

## Wildlife 2009

**Project:** 306 Development of a predictive species-habitat model for the California Black Rail using high-resolution satellite imagery.

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**Objective:** Accurately modeling the distributions of organisms based on habitat relationships is a critical first step in effective conservation planning. Recent advances in high-resolution satellite imagery provide an opportunity to collect fine-grained data on habitat characteristics over large areas in a manner that is both cost and time efficient. However, it remains largely unknown if data derived from high-resolution satellite imagery will demonstrably improve the predictive accuracy of species-habitat models. To date, no studies have compared the performance of species-habitat models using imagery-derived data versus models using data collected from rapid assessment field surveys, a relatively inexpensive alternative. The threatened California Black Rail (*Laterallus jamaicensis coturniculus*) is ideal as a study organism for developing and evaluating predictive species-habitat models because it is a habitat specialist and is known to depend on vegetation composition and structure, variables that may be measured using satellite imagery. The proposed study aims to: 1) test the accuracy of a wetland detection model developed by Plotts (2006), 2) determine if Ikonos imagery can be used to accurately estimate wetland habitat characteristics for the Black Rail, 3) determine the relative importance of different environmental variables for predicting Black Rail occurrence, 4) compare the predictive accuracy of rail-habitat models using satellite-derived data vs. models using field-derived data from rapid assessment surveys, 5) compare the predictive accuracy of two modeling approaches: logistic regression and classification trees, and 6) test the resulting rail-habitat model in predicting occurrence at new sites identified by Plotts' method.