

Adobe After Effects

2024 Release

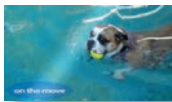


Classroom in a Book[®]

The official training workbook from Adobe

Brie Gyncild & Lisa Fridsma

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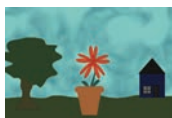
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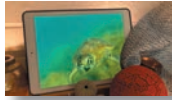


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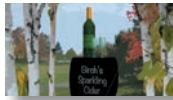
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9

USING THE ROTO BRUSH TOOL

Lesson overview

In this lesson, you'll learn how to do the following:

- Extract a foreground object from the background using the Roto Brush tool.
- Correct the segmentation boundary across a span of frames.
- Touch up a matte with the Refine Edge tool.
- Freeze a matte across a clip.
- Replace a background.
- Animate properties for creative effects.
- Track a face in footage.



This lesson will take about an hour to complete. If you haven't already done so, download the project files for this lesson from peachpit.com/AfterEffectsCIB2024, following the instructions in the Getting Started section under "Accessing the lesson files and Web Edition."



PROJECT: WEB BANNER

With the Roto Brush tool, you can quickly separate a foreground object from a background across many frames. You can achieve professional results in a fraction of the time you'd spend performing the same task with traditional rotoscoping.

About rotoscoping

When you draw or paint on the frames of a movie, you're *rotoscoping*. For example, a common use of rotoscoping is to trace an object, using the path as a mask to isolate it from the background so you can work with it separately. You could draw masks, animate the mask paths, and then use the masks to define a matte. (A *matte* is a mask used to hide part of an image so that another image can be superimposed.) While effective, this is a time-intensive, tedious process, especially if the object moves a great deal or the background is complex.

If a background or foreground object is a consistent, distinct color, you could use color keying to separate the object from the background. If the subject was shot against a green or blue background (green screen or blue screen), keying is usually much easier than rotoscoping. However, keying is less efficient when you're working with complex backgrounds.

The Roto Brush tool in After Effects, powered by an AI model, is much faster than conventional rotoscoping. You use the Roto Brush tool to define the foreground and background elements. Then After Effects creates a matte, and tracks the movement of the matte over time. The Roto Brush tool does much of the work for you, leaving only a little cleanup work to be done.

Getting started

In this lesson, you'll use the Roto Brush tool to isolate a bird and rock pool so you can replace the background. To finish up the project, you'll add an animated title.

First, you'll preview the final movie and set up your project.

- 1 Make sure the following files are in the Lessons/Lesson09 folder on your hard disk, or download them from peachpit.com now:
 - In the Assets folder: Chickadee.mov, Facetracking.mov, MillPond.mov
 - In the Sample_Movie folder: Lesson09.mp4
- 2 Open and play the Lesson09.mp4 sample movie in Windows Movies & TV or QuickTime Player to see what you will create in this lesson. When you are done, close Windows Movies & TV or QuickTime Player. You may delete the sample movie from your hard disk if you have limited storage space.

When you begin this lesson, restore the default application settings for After Effects. See "Restoring default preferences" on page 3.

- 3 Start After Effects, and then immediately hold down Ctrl+Alt+Shift (Windows) or Command+Option+Shift (macOS). In the Startup Repair Options dialog box, click Reset Preferences.

- 4 Click New Project in the Home window.

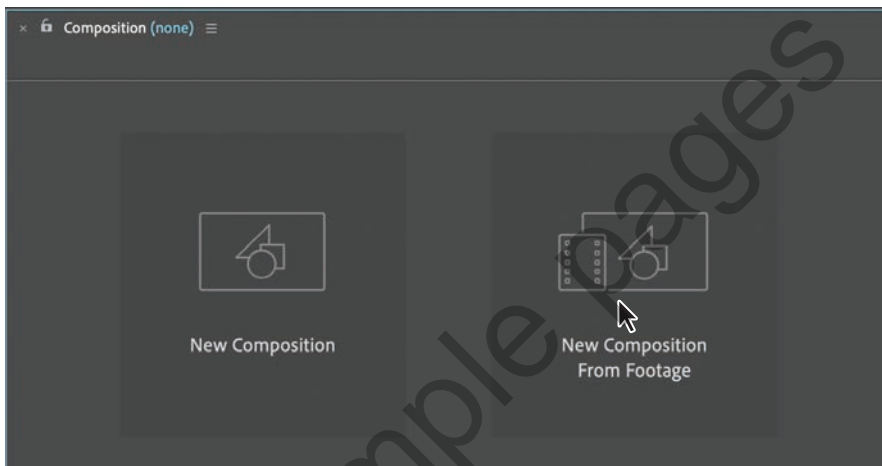
After Effects opens to display an empty, untitled project.

- 5 Choose File > Save As > Save As.
- 6 In the Save As dialog box, navigate to the Lessons/Lesson09/Finished_Project folder.
- 7 Name the project **Lesson09_Finished.aep**, and then click Save.

Creating the composition

You'll import a footage file and create a composition from it.

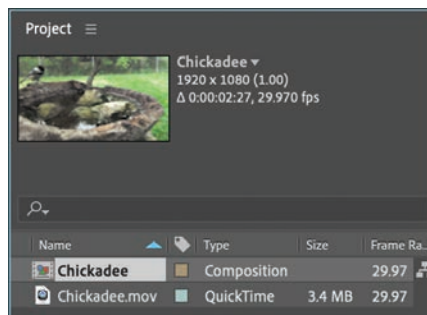
- 1 Click New Composition From Footage in the Composition panel.



- 2 Navigate to the Lessons/Lesson09/Assets folder, select the Chickadee.mov file, and then click Import or Open.

After Effects creates a composition named Chickadee, based on the settings in the Chickadee.mov file. The composition is two and one half seconds long, with a frame size of 1920 x 1080. The movie file was shot at a rate of 29.97 frames per second.

- 3 Choose File > Save to save the project so far.



Creating a segmentation boundary

You use the Roto Brush tool to specify which parts of the clip are in the foreground and which are in the background. You add strokes to distinguish the two, and then After Effects creates a segmentation boundary between the foreground and background.

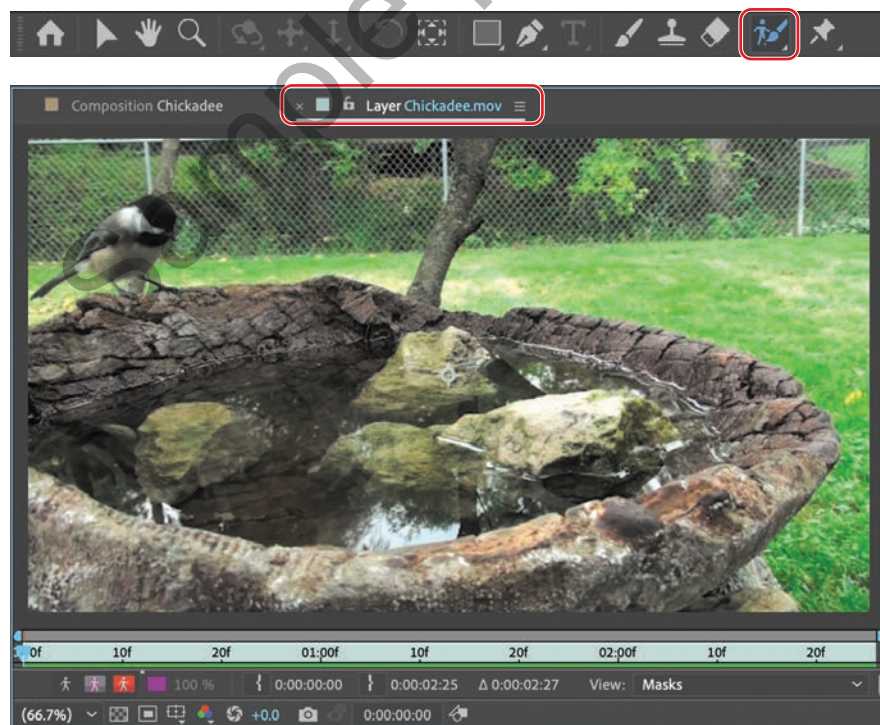
Creating a base frame

To use the Roto Brush tool to isolate a foreground object, you start by adding strokes to a base frame to identify foreground and background areas. You can start on any frame in the clip, but in this exercise, you'll use the first frame as the base frame. First, you'll add the strokes that identify the bird and the rock pool as the foreground objects.

- 1 Move the current-time indicator across the time ruler to preview the footage.
- 2 Press the Home key to move the current-time indicator to the beginning of the time ruler.
- 3 Select the Roto Brush tool (🖌️) in the Tools panel.

You use the Roto Brush tool in the Layer panel, which you'll open now.

- 4 Double-click the Chickadee.mov layer in the Timeline panel to open the clip in the Layer panel.



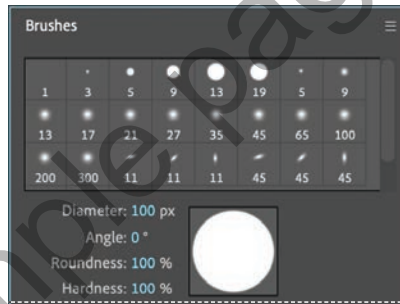
- 5 Choose Fit from the Magnification Ratio pop-up menu at the bottom of the Layer panel if you don't see the entire image clearly.

By default, the Roto Brush tool creates green foreground strokes. You'll start by adding strokes to the foreground—the rock pool and the bird. Generally, it's most efficient to start with broad strokes and then use smaller brushes to refine the border.

- 6 Choose Window > Brushes to open the Brushes panel. Set up a hard round 100-pixel brush. (You may need to resize the Brushes panel to see the options.)

When you're drawing strokes to define the foreground object, follow the skeletal structure of the subject. Unlike traditional rotoscoping, you don't need to define a precise boundary around the object. Start with broad strokes, and work down to small regions as After Effects determines where the boundary is supposed to be.

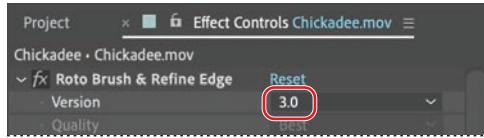
- 7 Draw a green stroke horizontally across the rock pool.



► **Tip:** You can quickly zoom in and out of the Layer panel using the scroll wheel on your mouse, if it has one.

Roto Brush tool properties appear in the Effect Controls panel. In the Layer panel, a magenta outline identifies the boundaries After Effects created for the foreground object. After Effects recognized only about half of the pool, because you initially sampled only a small area of the subject. You'll help After Effects find the boundary by adding some more foreground strokes. First, you'll make sure you're using version 3 of the Roto Brush tool.

- 8 In the Effect Controls panel, make sure 3.0 is selected for the Version.



- 9 Still using a large brush, continue to draw green strokes along the inside edges of the pool. Do not include the branches directly behind the pool and the bird.



- 10 Zoom to 200% and use the Hand tool (H) to pan to the bird.

- 11 Select the Roto Brush tool again. Then select a smaller brush, and draw a green stroke across the bird's body.



It can be tricky to get some areas without accidentally adding background as well. It's okay if you haven't captured every detail in the foreground. You'll use background strokes to remove any extraneous areas of the matte.

- 12 Press ALT (Windows) or Option (macOS) to switch to the red background stroke brush. Add red strokes to background areas you want to exclude from the matte.



- 13** Switch back and forth between the foreground and background brushes and brush sizes to fine-tune the matte. Don't forget to deselect the branches directly behind the bird and the pool. In some cases, one click may be all it takes to exclude an object or area from the matte.



- 14** When you're happy with the bird's matte, zoom back out and fine-tune any remaining areas that need to be addressed with the rock pool.



Editing Adobe Premiere Pro clips with After Effects

You can work with a clip in both Adobe Premiere Pro and After Effects, moving easily between the two applications as you edit your project.

To edit an Adobe Premiere Pro clip in After Effects, do the following:

- 1** Right-click or Control-click the clip in Adobe Premiere Pro, and choose Replace With After Effects Composition.

After Effects starts, and opens the Adobe Premiere Pro clip.

- 2** Save the project when you're prompted by After Effects. Then, work in the composition just as you'd work in any other After Effects project.
- 3** When you're finished, save the project, and return to Adobe Premiere Pro.

Your changes are automatically reflected in the timeline.

Don't worry about being exact about your brush strokes. Just make sure the matte is within 1 to 2 pixels of the edge of the foreground object. You'll have an opportunity to refine the matte later. However, After Effects uses the information on the base frame to adjust the matte for the rest of the span, so you want the matte to be accurate.

- 15 Click the Toggle Alpha button (⌘) at the bottom of the Layer panel. The selected area is white against a black background, so you can see the matte clearly.



- 16 Click the Toggle Alpha Overlay button (⌘) at the bottom of the Layer panel. The foreground area appears in color, and the background has a red overlay.



- 17 Click the Toggle Alpha Boundary button (⌘) at the bottom of the Layer panel to see the outline around the bird and rock pool again.



As you use the Roto Brush tool, the Alpha Boundary is the best way to see how accurate your boundary is, because you can see everything in the frame. However, the Alpha and Alpha Overlay options let you see your matte without the distraction of the background.

Refining the boundary across the span

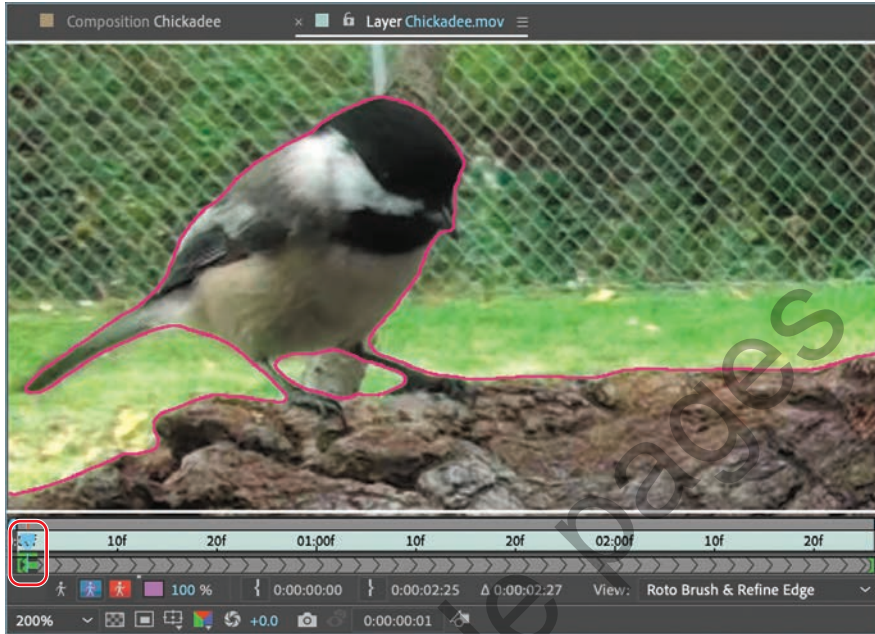
You used the Roto Brush tool to create a base frame, which includes a segmentation boundary that divides the foreground from the background. The Roto Brush span appears below the time ruler at the bottom of the Layer panel. When After Effects has propagated the current boundary for a frame, the bar beneath that frame on the time ruler is green.

As you move forward and backward through the footage, the segmentation boundary moves with the foreground object (in this case, the bird and the rock pool). You'll step through the frames in the span and make adjustments to the segmentation boundary as necessary.

Because the rock pool is stationary, its track matte is consistent throughout the span. Given that, we'll focus on the bird, which moves around a lot.

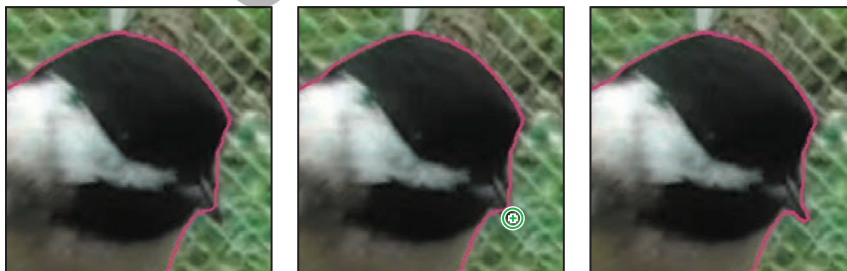
- 1 Zoom in on the bird, and then make sure the Roto Brush tool is selected in the Tools panel.
- 2 Press the 2 key on your main keyboard (not the numeric keypad) to move forward one frame.

► **Tip:** To move forward one frame, press the 2 key on your keyboard; to move back one frame, press the 1 key.



Working from the base frame, After Effects tracks the edge of the object and attempts to follow its movement. Depending on how complex your foreground and background elements are, the boundary may or may not conform exactly to the area you hoped it would.

- 3 Using the Roto Brush tool, paint foreground and background strokes to refine the matte for this frame. If the matte is accurate, you don't need to paint any strokes.



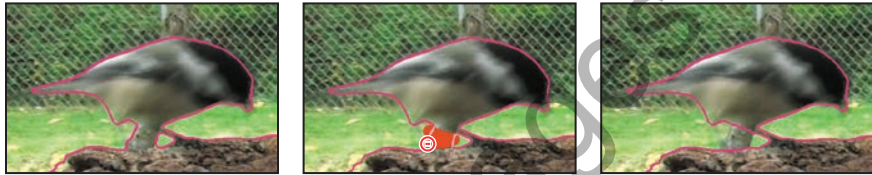
● **Note:** As it propagates the segmentation boundary for a frame, After Effects caches that frame. Cached frames have a green bar in the time ruler. If you jump ahead to a frame further along the span, After Effects may take longer to calculate the boundary.

As you progress through this clip, you'll notice changes to the segmentation boundary with the bird's beak. Likewise, you may need to refine the segmentation boundary around the feet and legs.

- 4 Press the 2 key again to move forward to the next frame.
- 5 Use the Roto Brush tool to add to the foreground or subtract from the background as necessary to refine the boundary.

If you make a stroke you don't like, you can always undo the stroke and try again. As you move through the span, each change you make affects the frames after it. The more you refine your selection, the better the overall results will be. You may find it useful to move forward a few frames to see how changes affect the boundary.

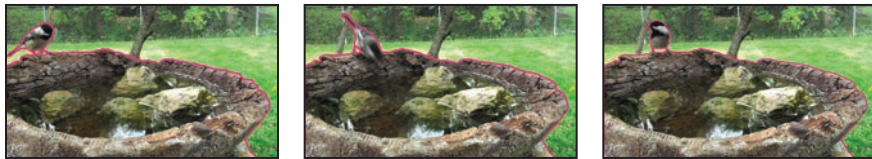
When the bird is moving quickly (such as 0:14 –0:19), you'll notice that the segmentation boundary becomes more vague, but then "catches up" once the bird slows down again. When a frame displays rapid movement, focus on removing areas that should be excluded (such as the branch behind the bird), rather than adding blurry areas of the bird.



- 6 Repeat steps 4 and 5 until you reach the end of the layer.



- 7 Once you're satisfied with the bird, zoom out to fit the entire screen, and scroll through the span, making any adjustments as needed.
- 8 When you have completed refining the segmentation boundary for the entire layer, choose File > Save to save your work so far.



Fine-tuning the matte

Roto Brush does a pretty good job, but there may be stray bits of background in the matte, or foreground areas that weren't included. You'll clean those up by refining the edge.

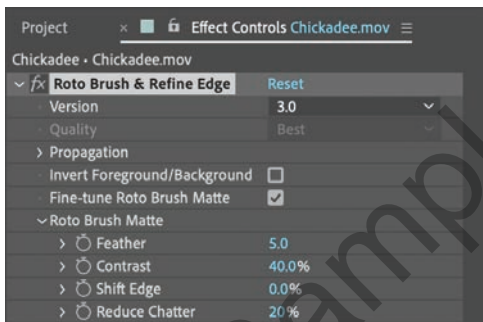
Adjusting the Roto Brush & Refine Edge effect

When you use the Roto Brush tool, After Effects applies the Roto Brush & Refine Edge effect to the layer. You can modify the effect using settings in the Effect Controls panel. You'll use those settings to further refine the edge of the matte.

- 1 Press the spacebar to play the clip in the Layer panel. Press the spacebar again to end the preview when you've seen the whole clip.

As you preview the clip, you may notice that the segmentation boundary jumps around a bit. You'll adjust the Reduce Chatter and Contrast settings to make it smoother.

- 2 In the Effect Controls panel, decrease the Contrast to **40%** and increase Reduce Chatter to **20%**.



The Reduce Chatter value determines how much influence the current frame has when performing a weighted average across adjacent frames. Contrast affects how tight the boundary is.

- 3 Preview the clip again.

Refine Soft Matte and Refine Hard Matte effects


After Effects includes two related effects for refining mattes: Refine Soft Matte and Refine Hard Matte. The Refine Soft Matte effect does the same thing as Refine Edge Matte, except it applies the effect to the entire matte at a constant width. If you need to capture subtle variations across an entire matte, use this effect.

The Refine Hard Matte effect performs the same edge refinements as the Roto Brush when Fine-Tune Roto Brush Matte is turned on in the Roto Brush & Refine Edge effect in the Effect Controls panel.

Using the Refine Edge tool

When an object isn't smooth, the Roto Brush may not pick up the nuanced edge. The Refine Edge tool lets you include fine details such as wisps of hair in designated areas of the segmentation boundary.

Though it might be tempting to use the Refine Edge tool immediately after creating the base frame, it's best to wait until you've refined the segmentation boundary across the entire clip. Because of the way After Effects propagates the segmentation boundary, using the Refine Edge tool too early results in a matte that is difficult to use.

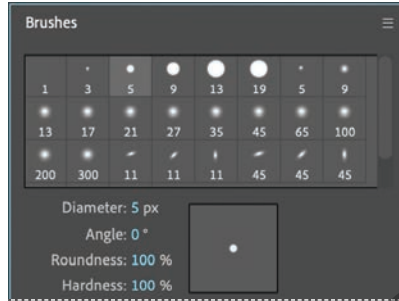
- 1 Go to the base frame, which is the first frame of the clip, and then zoom in so that you can see the edges of the bird's tail clearly. Use the Hand tool if necessary to move the layer so you can see the entire bird.
- 2 Select the Refine Edge tool () , hidden beneath the Roto Brush tool in the Tools panel.

The tail is relatively soft, so a small brush size will work well. For a fuzzier object, you might have better results with a much larger brush. The brush needs to overlap the stray edges that emerge from the object.

- 3 Change the brush size to 5 pixels.

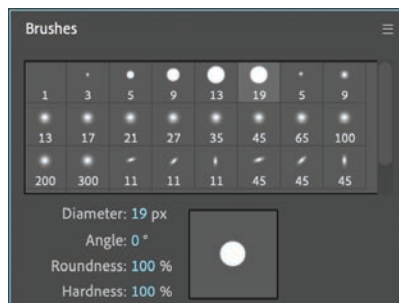
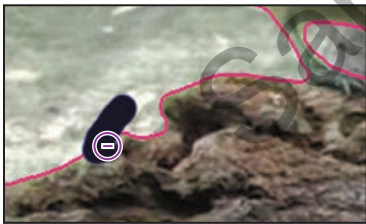
When you use the Refine Edge tool, draw strokes along the edges of the matte.

- 4 In the Layer panel, move the Refine Edge tool over the edge of the tail straddling the segmentation boundary and including the variations in the feathers. You can use multiple strokes if needed.



When you release the mouse, After Effects switches to the Refine Edge X-ray view so that you can see how the Refine Edge tool changes the matte, capturing the detail in the edges.

- 5 Move the current-time indicator across the time ruler to view the edge. At 0:15, Refine Edge breaks away from the tail as the bird moves away rapidly.
- 6 Change the brush size to **19** pixels.
- 7 At 0:15, press Alt (Windows) or Option (macOS) and erase the artifact from the Refine Edge tool, as it's no longer useful going forward.
- 8 Continue to move forward and backward through the scene, applying the Refine Edge tool wherever the matte's edge doesn't capture the fuzziness of the bird's feathers, and removing it wherever it strays from the tail.



- 9 Zoom out to see the entire scene, resize the Layer panel if you enlarged it, and then choose File > Save to save your work.


Note: Use the Refine Edge tool only after you have cleaned up the matte across the entire clip.

Freezing your Roto Brush tool results

You've put a fair amount of time and effort into creating the segmentation boundary across the entire clip. After Effects has cached the segmentation boundary so it can recall it without having to make the calculations again. To keep that data easily accessible, you'll *freeze* it. This reduces the processing demands on your system so you can work faster in After Effects.

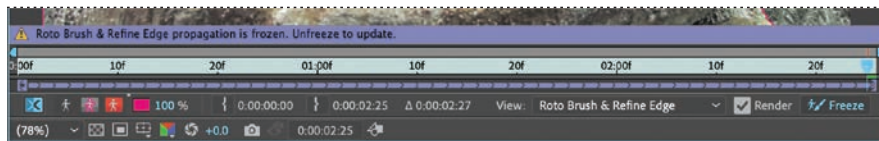
Once the segmentation is frozen, you cannot edit it unless you unfreeze it. Refreezing the segmentation is time-consuming, so it's best to refine the segmentation boundary as much as possible before freezing.

- 1 Click the Freeze button in the lower right area of the Layer panel.

 Depending on your system, this may take a while.



After Effects displays a progress bar as it freezes the Roto Brush and Refine Edge tool data. Freezing may take a few minutes, depending on your system. As After Effects freezes the information for each frame, the cache line turns blue. When it has finished freezing, a blue warning bar appears above the time ruler in the Layer panel, reminding you that the segmentation is frozen.



- 2 Click the Toggle Alpha Boundary button (⌘) in the Layer panel to see the matte. Then click the Toggle Transparency Grid button (⌘). Move the time marker across the time ruler to see the subject without the distractions of the background.



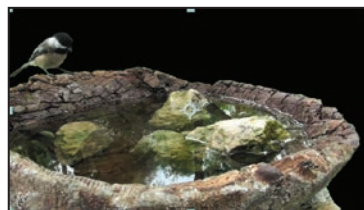
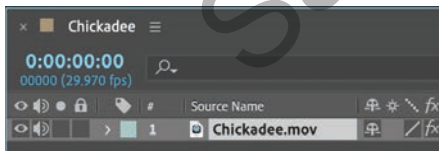
- 3 Click the Toggle Alpha Boundary button again to see the boundary.
- 4 Choose File > Save.

After Effects saves the frozen segmentation information with the project.

Changing the background

There are many reasons to isolate a foreground image from a background. You may want to replace the background entirely, moving the subject to a different setting. Or you could simply want to change the foreground or background without modifying the other. In this lesson, you'll remove the fenced in area of the background, and replace it with a different background, which you'll enhance with color correction tools.

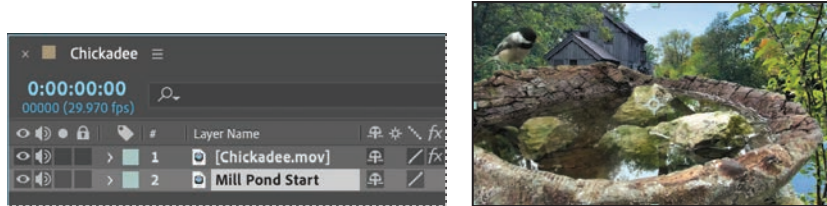
- 1 Close the Layer panel to return to the Composition panel, and then move the current-time indicator to the beginning of the timeline. Choose Fit from the Magnification Ratio pop-up menu at the bottom of the Composition panel.
- 2 Hide the properties for the Chickadee.mov layer, if they're visible.



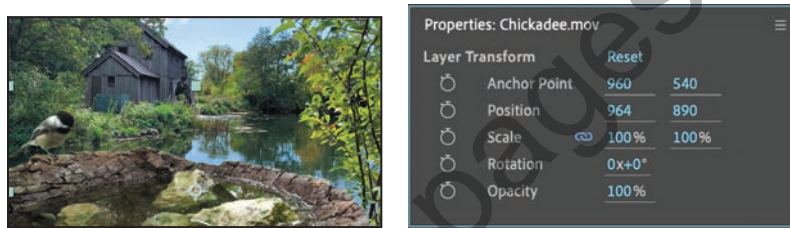
The Composition panel displays the composition, which includes only the Chickadee.mov layer, consisting only of the foreground you isolated from the clip.

- 3 Click the Project tab to display the Project panel, and double-click an empty area in the Project panel. Navigate to the Lessons/Lesson09/Assets folder, select the MillPond.mov file, and click Import or Open.

- 4 Drag the MillPond.mov clip from the Project panel to the Timeline panel, and place it below the original Chickadee.mov layer.
- 5 Click the new layer, press Enter or Return, and rename the layer **Mill Pond Start**. Then press Enter or Return again.



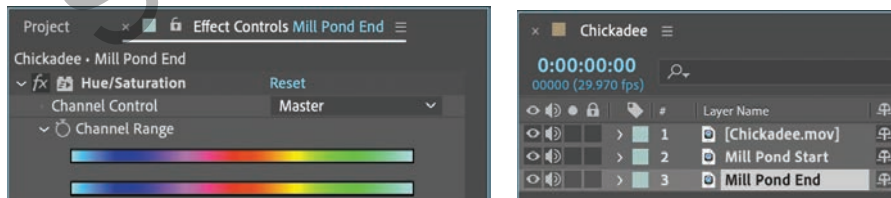
- 6 Select the Chickadee layer. Then, using the Selection tool (black arrow), drag the layer to the lower half of the Composition panel. Your values should be similar to ours.



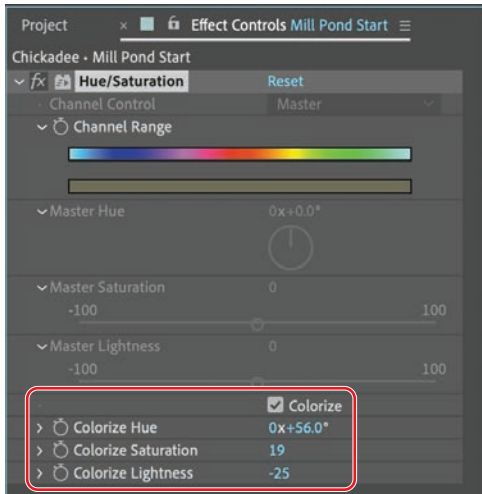
- 7 Select the Mill Pond Start layer, and choose Effect > Color Correction > Hue/Saturation.

You'll use the Hue/Saturation effect in two different ways, so you'll create a duplicate layer for the second effect.

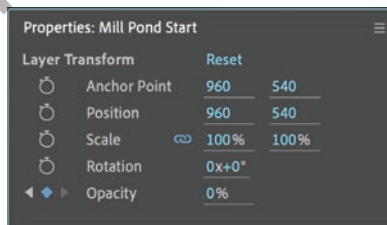
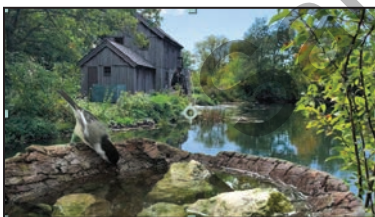
- 8 With the Mill Pond Start layer selected, choose Edit > Duplicate. Rename the bottom layer **Mill Pond End**. Then rename the top layer to remove the number 2 from the name (so that its name is Mill Pond Start).



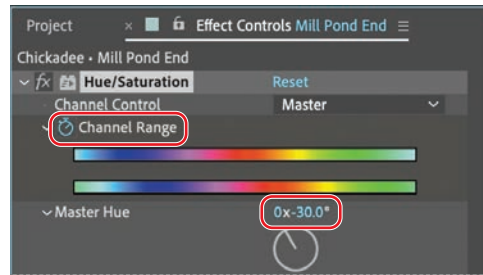
- 9 Select the Mill Pond Start layer, and then, in the Effect Controls panel, do the following:
- Select Colorize.
 - Change Colorize Hue to **56** degrees.
 - Change Colorize Saturation to **19**.
 - Change Colorize Lightness to **-25**.



- 10 In the Properties panel, click the stopwatch icon for the Opacity value to create an initial keyframe at 100%.
- 11 Go to 1:10, and change the Opacity to 0.



- 12 Still at 1:10, select the Mill Pond End layer.
- 13 In the Effect Controls panel, click the stopwatch icon for the Channel Range property to create an initial keyframe.
- 14 Go to the end of the footage (2:25), and change the Master Hue to -30.



- 15 Press the spacebar to preview the project. Press the spacebar again when you've finished.



The background transitions from a monochromatic dusk to a full summer day and then again to the beginning of fall as the leaves change.

- 16 Choose File > Increment And Save.

If you save incrementally, you can return to earlier versions of your project to make adjustments later. This can be very useful if you're experimenting or want to try alternative effects. The Increment And Save feature preserves the previously saved version of the project and creates a new project with the same name, with an increasing number added to the filename.

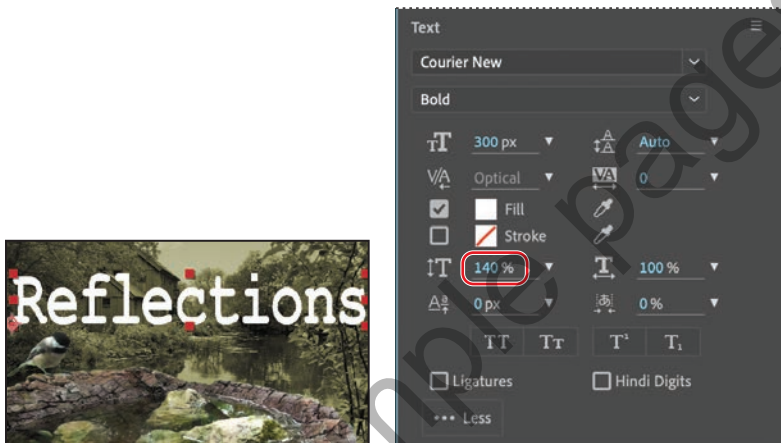
Adding animated text

You're nearly done. All you need to do is to add the animated title between the bird and the background.

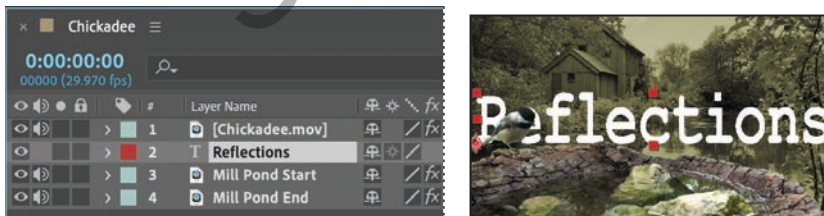
- 1 Deselect all layers, and then move the current-time indicator to the beginning of the time ruler.
- 2 Select the Type tool (T), and then type **Reflections** in the Composition panel.

A new text layer named Reflections appears in the Timeline panel at the top of the layer stack.

- 3 Select the Reflections layer, and then do the following in the Text section of the Properties panel:
 - Choose Courier New for the font.
 - Choose Bold for the font style.
 - Type **300 px** for the font size.
 - Choose Optical from the Kerning menu.
 - Select white for the Fill color.
 - Deselect the Stroke checkbox.
- 4 Click the More button, and then type **140%** for the vertical scale.



- 5 Use the Selection tool (V) to reposition the text to rest along the top edge of the rock pool, and then move the Reflections layer below the Chickadee layer.



You'll animate the text so that it appears on the screen in a liquid motion.