

HABITAT SUITABILITY OF MUGGER CROCODILE IN SARBAZ RIVER, IRAN

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Southwestern Iran is the western most limits for the Mugger crocodile (*Crocodylus palustris*) range. The main habitats of crocodiles are along the main rivers, of which the Sarbaz River is the most important. Local people of the area call the crocodiles 'Gandou' and respect them, so they are not directly harmed by people. The main threats for crocodiles are natural incidents such as floods and drought (Mobaraki & Abtin 2010).

No studies on habitat suitability and classification have been undertaken for Muggers in Iran. Information on habitat characteristics and requirements would provide considerable support to species management and conservation and provide the basis for responses to any deficiencies. We used Habitat Evaluation Procedure (HEP) (<http://www.fort.usgs.gov/products/software/hep/>) to define and identify the best and most suitable habitats for Muggers. A Habitat Suitability Index (HSI), is a nominal index representing a habitat's capacity to provide for the needs of the species. HSI values range between 0 (worst habitat) and 1 (best habitat).

Ten natural ponds along the Sarbaz River were selected for the study: listed from north to south - Firuz Abad, Shekar Jangal, Azadi, Pishin Dam, Dargas, Lower (Paien) Hutkat, upper (Bala) Hutkat, ShirGoovaz, Bahukalat, Kollani (near Govater Bay) (Fig. 1). Climatic, physical and chemical characteristics of soil, water and vegetation cover, as well as some ecological characteristics, were collected during monthly surveys from September 2008 to January 2010. Information on fauna (fish and amphibians) and flora diversity, water depth, habitat slope, area of ponds and the number of crocodiles in these habitats were also included in the study.

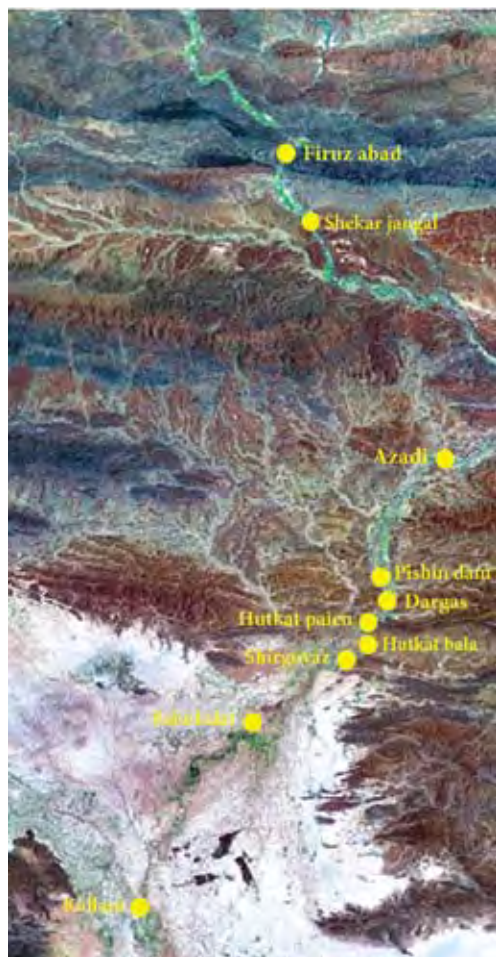


Fig 1: Selected sites/habitats along the Sarbaz River

The area of the habitat was considered as the initial criterion for selection of the habitats as study stations and comprised the highest population density, number of nests and occurrence of juvenile and adult crocodiles, based on the direct observation on crocodile occurrence in those habitats. As most sites had thick vegetation, sampling the number and variety of species was only conducted in 10% of the areas involved. Based on number and variety of species, vegetation diversity was determined using the Ecological Methodology (software) program. Climatic variables (e.g. mean temperature, humidity, evaporation, and rainfall) were compiled from existing meteorological stations at Bahu-kalat and Sarbaz.

Monthly data were averaged for each parameter, and analyzed using SPSS (correlation between factors). The significant variables were scored using Analytical Hierarchy Process (AHP) and IDRISI KLIMANJARO 8.4 software and the HSI for each habitat calculated. Cluster analysis was used to classify the habitats based on their main characteristics.



Fig 2: Pishin Dam Pond is the most important and suitable habitat for Mugger crocodiles along the Sarbaz River. (Elham Abtin).

There were no significant differences between habitats with respect to variables such as air and soil temperature, humidity, water and soil pH, and soil structure and elements of the habitats. Moreover, the correlation test did not show any significant relationship between parameters and crocodile population, with the exception of 6 variables for which significance was recorded.



Fig 3: Basking crocodile in Pishin Dam pond. (Elham Abtin).

Based on AHP all data, significant parameters, could be classified into one of three main categories: cover (vegetation cover, depth, slope); food (fish and amphibian species); and, chemical specification of water, such as DO and Conductivity.

The highest mean crocodile numbers were observed in the Pishin Dam pond (Fig 2) 10 crocodiles, and the lowest (zero) were recorded in Kollani and Firuzabad ponds. The HSI for Pishin Dam pond was 1 (highest suitability), followed by Shirgoovaz, Dargas, Hutkat-e-bala, Hutkat-E-paien respectively (0.96, 0.84, 0.75 and 0.74). Azadi, Firuzabad and Shekar Jangal had similar HSI (0.3-0.5) and Kollani had the lowest HSI (0.2), indicating that it was the most unsuitable habitat (Fig. 3). In general, Muggers prefer habitats with 2-4 m water depth, mean vegetation cover of 35%, mean slope of 25-35% and high density of fish and amphibians (Behrouzi et al 2010).