Learning the Watershed Lingo

by Peter Warshall

Watershed and river basins. In England, *watershed* meant the parting or separation of waters. It was the *boundary line* along the ridge that separated rainfall into one creek versus another. In the U.S., we call this the divide, the watershed divide.

In the U.S., *watershed* means the total surface of the land over which water flows, not just the divide (although literary types still use "watershed" to mean a significant dividing point). It as an *area of land* which drains water, sediment and dissolved materials to the channel of the creek. In Europe, they use the word catchment area or drainage basin.

A *river basin* is just a whole bunch of watersheds lumped together. There is no hard rule about how many watersheds you have to have before you can call it a river basin. In the U.S., watershed programs deal with 10 to tens of thousands of acres. River basins deal with hundreds to thousands of square miles. But, you can say the "Mississippi watershed" and still be correct.

Hillslope and channel. The pieces of a watershed that require a cultivated eye are its *hillslopes* that feed runoff to the more indented *channel*. In the Everglades, the "hills" are so low and flat and the channels so ill-defined that hillslope/channel investigators just can't decide which is which. In parts of the Grand Canyon, the hills are so steep and tall that they are canyon walls without surface runoff. When watersheds are less extreme, there is an area that is sometimes "hillslope" and sometimes "channel" depending on rain and floods. This is called the *riparian* zone (riverside)—a good indicator of channel and hillslope stability.

The tributaries that connect channel flow and collect surface flow form unique leaflike patterns called *drainage networks*. In the study of flood design, riparian restoration, runoff pollution, hillslope stability and sediment production management, the drainage network becomes the focus of practical implementation.

Types of waterflows. The ways water flows dictates the technical and social solutions required. The most important are *instream* flows (the amount of water left in a channel after all the human *off-stream* claims have been met.) The instream flow will determine if fish can remain, which kind of fish, and their abundance. Instream flows also influence the riparian and creekside plant communities. A major watershed concern is maintaining seasonal instream flows and instream flow quality.

Watershed care within river channels has two different doctors, one for *upstream* and one for *downstream*. Upstream flows require a checkup of all the activities that harm or benefit the water arriving at the point where you live or play. You have a strong legal right to insist that the quality and quantity of waterflow coming from upstream is beneficial to your needs. Similarly, what you do with the water (e.g., extract it and return it as sewage) can set the best example for proper care. If you extract minimal amounts, reuse them, and return some to the creek in good or better quality, then good news goes downstream and frees your community from political turmoil.

Some waterflow seeps into the soil (*soil moisture*) and some goes deeper (*groundwater*). The groundwater can follow a maze of cracks in the bedrock and leave the watershed. *Groundwater basins* do not always conform to watersheds. Reconciling aboveground flows with underground flows and wells with river diversions is one of the most tricky legal and technical tasks of river savers.

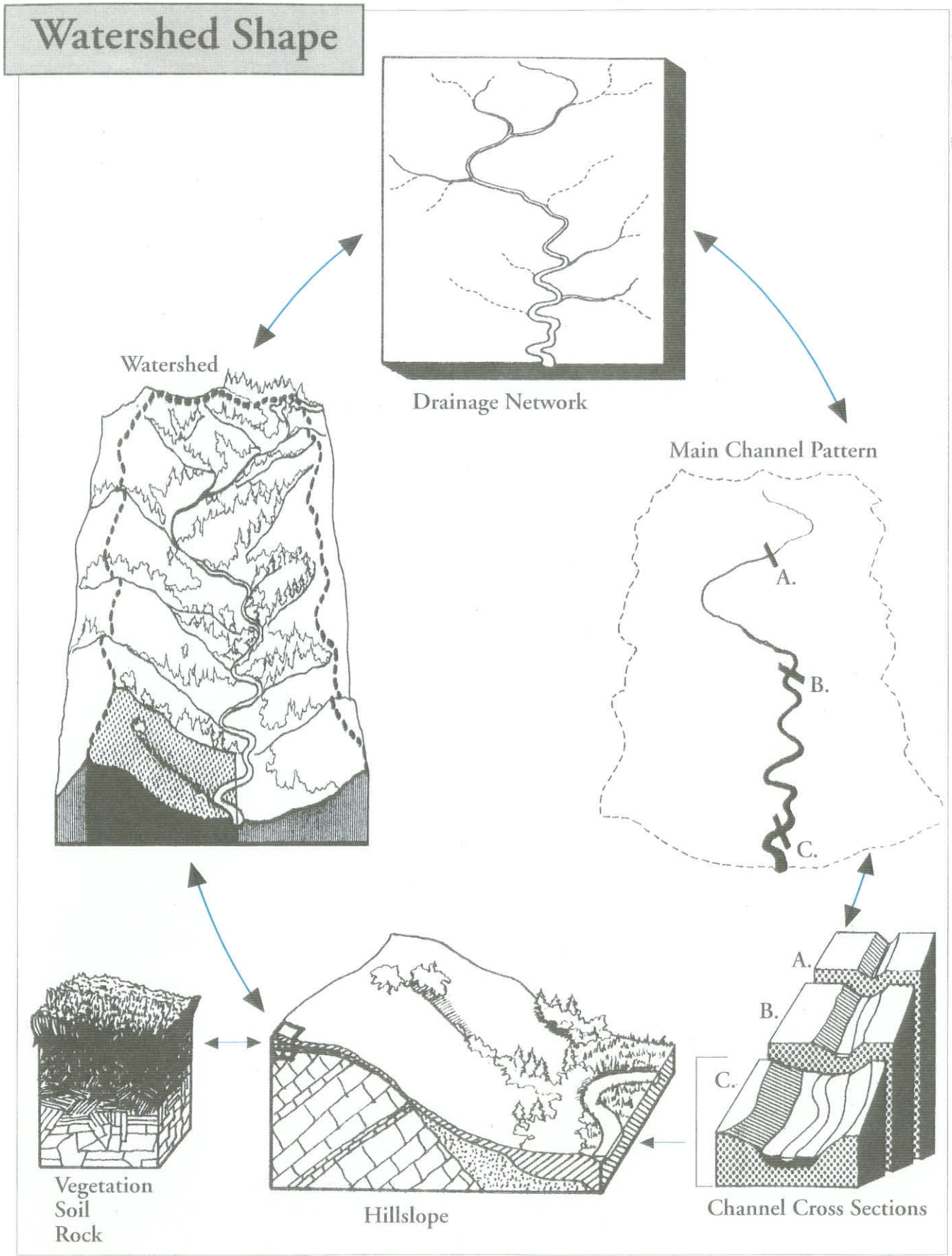
Springs and outfall pipes gush water from a single opening. They are called *point* sources. On the other hand, rain that washes the streets and fields and parking lots and roofs of a community (even if it winds up in a storm sewer) is called *nonpoint* source. Watershed management is the only administrative form that can deal with nonpoint pollution from surface runoff. The perpetrators may be many (cars on a highway) and responsibilities are most-times ill-defined.

Airshed. Just like groundwater basins, the *airshed* complicates watershed management. Acid-laden dust may come from miles away and settle in your watershed, harming the fish populations of the forest. Airsheds are fickle but it is important to learn the direction of airflows (wind) that eventually drop rain, snow, dust, and aerosols in your watershed.

Indicator species. If you're lucky the abundance of a single species or two will accurately reflect the health of your watershed. These plants or animals are "totemic" and should be revered on citizen group logos or at celebrations of creek and river restoration. The salmon is typical but so are cottonwoods or certain mussels in the southeast.

Inter-basin transfers. Besides groundwater basins and airsheds confounding the boundaries of watersheds, human-constructed waterworks that cross watershed divides and mix waters from different rivers cause all kinds of administrative and ecological havoc. Any city-dweller must contemplate river basins and greatly altered instream flows when pursuing watershed restoration.

The above is part of Peter Warshall's ongoing project "Gathering Waters," a look at human communities and sustainable watersheds. This excerpt is part of his work to make technical information more available to the public.



The watershed is a physical gatherer. Its surface of soils, rocks, and plant life forms a "commons" for the intermingling of sun, water and nutrient.