

Appendix C

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



Great Egret (*Ardea alba*)

This page intentionally left blank.

Sterling Wildlife Biology

Woodland CA 95695

Phone: 530 908-3836

E-Mail: jsterling@wavecable.com

Web: www.sterlingbirds.com

Kern Water Bank

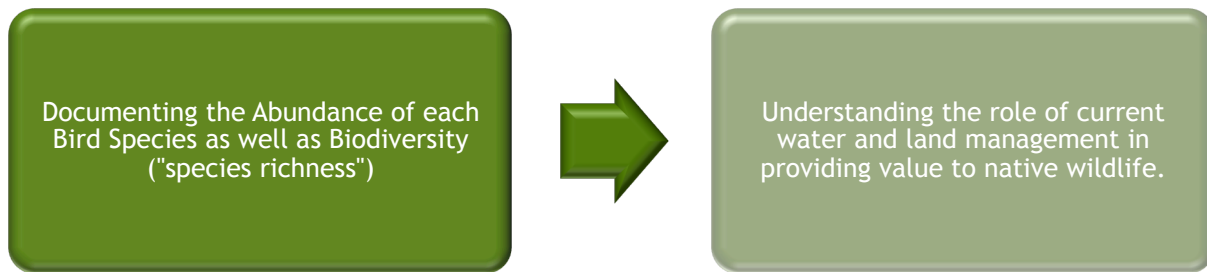
Bird Survey Report: October - mid-April 2012

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

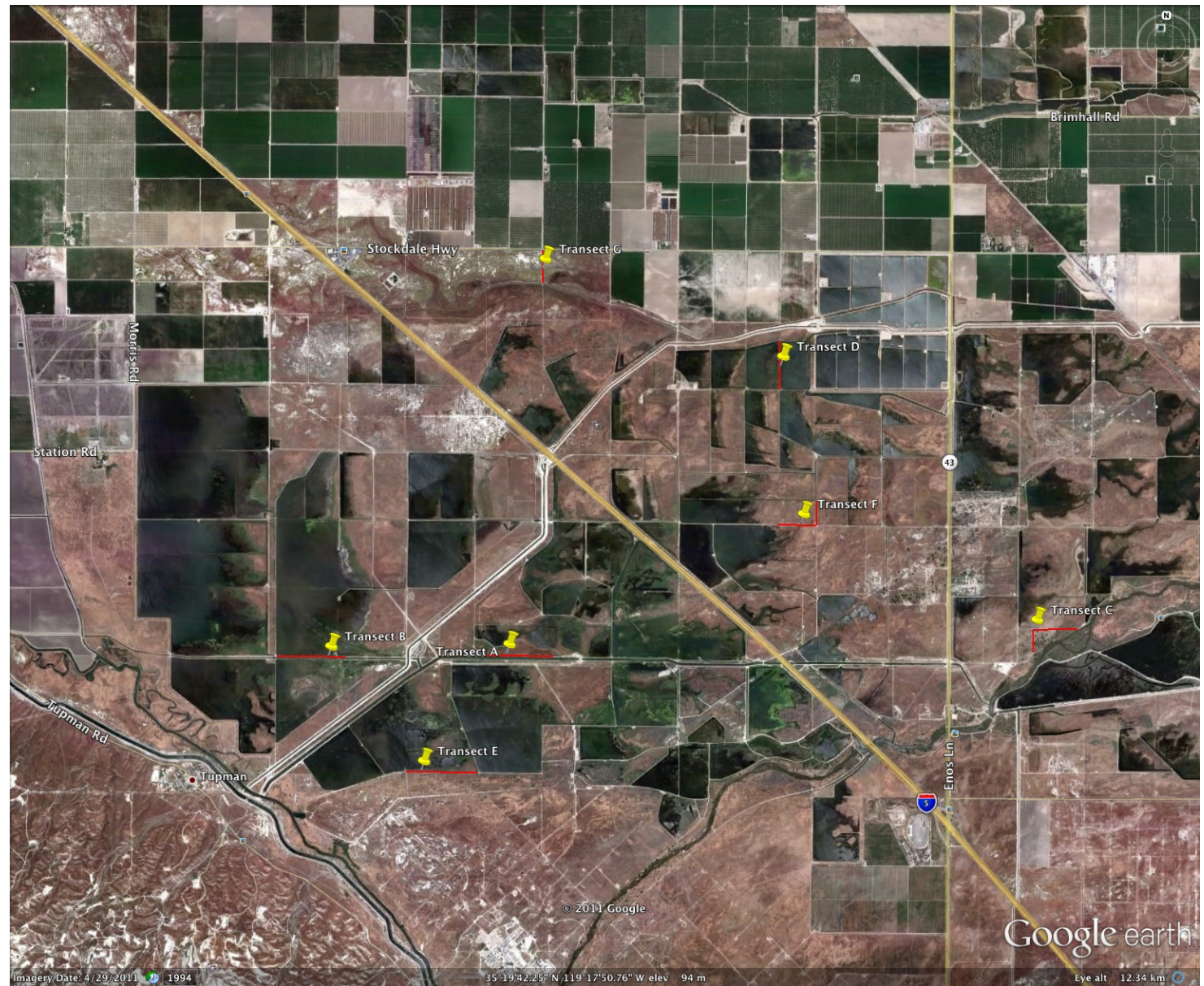


Figure 2. Results of Ten Waterbird Surveys in Winter 2011-2012: total waterbird counts.

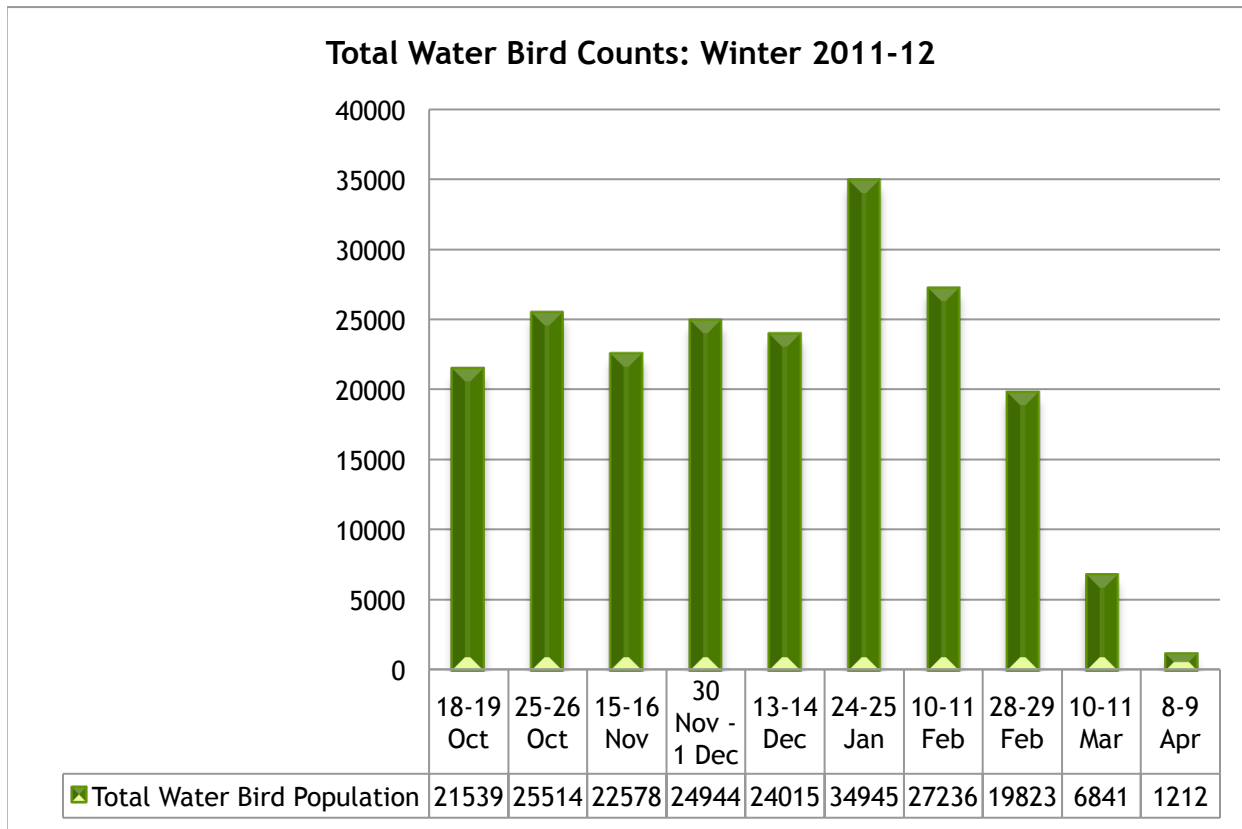
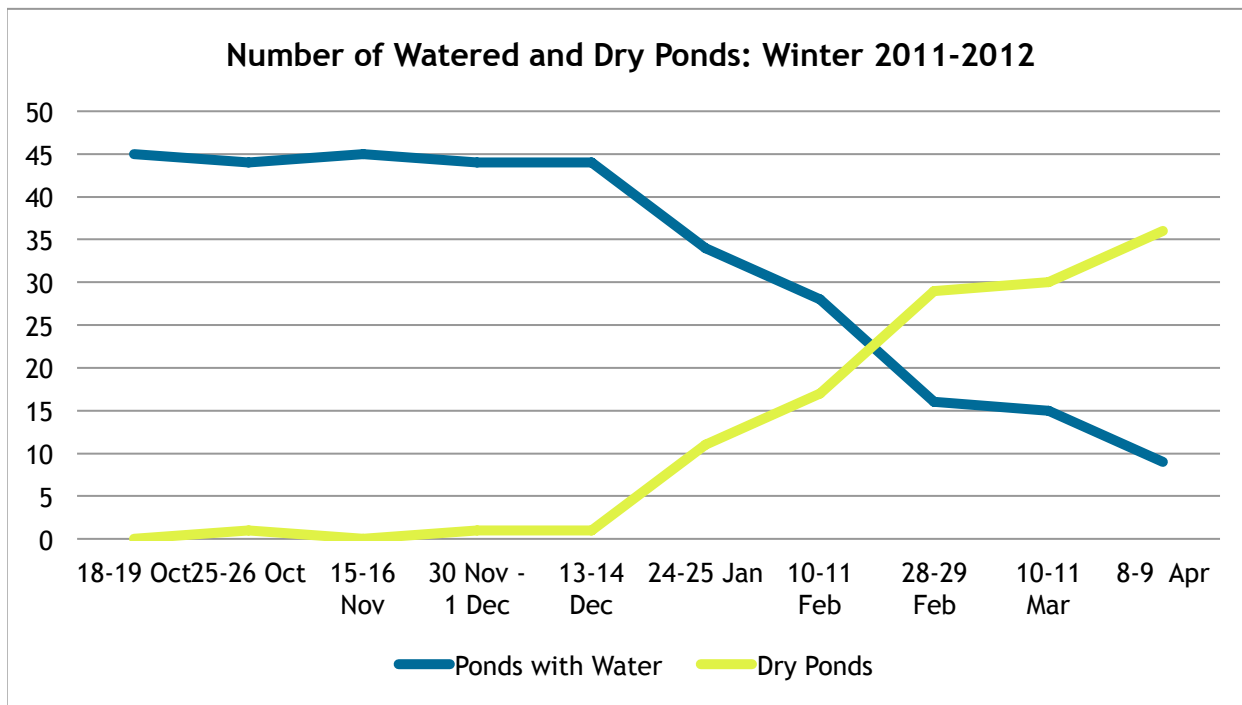


Figure 3. Seasonal Variation in Watered Ponds Surveyed for Birds: Winter 2011-2012.





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

Figure 4. Results of Grebe Counts.

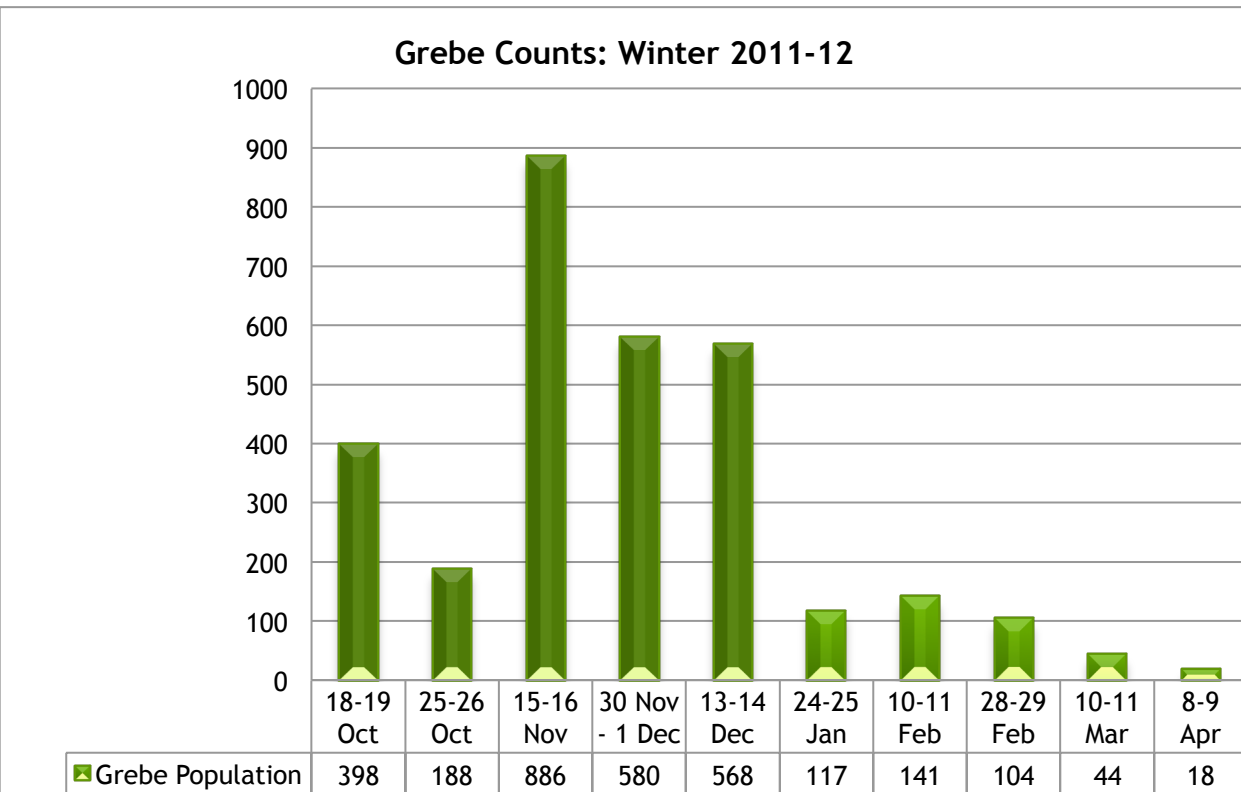


Figure 5. Results of Gull Counts.

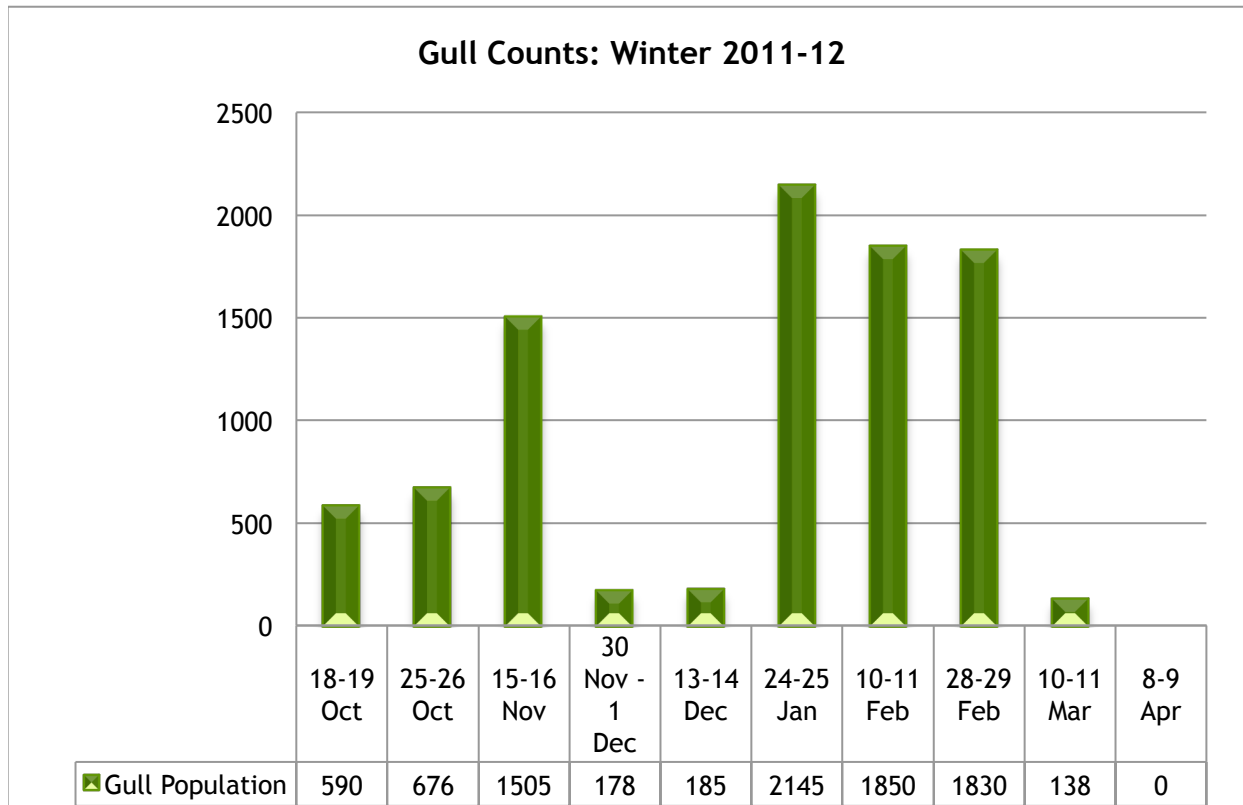


Figure 6. Results of Duck Counts.

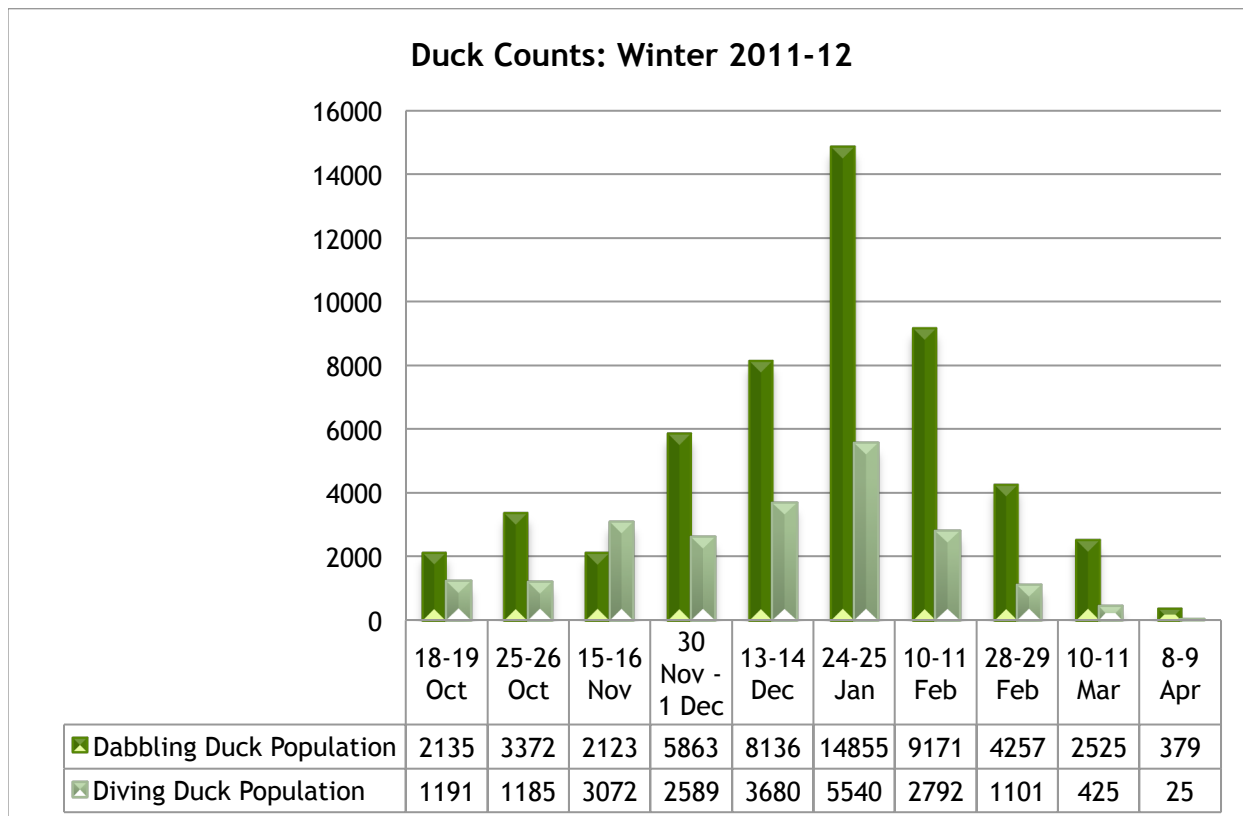


Figure 7. Results of Egret and Heron Counts.

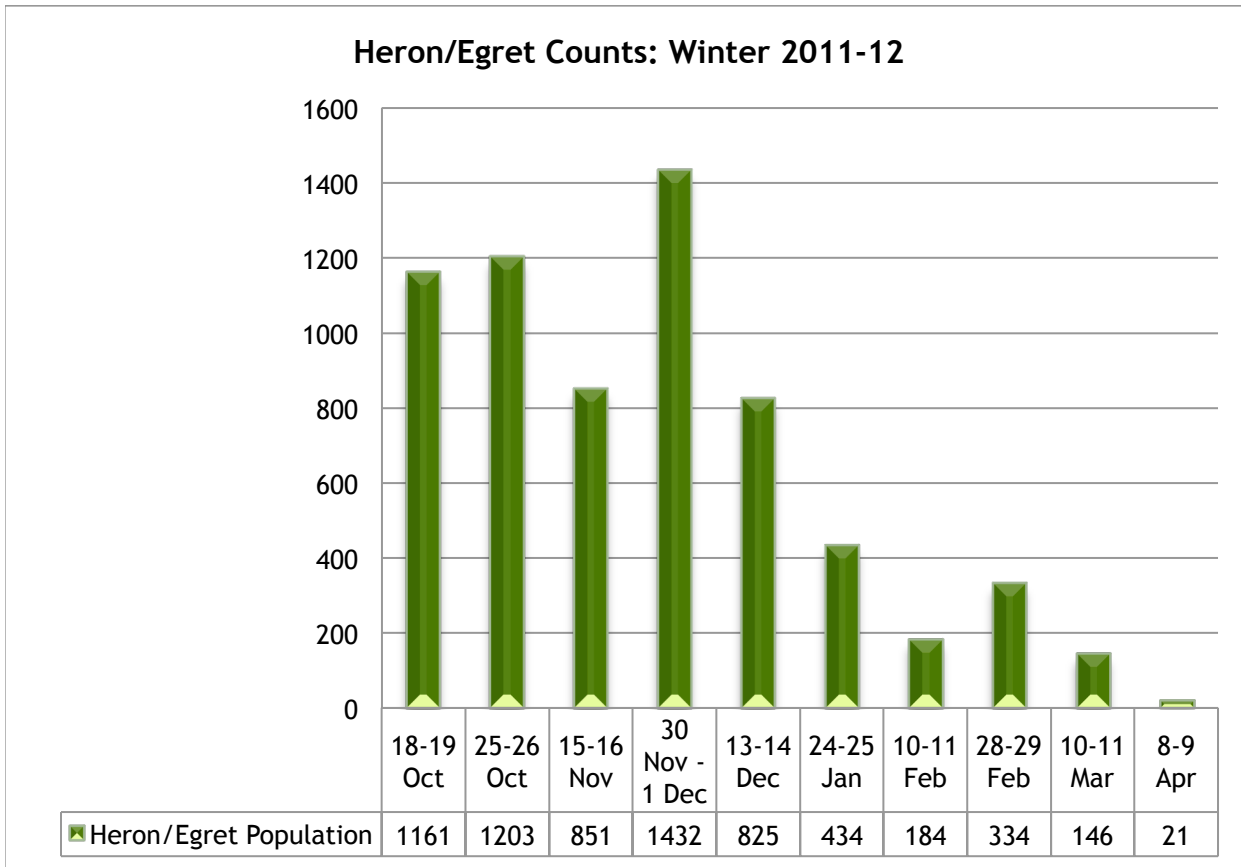


Figure 8. Results of Shorebird Counts.

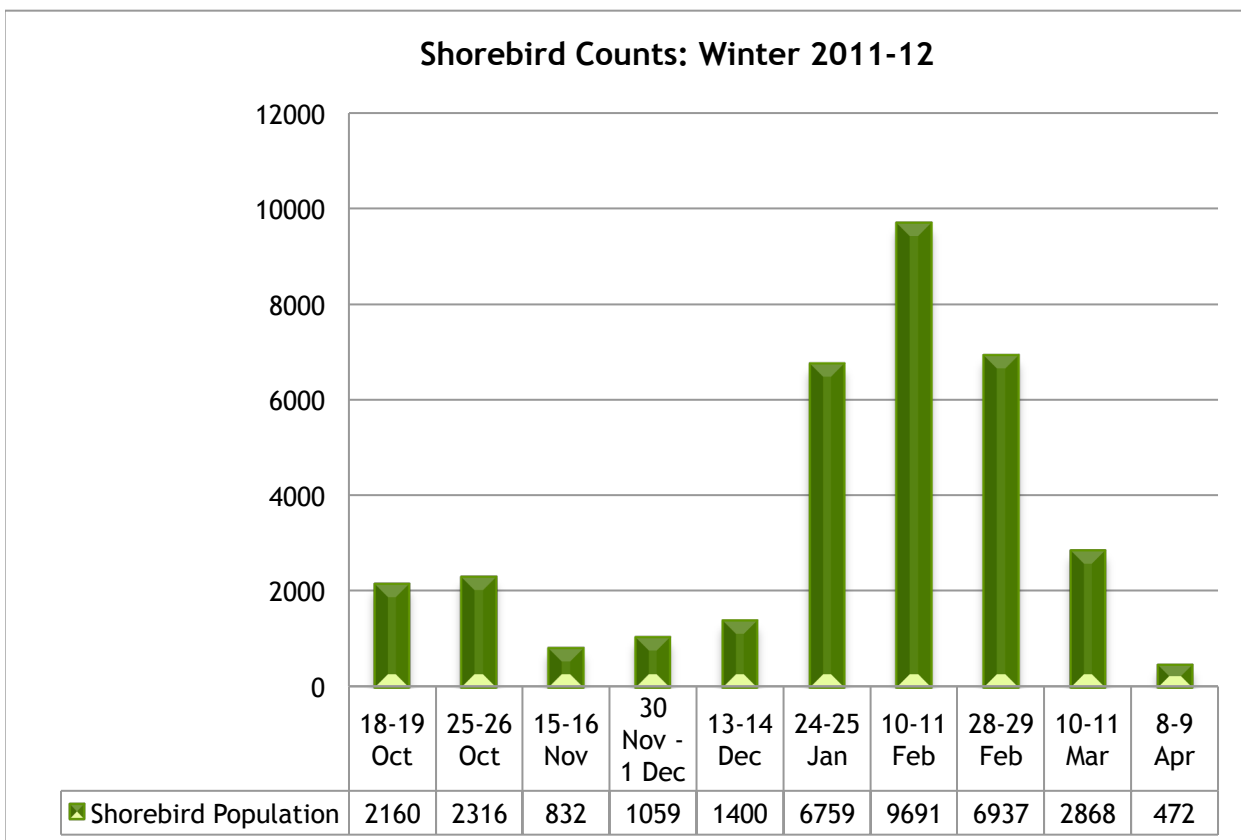


Figure 9. Results of American Coot Counts.

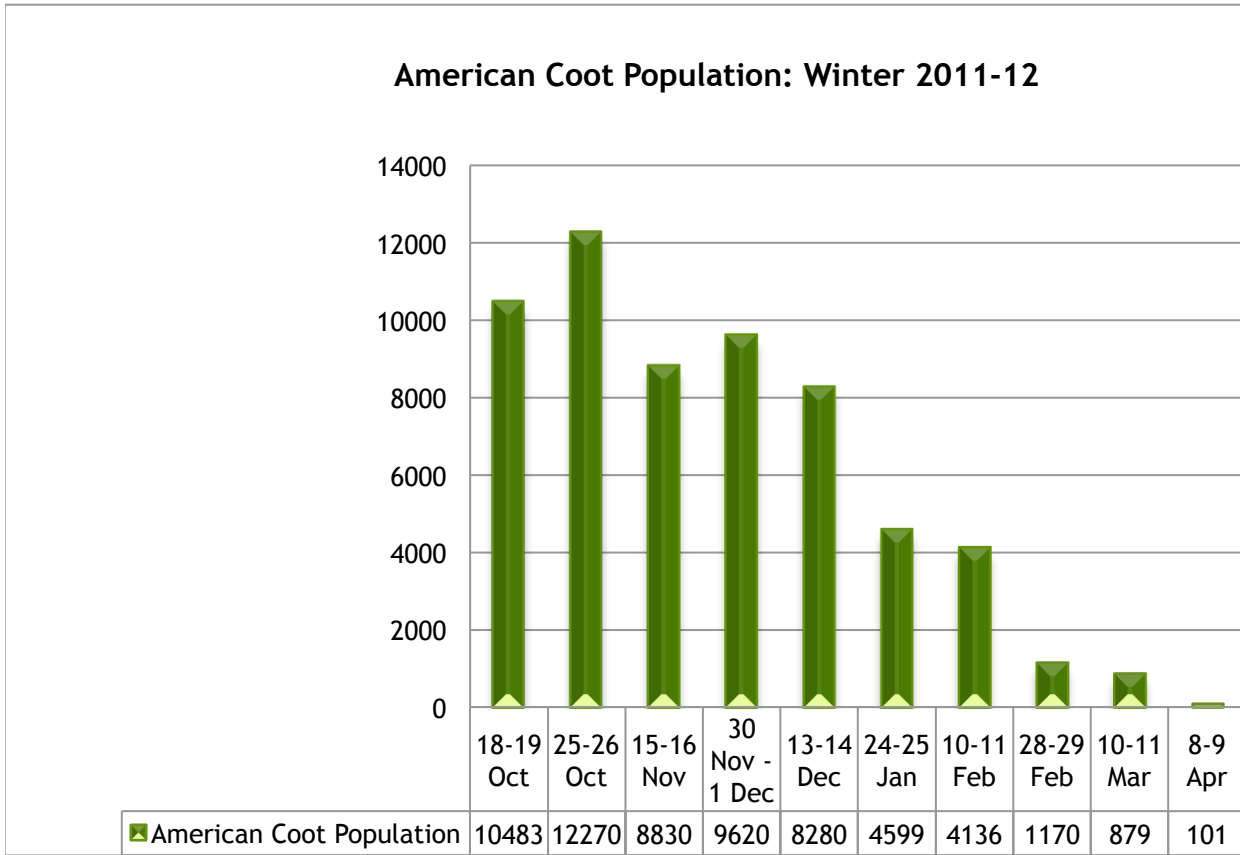


Figure 10. Results of White-faced Ibis Counts.

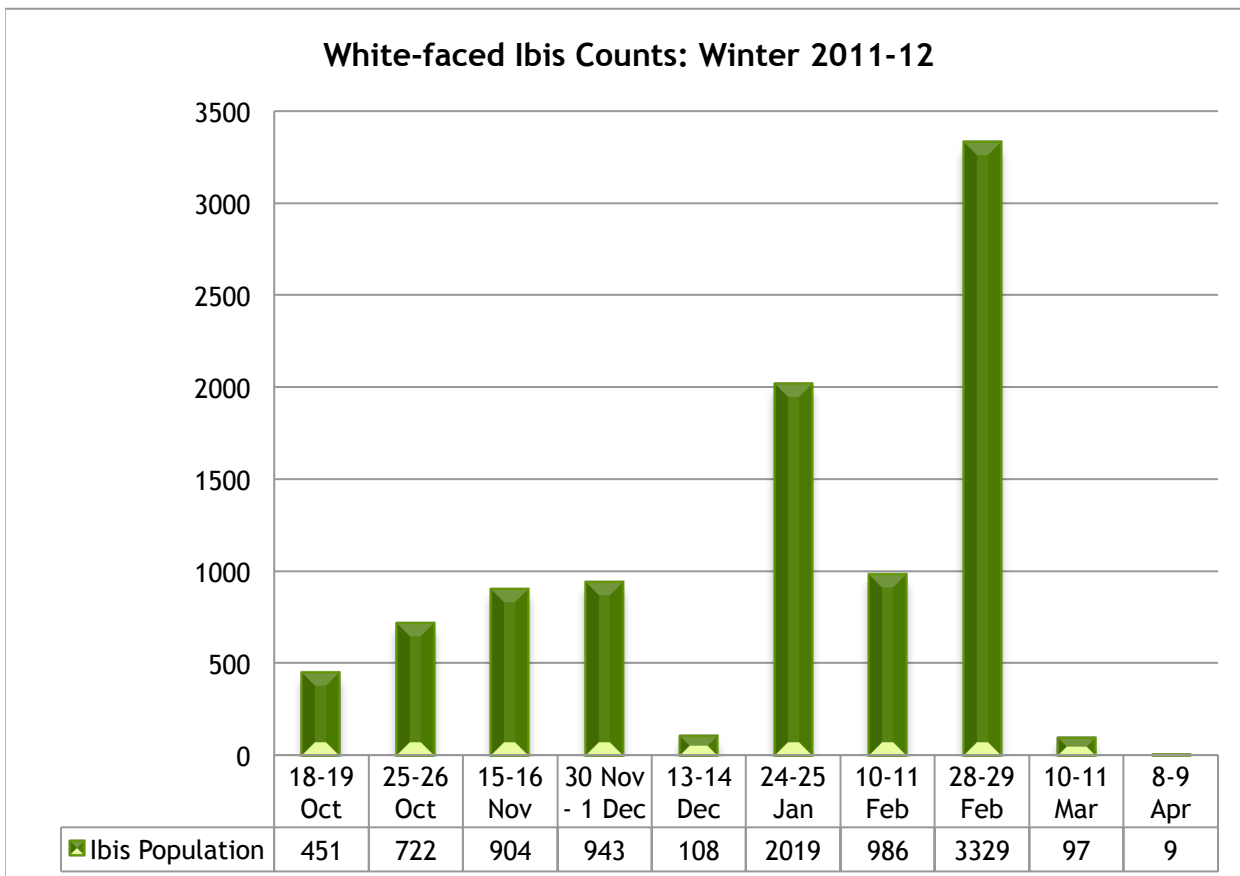


Figure 11. Results of Cormorant and Pelican Counts.

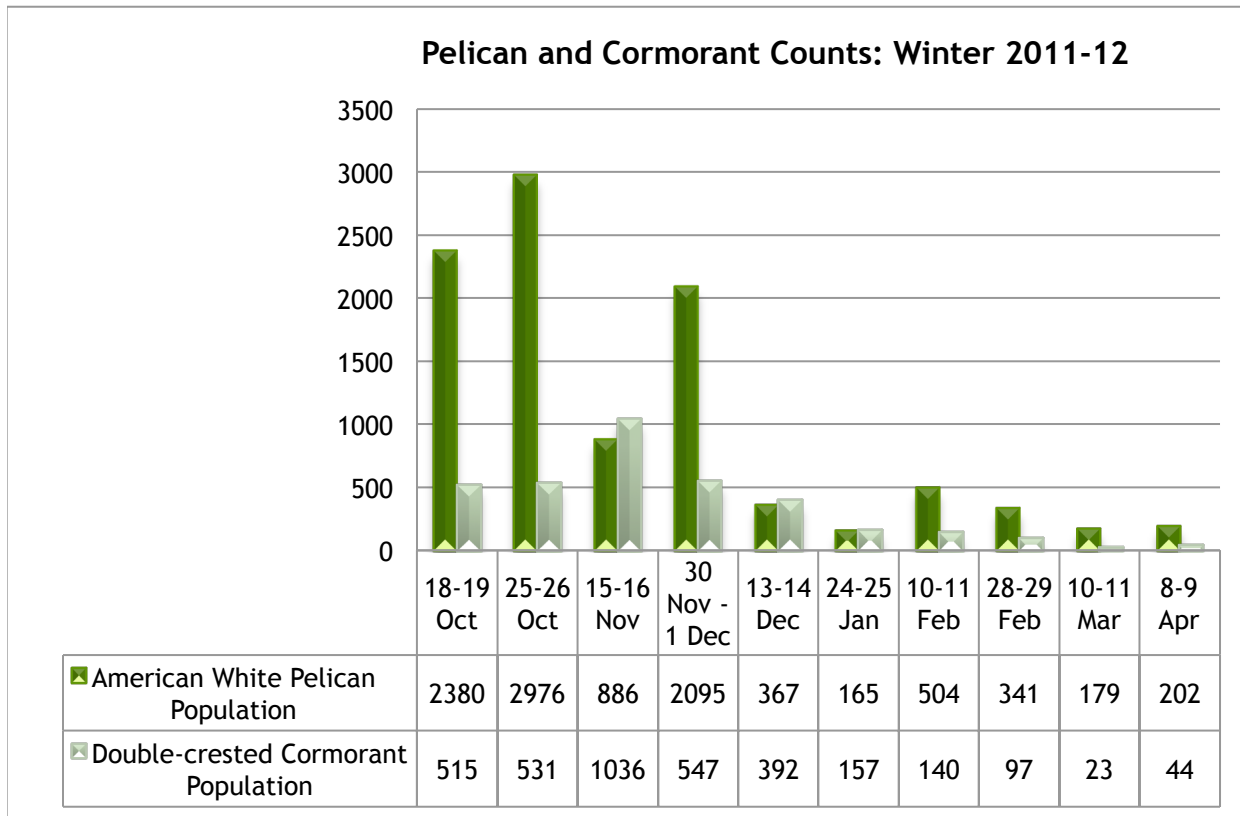


Table 1. Number of Species per Pond.

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
Species							
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		
Individuals	232	99	183	229	245	124	9
Species	13	13	21	20	20	14	9

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
Species							
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			
individuals	61	32	104	83	119	26	31
species	13	10	19	16	13	3	10

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

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

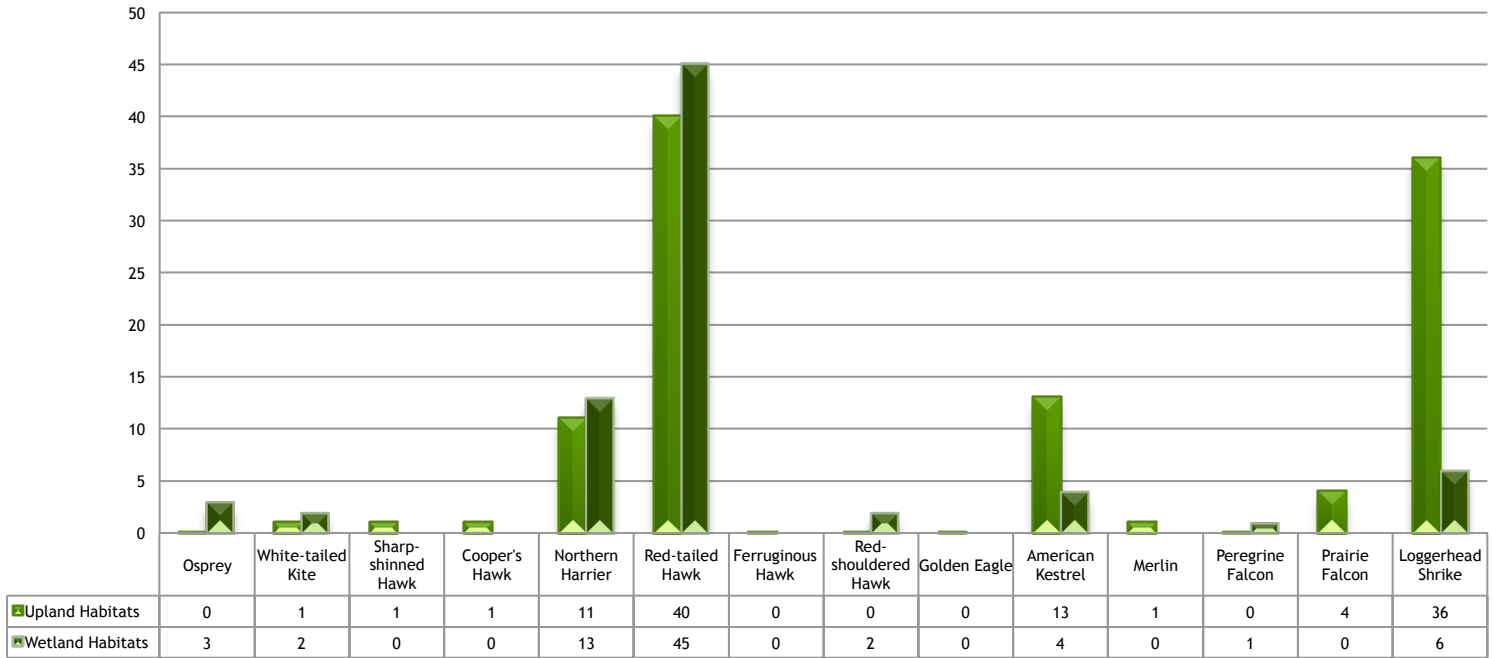


Figure 13. Results of the Raptor Survey on 9 January 2012.

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

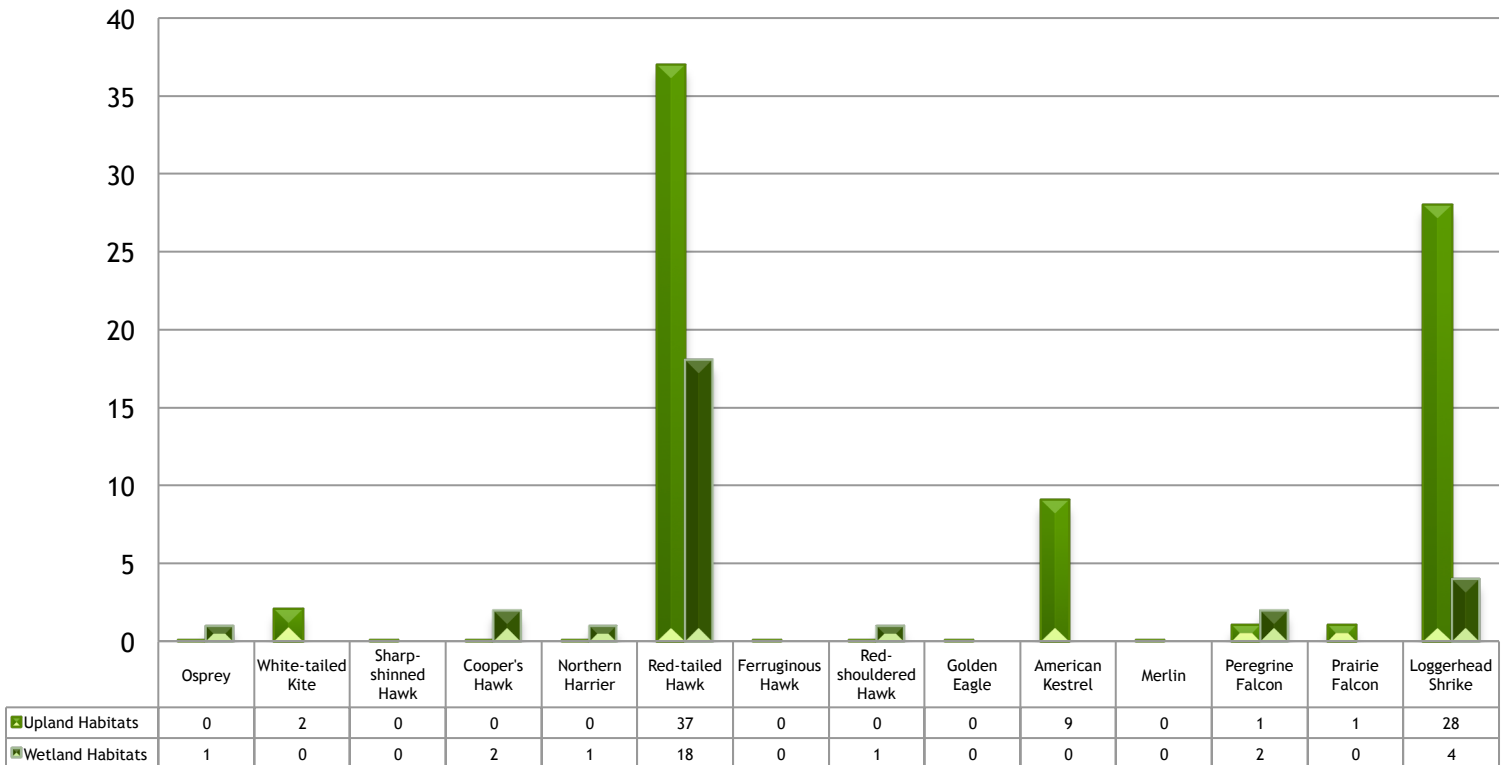


Figure 14. Results of the Raptor Survey on 24 January 2012.

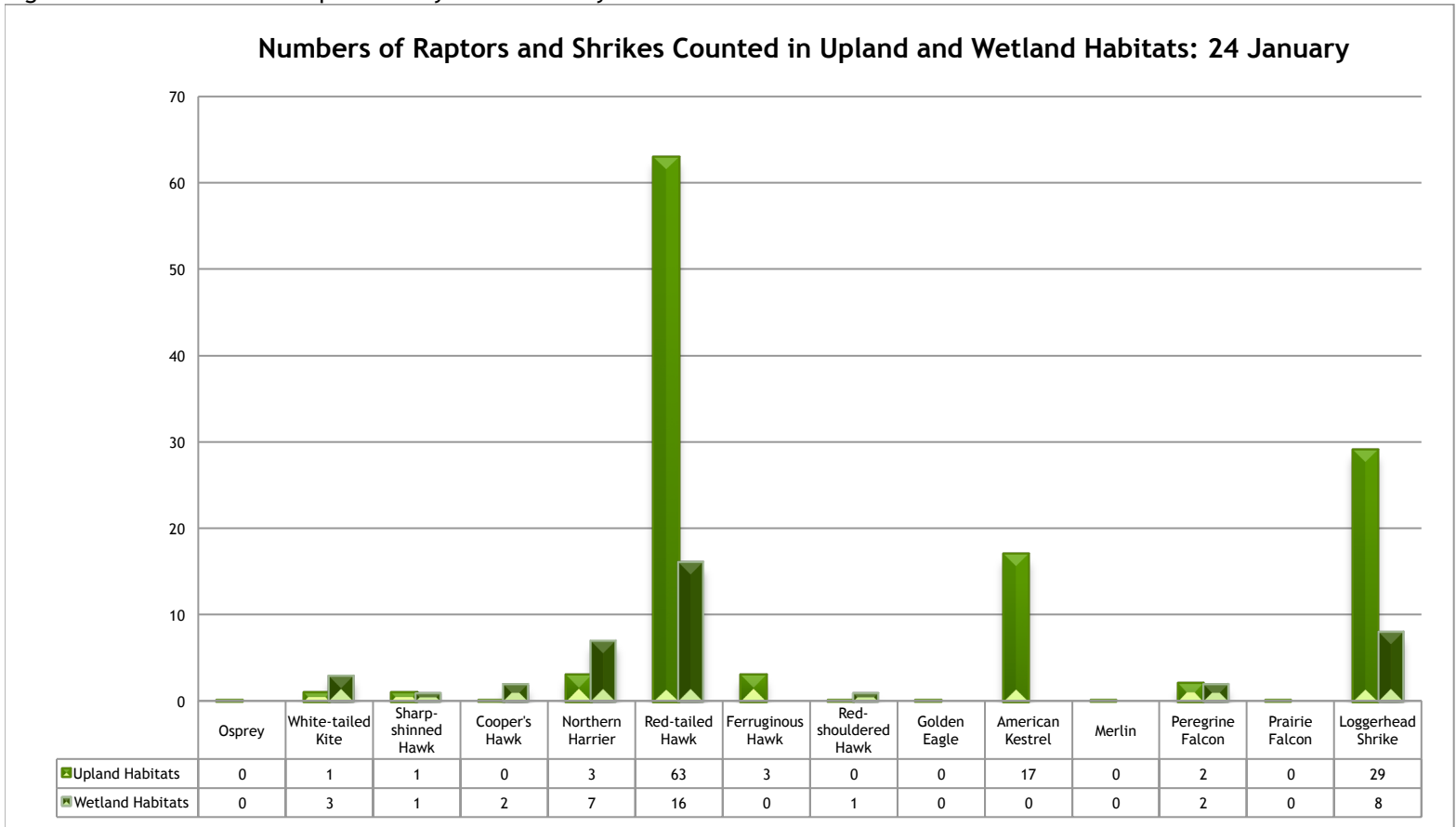


Figure 15. Results of the Raptor Survey on 29 February 2012.

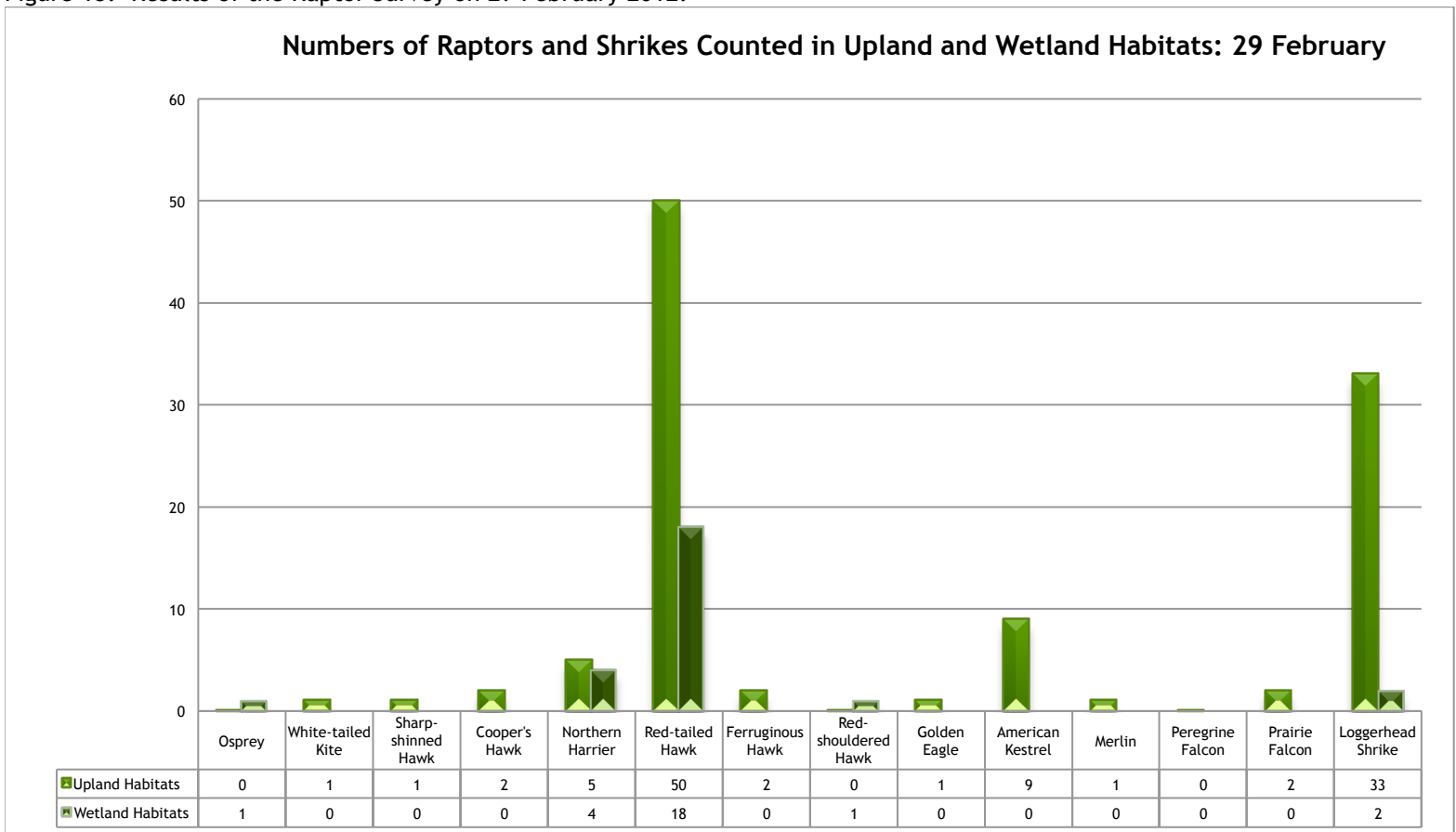


Figure 16. Results of the Raptor Survey on 1 April 2012.

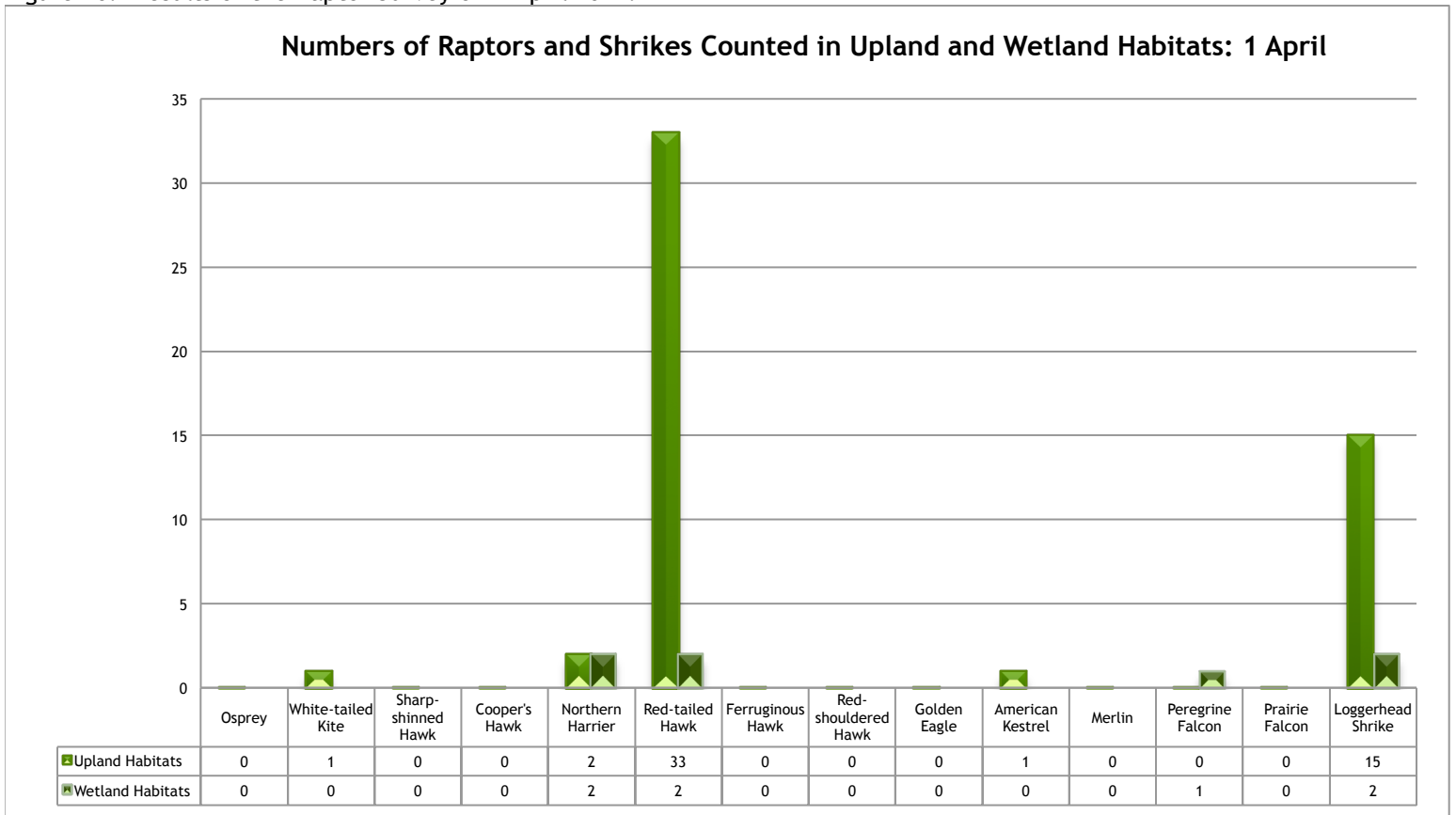


Figure 17. Total Numbers of Raptors Surveyed through the Winter 2011-12.

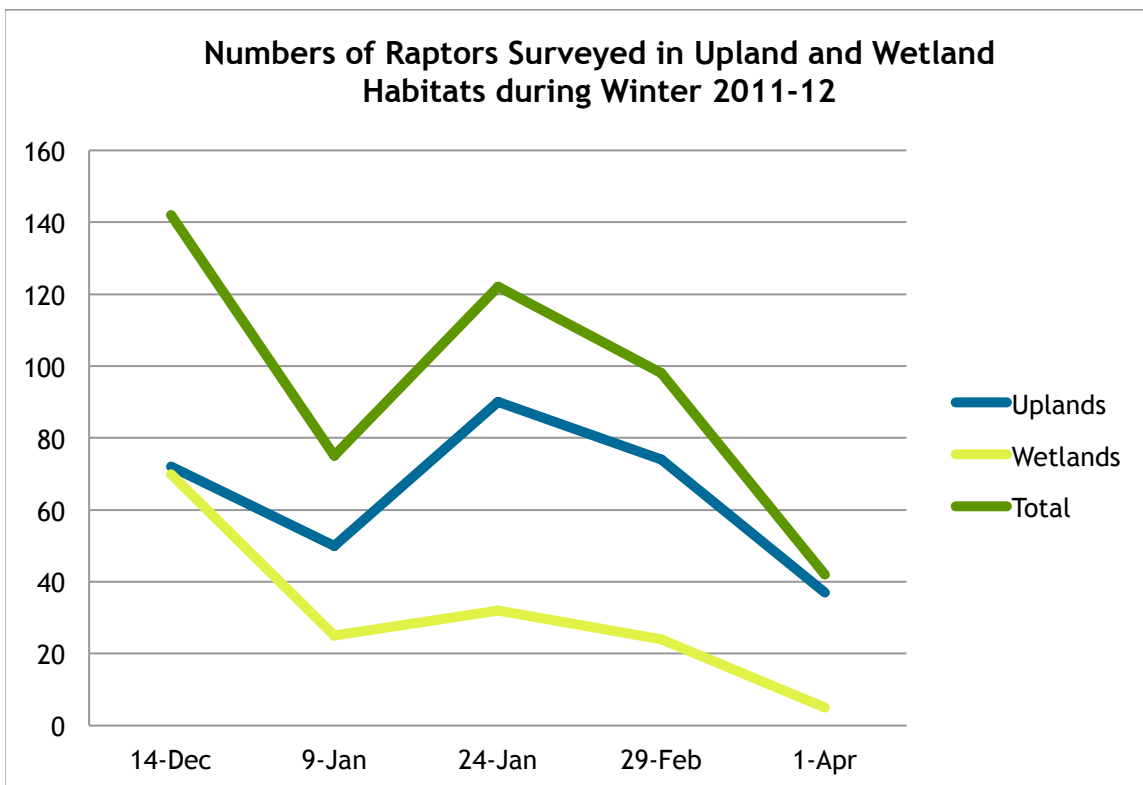
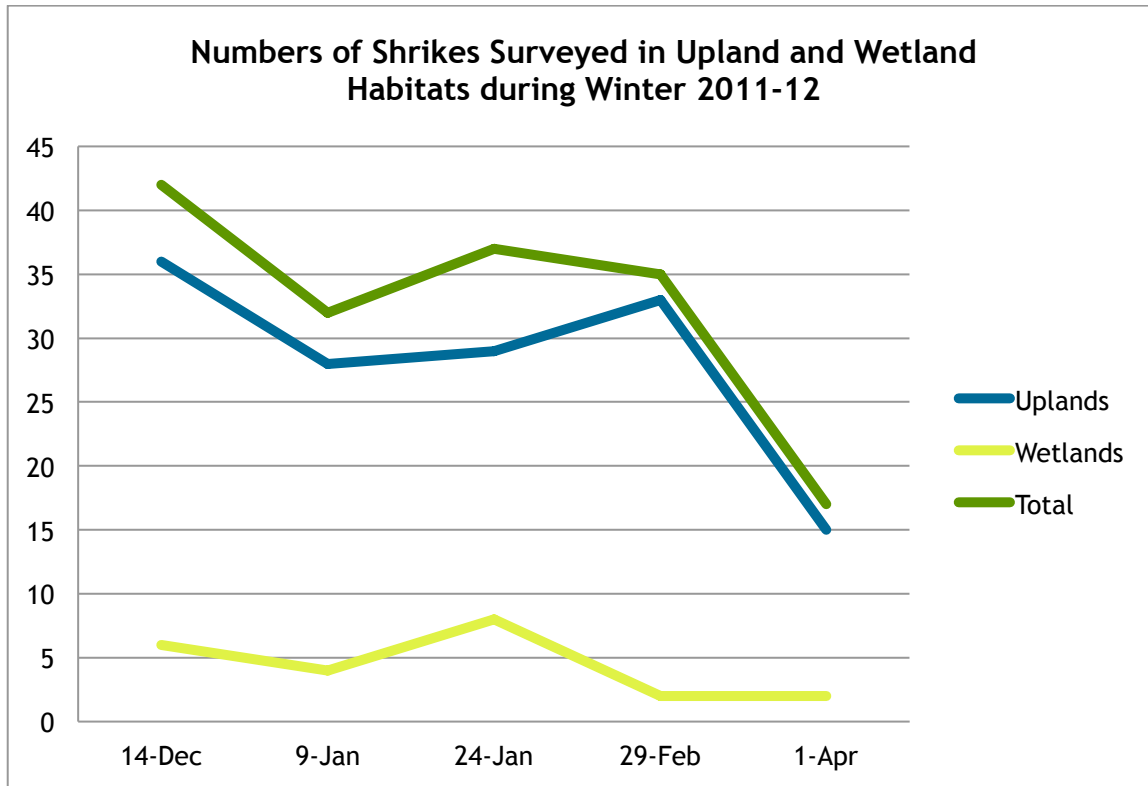


Figure 18. Total Numbers of Shrikes Surveyed through the Winter 2011-12.



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.