### A List of The Extinct Fossil Birds of California

# Hildegarde Howard

Abstract. —A list of the extinct fossil birds of California by Hildegarde Howard. Bull. Southern California Acad. Sci., 82(1):1–11. 1983. Ninety-six extinct species of birds are now known from fossil deposits in California, all within the Cenozoic Era. These are listed in taxonomic order together with the geologic age, formation and locality from which they were first recorded.

Forty years ago Loye Miller and Ida DeMay (1942) published a list and discussion of the paleo-avifauna of California. This covered the first forty years of discovery and recording of fossil birds in the state, an era that began with the description of *Mancalla californiensis* Lucas 1901 from the Third Street tunnel excavation in Los Angeles.

Except for the Los Angeles County Museum Science Series booklet, "Fossil Birds" (Howard 1962), which included the fossil record for California, there has been no further review of the subject. That publication, however, was designed for the lay reader and provided no comprehensive listing of species. It seems appropriate, therefore, to mark another forty year period of progress in paleon-tological research by presenting an updated list of the extinct birds now known from California, together with the geologic and North American Mammal Ages, formation and locality from which each was first recorded.

The 1942 list of over 180 birds found as fossils in California included 44 extinct species. One of these, however, was later synonymized with a previously described species (*Meleagris richmondi* Shufeldt 1915 = *Meleagris californica* (Miller 1909)). As of 1982, with more than 250 fossil birds known from California, the number of extinct species totals 96. All occur within deposits of Cenozoic age.

In terms of years before the present, the time spans of the geologic epochs within the Cenozoic Era are now estimated as follows (Berggren and Van Couvering 1974): Pleistocene 10,000 to 1,800,000 years; Pliocene 1,800,000 to 5,000,000 years; Miocene 5,000,000 to 22,500,000 years; Oligocene 22,500,000 to 38,000,000 years; Eocene 38,000,000 to 54,000,000 years; Paleocene 54,000,000 to 65,000,000 years.

The earliest known California bird is an owl, *Protostrix californiensis*, from the late Eocene of San Diego County. There are no avian records from the Paleocene or Oligocene. Forty extinct species are known from the Miocene, 15 from the Pliocene, and 40 from the Pleistocene. An additional species, *Lechusa stirtoni* Miller 1956, cited from the Pliocene, has recently been synonymized with the living Barn Owl, *Tyto alba*, tests on the bone having shown that the specimen is not a fossil (Chandler 1982b). Included in the Pleistocene record is the recently extinct Passenger Pigeon (*Ectopistes migratorius*), which, although abundant into the twentieth century elsewhere in the United States, has no historic record in California. There are now two Pleistocene records of *E. migratorius* in California,

one from Rancho La Brea, Los Angeles County (Howard 1937) and one from a stream terrace deposit in Bonita, San Diego County (Chandler 1982a).

In addition to the extinct birds known to have existed in the state, approximately 160 extant species have been identified from California's Pleistocene deposits, although some of the identifications are tentative. The distinction of the bones of living species from those of closely related Pleistocene forms has been a matter of question for many years (Howard 1947a and 1947b). Studies of the large collection of bones of raptorial birds from the Rancho La Brea asphalt seeps raised the question of possible ancestral relationship of Gymnogyps amplus to the California Condor of today (G. californianus), and the owl, Bubo sinclairi (described from Potter Creek Cave, Shasta County) to the living Horned Owl (B. virginianus) recorded from Rancho La Brea. The use of the trinomial, as a temporal, rather than a geographic subspecies, has been suggested as a means of expressing this relationship. More recently, Olson (1976), in a review of the caracaras, placed the Pleistocene *Polyborus prelutosus* as a temporal subspecies of *Polyborus planc* s. Olson (1974) also questioned the validity of the species Fulica hesterna, believing the bones from the Pleistocene Palm Springs Formation in the Anza Borrego Desert to be assignable to Fulica americana. Among the living species recognized from the Pleistocene, the Golden Eagle (Aquila chrysaetos), represented by hundred of bones in the Rancho La Brea collection, is also a candidate for temporal subspecific recognition. As in the case of the condor, the Rancho La Brea 24. chrysaetos specimens show skull variations from the living form, as well as paoportional distinction in the limbs (Howard 1947b). Unfortunately, lack of such large series of fossils for most of the Pleistocene species cited makes it impossible to analyze them so thoroughly. /82/1/1/315526

#### Methods of Procedure

The following list of California's extinct avian species is arranged by order and family following, for the most part, the 5th edition (1957) of the American (%)nithologists' Union Checklist of North American Birds. However, the placing of the flamingos, Family Phoenicopteridae, in the Order Charadriiformes follows recent studies by Olson and Feduccia (1980). The recognition of the grouse and turkeys as subfamilies within the Family Phasianidae follows Brodkorb (1963), but the genera Agriocharis Chapman 1896 and Parapavo Miller 1916 are synonymized with Meleagris Linnaeus 1758 as recently recommended by Steadman (1980). As proposed by Campbell (1979:85), the eagle, Morphnus woodwardi Miller 1911, is assigned to the extinct genus *Amplibuteo* Campbell 1979.

The evaluation of the extinct families follows the Catalogue of Fossil Birtis (Brodkorb 1963, 1964, 1967, 1971, 1978) in part. Continuing studies, however, justify the recognition of the Plotopteridae and Teratornithidae at the family rather than the subfamily level. In fact, Campbell and Tonni (1980:67) have indicated that a reassessment of the taxonomic position of the Family Teratornithidae is under study. As a matter of record the Family Palaeoscinidae is listed here, although Brodkorb (1978) synonymizes the family with the Subfamily Myadestinae under the Family Muscicapidae.

In the few instances in which species now recorded from California were first described from another state, the original state is placed in brackets preceding the first recorded California locality. Otherwise all California references apply to the type locality. In some cases modified data are given for the locality and formation name. For example, some earlier papers referred the Sharktooth Hill Bonebed to the Temblor Formation, whereas the currently recognized name for this rock unit is the Round Mountain Silt. Also, epoch designations have, in many instances, been changed owing to the establishment of an internationally recognized Miocene-Pliocene boundary at about five million years (see Repenning and Tedford 1977:2–6 for an analysis of this boundary revision as it affects Pacific coast terminology). The North American Land Mammal Ages, which divide, and in some instances overlap the geologic epochs (see Berggren and Van Couvering 1974, fig. 1, and Repenning and Tedford 1977, Table 1), further clarify the age of the rock units involved. As these Land Mammal Ages have now been correlated with marine rock units, they are included here in parentheses following the geologic epochs.

Bibliographic references through 1970 for the species listed herein, as well as additional locality records, may be obtained from the Catalogue of Fossil Birds, Parts 1–5 (Brodkorb 1963, 1964, 1967, 1971, 1978). References for species described since Brodkorb's work, and additional locality records (Add. loc.) cited subsequent to the Catalogue's treatment of the order and family involved are listed here in Literature Cited.

Extinct Species of Fossil Birds of California With Age, Formation and Locality from which first recorded<sup>1</sup>

## Order Gaviiformes

Family Gaviidae-Loons

Gavia brodkorbi Howard 1978 – Late Miocene (Clarendonian), Monterey Formation, Laguna Niguel, Orange County.

Gavia concinna Wetmore 1940—Latest Miocene or Early Pliocene (Hemphillian), Etchegoin Formation, Sweetwater Canyon, Monterey County.

Gavia howardae Brodkorb 1953—Late Pliocene (Blancan), San Diego Formation, San Diego, San Diego County.

## Order Podicipediformes

Family Podicipedidae-Grebes

Podiceps parvus (Shufeldt 1913)—[Pleistocene, Oregon] Late Pliocene? (Blancan?), Tulare Formation, oil well, Kern County (Wetmore 1937). Podiceps subparvus (L. Miller and Bowman 1958)—Late Pliocene (Blancan)

can), San Diego Formation, San Diego, San Diego County.

#### Order Procellariiformes

Family Diomedeidae—Albatrosses

Diomedea californica Miller 1962—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County. (Add. loc., Howard 1978).

Diomedea milleri Howard 1966—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County.

<sup>1</sup> Extinct Suborders, Families and Genera are marked with an asterisk.\*

Family Procellariidae—Fulmars and Shearwaters

Fulmarus hammeri Howard 1968 – Late Miocene (Clarendonian), Monterey Formation, Laguna Hills, Orange County.

Puffinus inceptor Wetmore 1930—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County.

Puffinus mitchelli L. Miller 1961—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County.

Puffinus priscus L. Miller 1961—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County. (Add. lgc., Howard 1968a).

Puffinus calhouni Howard 1968—Late Miocene (Clarendonian), Menterey Formation, Laguna Hills, Orange County.

Puffinus barnesi Howard 1978—Late Miocene (Clarendonian), Monterey Formation, Laguna Niguel, Orange County.

Puffinus diatomicus L. Miller 1925—Late Miocene (Clarendonian), gisquoc Formation, Lompoc, Santa Barbara County.

Puffinus felthami Howard 1949—Early Pliocene (Hemphillian), Repetto Fauna, Capistrano? Formation. Corona del Mar, Orange County.

Puffinus kanakoffi Howard 1949—Late Pliocene (Blancan), San Diggo Formation, San Diego, San Diego County.

Family Hydrobatidae—Storm Petrels

Oceanodroma hubbsi L. Miller 1951—Late Miocene to Early Pliocene (Hemphillian), Capistrano Formation, Capistrano Beach, Orange County.

#### Order Pelecaniformes

\*Suborder Odontopterygia Spulski 1910

\*Family Pseudontornithidae Lambrecht 1933-Bony-toothed Birds

\*Osteodontornis orri Howard 1957—Late Miocene (Clarendonian), Mönterey Formation, Tepusquet Canyon, Santa Barbara County. (Add. locs., Howard 1968a, 1978).

Suborder Sulae Sharpe

Family Sulidae—Boobies and Gannets

Sula pohli Howard 1958—Late Miocene (Clarendonian), Modelo Formation, Studio City, Los Angeles County.

Sula willetti L. Miller 1925 – Late Miocene (Clarendonian), Sisquoc Formation, Lompoc, Santa Barbara County.

Sula humeralis L. Miller and Bowman 1958—Late Pliocene (Blancan), San Diego Formation, San Diego, San Diego County.

\*Paleosula stocktoni (L. Miller 1935)—Late Miocene (Clarendonian) Valmonte Diatomite Member of Monterey Formation, Lomita, Los Angeles County.

\*Miosula media Miller 1925—Late Miocene (Clarendonian) Sisquoc Formation, Lompoc, Santa Barbara County. (Add. loc.? Howard 1978).

\*Miosula recentior Howard 1949—Late Pliocene (Blancan), San Diego Formation, San Diego, San Diego County.

Morus vagabundus Wetmore 1930—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County.

Morus lompocanus (L. Miller 1925) - Late Miocene (Clarendonian) Sis-

quoc Formation, Lompoc, Santa Barbara County. (Add. locs., Howard 1968a and 1978).

Morus magnus Howard 1978—Late Miocene (Clarendonian), Monterey Formation, Laguna Niguel, Orange County.

Morus revanus Howard 1936—Late Pleistocene (Rancholabrean), Palos Verdes Sand, Playa del Rey, Los Angeles County. (Add. loc., Howard 1968b).

## Family Phalacrocoracidae—Cormorants

Phalacrocorax femoralis L. Miller 1929—Late Miocene (Clarendonian), Modelo Formation, Calabasas, Los Angeles County.

Phalacrocorax kennelli Howard 1949—Late Pliocene (Blancan), San Diego Formation, San Diego, San Diego County.

Phalacrocorax rogersi Howard 1932—Early Pleistocene? (Irvingtonian?), Santa Barbara Formation, Veronica Springs Stone Quarry, Santa Barbara County.

\*Family Plotopteridae Howard 1969—Oar-winged Swimmers

\*Plotopterum joaquinensis Howard 1969—Early Miocene (Arikareean), Pyramid Hill Local Fauna, Pyramid Hill Sand member of Jewett Sands, Pyramid Hill, Kern County.

#### Order Ciconiiformes

#### Family Ciconiidae—Storks

Ciconia maltha L. Miller 1910—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County. (Add. loc., Jefferson et al. 1982).

Mycteria wetmorei Howard 1935—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

#### Order Anseriformes

# Family Anatidae

Subfamily Anserinae—Geese

\*Presbychen abavus Wetmore 1930—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County. (Add. loc., Howard 1968a).

Branta howardae L. Miller 1930 – Late Miocene (Clarendonian), Ricardo Formation, Ricardo, Kern County.

Branta dickeyi L. Miller 1924—Late Pleistocene (Rancholabrean), McKittrick asphalt seeps, Kern County.

## Subfamily Tadorninae-Sheld-ducks

\*Anabernicula gracilenta Ross 1935—Late Pleistocene (Rancholabrean) McKittrick asphalt seeps, Kern County.

\*Brantadorna downsi Howard 1963—Middle Pleistocene (Irvingtonian), Vallecito Creek Local Fauna, Palm Springs Formation, Anza Borrego Desert, San Diego County.

Subfamily Aythyinae—Diving Ducks

Bucephala fossilis Howard 1963—Middle Pleistocene (Irvingtonian), Vallecito Creek Local Fauna, Palm Springs Formation, Anza Borrego Desert, San Diego County.

\*Chendytes milleri Howard 1955—Early Pleistocene? (Irvingtonian). Equivalent of San Pedro Formation, San Nicolas Island.

\*Chendytes lawi L. Miller 1925—Late Pleistocene (Rancholabrean), Palos Verdes Sand, Santa Monica, Los Angeles County. (Add. locs., Howard 1968b and Morejohn 1976).

Subfamily Oxyurinae—Stiff-tailed Ducks

Oxyura bessomi Howard 1963—Middle Pleistocene (Irvingtonian), Vallecito Creek Local Fauna, Palm Springs Formation, Anza Borrego Desert, San Diego County.

#### Order Falconiformes

Family Cathartidae—American Vultures

Sarcoramphus kernensis (L. Miller 1931)—Latest Miocene (Hemphillian), Kern River Formation, Poso Creek, Kern County.

Coragyps occidentalis L. Miller 1909—Late Pleistocene (Rancholabrean)
Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Gymnogyps amplus L. Miller 1911—Late Pleistocene (Rancholabrean), Samwell Cave, Shasta County. (G. californianus in Rancho La Bea asphalt seeps reassigned to G. amplus (Fisher 1944)). (Add. loss.? Downs et al. 1959, and Howard 1968b).

\*Breagyps clarki (L. Miller 1910)—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

\*Family Teratornithidae L. Miller 1909-Teratorns

\*Teratornis incredibilis Howard 1952—[Late Pleistocene, Nevada] Maddel Pleistocene (Irvingtonian), Vallecito Creek Local Fauna of Padma Springs Formation, Anza Borrego Desert, San Diego County (Howard 1963).

\*Teratornis merriami Miller 1909—Late Pleistocene (Rancholabream), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County. (Add. loc., Jefferson et al. 1982).

\*Cathartornis gracilis L. Miller 1910—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Family Accipitridae—Hawks, Eagles, Old World Vultures

\*Miohierax stocki Howard 1944—Early Miocene (Arikareean), Tick Canyon Formation, Vasquez Canyon, Los Angeles County.

Buteogallus fragilis (L. Miller 1911)—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County (Add. loc.? W. E. Miller 1971, p.8).

Buteogallus milleri (Howard 1932)—Late Pleistocene (Rancholabrean)
Hawver Cave, Eldorado County.

\*Amplibuteo woodwardi (L. Miller 1911)—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

\*Wetmoregyps daggetti (L. Miller 1915)—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Spizaetus grinnelli (L. Miller 1911)—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

\*Neogyps errans L. Miller 1916—Late Pleistocene (Rancholabrean) Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

\*Neophrontops vallecitoensis Howard 1963-Middle Pleistocene (Irving-

tonian), Vallecito Creek Local Fauna of Palm Springs Formation, Anza Borrego Desert, San Diego County.

\*Neophrontops americanus L. Miller 1916—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Family Pandionidae-Ospreys

Pandion homalopteron Warter 1976—Middle Miocene (Barstovian), Round Mountain Silt, Sharktooth Hill Bonebed, Kern County.

Family Falconidae - Falcons and Caracaras

Falco swarthi L. Miller 1927—Late Pleistocene (Rancholabrean), McKittrick asphalt seeps, Kern County.

Polyborus prelutosus Howard 1938—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Order Galliformes

Family Cracidae—Chachalacas

\*Boreortalis tedfordi (L. Miller 1952)—Middle Miocene (Barstovian), Barstow Formation, Barstow, San Bernardino County.

Family Phasianidae

Subfamily Tetraoninae—Grouse

Dendragapus gilli milleri Jehl 1969—Late Pleistocene (Rancholabrean) Samwel Cave, Shasta County [species originally named *Palaeotetrix gilli* Shufeldt 1891, from Pleistocene of Oregon].

Subfamily Meleagridinae - Turkeys

Meleagris anza (Howard 1963)—Middle Pleistocene (Irvingtonian), Vallecito Creek Local Fauna of Palm Springs Formation, Anza Borrego Desert, San Diego County.

Meleagris californica (L. Miller 1909)—Late Pleistocene (Rancholabrean), Rancho La Brea tar seeps, Los Angeles, Los Angeles County. (Add. loc., W. E. Miller 1971 p.48).

Order Gruiformes

Family Gruidae-Cranes

Grus conferta A. Miller and Sibley 1942—Late Miocene (Hemphillian), Siesta Formation, Black Hawk Ranch, Contra Costa County.

Family Rallidae-Rails and Coots

Fulica hesterna Howard 1963—Middle Pleistocene (Irvingtonian), Vallecito Creek Local Fauna of Palm Springs Formation, Anza Borrego Desert, San Diego County.

Order Charadriiformes

Family Scolopacidae—Godwits, etc.

Limosa vanrossemi L. Miller 1925—Late Miocene (Clarendonian), Sisquoc Formation, Lompoc, Santa Barbara County.

Family Phoenicopteridae—Flamingos

\*Megapaloelodus connectens A. Miller 1944—[Miocene, South Dakota] Middle Miocene (Barstovian), Barstow Formation, Barstow, San Bernardino County (L. Miller 1950).

Phoenicopterus copei Shufeldt 1891—[Late Pleistocene, Oregon] Late Pleistocene (Rancholabrean), Manix Lake Beds, San Bernardino County (Jefferson et al. 1982).

Phoenicopterus minutus Howard 1955—Late Pleistocene (Rancholabrean) Manix Lake Beds, San Bernardino County.

Family Alcidae—Auk-like Birds

Subfamily Alcinae

*Uria brodkorbi* Howard 1981—Late Miocene (Clarendonian), Sisquoc Formation, Lompoc, Santa Barbara County.

Cepphus olsoni Howard 1982—Latest Miocene (Hemphillian), San Lisis Rey River Local Fauna of San Mateo Formation, Oceanside, San Diego County.

Brachyramphus pliocenus Howard 1949—Late Pliocene (Blancan), San Diego Formation, San Diego, San Diego County.

Ptychoramphus tenuis L. Miller and Bowman 1958—Late Pliocene (Blancan), San Diego Formation, San Diego, San Diego County.

Aethia rossmoori Howard 1968—Late Miocene (Clarendonian), Menterey Formation, Laguna Hills, Orange County.

Cerorhinca dubia L. Miller 1925—Late Miocene (Clarendonian), Sisquo Formation, Lompoc, Santa Barbara County.

\*Subfamily Mancallinae—Flightless Auks

\*Praemancalla lagunensis Howard 1966—Late Miocene (Clarendonian), Monterey Formation, Laguna Hills, Orange County.

\*Praemancalla wetmorei Howard 1976—Late Miocene (Clarendonian), Monterey Formation, Laguna Niguel, Orange County.

\*Alcodes ulnulus Howard 1968—Late Miocene (Clarendonian), Monterey Formation, Laguna Hills, Orange County.

\*Mancalla cedrosensis Howard 1971—[Latest Miocene-Early Pliocene, Cedros Island, Baja California]. Early Pliocene (Hemphillian), Lawrence Canyon Local Fauna of San Mateo Formation, Oceanside, San Diego County (Howard 1982).

\*Mancalla californiensis Lucas 1901—Early Pliocene (Hemphillian), Repetto Formation, Los Angeles, Los Angeles County. (Add. loc., Howard 1970).

\*Mancalla diegensis (L. Miller 1937)—Late Pliocene (Blancan), San Diggo Formation, San Diego, San Diego County. (Add. locs., Howard 1970 and 1982)

\*Mancalla milleri Howard 1970—Late Pliocene (Blancan), San Diggo Formation, San Diego, San Diego County. (Add. loc., Howard 1982).

\*Mancalla emlongi Olson 1981 – Late Pliocene (Blancan), San Diego Formation, Pacific Beach, San Diego County.

#### Order Columbiformes

Family Columbidae - Pigeons and Doves

Ectopistes migratorius (Linnaeus 1766)—[Recent, eastern North America]. Late Pleistocene, Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County (Howard 1937). (Add. Loc., Chandler 1982A)

#### Order Strigiformes

\*Family Protostrigidae Wetmore 1933—Ancient Owls

\*Protostrix californiensis Howard 1965—Late Eocene (Uintan), Poway Formation, San Diego, San Diego County.

Family Strigidae-Typical Owls

Bubo sinclairi L. Miller 1911—Late Pleistocene (Rancholabrean), Potter Creek Cave, Shasta County.

Strix brea Howard 1933—Late Pleistocene, (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Asio priscus Howard 1964—Late Pleistocene (Rancholabrean), Tecolote Member of Santa Rosa Island Formation, Arlington Canyon, Santa Rosa Island.

### Order Passeriformes

\*Family Palaeoscinidae Howard 1957-Early Passerines

\*Palaeoscinis turdirostris Howard 1957—Late Miocene (Clarendonian), Monterey Formation, Tepusquet Canyon, Santa Barbara County.

Family Icteridae - Blackbirds

\*Pandanaris convexa A. Miller 1947—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Euphagus magnirostris A. Miller 1929—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

Family Emberizidae—Towhees, etc.

Pipilo angelensis Dawson 1948—Late Pleistocene (Rancholabrean), Rancho La Brea asphalt seeps, Los Angeles, Los Angeles County.

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