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We show that closed, simply-connected, non-negatively curved 5 manifolds admitting an (almost) effective, isometric T^3 action are equivariantly diffeomorphic to one of S^5 , $S^3 \times S^2$ or $S^3 \tilde{\times} S^2$. If we allow only T^2 symmetry, the Wu manifold may also occur and we have a classification up to homeomorphism. As a direct consequence we can show that the maximal symmetry rank for manifolds under the same hypotheses of dimension up to and including 9 is equal to $[\frac{2n}{3}]$. (Received March 02, 2009)