

Identification of high risk areas and effective environmental factors on wolf attacks on livestock in Hamedan province using MAXENT modeling method

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Abstract

Livestock predation by wolf is one of the most frequent sources of conflict between human and wildlife and one of the reasons for species extinction throughout the world. Recent documented reports about the wolf attacks on livestock in Hamedan province is an example of the occurrence of such conflicts. This study aimed to identify risky areas for wolves' attacks on livestock and determination of environmental factors affecting these conflicts with maximum entropy modeling method using MAXENT software. The results showed that the most important factor is land use variable in study area. In making of map of high-risk areas, livestock density and distance from the river other effective factors are as well. According to obtained predictions, Bahar and Kaboodarahang are facing with the highest possibility of wolf attacks. Results of this study could be use as a useful tool for implementation of conservation activities for mitigation of wolf-livestock conflicts in high risk areas of Hamedan province.

Keywords: Hamedan province, MAXENT, maximum entropy algorithm, modeling of high risk areas, wolf depredation.

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Application of nested logit model in ecosystem services valuation (Case study: Ganjname recreational site)

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Abstract

Today, environment is an important part of any country's economy. One of the main issues in environmental economics is non-market value estimation. Recognizing the importance of environmental and tourism of recreational sites, the purpose of this study is economic valuation of Ganjname recreational ecosystem attributes, estimation of implicit price, impact assessment of socio- economic variables such as age, marriage status, indigenous status, family size and education stand on the mentioned values and analyzing welfare and compensation variation due to variation of hypothetical policy and movement from a hypothetical policy to another one. It has been used choice experiment approach that it is subset of choice modeling procedure and stated preferences methods. Data needed extracted from six different choice experiment questionnaires filled out by 300 random households in Hamedan city. Each questionnaire contained 72 hypothetical policies, 36 choice sets, 1296 observations and 3888 rows of data. In order to estimation of visitors willingness to pay for improving attribute levels for Ganjnameh site, nested logit models and full information maximum likelihood method were used which is on the basis of multinomial discrete choice analysis of preferences, Lancaster's theory of value and the theory of random utility function. Results showed that the visitors have willingness to pay for conservation of forest diversity, preservation of monument and environmental health by sequence 17810, 33518, 36121 Rial, while no positive willingness to pay for reduction of overcrowding. Some socio- economic variables have a positive impact on willingness to pay.

Keywords: choice modeling, Lancaster Theory, nested logit model, maximum likelihood.

Classification JEL: Q51, Q53, D46, D62.

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Tolerance comparison of four wild almonds to salinity in Chaharmahal and Bakhtiari province

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Abstract

Drought and salinity are the most important environmental stresses that are causing adverse effects on natural ecosystems. There are species among Iranian natural germplasm that are resistant to environmental harsh conditions. Restoring of degraded ecosystems, promoting of biodiversity and increasing of species richness will provide by identifying of these species. Almond species with broad ecological range have this capability. In order to compare the resistance of wild almond species to salinity stress and investigation on effect of aspect (geographical direction) on salinity resistant, seeds of *Amugdalus Arabica*, *A. scoparia*, *A. haussknechtii* and *A. eleagnifolia* were collected from north and south aspects from Karebas site in Chaharmahal and Bakhtiari province. Seeds were treated by cold-water stratification and then were planted in the nylon bags in green house. After two months, seedlings were experimented by using of sodium chloride with five levels of salinity (control, 25, 50, 75, 100 Mm), by factorial experiment in completely randomized design with three replications. Results showed that the maximum amount of growth and biomass belonged to seedlings from south aspect. Control seedlings were grown 14 cm during the experimental period and the growth rate of seedlings under 100 mmol reduced to 8.9 centimeters. By increasing of salinity, length and height increment of seedlings decreased. Increasing of salinity caused reduce in absorption of copper, zinc, iron, manganese and potassium and increase in uptake of magnesium, sodium, chlorine, nitrogen, calcium and proline concentration in the shoots of seedlings. Proline in control seedlings was 39 mg/g, by increasing of stress amount of proline received to 118.4 mg/g in seedlings under salt stress of 100 mmol. Among the studied species, *A. arabica* had highest levels of growth factors, pigments concentration and uptake of necessary elements in facing of salinity stress, which sounds to be the most resistant species to salinity.

Key words: nutrients, proline, sodium chloride, Zagross.

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The evaluation of the functionality of artificial neural network and geostatistical methods in simulation of quality parameters of groundwater (Case study: Koohpayeh, Isfahan)

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Abstract

Groundwater resources are the most important sources of water consumption (agriculture, industry and drinking water) in arid and semi-arid regions. The management of these water resources is more expensive and difficult than surface waters; therefore more complicated and economic methods are needed for determination of their quality and quantity. In this study geostatistical methods of kriging and cokriging and multilayer perceptron (MLP) artificial neural network model were used to estimate the quality parameters of SO_4^{2-} , TDS, Ca and TH. The methods were compared in order to understand which one is the best method for this estimation. Data obtained from 50 wells located in Koohpayeh plain in Isfahan province was used for this study. For estimation of the functionality of these methods in simulation of the parameters, RMSE and correlation coefficient were used. The results showed that for all of the studied parameters, MLP with a lower RMSE and higher correlation coefficient showed the highest precision followed by cokriging. Kriging showed to have the lowest precision in stimulation of the quality parameters.

Keywords: MLP Neural Network, Kriging, Cokriging, RMSE, Koohpayeh

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Vulnerability zoning of Sistan and Baluchistan's coastal area based on threatening centers

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Abstract

Despite the fact that coastal areas are benefiting from verity of biological resources of marine and inland systems, they are exposed to destructive threats from both systems. Hence, Coastal areas are the most vulnerable sectors in the world. Population growth, tourism, urbanization, and industrialization are the most important factors in increasing pressure on the coastal and marine areas. Identification of vulnerable areas and apply effective and appropriate management systems are suitable strategies to prevent further degradation of coastal areas. The region under study in this research is the coastal zone of Sistan and Baluchistan Province, one of the southern provinces of Iran at the northern parts of Oman Sea. The results of vulnerability zoning of Sistan and Baluchistan's coastal area Based on Threatening Centers using analytic hierarchy process (AHP) and overlaying layers by ArcGis showed that Chabahar bay southeast towards the east is the most important vulnerable areas which require an adaptive management, monitoring program, education and participation plan to improvement of the environment.

Keywords: coastal area, sensitive areas, severity of vulnerability, threatening centers, zoning.

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Assessing & modeling of landscape scenic values using the method of weighted linear combination (Case study: Walking tracks of Ziarat watershed, Golestan Province)

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Abstract

Recent literature attaches high importance to scenic evaluation of natural landscapes. Scenic beauty evaluation techniques often use parameters derived from photographs or collected in situ data via field assessment and questionnaires. Such techniques are relatively costly and time consuming. Park managers and recreational planners require spatial tools and techniques that are fast, flexible and repeatable in order to extract predictable spatial data from scenic resources. As it is impossible or very hard to measure all essential parameters directly, the use of spatial data and Geographic Information System for the assessment and modeling of visual quality of landscapes has become inevitable. This paper develops a spatial method for evaluation of scenic attractiveness of landscapes using geographic information systems (GIS). At first the effective criteria were chosen according to characteristics of study area then these criteria were weighted using AHP. In the next step criteria were combined using Weighted Linear Combination (WLC) method to reveal the suitability of scenic beauty. Eventually, for land zoning according to scenic value, the module of Zonal Land Suitability (ZLS) was applied and the walking tracks of Talambar, Chomazchal, Zeble, Mazookesh, The first waterfall of Ziarat and Sardansar were being suggested as more beautiful walking tracks.

Keywords: AHP, visual quality assessment, WLC Method, Ziarat Watershed.

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Diversity of *Bacillus thuringiensis* isolates in various ecosystems of Mazandaran province

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Abstract

Bacillus thuringiensis (Bt) is the most important microbial agent for biological control of insect pests of agricultural crops and forest plant. Effective control of these pests mostly relies on finding and practical application of native Bt isolates. In this study, 160 soil samples belong to various ecological area of Mazandaran province (forest, orchard, urban, agricultural and non-vegetative regions) were screened through selective sodium acetate methods and 635 isolates were acquired. The soil samples were cultured on LBA, T₃ and CCY media and primary and final colony selection were conducted based on appearance of Bt colonies on the media and microscopic determination, respectively. As consequence of microscopic description; 375 (59.05%), 100 (15.74%) and 160 (25.19%) isolates were produced spore, spore+cap and spore+cap+crystal, respectively. The most crystal producing isolates, based on geographical and ecological categories, were observed in the isolates of Sari (40.9%) and Juybar (40.54%) geographical regions and forest (32.63%) ecosystem. The results showed that the forest soil samples are an appropriate source for detecting the effective Bt strains.

Keywords: *Bacillus thuringiensis*, crystal protein, microbial control, specific isolation of Bt.

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Evaluation of green space changes with respect to landscape index and remote sensing in capital city of Karaj

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Abstract

Urbanization and population growth along with an increase in the environmental pollution resulting from human activities which have dramatically changed the green space and land cover have been key factors in the sustainable development of land and the management of land use. To collect reliable data required for providing land cover maps as well as for investigating the environment, remote sensing have been a useful method. The aim of the present study is to investigate any changes in green space in the capital city of Karaj in the years 1956, 1989 and 2011 using remote sensing techniques including aerial photographs and satellite images such as IRS-P5 and IRS-P6. For this purpose, satellite images were geometrically amended and then categorized by Minimum Distance. The pattern of the green space distribution was studied by selecting landscape indications including CA, PLAND, PD, LSI, and SHAPE-MN. In addition, according to the results, amount of green space per person, itself, had a decrease from 558 m² in 1956 to 25 m² in 2011. Comparing these green areas in the eleven regions in Karaj also shows a lack of equal distribution of green spaces in these regions and consequently in the city while the fifth, eighth and ninth regions now have the least amount of green space.

Keywords: amount of green space per person, city of Karaj, landscape index, remote sensing.

Estimating of forest cover changes in topographic zones in Mazandaran Province

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Abstract

This study was done to investigation forest cover changes in the Mazandaran province in topographic zones. For doing that in the first matched topographic zones and land-use map. After that distribution of forest cover was investigated in plain, lowland, middle land and high land. Forest cover changes analyzed in a period of 132 years since the beginning of the destructive activities in the forest in 1880, 2003 in topographic zones. Estimating of natural area in the base year was done with Isothermal lines map (1:25000 scale) and Forest cover in 2003 with land- use map (1:100000 scale). In this research the natural area of forest in Mazandaran province was estimated 2042385 hectares. Also rate, changes area, average of annual changes area, Percentage of total changes and annual forest changes area estimated -0.005, 972165.3(ha), 7364.9 (ha), 47.6 % and 0.36 %. Results showed the most and less of forest cover changes is in the plain lands with 96.25% and middle land with 21.88 %. According to this study Before the widespread destruction of forests in the north of Iran in 1880, the forest area in Mazandaran province was 86.29 percent of total Mazandaran territory and in 2003 was changed to 45.22 percent.

Keyword: estimating of changes, forest cover, Mazandaran province, topographic zones.

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Investigating birds' diversity and richness of Kohgiluyeh & Boyer Ahmad protected areas and the influence of area size and shape on diversity and richness

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Abstract

Investigating species diversity and richness is essential for defining conservation priorities. In addition, determining landscape parameters influencing species diversity and richness is important for selecting and designing parks and protected areas. Kohgiluyeh & Boyer Ahmad Province is a mountainous region, comprises hills, mounds, forests and plains. This vast province has high species diversity and six protected areas, including Dena, Khayyz and Sorkh, Eastern Dena, Khamyn, Daele and Solak, have been established to maintain this diversity. The present study aimed to compare species diversity and richness of the six protected areas and investigate the influence of area, size and shape on bird species richness and diversity. Overall, 52 bird species were recorded. The maximum values of species diversity and richness belonged to Dena Protected Area and the minimum values were obtained for Solak Protected Area. Linear regression analysis revealed the positive effect of area and the negative effect of shape on bird species richness and diversity. Due to the increasing habitat destructions which restricted the conservation of biodiversity to protected areas, it is necessary to prevent further reduction of perimeter to area ratio with an effort to increase area size. This might help to better manage and protect the biodiversity of Kohgiluyeh & Boyer Ahmad province.

Keywords: Kohgiluyeh & Boyer Ahmad, protected areas, Shannon-Wiener index, species diversity.

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