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LeaderCalc2007 | Sheetware To Calculate Segments For Hand-Tied Fly Fishing Leaders

The Global FlyFisher's *Guide To* **Hand-Tied Fly Fishing Leaders** *By Steven B. Schweitzer*



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Hand tied leader formulas offer the angler an unlimited portfolio of leader options. There have been literally thousands of hand-tied leader formulas developed and published over the years, all of which are based upon the fundamental 3-part principle of butt/taper/tippet. Hand tied leaders cost pennies per inch when compared to commercially machine-tapered leaders, which is a big incentive in itself for tying your own. Hand-tied leaders also offer you the flexibility of designing tapers that best fit your own personal needs, thus not limiting you to the tapers of commercially available leaders. It's also easier to modify a hand-tied leader on stream to meet your exact requirements by adding or removing some tippet material. But the biggest advantage to tying your own leaders is the "success factor". There's no feeling greater than knowing you had 100% complete control in presenting the business end of the fly line to a fish. Think back to the first fish you caught with a fly you tied. Amazing isn't it?!

It is my hope that you find LeaderCalc and this accompanying Guide useful and together they help you tie leaders that work best for you.

Steven B. Schweitzer
Co-Founder, The Global Fly Fisher
Author, LeaderCalc



Introduction & FAQ's

What is LeaderCalc?

LeaderCalc is the most comprehensive leader formula database of classical and contemporary fly fishing leaders. Currently with 121 leader formulas comprising 450 possible leader-tippet combinations, it boasts the largest collection of leader formulas available today. By entering 2 simple parameters (leader length & desired ending tippet), one can easily see all the formulas that perform the best and match the criteria entered.

Where can I get LeaderCalc?

LeaderCalc is distributed solely by The Global Fly Fisher (<http://www.globalflyfisher.com>); search for 'LeaderCalc' and follow the links. LeaderCalc is free "SheetWare". It is not to be repackaged or resold in any form. If you downloaded this document and any version of LeaderCalc from a website other than The Global Fly Fisher, it is most likely out of date and pirated by the site you got it from. Please note GFF does not support any version of LeaderCalc downloaded from sources other than this site.

How did LeaderCalc get its' start?

When I started out tying my own leaders, it was purely out of interest in the "how-to" and not the "need-to." I wasn't interested in saving money by tying my own and I wasn't ready to invest the time to learn another facet of this increasingly complex sport called fly fishing. Plainly speaking, I just was curious. But, as my interest grew, my frustration began.

I practiced plenty of patience searching for bits and pieces from books, magazines, friends and internet resources. So, as I found them, I realized that comprehensive resources on tying leaders were few and far between. There are lots and lots of general articles, but none that had all the information I needed to

really understand leader design and mechanics. I began to collect them...and since 1997, I have amassed a collection of tips, guidelines and formula variations not worthy to keep... to myself. In essence, it is my hope that this document and the accompanying leader calculation tool LeaderCalc will help you to understand the method behind the madness of tying your own leaders. At the same time LeaderCalc will help you easily sort through the seemingly infinite leader formulas to find the specific leaders that will work in the fishing situations *you* encounter most often.

What can I expect from this document?

This document focuses on the basic techniques and tidbits associated with non-braided, tapered, mono-filament leaders for freshwater and basic saltwater applications. The LeaderCalc tool does not presently include: big-game leaders, or specialty leaders for toothy saltwater critters. Nor does it include shooting, running, double-taper or straight-line mono leaders. These leaders really don't fit within the confines of LeaderCalc.

Can I suggest a leader formula?

Absolutely! There are always new formulas that surface, most are re-makes/re-names of the ones already in LeaderCalc. However, if you find a formula that is quite different than the ones in LeaderCalc, email The Global Fly-Fisher at lc_support@globalflyfisher.com. We most certainly take your suggestions for new and unique formulas for inclusion in future versions of LeaderCalc.

Prerequisites & Working Knowledge

It is required that you have access to and a working knowledge of Microsoft Excel® version 5.0 or newer.

Introduction & FAQ's (cont'd)

I spot an error. Who do I contact?

We want LeaderCalc and this Guide to be the best product of its' kind available. If you see an error or omission in this document or LeaderCalc itself, please email lc_support@globalflyfisher.com and clearly document your finding.

Can I use this Guide and LeaderCalc in my classroom?

Yes, you can use this Guide and LeaderCalc in teaching the art of tying leaders. You do not have to ask permission in advance, just download and go! We respectfully request that this Guide and LeaderCalc be freely provided to your students. At no time should this Guide and LeaderCalc be offered for a fee, or charged for in any manner. If this Guide and LeaderCalc is made part of a class and the class has a "materials fee" or any fee for instruction, the fees should only cover the cost of tuition and leader material. The fees may cover the costs of reproducing this Guide booklet and the LeaderCalc software, however.

Why are the spreadsheets password protected?

There is a significant amount of data and programming logic behind the workings of LeaderCalc. The core database structure, proprietary logic development and programming took place over an initial three-year period and has been updated/modified since 1997. To prevent the actual leader database and logic from being used in developing similar tools, the spreadsheet has been entirely protected. Don't worry, none of the functions required to operate LeaderCalc are made inoperable. You do not need to unlock the spreadsheet in order to use it.

Can I get the password to unlock the spreadsheet?

No.

Printing

In each spreadsheet tab, the print ranges have already been setup and formatted for you. To print, click the "Print" button built into the spreadsheet tab or choose File:Print:OK. Alternatively, you may click the print page icon on your toolbar. Each printout is designed to print on an 8.5" by 11" sheet of paper and will work fine for A2 sized paper as well.

The font on screen is so small...can I make it bigger?

Yes you can! This is a function of Microsoft Excel®. Within Excel®, choose the *View* menu, and then choose *Zoom*. Adjust the percentage larger so that the font is more easily read. By zooming the spreadsheet, you may have to scroll side-to-side more.

How can I get support?

Feel free to email lc_support@globalflyfisher.com with any questions or concerns you may have. Support is limited to the use of LeaderCalc itself. We do not support any questions regarding the use of Microsoft Excel®, your PC or Mac computer platform or any printing device connected to your computer. We try to answer every support email in a timely manner. We reserve the right to forego support if it falls outside the scope of using LeaderCalc. Remember, we are just a bunch of guys providing this for free, as well as the entire site of The Global Fly Fisher, so we think our time is more valuable fishing!

Part One - Principles of Leader Design



Why Hand-Tied Leaders?

Leaders Serve Several Purposes

- ▶ Providing a nearly invisible connection between you and your offering
- ▶ Aiding in the proper presentation of the fly
- ▶ Allowing the fly to respond in a lifelike manner
- ▶ Transferring and dissipating the energy of the cast towards the fly

The economics of tying your own fly leaders is an appealing notion. Quality, machine-tapered leaders go for \$4 US each. A typical leader kit sells for around \$40 US and as high as \$100 US. Most kits are comprised of 14 spools, where each spool has 20 to 30 meters. Let's assume there are 14 spools of 25 meters: that's 350 meters of material in our example kit.. At \$40 US for 350 meters, that works out to be \$0.11 per meter, \$0.12 per yard or \$0.04 per foot. If we use a 9 foot leader (2.7 meters) as our standard, that works out to cost us \$0.35 for a 9 foot leader (2.7 meters). Compare that to paying \$4 for a machined tapered leader! You're paying just slightly less than 1/10th the price for a customizable leader!

The Leader Concept

I'll give you the bottom line now: *No matter how experienced you are in fly fishing, don't neglect the leader! It pays to know as much as you can about how your leader affects your cast and the presentation and drift of your fly.* Just knowing the basics will give you more confidence in your ability to put the fly in front of the fish's nose. During a day of tough conditions in fly fishing, your choice of leader style can spell the subtle difference between catching fish and almost catching fish..

Tapered leaders, when designed properly, will present a fly in a stealthy, life-like manner. Proper selection and usage of leaders for your fishing environment is the single-most important element in fooling fish to the take.

The fly line is designed to efficiently transmit and maintain the energy from the cast. In contrast, the leader is designed to absorb, disperse and transmit a smooth and decreasing flow of energy to the fly.



Types of Tapered Leaders & Their Characteristics



There are literally thousands of leader designs. They can be roughly categorized in the following manner:

- ▶ Dry
- ▶ Stillwater or spring creek leaders: Long, limp, wispy, thin
- ▶ Nymph
- ▶ Streamer - straightens very rapidly and offers immediate control of the fly: A short, large diameter design made with tough, stiff materials is the ticket
- ▶ Bass/Panfish - relatively short and stiff
- ▶ Pike/Muskie - made for toothy fishes
- ▶ Steelhead/Salmon - durability and strength are key
- ▶ Saltwater - Stiff, strong and abrasion resistant, transparency is less of an issue

The length of the leader, the tippet size and the taper all play a vital role in the success of the leader "turning over" or delivering the fly to the target. Since a leader that turns over a fly is the ideal goal, we can decipher that the taper is the single most critical element of the leader. But, like any puzzle, there are several solutions to an acceptable end result. To complicate the puzzle, there are many intangibles to consider when designing/tying a hand-made leader. Consider:

- ▶ Your casting speed and style
- ▶ The rod's action (fast, medium, slow)
- ▶ Length of required cast
- ▶ Wind conditions
- ▶ Water surface currents for dry fly and nymph fishing
- ▶ Sub-surface water currents for nymphing
- ▶ Water clarity
- ▶ Water depth
- ▶ Water temperature (affects the "stiffness" and pliability of the leader material)
- ▶ Underwater structure that may nick and abrade the leader material
- ▶ The quarry you seek (size, "toothyness", fighting style, etc.)
- ▶ The characteristics of the leader material (stiffness, suppleness, color, abrasive-resistance, etc.)

Given the many variables listed above and the countless variables in leader taper design, you can easily see where one could actually tie a leader for each specific pocket, run, riffle and pool in every stream fished

Example: If I started upstream of a classic riffle/run/pocket/pool stream scenario where I wanted to fish dries, nymphs and streamers, I could hypothetically be forced to use a *minimum* of 12 different leader combinations to fish that one stretch (4 streams sections, 3 ways to fish them each). But if I did that, I would spend more time tying on leaders and flies than actually casting to fish. Thus, the challenge to you is: it is your decision to find the optimum leader for your fishing conditions and styles. Is it possible to design a combination leader that serves many functions? Sure!

Components of a Leader

There are three main components of a leader: Butt, Taper (also called mid-section or graduation), and Tippet. The most common formula basis for a leader is 60% butt, 20% taper, 20% tippet. Other formulas such as double taper formulas offer 40%,20%,40%, but for the most part, formulas are derivatives of the 60/20/20 rule. Many of my designs in LeaderCalc utilize a different proportion mix: 50/30/20.

Butt Section

According to Charles Ritz in his book "A Fly-Fisher's Life", the diameter of leader butts should be 60% of the diameter of the end of the fly line. Other formulas indicate that 75% is the optimum butt diameter, but in either case, a leader butt of .017" to .022" satisfies most any formula. A leader butt of 60%-75% is quite ample enough to transmit and disperse casting energy downward to the tippet. Also consider the stiffness of the butt material. It should approximate the stiffness of the fly line. Use the *Table 1* to guide you in selecting the correct leader butt thickness.

Taper Section

Again, Ritz reminds us that the ideal is to have the longest forward taper as possible while still remaining under control during the presentation. He subscribes to the 60/20/20 rule, where the 60% is strength, 20% is taper and the final 20% is terminal tippet.

Tippet Section

According to Ritz, suppleness in leader material is only necessary at the tippet, where, in his opinion, 20 inches is the ideal length.

Other sub-parts of a leader are: Shock

Butt, Shock Tippets and Wire Tippets. These components are geared toward specialty fishing situations like toothy fresh and saltwater critters. This document will not go into great detail in these areas.

Table 1
Recommended Leader Butt Diameters

Line Weight	(mm's) Butt Diameter	(Inches) Butt Diameter
3	.45-.50	.017"-.020"
4	.45-.55	.019"-.021"
5	.50-.55	.020"-.022"
6	.55-.60	.021"-.023"
7	.60-.65	.022"-.024"
8	.60-.65	.023"-.026"
9	.60-.70	.024"-.027"

Table 2
Recommended Fly Sizes for Tippets

(Inches) Diameter	(mm's) Diameter	X-Rating	Fly Size
.003"	.08	8X	#20-#28
.004"	.10	7X	#20-#28
.005"	.13	6X	#18-#26
.006"	.15	5X	#14-#20
.007"	.18	4X	#6-#14
.008"	.20	3X	#6-#12
.009"	.23	2X	#4-#10
.010"	.26	1X	#4-#8
.011"	.28	0X	#4-#6
.013"	.33	01X	#8-#12
.015"	.40	02X	#4-#8
.017"	.45	03X	#1/0-#4
.019"	.50	04X	#3/0-#1/0
.021"	.55	05X	#5/0-#3/0

Types of Leader Material

Clear Monofilament Nylon

Monofilament nylon, or "mono" as it is referred, is by far the most popular leader material in use today. Extruded nylon and co-polymer nylons comprise the best leader materials today. Stiffer mono, such as Maxima or Amnesia line offer great material as butt and taper sections. Co-polymer, being softer materials, such as Orvis SuperStrong, Umpqua, Dai Riki Velvet and Rio PowerFlex, make for great taper and tippet materials.

Fluorocarbon

Fluorocarbon filament leader material was introduced around 1993 by several leading manufacturers. Fluorocarbon material has several distinct advantages over standard monofilament materials. It's much more dense than water, thus it will sink faster than standard monofilament leader material. Fluorocarbon material also has the advantage of being more abrasion-resistant; which makes it a better choice for streamer leaders, nymph leaders and saltwater tippets. Another appealing trait is it's near-transparent nature - moreso than standard mono.

Fluorocarbon also has a few minor drawbacks, however. It isn't nearly as strong as standard mono and you must be sure of your knots when using fluorocarbon material. Fluorocarbon material tends to require more secure knots for sure-hold tippet section. Try using a surgeon's knot with three loops versus the standard two. I've found much greater success in retaining knot strength using a triple-loop surgeon's knot when affixing fluorocarbon tippet material to a leader section.



What the Manufacturers Don't Tell You – Stiffness Rating

Manufacturers will tell you the diameter and pound test and maybe even the color, but they don't tell you a stiffness rating. Mason mono is hard, we all know, and Orvis® SuperStrong is soft, but you couldn't tell by the names or the packages.

A simple method to determine if the stiffness of the leader material matches the stiffness of your fly line is to bend a section of each in half with your fingers and "feel" the approximate stiffness of each. You'll easily be able to feel the difference in the resistance to the bend. If you use a butt material that is too flimsy, you'll experience the "hinge" effect when you cast. The leader will not turn over properly and hinge where the fly line and leader connection is made. If you get over this hurdle and you're well on your way to a designing proper leader.

Leader Material Strength

Calculating Leader Material Strength

(This is the section where you learn more than you wanted to know. You've been warned!)

While manufacturers of leader material boasts different pound test ratings, they generally are within a predictable range. For example, most 8x tippets are around 1.2 lbs test. Likewise, most 0X tippets approximate 12 lbs test. Why is this important? Because the weakest link in any leader is the strength of the tippet material. If you build leaders based upon a tippet being of a certain strength, it is wise to understand the differences among brands.

In some cases, strength ratings are not provided by the manufacturers or the label has worn on your spool of material. For those instances, we've developed a formula to approximate the pound test of the average Monofilament leader material. The formula

is based upon the tippet diameter having a direct relation to the pound test a tippet can withstand. Specifically, the formula is $((\text{diameter} \times 1000)^2 \cdot 11) + (\text{diameter} \times 100)$. Knowing that this formula is cumbersome to remember, a quick method formula can replicate similar estimation results. The Quick Formula is: $((\text{diameter} \times 1000)^2 / 10)$. The formula is compared to a dataset of 15 different leader monofilaments showing the high test rating, the low test rating and the average test rating. As you can see by the wide variety of diameter-to-pound/test ratings, there is no industry standard...or even industry average. The formulas try to 'even out' the playing field and fairly estimate with some degree of reasonableness, pound tests for a given diameter of leader material. The tables below show calculations for 8X through 08X tippets.

Table 3a.
Monofilament Pound Test Estimations - 08X through 01X

Tippet Designation	08X	07X	06X	05X	04X	03X	02X	01X
Tippet Diameter	0.019" .55mm	0.018" .50mm	0.017" .45mm	0.016" .40mm	0.015" .38mm	0.014" .35mm	0.013" .33mm	0.012" .30mm
GFF's lb Test Formula	34.7	31.3	28.0	24.9	22.0	19.2	16.7	14.3
GFF's Quick Method	36.1	32.4	28.9	25.6	22.5	19.6	16.9	14.4
Hi Value in Tippet Dataset	45.0	26.4	35.0	25.0	28.0	17.6	21.0	18.5
Lo Value in Tippet Dataset	17.6	12.0	13.2	25.0	10.0	17.6	7.0	6.0
Average of Tippet Dataset	29.5	21.5	23.3	25.0	17.9	17.6	13.7	9.8

Table 3b.
Monofilament Pound Test Estimations - 0X through 8X

Tippet Designation	0X	1X	2X	3X	4X	5X	6X	7X	8X
Tippet Diameter	0.011" .279mm	0.010" .254mm	0.009" .229mm	0.008" .203mm	0.007" .178mm	0.006" .152mm	0.005" .127mm	0.004" .102mm	0.003" .076mm
Schweitzer lb Test Formula	12.1	10.1	8.3	6.6	5.2	3.9	2.8	1.9	1.1
Schweitzer Quick Method	12.1	10.0	8.1	6.4	4.9	3.6	2.5	1.6	0.9
Hi Value in Tippet Dataset	15.5	13.5	11.5	8.5	6.4	5.2	3.8	2.5	1.8
Lo Value in Tippet Dataset	4.4	4.0	6.6	5.7	4.8	4.0	2.8	1.9	1.0
Average of Tippet Dataset	9.8	8.5	8.3	6.9	5.4	4.3	3.2	2.2	1.4

Leader Design Principles

As mentioned before, a leader absorbs and disburse the energy created by the cast. It is the goal of good leader design to control energy absorption as best as possible; this is really the sub-plot of good leader turn-over.

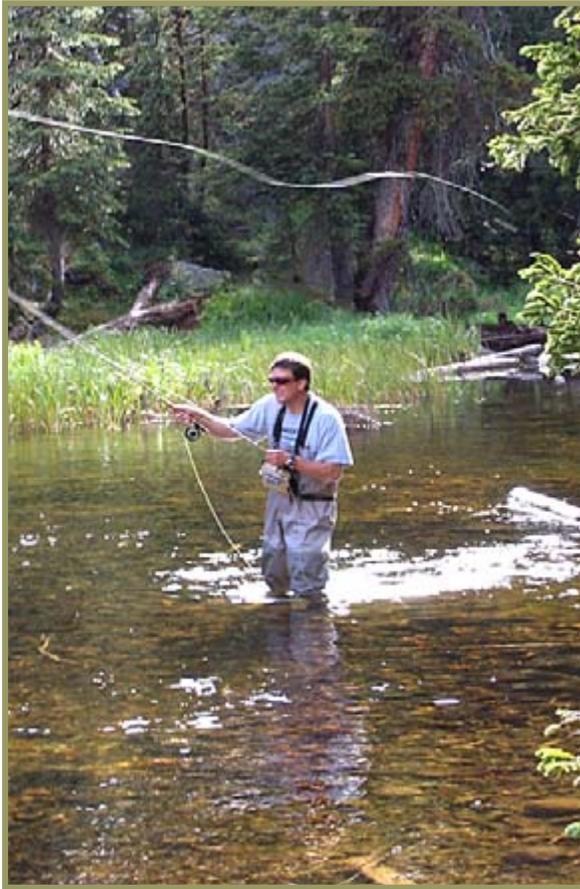
Given that, we can decipher the taper is the most single important aspect of a leader. A taper that is too short or stiff will snap your fly over during the presentation and a

taper that is too long or supple will "hinge" and not turn over at all. Additionally, a leader that turns over nicely on a short cast, may be too supple to turn over on a long cast. As you can see, there are many things to consider when designing a leader. This guide does not go too deep into the theory of leader design. Instead, consider the following principle rules-of-thumb when designing your own leader tapers.

Rules-of-Thumb For Good Leader Design

- ▶ Leaders don't increase the amount of energy from the cast, thus there is no need to use leader material that is capable of transferring more energy than the flyline can develop.
- ▶ 9 foot leaders accommodate 80% of fly fishing situations
- ▶ 4X or 5X tippets accommodate 80% of all fresh-water fishing demands
- ▶ A Good Start: Leader length equals rod length
- ▶ Extreme Length: leader length equal to 1 ½ the length of the rod
- ▶ Simplicity: Start with the Ritz 60/20/20 rule and modify from there
- ▶ Butt diameters should be roughly between 60% and 75% of the diameter of the fly line (.017" - .022"). 2/3rds is a good rule.
- ▶ The butt stiffness should approximate the stiffness of your fly line.
- ▶ Exceeding more than .002"- .003 difference in material diameters between each section is a standard rule-of-thumb. However, it is quite acceptable to reduce your leaders by 60% of the preceding leader section. Think of it this way: If it is OK for your leader butt to be 60% of the diameter of your fly line, it's certainly OK for each of your leader segments to follow suit!
- ▶ Abrasion resistance = the least amount needed as typically abrasion-resistant materials are less supple.
- ▶ Use blood knots for the butt and taper
- ▶ Use a surgeon's knot for combining tippet sections
- ▶ Design rapid tapers and long tippets where they transfer casting energy more quickly and smoothly
- ▶ Smaller diameter or softer materials are less efficient at energy transfer than larger diameter or stiffer materials
- ▶ The shorter the leader section, the more casting energy is carried forward
- ▶ More casting speed is required for long and light leaders
- ▶ Slow casters should use short tapers, fast casters should use longer tapers
- ▶ Typical freshwater shock tippets are 10"-12" of 25-30lb mono
- ▶ Fluorocarbon is much more transparent than nylon and copolymer leader material
- ▶ Fluorocarbon is not as strong as nylon and copolymer leader material
- ▶ Fluorocarbon material is more dense than water and will sink. It's not the best for dry fly leader tippets unless it is greased, and the grease will decrease the stealth by making the leader more visible

Determining Proper Leader Length



One of the looming fly fishing debates is "What is the proper leader length for a given circumstance". I can give you the answer right now: It's the leader length that you will use and have confidence to catch fish. So, what I am saying is, after *you* have assessed the circumstances surrounding catching your quarry, you'll tie on the leader you know *you* can cast and present the fly in the best possible manner. Let's explore a few opinions from masters of the art.

A Case for Long Leaders

George Harvey, Gary Borger, Ray Bergman and others have become advocates of longer

leader lengths, especially for dry-fly fishing. The belief is the longer leaders will deliver the fly and allow it to drift as though it weren't attached to anything. Others believe longer leaders extend the distance from the fly line to the fly making the connection less obvious. However, longer leaders require longer casts to be effective. Enter William C. Black.

A Case for Not Using Long Leaders

William C. Black, however, subscribes to the theory that leader length is mis-interpreted, mis-used and over-hyped. In his book, "The Art of Flyfishing Smaller Streams", Black writes "Theoretically, the longer and thinner the leader, the better the camouflage. Among flyfishing intelligentsia there is a tendency to regard the length of an angler's leader as commensurate with his degree of skill and sophistication." Black further reduces his concept to casting requirements. Using long leaders for short casts of, say, less than 25 feet, is futile. "Whipping near pure monofilament about (referring to long leaders and only a few feet of flyline) is very much like whistling in the breeze. Thus, the length of your leader has increasing impact on tackle performance as casts grow shorter.", writes Black. Reducing Black's opinions then, tells us to be smart about using long leaders. If you have short casts, where there will be very little flyline to load the rod, there will be very little energy to turn over a long leader. Shorter casts require shorter leaders, longer casts can activate longer leaders. Incidentally, Black typically uses leaders from 4 to 9 feet and may use longer slack-line leaders for bigger water where a drag-free float is required.

Symptoms of Poor Leader Design

Many times when I'm out on the stream, I notice a beautiful fly caster not having good 'luck' on the stream whilst many anglers around him/her are hooking fish. I first think too much drag, not getting deep enough, etc. But often, neither is the case. Many times, a poorly designed leader will be a major part of the problem, even for the seasoned angler.

It seems there are a million things to consider when you aren't catching fish. And it all seems daunting at first, but as you get more

seasoned, you start to eliminate those things that you feel you are doing right: presentation, casting, the right fly, the right combination of flies, getting down deep enough, etc. But have you considered that it may be your leader? Consider drag. Consider the tippet size. Consider the design itself. The chart below highlights some common leader design problems and their cures.

Cures for Common Leader Design Problems	
Symptom	Possible Solution
Leader doesn't turn over at all & lands in a curled-up pile?	Most likely, the leader butt is too light, not stiff enough, or middle taper is too stiff or thick.
Leader slaps the fly on the water	Slow your cast down or use a more supple leader formula
Leader 'hinges' - doesn't turn over well	There are several items to check: <ul style="list-style-type: none"> ▶ Is the fly too heavy? ▶ Are you casting too slowly? ▶ Are the Leader sections more than 60% difference in diameter size? ▶ Are you using soft leader material for butt section?
Leader turns over OK except for the tippet section	The tippet material is too supple or light for the fly selection. Not enough casting energy is transmitted to the tippet.
Leader breaks at a knot	Check your knot tying skills! Or, the "freshness" of the material you are using to tie leaders may be suspect.
Do fish come to your fly and turn away at the last second?	Most likely, the tippet is causing too much micro-drag. Lengthen the tippet segment to allow for a small S-curve or go to a smaller diameter tippet.

Common Knots for Tying Leaders

(For complete tying instructions for the following knots, refer to any quality fly fishing book. These are standard fly fishing knots and are illustrated and discussed in most fly fishing books.)

What Knots to Use

According to extensive research completed by Jim Vincent of RIO, the blood knot and the triple surgeon's knot prove the strongest knots to use when combining leader material. He recommends using the blood knot for tippet diameters greater than .007"/0.178 (4X) and the triple surgeon's knot for tippet sizes less than .007"/0.178 (4X).

I tie a 3/3 blood knot on my leader butt material, a 4/4 blood knot on my taper material and a combination of a 5/5 blood knot and a surgeon's knot for my tippet sections. For bass, steelhead and salmon leaders, I tie all blood knots.

(a 3/3 blood knot means there are 3 twists of leader material on either side of the tag ends and so on...)

The Perfection Loop

The perfection loop allows an optional loop-to-loop connection between the fly-line and the leader. There is rhetorical concern that the perfection loop affects casting energy transmission. My personal feelings are that it may if the connecting loops are quite large, allowing for plenty of "slop" in the connection. I try to keep my perfection loops as small as possible to reduce "slop" in the connection.

Surgeon's Knot

This is a quick and easy knot to tie. A double surgeon knot is ample for most tippet to taper connections, however a triple-surgeon's knot adds an extra insurance against slippage.

Blood Knot

This is the standard knot used to connect butt to taper and taper to tippet in all leader construction. It is a cumbersome knot to tie manually at first, but after only a few leaders, you see how easy the blood knot is to tie.

Discussions of the Blood Knot

There are two schools of thought regarding the tightening of blood knots: A quick-draw or a slow-draw. In either method, thoroughly wet the area with saliva or mineral oil. Grasp both ends of the leader connection and pull



them in opposite directions. You might hear a small "frog chirp" indicating the knot has tightened. If you hear the "chirp", you didn't lubricate the knot connection well enough. The controversy of the blood knot revolves around the element of heat caused by friction during tightening. Is more friction developed with a quick-draw or a slow-draw? Heat from friction weakens leader material. The debate remains, it's your call.

Knotless Leaders

They offer one major advantage over hand-tied leaders: no knots! If you are fishing a weedy lake or cress-filled spring creek, a

Common Knots for Tying Leaders, cont'd

knot with the slightest of tags will catch anything, and I mean *anything* floating in the water, including the leader itself.

But there is a way to minimize the pesky effect of knots. A little drop of clear acrylic fingernail polish or head cement, layered on a couple of times forms a nice smooth finish the shape of a football over the knot. Climax offers a similar product specifically formulated for tying leaders. It is offered as part of their leader kits.

A 'Wind' Knot

We all get them, especially when fishing long, wispy dry fly leaders. But be careful, they reduce line strength by an estimated 50%.

Final Thoughts on Knots

The knots in a leader, according to Ritz, reinforces the rigidity of a leader which assures greater precision in presenting the fly. "Suppleness is only necessary in the point, where a length of 20 inches is, in my opinion, the ideal compromise.", writes Ritz.

Blood Knot



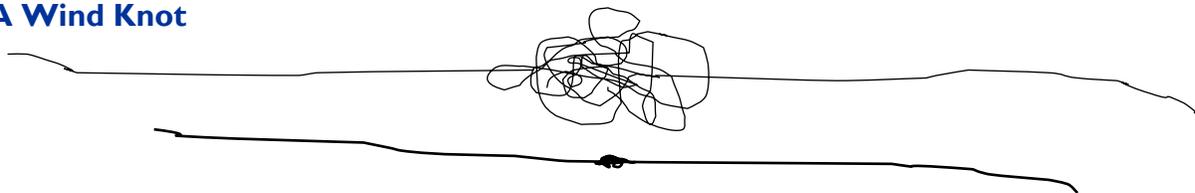
Illustration courtesy Martin Joergensen
The Global FlyFisher.

Surgeon's Knot



Illustration courtesy Martin Joergensen
The Global FlyFisher.

A Wind Knot



The proper wind knot effortlessly draws tight and small as if it were hand-tied on purpose. Anyone can become a pro at this knot instantly.

Non-Typical Leader Designs



Convex/Concave Designs

Convex and concave leaders, sometimes referred to as weight-forward and double-taper leaders, mimic to a smaller scale the popular concepts of fly line design. The LeaderCalc tool doesn't lend itself easily to presenting these specialty leaders, thus they are presented here in table format. They are ideally suited for a 4- or 5-weight rod. Since they are thicker in the middle than either end, they follow the modestly popular, but somewhat unconventional leader design rule of 40/20/40.

Straight Monofilament

There is nothing overly complicated or special about straight mono leaders. Just knowing the length of line desired and tippet thickness will get you by. In the Midwest USA, straight mono leaders are useful for salmon and steelheading. Straight mono leaders are also used in slow water nymphing and streamer fishing.

Table 4.
Two Styles of Concave Leaders

inches/ mm's	.017" .40mm	.019" .45mm	.021" .55mm	.017" .45mm	.015" .40mm	.012" .30mm	.009" .23mm	.007" .18mm	.006" .16mm
10-ft. Convex all-purpose	8" 20cm	16" 41cm	16" 41cm	8" 20cm	8" 20cm	8" 20cm	8" 20cm	16" 41cm	32" 80cm
17-ft. Convex nymph	18" 46cm	32" 81cm	40" 102cm	20" 51cm	16" 41cm	12" 31cm	12" 31cm	12" 31cm	34"-42" 86-107cm

Part Two - Using LeaderCalc2007



LeaderCalc: An Introduction

First and foremost, LeaderCalc is designed to be simple to use. Choose two essential design elements (leader length and tippet diameter) and two optional elements (metric/English and what rod is it for), and LeaderCalc does the rest. Print the LeaderCalc formula results, save it in a notebook, and you have ready reference to your favorite leader formulas. LeaderCalc also contains a Leader Label Generator so you can professionally create leader labels to slip in little plastic leader ziplock bags. An added feature of the Label Generator is a place for you to store your own notes about the leader formulas contained in LeaderCalc. You can even choose to have your notes printed on your custom leader labels.

Users of previous versions of LeaderCalc will notice a significant upgrade and change in this version. LeaderCalc is unique and unparalleled in leader design tools!

Getting Around Using The Sheet Tabs

Navigating the spreadsheet is easy too. At the bottom of the main LeaderCalc screen are five colored tabs: About, LC2007, Label Generator, Leader Notes and Custom Label Data. Each tab represents one major function of LeaderCalc.

The rest of this document will guide you through each tab and how to use it.

The 'About' Tab

When you open LeaderCalc for the first time, you are presented with the LeaderCalc splash screen and brief legal information. From here you can navigate to any tab you wish to begin using LeaderCalc.



The five sheet tabs in LeaderCalc make navigation between the core components easy.



25

When you see this icon, there is more information about the topic on subsequent pages as noted via the page number below the icon.

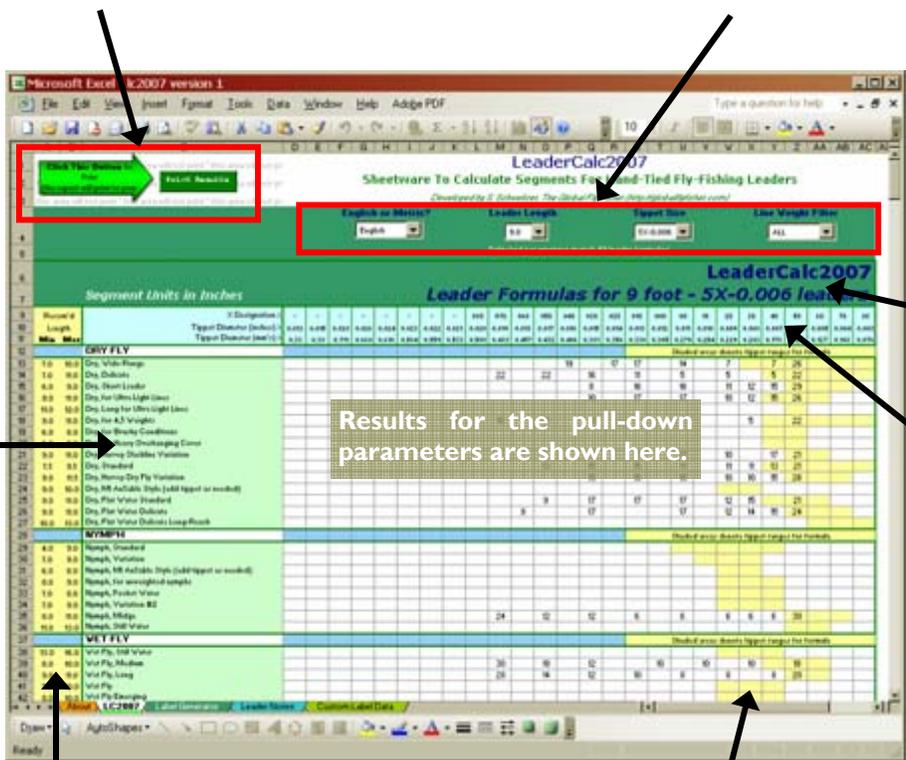
The LC2007 Tab

With this tab, you jump right into the heart of LeaderCalc! It is here that you select a few parameters to show all available formulas for leaders you may tie. While

it is incredibly easy to use LeaderCalc, there's a few things to know about this tab. Let's explore them via the image below.

i 21 Click the green "Print Results" button to print the leader formulas. The results are printed on two pages.

i 20 The four pull-down leader parameters tell LeaderCalc your preferences for showing matching leader formulas.



Leader formulas are sorted by style, such as dry fly, wet fly, streamer, etc.

Basic information about the leaders you have selected, in bold print for print-outs.

Results for the pull-down parameters are shown here.

Cross-reference information for X-designation, millimeters and English units.

The first two columns show you the minimum and maximum lengths the formula will show. You cannot force LeaderCalc to show you leader lengths outside these parameters.

Cells shaded yellow indicate the tippet range for the formula. You cannot force LeaderCalc to show you formulas outside the recommend tippet range for a formula.

The LC2007 Tab, Pull-Down Options

The four pull-down options tell LeaderCalc what formulas you are searching for.

English or Metric?

Selecting one or the other will force the entire spreadsheet to display the results in the desired measurement. Even the pull-downs will change based upon your selection.

Leader Length

The pull-down menu allows you to choose a leader length from 4ft to 17ft, or 1.2 meters to 5.2 meters.

Tippet Size

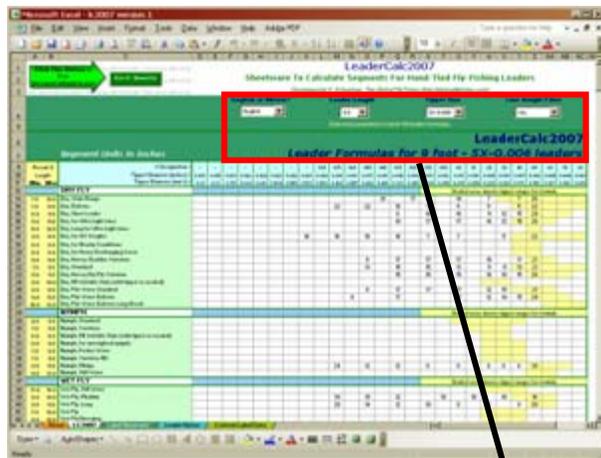
The pull-down allows you to choose common tippet sizes using the standard X-

designation. The mm- or inch thicknesses are also included in the pull-down.

Line Weight Filter

New for this version of LeaderCalc is the Line Weight Filter. Each leader formula in LeaderCalc is designed to be used with certain line-weights of rods. While you can use any leader with any rod, some perform optimally with certain weights of rods. This filter allows you to see formulas specifically developed for the rod/line weight you choose.

Below the four pull-downs is a formula count in yellow text. It tells you at a glance, how many formulas match your input criteria.

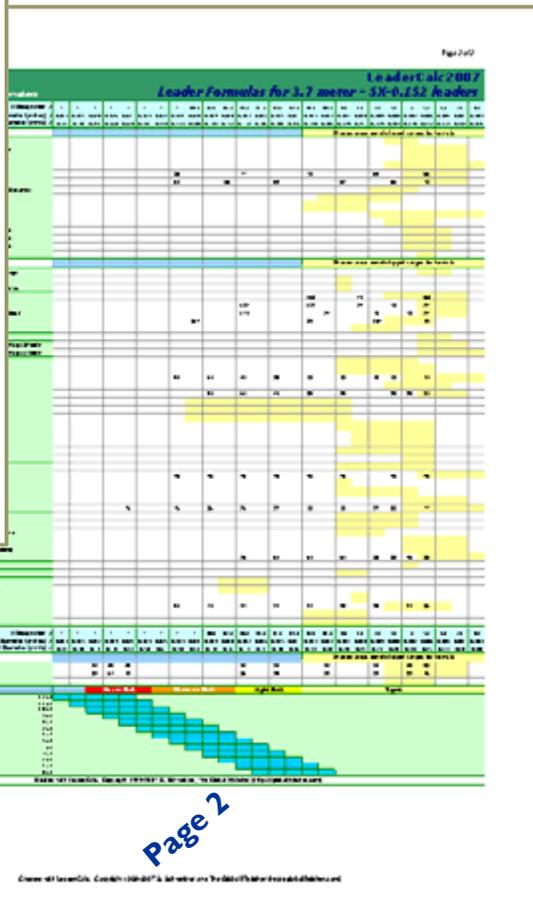
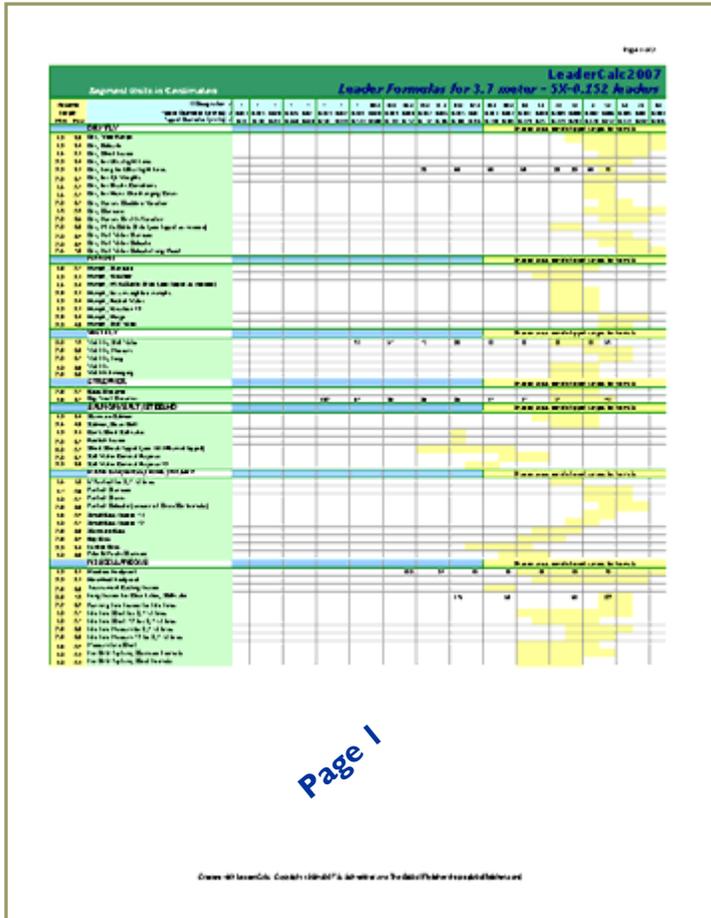


The four pull-down leader parameters tell LeaderCalc your preferences for showing matching leader formulas. The bottom row of the image above spells out very clearly what formulas are displayed in the rest of the spreadsheet.

The LC2007 Tab, Printing

When you click the print button, a neatly formatted, two page report is generated. The report shows all the leader formulas you selected. The top right-hand

corner of each page clearly identifies in words what the formulas are for. The example below indicates "Leader Formulas for 3.7 meter - 5X - 0.152 leaders."



LeaderCalc formula print-outs are designed to be three-hole punched and stored in ringed binders for future reference.

The Label Generator Tab

LeaderCalc provides a convenient way to design and print leader labels. Users of previous versions of LeaderCalc will notice some significant upgrades in this section. Most notably, you can now choose color schemes for your labels. This is useful for quickly identifying in your vest one type of leader from another. For example, you may

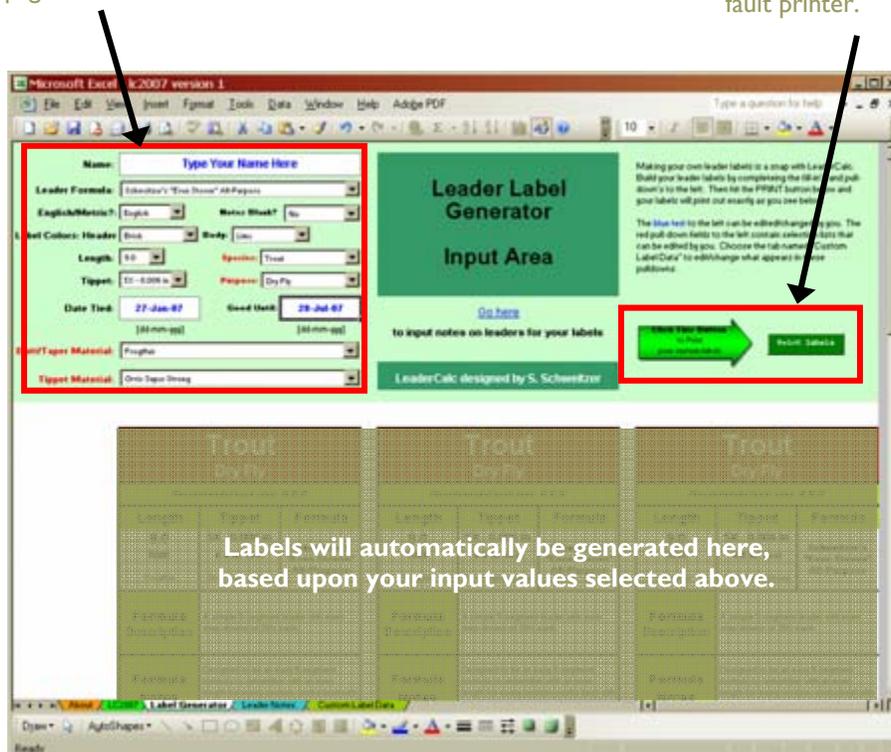
want to have the top color of all dry fly leaders be slate blue and wetfly leaders be brick red. Also, you may now enter a "tied-on" date. This is useful for ensuring leaders aren't used that are well past the suggested shelf-life of 1-year from the date of tying. Let's explore in more detail how to create a leader label below.



All the information needed to make leader labels is selected or entered here. The detailed functions are explored on the next page.



Click the green "Print Labels" button to print the labels to your default printer.



The main Label Generator screen allows you to generate leader labels all in one easy-to-use interface.

The Label Generator Tab, Input Area

Personalizing labels in LeaderCalc is easy. There are three fill-in fields, the rest are pull-downs, making customization easy and

quick. Refer to the diagram below to learn more about what's behind each of the pull-down customization options.



NOTE: pull-down menus with red text labels contain menu information which can be modified by you. The menus can be edited in the tab 'Custom Label Data'.

All the leaders found in the LC2007 tab are included in this pull-down. The formula you choose here will automatically load the correct label notes and comments from the 'Label Notes' tab.

Each label can print the leader notes found in the tab 'Label Notes'. Choose No to have them print, or YES to leave the notes area blank. Blank notes fields are useful for taking notes on-stream.

Modify labels colors by using these pull-down menus.

Enter the date the leader was tied. The 'Good Until' field will automatically add 1-year to the date tied. You can over-ride the 'Good Until' field, if you prefer.

The screenshot shows the 'Label Generator' input area in Microsoft Excel. The form is titled 'Microsoft Excel - lc2007 version 1'. It contains the following fields and options:

- Name:** Type Your Name Here
- Leader Formula:** Schweitzer's "Even Steven" All-Purpose
- English/Metric?:** English
- Notes Blank?:** No
- Label Colors: Head:** Brick
- Body:** Lime
- Length:** 9.0
- Species:** Trout
- Tippet:** 5X - 0.006 in
- Purpose:** Dry Fly
- Date Tied:** 27-Jan-07
- Good Until:** 28-Jul-07
- Butt/Taper Material:** FrogHair
- Tippet Material:** Orvis Super Strong

Choose the type of material you used to tie the leader. You can modify the contents of these pull-down menus via the 'Custom Label Data' tab.

These two fields determine the label header and sub-header. The species will print on the top of the label with the purpose directly underneath. You can modify the contents of these pull-down menus via the 'Custom Label Data' tab.

The Label Generator Tab, Printing

Printing labels in LeaderCalc is easy too! Six labels print per page. The layout neatly organizes all the key information you need to know about the leader. And if you share a leader or two with your friends, they have all the information about the leader right at their finger-tips. They are pre-formatted to fit a standard 3" x 4" plastic zip-

lock baggie, which can be found at any craft or hobby store. Convenient crop lines are provided between the labels to help guide an even cut. Consider printing the labels on tear-proof or water-proof paper to make them last a long time. Remember, labels can be re-used over and over.

<p align="center">Trout Dry Fly</p> <p align="center"><i>Recommended hook sizes: 14, 16, 18</i></p> <table border="1"> <thead> <tr> <th>Length</th> <th>Tippet</th> <th>Formula</th> </tr> </thead> <tbody> <tr> <td>9.0 foot</td> <td>5X - 0.006 in 4.8 lb. test</td> <td>Bahretzler's "Even Steven" All- Purpose</td> </tr> <tr> <td>Fighter</td> <td>Ovis Super Strong</td> <td></td> </tr> </tbody> </table> <p>Formula Description A simple 5-segment leader with even step-downs of 20% each.</p> <p>Formula Notes Designed to be an easy 5-segment formula to remember with an even length for every section, works best with a lighter butt section of 0.020 or less.</p> <p><i>Hand tied by Type Your Name Here</i></p> <p>Date tied: 27-Jan-2007 Good until: 27-Jan-2008</p> <p>Created with LeaderCalc - http://globalflyfisher.com</p>			Length	Tippet	Formula	9.0 foot	5X - 0.006 in 4.8 lb. test	Bahretzler's "Even Steven" All- Purpose	Fighter	Ovis Super Strong		<p align="center">Trout Dry Fly</p> <p align="center"><i>Recommended hook sizes: 14, 16, 18</i></p> <table border="1"> <thead> <tr> <th>Length</th> <th>Tippet</th> <th>Formula</th> </tr> </thead> <tbody> <tr> <td>9.0 foot</td> <td>5X - 0.006 in 4.8 lb. test</td> <td>Bahretzler's "Even Steven" All- Purpose</td> </tr> <tr> <td>Fighter</td> <td>Ovis Super Strong</td> <td></td> </tr> </tbody> </table> <p>Formula Description A simple 5-segment leader with even step-downs of 20% each.</p> <p>Formula Notes Designed to be an easy 5-segment formula to remember with an even length for every section, works best with a lighter butt section of 0.020 or less.</p> <p><i>Hand tied by Type Your Name Here</i></p> <p>Date tied: 27-Jan-2007 Good until: 27-Jan-2008</p> <p>Created with LeaderCalc - http://globalflyfisher.com</p>			Length	Tippet	Formula	9.0 foot	5X - 0.006 in 4.8 lb. test	Bahretzler's "Even Steven" All- Purpose	Fighter	Ovis Super Strong		<p align="center">Trout Dry Fly</p> <p align="center"><i>Recommended hook sizes: 14, 16, 18</i></p> <table border="1"> <thead> <tr> <th>Length</th> <th>Tippet</th> <th>Formula</th> </tr> </thead> <tbody> <tr> <td>9.0 foot</td> <td>5X - 0.006 in 4.8 lb. test</td> <td>Bahretzler's "Even Steven" All- Purpose</td> </tr> <tr> <td>Fighter</td> <td>Ovis Super Strong</td> <td></td> </tr> </tbody> </table> <p>Formula Description A simple 5-segment leader with even step-downs of 20% each.</p> <p>Formula Notes Designed to be an easy 5-segment formula to remember with an even length for every section, works best with a lighter butt section of 0.020 or less.</p> <p><i>Hand tied by Type Your Name Here</i></p> <p>Date tied: 27-Jan-2007 Good until: 27-Jan-2008</p> <p>Created with LeaderCalc - http://globalflyfisher.com</p>			Length	Tippet	Formula	9.0 foot	5X - 0.006 in 4.8 lb. test	Bahretzler's "Even Steven" All- Purpose	Fighter	Ovis Super Strong	
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Generated by LeaderCalc2007 - Free Shareware designed and developed by S. Schwelzler, The Global Fly Fisher

Leader Labels print out in a "six-pack", ready for cutting and making a half-dozen custom leaders.

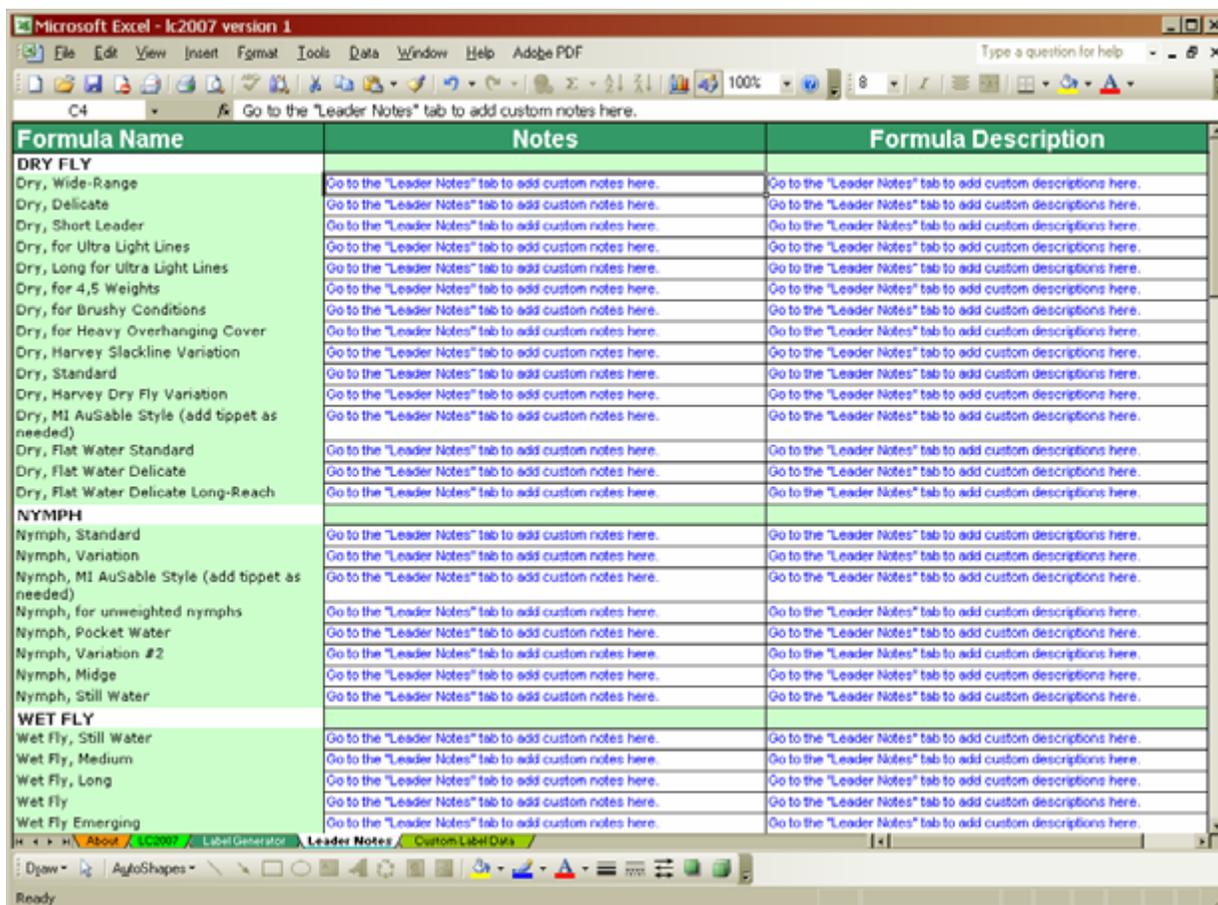
The Leader Notes Tab

The Leader Notes tab allows you to capture your own notes and comments on the formula description. It serves as part journal and part documentation for printing leader labels as discussed in the Label Generator section of this guide.

Every formula found in the main tab of LeaderCalc is found here. Notes and formula descriptions entered here are automatically added to the leader labels when selected via the leader formula pull-down on the Label Generator tab.

By default, most notes and formula descriptions are left unused, allowing you to input your personal comments. Descriptions for the LeaderCalc formulas developed by Steve Schweitzer are provided as examples.

Printing the notes is as easy as choosing File:Print:OK. Alternatively, you may click the print page icon on your Microsoft Excel® toolbar. Each printout is designed to print on an 8.5" by 11" sheet of paper in portrait mode and may take several pages depending on the amount of notes entered.



The Leader Notes tab allows you to capture usage and formula notes for future reference.

The Custom Label Data Tab

One of the most useful functions of LeaderCalc is creating your very own custom leader labels. With that in mind, this version of LeaderCalc allows you to customize the drop down menus in the Label Generator tab. This is a new feature to LeaderCalc.

The three pull-down menus that are customizable are Species, Material and Purpose. Each customizable menu can support up to 30 different values, which should be enough to cover most any situation.

The lists have been pre-populated with commonly used data values.

Species

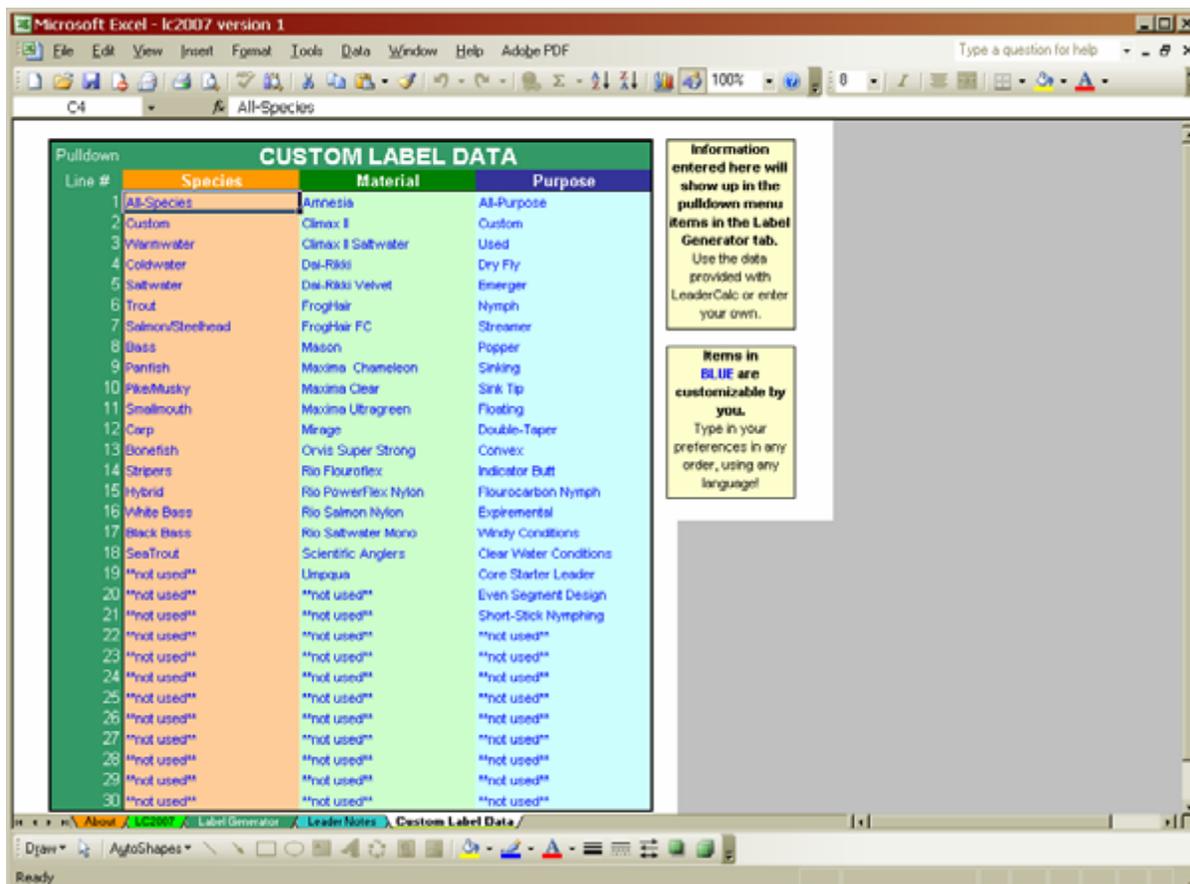
Use this list to customize what species the leader is tied to catch.

Material

Use this list to customize the different types of monofilament that is used in tying your leaders.

Purpose

Use this list to customize the type of fishing in which the leader is designed.



The Custom Label Data tab provides a convenient way to help you customize your own leader labels.

Notes

Selected Bibliography & Credits

Selected Bibliography

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- "Flyfisherman Magazine", July 1995

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FF@ listserv archives
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Rich Caccavale
Dave Engerbretson
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