Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 467-479

Investigation of Heavy Metals in Organisms from Different Trophic Levels of the Southwest Caspian

Alireza Mirzajani[1], Amir Hossein Hamidian[2*], Mahmoud Karami[3]

1. Research, Education, and Agriculture Extension Organization, Fisheries Science Research Institute, National Inland Water Aquaculture Institute, Banda-e Anzali, I. R. IRAN
2. Associate Professor, Department of Environment, Faculty of Natural Resources, University of Tehran, Karaj, I.R. IRAN
3. Professor, Department of Environment, Faculty of Natural Resources, University of Tehran, Karaj, I. R. IRAN

(Received: 30-May-2015; Accepted: 24-Jun.-2017)

Abstract

The Caspian Sea, as the largest land-enclosed drainage area in the world has been endangered by various environmental pollutants, discharged from coastal catchment. In this study, the trophodynamics of metals are investigated in different organisms from the Caspian food web. Furthermore, the species with potential bio-indicator abilities have also been distinguished. Nine species including three invertebrates *Mnemiposis leidyi*, *Cerastoderma glucaum*and *Balanus improvises*; five fish species *Neogobius spp, Atherina boyeri, Alburnus chalcoides, Rutilus kutum* and the Caspian seal *Phoca caspica* were studied in three regions of the southwestern Caspian: i.e. Astara, Anzali, and Chaboksar. The stable isotope of primary producer (POM) was quite various in each region compared to those from primary consumers. *Phoca caspica* had the highest average $\delta^{15}N$ and TLs as the top of the food chain. The concentrations of metals for the most samples of fish were below the detection limits; while the concentrations were detected in most invertebrate samples. Our results suggested the abilities of *Cerastoderma glucaum* as indicator of Ni and Co contamination. *Balanus improvises* had a high capacity for Zn, Sr, Mn and Cu bioconcentration. By comparing ln-concentration of metals vs. TLs, no metal biomagnification was observed. The marine pollution index in Anzali region was higher than those in Astara and Chaboksar regions. While this study provides the basic data from southwestern Caspian Sea; *C. glucaum* and *B. improvises* could be proper bioindicator species for worldwide comparison of metal pollution.

Keywords: Caspian Sea, heavy metals, stable isotope, trophic level, organisms

Corresponding Author: +982632223044 Email: a.hamidian@ut.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 453-465

Species-Abundance Models as an Indicator of Disturbance in Oakwoodland of West of Iran (*Quercus brantii* Lindl.)

Hamidreza Mirdavoudi[1*], Mohammadreza Marvie Mohajer[2], Ghavamedin Zahedi Amiri[3], Vahid Etemad[4]

1. Assistant Professor, Research Institute of Forests and Rangelands, Agricultural Research, Education and Extension Organization (AREEO), Arak, I. R. IRAN
2. Professor, Department of Forestry and Forest Economics, Faculty of Natural Resources, University of Tehran, Karaj, I. R. IRAN
3. Associate Professor, Department of Forestry and Forest Economics, Faculty of Natural Resources, University of Tehran, Karaj, I. R. IRAN
4. Associate Professor, Department of Forestry and Forest Economics, Faculty of Natural Resources, University of Tehran, Karaj, I. R. IRAN

(Received: 18-Jan.-2014; Accepted: 01-Aug.-2016)

Abstract

Changing environmental conditions, reactions of biotic factors and invasion of invasive species due to anthropogenic or natural disturbances will change composition and diversity of plant communities over time. Therefore, the measurement of species diversity can be useful in the analysis of disturbance and ecosystem management. Effects of disturbance regimes including "grazing", "fire" and "no disturbance" in Daalaab Park were studied on oak communities. Information of vegetation, soil and other environmental variables were collected from 77 sample plots (256 m^2) using the random sampling method in various disturbances classes. Species-abundance models were applied to assess diversity. Results of canonical correspondence analysis showed that "Grazing" and "fire" with the soil and topographic factors were identified as the most influential factors on plant composition. The results of species distribution models showed that grazing disturbance class was fitted with the geometric model. A trend of this model to the Log normal was observed. This result supported this assumption that communities affected by disturbance, have a change from a state with less destruction to the status with high destruction that most severely affected by natural and human disturbances. Matching of fire disturbance class with log series, was represented the immaturity of these communities that due to the onset of secondary succession in this class, it is logical and consistent this theory. If that, without disturbance class was matched with the log normal model. This model reflects mature communities with high richness and diversity.

Key word: Diversity, Fire, Grazing, Ordination, Zagros

Corresponding Author: +989183637366 Email: hmirdavoodi@yahoo.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 439-452

Evaluation and Ranking Environmental Risks of the Protected Area of Dena Using Analytical Hierarchy Process (AHP)

Fahimeh Malek Hosseini[1], Soolmaz Dashti[2*]

1. M.Sc. Graduate, Department of Environment, Ahvaz Branch, Islamic Azad University, Ahvaz, I. R. IRAN
2. Assistant Professor, Department of Environment, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.

(Received: 28-Nov.-2015; Accepted: 05-Apr.-2017)

Abstract

Protected areas are powerful tools to tackle the biodiversity crisis and threat assessments of protected areas are essential for ensuring conservation and taking protective measures in the future. Dena protected area is one of the richest parts of the country in terms of biodiversity with an area of 93780 hectares located in the Sisakht County. In this study, the Delphi method was used to identify risks in the region. According to the Likert range, from 26 identified risks in the region, 18 risk factors were selected as the final risks in tow groups of environmental risks and natural risks. In order to analyse and prioritize the identified risks, Analytical Hierarchy Process (AHP) and the Expert Choice software were used. The results showed that the soil erosion risk with weight of 0.105, the risk of damaging local agricultural impacts with weight of 0.025 in physical sub criteria, eradication of pasture and medicinal plants with weight of 0.049 in biological sub criteria, exploitation of vegetation and forests for providing the forage of livestock, fuel and… with weigh of 0.0104 in socio-economic sub-criteria and lack of efficient environment management with weigh of 0.074 in cultural sub criteria have the highest weight, respectively. Regional management indicated that proper planning and integrative efficient management for protecting the area is not currently carried out. Risk management, optimal implementation of all criteria specified in laws of protection and environment improvement and identifying vulnerable areas can be effective for managing the Dena Protected Area.

Keywords: Risks, Risk Management, Dena, AHP

Corresponding Author: +989163162176 Email: soolmazdashti@iauahvaz.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 427-438

Estimating of Economic Losses Caused by Oil Spill in 2010 in Nayband Bay National Marine Park (Boushehr, Iran)

Shima Madani[1*], Fatemeh Bazzazan[2], Saeedeh Khaleghi[3]

1. Associate Professor, Marine Policy Department, Iranian National Institute for Oceanographic and Atmospheric Science, Tehran, I. R. IRAN
2. Associate Professor, Faculty of Social Sciences and Economics, Alzahra University. Tehran, I. R. IRAN
3. Researcher, Marine Policy Department, Iranian National Institute for Oceanographic and Atmospheric Science, Tehran, I. R. IRAN

(Received: 22-Nov.-2015; Accepted: 11-Mar.-2017)

Abstract

The sinking of several floating oil near Nayband bay National Marine Park in Boushehr (south of Iran) which caused oil spills to the sea during 2009-2010 was one of the important events in the Persian Gulf. This oil pollution happened near one of the most valuable marine protected areas that is crucial for the fishing industry in the region. So in this paper, the aim is to estimate the economic losses that all productive sectors suffered through oil pollution with Input-Output model. In this regard decreasing in catch fish after oil pollution neat, the polluted area has been used as an external shock in the Input-Output table. The results indicate that oil spill had more effect on the wholesale and retail sector, construction and transportation, respectively. On the whole, total economic loss of the regional economy was at least $1,022,000 for 2011.

Keywords: Oil pollution, Input-Output Table, Regional Input-Output model, Nayband Bay National Marine Park, Boushehr, Iran

Corresponding Author: +989129373058 Email: sh.madani@inio.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 413-426

The Assessment of Iran's Bio-Climatic Conditions

Bakhtiyar Mohammadi[1*]

1. Assistant professor, Department of Climatology, Faculty of Natural Resources, University of Kurdistan, I. R. IRAN

(Received: 21-Aug.-2015; Accepted: 12-May.-2016)

Abstract

Cognition of the bioclimatic conditions of each location can be the first step in conducting environmental studies. In fact, awareness of the capabilities and limitations of bioclimatic conditions paves the way for planning and better management of human activities. This study was performed to determine the thermal comfort of Iran. For this purpose, the daily data of the climatic variables (air temperature, relative humidity, wind speed and cloudiness) in 193 synoptic stations was prepared from the Iran Meteorological Organization. First, based on the Physiological Equivalent Temperature index (PET), bioclimatic conditions of each the station studied. Then the long-term average bioclimatic conditions at each station were calculated for the whole year. Finally, database of the bioclimatic long-term conditions of all stations (with the dimensions of 193 * 366) was created. Using this database, bioclimatic daily conditions in Iran, was interpolated to Kriging method. The following, monthly bioclimatic map of Iran was drawn. The results showed a high diversity of bioclimatic conditions on a scale of temporal or spatial. One certain site in Iran can be both very cold and very hot during the year. Likewise, in a specific time in Iran, the bioclimatic conditions as well indicate such a variety. In each month in Iran, special bioclimatic conditions may dominate. For example, during twelve months, slightly warm (27.7 percent), warm (29.3 percent), very warm (30.8 percent), hot (45.5 percent), hot (42.2 percent), very warm (38 percent), warm (31.3%) and climatic comfort (28.2 percent), cool (29.2 percent), cool (33.5 percent), cool (30.1 percent) and slightly cool (28.1%) conditions were experienced in Iran. Based on this, November is a month when a large portion of Iran (28.2 percent) experienced climatic comfort. In other months, the extent of those regions that experienced climatic comfort reduced.

Keywords: Climatic comfort, environment, climate, comfort index, PET.

Corresponding Author: +988733627721 Email: b.mohammadi@uok.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 397-411

Land use Changes Modelling Using Logistic Regression and Markov Chain in the Haraz Watershed

Ataollah Kavian[1*], Zarifeh Zargoosh[2], Zeinab Jafarian[3], Hamid Darabi[4]

1. Associate Professor, Department of Watershed Management, Faculty of Natural Resources, Sari Agricultural Sciences and Natural Resources University (SANRU), Mazandaran Province, Sari, I. R. IRAN
2. MSc graduate of Watershed Management, Faculty of Natural Resources, Sari Agricultural Sciences and Natural Resources University (SANRU), Mazandaran Province, Sari, I. R. IRAN
3. Associate Professor, Department of Rangeland Management, Faculty of Natural Resources, Sari Agricultural Sciences and Natural Resources University (SANRU), Mazandaran province, Sari, I. R. IRAN
4. Ph.D Student of Watershed Management, Faculty of Natural Resources, Sari Agricultural Sciences and Natural Resources University (SANRU), Mazandaran province, Sari, I. R. IRAN

(Received: 02-Sep.-2014; Accepted: 19-Oct.-2016)

Abstract

Assessment of land use spatio-temporal changes presents the perfect data for managers to elaborate plans. Land use change modeling is one of the methods used by planers to manage land use changes. The present study aims to predict land use changes using logistic regression and Markov chain model in Haraz watershed. Land use maps of the study area were prepared from Lands at images (L5-TM-1988, L7-ETM+ -2000 and-L8-OLI-2013). For this purpose, image classification method and maximum likelihood algorithm was used in ENVI 4.8 software. Then transition potential modeling was performed using Land Change Modeler (LCM) and Logistic Regression (LR). In order to predict land use for 2025, maps of the calibration periods of1988-2000, 2000-2013 and 1988-2013 using a Markov chain model and hard prediction were used. The results of the calibration periods using the GEOMOD method and its parameters(N(n), N(m), H(m), M(m), K(m), P(m) and P(p)) and kappa coefficients showed that period of 1988-2013 with highest accuracy was selected to predict 2025 land use map. The results of the land use changes showed that over the period 1988-2013, the rate of decreasing of forest, grassland and irrigated land was 4.20, 5.09 and 0.63 percent, respectively. Also, during the period residential areas, orchard and bare land, increased 1.28, 2.20 and 6.62 percent, respectively. Dominant changes of this period were transition of forest and rangeland to orchards, residential area and bare land with 8836.4, 5165.1 and 426598.4ha, respectively. Also the results of land use modeling for 2025 revealed that the area of forest and rangelands will decrease to 2978.18 and 6367.41 ha, respectively and irrigated land, residential area, orchards and bare land will expand to 391.86,29.38, 1453.42 and 7214.94ha, respectively.

Keywords: Landsat satellite, Land use modeling, Logistic regression, Markov chain, Accuracy assessment

Corresponding Author: +989113221326 Email: a.kavian@sanru.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 385-396

Willingness to Pay for Environment-Based Energies in Khorasan-Razavi Province: Application of Spatial Tobit Model

Mohammad Ghorbani[1*], Nazanin Mohammadrezazadeh[2]

1. Professor of Agricultural Economics, Ferdowsi University of Mashhad, I. R. IRAN
2. Ph.D. Student of Agricultural Economics, Ferdowsi University of Mashhad, I. R. IRAN

(Received: 25-Jun.-2016; Accepted: 09-Aug.-2017)

Abstract

Applying methods for estimating factors that impact upon willingness to pay (WTP) for renewable energy is necessary for economic planning and making policy for investment in renewable energy. Using survey data from 245 urban and rural households in three counties of the Khorasan-Razavi province (Mashhad, Neishabour, Sabzevar), the article investigates the socioeconomic determinants of WTP for renewable energy in the year 1393. For this purpose, an open-ended contingent valuation method (CVM) was used via a spatial Tobit model. The results show that WTP is significantly influenced by spatial factors. The average of monthly WTP of Households living in Mashhad County is 485450RLS that is high in comparison with 43778RLS and 40261RLS or the households that respectively live in vicinty and Sabzevar. Thus, spatial structure is a non-negligible component in valuation studies. Accordingly, it is recommended that the spatial structure should be considered by researchers in valuation studies.

Keywords: Renewable energies, Willingness to pay, Spatial Tobit Model, Khorasan-Razavi province.

Corresponding Author: +985138805784 Email: ghorbani@um.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 373-384

Carbon Uptake and Leaf Gas Exchange of Ash Tree (*Fraxinus excelsior*) Affected by Different Intensities of Photosynthetically Active Radiation (Case Study: Central Europe Forests)

Ahmad Sadeghipour[1*], Davoud Kartoolinejad[2]

1. Assistant Professor, Faculty of Desert Studies, Semnan University, I. R. IRAN
2. Assistant Professor, Faculty of Desert Studies, Semnan University, I. R. IRAN

(Received: 29-May.-2015; Accepted: 07-Des.-2016)

Abstract

Massive structures of plants have been built on the basis of photosynthesis. In this study, the effects of different light intensity on the leaf photosynthesis, transpiration, CO_2 uptake and stomatal conductance were examined. Gas exchange was measured in the planted forest of European ash tree (*Fraxinus excelsior*) in Hainich national park of Germany. Net photosynthesis rate (A), transpiration rate (E), CO_2 stomatal conductance (Gs), intercellular CO_2 concentration (Ci) etc. was measured for leaves of six ash individuals using LC-pro plus machine. The results showed that maximum net assimilation was about 7.6 kg CO_2 per hectare per hour. The maximum intensity of the light used for photosynthesis in this study was 696 µmol m^{-2} s^{-1}; regarding the increasing rate of photosynthesis, it seems that the maximum rate of photosynthesis will occur at the PPF a little more than 696 µmol m^{-2} s^{-1}. Transpiration rate and stomatal conductance of CO_2 increased exponentially in all light intensities and their maximum were at 696 µmol m^{-2} s^{-1}. The photosynthetic rate proved that current species is a semi sun plant (light compensation point = 10.6 µmol m^{-2} s^{-1}), which can play the role of a shade plant in the forests of Central Europe (maximum intensity of photosynthesis = 3.5).This species has a valuable role in absorbing carbon in the mentioned forest ecosystem, which the annual carbon uptake equals to 1324 g m^{-2} $year^{-1}$, which is about 2.5 times more than the average uptake of all other species in the ecosystem.

Keywords: CO_2, Photosynthesis rate, Carbon fixation, Transpiration, Common ash, Shade tolerant

Corresponding Author: +982333335404 Email: a.sadeghipour@semnan.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 363-372

Optimization of Biodiesel Production from Grape Kernel Oil Using Alkaline Catalysts and Studying its Physical Properties

Hamed Rezaei[1], Hossein Esmaeili[1*], Rauf Foroutan[1]

Department of Chemical Engineering, Bushehr Branch, Islamic Azad University, Bushehr, I. R. IRAN

(Received: 31-Oct.-2015; Accepted: 19-Des.-2016)

Abstract

Biodiesel is a renewable fuel that, due to increasing environmental pollution, global warming caused by fossil fuels and limited fossil fuel resources, its production has increased. Different resources contribute to the production of biodiesel such as animal fats, edible waste oil and vegetable oils. In this study, grape kernel oil was used for production of biodiesel using potassium hydroxide and sodium hydroxide as catalysts and methanol. For this purpose, effect of several parameters such as temperature, reaction time, methanol to oil ratio, the amount of catalyst and type of catalyst were studied and optimal conditions for the production of biodiesel were obtained. The maximum efficiency of biodiesel production for KOH and NaOH were determined 99 and 95 %, respectively which these efficiencies were obtained in the optimum conditions such as temperature of 70^{o}C, 1 wt. % catalyst, 90 min and methanol to oil ratio of 9:1. For analysis of biodiesel produced in optimal conditions, the international standard ASTM D6751 and EN 14214 were used. The results showed that the properties of biodiesel using KOH such as density, viscosity, flash point, cloud point, acid number, cetane number, pour point and distillation temperature were 860 kg/m^3, 3.3 mm^2/s, 160^{o}C, 1^{o}C, 0.2, 52, -5^{o}C and 342^{o}C, respectively and this properties using NaOH were 870 kg/m^3, 3.5 mm^2/s, 172^{o}C, 4^{o}C, 0.15, 57, -4^{o}C and 354^{o}C, respectively.

Keywords: Biodiesel, Alkalyne catalysts, Grape kernel oil, Transestrification process

Corresponding Author: +989179885692 Email: esmaeili.hossein@gmail.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 351-362

The Ecological State Study of Striped Hyena (*Hyaena hyaena*) Denning Regions in Haftadgholeh Protected Area using Maximum Entropy Method

Sahar Rezaei[1*], Saeid Naderi[2], Peyman Karami[3]

1. Master of Habitats and Biodiversity, Department of Natural Resources, University of Guilan, Rasht, I.R. IRAN
2. Assistant Professor, Department of Environment, Faculty of Natural Resources, University of Guilan, Rasht, I.R. IRAN
3. Ph.D Student, Faculty of Natural Resources, University of Malayer, Arak, I.R. IRAN

(Received: 30-Jan.-2016; Accepted: 12-Nov.-2016)

Abstract

Dens as a useful shelter play an important role in social behavior development. However, movement between dens incurs a big cost upon animals especially upon carnivores but this cost will be compensated by benefits derived from territory recognition. Hyenas use dens for different goals including as shelter during the day, for breeding and cub rearing, and also for resting. Ecological status of the striped hyena (*Hyaena hyaena*) denning region was investigated in Haftadgholeh protected area using MaxEnt method. For this purpose, we used 30 dens localities and 11 Effective variables. The model was run ten times and the mean map was selected as prediction map. The validity of model was assessed by ROC statistical procedure. Based on obtained results, the prediction model of denning regions of species was successful (AUC=0.76) and on all of threshold limits it is significantly different from random model (P-value<0.001). Also, based on the sensitivity analysis results, the most effective variables on denning of this species was landuse (range lands), altitude, slope and geomorphological types of region. The suitable den in this region defined with vegetation cover types constitute *Stipa barbata, Astragalus spp., Artemisia aucheri* in limestone regions with shallow sandy soil, and in east and south-west aspects with 22 percent of slope. Our result showed that due to the role den has for survival of animals, identifying factor affecting on den site contribute to better recognition of ecological niches.

Keywords: Striped hyena (*Hyaena hyaena*), denning, Haftadgholeh protected area, MaxEnt model

Corresponding Author: +98919708088 Email: sahar.rezaei2@yahoo.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 337-349

Environmental Impact Assessment Statement of Iran

Fatemeh Rasoulinasab[1], Bahman Jabbarian Amiri[2*], Mohammad Kaboli[3], Afshin Danehkar[4]

1. Ph.D student, Department of Environment, Faculty of Natural Resource, University of Tehran, I.R. IRAN
2. Assistant Professor, Department of Environment, Faculty of Natural Resources, University of Tehran, I. R. IRAN
3. Associate Professor, Department of Environment, Faculty of Natural Resources, University of Tehran, I. R. IRAN
4. Associate Professor, Department of Environment, Faculty of Natural Resources, University of Tehran, I. R. IRAN

(Received: 16-Oct.-2015; Accepted: 16-Jun.-2017)

Abstract

Development impact assessments before decision making and project and development plans implementation enables identification, prediction, reduction or offseting the negative effects of the projects. Quality of impact assessment reports can assist to better decision making about environmental issues. To review the reports in European countries, the "Lee N & Colley" method is applied .This method has four levels or general sections, each of which is divided to sub-categories. In this article "Lee N & Colley" method has been used for reports assessment. In Iran, to evaluate the quality of impact assessment reports, six sections were considered. In this research, 50 reports from different provinces and various projects including linear and polygonal were evaluated by experts. The results showed that quality of 76% from assessments reports was favorable and satisfactory (very good, good, and fair). Description of Project had the highest percentage of satisfaction about 84 %. Monitoring of the environment and management had the lowest quality and satisfaction. Therefore, with assessment of different parts of impact assessments reports, you can recognize their strengths and weaknesses and in the future, impact assessments will be carried out more carefully and effectively.

Keywords: The EIA process, EIS, Satisfactory, Criterion.

Corresponding Author: +982632229683 Email: jabbarian@ut.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 319-336

Mapping the Geographic Distribution of Suitable Sites for Municipal Solid Waste Landfill (Case Study: Nazloochaei Urmia Rangeland)

Roya Jangi Daghdaghani[1], Hamidreza Momtaz[2], Mahshid Souri[3*]

1. MSc Graduate, Faculty of Agriculture Engineering, Urmia University, I. R. IRAN
2. Assistant Professor, Faculty of Agriculture Engineering, Urmia University, I. R. IRAN
3. Assistant Professor, Rangeland Research Division, Research Institute of Forests and Rangelands, Agricultural Research, Education and Extension Organization (AREEO), Tehran, I. R. IRAN

(Received: 02-May.-2016; Accepted: 18-Jun.-2017)

Abstract

Increased population growth and consequent increasing rural and urban solid waste increases the importance of solid waste management. Site selection have an important influence on the waste management. Therefore, in this study to prioritize suitable sites landfill Urmia Basin Nazloochaei Rangeland, decision-making support systems including TOPSIS and AHP method were used. Stages of this research consisted of the following processes including: determining effective criteria, providing criteria maps, providing decision making matrix, weighting of criteria, calculating the rate of incompatibility, calculating the ideal solution both positive and negative ideal solution, calculating relative proximity to positive ideal solution, ranking sub watersheds and ultimately mapping the geographic distribution of suitable sites for municipal solid waste landfill in Nazloochaei Urmia Basin. ARC GIS software, TOPSIS & EXPERT CHOISE was applied. Results showed that the first appropriate priority and the second priority were B11 and ABCDE-INT1. The AFGH-INT, C1, B1-INT third to fifth respectively in the appropriate priorities were. J3, J111 and J11-INT with the priorities forty -first and forty -third, were the least fit to landfill. B11 have maximum depth of soil and groundwater and least amount of rainfall, the number of wells, surface water density, slope and height than the other sub watersheds. B11 soil texture is average and its current use is inutile. However, J11-INT showed opposite conditions.

Keywords: Geographical distribution, Landfill Map, TOPSIS, AHP, Urmia Nazloochaei Rangeland

Corresponding Author: +989125279086 Email: souri@rifr-ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 309-317

Evaluation of Environmental Sustainability of Ahwaz with an Emphasis on Air Pollution (Using FPPSI Method)

Sayede Somayeh Hosseini[1*], Zoleikha Naderkhani[2], Bentalhoda Yazdanbakhsh[3]

1. Ph.D of Tourism, Kazan University, Kazan, Russia
2. PhD Student in Geography and Rural Planning, University of Isfahan, Isfahan, I. R. IRAN
3. PhD Student in Geography and Urban Planning, University of Isfahan, Isfahan, I.R.IRAN

(Received: 28-Feb.-2016; Accepted: 17-Feb.-2017)

Abstract

Environmental sustainability is one of the four main axes of sustainable development and one of the main factors of environmental sustainability is the Air Pollution Index. Ahvaz is the eighth largest metropolis of Iran that the issue of particulate matters and Aggregation of mineral oil industries has turned this city susceptible to environmental instability. Accurate and appropriate environmental assessments can help us to achieve environmentally sustainable development so considering it in policy and planning to achieve a proper planning along with the natural environment variables is inevitable. According to the research data, the research type is applied research. To display and analyze the data, Excel and MATLAB soft wares were used. In this study, five indicators of air pollution that are the average of carbon monoxide, the average of sulfur dioxide, the average Nitrogen gas, the average Ozone and the average of particulate matter under 10 microns were studied from years 1388 to 1391. The FPPSI model was used to assess sustainability. This model is a new model for evaluating sustainable development and has not ever been used in Iran. According to the findings, during the years 1388 to 1391, environmental situation of Ahwaz has tended to instability in terms of air pollution especially in terms of particulate matters. In other words, particulate matter and ozone had aggrevated Ahwaz instability more than any other contaminants and Carbon monoxide has a negligible impact on air pollution.

Keywords: Evaluation of the environmental sustainability, Ahwaz, Air pollution, FPPSI method

Corresponding Author: +989138711684 Email: sshosseini1361@gmail.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 295-308

Investigating the Relationship between Ecological Structure of Neyshabuor City and Heat Islands Patterns with an Emphasis on Landscape Ecology Approach

Elham Jafari[1], Hadi Soltanifard[2*], Kazem Aliabadi[3], Hadi Karachi[4]

1. Msc. in environmental sciences, Faculty of Geography and Environmental Sciences, Hakim Sabzevari University, Sabzevar, I.R. IRAN
2. Assistant Professor, Faculty of Geography and Environmental Sciences, Hakim Sabzevari University, Sabzevar, Islamic Republic of I. R. IRAN
3. Lecture, Geographic and social Research Center, Hakim Sabzevari University, Sabzevar, Islamic Republic of IRAN, I. R. IRAN
4. Lecture, Faculty of Geography and Environmental Sciences, Hakim Sabzevari University, Sabzevar, Islamic Republic of Iran, I. R. IRAN

(Received: 07-Dec.-2015; Accepted: 20-Oct.-2016)

Abstract

The growth of urbanization has changed the ecological structure by changing the land use and cover, creating urban heat islands (UHI) and has caused climate changes in previous decades. City of Neyshabuor has experienced above mentioned changes; thus, studying and analysis of changes may improve ecological conditions. The main question in this research is how ecological elements and structure affects heat islands patterns in Neyshabuor urban area. The present study is based on Landscape Ecology approach and metrics that were used to evaluate the ecological structure of Neyshabuor urban area. The purpose of the research is to analyze the relationship between ecological structure of Neyshabuor city, land surface temperature and heat islands pattern. Satellite images related to *ETM+* sensor of Landsat satellite have been used in August 2010 to evaluate heat islands. According to results, there is a significant correlation between landscape metrics and LST pattern. Accordingly, the composition and configuration of landscape metrics have significantly negative correlation with UHI. It suggests that the landscape elements such as green spaces, gardens, farmlands and etc. can mitigate the effect on LST and UHI in our case study. Although, characteristics of landscape spatial structure have different correlation with LST and UHI, but positive synergy in ecological elements can help to decreasing or preventing of LST and UHI effects in buildup area.

Keywords: Ecological structure, landscape ecology, metrics, heat islands, Neyshabuor.

Corresponding Author: +985144013132 Email: hsoltanifard@gmail.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 285-293

Investigation of Vegetation Changes of Almagol Lagoon due to Some Circumferential Factors

Mohammad Baluchi[1*], Mahlagha Ghorbani[2], Mousa Akbarlou[3]

1. Master Graduate, Department of Biology, Faculty of Science, Islamic Azad University of Gorgan, I. R. IRAN
2. Professor, Department of Biology, Faculty of Science, Islamic Azad University of Gorgan, I. R. IRAN
3. Associate professor, Department of Rangeland Management, Gorgan University of Agricultural Sciences and Natural Resources, I. R. IRAN

(Received: 02-Mar.-2016; Accepted: 20-Oct.-2017)

Abstract

Destruction of earth in arid and semi-arid ecosystems is considered as a serious environmental problem in 21th century that effect on universe population. The purpose of the present research is studying the relationship between vegetation and soil feature, determining the most important environmental factors on separate types of eruption on the suburb lands of Alma Gol Pond. The sampling was done randomly. To determine the correlation between environment and vegetation, canoncial correspondence analysis was done for environmental factors, and to ordinate the types of eruption, cluster analysis using CANOCO and PC-ord softwares were applied. Cluster analysis results showed 50% similarity between 7 groups of plants, and the results of cononcial correspondence analysis show that plants react differently to environmental factors. So the plants groups which from plant communities are effected by similar environmental factors. Hygroscopic and moisture escape plants were seperated totally. The hygroscopics contain Rumex acctatus, the moisture escape contain Artemisia siberi and Hordeum morinum, the communities on hillsides and height cotain Salsola turcomaniea, Phalaris minor, the halophyts communities contain Salicornia europa and salsola aurontiaceae. The non passion communities contain Plantago cornopus and Juncus inflexus. The results of this research show that the environmental factors affect on the establishment and mosaic distributon of plant communities, and the most important factors affecting on plant communities seperation are soil acidity and soil salinity.

Keywords: Canonical correspondence analysis, Environmental factors, Halophyte plants, Ordination, Vegetation

Corresponding Author: +989117532986 Email: mohamamad.baluchi1987@yahoo.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 273-284

Estimating Recreational Value of Forest Parks and Determining Effective Factors (Case Study: *Kuhnani* Forest Park, Koohdasht)

Neda Amiri[1], Kamran Adeli[2*], Maryam Pirikiya[3], Saba Peyrov[4]

1. BSc Graduate of Forestry, Faculty of Agriculture and Natural Resources, Lorestan University, Lorestan, I.R. IRAN
2. Assistant Professor of Forest Economics, Faculty of Agriculture and Natural Resources, Lorestan University, Lorestan, I. R. IRAN
3. PhD Student of Forestry, Faculty of Natural resources, University of Sari Agricultural and Natural Resource, Sari, I. R. IRAN
4. PhD Student of Forest Engineering, Faculty of Natural Resources, University of Agriculture and Natural Resource, Sari, I.R. IRAN

(Received: 31-Mar.-2017; Accepted: 21-Oct.-2017)

Abstract

Because of functions and services of natural ecosystem and the need for better planning for using of them, their true valuation becomes very important. Therefore, economists have focused on valuation and economic assessment of natural resource in order to help people understand the true value of benefits they are receiving from their environment, and in doing so a substantial progress have so far been realized. In this study, an attempt was made to estimate recreational value of martyr Kuhnani forest Park in bolooran, Kouhdasht, province of Lorestan using individual Travel Cost method. The required data was collected through completing questionnaires and interviewing with 150 visitors of the park in 1393. In individual travel costs method, in order to examine the effects of the explanatory variables on frequency of visit, linear regression model was utilized. For this purpose, traveling functions with various forms including linear, logarithmic, linear-logarithmic, logarithmic-linear were developed. Using econometrics criteria, a linear functional form was selected among the various available forms.Using individual travel cost method, consumer surplus for each person visiting the park was estimated at about 430,000 Rials and the annual recreational value per hectare of the nearly 1094 hectare of the park was calculated at about 66,000,000. The results also showed that the variables cost, revenue, distance and education were significant at1%, 5%, 5%, 10% statistical level, respectively.

Keywords: Recreational value, Kuhnani forest park, Individual travel cost method, traveling function

Corresponding Author: +989163675283 Email: adeli.k@lu.ac.ir

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 255-272

Determining the Economic Value of Non-Use Functions of Bamou National Park

Hamid Amirnejad[1*], Kamal Ataie Solout[2]

1. Associate Prof., Department of Agriculture Economics, Sari Agricultural Sciences and Natural Resources University, Sari, I.R. IRAN
2. Ph.D. Student., Department of Agriculture Economics, University of Zabol, I.R. IRAN

(Received: 13-Jan.-2016; Accepted: 21-Sep.-2017)

Abstract

In spite of the striking importance of ecosystems, their services are underestimated in analyses and decisions regarding economic contracts. The main challenge in macro management of environmental resource is guaranteeing the consideration of real value of all services and ecosystem functions at all levels of decision-making in this domain. In this study, Double-Bounded Dichotomous Choices Contingent Valuation was used for determining non-use grassland functions and finally existence, heritage and option values of Bamou National Park. Results show that bid, moralization-consequentiality, new brochure information, severe damages of the park, willingness to participate, preserving the wildlife and biodiversity, maintaining the perspective and tourism, education, household monthly income, minimum expected household income, household size, membership in the NGO organizations are the most effective factors on responders willingness to pay for conservation of Bamou National Park. Also, the average estimated willingness to pay of responders was 60329 Rial and non-use function's value of this park was 704.571 Billion Rial in 2011 which is approximately equivalent to 0.26 percent of GDP in Fars province.

Keywords: Economic value, non-use functions, willingness to pay, Double-Bounded Dichotomous Choices, Bamou National Park

Corresponding Author: +989111275328 Email: Hamidamirnejad@yahoo.com

Journal of Natural Environment
Iranian Journal of Natural Resources
Vol.: 70, No.: 2, Summer 2017
pp: 243-254

Assessing Impacts of Climate Change on Endangered *Kelussiaodoratissima*Mozaff Species Distribution using Generalized Additive Model

Seyed Mohammadreza Abolmaali[1*], Mostafa Tarkesh Esfahani[2], Hossein Bashari[3]

1. MSc. of Rangeland Management, Department of Natural Resources, Isfahan University of Technology, Isfahan, Iran, I. R. IRAN
2. Assistant Professor, Faculty of Natural Resources, Isfahan University of Technology, Isfahan, I.R. IRAN
3. Assistant Professor, Faculty of Natural Resources, Isfahan University of Technology, Isfahan, I. R. IRAN

(Received: 20-Feb.-2016; Accepted: 20-Oct.-2016)

Abstract

Climate change can potentially alter some aspects of habitat characteristics of vegetation around the world. This study aimed to evaluate the impacts of climate change on *Kelussia odoratissima* Mozaff distribution for two time steps (2030 and 2080) using Hadcm3model A2 scenario in west part of Isfahan. Stratified random sampling method was used to collect the present and absent data of the species form 50 sites. The species occurrence relationships with environmental factors including three physiographic parameters (slope, aspect and elevation) and 19 bioclimatic parameters (average daily temperature, annual precipitation, etc.) were explored using Generalized Additive Model (GAM), and the potential species distribution map was produced using Geographic Information System (GIS). According to the results, the average annual temperature, annual precipitation, elevation and slope were identified as the most important environmental factors influencing the species distribution. The produced model had an acceptable accuracy as its Kappa coefficient and Area Under Curve (AUC) index were 0/97 and 0/98, respectively. Comparing the current distribution of the species with the projected distribution maps of the species under A2 scenarios for the both two time steps indicated that the species distribution will shift to the higher elevation range and its occurrence will be more limited. The shifts in the species distribution are mainly due to the decreasing annual precipitation and increasing annual average temperature based on the A2 scenario prediction. The findings of this study can be used for conserving and restoring the degraded habitats of this endangered, valuable and medicinal plant species.

Keyword: Potential habitat, climate change, conservation, Geographic Information System, Fereidoonshahr

Corresponding Author: +989189291802 Email: m.abolmaali@na.iut.ac.ir