

## **Comparisons of avian populations at six localities in northern Nevada and Utah: 1867–1869 and 1994–2000**

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### **INTRODUCTION**

The Geological Exploration of the Fortieth Parallel under the leadership of Clarence King included a survey of the avifauna at several localities between Sacramento, California, and Salt Lake City, Utah, in the years 1867 to 1869. Robert Ridgway, who later achieved international acclaim for his long, distinguished career as a research ornithologist, was selected to record the avifauna along the way and obtain specimens for the Smithsonian collections (Ridgway, 1877). In some of the areas such as the Reno area and Salt Lake City, humans have changed the environment radically since his time but in others, very little.

Our goal was to determine if there had been important, long-term changes in the avian communities at six localities in the Great Basin where human intrusion has been minimal since Ridgway's time (Fig. 1). In choosing these six localities, we hoped that any changes would reflect mainly natural causes rather than human intrusion. We visited these localities at the same time of year that Ridgway did, and we attempted to spend the same amount of time at each locality as he did, falling short in two places. The complete results of both surveys are available on the Great Basin Bird Observatory website (<http://www.gbbo.org>); these tables include parallel columns for each locality, and they include data and observations that are summarized in this report.

### **FORT CHURCHILL, NEVADA**

Ridgway visited the Fort Churchill area, east of present-day Carson City, for about two days in June, 1868; we spent a total of three days there in June, 1994, and early July, 1997. Carson River flows eastward from the Sierra Nevada Mountains in western Nevada. Fort Churchill is a state park on the north side of the river at the site of a U.S. Army cavalry base built in 1860. Modern restoration and improvements are modest and not obtrusive. Ridgway listed the avifauna near Fort Churchill and near Table Mountain, seven miles upstream.

A gravel road now parallels the river between Fort Churchill and Table Mountain. Our observations were made in the vicinity of the Fort and along the road between the Fort and Table Mountain.

The floodplain next to Carson River is covered by a thick stand of cottonwood trees and a few marshy pastures with scattered trees. Ridgway described the floodplain as heavily wooded by cottonwood trees. Next to the

flood plain are sagebrush-covered hills. Humans apparently have not radically altered the environment where Ridgway made his observations since Ridgway's time.

Ridgway reported 32 species and we recorded 44. Although not reported in 1868, ducks, geese, herons, and egrets are now conspicuously present. Since every soldier at Fort Churchill had a gun, it is possible that most of the ducks and geese were shot for food, and the herons and egrets shot for their plumes, but none of this was mentioned by Ridgway. The absence, from the 1868 list, of magpies, Killdeer, gulls, crows, ravens, Great Horned Owls, and nighthawks is not easily explained. Magpies and Killdeer are especially abundant now and the other birds were observed repeatedly.

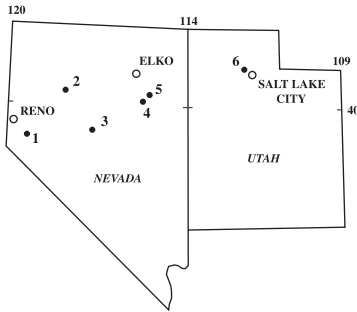


Figure 1. Index map showing localities cited in this report. 1, Fort Churchill; 2, Unionville; 3, Austin; 4, Ruby Mountains; 5, East Humboldt Range; 6, Antelope Island.

The absence from our list of Poorwills and Canyon Wrens is due more to the fact that their normal habitat in the hills was not visited than to any change in population. Shrikes are common in the region

and their absence from our list probably is due to chance. Ridgway's report of Black Swifts near Fort Carson has been challenged, and he seems to have been mistaken (Knorr, 2000). It remains unclear what species Ridgway actually did see. Absence of warblers and vireos from our list represents an important population shift. In general, the avian community here appears to be more diverse than in 1868 despite an apparent decline in warblers and vireos.

## UNIONVILLE, NEVADA

Ridgway stayed at Unionville for five weeks in September and October, 1867. We were there several days or parts of days in September, totaling about a week in the years between 1994 and 1997. This represents a large discrepancy in length of stays, five weeks versus one week, but our observations were bolstered by observations of others as indicated in a following section.

Unionville is a small settlement in Buena Vista Canyon on the east slope of the Humboldt Range, a major mountain range of northwestern Nevada. Buena Vista Creek is a strong, perennial stream that now is lined with giant Lombardy poplars and a wide variety of trees and shrubs introduced by the residents. In Ridgway's time, the place was an operating mining district. Ridgway reported that there was a thick growth of buffaloberry, willows, wild rose, and chokecherry along the stream, and a sparse growth of mountain mahogany, pinyon and juniper on the mountainside. His description could fit many a mountain

range in northern Nevada. However, it is probable that most or all of the cottonwood trees that normally would have grown along the stream had been cut down for firewood, housing, charcoal, and mine timbers. Mark Twain, who lived in Unionville briefly in 1862, reported that there was no firewood for miles around. In any event, Ridgway must have ranged widely on horseback, and his observations were not confined to the immediate vicinity of the mining camp. Ridgway observed 34 species and we observed 49.

A century after Ridgway's visit, as part of the annual Audubon Society Christmas Bird Count, Robert E. Wallace, then a geologist with the U.S. Geological Survey, with his wife, Trudy, began recording all the birds seen in the Unionville area on one day per year for 15 of the 29 years from 1963 to 1991. Wallace is a skilled, life-long birder and is thoroughly familiar with the local avifauna, having spent several years mapping the geologic formations of the Humboldt Range.

The list of birds seen on the Christmas counts differs from that for September-October, 1867. The Christmas counts represent a total of 15 days, all of which were after the fall migration. Ridgway was there for 37 days during fall migration. Despite the difference in season, significant comparisons can be made. Many more species were observed by the Christmas counters than by Ridgway. However, if introduced species and species observed on only a few years out of the 15, are subtracted from the Christmas list, the two lists become more alike. Furthermore, if the migratory birds, not to be expected on the Christmas list, are subtracted from Ridgway's list they become still more alike. However, the two lists modified thusly are not the same, and the residual differences are difficult to explain.

It is astonishing that Ridgway did not record any of the following in the five weeks of his residency there: Northern Harrier, Sharp-shinned Hawk, Red-tailed Hawk, Rough-legged Hawk, Golden Eagle, Prairie Falcon, Great Horned Owl, and Loggerhead Shrike. We observed these species during our short September visits, and they were recorded on most of the Christmas bird counts. The former scarcity of large trees around Unionville hardly could account for the apparent absence of these species in 1867 because they now thrive in parts of Nevada where trees are scarce and they range widely in their daily search for food. The avian community in the Unionville area appears to be more diverse now than it was in Ridgway's time.

## **AUSTIN, NEVADA**

Ridgway visited Austin, a silver mining camp on the flank of the Toiyabe Range in central Nevada, in July, 1868, and we were there in July of 1997 and 1998. He was there about four days, and we were there about four days as well.

Today, Austin is a very small town of about 300, probably with fewer residents than in 1868. Ridgway described shrubby-lined brooks and extensive copses of aspens and choke-cherry bushes. On the lower slopes of the range, thin growths of juniper and pinyon prevailed whereas the ridges were

partly covered by stunted growths of mountain mahogany. His description fits the present conditions quite closely; there seems to have been little change in the environment since the Fortieth Parallel Survey.

Ridgway reported 35 species and we saw 33, indicating no significant change in overall diversity at this location.

## **RUBY MOUNTAINS, NEVADA**

Ridgway camped at various points on the east side of the Ruby Mountains in northeastern Nevada for seven weeks in July, August, and September, 1868. We made several visits there totalling about two weeks between 1995 and 2000.

The Ruby Mountains actually are a single, long, high range. Alluvial fans slope away from the range and springs emerge at their margins. Ruby Marsh, fed by perennial springs, and Franklin Lake, fed by meltwater, border the range on the east side. Ruby Marsh now is the site of an extensive wildlife refuge accessible by roads along the dikes that separate the various ponds of more- or-less open water. Franklin Lake, just north of Ruby Marsh, is a large playa that normally is covered by shallow water in spring and, in wet years, is at least partially covered in summer and fall. Both Ridgway's and our observations were in canyons and on ridges, along the eastern slope of the range, and on alluvial fans between the range and the marsh. We included observations throughout Ruby Marsh, but, because he did not have access to open water in the interior of the marsh, Ridgway was hindered in observing waterfowl and waders.

Ridgway reported 94 species, and we recorded 105. For a fair comparison, most of the waterfowl and wading birds must be excluded from our list. Still, it seems strange that Ridgway did not report pelicans, gulls, terns, and Ospreys, which are easily visible in flight from the edge of the marsh. If waterfowl and waders are excluded from both lists, Ridgway's total count would be reduced to 81 and ours to 74. Had we spent five weeks in the area, as Ridgway did, our total probably would have equaled or exceeded his. The absence of warblers from our list is significant, and the absence of crossbills and Pine Siskins from our list may reflect the relatively short time we spent near timberline. It is notable that Ridgway reported no Steller's Jays on the mountain-side, or magpies and crows, which now are common on the lower slopes.

## **EAST HUMBOLDT RANGE, NEVADA**

Ridgway spent two weeks in and near the East Humboldt Range in late August and early September, 1868. We spent a total of about two weeks there in late August and September distributed between 1994 and 2000.

The East Humboldt Range is at the north end of the Ruby Mountains and separated from them only by a high pass. Ranches are located around the perimeter of the range where streams emerge from canyons, now as in Ridgway's time, but there are more of ranches now. Otherwise, the environment probably is similar to that in 1868.

Specifically, Ridgway's observations were at Secret Valley, "Dearing's Ranche," lower and upper Trout Creek, and the Clover Hills. Our observations were in Secret Valley, the Deering Creek area (probably the location of "Dearing's Ranche"), lower Trout Creek, and the Clover Hills. We substituted Angel Lake for upper Trout Creek; both are just below timberline at the north end of the range.

Ridgway observed 70 species and we saw 56. The chief difference between the two lists is the scarcity of warblers, vireos, and timberline species from ours. Other differences are also notable. Why did Ridgway not report any Killdeer, Scrub Jays, nutcrackers, Mountain Bluebirds or Red-winged Blackbirds? All of these are common now.

### ANTELOPE ISLAND, UTAH

Ridgway spent five days on Antelope Island in June, 1869. We were there for a total of five days in June of 1994 and 1995.

Antelope Island is a fifteen-mile-long island in Great Salt Lake in northwestern Utah. Topographic relief is 2,400 feet. Sparse junipers are present at higher elevations, and sagebrush occurs in patches at all elevations, but the principal vegetation is grass. The island has a long history of sheep and cattle grazing and very sparse human settlement beginning in 1848. A ranch house and outbuildings dating from the earliest times still are present at a permanent spring on the east side of the island. The ranch house is the longest continuously occupied dwelling in Utah. The area around the ranch house includes outbuildings, deciduous shade trees, an orchard, and a cattail marsh. Ridgway made most of his observations near the ranch, as did we.

The entire island is now a State Park and is accessible by a causeway at the north end. Picnic facilities at the north end of the island are used by small numbers of people on weekends in summer, but the effects of human intrusion on the wildlife are minor. The sheep and cattle, present in Ridgway's time, are gone now, but about 600 bison in small herds roam freely over the island, taking the place of the sheep and cattle. The environment probably is much the same as it was when Ridgway visited the island in 1869.

Ridgway observed 21 species; we saw 41. Several species not observed by Ridgway in 1869 were very abundant in 1994-5. These include Eared Grebe, American Avocet, Willet, California Gull, Black-billed Magpie, Horned Lark, and Western Meadowlark. Others not reported by Ridgway are common. These include American White Pelican, Canada Geese, Great Blue Heron, Black-necked Stilt, Barn Swallow, Yellow-headed Blackbird, and Brewer's Blackbird.

In general, the avian community appears to be more diverse than it was in 1869. The reasons for this are not clear. Changes in the salinity of the lake affecting the food supply for waterfowl and waders can be factors. According to records that have been meticulously kept since the earliest days of settlement, the lake level was very high in 1869 and therefore salinity was relatively low. Also, when the level is high, the shoreline encroaches on low-lying vegetated

areas, providing very good habitat for birds. The lake level and the salinity were about average in 1994-5, and a gravelly beach bordered the lake. The relatively high lake level in Ridgway's time should have favored a relatively high species count. Indiscriminate shooting and egg-collecting by early settlers may be contributing factors affecting population changes, but, in view of the sparsity of humans on the island, the apparently greater diversity now probably represents a significant increase in several species due to unknown natural causes.

## CONCLUSIONS

A fair overall comparison must compensate for random lucky or unlucky breaks and especially for the fact that Ridgway was not able to get to the open water along the east side of the Ruby Mountains, whereas we had ample opportunity to do so. Accordingly, we prepared two lists designed to eliminate the effects of luck and road-building in Ruby Marsh. The data tables that are available on the website show species we did not see at any of the six localities but that Ridgway saw at two or more localities, and species that Ridgway did not see at any locality but that we saw at two or more localities. We eliminated introduced species from this list. We conclude that, overall, we saw more water-loving birds than did Ridgway, and he saw more warblers and vireos than did we. An additional difference is that he saw more birds common at high altitudes in summer, such as juncos, Blue Grouse, and crossbills, possibly because he spent more time near timberline than we did; however, that is not certain. Of the residual differences, the lack of Great Horned Owls on Ridgway's list is most remarkable because we observed them at five of six localities, and the Wallaces saw them at Unionville on every one of their 15 Christmas counts. He saw no American Crows and we saw them at four localities. Lesser Goldfinches and Short-eared Owls appear to be more abundant now, and Spotted Sandpiper, Willow Flycatcher, Hammond's Flycatcher, Canyon Wren, Ruby-crowned Kinglet, and Swainson's Thrush appear to be less so.

Some of the differences between Ridgway's lists and ours could be due to the differing physical conditions of observation. Among Ridgway's advantages were the many hours he had available each day for observing; the use of a horse for stalking and access; and the opportunity for collecting specimens to be identified in his hand - a very great asset with respect to warblers and vireos half hidden among leaves in the cottonwood trees. Our advantages included a car for cover and mobility, good binoculars and a good spotting scope, but most of our days were relatively short - from mid-morning to late afternoon.

The human population in our six localities is not greatly different now compared with Ridgway's time, but its effect on the avian community may have changed over the years. There was probably more indiscriminate shooting of both game and non-game species in Ridgway's time, which could have reduced the numbers or visibility of some species significantly.

Our purpose was to detect any long-term changes in the avian community that could be ascribed to natural, as opposed to human, causes. It may be an

impossible task: the human foot-print, however light, is everywhere. The data of this report suggest that some species have declined and others have increased. Overall, whatever the causes, diversity of avian communities in areas of minimal human intrusion appears to be about equal to that of Ridgway's time.

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