Detection of free-living birds using visible and thermal cameras with an unmanned aerial vehicle

Mijin Park[1, 2], Won Young Lee*[1]

[1]Division of Polar Life Sciences, Korea Polar Research Institute

[2]Department of Forest Sciences, Seoul National University

Recent technologies in unmanned aerial vehicles (UAVs) have facilitated many ecological studies at fine spatial resolutions. UAVs are performed as supplementary tool for traditional ground monitoring. UAVs have several strengths such as reducing manpower and obtaining massive data easily when applied in wildlife research. In particular, thermal cameras have occasionally employed to capture nocturnal species and now can be equipped on UAVs. Accordingly, this research aims to detect bird species using visible and thermal camera combined with UAVs. In July 2018, a quadcopter UAV with a RGB and thermal camera was used to monitor birds in Northeast Greenland National Park. The targets were incubating common ringed plover (*Charadrius hiaticula*) and a flock of moulting pink-footed geese (*Anser brachyrhynchus*) near the sea shore. From acquired images, common ringed plover was detected only in thermal images due to its cryptic coloration in visible images, and pink-footed geese were distinguished in both visible and thermal images. Common ringed plover showed the highest radiation temperature among the surroundings, and the average temperature of pink-footed geese was 5.6°C higher than that of the ocean. In April 2019, a further blind survey was conducted at a military zone in Incheon in Republic of Korea. Resting black-faced spoonbills (*Platalea minor*) in a muddy tidal area were recorded in both visible and thermal images. We suggest that thermal cameras and UAVs can be applied to monitor animals in extreme environments and in restricted areas and help researchers find cryptic wader nests.

*Corresponding author: wonyounglee@kopri.re.kr