

Development of a Predictive Model and Conservation Prioritization Tool for Cerulean Warblers in the Appalachian Mountains

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Abstract: Fragmentation and loss of habitat at local and regional scales have been implicated as important factors contributing to declines of forest bird populations. Large-scale activities such as surface mining can alter the spatial configuration, increase edge:area ratio, and reduce overall patch size of forested habitats. These factors can negatively affect mature-forest dependent species such as the cerulean warbler (*Dendroica cerulea*). Canopy cover, canopy gaps (or amount of canopy closure), distance from large-scale edge, and aspect were identified as predictors of cerulean warbler presence and abundance in previous models developed for the central Appalachians, upper Midwest, and the Ohio Valley. Using classification and regression trees, we are developing region-specific predictive models for cerulean warbler presence/absence and abundance throughout the Appalachian Mountains Bird Conservation Region (BCR28). Models are being constructed using spatial datasets of cerulean warbler abundance and layers representing environmental variables (e.g., canopy cover, aspect, elevation) and potential threats to the species (e.g., forest fragmentation, mining). These variables will be modeled at multiple spatial scales. Additionally, because cerulean warblers display varying habitat preferences across their breeding range, variables that are preferred at different levels across different portions of the breeding range will be adjusted for each sub-regional model. Regions will be defined using boundaries for sub-BCR units, and combinations of units. We will be using stop-level data from the Breeding Bird Survey (BBS) and available point count data for the region to construct and test the models. A seven-year window of BBS data, centered around the 2001 NLCD data will be incorporated. Point count data from this time period will also be used. Preliminary modeling results and the application to cerulean warbler conservation will be presented. These models will be incorporated into a GIS-based decision analysis tool to facilitate conservation planning efforts.

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