

SERIES	Stages	Informal substages	Radiometric ages (m.y.)	Informal zone nos.	UPPER CRETACEOUS								Informal zone nos.						
					NW Black Hills	Red Bird	Rock River	Buckeye	Kassler/Littleton area	Pueblo area	Trinidad/Aguilar area	Springer area							
UPPER CRETACEOUS	Maastrichtian	Upper	K-T boundary = 65.50 ± 0.10	78	Lance Formation	Lance Formation	Medicine Bow Formation	Fox Hills Sandstone	Laramie Formation	Laramie Formation	Raton Fm. (part) and Vermejo Fm. undivided	Raton Formation (part) and Vermejo Formation, undivided	78						
				77		Fox Hills Sandstone	Fox Hills Sandstone		Fox Hills Sandstone	Fox Hills Sandstone			77						
				76		?	?		?	?			76						
				75		?	?		?	?			75						
				74		Fox Hills Sandstone	Pierre Shale (part)		Lewis Shale	?			Pierre Shale (part)	74					
		73	?	?	?	?	?	73											
		Campanian	Upper	71.98 ± 0.31	72	Pierre Shale (part)	Pierre Shale (part)	Rock River Formation	Pierre Shale (part)	Pierre Shale	Pierre Shale	Pierre Shale (part)	Pierre Shale (part)	Pierre Shale	72				
					71	?									?	?	?	?	71
					70	?									?	?	?	?	70
					69	?									?	?	?	?	69
	68				?	?									?	?	?	68	
	67				?	?									?	?	?	67	
	66				?	?									?	?	?	66	
	65				?	?									?	?	?	65	
	64				?	?									?	?	?	64	
	Middle		75.77 ± 0.34	63	Pierre Shale (part)	Pierre Shale (part)	Rock River Formation	Pierre Shale (part)	Pierre Shale	Pierre Shale	Pierre Shale	Pierre Shale (part)	Pierre Shale (part)	Pierre Shale	63				
				62	?										?	?	?	?	62
				61	?										?	?	?	?	61
				60	?										?	?	?	?	60
				59	?										?	?	?	?	59
				58	?										?	?	?	?	58
				57	?										?	?	?	?	57
				56	?										?	?	?	?	56
				55	?										?	?	?	?	55
	Lower	81.86 ± 0.36	54	Pierre Shale (part)	Pierre Shale (part)	Steele Shale	Pierre Shale (part)	Pierre Shale	Pierre Shale	Pierre Shale	Pierre Shale (part)	Pierre Shale (part)	Pierre Shale	54					
			53	?										?	?	?	?	53	
			52	?										?	?	?	?	52	
			51	?										?	?	?	?	51	
			50	?										?	?	?	?	50	
	Santonian	Upper	± 0.34	49	?	Pierre Shale (part)	?	Pierre Shale (part)	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	49					
				48	?									?	?	?	?	48	
				47	?									?	?	?	?	47	
		Middle	46	46	?	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	46				
				45	?										?	?	?	?	45
				44	?										?	?	?	?	44
	Turonian	Upper	± 0.39	43	?	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	Niobrara Formation	43					
				42	?									?	?	?	?	42	
				41	?									?	?	?	?	41	
				40	?									?	?	?	?	40	
				39	?									?	?	?	?	39	
		Middle	90.60 ± 0.46 92.46 ± 0.58	38	Carlile Shale (part)	Carlile Shale (part)	Sage Breaks Shale	Frontier Formation (part)	Carlile Shale (part)	Carlile Shale (part)	Carlile Shale (part)	Carlile Shale (part)	Carlile Shale (part)	Carlile Shale (part)	38				
				37	?										?	?	?	?	37
				36	?										?	?	?	?	36
				35	?										?	?	?	?	35
34				?	?										?	?	?	34	
33				?	?										?	?	?	33	
Lower	93.48 ± 0.58 93.19 ± 0.42	32	Carlile Shale (part)	Carlile Shale (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone (part)	32						
		31	?										?	?	?	?	31		
		30	?										?	?	?	?	30		
		29	?										?	?	?	?	29		
		28	?										?	?	?	?	28		
		27	?										?	?	?	?	27		
		26	?										?	?	?	?	26		
Cenomanian	Upper	93.32 ± 0.38 93.82 ± 0.30 93.99 ± 0.57	23	Greenhorn Formation	Greenhorn Formation	Greenhorn Limestone (part)	Greenhorn Limestone (part)	Greenhorn Limestone	Greenhorn Limestone	Greenhorn Limestone	Greenhorn Limestone (part)	Greenhorn Limestone (part)	23						
			22	?									?	?	?	?	22		
			21	?									?	?	?	?	21		
			20	?									?	?	?	?	20		
			19	?									?	?	?	?	19		
	Middle	94.71 ± 0.49 94.96 ± 0.50	18	Greenhorn Formation (part)	Greenhorn Formation (part)	Frontier Formation (part)	Greenhorn Limestone (part)	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	18					
			17	?										?	?	?	?	17	
			16	?										?	?	?	?	16	
			15	?										?	?	?	?	15	
			14	?										?	?	?	?	14	
Lower	(Gap in biostratigraphic record)	13	Belle Fourche Shale	Belle Fourche Shale	Frontier Formation (part)	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	Graneros Shale	13						
		12	?										?	?	?	?	12		
		11	?										?	?	?	?	11		
		10	?										?	?	?	?	10		
		9	?										?	?	?	?	9		
		8	?										?	?	?	?	8		
		7	?										?	?	?	?	7		
Lower	98.88 ± 0.35 99.6 ± 0.9	6	?	Mowry Shale	Mowry Shale	Mowry Shale	Mowry Shale	Dakota Group	Dakota Sandstone	Dakota Sandstone	Dakota Sandstone	Dakota Sandstone	6						
		5	?										?	?	?	?	5		
		4	?										?	?	?	?	4		
		3	?										?	?	?	?	3		
		2	?										?	?	?	?	2		
		1	?										?	?	?	?	1		

Figure 3. Lacunae (lined pattern) in Upper Cretaceous formations in eastern Wyoming, central Colorado, and northeastern New Mexico with informal fossil zone numbers and radiometric ages. m.y., millions of years.