Masks and Extractions

Masks are the most accurate selection mechanism available in Photoshop. Nothing against the marquee tools, the lassos, or the Magic Wand, but none of them can account for differences in focus levels. Masks, although blessed with all the benefits of these other selection tools, also address their various deficiencies. They not only can account for different levels of focus, but they also give you absolute control over the look of the edges, and they create selections every bit as natural as the image itself. In fact, a mask *is* the image itself.

Masks — unlike the other selection tools — use pixels to select pixels, and that is the core of their strength. By using masks, you can devote every one of Photoshop's other tools to the task of creating a selection.

Exactly what is a mask? A mask is a selection outline expressed as a grayscale image. The selected areas appear in white, and your deselected areas appear in black. Any shades of gray between these two extremes represent areas selected with an opacity of less than 100 percent.

Take a gander at Figure 4-1. The image to the left shows a selection outline delineated by Photoshop's traditional marching ants, softened with the feather command (Select ➪ Feather). These little insects only show you the gross area of the selection. The image on the right shows the same selection expressed as a mask. The selected area is white (*unmasked*) and the deselected area is black (*masked*). You can't see the feathering effect in the selection outline — marching ants can't accurately express softened edges — but in the equivalent mask it's completely visible.
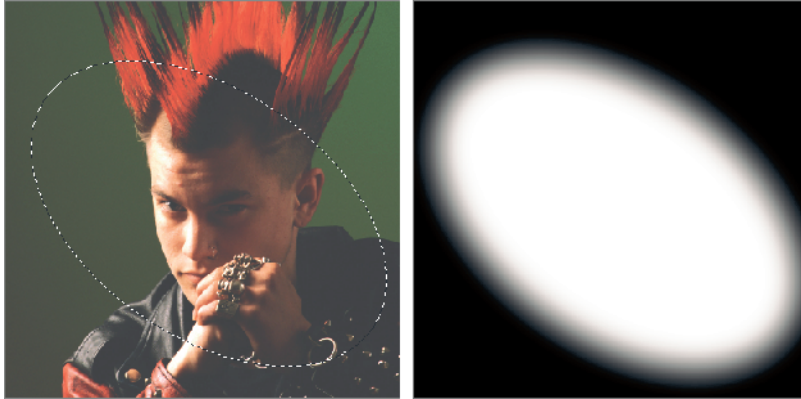
Figure 4-1: The outline of a feathered selection (left) and the physical mask itself (right).

Looking at the mask view on the right in Figure 4-1, you may wonder where the heck the image went. This perceived limitation is actually a plus. One of the strengths of masks is that you can view them independently of the image. You can also view them *with* the image, as seen in Figure 4-2.

Here, the mask is expressed as a color overlay. By default, Photoshop uses a translucent red, similar to the sheets of rubylith film you see in printing. Areas covered with the rubylith are masked (deselected); areas that appear normal — without any red tint — are unmasked (selected). When you return to the standard marching ants mode, any changes you make to your image affect only the unmasked areas.

Because a mask is essentially an independent grayscale image, you can edit the mask using paint and edit tools, filters, color correction options, and almost every other Photoshop function. You can even use the selection tools, including the Marquee, Lasso, and others. With all these features at your disposal, you can't help but create a more accurate selection outline in a shorter amount of time.

Figure 4-2: In Quick Mask Mode, you see how the mask actually affects the image.

Working in Quick Mask Mode

The most straightforward environment for creating a mask is the *Quick Mask Mode*. In the Quick Mask Mode, a selection is expressed as the rubylith overlay you saw in Figure 4-2. All deselected areas appear coated with red, and selected areas appear without the red coating. You can then edit the mask as desired and exit Quick Mask Mode to return to the standard selection outline. The Quick Mask Mode is — as its name implies — expeditious and convenient, with none of the trappings or permanence of more conventional masks.

How Quick Mask Mode works

Typically, you at least want to rough out a selection with the standard selection tools before entering the Quick Mask Mode. For example, at the top of Figure 4-3, the Pen tool was used to select a portion of the wolf's face, leaving holes in the selection for his eyes. The selection was then inverted by choosing Select ⇨ Inverse (Ctrl+Shift+I for Windows and ⌘-Shift-I for the Mac) so that the eyes and rest of the face were selected. After your selection mask is roughed in, you can concentrate on refining and modifying your selection inside the quick mask, rather than having to create the selection from scratch.

To enter the Quick Mask Mode, click the Quick Mask Mode icon in the Toolbox or press Q. You can see the red overlay covering the portions of the face that are masked off.

You can see that the selection outline disappears when you enter the Quick Mask Mode. The outline temporarily ceases to exist and any operations you apply affect the mask itself, leaving the underlying image untouched. When you click the marching ants mode icon (to the left of the Quick Mask Mode icon) or press Q a second time, Photoshop converts the mask back into a selection outline, enabling you to edit the image once again.

If you click the Quick Mask Mode icon and nothing changes on-screen, your computer isn't broken: you simply didn't select anything before you entered Quick Mask Mode. When nothing is selected, Photoshop makes the whole image open for editing. In other words, everything's selected. (Only a smattering of commands on the Edit, Layer, and Select menus require something to be selected before they work.) If everything is selected, the mask is white; therefore, the quick mask overlay is transparent and you don't see any difference on-screen.

In Quick Mask Mode, you can edit the mask in the following ways:

✦ **Subtracting from a selection:** Paint with black to add red coating and, thus, deselect areas of the image. You can selectively protect portions of your image by merely painting over them.
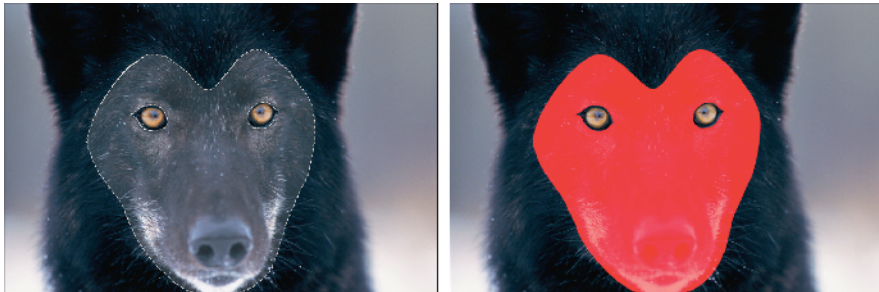

Figure 4-3: The marching ants-style selection (left) shows that the eyes and most of the head are selected. Clicking the Quick Mask Mode icon instructs Photoshop to express the selection temporarily as a rubylith overlay (right).

✦ **Adding to a selection:** Paint with white to remove red coating and, thus, add to the selection outline, as demonstrated in the top half of Figure 4-4. Assuming the background color is set to white, you can use the Eraser tool to whittle away at the masked area. Or you can swap the foreground and background colors so that you can paint in white with the Brush tool.
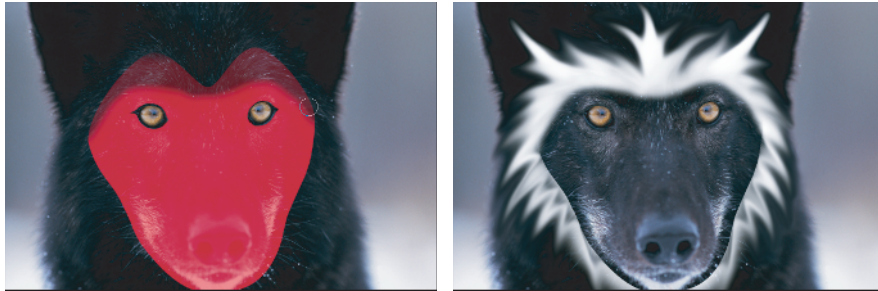
Figure 4-4: A soft-edged brush enlarges the selected area (left). In Quick Mask Mode, use the Brush and Smudge tools to accent a feature of your images, in this case, a wolf's face (right).

✦ **Adding feathered selections:** If you paint with a shade of gray, you add feathered selections. You also can feather an outline by painting with black or white combined with a soft brush shape, as shown in Figure 4-4. Here, we're painting in white with a soft-edged brush, adding a nice feathered edge to the top of the selection. Then, after reentering the world of the marching ants, a little painting and smudging creates the image on the bottom of the figure.

✦ **Cloning selection outlines:** If you have a selection outline that you want to repeat in several locations throughout the image, the quick mask is your friend. Select the transparent area with one of the standard selection tools, press and hold Ctrl+Alt (⌘-Option on the Mac), and drag it to a new location in the image, as shown in Figure 4-5. Although the Rectangular Marquee tool is used in the figure, the Magic Wand tool also works well for this purpose. To select an anti-aliased selection outline with the Wand tool, set the Tolerance value to about 10 and be sure the Anti-aliased check box is active before clicking inside the selection.

✦ **Transforming selection outlines:** You can scale or rotate a selection independently of the image, just as you can with the Transform Selection command. Enter the Quick Mask Mode, select the mask using one of the standard selection tools, and choose Edit ⇨ Free Transform or press Ctrl+T (⌘-T on the Mac). See Chapter 5 for more information on Free Transform and related commands.

These are only a few of the unique effects you can achieve by editing a selection in the Quick Mask Mode. Others involve tools and capabilities not yet discussed, such as filters and color corrections. We'll see how a few of these more advanced techniques work later in this chapter.

After you finish editing your selection outlines, click the Standard mode icon (to the left of the Quick Mask Mode icon) or press Q again to return to the marching ants mode. Your selection outlines again appear flanked by marching ants, and all tools and commands return to their normal image-editing functions.

The Quick Mask Mode offers a splendid environment for feathering one selection outline, while leaving another hard-edged or anti-aliased. Granted, because most selection tools offer built-in feathering options, you can accomplish this task without resorting to the Quick Mask Mode. But the Quick Mask Mode enables you to change feathering selectively after drawing selection outlines — something you can't accomplish with Select ⇨ Feather. The Quick Mask Mode also enables you to see exactly how your actions affect the selection — which is something the marching ants aren't capable of.
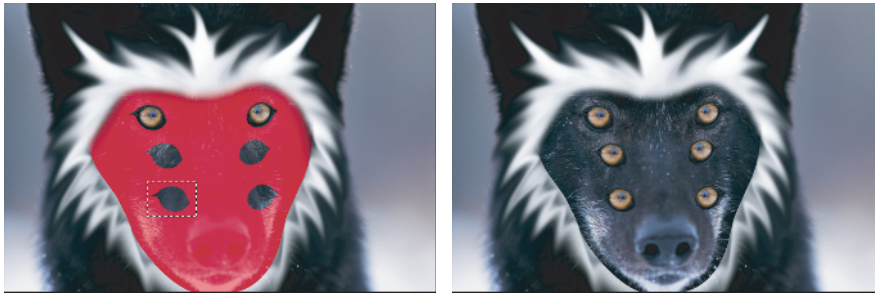

Figure 4-5: To clone a selection, marquee-drag around it, press Ctrl+Alt (⌘-Option on the Mac) (left) and drag it into a new position relative to the original selection (right).

Changing the red coating

By default, the protected region of an image appears in translucent red in the Quick Mask Mode, but if your image contains a lot of red, the mask can be difficult to see. Luckily, you can change it to any color and any degree of opacity that you like. To do so, double-click the quick mask icon in the Toolbox (or double-click the *Quick Mask* channel in the Channels palette) to display the dialog box shown in Figure 4-6. The Quick Mask Options dialog box has the following options:

✦ **Color Indicates:** Choose Selected Areas to reverse the color coating so that the translucent red coating covers selected areas, and deselected areas appear normally. Choose Masked Areas (the default setting) to cover deselected areas in color.

You can reverse the color coating without ever entering the Quick Mask Options dialog box. Simply Alt-click (Win) or Option-click (Mac) the quick mask icon in the Toolbox to toggle between coating the masked or selected portions of the image. The icon itself changes to reflect your choice.
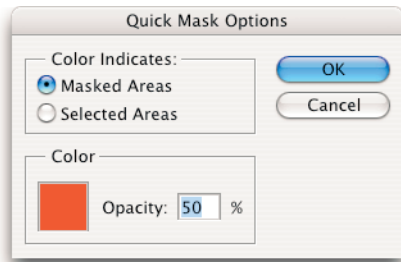
Figure 4-6: The Quick Mask Options dialog box lets you change the color and opacity of the protected or selected areas when you view it in the Quick Mask Mode.

✦ **Color:** Click the Color icon to display the Color Picker dialog box and select a different color coating. You can lift a color with the eyedropper after the Color Picker dialog box comes up; just keep in mind that you probably want to use a color that isn't in the image so that you can better see the mask.

✦ **Opacity:** Enter a value to change the opacity of the translucent color that coats the image. A value of 100 percent naturally makes the coating absolutely opaque.

You can also change the color coating to suit your needs. Typically, you want a balance between viewing and editing your selection and viewing your image. But you may have other motivations. Case in point, Photoshop's default settings — which work just fine for most people in daily usage — do not translate well when printed here as screenshots of the interface. So, before shooting the screens featured in Figures 4-3 through 4-5, I actually had to raise the Opacity value to 65 percent.

Gradations as masks

If you think that the Feather command is a hot tool for creating softened selection outlines, wait until you get a load of gradations in the Quick Mask Mode. There's no better way to create fading effects than by selecting an image with the Gradient tool.

Fading an image

Here the goal is to show you how to create a gradient mask to fade part of an image into nothingness. Figure 4-7 shows a handy biology class skeleton on the left, which will fade in from the ground up onto the stormy plain over on the right. To do this, follow these steps:

1. **Switch to the Quick Mask Mode by pressing Q.**

2. **Create a linear gradation.** Use the Gradient tool (which you can get by pressing the G key) to draw a linear gradation from black to white. The white portion of the gradation represents the area you want to select. To select the top portion of the skeleton, draw the gradation from just below the ankle to just below the knee, as shown in the first example in Figure 4-8.

Figure 4-7: In this section, a linear gradient is used in Quick Mask Mode to make the skeleton (left) rise from the stormy plain (right).
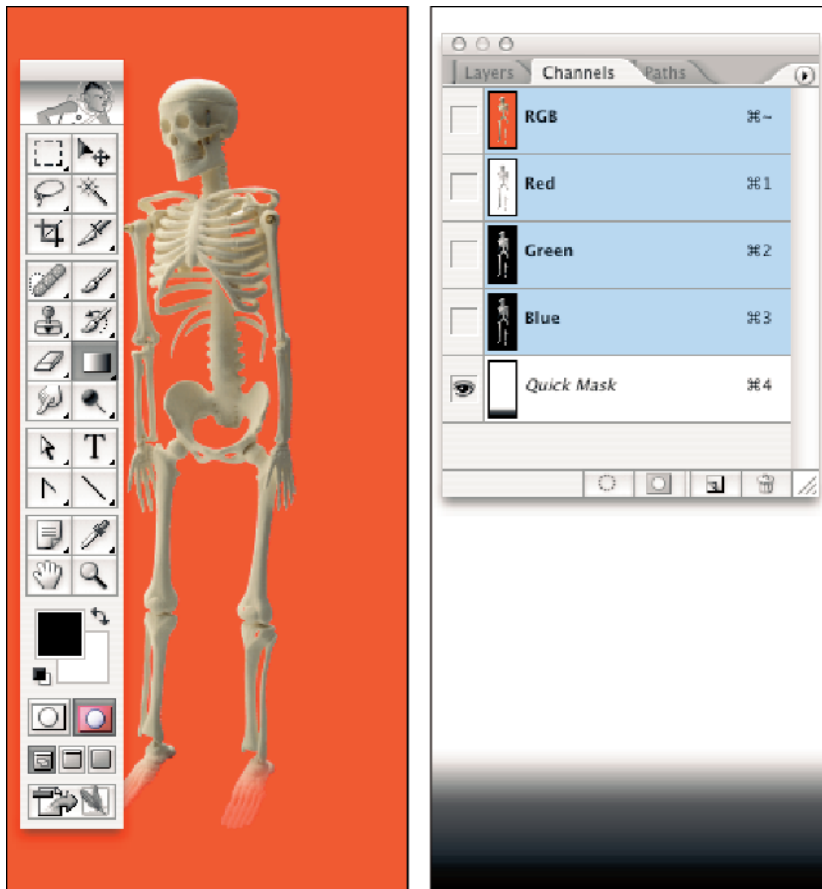
Figure 4-8: After drawing a linear gradation in the Quick Mask Mode over the bottom of the image (left), hide the image and apply the Add Noise filter with an Amount of 10 (right).

3. **Eliminate the banding effect.** Banding can be a problem when you use a gradation as a mask. To eliminate the banding effect, apply Filter ⇨ Noise ⇨ Add Noise at a low setting one or more times. To create the example on the right in Figure 4-8, the Add Noise filter is applied using an Amount value of 10 percent and the Uniform distribution setting.

In the example on the right in Figure 4-8, the image is hidden so that only the gradient mask is visible. As the figure shows, the Channels palette lists the *Quick Mask* item in italics. This is because Photoshop regards the quick mask as a temporary channel. You can hide the image and view the gradient mask in black and white by clicking the eyeball in front of the color composite view, in this case RGB. Or just press the tilde key (~) to hide the image. Press tilde again to view gradient mask and image together.

4. **Apply the gradation as a selection.** To do this, return to the marching ants mode by again pressing Q. Then Ctrl-drag (⌘-drag on the Mac) the selected portion of the mask and drop it onto the stormy plain, as seen in Figure 4-9.

5. **Tweak to your heart's content.** For example, not content with just that, I pressed Ctrl+T (⌘-T) to enter the free transform mode. Then I scaled and distorted the image by Ctrl-dragging (⌘-dragging) the corner handles (see Chapter 5). I also enhanced the skeleton by adding an outer glow, and then brought in five little unfaded copies of the skeleton to stand in awe before the big guy.
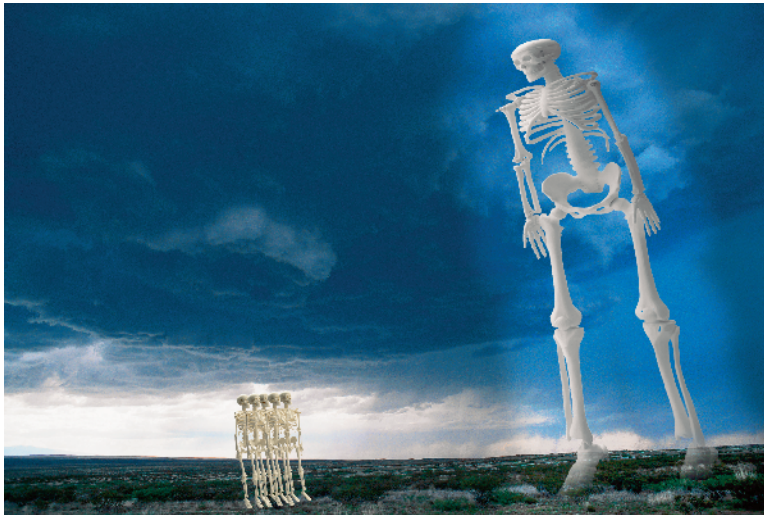

Figure 4-9: Select the upper portion of the skeleton using a gradient mask and then Ctrl-drag (⌘-dragging on the Mac) and drop the selection onto the plain. More tweaking creates a rather Bergmanesque tableau.

Applying special effects gradually

You also can use gradations in the Quick Mask Mode to fade the outcomes of filters and other automated special effects. For example, to the following steps show you how to apply a filter around the edges of the image that appears in Figure 4-10:

1. **Deselect everything in the image.** You do this by pressing Ctrl+D (⌘-D on the Mac) and switching to the Quick Mask Mode.

2. **Select the Gradient tool and select the linear gradient style icon in the Options bar.** You also want to select the Foreground to Transparent gradient from the Gradient drop-down palette and turn on the Transparency check box in the Options bar.

Figure 4-10: This time around, you'll surround the foreground image with a gradual filtering effect.

3. **Make the foreground black.** Press D to make the foreground color black.

4. **Create a series of short gradations.** Drag with the Gradient tool from each of the four corners of the image inward to create a series of short gradations that trace around the focal point of the image, as shown in Figure 4-11. (As you can see, the image is hidden so that you see the mask in black and white.) Because the Foreground to Transparent option is selected, Photoshop adds each gradation to the previous gradation.

5. **Jumble the pixels in the mask.** You do this by applying Filter ⇨ Noise ⇨ Add Noise with an Amount value of 10 percent.

What if you want to select the outside of the image, not the inside? You need the edges to appear white and the inside to appear black, the opposite of what you see in Figure 4-11. No problem. All you do is press Ctrl+I (⌘-I on the Mac) to invert the image. Inverting inside the Quick Mask Mode produces the same effect as applying Select ⇨ Inverse to a selection.

6. **Create an atmospheric effect.** Switch back to the marching ants mode by again pressing Q. Next, to get the atmospheric effect you see at the top of Figure 4-12, choose Filter ⇨ Render ⇨ Difference Clouds — with the foreground and background colors set to shades of green and yellow.
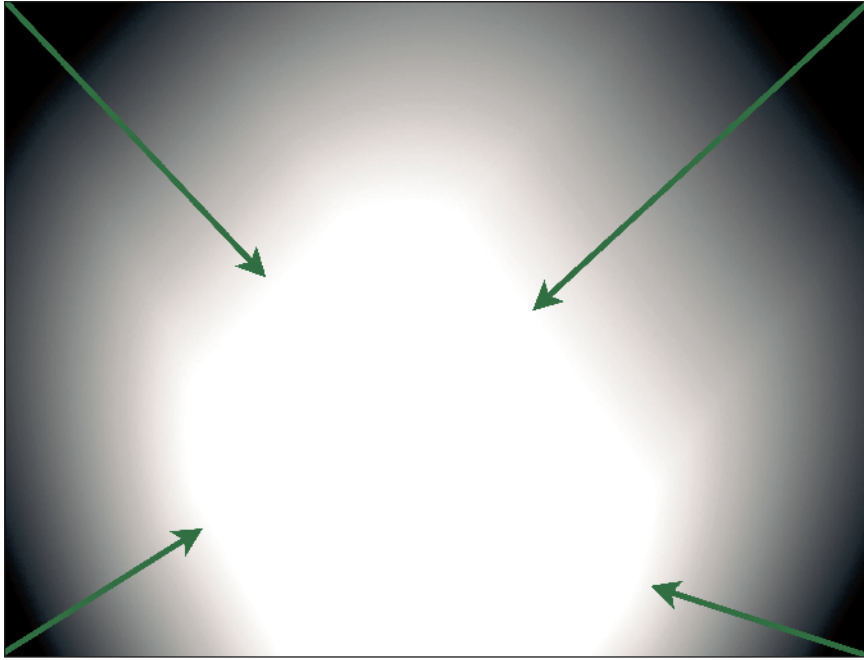
Figure 4-11: Inside the Quick Mask Mode, drag from each of the four corners with the Gradient tool (green arrows) and apply the Add Noise filter (in this example, set to 10 percent) to create your special effect.

The corners of the mask used in Figure 4-12 are soft and rounded, but you can achieve all kinds of corner effects with the Gradient tool. For harsher corners, select the Foreground to Background gradient and select Lighten from the Mode pop-up menu in the Options bar. For some *really* unusual corner treatments, try out the Difference and Exclusion brush modes.
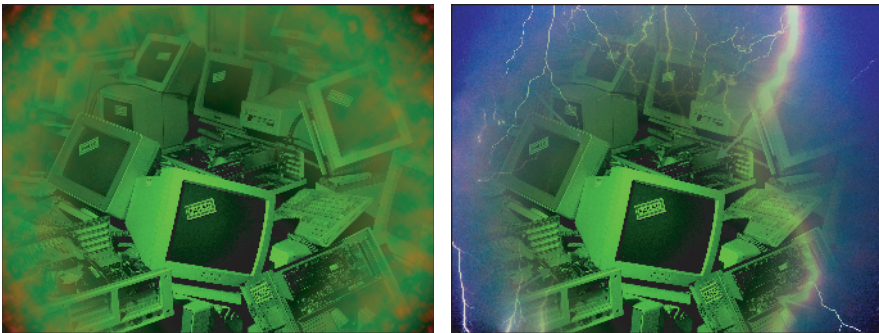

Figure 4-12: The Difference Clouds effect creates the green haze (left). I've added lightening bolts from another image to a new layer, and used the selection to remove its center (right). The new layer's opacity is 50 percent.

Generating Masks Automatically

In addition to the Quick Mask Mode and selection masking, Photoshop offers several tools that automate the masking process — or at least, automate *some* parts of the process. You still need to provide some input to tell the program exactly what you're trying to mask. Three of these tools — the Magic Eraser, Background Eraser, and Extract command — employ basic masking theory, but they do it in such a way as to hide the unpleasant details from you, the user. And rather than selecting pixels, these tools delete them. These three tools are given an in-depth workout in the standard edition of the *Photoshop CS2 Bible.* For this full-color version of the *Bible,* I'd like to demonstrate Photoshop's other automatic masker, the Color Range command. Color Range generates selection outlines based on the colors inside the image. Sound like the Magic Wand tool to you? Prepare yourself for something much, much better.

Using the Color Range command

Located on the Select menu, the Color Range command generates selections based on color ranges. You use the familiar eyedropper cursor to specify colors that should be considered for selection and colors that you want to rule out. In truth, the Color Range command is a lot like the Magic Wand tool, except that you can select colors with more precision and change the tolerance of the selection on the fly.

When you choose Select ➪ Color Range, Photoshop displays the Color Range dialog box shown in Figure 4-13. Like the Magic Wand with the Contiguous option turned off, Color Range selects areas of related color all across the image, whether or not the colors are immediate neighbors. Using the three eyedroppers, click in the image window to select colors, add to a color selection, and subtract from a color selection, just as you do with the Magic Wand — the difference being that rather than adjusting a Tolerance value *before* you use the tool, you adjust a Fuzziness option *anytime* you like. Photoshop dynamically updates the selection according to the new value. The advantage here is pretty obvious.

When you move your cursor outside the Color Range dialog box, it changes to an eyedropper. Use it to click anywhere within your image to specify the color on which you want to base the selection, or click inside the preview, labeled in Figure 4-13. In either case, the preview updates to show the resulting mask.

You can also do the following:

✦ **Add colors to the selection:** To add base colors to the selection, select the Add Color tool inside the Color Range dialog box and click inside the image window or preview. You can access the tool while the standard eyedropper is selected by Shift-clicking (just as you Shift-click with the Magic Wand to add colors to a selection).
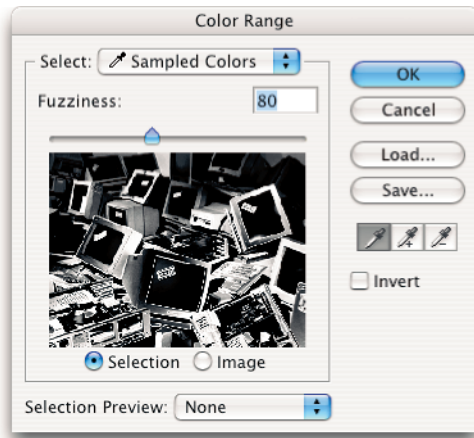
Figure 4-13: The Color Range dialog box enables you to generate a mask by dragging with the eyedropper tools and adjusting the Fuzziness option.

You can Shift-drag with the eyedropper to add multiple colors in a single pass, something you can't do with the magic wand.

✦ **Remove colors from the selection:** To remove base colors from the selection, click with the Remove Color tool or Alt-click (Option-click on the Mac) with the eyedropper. You can also drag or Alt-drag (Option-drag on the Mac) to remove many colors at a time.

The Undo command works inside the Color Range dialog box as well as out of it. If adding or removing a color sends your selection careening in the wrong direction, simply press Ctrl+Z (⌘-Z on the Mac) to correct the mistake.

✦ **Adjust the Fuzziness value:** This option resembles the magic wand's Tolerance value because it determines the range of colors to be selected beyond the ones on which you click. Raise the Fuzziness value to expand the selected area; lower the value to contract the selection. A value of 0 selects the clicked color only. Unlike changes to Tolerance, however, changing the Fuzziness value adjusts the selection on the fly; no repeat clicking is required, as it is with the Magic Wand tool.

Fuzziness and Tolerance also differ in the kind of selection outlines they generate. Tolerance entirely selects all colors within the specified range and adds anti-aliased edges. If the selection were a mask, most of it would be white with a few gray pixels around the perimeter. By contrast, Fuzziness entirely selects only the colors on which you click and Shift-click, and it partially selects the other colors in the range. That's why most of the mask is expressed in shades of gray. The light grays in the mask represent the most similar colors; the dark

grays represent the least similar pixels that still fall within the Fuzziness range. The result is a tapering, gradual selection, much more likely to produce natural results.

✦ **Reverse the selection:** Sometimes it's easier to isolate the area you don't want to select than the area you do want to select. In which case, just select the Invert check box to reverse the selection, changing black to white and white to black.

✦ **Toggle the preview area:** Use the two radio buttons below the preview area to control the preview's contents. If you select the first option, Selection, you see the mask that will be generated when you press Enter or Return. If you select Image, the preview shows the image.

Press and hold Ctrl (Win) or ⌘ (Mac) to toggle between the two previews. You might prefer to leave the option set to Selection and press Ctrl or ⌘ when you want to view the image.

✦ **Preview the selection in the image window:** The Selection Preview pop-up menu at the bottom of the dialog box enables you to change what you see in the image window. Leave the option set to None — the default setting — to view the image normally in the image window. Select Grayscale to see the mask on its own. Select Quick Mask to see the mask and image together. Select Black Matte or White Matte to see what the selection would look like against a black or white background.

Although they may sound weird, the Matte options enable you to get an accurate picture of how the selected image will mesh with a different background. Figure 4-14 shows an original image at the top left with the grayscale mask on the right. The two additional Matte views help you see how this particular selection looks against two backgrounds as different as night and day. Use the Fuzziness option in combination with Black Matte or White Matte to come up with a softness setting that will ensure a smooth transition.

✦ **Select by predefined colors:** Choose an option from the Select pop-up menu at the top of the dialog box to specify the means of selecting a base color. If you choose any option besides Sampled Colors, the Fuzziness option and eyedropper tools become dimmed to show they are no longer operable. Instead, Photoshop selects colors based on their relationship to a predefined color. For example, if you select Red, the program entirely selects red and partially selects other colors based on the amount of red they contain. Colors composed exclusively of blue and green are not selected.

The most useful option in this pop-up menu is Out of Gamut, which selects all the colors in an RGB or Lab image that fall outside the CMYK color space. You can use this option to select and modify the out-of-gamut colors before converting an image to CMYK.

✦ **Load and save settings:** Click the Save button to save the current settings to disk. Click Load to open a saved settings file. To use a settings file on a PC, it must end in the extension .*axt.*
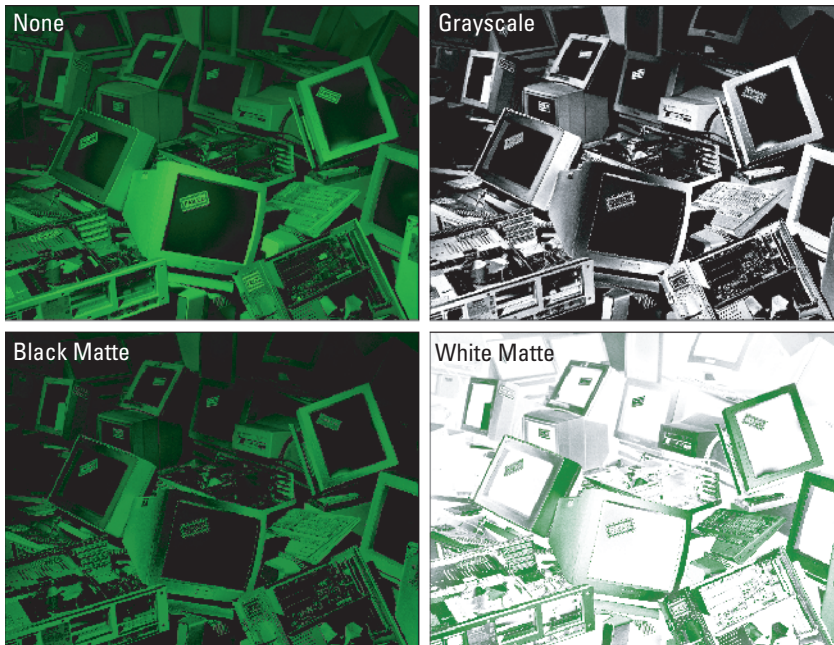
Selection Preview

Figure 4-14: The options in the Selection Preview pop-up menu change the way the Color Range command previews the selection in the image window.

After you define the mask to your satisfaction, click OK or press Enter or Return to generate the selection outline. Although the Color Range command is more flexible than the Magic Wand, you can no more expect it to generate perfect selections than any other automated tool. After Photoshop draws the selection outline, therefore, you'll probably want to switch to Quick Mask Mode and paint and edit the mask to taste.

If you learn nothing else about the Color Range dialog box, at least learn to use the Fuzziness option and the eyedropper tools. Basically, you can approach these options in two ways. If you want to create a diffused selection with gradual edges, set the Fuzziness option to a high value — 60 or more — and click and Shift-click two or three times with the eyedropper. To create a more precise selection, enter a Fuzziness of 40 or lower and Shift-drag and Alt-drag (Option-drag on the Mac) with the eyedropper until you get the exact colors you want.

A few helpful Color Range hints

To help you make better use of the Color Range dialog box, check out these hints, based on experience with this feature's strengths and weaknesses. You'll no doubt come up with some do's and don'ts of your own, but this list will get you started:

✦ **Limit the Portions of an Image:** You can limit the portion of an image that Select ⇨ Color Range affects by selecting part of the image before choosing the command. When a selection exists, the Color Range command masks only those pixels that fall inside it. Even the preview area reflects your selection.

✦ **Add or Subtract from your selection:** You also can add or subtract from an existing selection using the Color Range command. Press Shift when choosing Select ⇨ Color Range to add to a selection. Press Alt (Win) or Option (Mac) when choosing Color Range to subtract from a selection.

✦ **When you need to start over:** If you get hopelessly lost when creating your selection and you can't figure out what to select and what to deselect, click with the Eyedropper tool to start over. This clears all the colors from the selection except the one you click. Or you can press Alt (Option on the Mac) to change the Cancel button to a Reset button, which returns the settings inside the dialog box to those in force when you first chose Select ⇨ Color Range.

Creating an Independent Mask Channel

Masks generated via the Quick Mask Mode and Color Range command are temporary. After you let go of the selection, they're gone. Sometimes, this isn't a problem — you're only using the selection once, so what do you care? Other times, however, a selection is as much a work of art as the image you create with it is. You may need to work on it in stages; take a break, and come back to it when your brain isn't fried. The simplest solution is to back up your selection, save your file, and move on. In fact, anytime that you spend 15 minutes or more on a selection, you should save it.

Saving a selection outline to a mask channel

The following steps describe how to back up a selection to an independent mask channel, which is any channel above and beyond those required to represent a grayscale or color image. Mask channels are saved along with the image itself, making them a safe and sturdy solution.

STEPS: Transferring a Selection to an Independent Channel

1. **Convert the selection to a mask channel.** One way to do this is to choose Select ⇨ Save Selection, or right-click (Control-click on the Mac) in the image window and choose Save Selection from the shortcut menu, which saves the

selection as a mask. The dialog box shown in Figure 4-15 appears, asking where you want to put the mask. In most cases, you'll want to save the mask to a separate channel inside the current image. To do so, make sure that the name of the current image appears in the Document pop-up menu. Then select New from the Channel pop-up menu, enter any name for the channel that you like, and press Enter or Return. You can then either replace an old channel, or save the mask to a new channel. Regardless of the method you choose, your selection outline remains intact.

✦ **Replace an old channel:** If you have an old channel you want to replace, select the channel's name from the Channel pop-up menu. The radio buttons at the bottom of the dialog box become available, enabling you to add the mask to the channel, subtract it, or intersect it. These radio buttons work like the equivalent options that appear when you make a path into a selection outline, but they blend the masks together, instead. The result is the same as if you were adding, subtracting, or intersecting selection outlines, except it's expressed as a mask.

✦ **Save to a new channel:** Alternatively, you can save the mask to a new multichannel document all its own. To do this, choose New from the Document pop-up menu and press Enter or Return.

If you only want to save the selection to a new channel and be done with it, just click the make new channel icon at the bottom of the Channels palette (labeled in Figure 4-15). Photoshop automatically creates a new channel, converts the selection to a mask, and places the mask in the channel.

2. **View the mask in the Channels palette.** To do so, click the appropriate channel name in the Channels palette—automatically named *Alpha 1* unless you assigned a name of your own. In Figure 4-15, the contents of a channel called Existing Selection were replaced, so this is where my mask now resides.

This step is not mandatory. It's been included because it lets you see the mask and familiarize yourself with how masks look. Remember, white represents a selection, black is deselected, and gray is partial selected.

If you didn't name your mask in Step 1 and you want to name it now, double-click the Alpha 1 name in the Channels palette and type a new name.

3. **Return to the standard image-editing mode by clicking the first channel name in the Channels palette.** Better yet, press Ctrl+1 (⌘-1 on the Mac) if you're editing a grayscale image, or Ctrl+tilde (⌘-tilde on the Mac) if the image is in color.
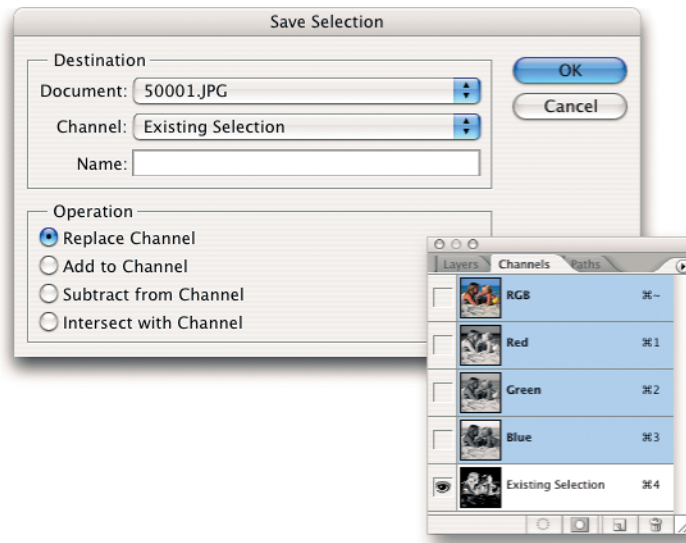
Figure 4-15: The Save Selection dialog box enables you to convert your selection outline to a mask and save it to a new or existing channel.

4. **Save the image to disk to store the selection permanently as part of the file.** A handful of formats — PICT, Pixar, PNG, TIFF, Targa, PDF, and native Photoshop — accommodate RGB images with an extra mask channel. But only TIFF, PDF, and the native Photoshop format can handle more than four channels, each format saving up to 56 channels in all. You might find that you prefer the TIFF format with LZW compression when saving images with masks. Because TIFF supports layers, you aren't restricted to the Photoshop format for multilayered images with masks.

Both the native Photoshop format and TIFF can compress masks so that they take up substantially less room on disk. The Photoshop format does this automatically, and you can save a TIFF image using LZW compression without fear. In both cases, this run-line compression is entirely safe. It does not change a single pixel in the image; it merely writes the code in a more efficient manner.

You can also save a quick mask to its own channel for later use. When you enter the Quick Mask Mode, the Channels palette displays an item called *Quick Mask*. The italic letters show the channel is temporary and will not be saved with the image. To clone it to a permanent channel, drag the *Quick Mask* item onto the new channel icon at the bottom of the Channels palette. Now save the image to the TIFF or Photoshop format, and you're backed up.

Converting a mask to a selection

Choose Select ⇨ Load Selection to retrieve your selection later. A nearly identical dialog box to that shown earlier in Figure 4-15 appears, except for the addition of an Invert check box. Select the document and channel that contain the mask you want to use. You can add it to, subtract it from, or intersect it with a currently active selection. Select the Invert option if you want to reverse the selected and dese- lected portions of the mask.

Want to avoid the Load Selection command? Ctrl-click (Win) or ⌘-click (Mac) the channel name in the Channels palette that contains the mask you want to use. For example, if you Ctrl-click the Existing Selection item in Figure 4-15, Photoshop loads the equivalent selection outline into the image window.

But wait, there's more:

✦ You can press Ctrl+Alt (⌘-Option on the Mac) plus the channel number to convert the channel to a selection. For example, Ctrl+Alt+4 would convert the Existing Selection channel shown in Figure 4-15.

✦ You can also select the channel and click the far-left mask selection icon at the bottom of the Channels palette.

✦ To add a mask to the current selection outline, Ctrl+Shift-click (⌘-Shift-click on the Mac) the channel name in the Channels palette.

✦ Ctrl+Alt-click (⌘-Option-click on the Mac) a channel name to subtract the mask from the selection.

✦ And Ctrl+Shift+Alt-click (⌘-Shift-Option-click on the Mac) to find the intersection.

You can also convert color channels or mask channels to selections. For example, if you want to select the black pixels in a piece of scanned line art in grayscale mode, Ctrl-click (Win) or ⌘-click (Mac) the first item in the Channels palette. This selects the white pixels; press Ctrl+Shift+I (⌘-Shift-I on the Mac) or choose Select ⇨ Inverse to reverse the selection to the black pixels.

Viewing mask and image

Photoshop enables you to view any mask channel along with an image, just as you can view mask and image together in the Quick Mask Mode. To do this, click in the first column of the Channels palette to toggle the display of the eyeball icon. An eyeball in front of a channel name indicates you can see that channel. If you are cur- rently viewing the full-color image, for example, click in front of the mask channel name to view the mask as a translucent color coating, again as in the Quick Mask Mode. Or if the contents of the mask channel appear by themselves on-screen, click in front of the composite name (RGB, CMYK, or LAB) to display the image as well.

When the mask is active, you can toggle the display of the image by pressing the tilde (~) key. Few folks know about this shortcut, but it's a good one to assign to memory. It works whether the Channels palette is open or not, and it permits you to focus on the mask without moving your mouse all over the screen.

Using a mask channel is different from using the Quick Mask Mode in that you can edit either the image or the mask channel when viewing the two together. You can even edit two or more masks at once. To specify which channel you want to edit, click the channel name in the palette. To edit two channels at once, click one and Shift-click another. All active channel names appear highlighted.

You can change the color and opacity of each mask independently of other mask channels and the Quick Mask Mode. Double-click the mask channel thumbnail or choose the Channel Options command from the Channels palette menu. (This command is dimmed when editing a standard color channel, such as Red, Green, Blue, Cyan, Magenta, Yellow, or Black.) A dialog box similar to the one shown back in Figure 4-6 appears, but this one contains a Name option box so you can change the name of the mask channel. You can then edit the color overlay as described in the "Changing the red coating" section earlier in this chapter.

If you ever need to edit a selection outline inside the mask channel using paint and edit tools, click the Quick Mask Mode icon in the Toolbox. It may sound a little like a play within a play, but you can access the Quick Mask Mode even when working within a mask channel. Do yourself a favor and make sure the mask channel color is different from the quick mask color, so you can tell what's going on.

Building a Mask from an Image

This being the *Professional Edition,* the least we can do is discuss how professionals do things. Of course, a professional with deep pockets may go out and buy an expensive third-party masking add-on for Photoshop, but it's not like the program can't do some pretty amazing stuff right out of the box.

So, in this final section, we'll examine every step required to create a mask for a complex image. You'll see how to select the stuff you never thought you could select — all the wispy little details from leaves, stray pieces of string, hair, you name it.

Figure 4-16 give you an idea of what is meant here. The major challenges presented by our subject are the stray bits of hair roaming about her head and shoulders. Imagine trying to select those using the Magnetic Lasso or Magic Wand. It ain't happening. As demonstrated in Figure 4-16, these tools lack sufficient accuracy to do any good. You'd be fit to be tied by the time you finished selecting the hairs with the pen tools, and the edges aren't definite enough for Select ➪ Color Range to latch onto.

The results of removing this background…   …with the magnetic lasso…

…with the magic wand (or magic eraser)…   …and the background eraser.

Figure 4-16: The details and indistinct transitions in this head of hair are too much for Photoshop's selection and extraction tools. This is a job for manual masking.

The solution is to mask your image manually. Granted, masking techniques vary as widely as the artists who employ them, but there are a few tried-and-true formulas that can work for just about everyone. First, you want to examine the image's channels to find one that lends itself best to a mask. You're looking for high degrees of contrast, specifically around the edges. After you've decided on a suitable channel, you copy it and boost the level of contrast using any of the weapons in Photoshop's arsenal that accomplish such things. For example, you can combine the High Pass filter (Filter ⇨ Other ⇨ High Pass) with adjustments to the channel's levels (Image ⇨ Adjustments ⇨ Levels). Some people prefer Image ⇨ Adjustments ⇨ Curves, but you may find that the Levels command is more straightforward. From this point, it's a matter of painting/editing the mask until you're satisfied with it. Like so many

things, the only way to get a feel for masking is to try it out for yourself. The following steps explain exactly how this woman was masked and pasted against a different background. The final result is so realistic, you'd think she was born there.

STEPS: Masking a Monstrously Complicated Image

1. **Browse the color channels.** Press Ctrl+1 (⌘-1 on the Mac) to see the red channel, Ctrl+2 (⌘-2) for green, and Ctrl+3 (⌘-3) for blue. Note that this assumes you're working inside an RGB image. You can also peruse CMYK and Lab images. If you're editing a grayscale image, you have only one channel, and that's Black, Jack.

   Figure 4-17 shows the three channels in this RGB image. Of the three, the blue channel offers the most contrast between the hair and the background.

   Figure 4-17: Of the three color channels, the blue channel offers the best contrast between hair and background.

2. **Clone the channel.** Drag the channel onto the new channel icon at the bottom of the Channels palette to create a duplicate Now you can work on the channel without harming the image itself.

3. **Choose Filter ⇨ Other ⇨ High Pass.** The next thing you want to do is to force Photoshop to bring out the edges in the image so you don't have to hunt for them manually. And when you think edges, think filters. All of Photoshop's edge-detection prowess is packed into the Filter menu. Several edge-detection filters are available to you — Unsharp Mask, Find Edges, and many others that are covered in Chapters 8 and 9. But the best filter for finding edges inside a mask is Filter ⇨ Other ⇨ High Pass.

   High Pass selectively turns an image gray. High Pass may sound strange, but it's quite useful. The filter turns the non-edges completely gray while leaving the edges mostly intact, thus dividing edges and non-edges into different brightness camps, based on the Radius value in the High Pass dialog box. Unlike most of Photoshop's filters, a low Radius value produces a more pronounced effect than a high one, in effect locating more edges.

Figure 4-18 shows the cloned blue channel on the left with the result of the High Pass filter on the right. The example uses a Radius of 16, which is a nice, moderate value. The lower you go, the more edges you find and the more work you make for yourself. A Radius of 3 is accurate, but it'll take you an hour to fill in the mask. Granted, 16 is less accurate, but if you value your time, it's more sensible.

Clone of the Blue channel   High Pass filter, Radius: 16 pixels

Figure 4-18: After cloning the blue channel (left), apply the High Pass filter with a Radius value of 16 to highlight the edges in the image (right).

4. **Choose Image ⇨ Adjustments ⇨ Levels or press Ctrl+L (⌘-L on the Mac).** After adding all that gray to the image, follow it up by increasing the contrast. The best command for enhancing contrast is Levels. Although this command is discussed in depth in Chapter 12, here's the short version: Inside the Levels dialog box, raise the first Input Levels value to make the dark colors darker, and lower the third Input Levels value to make the light colors lighter. (For now you can ignore the middle value.)

Figure 4-19 shows the result of raising the first Input Levels value to 110 and lowering the third value to 155. As you can see in the left-hand image, this gives you some excellent contrast between the black hairs and white background. To demonstrate the importance of the High Pass command in these steps, the example shows would happen if you had skipped Step 3 in the right-hand image in Figure 4-19. The example applies the same Levels values as in the left image, and yet the image is overly dark and quite lacking in edges.
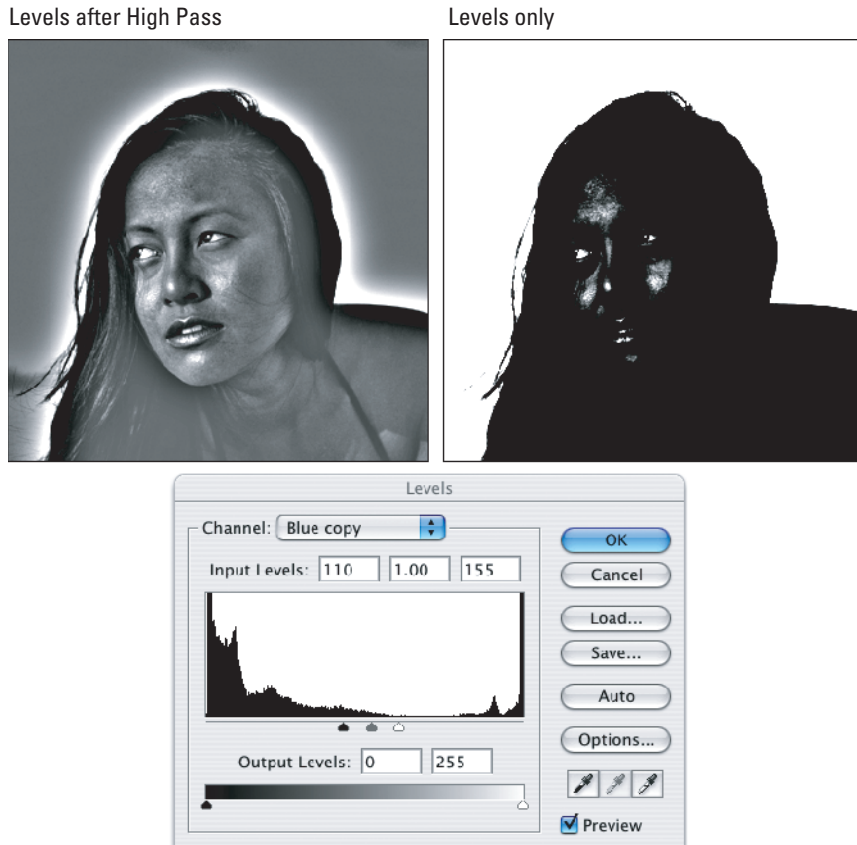
Levels after High Pass   Levels only

Figure 4-19: The results of applying the Levels command to the mask after the High Pass step (left) and without High Pass (right). High Pass has a very positive effect on the edge detail.

5. **Identify the edges.** By way of High Pass and Levels, Photoshop typically presents you with a complex coloring book. Items that are dark in the original image have a white ethereal glow, and light items are just the reverse. Luckily, the woman is basically darker than her background. Sometimes, you may want to select areas and invert them by choosing Image ➪ Adjustments ➪ Invert (Ctrl+I for Windows; ⌘-I for Mac) so all your outside edges are glowing uniformly. From here on, it's a matter of coloring inside the lines.

6. **Remove the big stuff you don't need.** To simplify things, get rid of the stuff you know you don't need. In the example, all you care about is the area where the woman meets her surroundings. Everything else goes to white or black.

In Figure 4-20, the area outside the woman is selected and filled with white by pressing Ctrl+Backspace (⌘-Delete on the Mac). A lot was accomplished with the Lasso tool, but not everything is as it should be. The areas inside the hair require some careful attention with the Brush tool.

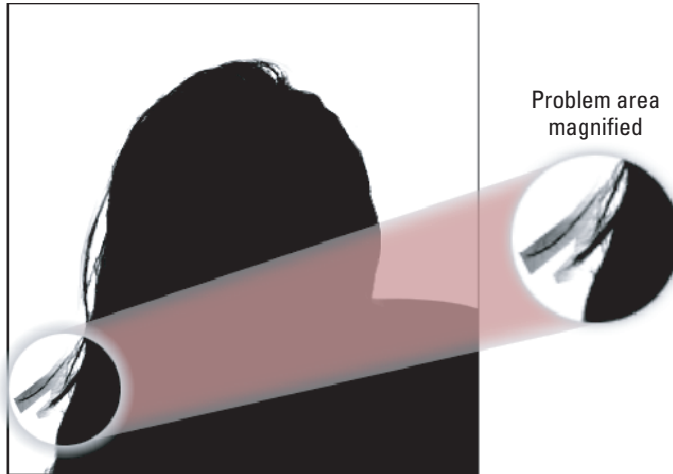Select outside areas & fill white

Problem area magnified

Figure 4-20: By selecting the area outside the object and filling it with white, you can clearly distinguish between foreground and background. The example still shows a few messy edges, identified by the circle.

7. **Paint inside the lines with the Brush tool.** This tends to be the most time-consuming part. Now you have to paint inside the lines to make the edge pixels black or white. For this image, the Brush tool was used with a hard brush size of about 5 to 10 pixels (try using the X key to switch between painting with black and white). The first image in Figure 4-21 shows the fruits of our labors.

8. **Invert the mask.** You may or may not need to perform this step. Based on the condition of the edges after choosing the High Pass command, the woman ended up black against a white background. Of course, now you want to select the girl, so she needs to be white. Therefore, press Ctrl+I (⌘-I on the Mac) to swap the blacks and whites. If your foreground image ends up white by this stage, then you can obviously skip this step.

9. **Switch to the color composite view.** Press Ctrl+tilde (⌘-tilde on the Mac). Or if you're working in a grayscale image, press Ctrl+1 (⌘-1). By the way, now is a good time to save the image if you haven't already done so. Remember, TIFF is a terrific format for this purpose.

10. **Ctrl-click (Win) or ⌘-click (Mac) the mask channel to convert it to a selection.** This mask is ready to go prime time.

Clean up edges   Invert for final mask

Figure 4-21: You can fix problem areas by hand using the Brush tool (left). You can then invert the entire mask so the area inside the object is white and the area outside is black (right).

11. **Ctrl-drag (Win) or ⌘-drag (Mac) the selection and drop it into a different image.** Figure 4-22 shows the result of dropping the woman into an evening background of orange sunset. Thanks to my mask, she looks as natural in her new environment as she did in her previous one. In fact, an uninitiated viewer may have difficulty believing this isn't how she was originally photographed. But if you take a peek at Figure 4-16, you can confirm that Figure 4-22 is indeed an artificial composite.

Figure 4-22: Thanks to the wonders of masking,
our girl has found a new life in a more sultry location.

Figure 4-22 looks great, in part because a little extra finessing was done to match the highlights in the hair with that of the new background's sky and water. Any photographer is familiar with using lens filters to correct color temperature for the film they're using. Where her hair was originally casting blue now needed to go orange. Photoshop provides adjustment tools that perform a similar function. To push those bluish highlights orange, a photo filter (Image ⇨ Adjustments ⇨ Photo Filter) was applied, using the warming filter with a density of 75 percent. Pretty snazzy compositing, huh?

✦   ✦   ✦