# TROPHIC ECOLOGY AND TAPHONOMY OF THE LOWER PERMIAN CRADDOCK BONE BED USING QUANTITATIVE ANALYSIS OF ASSOCIATED DIMETRODON SKELETONS.

**SIMON, Holly[1], DONNELL, Mckinzi[1], VOLLMER, Evelyn[1], STANCIK, Lauren[2], FLIS, Chris[1]**

1. The Whiteside Museum of Natural History, 310 N Washington St Seymour, TX 76380
2. Midwestern State University, 3410 Taft Blvd, Wichita Falls, TX 76308

A quantitative analysis of 4 *Dimetrodon* skeletons of varying completeness identified numerous consistencies and irregularities in expected patterns of carcass preservation in a low-energy fluvial channel deposit. Through quantitative analysis of associated and articulated specimens, predation and scavenging are identified as the primary agents of skeletal destruction followed by natural drifting of bones by low energy hydraulic forces. The high diversity, multitaxic Lower Permian Craddock bonebed (CBB) of Seymour, Texas has yielded tens of thousands of fossil bones of amphibians, reptiles, and synapsids since its discovery in 1907. The trophic ecology of the CBB is marked by a high frequency of scavenging and predation which contributes to the distribution of individual bones and complete skeletons within the deposit. Evidence of scavenger/predator-induced bone alterations such as tooth marks and dismemberment, and evidence of suspected invertebrate necrophagichnia contribute to the complex taphonomic activity observed at the CBB. *Dimetrodon* skeletons used for this study are WMNH123117 (Abby), WMNH063019 (Michael), WMNH32518 (Leigh), and WMNH042017 (Bonnie). These specimens range from little to no articulation (Abby) to full articulation (Bonnie) and were collected between 2016 and 2020 by the WMNH from site Kennesaw of the Craddock Bone Bed. Of the 4 specimens, none have complete tails; this conforms to predictable scenarios involving pre-mortem predation and post-mortem food processing in which the anatomical regions of highest muscle density are consumed first. Cranial elements are found separated along their natural sutural surfaces; articulated skulls of *Dimetrodon* are rarely found at this site, which is consistent with bone drift by low-energy hydraulic forces. Specimens displaying separation between successive centra in correct vertebral order while maintaining fully articulated necks is problematic. Lethargic hydraulic movement as a kinetic influence of disruption rather than predator/scavenger food processing is more likely in this situation. In concert with predictable scenarios involving pre-mortem predation and post-mortem food processing, 3 out of 4 skeletons lack limb bones and shoulder complexes, with Bonnie as the exception. In conclusion, a higher frequency of predator-altered bone than lethargic hydraulic disruption is suspected to be the primary agent of taphonomic influence.