

Modeling Rivers Part 1

By Rick Inglis

Why do we model rivers?

Good looking rivers add much to a modeled scene. They provide areas to focus attention and serve as a nice counter point to your trains. River crossings are usually a great place for railfanning and model photography. Scenic views that include a water feature are often aesthetically more pleasing. Artistic landscapes rely heavily on water elements, from rivers and waterfalls to ponds.

The prototype provides us with many great reasons to model rivers. Most railroads followed a water level route through difficult mountainous terrain. It was logical and economical to build track along the valleys instead of up and down hills and across ridges. Rivers justify bridges and trestles which can be favorite projects among modelers. And these days, there are many great techniques and materials to make very believable water features.

But sometimes a landscape scene seems only as believable as its weakest element, and many people find water to be difficult to convincingly model. Thankfully there is hope and that's what these articles will address.

Where do we go wrong?

Perhaps you have seen a layout with a river that looked only like a plaster trench filled with clear plastic. That's what it was, but why did it only look like plaster and plastic?

We all seem to think that we know what rivers are supposed to look like. Truth be told, it is something to which most people pay little attention. But when scenery materials are mixed and ready to apply to the layout, all we can remember is the emotional beauty of our mental model, but not the specific details that made us respond so strongly to a specific prototype.

Another difficulty is the constraint of limited space on the layout for convincing river or creek. Traditionally the track plan is designed first, after which consideration is given to the lay of the land. Including adequate space for rivers during track planning is a good place to start. Fortunately there are modeling tricks that will help you capture the essence of a river in smaller spaces without resorting to a scale model of the Mississippi River.

How can we make better rivers?

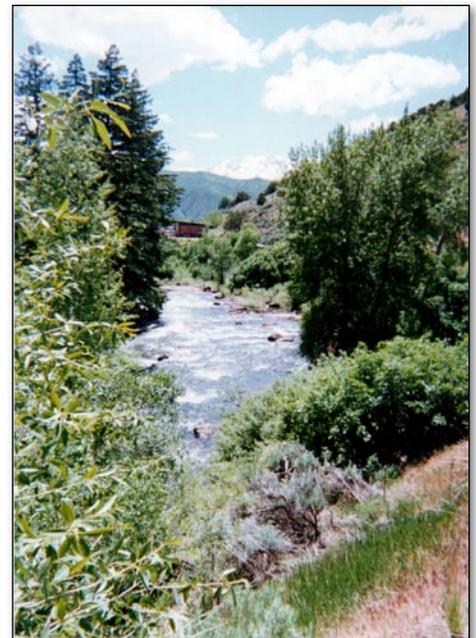
An important advantage of being a model railroader is we love to observe trains. We can transfer our observation



skills to the details in rivers, and in doing so make more convincing scenes.

Treat a river like any other serious modeling project. Do research. Be observant. Experiment a little. Just stay away from the thought that any generic river will do. If your other hobby is fly fishing this part will not be difficult (why might you catch a fish under that snag?) Here are some steps to think about when planning a river scene.

1. Get good pictures of the river scene you want to model. Prototype rivers look specific to their location. Try to get photos with different light (cloud conditions and sun angles), different times during the day for shadows and reflections, and during the season you want to model. Getting photos from the angle and distance that would match the view on your layout will really help in designing your model landscape. Many railroad books will have useful pictures of your favorite prototype crossing a river somewhere.



2. Study the photos for basic



design elements of the river scene. This is how we overcome our natural “seeing the emotion” without “seeing the details.” Take particular note of the placement and character of the trees and shrubs in the riparian zone on the river banks. How flat is the valley bottom (floodplain) and does it meander? Are there eroding banks, sandbars, and fallen trees near the edge of the water? Is part of the riverbed exposed, what is the bed made of, what color and shape are the rocks and sediment on the bottom (can you even see the bottom?) Is the water sort of clear or cloudy, and if so, what color? And what color are the reflections? What is the texture or roughness of the water surface? If you have a railroad in the photo observe how they used riprap and/or bank protection for the road bed and how much trackside junk is tangled along the edge of the river.

3. Make a sketch or diagram and label of a half of dozen elements that typify this river. Notice that rivers have a relatively flat surface and water falls are very rare. Observe the typical width of the river you want in your scene. What size is that in your scale. Some compression is allowed, but modeling the Hudson River in just a few inches is tough to do. If you do not have adequate space on your layout for at least one bank of your chosen river, consider



finding a smaller stream that can better fit into your space. Understanding the season that you choose to model can determine if the river is near flooding (flowing up to and into the edge of vegetation) or low flow with a lot of exposed river bed and sandbars as typical in late summer and on through the winter.

In the Midwest and South, model a flat and nearly smooth water surface, brown tan or green in color, occasional tall muddy banks, sinuously meandering between banks, drift wood floating in the water and piled on banks, bands of thick deciduous trees in remote areas, and corn fields or pastures on flood plains in farm country, all in a relatively flat valley. Rock riprap protects bridge abutments and at times the right of way when the river snakes too close to the tracks.

In the Western mountains the water could be clear with exposed cobbles peeking out of the river bed, white water and rapids, willows or other shrubs on the banks, steeper slopes and rock outcrops near the edge of the river, possibly blue spruce on the banks plus lots of cottonwoods and willows. Sometimes rock talus slopes continue right into the water.

In the East lots of deciduous trees crowd the river with rocky banks in the Appalachian Mountains, trees, deep valleys, more trees, big and darker brown water, and plenty of trees of many shapes and sizes. Don't forget the trees. And more trees!

Whatever region you model, rivers and creeks help define the landscape of your layout. Even if you freelance, find a favorite fishing hole or landscape calendar picture and really study it. Imagine your trains running through that scene. It will be a perfect setup for next years model photography contest.

Next time I will describe the materials and tricks I used in making a mountainous river. **I**

Modeling Rivers Part 2

Making a mountainous river for the Rocky Mountain region

By Rick Inglis

A good looking river in the Rocky Mountains does not have to be difficult to model if you followed the suggestions in part one (*NCMRC Dispatch, January 2005*). By now you selected some good photos of a river near your favorite railroad and identified a space on the layout to make a stab at reproducing it in three dimensions. A lot of work goes in before you add the water so don't get out the Envirotex until nearly the last step.

First, the bench work should be reasonably strong and stable. It is not a good idea to put a joint across the river between two sections of a movable layout unless you have a miracle plan to hide the joint. Sometimes a low-head dam, a road or a foot bridge can be used to camouflage the seam. I used a beaver dam across a small creek to hide one edge of an access hatch with reasonable success.

The bottoms of most rivers are relatively flat and have very low gradients. Usually they run around 1% unless you model a high mountain, hard rock canyon. In fact, most of my rivers are built flat and level and I use other features to give a sense of flow direction. 1/4-inch hardboard or plywood laid on 1x2 joists spaced about 12-16 inches apart will support your basic river. If for some reason you need the river bed to support more weight, use 1/2-inch plywood. If it takes more than one piece of plywood to support your river, put a joist under the joint and patch with wallboard tape and joint compound. Rough surfaces in the plywood and screw holes should be smoothed out with joint compound at this time.

Now, get out the river feature sketch you made after reading part one. Draw the general alignment of the river on the plywood, getting the approximate width and curvature you've seen in the photos. Obviously it must fit your space and some amount of compression is required. After getting the meandering outline on the plywood start adding other features such as floodplains, sandbars, high and low



banks, and bridge crossings. Fill in more detail from your sketch by indicating marshy areas, logjams, junk locations, docks and piers, fishing holes, riprap banks, bridge abutments, etc. By now you have figured out how the river valley will attach to your hill slopes, leaving enough room not to crowd the edges of the channel and floodplain.

After attaching the hill slopes to the plywood begin to build up the floodplain and low river banks. I used a couple of layers of corrugated cardboard, but a single layer of 1/2-inch Homasote, blue board, or ceiling tile would work. Cut it back just a little ways from the river's edge with a saber saw or share utility knife. This area can be plastered with the rest of the hillslope terrain, but try to keep plaster out of the river channel. Paint the river channel a dark color when you paint earth tones on the plaster.

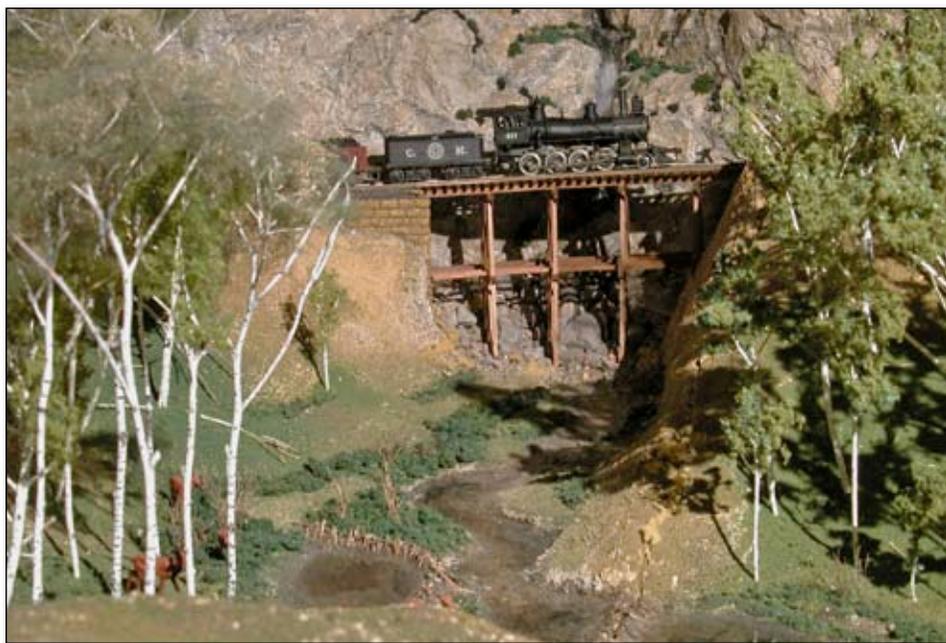
From here on try to visualize exactly where the water line will go. Envirotex, casting resins, and Woodland Scenics water usually end up very flat, making good lakes. Using

these materials to represent water means that the water line will be pretty flat around the edges. The next step is placing sand and small pebbles in the river bed below the water line and vegetation up on the banks. Natural rocks found in rivers are well rounded, while riprap is angular. It is usually used to protect bridges and roadbeds too close to the river. Use your photos to help locate where to locate the different textures. (If you are modeling muddy water this step is not important) Sand and fine grain material would be where the river currents are slow, and gravel and cobbles (less than 1/4-inch pea gravel) should be placed in swift water and rapids. Cluster of cobbles can be used to create shallow steps across the channel. Pools would form upstream of the steps. Sandbars form along the edges of the channel and sometimes in the middle of the channel where the currents are slower. A few boulders can be embedded in the river bed but generally keep these small, well rounded, and flat bottomed. Build up the low vegetation cover on the banks and hill slopes using greener material in low areas near the river. Glue this all down with 50-50 mix of white glue and water after misting with a detergent spray. Let this dry over night. The results should not have any leaks in the bottom of your river.

The fun part is to decorate your river by adding twigs representing woody debris, occasional pieces of junk, and emergent vegetation in marshy areas and backwaters. Be sure the base of the bridge abutments and piers below the water line are installed. Boats, swimmers, and other features you want in the river need to be glued in. Because river rock is usually dark under water I will paint the bed below the water line with a wash of burnt ochre and/or weather it with dark brown chalks. Deep pools are almost black with a muddy bottom (but do not necessarily need to be covered with thicker Envirotex).



With everything in place and glued down the big moment arrives to pour the water. Seal the edge of layout where the river ends with good tape, forming a tight seal to dam the flow of your water material. If you think you may have leaks, test it with water first and seal all leaks because the Envirotex will find its way to the floor. Be sure the river bed is dry when you pour. Follow the directions when mixing your water material and pour layers about 1/8-inch deep. If you decide on color, now is the time to add it. Most water in the mountains is usually clear. Envirotex will creep up the banks and into the sands and pebbles. I was able to avoid this creep by pouring a very shallow layer and brushing it up to the waterline. After this hardened the following pours do not seem to creep up on the cured Envirotex. Let this cure for a couple of days.



If you are happy with a flat water river, then you are now done. However, to add sparkle and real depth to your river scene get some gloss medium from the art store or Hobby Lobby. This is a water-based white paste that dries very clear and has a nice shine. Apply it with a 1/4-inch flat brush to the surface of the water to add ripples, small waves and rapids. I used a dabbing technique after studying my river photos to get the effect I wanted. I also tried dry brushing with white paint to capture the bubbles generated by white water. The final effect of a good looking river is a band of trees and shrubs planted on the river banks. **I**