Assessment of post forest fire reclamation in Algarve, Portugal

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Fire is a common phenomenon in Mediterranean landscapes and it plays a crucial role in its transformations, making the determination of its impact on the ecosystem essential for land management. During summer of 2012, a wildfire took place in Algarve, Portugal, on an area mainly covered by sclerophyllous vegetation (39.44%, 10080ha), broad-leaved forest (20.80%, 5300ha), agriculture land with significant areas of natural vegetation (17.40%, 4400ha) and transitional woodlands-shrubs (16.17%, 4100ha). The objective of the study was to determine fire severity in order to plan post-fire treatments and to aid vegetation recovery and land reclamation. Satellite imagery was used to estimate burn severity by detecting physical and ecological changes in the landscape caused by fire. Differenced Normalized Burn Ratio (DNBR) was used to measure burn severity with pre and post fire data of four Landsat images acquired in October 2011, February and August 2012 and April 2013. The initial and extended differenced normalized burn ratio (DiNBR and DeNBR) were calculated. The calculated burned area of 24291 ha was 552ha lower than the map data determined with field reports. The 19.5% of that area was burned with high severity, 45% with moderate severity and 28.3% with low severity. Comparing fire severity and regrowth with land use, it is shown in DiNBR that the most severely burned areas were predominantly sclerophyllous vegetation (37.6%) and broad-leaved forests (31.1%). From the DeNRB it was found that the reestablishment of vegetation was slower in mixed forests and higher in sclerophyllous vegetation and in land with significant areas of natural vegetation. Faster recovery was calculated for the land uses of sclerophyllous vegetation (46.7%) and significant regrowth in areas of natural vegetation and lands occupied by agriculture (25.4%). Next steps of the study are field validation and crossing with erosion risk maps before to take land reclamation decisions.