Population Risk-Based Criteria: Incorporating Habitat and Spatial Information into Ecological Risk Assessments (WO MYP)

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Agency Problem

The USEPA recognizes the need for improved methods and information to support its decisions affecting wildlife. The Wildlife Risk Assessment (WRA) model developed by the USEPA is a risk-oriented model used to characterize the potential effects of chemical compounds on wildlife species. However, the WRA model is limited in its ability to incorporate habitat-related effects into its analysis.

Research Goals

• Develop methods and models to predict population dynamics and evaluate risks from chemical and non-chemical stressors
• Integrate habitat models and information into Ecological Risk Assessments

Methods/Approach

Multi-scale Habitat and Risk Assessment

The influence of landscape patterns on wildlife and the relationships between landscape metrics and wildlife population dynamics have been widely recognized in the literature. The authors of this study present a novel approach to incorporate landscape metrics into Ecological Risk Assessments (ERAs). They use spatially explicit models that account for spatial variation in habitat and stressors at multiple scales.

Habitat Quality-Measuremen Assessment

The authors use Akaike information criterion (AIC) and Akaike weights to evaluate the relative importance of habitat quality metrics in predicting population dynamics. They find that habitat quality metrics, such as landscape metrics, are important predictors of population dynamics and that habitat quality varies across scales.

Model Validation/Field Validation

The authors validate their models using field data collected from the southern United States and Canada. They find that the models perform well in predicting population dynamics and that the models are robust to changes in habitat quality.

Results and Conclusions

The results of the study show that habitat quality metrics, such as landscape metrics, are important predictors of population dynamics and that habitat quality varies across scales. The authors recommend using these models to support decisions affecting wildlife.

Impact and Outcome

The findings of this study are significant for wildlife conservation and management. They provide a framework for evaluating the effects of habitat quality on wildlife population dynamics and can be used to support decisions affecting wildlife.

Future Directions

The authors recommend further research to improve the models and to develop more robust methods for incorporating habitat quality into Ecological Risk Assessments. They also suggest using more advanced statistical methods to improve the models.

References
