

*A GIS-Based Landscape Scale Model for Native Bee Habitat*

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Thesis Proposal submitted to Committee Chair and Members from  
Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements for the degree of

**MASTERS OF SCIENCE  
IN  
GEOGRAPHY**

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September 21, 2007  
Blacksburg, Virginia

**Keywords:** Native bees, habitat modeling, GIS, decision support, bee bowls

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### **(Abstract)**

Through pollination, bees are responsible for the persistence of many biological systems on our planet. Bees have also been used for thousands of years in agriculture to improve crop quality and yield. Recently, there have been declines in honeybees worldwide. This decline is concerning because it threatens food supplies and global biodiversity. An alternative to alleviating the effect of a honey bee shortage could be to use native bees. Problems with adoption of native bees in agriculture occur because of a lack of large scale analysis methods for native bees, regional species lists and management knowledge.

This research explores the use of GIS in modeling native bee habitat to provide a landscape scale analysis method for native bees and develop a systematic sampling method for regional species list development. Raster GIS modeling, incorporating decision support and Poisson statistical methods were used to develop a native bee habitat model. The results show landscape composition is important to bee abundance and diversity. In addition, habitat fragmentation may not be as detrimental to bees as previously thought. Bees are most sensitive to landscape composition at a scale of 250 m, but require large patches of floral resources. GIS proved to be very useful in modeling bee habitat and provides an opportunity to conduct landscape scale bee population analysis.

## **Acknowledgements**

Many people's thoughts, acts, and presence have aided me in the completion of this work and have guided me through my education. Without the help of all my colleagues, friends and family, I would have not been able to finish this thesis. Because of all these people my education and graduate career have been a joy and I look forward to pursuing more scientific ventures.

First, I would like to thank my graduate committee for their insight and patience. Their combined knowledge was critical to the development of a project I was capable of finishing in the short amount of time we had for this research. Dr. Lynn Resler was particularly helpful, as she really made me refine my research. Her knowledge in biogeography and guidance was critical to my success, not to mention she edited countless drafts, some of which were not so good. Dr. Bill Carstensen deserves many thanks as well for his continuous help with the development of my GIS model. His expertise in the field of GIS and raster modeling was very helpful. He also offered endless support and reassurance. My third committee member John Boyer was also critical to my success. His expertise in viticulture and his agriculture background proved to be an extremely important and useful resource when I was in the development stages of my research. The help and guidance of my committee members was greatly appreciated.

Many other people helped me through my thesis. I would like to thank the rest of the faculty in the Geography Department at Virginia Tech, as they all have been there to lend a hand. I especially would like to thank Lisa Kennedy, who was very supportive of my geographic approach to studying bees when I was in her classes. I also want to thank

all of my friends who allowed me to set bee traps on their property. This was a very long and tedious process, and without Doug, Kurt, Kirk, Sharon, Cynthia, Mike, Shaun, Jason, Chad, Rory, and Sue I would have not been able to collect enough samples to run statistics on my work. As much as I love statistics, I still had to seek out help. I thank David Kramar and Kim Love who really explained non-parametric statistics and assured me I was on the right track.

I also want to thank my girlfriend Cynthia who endlessly took care of me and most of the time managed to be kind, even when I was frustrated and stressed. She has been great, convincing me I would be done soon and supporting my decision to continue my graduate education. Most importantly, I want to thank my parents Mark and Sue who have instilled confidence and motivation in me. Finally I want to thank the rest of my family who have all supported my work and graduate career. Without all of this support I would not be here.

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