

Sharktooth Hill Bonebed Vertebrate Local Fauna

By

John P. Stegall

Paleontological Research Center

Buena Vista Museum of Natural History & Science

Bakersfield, CA

Revised: September 15, 2017

Acknowledgments

Special thanks for assistance on this faunal list and other research information goes to Lawrence G. Barnes, Thomas Demere, Jess Duran, the late Robert “Bob” J. Ernst, Timothy Elam, the late Benjamin E. Nafus Sr. and Jean Nafus, James F. Parham, Donald Prothero, Lisa & Sean Tohill, Robin Turner, Koral Hancharick and the staff & volunteers of the Buena Vista Museum of Natural History & Science.

Background

Geological Unit: Temblor Formation, Round Mountain Silt, Upper Layer [Sharktooth Hill Bonebed & Local Vertebrate Fauna]

Geological Age: Cenozoic Era, Tertiary Period, Middle Miocene Epoch [approx. 15 Million years ago]

North American Land Mammal Age: Barstovian

Geographical Location: Lower Kern River region [northeast of Bakersfield], Kern County, CA

Site Localities: Sharktooth Hill [National Natural Landmark]; Ernst Ranch; Tohill Quarries; Ant Hill; Sprinkle Hill; other unnamed localities within upper layer of Round Mountain Silt

Accessibility: Extremely Limited [Private and Public property]; fossil collecting at Ernst Ranch quarries is granted only with permission from owners and by arrangement with the Buena Vista Museum

Valley Fever: Widespread in San Joaquin Valley, CA and southwest USA. Sporadic at Sharktooth Hill Bonebed quarries; exposed fossil quarries at the Ernst Ranch are tested for valley fever before collectors are permitted to enter.

Contact:

Buena Vista Museum of Natural History & Science [BVMNHS]

Mail: 2018 Chester Avenue, Bakersfield, CA 93301

Phone: (661) 324-6350

Website: www.sharktoothhill.org

Note: Some of the vertebrate fauna reported below can be found in BVMNHS collection

Key:

* Taxons that were first reported in the upper Round Mountain Silt (Sharktooth Hill and Sharktooth Hill Bonebed collected from 1853-present)

** Taxons not yet reported in the literature

(?) Taxons that requires further study

Phylum Chordata [Vertebrates]

Class Chondrichthyes [Sharks, Rays & Skates]

Order Hexanchiformes

Family Hexanchidae (Cow shark/Six-Gill shark)

**Hexanchus andersoni* Jordan, 1907

Order Heterodontiformes

Family Heterodontidae (Bullhead “Horn” shark)

Heterodontus sp.

Order Squaliformes

Family Squalidae (Dogfish shark)

**Squalus occidentalis* Agassiz 1856

Family Echinorhinidae (Bramble shark)

**Echinorhinus blakei* Agassiz 1856

Order Squatiniformes

Family Squatinidae (Angel shark)

**Squatina lerichei* Jordan & Beal 1913

Order Lamniformes

Family Megachasmidae (Megamouth shark)

**Genus/species undetermined

Family Cetorhinidae (Basking shark)

**Cetorhinus huddlestoni* Welton 2014

Family Alopidae (Thresher shark)

(?) *Alopias latidens* Leriche 1909

Family Lamnidae (Mako shark)

**Isurus planus* Agassiz 1856 (Hooked-tooth Mako shark)

Isurus hastalis Agassiz 1843 (Big-tooth Mako shark)

Family Otodontidae (Mega-teeth and Great White sharks)

Carcharocles megalodon Agassiz 1837 (Mega-tooth shark)

***Parotodus benedeni* LeHon 1871 (False-tooth Mako shark)

Order Carcharhiniiformes

Family Carcharhinidae (Tiger sharks and Requiem sharks)

**Galeocerdo aduncus* (Tiger shark) Agassiz 1856

**Carcharhinus antiquus* (Gray shark) Agassiz 1856

Family Hemigaleidae (Weasel “Snaggletooth” sharks)

Hemipristis serra Agassiz, 1843 (Snaggletooth shark)

Family Triakidae (Hound sharks)

**Triakis beali* Jordan 1919

(?) *Galeorhinus* sp. (Tope shark)

***Mustelus* sp. (Smooth-hound shark)

Family Scyliorhinidae (Catshark)

(?) *Scyliorhinus* sp. (Catshark)

(?) *Cephaloscyllium* sp. (Swellshark)

Family Sphyrnidae (Hammerhead shark)

Sphyrnas zygaena Linnaeus 1758

Order Rajiformes (Skates)

Family Rajidae (Skates)

Raja sp. (see Mitchell 1965)

Family Rhinobatidae (Guitar fish)

***Rhinobatos* sp.

Order Myliobatiformes (Rays)

Family Myliobatidae (Eagle Bat ray)

Myliobatus sp.

Family Dasyatidae (Sting ray)

Dasyatis sp. (Diamond-back stingray) (see Mitchell 1965)

***Mobula loupianensis* Cappetta 1970 (Devil ray)

Family Gymnuridae (Butterfly ray)

***Gymnura* sp.

Family Moblidae (Manta ray)

***Mobla* sp.

Class Osteichthyes (Bony Fishes)¹

Order Perciformes

Family Scombridae (Mackerel, Tuna)

(?) Genus/species undetermined

Order Tetradontiformes

Family Diodontidae (Puffer fish)

Diodon sp.

Family Molidae (Ocean Sun fish)

Mola sp.

¹ Fragmentary vertebrae, teeth, jawbones and other remains make species identification difficult. The following orders, families and Genus/species of Bony Fishes are based on known materials at BVMNHS.

Class Reptilia (Reptiles)

Order Chelonia [Turtles & Tortoises]

(?) Family Testudinidae (Tortoises)

(?) *Gopherus* sp.

Family Cheloniidae (Hard-Shell Sea Turtles)

**Pacifichelys hutchisoni* Lynch and Parham 2003

cf. *Syllomus* sp.

Family Dermochelyidae (Leatherback Turtles)

**Psephophorus californiensis* Gilmore 1937 [species under investigation]²

Class Aves (Birds)

Order Procellariiformes

Family Diomedeidae (Albatrosses)

**Diomedea californica* Miller 1962

**Diomedea milleri* Howard 1966

Family Procellariidae (Fulmars & Shearwaters)

**Fulmarus miocaenus* Howard 1984

**Puffinus inceptor* Wetmore 1930

**Puffinus priscus* Miller 1961

**Puffinus mitchelli* Miller 1961

Order Suliformes

Family Sulidae (Gannets)

**Morus vagabundus* Wetmore 1930

² Parham, personnel communication, 2017

Order Pelecaniformes

Family Pelagornithidae (Giant bony-toothed birds)

Pelagornis (?) orri Howard 1957 (see Howard 1984, Stidham 2004)³

Order Anseriformes

Family Anatidae (Geese, Swans & Ducks)

Tribe Cygnini

**Megalodytes morejohni* Howard 1992 (Swan-like anseriform)

Tribe Anserini

**Presbychen abavus* Wetmore 1930 (Goose-like anseriform)

Order Phoenicopteriformes

Family Phoenicopteridae (Flamingos)

Megapaloelodus sp. [see Howard 1984]

Order Ciconiiformes

Family Ciconiidae (Storks)

Genus/species undetermined [see Howard 1984]

Order Charadriiformes

Family Recurvirostridae (Avocets)

Recurvirostra sp. [see Miller 1961]

Order Accipitriformes

Family Cathartidae (Condors & New World vultures)

**Hadrogyps aigialerus* Emslie 1988

Family Pandionidae (Ospreys)

**Pandion homalopteron* Warter 1976

³ Formerly known as *Osteodontornis* in past literature which was changed upon the suggestion of Mayr and Rubilar-Rogers 2010

Class Mammalia (Mammals)

Order Carnivora

Family Felidae (Cats)

Pseudaelurus, cf. *Pseudaelurus intrepidus* Leidy 1858 (see Prothero, et al 2008)

Family Canidae (Dogs)

Subfamily Borophaginae

Paratomarctus temerarius Leidy 1858 (see Prothero, et al 2008)

Aelurodon sp. (see Prothero, et al 2008)

Family Amphicyonidae (Bear-Dogs)

Subfamily Amphicyoninae

Pliocyon medius Matthew 1918 (see Prothero et al 2008)⁴

Family Mustelidae (Weasels and relatives)

Subfamily Oligobuninae

Brachypsalis obliquidens Sinclair 1915 (see Prothero, et al 2008)⁵

Family Desmatophocidae

Subfamily Allodesminae (Archaic Sea Lions)

**Allodesmus kernensis* Kellogg 1922

**Allodesmus kelloggi* Mitchell 1966

**Allodesmus gracilis* Barnes 1995

Family Odobenidae

Subfamily Imagotariinae (Archaic Walruses)

**Neotherium mirum* Kellogg 1931

**Pelagiarctos thomasi* Barnes 1988

⁴ Paratype no longer housed at BVMNHS

⁵ Paratype no longer housed at BVMNHS

Order Artiodactyla

Family Tayussuidae (Peccaries)

(?) Genus/species undetermined

Family Camelidae (Camels)

Subfamily Miolabinae (Llama-like Camels)

Genus/species undetermined (see Prothero, et al. 2008)

(?) Subfamily Aepycamelinae (Giraffe-like Camels)

Genus/species undetermined (see Prothero, et al. 2008)

Family Palaeomerycidae (Pronghorn-like mammals)

Subfamily Dromomerycinae

Tribe Cranioceratini

Bouromeryx americanus Douglass 1909 (see Liter & Prothero 2003, Prothero, et al 2008)

Order Cetacea

Suborder Odontoceti (Toothed Whales)

Superfamily Platanistoidea

Family Allodelphinidae (Dolphin-like Toothed Whale)

**Zarhinocetus errabundus* Kellogg 1931

Superfamily Delphinoidea

Family Kentriodontidae (Primitive Dolphins)

Subfamily Kampholophinae

**Liolithax kernensis* Kellogg 1931

Subfamily Kentriodontinae

**Kentriodon obscurus* Kellogg 1931

Family Phocoenidae (Porpoises)

**Loxolithax sinuosa* Kellogg 1931

Family Pontoporiidae

*New Genus/species [See Barnes, Tohill & Tohill 2015]

Undetermined Odontoceti (Dolphin-like Toothed Whales)

**Oedolithax mira* Kellogg, 1931

**Nannolithax gracilis* Kellogg, 1931

**Platylithax robusta* Kellogg, 1931

Superfamily Physeteroidea

Family Physeteridae (Sperm Whales)

**Aulophyseter morricei* Kellogg 1927

Suborder Mysticeti (Baleen Whales)

Family Cetotheriidae (Primitive Baleen Whales)

**Parietobalaena securis* Kellogg 1931

**Tiphyocetus temblorensis* Kellogg 1931

**Peripolocetus vexillifer* Kellogg 1931

Order Perissodactyla

Family Tapiridae (Tapirs)

Miotapirus sp. (Prothero, et al 2008)

Family Rhinocerotidae (Rhinoceros)

Subfamily Teleoceratinae

Tribe Teleoceratini

Teleoceras medicornutum Osborn 1904 (see Prothero, et al 2008)

Subfamily Aceratheriinae

Aphelops megalodus Cope 1873 (see Prothero, et al 2008)

Family Equidae (Horses)

Subfamily Anchitheriidae

Archaeohippus cf. *Archaeohippus mourningi* (see Prothero, et al 2008)

Hypohippus sp. (see Prothero, et al 2008)

Parahippus sp. (see Prothero, et al 2008)

Subfamily Equinae

Tribe Equini

Merychippus brevidontus Bode 1934 (see Prothero, et al 2008)

Order Proboscidea (Elephants and ancient relatives)

Family Mammutidae (Mastodons and relatives)

Miomastodon sp. (see Prothero, et al 2008)

Order Desmostylia (Hippo-like Mammals)

Family Desmostylidae

Desmostylus hesperus Marsh 1888 (see Mitchell 1965)

Family Paleoparadoxiidae

Subfamily Paleoparadoxiinae

Paleoparadoxia sp.

Order Sirenia (Dugongs and Manatees)

Family Dugongidae (Dugongs)

Subfamily Halitheriinae

Metaxytherium sp.

Reference

General Info.

- Barnes, Lawrence G. and J.D. Stewart. 1998. Sharktooth Hill Bonebed Faunal List. *The Sharktooth Hill Foundation*, <http://www.sharktoothhill.org/faunal.html>
- Barnes, Lawrence G., Samuel A. McLeod, Vanessa R. Rhue, Howell W. Thomas and Stephanie Lapeyre-Montrose. 2013. *Post-Meeting Field Trip, Sharktooth Hill National Natural Landmark, Kern County, California, USA*. Natural History Museum of Los Angeles County & in association with the 73rd Society of Vertebrate Paleontology Meetings, 32pp.
- Elam, Tim and Gregg Wilkerson. 2011. The Round Mountain Silt Bone Bed of Sharktooth Hill, Kern County, California: recent research yields new answers to old questions” In *The Incredible Shrinking Pliocene: the 2011 Desert Symposium Field Guide and Proceedings*, Robert E. Reynolds, ed. California State University Desert Studies Consortium, pp. 119-126.
- Elam, Tim. 2014 (April 26). *Paleontology and Geology of the Miocene Round Mountain Silt Bonebed at Sharktooth Hill*. Field Trip #2, Bakersfield, CA: PSAAPG Convention 2014, 40pp.
- Mitchell, Edward. 1965. *History of Research at Sharktooth Hill, Kern County, California*. Bakersfield, CA: A Special Publication of the Kern County Historical Society and the County of Kern through its Museum. vi + 45pp.

Allodesmus kelloggi

- Barnes, Lawrence G. 1970. A re-evaluation of mandibles of *Allodesmus* (Otariidae, Carnivora) from the Round Mountain Silt, Kern County, California. *PaleoBios*, 10: 1-24.
- Mitchell, Edward. 1966. The Miocene pinniped *Allodesmus*. *Univ. Calif. Pul. Geol. Sci.*, 61:1-1505.

Allodesmus gracilis

- Barnes, Lawrence G. and Kiyoharu Hirota. 1994. Miocene pinnipeds of the otariid subfamily Allodesminae in the North Pacific Ocean: Systematics and relationships. *The Island Arc* 3, 329-360.

Aulophyseter morricei

- Kellogg, Remington. 1927. Study of the skull of a fossil sperm whale from the Temblor Miocene of Southern California. *Carnegie Institution of Washington Publication* 346, p.1-24.

Birds (Marine & Shore species)

- Howard, Hildegard. 1966. Additional Avian Records from the Miocene of Sharktooth Hill, California. *Contributions in Science* 114, Los Angeles, CA: Los Angeles County Museum of Natural History.
- Howard, Hildegard. 1972. Type Specimens of Avian Fossils in the Collections of the Natural History of Los Angeles County. *Contributions in Science* 228: 1-27.
- Howard, Hildegard. 1983. A List of the Extinct Fossil Birds of California. *Bull. Southern California Acad. Sci.* 82(1), pp.1-11.
- Howard, Hildegard. 1984. Additional Avian Records from the Miocene of Kern County, California with the Description of a New Species of Fulmar (Aves: Procellariidae). *Bull. Southern California Acad. Sci.* 83(2), pp. 84-89.
- Miller, Loye. 1961. Birds from the Miocene of Sharktooth Hill, California. *The Condor* 63(5): 399-402.
- Wetmore, Alexander. 1930. Fossil bird remains from the Temblor Formation near Bakersfield, California. *Proceedings of the California Academy of Science*, ser.4, vol.19, pp.85-93.

Bouromeryx americanus

- Liter, Matthew and Donald Prothero. 2003. New Dromomerycids (Mammalia: Artiodactyla) from the Middle Miocene Sharktooth Hill Bonebed, California, and the systematic of the Crainoceratinins. In "Abstracts of Papers Sixty-Third Annual Meeting Society of Vertebrate Paleontology Science Museum of Minnesota St. Paul, Minnesota October 15-18, 2003" *Journal of Vertebrate Paleontology*, 23 (3): 72A.
- Prothero, Donald R. and Matthew R. Liter. 2008. Systematics of the Dromomerycines and Aletomerycines (Artiodactyla: Palaeomerycidae) from the Miocene and Pliocene of North America. In Neogene Mammals, Lucas et al (eds.), *New Mexico Museum of Natural History and Science Bulletin* 44: 273-298.

Cetorhinus huddlestoni

- Welton, Bruce J. 2014. A New Fossil Basking Shark (Lamniformes: Cetorhinidae) from the Middle Miocene Sharktooth Hill Bonebed, Kern County, California. *Contributions in Science* 522, Los Angeles, CA: Natural History Museum of Los Angeles County.

Diomedea californica

- Miller, Loye. 1962. A New Albatross from the Miocene of California. *The Condor* 64(6): 471-472.

Hadrogyps aigialerus

- Emslie, Steven D. 1988. An Early Condor-Like Vulture from North America. *The Auk* 105(3) pp. 529-535.

Kentriodontidae (Ancient Dolphins)

Barnes, Lawrence G. 1978. A Review of *Lophocetus* and *Liolithax* and their relationships to the Delphinoid family Kentriodontidae (Cetacea: Odontoceti). *Science Bulletin* 28, Natural History Museum of Los Angeles County.

Barnes, Lawrence G. and Edward Mitchell. 1984. *Kentriodon obscurus* (Kellogg 1931), A Fossil Dolphin (Mammalia: Kentriodontidae) from the Miocene Sharktooth Hill Bonebed in California. Natural History Museum of Los Angeles County, *Contributions in Science* 353, pp.1-23.

Ichishima, Hirota, Lawrence G. Barnes, R. Ewan Fordyce, Masaichi Kimura and David J. Bohaska. 1994. A review of kentriodontine dolphins (Cetacea; Delphinoidea; Kentriodontidae): Systematics and biogeography. *The Island Arc* 3, pp.486-492.

Mammals (Marine)

Kellogg, Remington. 1931. Pelagic mammals from the Temblor Formation of the Kern River region, California. *Proceedings of the California Academy of Science*, ser.4, vol.19, pp..217-397.

Mammals (Terrestrial)

Prothero, Donald R., et al. 2008. Land Mammals from the Middle Miocene Sharktooth Hill Bonebed, Kern County, California. In Neogene Mammals, Lucas et al (eds.), *New Mexico Museum of Natural History and Science Bulletin* 44, 299-314.

Tedford, Richard H., Morris F. Skinner, Robert W. Fields, John M. Rensberger, David P. Whistler, Theodore Galusha, Beryl E. Taylor, J. Reid Macdonald, S. David Webb. 1987. Faunal Succession and Biochronology of the Arikareean Through Hemphillian Interval (Late Oligocene Through Earliest Pliocene Epochs) in North America. In Michael O. Woodburne (editor), *Cenozoic Mammals of North America: Geochronology and Biostratigraphy*: 153-210. Berkeley, CA: University of California Press.

Tedford, Richard H., L. Barry Albright III, Anthony D. Barnosky, Ismael Ferrusquia-Villafranca, Robert M. Hunt Jr, John E. Storer, Carl C. Swisher III, Michael R. Voorhies, S. David Webb, and David P. Whistler. 2004. Mammalian biochronology of the Arikareean through Hemphillian interval (late Oligocene through early Pliocene epochs). In *Late Cretaceous and Cenozoic Mammals of North America: Biostratigraphy and Geochronology*. Columbia University Press, New York: 169-231.

Megalodytes morejohni

Howard, Hildegard. 1992. New Records of Middle Miocene anseriform birds from Kern County, California. Campbell, K.E. (ed.), In *Papers in avian paleontology honoring Pierce Brodkorb*. Natural History Museum of Los Angeles, Science Series, 36: 231-237.

Pacifichelys hutchisoni

Lynch, Shannon Colleen and James F. Parham. 2003. The first report of hard-shelled sea turtles (Cheloniidae *sensu lato*) from the Miocene of California, including a new species (*Euclastes hutchisoni*) with unusually plesiomorphic characters. *PaleoBios* 23(3): 21-35, Berkeley, CA: University of California Museum of Paleontology.

Pandion homalopteron

Walter, Stuart L. 1976. A New Osprey from the Miocene of California (Falconiformes: Pandionidae). In *Collected papers in avian paleontology honoring the 90th birthday of Alexander Wetmore*. Storrs L. Olson, ed. Smithsonian Contrib. *Paleobiology* 27, pp.133-139.

Pelagiarctos thomasi

Barnes, L. G. 1988. A new fossil pinniped (Mammalia: Otariidae) from the middle Miocene Sharktooth Hill Bonebed, California. *Natural History Museum of Los Angeles County, Contributions in Science* 396:1–11.

Boessenecker, R. , & Churchill, M. 2013. A reevaluation of the morphology, paleoecology, and phylogenetic relationships of the enigmatic walrus pelagiarctos. *PLoS One*, 8(1), e54311-e54316.

Pelagornis orri

Mayr, Gerald and David Rubilar-Rogers. 2010. Osteology of a New Giant Bony-Toothed Bird from the Miocene of Chile, with a Revision of the Taxonomy of Neogene Pelagornithidae. *Journal of Vertebrate Paleontology* 30 (5): 1313-1330.

Stidham, Thomas A. 2004. New skull material of *Osteodontornis orri* (Aves: Pelagornithidae) from the Miocene of California. *PaleoBios* 24(2): 7-12.

Pontoporiid (Ancient Dolphins)

Barnes, Lawrence G. Lisa Tohill and Sean Tohill. 2015. A New Pontoporiid Dolphin from the Sharktooth Hill Bonebed, Central California; The Oldest Known Member of its Family. In Western Association of Vertebrate Paleontology Annual Meeting: Program with Abstracts. *PaleoBios* 23(1): p.4 (Abstract)

Psephophorus californiensis

Gilmore, Charles Whitmore. 1937. A new marine turtle from the Miocene of California. *Proceedings of the California Academy of Science*, ser.4, vol.23: 171-174.