

## **Firing Hunting Bullets into Water Reveals Extreme Dissimilarities in Terminal Ballistics**

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Hunting bullets are often comprised of a lead core covered with a copper jacket. When the bullet collides with an animal, particles - sometimes thousands - can shed from the projectile and embed in animal tissues. Those lead fragments can end up in game meat and in the remaining carrion that many species scavenge. Hunters can reduce the availability of lead in food chains simply by shooting lead-free ammunition. With all bullets, it is vital to assess their accuracy and terminal ballistics to ensure they perform adequately and effectively. We fired 12 types of bullets into water to measure their weight retention and expansion at 100 and 260 yards. Bullet constructions included bonded, partition, cup-and-core lead, copper, and tin. Copper bullets retained >98% of their weight, whereas cup-and-core lead bullets retained 9-55%, depending on the brand. One brand of bonded lead bullet retained weight (~96%) almost as well as copper bullets, while another brand retained much less mass (~71%). Most copper bullets expanded similarly regardless of distances tested. Cup-and-core lead bullets often performed inconsistently, where the jacket separated from the lead core. Our data emphasize the importance of understanding a bullet's terminal ballistics as a prerequisite to hunting with that projectile.