

abstract

Plant species growth in a region are influenced by the ecological and environmental factors of that region. To locate potential habitat of plant species, making study on the biological needs and characteristics of the climate in the considered region is essential. In this study, locate potential habitat in negaze plain's of *ahvaz* in *Iran* for two species of *panicum antidotale* and *pennisetum divisum* using GIS, fuzzy logic and analytical hierarchy process was discussed. For this purpose, first habitats of considered species in region have been determine and then current status of the species was known as real environmental and ecological needs in specific points and location of this points were recorded with GPS. Also to determine soil needs of considered species, soil sample taken from a depth of 0 to 30 cm then experiments related to soil texture, soil acidity (PH) and the electrical conductivity was conducted. In the next step the required digital data layers was prepared and data proportional to project need was gathered. To calculate the factor of slope physiographic, direction of slope and height had been used from topographic map with 1/25000 scale and then maps of soil properties and ground water level was prepared and standardised with GIS. To standardization is used from fuzzy logic. Thus each of the fuzzy membership function were obtained and then using this function all the layers were fuzzy optimization and were weighting. For this purpose, components of multi criteria decision analysis was used. One of the newest method is an analytic hierarchy process (AHP) which also has the ability to integrate with GIS. Finally with integrate of data layers in ArcGIS10 program and in the shape of weighting model of hierarchy process (AHP) and using of fuzzy membership functions potential habitat maps for each species were obtained individually and they were determined on map and then the resulting map was classified based on potential habitat. Result for *pennisetum divisum* species's indicate that 881 ha of selected region is suitable for growth of species and 1983 ha of selected region has moderate potential to growth of species. 2155 ha and 1016 ha of considered region is weak and so weak for the growth of species respectively. Also result of locate potential sites of *panicum antidotale* species's indicate that 1824 ha of region is so suitable for growth species. 2331 ha, 686 ha and 1198 ha of region is moderate, weak and so weak for the growth of species respectively. To calculate the accuracy of GIS in locating potential habitat, quality fitness fort (kappa) was used and a part of habitat were randomly selected as control sample and not included in the model. After determining of the appropriate zones of studied species, this control samples were used for evaluation criteria and accuracy for determining of suitable habitat. The results showed that the model used can determine habitat of two species with an accuracy of 95/3 %.

Key words : location, potential habitat, analytic hierarchy process, GIS *Panicum antidotale* *Pennisetum divisum*



University of Zabol

Faculty of Water and Soil

Department of Range and Watershed Management

**The thesis submitted to fulfill Degree of M.Sc
in the field of Range Management**

**Locate of potential habitat of *Panicum antidotale* and
Pennisetum divisum with using AHP and fuzzy logic
in GIS (Ngazeh plain, Ahvaz)**

Supervisor

Dr. A. Fakhireh

Advisors

Majid sharifi rad

Kourosh kiani

By

Somaye Farhadvand

October 2013