FLY LEADERS
SYD SMITH, FFFCCI Page 1

I. General: The "right" leader is the leader which will most efficiently accomplish the delivery of the fly to the target in the setting of the anticipated and required cast, as invisibly as possible. There are as many "right" leaders as there are specific fishing circumstances.

II. General considerations.

A. A typical leader design is: 60% butt, 20 % taper and 20% tippet, or 50% butt, 30% taper and 20% tippet, although these are simply general rules and do not apply to some specific fish species: i.e. a trout leader for a spring creek or a tarpon leader would be much more technical. The three factors affecting leader performance: Mass Profile, Design, Stiffness (in descending order of importance).

B. Some definitions:

1. Butt section: the thick part of the leader attached to the fly line, which must meet Mass Profile specifications (see below).

2. Taper section: The tapered section between the butt and tippet in which the taper design of the leader occurs.

3. Tippet: The thinnest part of the leader to which the fly is attached.

4. Bite Tippet: often called the "shock" tippet, is wire, braided wire or heavy monofilament attached to the fly, designed to protect from the fish's gill plates and abrasion against obstacles such as coral. Per International Game Fish Assn. (IGFA) regulations the shock or bite tippet may not exceed 12 inches including all knots, for world record purposes. Any material may be used. May attach to fly with snell or crimp.

5. Class Tippet: IGFA has established strict requirements for world record catches; the Class tippet which joins the main leader to the shock tippet material and must exceed 15 inches in length. It is a specific pound test break strength. World record catches are categorized by class tippet break strength and run from 2 to 20 lbs. Wire or cable may NOT be used.

6. Level Leaders: Tapered leaders are not necessary for some types of fly fishing: bass fishing big flies in lily-pad choked waters, salty and fresh water situations with lots of grass for knots to pick up, sink lines, throwing under an overhang (short level leader will often be best as it may allow an extremely tight loop), and with sink tip lines throwing something like a Dahlberg Diver.

C. It is always a good idea to make the leader's sections out of the same material to insure as much as possible uniform specific gravity. Unfortunately, accomplishing this is not easy. Most of the leader butt material that will measure the 0.028 inches is approximately 50 lb material, and NOT SOLD routinely by Maxima, or the other manufacturers. The best you can get is 40 lb or about the usual 0.023-0.024 inch diameter material.

D. Available Leader (nylon) materials: One can find Ande, Trilene Big Game, Orvis or Mason in the proper sizes, but both are considerably stiffer than Maxima Ultra Green or Maxima Big Game, and I don't like them as well for that reason. A stiff leader material resists bending and will therefore not turn over the fly as well as a more flexible

Material. Also available from different vendors: Hard: (mostly used for abrasion resistance in leader butts) Maxima Chameleon, Maxima Clear, Rio Max, Mason. Medium memory low stretch (mostly fresh water) Umpqua, Amnesia, Janssen Leader Control, Dia-Rikki Fluorocarbon, Climax; Soft: low memory high shock absorption: Dia-Rikki, Scientific Anglers System leaders.

E. Very helpful "Rules"

1. Rule of Elevens: Subtract the"X" number of your leader/tippet material from "11" to give you the diameter of the leader material in thousandths of an inch: i.e. if the leader is 4X, 11 – 4 = 7, so the diameter is 0.007 inches.

2. Rule of Nines: Subtract the "X" number of your leader/tippet material from "9" to give you the pound strength of the leader material: i.e. if the leader is 5X, 9-5=4 or 4 lb leader strength/test.

3. Rule of Fours (or Threes): To approximate the most appropriate size (in "X" designation) of your tippet material to the hook size used, divide the hook size by either 3 or 4: i.e. if you are fishing a size 18 dry fly, 18 divided by 3 = 6X or divided by 4 appx. 5X tippet material.

F. Materials

1. Nylon monofilament: Specific gravity appx. 1.2 (slightly heavier than water), degraded by UV light (you should replace nylon leader/tippet material exposed to sunlight, each year), considerable "memory", stretches as much as 20% of length, holds knots well, does not have the same reflective index as water (can be see more easily by fish)

2. Fluorocarbon: Specific Gravity 1.8 so sinks more readily in water and as a result is a good choice for subsurface fishing; slightly larger diameter than nylon for the same break strength although more dense, more abrasion resistant than nylon; same reflective index as water so hard for fish to see, not as degraded by sunlight (some say), more expensive,

3. There are sinking leaders made with a metallic core, usually Tungsten, and wire or braided wire for toothy critters (see Tyger Wire).

4. Braided/Furled leaders: Becoming popular but as yet untested against tapered leaders re ability to turn over the fly for a given mass profile. Very flexible and knotless *(but if you're going to fly fish you will have to learn to build your knots securely as terminal tackle problems will continue to get you if you don't*).

Disadvantages of Braided/Furled leaders:

a. Since they are braided there is space between the filaments, no matter how small = larger diameter for mass = more wind resistance.

b. Not as adaptable: i.e. if you're fishing for Bones with a 16 foot leader and the wind comes up, you can easily, on the water, cut your tapered leader back and rebuild to 12 feet with an agreeable taper (takes about 5 minutes) – cannot be done anywhere nearly as easily with furled leaders.

c. Furled leaders pick up more water and therefore weigh more on initial casts which can be a problem especially in a strong wind.

d. Generally require a loop to loop connection, which means more mass at fly line/leader junction, which some don't like.

5. Commercially available knotless tapered leaders: Excellent selection for trout but not as good for salty situations as the butt sections are usually about 0.024 inches in diameter (about 40 lb test) and don't match Mass Profile requirements for our 7 wt and heavier fly lines (see below).

G. Don't throw old leaders in the water or by the river as nesting bird types will try to build a nest with it, get tangled in the material, and die.

III. The importance of the MASS PROFILE of the leader:

A. Like the fly line the leader caries Kinetic Energy according to the equation: KE = ½ (mass x Velocity x Velocity). This Kinetic Energy equation applies to the line and the leader. The leader accepts the kinetic energy from the fly line as the loop turns over, and it is necessary for there to be a smooth flow of energy from the line to the leader. To accomplish this, the MASS PROFILE of the leader must match the MASS PROFILE of the tip section of the fly line.

B. Leaders are made of nylon (or fluorocarbon), and both these substances have densities and specific gravities which differ from the density of the floating fly lines. Specific gravity is the ratio of a substance's density to fresh water, which is taken as a specific gravity of "1". Most floating lines have a specific gravity of about 0.8 (they would have to be less than "1" to float). Nylon monofilament has a specific gravity of about 1.2 (it will sink in fresh water once the surface film of he water is overcome – aid it will sink the tip of your fly line). Fluorocarbon has a specific gravity of about 1.8. Salt water lines can be more dense and still float since salt water is more buoyant, but the principles all still hold true.

C. Therefore, to match the Mass Profile of the tip of a standard floating fly line to the nylon leader, one takes the ratio of the specific gravity of the line tip (about 0.8) to the specific gravity of the leader (1.2) = 2/3's. Thus, assuming uniform densities, we can look simply at the diameters of the tip of the fly line and the leader using this 2/3's rule. *The nylon leader should be 2/3's the diameter of the tip of the fly line to which it is attached. And that attachment should be as efficient and small as possible (i.e. 5 turn nail knot works very well).*

D. Although flexibility/stiffness have some influence on how a leader performs, it is the MASS PROFILE which dictates success. Therefore, it is good to invest in a caliper or, better, a micrometer, to accurately measure the tips of your lines and your leader butt section diameters.

E. What I have found is that in general trout leaders are fairly close to the 2/3's rule of the diameter of the tips of trout lines, but this is not at all true for salt water situations. Most fly line tip sections of 6 Wt on up are generally about 0.041 inches and up. If you measure the butt section diameters of most salt water leaders you will find them to be about 0.023 inches, less than the 0.027- 0.028 (or more) they should be to match even 6

and 7 wt lines, much less 8 wts and larger lines. The difficulty is that the Kinetic Energy of the line cannot flow to the leader (one will often see a "kick" in the line at the

connection to the leader) and one ends up with less energy into the leader and difficulty in turning over the heavy salty flies, simply from the Mass Profile inequity, to say nothing of the construction of the leader beyond mass profile.

F. For Fluorocarbon, the ratio is the same 0.8 specific gravity of the tip of floating lines vs. 1.8 specific gravity for Fluorocarbon. *Therefore, using the same logic, the diameter of the fluorocarbon leader should be 4/9 the diameter of the line tip, or about ½. Easy to remember and apply*

IV.Salt Water Leader Construction

A. If one is using the same material (same specific gravity) to build one's leader, the segments of the leader can be allocated according to "poundage", i.e. one can graduate the leader by going from 50 Lb to 40, to 30 , to 20, etc., because the specific gravities are the same, and such gradation will reflect decreasing diameters and a successful Mass Profile.

B. Some Salty Leaders for an 8 Wt Fly Rod: Great for general use in our fishery. Use same leader material when building these leaders if at all possible.

8 ft leader: 4 ft 50 lb, 1 ft 40 lb, 6 in 30 lb, 6 in 20 lb rest tippet of 10-15 lbs
9 ft leader: 4.5 ft 50 lb, 1 ft 40 lb, 1 ft 30 lb, 6 in 20 lb, rest tippet as above.
10 ft leader: 5 ft 50, 1 ft 40, 1 ft 30, 1ft 20, 2ft tippet as above
12 ft leader: 6ft 50, 2 ft 40, 1ft 30, 1ft 20, 2 ft tippet as above
14 ft leader: 7 ft 5o, 3 ft 40, 1 ft 30, 1 ft 20, 2 ft tippet as above
16 ft leader: 8 ft 50, 4 ft 40, 1ft 30, 1 ft 20, 2 ft tippet as above

C. Big Game Leaders:

1. If claiming a world record, the IGFA requires that the angler submit the entire leader assembly with fly attached and at least 1 inch of the fly line, not disassembled from the leader (butt section to fly line attachment must be seen).
2. Many anglers call the tippet of a tapered leader the "Class Tippet" especially when fishing for records – remember, must be over 15 inches for a world record.
3. Many people buy commercially available "Tarpon" leaders which are generally excellent if mass profiles match. You can tie your own, in which case the butt section of the leader would match the mass profile of the tip portion of your fly line and for a 9 foot leader would be about 5 ft long looped to a Bimini Class section of 15+ inches attached to the shock tippet.

D. Use of Fluorocarbon: Fluorocarbon has the optical density of water and as such is nearly invisible. It has a specific gravity of 1.8, and sinks very well, and is more abrasion resistant. It therefore lends itself to subsurface fishing. This can be extremely important on a tropical flat with gin clear water of about 5-8 feet depth (where are often found tarpon and permit as well as bonefish). Finicky fish will often require some extreme measures. You will have to match the weight of the fly to the retrieval rate you want to

achieve the correct depth of water for each situation, and fluorocarbon sinks a lot faster than nylon.

Also fluorocarbon is often used attached to sinking lines for similar reasons, although the Teeny Company makes 4ft tapered nylon leaders for their sink lines which work splendidly in that the depth of the fly can fairly accurately be determined by the sink rate of his density compensated lines and current speed.

V. Trout Leaders (and similar fishing situations in which the fish are taking prey which have little ability to swim fast – insects in the nymph, emerger or dun/spinner form, pupae, many crustaceous, many terrestrials, worms, etc.)

A. General: These leaders have the most specialized duties among the leader family in that they must not only deliver the fly as efficiently as possible given the specific fishing situation, but they must also be as invisible as possible and counteract the stream forces that would "drag" the fly (move it unnaturally).

B. "Drag" – natural flies aren't good swimmers (with the possible exception of Caddis flies) and are at the mercy of the current. If a fly moves "on its own" in a river, trout are keen to recognize such action as unnatural and avoid it – called "drag"). Trout leaders are designed to cover many exigencies to accomplish the above.

B. Soft presentation: Unlike bass bugs and many salt water flies that may hit with a bang without hurting the presentation (helping it in the case of Bass and Reds), trout flies must generally land like a feather to appear natural. This requires that the energy of the cast be sufficiently dissipated so that when the leader unrolls the fly simply floats to the water. Therefore, although the mass profile of fly line tip to leader connection must match, the tapered section of the leader must decrease mass progressively allowing the friction of the leader against the wind/atmosphere to slow the inevitable increase in leader velocity that occurs with decreasing mass, to a point that at the end of the leader lay out, the energy is gone and the fly drops from the forces of gravity. The tippet function is largely to give some "slack" in the leader so that micro currents/swirls in the river do not drag the fly once on the water. There is a Leader called the Harvey leader which incorporates long sections of tippet material which by design do not carry any energy and simply settle on the water in loose coils so as to defeat drag. Many casts in trout fishing are "slack line" casts designed to defeat drag in a similar manner. Depending on the specific fishing situation, accomplishing the above can be quite tricky and require the angler to modify leaders streamside on often a continuing basis. But, fortunately, it's fun.

C. Trout leaders will generally follow roughly the same formula we have discussed. When we get close to some serious trout fishing we'll begin tying some of these.

D. Fluorocarbon: 90% of trout feeding goes on subsurface, so many feel "nymphing" is the most efficient method of catching trout, unless there is a "hatch" ongoing during which trout become extremely selective and may be feeding exclusively on the surface. Many use fluorocarbon for nymphing purposes because of its invisibility, abrasion resistance, and ability to sink well.

VI. Bass: We have already discussed the fact that Bass leaders may even be level leaders of short length. Bass love a good splash and most fishing is done in fairly close quarters with short, accurate casting. One needs a rod/line combo that loads with minimal line out from the tip and makes short accurate casts with little concern for splash down. Often a level leader of 30 lb test 3-5 feet long will do, or a 5-6 steeply tapered leader matching butt mass profiles to line tip, with steep taper to 20 lb tippet or thereabouts.