Determining the environmental water requirement of Boujagh wetland and providing appropriate solutions to supply it in different climatic conditions

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Abstract

Bojagh wetland is a large water area with suitable water depth locating in the Bojagh National Park, Gilan province. Considering the importance of this wetland in preserving the biodiversity of endangered species, the present study has been conducted to calculate the environmental water demand of Bojagh Wetland and providing appropriate solutions to supply it in different climatic conditions, based on a comprehensive method in year 2019. Comprehensive studies of all hydromorphological, ecological, biological, economic, and social indicators were performed, and finally, by analyzing the questionnaires, evaluating the indicators and selecting the desired indicators for each section, the Common pochard with the highest degree of importance has been selected as the final socio-economic index. In order to estimate the wetland area, LandSat satellite images were classified and interpreted using ENVI and ArcGIS software. Also, to calculate the environmental water demand of the wetland, the relationship between the number of Common pochard and the area of the wetland in the targeted conditions was investigated at three levels. It was concluded that the volume of water demand to achieve the desired conditions is acceptable and at least, respectively equal to 340, 285, and 235 thousand cubic meters. Furthermore, to investigate the rate of water scarcity in drought, normal and wet season scenarios on a monthly scale, all components of the balance equation were considered to achieve optimal ecological levels and at least as a long-term average. The results have been shown that in the normal and drought conditions, the volume of the wetland is even far from the minimum ecological conditions. So that annually there will be about, respectively 539.4 and 933.9 thousand cubic meters of water shortage compared to the corresponding conditions. Therefore, as a management solution, by creating new sources of water entering the wetland, the required water of the wetland can be provided without harm to other consumers from Sefidrood and Ashmak rivers, and the water level of the wetland can be brought to the targeted ecological level.

Keywords: Environmental Water Requierment, Boujagh Wetland, Ecological Conditions, Indicator Species, Water Shortage.