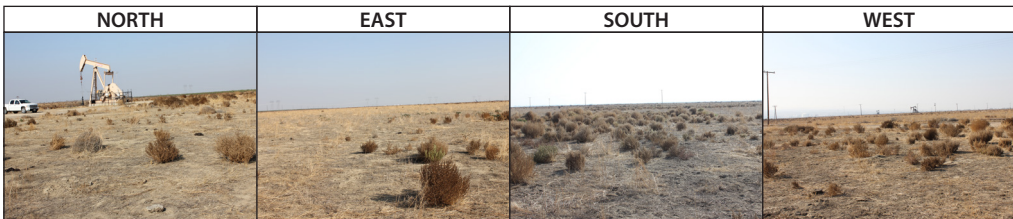
		NORTH	EAST	SOUTH	WEST
1ST QUARTER	<b>SURVEY DATE:</b> 03/04/2016 <b>TIME:</b> 12:28 PM <b>MONITOR(S):</b> J. JONES, Z. BRISCO <b>RAINFALL TO DATE:</b> 3.46 IN <b>WIND DIRECTION:</b> S <b>WIND VELOCITY:</b> 2 MPH <b>TEMPERATURE:</b> 76.5 F <b>HUMIDITY:</b> 41.5%				
	<b>NOTES:</b> SEVERAL ACTIVE KANGAROO RAT BURROWS. <b>WILDLIFE PRESENT:</b> WESTERN MEADOWLARK, WHITE-CROWN SPARROW. <b>PLANTS PRESENT:</b> AMSINCKIA MENZIESII, ATRIPLEX POLYCARPA, ERODIUM CICUTARIUM, HORDEUM MURINUM SSP. LEPORINUM, LASTHENIA CALIFORNICA, LEPIDIUM NITIDUM, PROSOPIS GLANDULOSA VAR. TORREYANA, SCHISMUS ARABICUS, VULPIA MICROSTACHYS.				
2ND QUARTER	<b>SURVEY DATE:</b> 05/24/2016 <b>TIME:</b> 12:48 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 4.88 IN <b>WIND DIRECTION:</b> N <b>WIND VELOCITY:</b> 3.1 MPH <b>TEMPERATURE:</b> 73.2 F <b>HUMIDITY:</b> 36.1%				
	<b>NOTES:</b> NUMEROUS ACTIVE KANGAROO RAT BURROWS. <b>WILDLIFE PRESENT:</b> JACKRABBIT, SAGE SPARROW, WESTERN MEADOWLARK. <b>PLANTS PRESENT:</b> AMARANTHUS SP., AMSINCKIA MENZIESII, ATRIPLEX ARGENTEA, ATRIPLEX POLYCARPA, BROMUS RUBENS, CHAMAESYCE OCELLATA, ERODIUM CICUTARIUM, HORDEUM MURINUM SSP. LEPORINUM, MALVA PARVIFLORA, PROSOPIS GLANDULOSA VAR. TORREYANA, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.				
3RD QUARTER	<b>SURVEY DATE:</b> 09/13/2016 <b>TIME:</b> 10:32 AM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 5.433 IN <b>WIND DIRECTION:</b> E <b>WIND VELOCITY:</b> 5.5 MPH <b>TEMPERATURE:</b> 74.5 F <b>HUMIDITY:</b> 36.8%				
	<b>NOTES:</b> MANY ACTIVE KANGAROO RAT BURROWS. <b>WILDLIFE PRESENT:</b> LOGGERHEAD SHRIKE, RAVEN. <b>PLANTS PRESENT:</b> AMARANTHUS SP., AMSINCKIA MENZIESII, ATRIPLEX ARGENTEA, ATRIPLEX POLYCARPA, BROMUS RUBENS, ERODIUM CICUTARIUM, PROSOPIS GLANDULOSA VAR. TORREYANA, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.				
4TH QUARTER	<b>SURVEY DATE:</b> 11/14/2016 <b>TIME:</b> 02:03 PM <b>MONITOR(S):</b> J. JONES <b>RAINFALL TO DATE:</b> 6.05 IN <b>WIND DIRECTION:</b> SE <b>WIND VELOCITY:</b> 1 MPH <b>TEMPERATURE:</b> 78.7 F <b>HUMIDITY:</b> 38.9%				
	<b>NOTES:</b> ACTIVE KANGAROO RAT BURROWS, AREA DID NOT HAVE A BIG TUMBLEWEED BLOOM, VERY FEW PLANTS PRESENT. <b>WILDLIFE PRESENT:</b> WHITE-CROWNED SPARROW. <b>PLANTS PRESENT:</b> ATRIPLEX SERENANA, BROMUS RUBENS, PROSOPIS GLANDULOSA VAR. TORREYANA, SCHISMUS ARABICUS, SISYMBRIUM IRIO.				

# KERN WATER BANK 2016 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

1ST QUARTER	<p> <b>SURVEY DATE:</b> 03/04/2016  <b>TIME:</b> 12:48 PM  <b>MONITOR(S):</b> J. JONES, Z. BRISCO  <b>RAINFALL TO DATE:</b> 3.46 IN  <b>WIND DIRECTION:</b> NW  <b>WIND VELOCITY:</b> 1.5 MPH  <b>TEMPERATURE:</b> 79.4 F  <b>HUMIDITY:</b> 34.9%                 </p> <p> <b>NOTES:</b> VERY DENSE VEGETATION, NEEDS TO BE GRAZED.  <b>WILDLIFE PRESENT:</b>  <b>PLANTS PRESENT:</b> AMSINCKIA MENZIESII, BROMUS ARIZONAEUS, BROMUS RUBENS, ERODIUM CICUTARIUM, GUILLENIA CALIFORNICA, HORDEUM MURINUM SSP.LEPORINUM, LASTHENIA CALIFORNICA, SCHISMUS ARABICUS, SISYMBRIUM IRIO.                 </p>	NORTH	EAST	SOUTH	WEST
					
2ND QUARTER	<p> <b>SURVEY DATE:</b> 05/24/2016  <b>TIME:</b> 01:30 PM  <b>MONITOR(S):</b> J. JONES  <b>RAINFALL TO DATE:</b> 4.88 IN  <b>WIND DIRECTION:</b> N  <b>WIND VELOCITY:</b> 1.4 MPH  <b>TEMPERATURE:</b> 75.2 F  <b>HUMIDITY:</b> 35.1%                 </p> <p> <b>NOTES:</b> MANY ACTIVE KANGAROO RAT BURROWS. HERBACEOUS VEGETATION IS PRETTY DENSE, COWS NEEDED.  <b>WILDLIFE PRESENT:</b> CALIFORNIA HORNEDLARK, RAVEN.  <b>PLANTS PRESENT:</b> AMSINCKIA MENZIESII, BROMUS DIANDRUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO, TROPIDOCARPULUM GRACILE.                 </p>	NORTH	EAST	SOUTH	WEST
					
3RD QUARTER	<p> <b>SURVEY DATE:</b> 09/13/2016  <b>TIME:</b> 12:02 AM  <b>MONITOR(S):</b> J. JONES  <b>RAINFALL TO DATE:</b> 5.43 IN  <b>WIND DIRECTION:</b> N  <b>WIND VELOCITY:</b> 1.3 MPH  <b>TEMPERATURE:</b> 75.4 F  <b>HUMIDITY:</b> 35.6%                 </p> <p> <b>NOTES:</b> ACTIVE KANGAROO RAT BURROWS. DENSE OVERGROWTH PRESENT. WILL ADD CATTLE THIS WEEKEND.  <b>WILDLIFE PRESENT:</b> LOGGERHEAD SHRIKE.  <b>PLANTS PRESENT:</b> DATURA WRIGHTII, HIRSHFELDIA INCANA, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.                 </p>	NORTH	EAST	SOUTH	WEST
					
4TH QUARTER	<p> <b>SURVEY DATE:</b> 11/14/2016  <b>TIME:</b> 01:18 PM  <b>MONITOR(S):</b> J. JONES  <b>RAINFALL TO DATE:</b> 6.05 IN  <b>WIND DIRECTION:</b> SE  <b>WIND VELOCITY:</b> 2 MPH  <b>TEMPERATURE:</b> 77.7 F  <b>HUMIDITY:</b> 40.6%                 </p> <p> <b>NOTES:</b> AREA HEAVILY GROWN WITH RUSSIAN THISTLE BUT CATTLE HAVE OPENED UP THE AREA AND NUMEROUS SIGN OF ACTIVE KANGAROO RAT OBSERVED.  <b>WILDLIFE PRESENT:</b> LOGGERHEAD SHRIKE.  <b>PLANTS PRESENT:</b> BROMUS RUBENS, DATURA WRIGHTII, SALSOLA TRAGUS, SCHISMUS ARABICUS, SISYMBRIUM IRIO.                 </p>	NORTH	EAST	SOUTH	WEST
					

# KERN WATER BANK 2016 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

<b>1ST QUARTER</b>	SURVEY DATE: 03/04/2016 TIME: 01:43 PM MONITOR(S): J. JONES, Z. BRISCO RAINFALL TO DATE: 3.46 IN WIND DIRECTION: NW WIND VELOCITY: 2 MPH TEMPERATURE: 74.6 F HUMIDITY: 41.2%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

NOTES: ACTIVE KANGAROO RAT BURROWS.  
 WILDLIFE PRESENT: WESTERN MEADOWLARK.  
 PLANTS PRESENT: AMARANTHUS SP., AMSIINCKIA MENZIESII, CENTAUREA MELITENSIS, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, HORDEUM MURINUM SSR, LEPORINUM, MALVA PARVIFLORA, SALIX GOODINGII, SCHISMUS ARABICUS, SISYMBRIUM IRIO.

<b>2ND QUARTER</b>	SURVEY DATE: 05/11/2016 TIME: 11:55 AM MONITOR(S): J. JONES RAINFALL TO DATE: 4.88 IN WIND DIRECTION: NW WIND VELOCITY: 6.5 MPH TEMPERATURE: 83.3 F HUMIDITY: 38.1%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

NOTES: NOT TOO MANY RUSSIAN THISTLE GROWING IN BASIN, BUT ADJACENT ROADWAY EDGES, ETC. HAVE A LOT OF PLANTS.  
 WILDLIFE PRESENT: NORTHERN MOCKINGBIRD.  
 PLANTS PRESENT: ACROPTILON REPENS, AMARANTHUS SP., ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, PHLYA NODIFLORA, POLYGONUM ARENAS-TRUM, SALIX GOODINGII, SALSOLA TRAGUS, SISYMBRIUM IRIO.

<b>3RD QUARTER</b>	SURVEY DATE: 09/13/2016 TIME: 02:28 PM MONITOR(S): J. JONES RAINFALL TO DATE: 5.43 IN WIND DIRECTION: NW WIND VELOCITY: 2.8 MPH TEMPERATURE: 79.8 F HUMIDITY: 30.9%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

NOTES: WILLOWS ARE HIGHLY STRESSED, SOME HAVE DIED. REMOVE CATTLE SOON. SEVERAL ACTIVE KANGAROO RAT BURROWS.  
 WILDLIFE PRESENT: SIDE-BLOTCHED LIZARD.  
 PLANTS PRESENT: ACROPTILON REPENS, AMARANTHUS SP., ERODIUM CICUTARIUM, HORDEUM MURINUM SPP. LEPORINUM, PHLYA NODIFLORA, SALIX GOODINGII, SALSOLA TRAGUS, SISYMBRIUM IRIO.

<b>4TH QUARTER</b>	SURVEY DATE: 11/28/2016 TIME: 03:28 PM MONITOR(S): J. JONES RAINFALL TO DATE: 6.05 IN WIND DIRECTION: -- WIND VELOCITY: 1.3 MPH TEMPERATURE: 59.8 F HUMIDITY: 51.5%	<b>NORTH</b>	<b>EAST</b>	<b>SOUTH</b>	<b>WEST</b>

NOTES: MANY ACTIVE KANGAROO RAT BURROWS. MANY OF THE WILLOWS HAVE LIKELY DIED FROM DROUGHT.  
 WILDLIFE PRESENT: KILLDEER, BLACK PHOEBE,  
 PLANTS PRESENT: ATRIPLEX SERENANA, PHLYA NODIFLORA, SALIX GOODINGII, SALSOLA TRAGUS, SISYMBRIUM IRIO.

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## Appendix C

### Kern Water Bank Bird Survey Report: October – mid-April 2012



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**Sterling Wildlife Biology**

**Woodland CA 95695**

**Phone: 530 908-3836**

**E-Mail: [jsterling@wavecable.com](mailto:jsterling@wavecable.com)**

**Web: [www.sterlingbirds.com](http://www.sterlingbirds.com)**

# Kern Water Bank

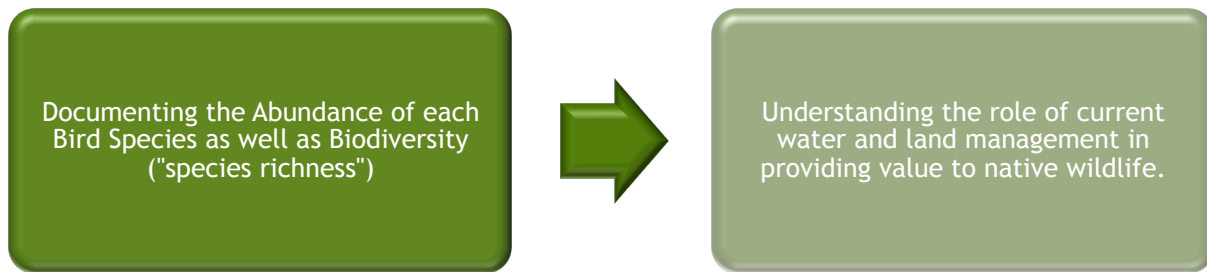
Bird Survey Report: October - mid-April 2012

27 April 2012



## Introduction

The property managed by the Kern Water Bank Authority supports a wealth of native wildlife, especially an abundance of water birds and raptors attracted to the recharge ponds and/or the upland habitats. In order to document and quantify this natural resource value, John Sterling of Sterling Wildlife Biology conducted bird surveys from mid October 2011 to mid April 2012. These surveys were intended to capture a snapshot of the bird use of the project area during the winter and early spring season. The resulting data serve to document the regional and statewide importance of these wetlands to waterbirds during this period. The data may also be used to inform management practices with regard to productive bird habitat.



## Methods

For the waterbird surveys, John Sterling visited watered ponds over ten survey periods. The dates of the surveys were 18-19 October, 25-26 October, 15-16 November, 30 November - 1 December, 13-14 December, 23-25 January, 10-11 February, 28-29 February, 10-11 March, and 8-9 April. Each pond was labeled in the datasheet according to the name on the map provided by the Kern Water Bank Authority. One pond was not marked on the map and was labeled CX for this study. For each pond, Mr. Sterling counted all individuals for species with fewer than one hundred individuals. For species with larger numbers of individuals, he made estimates by counting in increments of ten or one hundred. All watered ponds were visited in all ten surveys with the exception of Pond W3. All data were entered into Microsoft Excel spreadsheets (See attached Appendix A excel file).

Mr. Sterling conducted upland bird surveys by walking transects and recording all birds heard or seen within 100 meters of the transect line (Figure 1). He tabulated the numbers of each species. Each transect was surveyed twice, once in October (one transect in December) and again in February. Transects were 0.25 - 0.5 miles long. For five sets of raptor surveys (14 December, 9 January, 24 January, 29 February and 1 April), Mr. Sterling drove most roads to cover the entire project area and kept running tallies of numbers of individuals of all raptor species and Loggerhead Shrike detected in wetland and upland habitats.

## Results

### Waterbirds

A total of sixty-six native waterbird species were detected during these surveys. Overall numbers were consistently high during the first eight survey periods (mid-October through February) with 19,823 - 34,945 individuals estimated (Figure 2). After mid December, ponds started drying out. However, numbers climbed and remained high through February despite the drop in the number of watered ponds (Figures 2 and 3). The study area was able to absorb these increases as watered ponds held higher concentrations of birds. The peak was on 24-25 January when large numbers of ducks were present (Figure 5), most likely pushed south by winter storms in the north. There was a sharp decline in waterbird numbers by mid March and April as there were few watered ponds remaining—most of which had greatly reduced water levels and surface area.

The sixty-six species of waterbirds are grouped according to foraging ecology and evolutionary relationships. Grebes (Figure 4), gulls (Figure 5), dabbling and diving ducks (Figure 6), egrets/herons (Figure 7), and shorebirds (sandpipers and plovers) (Figure 8) were classified into separate categories. American Coot (*Fulica americana*), White-faced Ibis, Double-crested Cormorant (*Phalacrocorax auritus*), and White Pelican (*Pelicanus erythrorhynchos*) were treated individually in the summary data (Figures 9-11). There were two over-arching seasonal patterns in abundance amongst the groups of waterbirds. Grebes, herons and egrets, coots, and pelicans and cormorants numbers peaked during the late fall and early winter surveys, while ducks, gulls, shorebirds and White-faced Ibis (*Plegadis chihi*) numbers peaked in late winter and early spring surveys (Figures 3-10). Overall numbers of species per pond (species richness) as an index of biodiversity increased from mid October to 14 December, then slowly decreased (Table 1). The ponds that were most important for high numbers of species and populations throughout the winter were W2, W4, W5, W6, M1, M8, and M10. But many other ponds were important, especially earlier in the season when water was most prevalent east of Hwy 5 (for details see Appendix excel file). The average number of birds per pond varied across the survey periods but didn't change dramatically until decreases started in late February

(Table 2). The variation in ponds was dramatic with several ponds consistently having over 2,000 birds and others fewer than 100. Because of the varied topography of many of the ponds and the lack of direct measurements of water depths, it was not possible to determine average depths or the range of depths for the ponds during the surveys. Likewise, because many of the ponds were drying during the late winter and spring, the acreages of these ponds were not measured. However, the largest ponds consistently had the largest number of species and concentrations of birds.

Marsh species such as Sora (*Porzana carolina*), Virginia Rail (*Rallus limicola*), Black-crowned Night-Heron (*Nycticorax nycticorax*), and Marsh Wren (*Cistothorus palustris*) were found in nearly every pond with substantial amount of cattails, sedges and other emergent wetland vegetation. Curiously, no American Bitterns (*Botaurus lentiginosus*) or Least Bitterns (*Ixobrychus exilis*) were found despite plenty of suitable habitat, but these species are cryptic and usually in low density so are difficult to detect when not vocalizing.

### Upland Birds

Additional bird surveys that sampled the diverse upland habitats had 9 - 21 species with 9 - 245 individual birds in October (Table 3). By far the most abundant species was White-crowned Sparrow (*Zonotrichia leucophrys*), but large numbers of the typically uncommon Lincoln's Sparrow (*Melospiza lincolnii*) were found on two transects. All birds found during these surveys were typical wintering species with the exception of Yellow Warbler (*Setophaga petechia*), which was a late migrant.

The second set of surveys conducted in February had fewer species and individuals than in October with the exception of Transect G, which was surveyed in December, not October. These results may indicate an overall reduction in the populations of upland bird species on the study area. Among the factors that could play a role are reduced food (seed, insects), birds were temporarily stopping on the study area while enroute to wintering locations further south, and the loss of individuals through predation. Predators such as long-tailed weasel (*Mustela freneta*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), many raptors including owls, and Loggerhead Shrikes were observed on the study area during the surveys and undoubtedly prey upon many upland birds during the winter.

### Raptors and Shrikes

The comprehensive survey for raptors and Loggerhead Shrikes (*Lanius ludovicianus*) on the entire project area resulted in high numbers of Red-tailed Hawks (*Buteo jamaicensis*) and Loggerhead Shrikes, but also documented thirteen species of raptors using either the wetland or upland habitats during the surveys (Figure 12-16). Ferruginous Hawks (*Buteo regalis*), American Kestrels (*Falco sparverius*), Prairie Falcons (*Falco mexicanus*) and Loggerhead Shrikes preferred upland to wetland habitats, but Red-tailed Hawks and Northern Harriers (*Circus cyaneus*) were found nearly equally in both sets of habitats during the first survey (Figure 11). During subsequent surveys, Red-tailed Hawks were found primarily in upland habitats. The sample sizes are too small to draw definitive conclusions based upon the data, but Osprey (*Pandion haliaetus*), and Peregrine Falcon (*Falco peregrinus*) preference for wetlands and Prairie Falcon preference for uplands can be inferred based upon their primary diet—fish for Osprey, ducks and shorebirds for Peregrine Falcons, and rodents and upland birds for Prairie Falcons. Red-shouldered Hawk (*Buteo lineatus*) and White-tailed Kites (*Elanus leucurus*) were present in very small numbers and primarily associated with wetlands and/or rank fallow fields. Both Cooper's (*Accipiter cooperi*) and Sharp-shinned (*Accipiter striatus*) hawks, which prey upon small birds, were also found in small numbers in both upland and wetlands, but primarily where there were flocks of sparrows.

Overall numbers of raptors dipped sharply on 9 January, then rebounded on 24 January and declined to low levels found on 1 April. Likewise, Loggerhead Shrikes followed the same trend to drop to ~30% of the peak number by 1 April. The 17 remaining shrikes on 1 April were likely resident breeders. The decline from December was likely due to an influx of winter visitors that departed by April to their breeding grounds outside of the study area. The extent of immigration to the Central Valley is unknown, but it is likely that some shrikes breeding eastern Washington, Oregon and the Great Basin winter in the Central Valley.

### Rare Birds

A few rare birds were discovered during the surveys. A female Barrow's Goldeneye was on M10 on 25 January, which established only the third documented record for Kern County. Two female Greater Scaup on 14 December on E2 were the only ones reported in Kern County during 2011. Several Eurasian Wigeon were also seen including a female and three males. Other than Canada Goose, geese are rare in the Tulare Basin, so multiple records of Snow, Ross's, Cackling and Greater White-fronted geese were notable. A Glaucous Gull was on M1 on 29 February, which established the fourth or fifth record for the Tulare Basin. Other rare gulls included several Glaucous-winged, Thayer's and Mew gulls. Although not rare, an adult Golden Eagle put in a visit on 29 February. On 1 April, a Cassin's Kingbird and a male Purple Martin were photographed on the study area. The kingbird is a very rare breeder in Kern County and is only known from the South Fork Kern River Valley and a location near Bakersfield. This bird was probably a very rare wandering migrant. Purple Martins are only known to breed in Kern County in the high mountains of the Tejon Ranch, and there are very few records of migrants in the San Joaquin Valley and Tulare Basin.

The Kern Water Bank has exceptional habitats for birds and many rare birds will likely be found and documented in the future dependent upon survey efforts.

Figure 1. Locations of Upland Bird Survey Transects on the Kern Water Bank

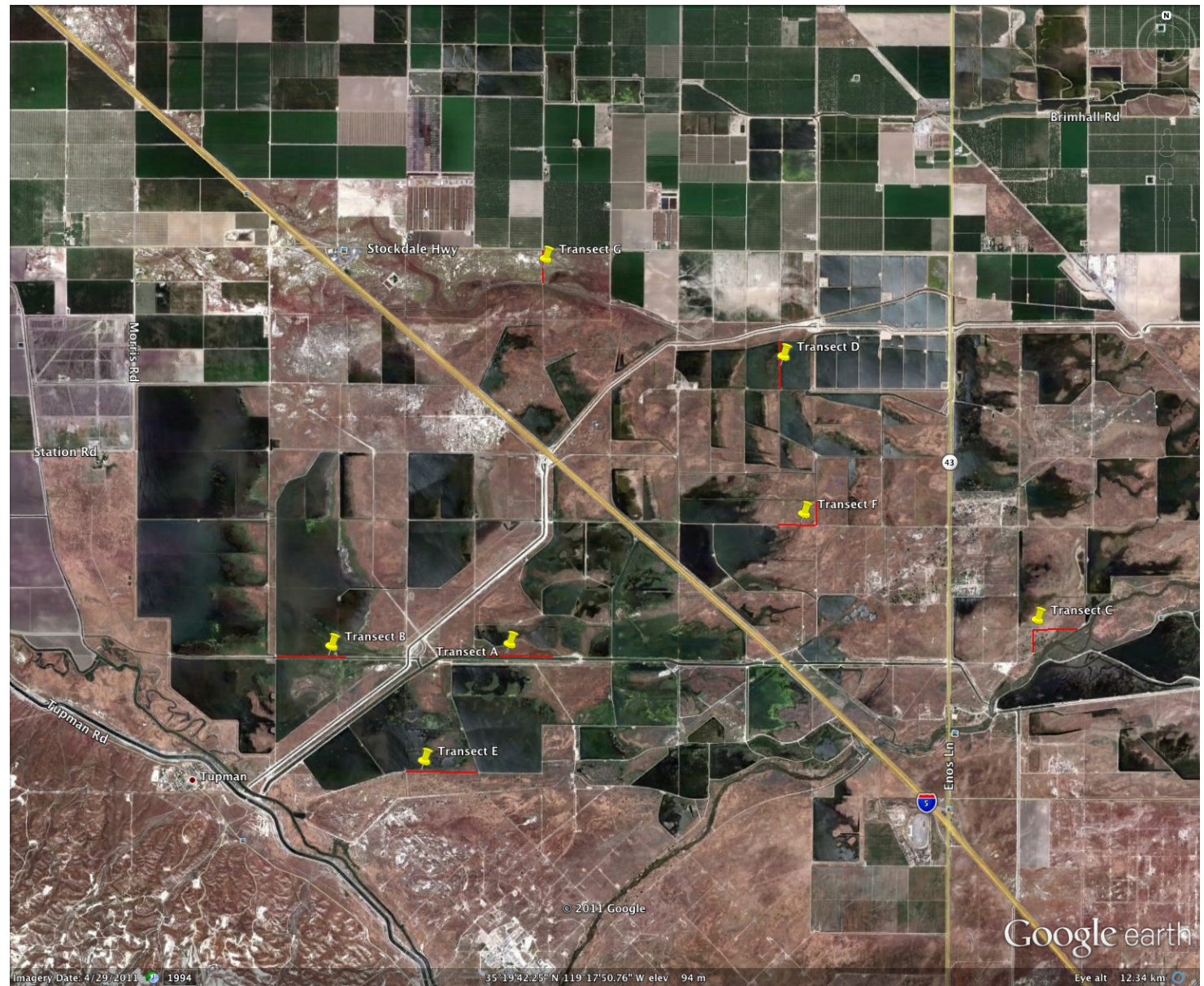


Figure 2. Results of Ten Waterbird Surveys in Winter 2011-2012: total waterbird counts.

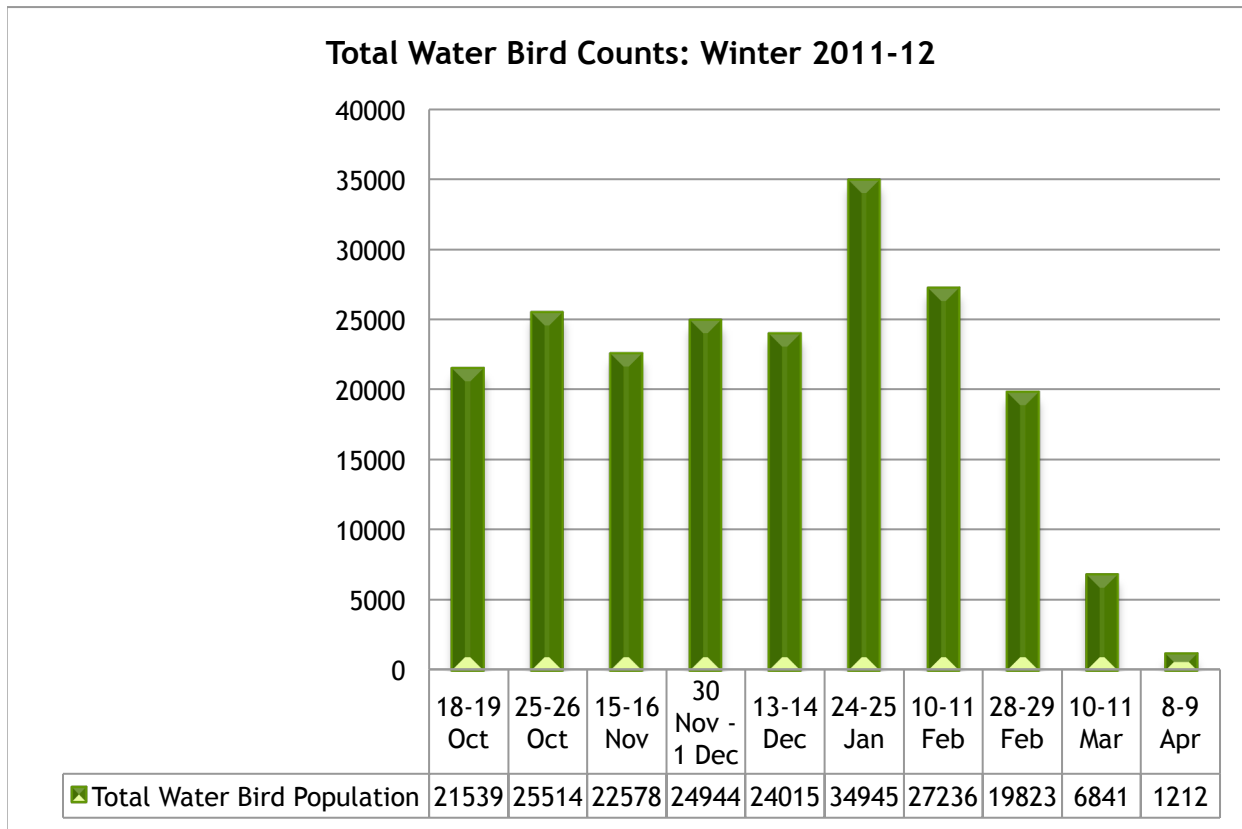
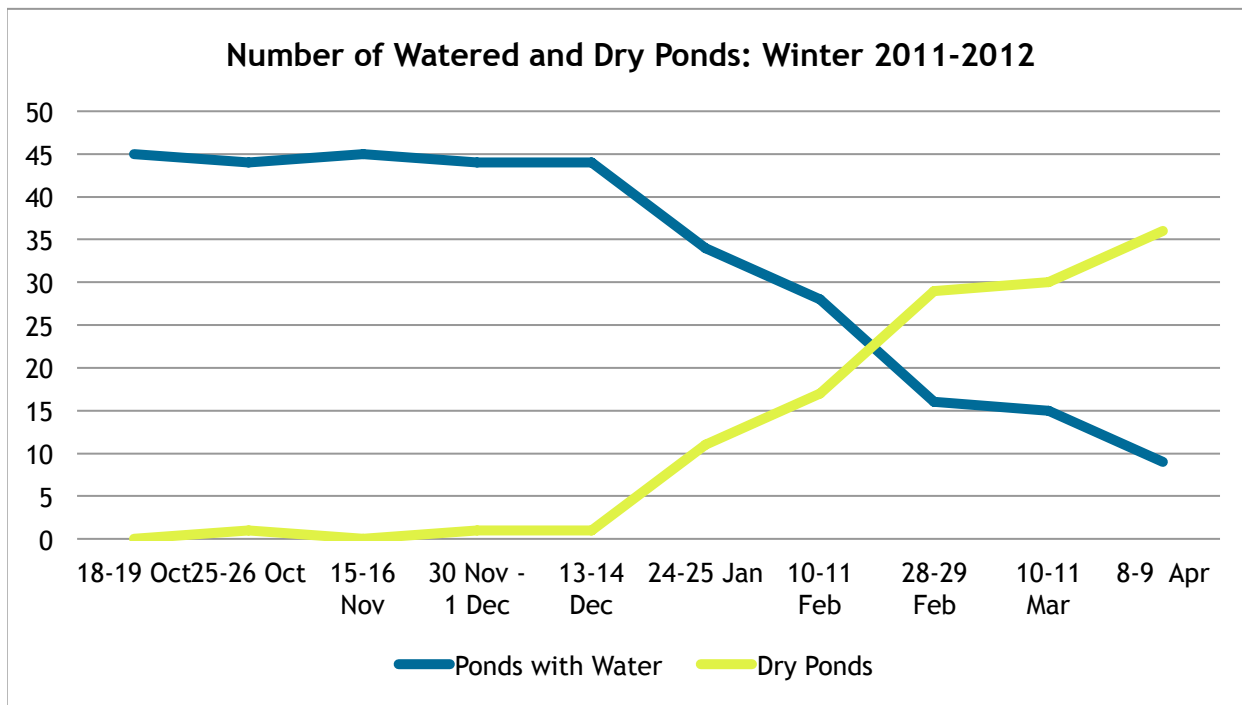


Figure 3. Seasonal Variation in Watered Ponds Surveyed for Birds: Winter 2011-2012.





Great and Snowy egrets, White-faced Ibis, American White Pelicans and Double-crested Cormorants

Figure 4. Results of Grebe Counts.

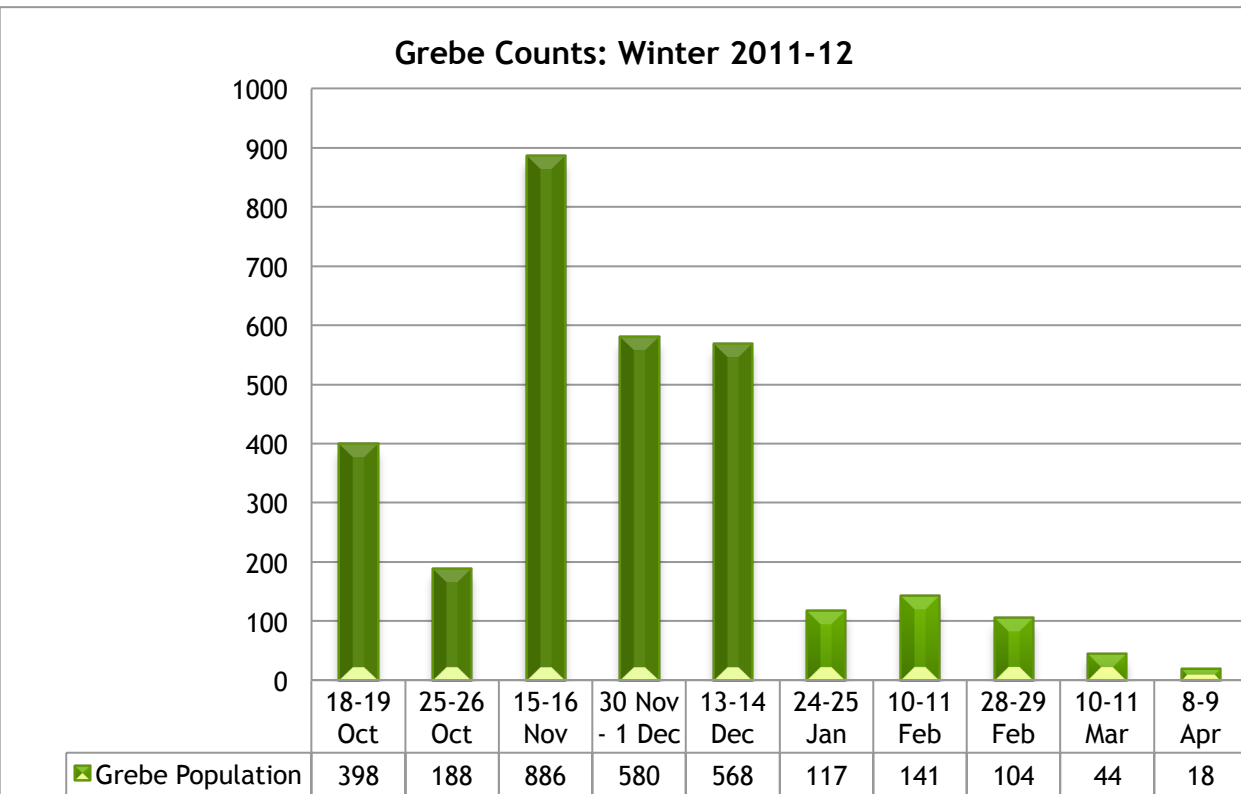




Figure 5. Results of Gull Counts.

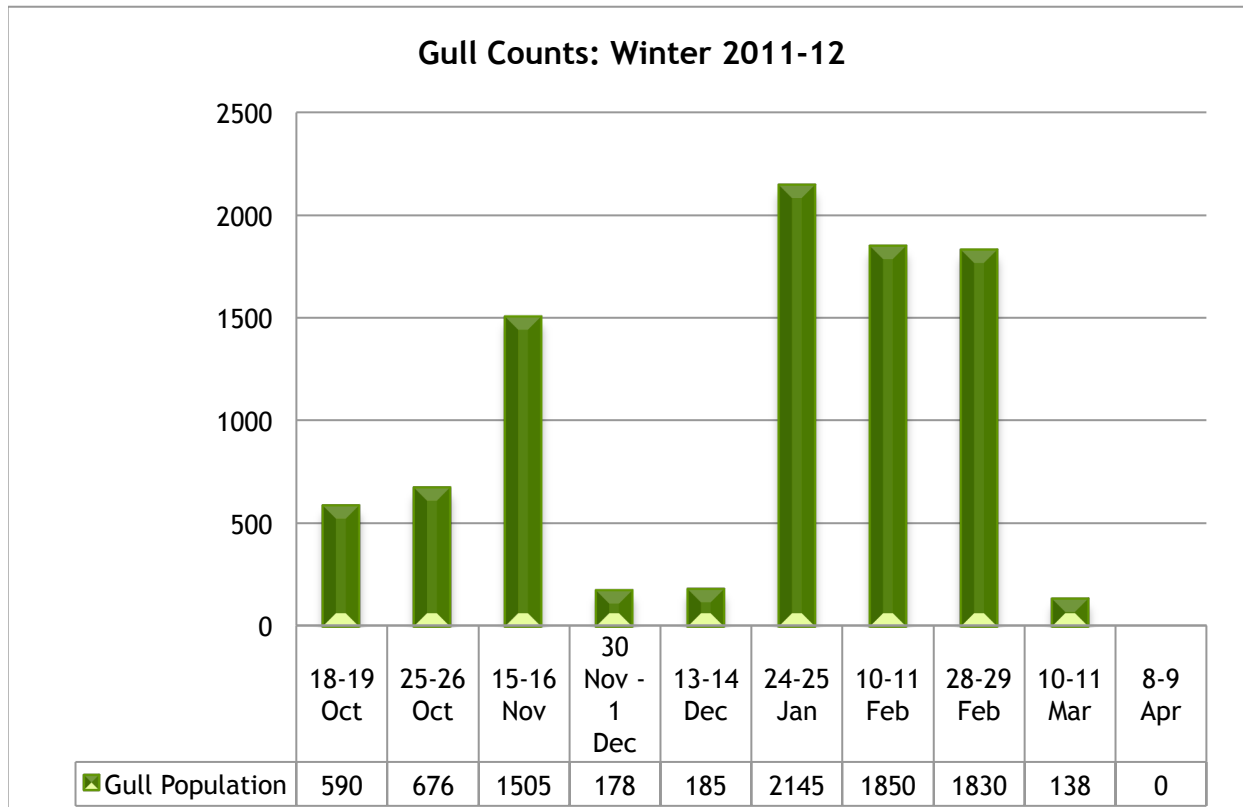


Figure 6. Results of Duck Counts.

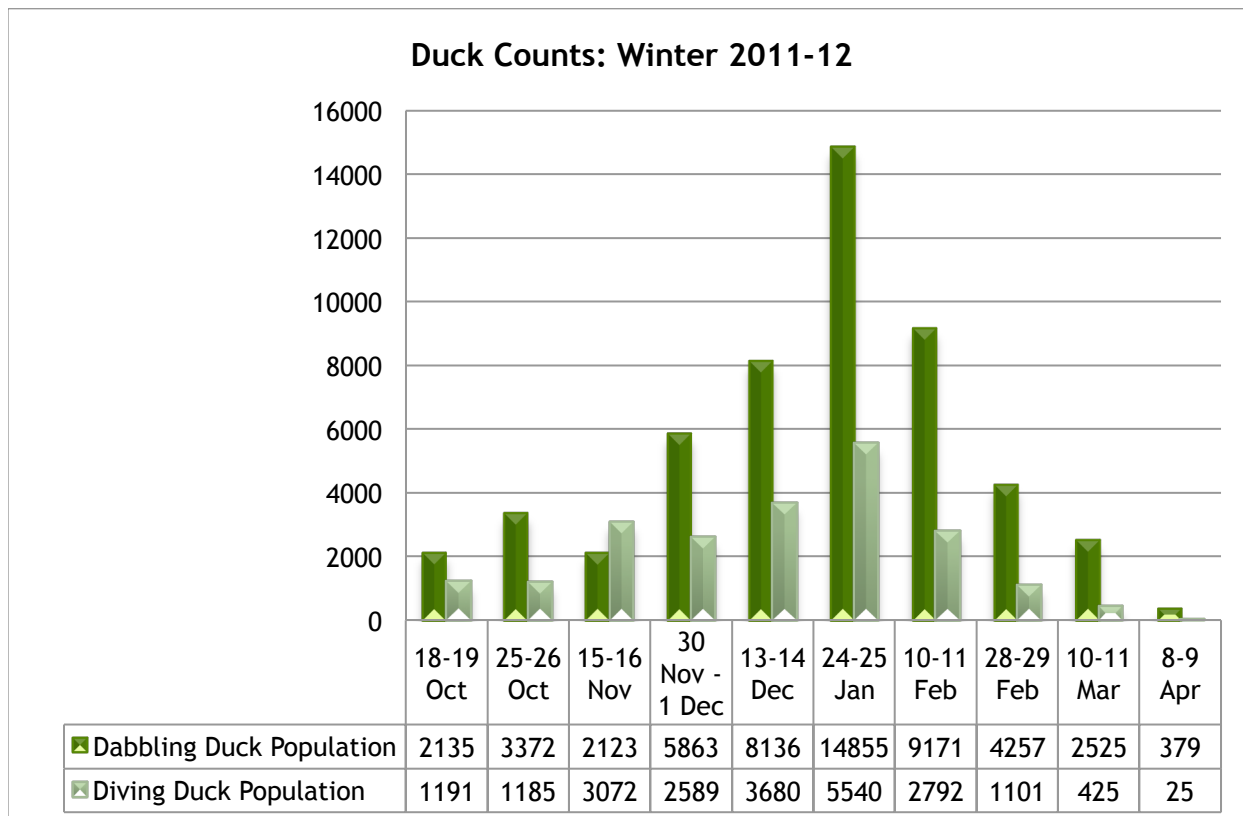


Figure 7. Results of Egret and Heron Counts.

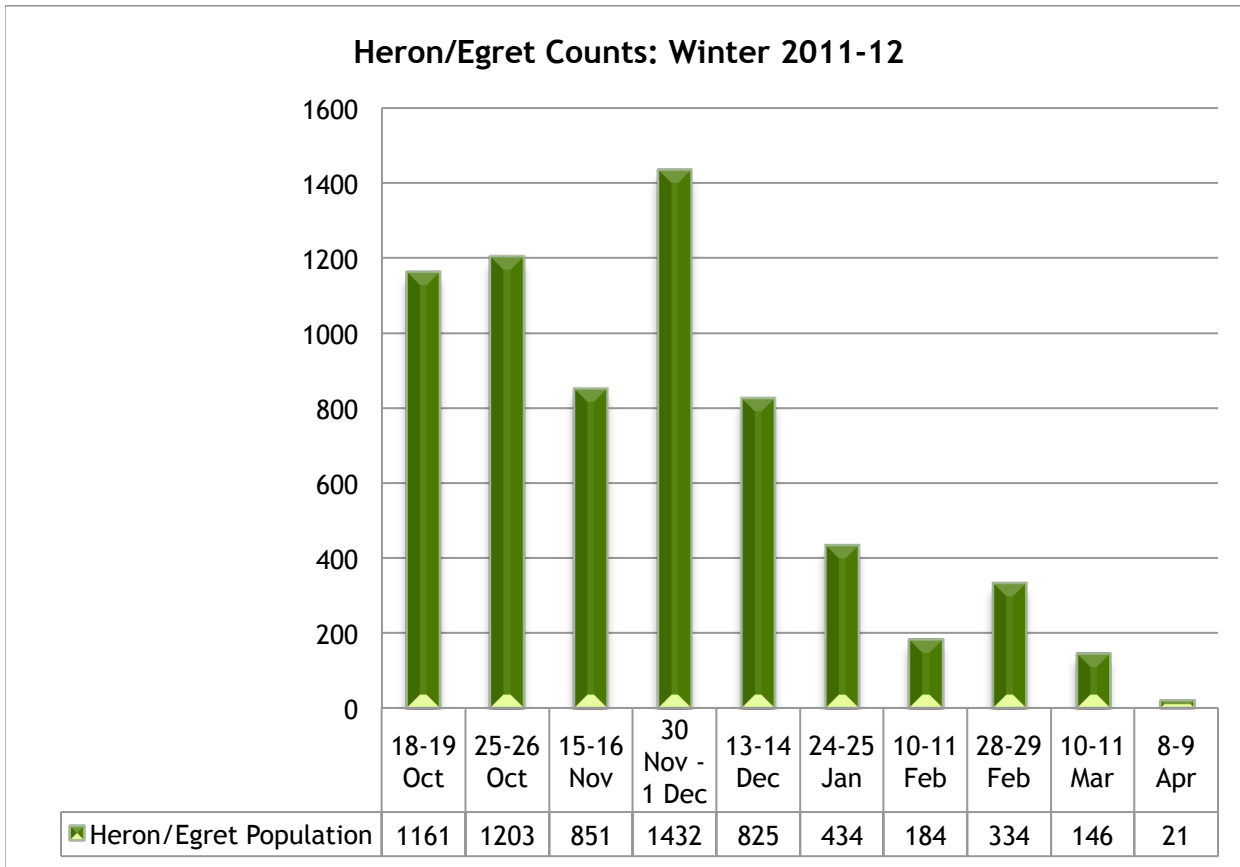


Figure 8. Results of Shorebird Counts.

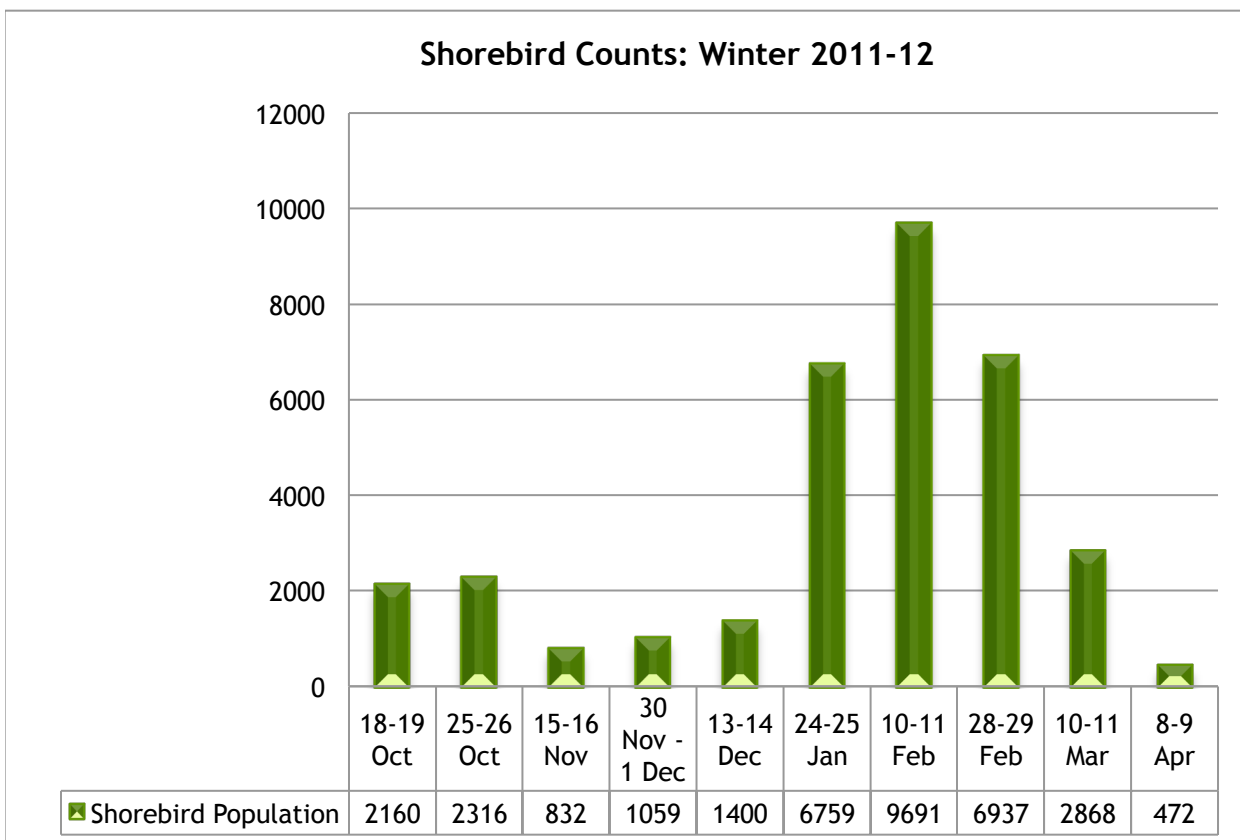


Figure 9. Results of American Coot Counts.

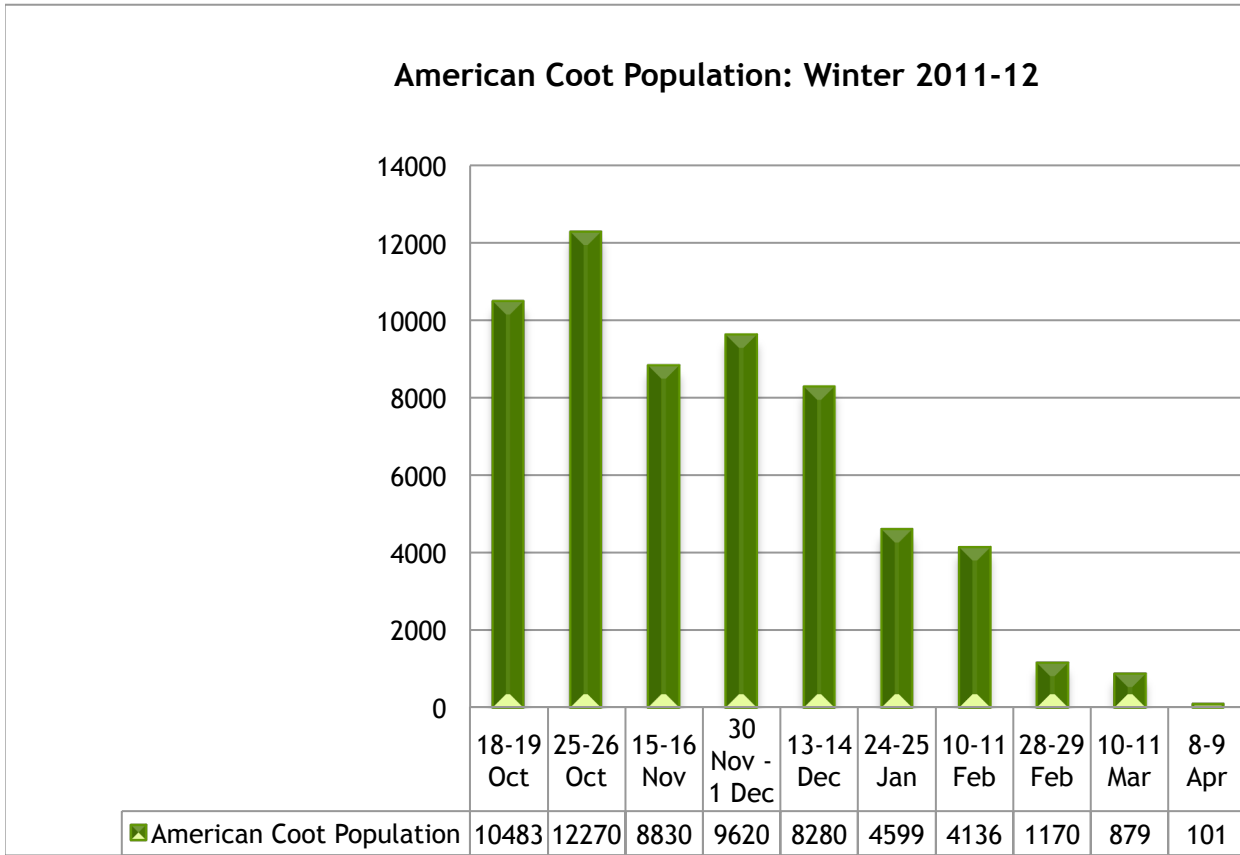


Figure 10. Results of White-faced Ibis Counts.

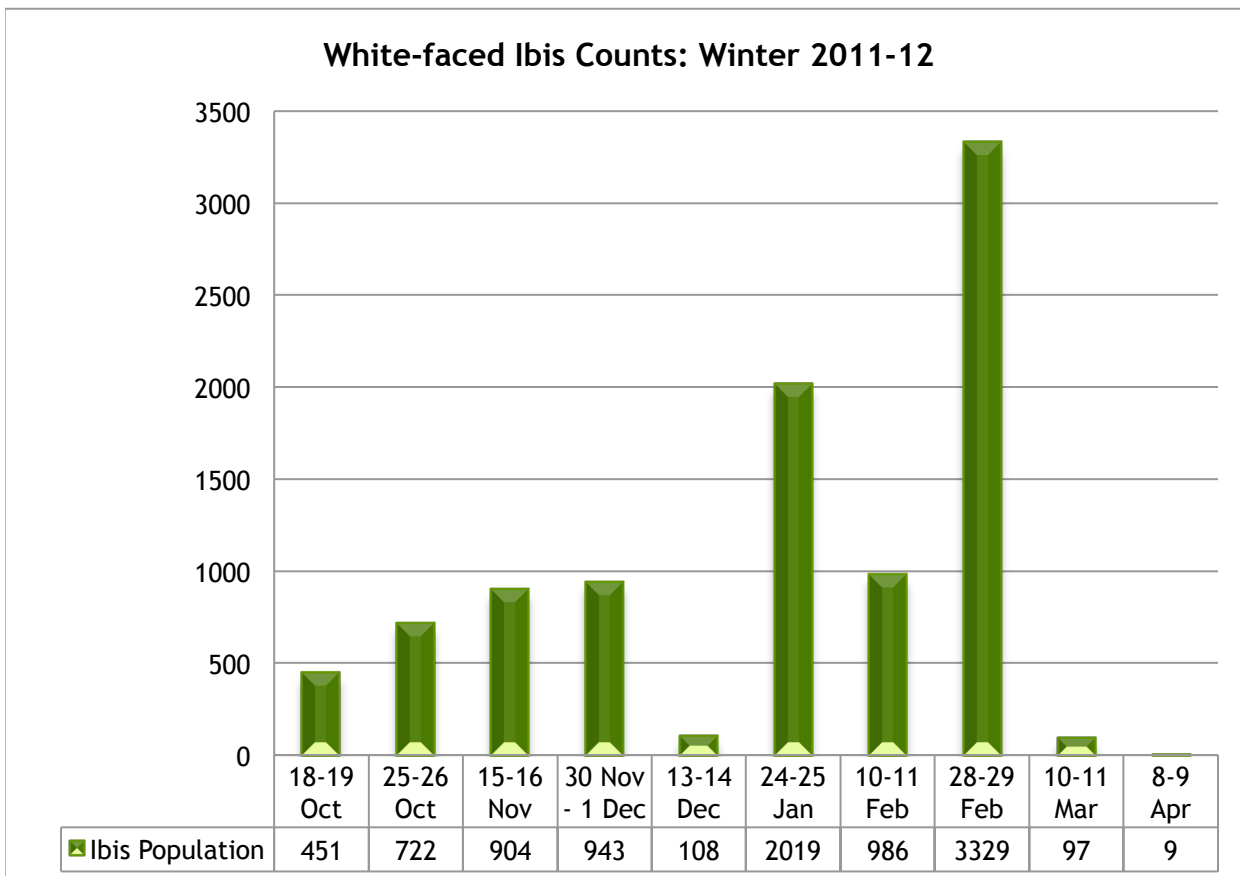


Figure 11. Results of Cormorant and Pelican Counts.

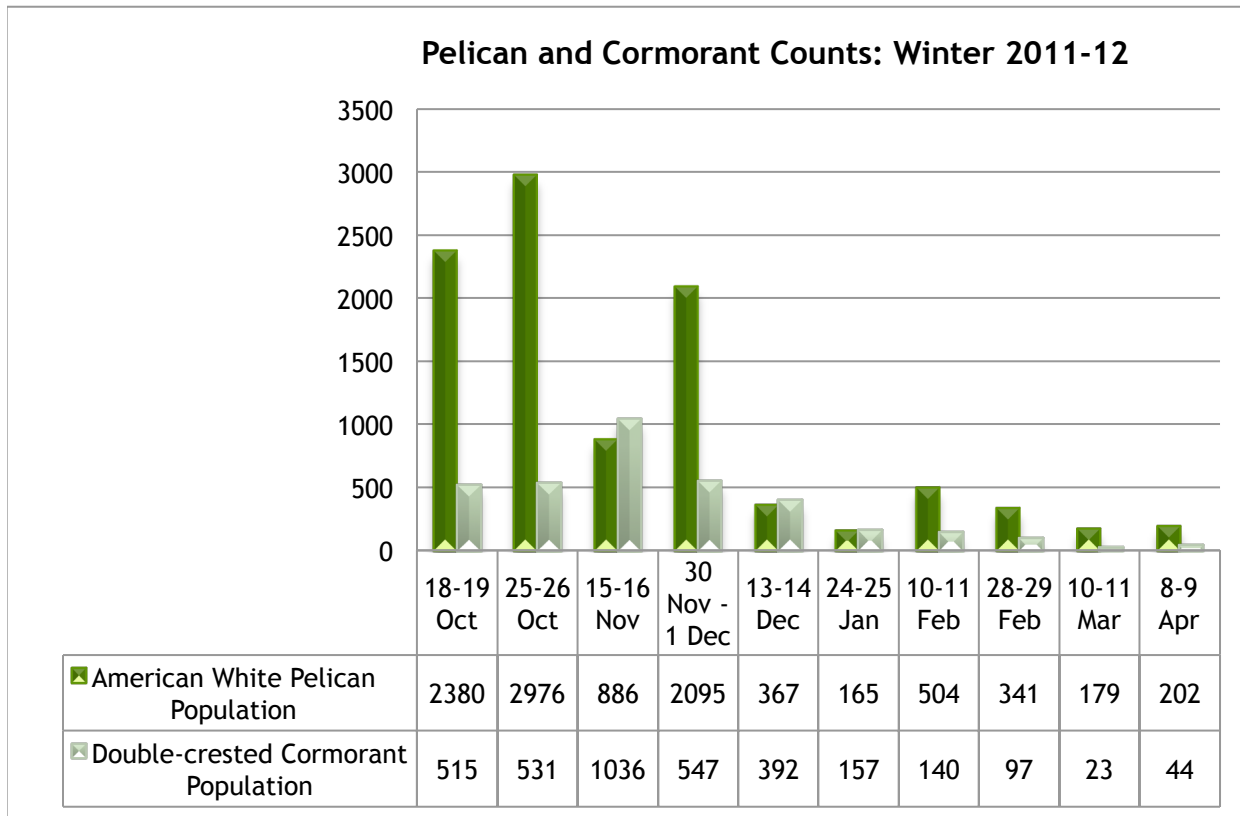


Table 1. Number of Species per Pond.

Survey Period	Average Species Richness	Standard Error	Range
18-19 Oct	9.56	5.47	1 - 23
25-26 Oct	10.35	5.67	0 - 21
15-16 Nov	11.95	6.44	1 - 28
30 Nov - 1 Dec	13.36	5.75	0 - 26
13-14 Dec	13.25	7.41	0 - 28
23-25 Jan	10.82	9.20	0 - 31
10-11 Feb	8.22	8.69	0 - 26
28-29 Feb	6.02	9.56	0 - 32
11 Mar	4.24	7.75	0 - 27
9 Apr	2.38	5.34	0 - 22

Table 2. Number of Birds per Pond.

Survey Period	Average Number of Birds	Standard Error	Range
18-19 Oct	552	660	12 - 2539
25-26 Oct	668	997	0 - 4373
15-16 Nov	599	638	3 - 3042
30 Nov - 1 Dec	640	691	0 - 3725
13-14 Dec	536	586	0 - 2274
23-25 Jan	790	1935	0 - 11432
10-11 Feb	637	1249	0 - 7050
28-29 Feb	445	1221	0 - 6121
11 Mar	162	443	0 - 2390
9 Apr	31	74	0 - 334

Table 3. Results of Upland Bird Surveys: October.

	Transect A	Transect B	Transect C	Transect D	Transect E	Transect F	Transect G
Date	19-Oct	19-Oct	20-Oct	20-Oct	26-Oct	27-Oct	12-Dec
Transect Length (miles)	0.5	0.5	0.5	0.35	0.5	0.5	0.25
<b>Species</b>							
COOPER'S HAWK	2				1		
RED-SHOULDERED HAWK		1	1				
RED-TAILED HAWK		1		2		2	1
AMERICAN KESTREL			1			1	
KILLDEER							1
CALIFORNIA QUAIL			71		43	2	
MOURNING DOVE			2	1		12	1
GREATER ROADRUNNER			1		1		
BARN OWL	3						
NORTHERN FLICKER			1		1		
BLACK PHOEBE	1	1	1	2	4	2	
SAY'S PHOEBE			1				
HORNED LARK			3			40	1
TREE SWALLOW	4			40			
WESTERN SCRUB-JAY			3				
COMMON RAVEN			3				1
BEWICK'S WREN			11		7		
HOUSE WREN	6			1	4		
MARSH WREN				4	1		
AMERICAN ROBIN			1				
NORTHERN MOCKINGBIRD	4	1	6	3	3	1	1
CALIFORNIA THRASHER			1		1		
AMERICAN PIPIT						3	
LOGGERHEAD SHRIKE	2	2	2	2	5	1	1
ORANGE-CROWNED WARBLER			2	6	1		
YELLOW WARBLER		2		1			
AUDUBON'S WARBLER		3	5	3	6		
COMMON YELLOWTHROAT		2		1			
LARK SPARROW					1		
SAVANNAH SPARROW					2	2	
SONG SPARROW	2	7		3	1		
LINCOLN'S SPARROW	47	3		33	4	1	
WHITE-CROWNED SPARROW	130	50	60	60	150	40	
RED-WINGED BLACKBIRD	10			60			
WESTERN MEADOWLARK	3		2	1		8	1
BROWN-HEADED COWBIRD				2			
HOUSE FINCH	18	6		2	1	9	1
AMERICAN GOLDFINCH		20		2	8		
<b>Individuals</b>	<b>232</b>	<b>99</b>	<b>183</b>	<b>229</b>	<b>245</b>	<b>124</b>	<b>9</b>
<b>Species</b>	<b>13</b>	<b>13</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>14</b>	<b>9</b>

Table 3. Results of Upland Bird Surveys: February.

	Transect A	Transect B	Transect C	Transect D	Transect E	Transect F	Transect G
Date	29-Feb	29-Feb	9-Feb	9-Feb	29-Feb	9-Feb	9-Feb
Transect Length (miles)	0.5	0.5	0.5	0.35	0.5	0.5	0.25
<b>Species</b>							
GREEN HERON		1					
COOPER'S HAWK			1				
WHITE-TAILED KITE	2						
NORTHERN HARRIER	1			1			
RED-TAILED HAWK			3				1
AMERICAN KESTREL				2			1
KILLDEER							1
CALIFORNIA QUAIL	20		1		40		
RING-NECKED PHEASANT	1						
MOURNING DOVE			4	4	3		
GREATER ROADRUNNER							1
GREAT HORNED OWL	1		3				
NORTHERN FLICKER			1				
BLACK PHOEBE		1	2	2			
HORNED LARK			14				2
TREE SWALLOW				3			
CLIFF SWALLOW					2		
WESTERN SCRUB-JAY							1
COMMON RAVEN			1		2		
BEWICK'S WREN		1	5	1	2		
HOUSE WREN					2		
MARSH WREN	1	1		8			
RUBY-CROWNED KINGLET		1	1	1			
NORTHERN MOCKINGBIRD	1		4				2
CALIFORNIA THRASHER			2		1		
AMERICAN PIPIT				1			
EURASIAN STARLING			4				
LOGGERHEAD SHRIKE	1		2		6		2
ORANGE-CROWNED WARBLER				1	1		
AUDUBON'S WARBLER	1	5	3		3		
SAVANNAH SPARROW		6				12	
SONG SPARROW		2		10			
LINCOLN'S SPARROW	6	4		17	1		
WHITE-CROWNED SPARROW	20	10	50	7	50	8	10
RED-WINGED BLACKBIRD				21			
WESTERN MEADOWLARK	4		2	2	6	6	10
HOUSE FINCH	2		1	2			
<b>individuals</b>	<b>61</b>	<b>32</b>	<b>104</b>	<b>83</b>	<b>119</b>	<b>26</b>	<b>31</b>
<b>species</b>	<b>13</b>	<b>10</b>	<b>19</b>	<b>16</b>	<b>13</b>	<b>3</b>	<b>10</b>

Figure 12. Results of the Raptor Survey on 14 December 2011.

Numbers of Raptors and Shrikes Counted in Upland and Wetland Habitats: 14 December

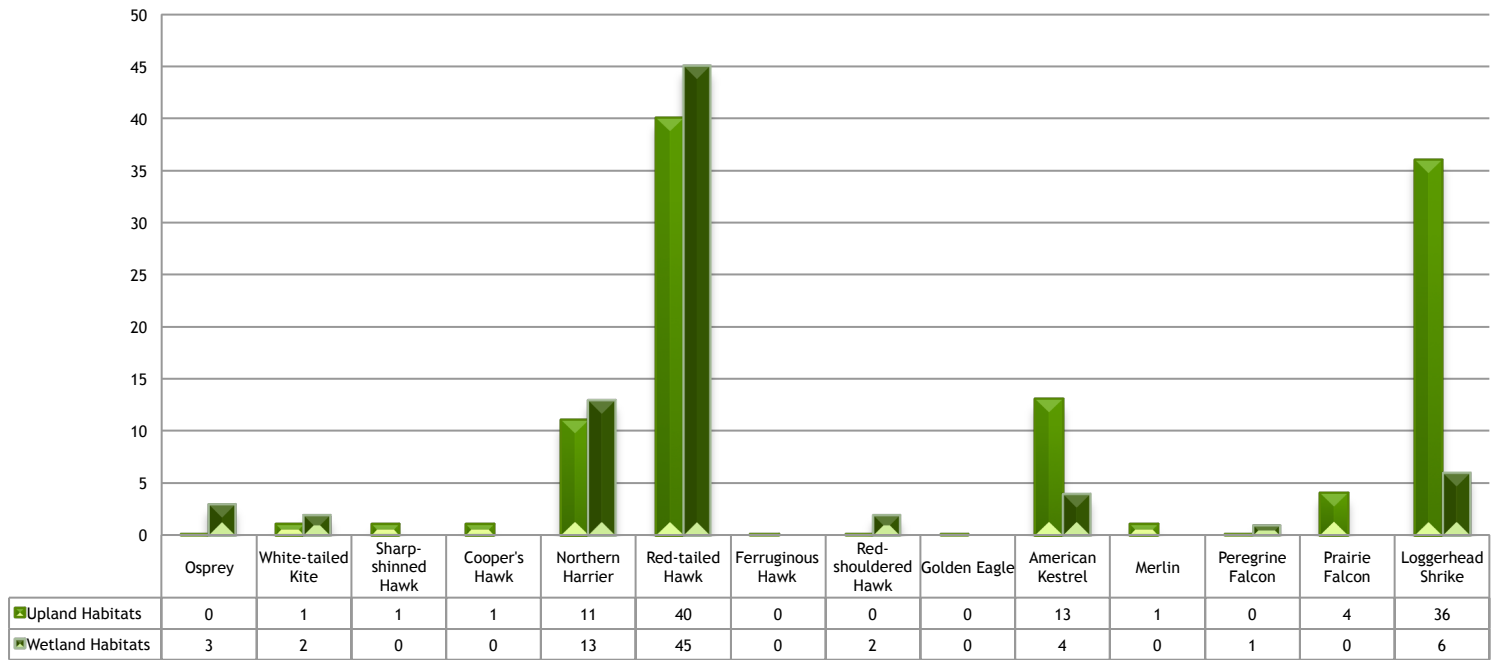


Figure 13. Results of the Raptor Survey on 9 January 2012.

Numbers of Raptors and Shrikes Counted in Upland and Wetland Habitats: 9 January

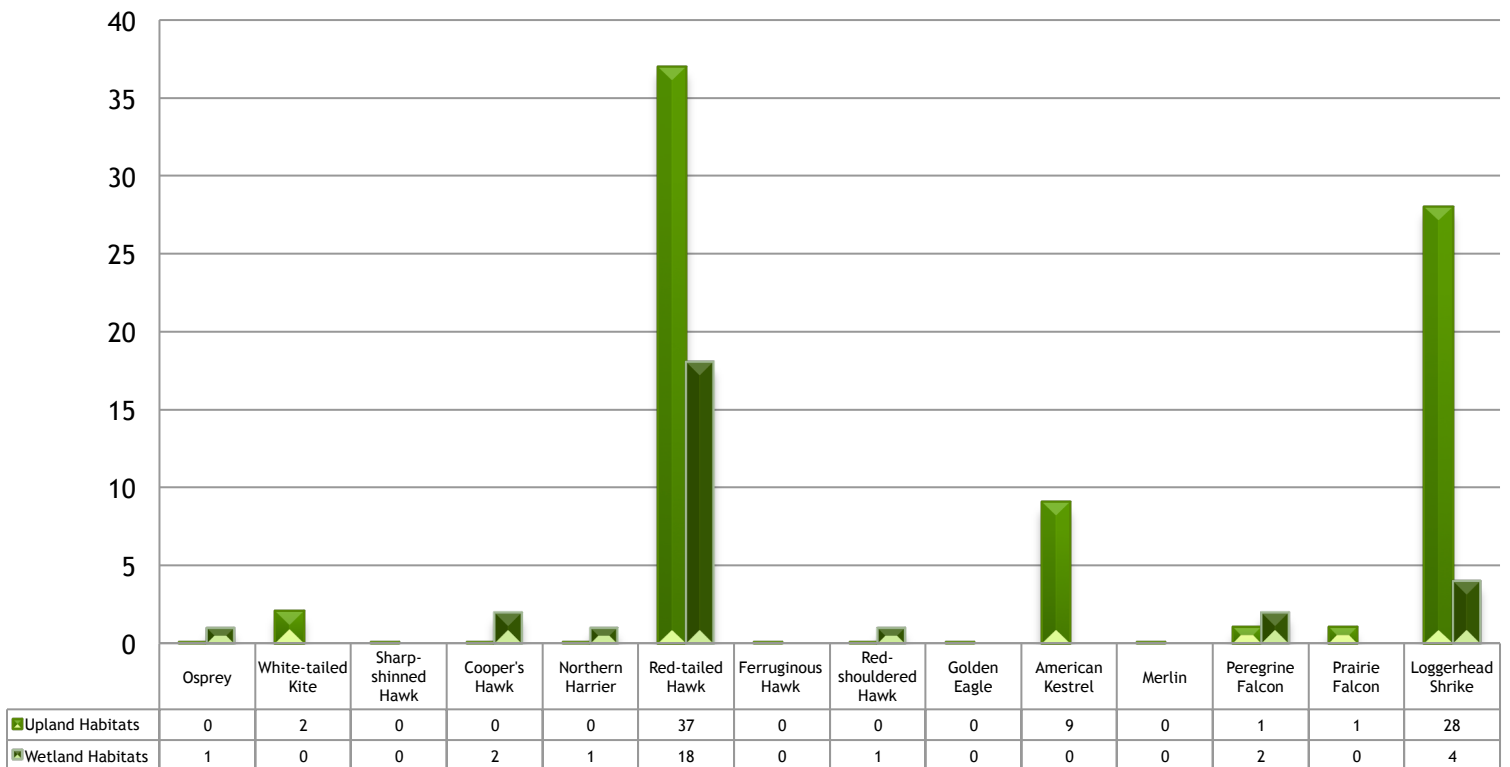


Figure 14. Results of the Raptor Survey on 24 January 2012.

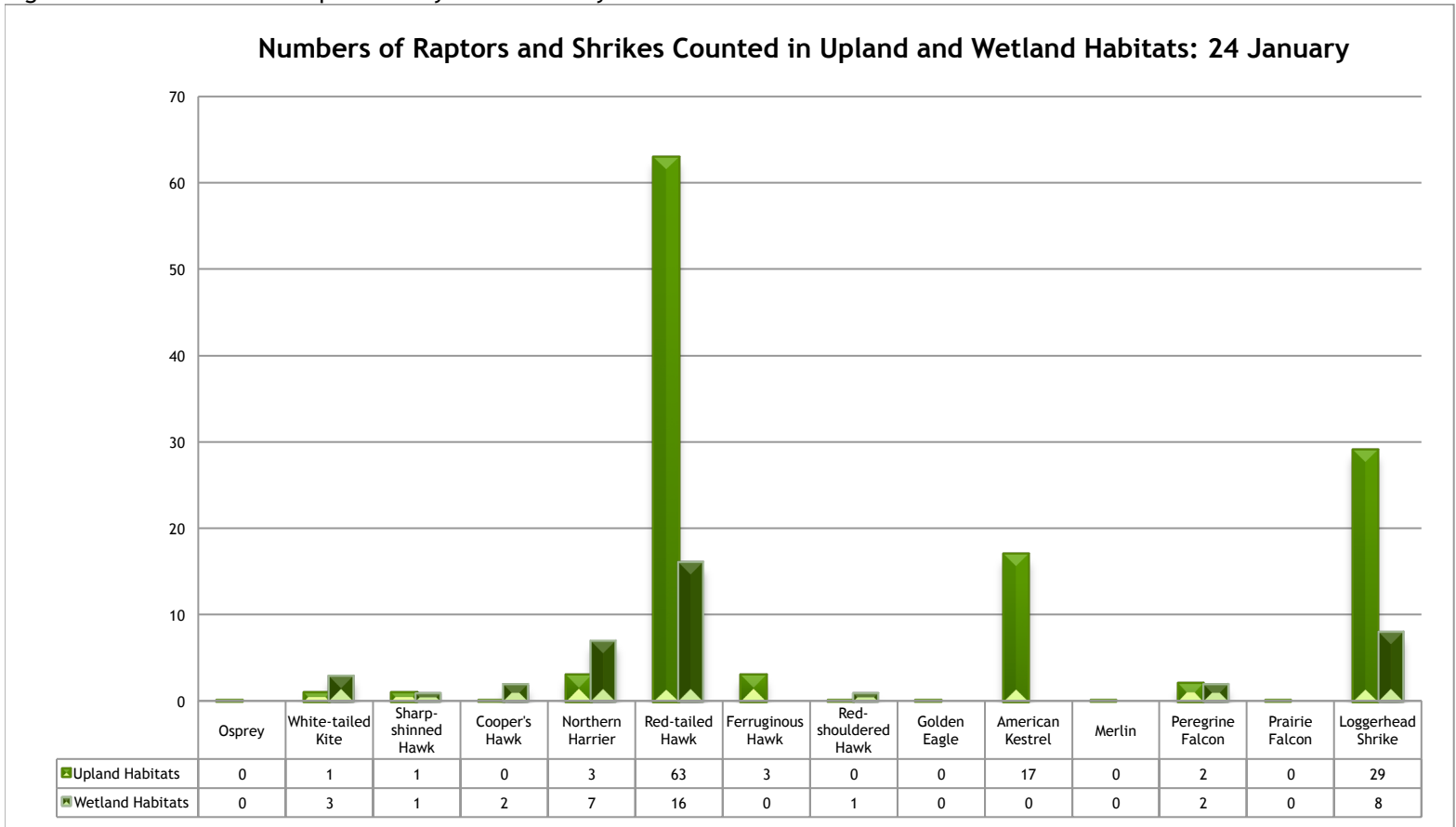


Figure 15. Results of the Raptor Survey on 29 February 2012.

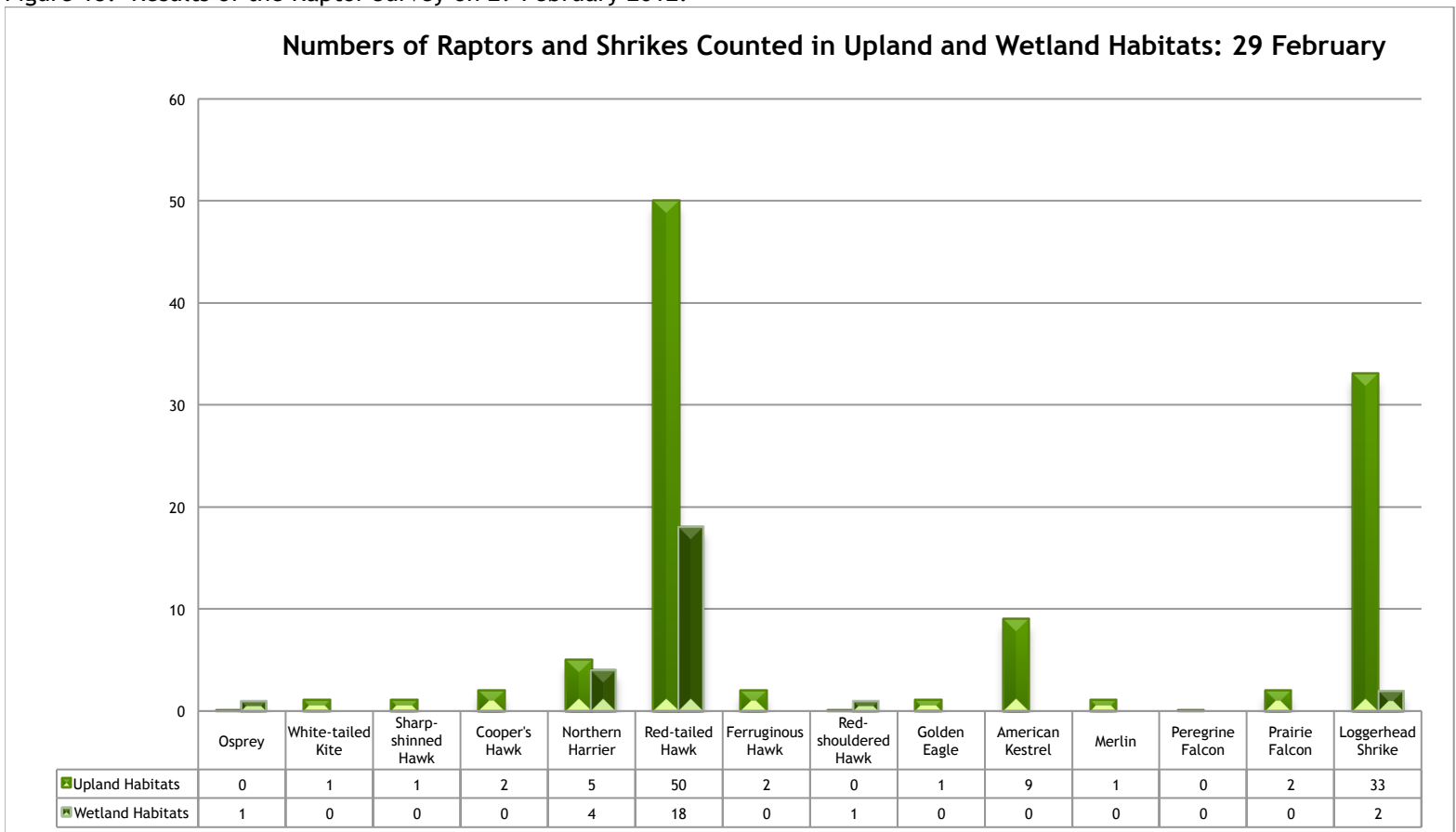




Figure 16. Results of the Raptor Survey on 1 April 2012.

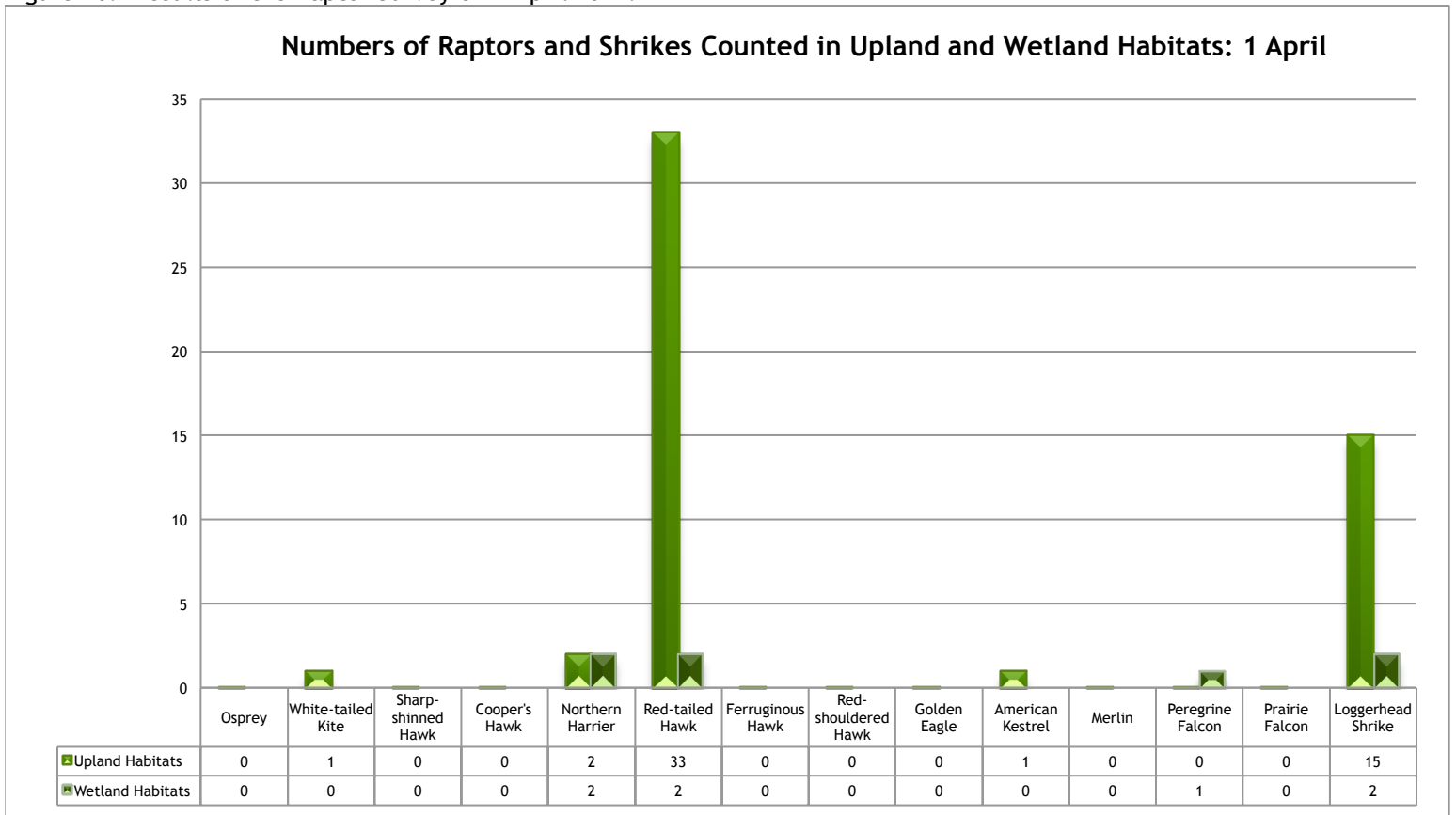


Figure 17. Total Numbers of Raptors Surveyed through the Winter 2011-12.

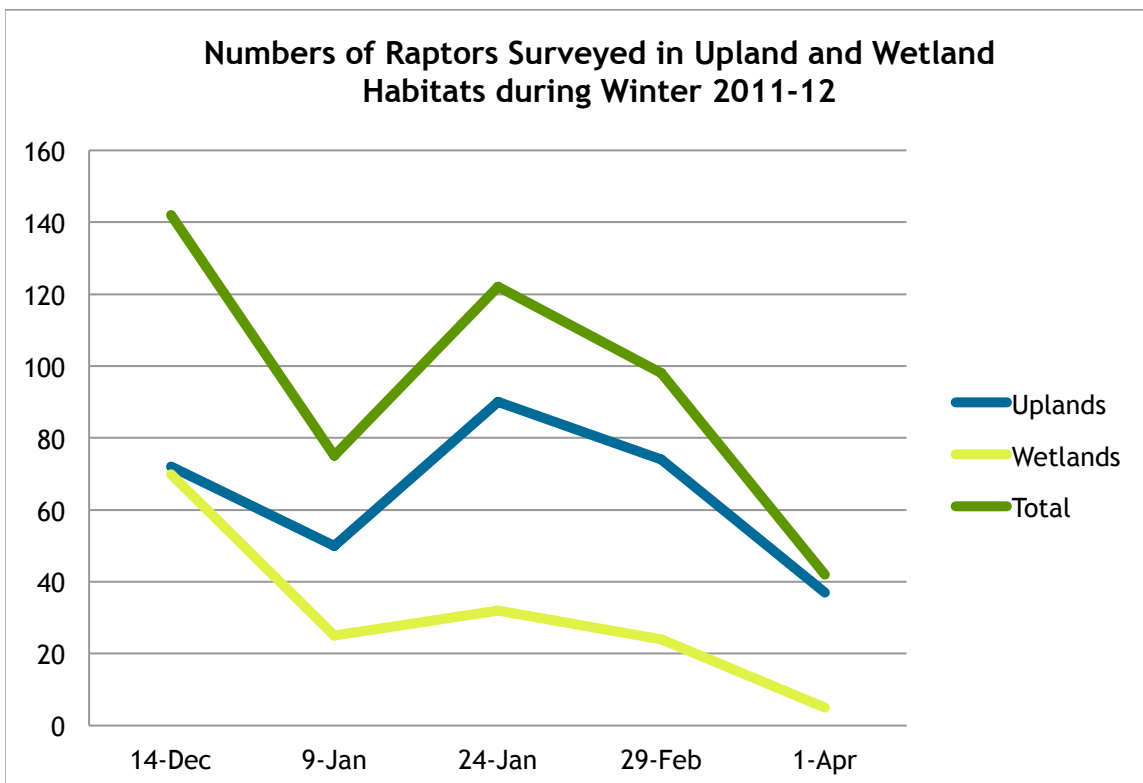
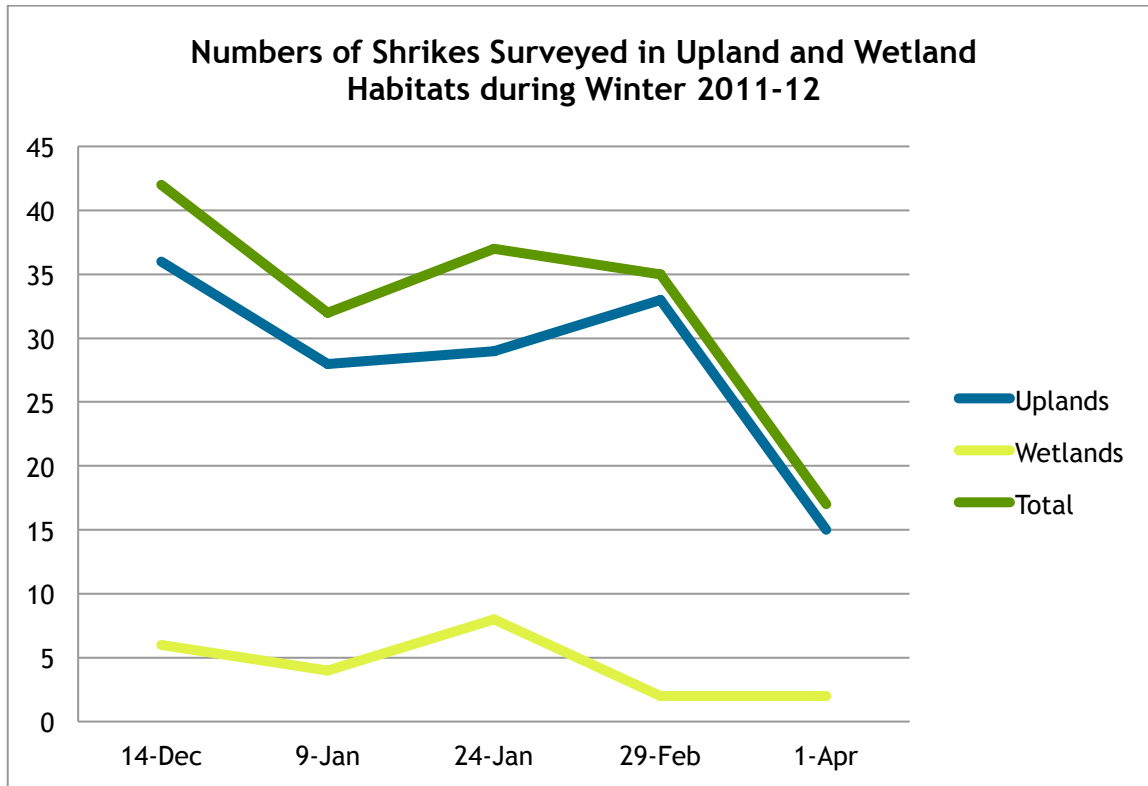


Figure 18. Total Numbers of Shrikes Surveyed through the Winter 2011-12.



## Discussion

The bird use of property managed by the Kern Water Bank Authority is clearly very high in accordance to the large acreages of diverse wetland and upland habitats. Overall, in terms of bird abundance, species diversity, acreage, location and habitat diversity, it is one of the most important freshwater wetlands in California, especially when compared to other privately managed wetlands. These surveys documented particularly large populations of waterfowl, herons/egrets (late fall/early winter), raptors and shorebirds (late winter). Additionally, the wetlands of the Kern Water Bank are very important for large numbers of American White Pelicans, Double-crested Cormorants, and White-faced Ibis that visit these wetlands from throughout this region in search of concentrations of prey. Some of the population changes documented during this study may be caused by birds moving to and from other nearby wetlands, including those adjacent to the project area, the Buena Vista Lake, the Kern National Wildlife Refuge, South Wilbur Flood Control Area and other wetlands in the Tulare Basin. There is a lot to be learned about the population dynamics not only of the project area but also of this greater region in the Tulare Basin. An important topic of future study would be the annual variation in species richness, overall abundance and species use throughout the winter. From a management perspective, research exploring the relationship and seasonal dynamics of water, food and bird abundance/diversity may provide meaningful recommendations to further enhance the carrying capacity of the existing habitats. Furthermore, it would be important to monitor spring and fall migrations as well as breeding bird populations, in both wetland and upland habitats in order to more fully understand bird use of this important area. Research on ecology and seasonal movements of Loggerhead Shrikes (a California Species of Special Concern and a federal Species of Conservation Concern) could provide significant and valuable information on this species that has not been studied much in the Central Valley and California. The project area has a large enough population to warrant such a study.

## Appendix D

### Kern Water Bank Raptor and Upland Bird Survey Report: August 2012 - May 2017



Mourning Dove (*Zenaida macroura*)

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**Sterling Wildlife Biology**

**Woodland CA 95695**

**Phone: 530 908-3836**

**E-Mail: [jsterling@wavecable.com](mailto:jsterling@wavecable.com)**

**Web: [www.sterlingbirds.com](http://www.sterlingbirds.com)**

# Kern Water Bank

Raptor and Upland Bird Survey Report: August 2012 - May 2017

11 June 2017

## Introduction

The property managed by the Kern Water Bank Authority supports a wealth of native wildlife, especially an abundance of upland birds and raptors attracted to the recharge ponds and/or the upland habitats. In order to document and quantify this natural resource value, John Sterling of Sterling Wildlife Biology conducted bird surveys from late August 2012 to late May 2017. These surveys are intended to capture a snapshot of the bird use of the project area during the winter, spring/fall migration and the breeding seasons. The resulting data serve to document the regional importance of habitats on the Kern Water Bank for raptors and upland birds during this period. Most importantly, the data describe the baseline of existing conditions that may be used to inform range management practices with regard to productive bird habitat. This baseline data will be used to measure population trends with range management enhancement and/or unmanaged changes in habitat due to the extension or end of current drought conditions.

## Methods

### Survey Methods

For the waterbird surveys, John Sterling visited watered ponds over ten survey periods. The survey dates for 2011-12 were 18-19 October, 25-26 October, 15-16 November, 30 November - 1 December, 13-14 December, 23-25 January, 10-11 February, 28-29 February, 10-11 March, and 8-9 April; and for 2017 were 21-22 January, 3-4 February, 23-24 February, 14-15 March, 23-24 March, 1-2 April, 9-10 April, 21-22 April, 3-4 May and 11-12 May. Each pond was labeled in the datasheet according to the name on the map provided by the Kern Water Bank Authority. One pond was not marked on the map and was labeled CX for this study. For each pond, Mr. Sterling counted all individuals for species with fewer than one hundred individuals. For species with larger numbers of individuals, he made estimates by counting in increments of ten or one hundred. All watered ponds were visited in all surveys. All data were entered into Microsoft Excel spreadsheets (See attached Appendix A excel file).

For the raptor/Loggerhead Shrike and upland bird surveys, John Sterling visited the sites approximately every two weeks for a total of one hundred and sixteen surveys. The dates of the surveys were approximately every two weeks starting on 31 August 2012 to 29 May 2017, with breaks in June and July. Raptor/Loggerhead Shrike surveys were conducted in June and July only in 2015 and 2016. Upland bird surveys were not conducted during the summer period as most nesting had been completed by 31 May and there were few birds remaining on the study area until fall migration began in mid August. Upland bird surveys were conducted on fixed, one-half mile long transects (Figure 1). Mr. Sterling conducted upland bird surveys by walking transects and recording all birds heard or seen within 200 meters of the transect line. He tabulated the numbers of each species. Each transect was surveyed up to from ninety-nine to one hundred and two times. Transects were 0.5 miles long with the exception of Transect G, which was 0.25 miles long due to the small size of that habitat fragment. For one hundred and sixteen of raptor surveys, Mr. Sterling drove most roads to cover the entire project area and kept running tallies of numbers of individuals of all raptor species and Loggerhead Shrike. All data were compiled onto spreadsheets (See attached Appendix B & C files).

### Descriptions of Upland Bird Survey Transects

The following are brief descriptions of the bird habitat along each of the survey transects including photographs showing conditions on 7 June 2013.

#### Transect A

The transect borders a large canal that is watered and supports a few water birds. As such, it also supports tules and some sunflowers and other ruderal plants along its edge. There are several large willow trees (*Salix sp.*) but the habitat is mostly open, ruderal fields with some tumbleweed cover (*Salsola sp.*). During wet years, the ruderal vegetation is rank and relatively tall (up to 4 ft).



Figure 1. Locations of Upland Bird Survey Transects on the Kern Water Bank



**Transect B**

This transect borders a canal that was watered until spring 2012. It supports several willow trees along its banks along with mulefat, thistles and other ruderal vegetation. The fields are dry ponds and support ruderal vegetation.

**Transect C**

This transect is a honey mesquite (*Prosopis glandulosa*) woodland with some tree tobacco, annual grasses and some ruderal vegetation.





Transect D

The west side of this transect is a dry pond that is now an open willow woodland with moderate ruderal and annual grassland cover. The east side is a dry pond that is now a ruderal field with low, sparse vegetative cover.



Transect E

This transect has a honey mesquite woodland on the south side, with some annual grasses, but otherwise little vegetative cover apart from the mesquite. On the north side is a dry pond that is a ruderal field.



**Transect F**

This transect is relatively barren with some grasses, forbs and in some years dominated by tumbleweed.

**Transect G**

This transect has several honey mesquite shrubs on the east side, but the west side is dominated by saltbush (*Atriplex* sp.).



Transect H

This transect has some Fremont cottonwood saplings, along with an open honey mesquite woodland and tall ruderal vegetation on the west side. The east side is a dry pond and now a ruderal field.



Transect I

This transect has two small willow trees in a field dominated by tumbleweed on the south side, while the north side is an alfalfa field on property adjacent to the project area.



### Special-Status Species Criteria

In evaluating the potential presence of special-status species, the following criteria were used to determine which species should be included:

- Bird species listed, or proposed for listing, as threatened or endangered under the ESA (50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed species]);
- bird species that are candidates for possible future listing as threatened or endangered under the ESA (61 FR 40: 7596-7613, February 28, 1996);
- bird species listed, or proposed for listing, by the State of California as threatened or endangered under CESA (14 CCR 670.5);
- bird species that meet the definitions of rare or endangered under CEQA (CEQA Guidelines, Section 15380);
- bird species of special concern to CDFG (CDFG in preparation [birds, Shuford and Gardali 2008];
- bird species fully protected in California (California Fish and Game Code, Section 3511 [birds]; and
- bird species included in CDFG's list of special animals and monitored by the California Natural Diversity Database (CNDDDB).

## Results

Two hundred and nine species of birds have been recorded thus far at the Kern Water Bank during water bird, upland bird and raptor surveys since this project began in mid October 2011 (Appendix A). Many of those are discussed below or in the previous reports (Sterling Wildlife Biology, 27 April 2012, 9 December 2013, 1 June 2015, and 23 May 2016).

### Upland Birds

One hundred and twelve species of birds were detected during the upland bird surveys. Of the nine transects, Transects A and C have the largest number of species with eighty-two and seventy-nine, respectively (Figure 2). Although species richness (number of species) did not vary greatly over time in each transect, numbers of birds counted fluctuated greatly (Figures 3-11). Transects with the most birds contained mesquite and/or willow trees although Transect I with its grassland and alfalfa harbored large numbers of sparrows during the winter.

Figure 2. Cumulative Number of Species Found in each Transect: 2012-2017

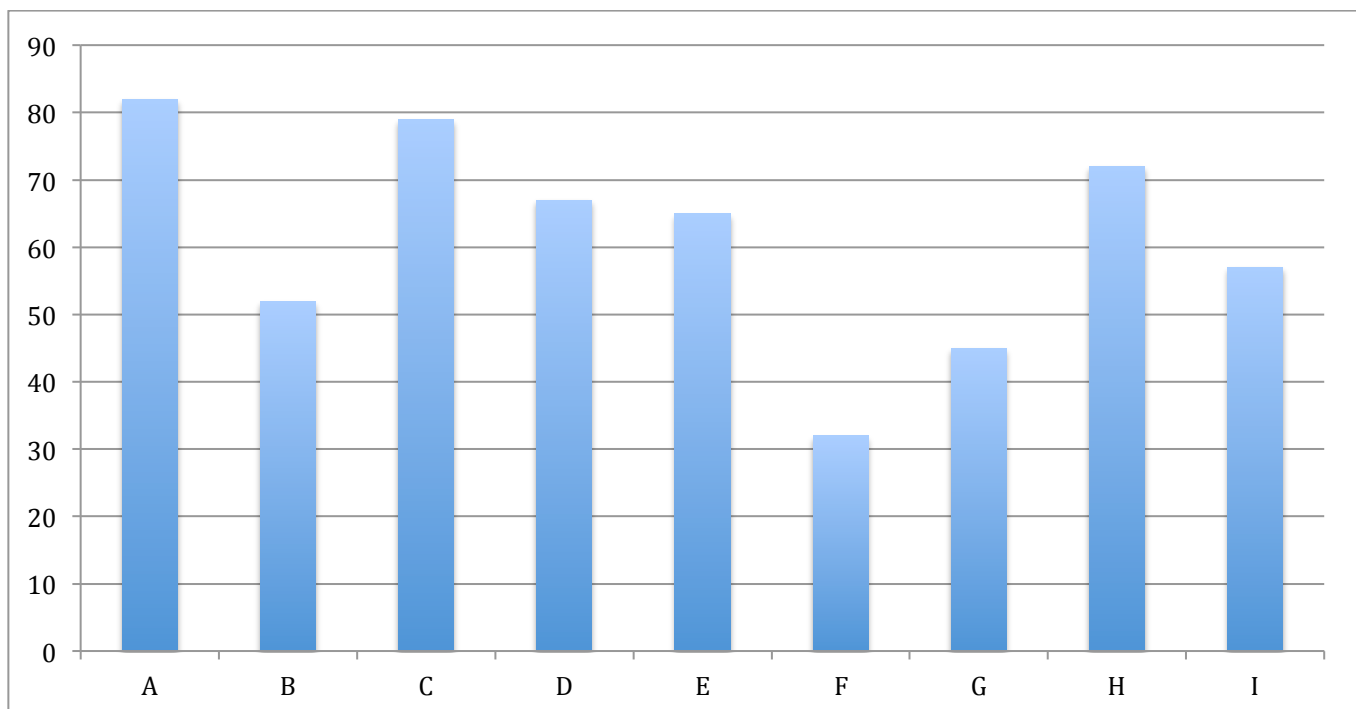


Figure 3. Number of Birds and Bird Species: Transect A.

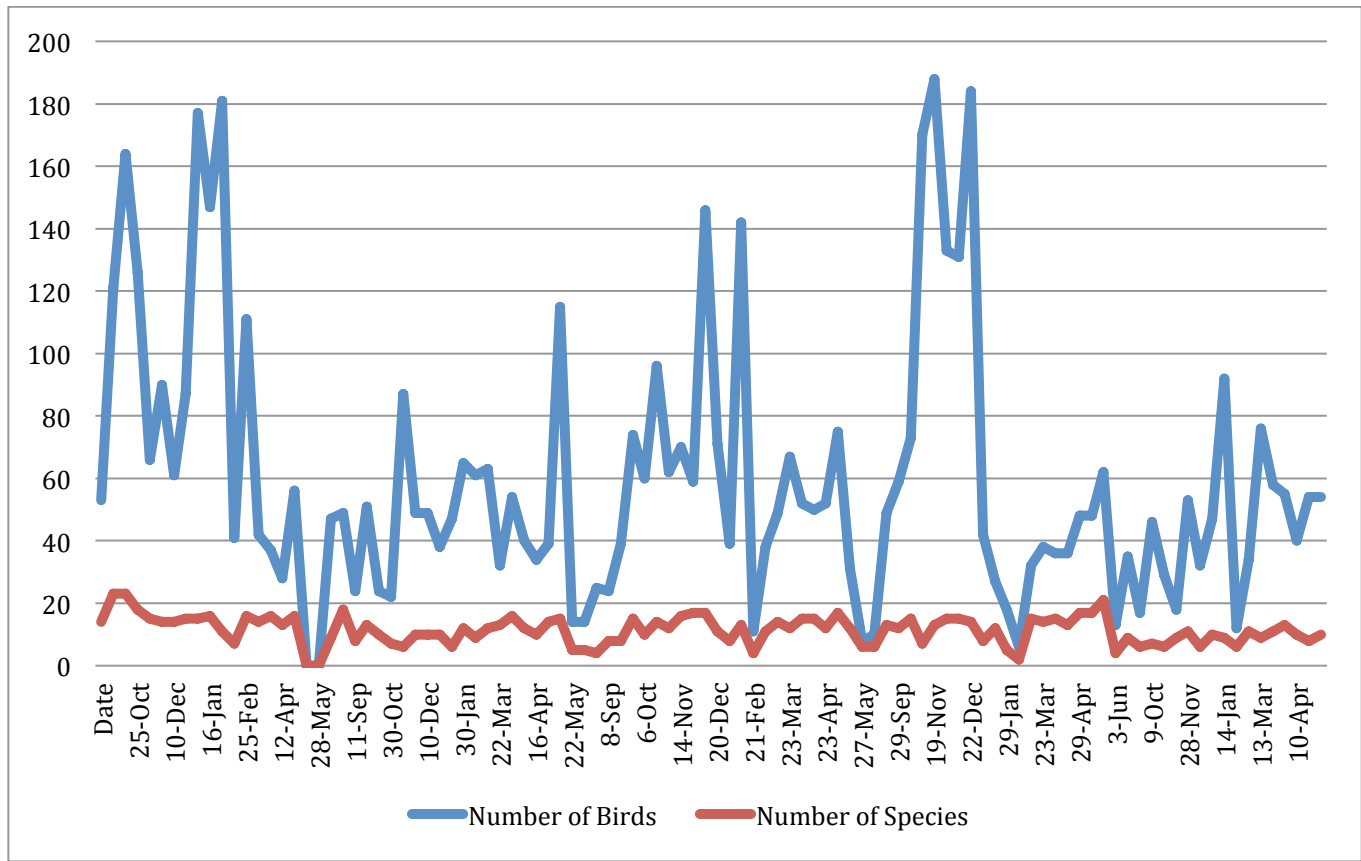


Figure 4. Number of Birds and Bird Species: Transect B.

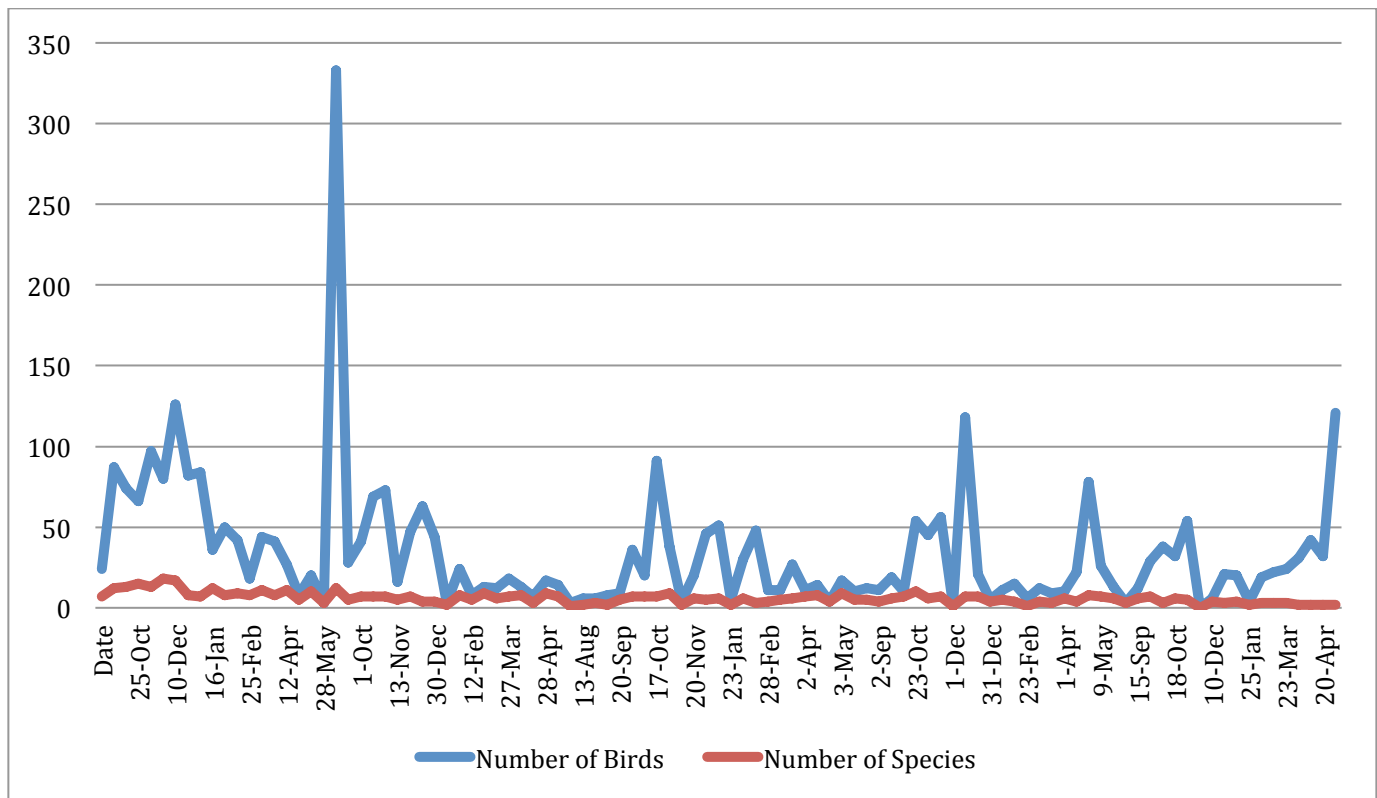


Figure 5. Number of Birds and Bird Species: Transect C.

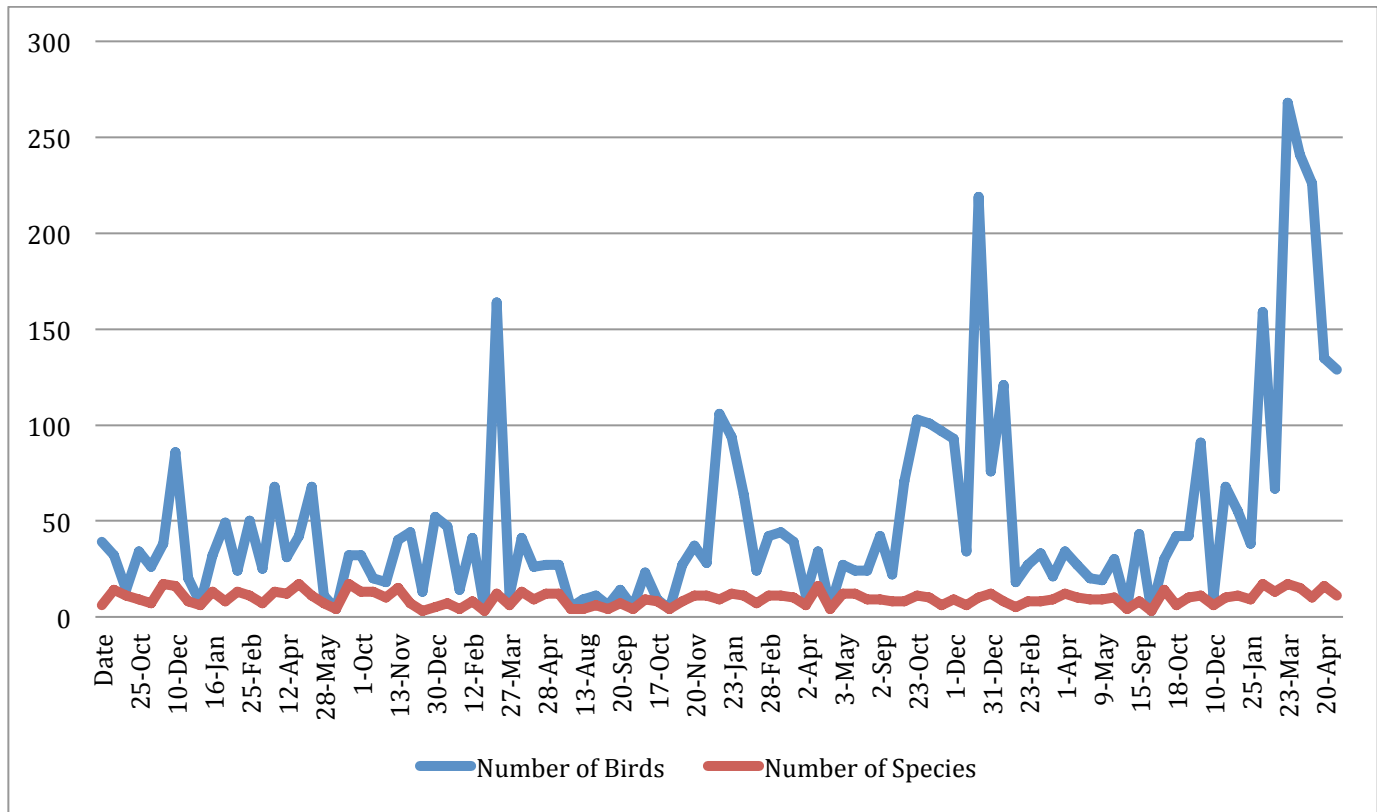


Figure 6. Number of Birds and Bird Species: Transect D.

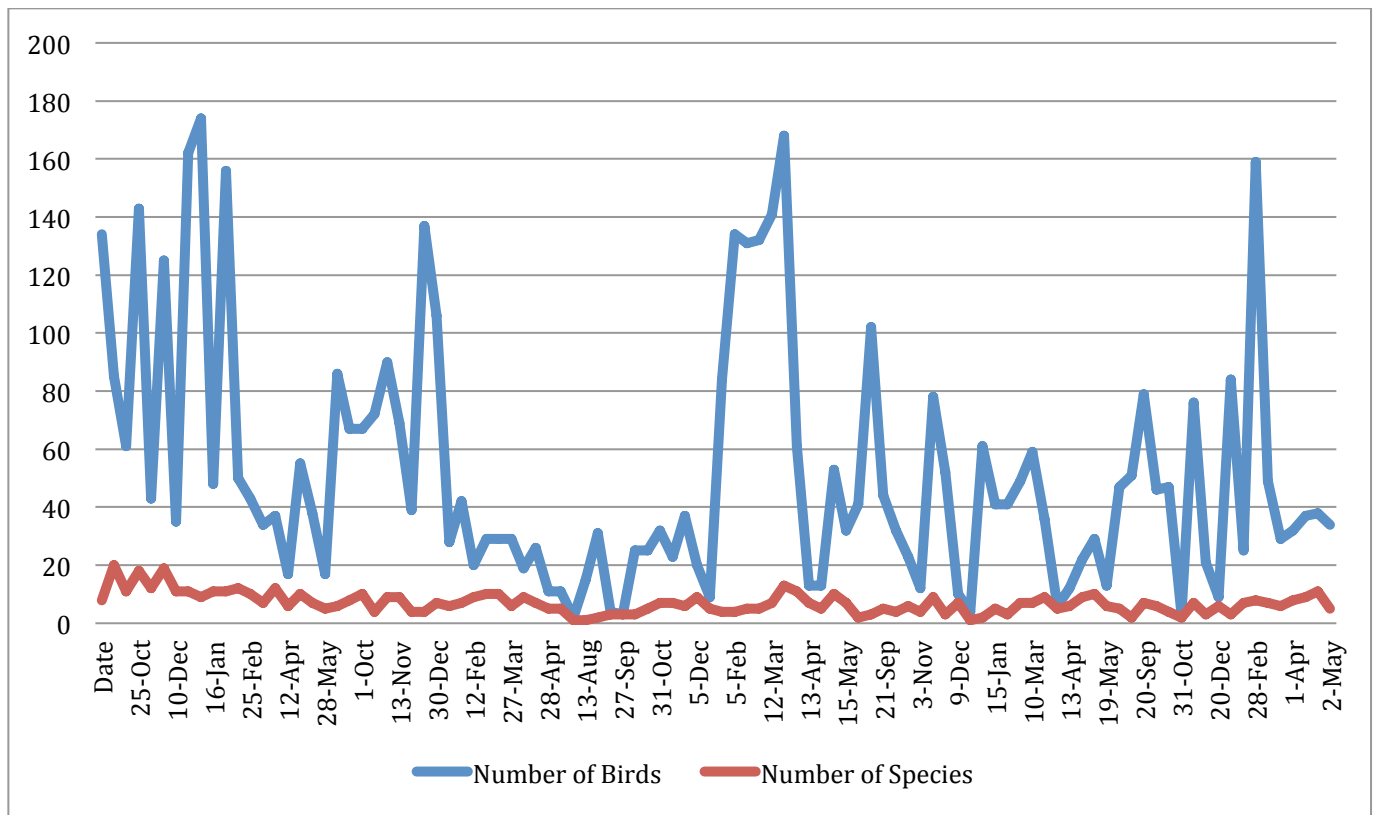


Figure 7. Number of Birds and Bird Species: Transect E.

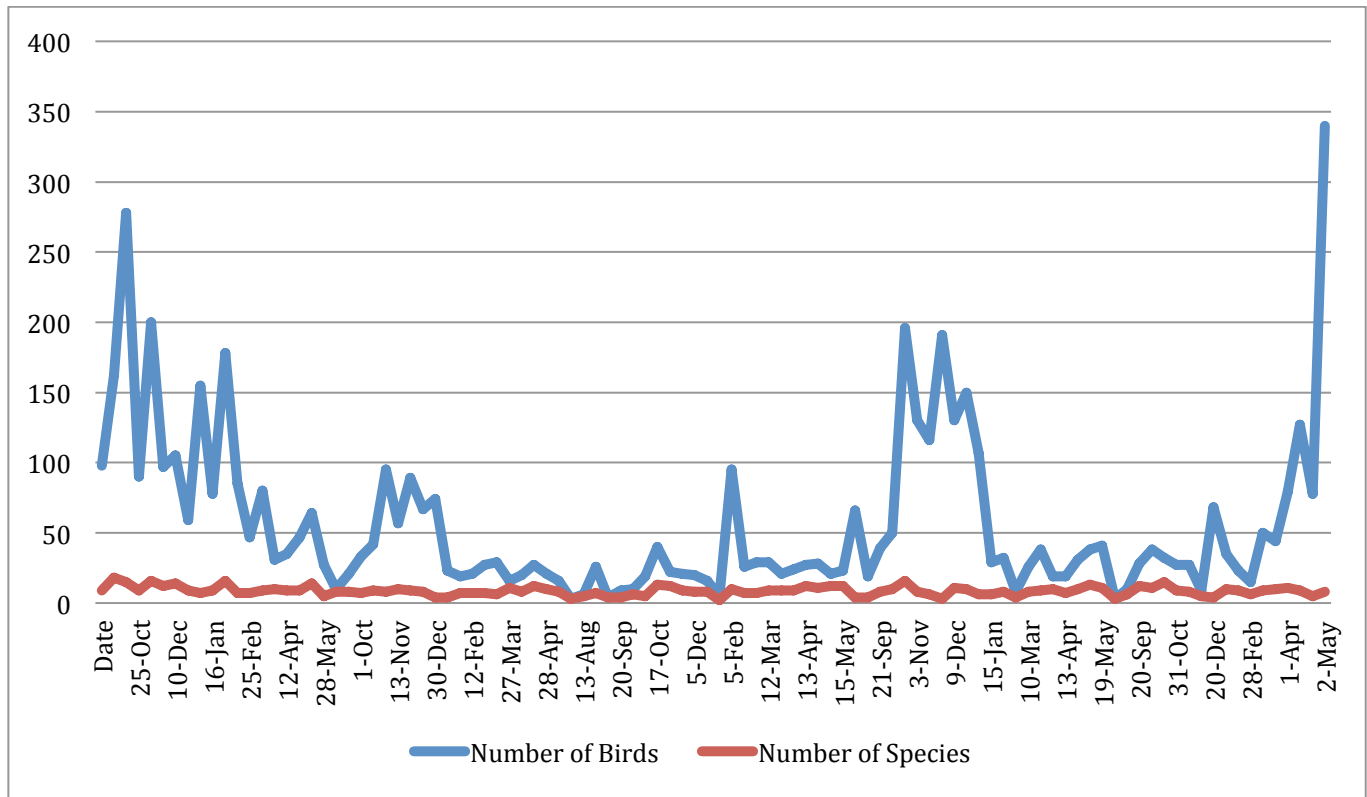


Figure 8. Number of Birds and Bird Species: Transect F.

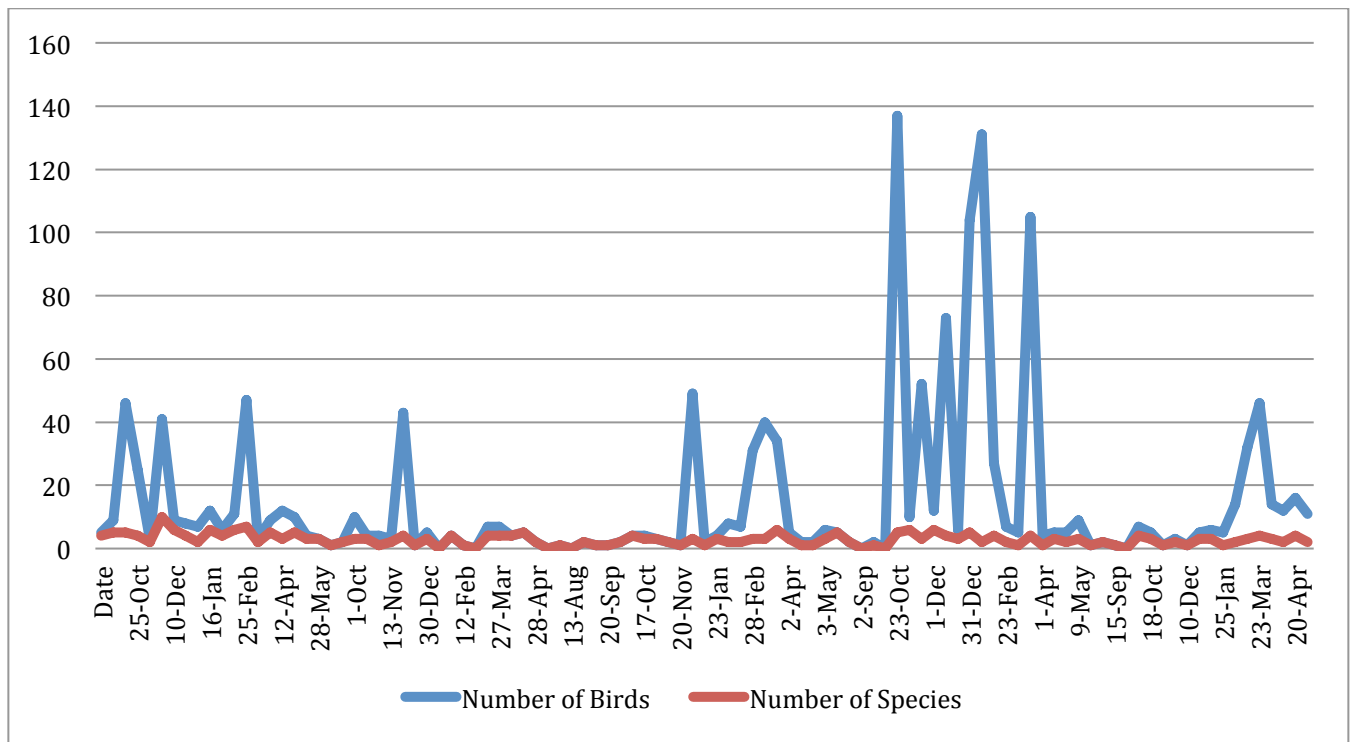


Figure 9. Number of Birds and Bird Species: Transect G.

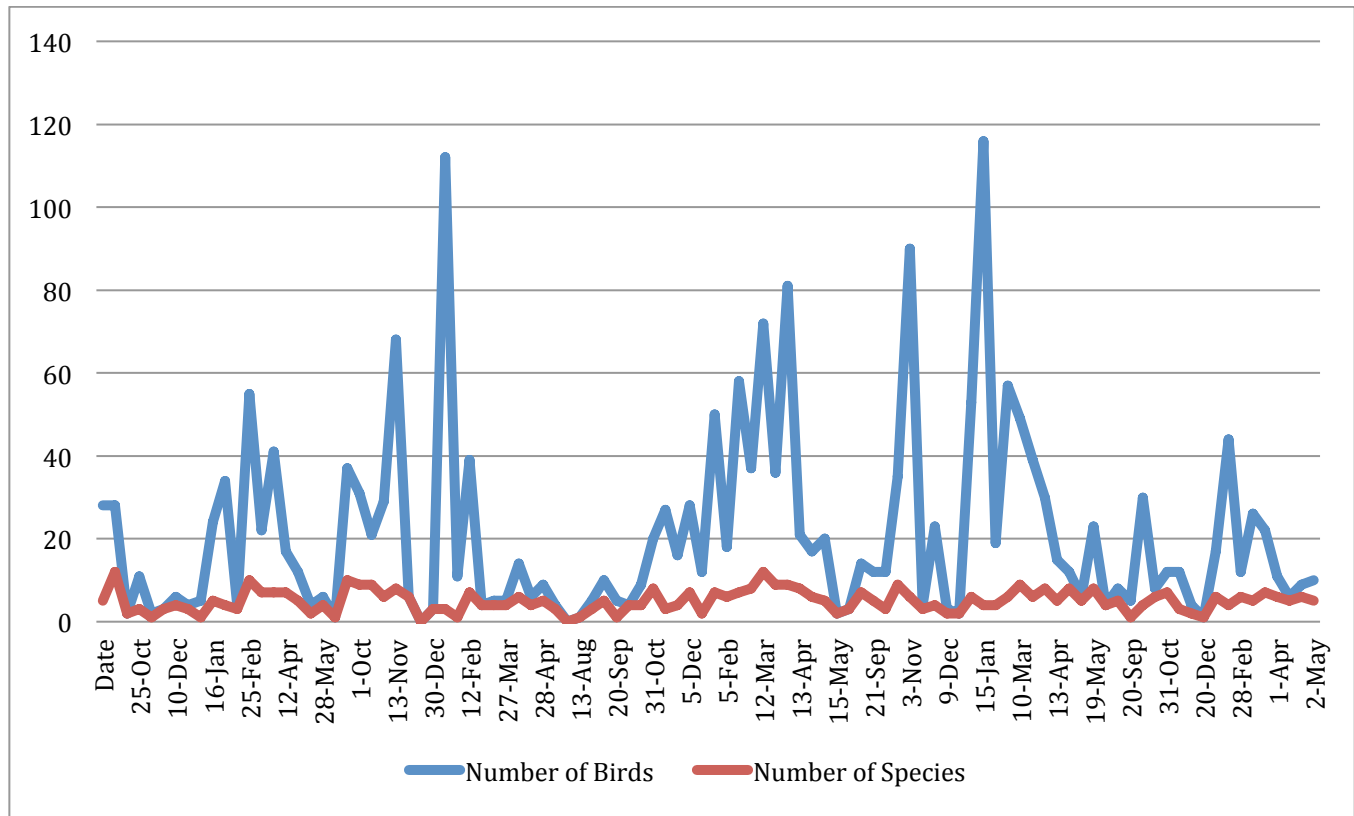


Figure 10. Number of Birds and Bird Species: Transect H.

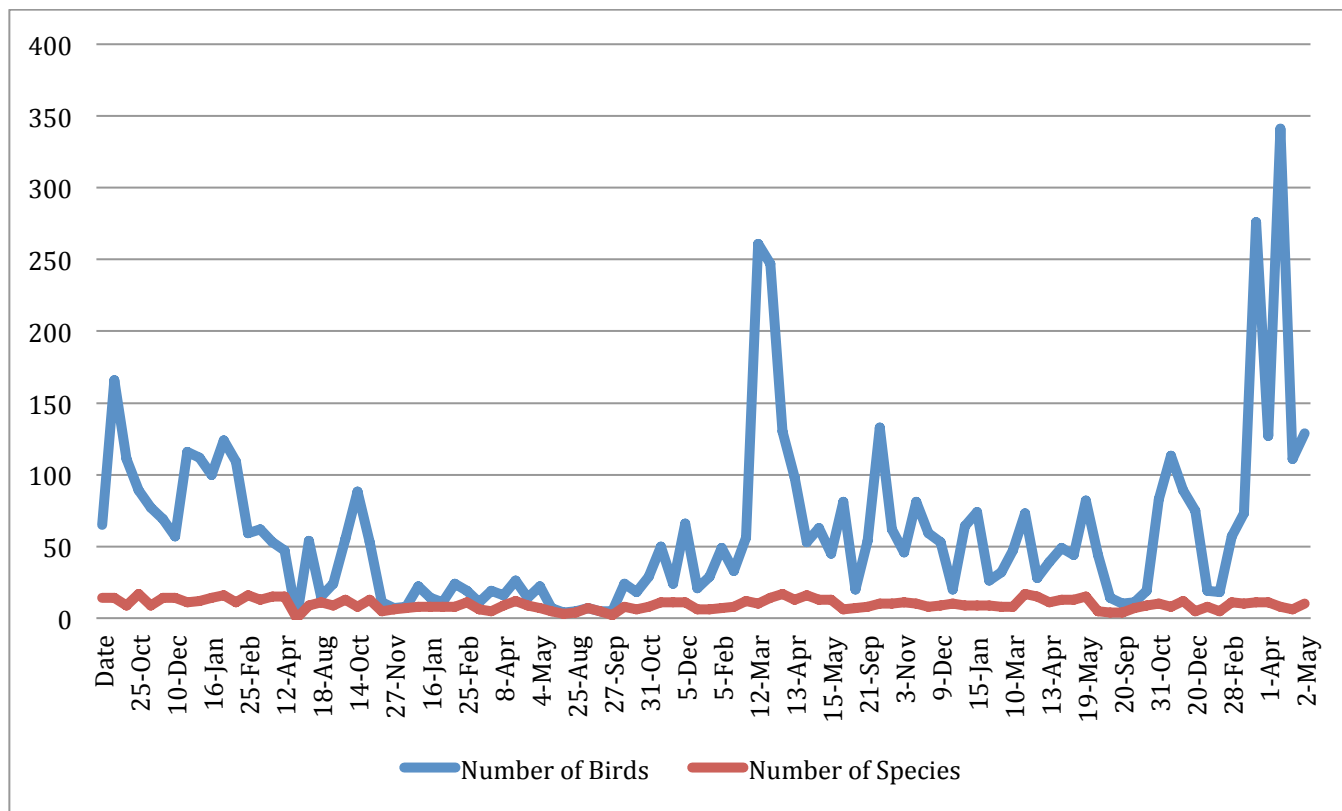
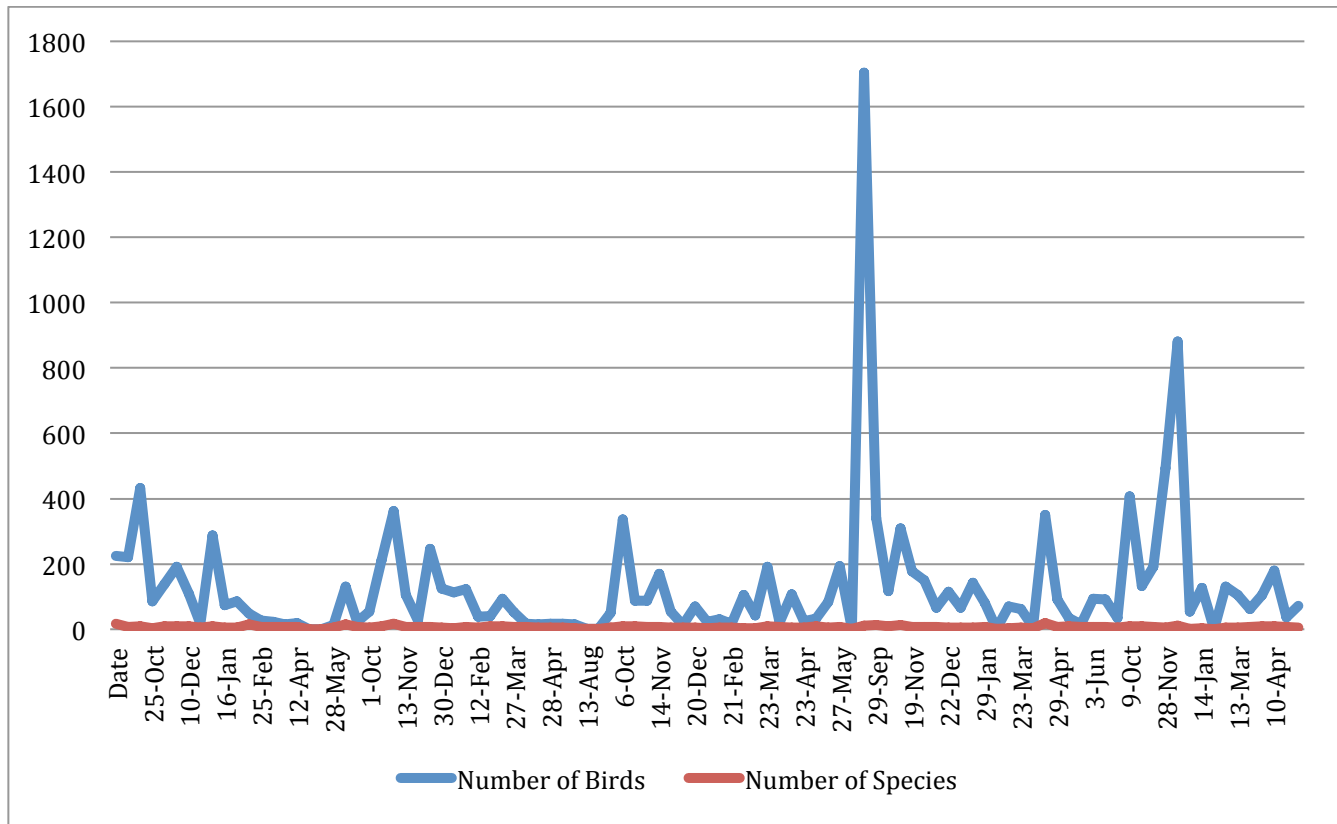




Figure 11. Number of Birds and Bird Species: Transect I.



### Raptors and Shrikes

The comprehensive survey for raptors and Loggerhead Shrikes on the entire project area resulted in high numbers of raptors including Red-tailed Hawks and Loggerhead Shrikes (Figures 20-22), but also documented fourteen species of raptors using upland habitats during the surveys (Appendix B). Overall numbers of raptors dipped sharply after the winter of 2012-2013 and then steadily decline to fewer than twenty individuals from February 2014 through May 2015, then consistently over twenty from October 2015 to March 2016. Conversely, Loggerhead Shrikes rebounded during the breeding season in 2015 after a similar decline (Figure 21). The increase from ten to fifty-five during a two-month period in spring 2015 was due to good reproductive success of local breeding population. The primary difference among the habitat conditions between spring of 2014 and 2015 was the lack of grasses and forbs in 2014 that resulted in low prey populations (large insects and lizards) in contrast to the tremendous amount of grasses and forbs in winter and spring of 2015. Although the amount of grasses and forbs were lower in 2016, the higher population maintained through the winter of 2015-2016 led to a higher breeding population that also had good reproductive success.

Figure 12. Raptor Population: 2012- 2017

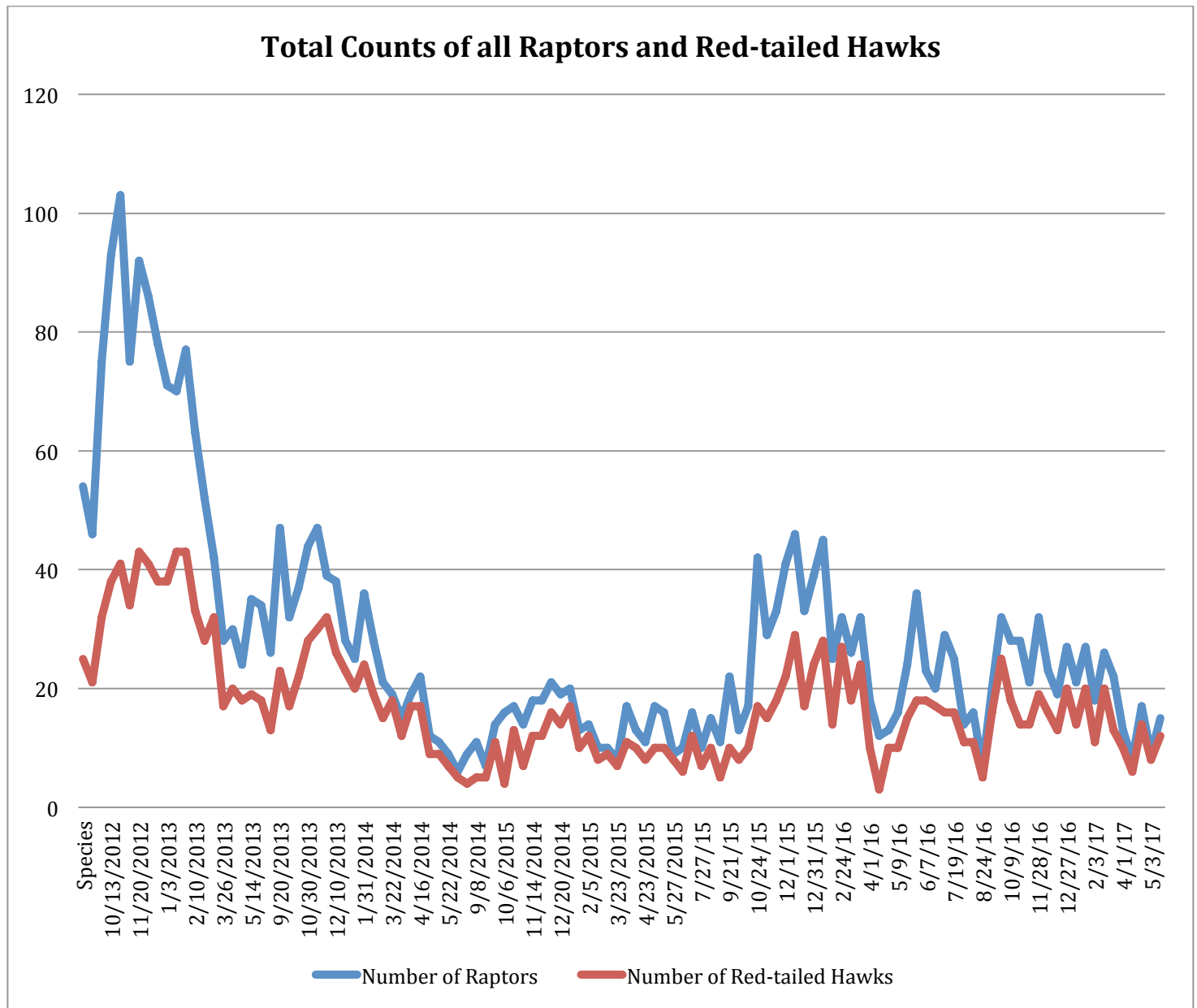
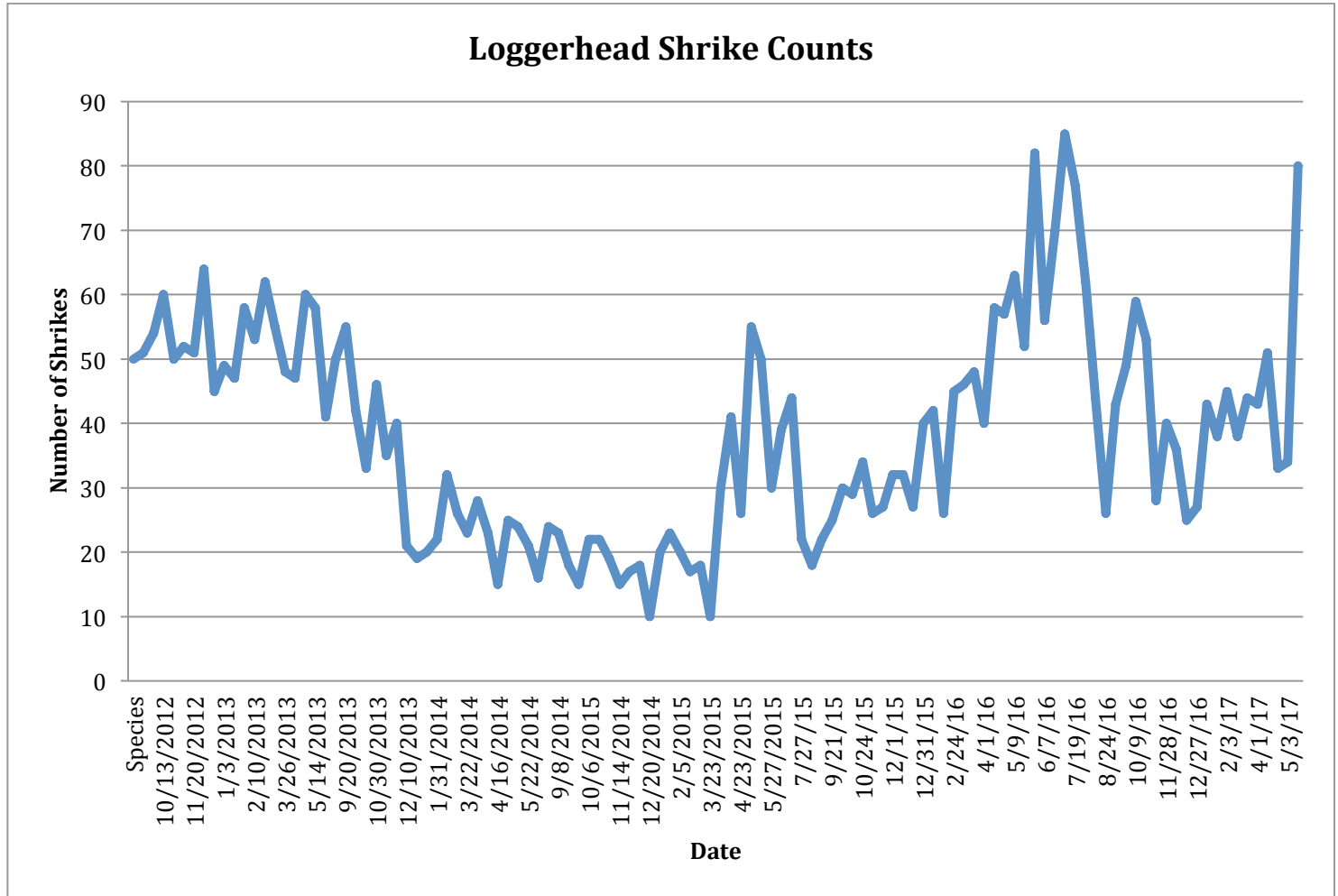


Figure 13. Loggerhead Shrike Population: 2012-2017



**Waterbirds**

A total of seventy-seven native waterbird species were detected during these surveys in which the number of watered ponds varied (Figures 14 and 15). Overall numbers were consistently high during the first eight survey periods (mid-October through February) with 19,823 - 34,945 individuals estimated in 2011-2012. However numbers were much lower overall in 2017 which peaked at nearly 17,000 on 9 April, likely due to lower levels of prey for most species and vegetative food for ducks that is consistent with the re-creation of wetlands after five years of drought (Figure 16).

The seventy-seven species of waterbirds are grouped according to foraging ecology and evolutionary relationships. Grebes (Figure 17), gulls and terns (Figure 18), dabbling and diving ducks (Figures 19 and 20), egrets/herons (Figure 21), and shorebirds (sandpipers and plovers) (Figure 22) were classified into separate categories. American Coot (*Fulica americana*), White-faced Ibis (*Plegadis chihi*), Double-crested Cormorant (*Phalacrocorax auritus*), and White Pelican (*Pelicanus erythrorhynchos*) were treated individually in the summary data (Figures 23-26).

The ponds that were most important for high numbers of species and populations throughout the surveys were W2, W4, W5, W6, M1, M8, and M10. But many other ponds were important (for details see Appendix excel file). The variation in ponds was dramatic with several ponds consistently having over 2,000 birds and others fewer than 100. Because of the varied topography of many of the ponds and the lack of direct measurements of water depths, it was not possible to determine average depths or the range of depths for the ponds during the surveys.

Figure 14. Number of Watered and Dry Ponds: 2011-2012

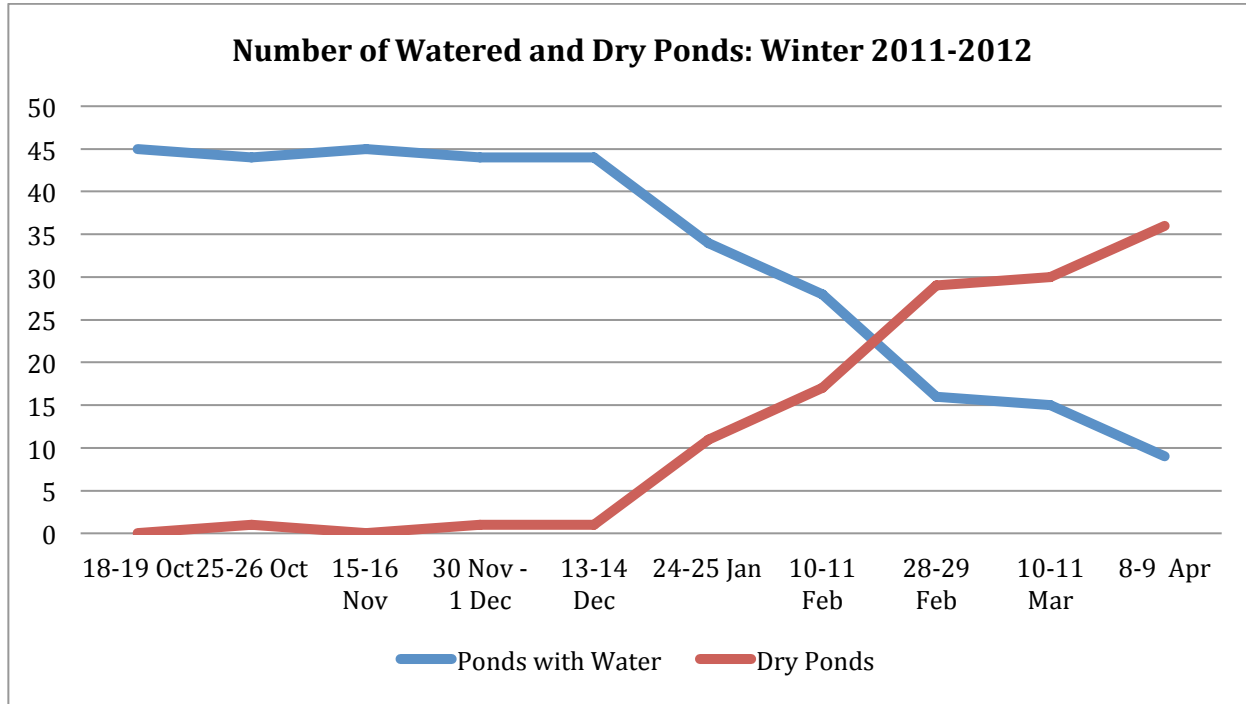


Figure 15. Number of Watered and Dry Ponds: 2017

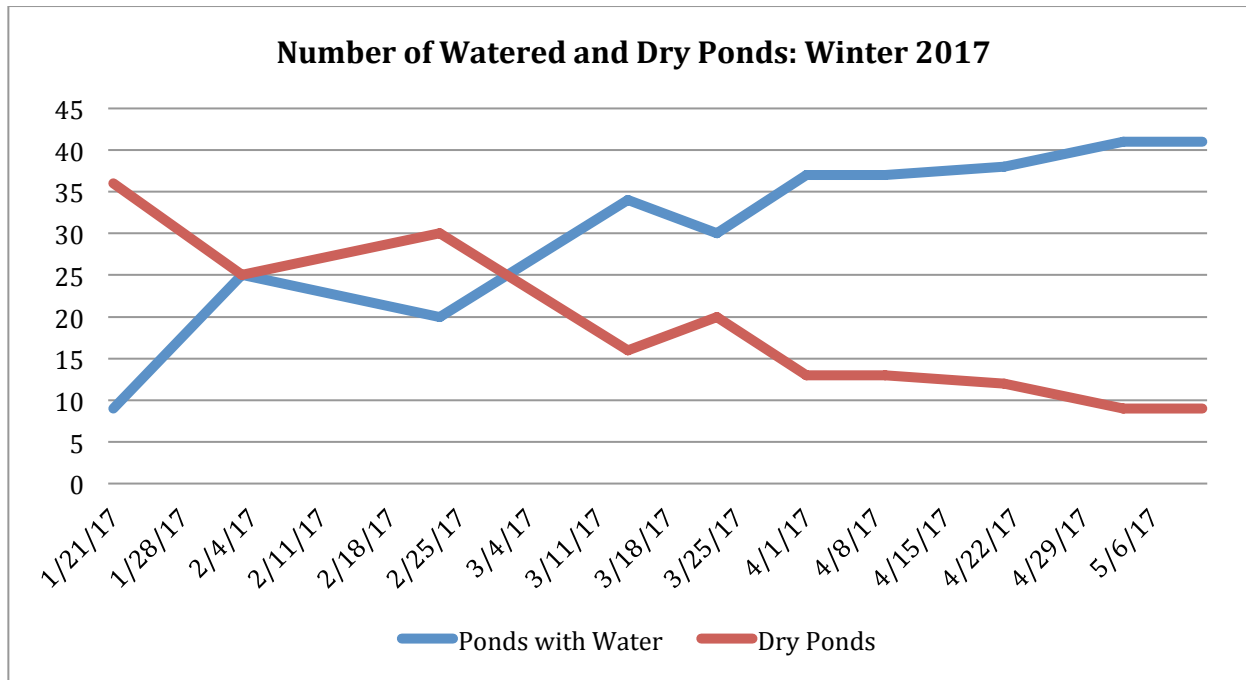


Figure 16. Total Number of Waterbirds Counted

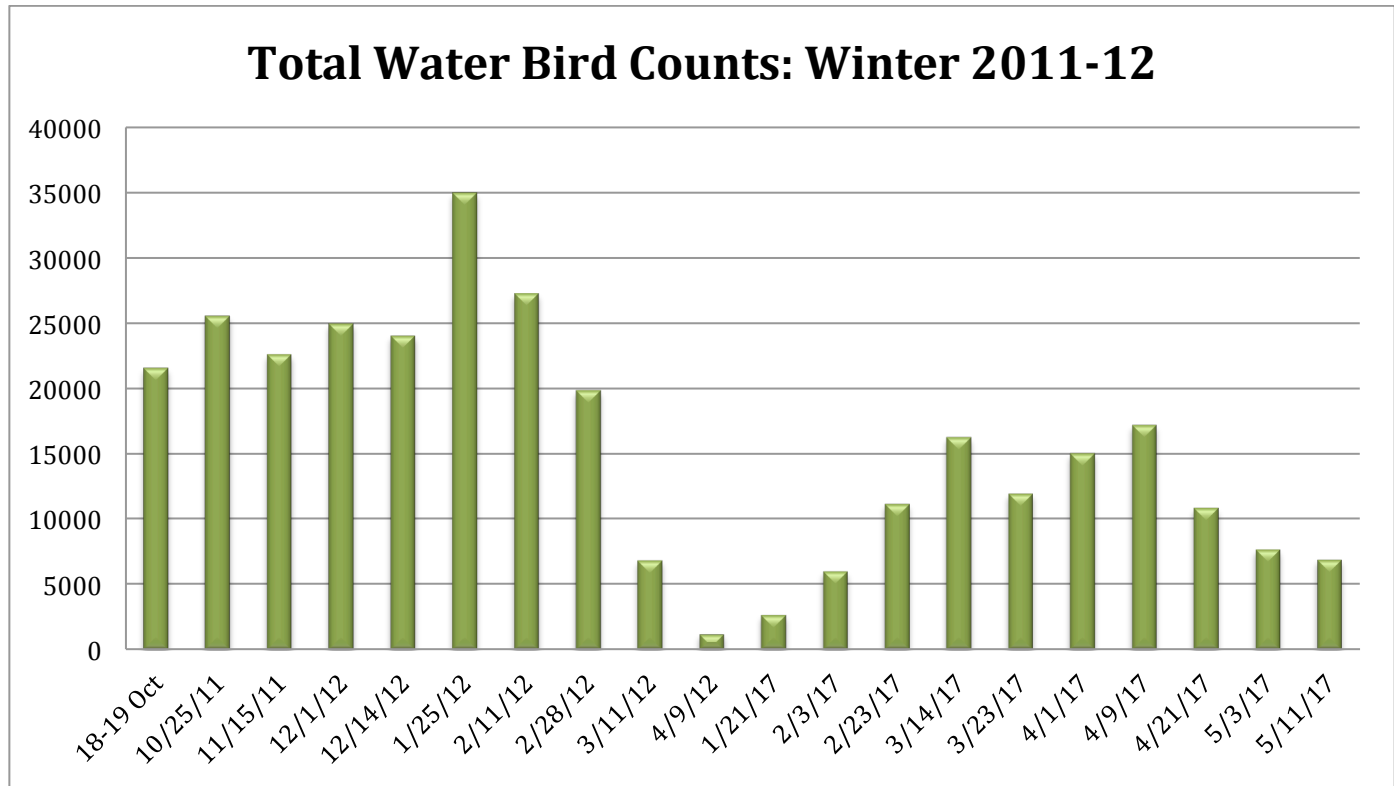


Figure 17. Total Number of Grebes Counted

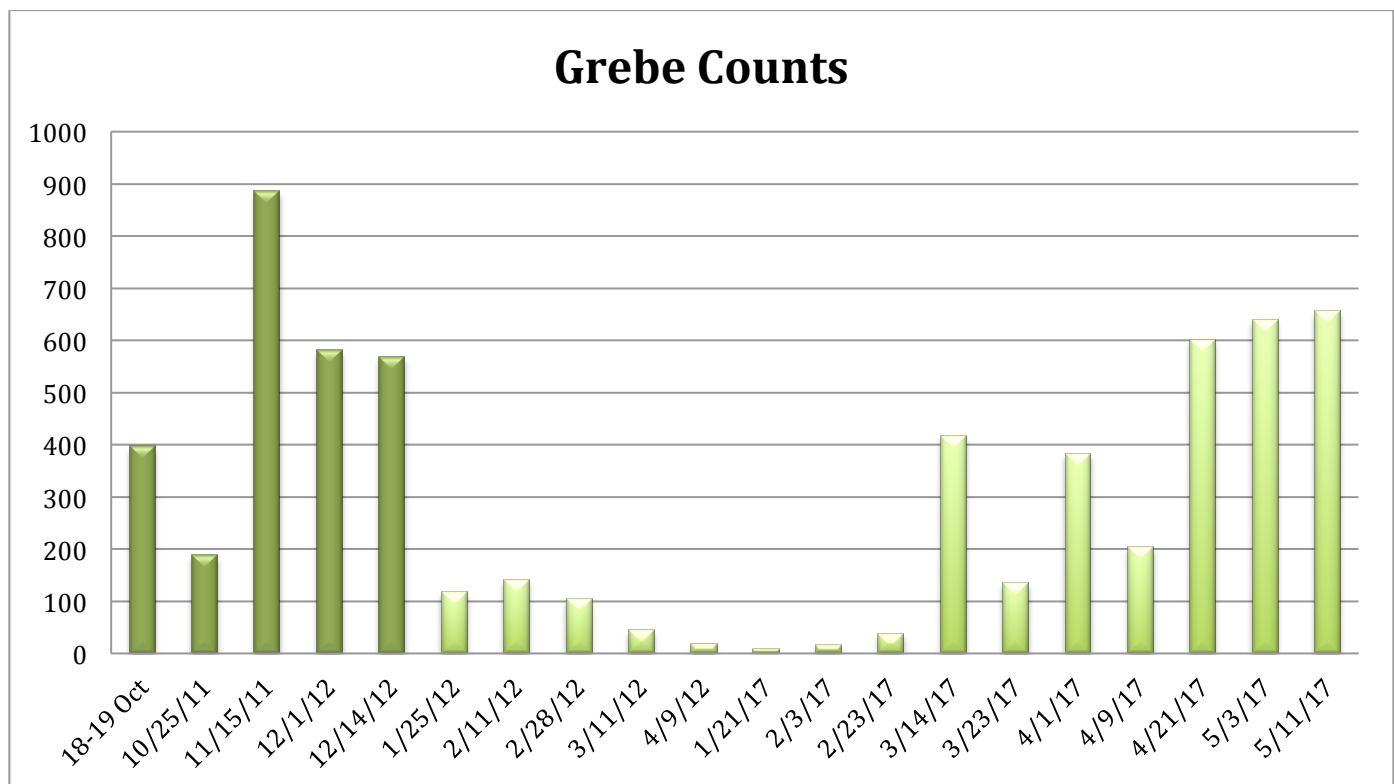


Figure 17. Total Number of Gulls and Terns Counted

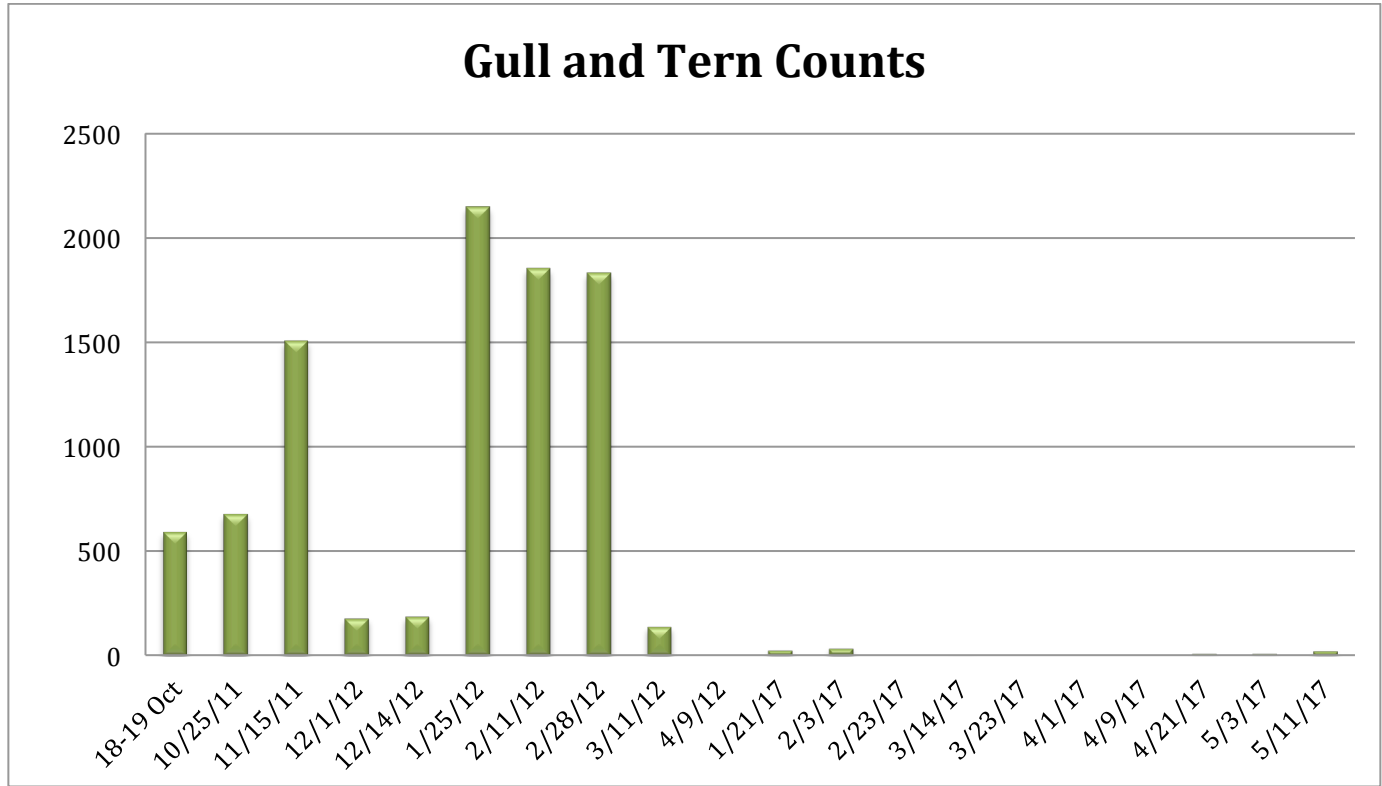


Figure 19. Total Number of Dabbling Ducks Counted

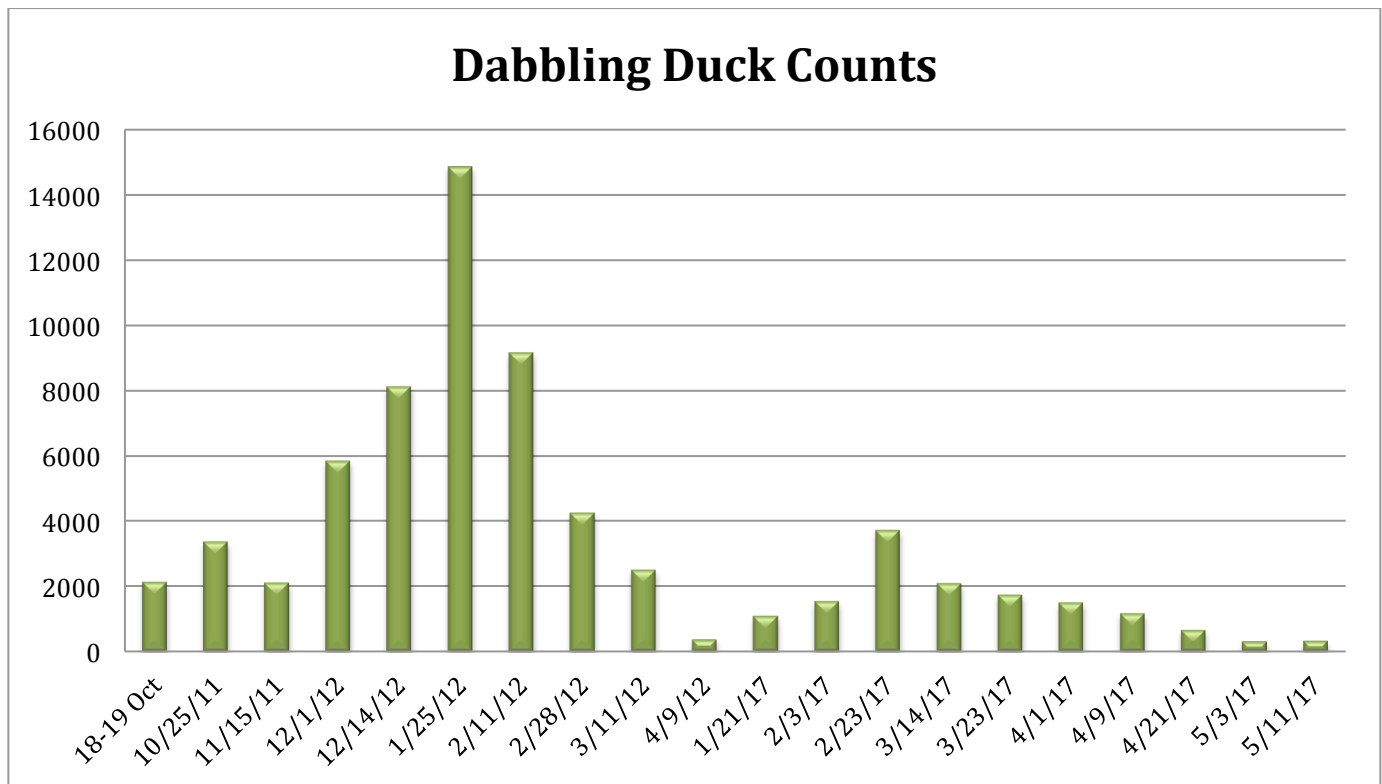


Figure 20. Total Number of Diving Ducks Counted

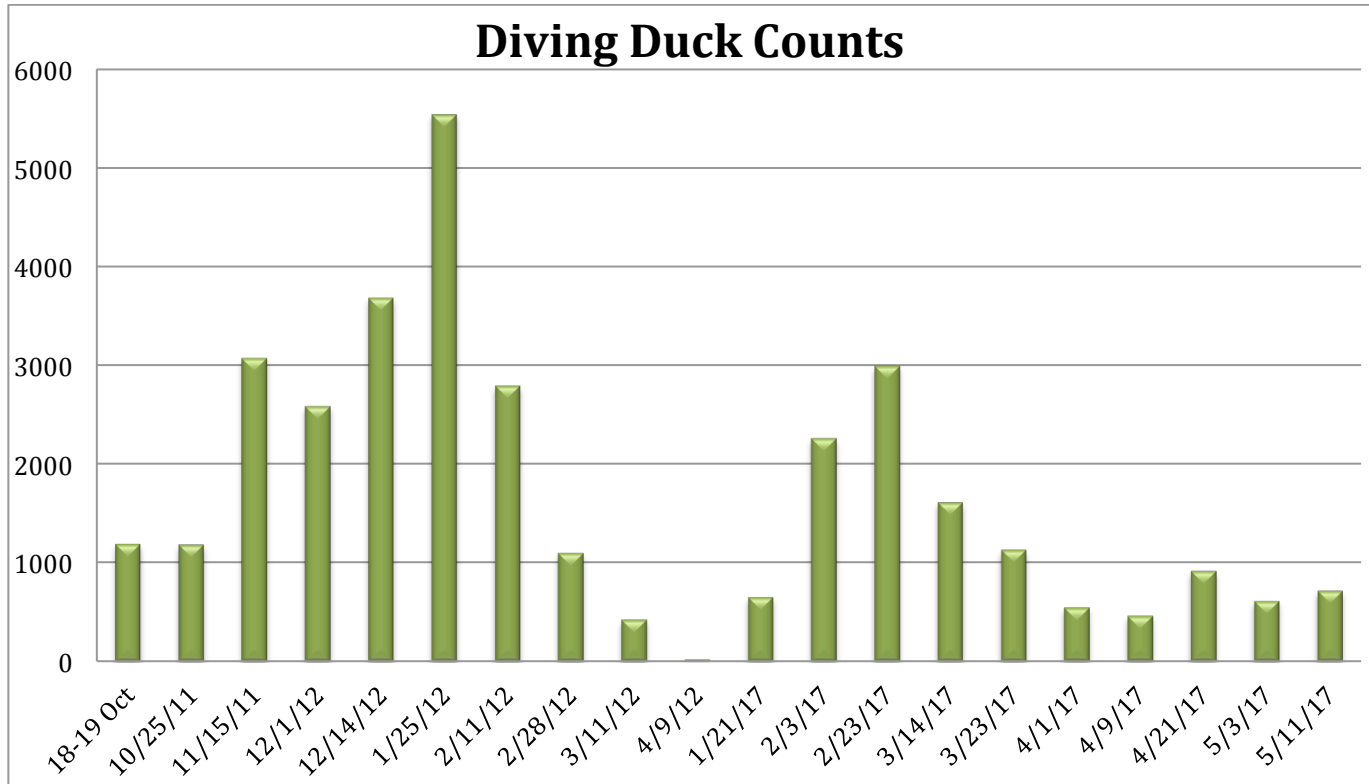


Figure 21. Total Number of Herons and Egrets Counted

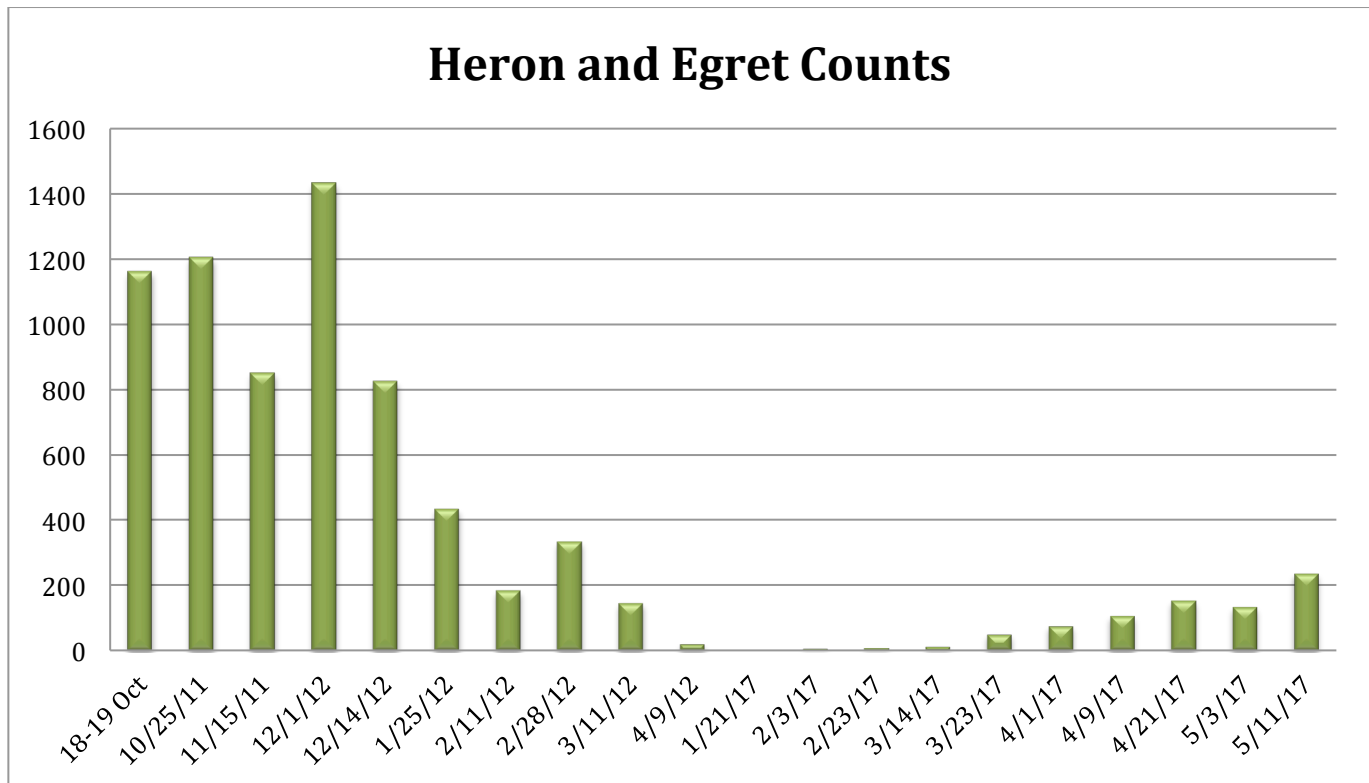


Figure 22. Total Number of Shorebirds Counted

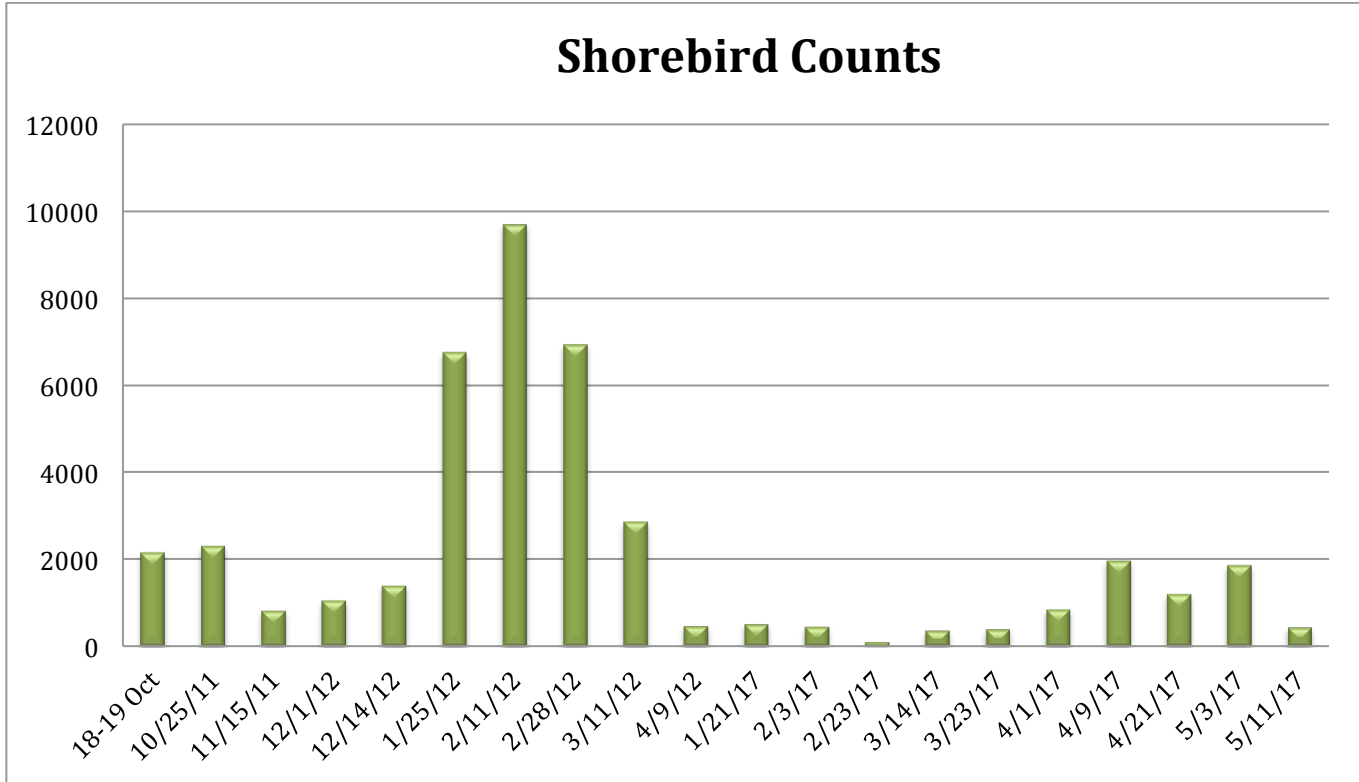


Figure 23. Total Number of American Coots Counted

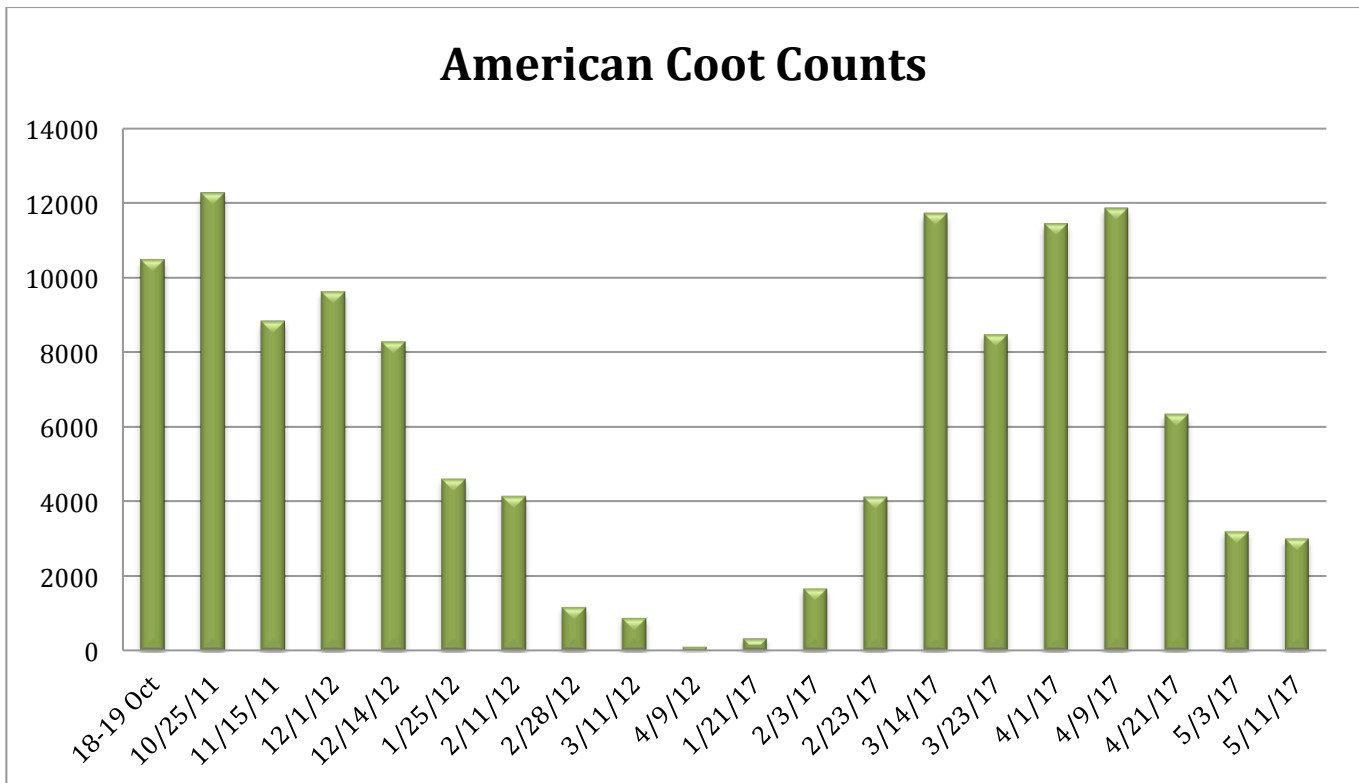




Figure 24. Total Number of Ibis Counted

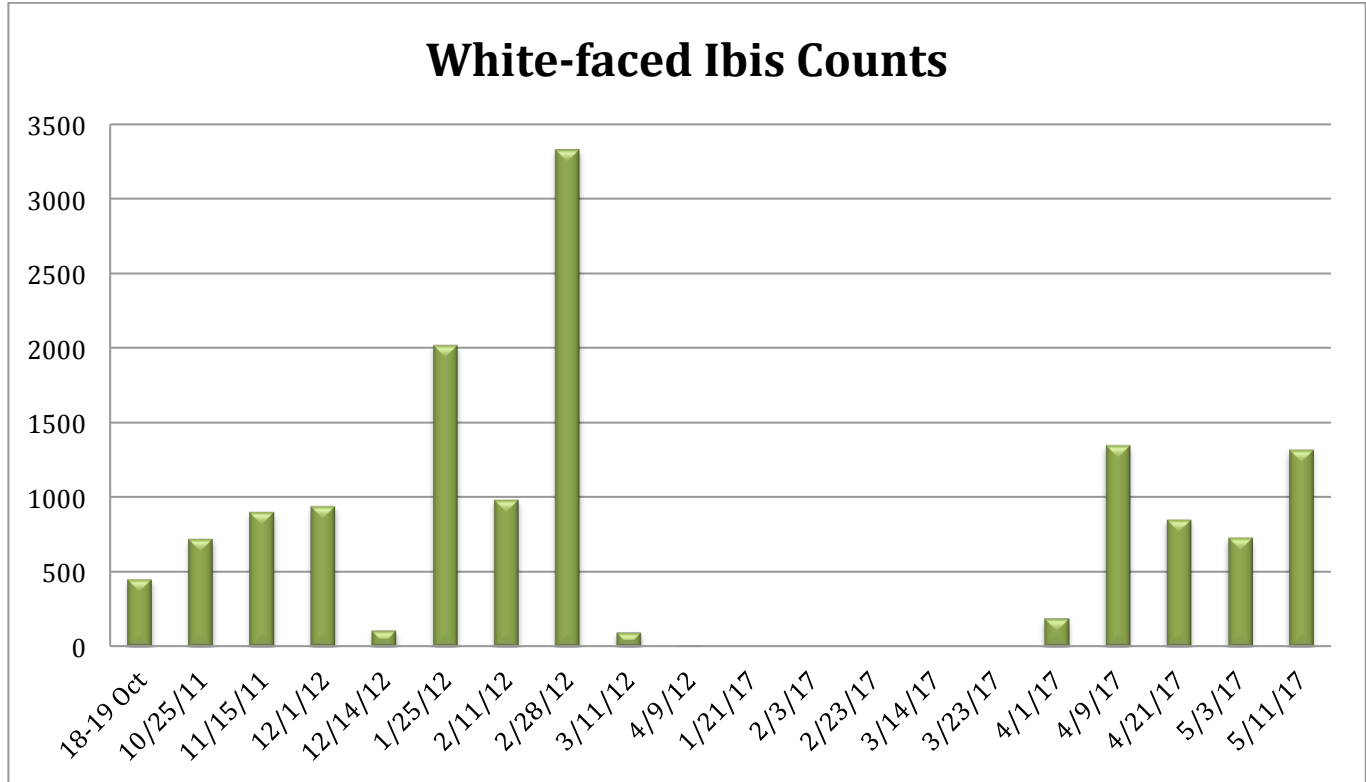


Figure 25. Total Number of Cormorants Counted

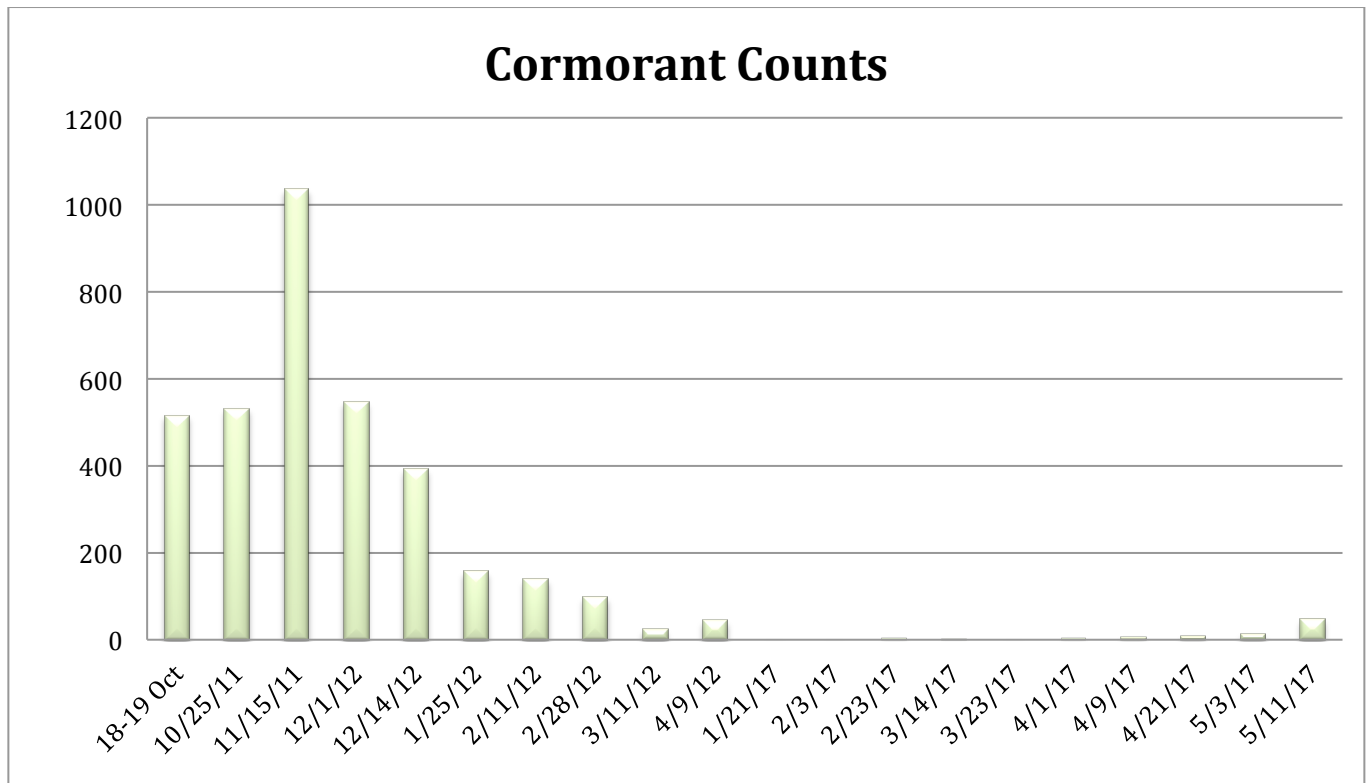
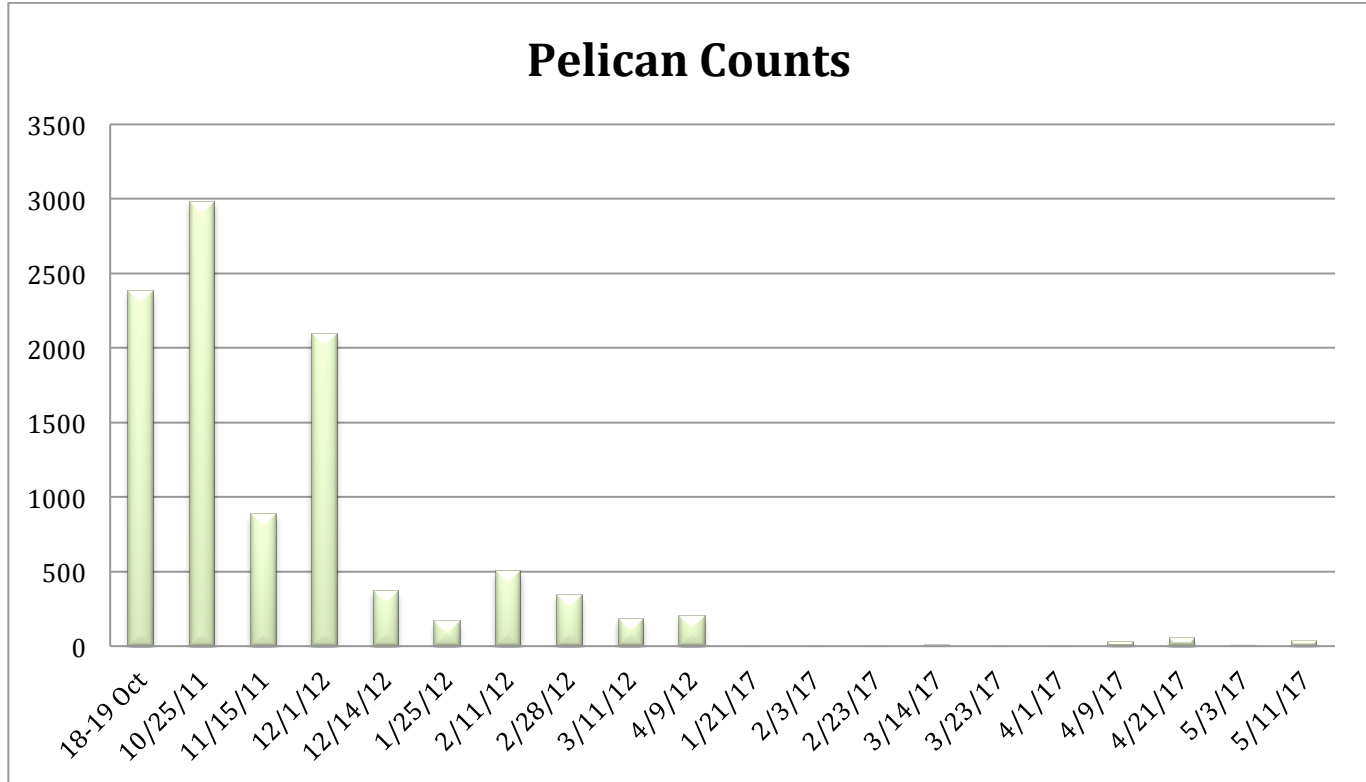


Figure 26. Total Number of Pelicans Counted



**Special Status Bird Species**

There have been twenty-five special-status bird species found during the raptor and upland bird surveys since the project began in October 2011 (Table 2) with an additional fourteen species of waterbirds found during waterbird surveys in winter 2011-12.

Table 1. Species Status Bird Species (Landbirds and Raptors) found on the Kern Water Bank

Species Name	Conservation/Legal Status	Seasonal Status	Habitat	Record Dates
Cooper’s Hawk	CA Watch List	Migration, Winter, Potential nesting	Nests in trees, hunts in woodlands and open grasslands	Daily during migration
White-tailed Kite	State Fully Protected	Migration, Winter, Potential nesting	Nests in trees, hunts in open grasslands	Daily during migration and winter in 2011-2013, but absent since then
Northern Harrier	CA Species of Special Concern	Migration, Winter, Potential nesting	Nests on the ground, hunts in wetlands and open grasslands	Daily during migration and winter in 2011-2013, but mostly absent since then with a few scattered records of individual migrants
Swainson’s Hawk	CA Threatened Species	Nesting, Migration, Winter	Nests in trees, hunts in open grasslands	Nesting in summer 2012, scattered winter records in 2011-12; up

				to five individuals in Mar-May 2013; up to three individuals in Mar-May 2014; and up to four individuals in Apr/May 2015. No nest located on water bank property in 2015. Three active nests on water bank property in 2016 (Figure 14). Approximate locations: 1) 35° 20'35.59"N, 119° 20'27.20"W; 2) 35° 20'43.52"N, 119° 15'42.37"W; and 3) 35° 19'11.17"N, 119° 13'15.58"W. No active nests found in 2017.
Ferruginous Hawk	CA Watch List	Winter	Hunts in open grasslands	Daily during winter, rare dark morph individual in March 2016
Golden Eagle	State Fully Protected and Federal Eagle Protection Act	Winter	Hunts in open grasslands	Five winter records
Osprey	CA Watch List	Migration, Winter	Hunts in wetlands and canals	Daily during winter 2011-12, only a few sightings of migrants since then
Mountain Plover	CA Species of Special Concern and Federal Proposed Threatened	Migration, Winter	Roosts and forages in grasslands	Two on 14 October 2013
Long-billed Curlew	CA Watch List and Federal Bird of Conservation Concern	Migration, Winter	Roosts and forages in grasslands and wetlands	Scattered winter and migration records
Burrowing Owl	CA Species of Special Concern	Nesting, Migration, Winter	Nests and hunts in grasslands	Found on most visits through year, and nested each spring
Vaux's Swift	CA Species of Special Concern	Migration	Forages over wetlands and grasslands	Found during a few spring migration visits
Merlin	CA Watch List and Federal Bird of Conservation Concern		Hunts in grasslands and wetlands	Regular during late fall to spring, with only on record in 2017
Peregrine Falcon	Federal Bird of Conservation Concern	Migration, Winter	Hunts in grasslands and wetlands	Regular during fall and winter of 2011-12, scattered records since then, increased sightings in 2017
Prairie Falcon	CA Watch List and Federal Bird of Conservation Concern	Migration, Winter	Hunts in grasslands	Found on most visits from Nov through Mar

Nuttall's Woodpecker	Federal Bird of Conservation Concern	Nesting, Migration, Winter	Nests in trees, forages in woodlands	Found during most survey visits on Transect C.
Willow Flycatcher	CA Endangered Species	Migration	Roosts in trees, hunts in open woodlands forages	Regular but sparse during migration
Vermilion Flycatcher	CA Species of Special Concern	Migration, Winter. Potential nesting	Nests in trees, forages in open woodlands and scrublands	Several winter records of at least four individuals since 2011 including one in 2017
Loggerhead Shrike	CA Species of Special Concern and Federal Bird of Conservation Concern	Nesting, Migration, Winter	Nests in trees, hunts in open woodlands and scrublands	Found during each survey visit.
California Horned Lark	CA Watch List	Nesting, Migration, Winter	Nests on ground, forages in barren fields with little grassland cover	Found during each survey visit. Many breeding during 2015-2017.
Purple Martin	CA Species of Special Concern	Migration	Forages over wetlands and grasslands	1 Apr 2012
Lucy's Warbler	CA Species of Special Concern	Migration	Nests in trees, hunts in open woodlands and scrublands	1-4 Oct 2012; second record for the entire Central Valley
Grasshopper Sparrow	CA Species of Special Concern	Migration, Winter, Potential nesting	Nests on ground in grasslands	13 Nov, 10 Dec 2013, 23 Oct 2015
Tricolored Blackbird	CA Species of Special Concern and Federal Bird of Conservation Concern	Nesting, Migration, Winter	Nests in ruderal and marsh vegetation, forages in grasslands, fields and wetlands	Nesting in summer 2012 and 2017, found most days in migration and winter during 2011-2012; nesting off site in 2015 but foraging on the water bank property
Yellow-headed Blackbird	CA Species of Special Concern	Migration, Winter. Potential nesting	Nests in marsh vegetation, forages in grasslands, fields and wetlands	Regular during migration and winter in 2011-12, and spring 2017 (may nest in 2017)
Lawrence's Goldfinch	Federal Bird of Conservation Concern	Migration, Winter, Potential nesting	Nests in trees, forages in open woodlands and scrublands	Two late fall records in 2013, pairs on 23 Apr 2015, 1 Apr and 9 May 2016. Flocks Oct 2015-Jan 2016. Small flocks in April and May 2017.

### Rare Birds

A few birds were discovered during the surveys that are not special-status species, but out of their normal range. These records are very important to our understanding of vagrancy in birds and the data are archived by county editors for "North American Birds" magazine and the online eBird database (administered by Cornell University's Laboratory of Ornithology). During fall migration two Black-throated Sparrows were found on Transects A and C. This desert species is very rare in the Central Valley. A fall migrant Clay-colored Sparrow was in mesquite and cottonwoods between transects A and B. This midwestern species is rare anywhere in California and especially in the Central Valley from which there are fewer than ten documented records. Surprisingly, no fewer than eight Brewer's Sparrows were found wintering in 2012-13 and several have been found each winter thereby establishing the area as a regular wintering area. Before the project there were very few documented records of this Great Basin and desert species during winter months in the Central Valley. There have been seven records of migrant Sage Thrashers—a Great Basin species, which is a rare but annual migrant in the Central Valley. During a 2012 fall survey, a Chestnut-collared Longspur was heard calling in flight over Transect I. This is a very rare wintering bird in the San Joaquin Valley and Tulare Basin with fewer than ten records. On a Christmas Bird Count before these surveys began, an Eastern Phoebe was documented for one of very few San Joaquin Valley and Tulare Basin records of this eastern species, which rarely occurs in California. During a spring surveys on 1 April 2012 and 12 March 2015, single Cassin's Kingbirds were found establishing the only Tulare Basin records away from eastern Bakersfield (only one record from nearby Kings County). Also on 1 April 2012, a male Purple Martin was photographed migrating over grasslands for one of few records for the Tulare Basin and San Joaquin Valley. Two rare warblers, Lucy's and Virginia's were found during fall migration for only the second and third records for the Central Valley, respectively. The Kern Water Bank has exceptional habitats for birds and many rare birds will likely be found and documented in the future dependent upon survey efforts.

### Discussion

The bird use of property managed by the Kern Water Bank Authority is clearly very high in accordance to the large acreages of upland habitats. Overall, in terms of bird abundance, species diversity, acreage, location and habitat diversity, it is an important area of upland habitat, especially when compared to surrounding agricultural lands. These surveys documented particularly large populations raptors and shrikes, sparrows, and many other species typical of native upland habitats on the San Joaquin Valley floor. Of particular interest were the differences in the effect of the drought conditions among the years. There was measureable precipitation in winter of 2014-2015 and in the spring of 2015 with lesser amounts in winter 2015-2016 and spring 2016, and again in winter 2016-2017 which resulted in much growth of grasses and forbs throughout the water bank property. This was in contrast to no new growth during spring 2014 that left the area devoid of grasses and forbs. As a result, Loggerhead Shrike populations rebounded to pre-winter 2013-2014 levels, primarily as a result of good reproductive success of local breeders. These shrikes prey upon large insects and lizards that were common during the springs of 2015, 2016 and 2017. In contrast, raptor counts remained low compared to wet years likely due to continuing low population levels of rodent prey, but did slightly increase in winter 2015-2016 through spring 2016 in response to relief of severe drought conditions. With the likely increase in the vole population in 2017 due to much vegetation growth especially near the newly watered ponds, raptors such as White-tailed Kites, Northern Harriers, and American Kestrels as well as Great Blue Herons and Great Egret may increase their populations to pre-drought levels.

The watering of many recharge ponds from January to the present has created exception conditions for most waterbirds. Forster's Terns, Clark's and Western grebes and several duck species have re-established breeding populations. A large White-faced Ibis breeding colony of several hundred pairs also formed in M1. Although peak population levels did not reach those of 2011-2012, there was still a sizeable population for most groups of waterbirds. The primary exception was the fish-eating birds, including herons, egrets, Double-breasted Cormorant and American White Pelican which were at very low numbers due lack of their preferred fish prey.

**Appendix A. List of Bird Species Recorded at the Kern Water Bank  
Compiled By John Sterling (6 June 2017)  
Bold-faced names = species rare in the Tulare Basin**

**Anseriformes - Screamers, Swans, Geese, and Ducks**

**Anatidae - Ducks, Geese, and Swans**

Greater White-fronted Goose *Anser albifrons*

**Snow Goose** *Chen caerulescens*

**Ross's Goose** *Chen rossii*

**Cackling Goose** *Branta hutchinsii*

Canada Goose *Branta canadensis*

**Tundra Swan** *Cygnus columbianus*

Wood Duck *Aix sponsa*

Gadwall *Anas strepera*

**Eurasian Wigeon** *Anas penelope*

American Wigeon *Anas americana*

Mallard *Anas platyrhynchos*

Blue-winged Teal *Anas discors*

Cinnamon Teal *Anas cyanoptera*

Northern Shoveler *Anas clypeata*

Northern Pintail *Anas acuta*

Green-winged Teal *Anas crecca*

Canvasback *Aythya valisineria*

Redhead *Aythya americana*

Ring-necked Duck *Aythya collaris*

**Greater Scaup** *Aythya marila*

Lesser Scaup *Aythya affinis*

Bufflehead *Bucephala albeola*

Common Goldeneye *Bucephala clangula*

**Barrow's Goldeneye** *Bucephala islandica*

Hooded Merganser *Lophodytes cucullatus*

Common Merganser *Mergus merganser*

**Red-breasted Merganser** *Mergus serrator*

Ruddy Duck *Oxyura jamaicensis*

**Galliformes - Gallinaceous Birds**

**Odontophoridae - New World Quail**

California Quail *Callipepla californica*

**Phasianidae - Partridges, Grouse, Turkeys, and Old World Quail**

Ring-necked Pheasant *Phasianus colchicus* - I

**Podicipediformes - Grebes**

**Podicipedidae - Grebes**

Pied-billed Grebe *Podilymbus podiceps*

**Horned Grebe** *Podiceps auritus*

Eared Grebe *Podiceps nigricollis*

Western Grebe *Aechmophorus occidentalis*

Clark's Grebe *Aechmophorus clarkii*

**Phalacrocoracidae - Cormorants**

Double-crested Cormorant *Phalacrocorax auritus*

**Pelecaniformes - Pelicans, Herons, Ibises, and Allies****Pelecanidae - Pelicans**

American White Pelican *Pelecanus erythrorhynchos*

**Ardeidae - Herons, Bitterns, and Allies**

Great Blue Heron *Ardea herodias*

Great Egret *Ardea alba*

Snowy Egret *Egretta thula*

Cattle Egret *Bubulcus ibis*

Green Heron *Butorides virescens*

Black-crowned Night-Heron *Nycticorax nycticorax*

**Threskiornithidae - Ibises and Spoonbills**

White-faced Ibis *Plegadis chihi*

**Accipitriformes - Hawks, Kites, Eagles, and Allies****Cathartidae - New World Vultures**

Turkey Vulture *Cathartes aura*

**Pandionidae - Ospreys**

Osprey *Pandion haliaetus*

**Accipitridae - Hawks, Kites, Eagles, and Allies**

White-tailed Kite *Elanus leucurus*

**Bald Eagle** *Haliaeetus leucocephalus*

Northern Harrier *Circus cyaneus*

Sharp-shinned Hawk *Accipiter striatus*

Cooper's Hawk *Accipiter cooperii*

Red-shouldered Hawk *Buteo lineatus*

Swainson's Hawk *Buteo swainsoni*

Red-tailed Hawk *Buteo jamaicensis*

Ferruginous Hawk *Buteo regalis*

Golden Eagle *Aquila chrysaetos*

**Gruiformes - Rails, Cranes, and Allies****Rallidae - Rails, Gallinules, and Coots**

Virginia Rail *Rallus limicola*

Sora *Porzana carolina*

Common Gallinule *Gallinula galeata*

American Coot *Fulica americana*

**Charadriiformes - Shorebirds, Gulls, Auks, and Allies****Recurvirostridae - Stilts and Avocets**

Black-necked Stilt *Himantopus mexicanus*

American Avocet *Recurvirostra americana*

### **Charadriidae - Lapwings and Plovers**

Black-bellied Plover *Pluvialis squatarola*  
Snowy Plover *Charadrius nivosus*  
Semipalmated Plover *Charadrius semipalmatus*  
**Mountain Plover** *Charadrius montanus*  
Killdeer *Charadrius vociferus*

### **Scolopacidae - Sandpipers, Phalaropes, and Allies**

Spotted Sandpiper *Actitis macularius*  
**Solitary Sandpiper** *Tringa solitaria*  
Greater Yellowlegs *Tringa melanoleuca*  
Willet *Tringa semipalmata*  
Lesser Yellowlegs *Tringa flavipes*  
Whimbrel *Numenius phaeopus*  
Long-billed Curlew *Numenius americanus*  
Dunlin *Calidris alpina*  
Least Sandpiper *Calidris minutilla*  
Western Sandpiper *Calidris mauri*  
Short-billed Dowitcher *Limnodromus griseus*  
Long-billed Dowitcher *Limnodromus scolopaceus*  
Wilson's Snipe *Gallinago delicata*  
Wilson's Phalarope *Phalaropus tricolor*  
Red-necked Phalarope *Phalaropus lobatus*

### **Laridae - Gulls, Terns, and Skimmers**

Bonaparte's Gull *Chroicocephalus Philadelphia*  
**Franklin's Gull** *Leucophaeus pipixcan*  
**Mew Gull** *Larus canus*  
Ring-billed Gull *Larus delawarensis*  
California Gull *Larus californicus*  
Herring Gull *Larus argentatus*  
**Thayer's Gull** *Larus thayeri*  
**Glaucous-winged Gull** *Larus glaucescens*  
**Glaucous Gull** *Larus hyperboreus*  
Caspian Tern *Hydroprogne caspia*  
Black Tern *Chlidonias niger*  
**Common Tern** *Sterna hirundo*  
Forster's Tern *Sterna forsteri*

### **Columbiformes - Pigeons, and Doves**

#### **Columbidae - Pigeons and Doves**

Rock Pigeon *Columba livia* - I  
Eurasian Collared-Dove *Streptopelia decaocto* - I  
Mourning Dove *Zenaida macroura*

### **Cuculiformes - Cuckoos and Allies**

#### **Cuculidae - Cuckoos, Roadrunners, and Anis**

Greater Roadrunner *Geococcyx californianus*



**Strigiformes - Owls**

**Tytonidae - Barn Owls**

Barn Owl *Tyto alba*

**Strigidae - Typical Owls**

Great Horned Owl *Bubo virginianus*

Burrowing Owl *Athene cunicularia*

**Caprimulgiformes - Goatsuckers, Oilbirds, and Allies**

**Caprimulgidae - Goatsuckers**

Lesser Nighthawk *Chordeiles acutipennis*

**Apodiformes - Swifts, and Hummingbirds**

**Apodidae - Swifts**

Vaux's Swift *Chaetura vauxi*

White-throated Swift *Aeronautes saxatalis*

**Trochilidae - Hummingbirds**

Black-chinned Hummingbird *Archilochus alexandri*

Anna's Hummingbird *Calypte anna*

Rufous Hummingbird *Selasphorus rufus*

**Coraciiformes - Rollers, Motmots, Kingfishers, and Allies**

**Alcedinidae - Kingfishers**

Belted Kingfisher *Megaceryle alcyon*

**Piciformes - Puffbirds, Jacamars, Toucans, Woodpeckers, and Allies**

**Picidae - Woodpeckers and Allies**

Nuttall's Woodpecker *Picoides nuttallii*

Downy Woodpecker *Picoides pubescens*

Northern Flicker *Colaptes auratus*

**Falconiformes - Caracaras and Falcons**

**Falconidae - Caracaras and Falcons**

American Kestrel *Falco sparverius*

Merlin *Falco columbarius*

Peregrine Falcon *Falco peregrinus*

Prairie Falcon *Falco mexicanus*

**Passeriformes - Passerine Birds**

**Tyrannidae - Tyrant Flycatchers**

Olive-sided Flycatcher *Contopus cooperi*

Western Wood-Pewee *Contopus sordidulus*

Willow Flycatcher *Empidonax traillii*

**Dusky Flycatcher** *Empidonax oberholseri*

**Gray Flycatcher** *Empidonax wrightii*

Pacific-slope Flycatcher *Empidonax difficilis*

Black Phoebe *Sayornis nigricans*

**Eastern Phoebe** *Sayornis phoebe*

Say's Phoebe *Sayornis saya*

**Vermilion Flycatcher** *Pyrocephalus rubinus*

Ash-throated Flycatcher *Myiarchus cinerascens*

**Cassin's Kingbird** *Tyrannus vociferans*

Western Kingbird *Tyrannus verticalis*

**Laniidae - Shrikes**

Loggerhead Shrike *Lanius ludovicianus*

**Vireonidae - Vireos**

Cassin's Vireo *Vireo cassinii*

Warbling Vireo *Vireo gilvus*

**Corvidae - Crows and Jays**

Western Scrub-Jay *Aphelocoma californica*

American Crow *Corvus brachyrhynchos*

Common Raven *Corvus corax*

**Alaudidae - Larks**

Horned Lark *Eremophila alpestris*

**Hirundinidae - Swallows**

**Purple Martin** *Progne subis*

Tree Swallow *Tachycineta bicolor*

Violet-green Swallow *Tachycineta thalassina*

Northern Rough-winged Swallow *Stelgidopteryx serripennis*

Cliff Swallow *Petrochelidon pyrrhonota*

Barn Swallow *Hirundo rustica*

**Aegithalidae - Long-tailed Tits and Bushtits**

Bushtit *Psaltriparus minimus*

**Troglodytidae - Wrens**

Rock Wren *Salpinctes obsoletus*

House Wren *Troglodytes aedon*

Marsh Wren *Cistothorus palustris*

Bewick's Wren *Thryomanes bewickii*

**Poliophtilidae - Gnatcatchers and Gnatwrens**

Blue-gray Gnatcatcher *Poliophtila caerulea*

**Regulidae - Kinglets**

Ruby-crowned Kinglet *Regulus calendula*

**Turdidae - Thrushes**

Western Bluebird *Sialia mexicana*

Mountain Bluebird *Sialia currucoides*

Hermit Thrush *Catharus guttatus*

American Robin *Turdus migratorius*

### **Mimidae - Mockingbirds and Thrashers**

California Thrasher *Toxostoma redivivum*

**Sage Thrasher** *Oreoscoptes montanus*

Northern Mockingbird *Mimus polyglottos*

### **Sturnidae - Starlings**

European Starling *Sturnus vulgaris* - I

### **Motacillidae - Wagtails and Pipits**

American Pipit *Anthus rubescens*

### **Bombycillidae - Waxwings**

Cedar Waxwing *Bombycilla cedrorum*

### **Ptilionotidae - Silky-flycatchers**

Phainopepla *Phainopepla nitens*

### **Calcariidae - Longspurs and Snow Buntings**

**Chestnut-collared Longspur** *Calcarius ornatus*

### **Parulidae - Wood-Warblers**

Orange-crowned Warbler *Oreothlypis celata*

**Lucy's Warbler** *Oreothlypis luciae*

**Virginia's Warbler** *Oreothlypis virginiae*

Nashville Warbler *Oreothlypis ruficapilla*

MacGillivray's Warbler *Geothlypis tolmiei*

Common Yellowthroat *Geothlypis trichas*

Yellow Warbler *Setophaga petechia*

Yellow-rumped Warbler *Setophaga coronata*

Black-throated Gray Warbler *Setophaga nigrescens*

Townsend's Warbler *Setophaga townsendi*

Wilson's Warbler *Cardellina pusilla*

### **Emberizidae - Emberizids**

Spotted Towhee *Pipilo maculatus*

California Towhee *Melospiza crissalis*

Chipping Sparrow *Spizella passerina*

**Clay-colored Sparrow** *Spizella pallida*

**Brewer's Sparrow** *Spizella breweri*

Vesper Sparrow *Pooecetes gramineus*

**Grasshopper Sparrow** *Ammodramus savannorum*

Lark Sparrow *Chondestes grammacus*

**Black-throated Sparrow** *Amphispiza bilineata*

Bell's Sparrow *Artemisospiza belli canescens*

Savannah Sparrow *Passerculus sandwichensis*

Fox Sparrow *Passerella iliaca*

Song Sparrow *Melospiza melodia*

Lincoln's Sparrow *Melospiza lincolnii*  
White-crowned Sparrow *Zonotrichia leucophrys*  
Golden-crowned Sparrow *Zonotrichia atricapilla*  
Dark-eyed Junco *Junco hyemalis*

**Cardinalidae - Cardinals and Allies**

Western Tanager *Piranga ludoviciana*  
Black-headed Grosbeak *Pheucticus melanocephalus*  
Blue Grosbeak *Passerina caerulea*  
Lazuli Bunting *Passerina amoena*

**Icteridae - Blackbirds**

Red-winged Blackbird *Agelaius phoeniceus*  
Tricolored Blackbird *Agelaius tricolor*  
Western Meadowlark *Sturnella neglecta*  
Yellow-headed Blackbird *Xanthocephalus xanthocephalus*  
Brewer's Blackbird *Euphagus cyanocephalus*  
Great-tailed Grackle *Quiscalus mexicanus*  
Brown-headed Cowbird *Molothrus ater*  
**Hooded Oriole** *Icterus cucullatus*  
Bullock's Oriole *Icterus bullockii*

**Fringillidae - Fringilline and Cardueline Finches and Allies**

House Finch *Haemorhous mexicanus*  
Purple Finch *Haemorhous purpureus*  
Pine Siskin *Spinus pinus*  
Lesser Goldfinch *Spinus psaltria*  
**Lawrence's Goldfinch** *Spinus lawrencei*  
American Goldfinch *Spinus tristis*

**Passeridae - Old World Sparrows**

House Sparrow *Passer domesticus* - I

## Appendix E

### 2016 Annual Wildlife Monitoring Report for the Kern Water Bank



Killdeer (*Charadrius vociferous*)

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2016 ANNUAL WIDLIFE MONITORING  
REPORT  
for the  
KERN WATER BANK



Submitted to:

KERN WATER BANK AUTHORITY

Prepared by:

svb  
south valley biology consulting llc

June 16, 2017

**2016 ANNUAL WILDLIFE MONITORING REPORT**  
**for the**  
**KERN WATER BANK**

Submitted to:  
Kern Water Bank Authority  
1620 Mill Rock Way, Suite 500  
Bakersfield, CA93311

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

June 16, 2017



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## Introduction

This report documents the results of the 2016 annual wildlife monitoring activities conducted at the Kern Water Bank (KWB). On behalf of the Kern Water Bank Authority (KWBA), biologists from South Valley Biology Consulting LLC (SVB) conducted all monitoring activities contained in this report.

As identified on Page IV-6 the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWBA 1997), hereinafter referred to as HCP/NCCP, the annual and bi-annual monitoring consisted of the following activities:

- San Joaquin kit fox (*Vulpes macrotis mutica*) monitoring

Nighttime spotlighting surveys to document the presence of San Joaquin kit fox, its predators and competitors, such as coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and bobcat (*Lynx rufus*), as well as several other nocturnal animals on the KWB.

In addition to the prescribed spotlighting surveys, infrared motion camera stations were again used in 2016 to better document kit fox activity on the KWB.

- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) monitoring

Trapping surveys on two established trapping grids to assess known population areas of Tipton kangaroo rats on the KWB.

- San Joaquin woollythreads (*Monolopia congdonii*) and other rare plant species monitoring.

## San Joaquin Kit Fox Monitoring

### Introduction



*San Joaquin kit fox*

San Joaquin kit fox monitoring at the KWB in 2016 consisted of nighttime spotlighting surveys conducted on an established route located throughout the KWB. These surveys are conducted annually in an effort to provide an index of San Joaquin kit fox presence. Data collected from the surveys are useful in supplying insights into the densities of not only kit foxes, but also their predator and competitor species that occur within the KWB boundary. The main predator/competitor species for the San Joaquin kit fox on the KWB are coyotes and bobcats. American badger (*Taxidea taxus*) also occurs on the KWB and is observed mostly in small numbers. Although the non-

native red fox is also known to occur in the region, this species has not been observed for many years at the KWB.

## Methodology

Prior to conducting the nighttime spotlighting surveys, all of the lesser-travelled areas of the established nighttime spotlighting route were driven by the biologists during daylight hours. This was primarily done in the interest of safety, however, the daylight surveys also allow for identifying areas where the most suitable habitats for San Joaquin kit fox are located and for identifying potential den locations that would be worthwhile to target during the nighttime spotlighting surveys. Although the KWB is a very dynamic place and can vary dramatically from year to year, there has been no need to significantly alter the established spotlighting route for several seasons. Figure 1 provides an illustration of the 2016 survey route.

Nighttime spotlighting surveys were conducted for six nights during the evening hours. Surveys commenced at or immediately after dusk and most surveys generally took from 3 to 3.5 hours to complete. Survey dates included November 10<sup>th</sup>, 11<sup>th</sup>, 16<sup>th</sup>, 17<sup>th</sup>, 22<sup>nd</sup>, and 23<sup>rd</sup>. Because the established survey route is just over 50 miles in length, it was divided into two portions totaling approximately 25 miles each (Figure 1). The East Route consisted of all portions lying east of Enos Lane (Highway 43), and an approximately 6-mile stretch lying west of Interstate 5 and south of the Kern River. The other route, referred to as the West Route, encompassed all remaining portions of the established route that lie west of Enos Lane. Both routes were surveyed equally over the six nights, yielding approximately 150 miles of nighttime spotlighting surveys conducted during the 2016 survey effort.

Each survey was conducted by two biologists traveling in a vehicle at approximately 5-10 miles per hour. The biologists each used a 3-million candlepower hand-held spotlight to observe eye-shines and individual animals. A third biologist was responsible for recording the observations onto the data sheet at specified intervals throughout the survey session and to aid in safely navigating the survey route. Double counting of observations was avoided by maintaining a constant communication while surveying and determining pre-defined areas of observation for each biologist. Observations of all identified animals, paying particular attention to kit fox and their predator and prey species, were recorded onto standardized field data sheets. The data sheets were later compiled into a Microsoft Access® database. All San Joaquin kit fox observations and observations of kit fox predator and competitor species, such as coyote, bobcat, and American badger, were recorded using a hand held Global Positioning System (GPS) and later entered into the database.

## Results

Results from the nighttime spotlighting surveys are presented in Figure 2. The locations of San Joaquin kit fox and competitor/predator species observations are presented in Figure 1.

There were no observations of San Joaquin kit fox made during the 2016 nighttime spotlighting surveys.

A total of 23 coyotes were observed during the surveys on 13 different occasions. All the observations were adults. Eight of the observations consisted of a single individual, while the remaining five observations consisted of multiple individuals ranging from two to five adults (Figure 1).

No bobcats were observed during the 2016 nighttime spotlighting surveys. However, American badgers were observed on two occasions. Both occasions consisted of a single adult badger.

Other mammalian species observations made during the 2016 nighttime spotlighting surveys included: 1 Unknown species of bat, 91 desert cottontail (*Sylvilagus auduboni*), 151 black-tailed jackrabbit (*Lepus californicus*), 22 mice, and 90 kangaroo rat (*Dipodomys* ssp.).

The only avian species that were observed were a total of 10 barn owl (*Tyto alba*) and three burrowing owl (*Athene cunicularia*).

## Discussion

The 2016 season saw a significant increase in the growth of herbaceous vegetation that led to much more seed and herbaceous forage production. This in turn led to an increase in populations for many of the upland species. For example, the 23 coyote observations in 2016 were 187.5% higher than the 8 observations made during the 2015 surveys. Similar increases in observations were also made for almost all of the prey species such as rabbits, kangaroo rats, and mice. Although no observations of bobcats and only two American badgers were made during the 2016 nighttime spotlighting surveys, both these species were observed on several other occasions by SVB biologists during the year. In particular, badgers seem to be on the rise at the KWB. These may be natural fluctuations in the population that may reflect an increase in small mammal prey availability in 2016.

San Joaquin kit fox was not observed during the 2016 nighttime spotlighting surveys; however, one kit fox individual was very active in the Southeast Area in 2016. As discussed below, many photographs were taken of this kit fox at one of the camera monitoring stations during 2016.

In 2016 SVB biologists placed a total of 9 cameras in several areas spread throughout the KWB. In 2015, cattle rendered two camera stations inoperable; however, only one camera station was disturbed on just one evening by cattle in 2016. The disturbance was mild and did not render the station inoperable. An infrared motion detection camera was placed at each station along with a perforated can of cat food that was securely fastened to the ground with a 12-inch metal stake. All cameras were operated

for 14 consecutive days and nights from September 17<sup>th</sup> through September 30<sup>th</sup>. Figure 1 shows the locations of the 9 camera stations.

One San Joaquin kit fox was photographed numerous times at the same camera station on 10 of the 14 nights. It is believed that this was the same individual each night. Coyotes were plentiful in 2016, visiting 8 of the 9 scent stations. One bobcat was photographed at the same camera station on two different nights, but no badgers visited the camera stations in 2016. Other wildlife species photographed included black-tailed jackrabbit, desert cottontail, kangaroo rat, and greater roadrunner. Several representative photographs of wildlife from the camera station monitoring are provided below.



*San Joaquin kit fox (Sept. 17, 2016)*



*San Joaquin kit fox (Sept. 19, 2016)*



*Coyotes visited 8 of the 9 camera stations*



*Bobcat*



*Heermann's kangaroo rat were present at 8 of the 9 camera stations*



*Desert cottontail were photographed in 2016 at most camera stations*



*Black-tailed jackrabbit were also abundant in 2016*



*Greater roadrunner at camera station*

## Tipton Kangaroo Rat Monitoring

### Introduction

Tipton kangaroo rat monitoring at the KWB is required annually at two permanently established trapping grids in accordance with the HCP/NCCP. The Strand Grid is located in the northwest ¼ of Section 7, Township 30 South, Range 26 East and the Southeast Area Grid is located in the northwest ¼ of Section 33, Township 30 South, Range 26 East.

### Methodology

The Strand Grid and the Southeast Area Grid are both standard 110-meter by 110-meter, 144-station, small mammal trapping grids. Each grid consists of twelve equidistant rows, spaced 10 meters apart. Monitoring efforts at each grid in 2015 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on September 13<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup>, 16<sup>th</sup>; and the Strand Grid was trapped on October 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup>. This technique yielded a total of 1,152 trap nights.

A 12-inch x 3-inch x 3.5-inch Sherman live trap was placed at each trap location. Each trap was baited using a millet-based seed mix. A wadded paper towel was also included in each trap to provide insulation material for the captured animals. The traps were baited and set in the evening and checked prior to sunrise the following morning. Two biologists worked independently on separate trap rows and checked 72 traps each morning. This technique was utilized to help reduce the handling time and minimize stress to the captured animals. Each captured animal was identified to species and the individual's weight, age, and sex were also recorded onto a standardized data sheet. After all data were collected and recorded, the animal was temporarily marked ventrally with a non-toxic ink marker and then immediately released. To further minimize subsequent handling times, males were marked with a blue marker and females were marked with red. Additionally, an individual was weighed only once and no re-weighing of recaptured animals was conducted.

Deer mice (*Peromyscus maniculatus*) were not handled in the same manner as all the other species. When a deer mouse was captured, no data on sex, weight, or any other parameter was collected. Therefore, the number of deer mice reported here includes recaptures. This was a safety consideration intended to minimize potential exposure to Hantavirus.

### Results

Results from the 2016 Tipton kangaroo rat monitoring are summarized in Figure 3.

Six Tipton kangaroo rats were captured at the Strand Grid in 2016. Other animals trapped at the Strand Grid were as follows: 58 Heermann's kangaroo rats (*Dipodomys heermanni*), 1 San Joaquin grasshopper mouse (*Onychomys torridus tularensis*), and 48 deer mice.

The trapping effort at the Southeast Area Grid yielded a total of 47 Tipton kangaroo rats, 9 Heermann's kangaroo rats, 1 San Joaquin grasshopper mouse, 6 San Joaquin pocket mice (*Perognathus inornatus*), and 6 deer mice.

### Discussion

2016 proved to be an excellent year for Tipton kangaroo rats at the KWB. The 53 individuals trapped in 2016 is a record high for the trapping effort in the history of the KWB. This is an astounding change from 2015, when no Tipton kangaroo rats were trapped at either of the trapping grids (SVB 2016). Results from the recently established Southeast Area Grid in 2016 are especially pleasing. In all, 47 of the 53 Tipton kangaroo rats trapped in 2016 were trapped at the Southeast Area Grid. The habitat at this grid location is high quality alkali sink habitat that was in excellent condition after the favorable rainfall during the 2015-2016 rain year. It is very encouraging to have had such an increase of Tipton kangaroo rats at this grid, while simultaneously seeing a much smaller increase in the number of Heermann's kangaroo rats at this grid. Only 9 Heermann's kangaroo rats were trapped at this grid. It appears from these data that the Tipton kangaroo rats were better able to exploit the abundant seed production from the favorable rainfall. Trapping results at the nearby Coles Levee Ecosystem Preserve also found record numbers of Tipton kangaroo rats trapped at all of the grids where this species is found (SVB 2017).

The results for San Joaquin pocket mouse in 2016 are interesting. It was reported from the 2015 trapping results that San Joaquin pocket mice were trapped in higher numbers than any other small mammal species at the Southeast Area Grid and the 7 individuals trapped at the Strand Grid was a record high for that grid (SVB 2016). It appears that when the populations of kangaroo rats are depressed, this may favor the San Joaquin pocket mouse. This may be a direct function of less competition, or other environmental factors may also be important. Anecdotally, there does seem to be a positive correlation with San Joaquin pocket mice increasing their numbers in years when habitat conditions are not as favorable for kangaroo rats.



Tipton kangaroo rat



San Joaquin pocket mouse

## Sensitive Habitat Botanical Monitoring

### Introduction

Five special-status plant species have historically been reported to occur at the KWB. These are: Hoover's woolly-star (*Eriastrum hooveri*), San Joaquin woollythreads (*Monolopia congdonii*), recurved larkspur (*Delphinium recurvatum*), Horn's milk-vetch (*Astragalus hornii* var. *hornii*), and slough thistle (*Cirsium crassicaule*). However, the USFWS now considers Kern mallow (*Eremalche kernensis*) to include the purple or pink-flowered populations where the populations include pistillate-flowered plants (*E. parryi* ssp. *kernensis*). This is a significant change from the policy that had been in place for many years that only considered the white-flowered populations to be "true Kern mallow". The change in designation is based upon the results of the 5-year review for the species that was published in August of 2013 (USFWS 2013). As a result of this designation, the range of the protected Kern mallow includes many additional areas, including portions of the KWB where the pink or purple-flowered plants occur. Because Kern mallow is listed as a federal endangered species and plants meeting this revised definition of Kern mallow (i.e., populations of pink or purple-flowered plants with pistillate plants present) are known to occur on the KWB, this species is now also targeted for surveys in favorable years of rainfall when this species is identifiable.

The 2015- 2016 rain year (October 1, 2015 - September 30, 2016) in the Bakersfield area, received approximately 5.51 inches of precipitation. This represents approximately 90% of the long-term normal of 6.12 inches. This resulted in an excellent blooming season for almost all plants at the KWB, especially for populations of San Joaquin woollythreads, Hoover's woolly-star, recurved larkspur, and Kern mallow.

SVB commenced monitoring of San Joaquin woollythreads populations at KWB in 2016 on January 25<sup>th</sup>. Several hundred plants had germinated at the known populations of this species and were primarily in the early rosette stage of growth. Most plants were small in stature, but appeared healthy. Regular visits continued throughout the flowering period for San Joaquin woollythreads. On February 9<sup>th</sup>, plants were much larger and still very healthy looking. No plants had begun flowering, but many plants did appear to have immature buds that looked to be within just a few days from blooming. On February 24<sup>th</sup> essentially all plants observed were well into the flowering stages. On March 2<sup>nd</sup>, the population was in prime bloom with many robust plants sporting numerous mature flowers.

Ryan O'Dell with the Hollister Field Office of the Bureau of Land Management continued their work with San Joaquin woollythreads on the KWB in 2016. Mr. O'Dell and SVB biologist Jim Jones visited one of the larger populations of San Joaquin woollythreads on March 19<sup>th</sup>. Mr. O'Dell collected one or two seed heads from approximately 20 individual plants. The seed was used to germinate and grow seedlings in the laboratory to provide material for chromosome counts to help determine the genetic structure of differing populations of San Joaquin woollythreads throughout the range of the species.



Preliminary results from this genetic study indicate that the populations of San Joaquin woollythreads on the KWB are most similar to populations located in the Lost Hills area of Kern County (Ryan O'Dell, pers. comm.).



*San Joaquin woollythreads rosettes (Jan. 25, 2016)*



*San Joaquin woollythreads in bud stage (Feb. 9, 2016)*



*San Joaquin woollythreads flowering (Feb. 24, 2016)*



*San Joaquin woollythreads full bloom (Mar. 2, 2016)*

Several site visits were also made to known populations of Hoover's woolly-star on the KWB in 2016. This species occurs in many areas at the KWB in a variety of habitats. The larger, healthier plants tend to be associated with cryptogamic crusts within saltbush scrub habitats. Flowering individuals were observed beginning about March 2<sup>nd</sup> and continued to be observed into early April.



*Hoover's woolly-star flowering (Mar. 28, 2016)*

Recurved larkspur occurs at the KWB within one sector of the conservation bank lands on both the eastern and western sides of the Alejandro Canal. In 2016, the population was very healthy and vigorous and approximately 500 – 750 plants were observed flowering and fruiting on March 28<sup>th</sup>.



*Recurved larkspur flowering and fruiting (Mar. 28, 2016)*

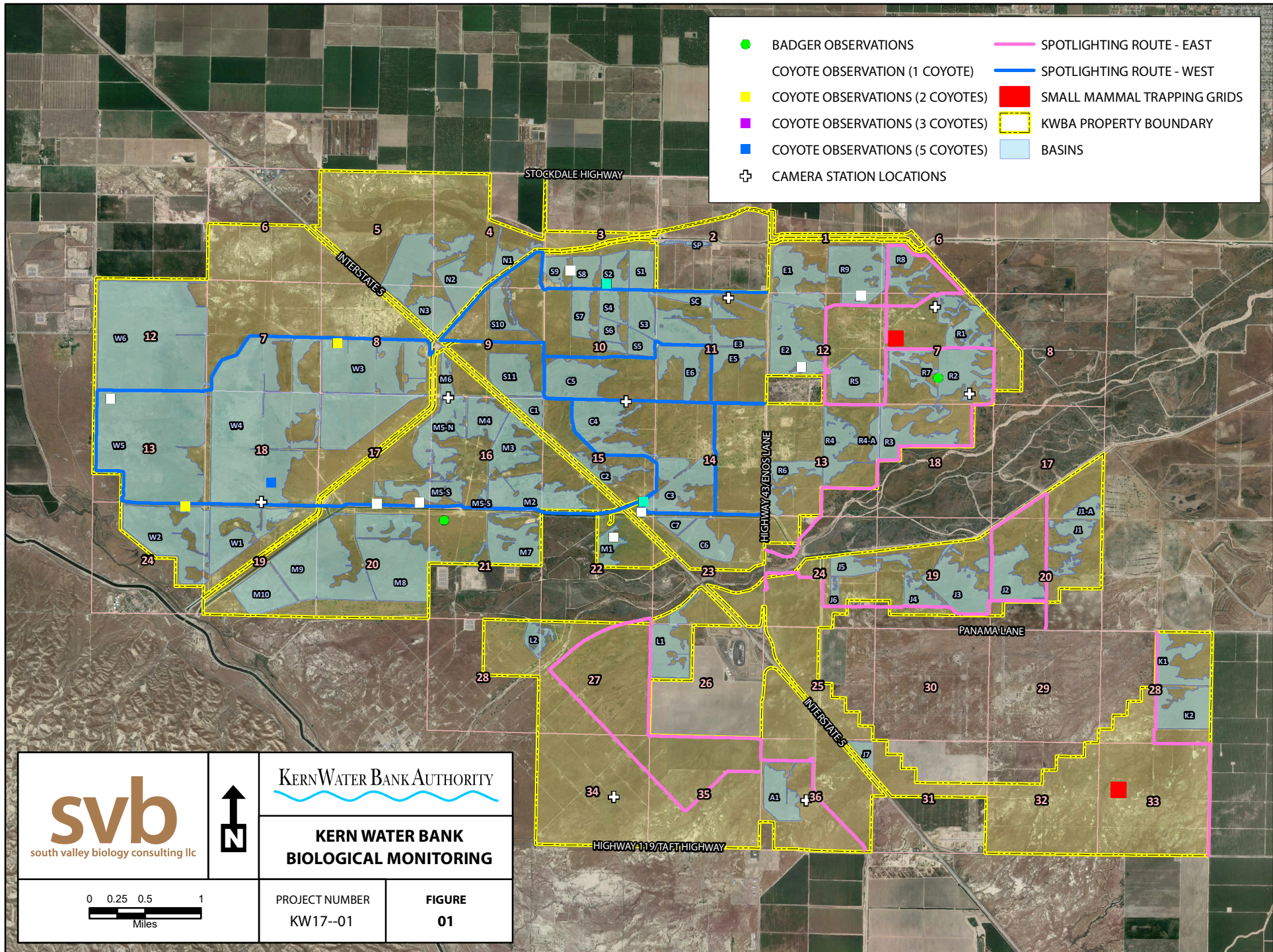
The pink-flowered Kern mallow was targeted for specific surveys in several areas throughout the KWB (Figure 4). SVB biologists observed populations of this species in each of the survey areas shown on Figure 4. Any population that contained pistillate plants within the population were considered to be Kern mallow. This species is likely located elsewhere in grassland and shrubland communities at the KWB. Most occurrences observed in 2016 consisted of fairly large numbers of individuals, ranging from a few hundred to as many a few thousand plants.



*Kern mallow pistillate plant (Mar. 8, 2016)*

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- South Valley Biology Consulting LLC. 2017. 2016 Coles Levee Ecosystem Preserve annual report. Prepared by South Valley Biology Consulting LLC for Aera Energy LLC. March 1, 2017.
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- United States Fish and Wildlife Service. 2013. *Eremalche kernensis* (Kern mallow) 5-year review: Summary and evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, CA. August 2013.



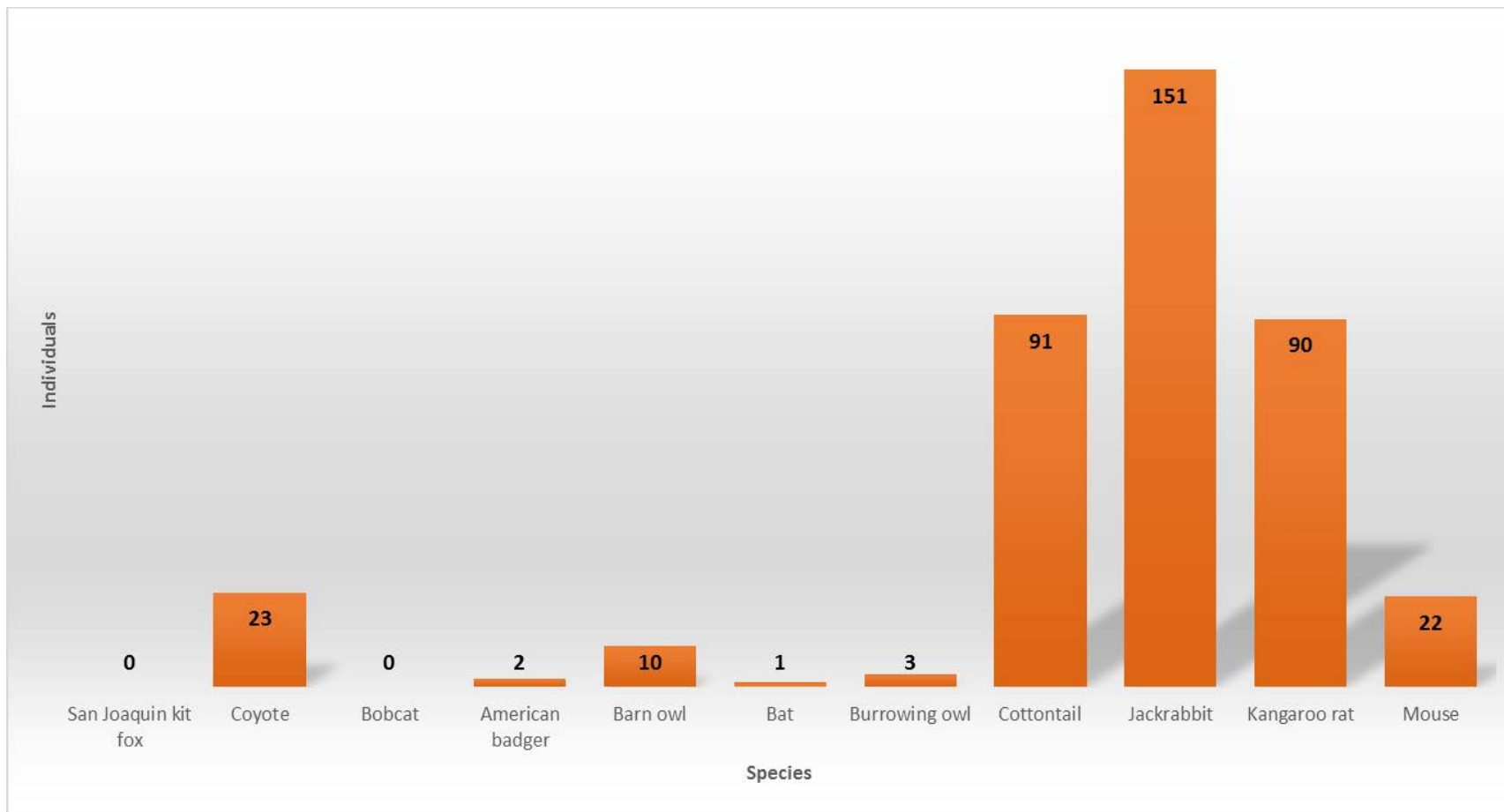


Figure 2. Results of 2016 nighttime spotlighting surveys at the Kern Water Bank.

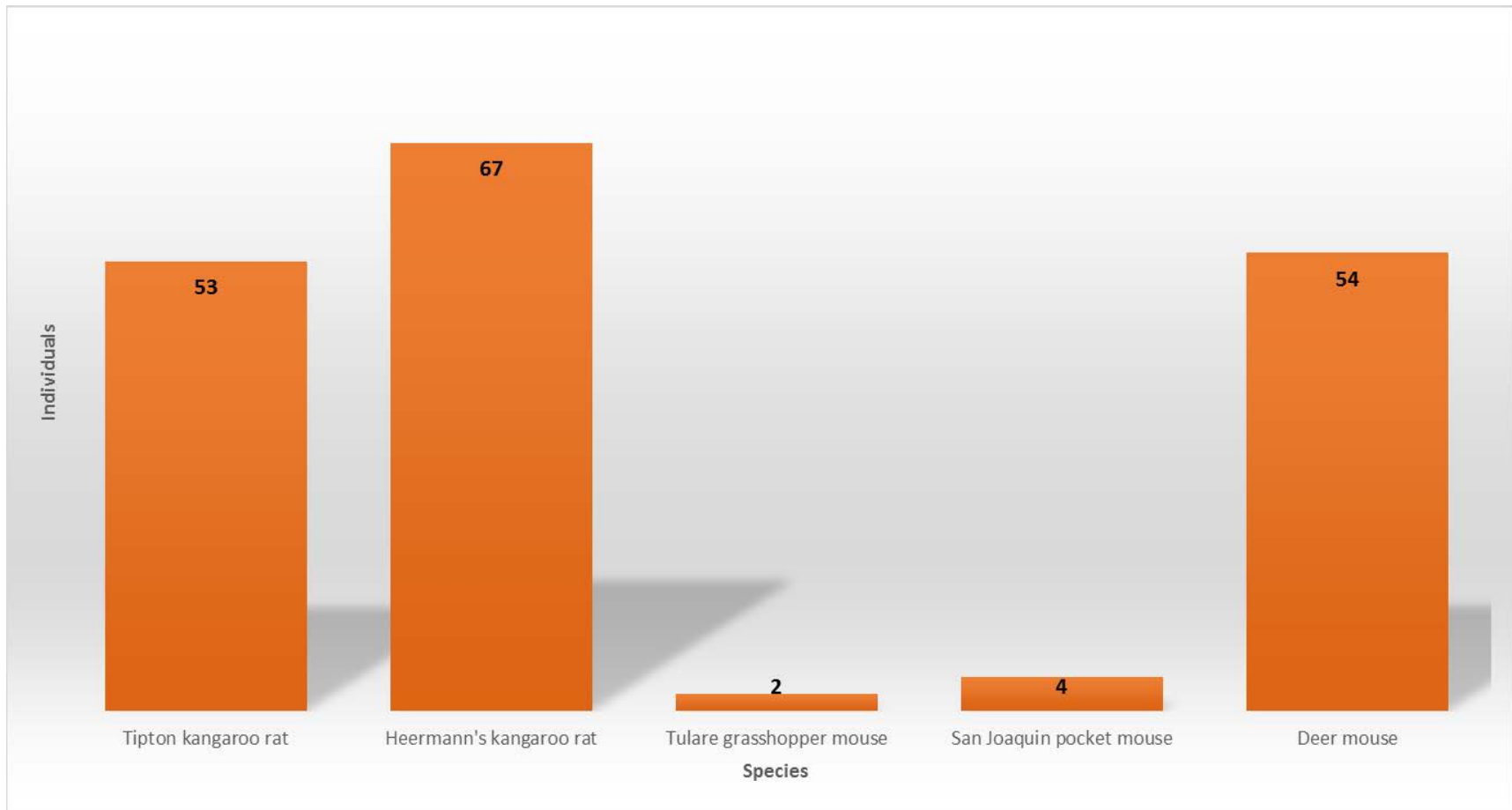


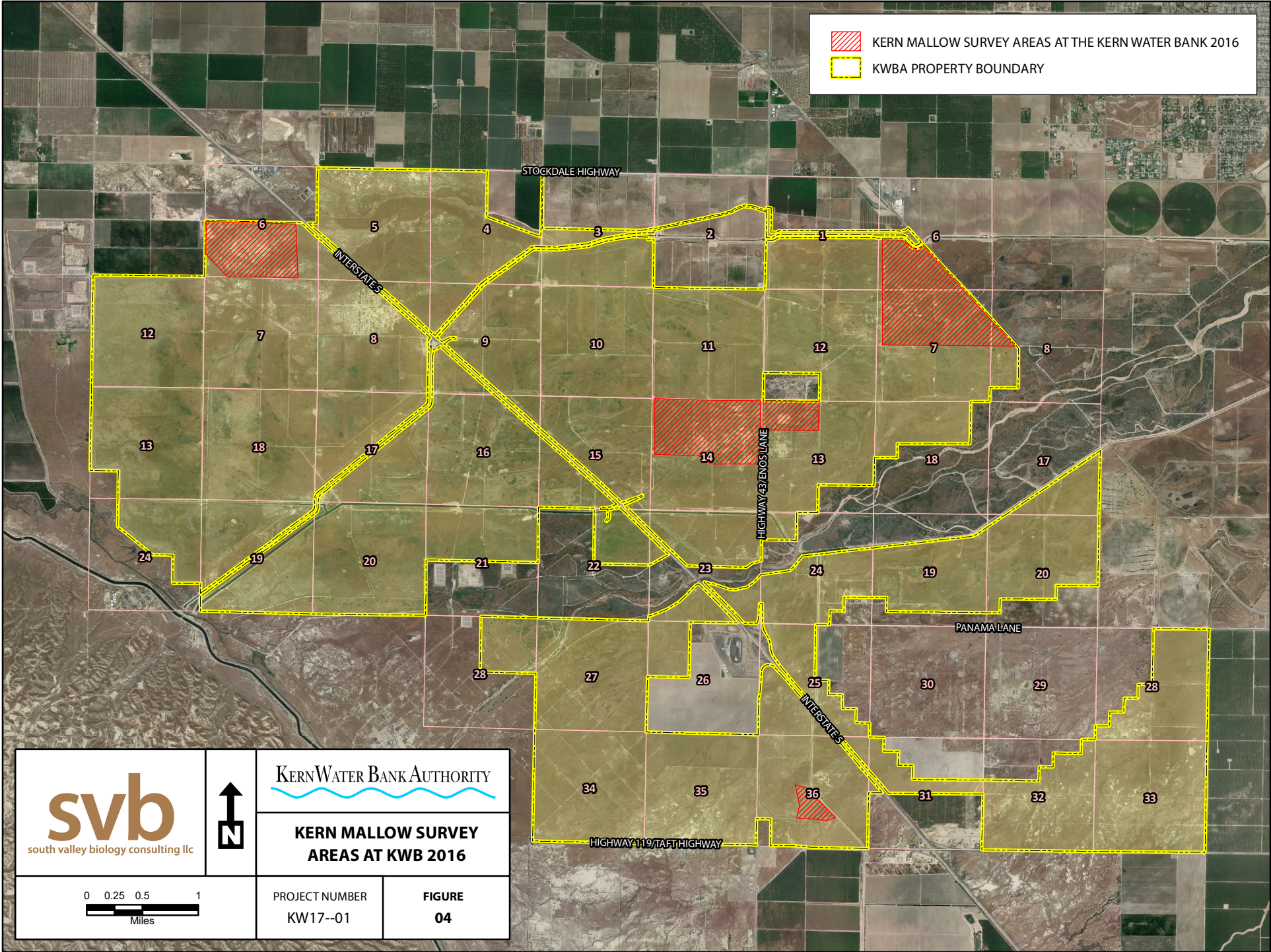


Figure 3. Results of 2016 Tipton kangaroo rat monitoring at the Kern Water Bank.

 KERN MALLOW SURVEY AREAS AT THE KERN WATER BANK 2016  
 KWBA PROPERTY BOUNDARY

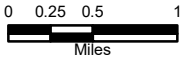


KERN WATER BANK AUTHORITY

**KERN MALLOW SURVEY  
AREAS AT KWB 2016**

PROJECT NUMBER  
KW17--01

FIGURE  
**04**



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## Appendix F

### *M. congdonii* Recommendation Report



Western Scrub-jay (*Aphelocoma californica*)

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## **Major recommendations for introduction/reintroduction of *M. congdonii* in the northern portion of its range**

- 1) At least six Conservation Units for *M. congdonii* are warranted based on microsatellite and chloroplast DNA evidence (Figures 1 and 2). These units are recommended as the first level of subdivision to consider recovery activities and boundaries for moving germplasm. The cpDNA data suggest there are distinctive lineages and/or sets of lineages in each of these units. Variation across these units accounts for approximately 25% of the genetic diversity in the taxon. Two of these units are in the northern portion of its range.
- 2) Given the genetic distinctiveness, small population sizes, and location at the edge of the species range, the Monocline and Panoche populations are a very high priority for conservation of populations and genetic diversity and, by some definitions, could be considered to represent a cryptic phylogenetic species. These northernmost populations are the only known representatives of a unique, derived cpDNA haplotype, cpMcB, and may represent divergence and adaptation that is critical for the species to survive climate change. Genetic distinctiveness of these populations is also supported by the microsatellite data; even when the inferred number of populations is two, these two populations are genetically distinct from the remaining populations (Figure 3). Additional resources required for careful population management without any potential for contaminating or swamping small populations are warranted. This may require seed bulking at a completely different site than the others and with methods that involve more investment per seed.

In addition, considerations for maintaining the cpDNA haplotype structure between these two populations is also warranted as Monocline is the only population where only the cpMcB haplotype was found (Figure 4) and leaving it that way will help ensure that lineage is maintained. Both populations are dominated by a single microsatellite allele per locus, but rare alleles are also present so it is important to collect seed from as many individuals as possible to ensure some genetic diversity in the collection. Surveys for additional populations in these areas that may represent this lineage and additional genetic diversity are recommended (although this has probably already happened).

We recommend that any seed introduction in Panoche Creek and Silver Creek watersheds should come from the Panoche populations and any introduced populations in the Ciervo Hills should come from the Monocline population.

- 3) Comparison of genetic uniqueness and richness among populations indicates that most of the smaller populations (in terms of numbers of individuals and patch size: Panoche/Monocline, Jacilitos1/2, BLM8300, BLM9100, and BLM8500) are genetically distinct but low in allelic richness and the larger populations are less distinct, but richer in allelic diversity (Figures 5 and 6). Even small populations in close proximity can be relatively distinct from each other (e.g., Figure 7 - BLM8300 and BLM8500). A pattern of high diversity between populations and low genetic diversity within populations is expected for a strongly selfing taxon. Thus, different populations and both small and large populations

should be considered for establishing new populations. In addition, small populations, even though low in genetic diversity, are valuable for conserving rare alleles and haplotype diversity.

- 4) Given that small and geographically discrete populations are important for genetic diversity on the landscape level, even when in close proximity to other populations (<0.2 mile), all introductions/reintroductions should be very careful to not displace existing populations even if small. Surveys for existing populations or considerations about possibly dormant populations are warranted even if germplasm is coming from a nearby population.
- 5) Introductions to Skunk Hollow and Anticline Ridge should probably come from seed collected at PVER given its proximity and large size. Introductions to Warathan Creek and Kreyhagen Hills should probably come from Jacilitos Creek populations. The two Jacilitos Creek populations are similar but not identical and should probably be amplified separately so that the existing differences can be used to either ensure maximum diversity for a given introduction population or to allow for keeping that diversity separate in introduced subpopulations.

For introductions on North Kettleman Dome, it makes most sense to use material in closest proximity to any introduction site, but use extreme caution that there is not an existing population nearby that represents another small but genetically divergent population. The proposed introductions between BLM 6800 and BLM 9100 are not recommended. Population BLM 8500 is not near any of the proposed introduction sites but it should be specially noted as the only population where the rare haplotype cpMcS was found, and therefore should be kept distinct.

**Fig. 1** Distribution and frequency of chloroplast haplotypes found in *Monolopia congdonii* (A-E and S) in the six proposed *M. congdonii* conservation units. A represents the ancestral haplotype (cpMcA). The other populations mapped are from Rarefind (California Natural Diversity Database 2015).

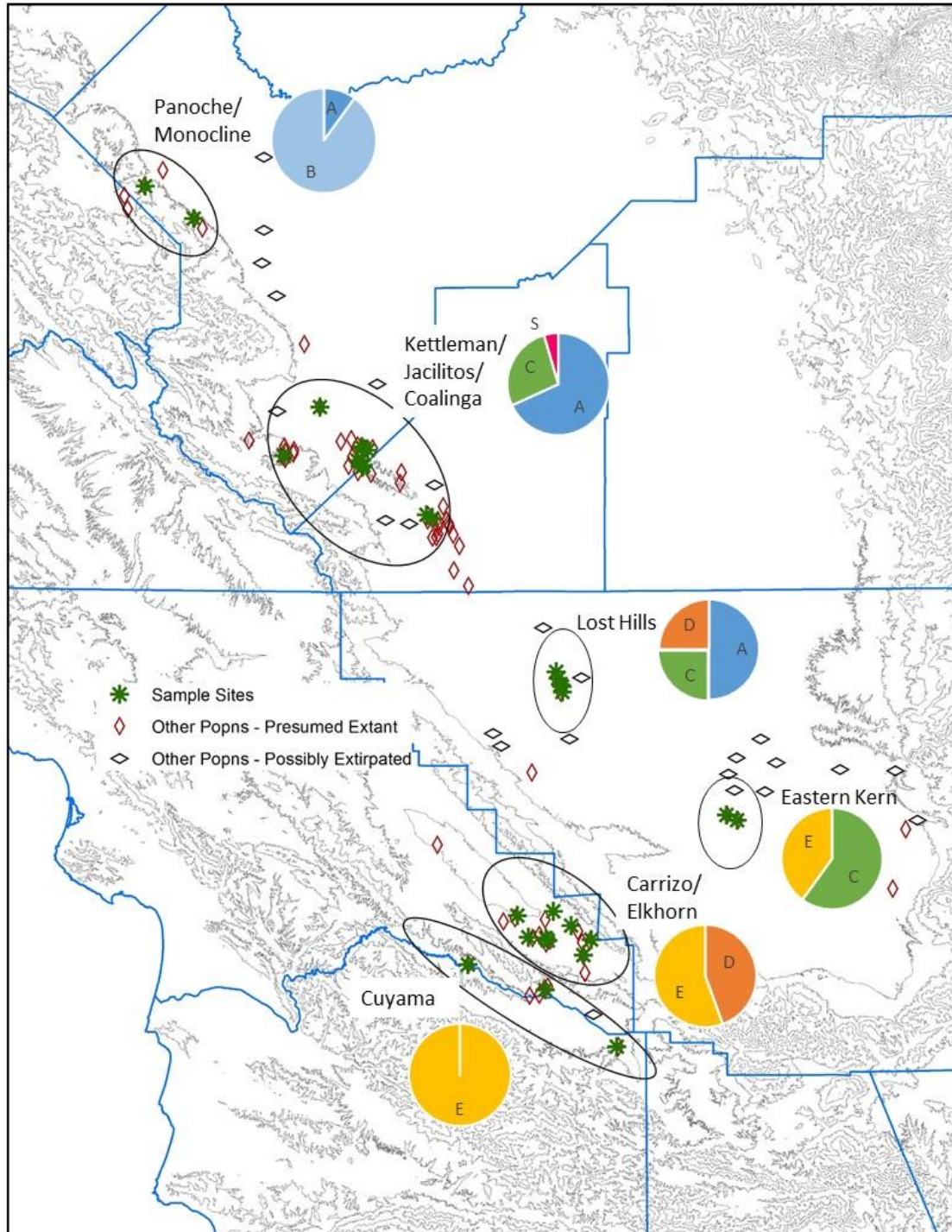


Figure 2. Principal Coordinates (PCoA) of *Monolopia congdonii* microsatellite data showing Conservation Units and concordance with cpDNA data (circles).

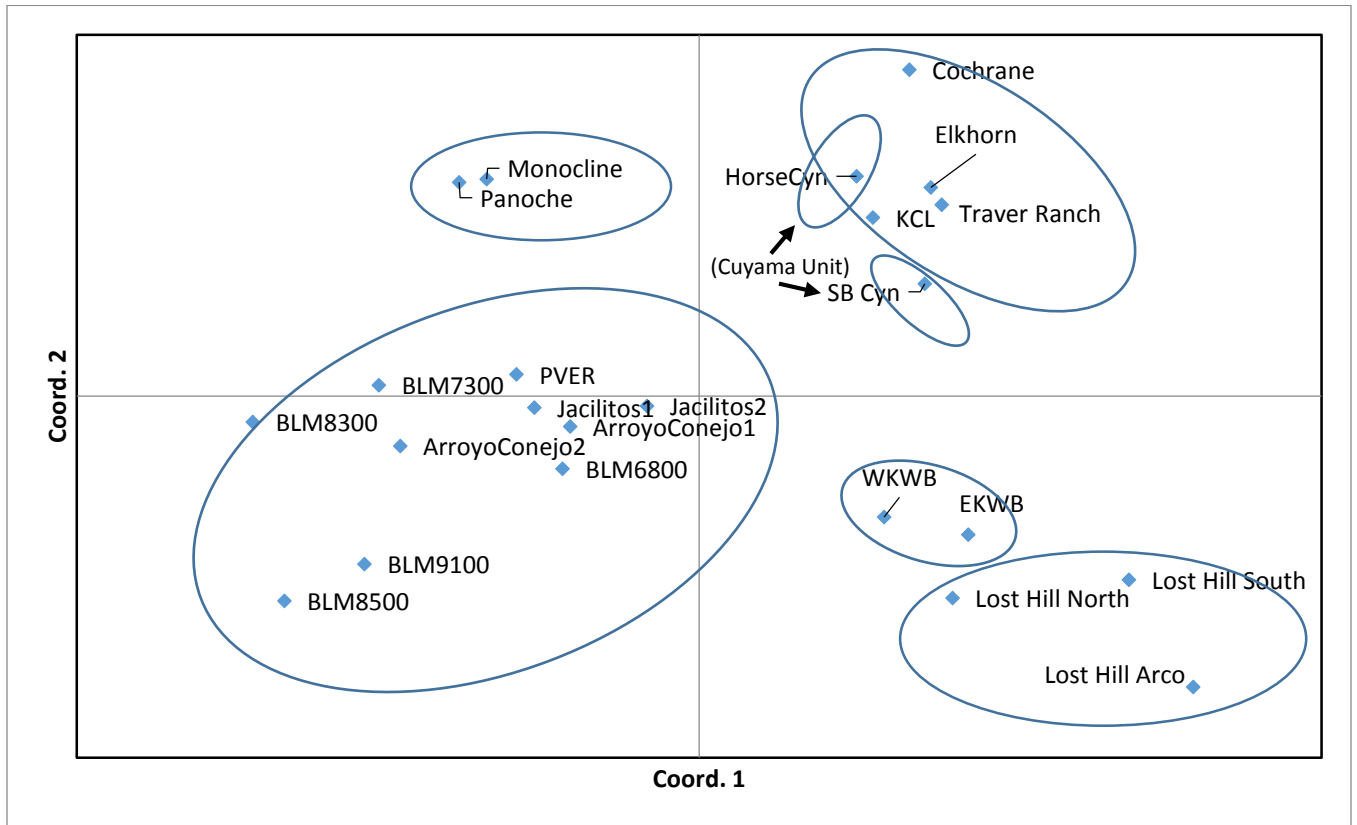
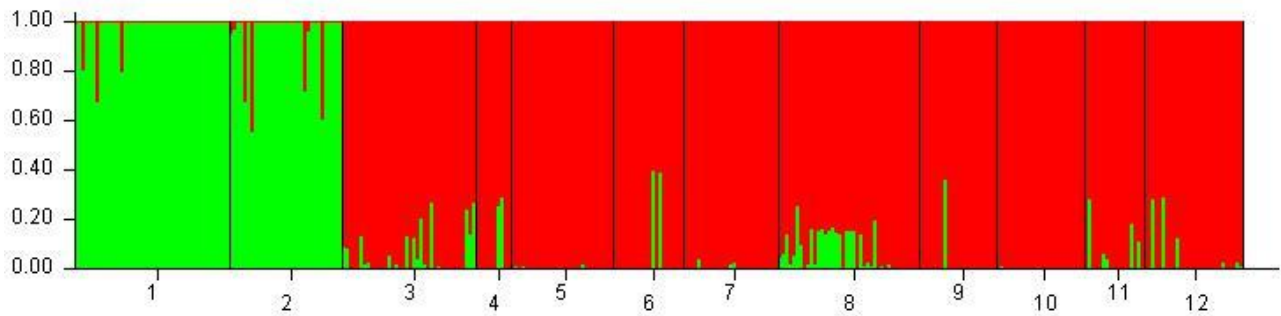


Figure 3. Diagram showing assignment of samples to populations based on microsatellite data using an inferred population size of 2. Vertical axis indicates probability of assignment of each sample to each inferred population and the numbers on the horizontal axis refers to the sampled populations. Sample populations 1 and 2 are Panoche and Monocline Ridge. The remaining sampled populations (3-12) are from PVER, Jacilitos Canyon, Kettleman Hills (North and Middle Domes).



**Fig. 4** Distribution and frequency of chloroplast haplotypes (A-C, S) within the two northern proposed *Monolopia congdonii* conservation units. S represent a haplotype similar to the single haplotype found in *M. stricta* from other parts of its range. The other populations mapped are from Rarefind (California Natural Diversity Database 2015).

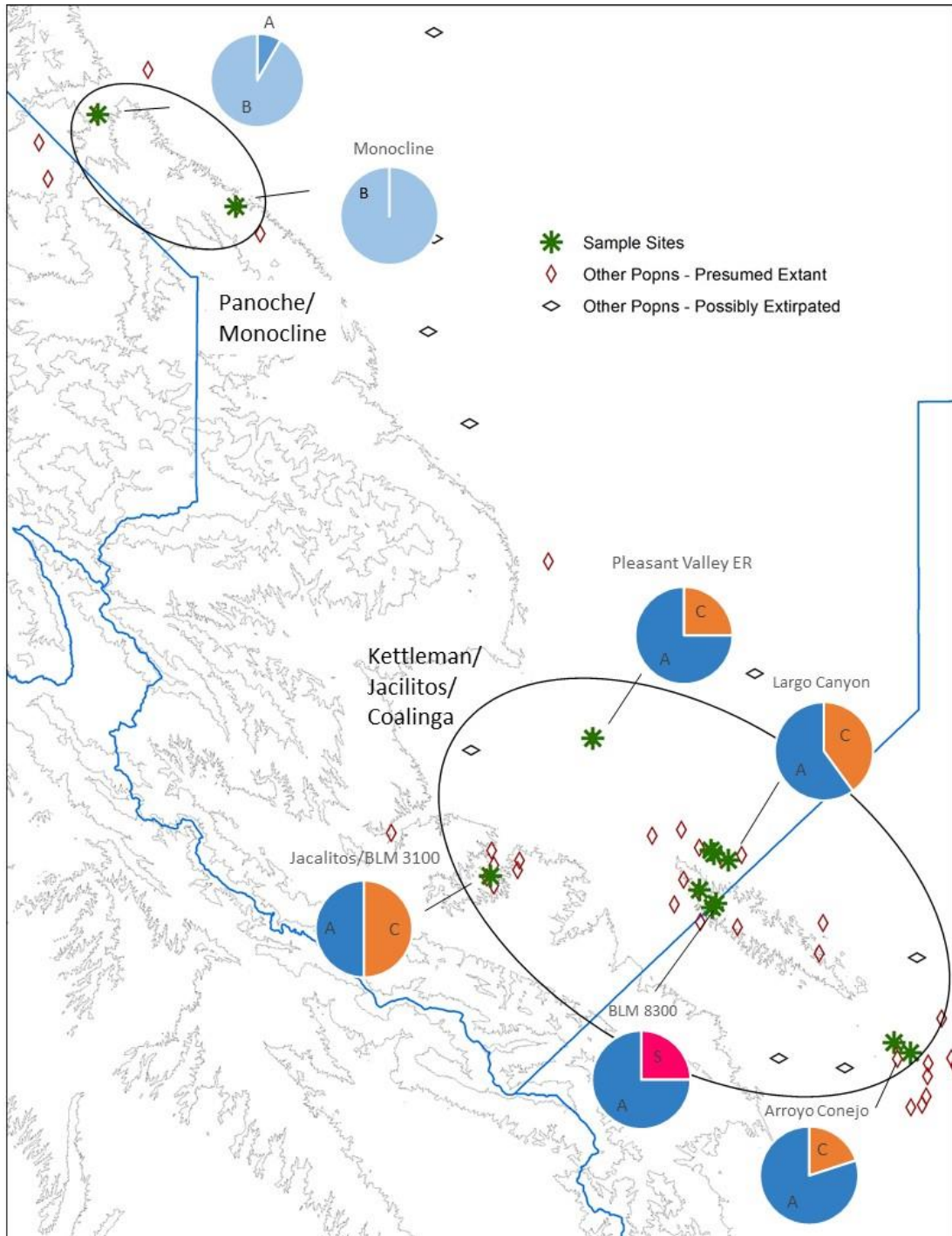


Figure 5. Principal Coordinates of the Northern Populations of *Monolopia congdonii* showing similarity among larger populations and uniqueness of smaller populations.

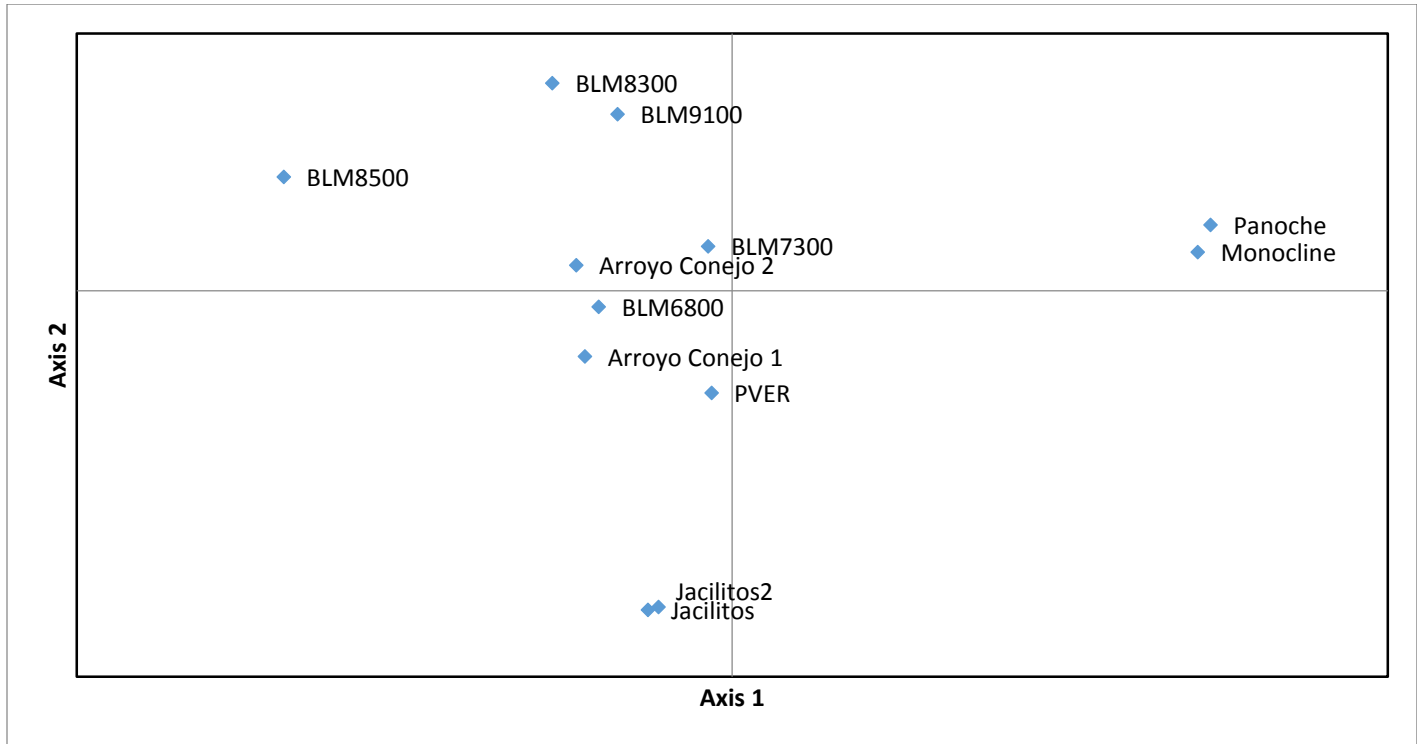


Figure 6. Relationship between allelic richness and genetic distinctiveness for the 12 northern populations sampled for microsatellite data. The relationship is identical for richness versus mean pairwise  $F_{st}$  and  $H_e$ .

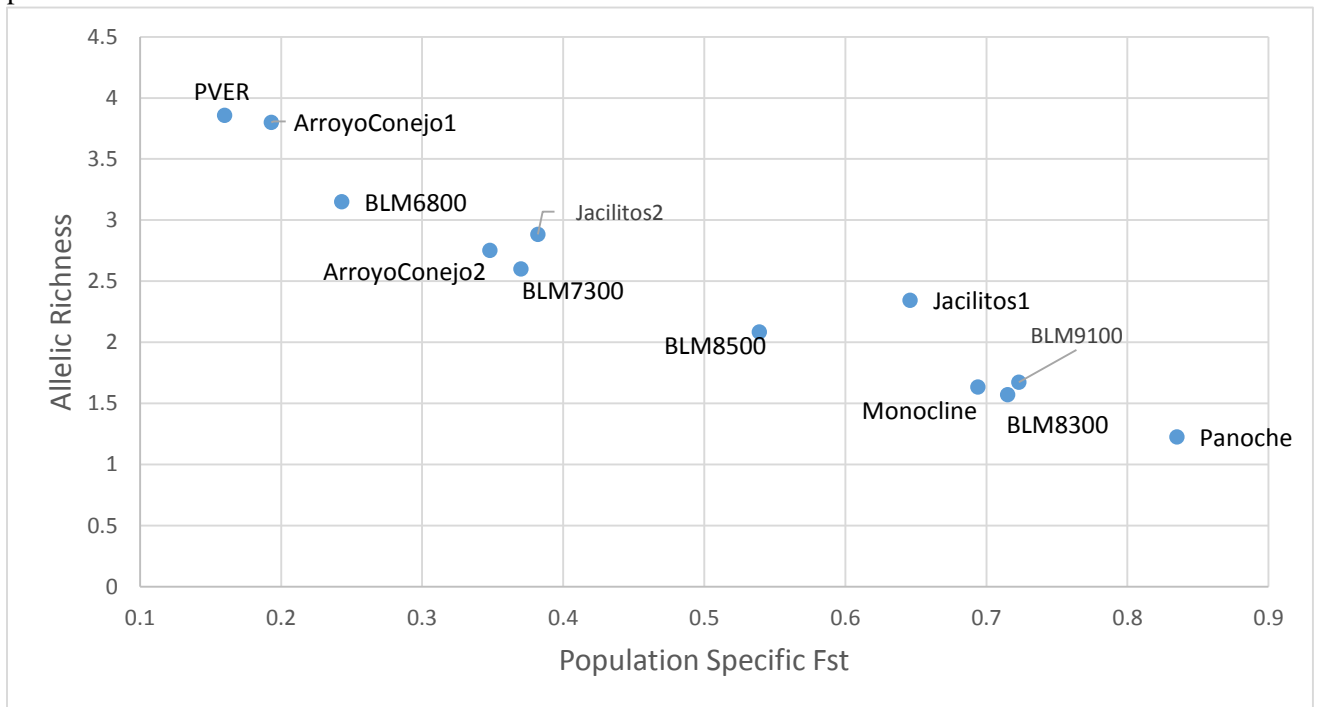




Figure 7. Genetic similarity between populations sampled in the North Kettleman Hills. The width of lines connecting populations is proportional to the genetic distance between the populations. Note the comparison between the two largest populations (BLM6800 and BLM7300) has the smallest  $F_{st}$  value despite the distance between the two populations relative to others. Also, the largest  $F_{st}$  values are generally between the smallest populations.



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## Appendix G

### Financial Statements



Flame Skimmer (*Libellula saturata*)

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# KERN WATER BANK AUTHORITY

**FINANCIAL REPORT**

**DECEMBER 31, 2016**



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NANCY C. BELTON

## INDEPENDENT AUDITOR'S REPORT

To the Board of Directors  
**Kern Water Bank Authority**  
Bakersfield, California

### ***Report on the Financial Statements***

We have audited the accompanying financial statements of Kern Water Bank Authority (the Authority) as of and for the year ended December 31, 2016, and the related notes to the financial statements, which collectively comprise the Authority's basic financial statements as listed in the table of contents.

### ***Management's Responsibility for the Financial Statements***

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### ***Auditor's Responsibility***

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### **Opinion**

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of **Kern Water Bank Authority** as of December 31, 2016, and the changes in financial position, and cash flows for the year then ended in accordance with accounting principles generally accepted in the United States of America.

### **Other Matters**

#### *Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis on pages 2 through 8 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

#### *Other Information*

The financial statements of the Authority, as of and for the year ended December 31, 2015, were audited by other auditors, whose report, dated April 5, 2016, expressed an unmodified opinion on those statements.

### **Other Reporting Required by Government Auditing Standards**

In accordance with *Government Auditing Standards*, we have also issued our report dated April 7, 2017 on our consideration of **Kern Water Bank Authority's** internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering **Kern Water Bank Authority's** internal control over financial reporting and compliance.

*Danielle Phillips Vaughan & Book*

Bakersfield, California  
April 7, 2017



## *Kern Water Bank Authority*

### *Management's Discussion and Analysis*

As management of the Kern Water Bank Authority (the Authority), we offer readers of the Authority's financial statements this narrative overview and analysis of the Authority's financial performance during the fiscal years ended December 31, 2016 and 2015. Please read it in conjunction with the Authority's financial statements, which follow this section.

The Authority is a Joint Powers Authority, established October 16, 1995, under the Joint Exercise of Powers Act. The Authority operates the Kern Water Bank, which is an area of land (approximately 20,000 acres) located in the southwest portion of the San Joaquin Valley uniquely suited for water recharge, water recovery and habitat preservation.

The Authority is a public agency, whose participants are the Kern County Water Agency, water storage districts, water districts and a mutual water company. The Authority oversees the day-to-day operations of the Kern Water Bank on behalf of the Participants.

The Authority recharges, recovers and stores water on behalf of the Participants. The Authority's governing body is a seven-member Board of Directors, comprised of Participant representatives, which includes a Chairman and a Vice-Chairman.

Participants receive water from a number of sources including the State Water Project (SWP), the Central Valley Project via the Friant-Kern Canal, and the Kern River. Participants recognized the benefit of developing the Kern Water Bank lands and constructed recharge basins, recovery wells, canals and other banking facilities on a portion of the Kern Water Bank lands while preserving the land for habitat conservation. Participants, under the Authority, utilize these banking facilities to create a more reliable water supply.

Hydrological patterns tend to be cyclical, often creating multiple years of excess water supply followed by multiple years of water supply shortage. Participants have, or acquire, water surplus to accommodate their needs in wet years and place it in storage in the Kern Water Bank for future recovery in dry years. This provides Participants with a unique water supply regulation tool.

Drought conditions during 2015 necessitated the recovery of 149,000 acre-feet of water. Although 2016 was not as dry, the Authority still had to recover approximately 26,000 acre-feet of water from January through May. There were no recovery or recharge operations for the balance of the year.

Significant precipitation in the winter of 2017 has resulted in a substantial snowpack throughout the Sierra. As a result, the Authority expects to recharge water through the spring and early summer months. Operations beyond that time are dependent upon weather conditions, and therefore, are difficult to predict.

## *Management's Discussion and Analysis*

### *Financial Highlights*

The Authority's total assets decreased by \$5 Million, or 7%, over the course of 2016, largely due to Participant reimbursements payable that were owed as of December 31, 2015, and the reduction of accounts receivable due to reduced operations throughout 2016.

The Authority's total revenues decreased from \$23.2 million to \$8.5 million because additional G&A assessments from Participants were not required in 2016 and operational revenues decreased due to a significant reduction in operations. Total expenses decreased from \$16.6 million to \$6.6 million because of lower legal fees and expenses from water recovery operations.

The Authority's long-term debt decreased by \$1.3 million from \$15.9 million to \$14.6 million. This was due to principal payments paid to the variable rate bond investors and to the State of California Department of Water Resources (DWR) of \$1,080,000 and \$274,799, respectively.

### *Overview of the Financial Statements*

This annual financial report includes this management's discussion and analysis, the independent auditor's report, the basic financial statements of the Authority and selected supplementary information. The financial statements also include notes that explain in more detail some of the information in the financial statements.

### *Required Financial Statements*

The financial statements of the Authority report information of the Authority using accounting methods similar to those used by private sector companies. These statements offer short and long-term financial information about its activities. The Statements of Net Position include all of the Authority's assets, deferred outflows of resources, liabilities and deferred inflows of resources and provides information about the nature and amounts of investments in resources (assets) and the obligations to Authority creditors (liabilities). It also provides the basis for evaluating the capital structure of the Authority and assessing the liquidity and financial flexibility of the Authority.

All of the current year's revenues and expenses are accounted for in the Statements of Revenues and Expenses. This statement can be used to determine whether the Authority has successfully recovered all of its costs through its user fees and other charges, its profitability, and its credit worthiness.

The Statements of Changes in Net Position reconciles the beginning net position balance to the ending net position balance.

The final required financial statement is the Statements of Cash Flows. This statement reports cash receipts, cash payments, and net changes in cash resulting from operations, financing, and investing activities and provides answers to such questions as where did cash come from, what was cash used for, and what was the change in the cash balance during the reporting period.

## *Management's Discussion and Analysis*

### *Financial Analysis of the Authority*

One of the most important questions asked about the Authority's finances is, "Is the Authority, as a whole, better off or worse off as a result of this year's activities?" The Statements of Net Position and the Statements of Revenues and Expenses and Changes in Net Position report information about the Authority's activities in a way that will help answer this question. These two statements report the net position of the Authority and the changes in it. One can think of the Authority's net position - the difference between assets, deferred inflows of resources, deferred outflows of resources and liabilities - as one way to measure financial health or financial position. Increases or decreases in the Authority's net position is also an indicator of whether its financial health is improving or deteriorating. However, one will need to consider other non-financial factors such as changes in economic conditions, population growth, and new or changed government legislation.

### *Net Position*

To begin our analysis, a summary of the Authority's Statements of Net Position is presented in the following table.

#### *Condensed Statements of Net Position December 31, 2016 and 2015 (000's)*

	<u>2016</u>	<u>2015</u>	<u>Dollar Change</u>	<u>Percentage Change</u>
Current Assets	\$ 4,484	\$ 11,630	\$ (7,146)	(61.44) %
Capital Assets - Net	59,395	57,632	1,763	3.06 %
Restricted Assets	1,981	1,733	248	14.31 %
Total Assets	<u>65,860</u>	<u>70,995</u>	<u>(5,135)</u>	<u>(7.23) %</u>
Deferred Outflows of Resources	<u>921</u>	<u>1,311</u>	<u>(390)</u>	<u>(29.75) %</u>
	<u>\$ 66,781</u>	<u>\$ 72,306</u>	<u>\$ (5,525)</u>	<u>(7.64) %</u>
Current Liabilities	\$ 3,677	\$ 9,392	\$ (5,715)	(60.85) %
Long-Term Debt	14,169	15,921	(1,752)	(11.00) %
Total Liabilities	<u>17,846</u>	<u>25,313</u>	<u>(7,467)</u>	<u>(29.50) %</u>
Net Investment in Capital Assets	43,863	40,355	3,508	8.69 %
Restricted	1,981	1,733	248	14.31 %
Unrestricted	3,091	4,905	(1,814)	(36.98) %
Total Net Position	<u>48,935</u>	<u>46,993</u>	<u>1,942</u>	<u>4.13 %</u>
	<u>\$ 66,781</u>	<u>\$ 72,306</u>	<u>\$ (5,525)</u>	<u>(7.64) %</u>

### *Management's Discussion and Analysis*

The decrease in current assets from the year ended 2015 to 2016 of 61.44% is largely due to Participant reimbursements payable that were owed as of December 31, 2015 and the reduction of accounts receivable owed to the Authority due to reduced operations throughout 2016, the increase in capital assets is due to offsetting investments in facilities and depreciation, and the increase in restricted assets is due to over-estimating debt service needs. The decrease in total liabilities of 29.50% is due, primarily, to reductions in accounts payable, Participant reimbursements payable, and debt service.

The following chart summarizes the Comparative Statements of Revenues, Expenses and Changes in Net Position.

#### *Condensed Statements of Revenues, Expenses and Changes in Net Position For the Years Ended December 31, 2016 and 2015 (000's)*

	<u>2016</u>	<u>2015</u>	<u>Dollar Change</u>	<u>Percentage Change</u>
Operating Revenues, Net	\$ 6,160	\$ 21,260	\$ (15,100)	(71.03) %
Non-operating Revenues	2,385	1,960	425	21.68 %
Total Revenues	<u>8,545</u>	<u>23,220</u>	<u>(14,675)</u>	<u>(63.20) %</u>
Operating Expenses	5,889	15,771	(9,882)	(62.66) %
Non-operating Expenses	714	781	(67)	(8.58) %
Total Expenses	<u>6,603</u>	<u>16,552</u>	<u>(9,949)</u>	<u>(60.11) %</u>
Change in Net Position	1,942	6,668	(4,726)	
Net Position, Beginning of Year	<u>46,993</u>	<u>40,325</u>	<u>6,668</u>	
Net Position, End of Year	<u>\$ 48,935</u>	<u>\$ 46,993</u>	<u>\$ 1,942</u>	

Operating revenues in 2016 were \$6.16 million compared to \$21.26 million in 2015. Operating expenses in 2016 of \$5.89 million represent a decrease of 63% from the 2015 expenses reported at \$15.77 million. The decrease in revenues is because no additional assessments from the Participants were required and operational revenues decreased. The decrease in expenses is due to lower legal fees and a significant reduction in operations.

## *Management's Discussion and Analysis*

### *Budgetary Highlights*

The Authority adopts an annual budget each year to project the expected coming year's administrative, land management, and general maintenance operations. The budget includes these proposed expenses and the means of financing them. The Authority's budget remains in effect the entire year. Budget-to-actual comparisons were analyzed by management throughout the year; however, it is not reported on nor shown in the financial statements section of this report.

A December 31, 2016 budget-to-actual comparison is presented in the following table:

***General and Administrative  
Budget vs. Actual Comparison  
For the Year Ended December 31, 2016  
(000's)***

	<u><i>Actual</i></u>	<u><i>Budget</i></u>	<u><i>Variance</i></u>
G&A Revenues	\$ 2,811	\$ 2,990	\$ (179)
Other G&A Revenues	93	120	(27)
Total G&A Revenues	<u>2,904</u>	<u>3,110</u>	<u>(206)</u>
G&A Expenses	<u>2,291</u>	<u>3,110</u>	<u>(819)</u>
Net Income	<u>\$ 613</u>	<u>\$ -</u>	<u>\$ 613</u>

The Authority collected both semi-annual general and administrative (G&A) assessments for the year ended December 31, 2016. The G&A revenues were under budget by \$206,000 because no conservation credit income was received in 2016. The G&A expenses are administrative expenses, such as payroll and benefits, equipment and supplies, general maintenance and legal fees. The 2016 G&A actual expenses were lower than anticipated because of lower than expected legal fees.

The Authority collects estimated fees from Participants for their recharge and recovery activity based on usage. These fees and the expenses, in addition to offsetting debt service assessments and payments, are not included in the annual G&A budget.

## *Management's Discussion and Analysis*

### *Capital Assets*

As of December 31, 2016, the Authority had invested \$80.7 million in total capital assets as shown in the following table:

*Capital Assets*  
*December 31, 2016 and 2015*  
*(000's)*

	<u>2016</u>	<u>2015</u>	<u>Dollar Change</u>	<u>Percentage Change</u>
Land	\$ 23,614	\$ 23,614	\$ -	- %
Wells - Recovery	36,073	34,931	1,142	3.27 %
Canals and Related Facilities	12,487	12,292	195	1.59 %
Earthwork - Recharge	4,178	3,293	885	26.88 %
Pumps - Recharge	533	358	175	48.88 %
Roads and Fences	972	756	216	28.57 %
Equipment	6	6	-	-
Office Equipment and Furniture	51	51	-	-
Trucks and Autos	126	126	-	-
Construction in Progress	<u>2,680</u>	<u>1,981</u>	<u>699</u>	<u>35.29 %</u>
 Total Capital Assets	 80,720	 77,408	 3,312	 4.28 %
 Less: Accumulated Depreciation	 <u>21,325</u>	 <u>19,776</u>	 <u>1,549</u>	 <u>7.83 %</u>
 Total Net Capital Assets	 <u>\$ 59,395</u>	 <u>\$ 57,632</u>	 <u>\$ 1,763</u>	 <u>3.06 %</u>

Total capital assets net of depreciation increased from \$57.6 million at December 31, 2015 to \$59.4 million at December 31, 2016. This change reflects the balance of investments in facilities and depreciation.

### *Debt Service Requirements*

Between 1999 and 2002, the Authority received a \$5 million loan from the DWR. The proceeds of this loan were used to complete a portion of the Master Plan Construction Project, and the Authority makes monthly deposits into a fiscal service agent account for semi-annual principal and interest payments. As of December 31, 2016, the outstanding principal on this loan was approximately \$1.65 million.

On November 25, 2003, the Authority received \$27 million in proceeds from the issuance of two series of variable rate demand bonds, Series 2003A (tax exempt) and Series 2003B (taxable). The proceeds from this bond issuance were designated to pay off a 1999 Bank of America loan, fund the Authority's 50% match for a DWR Proposition 13 grant to construct the River Area well and pipeline project, enhance recharge pond capacities, expand security fencing and roads, and possibly build an office facility on the Kern Water Bank property.

### ***Management's Discussion and Analysis***

As part of the bond issuance, Zions First National Bank, Trustee, established restricted cash accounts, including a \$1 million Reserve Fund. The remainder of the bond proceeds was placed, primarily, in the Project Fund to be used for the construction projects. The final requisition was drawn in 2007.

The principal amount owed on this bond issuance as of December 31, 2016 was approximately \$13 million. Principal is payable in annual installments, or mandatory redemptions, of \$1.08 million due on July 1, beginning in 2004 and ending in 2028 (maturity). Variable interest on the two series of bonds is accrued weekly and paid monthly.

On July 27, 2005, the Authority entered into an Interest Rate Master Agreement with Wells Fargo Bank, N.A. which established a fixed interest rate swap on the outstanding balance of the Series A and Series B bonds through July 1, 2023, in which the Authority pays interest at 3.86% and 4.75%, respectively, in exchange for receiving a Bond Market Association (BMA) rate and a London Interbank Offered Rate (LIBOR), respectively. Payments are made monthly.

#### ***Kern Integrated Regional Water Management Implementation Grant***

In 2014, the Kern Integrated Regional Water Management project proposal received final approval by the DWR. The Authority's portion of the project has an estimated cost of \$3 million, of which a 25% match was provided by the Authority. The Authority is the lead agency with the DWR on the project. For the year ended December 31, 2016, \$1,500,812 of grant funds had been approved by the DWR; \$1,494,113 had been received by the Authority.

#### ***Contacting the Authority's Management***

This annual financial report is designed to provide our customers and creditors with a general overview of the Authority's finances and to demonstrate the Authority's accountability for the money it receives. If you have questions about this report or need additional financial information, contact the Kern Water Bank Authority, 1620 Mill Rock Way, Suite 500, Bakersfield, CA 93311.

*Kern Water Bank Authority*

*Statements of Net Position  
December 31, 2016 and 2015*

<i>ASSETS AND DEFERRED OUTFLOWS OF RESOURCES</i>	<u>2016</u>	<u>2015</u>
<i>Current Assets</i>		
Cash and cash equivalents	\$ 3,749,367	\$ 9,360,415
Accounts receivable	720,399	2,252,176
Prepaid expenses	5,948	5,765
Interest receivable	8,778	12,003
	<u>4,484,492</u>	<u>11,630,359</u>
 <i>Capital Assets</i> , net of accumulated depreciation	 <u>59,394,556</u>	 <u>57,632,088</u>
 <i>Restricted Assets</i>	 <u>1,981,069</u>	 <u>1,732,722</u>
 <i>Total Assets</i>	 <u>65,860,117</u>	 <u>70,995,169</u>
 <i>Deferred Outflows of Resources</i>		
Deferred outflow of interest rate swap	<u>921,251</u>	<u>1,311,009</u>
	 <u>\$ 66,781,368</u>	 <u>\$ 72,306,178</u>

*See Notes to Basic Financial Statements.*



**LIABILITIES AND NET POSITION**

	<u>2016</u>	<u>2015</u>
<b><i>Current Liabilities</i></b>		
Current maturities of long-term debt	\$ 1,362,243	\$ 1,354,774
Accounts payable	415,457	2,788,604
Accounts payable, water transfers	819,282	314,428
Participant reimbursements payable	647,867	4,297,308
Advanced well replacement and refurbishment	62,390	64,148
Accounts payable - Department of Fish and Game	-	12,000
Accrued interest payable	11,146	13,001
Mitigation funds payable	358,635	547,539
	<u>3,677,020</u>	<u>9,391,802</u>
<b><i>Long-Term Liabilities</i></b>		
Long-term debt, less current maturities	13,248,518	14,610,786
Fair value of interest rate swap	921,251	1,311,009
	<u>14,169,769</u>	<u>15,921,795</u>
<b><i>Total Liabilities</i></b>	<u>17,846,789</u>	<u>25,313,597</u>
<b><i>Net Position</i></b>		
Net investment in capital assets	43,862,544	40,355,519
Restricted for debt service	1,981,069	1,732,722
Unrestricted	3,090,966	4,904,340
	<u>48,934,579</u>	<u>46,992,581</u>
	<u>\$ 66,781,368</u>	<u>\$ 72,306,178</u>

*Kern Water Bank Authority*

*Statements of Revenues and Expenses  
For the Years Ended December 31, 2016 and 2015*

	<u>2016</u>	<u>2015</u>
Operating revenues (net of participant refunds)	\$ 6,160,431	\$ 21,260,236
Operating expenses	<u>(5,889,109)</u>	<u>(15,770,706)</u>
Operating income	<u>271,322</u>	<u>5,489,530</u>
Non-operating revenues	2,384,926	1,959,653
Non-operating expenses	<u>(714,250)</u>	<u>(781,360)</u>
Non-operating income	<u>1,670,676</u>	<u>1,178,293</u>
Change in net position	<u><u>\$ 1,941,998</u></u>	<u><u>\$ 6,667,823</u></u>

*See Notes to Basic Financial Statements.*

*Kern Water Bank Authority*

*Statements of Changes in Net Position  
For the Years Ended December 31, 2016 and 2015*

<i>Balance, December 31, 2014</i>	\$ 40,324,758
Change in net position	<u>6,667,823</u>
<i>Balance, December 31, 2015</i>	46,992,581
Change in net position	<u>1,941,998</u>
<i>Balance, December 31, 2016</i>	<u><u>\$ 48,934,579</u></u>

*See Notes to Basic Financial Statements.*

*Kern Water Bank Authority*

*Statements of Cash Flows  
For the Years Ended December 31, 2016 and 2015*

	<u>2016</u>	<u>2015</u>
<b><i>Cash flows from operating activities:</i></b>		
Receipts from customers and participants	\$ 3,674,694	\$ 18,372,065
Payments to other suppliers for goods and services	(4,793,850)	(16,760,877)
Payments to employees for services	(572,882)	(505,506)
	<u>(1,692,038)</u>	<u>1,105,682</u>
<b><i>Cash flows from capital and related financing activities:</i></b>		
Payments for construction loan principal	(1,354,799)	(1,347,568)
Payments for construction of water banking facilities and capital assets	(4,337,727)	(3,086,787)
Interest paid on construction loans	(514,164)	(569,265)
Reimbursement from Participants for interest on construction loan	51,784	58,975
Reimbursement from Participants for annual bond fees	735,800	806,460
Grant payments from DWR	1,678,224	23,249
	<u>(3,740,882)</u>	<u>(4,114,936)</u>
<b><i>Cash flows from investing activities:</i></b>		
Receipt of interest	70,219	65,644
<b><i>Net decrease in cash and cash equivalents</i></b>	(5,362,701)	(2,943,610)
<b><i>Cash and cash equivalents at beginning of the year</i></b>	<u>11,093,137</u>	<u>14,036,747</u>
<b><i>Cash and cash equivalents at end of the year</i></b>	<u>\$ 5,730,436</u>	<u>\$ 11,093,137</u>

*See Notes to Basic Financial Statements.*

	<u>2016</u>	<u>2015</u>
<b><i>Reconciliation of operating income to net cash provided (used) by operating activities:</i></b>		
Operating income	\$ 271,322	\$ 5,489,530
<b><i>Adjustments to reconcile operating income to net cash provided (used) by operating activities:</i></b>		
Depreciation	1,549,768	1,456,852
Other expense	(172,406)	(165,867)
<b><i>Change in operating assets and liabilities:</i></b>		
Accounts receivable	1,354,366	(901,677)
Prepaid expenses	(183)	(159)
Accounts payable	(5,009,097)	(2,244,764)
Accounts payable, water transfers	504,854	(2,730,265)
Advanced well replacement and refurbishment	(1,758)	(15,259)
Advanced mitigation funds	(188,904)	217,291
Net cash provided (used) by operating activities	<u>\$ (1,692,038)</u>	<u>\$ 1,105,682</u>
<b><i>Reconciliation of cash and cash equivalents:</i></b>		
Unrestricted cash	\$ 3,749,367	\$ 9,360,415
Restricted cash	1,981,069	1,732,722
	<u>\$ 5,730,436</u>	<u>\$ 11,093,137</u>
<b><i>Supplemental disclosures of cash flow information:</i></b>		
<b><i>Noncash activities:</i></b>		
DWR grant revenue approved but not received	<u>\$ 6,699</u>	<u>\$ 184,111</u>
Capital assets purchased through issuance of accounts payable	<u>\$ 48,832</u>	<u>\$ 1,074,323</u>
Participant refund through issuance of accounts payable	<u>\$ 647,867</u>	<u>\$ 4,297,308</u>
Decrease in fair value of interest rate swap liability	<u>\$ 389,758</u>	<u>\$ 235,878</u>

***Kern Water Bank Authority***

***Notes to Basic Financial Statements***

***Note 1. Summary of Significant Accounting Policies***

***The reporting entity:***

In 1995, the Monterey Agreement was signed which, among other things, modified how State Water Project water supplies are allocated and how users are charged. One of the components of the Monterey Agreement was the transfer of Kern Fan Element lands from the California Department of Water Resources (DWR) to local ownership.

Kern Water Bank Authority (the Authority) was established October 16, 1995 under the Joint Exercise of Powers Act, as amended by the First Amended and Restated Joint Powers Agreement signed July 19, 1999. The Authority is a public agency comprised of the Kern County Water Agency, water storage districts, water districts, and a mutual water company (Participants). Water is stored in aquifers during times of surplus and recovered during times of shortage. The Authority oversees all day-to-day operations of these facilities. As organized, the Authority does not own the stored water, but rather, acts on behalf of the Participants.

***Kern Water Bank Authority Participants:***

The Participants and their percentage of ownership are:

Tejon-Castac Water District	2.00%
Semitropic Water Storage District	6.67%
Dudley Ridge Water District	9.62%
Kern County Water Agency	9.62%
Wheeler Ridge-Maricopa Water Storage District	24.03%
Westside Mutual Water Company	48.06%

***Management and Board of Directors:***

The Authority has a full time staff to administer the day-to-day operations. The Authority's governing body is its seven-member Board of Directors (Board), which includes a Chairman and a Vice-Chairman. The joint powers agreement directs that voting is based on each member's ownership in the Authority.

***Financial reporting:***

The Authority prepares its financial statements in accordance with the provisions of Governmental Accounting Standards Board (GASB) Statement No. 34, "Basic Financial Statements - and Management's Discussion and Analysis - for State and Local Governments." GASB Statement No. 34 established standards for external financial reporting for all state and local governmental entities, which includes a statement of net position; a statement of revenues, expenses and changes in net position; and a statement of cash flows. It requires the classification of net position into three components – net investment in capital assets, restricted components of net position, and unrestricted components of net position. These classifications are defined as follows:

### *Notes to Basic Financial Statements*

*Net investment in capital assets* - This component of net position consists of capital assets, including restricted capital assets, net of accumulated depreciation and reduced by the outstanding balances of any bonds, mortgages, notes, or other borrowings that are attributable to the acquisition, construction, or improvement of those assets. If there are significant unspent related debt proceeds at year end, the portion of the debt attributable to the unspent proceeds is not included in the calculation of investment in capital assets, net of related debt. Rather, that portion of the debt is included in the same net position component as the unspent proceeds.

*Restricted component of net position* - This component of net position consists of constraints placed on net position use through external constraints imposed by creditors (such as through debt covenants), grantors, contributors, or laws or regulations of other governments or constraints imposed by the law through constitutional provisions or enabling legislation.

*Unrestricted component of net position* - This component of net position consists of net position that does not meet the definition of "restricted" or "net investment in capital assets."

The Authority reports its interest rate swap in accordance with the provisions of GASB Statement No. 53, "Accounting and Financial Reporting for Derivative Instruments," which addresses the recognition, measurement, and disclosure of information regarding derivative instruments entered into by state and local governments. It requires governments to measure derivative instruments, which include interest rate swaps, at fair value.

The Authority has adopted the provisions of GASB Statement No. 62, "Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements," as amended by GASB Statement No. 66, "Technical Corrections--2012--An Amendment Of GASB Statements No. 10 and No. 62." GASB Statement No. 62 incorporates into the GASB's authoritative literature certain accounting and financial reporting guidance that is included in the following pronouncements issued on or before November 30, 1989, which does not conflict with or contradict GASB pronouncements: Financial Accounting Standards Board Statements and Interpretations, Accounting Principles Board Opinions and Accounting Research Bulletins of the American Institute of Certified Public Accountants' Committee on Accounting Procedure. The adoption of GASB Statement No. 62 does not have any impact on the Authority's financial statements.

The Authority has adopted the provisions of GASB Statement No. 63, "Financial Reporting of Deferred Outflows of Resources, Deferred Inflows of Resources, and Net Position." GASB Statement No. 63 provides guidance for reporting deferred outflows of resources, deferred inflows of resources and net position in a statement of financial position and related disclosures. The statement of net assets is renamed the statement of net position and includes four components: assets, deferred outflows of resources, liabilities, and deferred inflows of resources.

### ***Notes to Basic Financial Statements***

The Authority has adopted the provisions of GASB Statement No. 65, "Items Previously Reported as Assets and Liabilities." GASB Statement No. 65 establishes accounting and financial reporting standards to either (a) properly classify certain items that were previously reported as assets and liabilities as deferred outflows of resources or deferred inflows of resources or (b) recognize certain items that were previously reported as assets and liabilities as outflows of resources (expenses) or inflows of resources (revenues).

The Authority has adopted the provisions of GASB Statement No. 72, "Fair Value Measurement and Application." GASB Statement No. 72 improves financial reporting by clarifying the definition of fair value for financial reporting purposes, establishing general principles for measuring fair value, providing additional fair value application guidance, and enhancing disclosures about fair value measurements. The adoption of GASB Statement No. 72 does not have any impact on the Authority's financial statements.

#### ***Fund accounting:***

The Authority utilizes a proprietary enterprise fund category to account for its activities. Enterprise funds are used to account for operations (a) that are financed and operated in a manner similar to private business enterprises - where the intent of the governing body is that the costs (expenses, including depreciation) of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges or (b) where the governing body has decided that periodic determination of revenues earned, expenses incurred, and/or net income is appropriate for capital maintenance, public policy, management control, accountability or other purposes. Other items not properly included among operating revenues are reported as non-operating revenues. All assets and liabilities associated with an enterprise fund's activities are included on its statement of net position.

#### ***Basis of accounting:***

The accompanying financial statements are reported using the economic resource measurement focus and the accrual basis of accounting. Revenues are recognized when earned and expenses are recognized when a liability is incurred regardless of the timing of related cash flows.

#### ***Use of estimates:***

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reporting of assets and liabilities and revenue and expenses in the financial statements and accompanying notes. Actual results could differ from those estimates.



## *Notes to Basic Financial Statements*

### ***Retirement plan:***

Employees of the Authority may participate in the 457 deferred compensation plan, and employees with at least one year of service are eligible for the 401(a) employer match program. Maximum annual contributions to the 457 plan, as established by the Internal Revenue Service, was \$18,000 for both years ended 2016 and 2015. The employer match by the Authority is 100% of the employee's annual deferred compensation, up to 6% of the employee's annual salary. Subject to eligibility requirements, employees are vested in the 401(a) employer match contribution at 25% per year of employment, whereby they are fully vested at the end of the fourth year of employment. For the years ended 2016 and 2015, the plan expense was \$29,010 and \$22,256, respectively.

### ***Capital assets and depreciation:***

The straight-line method has been used to determine depreciation based on the following estimated useful lives:

	<u>Years</u>
Wells - recovery	39
Canals and related facilities	20-50
Earthwork - recharge	20-50
Pumps - recharge	20-25
Roads and fences	10-50
Equipment	7
Office equipment and furniture	5
Trucks/autos	5

Capital assets are capitalized at cost and updated for additions and retirements during the year. The Authority maintains a capitalization threshold of \$10,000. Maintenance and repairs of capital assets that do not add to the value of the asset or materially extend the asset's life are charged to operations; major improvements are capitalized. Upon retirement, sale or other disposition of capital assets, the cost and accumulated depreciation are eliminated from the accounts, and the gain or loss is included in operations.

### ***Deposits and investments:***

#### ***Cash and cash equivalents***

For purposes of reporting cash flows, the Authority considers highly liquid investments (including restricted assets) with an original maturity of three months or less when purchased to be cash equivalents. The Authority utilizes a financial institution to service bonded debt as principal and interest payments come due. The balances in these accounts are presented on the financial statements as "Restricted Assets". Cash and cash equivalents also include cash on hand and amounts deposited with banks and the County of Kern's (the County) investment pool money fund. Investments are reported at fair value, which is based on quoted market prices.

*Notes to Basic Financial Statements*

***Cash deposits***

The Authority has adopted GASB Statement No. 40, "Deposit and Investment Risk Disclosures - an amendment of GASB Statement No. 3." This statement addresses common deposit and investment risks related to credit risk, concentration of credit risk, interest rate risk and foreign currency risk. As an element of interest rate risk, this statement requires certain disclosures of investments that have fair values that are highly sensitive to changes in interest rates. Deposit policies related to the risks identified in this statement also are required to be disclosed.

The Authority's cash deposits at December 31, 2016 and 2015 were either entirely insured by appropriate federal depository insurance, partially insured up to the federal limit and the remainder collateralized, or fully collateralized with collateral held by the pledging financial institution's trust department or agent in the Authority's name in accordance with provisions of the California Government Code. The carrying amount and bank balance of the Authority's deposits at December 31, 2016 and 2015 are as follows:

	<i>2016</i>		<i>2015</i>	
	<i>Carrying Amount</i>	<i>Bank Balance</i>	<i>Carrying Amount</i>	<i>Bank Balance</i>
Insured	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
Uninsured and collateralized with securities held by the pledging financial institution	1,797,986	1,842,040	1,852,400	1,943,055
County of Kern's investment pool	3,682,450	3,732,426	8,990,737	9,040,737
	\$ 5,730,436	\$ 5,824,466	\$ 11,093,137	\$ 11,233,792

Cash funds deposited with the County are in a pooled money fund. Funds are pooled with other agencies in the County. Investments are made in accordance with California Government Code Section 53635.

Pooled funds may be invested in: (1) direct obligations of the United States government, the payment of which the full faith and credit of the United States government is pledged, (2) certificates of deposit at savings and loan associations and federally insured banks when secured by acceptable collateral, and (3) savings accounts at savings and loan associations and banks, to the extent fully insured.

## *Notes to Basic Financial Statements*

### *Cash flows*

GASB Statement No. 9, "Reporting Cash Flows of Proprietary and Nonexpendable Trust Funds and Governmental Entities That Use Proprietary Fund Accounting" states, for all purposes of preparing the statement of cash flows, all transactions not classified as capital and related financing activities or investing activities are classified as operating activities. The adjustments to reconcile operating income (loss) to net cash provided by (used in) operating activities include other income (expense) which consists of unrestricted non-operating revenues and expenses.

### *Water banking revenue and assessments:*

#### *Water banking revenue*

Water banking revenue to cover the costs of recharging and recovering water is received from the Participants. The amount charged per acre-foot recharged or recovered is set after considering actual cost incurred in the most recent year for recharge and recovery operations. Any revenue collected in excess of actual expenses is refunded to the Participants in the following year. If the amount collected is less than the recharge and recovery expenses incurred by the Authority, the Participants will be billed for their proportionate share of the shortage.

In 1999, the Authority began billing the Participants capital fees for their recharge and recovery use of the facilities. These fees are distributed annually to the Participants based on their ownership shares in the Authority.

#### *General administrative assessment revenue*

Assessments for general and administrative, general maintenance, and land management expenses are collected from the Participants. The amount of the assessment is determined by the Board based on the operating budget and the amount of cash that is available. Each Participant pays its proportionate share of the operating assessments based on ownership shares. For the years ended 2016 and 2015, the Authority recorded general administrative assessment revenue of \$2,750,000 and \$7,750,000, respectively.

### *Note 2. Capital Assets*

Capital assets consist of land and the accumulated costs to build the ponds, basins, and roads used for collection and storage of the water; wells used for recovery of the water; canals, pump station, pipelines, pumps, and equipment used for transportation of the water; and office equipment and furniture.

*Notes to Basic Financial Statements*

Title transfer of assets from the DWR to the Authority was completed on August 9, 1996. Upon the exchange of water entitlements by the Participants to the DWR, reflected as contribution of capital in the amount of \$27,858,500 by the respective Participants, the Participants received Kern Fan Element lands and 42,830 acre-feet of banked water. The 42,830 acre-feet of water was subsequently transferred to each of the Participants in proportion to their ownership shares in the Authority.

The following is a summary of changes in the Authority's capital assets for the years ended December 31, 2016 and 2015:

*Notes to Basic Financial Statements*

<i>Assets</i>				
	<u><i>Balance</i></u> <u><i>12/31/15</i></u>	<u><i>Additions</i></u>	<u><i>Transfers/ Retirements</i></u>	<u><i>Balance</i></u> <u><i>12/31/16</i></u>
Land	\$ 23,613,500	\$ -	\$ -	\$ 23,613,500
Wells-recovery	34,930,701	767,813	373,937	36,072,451
Canals and related facilities	12,291,526	132,048	63,692	12,487,266
Earthwork – recharge	3,293,074	806,757	78,525	4,178,356
Pumps – recharge	358,153	174,952	-	533,105
Roads and fences	756,149	215,274	-	971,423
Equipment	6,235	-	-	6,235
Office equipment and furniture	51,027	-	-	51,027
Trucks/autos	126,262	-	-	126,262
Construction in progress	1,980,990	1,215,392	(516,154)	2,680,228
	<u>\$ 77,407,617</u>	<u>\$ 3,312,236</u>	<u>\$ -</u>	<u>\$ 80,719,853</u>
 <i>Accumulated Depreciation</i>				
	<u><i>Balance</i></u> <u><i>12/31/15</i></u>	<u><i>Expense</i></u>	<u><i>Transfers/ Retirements</i></u>	<u><i>Balance</i></u> <u><i>12/31/16</i></u>
Wells-recovery	\$ 11,492,589	\$ 914,575	\$ -	\$ 12,407,164
Canals and related facilities	6,432,741	456,360	-	6,889,101
Earthwork – recharge	1,160,616	77,844	-	1,238,460
Pumps – recharge	207,303	16,507	-	223,810
Roads and fences	333,047	73,713	-	406,760
Equipment	6,235	-	-	6,235
Office equipment and furniture	45,729	2,051	-	47,780
Trucks/autos	97,269	8,718	-	105,987
	<u>\$ 19,775,529</u>	<u>\$ 1,549,768</u>	<u>\$ -</u>	<u>\$ 21,325,297</u>

*Notes to Basic Financial Statements*

*Assets*

	<i>Balance 12/31/14</i>	<i>Additions</i>	<i>Transfers/ Retirements</i>	<i>Balance 12/31/15</i>
Land	\$ 23,613,500	\$ -	\$ -	\$ 23,613,500
Wells-recovery	33,212,523	1,718,178	-	34,930,701
Canals and related facilities	12,086,593	12,296	192,637	12,291,526
Earthwork – recharge	3,174,279	118,795	-	3,293,074
Pumps – recharge	358,153	-	-	358,153
Roads and fences	638,061	118,088	-	756,149
Equipment	6,235	-	-	6,235
Office equipment and furniture	51,027	-	-	51,027
Trucks/autos	126,262	-	-	126,262
Construction in progress	256,412	1,917,215	(192,637)	1,980,990
	<u>\$ 73,523,045</u>	<u>\$ 3,884,572</u>	<u>\$ -</u>	<u>\$ 77,407,617</u>

*Accumulated Depreciation*

	<i>Balance 12/31/14</i>	<i>Expense</i>	<i>Transfers/ Retirements</i>	<i>Balance 12/31/15</i>
Wells-recovery	\$ 10,625,575	\$ 867,014	\$ -	\$ 11,492,589
Canals and related facilities	5,983,463	449,278	-	6,432,741
Earthwork – recharge	1,095,250	65,366	-	1,160,616
Pumps – recharge	192,381	14,922	-	207,303
Roads and fences	290,524	42,523	-	333,047
Equipment	6,235	-	-	6,235
Office equipment and furniture	43,678	2,051	-	45,729
Trucks/autos	81,571	15,698	-	97,269
	<u>\$ 18,318,677</u>	<u>\$ 1,456,852</u>	<u>\$ -</u>	<u>\$ 19,775,529</u>

*Notes to Basic Financial Statements*

**Note 3. Restricted Assets**

Restricted assets are cash and cash equivalents whose use is limited by legal requirements.

***Restricted cash:***

As part of the Authority's 2000 loan agreement with the DWR, the Authority executed a Fiscal Services Agent Agreement with Bank of America to collect monthly deposits for the semi-annual principal and interest payments to DWR. The Authority also agreed to accumulate a Reserve Fund equal to at least two semi-annual payments within the first ten years of the repayment period. In 2015, Bank of America discontinued offering Fiscal Services Agent services for clients. When Zions First National Bank agreed to perform the services, the cash was transferred to accounts at that bank.

As part of the Authority's 2003 Bond Indenture for two series of variable rate demand bonds, the Authority agreed to maintain a debt service reserve of \$1,000,000 with the bond trustee, Zions First National Bank. This reserve was funded as part of the bond closing in November 2003.

The following schedule summarizes the restricted assets at December 31, 2016 and 2015:

	<u>2016</u>	<u>2015</u>
Cash, Wells Fargo Bank - debt retirement	\$ 540,618	\$ 289,956
Cash, Zions First National Bank - debt retirement	7,056	6,927
Cash, Zions First National Bank - reserve fund	1,000,000	1,000,000
Cash, Zions First National Bank – debt retirement	108,348	110,834
Cash, Zions First National Bank – reserve	<u>325,047</u>	<u>325,005</u>
	<u>\$ 1,981,069</u>	<u>\$ 1,732,722</u>

*Notes to Basic Financial Statements*

**Note 4. Loans for Master Plan**

***DWR Proposition 204 Construction Loan:***

In March 2000, the Authority and the DWR executed a contract for a \$5,000,000 “Groundwater Recharge Construction Loan under the Safe, Clean, Reliable Water Supply Act.”

After all conditions were met, the DWR began disbursing the loan commitment to the Authority in 2001. At December 31, 2002, the DWR had advanced the full loan commitment to the Authority. In 2016 and 2015, interest expense on the loan principal balance was \$48,329 and \$55,603, respectively.

The interest rate is 2.7% per annum on the unpaid balance, and the DWR bills the Authority’s Fiscal Services Agent, Zions First National Bank, for semi-annual principal and interest payments until the principal is repaid. Principal repayment commenced upon completion of the initial project and will continue at semi-annual intervals for a period not to exceed 20 years.

***Variable Rate Demand Revenue Bonds - Series “A” and “B”:***

On November 25, 2003, the Authority issued Series 2003A (tax exempt) and Series 2003B (taxable) variable rate demand revenue bonds, pursuant to an Indenture of Trust dated November 1, 2003 between the Authority and Zions First National Bank, as Trustee. The 2003 Bonds were identified in the Official Statement as:

A. Series 2003A	\$10,800,000 – CUSIP: 492291 AA7
B. Series 2003B	\$16,200,000 – CUSIP: 492291 AB5

The 2003 Bonds were issued to provide funds to (a) prepay in full the principal amount owed by the Authority to Bank of America under the 1999 Loan Agreement; (b) finance certain capital expenditures of the Authority; (c) fund a \$1,000,000 Reserve Fund; (d) fund a deposit to the Interest Fund to pay capitalized interest on the bonds; and (e) pay costs of issuance. The bonds will mature in 2028.

The Indenture of Trust, executed by the Authority and Zions First National Bank, as Trustee, documented that the Trustee received \$27,870,412 on the date of closing as the aggregate purchase price of the bonds, including \$1,000,000 relating to repayment of the Bank of America loan. The Trustee transferred \$19,000,000 as repayment of the principal for the Bank of America loan, and the remaining proceeds were deposited by the Trustee as follows:

Project Fund	\$ 6,166,332
Reserve Fund	\$ 1,000,000
Costs of Issuance Fund	\$ 704,080
Interest Fund	\$ 1,000,000



*Notes to Basic Financial Statements*

The bonds bear interest at variable rates determined weekly which is paid semi-annually to the Trustee for the benefit of the bond holders. The Participants are assessed semi-annually for their proportionate share of the interest due to bond holders. Interest expense for the years ended December 31, 2016 and 2015 was \$463,979 and \$511,851, respectively. The interest rates in effect as of December 31, 2016 and 2015 for Series 2003A (tax exempt) bonds were 0.64% and 0.01%, respectively. The interest rates in effect as of December 31, 2016 and 2015 for Series 2003B (taxable) bonds were 0.70% and 0.33%, respectively.

On July 27, 2005, the Authority entered into an Interest Rate Master Agreement with Wells Fargo Bank, N.A. which established a fixed interest rate swap on the outstanding balance of the Series A and Series B bonds through July 1, 2023 at 3.86% and 4.75%, respectively. These rates were used to calculate the interest rate swap, net in the "Summary of long-term debt" schedule of this note. Also, see Note 5 regarding derivatives.

Equal portions of the bonds are subject to mandatory redemption annually, on July 1, until they reach maturity in 2028. The bonds are selected by lot and are redeemed by Authority revenues at a redemption price equal to the principal amount to be redeemed. The annual redemption amount for Series 2003A (tax exempt) and Series 2003B (taxable) bonds is \$432,000 and \$648,000, respectively.

While the bonds are outstanding, the Authority is required, with certain exceptions, to maintain a Letter of Credit, currently provided by Wells Fargo Bank, or alternate credit facility to provide security and/or liquidity. The Wells Fargo Letter of Credit (LOC) was issued for \$27,434,959. The LOC is automatically extended every year on November 1 unless notice is given by Wells Fargo Bank to the contrary. The Authority is required to meet certain loan covenants. At December 31, 2016, the Authority was in compliance with these covenants.

***Summary of long-term liabilities:***

The following summarizes long-term liabilities transactions for the years ended December 31, 2016 and 2015:

	<i>Payable</i> <i>12/31/15</i>	<i>Additions</i>	<i>Deletions</i>	<i>Payable</i> <i>12/31/16</i>	<i>Amount Due</i> <i>Within One</i> <i>Year</i>
Bond principal	\$ 14,040,000	\$ -	\$ (1,080,000)	\$ 12,960,000	\$ 1,080,000
Loan, DWR	1,925,560	-	(274,799)	1,650,761	282,243
Fair value of interest rate swap	1,311,009	-	(389,758)	921,251	-
	<u>\$ 17,276,569</u>	<u>\$ -</u>	<u>\$ (1,744,557)</u>	<u>\$ 15,532,012</u>	<u>\$ 1,362,243</u>

*Notes to Basic Financial Statements*

	<i>Payable 12/31/14</i>	<i>Additions</i>	<i>Deletions</i>	<i>Payable 12/31/15</i>	<i>Amount Due Within One Year</i>
Bond principal	\$ 15,120,000	\$ -	\$ (1,080,000)	\$ 14,040,000	\$ 1,080,000
Loan, DWR	2,293,128	-	(267,568)	1,925,560	274,774
Fair value of interest rate swap	1,546,887	-	(235,878)	1,311,009	-
	<u>\$ 18,860,015</u>	<u>\$ -</u>	<u>\$ (1,583,446)</u>	<u>\$ 17,276,569</u>	<u>\$ 1,354,774</u>

The annual requirements to amortize all debt outstanding as of December 31, 2016 are as follows:

<i>Years Ending December 31,</i>	<i>Principal</i>	<i>Interest</i>	<i>Interest Rate Swap, net</i>	<i>Total Debt Service</i>
2017	\$ 1,362,243	\$ 126,155	\$ 326,020	\$ 1,814,418
2018	1,369,915	111,226	275,863	1,757,004
2019	1,377,796	96,087	225,706	1,699,589
2020	1,385,890	80,735	175,549	1,642,174
2021	1,394,205	65,163	125,392	1,584,760
2022-2026	5,560,712	165,473	100,314	5,826,499
2027-2028	2,160,000	14,515	-	2,174,515
	<u>\$ 14,610,761</u>	<u>\$ 659,354</u>	<u>\$ 1,228,844</u>	<u>\$ 16,498,959</u>

*Notes to Basic Financial Statements*

**Note 5. Derivatives**

The Authority accounts for derivatives under GASB Statement No. 53. The objectives and terms of the Authority's hedging derivative instruments outstanding at December 31, 2016 are listed below:

<u>Type</u>	<u>Objective</u>	<u>Notional Amount</u>	<u>Effective Date</u>	<u>Maturity Date</u>	<u>Terms</u>	<u>Fair Value</u>
Pay-fixed interest rate swap	Hedge of changes in interest rates of the Series 2003A Bonds	\$ 3,780,000	8/1/2005	7/1/2023	Pay 3.86%, receive BMA	\$ (319,277)
Pay-fixed interest rate swap	Hedge of changes in interest rates of the Series 2003B Bonds	\$ 5,670,000	8/1/2005	7/1/2023	Pay 4.75%, receive LIBOR	<u>(601,974)</u>
						<u>\$ (921,251)</u>

The objectives and terms of the Authority's hedging derivative instruments outstanding at December 31, 2015 are listed below:

<u>Type</u>	<u>Objective</u>	<u>Notional Amount</u>	<u>Effective Date</u>	<u>Maturity Date</u>	<u>Terms</u>	<u>Fair Value</u>
Pay-fixed interest rate swap	Hedge of changes in interest rates of the Series 2003A Bonds	\$ 4,320,000	8/1/2005	7/1/2023	Pay 3.86%, receive BMA	\$ (483,491)
Pay-fixed interest rate swap	Hedge of changes in interest rates of the Series 2003B Bonds	\$ 6,480,000	8/1/2005	7/1/2023	Pay 4.75%, receive LIBOR	<u>(827,518)</u>
						<u>\$ (1,311,009)</u>

### *Notes to Basic Financial Statements*

The fair values of the interest rate swaps were estimated using the zero-coupon method. This method calculates the future net settlement payments required by the swap, assuming that the current forward rates implied by the yield curve correctly anticipate future spot interest rates. These payments are then discounted using the spot rates implied by the current yield curve for hypothetical zero-coupon bonds due on the date of each future net settlement on the swaps. The above swaps were classified as deferred outflows of resources on the statements of net position. The total change in fair value for the years ended December 31, 2016 and 2015 was \$(389,758) and \$(235,878), respectively. The balance at December 31, 2016 and 2015 was \$921,251 and \$1,311,009, respectively.

#### ***Risks:***

*Credit Risk* - Credit risk is the risk that Wells Fargo Bank cannot fulfill the terms and obligations specified in the swap agreements. Because the swaps had a negative fair value as of December 31, 2016 and 2015, the Authority did not have exposure related to credit risk on its swaps with Wells Fargo Bank. However, the Authority would have exposure related to credit risk in the amount of the swaps' positive fair value if interest rates increased to cause the fair value of the swaps to become positive. The credit ratings of Wells Fargo Bank are AA- and Aa2 by Standard and Poor's and Moody's Investors Service, respectively.

*Basis Risk* - The Authority is exposed to basis risk on its pay-fixed interest rate swaps because the variable rate payments received are based on an index other than the interest rates the Authority pays on its Series 2003A and 2003B revenue bonds. As of December 31, 2016, the weighted average interest rate on the Authority's hedged variable rate bonds was 0.64% and 0.70 %, respectively, while the Bond Market Association (BMA) rate was 0.67% and London Interbank Offered Rate (LIBOR) was 0.70%. As of December 31, 2015, the weighted average interest rate on the Authority's hedged variable rate bonds was 0.01% and 0.33%, respectively, while the BMA rate was 0.01% and LIBOR was 0.42%.

*Termination Risk* - Neither party may terminate the transaction prior to its maturity date, unless the Authority or Wells Fargo Bank fails to make any payment when due or otherwise fails to perform any of its obligations with respect to the swap agreement. The non-defaulting party may terminate the swap agreement. If at the time of termination, a derivative instrument is in a liability position, the Authority would be liable to Wells Fargo Bank for a payment equal to the liability, plus interest.

*Notes to Basic Financial Statements*

**Note 6. Self-Insurance**

The Authority is a member of the Association of California Water Agencies, Joint Powers Insurance Authority (JPIA). JPIA is a group of California Water Districts who have pooled funds to provide self-insurance coverage as follows:

<u>Type of Coverage</u>	<u>Limits per Occurrence</u>	
	<u>Self-Insurance</u>	<u>Excess Insurance</u>
General, automobile and public officials liability	\$ 5,000,000	\$ 171,000,000
Buildings, fixed equipment, personal property and licensed vehicles	\$ 100,000	\$ 150,000,000
Fidelity coverage	\$ 100,000	\$ -
Workers' Compensation	\$ 2,000,000	\$ 2,000,000

The Authority is in a group that has a \$2,500 retention level (deductible) per occurrence for property damage due to theft and natural causes. Property includes buildings, personal property, fixed equipment, mobile equipment, licensed vehicles, and turbine generators and transformers. For mechanical damages to turbines, generators and transformers, the deductible ranges from \$25,000 to \$50,000. For fidelity coverage, the deductible is \$1,000. Claims over the retention levels are insured by the group up to the self-insurance limits (see above) and by policies purchased by JPIA from the Markel-Evanston Insurance Company, Great American Insurance Company of New York, Endurance Risk Solutions Assurance Company, General Security Indemnity Company of Arizona, and Allied Public Risk/Allied World Assurance Company for the excess.

JPIA bills the Authority a deposit premium at the beginning of each policy year, which is placed in a reserve fund to cover the self-insurance portion of any claim. Settlements and/or expenses related to claims during the year are charged against the reserve. If the balance of the reserve at the end of the year is deemed too low in relation to the amount of outstanding claims, the Authority is retrospectively billed for additional premiums. When the claims are fully settled, any amounts remaining in the reserve are refunded to the Authority.

**Note 7. Commitments**

**Leases:**

The Authority leases office space under an agreement that expires in 2018. Total rent expense for the years ended December 31, 2016 and 2015 was \$70,182 and \$68,540, respectively.

*Notes to Basic Financial Statements*

Future minimum lease payments are as follows:

<i>Years Ending December 31,</i>	
2017	\$ 71,720
2018	<u>61,254</u>
	<u>\$ 132,974</u>

**Note 8. Contingent Liabilities**

***Covered Species Viability Fund:***

On October 2, 1997, the Authority received a 75-year Federal Fish and Wildlife Permit, the purpose of which is to authorize incidental “take” of endangered species subject to the terms and conditions of the Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan (KWBA HCP/NCCP) and the California Endangered Species Act Management Authorization, also executed on October 2, 1997. In accordance with the Implementation Agreement (IA) of the KWBA HCP/NCCP, in 1997 the Authority established the KWBA Covered Species Viability Fund (Viability Fund) with the Treasurer of Kern County for \$50,000. The Wildlife Agencies may draw up to \$10,000 per year, not to exceed \$75,000, from this account to fund preservation of covered species not undertaken by the Authority. If necessary, on January 1 of each year during the term of the KWBA HCP/NCCP, the Authority will deposit up to \$10,000 to restore this fund to \$50,000, however, the Authority is not obligated to make additional deposits above a cumulative contribution of \$75,000. As of December 31, 2016, the Wildlife Agencies had made no withdrawals from this fund and no additional principal had been deposited by the Authority. Interest earned on the required \$50,000 principal may be withdrawn by the Authority annually. No withdrawals were made during the years ended December 31, 2016 or 2015. In 2016 and 2015, interest earned was \$465 and \$309, respectively.

***Financial guarantees:***

The KWBA HCP/NCCP is designed to achieve both water conservation and environmental objectives, including protection of the sensitive habitat. In addition to the agreement with the United States Fish and Wildlife Service and the California Department of Fish and Game (Wildlife Agencies), and in accordance with the KWBA HCP/NCCP and IA, the Authority executed financial guarantees with the Wildlife Agencies in 1997. The purpose of the guarantees is to ensure the Authority’s performance of mutually agreed upon covenants, conditions, and obligations. The guarantees include two promissory notes with principal amounts of \$200,000 and \$300,000 which are secured by Deeds of Trust and Subordination Agreements.

### *Notes to Basic Financial Statements*

The \$200,000 Ongoing Management Note requires the Authority to pay principal and interest on demand if the Authority violates any provision of the KWBA HCP/NCCP or IA while the 75-year permit is in effect.

The \$300,000 Permanent Management Note requires the Authority to pay principal and interest if the Wildlife Agencies choose to call the note after the 75-year permit terminates, or following revocation of the permit, or following the Authority's relinquishment of the permit, whichever occurs first.

#### ***Litigation:***

The Authority was involved in the mediation phase process regarding litigation involving the propriety of a series of amendments to the contracts between the State Water Project contractors and the DWR in 1995. In 2003, the trial court (the Court) approved a settlement agreement which, among other things, confirms that the Authority will continue to own and control the Kern Water Bank. Pursuant to the settlement, the Plaintiffs agreed to dismiss the validation cause of action without prejudice and to not re-file it if conditions of the settlement agreement were fulfilled. A new Environmental Impact Report (EIR) was finalized in May 2010 by the DWR. Litigation challenging the new EIR and amendments was filed. The first phase of that litigation, again challenging the propriety of the contract amendments and transfer of the Kern Fan Element lands to the Kern County Water Agency (which was in turn transferred to the Authority), was dismissed by the Court on January 25, 2013 for not being timely filed. The second phase was regarding the adequacy of the EIR and on March 5, 2014, the Court rejected all Plaintiff's claims that the new EIR was deficient, except as to a claim that the EIR was deficient in not adequately evaluating future impacts of operation of the Kern Water Bank on groundwater. On September 5, 2014, the Court held a hearing on the remedy for the deficient EIR. On October 2, 2014, the Court issued its ruling and subsequently issued a writ of mandate (2014 Writ) confirming that DWR would prepare a Revised EIR to address the groundwater issues and that the Kern Water Bank could continue to operate pursuant to an interim operating plan that was developed by the Authority and neighboring districts that were Plaintiffs in the action. Certain of the Plaintiffs appealed the Court decision. The Authority and others filed a protective cross-appeal. The appeals are fully briefed. In September 2016, DWR certified a Revised EIR and filed its return to the 2014 Writ. On October 21, 2016, Plaintiffs filed a new lawsuit against DWR challenging the Revised EIR. On February 10, 2017, the Court issued an order for briefing and a joint hearing on August 18, 2017, to resolve all issues raised by the Plaintiffs concerning the adequacy of the Revised EIR and any objections to the Court discharging the 2014 Writ. Because the ultimate outcome of the litigation and its impact on the Authority are unknown at this time, no specific reserve for any potential liability has been recorded.

#### ***Note 9. Fair Value of Financial Instruments***

The Authority categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between

### *Notes to Basic Financial Statements*

market participants at the measurement date. The hierarchy is based on the valuation inputs used to measure the fair value of the assets. Level 1 inputs are quoted prices in active markets for identical assets or liabilities; Level 2 inputs are quoted market prices for similar assets or liabilities, quoted market prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data of substantially the full term of the assets or liabilities; Level 3 inputs are significant unobservable inputs for assets or liabilities. The Authority's recurring fair value measurements as of December 31, 2016 and 2015 consist of its interest rate swaps which were estimated using the zero-coupon method with observable inputs (Level 2).

#### ***Note 10. Kern Integrated Regional Water Management Implementation Grant***

In 2014, the Kern Integrated Regional Water Management project proposal received final approval by the DWR. The Authority's portion of the project has an estimated cost of \$3 million. The Authority requested \$2,311,458 in grant funding and provided a 25% match of \$770,572. The Authority is the lead agency with the DWR on the project. During the year ended December 31, 2016, \$1,500,812 of grant funds had been approved by the DWR of which \$1,494,113 had been received by the Authority. During the year ended December 31, 2015, \$207,360 of grant funds had been approved by the DWR of which \$23,249 had been received by the Authority.

#### ***Note 11. Subsequent Events***

The date to which events occurring after December 31, 2016 have been evaluated for possible adjustments to the financial statements or disclosures is April 7, 2017, which is the date that the financial statements were available to be issued.





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NANCY C. BELTON

## INDEPENDENT AUDITOR'S REPORT ON THE SUPPLEMENTARY INFORMATION

To the Board of Directors  
**Kern Water Bank Authority**  
Bakersfield, California

We have audited the financial statements of **Kern Water Bank Authority** (the Authority) as of and for the year ended December 31, 2016, and have issued our report thereon which contains an unmodified opinion on those financial statements. The financial statements of the Authority, as of and for the year ended December 31, 2015, were audited by other auditors, whose report, dated April 5, 2016, expressed an unmodified opinion on those statements. See page 1.

Our audit was conducted for the purpose of forming an opinion on the financial statements as of and for the year ended December 31, 2016, as a whole. The schedules of revenues and expenses, as listed in the table of contents as other supplementary information, are presented for purposes of additional analysis and are not a required part of the financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information for the year ended December 31, 2016, has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information for the year ended December 31, 2016, is fairly stated in all material respects in relation to the financial statements as a whole. The supplementary information for the year ended December 31, 2015, was audited by other auditors whose report, dated April 5, 2016, expressed an unmodified opinion on such information in relation to the financial statements as a whole.

*Daniells Phillips Vaughan & Bock*

Bakersfield, California  
April 7, 2017

*Kern Water Bank Authority*

*Schedules of Revenues  
For the Years Ended December 31, 2016 and 2015*

	2016	2015
<b>Operating revenues:</b>		
<b>Recharge/recovery revenues:</b>		
Water banking O & M	\$ 260,711	\$ 1,286,493
Water banking capital use fees	569,240	3,055,644
Energy fees	1,767,955	11,251,819
Third party conveyance	42,783	256,963
	2,640,689	15,850,919
<b>Other operating revenues:</b>		
Assessments - general and administrative	2,750,000	7,750,000
Assessments - well replacement and refurbishment	1,758	15,259
Cattle and sheep grazing	27,174	26,567
Easements	33,878	82,231
Conservation credits	-	485,000
Loan principal charges received from Participants	1,354,799	1,347,568
	4,167,609	9,706,625
Total operating revenues	6,808,298	25,557,544
<b>Participant refunds:</b>		
Participant refund	(647,867)	(4,297,308)
Net operating revenues	6,160,431	21,260,236
<b>Non-operating revenues:</b>		
Grant revenue	1,500,812	207,360
Loan interest charges received from Participants	51,784	58,975
Line of credit bond fees from Participants	735,800	806,460
Interest income	66,994	68,246
Other non-operating income	29,536	818,612
	2,384,926	1,959,653
Total non-operating revenues	2,384,926	1,959,653
Total revenues	\$ 8,545,357	\$ 23,219,889

*Kern Water Bank Authority*

*Schedules of Expenses  
For the Years Ended December 31, 2016 and 2015*

	<u>2016</u>	<u>2015</u>
<i>Operating expenses:</i>		
General and administrative	\$ 1,182,155	\$ 1,672,465
Depreciation	1,549,768	1,456,852
Operating and maintenance - Participants	1,954,928	11,553,611
Operating and maintenance - general	<u>1,202,258</u>	<u>1,087,778</u>
Total operating expenses	<u>5,889,109</u>	<u>15,770,706</u>
<i>Non-operating expenses:</i>		
Interest expense	512,309	567,454
Finance charges	<u>201,941</u>	<u>213,906</u>
Total non-operating expenses	<u>714,250</u>	<u>781,360</u>
Total expenses	<u><u>\$ 6,603,359</u></u>	<u><u>\$ 16,552,066</u></u>

NANCY C. BELTON

## INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH GOVERNMENT AUDITING STANDARDS

Board of Directors  
**Kern Water Bank Authority**  
Bakersfield, California

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of **Kern Water Bank Authority** as of and for the year ended December 31, 2016, and the related notes to the financial statements, which collectively comprise **Kern Water Bank Authority's** basic financial statements, and have issued our report thereon dated April 7, 2017.

### Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered **Kern Water Bank Authority's** internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of **Kern Water Bank Authority's** internal control. Accordingly, we do not express an opinion on the effectiveness of **Kern Water Bank Authority's** internal control.

*A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.*

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies and therefore, material weaknesses or significant deficiencies may exist that were not identified. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

## Compliance and Other Matters

As part of obtaining reasonable assurance about whether **Kern Water Bank Authority's** financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

## Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

A handwritten signature in cursive script that reads "David Phillips Vaughan & Boek".

Bakersfield, California  
April 7, 2017