

# Sharp, Cut Out Selections

## Why Sharp Selections are Needed

1. When changing the tone, contrast, colour, saturation or sharpness of the background with out affecting the subject. The subject may also be changed.
2. When moving a subject within an image or onto a new image. This is not allowed in Nature, Photo Journal and Social Documentary, and in Travel images but in Open and Monochrome the image may be greatly improved by small changes.
3. When adding a person or part of a person to a group. In record images of an occasion some one may be missing or one of the group may be poorly shown. A much better record can easily be made.
4. When adding a new sky. There are often other good choices.
5. When making a montage which may be realistic or fanciful. Not everyone's choice but great fun and allows serious creativity in making a picture.

## Principles

1. Allow enough time. There is rarely a quick answer and the job may take up to an hour or days.
2. Choose a method suitable for the job. Often use a combination of several methods.
3. Save the selection before proceeding. Every selection that takes more than a few minutes should be saved to avoid frustration and irritation.

## Selection Tools

There are many and varied tools because none have been perfect.

1. Polygonal Lasso. The most popular method among amateurs and very successful with smooth surfaced objects. No good for fur, hair etc
2. The Pen Tool. There is no doubt that this is the best tool for smooth surfaced objects but it is difficult to learn. It is not much used by photographers.
3. Color Range. A large tool that takes some practice to use well. Color Range works well where there is good contrast of colour or tone. Color Range has the added advantage that it picks up some of the marginal pixels giving a natural edge.
4. Magic Wand. Been around some time and works well where there is good contrast of colour or tone. However, the Magic Wand is "edge shy". The

edge of the selection is sharp and the marginal pixels are not selected. A good feather is needed, or even a shift of the selection out 1 pixel.

5. Quick Selection Tool. Arrived with CS 5 and has proved very useful. Subjects with some contrast of tone or colour are selected well and the edge pixels may be included. For many it has become the tool of choice.
6. Channels. For many years was channels the choice of experts as very good selections of hair, sky through leaves etc could be made and the edge pixels were retained making edges very natural. It took skill and practice to learn and is seldom used as the primary method now. However, choosing to work on a channel showing good contrast instead of a layer can make selection with other techniques much easier.
7. Painting a Mask. This is one of the best ways to make a selection and is often used as part of the process of making a selection.
8. Refine Edge or Refine Mask. Refine Edge has been around for some time but in CS 5 Refine Edge with the Refine Radius Tool was added and a big step forward in selection technology became available. It is so good that there is now no need to buy plug ins. It is worth learning this technique.

We will study the Polygonal Lasso, Painting a Mask, Quick Selection Tool and Refine Edge.

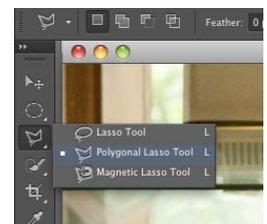
## Polygonal Lasso

### Uses

1. Subjects with straight sides. Click at one corner, lift the cursor and click on the next corner. A straight line will be laid down. Continue on round the subject.
2. Irregular and curved subjects. Although only straight lines can be made if many short lines are made under magnification a very good apparent curve can be created.

### Technique

1. Duplicate the Background layer
2. Choose the Polygonal Lasso from the Tool Bar. The Polygonal Lasso is nested with the Lasso and the Magnetic Lasso.
3. Zoom in to a magnification of at least 200%. The marginal pixels should be seen.
4. For straight sided subjects click at one corner but inside the marginal pixels, and then click on the next corner. Work round



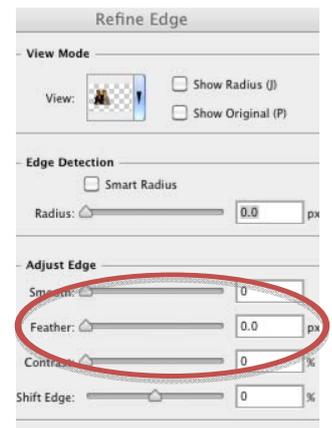
*Be sure to click inside the line of the marginal pixels*

the subject using the Space Bar to move to other areas of the subject.

5. For irregular and curved subjects click at one point on the selection inside the marginal pixels of the subject. Release the mouse and click on another point inside the subject but not far away. A straight line will be drawn between the points. Continue round the selection making a series of short straight lines. To move round the selection use the Space Bar to temporarily obtain the Hand Tool. When you release the Space Bar the Polygonal Lasso will still be active.
6. When the starting point is reached a 0 will be added to the cursor and a further click will complete the selection. The selection will now be defined by "marching ants". Double clicking at any time will complete the selection with a straight line to the starting point.
7. Hit Delete to remove the last straight line. This may be repeated to move back through the selection.
8. Note that with the Polygonal Lasso it is possible to pause at any time. cf this with the Lasso where the job has to be completed in one mouse click.
9. To draw a small portion of the selection free hand, such as a sharp curve, while the Polygonal Lasso is in action (ie clicked on a point) hold the ALT/Option and the Polygonal Lasso is converted to the Lasso until the ALT/Option is released. Note here the importance of the timing. If the ALT/Option is held before the Polygonal Lasso is used the Polygonal Lasso will start to draw a reduction in the selection but if the Polygonal Lasso is active the Lasso will be substituted.
10. To add to the selection or add another selection hold Shift before making a further selection. If shift is not held the previous selection will be removed. If this happens by mistake hit delete to remove the last straight line.
11. To reduce the selection hold ALT/Option before clicking to reduce the selection. See 9 above.
12. To remove the entire selection go Control/Cmd + D.
13. **Feathering.** As the Polygonal Lasso will draw a selection line between pixels leaving no marginal pixels it is necessary to soften the selection line. Feathering which adds pixels on each side of the selection line to imitate marginal pixels does this. Some experts choose the feather before making the selection but it is better to do this after. To feather either:
  - a. On the menu go Select > Modify and choose Feather.
  - b. On the Title bar click Refine Edge > Feather. This is the best way as the feathering will be applied in real time and the result can be seen and judged.

Usually a small feather of 1 to 2 pixels will be right but occasionally up to 5. The same feather will be applied all round the selection. If this is inappropriate part of the line may be blurred.

**14. Saving the Selection.** As soon as the selection is satisfactory save it. Click Selection > Save Selection, give it a name and click OK. The selection will be saved as a Channel and may be reapplied by Select > Load Selection and choosing the selection name. Also can double click on the channel in the Channel palette.



**15. Changing the Selection into a Mask.** With the selection active either:

- a. Open an Adjustment Layer.
- b. Add a mask to a pixel layer by clicking on the mask icon at the foot of the layers panel.

In both cases the selection will be added to the mask thumbnail as a mask.



*The Background layer was duplicated, the teapot selected, and then a mask was added to the layer by clicking on the icon circled. The marching ants disappeared and the added mask thumbnail showed the selection as a mask*

## Painting a Mask to make a Selection

The late Barrie Thomas was one of the best tutors for amateurs. Barrie maintained that anyone with enough patience could make a perfect selection by painting on a mask. His own work won medals round the world. The technique could not be used to isolate hair but Barrie could select quite fine detail. Perhaps wrongly the technique is not often used alone but is frequently used in part of the selection of an object.

### The Method

Say in a group photo of an event some one is blinking or turning away but in another shot the group is not so good but the person is much better



*The man and woman have good eye contact but the baby is looking down, the couple are a little far apart and the background is awful*



*The baby's head is up but the group is not so good. The figures are nearer the camera in this shot.*

In this example the baby's head must be moved to the better group, the size of the head will need reducing and it would be nice if the couple could be brought closer and the background changed.

1. Open the image with the good head. Make a loose selection with the lasso and copy the selection (Control/Cmd + C). Close this image..
2. Open the good group and paste the selection of the head into the image (Control/Cmd + V). The new head will appear as a new layer in the good group layer palette. Move the new head layer, if necessary, above the group layer.
3. Now move the head into position, and correct for size and rotation. Holding V (to get the Move Tool) the head may be dragged to the correct position. To make it easier to assess the correct position reduce the opacity of the head layer to say 70%. To change rotation and size keep the head layer active and get the Transform Tool (Control/Cmd + T). A box will appear round the head. To change the size hold Shift, click on a corner of the box and drag. Holding Shift ensures that the proportions will stay the same. Clicking just outside a corner of the transform box will produce a double headed curved arrow. Clicking on the arrow and dragging will rotate the selection.
4. There will be quite a lot of the head layer image around the head. To get rid of this unwanted detail and isolate the head add a mask to the head layer by clicking on the Mask Icon at the foot of the Layers palette. The mask will be white so all the head layer will be visible. By painting the mask with a black brush a mask will be made that hides the unwanted detail and reveals the head neatly isolated.
5. To Paint out the unwanted part of the Head Layer change the Foreground Colour to black (Control/Cmd + X). Choose a 50% soft brush of an appropriate size (hit B for brush, right click in the selection and choose 50% hardness, and using the Square Brackets adjust the size of the brush). May also use the Brush Icon in the menu, which is second from the left.
6. Now, with 100% Opacity, start painting away the unwanted detail. As the edge of the head is approached reduce the size of the brush. The degree of hardness of the brush will "feather" the final selection of the head. That is marginal pixels will be left softening the edge of the head. To get the desired softness the hardness of the brush may be adjusted.

Note that with this technique the softness does not have to be the same all the way round. To isolate fine detail use a small fairly hard brush.

7. The big advantage of this technique is that if a mistake is made the Foreground Colour can be changed to white (hit X) and the error painted out. Change back to a black brush and continue. In this way, with patience, a perfect selection can be made.
8. With the new head isolated and in place it may be necessary to tidy up the group image where the old head was. With the Group Layer active use the Clone Tool to repair the image and reform the person. This not too difficult as the new head is still on a separate layer
9. Save this image in the Processed Image folder with the layers intact. The file will have to be .psd or .tiff. For printing or sharing flatten the image.



*The final image. This took me several days. In my opinion this is a good result. The three images used were taken within a few yards of each other and the final image represents what I saw. It would have been impossible for me to stage the shot.*

## The Magic Wand

The Magic Wand has been around for some time but is still useful in selecting solid colours especially where the colour is not continuous as in sky showing through leaves.

1. The Magic Wand Tool is nested with the Quick Selection Tool in the Tool Bar.
2. In the Options bar choose a Tolerance of 30. The tolerance determines how similar colours have to be for them to be selected. Choose a sample size of 3 x 3 and tick anti-alias. Untick Contiguous if there are separate areas of sky etc to be selected. Usually tick Sample All Layers.
3. Click in the sky to start the selection. To increase the selection hold Shift and click again. Repeat this process till the sky is selected. Increasing Tolerance spreads the selection but is difficult to control. It is easier to hold Shift and continue clicking.
4. If too much is selected hold ALT/Option and click in the over selected area. If this continues to happen reduce the Tolerance and continue Shift clicking.
5. A selection with the Magic Wand Tool will need feathering. Click on Refine Edge in the Option Bar or go Select > Modify and choose Feathering. Refine Edge is the best as the feathering will occur in real time and the result can be judged. The Magic Wand Tool often leaves a selection just short of the edge so it may be necessary to increase the size of the selection in Refine Edge or Modify.

## The Quick Selection Tool

The addition of the Quick Selection Tool in CS 5 marked a major advance in selection technology. The Quick Selection Tool is the tool of choice for most selections. A rough selection is “quick” but a tight selection takes longer.

1. As usual duplicate the Background layer.
2. The Quick Selection Tool is nested with the Magic Wand Tool in the Tool Bar
3. In the Options bar in the Brush icon (fourth



from the left) choose a Hardness of 100% and a Spacing of 25%. Click Sample All Layers (in most cases) and Auto-enhance. Adjust the size of the brush using the Square Bracket keys. The larger the brush the quicker but the less accurate. Start with a large brush and complete the selection with a smaller brush.

QuickTime™ and a decompressor are needed to see this picture.

4. To make the selection click and drag in the image. To select more of the image continue clicking and dragging. The Quick Selection Tool is the only selection tool where the Shift key is not held to increase the selection. To reduce the selection where it has gone too far hold ALT/Option and click and drag. The Quick Selection Tool attempts to find the edge of the subject and with reasonable contrast it does a good job.

*Dragging with the Quick Selection Tool rapidly spreads the selection over the image. Carefully select all the solid areas but not the areas where the background shows through. In this image selection was rapid and easy as there is good contrast between the subjects and the background. It was not possible to capture the selection lines for this image.*

5. With most of the subject selected magnify the image to 200% (double click on the Magnify Tool in the Tool Bar), make the brush smaller and go round the selection line adjusting the edge by clicking and dragging and holding ALT/Option and clicking and dragging. The Selection Tool will understand where the edge should be and a really good selection will be made. In moving from area to area of the selection use the Space Bar to drag to a new area.
6. Be sure to save the selection.

## Refine Edge/Mask

Refine Edge may be applied to a selection or to a mask. The dialogue window and the process are exactly the same. To get the Refine Edge, with a selection active, click on Refine Edge in the menu bar. To get Refine Mask, with a mask highlighted, click on Refine Mask in the Mask palette.

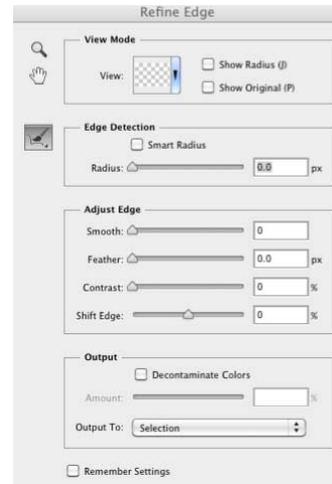
Refine Edge has been around for some time but with CS 5 Edge Detection was added. When combined with Quick Selection Tool this gave Photoshop the very best selection tool. It is now the method of choice for most selections.

Refine Edge/Mask has 4 boxes.

1. View Mode.
2. Edge Detection
3. Adjust Edge
4. Output

Also, there are 2 icons top left.

**The Magnifying Glass or Zoom Tool.** Click on the tool and then on the image. A minus cursor appears and clicking zooms the image in. Hold ALT/Option and clicking on the image a plus cursor appears and clicking will zoom the image out. Double click on this icon and the image will be zoomed out to 200%.



**The Hand Tool.** Click on this and dragging will move the image to other areas. Double click on this icon and the image will be returned to full screen.

So, on working on an edge, double click on the Magnifying Glass to see the edge better and then double click on the Hand tool to return to full screen.

## Adjust Edge

Adjust Edge is the oldest box so will be dealt with first. It is similar to Select > Modify but offers more and the changes occur in real time, that is the changes are seen in the image immediately. In Adjust Edge there are 4 sliders.

1. **Smooth.** Smooth removes outlying pixels and spikes making the selection edge smoother.
2. **Feather.** Feather adds pixels to the selection edge imitating marginal pixels. This makes the cut out selections more realistic. As the Edge Detection will actually select the marginal pixels feathering is not usually needed but some times a feather 0.8 helps.
3. **Contrast.** Adding contrast increases the density of the edge pixels making the selection look sharper.
4. **Shift Edge.** Shift Edge does what it says and is useful in some selections where haloes form.

## View Mode.

Click on the arrow beside View and there will be a choice of 7 ways of viewing the selection. Of these "Marching Ants" is of little use, as the actual edge is not shown.



*In the View drop down menu Overlay is selected.*

1. **Overlay.** In Overlay a red overlay masks the unselected area. This is useful as the areas to be selected can be seen through the mask.
2. **On Black.** The selection is clearly seen against a black background. If the final selection is to be seen against a dark background this view is useful.
3. **On White.** The selection is clearly seen against a white background. If the final selection is to be seen against a light background this is useful.
4. **Black and White.** Shows the selected area as white and the masked area as black. The view of the edge is clear but what needs to be done is not seen.
5. **On Layers.** The masked area is transparent so that the underlying layer is visible. This previews the final result and what needs to be done.
6. **Reveal Layer.** Shows the selection against the original background.

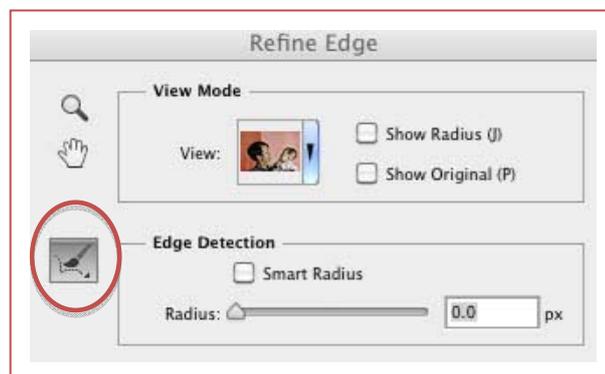
I find Overlay, On Black and On White the most useful but the choice is personal and perhaps depends on the image.

In the View Mode there are 2 buttons that really belong in the Edge Detection Box.

## Edge Detection

This is where the work is done.

**Radius Slider.** The Radius Slider determines the width of the zone round the selection in which the computer looks for the edge. A small radius will catch the marginal pixels of a firm edge. A little larger radius will catch the soft edge of wool or the hairs on an arm. A large radius will catch loose hair etc. Wonderful technology but there are limitations.



1. If there is not enough contrast across the edge of the subject and the background the computer will select some of the background or fail to select some of the image or both. Some of these mistakes can be corrected by working on the final mask.
2. A small radius will cause the computer to fail to select all of the edge and too large a radius may cause the computer to select some of the background. Again working on the mask can correct these errors.

**Smart Radius.** Clicking on the Smart Radius asks the computer to use a narrow radius where the edge is narrow and a wider radius where necessary. This helps but is not a complete answer.

**Show Radius.** The Show Radius button rests in the View Mode box but belongs in the Edge Detection box. Click on this button and the computer shows the zone round the selection where the computer will be looking for an edge. It is probably best to work with this button toggled off but to toggle it on occasionally.

**Refine Radius Tool.** Click on the icon to the left of Edge Detection, circled in red, and choose the Refine Radius tool. With this tool a wider radius can be painted at the edge of the selection.

Also in the icon to the left of Edge Detection is the Erase Refinements Tool that allows, if necessary, the removal of excess radius.

### Using the Refine Selection Tool.

1. Have a good selection of the subject. Any selection tool may be used but the Quick Selection tool is probably the easiest. Make as tidy a selection as possible of all solid areas but do not include areas where the background shows through, eg as through leaves or flyaway hair.
2. On the Menu bar click on Refine Edge to get the Refine Edge dialogue.
3. Start by choosing the View. The Overlay, On Black or On White are the usual choice. During the refining it will help to change the view occasionally.
4. Next raise the Radius. I advise starting with a small radius of 2 or 3 pixels and checking with the Show Radius that all of the pixels in the sharper edges are selected. Double click on the Magnify Glass/ Zoom Tool to see the edge clearly. Raise the Radius slider up to 10 pixels or more to include soft edges, fur etc. If in doing this the computer selects part of the background reduce the radius. Where there is good contrast the radius can be raised to good effect.
5. Click on Smart Radius as it may help.
6. To include hair etc in the selection zone click on the Refine Radius Tool and paint along the selection line. Be generous and include all the stray hair but try not to paint into areas already fully selected. As the selection edge is painted the brush strokes will be seen but soon after the computer will show detail of the edge selected. Repeated brushing may help.
7. Usually leave all the Adjust Edge boxes unticked. They are not needed as the Refine Radius tool and Radius slider do such a good job of selecting the pixels at the edge. Sometimes choose a small feather of say 0.3 pixels to increase the softness of the edge.



*The Refine Radius tool in action.*

*The View is On White, The Radius of 7.8 was chosen. This covered much of the edge. To increase the radius to cover the loose hair the Refine Radius tool is in use. On top of the man's head the radius is being increased by painting over the loose hair.*

**Check the selection.** Choose another View such as On White or On Layers to be sure that the edge is as good as it can be. There may be areas, which are not satisfactory, but if these cannot be improved in Refine Edge they can be improved by working on the mask.

## Output

**Decontaminate Colours.** In some selections the edge picks up the colours of the background. If so click on Decontaminate Colors and move the slider to the right. Watch the edge under magnification and choose the best result. Some times this is a very effective tool.

**Output To.** Determines how the selection will be presented in the Layers palette. Usually it is best to choose either Layer Mask or New Layer with Mask. If Decontaminate Colors has been used the Output will be New Layer with Mask.

## Adjusting the Mask

Occasionally the mask will be perfect especially when there was good contrast round the subject. Usually, however, the mask edge needs improvement. This is not difficult.

1. Highlight the mask so that a black line runs round the edge.
2. Magnify the view to at least 200%. Double click the Zoom Tool in the Tool bar.
3. At this stage realise that the selected areas are white and the masked or hidden areas are black.
4. If areas of the subject have been missed choose a white brush (type B for brush, D for the default colours and X if necessary to make the Foreground Colour white) and adjust the brush size with the Square Brackets. Carefully paint over the missing area of the subject. If a mistake is made type X to get a black brush and paint over the mistake.
5. The same can be done for areas of the background that have been erroneously included. In this case use a black brush.
6. Often, if the contrast was not good, the edge of the subject will be soft and areas of the background will form a grey halo round the selection. This is easily dealt with.
  - a. For the grey halo choose a brush and change the Bend Mode of the brush to Overlay. Make sure that the Foreground Colour is black



*Near perfect mask made in less than 5 minutes using Quick Selection tool and Refine mask. Subjects with not such good contrast will take longer.*

*If the edge is examined under magnification flaws will be seen but these will be easy to correct by painting on the mask as described.*

*From this mask an excellent selection can be made and moved to another background or the present background can be modified.*

and that the mask is highlighted. Now paint along the halo. The grey halo will be removed and the dark edge of the subject will be protected. Do not repeat the brushing too much or the edge will be damaged.

- b. For the soft edge of the selection do much the same but choose white for the Foreground Colour.

Using this technique the marginal pixels may be reduced slightly or their tones hardened, so a little feathering may be needed. As a mask is highlighted the Mask Panelle will be available. In this panelle click Adjust Mask and choose Feather.

8. There is more that can be done but it becomes complicated and this is enough to get a good mask. Further reading suggest "Photoshop Compositing Secrets" by Mat Kloskowski.
9. To change the mask into a selection, if wanted, Control/Cmd click on the mask and a selection will be applied to the image.