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Abstracts

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A MULTISTATE CAPTURE-RECAPTURE MODEL USING A POSTERIORI CLASSIFICATION TO ENHANCE ESTIMATION OF MOVEMENT RATES

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Abstract. Biologists commonly use multistate capture-recapture models to estimate movement and survival rates of animals. Recent improvements to genetic and stable-isotope techniques have created the potential for making a posteriori determinations of an animal's location. Here, I present a new multistate model structure that incorporates captured animals' backdated locations. To provide data for this model, I developed a computer simulation in which birds moved between two geographic strata during three time periods. Birds were captured and assigned mortality, and multistate capture histories were recorded. I enhanced capture histories for birds using data from simulated stable-isotope analyses. I then used the modified multistate model to estimate survival, movement, and recapture probabilities. I evaluated the ability of stable-isotope data to more precisely estimate movement over a range of recapture and movement rates. In each of nine simulations, information from stable isotopes improved the precision of the movement estimate; estimates and precision of survival and recapture rates did not change. As real stable-isotope data sets become available, this estimation model may be useful to biologists interested in improving precision of movement rates among geographic strata.

Key words: movement rate, multistate models, simulation model, stable isotopes, survival estimate.