

Dropping Some Science

by Kirston Koths

In the mid-1980s, when I began tying flies, the standard nymph pattern began with wrapping a number of turns of lead wire around the hook shank to help the fly sink rapidly. This was the era before beadhead flies, so before casting, I would crimp a lead split shot or two onto the tippet above my nymph (often using my teeth!). We now understand that this approach, although somewhat effective, was seriously misguided for the following reasons.

First of all, lead is toxic, affecting all organs, especially neural tissue in developing children. There is no safe exposure level for humans. Lead can be absorbed through breaks in the skin, breathing, and ingestion. Effects are cumulative, so a lifetime of tying and fishing with lead products is probably a bad idea. Lost lead split shot and bird shot from hunters have accumulated in many watersheds to the extent that wildlife (especially waterfowl) has been shown to be suffering from lead poisoning. Since 1991, lead birdshot has been banned in the U.S., and in some countries lead is no longer allowed for fishing.

So what are the alternatives to using lead? Around 1990, the European practice of using brass beads at the head of nymph patterns took America by storm. Everyone's favorite pattern soon had a beadhead variant. The amount of weight provided by the brass bead (plus a bit of lead-substitute wire on the shank) meant that sometimes you could catch fish in moderately deep water without using lead split shot (or even the lead-free split shot substitute that was appearing on the market). But the temptation to continue using lead was still there. Why? Because it was still a bit denser.

Density (the amount of weight in a given volume) is what is important in sinking fast, not weight alone. A fly attached to a brick will get down, but it won't look too attractive to a fish. If water is taken as a density of 1.0 (grams per cubic centimeter), the following materials are especially useful for nymph patterns because they are significantly denser than water:

- Glass (2.6 g per cubic centimeter)
- Aluminum (2.7)
- Tin (7.3)
- Steel (7.9)
- Brass (8.7)
- Nickel (8.8)
- Lead (11.3)

- Tungsten (19.3 grams per cubic centimeter; 17-19 in alloyed form).

A quick comparison shows that a brass beadhead would need to be over twice as big as a tungsten bead to contain the same mass, because brass is less than half as dense. In fact, tungsten is almost twice as dense as lead! So replacing a brass bead with a tungsten bead of nearly equal size means that you could eliminate the lead wire in the fly, and one lead split shot on the leader, and still sink almost as fast. Equally as important, using tungsten beads can eliminate the casting tangles inherent in using split shot and also avoid contaminating the environment with lead. To be fair, heavy metals such as tungsten may soon be shown to have some negative effects on the environment, but tungsten is likely to be far less dangerous than lead.

So if we want to “get the lead out” by using tungsten beads, what are our choices? The photo shows that tungsten beads are now made by several companies and come in a variety of sizes as well as some new colors. They are corrosion-resistant and have that special beadhead “sparkle” that often is an important component of the beadhead’s reputation as a fish attractor. The only drawback is that tungsten beads cost about three times as much as other beads. Pre-formed scud shellbacks are also available in tungsten.

A Czech nymph made with a tungsten bead sinks like a rock. (Actually, this is a poor comparison because the density of a rock is only 2.7!) The streamlined shape of the Czech nymph also helps to minimize frictional drag, another attribute affecting the sink rate. Pre-formed scud backs made of tungsten are also now available. Very small tungsten beads solve the vexing problem of how to weight midge patterns without increasing bulk.

Nymph and streamer patterns have appeared recently with two brass beads under the thorax, for quick sinking. Substituting double tungsten beads will surely follow. And I am even experimenting with multiple colored tungsten beads as bodies of some of my patterns. This should get my nymph down quickly at the head of the pool under torrents of fast water. So if you want to catch more big fish, avoid the tangles of split shot, and protect the environment, give tungsten beadhead flies a try.