

## Avian material from Rancho del Oro, a Pleistocene locality in San Diego County, California

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*Abstract.*—Late Pleistocene avifaunal material from a construction site in Oceanside, California is described. The material includes 77 bones from 21 species, only one of which (*Podiceps parvus*) is extinct. Two previously described Pleistocene species (*Oxyura bessomi* and *Bucephala fossilis*) are placed in extant species. The first fossil record for *Phalaropus lobatus* is recorded.

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In 1994 a lacustrine sandstone containing vertebrate material was discovered at a construction site in Oceanside, California (33° 4'26"N, 117° 7'25"W). Approximately 500 kg of matrix were removed and dry screened through 1/8 in mesh. The site was subsequently graded away. The locality, named Rancho del Oro, has yielded bones of turtle, anuran and fish (*Mugil* sp.) as well as twenty-one avian taxa, now cataloged at the San Diego Natural History Museum (SDNHM). Table 1 presents a list of these taxa and comments on each species appear below.

Table 1. Avian species from Rancho del Oro, late Pleistocene of Oceanside, California.

Taxa	No. bones
<i>Aechmophorus occidentalisclarki</i>	3
<i>Podilymbus podiceps</i>	11
<i>Podiceps parvus</i>	4
<i>Pelecanus</i> , cf. <i>P. erythrorhynchus</i>	1
<i>Anas clypeata</i>	1
<i>Aythya affinis</i>	3
<i>Bucephala albeola fossilis</i>	3
<i>Oxyura jamaicensis</i>	16
Anatid	4
<i>Calipepla californica</i>	3
<i>Rallus limicola</i>	2
<i>Fulica americana</i>	11
<i>Phalaropus lobatus</i>	1
<i>Geococcyx californianus</i>	2
<i>Apheloocoma californica</i>	1
<i>Vireo</i> sp.	1
<i>Toxostoma redivivum</i>	5
<i>Piranga ludoviciana</i>	1
<i>Melospiza</i> cf. <i>M. melodia</i>	1
Emberizid sp.	1
<i>Agelaius phoeniceus</i>	2
total number of bones	77

***Aechmophorus occidentalis*** (Lawrence) or ***A. clarkii*** (Lawrence)

Material: SDNHM 50700, partial skull; 45102, left distal coracoid; 50679 phalange.

The San Diego bones are inseparable from those of the two living species of *Aechmophorus*, which cannot be separated on the basis preserved material.

The only other named species of Pleistocene *Aechmophorus* is *A. lucasi* from Fossil Lake, Oregon (Miller 1911), which was subsequently shown to be inseparable from recent material of *A. occidentalis* (Storer 1989). Storer also noted that “no valid differences between skeletal elements of the two species (*A. occidentalis* and *A. clarkii*) have been found yet” (Storer 1989:322).

***Podilymbus podiceps*** (Linnaeus)

Material: SDNHM; 50668, distal right humerus; 51597 and 51598, distal left humeri; 51604 and 51605, right coracoids; 50673 and 61249, distal right ulnae; 50601, proximal left ulna; 50699, proximal right tibiotarsus; 51612, right tarsometatarsus; 50697 vertebra.

Two specimens, 51598 and 50601, are slightly more robust than modern material of this species. Howard (1946) noted the large size difference between males and females of living members of this species, a difference which led Shufeldt (1913) to mistakenly name some specimens from Fossil Lake as a new species *P. magnus*.

***Podiceps parvus*** (Shufeldt)

Material: SDNHM 50661, right ulna; 50692, right scapula; 50693-94, left carpometacarpus; 51621, tip of premaxilla.

Shufeldt (1913) based *Podiceps parvus* on material from Fossil Lake Oregon. The bones were intermediate in size between *Aechmophorus* and the smaller *P. nigricollis* and *P. auritus*, being slightly smaller than *P. grisegena* with which it shares this intermediate size (Howard, 1946). Howard (1949a) referred Pliocene material from San Diego to this species. Later, in reviewing the Pleistocene material from Vallecito Creek deposits in the Anza Borrego Desert, she noted (1963) that while other bones agreed in size with *P. parvus*, the tarsometatarsi from Vallecito are longer than the type material of *P. parvus* and are larger than *P. grisegena*. Howard, therefore, considered both the Pliocene and Pleistocene material from San Diego as a different, longer-legged species which she listed as *Podiceps* sp. in her 1963 paper. The current material from Rancho del Oro agrees in size with the type collection of *P. parvus*. The ulna (50693-4) has a maximum length of 91.15 mm. Although the ulna assigned to this species from Fossil Lake was unmeasurable, this measurement agrees with other measurements of *P. parvus* as being slightly smaller than specimens of living *P. grisegena*. The carpometacarpus has a maximum length of 40.65 mm, which is smaller than material referred here from Fossil Lake, Oregon but may reflect sexual dimorphism in grebes. The premaxilla seems slightly smaller but similar in configuration to that of *P. grisegena* and quite unlike the bills of other grebes. I know of no living grebe whose body proportions could be considered especially long-legged, and believe it just as likely that there are two grebes represented in the Vallecito Creek material rather than a single grebe with longer legs. Be that as it may, it is impossible to separate the Rancho del Oro material from the type material of *P. parvus*.

***Pelicanus erythrorhynchus*** Gmelin

Material, SDNHM 51624, fragments of a synsacrum

These fragments, including a partial articular surface with the vertebral column, are more the size of this species than *P. occidentalis*.

*Anas clypeata* Linnaeus

Material: SDNHM 50696, distal left coracoid

This bone is inseparable from recent material of this species.

*Aythya affinis* (Eyton)

Material: SDNHM 50665, proximal left ulna; 51603, right coracoid; 51619, a partial synsacrum.

These bones are nearly identical to recent material of this species. On the ulna, the scar of the anterior articulate ligament and ridges around the impression of the brachialis anticus are much more similar to *Aythya* than to species of *Anas*. The coracoid is slightly small for *A. affinis*, but closer in size to this species than to *A. americana* or *A. marila*. The ridge along the edge of the triosseal canal is quite unlike the pattern seen in *A. collaris*.

*Bucephala albeola fossilis* (Howard) new combination

Material: SDNHM 50687, right proximal ulna; 50689, right proximal carpometacarpus; 50695, phalange.

Three bones of a small duck are referable here rather than to teal or ruddy duck. Howard (1963) named a new species, *Bucephala fossilis*, based on material in the Vallecito Creek fauna. Her diagnosis indicated most bones were similar in size to *B. albeola*. Her distinguishing characteristics on the type bone, a carpometacarpus, were based on the shape of the process of metacarpal I, which is missing from SDNHM 50689. She noted some slight size differences in ulna between her species and recent material. The San Diego material agrees with the type material of *B. fossilis* in that the ulna is identical in size to recent material of *B. albeola*, but the carpometacarpus is longer. Measurements of the carpometacarpus of the type, compared to recent material and SDNHM 50689 are as follows

Measurements in mm of carpometacarpus	Type of <i>B. fossilis</i>	SDNHM 50689	<i>Bucephala albeola</i>			
			n.	min	max	mean
max. width of prox. end anterior to ext. ligamental attachment	4.15	3.93	6	3.40	4.32	4.01
prox. end to distal edge of process for metacarpal I	8.58	8.62	6	7.52	8.44	7.93

The living species *Bucephala albeola* has been described from Pleistocene deposits at Fossil Lake, Oregon (Shufeldt 1913), McKittrick (Miller 1935) and San Pedro (Howard 1949b), as well as deposits in Kansas, Virginia and Florida (Brodkorb 1964b). As there is overlap in nearly all characteristics between *B. albeola* and *B. fossilis*, I consider *B. fossilis* as distinct only as the subspecific level.

*Oxyura jamaicensis* (Gmelin)

Material: SDNHM 50664, right distal humerus; 51595, fragmentary left humerus; 50660, left humerus; 50686 right humerus; 51600 left ulna; 50667, proximal right ulna; 50674, distal right ulna; 51608, left carpometacarpus; 51606, left coracoid; 51611, left scapula; 50666 distal left tarsometatarsus; 50669, synsacrum; 50680, claw; 51623, 3 phalanges

As might be expected from a fresh water pond, *Oxyura* is one of the commonest species present. Bones referred here are nearly identical to *O. jamaicensis* in configuration, but are slightly smaller (Table 2). They are quite unlike *O. dominica*, both in size and morphology.

Table 2. Measurements of *Oxyura jamaicensis*.

	San Diego				Recent			
	N	min	max	mean	N	min	max	mean
Humerus; max length	2	65.38	67.97	66.67	8	66.12	71.80	69.33
Humerus;max distal width	3	8.26	8.64	8.51	7	8.38	9.14	8.84
Ulna; max length				54.34	8	57.12	62.42	60.65
Carpometacarpus; max length				32.03	8	33.65	35.83	34.92
coracoid, max length				36.46	8	36.59	39.50	38.33

The living species of ruddy duck, *Oxyura jamaicensis*, has been identified from late Pleistocene deposits at Fossil Lake (Howard 1964) and Lake Manix (Jefferson 1985). The only other Pleistocene species of *Oxyura* is *O. bessomi*, described by Howard (1963) from Vallecito Creek. This species was based on a nearly complete carpometacarpus and referred ulna and coracoids. Howard considered the type carpometacarpal bone to be quite odd, and was “tempted to assign this fossil species to a distinct genus” (Howard 1963:14). I find this type carpometacarpus unlike *Oxyura* in at least four characteristics:

1. the proximal end between the carpal trochlea is flat, not notched as in *Oxyura*,
2. the process of metacarpal I is more upright, especially on its distal surface, not slanted as in *Oxyura*.
3. the internal ligamental fossa is fairly deep, not shallow as in *Oxyura*, and.
4. the internal carpal trochlea is anteriorly rounded, not somewhat pointed as in *Oxyura*.

The maximal height of the proximal end of the carpometacarpal in the type of *O. bessomi* is 8.22 mm, which compares to an average height (n=8) of 8.30 in *Anas crecca* and 7.43 mm and 7.84 mm in female and male *Oxyura jamaicensis*. In the features listed above, the type specimen of *O. bessomi* is similar to *Anas crecca*. The slightly larger size of the type of *O. bessomi* (length of the carpometacarpal from the proximal end to the tip of the facet for digit III is 33.51 mm in the type specimen and 35.11 mm in female and 37.33 mm in male *Anas crecca*) may warrant retention as a separate species within the genus *Anas*. The remaining bones from Vallecito Creek seem correctly assigned to *Oxyura* and, like the material listed here, are slightly smaller than recent material of *O. jamaicensis*. This size difference is not enough, in my opinion, to warrant separate specific status, leaving *O. jamaicensis* as the only Pleistocene species of *Oxyura*.

#### Anatidae

Material SDNHM 50676, phalange; 50698, 50675, 51620, vertebrae

All material is from a medium sized duck but cannot be accurately assigned to species.

#### *Callipepla californica* (Shaw)

Material: SDNHM 50662 proximal humerus; 50691, a coracoid; 51610, fragmentary carpometacarpus.

The referral of this material to *Callipepla californica* and not *C. gambelii* is based solely on the current range of the two species.

#### *Rallus limicola* Vieillot

Material: SDNHM 50690, a distal tibiotarsus; 50670 proximal tarsometatarsus.

These bones are inseparable from the living species.

***Fulica americana*** Gmelin

Material: SDNHM 51599, left distal humerus; 50672, right distal ulna; 51602, left distal radius; 51609, right distal carpometacarpus; 51607, left coracoid; 50681, left scapula; 51622, sternal fragment; 51625, right distal tibiotarsus; 50677, phalange; 50678, phalange; 51623, 5 phalanges.

*Fulica americana* is the only valid species of this genus known from the Pleistocene of the continental United States. The Rancho del Oro material is identical to living coots, except that the ulna and tibiotarsus are slightly more slender.

Pleistocene coots from Fossil Lake, Oregon were described as a new species, *F. minor*, by Shufeldt (1892). Howard (1946), with more material, showed that although slightly different in mean size, most of the Fossil Lake material fell within the size range of living coots and, on that basis, relegated Shufeldt's species to subspecific status under *F. americana*. (Although Whetmore (1956) resurrected the name *F. minor*, Brodkorb (1964a) renamed this species *F. shufeldti* as the name *F. minor* was preoccupied.)

Howard (1946) noted that the Fossil Lake material had slightly longer leg bones and slightly shorter wing bones than recent material, and (1967) designated Fossil Lake specimens as *F. a. shufeldti*.

Howard (1963) described *Fulica hesterna* based on material from the Vallecito Creek Olson (1974) in a review of Pleistocene rails, considered this species to be a synonym of *F. americana*, despite its slightly larger size. He noted that several Pleistocene precursors of modern species, including *F. americana* and *Rallus limicola*, were slightly larger and attributed this to cooler climates during Pleistocene glaciation.

***Phalaropus lobatus*** (Linnaeus)

Material: SDNHM 51627, a left carpometacarpal

This bone is identical to material of the living species. Rubega et al. (2000), quoting Olsen (1985) states that there is no fossil record of this species.

***Geococcyx californicus*** (Lesson)

Material, SDNHM 51617, a proximal right tibiotarsus; 51623, first phalange of second digit.

These bones are at the small end of the size range for the living species but assignable here.

## Passeriformes

The bones of many species of passerines are nearly identical. The identifications here are based on comparisons with the most common species from wet riparian and coastal sage habitats in southern California.

***Aphelocoma californica*** (Vigors)

Material: SDNHM 50671, a right distal femur.

This femur is slightly less robust than that in the living species, but is best referred here.

***Vireo* sp.**

Material: SDMNH 50684, left proximal coracoid

This small bone seems assignable to the Vireonidae, and is about the size of warbling vireo, *V. gilvus*.

***Toxostoma redivivum*** (Gambel)

Material: SDMNH 51626, proximal left humerus: 51614 and 51615, distal right tarsometatarsi; 51616, distal left tarsometatarsus; 51613, proximal right tarsometatarsus;

These bones are inseparable from material of the living species.

***Piranga ludoviciana*** (Wilson)

Material: SDMNH 51628, a distal right coracoid.

This coracoid is identical to modern material of this species.

***Melospiza* sp. cf. *M. melodia*** (Wilson)

Material: SDNHM 50659, right humerus

This bone is identical to living *Melospiza melodia*, but cannot be definitely assigned due to similar humeri of several other sparrow taxa.

**Emberizidae**

Material: SDNMH 50683, a distal left coracoid.

This bone is similar in size and configuration to material of *Melospiza lincolnii*, but I could not compare it to all possible species of emberizids.

***Agelaius phoeniceus*** (Linnaeus)

Material: SDNHM 51596, a proximal left humerus; 51618, a distal right tibiotarsus;

These bones are inseparable from those in the living species.

**Discussion**

Based on the identified fauna, the Rancho del Oro assemblage is considered late Pleistocene in age. Comparable deposits of similar age are the mid-Pleistocene fluvial deposits at Vallecito Creek in the Anza-Borrego Desert of eastern San Diego County (Howard 1963; Jefferson 2006), material from late Pleistocene Fossil Lake Oregon (Miller 1911; Howard 1946; Jehl 1976), the late Pleistocene Rancho La Brea fauna from Los Angeles (Howard 1962) and the lacustrine material from late Pleistocene Lake Manix (Howard 1955; Jefferson 1985) in the Mojave Desert of San Bernardino County. The Rancho del Oro assemblage, however, lacks the raptorial birds associated with tar seeps (Rancho la Brea) and species (eg. flamingos) associated with inland desert lakes like Fossil Lake and Lake Manix.

Except for *Podiceps parvus*, all material is assigned to extant lineages, although in some cases differing at the subspecific level. The avian species present are what one would expect at a fresh water lagoon along the California coast, with a surrounding vegetation of coastal sage scrub.

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