

Civtech Project Update - March 2021

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- 1) The accelerator stage of phase 1 of the CivTech project concluded at the start of February with the demo day which hopefully a few people saw the presentations. We have been working with two companies - Eolas looking at satellite imagery at 30cm resolution combined with AI image recognition software and Sentinel Unmanned using UAVs combined with AI image recognition software. Understandably there has been a lot of interest in the subject from a wide range of stakeholders
- 2) Both companies have developed a minimum viable product and proved the concept that there are alternatives to using helicopters to count deer accurately and in a sensitive fashion.
- 3) Currently satellite imagery does have some limitations around the image resolution required to accurately classify deer, but it can be used to find deer in the wider landscape setting and provide data on total numbers. It is also likely to be useful for combining with land use / habitat type / HIA information and measuring change over time.
- 4) UAVs are likely to be more suitable for providing more localised information included classification of deer and species distinction utilising both high definition colour cameras and infra-red cameras.
- 5) Both approaches have multiple options for imagery – In terms of the UAVs there may be the ability to identify within woodland cover – unlikely in mature coniferous forest canopy but more likely in more open native woodland areas depending on topography and time of year. This is something that will be explored further through the next phase of work.
- 6) Both approaches have achieved in excess of <80% accuracy in successfully identifying deer in images using the newly developed AI algorithms. At this stage it is correctly identifying <80% of the deer in the image, not 80% of the deer in the count area. It is expected that these accuracy figures will improve as the system is further developed and trained and should be in line with current helicopter count accuracy levels or better.
- 7) Phase 2 of the work will commence in March 2021 and we have signed two pre-commercial agreements with both companies. This will involve a further 6-month project with Eolas including a trial count of Mar Lodge, including further development of the AI software. Sentinel will undertake another 12 months' work including developing flight procedures for two different types of high spec drones; fixed wing and rotary engine units and capable of flight times 4-8 hours in beyond line of sight operations, carrying out test flights, further refinement of the image classifier, testing of different cameras systems and exploration of options for data sharing through a portal. We are currently looking at undertaking the Sentinel trial in Glenartney DMG.

- 8) Both these trials will involve working with estates and relevant area DMGs and NatureScot will help facilitate this and provide opportunities for stakeholders to get some exposure to the developing technologies and build on land manager confidence.
- 9) NatureScot is committed to further exploring alternatives to helicopter use and has secured an £80k grant from Civtech towards the overall project cost of £200k for the 2021/22 financial year.
- 10) At this stage this is not a replacement of helicopter use but being fully explored as an alternative solution that in time could see greater applications to help reduce costs and our carbon footprint in future.
- 11) There is still a fair bit of work to do to hone the process, better understand the impact of UAVs on deer behaviour and movement, explore flight paths and train the AI classifier for both companies.