

DIPARTIMENTO DI PIANIFICAZIONE DESIGN
TECNOLOGIA DELL'ARCHITETTURA



SAPIENZA
UNIVERSITÀ DI ROMA



54th SISV Congress

*Twenty years in the third millennium
with Vegetation Science*

September 28th-29th 2021

Abstract book

SISV 2021 is organised with the Scientific Support of the following Authorities



SAPIENZA
UNIVERSITÀ DI ROMA



UNIVERSITÀ
DEGLI STUDI
DEL MOLISE



Institute of Botany and Botanical Garden „Jevremovac“
Faculty of Biology – University of Belgrade



REGIONE
LAZIO

SSDNT
Scuola di specializzazione
beni naturali e territoriali
Sapienza Università di Roma



CAPITALE NATURALE
E AREE PROTETTE
PIANIFICAZIONE
PROGETTAZIONE
GESTIONE
Master di II livello

The 54th Congress of the Italian Society for vegetation Science was set to be hold in June 2020 at the Faculty of Architecture of the University of Rome. The explosion of the COVID-19 pandemic in the spring of last year led first to move the congress to October 2020 and then definitively to 2021. However, the persistence of the serious situation of COVID-19 infections in Europe during these first months of 2021 and the uncertainty about the results of the current vaccination campaign does not allow us to plan a “face to face” congress as we had planned it.

The SISV 2021 congress will therefore be carried out as a **virtual conference**.



Scientific Committee

Alicia Teresa Acosta, Marina Allegrezza, Silvia Paola Assini, Simonetta Bagella, Marco Caccianiga, Romeo Di Pietro, Anna Rita Frattaroli, Daniela Gigante, Riccardo Guarino, Dmtar Lakusic, Ladislav Mucina, Leonardo Rosati, Massimo Terzi, Jean-Paul Theurillat, Daniele Viciani, Wolfgang Willner

Organizing Committee

Romeo Di Pietro (romeo.dipietro@uniroma1.it), Sabina Burrascano, Antonio Luca Conte, Piera Di Marzio, Paola Fortini, Duilio Iamónico, Francesca Perrone, Elisa Proietti, Massimo Terzi

Secretary

Piera Di Marzio (sisv54.2021@gmail.com)

Design and layout of the Abstract book

Piera Di Marzio

UAV IMAGERY AS TOOL FOR HABITAT MONITORING IN A CONSTANTLY CHANGING DUNE ENVIRONMENT: THE CASE STUDY OF THE TENUTA DI SAN ROSSORE (PI), TUSCANY

Bertacchi A.¹, Piemonte A.²

¹ Department of Agriculture, Food and Environment (DAFE) University of Pisa, Pisa (Italy), ² Department of Civil and Industrial Engineering, University of Pisa, Pisa (Italy)

Presenting author: Andrea Bertacchi, andrea.bertacchi@unipi.it

Preliminary results related to the use of UAV technology for monitoring coastal erosive dynamics and effects on dune habitats (sensu 92/43/EEC directive) are reported.

The investigated coastline (San Rossore Estate, part of the M.SR.M.Regional Park) in the north-west of Tuscany is one of the coastal sectors of Tuscany most affected by coastal erosion. Since 1954 to present, with a range that goes from a minimum of 10 m to a maximum of 382 m of coastal retreat, erosion has determined and determines constant readjustments or, often, disappearance of the dune habitats. In spite of this, the sandy coast still reveals the presence of the most significant dune habitats, although discontinuous, fragmented and often altered in their floristic-vegetational physiognomy [1]. The belt relative to entire foredune system including the 1210, 2110 and, in part, 2120 habitats, has been and it is still subject to erosive processes while the fixed dune, in part, still remains.

In this context, as part of ongoing research into coastal line surveying methods, implemented by A.S.T.R.O. laboratory of the Civil and Industrial Engineering Department of the University of Pisa, UAV high definition images (0.45 cm/px, flight alt.20 m) were taken in order to test a quick monitoring on georeferenced plots, located on the N and S of the mouth of the Morto Nuovo River. Here, the north sector is completely eroded while the south sector undergoes a process of erosion and redeployment of sediments. On two series of flights (2016-2019) carried out in the area, 6 adjacent- plot transects, orthogonal to the coast line, were highlighted on the UAV imagery. Afterwards, phytosociological surveys were carried out on the ground and compared with what is identified by manual and semi-automatic interpretation of imagery on GIS platform.

Together with the partial collapse of the dune system due to erosion, it detects an impressive coverage of *Euphorbia paralias* that actually extends from the edge of the annual vegetation of drift lines (H1210) to the foot of the partially consolidated dune (H2210) that still survived erosion.

From what has been pointed out so far, some considerations can be drawn : 1- the use of high definition UAV imagery, with appropriate software, allow a very accurate recognition of the main species / communities, not unlike that on the ground and highly accurate coverage measurement; 2- where the erosive process is continuous and progressive, there is the disappearance of habitats and a partial translocation of some species towards the interior; where a dynamics of erosion and partial redeployment of sand insists, the rarefaction/disappearance of diagnostic species of H2110 (i.e *Elymus farctus*) the rarefaction of diagnostic species of H2120 (i.e *Ammophila arenaria*) and the massive expansion of semi-monophytic communities of other diagnostic species of innermost dunes H2120 (i.e *Euphorbia paralias*) is observed. In this case, *Euphorbia paralias* coverage, could be used as an “early warning” of degradation of habitat.

This case study reveals that monitoring with UAVs can be of great help to the survey in the field, being able to quickly record the entire spatial context where to have the possibility to detect innumerable survey plots, at a later time. The high resolution orthophotos, in these environments, can provide an excellent habitat identification tool and detection of some target species (typical-diagnostic-characteristic).

1) Bertacchi A., 2016. Dune habitats of the Migliarino – San Rossore – Massaciuccoli Regional Park (Tuscany – Italy). *Journal of Maps*, 13:322-331