

Correlation of Paleogene strata across Wyoming — a users' guide

Jason A. Lillegraven

Departments of Geology/Geophysics and Zoology/Physiology

University of Wyoming

Laramie, Wyoming, 82071

Abstract

In reference to Paleogene (i.e., Paleocene through Oligocene) time, the geologic record of Wyoming is better understood than any other comparably sized tract of Earth's dry land. The following graphical devices are presented as means of summarizing the status of knowledge of Wyoming's Paleogene history:

1. *A map of Wyoming, showing statewide distribution of remnants of two temporal components (pre-Chadronian versus post-Duchesnean) of Paleogene sedimentary rocks;*

2. *A series of 30 locally representative Paleogene stratigraphic sections, including almost all named non-Absarokan formations and members (set on a radiometrically calibrated time scale, but emphasizing primacy of correlation using North American Land Mammal "Ages"), coordinated with listings of primary research literature for each surrounding area; and*

3. *Statewide, interbasinal comparative diagrams showing consistency of presence or absence of sedimentary records for each estimated million-year interval of the Paleogene.*

Wyoming's Paleogene record is dominated by Paleocene through earlier Eocene strata; early parts

(Paleocene into late Wasatchian) represent influence of subsidence associated with the Laramide orogeny, and later parts (late Wasatchian through Uintan) reflect increased influence of local volcanism. Sudden, massive influx of distantly derived volcanoclastic debris began in the late Eocene (Chadronian) and continued with sporadic interruptions until late in the Tertiary; Wyoming probably experienced generally aggradational conditions throughout that entire interval. Important, geographically widespread episodes of erosion occurred statewide during the following intervals of the Paleogene:

1. *Early Paleocene (largely restricted to tectonically unstable basin margins);*

2. *Late Wasatchian (also of localized importance, as Laramide subsidence abated);*

3. *Late Eocene (Duchesnean; profoundly important, affecting much of western North America); and*

4. *Late Oligocene (probably medial Arikareean; affecting Wyoming generally, and perhaps nearby parts of western Montana).*

Introduction

Hundreds of man-years of field and laboratory effort and millions of dollars have been invested into research on the Cenozoic geologic history of Wyoming. Because of the nature of the State's preserved

record, most of the investment has been applied to Paleocene through Oligocene (Paleogene) components of the story.

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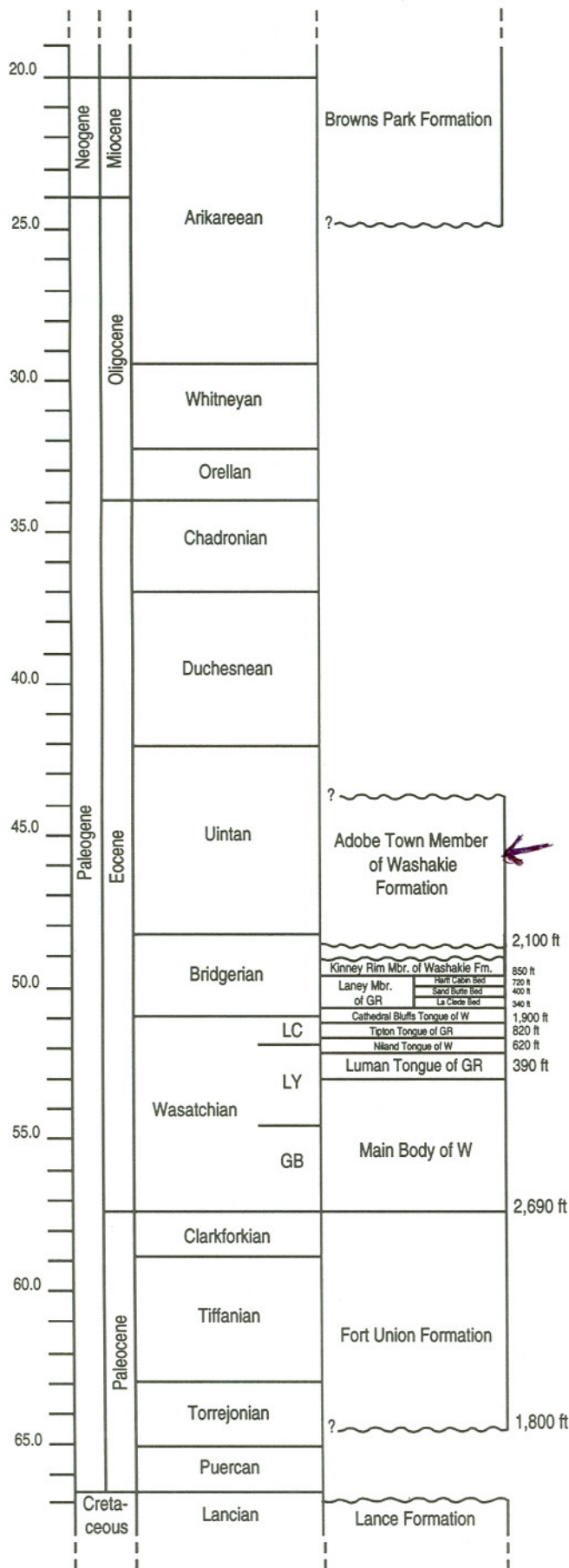


Figure 4U. Generalized Paleogene stratigraphy in vicinity of Section U (Figures 1 and 2) — eastern Rock Springs uplift, Wamsutter arch, Washakie Basin, western Sierra Madre, south-central and southeastern Wyoming. Browns Park Formation occurs locally only along south rim of Washakie Basin. Hettinger and others (1991) and Honey and Hettinger (1989) report on "unnamed Cretaceous and Tertiary sandstone unit" (up to 1,100 ft. thick) along eastern flank of Washakie Basin. *Locations of thickness measurements:* Adobe Town Member (Adobe Town Rim); Kinney Rim Member (southwestern Washakie Basin); Laney Member (including Hart Cabin, Sand Butte, and La Clede beds; central Washakie Basin); Cathedral Bluffs Tongue, Tipton Tongue, Niland Tongue, Luman Tongue, and Main Body (south of Bitter Creek Station); and Fort Union Formation (vicinity of Black Butte Coal Company Mine). *Abbreviations:* GR = Green River Formation and W = Wasatch Formation.

Key literature to Paleogene history in vicinity of Section U
 Breithaupt, 1982
 Colson, 1969
 Flynn, 1986
 Grande, 1984
 Hanley, 1976, 1977
 Hettinger and others, 1991
 Honey and Hettinger, 1989
 Izett, 1975
 Izett and others, 1970
 Korengay and Surdam, 1980
 McKenna, 1960
 Mauger, 1977
 Morris, 1954
 Rigby, 1980
 Roehler, 1973a,b, 1977, 1979a,b, 1983
 Rose, 1981
 Ryder, 1988
 Savage and Russell, 1983
 Sklenar and Andersen, 1985
 Stanley and Surdam, 1978
 Sullivan, 1980
 Surdam and Stanley, 1979, 1980
 Surdam and Wolfbauer, 1975
 Turnbull, 1978, 1991
 Turnbull and Martill, 1988
 Winterfeld, 1982