The International Fly Fishing Fair will be held in 2016 in Livingston, Montana, August 2-6!! Tiers begin their activities on Tuesday and continue through the Fair.

The Fly Tying Group of the International Federation of Fly Fishers is dedicated to the preservation, enhancement and support of the art of fly tying as a historic element of the fly-fishing experience. Archiving of historic documents, development of educational and instructional materials, teaching, and demonstrations are fundamental to perpetuating the art of fly tying for anglers who fish with the artificial fly. If this sounds like something you would be interested in, please join us today. Please Note: You must be a member of the International Federation Fly Fishers to join the Fly Tying Group.

Click here to join www.fedflyfishers.org/Si#9EDE95
The IFFF recognizes members, groups and other individuals each year who have made outstanding contributions to some aspect of the fly fishing experience and/or conservation of fishery resources and their habitats throughout the world. These individuals typically are presented special awards that were established and named for some of the most outstanding individuals in the history of our sport. It is a great honor to be recognized by one’s peers. And, those receiving these honors will be viewed by our grandchildren as today’s leaders who also left their positive mark on fly fishing for future generations. Three of these awards honor members who have made lasting contributions specific to the art form of fly tying. These are the Buz Buszek Memorial Fly Tying Award, Darwin Atkin Memorial Fly Tying Achievement Award and Dick Nelson Fly Tying Teaching Award.

Nominations are now open for awards, and the process for making nominations is very easy. Simply go to www.fedflyfishers.org and click on About/Awards/Award Nomination Form and the instructions will lead you through the process. Be sure to read the descriptions and criteria for the award you think best fits the individual you have in mind for special recognition. Nominations are due at any time before April 1. So, now is the time to nominate someone who has impacted your fly tying in a special way, ask a fellow fly tier to help you with the nomination and call the Livingston office if you have any questions regarding the process. Recognition of that outstanding individual will bring honor to you, as well.

Teaching is a very important activity of the Fly Tying Group, and much of our focus involves the compilation and sharing of information on fly tying with our members and others who want to learn and improve their fly tying skills. One new source of such information that is now posted on our website is the Fly Tying Video Library. You will find the Library one place where you can watch some of the best tiers in the world tie fly patterns of equal importance. Also, be sure to check out the Fly Tying Group posts on Facebook and Twitter.

Buszek Award recipient, Wayne Luallen has contributed a very good article in this issue on how feathers are constructed. Understanding the nature of the materials we use is fundamental to how we attach...
them to hooks, but I can think of no material that is more complex than the feathers we use in our tying. Read Wayne’s article, apply a new understanding of the parts and shapes of feathers and see how the appearance of your flies improves. Much of the same can be said about the variety of threads available for tying, and Jim Ferguson has a fine article in this issue to help you understand and select the proper thread for your particular tying application. And for those of you who may be interested in framing flies for your own enjoyment or auctions, you’ll find the second installment of, Darwin Atkin Award recipient, Steve Jensen’s articles on Framing Fly Plates of interest. After all…the tying of artificial flies is an art form we strive to preserve.

Editor, Bob Clay, has done another outstanding job of compiling the above information into this issue of Tying Times; let us know if there is a particular topic you would like addressed and I hope you’re looking forward to the next issue, as I am.
The Nature of Feather Construction

By Wayne Luallen

An important aspect of fly tying is sharing information. In turn it behooves us as fly tiers to speak the same language. We have all read fly patterns that refer to quills, barbs, barbules, fibers, shafts, stems, vanes, and so forth, but when we read these terms do we know what they have reference to? We may, but what about the author; did he truly describe by name what he intended? How often have we read quill when in fact what was referred to was actually a barb or perhaps shaft? How often have we read fibers when the author meant barbs or perhaps barbules? How often have we read barbs, barbules, fibers, or even barbels (which are tactile processes on the lips of a fish rather than components of a feather) when referring to a feather’s ability to marry, when in actuality barbicels or perhaps more specifically hooklets and/or spines would have been accurate as well as descriptive names? If we spoke the same language we would better comprehend what was intended. It may not be necessary to know scientific names, but if we wish to communicate, we need to have standards.

The parts of a typical feather are simple to learn, and once understood help us to better appreciate why feathers do what they do in different applications. For instance why does a dry fly hackle when wound on an uneven surface (i.e., twisted thread, bulky surface, etc.) lead to a fly with the barbs strewn all about? Why does the same feather mounted on an even surface produce a fly with barbs at a distinct ninety degree angle out from that surface? If you understand the shape of the rachis and the location of the barbs on the rachis it all makes sense. What does understanding of feather construction lead to? Better flies that we control rather than the material controlling us. It also leads to a more appropriate selection of materials for specific tasks.

This article is not intended to be a complete scientific discourse on the nature of feathers. Feathers are as unique as the birds that wear them. The following discussion is general in its scope while being specific enough to cover the majority of feather types that the fly tier will encounter. All the same great effort has been placed on accuracy of feather and component names and descriptions. Perhaps just as important has been a desire to whet the appetite of the fly tier toward better understanding of not only physical construction, types, and purposes of feathers, but also to make that same tier more curious about the nature of other materials. Observation leads to understanding. Understanding leads to better results in any endeavor. Sadly it is easier to take for granted what has been said in the past rather than investigating on our own.

It may prove beneficial to have a selection of feathers on hand while reviewing this article such as an eyed peacock upper tail covert, a turkey tail feather, a turkey marabou semi-plume, a ring-necked pheasant contour feather, and a rooster neck hackle.
Anatomy Of A Typical Feather

[Diagram showing parts of a feather: Quill, Cut Section, Shaft, Barb, Barbules, Barbicels, Vane/Web - flat expanse of barbs on a feather]
Feather Anatomy 101

The quill or calamus is often mistakenly described as being anything from the feather shaft to the barbs themselves. The fact is that the quill is simply that portion of the feather that is inserted in the skin follicle; nothing more. It is cylindrical, transparent, and hollow. There are no barbs attached to the quill.

The shaft or rachis is that portion of the feather that the barbs are attached to. It is flattened on the sides that support the barbs, and differs from the quill by being roughly rectangular in cross section. Internally it is not hollow, but rather is filled with a pithy material that contains air cells.

The barbs or rami (singular: ramus) come off the flattened sides of the shaft more toward the anterior (face) surface of the feather and in parallel rows generally opposing one another. They point outward and toward the tip of the feather. They are somewhat ovoid in cross-section (thinner side to side, wider front to back,) broader near their attachment to the rachis, flattening and narrowing as they approach the tip. Barbs, like the shaft, are filled with a pithy material containing air cells. A feather may have only a couple of dozen barbs or several hundred.

Barbules or radii (singular: radius) extend out from either side of the barbs. From the base to about half way to their tip, they are ribbon-like (the basal lamella). The distal half is more whip-like (the pennulum.) The barbules on the distal (upper) edge of a barb extend outward almost perpendicular to the barb. The barbules on the proximal (lower) edge of a barb lay more parallel with the barb. This is readily visible with a peacock upper tail covert feather’s barbs, commonly referred to as herl. (Herl according to dictionary definition is a barb or barbs of a feather, originating from the Middle English harle or herle which referred to fiber, hair of flax, or hemp.) Barbules extend out from a barb more proximal to the anterior (face) surface similar to barbs on a shaft. Again note the appearance of the peacock upper tail covert feather. When viewed from the anterior surface of the feather, the brightly colored eye is more dominate because the barbules (which often provide the majority of a feather’s color) are attached closer to the anterior edge of the barb. When viewed from the opposing surface, the flat, rather dull color is due to the dominance of the color of the edges of the barbs as well as the location and physical shape, and in turn, light reflectance of the barbules.

Barbules may or may not have attached to them structures collectively referred to as barbicels. Barbicels allow adjacent barbules to interlock or marry. They differ on the barbule in shape and function by location. Distal barbules (those extending off the barb toward the feather tip) with barbicels have projecting structures at the base of the whip-like pennulum (distal half of the barbule) on the ventral (under) surface that are long and hooked, hooklets (hamuli,) with the remainder of the pennulum having shorter spines (ventral processes.) Proximal barbules (those extending off the barb toward the feather’s quill) tend to be more twisted than the distal barbules, and have a trough-shaped dorsal flange (groove) on the anterior (front) edge. As the hooklets of a distal barbule overlap the adjacent proximal barbule, the hooklets attach to the grooved edge while the spines stop the hooklets from sliding too far. The diagonal cross-over of barbules creates a visible herringbone pattern. Both distal and proximal barbules have other lesser processes on the underside of the ribbon-like lamella referred to as ventral teeth and on the upper side of the whip-like pennulum referred to as dorsal cilium and spines. The hooklets and spines create the marriage of the adjacent barbs while the dorsal processes and ventral teeth catch the barbs and barbules of
overlying feathers to help maintain a solid, air-tight surface in flight. In turn the feather vane is maintained as not only air tight, but with some birds, a water tight structure. Barbicels refers to all the processes that interlock to create the vane.

The shaft gives support while the vane (vexillum) or the web of a feather (which includes all the flat, expanded barbs, as well as any attached barbules, and barbicels) provides the surface for an airfoil in flight feathers and for covering and insulation in contour feathers. At the typical feather’s base, the vane is downy and provides some insulation. This part of the vane is referred to as the plumulaceous vane. The remaining portion of the vane is more firm and compactly arranged, and is referred to as the penaceous vane. Feather types are often defined by the proportion of plumulaceous and penaceous material present. Some feathers are strictly plumulaceous, others are strictly penaceous, and others are both plumulaceous and penaceous.

Birds have a tremendous variety of combinations of feather components. For instance the Crowned Crane crest feathers are each made up of a short quill, a twisted rachis, and few barbs. What the fly tier considers the useable portion of a typical cocks hackle in a dry fly has few or no barbules on the barbs since those barbs with barbules are stripped prior to application. (Fly tiers somewhat incorrectly refer to this part of the feather as being the web or webby portion of the feather. Web is a term synonymous with the whole vane.) Some feathers have barbules without barbicels. Examples would include peacock upper tail covert feather bars below the eye as well as down feathers from any bird. (When considering peacock herl, the barbs are often mistakenly referred to as quills. Also the barbules on the barb are confusingly referred to as herl. For example the Quill Gordon fly pattern calls for a body made from a “quill” that before wrapping onto the hook requires removal of the “herl”. The “quill” called for in actuality is a barb and the “herl” referred to are barbules on the herl or barb.) Barbicels are found on flight feathers (i.e., turkey tail feathers, peacock secondary wing feathers, etc.) with the exception of flightless birds (i.e., emu, ostrich, kiwi, etc.) Just as a barb does not necessarily have barbules, barbules do not necessarily have barbicels. Turkey marabou (semi-plume) is an example of a feather with barbules, but no barbicels. Body (contour) feathers of most pheasants are examples of feathers having barbules without barbicels (plumulaceous vane) on some bars and barbules with barbicels (penaceous vane) on others.

The arrangement of barbs, barbules, and barbicels is important to understand when marrying feather strips for a wing on a wet fly or Atlantic Salmon fly. The marriage of a strip of upper barbs to a correctly matching strip of lower barbs is quite easy if the face side of the upper strip is placed slightly behind the face side of the lower strip. This allows the hooklets on the barbules of the top barb of the lower strip to have opportunity to grasp the grooved edge (dorsal flange) of the barbules on the upper strips’ bottom barb. If the strips are overlapped immediately above and below one another, or perhaps the upper strip is in front of the lower strip, due to their arrangement on the barbules, a complete interlocking of hooklets to flanges will not occur. If a strip is overlaid with another strip, but the matching strip is upside down, this arrangement of barbicels will not allow the strips to marry. If a right strip is overlaid with a left strip, even though the proximal to distal arrangement of the barbules is correct, no reliable marriage will occur, because the hooklets and flanges do not align.

Many feathers develop fault bars across the vane. As feathers grow, a disruption in cell development may occur leaving distinct lines across the vane generally perpendicular to the shaft. These are due to stress, other abnormal conditions, or may be present under normal conditions. A fault bar’s appearance is due to underdevelopment of barbules or total lack of barbules in the area of the disruption.
Feather Types

Each feather grows out of the dermal tissue from a follicle in similar fashion to hair in mammals. Some feathers can be moved by muscles attached to the follicles. For example, tail and wing feathers can be adjusted to aid in flight. Body feathers can be erected independently or in groups for the purpose of body temperature adjustment as well as for display. Most feather follicles are well supplied with nerves, so it appears that feathers may serve as organs of touch. During development the feather is a living structure well supplied with blood, but once matured the feather itself is a dead structure. After a period of use it is shed or molted, and then replaced by a new feather from the same follicle.

There are two basic types of feathers from which others are derived; down feathers and vaned feathers. Down feathers are essentially random fluff having no barbicels on the barbules to interlock their barbs. In nestling birds down feathers consist of a tuft of barbs without a rachis. Juvenile and adult birds have down feathers that include a rachis. Vaned feathers include all feathers with a flat expanse of barbs extending parallel out from the shaft. Contour and flight feathers are pennaceous vaned feathers and are accepted as vaned feathers, where that plumulaceous feathers generally are not. Technically speaking, as discussed under Feather Anatomy 101, a marabou feather, though strictly a plumulaceous feather, is also a vaned feather. Down feathers, though plumulaceous, have a random arrangement of barbs, and thus would not be considered vaned.

Other feather types similar in some respects to down and vaned feathers while unique in others include filoplumes, bristles, and semiplumes. A filoplume (thread feather) is a hair-like feather with barbs at the end of the shaft. They are distributed to all feather types, are always intimate to other feathers (from one to twelve adjacent a feather,) but grow out of their own follicles. Their purpose seems to have to do with subtle detection of movement of the adjacent feather such that they may, for example, aid in adjustment of feathers when in flight. (Filoplumes are sometimes incorrectly referred to as pinfeathers. A pinfeather is any feather that is immature.) Virtually all bristles are found on bird’s heads. They are stiff with a tapered shaft having barbs only on the proximal portion of the shaft (i.e., Crown Crane crest feathers.) Often they are mistaken for filoplumes which differ by having barbs at the distal end of the shaft. A semiplume is a down-like (plumulaceous) feather having a rachis, barbs, and barbules, but no barbicels (i.e., marabou.)

Feather Names

Numerous specialized names are applied to feathers appropriate to their location on the bird, from the face to the toes, but there are just a few basic types that would likely concern most fly tying needs.

Contour feathers cover the bird’s body. They are close fitting, yet separated from the skin to help isolate the body from outside humidity and temperature. With the assistance of follicle muscles, the contour feathers can be erected, then lowered to adjust the depth of the protective layer. Contour feathers are typically broad, thin, curving inward toward the skin, directed toward the tail in overlapping rows, and have a combined pennaceous/plumulaceous vane. They help to smooth and streamline the body for flight. In some species they may be greatly modified for purposes of display.
or some other ornamental purpose. Many contour feathers have **afterfeathers** attached at the base. These are small plumulaceous feathers which may or may not have a shaft (hyporachis.) Usually a contour feather's afterfeather is no more than half the length of the attached contour feather, yet exceptions always seem to occur in nature. Two birds, the Emu and the Cassowary, have afterfeathers as long as their contour feathers, while some birds such as the pigeon and ostrich have no afterfeathers.

**Flight feathers** include the tail feathers (rectrices) and wing feathers (remiges) as well as supplemental feathers that cover the adjacent upper and under surfaces.

The **tail feathers** (rectrices) act as a stabilizer tilting the front of the body up and down, as well as an air brake when the bird lands, but they are not used for steering except in steep turns. Tail feathers are usually large, stiff in texture, asymmetric, have vanes that are almost entirely pennaceous, and lack afterfeathers. In most cases tail assemblies are made up of 10-12 feathers (with some pheasants having up to 24) arranged in a single horizontal row. They each overlap their lateral (outside) edge over the medial (inside) edge of the adjacent feather. The outermost feather’s lateral vane is narrow, stiff, and convex compared to the softer, longer, concave barbs of the inner vane. This effect is digressive as the feathers work toward the center pair, such that the center pair’s vane is fairly symmetric right to left. The turkey tail assembly when fanned clearly demonstrates this. At the bases of the tail feathers are **upper tail** and **under tail covert feathers** that smooth and streamline the tail of the bird. Exceptions do occur such as with the peacock upper tail coverts, which lack streamlining, but are useful for display.

The **wing feathers** (remiges) are used for steering. Like tail feathers, they are usually large, stiff in texture, asymmetric, have vanes that are almost entirely pennaceous, and lack afterfeathers. Wing feathers include primary, secondary, and tertiary feathers. The **primary** wing feathers (typically 10-11 in number) attach to the middle digit and the hand. They are asymmetrical in vane structure with their leading and trailing margins notched. This sudden narrowing produces a series of slotted spaces between the primaries which in flight reduces air turbulence over the wing tips. Where turbulence is most extreme, the leading edge barbs are broadened and stiffened. These barbs are referred to in fly tying parlance as biots. The **secondary wing feathers** (anywhere from 9 to 40 in number and up to six inches wide by six feet in length) attach to the ulna of the forearm. The **tertiary wing feathers** attach to the humerus. There may also be a group of 3 or 4 feathers attached to the bones of the thumb forming a **bastard wing** (alula.) These feathers lie flat during normal flight, but extend out when flying slowly to prevent stalling.

Wing feathers may be uniquely developed for specific purposes. For example waterfowl wing feathers are designed to be water repellent. This is accomplished by modifications in the structure and position of the barbules such that a surface through which water cannot enter is created. They are so unique that a specific name is applied to this type of barbule/barbicel structure; flexules. The owl differs dramatically in having soft overlays of barbules on the surface of the feathers that allow this bird to be silent in flight.

The bases of the wing feathers as well as the upper and lower surface of the remainder of the wing are covered by several rows of small, flattened **wing coverts** (tectrices.) The largest wing coverts are adjacent the wing feathers digressing in size toward the wings leading edge. The vane is principally pennaceous and designed to supply an air-tight surface to the wing. The upper wing coverts, like contour feathers, are convex. Under wing coverts are concave, which fits them up into
the underside curve of the wing. (This is an important consideration for the fly tier. For example in Frederic Tolfrey's Jones's Guide to Norway a component of the wing on "The Major" salmon fly dressing calls for an overlay of two snipe feathers. These are under wing coverts on the snipe, and thus are concave. Their natural concavity forces the fly tier to carefully select a pair that will produce little or no outward curve when placed over the wing.) The under wing coverts on the leading edge of the wing initially extend vertically and then bend backward over the wing at an acute right angle creating a camber or upward curve.

A bird passes through various distinct stages of plumage. The plumage of the nestling stage is mostly down and contour feathers which plays a role primarily of warmth and concealment. There may also be an intermediate nestling stage with yet a different plumage. The adult may have different stages of plumage such as immature, full adult, pre-nuptial, and courtship. Male to female can be quite different, especially in the adult. Some immature birds take on the appearance of a mature female (i.e., some cockatoos and parrots.) For the fly tier this can be of importance since some feathers in a fly may be obtained only from an adult male, an adult female, an immature male and/or female, either the adult female or an immature bird, or perhaps any of these. For example in The Salmon Fly, George Kelson's dressings for The Silver Spectre and Prince's Mixture call for the use of Black Cockatoo's tail. Experience teaches that the feather of choice is only found on female or immature male Red-Tailed Black Cockatoo mottled orange, black and yellow center tails. A mature male has completely different black-red-black center tails. Then in Francis Francis' A Book on Angling another dressing may simply read Black Cockatoo or any other black feather. Here the feather becomes more obvious and might be either a strip from the black portion of an adult male Red-Tailed Black Cockatoo's tail, or better yet the all black tail of an adult male Palm Cockatoo.

Summation

The more the fly tier knows about the materials he has access to, the better his ability to select and apply the proper material to achieve the desired end result. Do not always accept what is read or told without a bit of personal investigation. Take time to look at materials. Feel them. Observe them under magnification. If possible gain access to a good hand lens of at least 15x, or better yet a dissecting microscope. Close observation of the structure of the materials we tie with can prove amazingly enlightening. Do some homework in books such as Darrel Martin's Fly Tying Methods, which includes excellent microphotographs of all manner of tying materials. Thorough knowledge of materials, dexterity, and experience are always found in abundance with the best fly tiers.

A quote from Mr. Martin's book sums up so well a great deal of the motivation for this article: The birth of a fly begins with a feather. The tier will require time and experience to know the various feather types, their numerous names, and their craft possibilities. The fly at the end of your tippet should be the result of all your knowledge and skill; it is the touchstone that drifts over the mystery of water and trout. After all, a fly is more feather than steel. It is the different feathers and the different methods that make a different fly. (Fly Tying Methods, pg. 59.)
Definitions

**Afterfeather** - attached at the base of contour feathers; small plumulaceous feathers which may or may not have a shaft.

**Barbicel** - a collective term referring to all the processes found on the barbule that interlock to create the vane.

**Barbs** - *sing* ramus, *pl* rami; fibers that extend off the flattened sides of the shaft in parallel rows generally opposing one another; somewhat ovoid in cross-section; filled with a pithy material containing air cells.

**Barbules** - *sing* radius, *pl* radii; extend out from either side of the barbs; each is ribbon-like from the base to about half way to the tip and whip-like over the distal half.

**Basal Lamella** - ribbon-like base of the barbule; ventral teeth are attached to the under surface.

**Bastard Wing** - *sing* alula; feathers that lie flat during normal flight, but extend out when flying slowly to prevent stalling.

**Bristles** - generally found on bird’s heads; stiff with a tapered shaft having barbs only on the proximal portion of the shaft.

**Contour Feathers** - cover the bird’s body; typically broad, thin, curving inward toward the skin, and directed toward the tail in overlapping rows; help to smooth and streamline the body for flight.

**Dorsal Flanges** - trough-shaped proximal barbules that are more twisted than the distal barbules; hooklets overlap and attach to the flanges.

**Flight Feathers** - include the tail feathers and wing feathers as well as supplemental feathers that cover the adjacent upper and under surfaces.

**Filoplume** - synonymous with thread feather; hair-like feather with barbs at the end of the shaft, always intimate to other feathers (from one to twelve adjacent a feather,) but grow out of their own follicles.

**Hooklets** - *pl* hamuli; hooked barbicel structures on the distal barbules that overlap and attach to opposing dorsal flanges.

**Pennaceous** - referring to barbs having barbules with barbicels that interlock adjacent barbs.

**Pennulum** - whip-like tip of the barbule; hooklets are attached to the proximal, ventral portion with the dorsal spines and dorsal cilium attached to the remainder of the pennulum.
Pinfeather - any feather that is immature.

Plumulaceous - referring to downy like barbs having barbules without barbicels.

Primary Wing Feathers - typically 10-11 in number; attach to the middle digit and the hand; asymmetrical in vane structure with their leading and trailing margins notched.

Quill - *sing* calamus; that portion of the feather that is inserted in the skin follicle. It is cylindrical, transparent, and hollow having no barbs attached.

Secondary Wing Feathers - from 9 to 40 in number; attach to the ulna of the forearm.

Semiplume - a plumulaceous vaned feather (i.e., marabou.)

Shaft - *sing* rachis; that portion of the feather that the barbs are attached to; flattened on the sides that support the barbs; roughly rectangular in cross section; filled with a pithy material that contains air cells.

Spines - ventral processes on the distal barbules that stop the hooklets from sliding too far and collapsing the vane.

Tail Feathers - *pl* rectrices; large, stiff in texture, asymmetric, have vanes that are almost entirely pennaceous, and lack afterfeathers; act as a stabilizer tilting the front of the body up and down, as well as an air brake.

Tertiary Wing Feathers - attach to the humerus.

Upper and Under Tail Covert Feathers - smooth and streamline the tail of the bird.

Vane - *sing* vexillum; the web of a feather which includes all the flat, expanded barbs, as well as any attached barbules, and barbicels which provide the surface for an airfoil in flight feathers and for covering and insulation in contour feathers.

Vaned Feathers - a collective term generally referring to a feather that has at least some interlocked barbs as seen in contour, wing, and tail feathers on birds that can fly.

Web - synonymous with vane.

Wing Coverts - *C pl* tectrices; cover the upper and lower wing surfaces and the bases of the wing feathers.

Wing Feathers - *pl* remiges; usually large, stiff in texture, asymmetric, have vanes that are almost entirely pennaceous, and lack afterfeathers; used for steering.
References

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With thanks to my friends Marvin Nolte (U.S.A.,) Thomas Whiting, Ph.D. (U.S.A.,) Martin Jørgensen (Denmark,) and Garth Coghill (New Zealand) for their advise and comments.

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DESIGN STRATEGY AND CONSTRUCTION
TIPS FOR BUILDING FLY PLATES

Part 2 of a Series

By

Steve Jensen
Chair, Legends of Fly Tying Fly Plate Series
The Fly Tying Group, International Federation of Fly Fishers

Photography by Ralph Eichholz

INTRODUCTION

In the previous article in this series, I indicated that four decisions must be made in designing a fly plate. To better illustrate these decisions, I will use as an example a fly plate being designed and constructed for Phil Greenlee who, as this is being written, is President and Chief Executive Officer of the IFFF.

During the Federation’s International Fly Fishing Fair held in Bend, Oregon in 2015, the demonstration fly tiers were asked to contribute a fly for the purpose of a fund raiser for the Federation’s Fly Tying Group. In purchasing the fly plate, Phil selected some of the flies from those that were contributed, but gave me considerable latitude in the selection of others. We ended up with a total of twenty-five flies to be included in the fly plate (note: that is generally the maximum number of flies that I include in any one fly plate because of plate size considerations).

At this point, let’s review the four decisions discussed earlier as they apply to this particular project:

First Decision. What category of frame will be used? The decision to include a specific number of flies dictates the use of a custom frame. Thus I am able to arrange the flies in a suitable configuration and then construct the frame to accommodate that design. The decision was also made much easier when Phil gave me the latitude to include/exclude flies as necessary.

Second Decision. How many flies will be included in the fly plate? In attempting to represent the diversity of fly tying techniques that are on display at a Fly Fishing Fair, I included flies from three broad categories. First, since many of the featured tiers were from the northwest, steelhead flies were prevalent among those that were contributed and nine such flies were included. The northwest is also trout country and so I included six subsurface flies and six dry flies. Finally, Phil had selected three additional flies that didn’t really fit in any of those categories and I used those to balance the fly plate.

In an earlier article for this newsletter, I addressed the subject of how to obtain flies for fly plates. One thing that I failed to mention is the potential for hard feelings by a tier if his/her fly isn’t selected for inclusion. Logistically it isn’t possible to include all of the flies and the selection process involves more than just tying ability. Sometimes flies don’t fit into a particular design no matter how well they are tied. And sometimes the person who purchased the fly plate wants to include a poorly tied fly for strictly sentimental reasons.
Third Decision. In addition to the flies, what else, if anything should be incorporated within the fly plate? One of the really nice aspects of custom fly plates is that you can include a variety of interesting things. But, the more that you include, the larger the fly plate and at some point, sheer size becomes a factor.

For this fly plate, I decided to include only the minimum collateral information: a main plaque or plate legend that describes the nature of the fly plate, and individual labels below each fly that identifies the fly and who tied it.

Fourth Decision. For fly plates featuring multiple flies, how will the flies be arranged? As will be apparent from the photographs, I grouped the flies by basic types and, with the exception of the large spey fly, arranged the smaller flies at the upper portion of the plate and the larger flies in the lower portion.

PRINTING THE FLY PLATE LABELS

In designing the fly plate, it is of course necessary to allow an adequate amount of space for all of the printed information to be included. So the first thing that I do after the flies have been selected is to type and print the various labels. This accomplishes two things: first, it allows me to accurately measure the space required for each fly; and second, it provides a convenient sized identification tag that accompanies each fly through the mounting processes.

![Figure 1](https://example.com/label.jpg)

Figure 1. This is the approximate size of a typical label used in the boxes holding the individual flies. It was generated using a 20 year old (thus ancient) version of Corel Draw. The theme font is Lucida Calligraphy while the font sizes are 12 point (top line) and 10 point (bottom line). I also draw a line around each label using that program.

I type all of the labels (which may include some that require three lines of type), select the largest one to draw a box around, and then duplicate that box size for all of the remaining labels. Since an opening for each label must be cut in the mat board making up the box which holds the flies, this assures that each opening (and thus the spaces that they require) is the same size. If you find that concept a bit confusing, when I discuss making the fly boxes in the next article of the series, it will be much easier to comprehend.

At this point, it is also appropriate to discuss a little about measurements. Like most Americans, especially those born about halfway through the previous century, I think in term of inches and feet. And, in fact, most of the measurements given in this article will be using those English units of measure. But in those instances where extremely accurate cuts must be made, it is much more useful to work using the metric system. For example, the individual openings that will be cut to accommodate the fly labels with the current project, measure 17 x 49 mm (try expressing that in a convenient way using inches instead of millimeters).
PRELIMINARY DESIGN

At this point in the project I have selected the flies and printed the labels. It is now time to start looking at the overall general design of the fly plate.

For design purposes, I keep a large cutting mat that is ruled in ½ inch increments. Figure 2 is a photo of the flies laid out on that cutting mat. Please note that:

- Each fly is accompanied by a descriptive label. I can’t over stress the importance of that. Never trust your memory to decide who tied what. About the first time that you do, you may end up taking a finished fly plate apart to correct an error. Trust me with this; I speak from experience (and, unfortunately, more than once).

- At this point you aren’t trying to be too precise with your measurements. Good approximations will work here.

![Figure 2. Flies laid out in six groups representing the six different openings that will be cut in the main mat. The six groups are:
Dry flies – upper left (6 flies)
Large spey fly – upper center (1 fly)
Subsurface flies – upper right (6 flies)
Steelhead flies – lower left (4 flies)
Miscellaneous flies – lower center (4 flies)
Steelhead flies – lower right (4 flies)
REFINING THE DESIGN

Once the fly groupings and approximate sizes have been determined, the next step is to look at each group and more accurately measure the space required for both the flies and the labels (Figure 3).

Figure 3. One group of four flies.

By counting the squares in figure 3 (each square = ½ inch) you can easily see that the approximate minimum size of the opening for that group of flies will be 6 inches high and 4 ½ inches wide. This process is then repeated for each of the other groups.

Next, the boxes are compared and adjusted in size. As a general rule, it is usually much better to increase the size of an opening than to decrease it. Flies that are a bit too widely spaced still look much better than flies that are a bit crowded.

The final step in this phase is to make a sketch of the overall dimensions of the plate and its openings. In most cases a simple hand drawn sketch with critical measurements listed will suffice. In the case of more complex projects, I do an accurate scale drawing. Figure 4 is a scale drawing of the current project.
Figure 4. Scale drawing of the proposed plate design.

Several more ideas in conclusion: First, notice that I have labeled each opening (A, B, C, etc) on the scale drawing. It is convenient to also label the backs of the fly boxes with the same labels. On more than one occasion I have glued the wrong box on the wrong opening. Anything that you can do to ensure accuracy is valuable in the long run.

Second, although at this point in the process you think that you know the overall dimensions of the plate, do not cut the mats for the plate until you have mounted all of the flies and constructed the fly boxes. If you build a fly box only to discover that it is too crowded and it is necessary for you to increase the overall size, it is much better to discover that before you ruin a bunch of expensive mat board.

NEXT IN THE SERIES

Mounting the flies and constructing the fly boxes that hold them.
Protocol for Management of Demonstration Fly Tier Invitations

International Fly Fairs

This protocol has been developed and approved by the International Federation of Fly Fishers (IFFF) Fly Tying Group Board of Governors (FTG BOG) for maintaining and managing a dynamic list for invitation of demonstration fly tiers to IFFF Fly Fairs. It generally will serve as a standard decision making process that will be maintained and managed by IFFF staff with specific assistance of the FTG BOG. The invitation list will not be available for distribution, for reasons of protecting privacy. However, IFFF staff will assist Councils with special mailings from the list as appropriate.

The protocol is as follows:

- The mailing list used for inviting demonstration tiers to the previous Fly Fair will serve as the base list for invitations.
  - Tiers will be deleted from the list if they failed to respond to the invitation, declined to tie for 3 consecutive years or failed to tie after committing to do so.
  - Tiers who were assigned vacant tying periods on the floor at a Fly Fair may be added to the invitation list.
  - All Buz Buszek, Dick Nelson and Darwin Atkin Award recipients shall be on the invitation list.
- A request will be made of Council Presidents and/or Council Fly Tying Chairs each fall to recommend up to 5 fly tiers from within their respective Councils as candidates for invitation. The recommended tier must be, in the opinion of the recommendation, a skilled and experienced fly tier, teacher and communicator who would represent a high level of fly tying skill as a demonstrator at the Fly Fair.
• A request will be made of FTG BOG members each fall to recommend up to 5 fly tiers as candidates for invitation.

• A request will be made of the FTG BOG International Ambassador to solicit and provide recommendations for international fly tiers to whom invitations will be extended.

• The FTG BOG will assist IFFF staff accomplish refinement of the final invitations list.

• Invitations will be prepared and mailed by Thanksgiving each year.

• The invitations will specify a deadline for response that will be determined by IFFF staff, but no later than January 31 each year. Invitees must respond by the set deadline to receive a tying assignment. Assignments will be made on a first response/first assignment basis. Each tier will be assigned up to two tying time periods. Responding invitees may request the two time periods they prefer to tie. These requests shall be honored to the extent possible. Responding invitees who are assigned tying times will be notified by March 1 each year.

• Those invitees who respond prior to deadline but after the initial assignments have been made, will be placed on a reserve list and may receive a tying assignment(s) as cancellations are received prior to June 1 each year. New assignments shall be selected from the reserve list after June 1 and notified by June 20. Acceptance of assignments to tie as a demonstration fly tier shall be considered a commitment on part of the tier; tiers who fail to show or notify staff of need to cancel prior to the Fly Fair shall be removed from the invitation list.

• Any assigned tying assignments receiving cancellations after June 1 will be held open until the first day of the Fly Fair and may be assigned at that time as appropriate by the Fly Fair Demonstration Fly Tier Coordinator.

• Tying assignments for Buz Buszek, Dick Nelson and Darwin Atkin Award recipients and selected international tiers to tie as “Featured Fly Tiers” will be made at the same time other assignments are made and notification will be by March 1. Featured Fly Tiers shall be assigned at least one time period in a central area that will be dedicated to Featured Fly Tiers and one on the tying floor, unless they request otherwise.

• The Standing Fly Tying Chair will draft the following letters:
  o A letter of invitation to serve as a demonstration fly tier at the Fly Fair will be drafted prior to November 1. This invitation shall include the assignment criteria specified above.
A special letter of invitation will be drafted to Featured Fly Tiers indicating the intent to feature them in the central area dedicated to Featured Fly Tiers and on the floor during the Fly Fair, unless they indicate a preference otherwise.

A “Thank You” letter will be prepared and sent to all tiers who served as demonstration tiers at the Fly Fair no later than September 30.

The Fly Fair Demonstration Fly Tier Coordinator shall be responsible, with assistance of IFFF staff and the Standing Fly Tying Chair, for reviewing responses to invitation and making assignments for those fly tiers who agree to serve as Demonstration Fly Tiers.

IFFF staff will use the protocol for maintaining and making decisions regarding managing an invitation list for demonstration fly tiers as part of the overall membership list, with input and assistance of the FTG BOG, as appropriate. This includes maintaining the invitation database, mailing invitations, handling and addressing calls regarding invitations, notifying demonstration fly tiers of assignments, etc.

The Standing Fly Tying Chair generally will be responsible for assisting in management of the database, assisting in review of subsequent annual invitation lists at the beginning of each invitation cycle, assisting with tying floor assignments and drafting applicable letters associated with invitations and notifications.

The Fly Fair Demonstration Fly Tier Coordinator generally will be responsible for assisting in management of the database, directing assigned demonstration fly tiers to their assigned tying stations each day of the Fly Fair, providing each tier with name tent cards for their stations, delivering/accounting for gift packages provided to demonstration fly tiers, making on-the-floor assignments for tiers to occupy vacated time periods/stations and collecting flies and other information from each tier as required.

Reasonable circumstances may occur that suggest minor deviations on a case by case basis.

The FTG BOG Chairman will provide assistance and overview for the invitation protocol as appropriate.

Approved by the Fly Tying Group Board of Governors

December 17, 2015
The Fly Tying Group is now on Twitter!

You can now receive tweets from the Fly Tying Group. Follow us on Twitter, @IFFF_FTG. Posts from our Facebook page are tweeted to our Twitter account.

Why use Twitter? Well why not, it's free, and it can be another useful communication tool. We can now Tweet our council events to a larger audience. So if you are on Twitter follow us @IFFF_FTG or #IFFF_FTG.

The Fly Tying Group Facebook Page

Thank you everyone for liking our Facebook page, we now have over 2,000 likes and followers. If you have notice there are videos, photos of how to tie flies, and now posts from our councils and chapters and what they are up to and events they are running. If you chapter and/or council is running any kind of event, demonstration, or workshop and you would like the rest of the IFFF to know about it, just message the Facebook group, or post it on our Facebook page. Or you can email me your information if you are not on Facebook to jerry_coviello@verizon.net. If you would like to see a specific pattern tied drop me a message. Thanks
Tying thread or tying silk refers to the material used to wrap around hook shanks to secure materials onto the hook shank. Tiers often use the "generic" term thread to refer to a multitude of different substances used to wrap around or tie down materials. Each substance has its own characteristics and it can be confusing to the new tier trying to start out with the "right stuff."

Cotton, nylon, polypropylene, Kevlar, polyester, silk, acetate, spider wire, rayon, GSP, and even thin wires have been used for "thread." Some of the first synthetic threads materials worked great at first until the sun got to them and they just disintegrated. Finding a synthetic material that would hold up under UV light and also retain the dye color were some of the concerns of manufacturers of quality threads.

Tiers are usually concerned with certain thread characteristics or properties when they make their choice of what thread to use for tying. Some of these concerns are; color, size, strength, single strand or multiple strands, flatness or roundness, waxed or non-waxed, discoloring with head cement, solubility in some head cements, availability, and cost. Eventually, you discover the thread that works best for you for a certain application. Yes, you will probably have to try many different kinds of thread and you will also realize one thread does not do all the jobs you want it to do. If you are tying only one type of fly or a limited number of patterns, you might get by with one thread but if you start varying your patterns, and using different materials, you may have to increase you collection of threads.

If you are a beginning tier, you will probably start out with the thread recommended by your instructor, or listed in the material recipe (often color is the only criteria listed.) Many of us stick with that "first" thread longer than we should. When I attend or teach intermediate to advanced classes I can look around and see 4 or 5 different threads being used and sucked thru the bobbins. Everyone will tell you they are using the best stuff around. What they mean is; they have located a material that works for them for the job at hand.

Part 1 on this topic is covering some of the basics of thread. Color is real easy to classify, unless you are colorblind. There are a few excellent colorblind tiers. One of the other parameters tiers are interested in is size. We usually are referring to the diameter of the thread. For threads made from the same material, the size will be related to the strength but it is not a standardized relationship.
Thread sizes are usually measured by two scales. The "0", or "ought", system uses a certain number of 0's to refer to the thickness. A thread with six 0's has a larger diameter than a thread with eight 0's. To save space six 0ught would be written 6/0. Briefly, the larger the number of 0ughts, the finer the thread. Yes, this usually means the smaller the number of 0ughts, the stronger the thread but different manufacturers may not be using a uniform 0ught system. One manufacturer's 8/0 thread might be stronger than another manufacturer's 8/0, and, different compositions (8/0 nylon vs. 8/0 cotton) won't have the same strength. Remember, some threads are flat, and some are round. Experience will give you an idea of which 0ught size works best for you for a particular manufacturer's thread composition.

Another system, the Denier scale, measures the sheerness or fineness based on the weight of a set length of thread fiber. If the label reads 70 denier, it means 9,000 yards of the thread would weigh 70 grams. Finer threads would have smaller denier numbers. Again, because of different chemical properties of different substances, strength may not be a direct correlation to Denier size unless you are comparing threads made from the same substance.

If you run into spools of thread with an alphabetical letter, you are probably looking at some thread from the sewing supply store. One common cotton thread used for sewing is marked "A" and is usually larger than 6/0.

Other properties a tier will need to consider will be related to how they use the thread. When dubbing, some tiers use wax and get the dubbing to stick to the thread (some use spit). Other tiers like to split the thread and insert fibers into thread which when spun, produces a spiky dubbing herl. How well does the thread grip materials, will three wraps hold the material or do you need 5 more wraps? Does it cut thru the foam bodies when you try to tighten up wraps?

Nothing is better than experience! One procedure you should perform with thread is - Learn the threads breaking strength. We don't have to know a numerical value but we do have to learn to tie with consistent wraps. When wrapping thread on a shank, or around materials when tying them on or off, we should be applying tension, just shy of the breaking strength. Hopefully, the materials will be rigidly held if you do this. Spend some time wrapping various threads on the shank of a rigidly held hook and simply pull on the bobbin until the thread breaks. Start correlating the size of the thread with the thread tension you are using in making your wraps.

For someone just starting out, a thread such as 6/0 or 8/0 Uni is a good beginning. A 70 denier UTC is another possible choice. These seem to work well with size 12, 10, 8, or 6 hooks. Most starting hook sizes are in the 10 to 12 range with and 8 or 6 thrown in for a wooly bugger or streamer. 8/0 will work for size 14 but 6/0 will probably be too large in diameter. Head size and bumps along the shank build up fast with the larger diameter threads.

Some additional information on thread can be obtained by reading the FTG Bronze Award Handbook, page 18 or the FTG Instructor Resource web site on which are some posted articles on thread control. Additional information will be forthcoming in later newsletters. If you ever have the opportunity to take a class from Wayne Luallen, 1991 Buszek Award recipient, on thread control do not hesitate! Wayne will teach you what you can do with thread to construct superior ties.
I am sure your collection of threads will grow. You will end up with your favorites and the extra spools of all sorts of threads will start to fill your storage containers. As you can see from the pictures, I have a difficult time throwing anything relating to fly tying away. Having two friends close their fly shops has helped increase the available threads to try.

How many brands can you identify?
Different spool sizes make storage fun.
Choices, choices, choices! Nice to have the materials close at hand at the tying station. Wonder where the vise is? Scissors are on the floor.

Be careful when leaving realistics around your tying station, they get hungry!
Fred Dupre

Announces.....

Fly Tying Group Videos

The IFFF Fly Tying Group (FTG) has launched a large online searchable fly tying video library on our website, in keeping with our mission to “provide educational resources for fly tiers”. This fly tying video library is accessible by going to the IFFF main page on their website and clicking on the Tying button then clicking on the Tying Video Library button.

Check it out now at:

The library allows you to either search by fly name; or by Category such as: Cold Water, Salt Water, Warm Water or Technique; or by Sub Category such as: Pike, Salmon/Steelhead, Trout, Bonefish/Permit, Redfish/Speckled Trout, Bass, or Bluegill/Crappie. We currently have several hundred high quality tying videos loaded and will be adding new ones each month. We view each video to make sure that it is high quality. If you know of any high quality YouTube or Vimeo tying videos that you want loaded in our library, please contact Fred DuPre’ at flytyerfred@gmail.com.

The FTG would like to recognize Rhonda Sellars, Jessica Atherton and the FTG Video Library Team for an outstanding fly tying video library that will be a vital resource to both beginning and seasoned tiers in years to come.
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**Fly Tying Group Shirts & Caps Now Available!**

Check out our newest line of Patagonia Sol-Patrol II shirts with [long-sleeves](#) or [short-sleeves](#) that can be embroidered with the Fly Tying Group Lifetime logo or the regular Fly Tying Group logo (your membership will be checked). Shop here!! [https://www.fedflyfisher#3DD96C](https://www.fedflyfisher#3DD96C)

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**Pins**

![Pins Image]

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