Chapter

7

Markers

Marker Properties And Combination Markers

To work with markers, you click on a marker in the **Markers** toolbar to select or deselect a marker. To make changes to markers, right-click on the marker toolbar and choose a command from the menu.

Showing Marker Summary And Names

You can display both marker name and a summary of how many markers have been placed.

To display the marker summary

- Right-click on the **Markers** toolbar and choose Show Marker Summary.

To display marker names

- Right-click on the **Markers** toolbar and choose Show Marker Names.

Changing Marker Attributes

To change a marker color

1. Right click on a marker in the **Markers** toolbar and choose **Change Marker Color**. Stereo Investigator displays the **Color** dialog box.
2. Pick a new color, and click **OK**.

Stereo Investigator changes the color for that marker, including markers already placed.

To change a markers size

1. Right click on a marker in the **Markers** toolbar and choose **Resize Marker**. Stereo Investigator displays the **Resize Marker** dialog box.
2. You can change the size in pixels, in microns, or by an intrinsic value. Choose one, type a required measurement, and click **OK**.
3. Stereo Investigator changes the size for that marker, including markers already placed.

To hide a marker

You can hide a marker—make it unavailable for placement and hide those already placed.

- Right click on a marker in the **Markers** toolbar and choose **Hide Marker**.

Stereo Investigator makes the marker unavailable in the toolbar and hides markers already placed.

To rename a marker

1. Right-click on a marker and choose **Rename Marker**.

2. In the **Rename Marker** dialog box, type a new name and click **OK**.

To unhide a marker

- Right click on a hidden marker in the **Markers** toolbar and choose **Hide Marker**.

Stereo Investigator makes the marker unavailable in the toolbar and hides markers already placed.

Working With Combination Markers

Combination markers combine 2, 3, or 4 markers into one marker. Use a combination markers for labeling cells and structured that are marked with two or more staining methods.

To create a combination marker

1. Right click on the **Markers** toolbar and choose **Define Combination Marker**.

2. Choose one marker from the top grid to represent 2 or more other markers.

3. Choose up to 4 markers from the lower grid. These markers are replaced by the marker from the top grid when you place the combination marker.

   Click on a marker to see if it has been defined as a combination marker. If it has, Stereo Investigator highlights the markers in the lower grid markers combined by this marker.

4. To record the definition of a combined marker, click **Apply** if you want to define more combination markers. Click **Apply and Close** accepts the current definition and closes the dialog box.

To mark with combined markers

1. Place *individual* markers as appropriate in your tracing. Use the markers selected in the lower box of the **Define Combination Marker** dialog box to designate cells seen with different staining protocols.

2. Go back through your tracing after the individual markers have been placed, and at each site where you determine that the markers are close enough together to represent double labeling of the same structure, place a *combined* marker (described in the following steps).

3. On the Markers toolbar, right-click and choose **Enable Combination Markers** or click **Enable Combination Markers**.

4. To place a combined marker, adjust the circular cursor (with the mouse wheel or + and - keys on the numeric keypad) so that it is large enough to encompass all markers to be combined. Select the combination marker from the marker toolbar. Each time you left click over 2 or more markers to be combined, the markers are replaced with the combination marker.

> If you left click and the circular cursor does not encompass all the individual markers that make up the definition of the combined marker, the combined marker is still placed but no individual markers are removed.

The individual markers that have been combined are removed from the marker totals and replaced with the new combined marker. It is up to you to keep track of what the combined markers represent, and remember that when a combined marker is listed in Marker Totals in Neurolucida Explorer, it actually represents two or more other markers.

> This function is not available if you have interrupted tracing of a contour or tree to place markers. All trees and contours must be complete for the combination marker tool to be available.

Changing Markers Already Placed

To change markers to another type

1. Right click over the marker type to change on the **Markers** toolbar and choose **Change Traced Marker**.

2. In the **Change Marker Type**, click on the new marker type and click **OK**. All existing markers of the selected type are changed to the new type. If the color was changed previous to this operation, the new color is preserved.

> This operation only effects markers that were already placed. Any new markers maintain their original type.

To delete markers

1. Right click over the marker type to delete on the **Markers** toolbar and choose **Delete All Markers of This Type**. Stereo Investigator deletes all instances of this marker.

Placing Markers

Placing markers acts is a separate mode of operation within Stereo Investigator. While a marker is selected, the ability to trace contours or neurons is blocked. In order to exit the Marker mode, click a second time on the Markers button.

Selecting Markers

Click to select a marker on the **Markers** toolbar along the left edge of the tracing window. To choose a different marker, click on it. Click **Undo** to delete markers in the reverse order of their placement. However, once you exit Marker mode by clicking an already depressed marker icon, the ability to delete markers with the Undo button is lost; at this point you must use the Editing Mode to delete them.

Mapping Markers Of Choice

Here are some hints for working with markers:

- If the area being mapped is larger than the field-of-view, turn on AutoMove (click **Move>AutoMove**).

- If you make a mistake, **Undo** erases the last drawn marker one by one back to the first one placed when the marker toolbar was activated.

- While placing markers, you can use **Joy Free** or **Joy Track** to move the stage. Remember that if you use **Joy Free**, you lose registration between the specimen and the tracing. Stereo Investigator returns you to Marker mode when the joystick mode is finished.
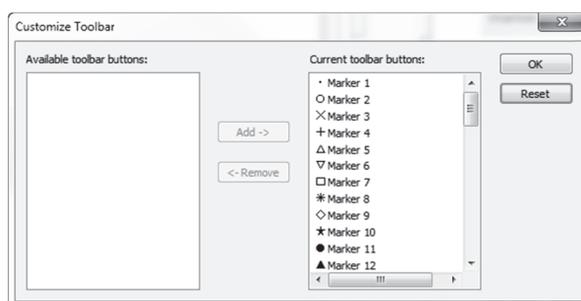
Attaching Markers To A Contour

- If you select a marker while of a contour, but before the contour has been completed with either **End Open Contour** or **Close Contour**, Stereo Investigator attaches the markers to that contour. This provides analysis information in Neurolucida Explorer, and also allows for editing operations to be applied to the contour and marker simultaneously.

- if you want to attach markers to a contour after the contour has been completed, select all appropriate markers in the Editing Mode, right click, and choose **Attach Markers to Object**. .

Customizing the Markers Toolbar

You can add or remove markers from the Markers toolbar.

To add or remove markers from the toolbar

1. Right-click on the Markers toolbar and choose **Customize Markers** bar. Stereo Investigator displays the **Customize Toolbar** dialog box.

The current buttons are in the right column. Any buttons you can add are in the left column.

2. Select the button or buttons to add or remove and click the appropriate button.

3. Click **OK** when done.