Let G be a connected graph and let U be a set of vertices in G. A *minimal U-tree* is a subtree T of G that contains U and has the property that every vertex of $V(T) - U$ is a cut-vertex of $\langle V(T) \rangle$. The *monophonic interval* of U is the collection of all vertices of G that lie on some minimal U-tree. A set S of vertices of G is *m_k-convex* if it contains the monophonic interval of every k-subset U of vertices of S. Thus S is m_2-convex if and only if it is m-convex.

In this paper we consider three local convexity properties with respect to m_3-convexity and characterize the graphs having either property.