Winter camouflage protects animals

by The Geophysical Institute
for the Tundra Times

The white winter camouflage of many birds and mammals such as the ptarmigan, the Arctic hare and the harp seal as a pup serves to protect against predators.

The polar bear scarcely needs such protection, and one might wonder why nature chose to provide it — until it is considered that a sneaking white polar bear cannot be easily seen by a sunbathing seal. In any case, to biologists who are concerned with keeping track of animal populations, such camouflage can be frustrating.

These animals often live in areas such as on ice packs where aerial counts are feasible because of the lack of overhead cover, but ordinary photographic means do not easily distinguish white animals against a white background.

Zoologists D. Lavigne and N. Oritsland of Ontario tried using thermal infrared imagery as a means of detection. This is one of the methods used by border patrols to catch illegal aliens during the hours of darkness.

But they found that in cold and windy conditions, sufficient temperature differences did not exist between a well-insulated animal and its environment to enable them to identify the animals.

However, it was found that photography at the other end of the spectrum — the ultraviolet — did. Infarred and ultraviolet are both invisible to our eyes, but most film emulsions are sensitive to them.

The coat of a polar bear or a harp seal pup reflects all wavelenghts in the visible spectrum, and thus appears white to the human eye. The same applies to a snow field. However, while the snow also reflects ultraviolet — which explains why it's so easy to get a sunburn while skiing — an animal's coat absorbs it.

This being the case, harp seal or polar bear census counts on the ice are simplified by using aerial ultraviolet photography. If a lens filter is used that screens out the visible spectrum and transmits the ultraviolet, the animals look black against a white background in the picture.

As a measure of the effectiveness of the technique, Lavigne and Oritsland compared the numbers of harp seal pups detected with ordinary photography and ultraviolet in the same area of the North Atlantic. Black and white picked up only 21 percent of the pups seen on the ultraviolet.

The authors also make the observation that ultraviolet photography of military equipment camouflaged white was as revealing as their photography of the white mammals. They recommend a change of paint to something with a high ultraviolet reflectivity.