Early Cenozoic Survivors: Puercan Metatheria In The Western Interior
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Introduction
Survival across the Cretaceous-Paleogene (K-Pg) boundary was difficult for most terrestrial life. Mammals alone are estimated to have lost 75% of faunal diversity. In the latest Cretaceous, Metatheria (marsupials and their closest fossil relatives) dominated the mammalian fauna. At least 25 species of Metatheria have been recovered from the Maastrichtian (Lancian) of North America with evidence of significant diversification and growth; however, exceedingly few crossed the K-Pg boundary. In earliest Paleocene (Puercan) time, only Thylocodon pusillus, T. montanensis, and Pedactes minor are currently known in North America, with five additional species in later Puercan strata. Here we describe three Metatherian fossils: two from the Great Divide Basin in Wyoming and one from the Denver Basin in Colorado.

Materials and Methods
We compared the UCM specimens to characteristics of T. pusillus, T. montanensis, and P. minor. After recognizing a substantial size difference in UCM 48598, we compared it to loaned specimens and measurements published in literature of T. pusillus and T. montanensis from the Denver 1, San Juan 2, and Willowston Basins. Measurements of UCM 48598 followed Clemens 3. Tooth nomenclature follows Williamson 4.

Results and Conclusions
We identified UCM 103091 as a right dentary and UCM 103314 as an upper right M2 of T. pusillus. Furthermore, UCM 48598 is morphologically similar to Thylocodon species with differences mostly seen in size. Based on these conclusions, we propose that UCM 48598 is a new species within the Thylocodon genus. While the Puercan quarry in the Great Divide Basin has produced many other eutherian and multituberculate jaws and teeth, UCM 103091 and UCM 103314 are the first Thylocodon specimens to be described from that basin. While a few specimens have been described from the nearby Hanna Basin, most Thylocodon specimens are found further north in Montana’s Willowston Basin or further south in New Mexico’s San Juan Basin. Notably, UCM 48598 from the Denver Basin, is a larger species of Thylocodon than previously known. The speciose increase the known diversity of metatherians in earliest Paleocene time. Further, it supports the hypothesis that mammalian body sizes increased within the first few hundred thousand years after the K-Pg extinction as ecosystems recovered and new niches opened for adaptation. 1,2,5,6,7,8,9,10,11