Map Unit Properties Table

Age	Unit Name (Symbol)		Description	Depositional Setting	Local and Global Significance	Development Potential	Paleontological Resources
Quaternary	Colluvium (Holocene and Pleistocene) (Qc)		Thin gravels mantling slopes, composed of granular grus derived from the Pikes Peak Granite, rhyolitic gravel derived from the Wall Mountain Tuff, and shale, mudstone, sandstone, and silicified wood fragments derived from the Florissant Formation	Brought to the foot of a slope or cliff by gravity	None		Redeposited silicified wood fragments from the Florissant Formation
	Holocene alluvium (Qal)		Brown unconsolidated humus- rich (peat) sands and gravelly sand	Occurs along streams	None	Rich riparian habitats	
	Pleistocene gravels (Qg)		Thick gravels mainly composed of granular grus derived from the Pikes Peak Granite, also scattered fragments of Wall Mountain Tuff	Stream deposits (alluvial fan and terrace)	None		Source of gravel, redeposited silicified wood fragments from the Florissant Formation, vertebrate fossils (including mammoth, radiocarbon dated at 49,830 ± 3,290 B.P.)
unconformity							
Tertiary (Eocene)	Florissant Formation	Unit 5 (Tf5)	Upper pumice conglomerate unit: pumice- rich white sandstones and conglomerates, structureless to locally trough cross- bedded; numerous pink pumice clasts near top; poorly sorted brown pumiceous sandstones interbedded with scattered lenticular mudstones and shales (near south entrance); maximum measured thickness 75 ft (22.8 m).	Lacustrine at base (deposited in Lake Florissant), fluvial at top (streams in tributary valleys washed pumice pebbles into lake)	Age: 34.07 ± 10 Ma (based on $^{40}Ar/^{39}Ar$ dating); dates come from Tf3, Tf4, and Tf5 (Evanoff and others, 2001)		Locally abundant fingernail clams, rare plant, and lymnaeid snail fossils
		Unit 4 (Tf4)	"Upper lake shale" (upper shale unit): gray to greenish- brown paper shales and blocky mudstones; interbedded with planar, thin yellow to white pumiceous sandstone beds; maximum measured thickness 18 ft (5.6 m) in the NW corner of the monument; unit thins to the south.	Lacustrine (represents younger generation of Lake Florissant)	Prolific fossil- bearing unit	Very sensitive to disturbance	Fossiliferous gray to yellowish- brown sandstones interbedded with diatomaceous mats* (near the south entrance); fossils include leaves, insects, ostracods, fish scales, and fingernail clams
		Unit 3 (Tf3)	"Cap rock" (cap rock conglomerate unit): yellowish- gray conglomerate with subangular to rounded clasts of tuff, quartz, and andesite; locally contains blocks of andesite, pumiceous sandstones, and blocky mudstone; typically graded, otherwise structureless to crudely horizontally bedded; maximum thickness 26 ft (7.9 m) measured near Lodge stump (E of Scudder pit); thins to the north and is not present in the NW corner of the monument.	Volcanogenic debris: flow deposit in Lake Florissant, later reworked by lacustrine processes; vertical tubes represent water- escape structures	Protects Tf2 from erosion		Scattered fingernail clam fossils in upper half of unit
		Unit 2 (Tf2)	"Lower lake shales" (middle shale unit): interbedded brown paper shales, grayish brown blocky mudstones, thin yellowish pumiceous sandstones, and thin granular pumice conglomerates; maximum thickness 30 ft (9 m).	Lacustrine (represents younger generation of Lake Florissant); also may represent marginal swamp environments; volcanic fallout in lake	Most of the fossil quarries occur in this unit (e.g., Princeton quarry and Tennessee pit)	Very sensitive to disturbance	Abundant plant fossils with less abundant insects and planorbid snails; diatomaceous mats; rare fish, mollusks, and ostracod fossils
		Unit 1 (Tf1)	"Lower fluvial sequence" (lower mudstone unit): tan to gray blocky tuffaceous mudstones interbedded with yellowish gray pumiceous sandstones and rare arkosic sandstone ribbons, which typically have abundant trough cross- bedding; bottom contact poorly exposed; maximum thickness 34 ft (10.4 m).	Fluvial (with rare channel deposits) topped by a volcanogenic mudflow deposit on valley bottom; not in Lake Florissant	Upper 16 feet (5 m) is a single mudflow deposit that buried stumps; probably associated with down- valley debris flow that dammed Lake Florissant		Fossils include stumps and logs of gymnosperms and angiosperms, scattered leaves, and rare mammal bones (e.g., *Mesohippus* and brontothere)
			Lower shale unit: alternating tuffaceous siltstone and paper shale beds (alternating laminae of diatomite and volcanic ash altered to smectite clays); thin pumice conglomerate with granite and volcanic clasts scattered throughout. Note: Florissant Fm. underlies about one- third of monument; total thickness 23 ft (75m)	Lacustrine (represents earlier Lake Florissant)	Lowest occurrence of prominent paper shales	Very sensitive to disturbance	Plant and insect fossils, contains most of the fish and almost all of the bird fossils known from the Florissant Formation; outcrops do not occur within the monument
	Boulder Conglomerate (Tb)		Lenticular boulder conglomerate composed primarily of large rounded blocks of Pikes Peak Granite, and secondarily of gneiss and rhyolite cobbles and boulders; rhyolite clasts rounded to subangular and derived from the Wall Mountain Tuff; interbedded with Tf1, and rests on surface cut into the Wall Mountain Tuff and the Pikes Peak Granite; maximum thickness about 49 ft (15 m).	Fluvial and debris- flow deposit	Probable equivalent of the Tallahassee Creek Conglomerate exposed south of Wrights Reservoir (Wobus and Epis, 1978)		According to Evanoff (2001), scattered silicified wood fragments from Tf1 occur in this unit (may be stratigraphically questionable (Herb Meyer, Florissant Fossil Beds National Monument, written communication, May 2, 1005)
unconformity							
Tertiary (Eocene)	Wall Mountain Tuff (Twm)		Rhyolitic welded tuff, brownish- gray to dark gray; abundant sanidine and less abundant biotite, argillized plagioclase, and magnetite; weathers to large angular to subangular blocks; maximum thickness 49 ft (15 m) in lower exposures.	Pyroclastic flow from the southwest (probable source is Mount Princeton batholith), strongly controlled by paleotopography, mantles sides of the Florissant paleo- valley	Oldest Tertiary rock in the monument—37.73 ± 0.07 Ma (average of two ages reported by McIntosh and Chapin, 1994)		No fossils
unconformity							
Precambrian	Pikes Peak Granite (pCg)		Medium to coarsely crystalline reddish granite and quartz monzonite; contains abundant perthitic microcline, quartz, and biotite; contains micro- joints.	Emplaced during a time of crustal extension, perhaps associated with continental epeirogenic uplift and doming	Oldest rocks in the monument, but among the youngest Proterozoic rocks in Colorado—1.08 Ga (Unruh and others, 1995), Lake Florissant formed on the eroded surface of this unit	Weakest of the Precambrian batholiths in area; forms domes, tors, and boulder piles; weathers into grus	No fossils

Sources: Evanoff (1992, 1994), Evanoff and others (2001), Gregory- Wodzicki (2001), Meyer (2003), Wobus (2001).
*Diatom mats were originally interpreted as stromatolites (Evanoff and Doi. 1992).