Evaluating Habitat Value for Red-cockaded Woodpeckers Using Individual-based Modeling

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Abstract: We have developed a user-friendly geographic information system (GIS)-based, spatially-explicit decision support system (DSS) using red-cockaded woodpecker (RCW; *Picoides borealis*) habitat and population information to help land managers identify and prioritize critical habitat patches. Using state-of-the-art spatial modeling and GIS technologies, we coupled an existing, validated, and peer-reviewed individually-based, spatially-explicit RCW population model with actual landscape features in a user-friendly DSS format. Users can assess the effects of landscape fragmentation, habitat loss, habitat restoration, and "no management" action on RCW populations, now and into the future. The value of habitat patches is assessed through simulations of the RCW population through time, and value is measured in terms of each patches' projected contribution to RCW population parameters. The system provides land managers the capability to analyze potential interactions of that population with any habitat patch for which the habitat condition is known. Additional criteria related to land use easily can be combined with the DSS output to determine which patches offer the greatest synergy between endangered species management objectives and other competing management activities.