

UNMANNED AERIAL SYSTEMS FOR WILDLIFE MONITORING

Perez F., Albo C., Viguria A., Ollero A. - FADA-CATEC [1]

{fjperez, calbo, aviguria, aollero}@catec.aero

Abstract

Recent advances in key technologies have boosted the development of Unmanned Aerial Systems (UAS) for many civilian applications regarding inspection, surveillance or monitoring. The overall aim of this research is to investigate the use of UAS for making population census and biological sample collection, as well as evaluating the environmental impact of infrastructures on the natural environment. The implementation of such system intends to develop new data acquisition methods using advanced technologies that have already shown their usefulness in other areas, but have been rarely implemented in a realistic way as a technological tool for environmental preservation.

Doñana

The missions take place in Doñana Natural Park, whose marshlands can concentrate 700,000 aquatic birds, making this reserve the most important wetland in Spain and one of the most important protected areas in Europe.



Aerial Platform

Viewer is an unmanned aerial system by Elimco [2] that is being used for data acquisition in this research. It is a light and easy to carry supervision system designed for surveillance and reconnaissance tasks. *Viewer* is notable in these applications for its high payload capacity and its low sonorous impact thanks to its electric propulsion. The basic specifications of *Viewer* are shown below.

WINGSPAN	4.7 m
ENDURANCE	75-90 min
RANGE	45 Km
MTOW	8 Kg
PAYLOAD	2 Kg
SPEED	40-110 Km/h
MAX ALTITUDE	1,500 m



Data Acquisition



High resolution images along with inertial measurements are captured and stored using an embedded system onboard the aircraft.

Images are then geotagged and the mission route is presented to the researchers using common geographic information systems (GIS).



All the data is also presented in a graphical user interface, in order to facilitate mission reviews and easily locate specific regions of interest.

Data Processing

Current work considers the implementation of several image processing algorithms to perform:

- mosaic building



- animal tracking



- detection of casualties



More information

[1] Andalusian Foundation for Aerospace Development (FADA), Center for Advanced Aerospace Technologies (CATEC)
<http://www.catec.aero>

[2] <http://www.elimco.com>

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