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# An Examination of the Use of Birds by the Fremont People

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*A collection of 2,185 bird bones recovered from twelve sites was analyzed to determine how the Fremont people made use of birds and their remains. Although bird bones are present at many of the Fremont sites that have been excavated in the last few decades, bird remains are rarely studied by archaeologists. The relative abundance of bird taxa and the contexts of bird bones suggest how some bird families were used by the Fremont people. We combine data from our bird-bone assemblage with data provided by Parmalee (1980) to determine which bird families are most commonly found as dietary remains or as raw materials for manufacturing artifacts. GIS data suggest that waterfowl were hunted primarily at wetland sites, while the Fremont people at open desert sites focused their bird hunting efforts on grouse. We found that the Fremont people used birds for a variety of purposes, including as food sources and as raw materials for tools and artifacts involving bones and feathers. Contextual data for bird bones recovered from Wolf Village and Baker Village suggest that some bird species were used at possible ceremonial and communal structures.*

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**T**HE FREMONT PEOPLE INHABITED MUCH OF UTAH, as well as parts of Nevada, Idaho, Wyoming, and Colorado, from approximately A.D. 500 to 1300. Fremont sites have been identified in the greatest concentrations along the eastern edge of the Great Basin and the northern Colorado Plateau. Like Southwestern groups, the Fremont people practiced agriculture by cultivating maize (Simms 1986), used ceramics similar to other Southwestern groups (Watkins 2009), and aggregated into villages involving various architectural types, including both surface and pit structures (Talbot 2000).

Fremont archaeologists have rarely considered the use of prehistoric avifauna. A notable exception is a study by Paul Parmalee (1980), who presented data on bird bones obtained from five Archaic and eleven Fremont sites in Utah. He noted that “archaeologically derived

bird bones have not, for the most part, received much attention” (Parmalee 1980:237), a statement that still essentially holds true. While some archaeologists have commented on the use of birds by the Fremont people (Baadsgaard 2004:240, 255–256; Lambert 2018:92–97; Rood and Butler 1993:171–176; Talbot et al. 2000:486–489), Parmalee’s (1980) study is the last major publication to explore bird usage by the Fremont people in any depth. This is unfortunate, since bird remains have been found at several major Fremont habitation sites (Lambert 2018; Metcalf et al. 1993a, 1993b; Searcy et al. 2016; Sharp 1992; Stauffer 2012; Talbot et al. 2000; Talbot et al. 2004; Wilde and Soper 1999) and scholars in adjacent regions have addressed bird harvesting practices (Broughton 1999, 2004; Daily 2011; Goshen 2013; Morejohn and Galloway 1983; Porcasi 1999).

The purpose of this article is to report the results of a recent analysis of the avifauna from 12 Fremont-period sites in Utah and Nevada and to examine avifaunal use more generally among the Fremont (Fig. 1). The focus of the current study are data from sites excavated after 1980 (the year of Parmalee's publication), or from sites with recently reanalyzed faunal collections (such as the Parowan Valley sites). The sites in our study include the Block 49 site (42SL98), the South Temple site (42SL285), the Hinckley Mounds (42UT111), Wolf Village (42UT273), the Round Spring site (42SV23), Nawthis Village (42SV1291 and 42SV1292), Five Finger Ridge (42SV1686), Radford Roost (42SV1688), Baker Village (26WP63), and sites included as part of the Parowan Valley Archaeological Project (PVAP), including Paragonah (42IN43), Summit (42IN40), and Parowan (42IN100).

We examine bird taxa used primarily as dietary resources and those used for both dietary purposes and as raw materials. Following Talbot et al. (2000:489), we group assumed food birds such as grouse and waterfowl for comparison with assumed non-food birds (raptors, corvids, woodpeckers, and passerines). For the purposes of this study, we define "food birds" as members of medium- to large-sized taxa such as grouse (Phasianidae) and waterfowl (Anatidae). These two bird families are the most common bird taxa in the regional assemblage, probably due to their value as food, although the bones and feathers of waterfowl were almost certainly used to construct tools and other objects as well. The bones of food birds are often found in dietary contexts, such as hearths and storage pits. In contrast, "non-food birds" are those that were collected primarily for feathers; although they were probably also used as food resources at least part of the time. These include accipiters, owls, corvids, woodpeckers, and passerines.

The results of our study suggest that the Fremont people, with few exceptions, primarily hunted local food birds. Waterfowl are primarily recovered from Fremont sites near marshlands, while grouse bones are recovered from sites away from marshes. In addition, accipiters, owls, and passerine taxa were also hunted; however, they were primarily used for their feathers. In this analysis, we note that several bones of non-food birds were recovered from possible ceremonial and communal structures.

## BACKGROUND

The only major discussion of Fremont bird use was written by Parmalee (1980), who examined bones to identify various bird species used by the Archaic and Fremont cultural groups in Utah. In addition to unmodified faunal remains, bird bones appear in assemblages as worked or shaped tools or ornaments. Worked bone is often discussed briefly in reports of excavations at Fremont sites, but the data have never been synthesized. Bird bones and feathers were used for both utilitarian and ceremonial purposes, and are recovered in specimens ranging in form from fragmentary awls to elaborate, multi-component headdresses.

### *Birds as a Dietary Source*

Birds were an important food resource for the Fremont people. Parmalee (1980) analyzed approximately 5,050 bird bones from sites in Utah, some 3,555 of which were recovered from Fremont contexts. His analysis suggests that the Fremont people focused primarily on hunting waterfowl, while grouse were rarely exploited; however, many of the sites covered in his analysis were located close to the Salt Lake marshlands (Parmalee 1980:249). Parmalee (1980:247) noted that grouse were numerous at Nephi Mounds and Pharo Village, two open desert sites included in his study. This suggests that grouse and perhaps other birds were used more heavily by the Fremont than Parmalee thought. The abundance of grouse at open desert sites in central Utah was also noted at Five Finger Ridge (Talbot et al. 2000:487). Our research expands upon the idea that the Fremont probably hunted local birds, an idea which we explore by testing the relationship between site locations and the use of waterfowl using GIS and regression analyses.

### *Birds as a Source of Raw Materials*

*Bird-bone Artifacts.* Bird long bones are relatively straight and hollow, making them ideal materials for certain tools (Bailey 1940:19). The Fremont people removed most of the features during the manufacturing process that are commonly used to identify bone element and species, but there was a marked preference for the long bones (i.e., femurs, ulnae, and humeri) of medium- to large-sized birds (likely including grouse and waterfowl). Dalley (1970:97) has described the most common manufacturing process used to make bird-bone artifacts

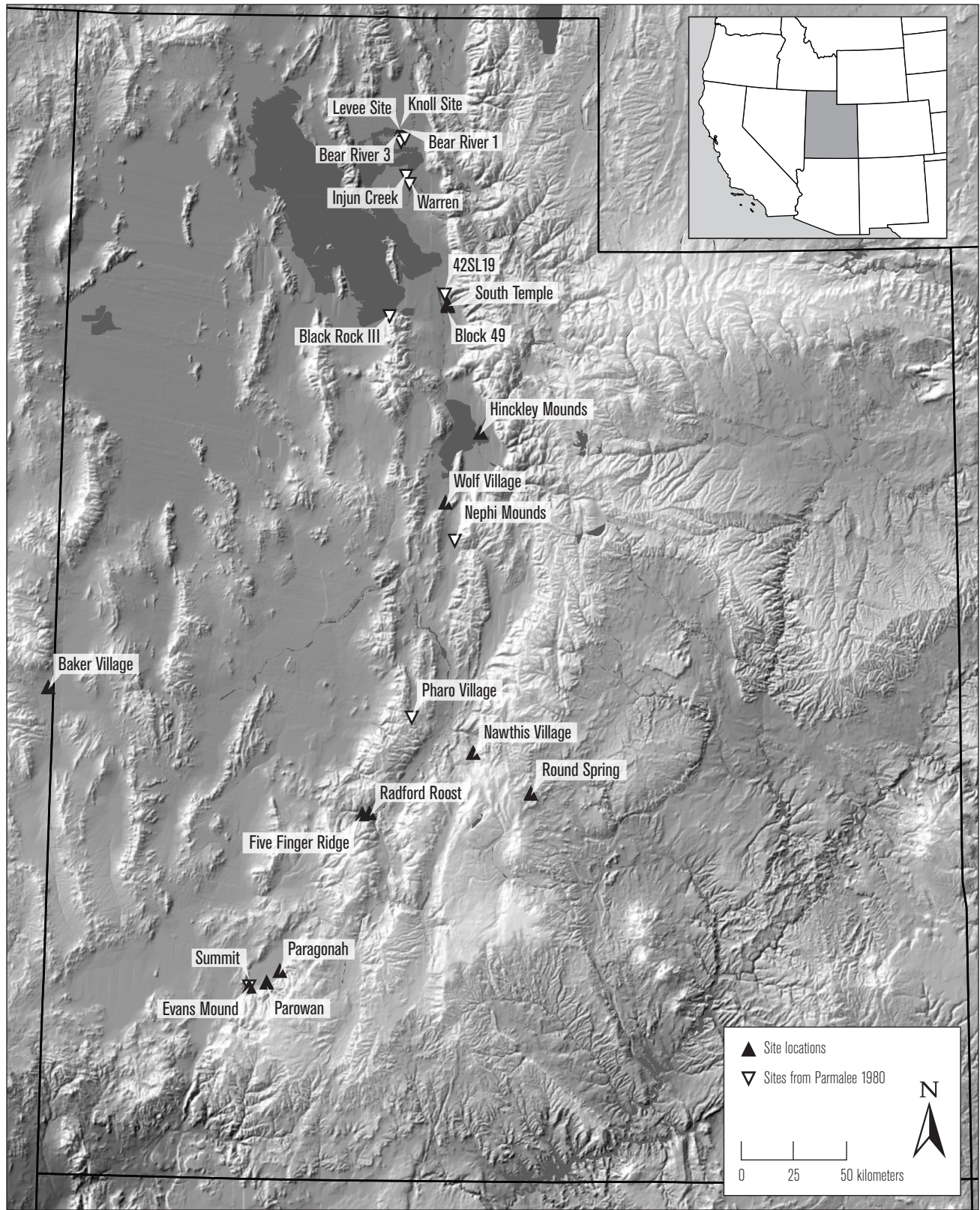


Figure 1. Map of Utah showing the location of Fremont sites from this study and Parmalee (1980). Note that the Baker Village site is in Nevada rather than in Utah.



**Figure 2. Examples of tubular bird-bone beads from Wolf Village.**

as “sawing a groove completely about the circumference of a bone until it was either sawed completely through or was sufficiently weakened so a portion could be neatly snapped off.” Parmalee (1980:247) describes bone tools made from the humerus and ulna of a Sandhill Crane (*Antigone canadensis*) by means of this technique.

The most common bird-bone artifacts recovered from Fremont sites are beads or tubes made by sectioning portions of the long bones (Fig. 2). The terms “tube” and “bead” are often used interchangeably to describe ornamental objects incorporated into necklaces. The distinction between beads and tubes is highly subjective, and the objects were likely used in the same way (Dalley 1970:103; Kidder 1932:256). A recent analysis of worked-bone beads from Wolf Village suggests that 23 percent ( $n=10$ ) of the bone beads were constructed from medium- to large-sized bird bones, especially those of Anatidae (Lambert 2018:176–179).

Whistles, simple musical instruments made from long bones and with one or two apertures, have been recovered from ten Fremont sites (Bryce and King 2014). In general, the apertures are located near one end of the instrument, using transverse sawing or grinding to create a rectilinear opening (Fry and Dalley 1979; Russell 1989). This contrasts with the typical tubular whistles from the Greater Southwest which have a single hole drilled in the center of the shaft (Brown 2005:245; Bryce and King 2014). Whistles may have had utilitarian functions, such as communication and signaling, or have been used in

ceremonial contexts as is commonly seen in the Puebloan area (Brown 2005).

Although they are not common, awls were also made from bird long bones (Dalley 1970). These tools consist of sharpened fragments of bone shafts, which sometimes include the articular head. There are few sites where bird-bone awls have been found, and with the exception of the 38 awls found at the Levee site (Fry and Dalley 1979), they are few in number.

*Feathers.* The best-known use of feathers by the Fremont people involves elaborate headdresses. The finest example was recovered from Mantle’s Cave in Dinosaur National Monument. The headdress was constructed from over 370 feathers from at least 61 birds (Burgh and Scoggin 1948:40). The vanes of the feathers were trimmed to create a diamond pattern at the end. The feathers came from red-shafted flickers, with six yellow-shafted flicker feathers forming the center. The exposed quills created a colored pattern. The feathers were all sewn together below the tufts with two rows of twisted sinew. Three or more pieces of long-tailed weasel hide were attached at the base (Truesdale 1993:28). The weasel skins were backed with buckskin from either deer or elk. A second example of a feathered headdress was recovered by Morss (1954) in a site along Temple Creek. The 122 feathers were individually attached to a 53-inch-long strip of buckskin by short lengths of string. Most of the feathers were approximately seven-inch-long pinion (long, stiff feathers used for flight) feathers that

were likely from some raptor species (Morss 1954:18). One other headdress was made from the crown of a deer scalp that had the eyes sewn shut (Burgh and Scoggin 1948:41–42). Feather quills were used to stiffen the ears so that they stood erect (Gunnerson 1969:156).

Like many groups in the Southwest, feathers were also used to make cordage. These feathers have not always been identified, nor has the construction of the artifact normally been recorded. There are five examples, in Fremont contexts, where the foundation of the cordage was two-ply vegetal fiber (Fowler 1963; Janetski et al. 2005). Feathered cordage was likely used to make robes or capes, though only a few fragmentary pieces of feathered cloth have been found in Fremont contexts (Burgh and Scoggin 1948:66; Gunnerson 1969:155). A charred mass found at Snake Rock Village is a possible example of a feather robe from an open-air site (Aikens 1967:27).

One unique form of clothing was found with two burials in the Parowan Valley. One individual from the Paragonah site was surrounded by the bones of weasels and at least six birds in a configuration that suggests some type of belt (Meighan et al. 1956). The bird bones present, and the damage observed on the bones, indicate that these were complete bird carcasses with the feathers intact. The feathers and the cordage that bound them were represented by impressions in mud surrounding the body. The species of birds were not identified, but it was suspected that at least three species were represented, one of which was a duck (Meighan et al. 1956:84). An additional burial was recovered from the Evans Mound in the 1970s (Dodd 1982). The individual was interred facing a great horned owl (probably with the skin, wings, and head still attached), with nine black-billed magpie skulls around the waist (Pecotte 1982:117). The fill below the burial contained chalcedony bifaces, a quartz crystal, a probable whistle, and bone shavings. The burial may also have been associated with eight ceramic vessels and seven Parowan Basal-notched projectile points arranged alternately point to base on the surface of an inverted metate (Pecotte 1982:120). These were two of the richest Fremont burials to be encountered, and the individuals may have been shamans or persons of status.

Feathers were also incorporated into other artifacts. Usually only fragments of arrows have been found, but it appears that three equally-spaced split feathers

were a common fletching configuration, attached to the shaft with sinew (Burgh and Scoggin 1948:62; Dalley 1976:119–120). Unfortunately, the feathers used in fletching are seldom identified to species. Fletching on arrows is not commonly found, but there must have been a need for fletching feathers, judging by the large number of projectile points found at Fremont sites. Additionally, there may have been arrows that did not use stone tips which would have also required fletching.

Some artifacts have been found with feathers attached to sticks or cane. The method of attachment differs from that used for arrows, with the feathers often inserted into the cane instead of being tied to the outside, and some artifacts resemble prayer sticks used in the Puebloan area (Meighan et al. 1956:85, 87). Hollow cavities were identified above a Paragonah burial (the same burial with the bird and weasel belt discussed above) that showed two sticks with feathers attached (Meighan et al. 1956:85). Other examples include feathers inserted into pieces of phragmites or horsetail-style reed, typically found in the Fremont River area (Janetski et al. 2005:410, 419; Morss 1931:24, 76).

Birds likely had symbolic meaning for the Fremont people, and feathers found in bundles were likely used ceremonially. One bundle, found at the Morss Site 11 (Morss 1931), consisted of a stubby corn cob tied to a piece of dressed hide containing a rectangular piece of sandstone. Some downy feathers protruded from the bundle (Janetski et al. 2005:417). Another bundle, from Site 25, was rolled in a long strip of mountain sheep hide. The roll contained two large bifaces and fifteen feathers from an eagle or hawk (Morss 1931:75–76).

Feathers were sometimes tied together for later use. Bundles of Northern Flicker, poorwill, magpie, and eagle have been identified (Burgh and Scoggin 1948:40; Fowler 1963; Goff 2010:46). These bundles may have been stored or may have been items of use in other ways. Many of the objects described above required a large number of feathers (370 and 122 for the headdresses), and feathers were likely cached until enough could be collected.

## MATERIALS AND METHODS

New data, which have not been previously reported in one place, involve 2,185 bird bones from twelve Fremont sites in Utah and Nevada (Table 1; see Fig. 1). Data from ten

**Table 1**  
**LIST OF TWELVE FREMONT SITES INCLUDED IN THIS STUDY**

Site Name and Designation	Year(s) Excavated	Occupation Ranges (A.D.)	Screen Size	Site References
Block 49 site	1986	950-1300	1/4 inch for overburden	Talbot et al. 2004
42SL98			1/8 inch for fill and floor	
South Temple site	1998	950-1300	1/4 inch for overburden	Talbot et al. 2004
42SL285			1/8 inch for fill and floor	
Hinckley Mounds	2015	1100-1200	1/8 inch	Searcy et al. 2016
42UT111				
Wolf Village	2009-2016	650-1150	1/8 inch	Johansson et al. 2014;
42UT273				Lambert 2018
Round Spring	1986-1987	650-1250	1/8 inch	Metcalf et al. 1993a, 1993b
42SV23				
Nawthis Village	1978-1982	850-1150	1/4 inch for overburden	Sharp 1992
42SV1291			1/8 inch for fill and floor	
Five Finger Ridge	1983-1984	1200s	1/4 inch for overburden	Talbot et al. 2000;
42SV1686			1/8 inch for fill and floor	Janetski et al. 2000
Radford Roost	1983-1984	1165	1/4 inch for overburden	Talbot et al. 1999;
42SV1688			1/8 inch for fill and floor	Janetski et al. 2000
Summit	1954-1964	600-1400	1/4 inch	Berry 1972
42IN40				Stauffer 2012
Paragonah	1954-1960	810-1280	1/4 inch	Stauffer 2012
42IN43				
Parowan	1960s	850-1400	1/4 inch	Stauffer 2012
42IN100				
Baker Village	1991-1992	1000-1300	1/8 inch	Wilde and Soper 1999
26WP63				

of the sites stem from projects involving archaeologists affiliated with the Office of Public Archaeology or the Department of Anthropology, both at Brigham Young University (BYU). Data from Nawthis Village and the Round Spring site were obtained from Sharp (1992) and Metcalf et al. (1993a, 1993b), respectively. Other sites (Salt Lake Airport site, Woodard Mound, Icicle Bench, and Lott's Farm) were considered for this research but were not included, since a combined total of only 13 bird bones were identified to the family level from their Fremont occupations, and their counts do not impact our findings.

The twelve assemblages included in this study were collected using varying excavation methods, sampling strategies, and analytical protocols. Dissimilar methods and strategies can greatly affect the results of a faunal

bone analysis, and these factors must be considered (Driver 2011; Fisher 2015). All or most of the bone was identified from the following sites: Block 49 (Talbot et al. 2004), South Temple (Talbot et al. 2004), Nawthis Village (Sharp 1992), Five Finger Ridge (Talbot et al. 2000), and Radford Roost (Talbot et al. 1999). Although the Baker Village assemblage was completely identified (Hockett 1998; Wilde and Soper 1999), our data for that site come from a reanalysis of the bones presented in Johansson (2014). At the Hinckley Mounds, analysts focused on identifying bones associated with the three excavated buildings (Searcy et al. 2016). Likewise, only a sample of the Wolf Village faunal assemblage was identified, with a focus on Fremont architecture and extramural pits (see Lambert 2018:59-63 for a detailed explanation of the sampling strategy). Lastly, approximately 40 percent

of the combined assemblage for the Summit, Parowan, and Paragonah sites was identified as part of the Parowan Valley Archaeological Project (PVAP), an effort by archaeologists at BYU to produce syntheses of the excavations in Parowan Valley conducted during the 1950s and 1960s (Stauffer 2012:10–17).

Unfortunately, precise contextual information for each bird-bone specimen was difficult to obtain for most of the sites. There are two exceptions: (1) Wolf Village, where raw data from Lambert (2018) were provided by the author, and (2) Baker Village, where raw data were provided by Johansson (2014). For five sites, several sources list contexts for bones based on provenience: the Block 49 site (Baadsgaard 2004:260–262), South Temple (Baadsgaard 2004:245–247), the Round Spring site (Rood and Butler 1993:171–176), Nawthis Village (Sharp 1992:64–75), and Radford Roost (Talbot et al. 1999:116–117). All bird bones in our assemblage originated from Fremont contexts, either the fill or floors of Fremont buildings, or from associated middens or pits.

Screening methods are directly correlated with the types of bones present in an assemblage (Grayson 1984; Serjeantson 2009; Thomas 1969). In most contexts, however, 1/8-inch screening was used, so screening bias is unlikely to be a major factor. The PVAP sites are exceptions, since they were excavated using only 1/4-inch screens; consequently, the low number of identified bird bones from those sites may be due to screening bias, since small bird bones may have fallen through the larger mesh. Therefore, we are somewhat distrustful of the small bird NISP counts for the PVAP sites.

Multiple analysts with varying degrees of skill and with varying access to comparative specimens identified the bird bones included in this study; therefore, while the analysts identified several bird genera and species at the sites, we only consider birds at the family level. Determining species level identifications for birds is very challenging, particularly within certain families (Serjeantson 2009:63), and some species seem more abundant in faunal assemblages because they are easier to identify (Driver 2011:24). Considering bird bones only to the family level minimizes concerns about the varying skill sets and comparative collections available to each analyst. When discussing bird families, genera, or species, we use the taxonomic names provided by the American Ornithological Society (2018). Number of

Identified Specimens (NISP) counts are used rather than Minimum Number of Individuals (MNI) because not all analysts calculated MNI measures for assemblages.

## RESULTS OF THE ANALYSIS

Twenty-two bird families were identified within Fremont assemblages in this study (Table 2; Fig. 3). Phasianidae (primarily grouse from the subfamily Tetraoninae), Anatidae (swans, ducks, and geese), Corvidae (jays, magpies, and crows), Accipitridae (hawks and eagles), and Picidae (flickers and woodpeckers) were the most commonly represented bird families at study sites.

### *Food Birds*

The two most common bird families in the regional assemblage are Phasianidae and Anatidae, probably due to their value as food birds. While Parmalee (1980:245) noted that waterfowl comprised more than 70 percent of his assemblage (see also Serjeantson 2009:234), waterfowl make up roughly 25 percent ( $n=549$ ) of our assemblage. These differences are probably due only to the variability in the sites examined by us and Parmalee. Most of the bird bones analyzed by Parmalee (1980:249) were from wetland sites, while many of the sites in our study are open desert sites. Despite the lower percentage of waterfowl in the faunal assemblage, approximately 67 percent of the Anatidae bones in our assemblage are from sites close to wetland sources: Wolf Village and the Hinckley Mounds. At Wolf Village, 71 percent of all identified bird bones ( $n=199$ ) were from waterfowl (Lambert 2018), while 70 percent of all bird specimens at the Hinckley Mounds ( $n=169$ ), a site in the old Provo River delta, were waterfowl (Searcy et al. 2016). In contrast, Phasianidae (specifically grouse from the subfamily Tetraoninae) is the most commonly identified taxon in open desert sites, accounting for approximately 40 percent ( $n=872$ ) of the sample. Over half of the grouse assemblage comes from Five Finger Ridge and Nawthis Village, suggesting that Fremont people living away from large lakes hunted grouse more frequently than any other species of birds.

Combining our bird-bone data with data provided by Parmalee (1980) allows the development of a broader, regional synthesis on Fremont bird use than was previously available. Since Parmalee analyzed bird bones



Table 2

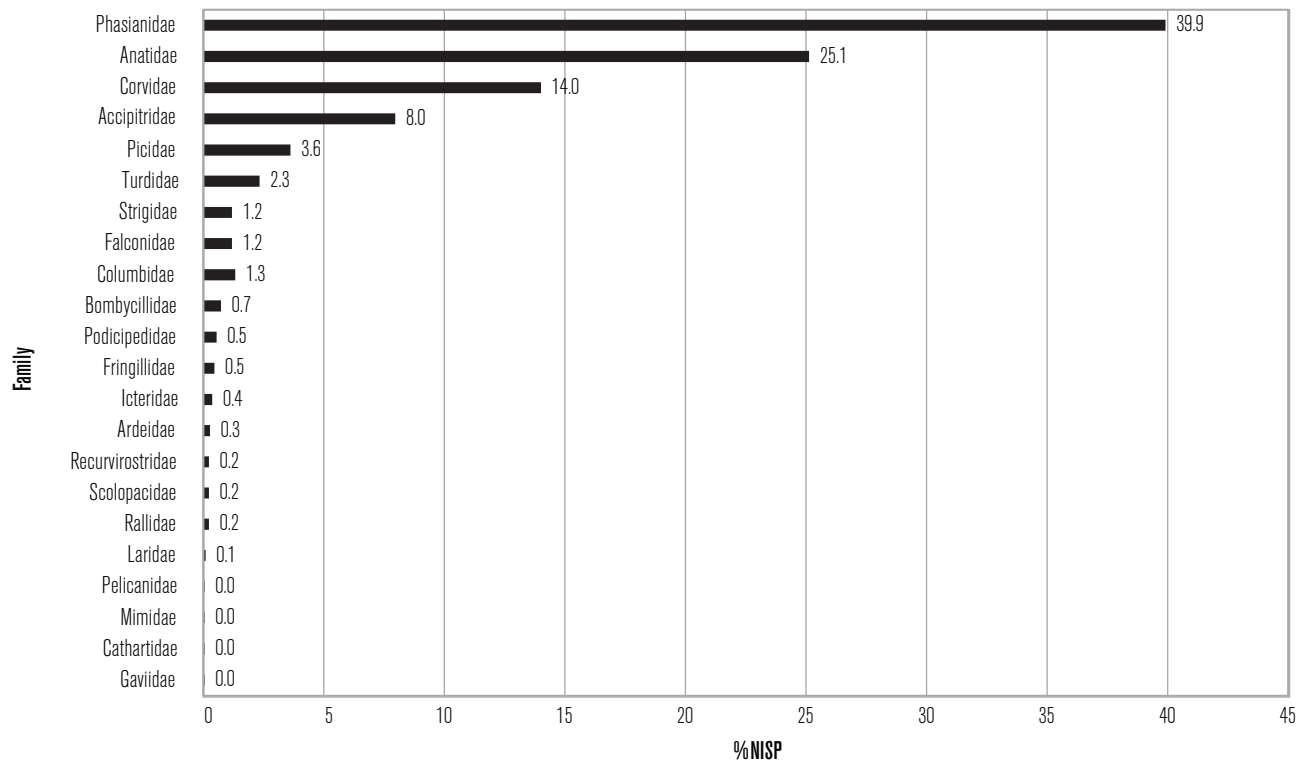
## NISP COUNTS OF BIRD FAMILIES IDENTIFIED FROM TWELVE FREMONT SITES INCLUDED IN THIS STUDY

Families	Block 49	South Temple	Hinckley Mounds	Wolf Village	Round Spring	Nawthis Village	Five Finger Ridge	Radford Roost	Summit	Paragonah	Parowan	Baker Village	Total No. Specimens
Gaviidae – Loons	–	–	–	–	–	–	1	–	–	–	–	–	1
Podicipedidae – Grebes	5	1	2	1	–	–	–	–	1	–	2	–	12
Pelecanidae – Pelicans	–	–	–	1	–	–	–	–	–	–	–	–	1
Ardeidae – Herons	–	3	2	1	–	–	–	–	–	–	–	–	6
Anatidae – Swans, Ducks, and Geese	53	21	169	199	2	23	33	10	11	10	14	4	549
Cathartidae – Vultures	–	–	–	–	–	–	1	–	–	–	–	–	1
Accipitridae – Hawks and Eagles	14	26	–	–	6	109	8	–	6	–	4	1	174
Falconidae – Falcons	–	–	1	1	3	8	8	–	2	–	3	–	26
Phasianidae – Grouse	43	7	1	18	27	193	477	40	31	6	20	9	872
Rallidae – Coots	–	–	–	–	–	–	4	1	–	–	–	–	5
Scolopacidae – Snipes	–	–	3	2	–	–	–	–	–	–	–	–	5
Recurvirostridae – Avocets	–	–	3	1	–	–	–	–	–	–	1	–	5
Laridae – Gulls	–	–	1	–	–	–	–	–	–	–	1	–	2
Columbidae – Doves and Pigeons	–	–	–	20	–	2	5	–	1	–	1	–	29
Strigidae – Owls	–	–	–	1	–	8	7	–	4	4	2	–	26
Picidae – Flickers and Woodpeckers	–	–	7	2	–	20	41	–	3	1	5	–	79
Bombycillidae – Waxwings	–	–	8	6	–	–	–	–	2	–	–	–	16
Mimidae – Catbirds	–	–	–	–	–	–	1	–	–	–	–	–	1
Turdidae – Robins	–	3	18	22	–	–	–	–	1	3	4	–	51
Icteridae – Blackbirds	–	–	–	–	–	–	7	1	–	–	–	–	8
Fringillidae – Finches	2	–	–	–	–	–	6	2	–	–	–	–	10
Corvidae – Jays, Magpies, and Crows	–	–	30	5	150	73	41	3	1	3	–	–	306
<b>TOTAL</b>	<b>117</b>	<b>61</b>	<b>245</b>	<b>280</b>	<b>188</b>	<b>436</b>	<b>640</b>	<b>57</b>	<b>63</b>	<b>27</b>	<b>57</b>	<b>14</b>	<b>2,185</b>

from both the Archaic and Fremont time periods, we combined the 3,555 bird-bone specimens associated only with Fremont contexts with the bird specimens in our assemblage. The combined data are presented in Table 3.

The combined results provide a clearer picture concerning which types of birds were used by the Fremont people (Fig. 4). Bone specimens from both the Anatidae and Phasianidae families comprise 74 percent of the total NISP. Parmalee (1980:245–246) observed that Anatidae bones were more abundant than bones from other bird families in his study. As noted, this was due in large part to the fact that his data came from sites in the vicinity of the Great Salt Lake wetlands (Parmalee 1980:249; Talbot et al. 2000:489). In contrast, Phasianidae

bones were less-abundant, comprising approximately 7 percent of Parmalee's assemblage ( $n=239$ ) and coming primarily from open desert Fremont sites in central Utah (Parmalee 1980:247). Our study suggests that while waterfowl species were regularly hunted by the Fremont at wetland sites, grouse species were hunted more at open desert sites than Parmalee's research suggested. In the combined assemblage, Phasianidae comprises 19 percent of the assemblage, second only to Anatidae in terms of abundance. The location of a site determined whether the main food birds used by the Fremont people were grouse or waterfowl, but the combined data suggest that it was usually one of the two—grouse at desert sites, and waterfowl near wetlands.



**Figure 3.** Bar chart showing the relative abundance of bird families at the 12 Fremont sites.

Besides grouse and waterfowl, other food birds represented in the combined assemblage include pelicans (Pelecanidae), rails (Rallidae), and herons (Ardeidae). None of these bird families have a significant presence in our own assemblage, probably because we gathered data from more open desert sites than Parmalee (1980) did. While the combined data suggest a regular use of pelicans, rails, and herons, they were probably only hunted regularly at Fremont wetland sites.

There is little evidence of cut and burn marks on bird bones in the regional assemblage. The lack of cut marks likely reflects the fact that bird bones are often reported with very little detail, if they are reported at all (Serjeantson 2009:131). Humeri are generally the elements with the most cut marks (Serjeantson 2009:136), which is true for the Anatidae in our study. Only 30 bird bones in our assemblage exhibit signs of cut marks. Unsurprisingly, 24 are Anatidae and Phasianidae bone specimens, primarily consisting of wing and leg bones. Since 26 of the 30 cut bones are from Summit and Nawthis Village, we suspect one of two things: (1) either Fremont people from those sites butchered birds

differently than Fremont people from the other sites in our study, or (2) the analysts who identified the cut marks on those bones were more skilled at detecting cut marks than the analysts who identified bones from the other sites. It should be noted, however, that it is possible to dismember bird bones without stone tools. Birds can be dismembered by disarticulating the main joints, such as the wings and legs. Disarticulation might leave visible marks on the distal and proximal ends of long bones, although none were noted in the assemblage. Therefore, the lack of cut marks on the bird specimens in our assemblage does not necessarily mean birds were not used as a food resource.

Likewise, burn marks on bird bones are also rare in the assemblage. Only 2 percent (n=42) of the bird bones exhibit burn marks. Again (and unsurprisingly), most of the burned bones are of Anatidae and Phasianidae (n=37). As expected, the burned Anatidae bones are from sites close to water. In fact, almost all of the burned Anatidae bones are from Wolf Village and the Hinckley Mounds, although a single specimen is from the South Temple site. The burned Anatidae bones are primarily from legs and wings, suggesting these body parts were sometimes

**Table 3****NUMBER OF IDENTIFIED SPECIMENS REPRESENTED IN AVIAN ASSEMBLAGES FROM PARMALEE (1980) AND THIS STUDY**

Families	Parmalee (1980)	This Study	Total NISP	% NISP
Gaviidae – Loons	–	1	1	0.0
Podicipedidae – Grebes	19	12	31	0.5
Pelecanidae – Pelicans	233	1	234	4.1
Phalacrocoracidae – Cormorants	21	–	21	0.4
Ardeidae – Herons	106	6	112	2.0
Plataleidae – Ibises and Spoonbills	1	–	1	0.0
Anatidae – Swans, Ducks, and Geese	2,584	549	3,133	54.6
Cathartidae – Vultures	–	1	1	0.0
Accipitridae – Hawks and Eagles	47	174	221	3.9
Falconidae – Falcons	17	26	43	0.7
Phasianidae – Grouse	239	872	1,111	19.4
Gruidae – Cranes	7	–	7	0.1
Rallidae – Coots	143	5	148	2.6
Charadriidae – Plovers and Turnstones	2	–	2	0.0
Scolopacidae – Snipes	13	5	18	0.3
Recurvirostridae – Avocets	27	5	32	0.6
Laridae – Gulls	11	2	13	0.2
Columbidae – Doves and Pigeons	2	29	31	0.5
Strigidae – Owls	26	26	52	0.9
Picidae – Flickers and Woodpeckers	6	79	85	1.5
Bombycillidae – Waxwings	–	16	16	0.3
Mimidae – Catbirds	–	1	1	0.0
Turdidae – Robins	–	51	51	0.9
Icteridae – Blackbirds	6	8	14	0.2
Fringillidae – Finches	–	10	10	0.2
Corvidae – Jays, Magpies, and Crows	45	306	351	6.1
<b>TOTAL</b>	<b>3,555</b>	<b>2,185</b>	<b>5,740</b>	<b>100.0</b>

exposed to open flames. All but one of the burned Phasianidae bones are from Five Finger Ridge, with the remaining one from Summit. Besides butchering, other methods of dismembering and cooking birds include boiling or roasting whole birds (Rae 2007:85). Boiling and roasting leave little or no visible traces (Serjeantson 2009:153), which might explain the lack of cut or burned bones in our assemblage.

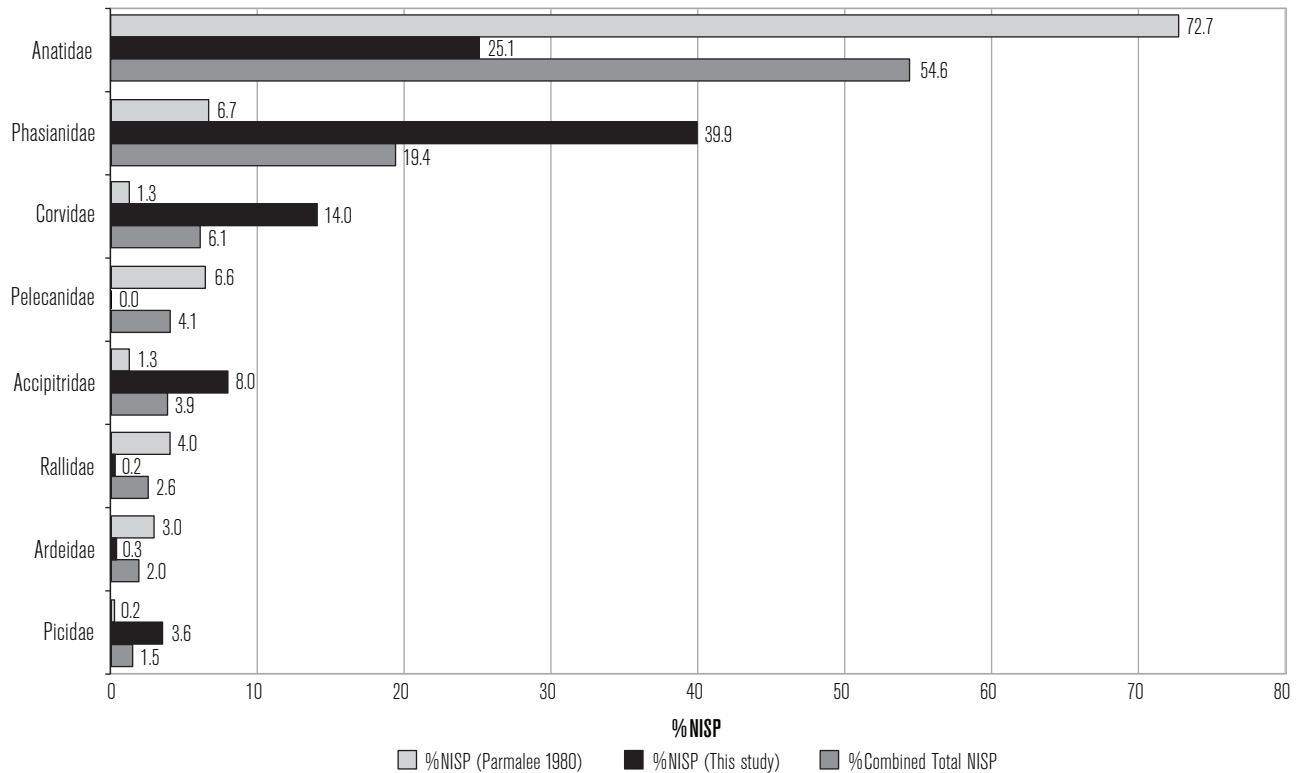
#### *Non-Food Birds*

Non-food bird families that are well-represented in our assemblage include the Corvidae, Picidae, and

Accipitridae. Approximately 14 percent (n=306) of the birds included in this study are Corvidae, most (n=150) of which were excavated from the Round Spring site. Most elements from the Picidae family were recovered from Nawthis Village, Five Finger Ridge, and the Parowan Valley sites, although seven elements were also identified in the Hinckley Mounds' assemblage and two in the Wolf Village assemblage. Picidae elements comprise approximately four percent (n=79) of all bird specimens included in this study. Parmalee (1980:248) suggested that Picidae species were probably hunted for their feathers rather than as food. Approximately 63 percent (n=109) of the Accipitridae bones in our study were from Nawthis Village. Accipitridae comprise 25 percent of the Nawthis Village avifauna assemblage, suggesting the importance of these birds, at least at that site. Among the Hopi, hawks and eagles have symbolic and ceremonial significance (Parmalee 1980:246; see also Fewkes 1900). This may also have been true for the Fremont people, although the faunal bone record suggests that hawks and eagles were infrequent "participants" in ceremonies or rituals outside of Nawthis Village. Likewise, recent Great Basin peoples usually did not eat eagles and hawks, nor did they eat corvids or other passerines. They did, however, eat owls, grouse, quail, and waterfowl (Steward 1941, 1943).

In addition to these frequently-represented bird families, we identified other bird families in the faunal record that are less well represented (see Fig. 3). The less frequently represented bird families include food birds such as Podicipedidae (grebes), Ardeidae (herons), Rallidae (coots), Scolopacidae (snipes), Recurvirostridae (avocets), and Laridae (gulls). All of these bird taxa are generally associated with wetlands. Non-food birds identified in this study include Falconidae (falcons), Columbidae (doves and pigeons), Strigidae (owls), and Icteridae (blackbirds). Of these bird families, Parmalee (1980:245) suggests that herons were used, in part, for their feathers. We propose that other bird families, such as owls, were also exploited by the Fremont people for their feathers.

Owl bones are not abundant in the overall assemblage, but were identified at approximately half of the sites in this study: Wolf Village, Nawthis Village, Five Finger Ridge, Parowan, Paragonah, and Summit. The presence of owls at these sites suggests their value to the Fremont people. Interestingly, each of these sites was large and appears to

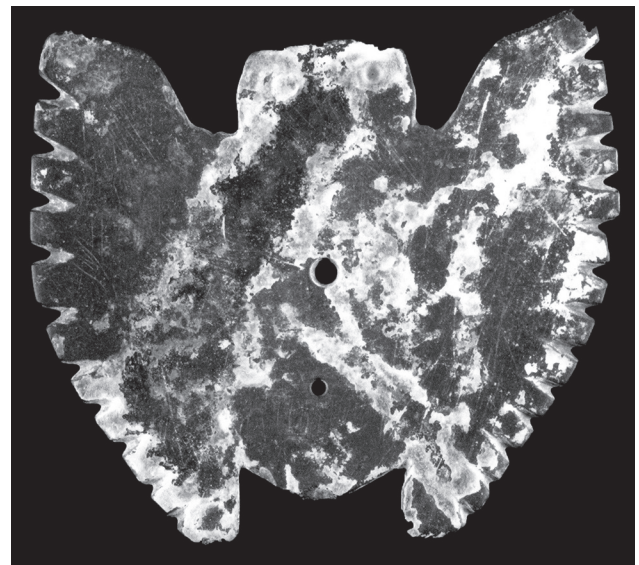


**Figure 4. Bar chart showing the relative abundance of bird families for Parmalee (1980), this research, and combined NISP totals.**

have had connections to extensive trade networks (Castro and Dement 2013; Janetski 2002; Janetski et al. 2011). In total, 26 Strigidae elements (1 percent) were identified in this study. Parmalee (1980:248) noted that owls were especially important for Native American groups as both a food resource and a supernatural symbol. The presence of owl bones at large Fremont sites suggests that they may have had value to the Fremont people on a regional scale. Indeed, owls may have been a symbol of a Fremont bird cult (Watkins 2010). A slate owl was found during excavations at Baker Village (Fig. 5; Janetski and Eccles 1999:159). This object had holes drilled in the body and it may have been a pendant. The wings were outstretched, with multiple notches in each wing representing the feathers. This specimen suggests that owls were important symbols for the Fremont people.

#### *Feather Record*

Bird feathers were not found in our assemblage; however, feathers from at least 23 different bird species have been identified at Fremont cave sites. The bird families represented among those species include Podicipedidae



**Figure 5. Slate owl from Baker Village (Museum of Peoples and Cultures Accession No. 1991.78.2892.1). Photo courtesy of the BYU Office of Public Archaeology.**

(grebes), Anatidae (waterfowl), Accipitridae (hawks and eagles), Cathartidae (vultures), Strigidae (owls), Phasianidae (grouse), Fringillidae (finches), Picidae

(woodpeckers and flickers), Corvidae (magpies and jays), Columbidae (pigeons and doves), Turdidae (robins), and Caprimulgidae (poorwills and nightjars) (Aikens 1970; Burgh and Scoggin 1948; Fowler 1963; Janetski et al. 2005; Sommer 2013). Out of these 12 identified bird families, only Caprimulgidae elements were not identified in the combined faunal assemblage (Table 4). It may be that the Fremont people only collected poorwills and nightjars for their feathers, so their bones are not represented in the archaeological record. It is also possible that these birds are so small that their bones are unlikely to be recovered from 1/8-inch mesh screens.

Some feathers were incorporated into composite artifacts, while some loose feathers may simply indicate that the bird was present at a site (this is usually only in a cave setting). In many instances, the feathers found are from families that are represented among the bones associated with the subsistence practices discussed in the previous sections, although some taxa (including such birds as grebes, finches, poorwills, turkeys, and bluebirds) are represented infrequently enough to suggest that they were not a common source of food.

### FOOD BIRDS AND HABITAT

Waterfowl are the most common food birds at sites close to modern water sources (Broughton and Miller 2016:144). Cook (1980) hypothesized that the Fremont people of Utah Valley emphasized the exploitation of marsh resources such as fish, waterfowl, and small mammals, and that this emphasis would be visible in the archaeological record. He analyzed bones from several sites around Utah Valley, and his results suggest that Fremont people at wetland sites did take advantage of the abundant marsh resources. In our own analysis, we tested the relationship between site locations and the use of waterfowl. We compared the proportion of waterfowl in the total avian assemblage with the distance from the site to water. A major assumption of this method is that the water source information currently available reflects water sources available prehistorically. Distance to water was calculated using GIS to locate the nearest lake, spring, or river/stream to the site. The water data were derived from the National Hydrography Dataset (NHD). Only water features coded as natural and permanent in the NHD were used in this analysis.

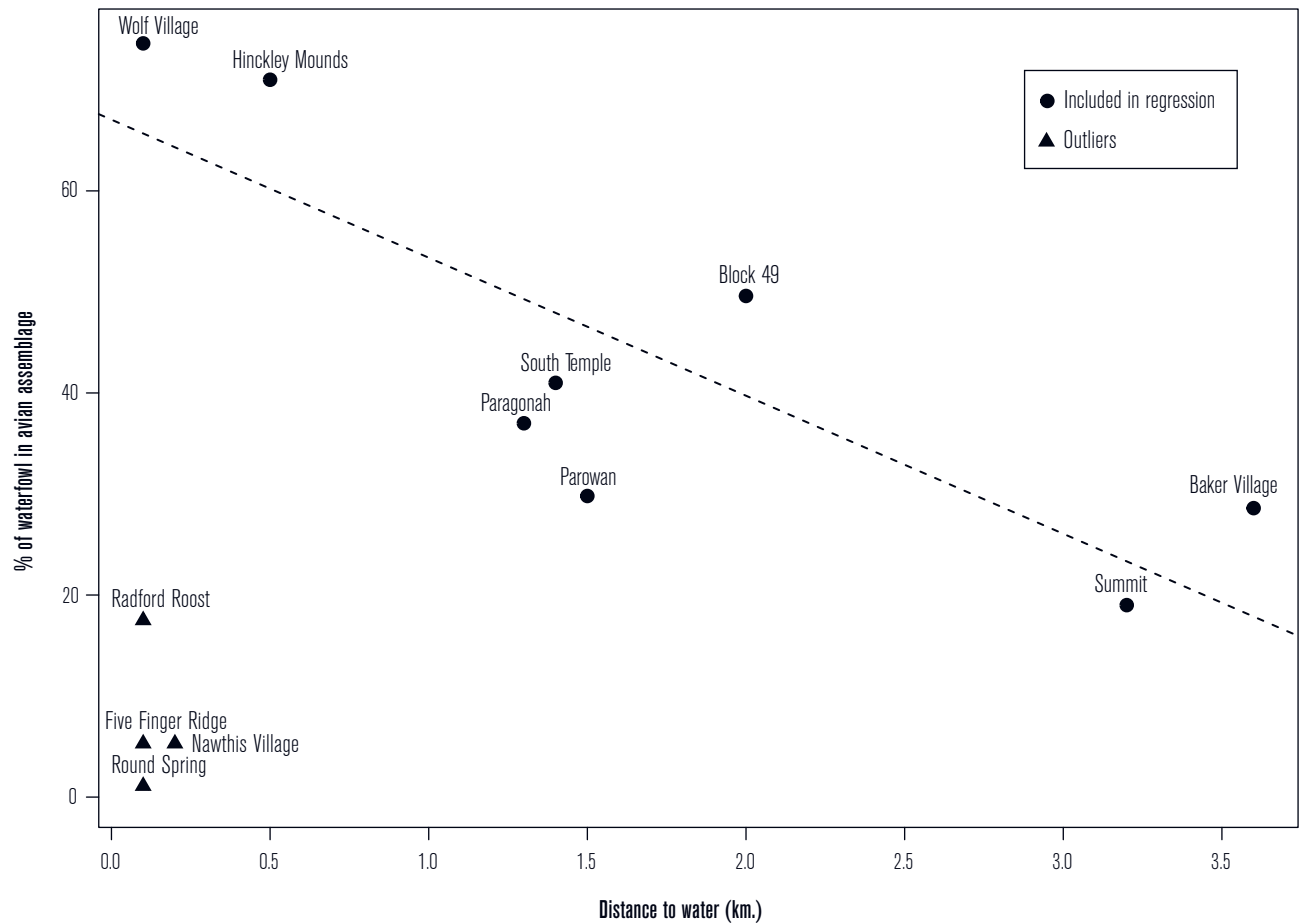
**Table 4**  
**BIRD FAMILIES IDENTIFIED IN FREMONT**  
**BONE AND FEATHER ASSEMBLAGES**

Families	Bone Record <sup>a</sup>	Feather Record <sup>b</sup>
Gaviidae – Loons	X	
Podicipedidae – Grebes	X	X
Pelecanidae – Pelicans	X	
Phalacrocoracidae – Cormorants	X	
Ardeidae – Herons	X	
Plataleidae – Ibises and Spoonbills	X	
Anatidae – Swans, Ducks, and Geese	X	X
Cathartidae – Vultures	X	X
Accipitridae – Hawks and Eagles	X	X
Falconidae – Falcons	X	
Phasianidae – Grouse	X	X
Gruidae – Cranes	X	
Rallidae – Coots	X	
Charadriidae – Plovers and Turnstones	X	
Scolopacidae – Snipes	X	
Recurvirostridae – Avocets	X	
Laridae – Gulls	X	
Columbidae – Doves and Pigeons	X	X
Strigidae – Owls	X	X
Picidae – Flickers and Woodpeckers	X	X
Bombycillidae – Waxwings	X	
Mimidae – Catbirds	X	
Turdidae – Robins	X	X
Icteridae – Blackbirds	X	
Fringillidae – Finches	X	X
Corvidae – Jays, Magpies, and Crows	X	X
Caprimulgidae – Poorwills and Nightjars		X

<sup>a</sup>Bone record includes sites in Parmalee (1980) and the sites in this study.

<sup>b</sup>Feather record includes birds mentioned in Aikens 1970; Burgh and Scoggin 1948; Fowler 1963; Janetski et al. 2005; Sommer 2013.

The results of the analysis are displayed in a scatterplot (Fig. 6). Four sites clearly stand out as outliers—Five Finger Ridge, Radford Roost, Nawthis Village, and the Round Spring site. These four sites are all located close to one another (see Fig. 1) and are classified as outliers since they are close to modern water sources, but they have some of the lowest proportions of waterfowl. If these sites are removed from the linear regression model, the results change from an  $r^2$  value near zero to 0.68 ( $t=-3.556$ ,  $df=6$ ,  $p\text{-value}=0.012$ ), which means that most of the variance in the proportion of waterfowl is explained by distance to water. Despite the potentially problematic use of modern water information, we believe the data indicate



**Figure 6. Scatterplot showing the relationship between the percentage of waterfowl in the avian assemblage and the distance to water in kilometers.**

that people at sites located near water (with the exceptions noted above) exploited waterfowl much more frequently than people at other sites. Based on these results, it seems waterfowl were not attractive enough on a regular basis for hunters to travel even a few kilometers to obtain, but were taken if conveniently located next to the site.

Despite being close to a water source, waterfowl comprise only 5 percent ( $n=33$ ) of the avian assemblage at Five Finger Ridge, while grouse comprise nearly 75 percent ( $n=477$ ). Similar numbers are present in the assemblages from Radford Roost (waterfowl at 17 percent and grouse at 70 percent) and Nawthis Village (5 percent and 44 percent). Waterfowl comprise only 1 percent of the avian assemblage from the Round Spring site, while corvids make up 80 percent. These four sites are all near modern wetlands. The fact that waterfowl are rare both at sites more distant from water and at several sites near water indicates that waterfowl were not preferred, or

perhaps were not as easily acquired, as other bird species. In other words, the availability of grouse, hawks, eagles, and corvids reduced the need for the Fremont people to rely on waterfowl.

### BIRDS IN CEREMONIAL AND COMMUNAL STRUCTURES

The preceding sections have identified patterning in the relative use of birds for food and for feathers. The contexts in which bird remains were found provide some further insight into the non-dietary use of some taxa. Important distinctions may be found between general midden (i.e., pit fill) and residential (i.e., house floor) contexts. Clear contextual information is not available for many of the sites included in the study (Baadsgaard 2004; Metcalf et al. 1993b; Sharp 1992), but some data are available from Wolf Village and Baker Village.

Non-food birds from floor or floor zone contexts at Wolf Village include robins (Turdidae), pigeons and doves (Columbidae), waxwings (Bombycillidae), corvids (Corvidae), flickers and woodpeckers (Picidae), falcons (Falconidae), and owls (Strigidae). Passerines, birds most likely to be used for feathers, were also found in five architectural features, including one pithouse and in Structures 1, 2, 6, and 8 (see Johansson et al. 2014 and Lambert 2018 for descriptions). With the exception of Structure 1 and the pithouse, the other buildings could have been used communally at least part of the time (see Johansson et al. 2014; Lambert 2018; Wilson 2013). Structure 1, out of the five buildings with passerines bones, had the most ( $n=9$ ). If Structure 1 was used to house a village leader or prestigious individual, as some have theorized (Johansson et al. 2014:47; see also Talbot 2000:139), they may have gathered more passerine feathers than others to use in rituals and communal activities. Among the non-food birds, the single falcon and owl specimens recovered from Structure 8 are also noteworthy. The presence of owl and falcon bones may provide further clues about the building's uses, and suggests that both bird families were at least sometimes hunted by the Fremont people of Wolf Village.

There are four bird families represented in the Baker Village assemblage, including Anatidae, Accipitridae, Phasianidae, and Laridae (see Table 2). Accipitridae and Laridae bones were only recovered from the central structure. Central structures are larger than average-sized pithouses (Talbot 2000:139). There is usually only one central structure in a Fremont site. All other buildings at Baker Villager were arranged around the central structure, suggesting its importance as a potential communal building (Johansson 2014:4–5). Hockett (1998) and Johansson (2014) have both argued that communal feasting may have occurred in the Baker Village central structure (although they disagree on how much of a role leporids or artiodactyls played in the proposed feasts). Since bones of food birds were present in both the pithouses and in the central structure, food birds may have been available to all Fremont people living at Baker Village. In contrast, Laridae and Accipitridae bones were only found in the central structure. If central structures truly were communal places with special functions, then Laridae and Accipitridae species may have been part of special communal or ceremonial practices.

The contextual data from Wolf Village and Baker Village demonstrate two trends. First, bones of passerine bird families were found primarily in communal structures at Wolf Village (Structures 2, 6, and 8). Falcon and owl bones, on the other hand, were found only in one large pithouse at Wolf Village (Structure 8). Likewise, raptor bones were only found in the central structure of Baker Village, a building where feasting activities may have occurred (Hockett 1998; Johansson 2014). That most raptor birds were found in communal buildings suggests their use in communal or ceremonial practices. These data are intriguing, but further data from additional sites are needed to support the conclusion that raptors were used/stored mainly in communal and ceremonial buildings.

## CONCLUSIONS

Birds were used by the Fremont people in both dietary and non-dietary contexts. The present study has shown that food birds predominate avifaunal assemblages at all Fremont sites, with the principal prey taxon dependent mainly on the proximity of the site to wetlands. Near wetlands, waterfowl—mainly ducks and geese—predominate, whereas away from wetlands, grouse are most common. Other food birds include pelicans, rails, and herons.

Accipiters, owls, and passerine taxa were likely harvested primarily for their feathers, and are common components of avifaunal assemblages at Fremont sites. In addition, the Fremont people used bones from medium- to large-sized birds—including ducks, grouse, accipiters, cranes, and owls—to create bone objects such as beads, whistles, and tools. Feathers from a number of taxa appear on ceremonial and burial regalia and on artifacts found in dry caves. These include feathers from grebes, ducks/geese, hawks/eagles, vultures, owls, grouse, finches, woodpeckers/flickers, crows, and various other passerine taxa.

The bird bones from the archaeological record, combined with artifacts constructed out of bird parts, suggest that birds were used by the Fremont people as a supplemental source of protein and as a resource for bones and feathers. Preliminary data indicate that the remains of certain taxa, most notably owls, hawks, and eagles, may have been curated within ceremonial or communal structures, and therefore may have played a symbolic role in Fremont rituals. Future excavators

should note the contexts of bird bones in their reports and publications in order to further explore this pattern. Detailed accounts of cut and burn marks on bird bones should also be noted, at least in as much detail as large- and small-sized mammal bones are afforded. As other large Fremont sites are excavated, future researchers can perform analyses similar to ours to help determine how other families of birds were used by the Fremont.

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