

Evaluating the Effects of Residential Development in Grasslands on Birds

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My sixth grade Earth Science teacher asked us to research topics and find evidence on an environmental issue, which if fixed, would make life better for Californians. I came up with the idea of effects of human development on grassland areas and comparing the birds and animals in grasslands to a residential area. This is an important topic because the grassland area is an important biome. It has so much natural value and so many species needed for California to thrive. This paper presents the information I found in surveys of grassland and residential areas near Folsom, California.

STUDY AREA

I chose two sites to compare: one grassland area and another area that used to be grassland but was developed. The grassland study area, along Payen Road in eastern Sacramento County, was chosen because the road provided access to grassland areas without traffic. Payen Road is a very open natural grassland area with barbed wire fences and a few scattered little ponds (Figure 1). The area has hills and flat areas. The residential study area was the Four Seasons Homes subdivision in El Dorado Hills, El Dorado County, located 0.6mi northeast of Payen Rd. This area was developed from 2004-2009. Besides the typical residential landscaping, the Four Season area surprisingly included quite a bit of native and low water landscaping (Figure 2). It also had a creek flowing through it with native trees and shrubs. The two study sites are 2 km (1.3 miles) apart.

METHODS

I collected my data on birds by going to the grassland and residential areas three times, on March 15, 20, and 21, 2015. During each survey, I walked a 1-mile long transect at each site and recorded all the birds I saw or heard. My dad, Dan Airola, helped me identify the birds in each area, but I ended up learning most of them myself. I made a data table that shows the total number of each bird species I saw on each survey and the average number per survey.

RESULTS

The numbers of each bird species seen on the three days and the average number per survey at Payen Road and Four Seasons are shown in Table 1. I saw a total of 40 species in both areas. The residential area has more species (27) than the grassland area (18). Overall, though, there were three times as many individual birds in grassland (200) as in the residential area (63).



Figure 1. Payen Road grassland study area



The birds on the residential plot area were different than the birds on the grassland plot. Thirteen bird species were seen only in the grassland and not in the residential area: Canada Goose, Turkey Vulture, Killdeer, Merlin, Western Kingbird, Common Raven, Horned Lark, American Pipit, Tricolored Blackbird, Western Meadowlark, Brewer's Blackbird, Brown-headed Cowbird, and Savannah Sparrow (Table 1). Nineteen birds lived only in the residential area (Table 1) and were not found in grassland. Five species were found in both areas.



Figure 2. The Four Seasons residential study area, with different types of native and non-native trees, bushes, and other plants.



The grassland had an especially high average number of birds from the blackbird family (including blackbirds, meadowlarks, and cowbirds) (92), Starlings (56) and Savannah Sparrows (25). The residential area had many House Finches (average of 15), Lesser Goldfinches (11), and White-crowned Sparrows (9) (Table 1).

DISCUSSION

My study was done during a one week period in March, so it only provides information for this period. But it still showed that there is a major difference between the birds at the grassland and residential areas.

The residential area probably had more species because it had more variety of plants. Common areas within the residential area had many native trees, shrubs, and other plants. Also, there was a small creek for birds to drink from and riparian trees to roost in near food sources. Also, many of the birds in the residential area are adapted to human areas, such as doves, hummingbirds, mockingbirds, sparrows, and finches.

Table 1. Numbers of bird species seen during surveys at Grassland and residential study sites, Sacramento and El Dorado counties.

Species	Payen Road Grasslands Area			Average	Four Seasons Residential Area			Average
	Survey 1	Survey 2	Survey 3		Survey 1	Survey 2	Survey 3	
Canada Goose		5		1.7				
California Quail						1	1	0.7
Turkey Vulture		1	2	1				
Cooper's Hawk					1			0.3
Red-shouldered Hawk					1		1 (+ nest)	0.7
Red-tailed Hawk		2	3	1.7	1			0.3
Killdeer	2	1	3	2				
Mourning Dove		1		0.3			3	3.7
Anna's Hummingbird					1	2	3	2
Rufous Hummingbird							1	0.3
Nuttall's Woodpecker					1	1	1	1
Merlin		1		0.3				
Black Phoebe						2	1	1
Western Kingbird		1		0.3				
Western Scrub-jay						2	2	1.3
Common Raven	4	2		2				
Northern Rough-winged Swallow					1			0.3
Tree Swallow							1	0.3
Bushtit						6	2	2.7
Bewick's Wren					2		1	1
Horned Lark	15	4	9	9.3				
Northern Mockingbird		1		0.3	4	3	0	2.3

Species	Survey 1	Survey 2	Survey 3	Average	Survey 1	Survey 2	Survey 3	Average
European Starling	61	7	100	56	7	0	0	2.3
American Robin		3			3	0	0	1
American Pipit			25	8.3				
Yellow-rumped Warbler		4			4	1	1	1.7
Fox Sparrow					1			0.3
White-crowned Sparrow					2	14	14	9.3
Golden-crowned Sparrow					1	1	1	0.7
Savannah Sparrow	5	33	36	24.7				
California Towhee						2		0.7
Spotted Towhee					1			0.3
Red-winged Blackbird	62	3	5	23.3		3		1
Tricolored Blackbird	44	57		36.7				
Western Meadowlark	6	10	6	7.3				
Brewer's Blackbird	4	1	50	18.3				
Brown-headed Cowbird	20			6.7				
House Finch					8	15	21	14.7
Lesser Goldfinch					10	19	3	10.7
House Sparrow					3	3	2	2.7
Total # birds	223	130	239	200.2	37	94	58	63.3
Total # species	10	16	10	18	14	18	19	27
# Species in Common				5				5
# Unique Species				13				22

Birds that occurred only in the grassland area probably need open areas and are not as common where there are lots of trees and shrubs. Some uncommon and important species occurred only in the grassland. For example, the Tricolored Blackbird and Merlin used the grassland but not the residential area. The blackbird is a state candidate species for listing as Endangered. Its population is declining because of habitat loss. Several recent nesting colonies are located near the Payen Road study area (Airola et al. 2015; <http://tricolor.ice.ucdavis.edu/>). If this grassland gets developed, then these birds will have nowhere else to live or get food.

The Payen Road study area is similar to a large adjacent grassland area, between White Rock Road and Interstate 50, south of the City of Folsom. Most of this area is planned to be developed for residential housing (<http://www.sacbee.com/news/business/real-estate-news/article12966740.html>). The plans for these areas protect oak woodland and streams, but will develop the grassland areas.

My study shows that the proposed development in grasslands will destroy the habitat for a number of grassland species that live only in the grassland. Other studies have shown similar results (Mazlaff 2001). A few of the birds in the grassland I studied are endangered or rare, including the Tricolored Blackbird.

My results show that people should set aside conservation areas especially for grassland species. The lands along my study area on Payen Road would be a great conservation area and should be protected. Having a grassland conservation area here would benefit Californians.

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LITERATURE CITED

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