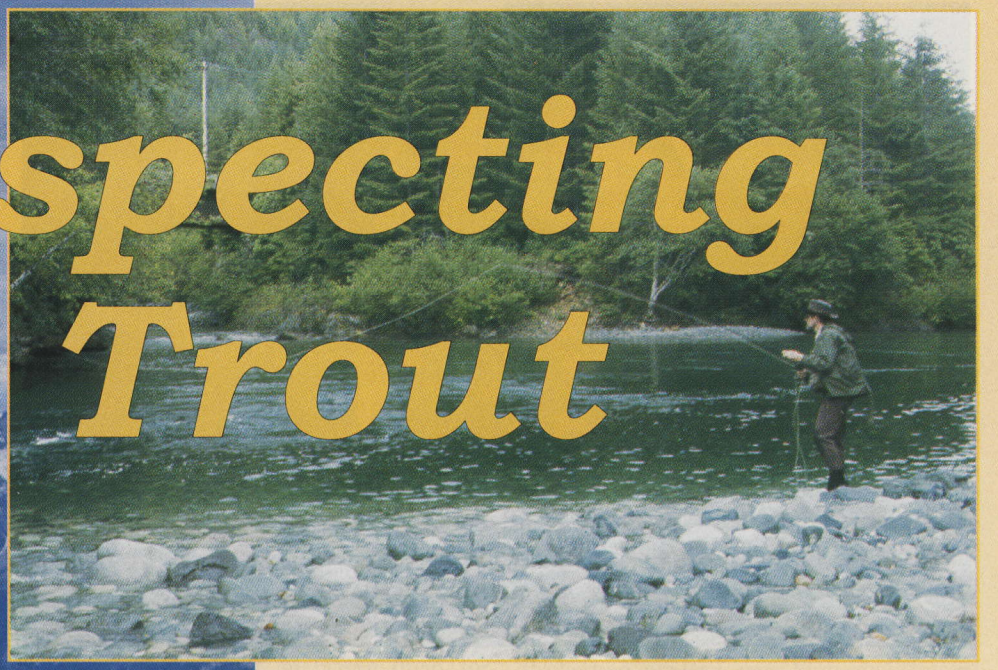
Prospecting For Trout



By: J. G. Imhof

The deep, frothy trough of water swung around the large boulder. I knew it had to hold a trout. The foam line over the deep water streamed up to the leading edge of the marl-covered rock, was sucked around the edge, and continued downstream, two inches from the boulder's face. More by luck than skill, I placed my fly into the middle of the foam, upstream of the rock. The Isonychia emerger floated down with the foam, swung around the boulder, and was promptly nailed by a respectable brown trout. Old Bill Philips' words came back to me as I released the trout, "Watch the foam. Ausable brown trout always rise in the foam". However, this wasn't the Ausable River in upstate New York, but one of my favourite sections of the Credit River in Ontario.

Resting by the side of the stream that day, I reflected upon the uniqueness, yet haunting similarity of all the rivers I have fished. Uniqueness occurs in the combination of fine details of colour, smell, view and character, while similarity appears to occur at a broader scale in the form and structure of the river's watershed and the channel forms found within the stream's valley. The Credit River below Cataract is very different from the West Branch of the Ausable River in upstate New York: it is a unique stream flowing off the Niagara Escarpment less than one hour northwest of Toronto. Although it is very different in scale and channel from the Ausable and other large rivers, such as the Madison, the Credit has pocket water, foam lines and lies which appear identical. On a watershed scale, however, it is the Ausable which is the odd one out: the Credit and the Madison are similar in productivity because of sedimentary rock found in their watersheds, while the Ausable, which arises in the igneous rock of the Adirondack Mountains, is much less productive.

A number of questions come to mind. Why are some watersheds jewels of productivity while others are relatively barren? What is it about river channels that on one hand make them unique and on the other so familiar? How is it that you might never have fished a particular river before and yet you just know where the fish should lie?

Whether you are an angler or conservationist, the answers to these questions are important. An understanding of watershed

Back Ground Photo: Athabaska River, Jasper, Alberta
Inset Photo: Taylor River, Vancouver Island. Lovely but low in productivity.
J. G. Imhof

Pat Imhof with a fine Grand River, Ontario brown. *Jack Imhof*

geology can help us prospect for new trout waters, and an understanding of the channel forms created by rivers will improve our ability to find and catch fish. As conservationists, an understanding of the physical forces that create the opportunity for life and productivity within a watershed and channel, enable us to help protect them. In this first of two articles, I will provide the watershed principles and characteristics necessary for you to become a prospector for new trout waters. In a subsequent article I will explore the relationship between channel form and fish lies.

The productivity of a watershed is controlled by geology and climate. These create the physical parts, forms and functions that dictate the potential of the watershed to support fish communities. Climate, over time, can move surface materials around and create new landforms. The changes that occurred after periods of glaciation are dramatic examples of this. During shorter periods of time, climate creates weather patterns that provide water that is essential to a watershed's yearly water cycle. The type of bedrock and surface materials dictate the chemistry of the water: granite rock (formed from lava) creates acid waters with low mineral salts and low productivity; sedimentary rock (formed from the deposition of material and organisms over millions of years) such as limestone, creates alkaline waters with high mineral salts and potentially high productivity. Certain bedrock types, especially fractured limestone can also store and transport enormous amounts of groundwater. These water-bearing formations are called regional aquifers.

If the groundwater from these formations has an easy route to the surface, it often creates streams of icy-cold, stable flows ideal for trout. Certain surface features such as gravel or sand moraines and glacial outwash channels can also create active watertables and discharge large amounts of water into streams. The topography of a particular watershed acts with the geology to control how well water moves over and through the watershed.

Understanding these relationships can help an angler prospect for new potential fishing areas. A few friends and I have used this understanding for many years to pinpoint likely productive coldwater streams. It may seem a bit strange to plan a fishing trip using a scientific text such as "Physiography of Southern Ontario", or a set of brightly coloured maps such as, "The Quaternery Geology of Wellington County". But, based upon this information and a knowledge of the factors that create coldwater streams, we can make relatively accurate predictions of which streams within a large watershed or particular geographic area should, not only have a coldwater fish community, but also which would be the most productive.

For example, in southern Ontario, two adjacent sub-basins of the Grand River, the Speed and Eramosa Rivers, rise within two kilometers of each other, and have roughly the same drainage area. Despite their proximity to each other, the Eramosa River is a substantially better and more productive trout stream than the Speed, not only in the amount of baseflow, but in the number and size of trout. The major reason for these differences rests with the difference in geology. The Speed flows into and through an area of till plains and till moraines that generate very little groundwater. The Eramosa on the other hand flows through an extensive gravel outwash area left after the last glaciation. This glacial material sits on top of a major bedrock groundwater system. The bedrock comes close to the surface and augments the shallow groundwater with large quantities of bedrock groundwater, creating a stream that is substantially more productive for brook trout than the Speed.

The same pattern holds true elsewhere. Last year I had the opportunity to fish several B.C. rivers in the East Kootenay's. Two rivers near Revelstoke, the Jordon and the Akokelex, flow through spectacular scenery and contain good populations of east-slope cutthroat trout. Both rivers rise in the high mountain peaks of the Selkirk Range of mountains and travel through deep forested valleys. Both flow over clean almost scrubbed looking cobble. Their waters are clear with a slight turquoise tone. The cutthroat trout are beautiful, slim, jade-coloured, spotted fish. However, the density

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of trout was relatively low. Each pool had several nice fish, but once caught or missed, the best strategy was to move on to the next pool.

Both the Jordon and Akokelix rivers rise in mountain ranges composed of igneous rock. The water is soft (i.e. pH < 7.0) and contains few mineral salts and nutrients. Despite the beauty of these rivers and the pleasure I derived from fishing them, they were not productive waters. Productive, that is, compared to waters that flow off the Rocky Mountain range.

The true Rocky Mountains, close to the B.C./Alberta border are composed of sedimentary rock. The Elk River flows out of these mountains. The Elk River and its valley have a similar structure as the Jordon and Akokelix Rivers, but the water is very different. The water in the Elk is hard (i.e. pH >7.0) and is rich with mineral salts from the sedimentary rock that makes up the surrounding mountains. Like the Jordon and the Akokelex, the Elk also has native, east-slope cutthroat trout, but the density of trout in the Elk and the numbers of large fish are far greater. I fished one pool all afternoon and evening on the Elk and still had many fish rising in front of me. Moving to another pool would have been for variety, not necessity.

In order to prospect for trout, you will need several basic maps and an explanatory text that explains the fundamentals of water movement in different materials and instructions on how to assess this information. Most Provincial book stores, or Provincial Natural Resource agencies will have these maps, or will point you in the right direction. In the United States, maps are available from the United States Geological Survey. Some of these maps and information may also be available at university libraries. A useful set would include topographic maps and maps depicting the geology of the area. These (where available) would include maps presenting the surficial or overburden geology (stuff on top of the underlying bedrock) and bedrock geology maps. In addition, a book explaining the various general properties of these materials would be useful. In southern Ontario, older books such as "The Physiography of Southern Ontario" by Chapman and Putnam, published in the 1960's are still relevant today.

Maps of various scales depicting the surficial geology as well as the bedrock geology are available from the Geological Survey of Canada. More detailed maps (down scales as fine as 1:50,000) are available for some areas from some provincial agencies.

Once the maps and information are acquired, the task of analyzing them for information on trout potential begins. Total fish productivity is controlled by the amounts of nutrients available within the watershed, balanced by the watershed's climate, flow patterns and in-stream habitat. Therefore, the simplest analysis for prospectors interested in a particular region would be to sort streams based upon whether or not they flow through limestone geology or granitic geology. Using this approach, streams in certain areas of British Columbia and Alberta could be sorted out simply on the basis of their relative production potential, over and above any consideration of the role of habitat in achieving that potential.

Within certain regions, a high variability in the location and production of trout can also occur. For example, all of southern Ontario lies in limestone bearing rock and, therefore, has the general potential to be much more productive than rivers in Northern Ontario, which is located on the granitic rock of the Canadian Shield. However, within southern Ontario there is still a wide variability in the location and quality of good trout streams. At this point, an assessment of the mix of geological features can be important in determining good trout streams from marginal ones. A few key rules of thumb can help you to assess which stream or section of stream will be potentially good or marginal. These are the keys to obtaining information on groundwater contributions, temperature and flow potential.

There are three basic steps to follow

1 Identify and check the composition of the local bedrock: The nature of the bedrock can provide a clue to the major groundwater activity in a region. Granite bedrock, although it can contain groundwater is not as active in storage and movement of groundwater as sedimentary rocks such as limestones, sandstones and dolostones. However, not all sedimentary rock is created equal. Check the geology texts. The best sedimentary rocks are porous and highly fractured. This type of bedrock, such as the Amabel formation in southern Ontario, has the capability of moving large amounts of groundwater. Where these formations touch or approach the surface of the landscape, large amounts of groundwater are discharged, creating very high quality trout streams.

2 Examine the composition and location of the overburden. The loose materials that occur on top of the bedrock in any particular area are called the overburden. Certain types of overburden can create active localized groundwater resources that can play an important role in the quality of local trout streams. When examining surfical geology maps, look for areas that have glacial spillways, deep sand plains, and sand or gravel moraines. These types of forma-tions can create major localized good quality groundwater tables. Overburden materials such as till moraines are more variable in their potential to create active water tables.On the other hand, clay and silt plains or moraines do not create active groundwater areas. On the other hand, clay and silt plains or moraines do not create active groundwater areas.

Depending upon the types of overburden, their depths and topography, certain opportunities may occur that will create active shallow groundwater tables. These shallow water tables at a medium scale (e.g. 1 - 10 km^2) can provide the opportunity for local discharge and, therefore, local cool or coldwater communities. One rule of thumb would be to classify the potential of the units as follows: gravels/coarse sand moraines or outwashes provide good quality trout potential; patchy sands and sandy-silt deposits provide mixed to poor trout potential; silty-sands to silty-clay usually provide warmwater streams with low trout potential.

Continued on page 39

➤ EAST COAST SMALLMOUTH

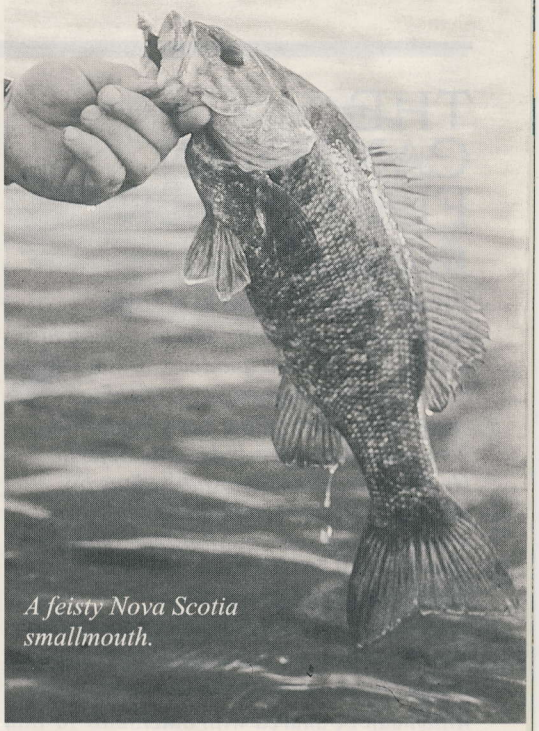
Continued from Page 32

Here is another, very specific but nonetheless useful, bit of intelligence. Where dams, such as the giant Mactaquac on New Brunswick's Saint John River, create impoundments, the flooded valley sprouts a series of arms or back bays. Road builders, being who they are, cherish straight lines. So they frequently cross these indentations with fill and provide a large culvert to allow water circulation. The direction of the flow through these, depends upon the amount of flow through the dam. The culvert openings are often totally underwater and bass find the reversing currents a prime source of suitable meals. A successful New Brunswick tournament angler, Robert McNeil, showed me such a spot. If I wasn't certain I'm speaking to a different audience than his competitors, I'd zip my lip. We had gratifying success at his honey hole and the concentration of bass was staggering. Nevertheless, if you miss the underwater entrance by a meter, you will go begging.

What are the smallmouth prospects for the dedicated river fly-fisher? Limited. Unfortunately, the LaHave River in Nova Scotia, which still supports a reasonable run of salmon, is one. Although some will disagree, a case can be made for killing every bass caught in the LaHave and contributing the carcasses to the food-chain if unwanted for the table. Several smaller streams in the Halifax area also offer a pleasant wading experience. The top New Brunswick rivers are the St. Croix, Magaguadavic (lower section), Eel (downstream of the DU impoundment at Benton), and Meduxnekeag (near Woodstock).

Nova Scotia and New Brunswick offer superb fly-fishing for smallmouth bass (Prince Edward Island and Newfoundland have none). Trophies are scarce, but anglers regularly land two kilogram specimens.

Many venues are small and accessible enough to be easily fished from a canoe or float tube. Someone reported that after a tour of several Yarmouth County (NS) waters a prominent American tournament angler called them the best bass habitat he had ever seen. High praise, and likely deserved.



A feisty Nova Scotia smallmouth.

Paul Marriner

Where

Nova Scotia's smallmouth fisheries are concentrated to the south and southwest of Halifax. More than twenty bass lakes ring the city itself. The Official Nova Scotia Fishing Map pinpoints many of the province's bass lakes (send $3.50 to Nova Scotia Fisheries, P.O. Box 700, Pictou, NS B0K 1H0) and you can also request a free current listing.

The top professional smallmouth guide in Nova Scotia is Perry Munro of Munro's Mountain Maple Lodge (902-542-2658). Perry is a well-known fly-fisher, and his Carolina skiffs on Black River Lake (one of the province's best smallmouth fisheries) are stable and comfortable fly-fishing platforms. Black River Lake is near Kentville in the Annapolis Valley.

New Brunswick's smallmouth fisheries are found in the southwest corner of the province and along the Saint John River valley. Perhaps the best choice for big bass is Harvey Lake, about 50 kilometers southwest of Fredericton. River lovers might prefer the St. Croix River on the border between Maine and New Brunswick. For those wishing a guide, I highly recommend Mike Best (506-529-3609).

➤ PROSPECTING FOR TROUT

Continued from Page 35

3 Determine the relative thickness of the overburden and the depth of the valley

If the overburden is composed of gravels/coarse sand moraines or outwashes, then the next question is to determine the relative depth of this material. Overburden thicknesses of less than 2-4 metres may not have enough depth to produce very much groundwater, even if it covers a large area. If the overburden is deep (i.e. >4m) and covers several km^2, then the last step is to determine where the streams of the watershed cut a valley through these materials and whether the valley is deep and well-defined. The deeper the valley and steeper the slopes, the more potential for the groundwater to find its way into the stream. If you find a stream with a well-defined valley, cutting through a large, deep deposit of sands and/or gravels, this stream has a high likelihood of being a good trout stream.

Of course, a stream and its watershed are more complicated than this. There are always exceptions, special rules, and special conditions dictated by local geology and climate that may alter some of the analysis you have done. However, the tips I have provided should save you a great deal of time in the long run when searching for good trout streams and definitely improve your prospects for finding trout!

How good these streams actually are is controlled at a more local level by the type of stream channel found in a particular section of valley, by the quality of the riparian zone associated with the stream, and the influence of adjacent landuses. This is the stuff of the second part of our prospecting adventure.

Jack Imhof

Jack is a senior biologist with the Ontario Ministry of Natural Resources. One of the originals of the Izaak Walton Fly Fishing Club in the early seventies, he has become an expert in "natural" management of sport fisheries and their watershed.

He's also a mean fly fisher.

He lives within casting distance of the Credit River, Ontario

Watch for part two of "Prospecting for Trout" to be published later this year. Ed.