

Beginning Photoshop
for
Underwater Photographers

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Secret decoder ring

- When a number of commands or mouse selections are performed in a row, I'll separate them by commas
 - E.g. Selecting the file menu, then selecting open will be written as: file, open.
- Many slides contain a piece of wordart that lists the relevant PS workspaces
 - E.g. Means all three; Guided, Quick, Full
- Unfortunately, there is some jargon
 - Pause me if I'm not clear

GQF

Introduction to photo editing with Photoshop Elements Guided Edit and Quick Edit

The standard editing workflow ^{GQF}

- Duplicate
- Crop
- Tone (lightness, darkness, and contrast)
- Color balance (if color is far off, do this before tone)
- Image cleanup (spots, healing)
- Noise reduction and Sharpening (if needed)

Use these steps, in this order, to edit your photos
This works with any editing program

Guided edit



- Start PS, edit, guided, file, open.
- Right side lists guided activities
- Follow our editing workflow
 - Unfortunately the activities are not listed in workflow order



Quick edit



- Start PS, edit, quick, file, open.
- Toolbar on right has common activities
 - There are many more available in the menus
- Follow our editing workflow



You can accomplish a lot in Quick edit but it's still simple
Some people never feel the need to leave it

More about photo editing and Photoshop Elements

There are many photo editing programs

Photoshop is the most popular

- Paintshop pro is also widely used
- Your camera probably came with free photo editing software
 - Canon: zoombrowser or digital photo professional
 - Nikon: capture NX
- These all basically do the same thing
 - Many techniques I show will work with any editor
- Photoshop has a couple of advantages
 - Elements is user friendly
 - It's popularity means it's easy to find help

Which Photoshop?

- Photoshop comes in two flavors:
 - Photoshop elements and Photoshop CS
- Elements is for casual to enthusiast users
- CS is for advanced amateurs and professionals
- Most people don't need CS
 - Elements has most of CS' features
 - Elements is *much* easier to use
- Elements version 7 is a bargain
 - \$80 street, \$65 educational, \$60 w upgrade rebate
 - 1 month free trial
 - Newer elements versions have simplified and improved the UI

There are three photoshop elements editing workspaces

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- Guided edits – hand holding
 - Helps you when you're unsure of what editing commands to use *but* the choices are very limited
- Quick Fix – editor on training wheels
 - Contains simple editing tools including all automatic adjustments
- Full edit – full elements editor
 - The most powerful and complicated
 - Can look daunting; hopefully this class will help
 - Move here as you gain experience or have a problem image

Guided edit workflow tools



- Duplicate file, duplicate
- Crop basic photo edits, crop photo
- Tone lighting and exposure, lighten or darken
- lighting and exposure, brightness and contrast
- Color color correction, remove a color cast
- color correction, enhance colors
- Image cleanup guided activities, touch up..., spot healing
- Noise reduction not available
- Sharpening basic photo edits, sharpen photo
- Save file save

Guided Edit's options are limited but it's easy

Quick edit workflow tools

- Duplicate file, duplicate
- Crop left hand side crop tool
- Tone general fixes, auto smart fix
- lighting, auto levels or contrast
- color, auto color
- lighting, shadows or highlights or midtone
- Color color, auto color
- color, sat or hue or temperature or tint
- Image cleanup **no spot healing brush?**
- Noise reduction filter, noise, reduce noise
- Sharpening sharpen, auto sharpen
- Save file save



There are many more editing options under the menus.
(See Full edit workflow for examples)

Full edit



- Arrange the workspace to your liking
- Left side has icons for common editing operations
- Menus contain most functionality
- Start PS, edit, Full, file, open
- Follow our editing workflow



Full edit isn't as difficult as it may look.
Just use the workflow to find the options you need.

Suggested Full edit workspace configuration



- Place the info and histogram and undo history (and layers) panes into the right hand palette bin
 - Window, info...etc
 - These panes display valuable information and readily provide important tools
 - (layers palette if you're using them...)



Full edit workflow tools



- Duplicate file, duplicate
- Crop left hand side crop tool
- Tone enhance, auto smart fix or auto levels
- or auto contrast or auto color
- enhance, adjust lighting, levels
- enhance, adjust lighting, shadows/highlights
- enhance, adjust lighting, brightness/contrast
- Color enhance, auto color
- enhance, adjust color, remove color cast
- enhance, adjust color, adjust hue/saturation
- enhance, adjust color, color variations
- filter, adjustments, photo filter
- enhance, adjust color, color curves IS A Tone TOOL
- Image cleanup left hand side spot healing brush
- left hand side healing brush
- (two brushes cover each other. Right click to select.)
- Noise reduction filter, noise, reduce noise
- Sharpening enhance, auto sharpen or adjust sharpness
- Save file save or save as

Editing Techniques
in more detail

Crop

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- Trim photo to re-compose
 - Position main subject
 - Exclude distracting elements
 - No “right” crop. What you like is best.
- Select crop.
 - Drag side, top/bottom boxes to move that edge.
 - Drag corner box to move corner.
 - Press done or check box when you like crop.
 - Press discard or red **X** or undo to reject crop.



More Crop

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- Crop *before* using automatic adjustments
 - Otherwise the auto tool tries to adjust parts of the image you don't want
- Try to keep as much of the original as possible -
The more you crop, the lower the quality
 - E.G. Don't try to crop out one fish in a school
- If you lose a drag box off to the side, get it back by dragging the crop area sideways

Automatic adjustments

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- PS contains four automatic adjustments that attempt to optimize the image tone and color.
 - This can be the fastest and easiest way for a beginner to get started editing.
- It is difficult to predict which will work the best.
 - Many times none of them will work really well for UW images! But they're worth a try
 - Knowing what they do can help you select between them.
 - Try each adjustment one at a time, “undo-ing” the effect of the previous.
- Even if none of the auto adjustments *perfects* the image, you can often use one as a starting point for further edits.



Automatic adjust description QF








- Auto levels
 - Expands contrast without preserving colors
 - Makes darkest color black and lightest white
 - Similar to using “Levels” to maximize dynamic range. (we will see levels later)
- Auto contrast
 - Expands contrast while preserving colors
 - Makes darkest and lightest colors as dark and light as possible without changing the color

Automatic adjust description cont ^{QF}

- Auto color
 - Attempts to send darkest to black and lightest to white while preserving color of midtones
- Auto smart fix
 - Runs auto contrast, then lightens shadows and darkens highlights, then attempts to remove color cast

Undo and Redo

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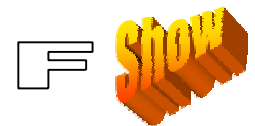
- Undo “undoes” your last edit. 
- Redo “redoes” that edit after undoing it. 
- You can undo all the way back to opening 
 - Just keep clicking
- Full edit mode lets you see the editing “History”. You can jump directly to a previous command. 


Tone

- Digital photos and histograms
- Levels
- Shadows / Highlights

Digital photos are made of pixels

- Pixels are very small.
 - An image from a 6 megapixel camera contains 6 million pixels.
- The brightness of each pixel is represented by a number 0 - 255
 - 0 = black, the darkest
 - 255 = white the lightest
- Color digital images are made of three primary colors: red, green, blue
 - You can make any color in the image by varying the proportions.
 - Each pixel is a mixture of these three colors
 - So we have three numbers to describe each pixel:
 - Red 0-255, green 0-255, and blue 0-255
 - Eg bright red pixel (255,0,0), mid green (0,128,0), dim blue (0,0,64), mid purple (0,128,128), grey (128,128,128), white (256,256,256)
- The “info window” displays pixel values



Histograms show the brightness distribution



- In it's simplest form, the histogram is a graph
 - The horizontal axis charts the brightness value
 - Darkest, black is on the left. = pixel level 0
 - Brightest, white is on the right = pixel level 255
 - The vertical axis displays the number of pixels with that brightnessOR to say it in another way
 - Count how many pixels have each distinct brightness value (0 – 255) and plot this on the y axis.
- A dark image has a histogram that clusters towards the left
- A bright image clusters towards the right
- A balanced image is evenly distributed
- A “flat” image doesn't extend to the left or right
- None of these is right or wrong. It depends upon your intent



Adjust tone - Levels

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- A powerful tonal (and color) adjustment tool
 - The most common manual tool after crop. Start here after trying auto adjustments
- Use when
 - image lacks punch or impact (often = dynamic range)
 - Histogram doesn't reach 0 or 255
- Set the shadow and highlight values by dragging the black and white input levels sliders (left and right under histogram) to the edge of the first group of pixels on either end of the histogram.
 - This increases the dynamic range of the image
- Press Alt (alt-drag) the sliders to see which area will be clipped to black or white.
- Adjust the brightness of the middle tones by dragging the grey input level slider (middle under histogram)



Adjust tone – Levels cont

QF

- Compare to original by clicking preview box.
- Black and White droppers select shadow / highlight levels directly from image
- Can use grey dropper to white balance image. Same as enhance, adjust color, remove color cast.
 - I'll often white balance from levels
- Use channel selector to operate upon primary colors individually. Can correct color imbalances or tweak contrast further

Advanced
topic

Adjust Tone - Shadows/Highlights

- Can quickly improve shadows and/or highlights in images that would be difficult to fix otherwise
- Use when
 - dark areas are too dark or gloomy
 - light areas lack detail or are too bright
- Lighten shadows brightens dark areas and reveals more shadow detail
 - Too much will reveal noise
 - Very helpful with single flash photos
- Darken highlights darkens light areas and reveals more highlight detail
 - Knocks down bright reflections off of divers
 - May increase color saturation if highlights are washed out
- Midtone contrast adds or reduces the contrast. Use after adjusting shadows and highlights if needed
- Pane always opens with lighten shadow set to 25%. This often isn't what you want



Color



- Remove a color cast
- Variations
- Photo filters
- Levels on a color

Color (white) balance gets the blue out

- Many UW photos look too blue or green
 - They have an overall color “cast”
 - This occurs because water filters out colors – especially red
 - Its common with no flash or the cameras relatively weak built-in flash.
- Color or white balancing corrects the image so whites look white and grey looks grey
- Color balance, cropping, and a levels adjustment are the most common edits

Adjust colors – Remove color cast^{QF}

- A powerful, fast way to set white balance
- Use when
 - Color balance is off; a little or a lot
 - you can find a white or grey area in the image
- Click the dropper where you believe the image should be grey or white.
 - Keep clicking until the image looks good
 - A partial correction can be a good starting place for fine tuning with other tools



Adjust colors – color variations^{QF}

- A visual technique to shift color balance
- Use when
 - Color balance is off or you want to shift color for creative purposes
 - Remove color cast doesn't work or needs refinement
- Click the box that adds or subtracts the color you need.
 - Reset and repeat as needed
 - Pressing a box more than once increases the effect
 - Lower the amount slider to reduce the effect
 - Midtones, Shadows, Highlights contain effect to those tonal levels
 - Look for and correct color cast in shadows



Advanced
topic

Adjust colors – photo filters

QF

- Shifts color balance immediately seen in image
 - Warming filters decrease blue and green
 - Red adds back color most often missing
 - Warming (85) and Red seem most useful
- Use when
 - Color balance is off or you want to shift color for creative purposes
 - Remove color cast doesn't work or needs refinement
- Select filter and adjust intensity



Adjust colors – Levels

QF

- Levels white balance dropper or individual color controls provide a wide range of color adjustment
- Use when
 - Color balance is off or you want to shift color for creative purposes
 - You're already doing a tone adjustment with levels
- See Levels for directions

Image cleanup, Noise, Sharpening and more

- Spot healing brush
- Healing brush
- Reduce Noise
- Auto Sharpen
- Adjust Sharpness

- Selections and Layers

Image cleanup - Spot healing

- Excellent results - although tedious; Almost magically cleans up backscatter
- Use when you want to remove backscatter or other local spots in the image
- Adjust circle size to slightly larger than the spot
 - Click on spot
 - Avoid including more than one tonal/color area (or getting close to another area) – it will mix in tone / color of second area into the first



Image cleanup – Healing brush

Advanced
topic

- Amazing results but more touchy than spot healing brush
- Use to erase objects entirely. Works well with isolated lines – less well with larger sized surfaces
 - Try erasing distracting fish in the background
- Best results when adjust circle size to somewhat larger diameter than the area to be fixed / removed.
 - Alt-click on replacement pixels
 - Drag brush along pixels to replace
 - Healing brush blends the new pixels into the old.
 - Avoid getting near a different tonal/color area – it will mix in tone / color of second area into the first

Demo

Noise - reduce noise

- Photos taken at 400 or higher ASA/ISO (and those with levels or shadows boost) will look grainy / noisy
 - Reducing noise makes them look smoother
 - Reducing noise always reduces sharpness too – it's a balance
 - You can gain sharpness back with adjust sharpness
- Use to reduce visible camera noise or grain from film scans


Reduce noise - cont

- Settings

- Image view = 100%
- Preserve details 0 – 20%
 - Doesn't work well. Don't set very high.
- Reduce color noise at default. Remove jpeg artifact off
- Move strength slider balancing noise reduction with sharpness loss



Sharpening – auto sharpen

- Auto sharpen attempts to set sharpening settings automatically. This is a good approach for beginners 
 - Adjust sharpen, the manual sharpener, takes practice to master
- Use when image is blurred by minor camera movement or noise reduction
- Set auto sharpen

Sharpening – adjust sharpness

- Adjust Sharpness gives you control over the degree of sharpening.
- Use when image is blurred by minor camera movement or noise reduction and auto sharpen either over or under sharpens
- Set
 - Image view at 100%
 - Remove lens blur
 - Check more refined
 - Amount and radius interact
 - Start with amount at 100%,
 - adjust radius around 1 to 3 pixel range to get most balanced effect
 - then adjust amount up or down as needed
 - Settings over 200% are very unusual

Selections

Advanced
topic

- Use when you need to edit one area of an image different from others
- Magic selection brush is most powerful tool
 - Located in left-hand toolbar
 - Often other tools are needed to “clean up”
 - Select, inverse is very useful
- There are lots of selection techniques
 - We’ll have to postpone that discussion

Layers

Advanced
topic

- Allow you to adjust edits after the fact
 - Layers remain after you save the file
- Masking provides “degrees” of selection
- Layer, create adjustment layer, (then choose the type)

- Too much detail to even touch upon tonight.
 - Take the “intermediate” class!

3 Advanced topics and supporting information

Photo editing tips

- Try not to crop too much
 - The fewer pixels left, the lower the quality
- Ensure the “preview” box is checked
 - Unless you have a slow PC, in which case unchecking it saves time
- Set View “size to fit”
 - Try to avoid 33% or 66 when gauging image quality
 - They create jagged edges
- A light bulb means help is available

More tips

- Be careful when using 33% and 66% zoom settings
 - Edges take on a rough look
- Use 100% zoom to see noise, sharpness
- There are many ways to accomplish an edit in Photoshop
 - Choose the one that's most comfortable for you.

What color is right?

Advanced
topic

- We often set color balance visually – what looks right is right
 - That's fine as long as you stay on the monitor you used for editing
 - But the colors can appear different when you use the photos elsewhere (print, project, tutor)
- Info pane helps
- The best solution is monitor calibration

Taking photos that edit well

Advanced
topic

- Get the exposure right
 - To stop underexposure, turn on camera's histogram and watch for pixels clustered to the left
 - To stop overexposure, turn on camera's overexposure warning and watch for blinking white pixels
- Use the highest resolution and highest quality settings.
 - Canon: resolution "L", compression "superfine"
- Compose in the camera
 - Don't waste pixels unnecessarily

Taking photos cont

Advanced
topic

- Learn how to use manual settings on your camera..
 - Full “auto” setting (“A” on canon) often does not provide the best results
 - UW is very different than above
 - Try “program mode”, shutter priority, aperture priority setting (“P”, “Tv”, “Av” on canon)
 - Set ASA / ISO manually
 - The higher the ASA, the lower the image quality
 - In PS I find 100 is fine for macro. 200 fish. 400 wide angle.
- Set auto white balance
 - Or try custom white balance if you’re adventurous

Taking photos – Raw capture

Advanced
topic

- Use “raw” capture if available
 - This stores much more data per pixel making exposure and white balance adjustments much easier
 - Some PS cameras respond very slowly with raw
- In normal “jpeg” capture the camera is making a lot of decisions for you
 - It selects the black and white clipping, white balance, noise reduction, sharpening etc

Noise reduction and Sharpening

Advanced
topic

- Noise reduction always reduces the sharpness of images
 - Use only when needed (high ASA shots)
- Digital cameras automatically sharpen JPEG images
 - Additional sharpening in Photoshop is usually not needed
- Over-sharpening will ruin your photos
 - Amplifies noise, looks grainy, gives harsh edges.

Elements can do many things besides editing

- It has several cooperating applications
- Create and Share help you build things with your photos and share them
 - Create has a nice slide show tool
- The Organizer is great!
 - It helps you organize, file, search, browse
 - Very well done, almost worth the price alone



Parting thought

Learning to use Photoshop isn't that hard

- just follow this (or any other good) guide

The real tricks are:

- deciding on your vision for the photo
- translating that vision into the language of the editor or

“What %\$#X? command do I use now!”

References

- Online links
 - Elements Village
 - <http://www.elementsvillage.com/forums/index.php>
 - Photoshop levels
 - <http://www.earthboundlight.com/phototips/photoshop-levels-1-2-3.html>
 - Histograms (intermediate level)
 - <http://www.sphoto.com/techinfo/histograms/histograms2.htm>
 - Instant photoshop (intermediate level)
 - http://www.luminous-landscape.com/tutorials/instant_photoshop.shtml
 - PSE quick reference card
 - <http://www.customguide.com/pdf/photoshop-elements-quick-reference-6.pdf>
 - Free PSE trial
 - <http://www.adobe.com/products/photoshopelwin/>