Assessing Patterns of Urban Development to Predict Future Habitat Availability and Species Diversity[TWS]

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The western portion of the United States is the fastest growing region in the country in both population and per capita income. With growth and increased wealth come development and the conversion of lands from natural habitats to urban and rural residential landscapes. Loss and alteration of habitat directly affect members of biotic communities. As habitat loss is the leading cause of species' extinction and endangerment, it is wise to assess habitat availabilities and roles in biodiversity prior to extensive land change or fragmentation. This study employs a GIS and aerial photographs to determine the pattern of urbanization in the Gallatin Canyon/Big Sky planning district of Gallatin County, Montana. Analysis of building locations in reference to vegetation identifies those habitats most often chosen for development. Multivariate analysis is used to assess the correlation of abiotic and biotic variables with development. The results of this analysis are used to assess the similarity of all undeveloped areas to those that have been impacted by development. Species distribution models from the Montana GAP project are used to classify suitable/unsuitable habitat for all potential vertebrate species (excluding fishes) and assess biodiversity. 'Hot spots' of biodiversity are identified, and the environmental variables at those locations are compared to those in developed areas. The information generated by these analyses is useful to human communities wanting to make better-informed decisions regarding zoning plans and open-space preserves.