

South-Mediterranean Oaks Forests Management in Changing Climate Case of the National Park of Tlemcen-Algeria

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Abstract : The expected climatic changes in North Africa are the increase of both intensity and frequencies of the summer droughts and a reduction in water availability during growing season. The existing coppices and forest formations in the national park of Tlemcen are dominated by holm oak, zen oak and cork oak. These opened-fragmented structures don't seem enough strong so to hope durable protection against climate change. According to the observed climatic tendency, the objective is to analyze the climatic context and its evolution taking into account the eventual behaving of the oak species during the next 20-30 years on one side and the landscaped context in relation with the most adequate silvicultural models to choose and especially in relation with human activities on another side. The study methodology is based on Climatic synthesis and Floristic and spatial analysis. Meteorological data of the decade 1989-2009 are used to characterize the current climate. An another approach, based on dendrochronological analysis of a 120 years sample Aleppo pine stem growing in the park, is used so to analyze the climate evolution during one century. Results on the climate evolution during the 50 years obtained through climatic predictive models are exploited so to predict the climate tendency in the park. Spatially, in each forest unit of the Park, stratified sampling is achieved so to reduce the degree of heterogeneity and to easily delineate different stands using the GPS. Results from precedent study are used to analyze the anthropogenic factor considering the forecasts for the period 2025-2100, the number of warm days with a temperature over 25°C would increase from 30 to 70. The monthly mean temperatures of the maxima's (M) and the minima's (m) would pass respectively from 30.5°C to 33°C and from 2.3°C to 4.8°C. With an average drop of 25%, precipitations will be reduced to 411.37 mm. These new data highlight the importance of the risk fire and the water stress which would affect the vegetation and the regeneration process. Spatial analysis highlights the forest and the agricultural dimensions of the park compared to the urban habitat and bare soils. Maps show both fragmentation state and forest surface regression (50% of total surface). At the level of the park, fires affected already all types of covers creating low structures with various densities. On the silvicultural plan, Zen oak form in some places pure stands and this invasion must be considered as a natural tendency where Zen oak becomes the structuring specie. Climate-related changes have nothing to do with the real impact that South-Mediterranean forests are undergoing because human constraints they support. Nevertheless, hardwoods stand of oak in the national park of Tlemcen will face up to unexpected climate changes such as changing rainfall regime associated with a lengthening of the period of water stress, to heavy rainfall and/or to sudden cold snaps. Faced with these new conditions, management based on mixed uneven aged high forest method promoting the more dynamic specie could be an appropriate measure.

Keywords : global warming, mediterranean forest, oak shrub-lands, Tlemcen

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