

# Ecological Restoration Brief

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## Monitoring More Using Photos – (Series) Part II: Photo Frame Photography

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Most vegetation monitoring is focused on how many individual plants are in an area or how much space they occupy (cover). Sometimes, however, the vertical structure of the vegetation is very important. For example, the grassland birds using a particular site will change after mowing or heavy grazing that changes a tall, dense grasslands to a short one, even if all the same plant species are present. Monitoring vertical structure (also called visual obstruction) is often done using range poles, but a large number of measurements are needed and it can be difficult to do accurately.

Ryan Limb and his colleagues developed a technique using a frame covered with white plastic sheeting as a background for a photograph. The photograph is then cropped to include only the frame and turned into black and white. All the black is vegetation cover and the total percent cover is calculated as the number of black pixels divided by the number of white pixels. As with all photographic methods, the analysis can be repeated in different ways. I often split the frame into height categories and calculate cover for vegetation under 1 m and over 1 m separately.

The height of the frame should be tall enough to encompass most of the vegetation you expect to encounter. In coastal grasslands, I use a frame 1.5 m tall (and sometimes the little bluestem is still taller than the frame!); in west Texas, I use a 1 m tall frame. I constructed my frames from PVC pipe (putting electrical tape on the upright sides every 10 cm to



Setting up the photo frames.  
Davis Mountain Preserve, Jeff Davis County.  
Photo credit: Charlotte Reemts



**Adjusting for sunlight and shadow.  
Mad Island Marsh Preserve, Matagorda  
County. Photo credit: Mad Island Marsh  
Preserve Volunteer**

measure vegetation height) and sewed fabric covers. The fabric is more durable than the sheeting when working in dense vegetation, but it can be difficult to get it stretched tightly across the frame. Limb analyzed his photos in Adobe Photoshop. I use ImageJ, free software developed for medical imagery. ImageJ has a lot of flexibility in analyzing different parts of the photo separately. You can also exclude certain parts of the photo, such as a shadow from the person holding the frame.

Some tips to keep in mind with this method. First, it is much easier to do with two people (one to hold the frame and one to take the photo). If you have to do it by yourself, use some long rebar and put your PVC over the rebar (easiest to do in deep, soft soils). Second, lighting can be tricky, since sometimes you have to take the photograph into the sun. In that case, switch the positions of the frame and the photographer; you'll still "sample" the same vegetation, but the light will work in your favor.

#### References:

Limb, R. F., K. R. Hickman, et al. (2007). "Digital Photography: Reduced Investigator Variation in Visual Obstruction Measurements for Southern Tallgrass Prairie." Rangeland Ecology & Management **60**(5): 548-552.

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