

Chapter 6

Color Management And Indexing

In Chapter 5 we looked at projects with two weave structures; design files were reduced to two colors, black and white, and the weaves assigned to these two areas. When more than two weaves will be used in a Photoshop file, we should look into color indexing as a way of managing the information.

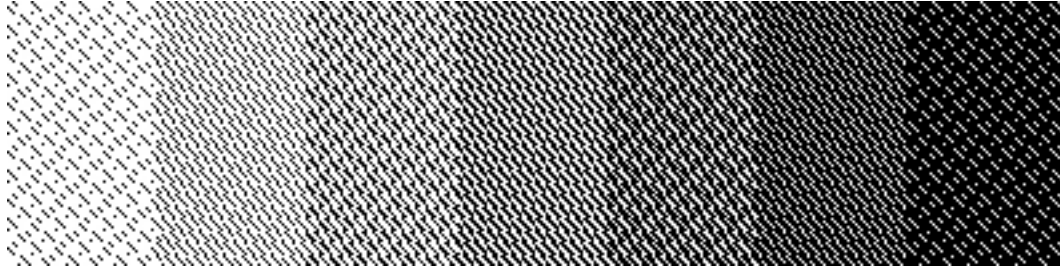
An RGB file may contain many thousands of colors; in order to group the pixels into manageable units for assignment of weaves, we must reduce the number of colors in the file. Even if we are using only black and white yarns, by judicious choices of weave structures we may develop a palette of many shades of gray, and we find it convenient to order the colors in our file to correspond to the number of weaves we will be using.

Working Backward from a Known Set of Weaves and Color Table

A first step would be to weave a color blanket with the yarn and sett exactly corresponding to those in the project, containing all the weaves we have chosen as suitable for the project. For instance, we might want to weave an image in the seven shades of gray possible in the shaded 8-end satin family. Figure 6-1 shows a typical image file for a blanket comprising seven shades of gray.



6-1



6-2

The same blanket with shaded satins (1/7 through 7/1) assigned is shown in Figure 6-2.

Other blankets might be woven for other sets of weaves; for instance, a group of compound satins with a single warp and several wefts might produce 20 or 30 different weaves and an extensive color palette with many hues and tones, and several different textures, not just a range of tonal values. Weaving a blanket of such weaves in a given yarn and sett is important in order to establish what the available palette really looks like and to determine a ballpark figure of the ppi.

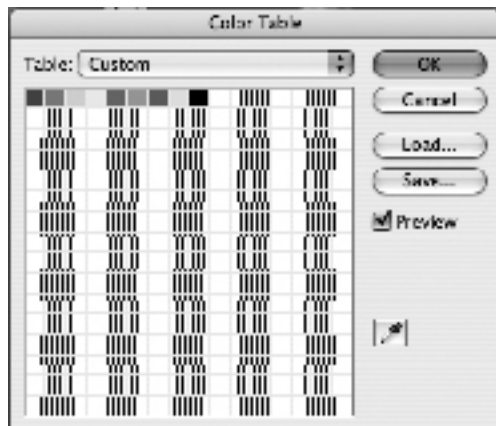
We would typically analyze the blanket and from it choose a subset of weaves for our project; for instance, we might choose a dark red square, a light red, medium green, pale green, medium blue, light blue, dark gray, light gray, and black, a total of nine weaves. We could then build a palette of these colors in Photoshop and save it as a Color Table. Here is one way to do this.

Note: Images can be found in color in the Chapter 6 folder of the CD.

Create a Color Table

Create a small temporary RGB file. Index it by going to **Image>Mode>Indexed Color**, then choose Palette: Local (Adaptive), Colors: 0, Forced: None, Transparency unchecked, Dither: None. Click OK.

If we go to **Image>Mode>Color Table**, we will see a table with no colors; all the squares are blank (gray). What we've done is create a small temporary color table which will be the starting point for the creation of a custom table. Color Tables are not available in RGB Mode; that is why we had to go to Indexed Color Mode.



6-3

Now with the Color Table window still open, click on the first square, and the Color Picker window will open. Using the various sliders and buttons, choose the first color, which will be a dark red, since we are imitating the colors in the weave blanket. (For more information on how to use the Color Picker, refer to the Help menu or to your Photoshop manual. The Color Picker in Mac and Windows is slightly different.) Still in the Color Table window, click on each square in turn, fill with a color, until all nine colors have been created. Then click on **Save** and give it a descriptive name; Photoshop will automatically assign the *.act* suffix, which indicates that it is a Color Table. It can be saved in any location. A good place to keep it would be in the Workfiles folder for a given project. At this point our Color Table looks like Figure 6-3.



6-4

We may also load the Color Table (.act) files into the Swatches palette, and use the same set of colors there. If the Swatches palette is not visible on screen, go to **Window>Swatches**. In the Swatches palette we have choices of view mode; access these choices through the little flyout triangle at the upper right of the palette. The choices are *Small Thumbnail*, *Large Thumbnail*, *Small List*, and *Large List*. Figures 6-4 and 6-5 show Large Thumbnail and Large List options.

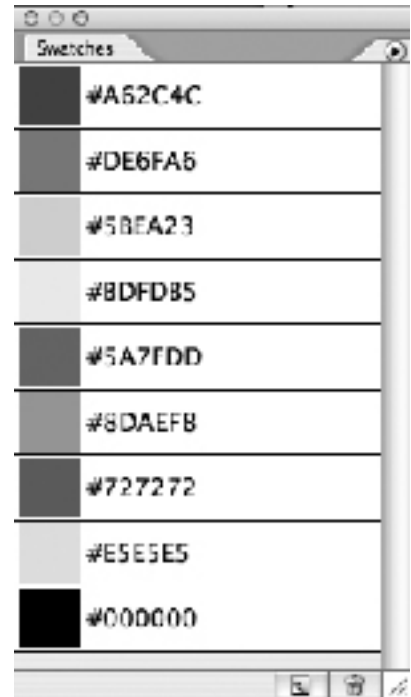
We may also give the swatches more descriptive names by double clicking on each item in the list and renaming it, as in Figure 6-6.

We may in turn save this renamed palette from the Swatches window, via the flyout triangle (**Save Swatches**). Palettes saved from the Swatches palette are automatically given the suffix of .aco. *Note that palettes with the .act suffix are interchangeable with palettes with the .aco suffix; that is, either type of palette may be opened from either the Color Table window or the Swatches palette.* Indexed files will only permit the use of colors in the file's associated Color Table. If you select a swatch from an RGB Swatch palette for an indexed image, the Swatch color will be modified to the closest index color in that file's Color Table. We will discuss more about Color Tables and Swatches later in this chapter.

Working Forward from an Image To a Color Table

Instead of working toward a known set of weaves and color palette, it might be that a particular image or design is the starting point for a project, and the palette is yet to be determined. Here is an example of how we might proceed. We will start with the image *FrangiCenter.psd*. The upper left corner of the image is shown in Figure 6-7 on the next page.

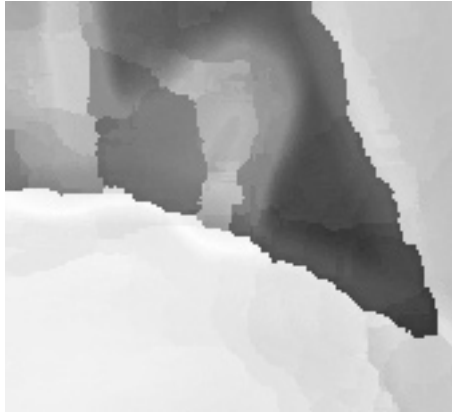
From this starting point we go to **Image>Mode>Indexed Color**, and in the Indexed Color Dialog Box, with Preview checked, we try out various options. There are several choices here, and you should explore them, but usually we use Local (Adaptive) for the Palette, and Forced: None (we are not using a predetermined Color Table this time). We like the look of this image when 10 is chosen as the number of colors. If we



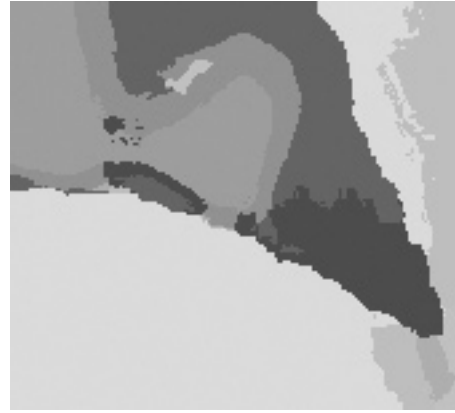
6-5



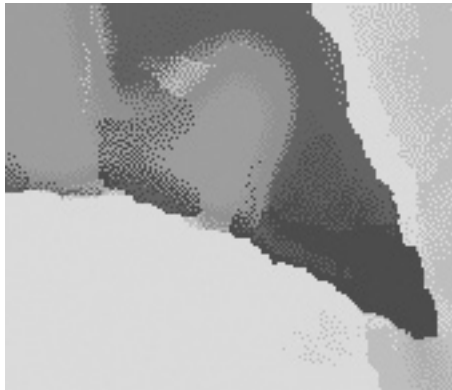
6-6



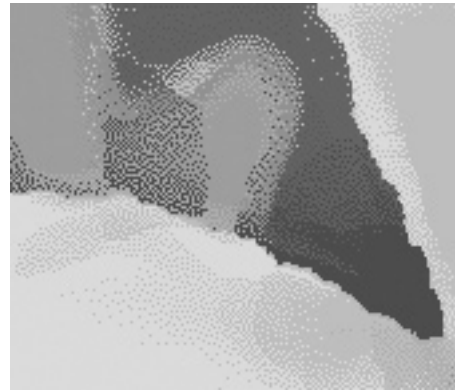
6-7 The original image



6-8 Indexed to 10 colors, no dithering



6-9 Indexed to 10 colors, 50% dithering



6-10 Indexed to 10 colors, 100% dithering

want large flat areas of color with a posterized effect, we choose *Dither: None*. If we want an extreme pixellated style of color blending with the 10-color palette, we choose *Dither: Diffusion*. When choosing dithering, we have the option of various amounts; try various settings, all the way from 0 (no dithering) to 100%, or maximum dithering. We may also experiment with the other dither settings of Pattern or Noise, although note that no percentage amounts are available with these options.

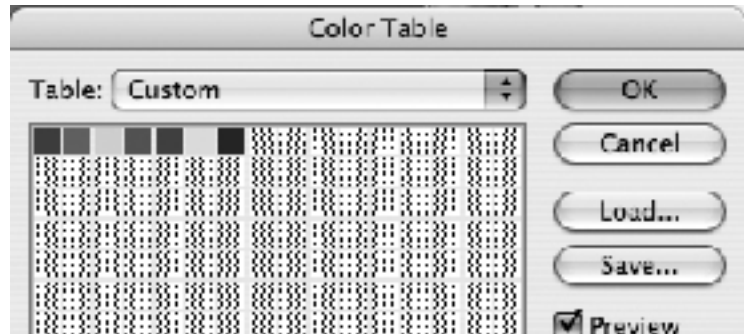
The original image, *FrangiCenter.psd*, is shown at Figure 6-7. For indexing and no dithering, see Figure 6-8. For indexing and 50% dithering, see Figure 6-9. For indexing and 100% dithering, see Figure 6-10. After the image is indexed, you can go to **Image>Mode>Color Table** and see the 10 colors. You can also save them as an .act for future use.

Reordering Colors in the Palette

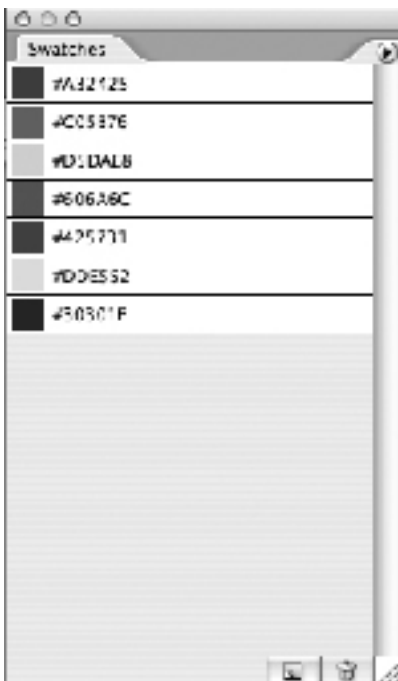
Sometimes it makes more sense to reorder the colors in a palette so that they conform to light/dark order, or ranking of hues, or some other scheme. It is possible to do this in Photoshop, although not as easy as one would like. Here is the way we do it.

Figure 6-11 shows a Color Table generated by indexing an RGB file to 7 colors. We would like to reorder the colors to this sequence: light gray, pink, red, lime green, medium green, dark green, black. First we save the table as *7colors.act*. Then we open it in the Swatches palette (Figure 6-12). *The Swatches Palette may be changed to the list view via the flyout triangle on the upper right corner of the palette.* We then decide which color will be the first in the list (the pale gray D5DAE8 in this case), drag it on top of the Create New Swatch icon at the bottom of the palette (the little turned-up page), which makes a copy of it, and give it a distinctive name Lt. gray). Notice that the original swatch is not eliminated—we have only created a duplicate. Do this with each swatch in turn in the order desired. The finished list now looks like (Figure 6-13).

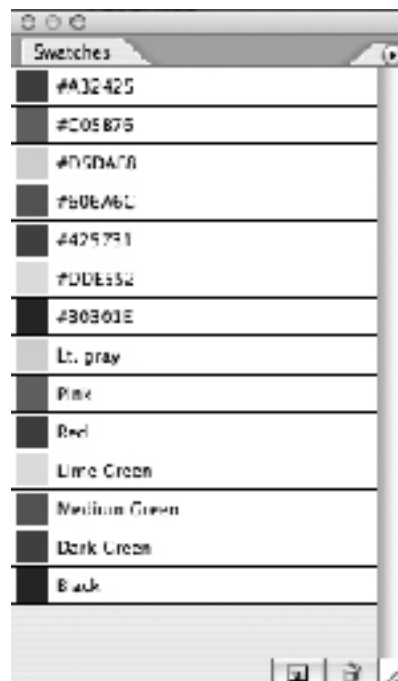
When we are sure all the original colors are duplicated, the final step is to delete the originals. Drag each original to the Trashcan icon at the bottom of the palette, or hold down the Option key and click on the swatch. You will see a scissors icon appear over the swatch, and then the swatch will disappear when you click on it. The Swatches palette now looks like Figure 6-14.



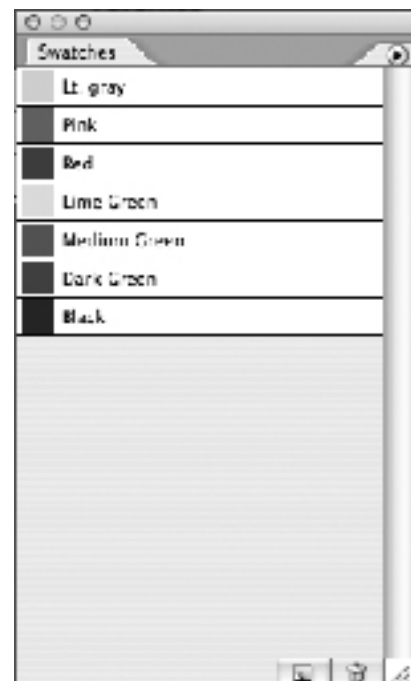
6-11



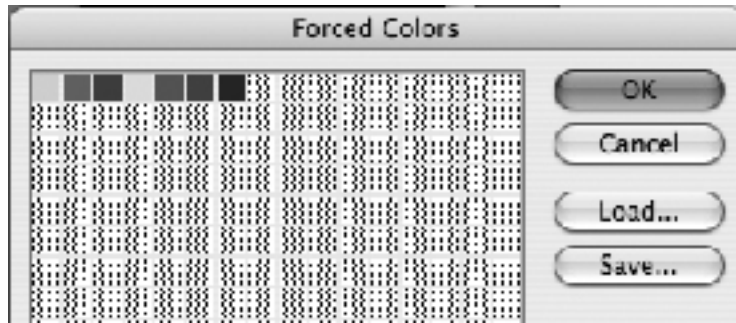
6-12



6-13



6-14



6-15

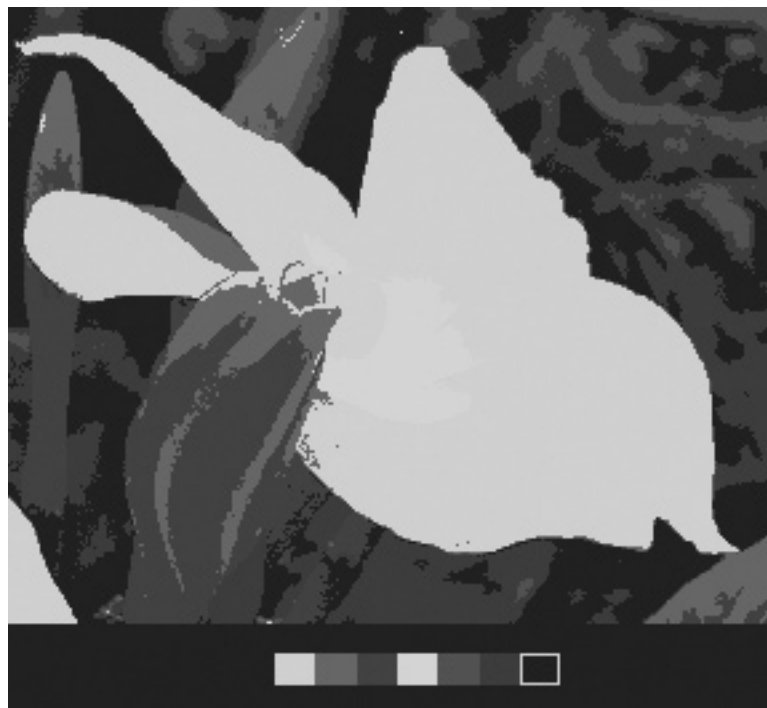
Save the palette as *7colorsReordered.aco*. It may now be loaded into either the Color Table window or the Swatches palette. Figure 6-15 illustrates our reorder palette loaded into the Color Table.

Note: if we load the reordered palette into the indexed file, the colors in the image will be reordered, too. Indexed colors are identified by their position in the table. If we change the color's

position (index number), then any motif filled with the index color of the original index position will take on the color that has been moved to that position. This is not what we want.

Instead, we go back to the original RGB file before indexing and **Image>Mode>Indexed Color**, Palette: Local (Adaptive), Colors: 7, *Forced: Custom*, Dither: None; we are then taken to the **Forced Colors** dialog box, where we click on **Load**, then navigate to *7colorsReordered.aco*, click OK. Our image is now indexed as it was the first time, but with the colors ordered the way we want them. Check the reordered Color Table (Figure 6-15) and compare it with the one in Figure 6-11.

Forced Colors tells Photoshop to use the colors of whatever palette we designate, and gives us back control of the color order in our palette.



6-16

Why Bother to Reorder Colors?

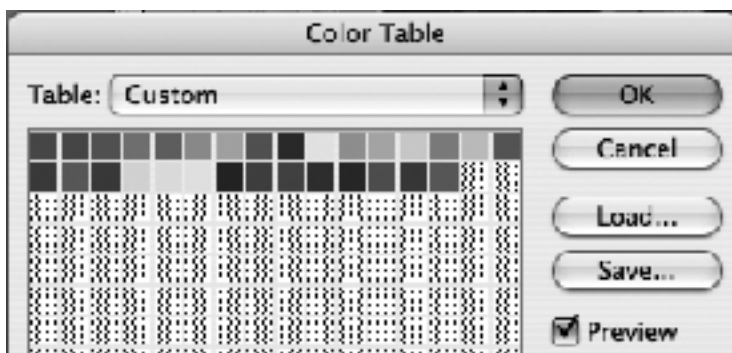
Why would we go to so much trouble to order the colors? Here is where a reordered palette is useful: at the very bottom of our indexed file we add a small border (by **Image>Canvas Size**), and within this border paint a small chip of each color in the file. We choose our colors in order from the Swatches palette, into which we have already loaded our reordered Color Table. We then convert the file to RGB. With the Magic Wand tool, (Tolerance 0, Anti-alias, Contiguous, and Sample All Layers all unchecked), Background layer highlighted, click on each chip in turn to identify all pixels in the image with that color, and to make separate layers for adding weaves.

Ordering colors in this way can help your decisions about the sequence of weaves to be used; ordering helps you remember which color will become which weave. The file with color chips is shown in Figure 6-16 at the bottom of the previous page.

Reducing Number of Colors in a Color Table

It is also possible to reduce the number of colors in a Color Table by combining two or more colors. This process is easier if the colors are first reordered as described in the previous section.

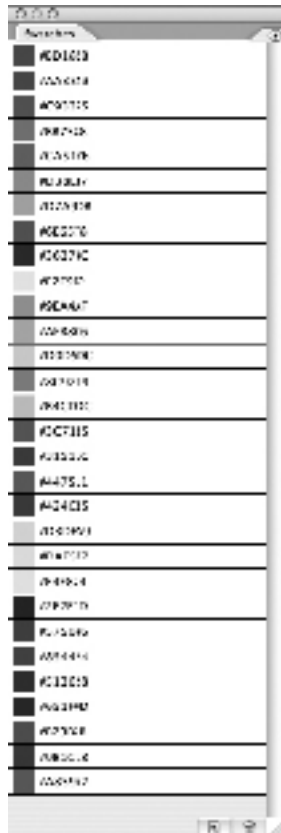
In Figures 6-17 and 6-18 we see an indexed image and its associated Color Table containing 30 colors. We would like to reduce it to 27 colors. There is instant feedback in the image, so we may observe changes as we make them, and undo unwanted changes on the spot.



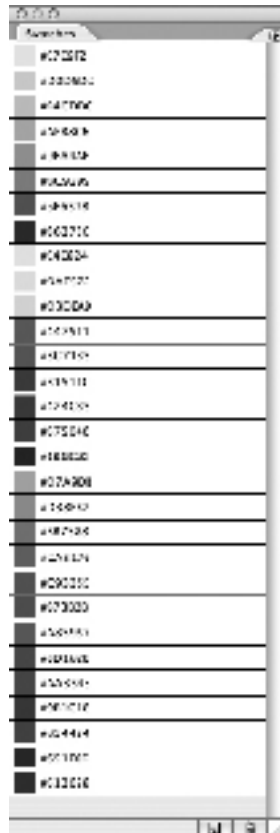
6-18



6-17



6-19



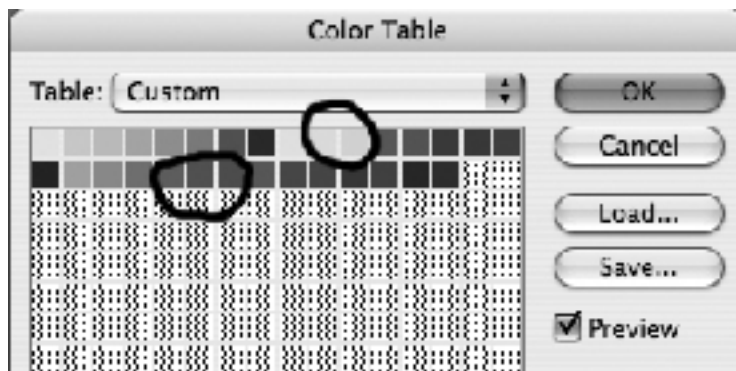
6-20

The Color Table is saved as *Frangi30.aco*, and is loaded into the Swatches palette. It looks like Figure 6-19.

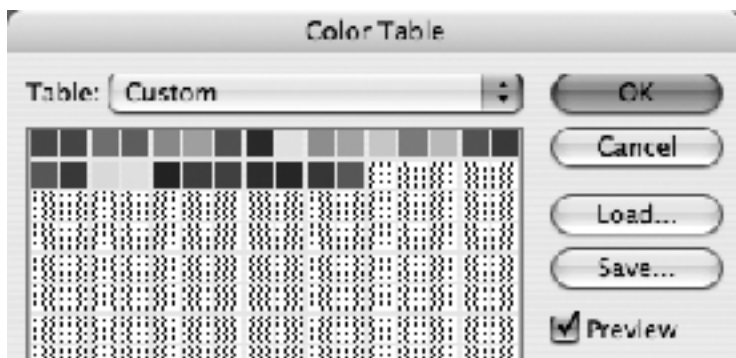
After reordering, so that families of color sit together, the Swatches palette looks like Figure 6-20. Save this palette as *Frangi30Reordered.aco*, reopen the original *FrangiColorful.psd* (before Indexing), then perform **Image>Indexed Color**, and choose Custom palette; navigate to the reordered palette, load it, click OK.

Choose **Image>Mode>Color Table**, and now with the Color Table window open, examine the colors and determine adjacent groups which may be combined (Figure 6-21). Drag the mouse pointer over a group, and in the resulting window, choose the color you would like to assign to all colors in the group (jot down the hexadecimal value of this color for reference), click OK.

In the next window, choose the same color by assigning the same hexadecimal value and click OK. Now all colors in the group are assigned the exact same identity. Repeat this process for any other groups of adjacent colors you would like to combine. You may combine any two or more adjacent colors. To achieve the actual reduction, convert the indexed file back to RGB, then index it again; be sure that this time *Forced: None* is chosen as an option. Note that the size of the Color Table is reduced by combining all duplicates (Figure 6-22). The colors may have to be reordered again as a final step. We reduced our Color Table by only three colors, but of course we could have reduced it much more.



6-21



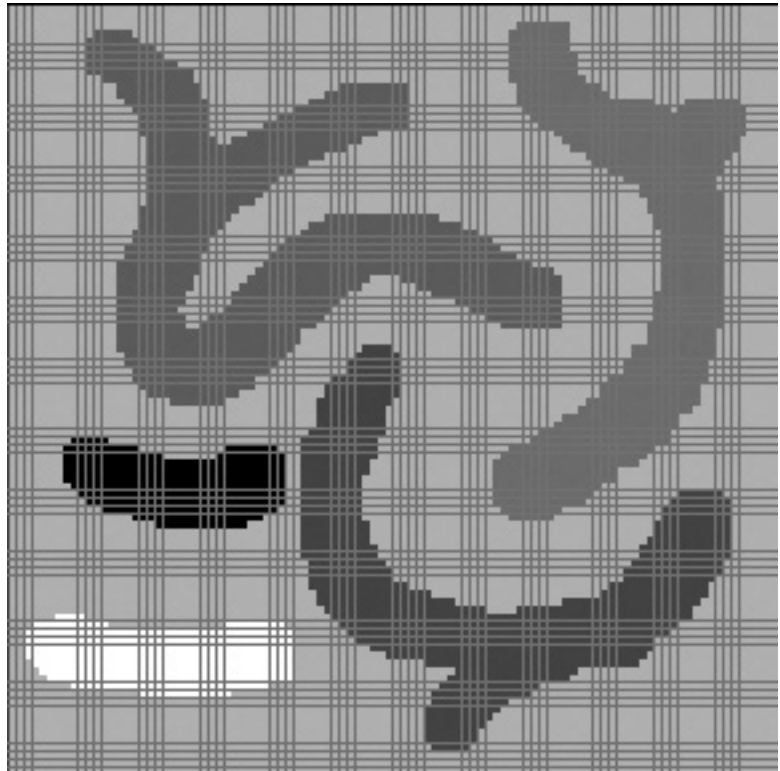
6-22

Painting with a Restricted Palette

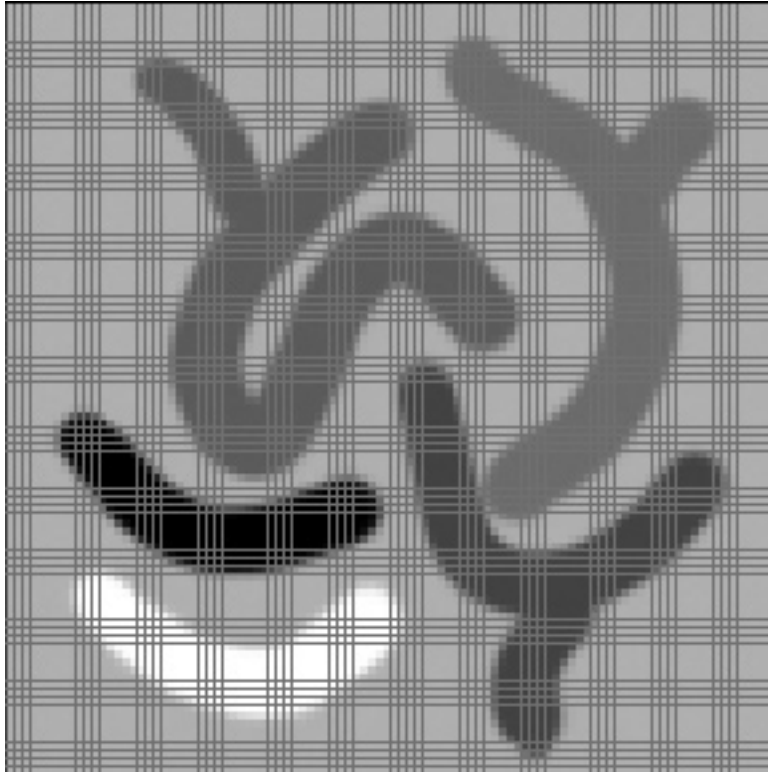
When we design directly in Photoshop with brushes (virtual painting), and wish to restrict our palette to a fixed number of colors, we start out with a new RGB file (**File>New**), then go to **Image>Mode>Indexed Color**, and in the Indexed Color dialog box choose Forced: None, Palette: Custom, then in the Color Table dialog choose Load, and load your desired palette. Click OK. Open the Swatches palette, load the same color palette, and click OK. Now we may paint with the Brush tool, choosing colors at will by clicking on the swatches in the Swatch palette, and our painting will contain only those colors in our chosen palette. There will be no anti-aliasing at the edges because we are in Index Mode. Text may be added as well with the chosen palette, but it will not be on a separate layer (Indexed Color mode does not permit layers).

The advantage of designing in Indexed mode is that we know immediately which pixels are assigned to a particular color and no further indexing or color management needs to be done. The disadvantage is that no layers are available in this mode, so design elements cannot be shifted, reordered, or further reworked. The file may be resized, but there will be a coarse blockiness if it is sized up, and unpredictable results if sized down. Weaves can be added as Fills in Indexed mode, but only if the structure has been saved as a Pattern while in Index mode and the Color Table of the indexed image file has the same black and white in it. This is tricky, so we recommend that you do the following. After designing in Indexed mode convert back to RGB, separate the colors into individual layers, then assign the weaves as Layer Styles. In that way, resizing may be done if necessary, to conform to changes in sett and Pixel Aspect Ratio, without having to redo the weave assignments.

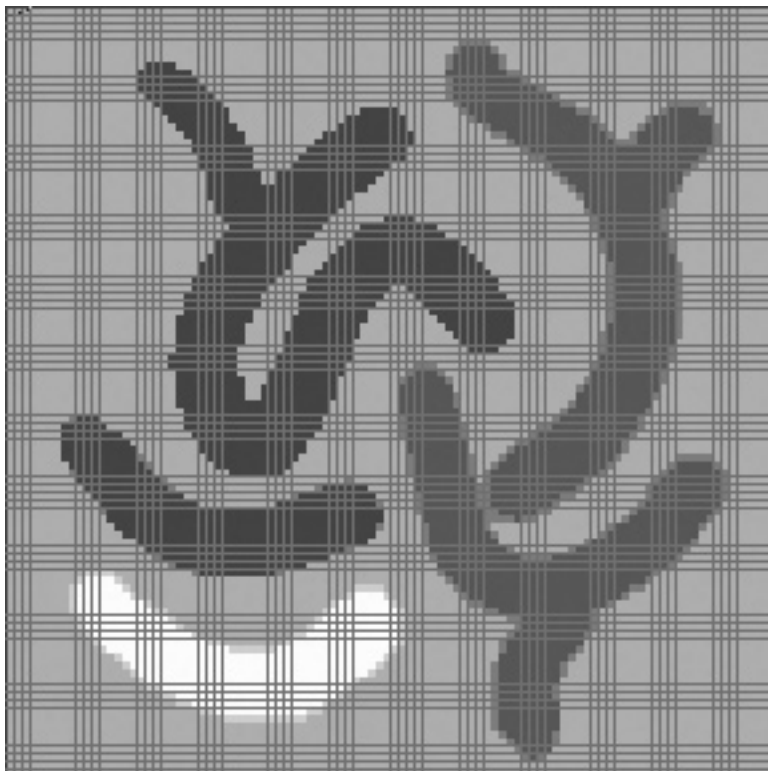
We drew the following small sketch in Indexed Color mode, using a Color Table of six colors: yellow, red, green, blue, black and white (see Figure 6-23). Note that the colors are distinct and blocky. If we had done a similar drawing in RGB mode, using six colors, it might have looked like (Figure 6-24), and after indexing to six colors it would look like (Figure 6-25), with the colors distributed in unpredictable places. Compare these two methods of drawing directly in Photoshop, and choose the one which suits your personal style.



6-23



6-24



6-25