Protocol for Identifying Wildlife in Camera-Trap Photos

Supplemental research to:
Influence of deer harvest regulations on antlerless harvest, abundance, and sex and age composition: implications for managing deer in the face of chronic wasting disease

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Thank you so much for your interest in helping us ID photos from our APR project! I know this is a lot of text, but please review this document before beginning to tag photos, even if you have tagged photos for this project in the past!

What you will receive (on a flash drive):

The main folder will contain folders labeled things like "21003 Module Check 2." Within this folder will be another folder titled "Photos" and a database file called "PhotoID.accdr." This database file is a standalone file that is not truly connected to our main photo database (i.e., if something happens to the file you have access to it will not harm the main database). Each of these folders and databases contains the info for one camera during one two-week period. Depending on the site, the folder could contain 5 to over 5000 photos—and our big goal is to identify the deer in each of these photos. Also worth noting, the database you will be working with is a Microsoft Access application and uses an auto-save feature.

When you open the PhotoID.accdr file you will be asked to select your name. If your name doesn't appear in the list, just type it in and the database will add your info (we just need your name and initials in the dialog box that pops up). Sometimes it is much quicker to flip through the photos outside of the database, and sometimes you will want to look at a series of photos before deciding on an ID.

To assign a species to a photo, select the appropriate species in the drop-down box at the bottom left. You can assign multiple species to the same photo by adding additional rows in the subform. For this project, we have divided deer into multiple "species" – Doe, Fawn, Legal Buck, Sub-legal Buck, and Unknown Deer, then those species are broken down even farther based on the number of points seen on bucks. The only other species we are interested in are bear, bobcat, fox, and coyote. Once you've created a row in the subform for each species present in an image, use the "Next" button to move on. Don't just skip photos with nothing or non-focus species in them – specify "None" as the ID otherwise you won't be able to differentiate between photos that haven't been looked at yet and those that have been reviewed but don't contain any focal species. We are only identifying deer, bear, bobcat, fox, and coyote. Please do not add other species to the table (i.e., if a photo contains a raccoon, it is still tagged as "None"). Also, do not worry about the number of individuals in a photo tagged as "None"—leave it as the default 1 individual for photos tagged as "None."

If you spot an interesting photo, a photo that would be good for presentations, or a photo of an animal that appears ill, please use the "Highlight" checkbox on the right side – tick this box to flag photos to be reviewed by project PIs. If you identify an animal that looks ill, or if you identify a feral hog in any images, share that information with the project PIs immediately. You can also add comments to these photos.

Using Keyboard Shortcuts

Using the mouse to identify species can be unwieldy and time-consuming, so there are keyboard shortcuts available when using the PhotoID form. To see a list of keyboard shortcuts available, click the link below the "Next" and "Previous" buttons. These shortcuts will only work when the "focus" is on the main form, not within the subform where species are listed. This can be tricky to figure out, but if the keyboard shortcuts aren't working, try clicking the "Next" button, and then click the "Previous" to return to the record you were on – this ensures that the main form has the focus. In addition to the shortcuts specific to a species or detail, you can use the "Z" key to repeat all of the data from the last photo.

You can also use the up, down, left, and right arrows to move between records, and pressing the space bar will move to a new line in the subform so you can add additional ID. Getting this system down can take some practice, but once you learn how to use it you will be able to work through hundreds of photos in no time. There are a couple of situations to note when using the shortcut keys – first, detail shortcuts will only work if the appropriate species has already been assigned. Otherwise, the species shortcut will take precedence if it exists. For example, if "D" is the shortcut for dog, "L" is the shortcut for lynx (both in the Species table), and "L" is also assigned for the detail "On Leash" associated with the species dog (in the DetectionDetails table). Pressing "D" then "L" will set the species to dog and the detail to "On Leash," but pressing "L" first will set the species to lynx.

How we ID

Almost all deer should be assigned a species and detail tag. Keyboard shortcuts for all possible combinations:

Species shortcut table:

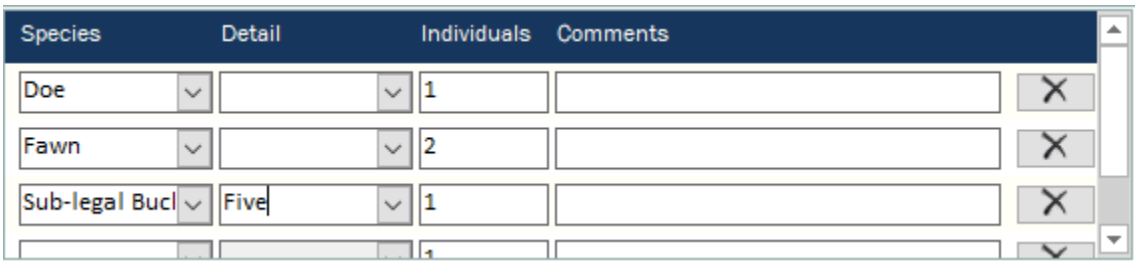
Shortcut	Species
b	Bear
c	Bobcat
y	Coyote
v	Fox
p	Camera Problem
d	Doe
f	Fawn
l	Legal Buck (at least 4 points on one side)
s	Sub-legal buck (does not have 4 points on a side)
u	Unknown Deer
x	Camera Setup/Takedown
r	**Remove (photos of humans)**

Detection Details List:

Shortcut	Species	Detail
b	Fawn	Buttonbuck
f	Fawn	Female
q	Legal Buck	Four Point
f	Legal Buck	Five Point
s	Legal Buck	Six Point
v	Legal Buck	Seven Point
e	Legal Buck	Eight Point
n	Legal Buck	Nine Point
t	Legal Buck	≥ Ten Point
t	Sub-Legal Buck	Three Point
q	Sub-Legal Buck	Four Point
f	Sub-Legal Buck	Five Point
s	Sub-Legal Buck	Six Point
p	Sub-Legal Buck	Spike

a	Unknown Deer	Antlered
l	Unknown Deer	Antlerless
u	Unknown Deer	Cannot see head

Example: You have a photo with a doe, two fawns, and a buck with three points on one side and two points on the other. You should have three tagging lines:



If you were using keyboard shortcuts you would have typed out: “D”, “Space bar”, “F”, “2”, “Space bar”, “S”, “F” → these key strokes would indicate “Doe”, “New line”, “Fawn”, “2 individuals”, “New line”, “Sublegal buck”, “Five Points”

The spacebar will allow you to jump to the next row for data entry.

For counting antler points, always count every single point that looks like it would be an inch or greater by November. We are recording total points, not just the points from one side. Sometimes it is not possible to see every single point. If you can see that a deer has at least four points on one side but cannot see both sides of the rack, ID the deer as “legal buck” with no point description. If you can only see one side of a rack and there are three or fewer points on that side, ID the deer as “unknown deer – antlered” since you cannot be sure the other side of the rack doesn’t have four points. **Every deer tagged as “Unknown Deer” must have a detail with it (antlered, antlerless, cannot see head).** Sometimes it is very obvious that a deer is not a legal buck but you cannot count all points, in this case it would be okay to ID the deer as “sublegal buck” with no detail, but only use this if you are extremely confident there’s no way the other side has four points.

If a deer walks out of the frame, it should not be identified. If, however, one deer walks in front of another deer, but you know both deer are still present you should ID both deer.

Eyeshine without deer confirmation is not enough to ID a deer, photos that contain eyeshine that does not later reveal itself to be a deer should be labeled as “None”.

Don’t be afraid to go back and change your IDs if more information presents itself (i.e., you didn’t notice a fawn in some tall grass until it pops out, but then you go back and can see movement behind the grass. Those photos can be identified as the fawn).

If you find a photo of a human who isn’t one of our technicians (i.e., the photo is not at the very beginning or end of the series), please ID it as “Remove” so we can delete them from our master photo storage. We do not want to keep any photos of humans—we are actually required by the university to remove photos of humans (tag as “Remove” and so we can delete in bulk later).

If a photo is a white-out due to the flash and you cannot be sure what is in the photo frame, label the photo as “camera problem.” If there is a white-out photo but you can identify deer, then do not label the photo as “camera problem.”

The “Batch ID” button is a wonderful resource, especially when you are looking at a thousand photos of a bedded deer. Flip through the photos outside of the database to find the last photo in the series of nothing (or the series of a fawn

dawdling in front of the camera which also happens often), click “Batch ID” and navigate to the final photo. Notice you can only add one ID per “Batch ID,” so if you have a doe and a fawn in 100 photos you will have to add them separately using the Batch ID function.

Sometimes you will have a group of deer hang out/move around in front of a camera for a long series of photos and it can be difficult to know what deer are in each photo. In these instances, it can be helpful to copy the photos into a PowerPoint and label each deer; then track one deer through the series of photographs to better tell (a) what the deer is (i.e., sometimes you only get one clear shot of antlers out of a series of 100 photographs) and (b) to tell when each deer leaves the frame. Once you have tracked each deer throughout the photo series and have triple checked that each deer has been marked, go back to the database and enter all of the information for each photograph.

Adding Tags to Photos

In some cases, even after photos have been identified it can be difficult to spot the animal in question or figure out exactly what’s going on. These cases can be frustrating when the IDs are reconciled, since the referee needs to repeat the effort of trying to find the animal all over again to determine which ID is correct. To alleviate these issues, you can add “tags” to photos to highlight specific regions, thereby helping the referee spot the important content. A tag is just an orange box that draws attention to a specific part of a photo. They are stored in the database and not added to the image files themselves, so they won’t appear if you open the image file externally. They only appear within the database in the PhotoID form, and they’re only visible to the observer who created them or when comparing IDs. To add tags in the PhotoID form, single-click or click and drag on the region you want to highlight. You can add up to 5 tags per photo. To delete an existing tag click within it. Also, there is an option to add comments in the table where you input species.

Photo and data input example:

Species	Detail	Individuals
Doe		1
Fawn		**2**