

STEP BACK INTO TIME: FOSSIL FOOTPRINT RECOGNITION OF CHEETAH, LLAMA, GOMPHOTHERE, AND OTHER TRACKMAKERS OF THE PLIO-PLEISTOCENE

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This chapter introduces a ubiquitous avian and mammaloid hoof- and footprint vertebrate ichnofauna discovered and identified from basin-margin sediments in the Vallecito-Fish Creek Basin and lacustrine floodbasin sediments in the Borrego Badlands of Anza-Borrego Desert State Park, California. The terrestrial assemblage is one of the most varied yet found, ranging from early Pliocene (Blancan) to Pleistocene (Irvingtonian to Rancholabrean) in age. Seven morphofamilies are recognized, represented by nine ichnospecies with morphologic parameters quantified. Four ichnospecies are new. The most noteworthy ichnofauna, named as the Fish Creek Canyon Ichnofauna, includes *Gruipeda diabloensis*, a small ansiodactyl bird, *Mustelidichnum vallecitoensis*, an aquatic musteloid, *Chelipus therates*, a typical carnivorian canoid, *Pumaeichnum milleri*, an intermediate feloid, *Pumaeichnum stouti*, a larger feloid, *Hippipeda downsi*, a monodactyl equoid, *Lamaichnum borregoensis*, a small llamoid, *Megalamaichnum albus*, a large llamoid, and *Stegomastodonichnum garbanii*, a probable gomphotherioid. Further research in the field yields additional footprints that compare very favorably to bobcat, deer, peccary, camel, and possibly a larger llama, warranting further investigations. Most mammaloid trackmakers are hitherto unknown from the fossil record of the Fish Creek Canyon but do occur within the known osteological record of the stratigraphically younger Vallecito Badlands (distal sandstones and lacustrine claystones sourced from the Canebrake Conglomerate).

Footprints are preserved as positive ceiling casts on the undersides of thick, overhanging sandstone ledges, or as natural negative floor impressions associated with various interstratified, dessication mud drapes. Well-documented tracksites occur throughout multiple stratigraphic levels of a vertically-continuous mixed-affinity marine-deltaic (Yuha Formation), delta-plain (Palm Spring Formation), and fluvial-alluvial fan (medial sandstones sourced from the Canebrake Conglomerate) transition zone exposed between Hanging Tracks Wash in the Fish Creek Badlands and Arroyo Tapiado in the Vallecito Badlands. The majority of tracksites occur between Fish Creek Canyon and Camel Ridge. Recent discoveries of cloven-hoofed and canoid-type footprints in the area of Arroyo Tapiado and Arroyo Hueso increase the range of tracksites for this section. This chapter provides a significant treatise on identification for, and expansion of, the morphological ranges known among Neogene vertebrate inchnotacks of western North America.