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Abstract

Railsback, Steven F.; Harvey, Bret C. 2001. **Individual-based model formulation for cutthroat trout, Little Jones Creek, California.** Gen. Tech. Rep. PSW-GTR-182. Albany, CA: Pacific Southwest Research Station, Forest Service, U. S. Department of Agriculture; 80 p.

This report contains the detailed formulation of an individual-based model (IBM) of cutthroat trout developed for three study sites on Little Jones Creek, Del Norte County, in northwestern California. The model was designed to support research on relations between habitat and fish population dynamics, the importance of small tributaries to trout populations, and the usefulness of individual-based models for forest management. The model simulates the full trout life cycle at a daily time step; habitat is modeled at a resolution of several square meters. The major trout activities simulated are spawning, habitat selection (movement), feeding and growth, and mortality. Two feeding strategies are simulated: drift feeding and searching for stationary food. Mortality risks include starvation, aquatic predation, terrestrial predation, high temperature, stranding, and high velocity. Movement maximizes the probability of surviving and attaining reproductive size over a future time horizon. Risks to incubating trout eggs include extreme temperatures, dewatering, and scouring by high flows. The model design approach was adapted from complex adaptive systems theory.

Retrieval Terms: cutthroat trout, habitat selection, individual-based model, population model, salmonids

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