

Strategic Conservation Planning for High Knob, Virginia:  
A GIS Decision Support Approach

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## Abstract

Conservation strategies frequently require prioritization of targets due to limited budgets and personnel. Prioritization involves choosing those areas that return the most conservation value for the time and money invested. Hence, the process of prioritization involves evaluating multiple conservation values and the uneven spatial distribution of those values across a landscape of concern. The goal of this study was to help conservation organizations improve decision making for implementation of prioritization-based strategies for land protection using a GIS-based, multi-criteria decision support system (GIS-MCDS).

Geographic Information Systems (GIS) can assist conservation planners in quantifying the relative desirability of one area over another, therefore enabling better business and ecological decisions. GIS analyses for planning are routinely undertaken over large geographic extents such as ecoregions to identify priority areas. These analyses often summarize priority by pixel values in a raster image. Implementation of conservation strategy often takes place at the much larger parcel level. Therefore, aggregating pixel-based results by parcels is a prerequisite to implementation of a purchase or easement strategy. I developed a spatial decision support system in an

attempt to quantify private land holdings in the High Knob area of Virginia for their relative conservation value, as defined by the Clinch Valley Program of The Nature Conservancy. It utilizes a proxy approach for measuring conservation values and an analytical hierarchy process to aggregate the results by privately held real estate parcels.

Simple prioritizations are often based on parcel size alone, rather than consideration of the many conservation values that characterize land parcels. Though it is much quicker and easier to prioritize parcels in this manner, such simplicity risks missing important smaller areas for conservation while prioritizing larger parcels with less value. I compared this simple “bigger is better” ranking method to the GIS-based multi-criteria method developed for TNC. There was a 0.57 correlation between the ranked lists produced by the two models, suggesting that parcel size alone does partially explain the complexity modeled by the multi-criteria method. However, the more complex method did produce different top priority parcels, which could significantly change an organization’s implementation strategy. I conclude that both methods have their applications, though the multi-criteria method is better for long-term implementations of strategic acquisition and easement.

A secondary goal was to identify to what extent land trust organizations are prepared to implement a multi-criteria type analysis like the one considered in this study. I conducted an online survey of conservation professionals on how their organization currently uses GIS and their satisfaction with GIS analyses to meet their organizational mission. Sixty-one responses were collected and analyzed. The

overwhelming majority of conservation organizations recognize the benefits that GIS bring and have already developed some level of internal expertise, though many barriers to using GIS were also identified. From these results, I conclude that most land trust conservation organizations are not currently utilizing the insights that multi-criteria GIS prioritization is capable of offering, but that their previous positive experience with GIS makes such analyses an attractive proposition for those on the cutting edge of the land conservation movement.

## **Acknowledgements and Dedication**

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When I made a decision to pursue a graduate degree in geography, I did so knowing that I would be absent from my family for much of the two years of coursework. Christine Lindeman, working as nanny to our two sons, enabled me to be gone for days at a time, with my absolute confidence in her to care for our boys and love them like they were her own. This thesis would never have been written without “Miss Chris” in our lives.

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Finally, I wish to dedicate this work to my sons, James and Benjamin Elmore, ages six and eight. They have now each spent a significant portion of their childhood with a father who was either gone, leaving soon, or busy reading and writing for a school or work assignment. They are my inspiration to do what I can to make the world

a better place, one conserved parcel at a time. In a very small way, I hope this thesis contributes to that end, and to their bright future.

Link Elmore

Abingdon, VA

May 8, 2012

## Table of Contents

List of Figures .....	xi
List of Tables.....	xiv
List of Abbreviations.....	xv
Chapter 1 Introduction.....	1
Problem Statement .....	1
Terminology, Agencies, and Abbreviations.....	2
Goal and objectives.....	3
Significance of the Study.....	6
Chapter 2 Literature Review.....	8
Conservation in the geographic tradition .....	8
Conservation area network (CAN) design and planning .....	9
GIS multi-criteria decision support (MCDS) systems for modeling CAN design .....	15
Conservation easements as implementation tools.....	17
Summary.....	19
Chapter 3 Study Area.....	20
Ecoregional Context.....	21
Geology .....	22
Climate.....	23
Watershed.....	23
Chapter 4 Methodology.....	24
Objective 1: Assess the conservation community’s attitude toward GIS .....	24
Objective 2: Spatially model and quantify conservation values articulated by TNC within the High Knob area of southwest Virginia.....	25
Data Layers.....	30
Data Standardization.....	30
The Models .....	32



Bio1: Rare Species .....	32
Bio2: Karst and Caves .....	34
Bio3: ELU Rarity .....	35
Spatial1: Parcel Size .....	37
Spatial2: Adjacent to Protected .....	38
Spatial3: Core Forest .....	39
Spatial 4: Distance to Protected .....	41
Spatial 5: Special Biological Area.....	43
Spatial 6: Fragmentation .....	44
Threat2b: Potential Development.....	46
Threat 3: Conversion of Undeveloped Land .....	46
Threat4: Potential Small Scale Development .....	47
Threat5: Loss of Forested Riparian .....	48
Water 1: Drains to Clinch River .....	49
Water2: Riparian Buffer.....	50
Water3: Impaired Drainage .....	51
Objective 3: Rank eligible parcels based on their overall conservation value .....	52
Pairwise Comparison and Eigenvector Calculation .....	53
Weighted Linear Combination .....	56
Aggregation by Parcel.....	57
Objective 4: Compare the ranking produced by MCDS to ranking by size .....	59
Chapter 5 Results .....	60
Objective 1 .....	60
Objective 2 .....	71
Objective 3.....	88
Objective 4.....	93
Chapter 6 Discussion.....	98
The Role of GIS in Conservation Organizations .....	98
Conceptual Model .....	99
Identify study area boundaries .....	100
Articulate priorities in plain language.....	100
Translate Priorities into Measurable Proxies .....	100

Acquire and Organize source data .....	101
Model distribution of each proxy across the study area as raster cells .....	101
Identify relative weights of each priority.....	102
Combine values and weights to produce a summary distribution .....	102
Aggregate distributions to parcels or other zones of conservation action .....	102
Apply constraints to mask out parcels not for sale or easement .....	103
Sort and rank parcels by highest mean value of aggregated zones .....	103
Size and Significance .....	103
The Burden of Complexity .....	104
Limitations.....	106
Future research.....	106
Conclusion: The nature of decision-making.....	107
Evaluation by TNC .....	107
Works Cited .....	109
Appendix A: Data Sharing Agreements .....	119
Virginia Outdoors Foundation.....	119
Virginia Department of Conservation and Recreation .....	120
Appendix B: IRB Documentation .....	122
Appendix C: Text of Online Survey .....	127
Survey Responses .....	132
Appendix D: Software and Data Sources .....	136
Appendix E: Evaluation by TNC .....	139
Appendix F: Modelbuilder Exports as Python Scripts .....	141

## List of Figures

Figure 2.1 An example of broad-scale mapping of biodiversity.....	14
Figure 3.1 Map of High Knob Study Area with Virginia Inset Map.....	20
Figure 3.2 Map of High Knob in Ecoregional Context.....	22
Figure 4.1 Bio1 model: Rare and threatened species and communities. ....	33
Figure 4.2 Bio2 model: Bio-significant caves and karst geology .....	35
Figure 4.3 Bio3 model: Ecological Land Unit (ELU) rarity .....	36
Figure 4.4 Spatial 1 model: Parcel Size.....	38
Figure 4.5 Spatial 2 model: Adjacent to Protected Land.....	39
Figure 4.6 Spatial 3 model: Core Forest.....	41
Figure 4.7 Spatial 4 model: Distance to Protected Land.....	43
Figure 4.8 Spatial 5 model: Special Biological Areas.....	44
Figure 4.9 Spatial 6 model: Fragmentation.....	45
Figure 4.10 Threat 2b model: Development potential .....	46
Figure 4.11 Threat 3 model: Conversion of Undeveloped Land.....	47
Figure 4.12 Threat 4 model: Potential Small scale development .....	48
Figure 4.13 Threat 5 model: Loss of forested riparian .....	49
Figure 4.14 Water 1 model: Drains to Clinch River.....	50
Figure 4.15 Water 2 model: Riparian buffer.....	51
Figure 4.16 Water 3 model: Drains to Impaired Waters.....	52
Figure 4.17 Example of pairwise tool used to evaluate relative preferences between factors. ....	54
Figure 4.18 IDRISI's WEIGHT module was used to compute eigenvectors .....	54
Figure 4.19 Aggregation by Parcels model.....	58
Figure 5.1 Survey question #1: My organization is a.....	60

Figure 5.2 Survey question #2: My primary role in my organization is.....	61
Figure 5.3 Survey question #3: Do you personally use GIS in your role with the organization? .	62
Figure 5.4 Survey question #4: GIS analyses for my organization is performed by.....	63
Figure 5.5 Survey question #5: I consider GIS to be a vital tool for fulfilling my organization’s goals.....	64
Figure 5.6 Survey question #6: My organization uses GIS to practice strategic conservation in order to protect the following resources:.....	65
Figure 5.7 Survey question #7: My organization bases decisions about conservation strategy on GIS analysis:.....	66
Figure 5.8 Survey question #8: Does your organization use GIS specifically to target or rank individual parcels, areas, or zones for strategic conservation action? .....	67
Figure 5.9 Survey question #9: What best represents the operational unit or geographic scale most often targeted for strategic conservation action by your organization?.....	68
Figure 5.10 Survey question #10: Would you characterize your organization's implementation of GIS to meet strategic conservation goals as: .....	69
Figure 5.11 Survey question #11: What are the barriers your organization faces in pursuing GIS-based strategic conservation?.....	70
Figure 5.12 Raster image output from Model Bio1 .....	72
Figure 5.13 Raster image output from model Bio 2. ....	73
Figure 5.14 Raster image output from model Bio 3. ....	74
Figure 5.15 Raster image output from model Spatial 1.....	75
Figure 5.16 Raster image output from model Spatial 2.....	76
Figure 5.17 Raster image output from model Spatial 3.....	77
Figure 5.18 Raster image output from model Spatial 4.....	78
Figure 5.19 Raster image output from model Spatial 5.....	79
Figure 5.20 Raster image output from model Spatial 6.....	80
Figure 5.21 Raster image output from model Threat 2b. ....	81
Figure 5.22 Raster image output from model Threat 3. ....	82

Figure 5.23 Raster image output from model Threat 4. ....	83
Figure 5.24 Raster image output from model Threat 5. ....	84
Figure 5.25 Raster image output from model Water 1. ....	85
Figure 5.26 Raster image output from model Water 2. ....	86
Figure 5.27 Raster image output from model Water 3. ....	87
Figure 5.28 Results of Weighted Linear Combination.....	88
Figure 5.29 Map of conservation value, aggregated by parcels.....	89
Figure 5.30 Map of parcels ranked by size method.....	93
Figure 5.31 Map of difference in parcel rankings produced by MCDS and size methods. ....	94
Figure 5.32 Graph of Relationship between Parcel Area and MCDS Rank .....	95
Figure 5.33 Graph of Parcel Area by MCDS Rank Percentiles.....	96

## List of Tables

Table 4.1 TNC identified conservation targets and data sources.....	27
Table 4.2 Eigenvectors of Weight by TNC Employee .....	55
Table 4.3 Summary of TNC CVP employee factor weights .....	56
Table 5.1 Top 100 parcels by MCDS method.....	90
Table 6.1 Sequence of Steps in a conceptual Model.....	99

## List of Abbreviations

CAIL	Central Appalachian Integrated Landscape (TNC)
CAN	Conservation Area Network
CE	Conservation Easement
CRD	Clinch Ranger District (USFS)
DCR	Department of Conservation and Recreation (Virginia)
DCR-NH	DCR-Natural Heritage Division
DEM	Digital Elevation Model
DMME	Department of Mines, Minerals, and Energy (Virginia)
E&H	Emory & Henry College
ELU	Ecological Land Units
EPA	Environmental Protection Agency
ESRI	Environmental Sciences Research Institute
GIS	Geographic Information Systems
GWNF	George Washington National Forest
HKFM	High Knob Forest Matrix
IUCN	International Union for the Conservation of Nature
JNF	Jefferson National Forest
LMU	Land Management Unit
LT	Land Trusts
LTA	Land Trust Alliance
MCDS	Multiple Criteria Decision Support
NLCD	National Land Cover Dataset
NDS	Non Dominated Set

SBA	Special Biological Area
TNC	The Nature Conservancy
USDA	United States Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Survey
VDOT	Virginia Department of Transportation
VGIN	Virginia Geographic Information Network
VOF	Virginia Outdoors Foundation
WLC	Weighted Linear Combination



# Chapter 1 Introduction

## Problem Statement

Worldwide population growth, global climate change, and land use trends cause concern that decreased plant and animal habitat will produce a critical loss of species biodiversity (McKibben 2006, Ehrlich 2008, Lovelock 2010). Planners are attempting to preserve biodiversity through habitat protection using conservation easements, land purchases, wise management of public lands, and restoration of impaired areas to form conservation area networks (Benedict 2006). A challenge for many conservation organizations is determining how to apply limited financial resources across landscapes of concern in a way that is both cost-efficient and ecologically significant (Fairfax 2005). Previous research (Strager 2002) has shown that it is possible to produce a prioritized list of land parcels for conservation easements by use of a customized GIS decision support system. This study builds upon previous efforts (Claggett et al. 2004, Strager and Rosenberger 2007) at computer modeling by using preexisting cadastral, physiographic, and biological data to prioritize discrete zones for a conservation strategy of land protection (i.e. purchase or conservation easement) using Geographic Information Systems (GIS). The study is significant because its results offer conservation planners insight into how taking multiple criteria into account can result in identifying priority target areas that might otherwise be overlooked.

## Terminology, Agencies, and Abbreviations

This study references several agencies and units of landscape. In an effort to avoid confusion, the following conventions are applied. A *parcel* or *tract* is a privately owned piece of real estate. A *land management unit* (LMU) is a subdivision of a larger publicly owned entity; in this case the Jefferson National Forest. The JNF contains *special biological areas*, (SBA) in which timber and mineral extraction is limited management decisions are designed to favor protection of existing biological communities. SBAs may span across multiple land management units but are completely contained within the national forest. A *zone* is a generic term meant to describe a discrete area of analysis and encompasses any and all parcels/tracts, land management units, and special biological areas. Differing conservation strategies require aggregation by different zones for analysis (e.g. parcels or LMUs).

The National Forests are administered by the *United States Forest Service* (USFS), a division of the *United States Department of Agriculture* (USDA). There are two national forests in Virginia, the *Jefferson National Forest* (JNF) and the *George Washington National Forest* (GWNF), which are administered jointly. Collectively, they are composed of seven ranger districts and one National Recreation Area. All USFS land located in the High Knob Forest Matrix is in the *Clinch Ranger District* (CRD) of the JNF.

*The Nature Conservancy* (TNC) is a private nonprofit corporation whose mission is “to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive” (The Nature

Conservancy 2006). Their *Clinch Valley program* (CVP), located in Abingdon, VA, is the local office charged with oversight of the area encompassed by High Knob. The *High Knob Forest Matrix* (HKFM) is defined by a boundary of their design.

The *Virginia Department of Conservation and Recreation's Natural Heritage program* (DCR-NH) is the state agency responsible for oversight of rare and endangered species across the Commonwealth. Every state in the United States and most countries in the Americas contribute to and share a database of globally rare and endangered species. DCR-NH also oversees conservation for state-listed species of concern for Virginia.

The *Virginia Outdoors Foundation* (VOF) was established by the General Assembly in 1966 to promote the preservation of open spaces and encourage gifts of private land to the Commonwealth. They are the de facto holders of most conservation easements in Virginia, even those purchased and negotiated by other entities, such as land trusts. The last two gubernatorial administrations in Virginia (Kaine and McDonnell) have each pledged to conserve over 400,000 acres during their term (Virginia Department of Conservation and Recreation, 2012). VOF is the state agency charged with meeting that mandate.

### **Goal and objectives**

The goal of this study was to help conservation organizations improve decision making for implementation of prioritization-based strategies for land protection using a GIS-based, multi-criteria decision support system (GIS-MCDS). To meet this goal, it was necessary to understand how conservation organizations are already using GIS to

perform priority analyses. The first objective (Objective 1) was to assess the conservation community's attitude toward GIS as a useful tool. I surveyed conservation professionals, mostly employed by land trust organizations, about the use of GIS in their organization. The survey was designed to assess if they are using GIS, and if so, how. The survey asks if conservation professionals are interested in using GIS for land protection prioritization, and which categories of items they are interested in protecting. Such a survey of end-users offers useful feedback to GIS programmers to better design GIS applications targeted to the conservation planning community.

The second objective (Objective 2) was to spatially model and quantify conservation values articulated by TNC within the High Knob area of southwest Virginia. Raster images are cell-based grids of values; each equally sized cell corresponds to a geographic location within the study area. When cells are symbolized in the GIS according to their relative value, each raster image displays as a map, revealing the distribution of a singular item that TNC desires to conserve when prioritizing zones for land protection efforts. Images were created using a variety of data and tools in the Modelbuilder environment of ESRI's ArcMap GIS application. Each image offers its own insight but is principally utilized in this study as an input to a secondary process which combines several rasters as factors in a final analysis product which aggregates cells by zones. TNC's conservation efforts include three distinct, yet geographically overlapping strategies of purchase or easement (referred to in their nomenclature as land protection), management advocacy of public lands, and restoration of impaired or degraded areas. The collection of raster images retains value beyond this study if

used as input to combinations by different zones (e.g. land management units) for an objective other than land protection (i.e. restoration or management advocacy). Thus, this objective offers value for further research.

The third objective (Objective 3) was to rank eligible parcels in the study area based on their overall conservation value. A customized GIS decision support model was created to prioritize parcels in the study area. The model allows the user to weight the contributing value of each constituent raster image, combines them, aggregates the cell values by parcel polygons, and ranks the parcels in order of accumulated value. The resulting list and map offers TNC the opportunity to focus on acquiring or seeking easements for those parcels that represent the best collection of their articulated conservation values within the study area.

The fourth and final objective (Objective 4) of this study was to compare the ranked list and map produced by the MCDS method to a ranked list produced by prioritizing parcels by size alone. Ranking by size reflects the perspective that conservation values are best served by protecting a larger total amount of land, regardless of its features. Acquiring or easing larger parcels more quickly contributes to that goal. By comparing the ranked lists produced by these two methods, conservation organizations can get a sense of how they differ and what valuable (though smaller) parcels might be otherwise missed by the “bigger is better” strategy. Incorporating the contributions of multiple criteria allows for a more detailed analysis with greater nuance and attention to the complexity of conservation targets and values

than ranking zones by size alone. However, such an undertaking is demonstrably more complex, time-consuming, and therefore expensive to conservation organizations.

### **Significance of the Study**

Objective 1 reports the state of current penetration of GIS technology into the land trust and conservation community. The usefulness of GIS-based decision making among conservation organizations is diminished where GIS is not already a part of the organizational culture. By conducting a survey of how GIS has penetrated the land trust market, we gain an appreciation of what impact the models and methodology put forth herein might have toward implementation in local contexts beyond this study area. GIS developers seeking to enhance technical tools available for use by this community will be interested in the survey results.

This study offers the conservation community an example of a GIS-based methodology for parcel prioritization at the local scale, utilizing the most commonly used GIS software on the market; ESRI Arcmap. The models presented in objective 2 to create raster images of proxy measurements for conservation values may be of use to others attempting to do the same in other areas.

Though the ranking analysis in objective 3 is specific to High Knob, Virginia, the ecological and social concerns that it seeks to prioritize are common to other areas, most specifically in the Cumberlands and Southern Ridge and Valley Ecoregion, but also to other ecoregions to the extent that biota and physical features of the landscape are similar.

Finally, objective 4 should be of interest to public policy makers and politicians who often dictate a measurement of conservation based on quantity rather than quality. Those communicating conservation efforts to the public may be tempted to use the rubric of size because it is simple and easily comprehensible. However, doing so may be unwittingly contributing to a faulty valuation of what matters most on the landscape.

Conservation organizations, in general, are interested in protecting the most valued landscapes for the least amount of money using the least cumbersome organizational process. Albert Einstein is reported to have said that when describing complex systems, explanations should be made as simple as possible, but no simpler (Hoch, 2004). A number of prioritization methods currently exist, from overly simplistic to overly complex. This study encourages conservation organizations to consider the cost-benefit ratio of two approaches along this spectrum, and hopefully will result in an understanding of the most efficient process to achieve their prioritization goals, while appreciating the tradeoffs implicit in any simplification of a complex reality.

The study's goal to help conservation organizations improve their decision making for land protection efforts is significant due to the rapid environmental and population changes now taking place. Our age has been dubbed the "Anthropocene" (Crutzen, 2000) due to the unprecedented influence that humans (*Gk. anthropos*) are now exerting on the planet's resources. Conservation organizations are under increasing pressure to make better and more efficient decisions about how to allocate their land protection resources. This study is significant in that it contributes to that ongoing effort.

## **Chapter 2 Literature Review**

This literature review will summarize the existing research on conservation planning and conservation area network (CAN) design utilizing GIS multi-criteria decision support systems (GIS-MCDS). It will also review the use of conservation easements (CE) as implementation tools for CAN design.

### **Conservation in the geographic tradition**

Robinson (1976) offers a convenient lens through which to contextualize this review of the literature. His article updates previous efforts (Pattison 1964) to outline the four traditions of geographic research (Robinson 1976). Conservation geography has its roots in all four traditions, yet falls uniquely in none. It recognizes that ecological communities are distributed across the landscape (the spatial tradition) yet have functional connections (the area studies tradition). The earth science tradition is present in the recognition that protection of living creatures is often predicated on protection of abiotic diversity, such as variations in the physical habitat. The human-land tradition is most apparent when considering applied objectives as any successful conservation strategy must account for human uses of the land. It is important to note that Robinson's article was written prior to the rise of GIScience. If we consider GIScience a possible "fifth tradition", elements of the current review might well be considered as falling within its bounds as well.

Likewise, Cutter (2002) suggests ten "big questions" that geographers attempt to ask and answer with research. Cutter asks, "What makes places and landscapes



different from one another, and why is this important?” Defining differences at a local scale is vital to successful habitat protection efforts. It is impossible for most conservation strategies to be carried out at a broad scale. It would be impossible, in terms of time, effort, and money, for any conservation agency or organization to purchase (or negotiate an easement for) all the ecologically significant privately held land in a state or an ecoregion. These tasks, while remaining a challenge, are real possibilities at the local level. Cutter also asks, “How do we delineate space?” Conservation easements are an attempt to recognize the intersection of ecological distributions and private land ownership. As a corollary to her big question, “How has the earth been transformed by human action?”, Cutter identifies the geographic question, “What areas should be set aside and preserved?” Though the applied objectives of conservation research have an obvious affinity with other disciplines like ecology and planning, their basic questions are undeniably within the mainstream of geography.

### **Conservation area network (CAN) design and planning**

Conservation Area Network (CAN) design is the process of defining functional connections between spatially discrete zones for the purpose of habitat protection. Despite the clear spatial nature of the problem, CAN design and conservation planning has largely been ignored in the geographic literature. Instead, it has been left largely to the disciplines of ecology and conservation biology to publish research on spatial analysis with applied conservation objectives. Though these other disciplines have made liberal use of the analytical tools of geography, such as GIS and remote sensing,

the debates about conservation planning have not been prominent in the geographic literature. Geographers have an opportunity to publish on CAN design in our two flagship journals to advance the debate within our profession about geography's role in the conservation movement and how geographic research can contribute.

Geography's conversation about conservation tends to appear in the biogeographic literature. A good example of biogeographic research with explicit application for conservation planning is Cunningham's analysis of songbird habitat on public and private grasslands in Minnesota (Cunningham 2005). While not specifically advocating conservation easements, she concludes that "as long as most available grasslands remain in private hands, it will remain essential to understand the role of private lands in overall conservation efforts and to use farmland retirement and conservation programs effectively." This emphasis on the use of private land for conservation planning is consistent with the aims of the problem considered by this review.

CAN design is at its essence a geographic problem, because it exists at the intersection of our human/cultural and physical traditions. The common use of GIS to analyze landscapes for conservation further places CAN design within the geographic discipline. However, the only article in the past ten years to appear in the *Annals of the Association of American Geographers* or the *Professional Geographer* to explicitly address conservation planning through CAN design was Church (2003). In it, the scope of the site-location problem, familiar to geographers, is expanded to consider biological habitat as "patches" of connected pixels useful as conservation planning

units. This approach is an excellent example of a spatial application to the conservation planning problem because it views habitat in terms of delineated space. Once properly delineated, it becomes a candidate for conservation action.

Contributions to the literature also exist in other geographic journals, though sparingly. Two consider CAN planning in China from a policy (Jim and Xu 2004) and landscape ecology retrospective (Fu and Lu 2006). China's centralized conservation planning approach contrasts to that in the U.S. A third article offers a computer model to maximize coverage for both the number of species as well as redundancy for rare species (Hamaide et al. 2006). Hamaide has also written about the trade-off between diversity and abundance in CAN planning (Hamaide et al. 2006).

The relative lack of attention to CAN design in the geographic literature is not common to the research of ecologists and conservation biologists. A number of optimization protocols and methods have been proposed for CAN design. CREDOS (Crossman et al. 2004) and Zonation (Moilanen 2007) represent software application attempts toward spatial decision support that seek to be comprehensive and unifying of competing theories in CAN design. Similarly, MultCSync is a software package for multicriteria decision support in CAN design that seeks to incorporate calculation of the non-dominated or "Pareto set" of best possible competing solutions (Moffett, et al. 2005). Others have put forth approaches that emphasize different perspectives such as interior-point search (Moilanen 2005), multi-species protection (Nicholson et al. 2006), benefit-function (Arponen et al. 2007), multi-function (Evaristo and Botequilha-Leitao 2008), target-species (Jiang et al. 2007), and species-richness (Kati et al. 2004).

Despite this multiplicity of efforts and approaches, none specifically envisions implementation via conservation easements. Instead, theoretical model-builders seem to assume the equal availability of parcels and land to construct CANs, as though private ownership were not a factor in implementation.

Landscape Ecology theory views ecological data, such as species occurrence, abundance and habitat availability, from a broad scale, when compared to most life sciences. Landscape Ecology attempts to show the impacts of landscape pattern on biological processes (Dramstad 1996, Gergel 2002). Primary units of analysis in landscape ecology studies are size, shape, spatial distribution, fragmentation, and connectivity of habitats (Turner, 1989, Dramstad 1996).

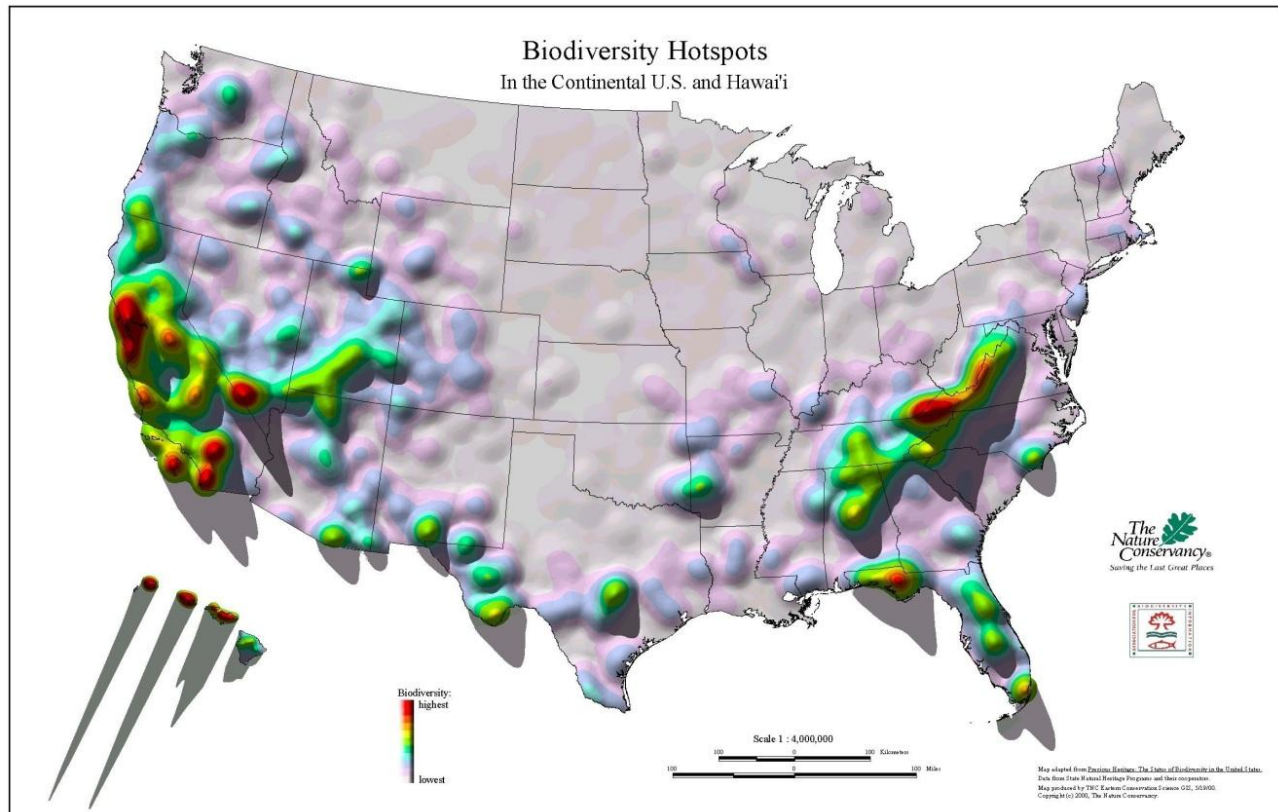
Theory from Landscape Ecology provides a useful basis for conservation easement planners (Groves et al. 2002) as it takes into account the complex heterogeneous nature of biological and anthropogenic land use. Ecologists define landscapes as spatially heterogeneous areas (Turner 1989, Forman 1995). Protection of ecosystem heterogeneity is necessary for effective conservation (Huston 1997, Pickett and Rogers 1997, White and Harrod 1997, Koehler 2000). However, as ecosystem heterogeneity is complex by its very nature, the key for simplifying for the purpose of conservation planning for maximizing biodiversity is choosing which elements correspond most directly to threatened species (Sanderson et al. 2002).

There are many different approaches in the literature to choosing the appropriate variables for conservation planning (Franklin 1993, Simberloff 1998, Caro and O'Doherty 1999, Poiani et al. 2000, Steiner et al. 2000). Some emphasize landscape

patterns in a “hotspot” approach (Myers et al. 2000, Myers 2003). The hotspot approach seeks to identify spatial zones of greatest density of threatened species. A conservation strategy based on this approach might attempt to set aside a minimal area to affect the most number of species. Other approaches include anthropogenic factors in an “ecosystem services” analyses (Barrett and Arcese 1995). The ecosystem services approach attempts to quantify areas in terms of their economic value to humans. An example of ecosystem services analysis is the attempt to quantify the carbon sequestration potential of a forest stand as a strategy against global climate change due to greenhouse gas emissions. In this example, while cut timber might produce income, its overall value is reduced or negated entirely by the reduction in sequestration ability represented by that forest stand. Still others plan to protect specific species and communities (Anderson 1999, Groves 2000) in a “portfolio” approach, predetermining a set of keystone or indicator species for conservation. The “landscape species” method chooses species that represent a landscape’s heterogeneity (Redford 2000) as a protection strategy against the loss of biodiversity. Though comprehensive criteria for evaluating biodiversity conservation planning have been proposed (Regan et. al 2007), no consensus yet exists about which protection method is best. Different conservation organizations each follow their own methodology (Redford et al. 2003).

The Nature Conservancy evaluates the potential of an area for terrestrial ecological diversity by use of abiotic proxies, such as elevation, geology, landform and land cover type. They collectively refer to these abiotic layers as “ecological land units”

(ELU), and relative values are assigned to cells in a raster-style grid across a landscape (Ferree 2007). Implementation of a conservation strategy then requires that these data be aggregated to the zone level (Strager 2007).



**FIGURE 2.1 AN EXAMPLE OF BROAD-SCALE MAPPING OF BIODIVERSITY.**

FIRST PUBLISHED IN STEIN, ET. AL (2000). USED WITH PERMISSION OF THE NATURE CONSERVANCY.

Researchers have noted the importance of spatial scale in landscape analysis and its particular relevance in landscape ecology (Gergel 2002). While evaluation of habitat or land use often takes place at one spatial scale, implementation of conservation plans based on that analysis may take place at another (Harris, 2005, Strager 2007). For example, Strager and Rosenberger (2007) note that most conservation planning is done at a broad scale using cell-based units of analysis

(pixels) as in figure 2.1, but that implementation of land protection strategies takes place at the parcel level in financial negotiation with individual landowners. This gives rise to the conservation planning axiom, “You can’t buy a pixel but you can buy a parcel” (Strager 2002).

#### Spatial Conservation Prioritization: Quantitative Methods & Computational Tools

(Moilanen, et al. 2009) provides an up to date review of the literature, focusing on both the ecological and computational aspects of conservation. The authors’ concerns are not just new and novel methods of computation but instead focus on implementation of spatial quantitative methods for conservation in “real-world” applications.

#### **GIS multi-criteria decision support (MCDS) systems for modeling CAN design**

MCDS is the process of defining conservation priorities (often included in an organizational mission statement), selecting spatial attribute proxies for each priority, and defining the relative weight of each proxy to the whole. A GIS-MCDS is a computer spatial model that facilitates the necessary calculations and produces outputs such as thematic maps to aid implementation of the given priorities.

GIS-MCDS are capable of assisting the conservation planning process by modeling spatially linked biotic and abiotic data that are collected and displayed at different spatial scales (Phua and Minowa 2005, Nelson et al. 2009). Mission-driven planning organizations develop measurable criteria for each of their priorities, which they then rank by importance. These ranks are then converted to a mathematical value representing the relative contribution of each criteria to the whole (Strager 2006). Each weight is assigned a spatial feature as its measurable proxy. These spatial

features with weighted attributes are analyzed and displayed by the GIS as thematic maps to assist conservation planners in prioritizing areas for protective action (Jankowski 1995, Malczewski 1999, Thill 1999).

A number of different approaches for MCDS for CAN design are available in the literature. Moffet and Sarkar (2006) compiled a convenient mini-review of 26 different methods. The authors recommend those methods that first incorporate non-dominated set (NDS) computation (Sarkar and Garson 2004). The analytic hierarchy process is one such method (Duke and All-Hyde 2002), however the use of NDS is a significant departure from most prior CAN designs (Moffett and Sarkar 2006). Despite the MCDS model design, research suggests that the most influential factor in determining decision recommendations are the specific weights assigned to the different conservation criteria by decision makers (Strager and Rosenberger 2006).

Conservation does not take place in an economic or sociopolitical vacuum (Czech 2002, Sarkar 2005), and any GIS-MCDS for CAN design must take into account not only the ecological significance of the land but also economic value and potential land uses that might compete with conservation goals (Murdoch et al. 2007, McDonald et al. 2007). Urban planners have developed predictive models of development, using such techniques as artificial neural networks (Thekkudan 2008). Predictive modeling allows decision makers to incorporate not only the known ecological realities but also the potential impacts of development when considering how best to structure conservation plans.



Previous research (Strager and Rosenberger 2007, Markwood 2007, Convery 2007, Li and Nigh, 2011) has provided conservation organizations with customized GIS-MCDS applications for the purpose of targeting individual parcels based on organizational priorities. Current technology offers an opportunity to present case study analysis of previous strategic easement implementations to assess retrospectively whether a spatially based analysis does in fact contribute to actual conservation action. Such a review is not currently reported in the literature.

### **Conservation easements as implementation tools**

Conservation easements (CE) are voluntary legal agreements between landowners and protection agencies that place restrictions on land use and development in exchange for financial incentives (Diehl 1988). Purchase of threatened lands by protection agencies is still widely practiced in the conservation community. However, a legal instrument of growing popularity (Rissman and Merenlender 2008) is the conservation easement, which takes into account the economic needs of the owner as well as their desire to retain ownership (Diehl 1988). In a CE, the ownership of the land remains private but the owner relinquishes certain development rights as specified in the easement agreement. While there is evidence that conservation easements were first used as early as the nineteenth century, they became popular in the 1930s, notably near Virginia's Blue Ridge Parkway (Wright 1993). The Nature Conservancy (TNC) is currently the nation's largest nonprofit holder of such easements (Rissman et al. 2007).

Conservation easements have become popular and effective tools for protecting ecologically sensitive private lands from development pressure (Corcuera 2000, Czech 2002, Rissman et al. 2007). They allow for protection from development in perpetuity, while allowing landowners to retain and exercise other rights. This permanent legal protection is celebrated by advocates as a way for conservation efforts to be effective over the long term (Mitchell 2006). However, critics of such easements also point to this attribute of permanence as too restrictive on future generations with unknown land use needs (Mahoney 2002, Richardson 2008). Finnish researchers report on a pilot-program effort where private lands were targeted in a voluntary program designed to create markets for biodiversity (Juutinen et al. 2009). These were analogous to the United States based conservation easement approach in that the program was both voluntary for landowners and targeted privately held lands. The Finnish research concludes that such contracting programs have the potential to be effective and popular, in contrast to “top-down” land acquisition by governments or conservation organizations.

Though The Nature Conservancy has been a leader in utilizing conservation easements (Kiesecker et al. 2007), the literature has criticized TNC for their haphazard use (Groves et al. 2002, Greer 2004, Strager 2007). Indeed, a key debate in the literature concerns the effectiveness of conservation easements. Some studies have questioned whether easements actually achieve their conservation objectives (Kiesecker et al. 2007), though others have lamented that there is no easy way to study

their actual ecological impact, given the multitude of easement holders and lack of continual biological monitoring (Merenlender et al. 2004).

In the absence of comparative ecological data to validate previous efforts, the size of a real estate parcel has become a common indicator of its presumed ecological value for biodiversity by conservation planners who prefer to limit the minimum size of easements they write (Virginia Outdoors Foundation 2009). The species-area relationship is a long-held principle of biology (Drakare et al. 2006) that states the number of species increases with the size of the available habitat. However, it has been shown that isolation also factors into biodiversity potential (MacArthur 1967). The current literature has not yet produced evidence that a sole dependence on size to set priorities for conservation easements is an adequate predictor of their effectiveness.

### **Summary**

A collection of voluntary conservation easements on privately-owned individual parcels and managed public lands can be used to create a *de facto* conservation area network in furtherance of biodiversity and other species-specific habitat goals. Choosing which zones to use as the individual units of a CAN is a spatial-ecological-economic problem for which geographic information systems, working as multi-criteria decision support applications, can assist conservation planners in prioritizing their efforts. The use of such an approach requires well articulated organizational priorities and data availability that adequately represents organizational goals. This type of analysis falls within both the historical and contemporary understanding of the geographic discipline.

## Chapter 3 Study Area

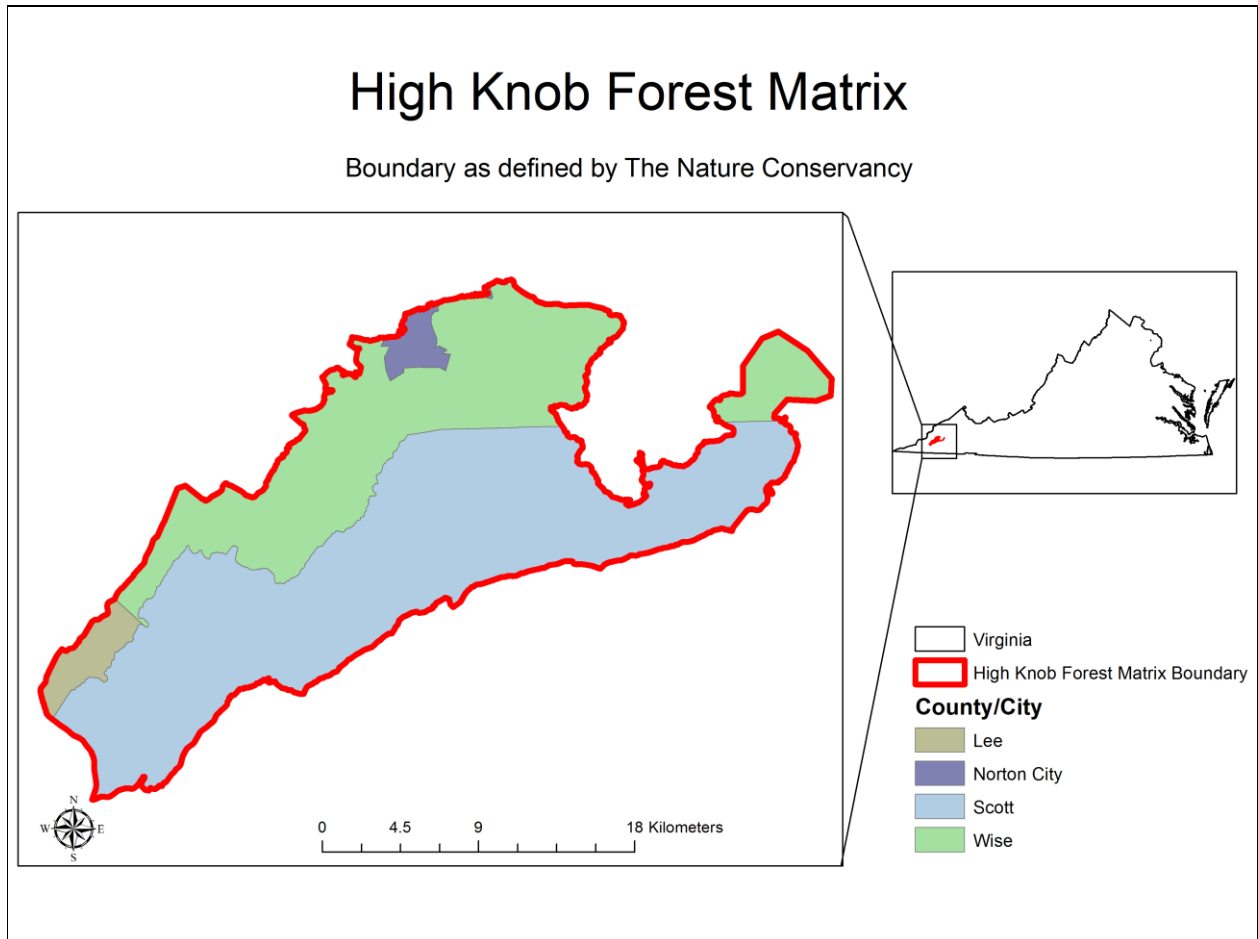


FIGURE 3.1 MAP OF HIGH KNOB STUDY AREA WITH VIRGINIA INSET MAP

As part of its broad-scale planning process for the Cumberlands and Southern Ridge and Valley Ecoregion, TNC has identified the High Knob area of southwest Virginia as an important focus for future conservation efforts (figure 3.1). Each area identified by this planning process is referred to as a forest matrix area, indicating the unique and complex array of landforms and organisms collectively present within its borders. This study refines TNC's previous broad-based investigation (Watland 2008) to a fine scale, using priorities specific to the High Knob Forest Matrix (HKFM) area. The

HKFM encompasses portions of Virginia's Scott, Wise, and Lee counties, as well as the independent City of Norton. TNC has defined a forest matrix area of 330 sq. km (81,516 acres) in High Knob that includes portions of the Jefferson National Forest as well as private lands that are adjacent or potentially connected (Watland 2009). A challenge both to this analysis as well as any subsequent conservation efforts for High Knob is that the area contains five distinct jurisdictions from municipal to county to federal, as well as both private and public holdings. High Knob contains Stone Mountain (36.89N, -82.63W, elevation 1287m (4,223 ft) above sea level), which was the site of an historic USFS fire tower, listed on the National Register of Historic places. The tower, originally built by the Civil Conservation Corps in 1939, was a focal point of local pride until it was burned by arsonists in 2007 (Igo 2007). Efforts are now underway to rebuild the tower (McLean 2008).

### **Ecoregional Context**

The Nature Conservancy utilizes the concept of ecoregions (Bailey 1983), which group areas of geographic and biological similarity, for the purpose of analysis and planning. The High Knob Forest Matrix lies within the Cumberlands and Southern Ridge and Valley Ecoregion (figure 3.2). More specifically, it lies within what TNC refers to as the Central Appalachian Integrated Landscape (CAIL), extending from West Virginia into Eastern Kentucky and Southwest Virginia, terminating at the northern border of Tennessee. High Knob lies toward the southern end of the integrated landscape.

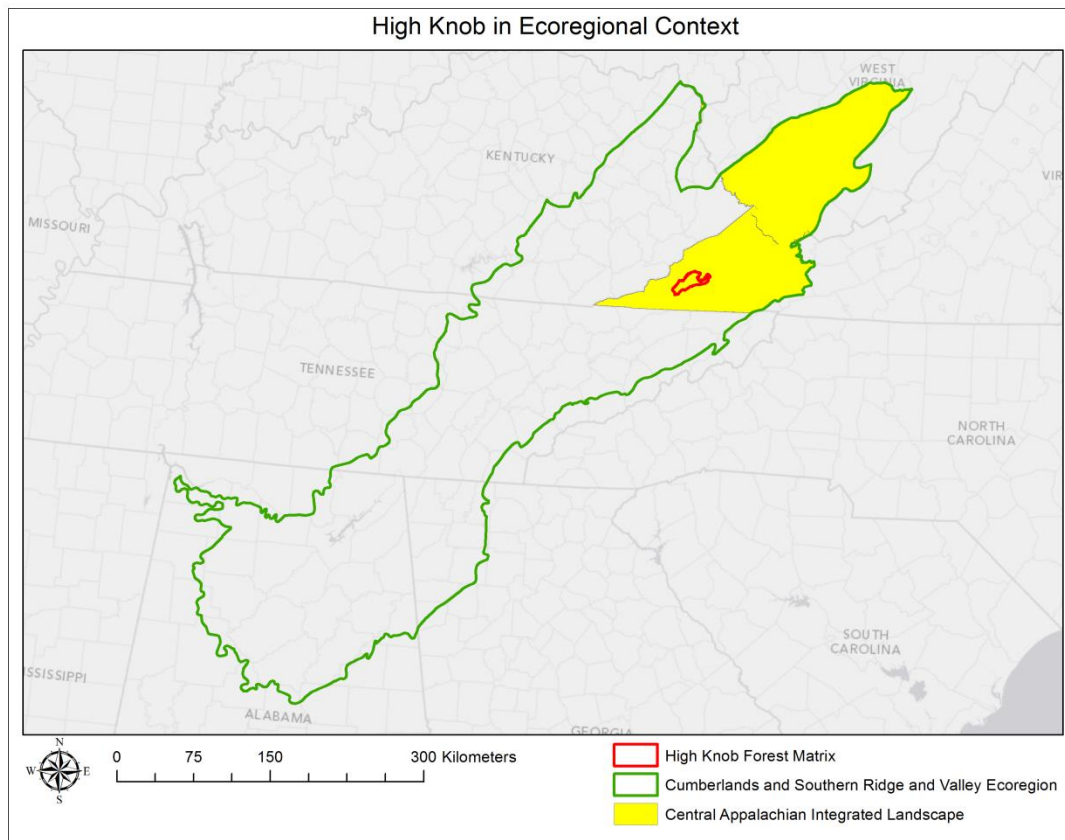


FIGURE 3.2 MAP OF HIGH KNOB IN ECOREGIONAL CONTEXT

## Geology

The High Knob Forest Matrix is situated on a massive limestone geological formation known as the High Knob Landform, which stretches from the Powell River Valley in Wise County to Norris Lake in Tennessee- part of the Cumberland Mountain Overthrust Block. The HKFM lies at the extreme eastern end of this landform and is part of the Powell Valley Anticline, a structure which contains caves in all major cave-bearing strata from the Cambrian through Mississippian ages. This subterranean

pervasiveness is unique within Virginia and unreported elsewhere in the Appalachians (Browning 2009).

### **Climate**

According to local weather observers, the High Knob massif receives 150-175 cm (60-70 inches) of precipitation a year, making it among the wettest locations in Virginia (Browning 2008). The nearest weather station that submits data to the National Climactic Data Center is Big Stone Gap, which records average annual precipitation of 129.6 cm (51.02 inches) and mean temperature of 12.4° C (54.4° F). Extremes include a low of -9.4° C (-15° F) and high temperature of 36.1° C (97° F) (National Climactic Data Center 2010). High Knob is on the western upslope of the Appalachians which captures a good deal of precipitation from storms prevailing to the east. In winter the area is subject to a distinctive weather phenomenon known as rime or hoar frost, a thick coating of white ice crystals, made of super cooled particles that freeze on contact with surfaces (Mayhew 2009).

### **Watershed**

High Knob lies entirely within the Clinch-Powell watershed, part of the Upper Tennessee River watershed. The southern portion of High Knob drains to the Clinch River, an important habitat for several rare and endangered species of freshwater mussels. An ecological assessment of anthropogenic risks to stream biota characterized the risk to the Clinch-Powell watershed as “moderate” (Mattson 2007).

## Chapter 4 Methodology

The essence of this study (objectives 2 and 3) was to use GIS to translate human values about *what* should be conserved into a map and corresponding ranked list of parcels showing *where* those values are distributed across a landscape in order to facilitate better decision making. As a prelude to that translation, it was necessary to better understand the conservation community's attitude toward GIS as a useful tool for prioritization (objective 1). As an evaluation of the core methodology, its results were compared to those produced by a commonly used ranking method, assigning priority based on size alone (objective 4). In an attempt to ground validation of the method within the conservation community, the results of objectives 2 and 3 were evaluated by the Director of TNC's Clinch Valley Program.

### **Objective 1: Assess the conservation community's attitude toward GIS**

I wrote and administered an online survey via [survey.vt.edu](http://survey.vt.edu) (a free online survey development tool available through Virginia Tech) to assess the conservation community's attitudes toward GIS, with particular interest in how prevalent GIS priority ranking attempts are and the effectiveness of priority ranking attempts (Appendix A). The survey was publicized via a posting to the Land Trust Alliance email list serve. The Land Trust Alliance (LTA), located in Washington, DC, is a national organization which does public policy advocacy, offers continuing education and training, and accredits land trusts (LT). There are more than 1700 land trusts in the United States



and over 700 of these are members of LTA. As part of their mission to facilitate the sharing of ideas within the LT community, LTA maintains an active email list serve discussion group to facilitate conversation among conservation professionals. Non-member organizations, including some who are not land trusts but otherwise involved in conservation, are welcome to read and participate in the conversation.

**Objective 2: Spatially model and quantify conservation values articulated by TNC within the High Knob area of southwest Virginia**

Before any modeling to create raster images could proceed, it was vital to have a clear understanding of how the partner agency's mission statement and values are operationalized in the current context. The Nature Conservancy has a defined method for translating their philosophically worded mission statement into actual conservation targets. This method is known as "Conservation by Design" and has recently been used to update the central planning document for their Clinch Valley Program (CVP) (Watland 2008). CVP employees participated in the recent update and were therefore familiar with and conversant about the organization's identified conservation values for High Knob. This document, used as a basis for discussion, was helpful in reaching consensus among all staff of the CVP about their specific priorities for High Knob at a meeting held on 1/15/2010. This interview with the CVP staff was similar to that reported in Strager (2002) at a meeting of West Virginia state agencies and other stakeholders on a much larger scale. The CVP staff consists of six people, including the Executive Director, GIS Analyst/Conservation Planner, Wildlife Biologist, Conservation Forester, and Land Acquisition Specialist. All were in attendance and

participated in achieving a consensus list of conservation targets based on their recently updated plan.

The consensus revealed seventeen individual conservation targets. For purposes of abbreviation, these were grouped and numbered under four themes. Three targets dealt with the maximization of terrestrial biodiversity potential (BIO). Six targets focused on the significance of any one zone in its spatial context (SPATIAL). Five, later reduced to four, concerned minimizing threats to biodiversity (THREAT). The final three targets sought to protect water quality (WATER).

Initial evaluation criteria for each target were discussed with TNC staff at the meeting on 1/15/2010, but finalized as part of the modeling process in consultation with the GIS Analyst/Conservation Planner. Two targets (Threat 1: Residential development potential and Threat 2: Commercial development potential) were eventually combined into Threat 2b: Development potential due to similarity, which lowered the final number of targets to 16. Table 4.1 summarizes each conservation target, proxy data source, and operational criteria used in the study.

TABLE 4.1 TNC IDENTIFIED CONSERVATION TARGETS AND DATA SOURCES

Abbreviation	Conservation Target	Proxy data source	Operational Criteria	Measurement
Bio1	Rare species/communities	DCR Natural Heritage element occurrence	Priority to areas containing a documented rare or threatened species or biological community	Fuzzy
Bio2	Bio-significant caves and karst geology	DCR Natural Heritage data, Virginia Cave Board	Priority to areas overlaying limestone karst geology or containing a bio-significant cave	Fuzzy
Bio3	Ecological Land Unit (ELU) rarity	TNC ELU data	Priority to areas containing ELUs deemed rare at the scale of the Central Appalachian integrated landscape	Fuzzy
Spatial 1	Parcel size	County and municipality cadastral data	Priority to larger parcels	Fuzzy
Spatial 2	Adjacent to “protected” land	VOF easements, USFS boundary	“Protected” = USFS or existing conservation easement. Priority to parcels sharing a border.	Binary

<b>Abbreviation</b>	<b>Conservation Target</b>	<b>Proxy data source</b>	<b>Operational Criteria</b>	<b>Measurement</b>
Spatial 3	Part of core forest area	TNC, DMME oil/gas wells, VGIN Roads	Priority to areas > 20m inside matrix boundary edge or fragmenting features of roads and natural gas well pads	Binary
Spatial 4	Potential to establish connectivity between existing isolated patches	VOF easements, USFS boundary	Priority to areas of shorter distance to reach a protected area.	Fuzzy
Spatial 5	Area designated as "special biological area"	USFS SBA	Priority to SBA areas	Binary
Spatial 6	Minimize fragmentation	VGIN Roads, DMME oil/gas wells	Priority to less fragmented areas for easement/purchase, priority to more fragmented for management advocacy and restoration.	Fuzzy
Threat 2b (Threat 1 and Threat 2 were combined)	Potential for development	USGS DEM, VGIN Roads	Priority to areas with average slope < 10%, adjacent to a major road	Binary
Threat 3	Conversion of undeveloped land	NLCD	Priority to areas with undeveloped uses	Binary

<b>Abbreviation</b>	<b>Conservation Target</b>	<b>Proxy data source</b>	<b>Operational Criteria</b>	<b>Measurement</b>
Threat 4	Potential small-scale development	USFS boundary, USGS DEM, VGIN Roads	Priority to areas adjacent to public land, within ridgeline buffer, with road accessibility	Binary
Threat 5	Forested riparian condition	USFS Streams, NLCD	Priority to areas within a buffer of streams located in areas of forested land cover class.	Binary
Water 1	Within Clinch River watershed	USGS DEM, USGS Hydro	Priority to areas that drain to Clinch	Binary
Water 2	Potential riparian habitat	USGS Streams	Priority to areas with more stream buffer area	Binary
Water 3	Impaired aquatic streams	USGS Streams, USGS DEM, EPA 303D	Priority to areas that drain to 303D listed streams	Binary

## **Data Layers**

Any decision support system is only as reliable as the data it processes. Obtaining the most recent data from the most authoritative source is crucial to a successful analysis. I began collecting data layers from numerous public sources during the Fall 2009 semester. Data sharing agreements were completed with the Virginia Outdoors Foundation and Virginia Department of Conservation and Recreation (Appendix B). TNC also provided many relevant layers. Parcel data were obtained from the individual counties or municipalities, with the exception of Lee County, which is not yet available in digitized form. Lee County parcels within the study area were manually digitized and joined to tabular attributes. Other data layers were collected from online sources of publicly available data from both federal and state agencies, particularly the USGS. All data layers were converted from shapefiles to feature classes in an ESRI file geodatabase for use in the Modelbuilder environment of ESRI ArcMap software, version 10.0. Data sources used are reported in Appendix D.

## **Data Standardization**

The output of each of the models (summarized in Table 4.1) was a raster image of the distribution of each of TNC's identified conservation targets. Preparation of all images was done using ESRI ArcMap's Model builder environment. Two types of standardization were necessary; spatial and mathematical. These standardizations were shared components of each individual model.

Spatial standardization was imperative because all cells of each output raster must align properly if they are to be subsequently combined to achieve objective 3. To

achieve spatial standardization, all rasters were projected into a common coordinate system; all cells needed to be of the same size; and all rasters had to share a common extent, meaning that all rasters were georeferenced to the same point of origin. The coordinate system of all spatial data was the NAD83 State Plane Virginia South FIPS 4502 (feet). A common cell size of 28.8 x 28.8 US feet (8.8m x 8.8m) was used for all output rasters. Output rasters all shared a common rectangular extent bounded by the following (in State Plane feet from the respective line of origin); Top; 3529739, Left: 10216035, Right: 10339392, Bottom: 3450469, resulting in 4281 columns and 2751 rows for each raster.

Mathematical standardization refers to the range of values present within a raster (Eastman et. al 1995). The final output of each model was scaled, often using the Fuzzy Membership tool, to contain values between a common scale of 0 and 1. The higher the value in a cell, the more it approximated the presence of its conservation target. In addition to simply standardizing the range of values, the use of fuzzy membership logic allows a gradient of output to be symbolized, rather than the “hard” cutoff values of a Boolean or categorical method. Many of the modeled phenomena lent themselves naturally to a fuzzy representation, to which a categorical method would have done a disservice.

A secondary mathematical standardization concerned the presence of values marked by the GIS as NoData, often outside the study area but within the bounding box of the output raster. While using the NoData designation was helped to simplify the models, the eventual combination of rasters would be complicated by the presence of

NoData values. As preparation for objective 3, these were removed and converted to values of zero, often using Raster Calculator and a conditional statement, similar to

**Con(IsNull("%Name\_of\_output\_raster%"),0,1)**

within each model. In the discussion of individual models that follows, this process was referred to simply as “error handling”.

### **The Models**

Each of the sixteen models summarized in Table 4.1 is unique and produces a unique output raster. While the visual flowchart of the Modelbuilder environment documents the major steps of the sequence, it does not reveal parameters set within each tool, nor environment settings for the model. These parameters, created using the output of the Modelbuilder Reports tool, are reported in Appendix F as Python scripts. This section will briefly describe the purpose of each model, discuss the model and conservation logic, and show the flowchart from Modelbuilder. The output of each model is graphically displayed in Chapter 5 Results.

#### ***Bio1: Rare Species***

The purpose of the model was to create a raster of cells containing counts of globally rare or threatened species or biological communities within the study area. The preservation of biodiversity on earth is the main objective of TNC. Data obtained from Virginia’s Department of Conservation and Recreation’s Natural Heritage Division (DCR-NH) documented biological field observations of known endangered and threatened species and biological communities as listed on the International Union for



the Conservation of Nature’s “red list” (IUCN 2011). The data are presence/absence and do not indicate abundance.

Input data for the model below were prepared manually (prior to the functions in the flowchart below) by creating a Relate (one to many relationship) between the spatial features (biological survey area polygons) and the species associated with that survey area in the associated database table (not shown). A count of the number of relationships was added to the attribute table of the polygon layer, which was used as the basis for the Polygon to Raster operation. These counts became the values in all cells contained by the (rasterized) polygon. Raster Calculator was utilized for error handling of NoData values via the following expression:

**Con(IsNull("%nhr\_screen\_SPC\_Clip\_PolygonT%"),0,"%nhr\_screen\_SPC\_Clip\_PolygonT%").**

Final values were redistributed between 0-1 with the Fuzzy Membership tool over a linear monotonically increasing membership function.

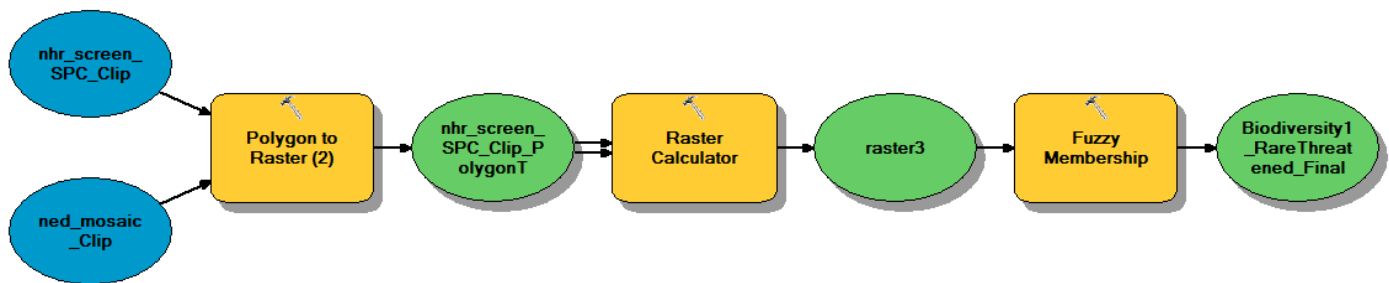


FIGURE 4.1 BIO1 MODEL: RARE AND THREATENED SPECIES AND COMMUNITIES.

BLUE OVALS REPRESENT DATA SOURCES. YELLOW RECTANGLES REPRESENT TOOLS. GREEN OVALS REPRESENT TOOL OUTPUTS.

## ***Bio2: Karst and Caves***

The purpose of the model was to create a raster of areas overlaying limestone karst geology or that contain an entrance to a biosignificant cave. Karst geology is extremely porous and allows rainfall to reach groundwater levels much faster than in non-karst areas. As such, waterborne contaminants are not filtered by the soil and can result in impaired groundwater, affecting not only human consumption but also the health of fragile aquatic species. Limestone caves associated with karst contain biological communities that may not be fully explored, potentially containing species and ecosystems unknown to science. TNC's focus on biodiversity extends not only to known diversity but also the protection of that which has not yet been documented.

The Nhr\_screen\_SPC data layer, from DCR-NH, contained polygons where karst is noted as an attribute. Karst polygons were selected, rasterized, and extracted to the study area. A polygon layer of caves was also rasterized and extracted. Raster calculator was used to convert NoData values to zero and the rasters were added and then re-scaled.

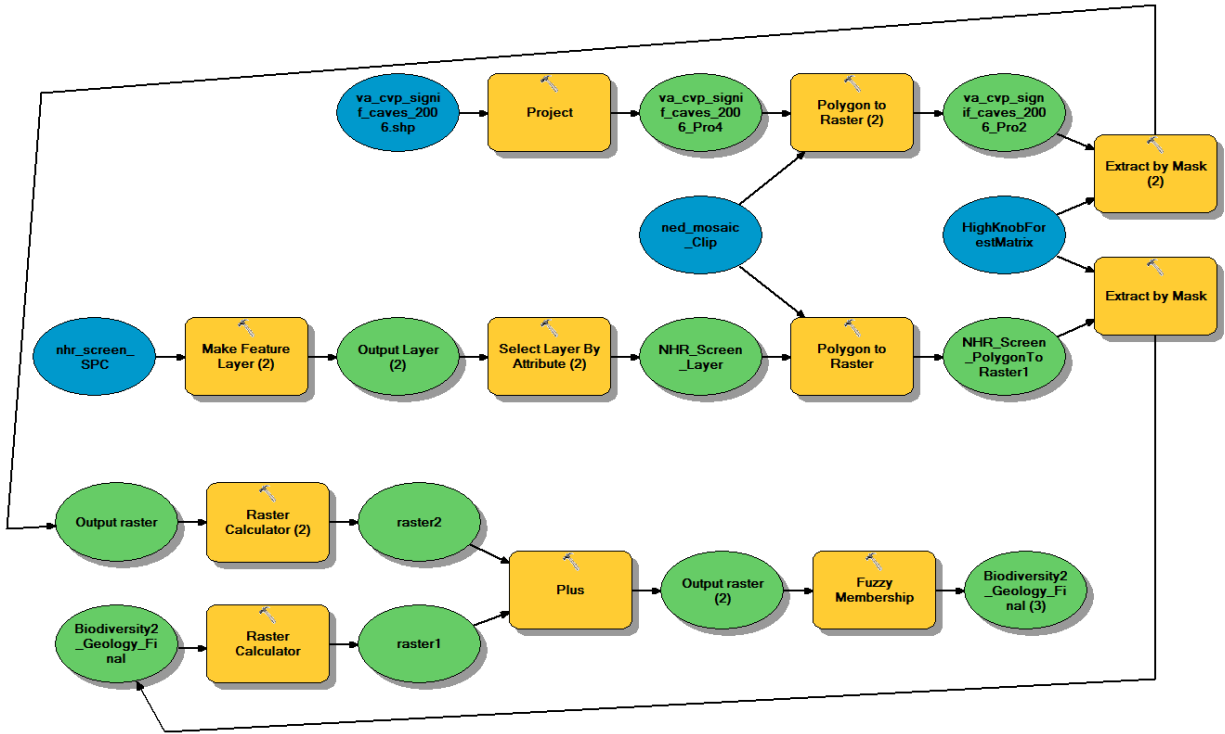


FIGURE 4.2 BIO2 MODEL: BIO-SIGNIFICANT CAVES AND KARST GEOLOGY

### ***Bio3: ELU Rarity***

The purpose of the model was to create a raster of ecological management unit (ELU) rarity within the High Knob Matrix, weighted by their frequency of occurrence at the (smaller-scale) Central Appalachian Integrated Landscape. Ecological Land Units are a composite of three abiotic measurements: elevation, bedrock geology, and topographic features, used to classify unique combinations across a landscape (Anderson, 2006). TNC uses ELUs as a proxy for ecological niche diversity. They seek to conserve the diversity of available niches in recognition that while the species that inhabit a niche may change over time, biodiversity protection is about preserving the range of opportunities (niches) for species to inhabit. An oft-repeated (though unattributed) summary of this strategy is to “Preserve the stage, not the actors.”

ELUs in the study area may be globally rare but locally abundant (and vice versa). Thus, calculating the frequency only within the study area may not correspond to the value of conserving a particular ELU. With this in mind, an ELU layer for the (larger) Central Appalachian Integrated Landscape (CAIL) was used as the scale at which frequency/rarity would be evaluated. These values were then extracted from the study area and scaled for standardization. Summary Statistics on the larger area yielded the total number of cells, which was then used as the denominator of the Calculate Field tool to produce a percentage of each ELU's frequency within the CAIL. The Lookup tool produced a new raster based on this value which was scaled for the CAIL, extracted to the study area, and scaled again for standardization using a linear monotonically increasing function.

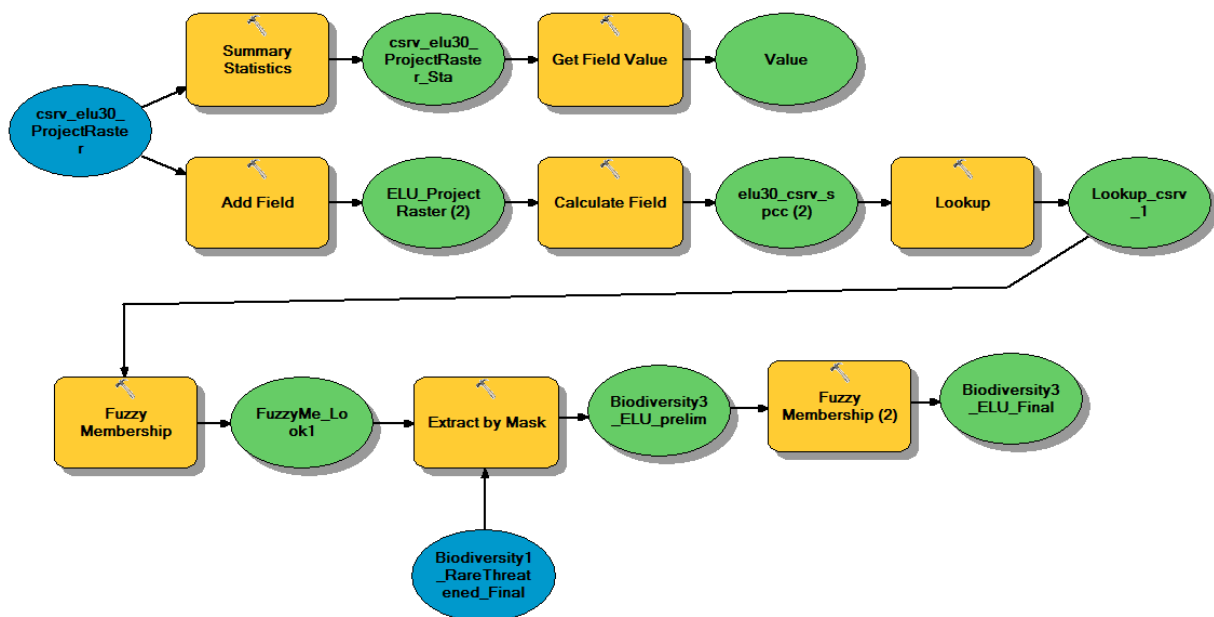


FIGURE 4.3 BIO3 MODEL: ECOLOGICAL LAND UNIT (ELU) RARITY

### ***Spatial1: Parcel Size***

The purpose of the model was to create a raster of cells containing values between 0 and 1 for membership based on the acreage of the corresponding parcel. Fuzzy values were based on a linear scale (skewed in display due to the large USFS parcels). Cells contained by parcels with more acreage are closer to 1. Smaller parcels will contain cells with values closer to 0.

The species-area relationship states that the greater the area, the more species there are likely to be. Since land protection takes place at the parcel level, this means that larger parcels contain more diversity of species and are therefore more worthy than smaller parcels of conservation. This “bigger is better” perspective is relatively easy to calculate and intuitive to understand and is often the extent of analysis for those seeking a simple and straightforward method for conservation prioritization.

Parcels from the multiple jurisdictions were merged and the composite polygon layer used to define zones. Zonal Geometry rasterized the vector polygons while extracting a value indicating the total area within each zone (parcel) and applied that to all cells with centroids falling within the zone. The result was extracted to the study area and scaled using a linear monotonically increasing function to standardize the data.

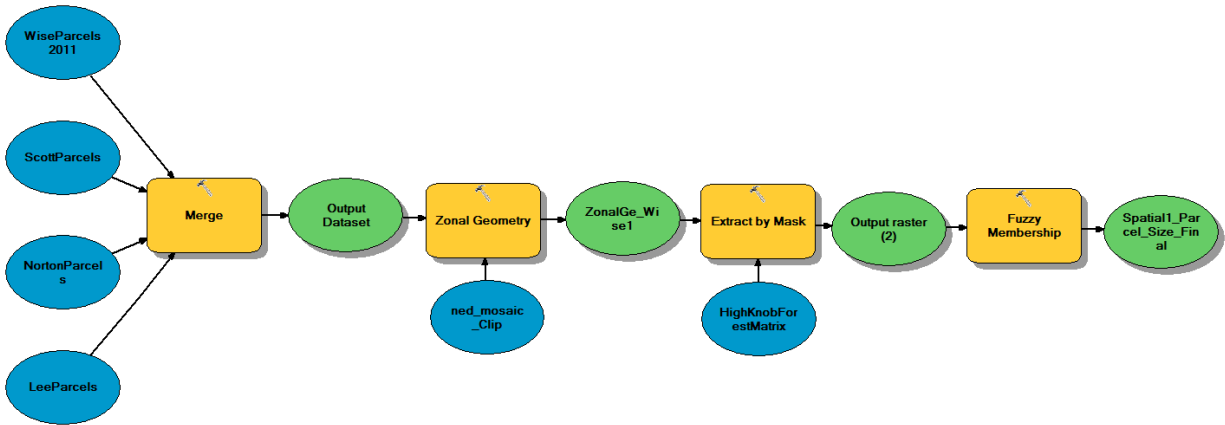


FIGURE 4.4 SPATIAL 1 MODEL: PARCEL SIZE

### ***Spatial2: Adjacent to Protected***

The purpose of the model was to create a raster of Boolean values (1,0) indicating whether the cell was contained by a parcel that is adjacent to protected land. Consistent with the species-area relationship (Drakare et al. 2006) and a conservation strategy based on parcel size (Virginia Outdoors Foundation 2009) is the concept of conservation of areas adjacent to already-protected lands. When even a small areas is added to an existing CAN, the conservation value of the whole increases. Certainly this is because of size but also because it increases the potential for wildlife corridors within the already protected zone and reaching beyond it to other protected zones nearby. With an increase in area of a protected zone, there is a corresponding decrease in the distance to other protected areas, increasing the possibility of eventual connection and corridor completion. Greater area and connectivity offers the potential for development of new populations, potentially increasing genetic diversity within a species.

Merged parcels were selected by location for their adjacency with merged protected lands. A second Select by Location refined the selection by removing those with centroids in the already-protected areas, thus limiting results to adjacent lands only, not including previously protected areas. The result was rasterized and reclassified using Boolean logic. The final raster shows all cells in parcels that are adjacent to (but not within) already protected zones.

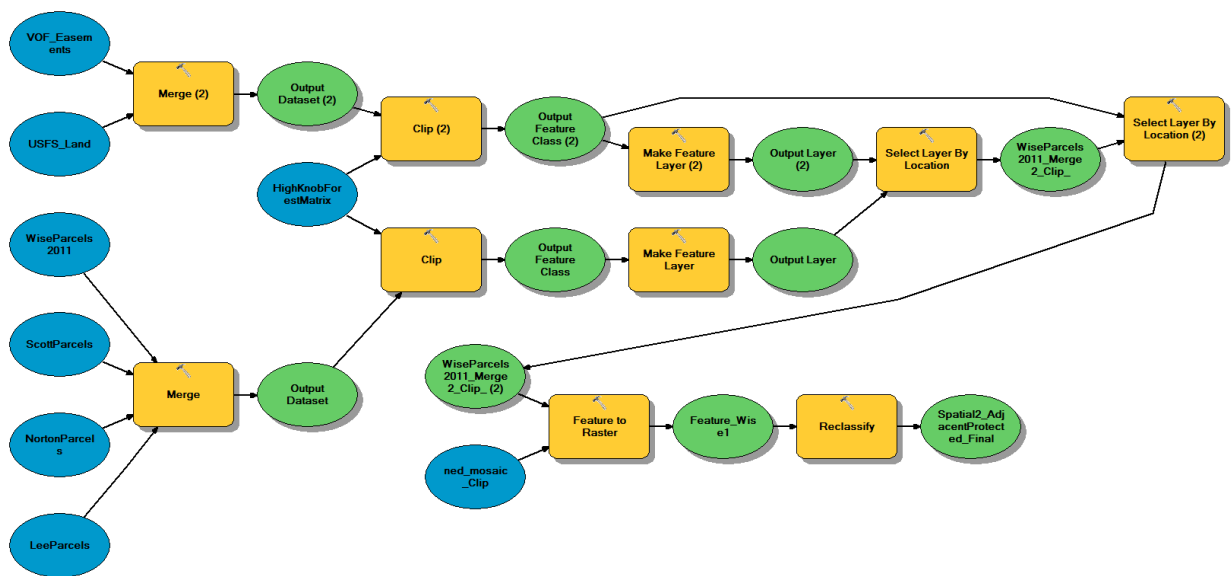


FIGURE 4.5 SPATIAL 2 MODEL: ADJACENT TO PROTECTED LAND

### ***Spatial3: Core Forest***

The purpose of the model was to create a raster of cells with forested land cover that are greater than 20m from the TNC High Knob Matrix boundary, oil/natural gas well pads, and roads. The 20m distance was provided by TNC staff based on edge effects for bird habitat. The interior of a forest is more ecologically intact and stable than areas bordering disturbances and fragmenting features. Edge effects like the thinning of tree canopy favor sun-tolerant plants that would not be encouraged to grow in the interior.

Even a small fragmenting feature, like a well pad has an effect on the surrounding forest and decreases the total amount of intact area needed to maintain an ecological balance among native biota.

The essential function in this model was “Extract by Mask” that took place just before the end. Forested land cover classes from NLCD were extracted by a raster mask constructed from buffers around the study area boundary, roads, and oil/gas well pads.



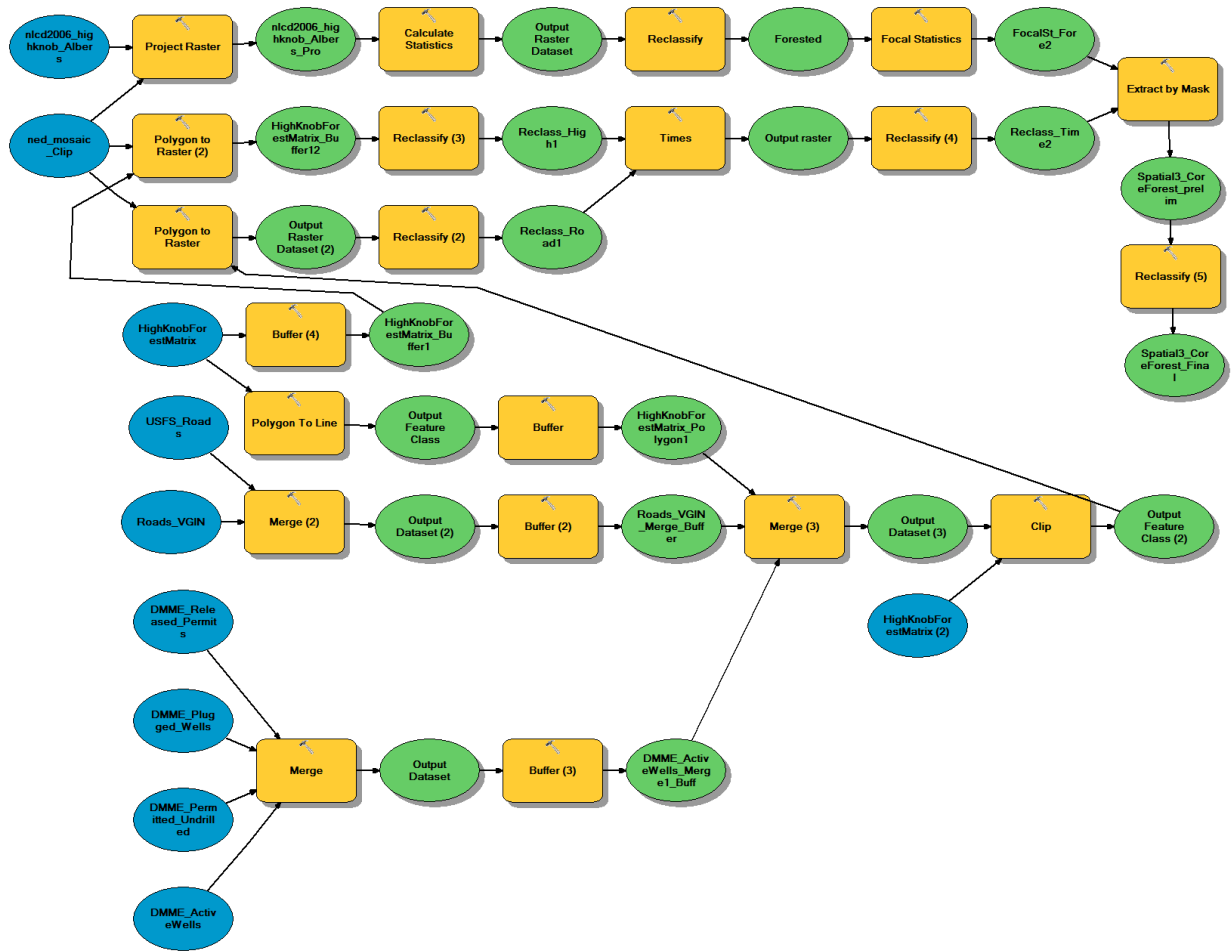


FIGURE 4.6 SPATIAL 3 MODEL: CORE FOREST

### *Spatial 4: Distance to Protected*

The purpose of the model was to create a raster containing values indicating the Euclidean distance to reach a cell with a protected status. The final result was calculated as a fuzzy membership between 0 and 1. The closer to 1, the shorter the distance required to reach a protected cell.

From a conservation perspective, the distance from one (unprotected) cell to an already-protected one is a measure of the potential for that unprotected cell to eventually connect to the larger conservation area network (CAN). Connectivity of one

new cell modestly increases the total protected habitat. However its more significant contribution is in offering a “stepping stone” from one patch to another, potentially increasing the connectivity of the total area available to a species by many magnitudes (Heller and Zavaleta 2009). Simple distance is not the only factor in the potential for establishing connectivity, nor is it the most important; that being placement. For example, an unprotected cell at a distance of 100 meters is more important than one 10 meters away because it also lies halfway between the primary patch and a secondary (unconnected) one. This is further complicated because as soon as the new cell is protected, it becomes its own patch and the potential of every other cell around it changes, necessitating a recalculation of the entire model with every newly protected zone. This complex interplay of distance and placement is difficult to model so simple distance is used as a proxy, recognizing its inherent limitation.

Protected lands were rasterized and delineated via reclassification. The “Euclidean Distance” function calculated, for each cell in the study area, the distance to the nearest protected cell. These distances were rescaled using a monotonically decreasing function (because the greater the distance, the less potential for connectivity exists). Those areas with a value of 1 represent already protected zones.

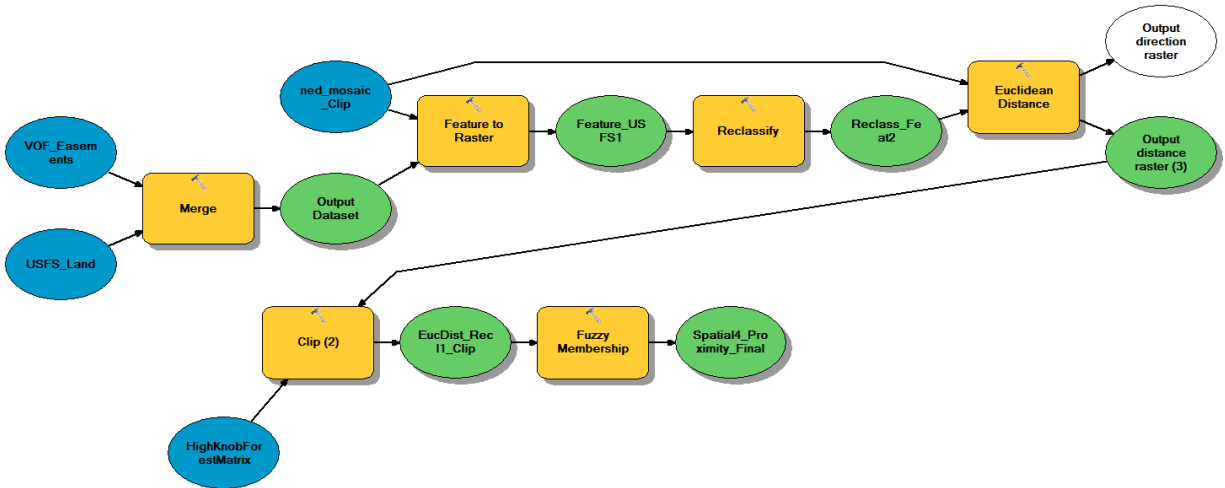


FIGURE 4.7 SPATIAL 4 MODEL: DISTANCE TO PROTECTED LAND

### ***Spatial 5: Special Biological Area***

The purpose of the model was to create a raster of cells designated by USFS as Special Biological Areas. USFS biologists and staff have particular knowledge about biologically important and sensitive areas within their zones of protection. The SBA designation has been established to prevent undue disturbance that could impair these areas. As a USFS designation, SBAs fall entirely inside already-protected areas and therefore have no impact upon private land protection targets outside the boundary. The inclusion of these areas in the study is for evaluation of USFS lands for management advocacy by TNC. Polygon features were rasterized and reclassified using Boolean logic to delineate those cells inside an SBA.

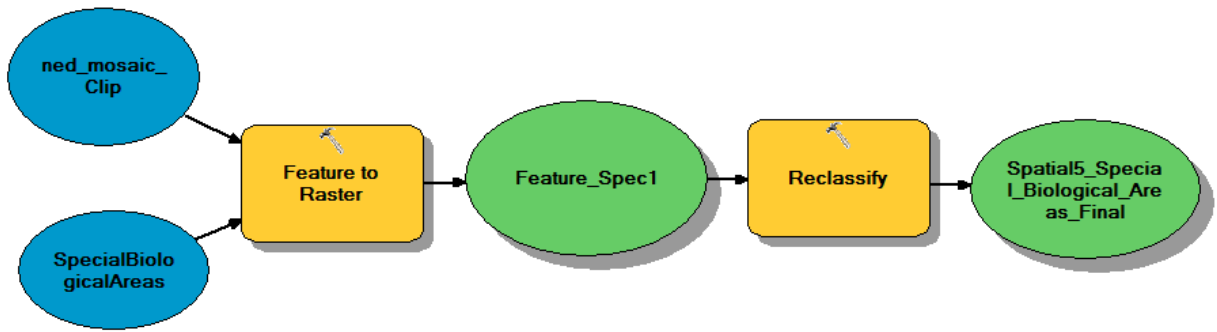


FIGURE 4.8 SPATIAL 5 MODEL: SPECIAL BIOLOGICAL AREAS

### ***Spatial 6: Fragmentation***

The purpose of the model was to create a raster image, showing areas of high fragmentation by roads and gas well sites. This model is similar in logic, though almost exactly the inverse of the Spatial3: Core Forest model. Fragmented areas represent opportunities for restoration and prevention of further loss of core forest integrity. Restoration programs exist for both public and private lands so there is some overlap with both the land protection and management advocacy objectives.

The National Land Cover Dataset of 2006 is the basis for the model. Using rasterized well sites and roads, the NLCD was updated to reclassify cells covering those areas using the “developed” category. This method reflects that NLCD, while the most accessible land cover dataset, is now six years old and new roads and well sites may not be represented. In addition to the temporal correction, it offered the opportunity to correct a cell value that, at 30m resolution, may not have previously picked up the presence of a road or well pad. Once updated, the entire land cover dataset was reclassified to delineate cover classes 40 and 90 as fragmenting. A window was then

passed to create new values based on neighborhood cells and rescaled using a linear monotonically increasing membership function for data standardization.

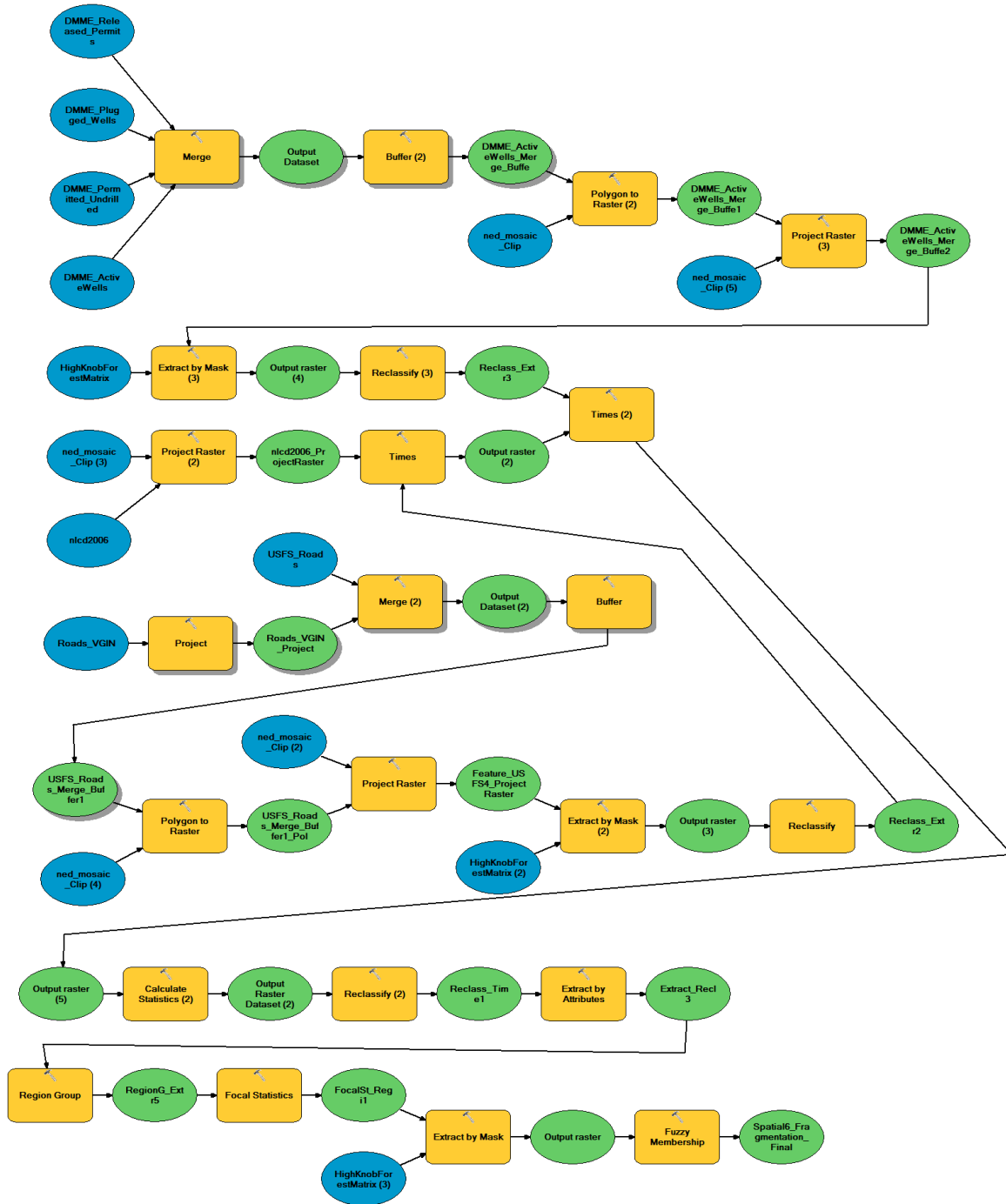


FIGURE 4.9 SPATIAL 6 MODEL: FRAGMENTATION

### ***Threat2b: Potential Development***

The purpose of this model was to create a raster of areas with a higher potential for commercial and residential development. Conversion of land to developed uses is rarely reversed; therefore haphazard development represents a major challenge to ecological integrity.

Originally, this model was conceived as two; commercial development potential (Threat1) and residential development potential (Threat2), each modeled separately. When it became obvious that the differences between the two were negligible, TNC advised that they be combined into a single layer, using a third model (Threat2b). The model selected parcels with average slope < 10%, adjacent to a class 1-4 road (VDOT).

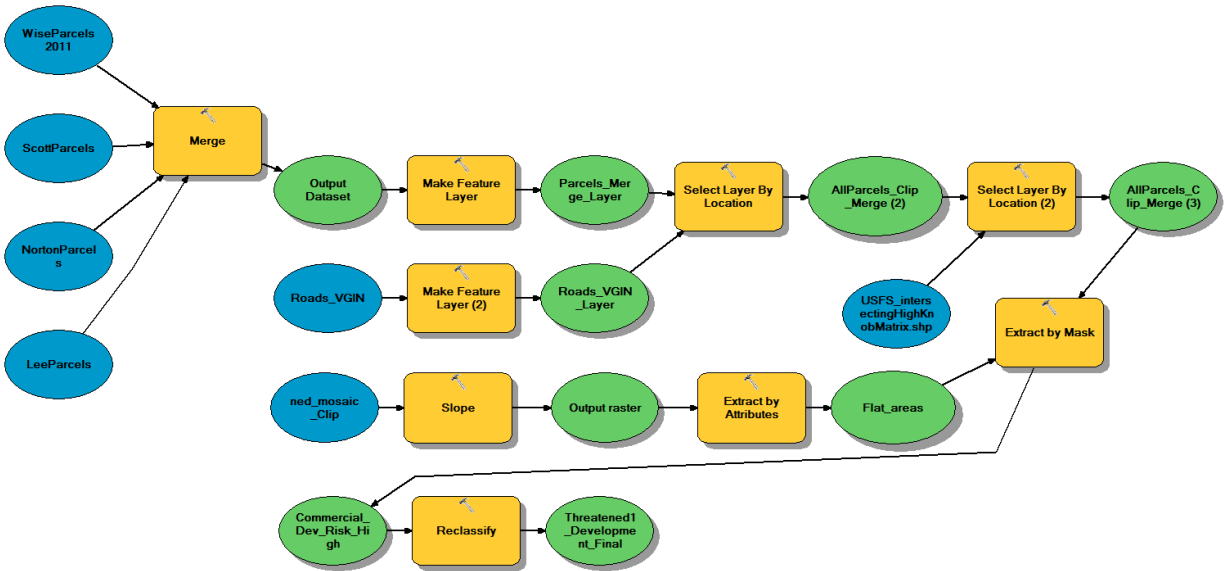


FIGURE 4.10 THREAT 2B MODEL: DEVELOPMENT POTENTIAL

### ***Threat 3: Conversion of Undeveloped Land***

The purpose of this model was to create a raster of cells with undeveloped land use classifications. Land uses not already converted for development are more likely

to be useful for a land protection strategy. When purchasing or easing land for conservation planners working at the parcel level must often spend resources on mixed (already partially developed) parcels, though they prefer to minimize this activity whenever possible. This layer, when aggregated by parcel, provides information about what portion of the parcel remains undeveloped.

Undeveloped land classes in the study area were delineated from NLCD using Reclassify and Extract by Mask tools.

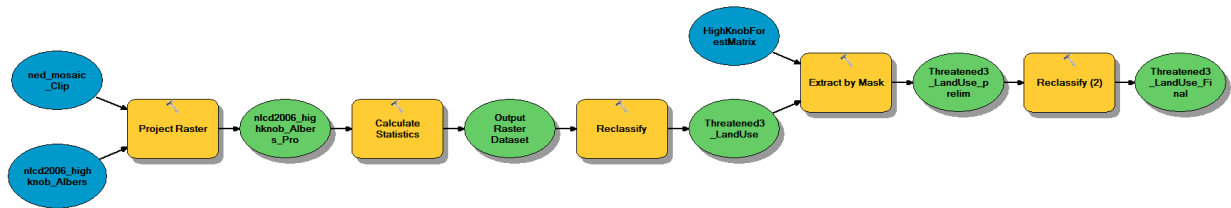


FIGURE 4.11 THREAT 3 MODEL: CONVERSION OF UNDEVELOPED LAND

### ***Threat4: Potential Small Scale Development***

The purpose of this model was to create a raster of cells within parcels having road access and intersecting USFS land and a ridgeline over 3000 feet. Ridgeline development of small scale housing like hunting cabins and trailers can be prolific, particularly on small parcels adjacent to public land. For a minimal cost, a residence or retreat can be purchased, often with a wonderful view of the mountains. Though small compared to larger developments in the valleys which are often adjacent to better roads, these residences cause fragmentation to the forest due to new driveways and building footprints. A cluster of such residences can effectively change the forest type from core forest to that resembling an edge.

Ridgelines were delineated using the Flow Accumulation tool, typically used for streams. Cells of zero accumulation were selected to represent a ridgeline from which water would drain below. The model delineates ridgeline cells above 914 meters (3000 feet), since higher elevations are typically selected for small scale development for the view they provide. Further limitation was made by requiring that qualifying cells be within a parcel that intersects a road, since even small scale development without road access is unlikely.

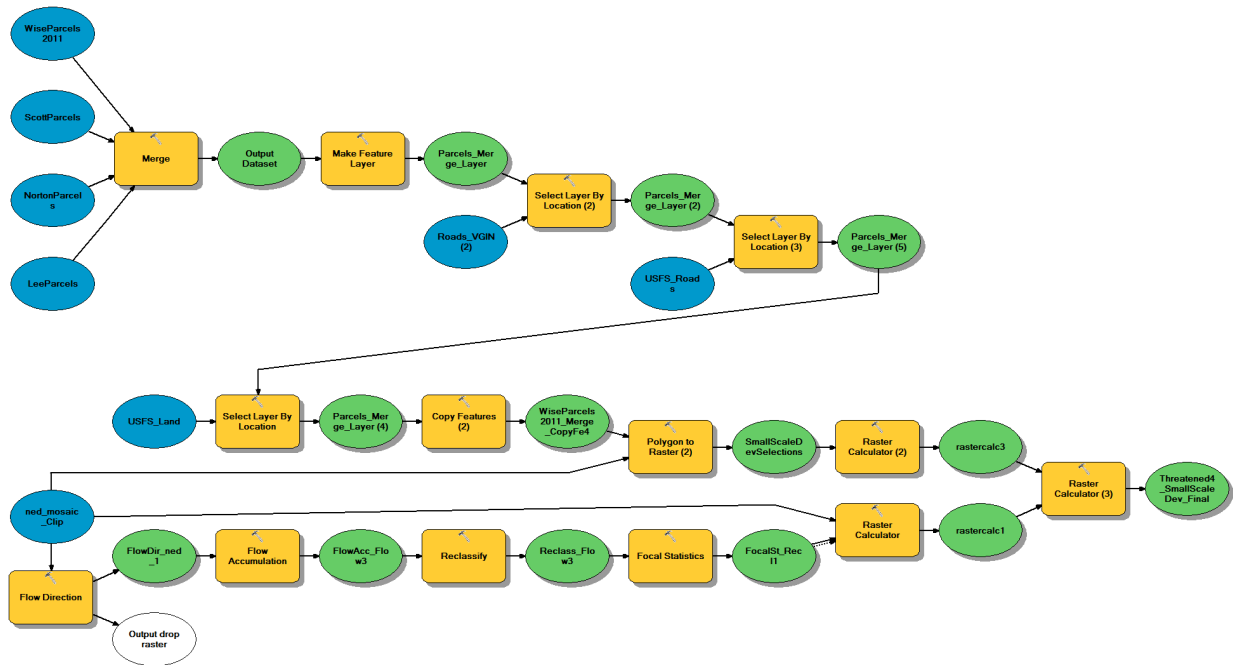


FIGURE 4.12 THREAT 4 MODEL: POTENTIAL SMALL SCALE DEVELOPMENT

### ***Threat5: Loss of Forested Riparian***

The purpose of this model was to create a raster of cells composed of forested land cover within 20m of a stream. TNC's conservation portfolio includes not just terrestrial plants and animals but aquatics as well. Protecting healthy stream habitat is a primary goal of the organization. Forests contribute to water quality by filtering



pollutants through the soil as well as contributing organic material for waterborne plants, on which aquatic life is dependent.

Streams were buffered 20m and the resulting polygon rasterized and multiplied by NLCD forested land cover types to produce an intersection of cells with both a stream and forested land cover.

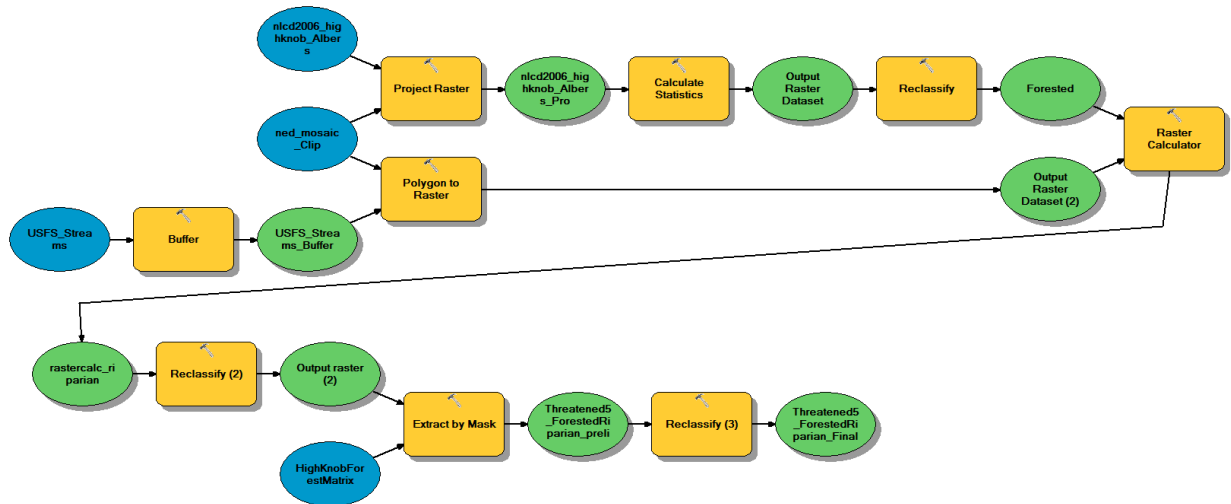


FIGURE 4.13 THREAT 5 MODEL: LOSS OF FORESTED RIPARIAN

### ***Water 1: Drains to Clinch River***

The purpose of this model was to create a raster of all cells that drain to the Clinch River. The Clinch River is home to several species of globally endangered freshwater mussels. These filter-feeders are very sensitive to pollutants. They are an important indicator species in the Clinch Valley Program’s ecological portfolio. Protecting the Clinch’s drainage basin from development is one way to minimize threats to these fragile bivalves that live outside the study area but within its influence.

A digital elevation raster from USGS was used to calculate flow direction and the resulting basins within the study area. The one draining south to the Clinch river was extracted.

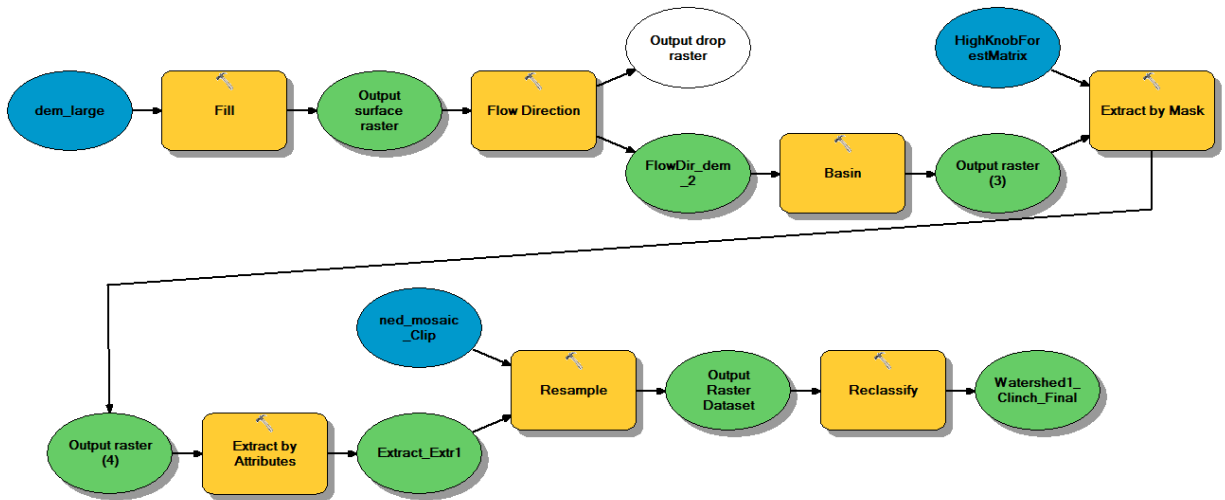


FIGURE 4.14 WATER 1 MODEL: DRAINS TO CLINCH RIVER

### ***Water2: Riparian Buffer***

The purpose of this model was to create a raster of all cells of buffered (15 foot) streams. This model is similar to the Threat5 model, though without the requirement that the land cover be forested. Instead, this shows the potential for riparian habitat where streams meet land. These transition zones between terrestrial and aquatic are often species-dense areas that provide habitat and nutrients to a number of amphibians and “wet-footed” plants.

A simple buffer of streams in the study area was rasterized.

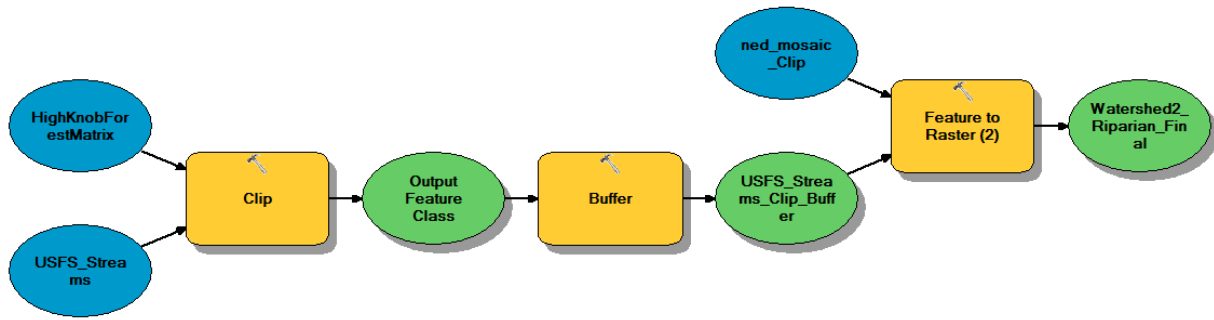


FIGURE 4.15 WATER 2 MODEL: RIPARIAN BUFFER

### ***Water3: Impaired Drainage***

The purpose of this model was to create a raster of cells that drain to EPA 303D listed streams. The Environmental Protection Agency (EPA) maintains a list of impaired waterways. Referred to by the legislative section of the Clean Water Act that empowers its collection, the 303D list is an important resource for establishing restoration priorities. Water in 303D-listed streams flows from within the study area, even when affected streams lie outside of the study area boundary. By identifying the drainages that supply those streams, efforts can be made to restore the quality of the water by protecting the land that first filters it from further impacts.

303D listed streams were selected by attributes from an EPA hydro layer and rasterized within the study area. Flow direction was calculated from a digital elevation raster as an input to the Watershed tool, which calculated the contributing area above a set of cells. Because the Watershed tool changed the output cell size, the result had to be resampled for data standardization and a successful subsequent overlay.

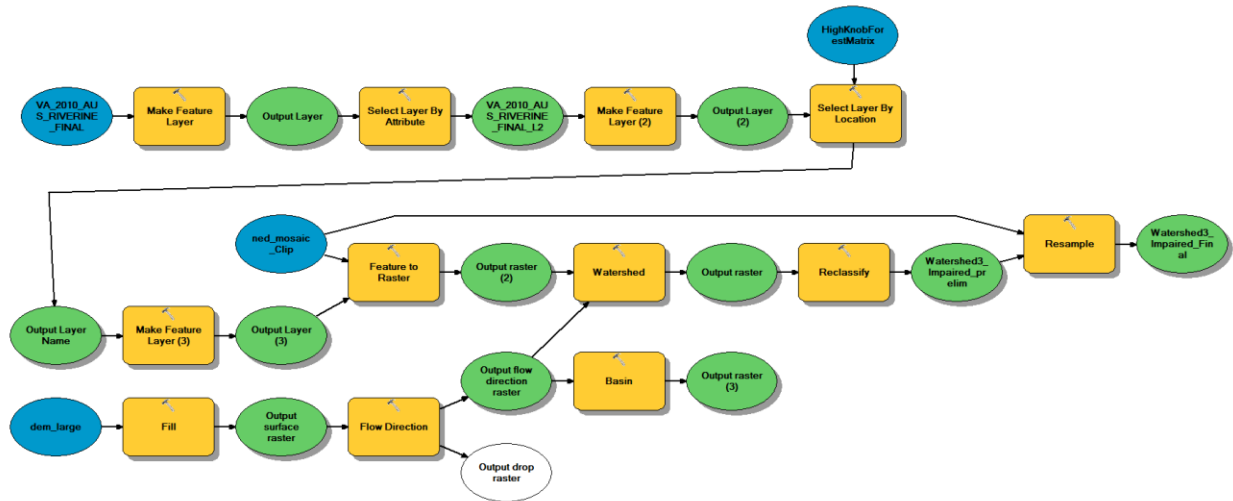


FIGURE 4.16 WATER 3 MODEL: DRAINS TO IMPAIRED WATERS

### Objective 3: Rank eligible parcels based on their overall conservation value

Objective 2 resulted in sixteen individual rasters. To facilitate decision making based on overall priority, the individual rasters were used as factors in a multi-criteria decision support process, resulting in a single output raster image that tells the conservationist where the highest concentrations of weighted priorities are located. This raster image was then aggregated by parcels and each parcel scored according to the average values of cells it contains. Finally, the parcels were ranked in ascending order of their conservation value and assigned a rank, with 1 designating the parcel with the highest conservation value. The final output was available both as a ranked list and a map of corresponding parcels, symbolized by their overall conservation value. These outputs are what the conservation organization will use to help implement their agenda for land protection in High Knob.

## **Pairwise Comparison and Eigenvector Calculation**

The conservation targets, identified in Table 4.1 and modeled in Objective 2, were each valued differently by TNC. Each therefore contributes unequally to the final ranking calculation, but to what degree must first be calculated. The framework for weighted evaluation of the factors was the Analytical Hierarchy Process (AHP), a commonly used technique in complex decision making to evaluate mathematically alternatives in conservation and land use planning (Saaty 1990, Duke 2002, Moffett et al. 2005, Moffett and Sarkar 2006).

Criteria weighting was accomplished by surveying each of the five TNC CVP employees using a pairwise comparison, administered on paper. The pairwise comparison tool simplifies the weighting process by comparing each factor to one other in sequence (Saaty 1988, Barzilai 1997). Survey respondents rated how much less (or more) important one factor is than another on a nine point scale. Each respondent was free to include only those factors from the potential sixteen that they believed should contribute to a land protection strategy. Any they chose to cross out were weighted as zero.

	Bio1	Bio2	Bio3	Spatial1	Spatial2	Spatial3	Spatial4	Spatial5	Spatial6	Threat1	Threat2	Threat3	Threat4	Threat5	Water1	Water2	Water3
RareSpecies	Bio1	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Karst/Caves	Bio2	1/3	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x
ELURarity	Bio3	3	5	1	x	x	x	x	x	x	x	x	x	x	x	x	x
ParcelSize	Spatial1	1/5	1/3	1/5	1	x	x	x	x	x	x	x	x	x	x	x	x
AdjacentProtected	Spatial2	1/3	1/5	1/5	3	1	x	x	x	x	x	x	x	x	x	x	x
CoreForest	Spatial3	1/3	1	1	5	1	x	x	x	x	x	x	x	x	x	x	x
ProximityProtected	Spatial4	1/3	1/5	1/3	1	1/3	1/3	1	x	x	x	x	x	x	x	x	x
SpecialBioArea	Spatial5							1	x	x	x	x	x	x	x	x	x
HighlyFragmented	Spatial6	1/3	1/3	1/3	1	1/3	1/7	1	1	x	x	x	x	x	x	x	x
PotentialCommercial	Threat1									1	x	x	x	x	x	x	x
PotentialResidential	Threat2	1/5	1/7	1/7	1/3	1/3	1/5	1	1	1	x	x	x	x	x	x	x
Undeveloped	Threat3										1	x	x	x	x	x	x
PotentialSmallScaleD	Threat4	1/5	1/5	1/7	1/3	1/3	1/3	1/3	3	3		1	x	x	x	x	x
ForestedRiparian	Threat5	1/3	1/3	1/3	3	3	1	3	5	5		3	1	x	x	x	x
ClinchDrainage	Water1	1/3	1/3	1/3	3	3	1	3	3	7		3	3		1	x	x
RiparianBuffer	Water2	1/3	1/3	1/5	1/3	1	1/5	3	3	3		5	1	3		1	x
ImpairedDrainage	Water3																1

Pairwise Comparison 9 Point Continuous Rating Scale

1/9	1/7	1/5	1/3	1	3	5	7	9
extremely	very strongly	strongly	moderately	equally	moderately	strongly	very strongly	extremely
← Less Important								More Important →

FIGURE 4.17 EXAMPLE OF PAIRWISE TOOL USED TO EVALUATE RELATIVE PREFERENCES BETWEEN FACTORS.

Results from each survey were then entered into IDRISI Taiga's WEIGHT module for calculation of eigenvectors.

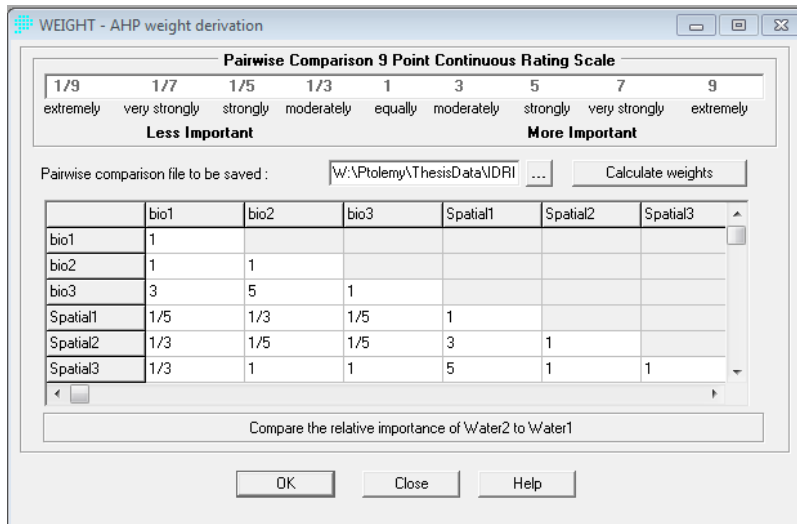


FIGURE 4.18 IDRISI'S WEIGHT MODULE WAS USED TO COMPUTE EIGENVECTORS

IDRISI's WEIGHT module compares the matrix of input values and computes an eigenvector of weights, all totaling to 1. The eigenvector of each factor represents its relative contribution to the final raster image. The pairwise comparisons collected from the five TNC CVP employees were used to calculate eigenvectors of weight (Table 4.2).

TABLE 4.2 EIGENVECTORS OF WEIGHT BY TNC EMPLOYEE

	Employee 1	Employee 2	Employee 3	Employee 4	Employee 5
<b>Bio1</b>	0.1165	0.2485	0.1614	0.138	0.1554
<b>Bio2</b>	0.0894	0.1117	0.1228	0.1297	0.081
<b>Bio3</b>	0.2337	0.1459	0.2041	0.2065	0.2477
<b>Spatial1</b>	0.0333	0.0445	0.0542	0.0403	0.0587
<b>Spatial2</b>	0.0489	0.1266	0.0524	0.0536	0.06
<b>Spatial3</b>	0.0893	0.0408	0.0481	0.1097	0.1798
<b>Spatial4</b>	0.0315	0.0748	0.0534	0.0304	0
<b>Spatial5</b>	0	0	0	0	0
<b>Spatial6</b>	0.0247	0.009	0.0122	0.25	0.0403
<b>Threat1</b>	0	0	0	0	0
<b>Threat2</b>	0	0	0	0	0
<b>Threat2b</b>	0.0139	0.13	0.0188	0.0172	0.0254
<b>Threat3</b>	0	0	0	0	0
<b>Threat4</b>	0.0216	0.023	0.0394	0.0252	0
<b>Threat5</b>	0.0984	0.0944	0.0828	0.0781	0.0873
<b>Water1</b>	0.0691	0.0214	0.0853	0.083	0.0643
<b>Water2</b>	0.1298	0.0237	0.0466	0.0633	0
<b>Water3</b>	0	0.0226	0.0185	0	0
<b>Total Factors</b>	13	14	14	13	10

Individuals chose to weight between ten and fourteen of the available sixteen factors. Not all factors were designed for a land protection objective, so it is not surprising that some were not utilized. This process honors individual preferences, based on differing conservation philosophy and confidence in model output. From these individual weights, an organizational profile was developed based on the mean of all individual weights (Table 4.3).

TABLE 4.3 SUMMARY OF TNC CVP EMPLOYEE FACTOR WEIGHTS

	TNC CVP Mean	TNC CVP Median	TNC CVP Standard Deviation
<b>Bio1</b>	0.16396	0.1554	0.04506265
<b>Bio2</b>	0.10692	0.1117	0.018829488
<b>Bio3</b>	0.20758	0.2065	0.034955881
<b>Spatial1</b>	0.0462	0.0445	0.0092126
<b>Spatial2</b>	0.0683	0.0536	0.029370189
<b>Spatial3</b>	0.09354	0.0893	0.050132249
<b>Spatial4</b>	0.03802	0.0315	0.025041597
<b>Spatial5</b>	0	0	0
<b>Spatial6</b>	0.06724	0.0247	0.092041221
<b>Threat1</b>	0	0	0
<b>Threat2</b>	0	0	0
<b>Threat2b</b>	0.04106	0.0188	0.044627418
<b>Threat3</b>	0	0	0
<b>Threat4</b>	0.02184	0.023	0.012633543
<b>Threat5</b>	0.0882	0.0873	0.007408914
<b>Water1</b>	0.06462	0.0691	0.023037483
<b>Water2</b>	0.05268	0.0466	0.044073275
<b>Water3</b>	0.00822	0	0.010150547
<b>Total Factors</b>	14	14	14

### Weighted Linear Combination

Weighted Linear Combination (WLC) is the process of producing an output raster based on the values in each cell, having been first weighted by its eigenvector value. A custom Raster Calculator statement was developed (see Appendix F) to achieve this calculation while handling errors presented by the possibility of NoData values in the input rasters. In simplified form, it was (Factor1 \* Weight1) + (Factor 2 \* Weight2) + (Factor 3 \* Weight3)...

ESRI's ArcToolbox also contains a tool called Weighted Sum in the Spatial Analyst toolbox that will combine rasters by relative weights. However, the inclusion of



any No Data values produces errors. A custom expression in Raster Calculator accomplished the weighted linear combination while also providing for error handling of No Data values.

WLC produced a single raster showing the distribution of weighted priority across the study area. Order weighted averaging, a technique designed to control tradeoff among factors, was not employed and all factors were allowed to fully trade off with one another. Full factor trade-off represents a midpoint on the spectrum between risky and risk averse in the context of making a bad decision.

### **Aggregation by Parcel**

The raster produced by WLC is useful in showing the distribution of priorities across the landscape on a cell by cell basis. However it is inadequate for purposes of planning conservation easements or land purchases as it is based on 28.8 x 28.8 foot cells and not on the unit of real estate and legal transactions, the parcel. To transform the results to something appreciable by conservation organizations, the cell values must be aggregated by parcel polygons. A custom model was produced in order to aggregate by parcels.

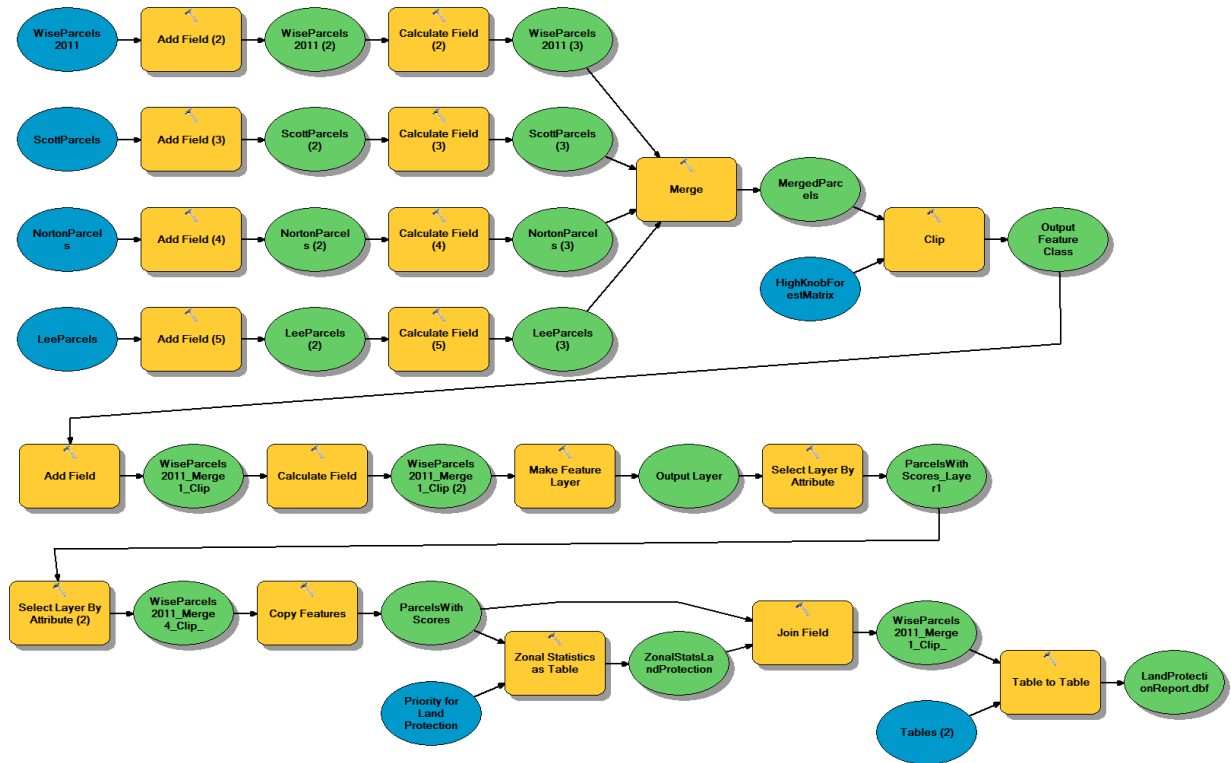


FIGURE 4.19 AGGREGATION BY PARCELS MODEL

Parcels from the four municipalities were combined, clipped to the study area, and a unique ID assigned. Select By Attributes was used to remove parcels owned by USFS, since only private parcels are eligible for the land protection objectives of purchase or easement. Finally, Zonal Statistics as Table was used to calculate summary values, including the mean, of all cells within each parcel polygon. A Table to Table export was used to create a file suitable for opening in Excel for the convenience of comparing sorted lists, based on differing summary statistics. The mean of all cell values within a parcel polygon was used to sort the parcels in order of priority, regardless of size. Once sorted, a new field was created in the attribute table which was used to record ranks assigned in ascending order (e.g. the parcel with the highest average was ranked as 1, the second highest as 2, etc).

#### **Objective 4: Compare the ranking produced by MCDS to ranking by size**

Objective 3 produced rankings of parcels based on TNC's conservation targets (values). An additional ranking was assigned by re-sorting the parcels in descending order of size. Once re-sorted, a new field was created in the attribute table which was used to record ranks assigned in ascending order (e.g. the largest parcel was ranked as 1, the second largest as 2, etc).

Using JMP statistical software, I calculated Spearman's rho, a nonparametric statistic used to indicate the correlation between ranked (ordinal) variables. It describes the strength of association between two variables using a monotonic function where  $x$  and  $y$  are the first and second rank, and  $i$  = tied rankings (Myers and Arnold 2003).

$$\rho = \frac{\sum_i(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i(x_i - \bar{x})^2 \sum_i(y_i - \bar{y})^2}}$$

Finally, I calculated the absolute value of the difference between the two rankings ( $|\text{Rank1}-\text{Rank2}|$ ) to show how much the two methods agreed and disagreed for each individual parcel. These absolute value differences were used to create a map showing where in the study area the two methods tended to converge and diverge.

## Chapter 5 Results

### Objective 1

Sixty-one survey responses were received over twenty-six days, at which point the online survey was closed for further responses. Respondents represented a variety of organization types, but the majority were from land trusts.

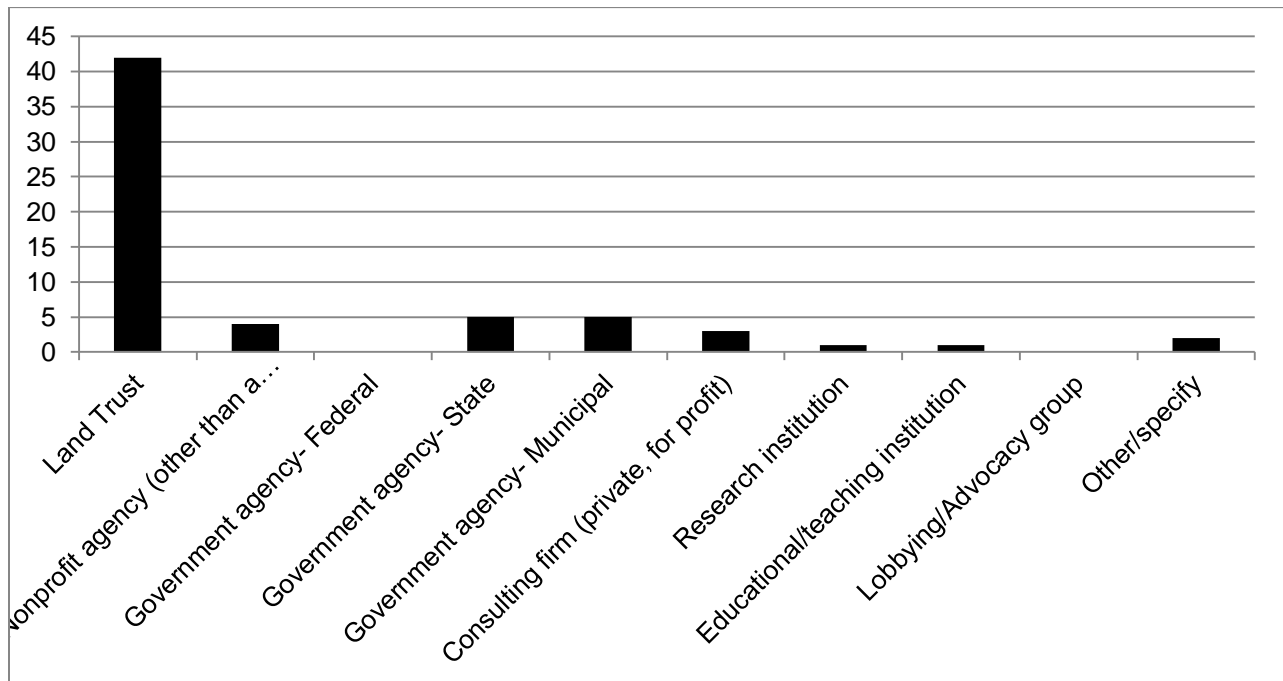


FIGURE 5.1 SURVEY QUESTION #1: MY ORGANIZATION IS A...

Over ¼ of the survey respondents self-identified as GIS specialists.

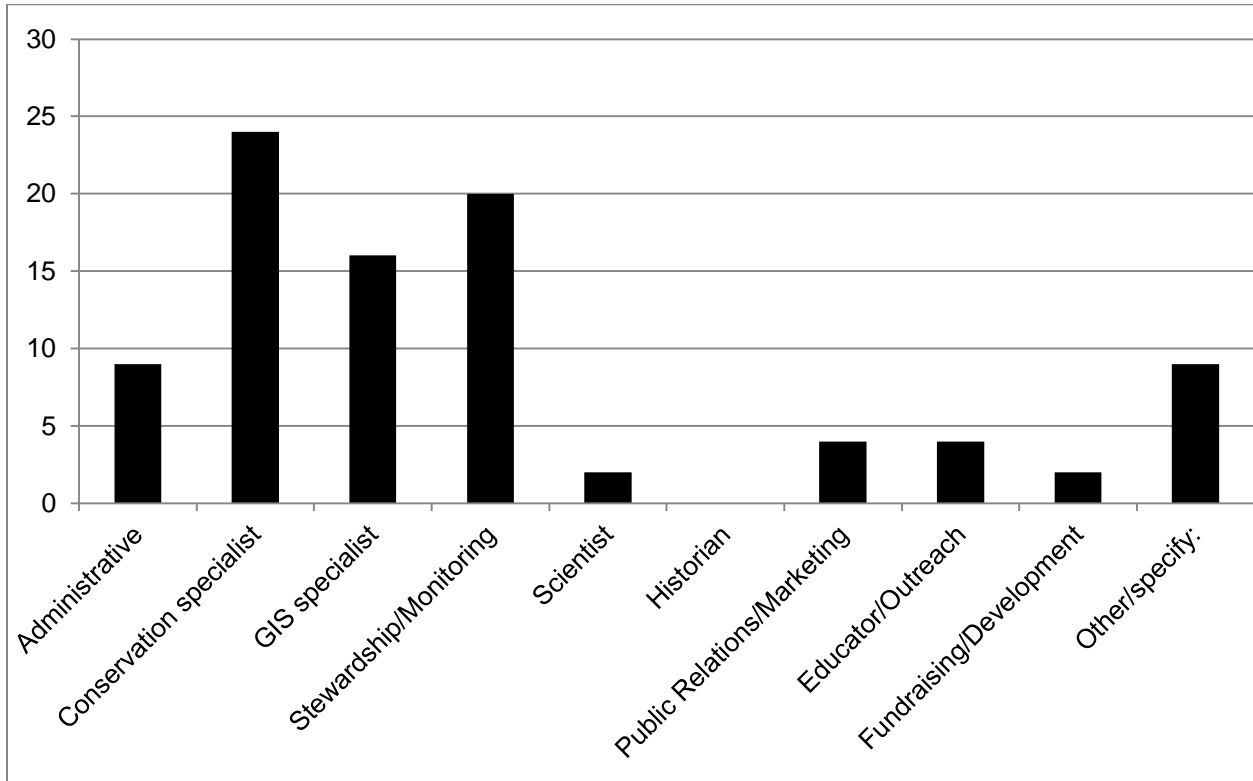
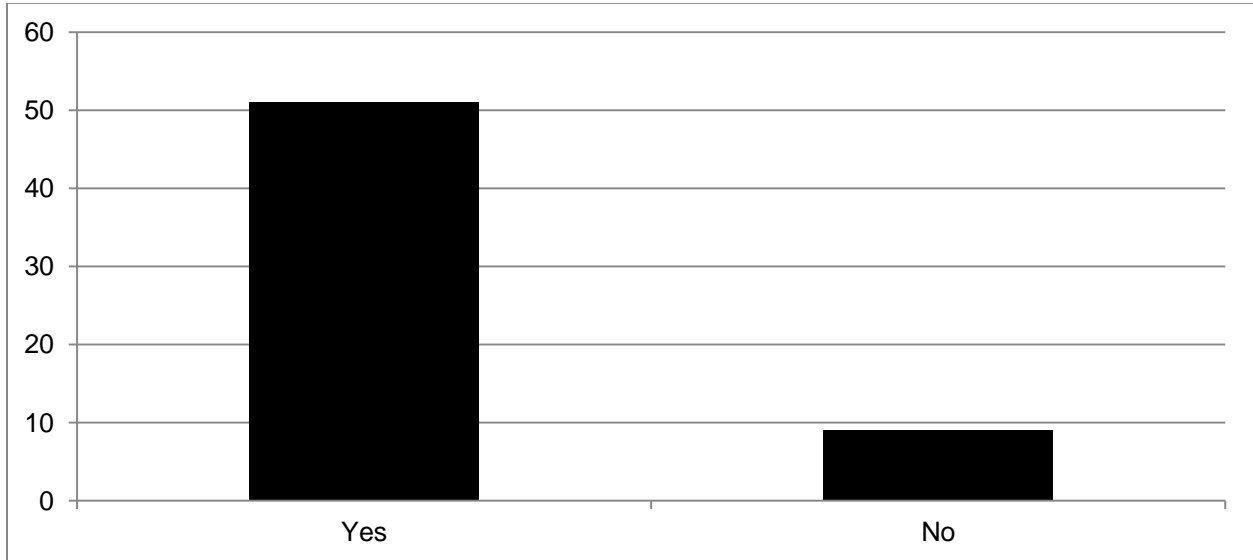


FIGURE 5.2 SURVEY QUESTION #2: MY PRIMARY ROLE IN MY ORGANIZATION IS...

Over 85% of respondents acknowledged a personal use of GIS, despite their primary role.



**FIGURE 5.3 SURVEY QUESTION #3: DO YOU PERSONALLY USE GIS IN YOUR ROLE WITH THE ORGANIZATION?**

Respondents indicated that GIS analyses for their conservation organization are predominantly carried out by employees.

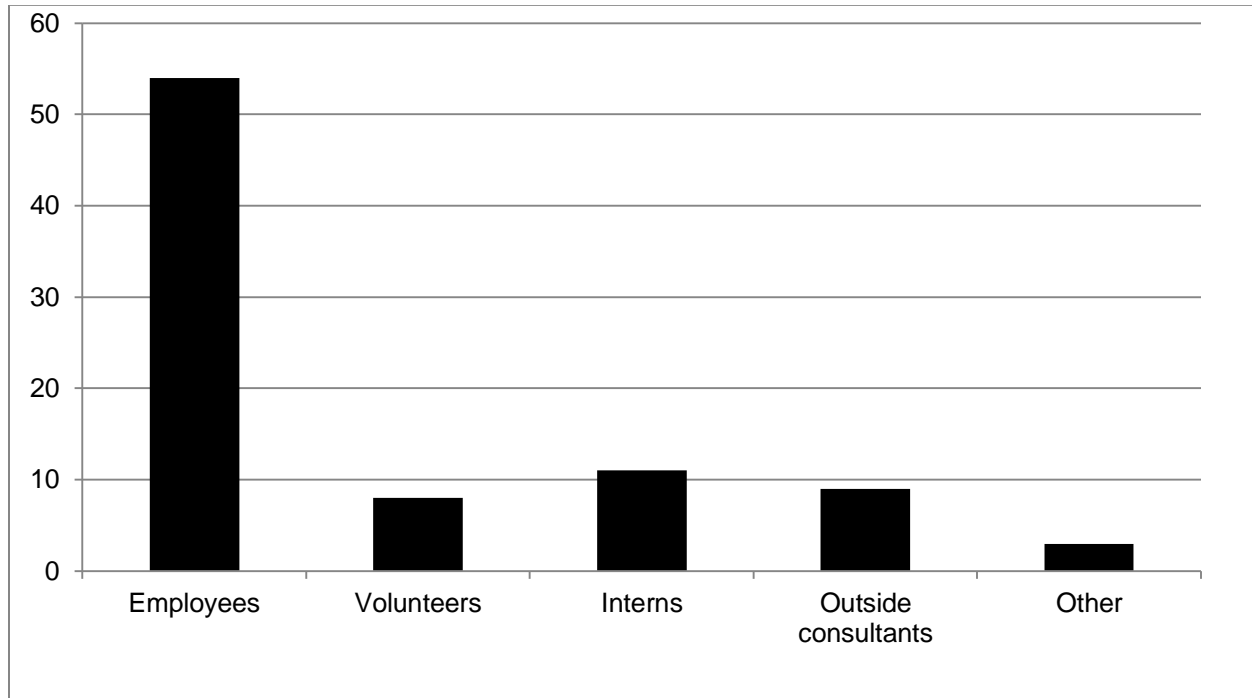
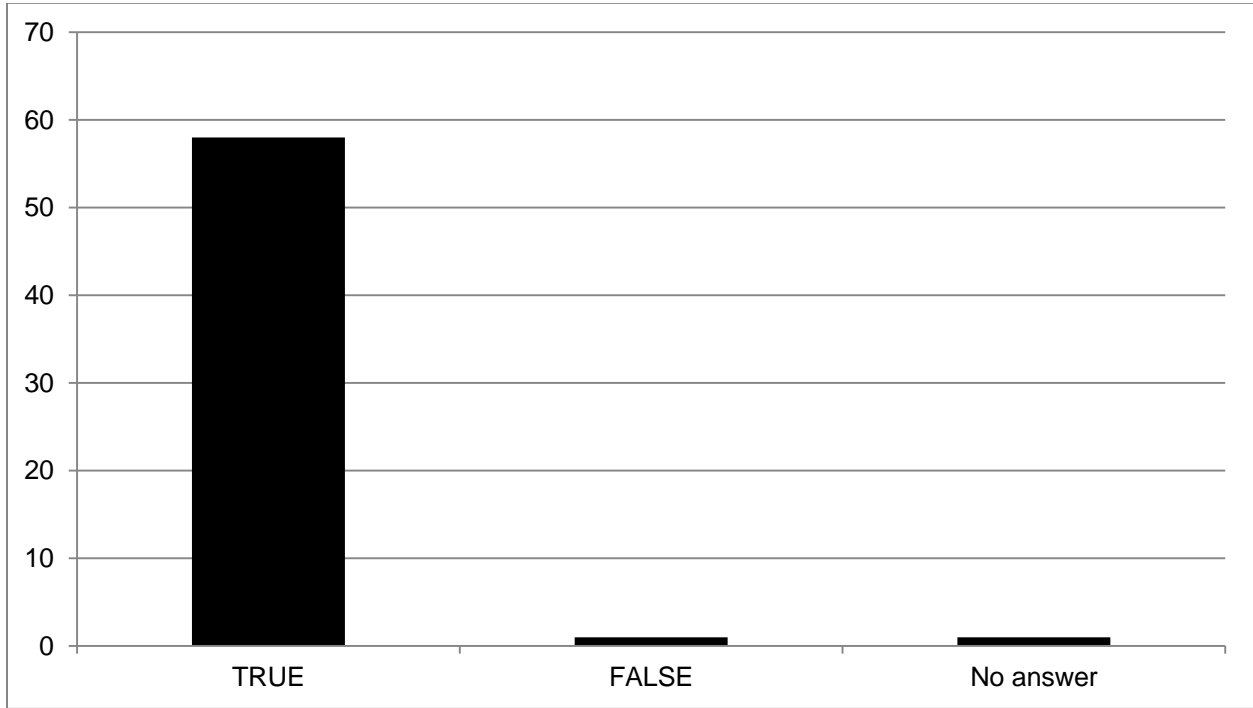


FIGURE 5.4 SURVEY QUESTION #4: GIS ANALYSES FOR MY ORGANIZATION IS PERFORMED BY...

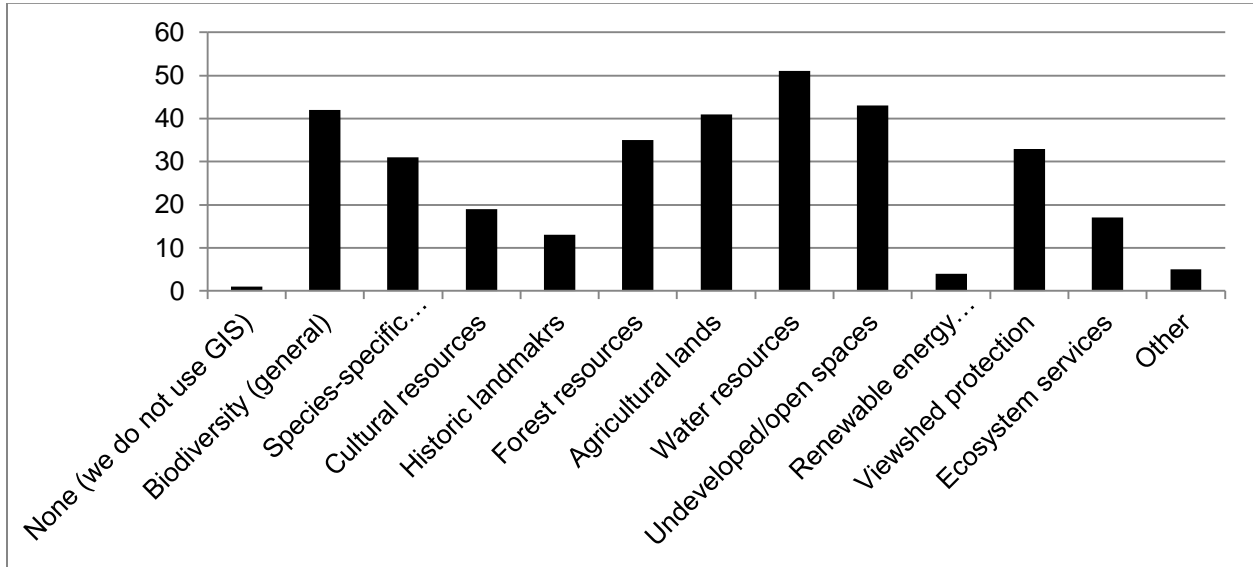
Nearly all agreed with the statement, "I consider GIS a valuable tool for fulfilling my organization's goals."



**FIGURE 5.5 SURVEY QUESTION #5: I CONSIDER GIS TO BE A VITAL TOOL FOR FULFILLING MY ORGANIZATION'S GOALS.**

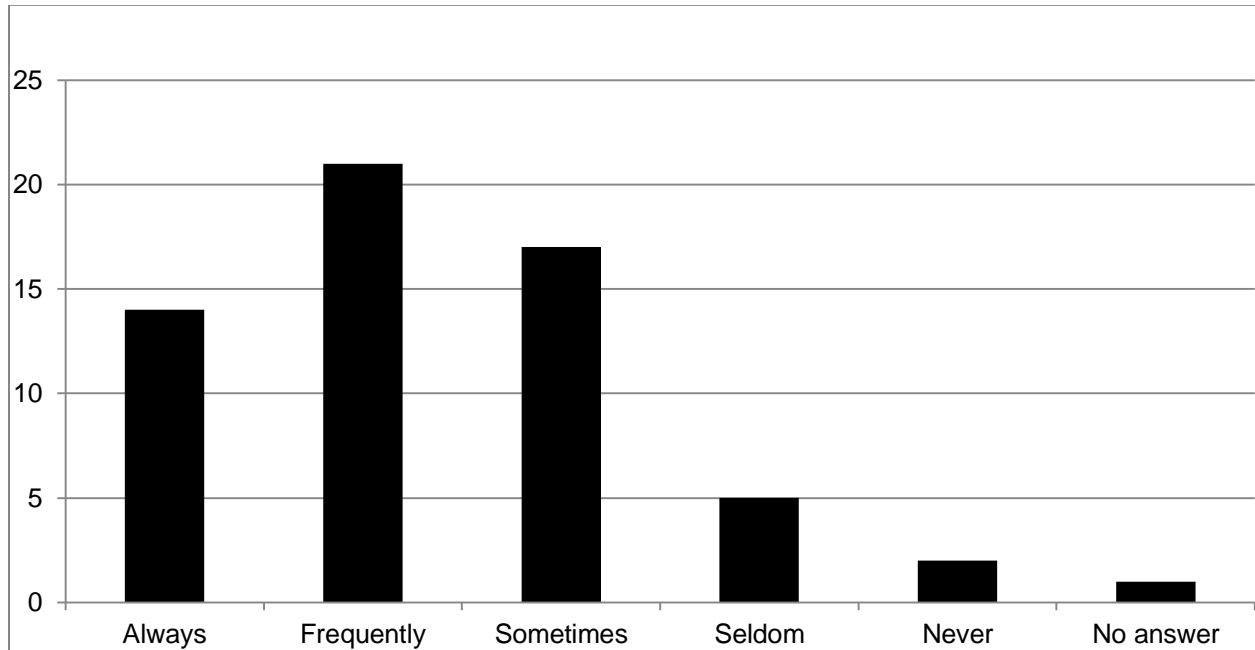


GIS is used to practice strategic conservation of a number of different resources, including cultural/historical as well as biological and landscapes.



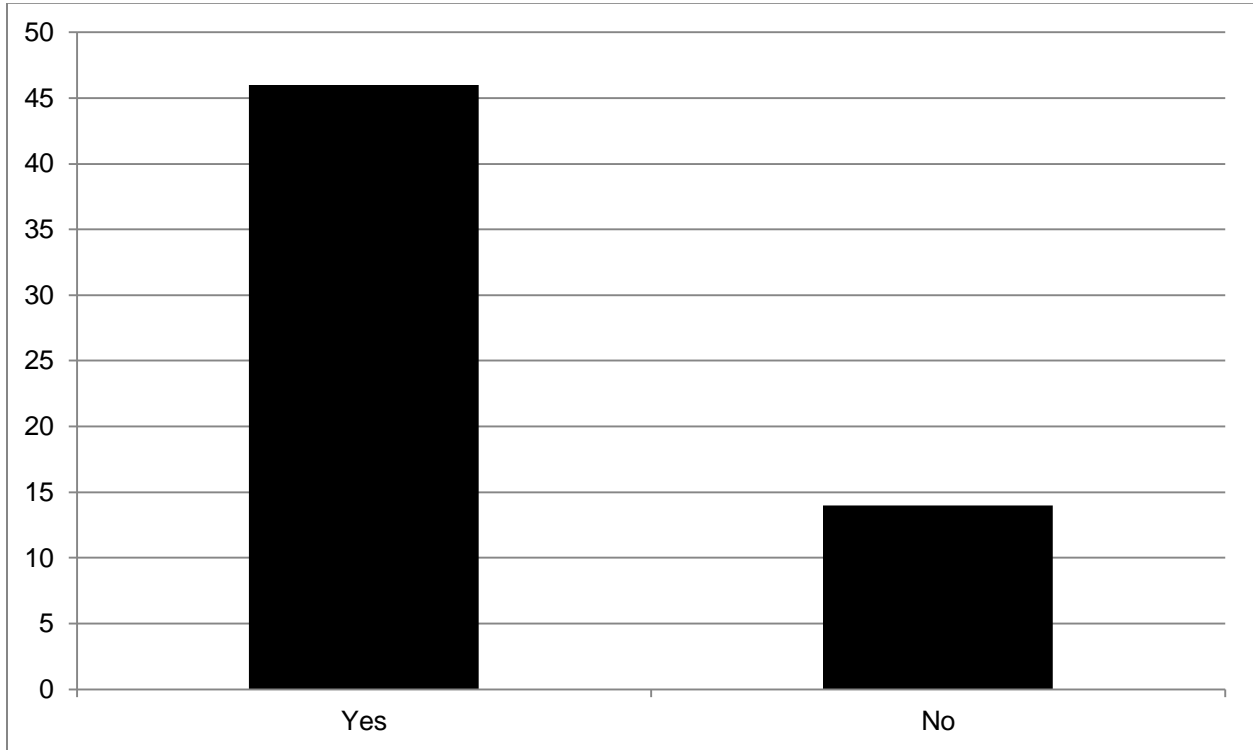
**FIGURE 5.6 SURVEY QUESTION #6: MY ORGANIZATION USES GIS TO PRACTICE STRATEGIC CONSERVATION IN ORDER TO PROTECT THE FOLLOWING RESOURCES:**

Organizational decision making about strategic conservation incorporates GIS analysis by nearly all organizations.



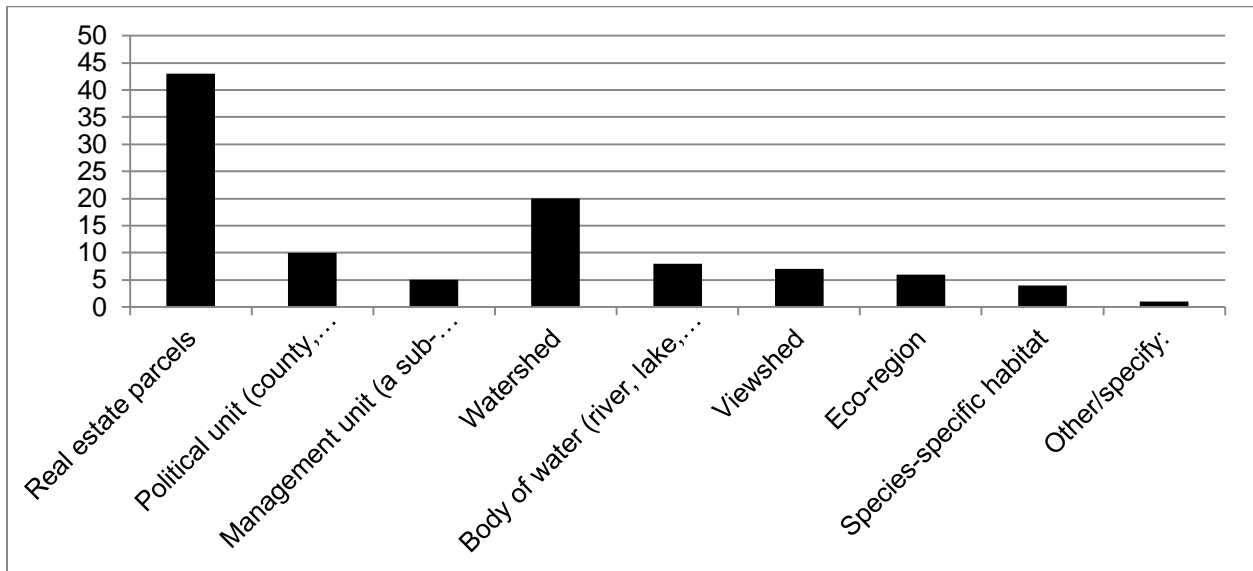
**FIGURE 5.7 SURVEY QUESTION #7: MY ORGANIZATION BASES DECISIONS ABOUT CONSERVATION STRATEGY ON GIS ANALYSIS:**

GIS was reportedly used as a ranking tool of parcels and other zones by 75% of respondents.



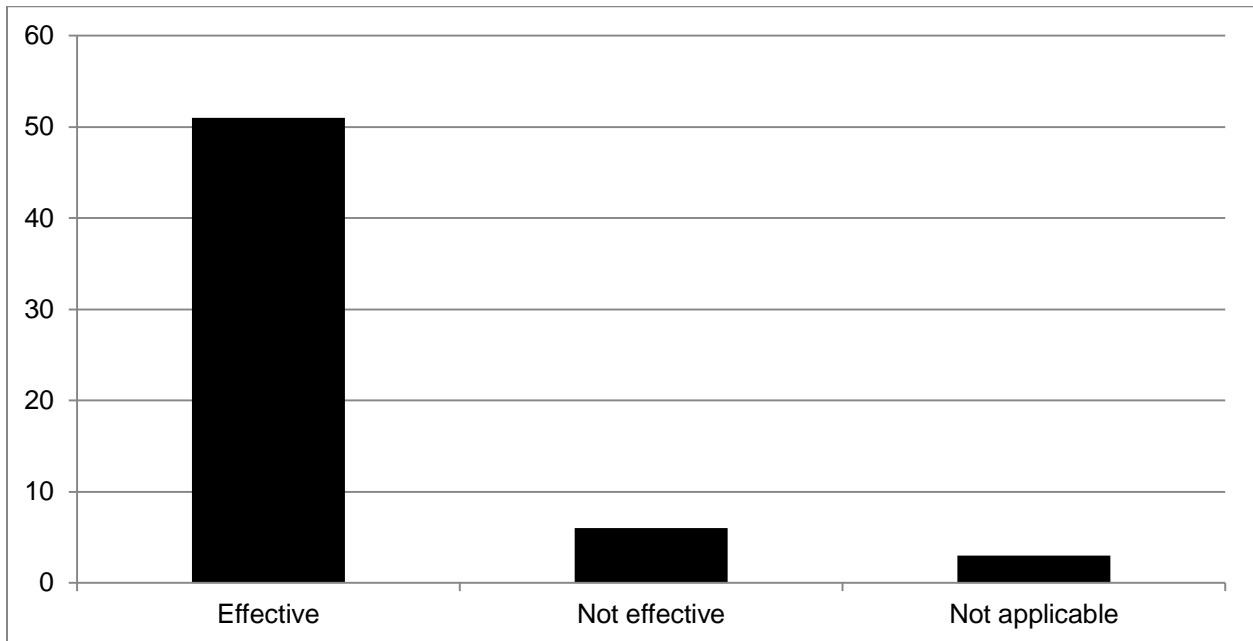
**FIGURE 5.8 SURVEY QUESTION #8: DOES YOUR ORGANIZATION USE GIS SPECIFICALLY TO TARGET OR RANK INDIVIDUAL PARCELS, AREAS, OR ZONES FOR STRATEGIC CONSERVATION ACTION?**

The operational unit of prioritization is most frequently the real estate parcel.



**FIGURE 5.9 SURVEY QUESTION #9: WHAT BEST REPRESENTS THE OPERATIONAL UNIT OR GEOGRAPHIC SCALE MOST OFTEN TARGETED FOR STRATEGIC CONSERVATION ACTION BY YOUR ORGANIZATION?**

Most respondents characterized their organization's use of GIS as effective.



**FIGURE 5.10 SURVEY QUESTION #10: WOULD YOU CHARACTERIZE YOUR ORGANIZATION'S IMPLEMENTATION OF GIS TO MEET STRATEGIC CONSERVATION GOALS AS:**

Time, money, expertise, and data were the major barriers identified to using GIS for strategic conservation.

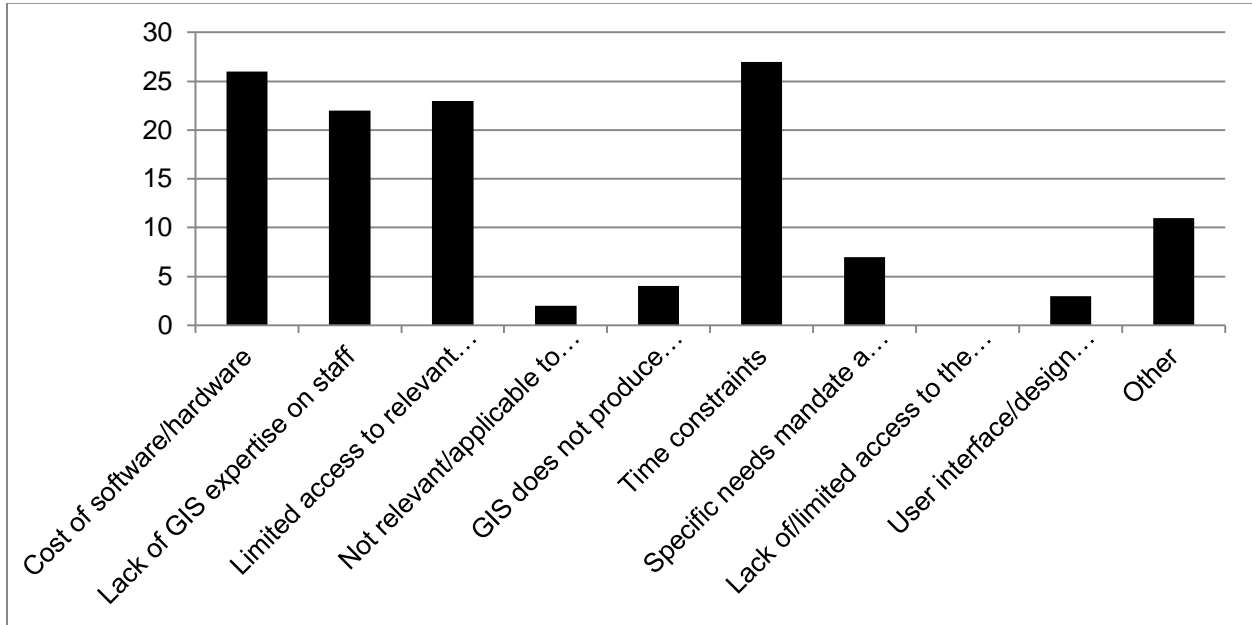


FIGURE 5.11 SURVEY QUESTION #11: WHAT ARE THE BARRIERS YOUR ORGANIZATION FACES IN PURSUING GIS-BASED STRATEGIC CONSERVATION?

## **Objective 2**

The results of objective 2 were sixteen raster images, each showing the distribution of an individual conservation target across the study area. Each has a range of values no greater than 1 and no less than zero. The higher the value, the more that target is deemed to be present. Boolean values of zero and 1 indicate delineation between absolute presence and absence while fuzzy values between zero and 1 indicated a gradient of increasing presence.

Bio1: Rare and Threatened Species

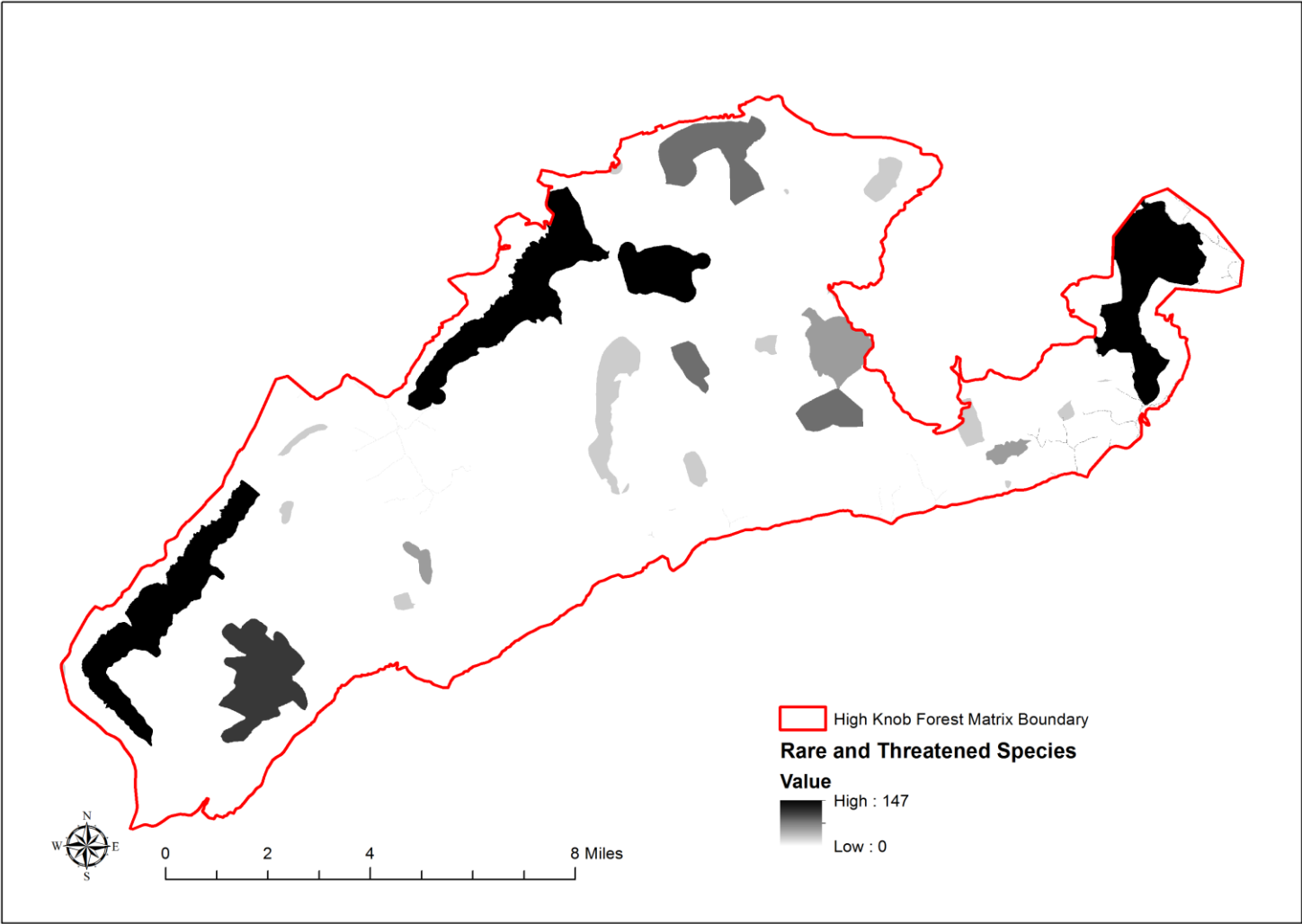


FIGURE 5.12 RASTER IMAGE OUTPUT FROM MODEL BIO1



Bio2: Karst and Caves

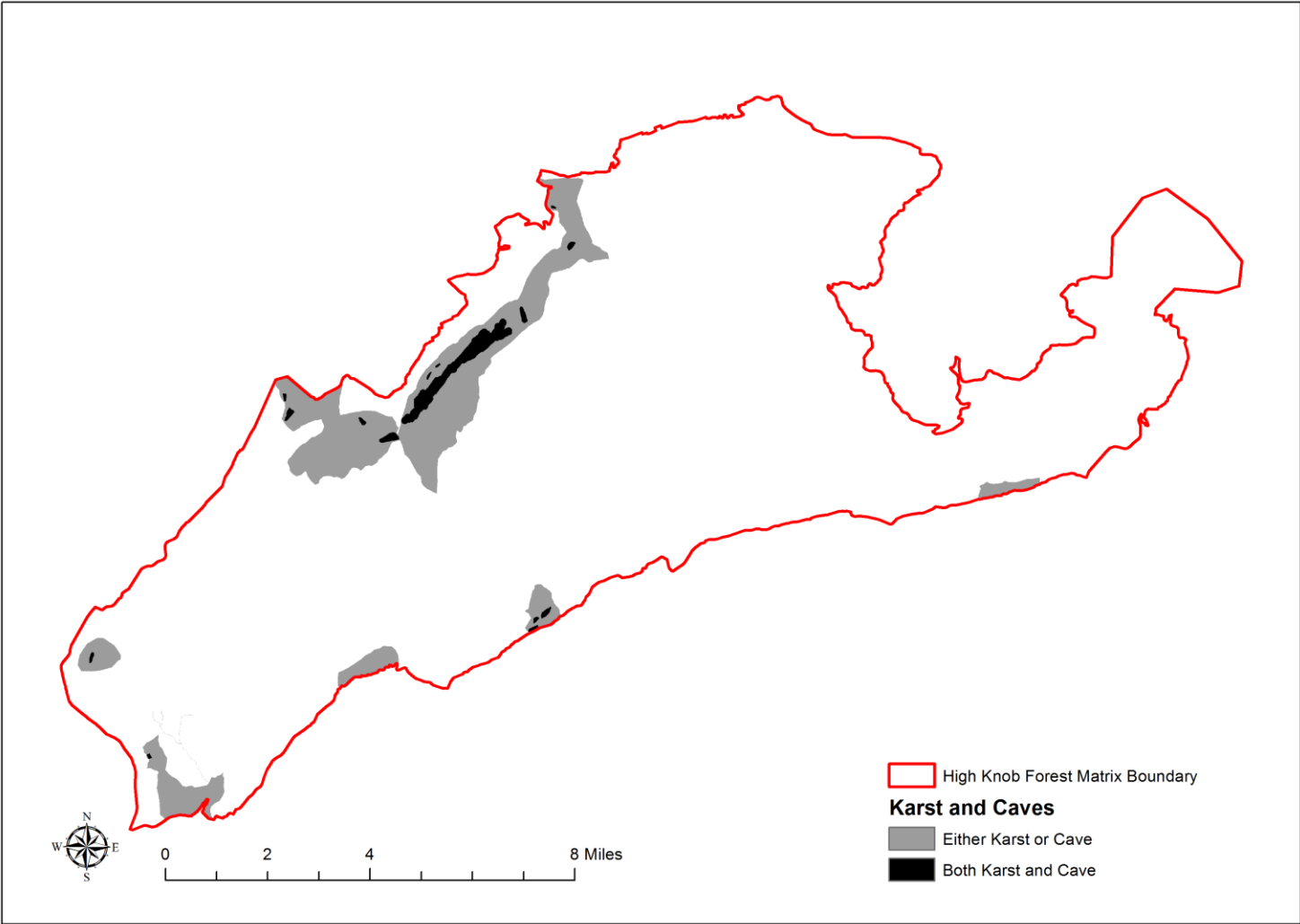


FIGURE 5.13 RASTER IMAGE OUTPUT FROM MODEL BIO 2.

Bio3: Ecological Land Unit Rarity

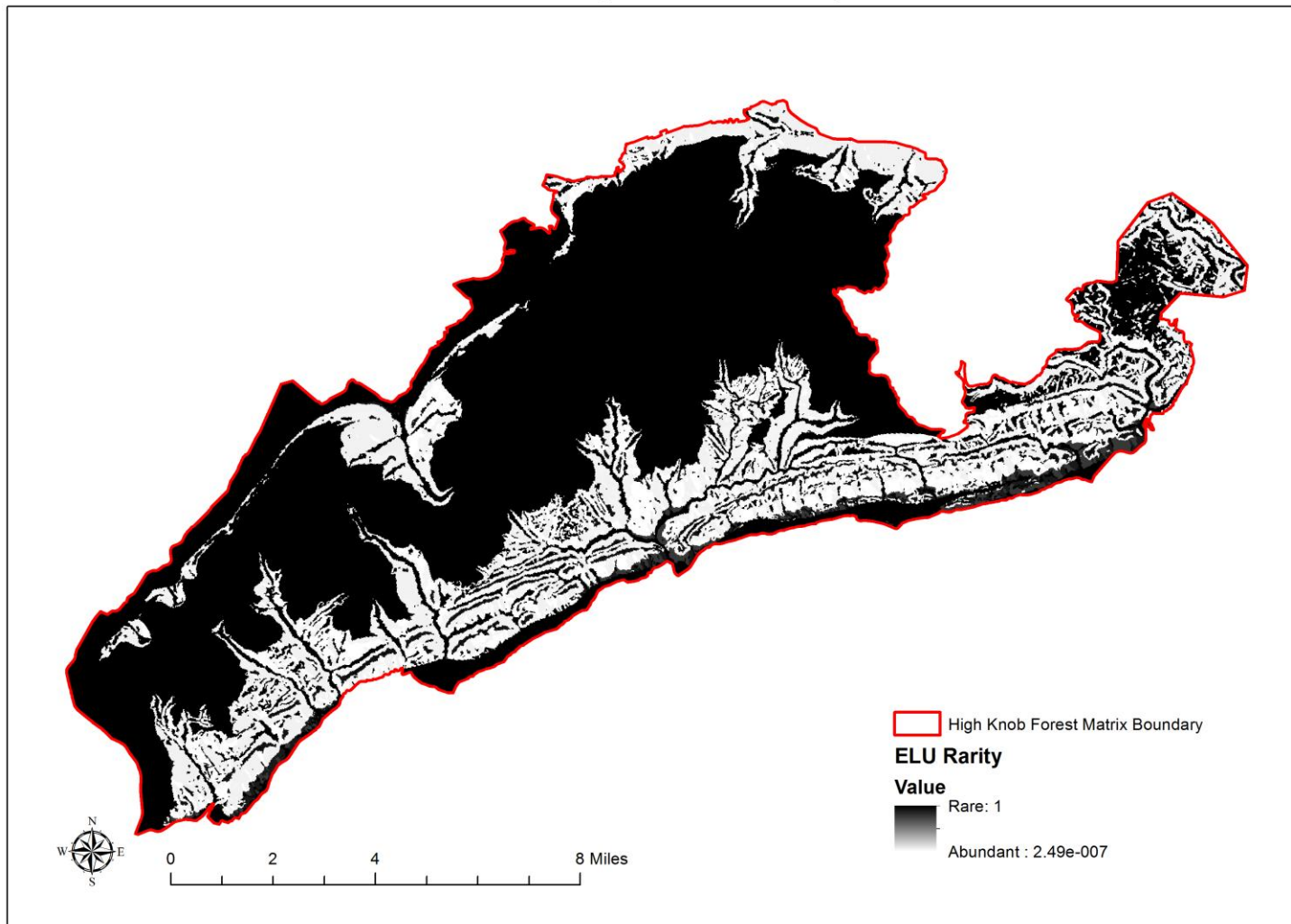


FIGURE 5.14 RASTER IMAGE OUTPUT FROM MODEL BIO 3.

Spatial 1: Parcel Size

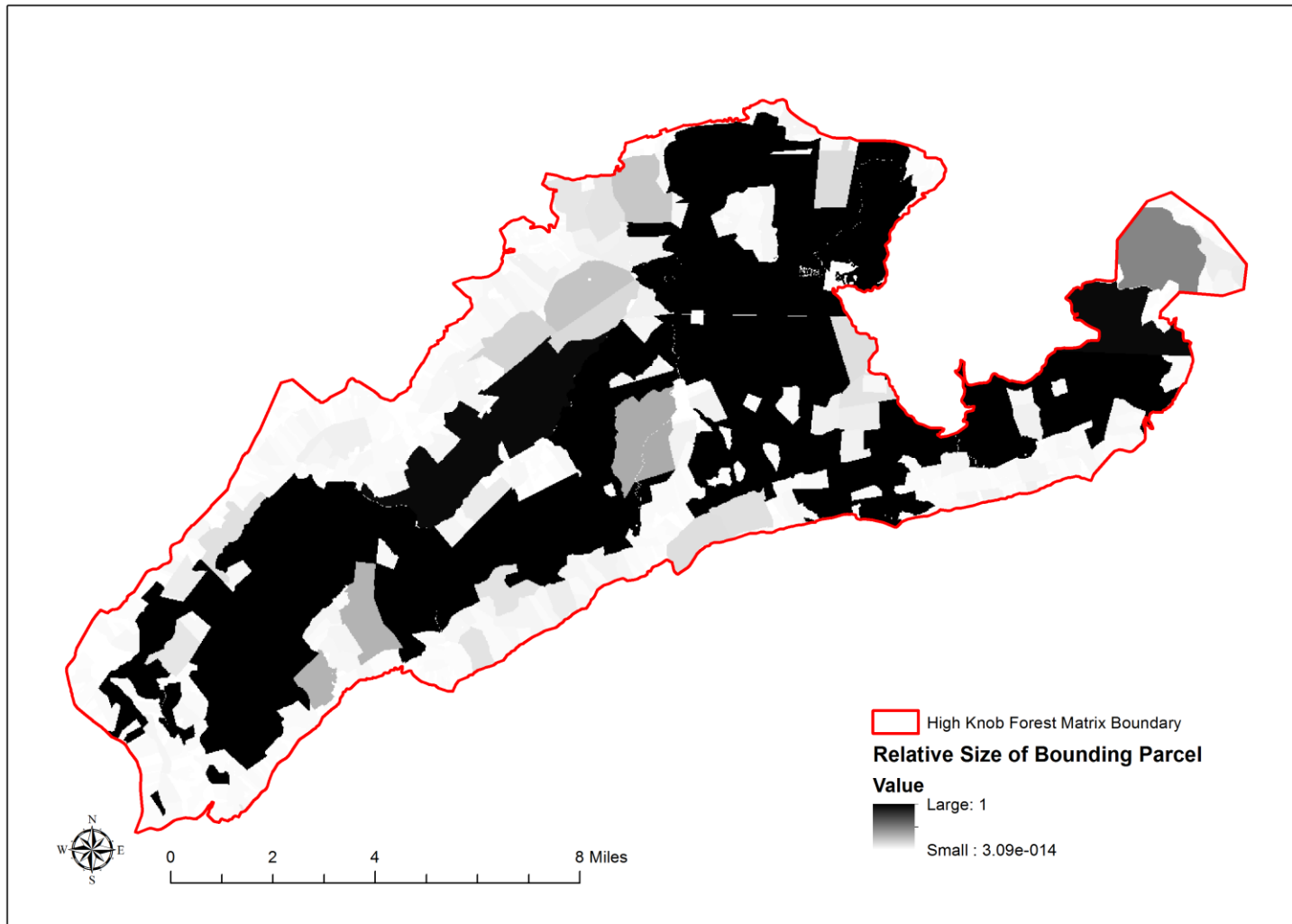


FIGURE 5.15 RASTER IMAGE OUTPUT FROM MODEL SPATIAL 1.

Spatial 2: Adjacent to Protected Land

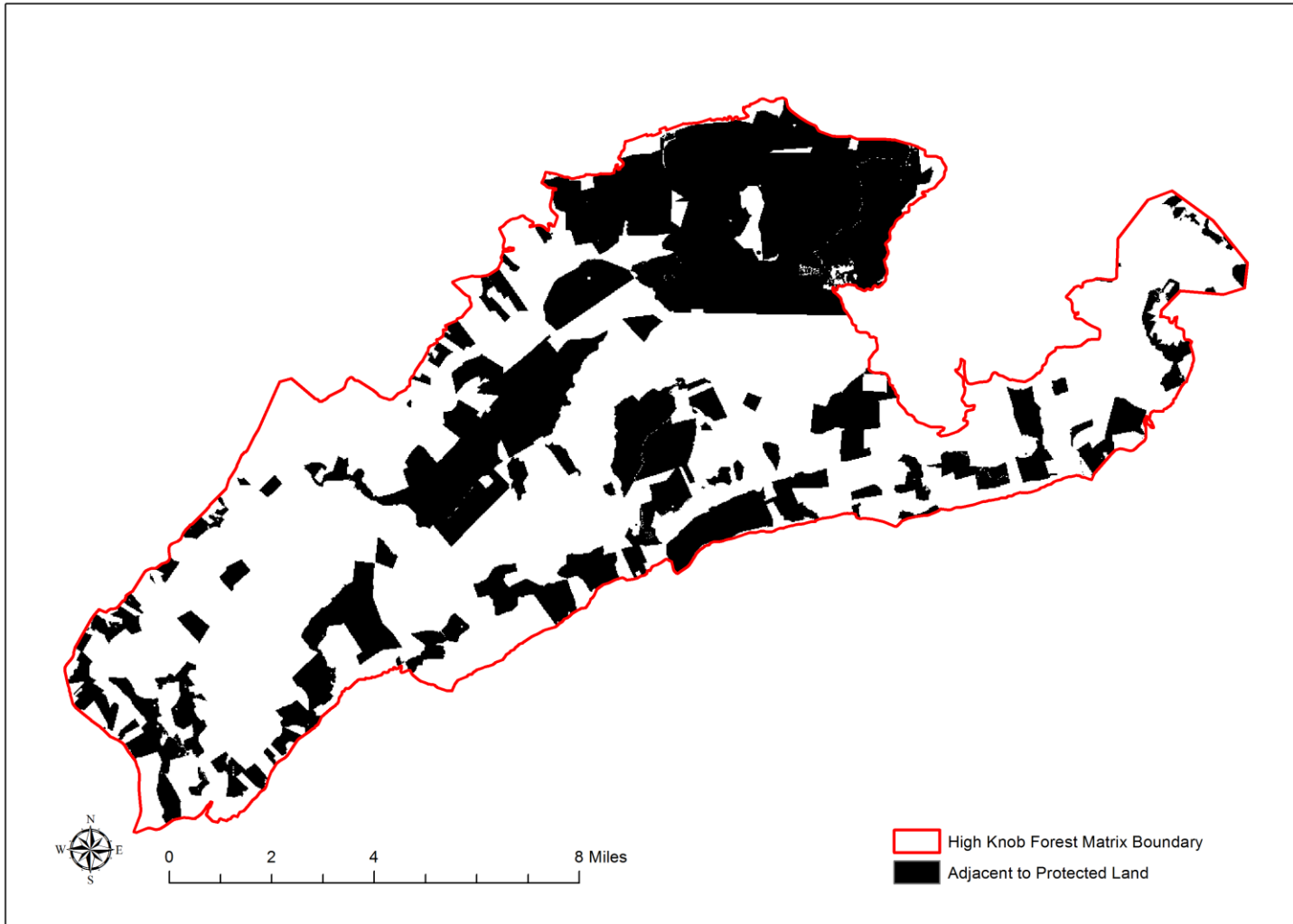


FIGURE 5.16 RASTER IMAGE OUTPUT FROM MODEL SPATIAL 2.

Spatial 3: Core Forest

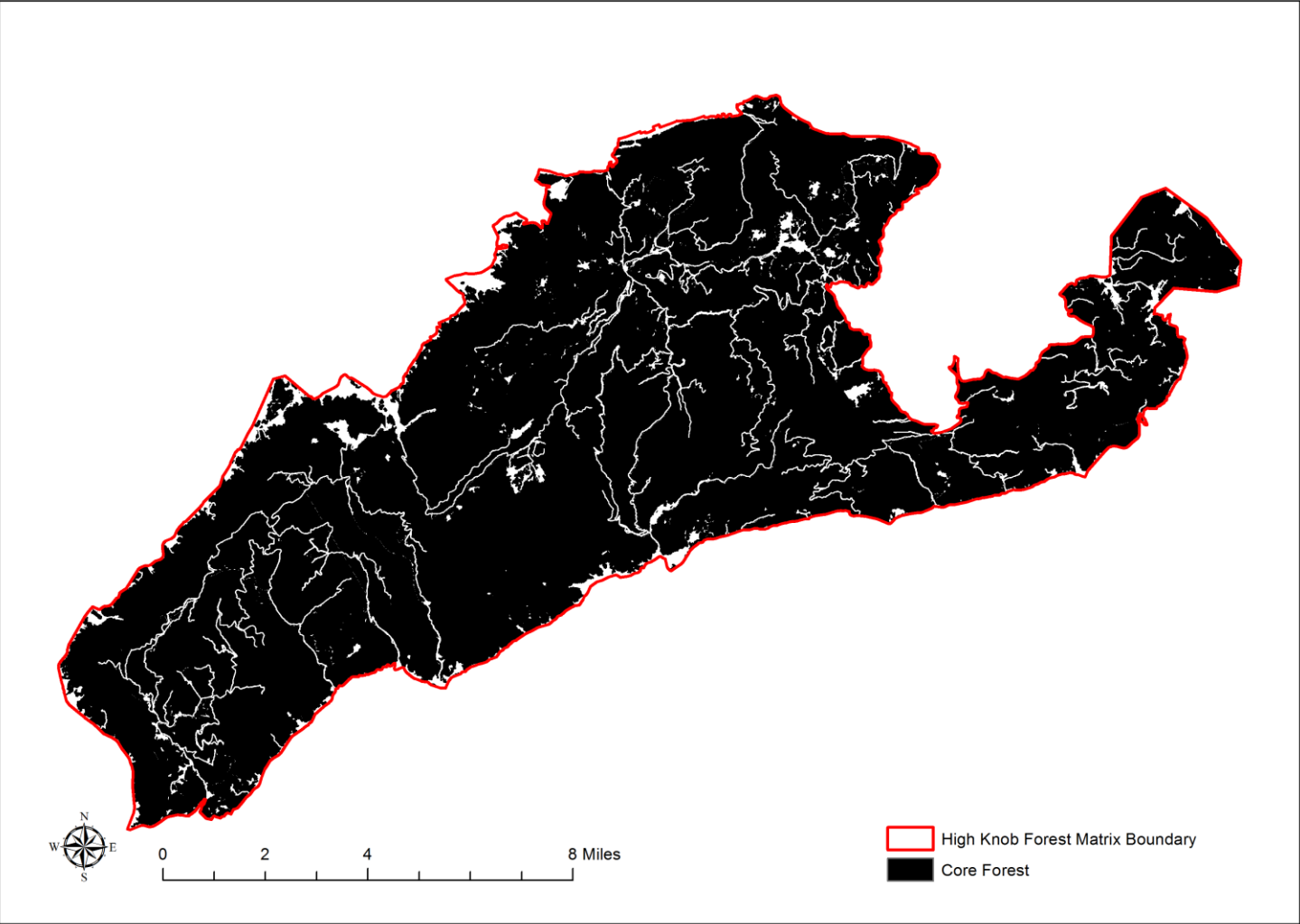


FIGURE 5.17 RASTER IMAGE OUTPUT FROM MODEL SPATIAL 3.

Spatial 4: Proximity to Protected Land

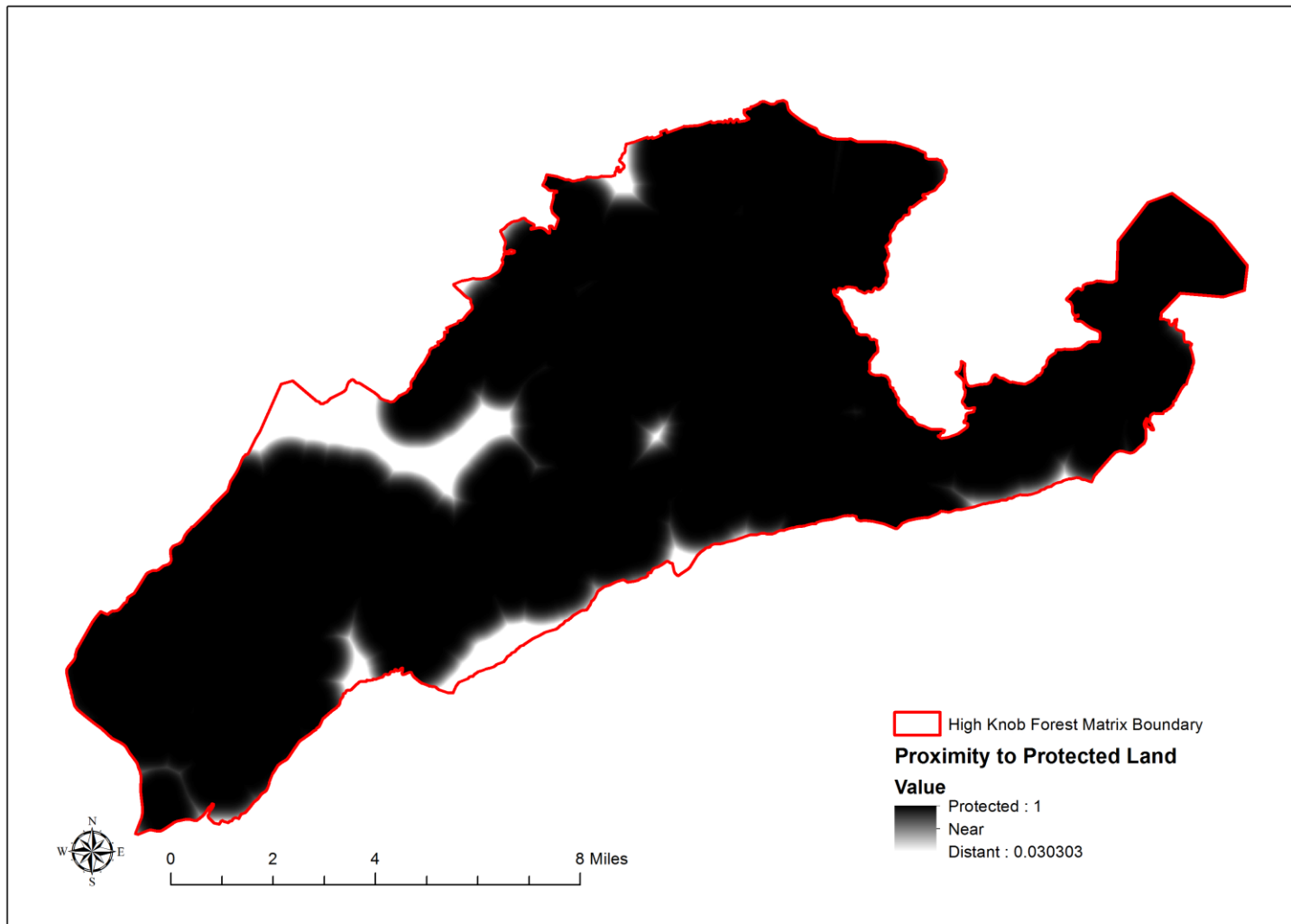


FIGURE 5.18 RASTER IMAGE OUTPUT FROM MODEL SPATIAL 4.

Spatial 5: Special Biological Areas (USFS Designation)

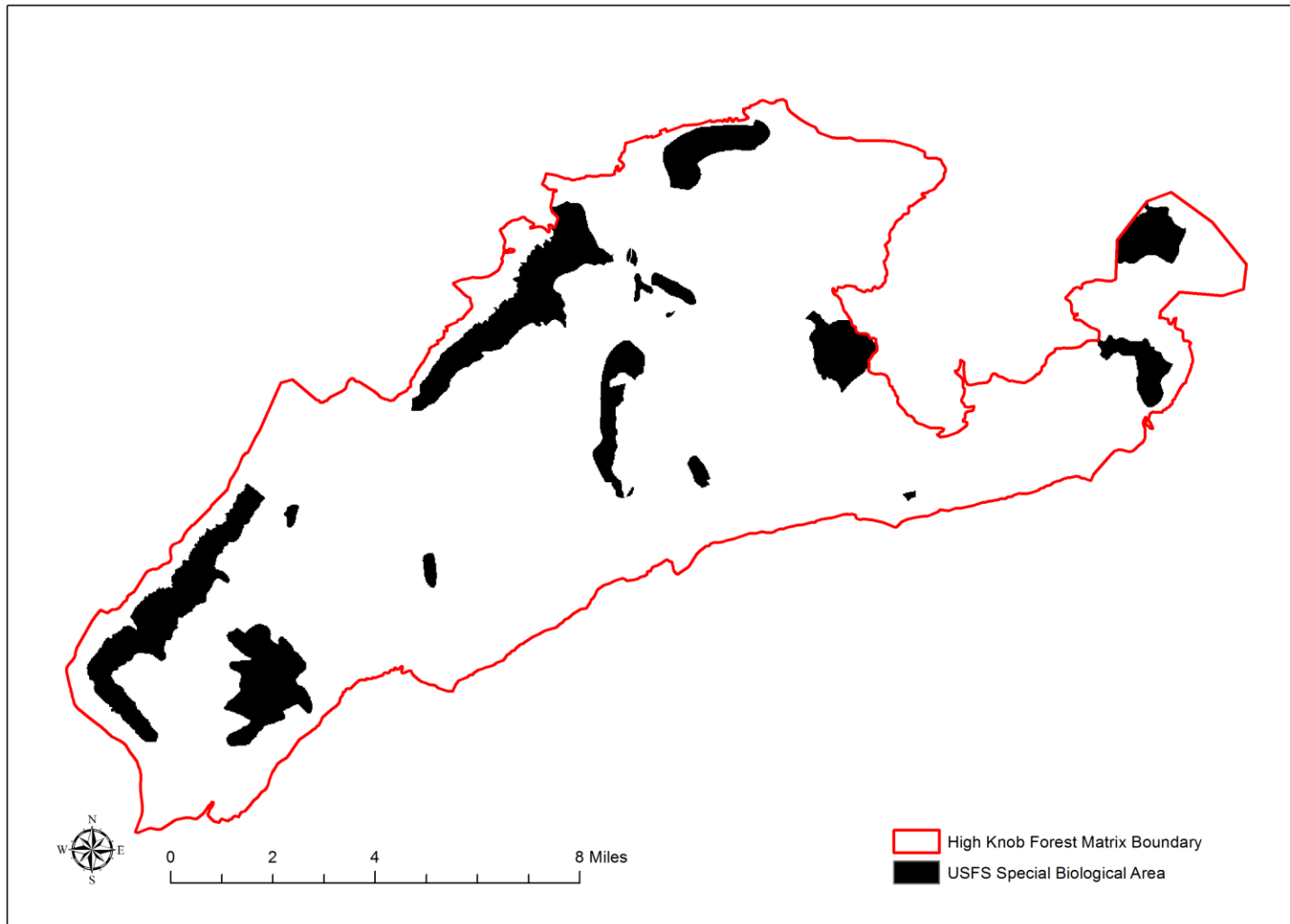


FIGURE 5.19 RASTER IMAGE OUTPUT FROM MODEL SPATIAL 5.

### Spatial 6: Fragmentation

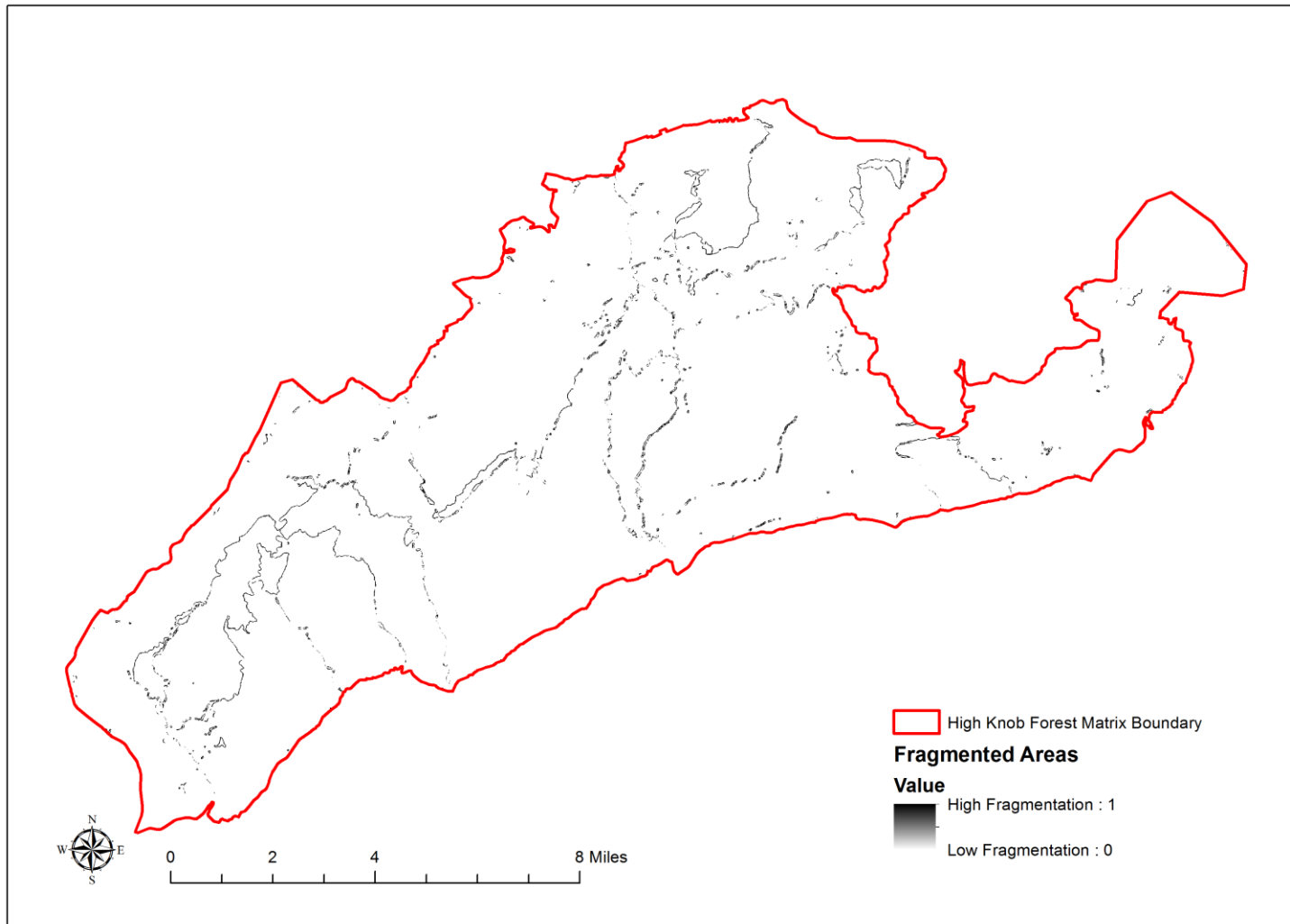


FIGURE 5.20 RASTER IMAGE OUTPUT FROM MODEL SPATIAL 6.



Threat 2b: Potential Development

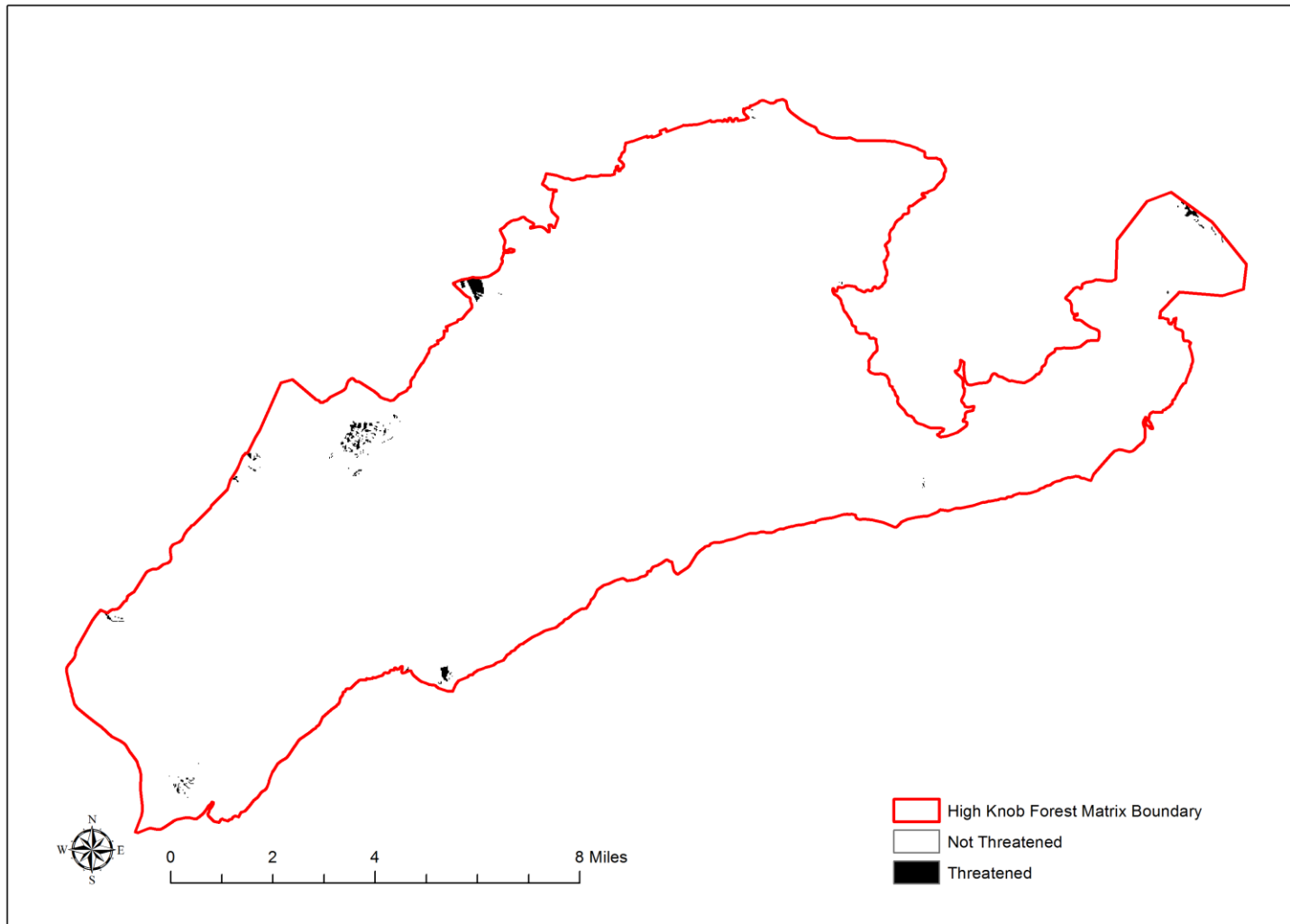


FIGURE 5.21 RASTER IMAGE OUTPUT FROM MODEL THREAT 2B.

Threat 3: Conversion of Undeveloped Land Uses

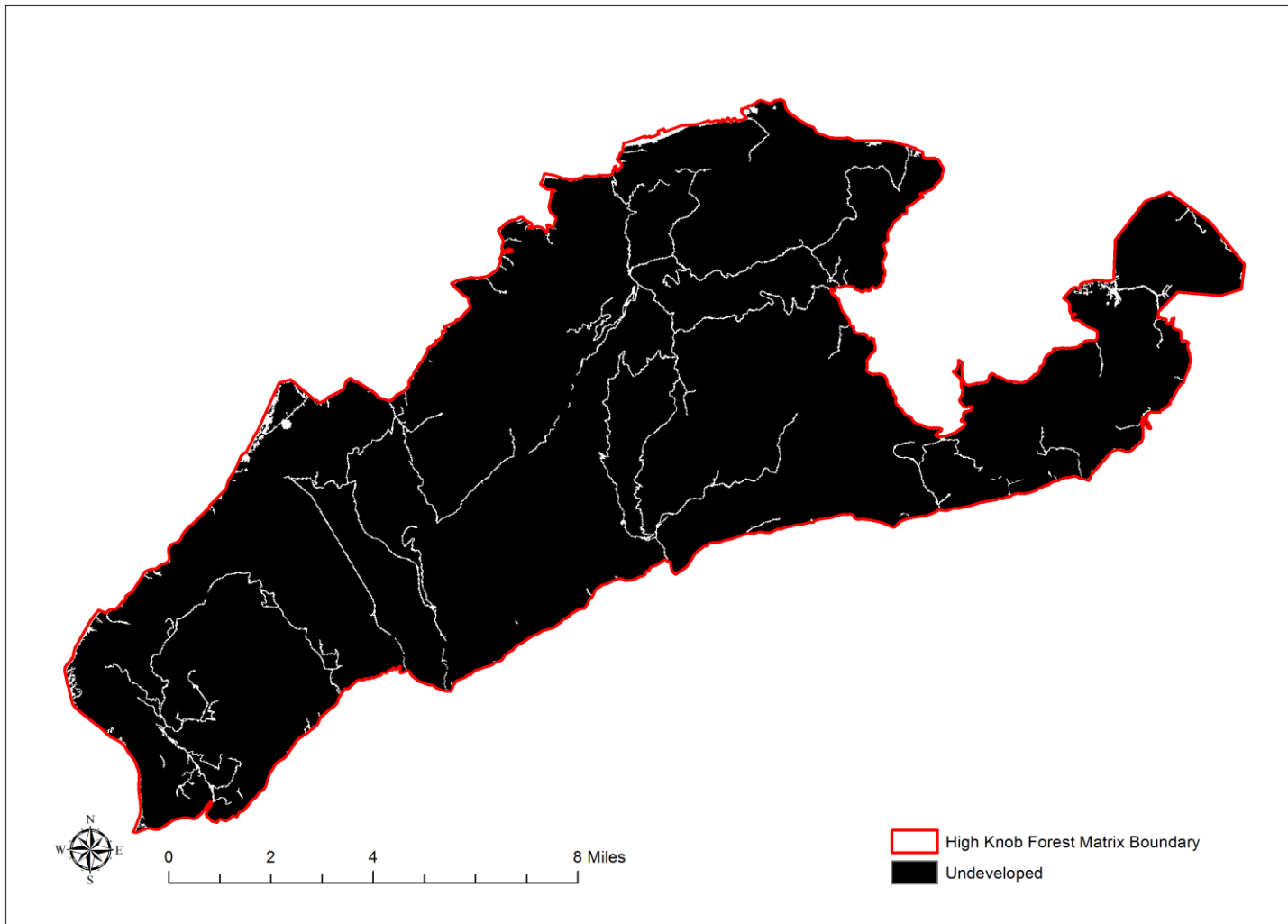


FIGURE 5.22 RASTER IMAGE OUTPUT FROM MODEL THREAT 3.

Threat 4: Potential Small Scale Development

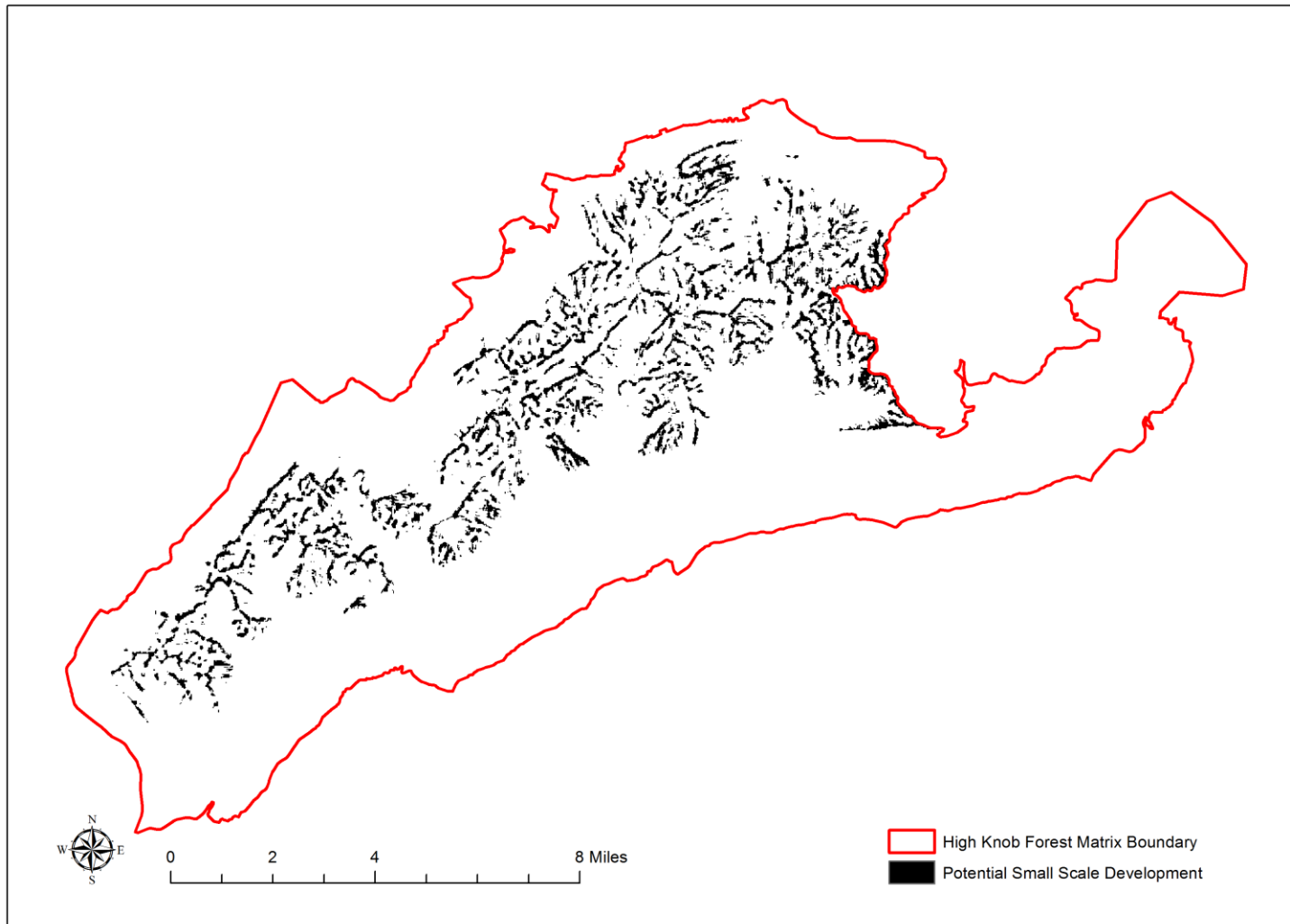


FIGURE 5.23 RASTER IMAGE OUTPUT FROM MODEL THREAT 4.

Threat 5: Conversion of Forested Riparian Areas

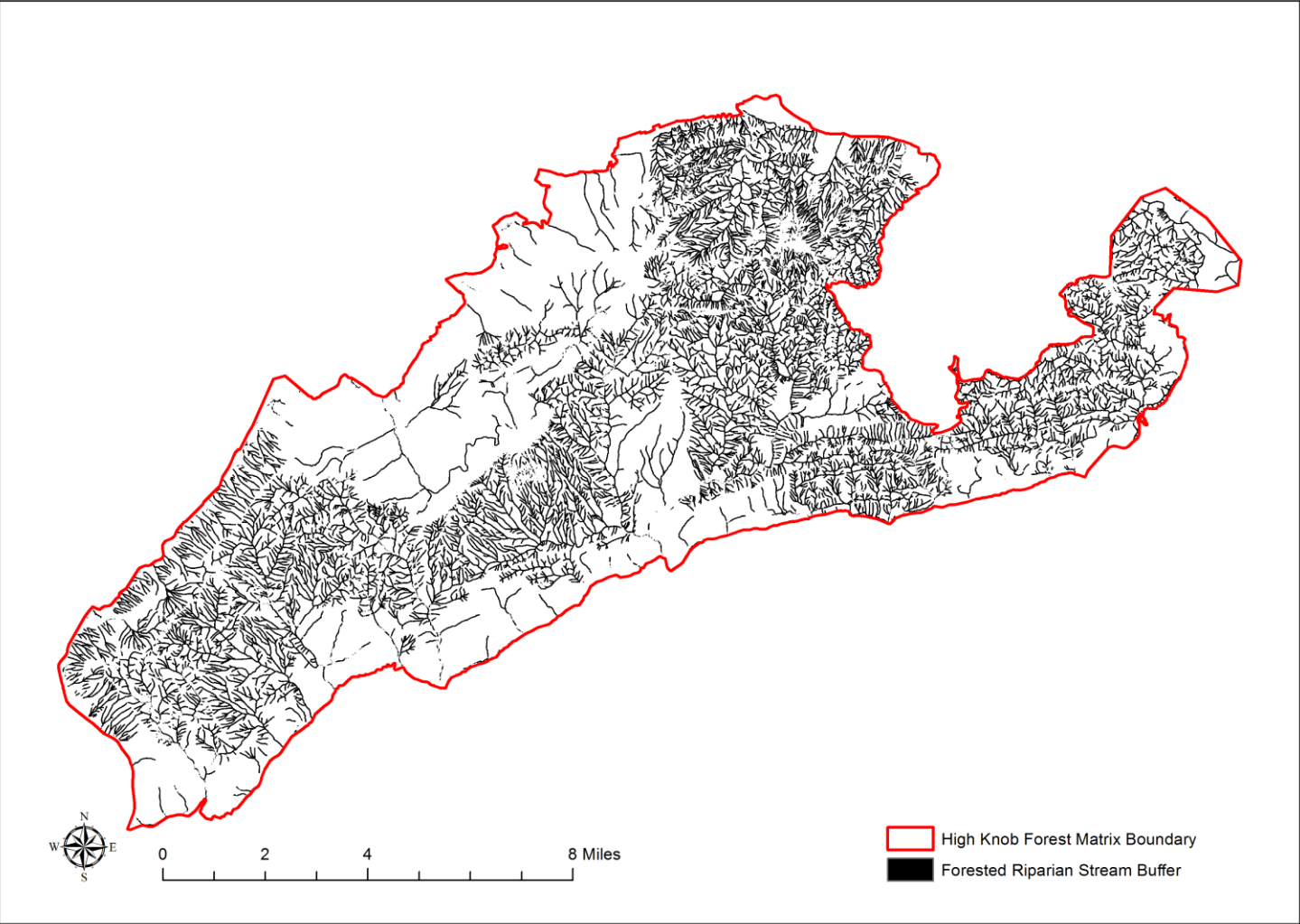


FIGURE 5.24 RASTER IMAGE OUTPUT FROM MODEL THREAT 5.

Water 1: Clinch River Watershed

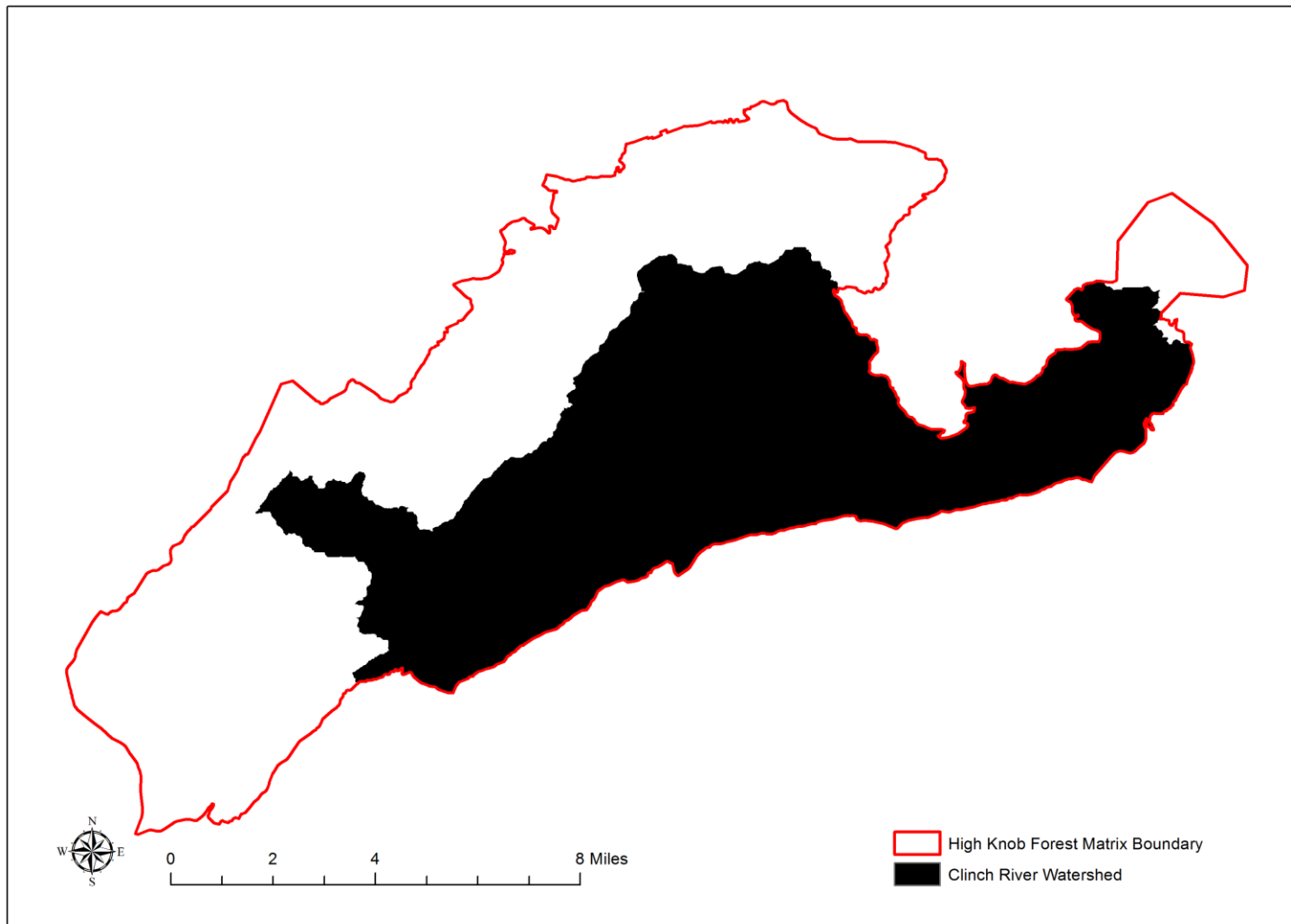


FIGURE 5.25 RASTER IMAGE OUTPUT FROM MODEL WATER 1.

Water 2: Riparian Stream Buffer

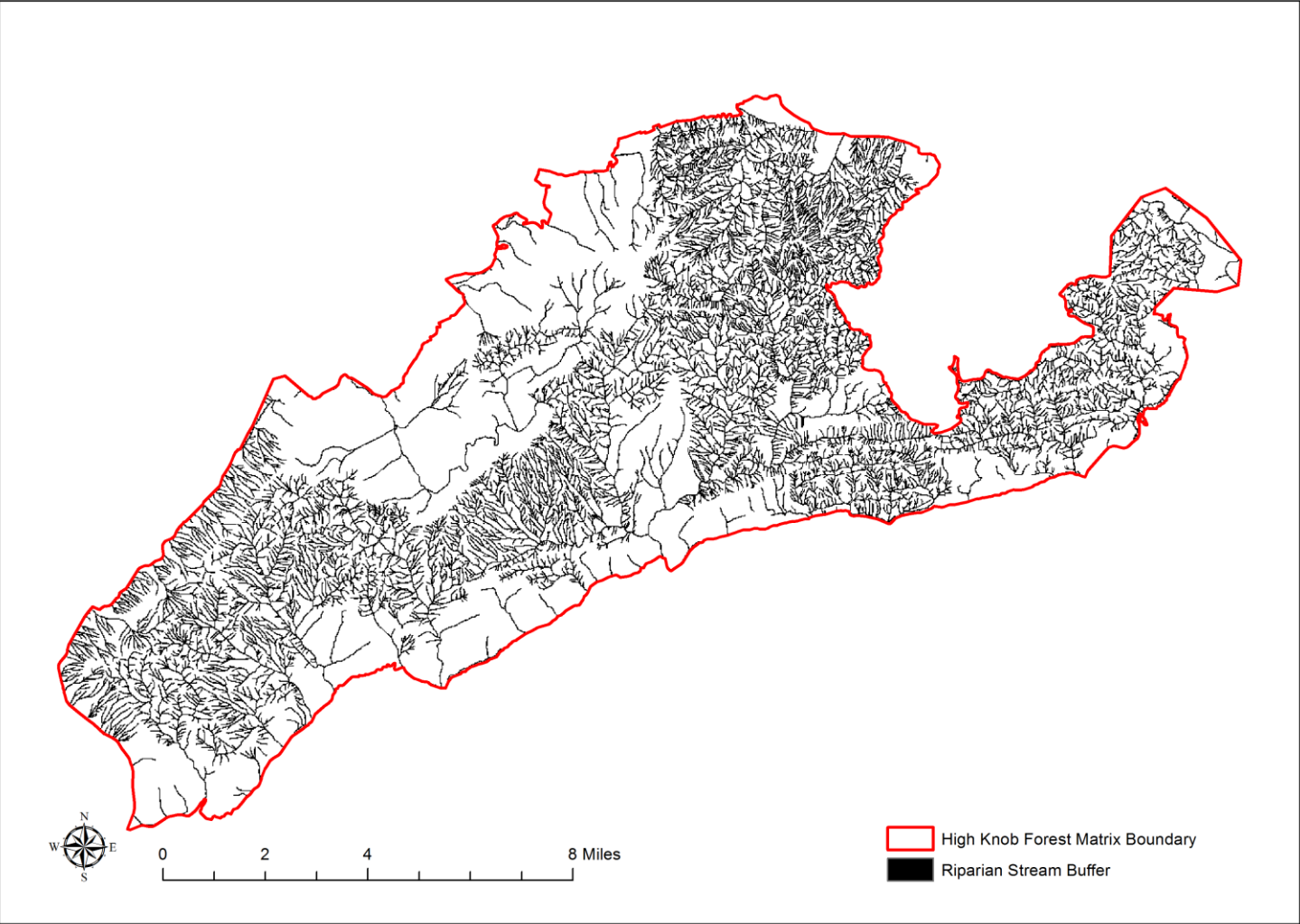


FIGURE 5.26 RASTER IMAGE OUTPUT FROM MODEL WATER 2.

Water 3: Impaired Watersheds

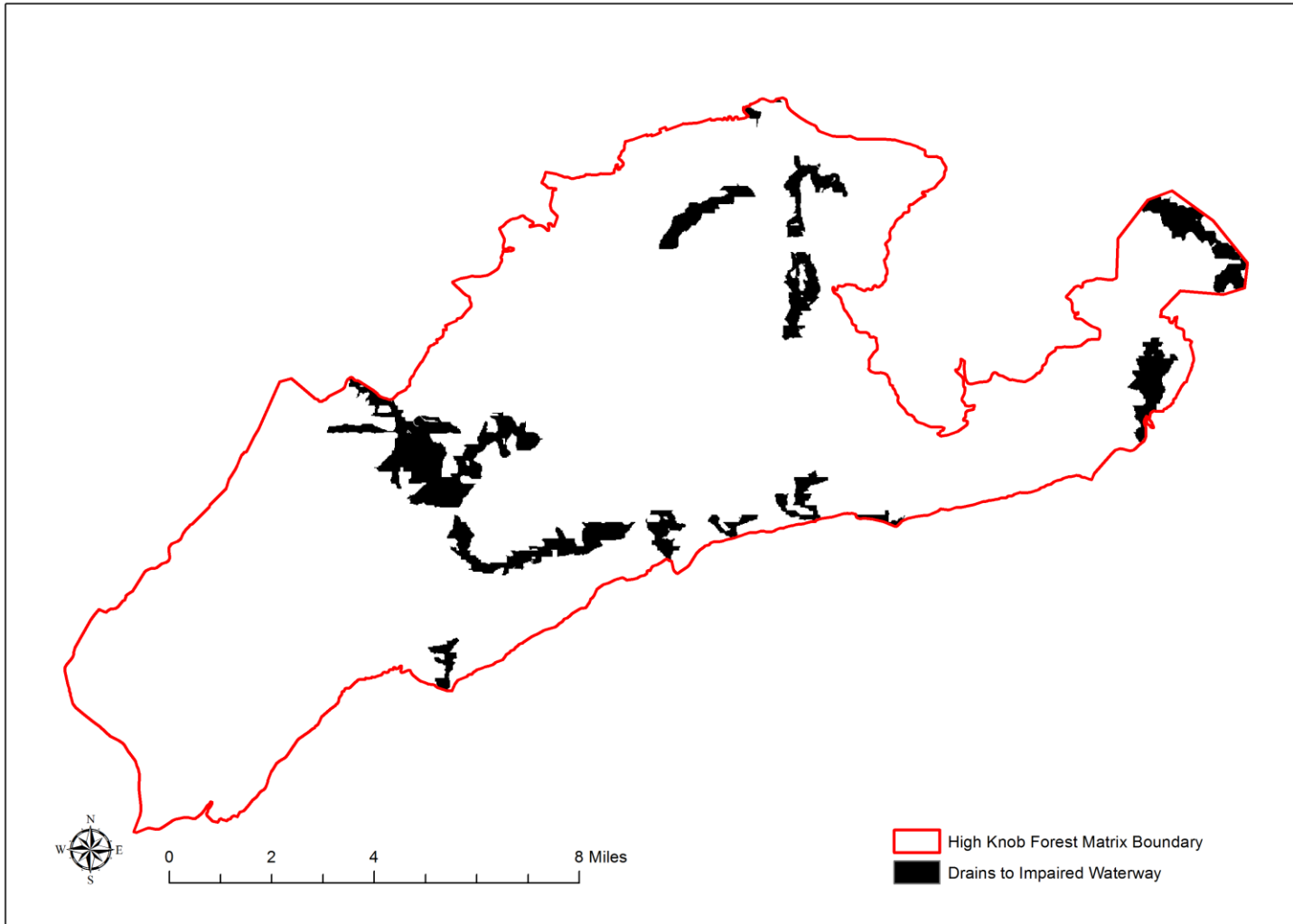
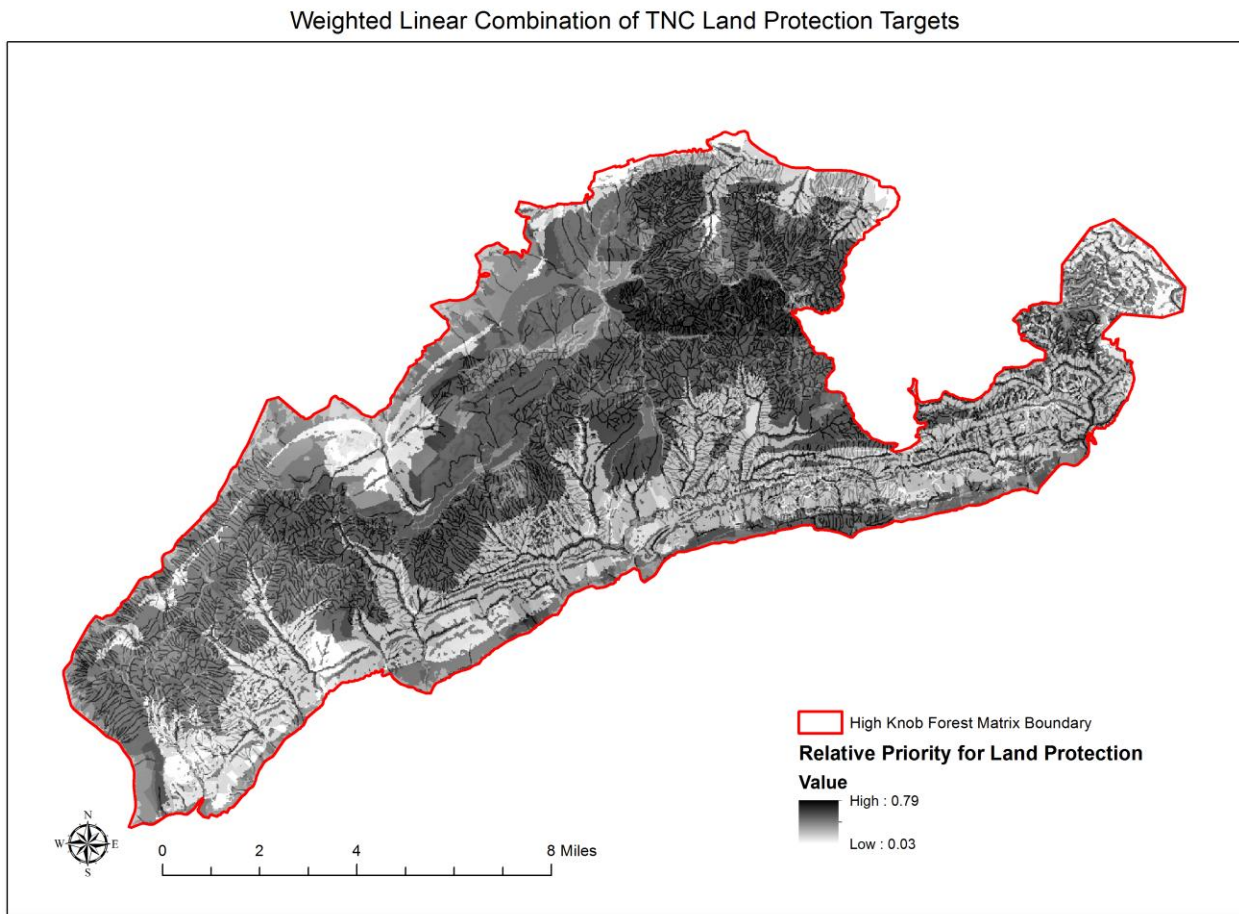


FIGURE 5.27 RASTER IMAGE OUTPUT FROM MODEL WATER 3.

### Objective 3

Weighted Linear Combination was used to produce a raster image which incorporated 14 of the possible 16 input rasters, weighted according to mean TNC preferences.

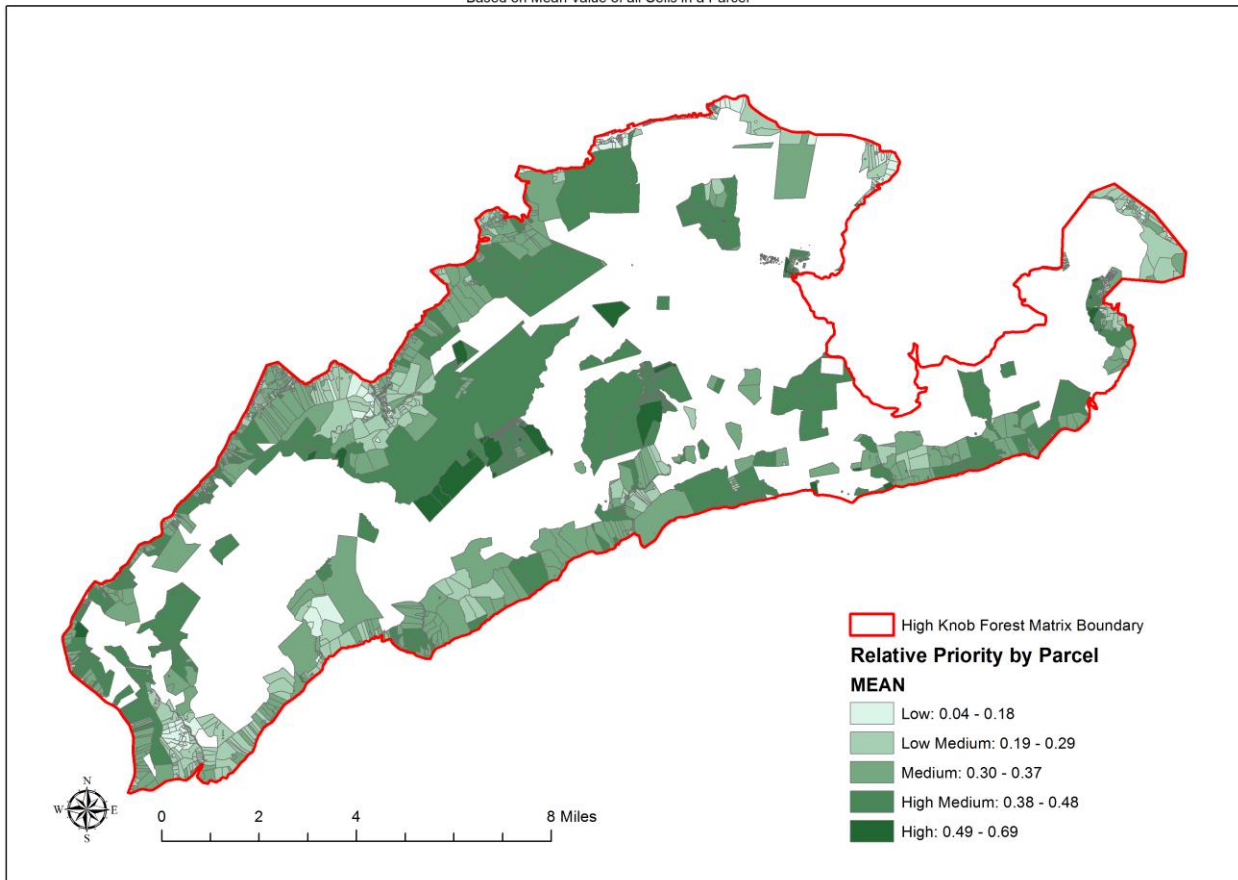


**FIGURE 5.28 RESULTS OF WEIGHTED LINEAR COMBINATION**

This raster image served as the input for the Aggregation by Parcels model.



Aggregation to Parcel Level of Identified Priority Areas  
Based on Mean Value of all Cells in a Parcel



**FIGURE 5.29 MAP OF CONSERVATION VALUE, AGGREGATED BY PARCELS**

**PARCELS APPEARING IN DARKER GREEN CONTAIN HIGHER VALUES OF WEIGHTED CONSERVATION TARGETS.**

The Aggregation by Parcels model also produced a corresponding list of parcels, sorted in descending order by their mean value and ranked accordingly. Table 5.1 features only the top 100 parcels (of 3056 total) for the sake of brevity. To preserve ownership confidentiality, parcels are reported here using a unique ID, assigned by the model and a county-assigned Map Number. However, ownership information is public record and is available when viewed through the GIS and at the respective county courthouse.

TABLE 5.1 TOP 100 PARCELS BY MCDS METHOD.

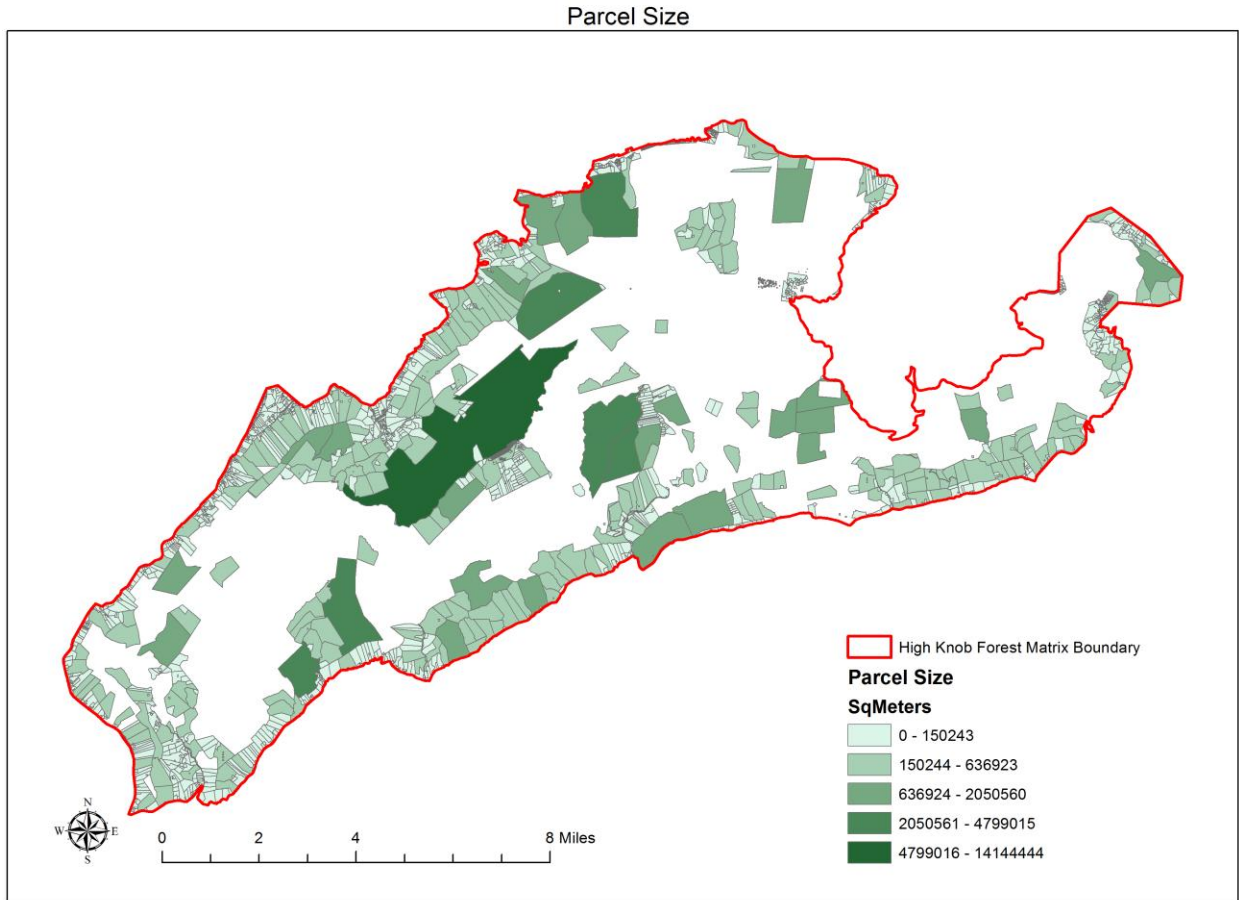
County Name	Unique ID	Mean	MCDS Rank	Area (sq. m)	Area Rank
Wise	419	0.6892	1	1065.42	2140
Wise	430	0.6810	2	721.31	2421
Wise	358	0.6674	3	1065.42	2150
Wise	416	0.6674	4	1065.42	2185
Wise	335	0.6673	5	1065.42	2180
Wise	395	0.6673	6	1065.42	2167
Wise	338	0.6671	7	1065.42	2142
Wise	359	0.6671	8	1065.42	2170
Wise	360	0.6671	9	1065.42	2143
Wise	412	0.6671	10	1065.42	2179
Wise	413	0.6671	11	1065.42	2161
Wise	436	0.6671	12	1065.42	2155
Wise	380	0.6591	13	1065.42	2176
Wise	381	0.6589	14	1065.42	2152
Scott	1904	0.6569	15	11450.51	968
Wise	361	0.6283	16	1065.42	2162
Wise	404	0.6145	17	1065.42	2168
Wise	370	0.6019	18	1065.42	2160
Wise	388	0.6017	19	1065.42	2139
Wise	197	0.6000	20	1996.45	1810
Wise	344	0.5944	21	298.81	2748
Wise	394	0.5789	22	1065.42	2169
Wise	402	0.5736	23	1065.42	2165
Wise	352	0.5733	24	1065.42	2153
Wise	367	0.5610	25	3918.35	1461
Wise	345	0.5528	26	1065.42	2141
Wise	337	0.5526	27	1065.42	2156
Wise	1412	0.5513	28	1376.54	2008
Wise	362	0.5401	29	1065.42	2146
Wise	422	0.5401	30	1065.42	2164
Wise	423	0.5401	31	1065.42	2172
Scott	1903	0.5368	32	113058.49	290
Scott	2511	0.5334	33	2800.66	1634
Wise	387	0.5312	34	1065.42	2181
Scott	2400	0.5302	35	397147.77	61
Wise	198	0.5295	36	1747.98	1878
Scott	1754	0.5286	37	4820.99	1342
Scott	2364	0.528	38	15183.19	883
Wise	418	0.5265	39	1065.42	2158
Wise	346	0.5264	40	1065.42	2136
Wise	396	0.5264	41	1065.42	2178

<b>Wise</b>	403	0.5264	42	1065.42	2151
<b>Wise</b>	435	0.5264	43	1065.42	2187
<b>Wise</b>	414	0.5263	44	1065.42	2175
<b>Wise</b>	55	0.5243	45	939.49	2276
<b>Scott</b>	2317	0.5222	46	22937.32	716
<b>Scott</b>	2281	0.5195	47	503302.93	43
<b>Wise</b>	357	0.5183	48	1065.42	2147
<b>Wise</b>	433	0.5183	49	456.25	2603
<b>Wise</b>	385	0.5180	50	1065.42	2137
<b>Scott</b>	2410	0.5154	51	5865.85	1251
<b>Scott</b>	2346	0.5141	52	1096561.78	13
<b>Scott</b>	1621	0.5139	53	70270.93	406
<b>Scott</b>	2301	0.5130	54	242461.08	142
<b>Wise</b>	424	0.5128	55	1002.64	2227
<b>Scott</b>	2233	0.5124	56	7173.84	1169
<b>Wise</b>	1112	0.5123	57	4660.48	1358
<b>Wise</b>	398	0.5060	58	1065.42	2154
<b>Scott</b>	2386	0.5043	59	20815.18	759
<b>Scott</b>	1622	0.5039	60	2394.16	1699
<b>Scott</b>	2359	0.5038	61	56573.07	451
<b>Wise</b>	80	0.5036	62	21086.35	751
<b>Scott</b>	2328	0.5023	63	2998.79	1596
<b>Scott</b>	1921	0.5009	64	545693.32	41
<b>Wise</b>	417	0.5002	65	1065.42	2144
<b>Scott</b>	1769	0.5001	66	58992.84	435
<b>Scott</b>	2361	0.5000	67	18533.61	798
<b>Wise</b>	334	0.5000	68	1065.42	2182
<b>Wise</b>	339	0.5000	69	1065.42	2173
<b>Scott</b>	2382	0.4990	70	29772.72	647
<b>Scott</b>	2479	0.4981	71	14784.82	894
<b>Scott</b>	1814	0.4981	72	8731.67	1071
<b>Scott</b>	2409	0.4973	73	4524.79	1373
<b>Scott</b>	2383	0.4970	74	10094.30	1006
<b>Lee</b>	2998	0.4957	75	168366.30	213
<b>Wise</b>	890	0.4940	76	1877.27	1843
<b>Wise</b>	180	0.4937	77	12790.67	933
<b>Scott</b>	1787	0.4933	78	27297.97	672
<b>Scott</b>	2237	0.4932	79	3284.52	1556
<b>Scott</b>	1839	0.4916	80	4627.74	1361
<b>Scott</b>	2480	0.4897	81	96494.08	339
<b>Wise</b>	468	0.4889	82	103053.97	315
<b>Scott</b>	2388	0.4887	83	411833.10	59
<b>Wise</b>	1171	0.4878	84	264817.64	128

<b>Wise</b>	1158	0.4869	85	62299.66	429
<b>Scott</b>	2481	0.4869	86	15999.82	862
<b>Scott</b>	2362	0.4853	87	166078.29	218
<b>Wise</b>	58	0.4843	88	5040.22	1316
<b>Scott</b>	1883	0.4840	89	9622.12	1021
<b>Wise</b>	1576	0.4838	90	31002.53	641
<b>Scott</b>	2430	0.4837	91	737448.55	26
<b>Wise</b>	399	0.4803	92	5704.63	1262
<b>Scott</b>	1838	0.4791	93	4459.50	1381
<b>Wise</b>	1160	0.4774	94	183680.18	196
<b>Scott</b>	2431	0.4772	95	9176.53	1048
<b>Wise</b>	77	0.4768	96	146515.49	246
<b>Scott</b>	1843	0.4766	97	7769.33	1129
<b>Scott</b>	2330	0.4765	98	49733.47	492
<b>Scott</b>	1755	0.4756	99	48177.37	504
<b>Wise</b>	307	0.4742	100	99585.04	327

## Objective 4

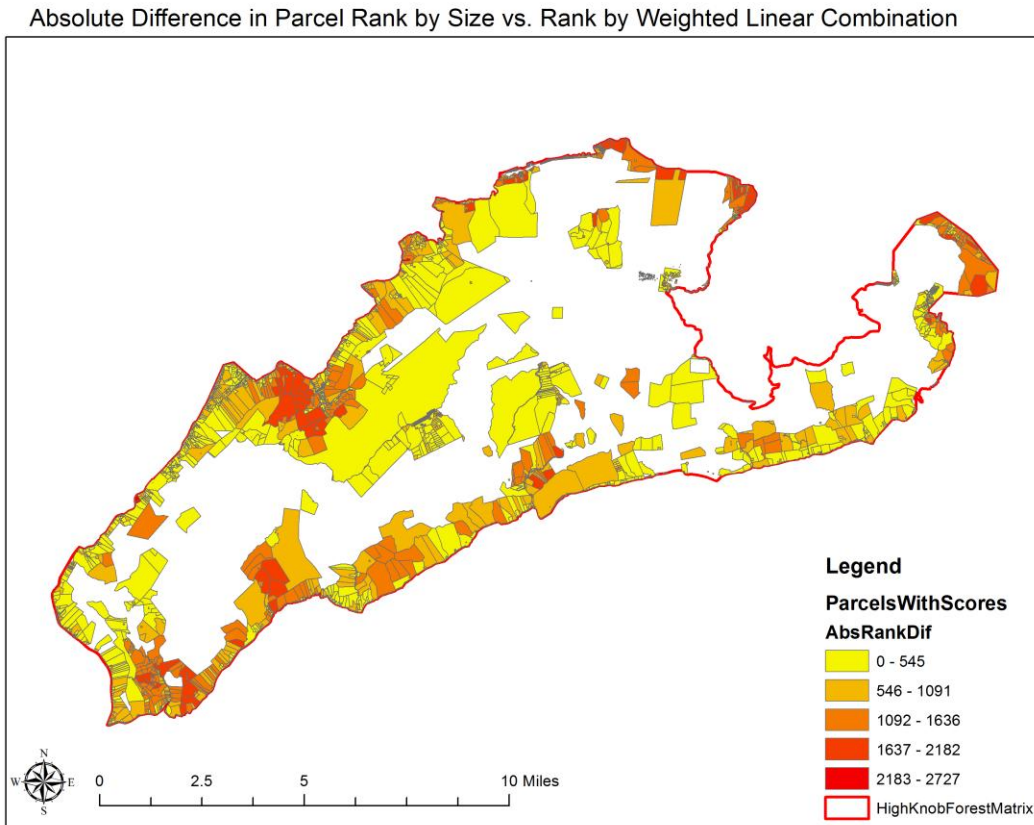
The MCDS rankings produced for objective 3 were compared to rankings based on parcel size alone.



**FIGURE 5.30 MAP OF PARCELS RANKED BY SIZE METHOD**

The absolute difference in value between the ranks produced by the two methods indicates where they agree and disagree. Figure 5.31 visualizes these differences using an equal interval breaks method. Areas of highest disagreement, shown in red, tend to be smaller parcels that are clustered toward the exterior of the

study area.



**FIGURE 5.31 MAP OF DIFFERENCE IN PARCEL RANKINGS PRODUCED BY MCDS AND SIZE METHODS. RED AREAS INDICATE HIGHER LEVELS OF DISAGREEMENT BETWEEN THE METHODS.**

While red areas highlight those parcels ranked most differently by the two methods, the map does not show which method favored a higher or lower ranking for that parcel, only the absolute value of the difference in their rankings. The yellow parcels that predominate the interior indicate a general agreement in ranking by both methods. The red areas indicate the highest level of disagreement, and occur in smaller parcels toward the study area boundary. Parcels in the highest difference category comprise only 0.05 km (13.3 acres) in total. By contrast, those in yellow,

showing the least disagreement, total 82.5 square km (20,405 acres), which is 53.1% of the total available parcel area.

Spearman’s rho of 0.57 with  $p < 0.0001$  was calculated as a measure of correlation between the rankings of the two methods. The size of parcels partially explained their conservation value as ranked by MCDS. However, size alone does not account for the total conservation value of a parcel in the study area, when evaluated by TNC’s identified conservation targets.

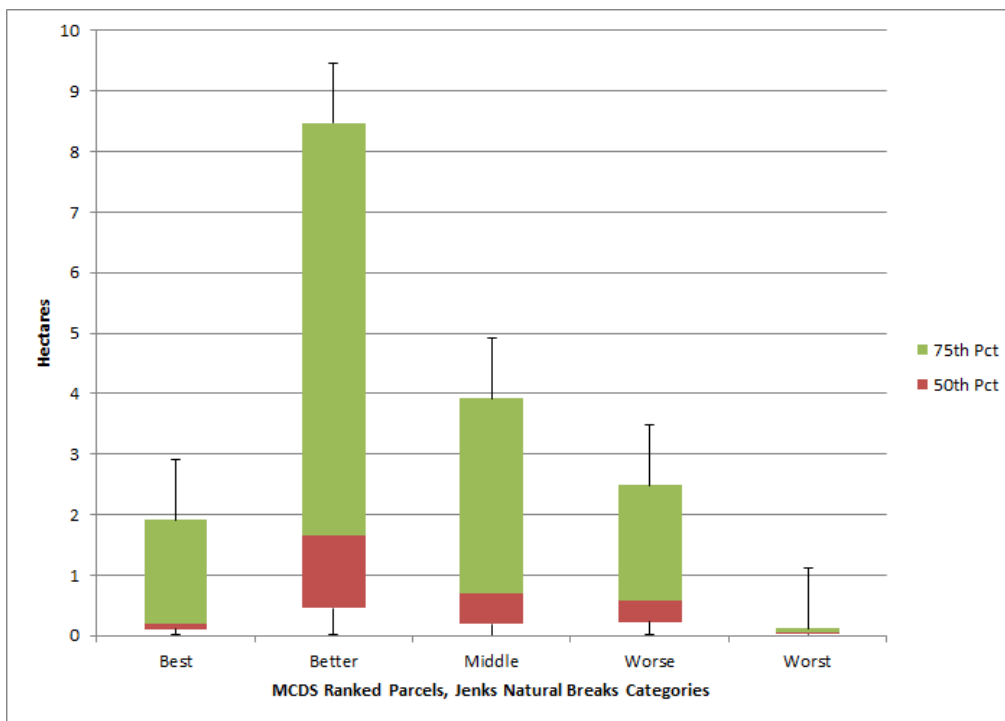
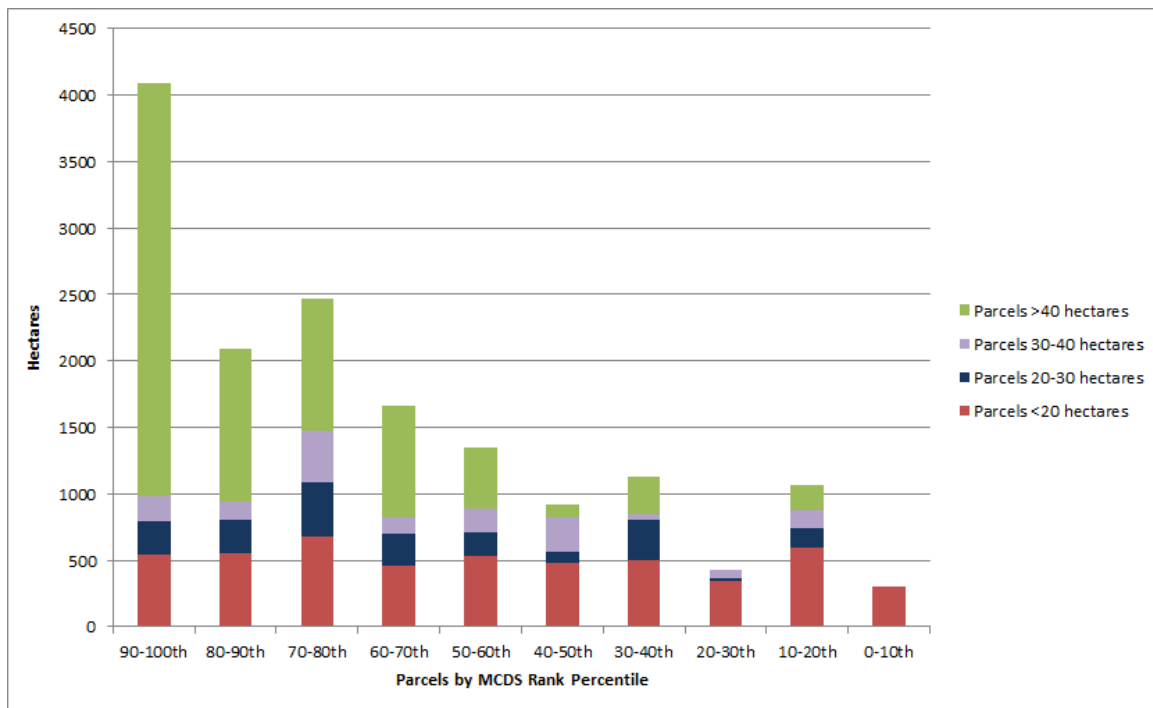


FIGURE 5.32 GRAPH OF RELATIONSHIP BETWEEN PARCEL AREA AND MCDS RANK

It is important to note that while the overall correlation between parcel rank and size is positive, it is not monotonic. Figure 5.32 shows the best ranked parcels tended to be smaller than those ranked next highest (“Better”) as do those ranked lower

(“Middle, Worse, and Worst”). Clearly, there are some highly ranked parcels that are not among the largest by size. This finding is primarily due to small parcels that only enclose a few cells of high value and have a score disproportionate to their size. This is a significant finding because using traditional “bigger is better” methods, these small parcels would not have been identified as high priorities for land protection.



**FIGURE 5.33 GRAPH OF PARCEL AREA BY MCDS RANK PERCENTILES**

Likewise, the distribution of the largest parcels is not limited to those ranked highest by the MCDS method. The graph in figure 5.33 shows that there are parcels greater than 40 hectares (the largest class) in eight of the ten percentile categories. Indeed, those parcels ranked best (highest percentile) by the GIS method also contain some of the smallest parcels by size. An approach favoring an evaluation by size



alone cannot guarantee that a large parcel is not among the mid to lower percentile ranks by MCDS.

## **Chapter 6 Discussion**

To be responsible stewards of their resources and effectively achieve their goals, conservation organizations must find efficient ways to identify the most important land for their protection efforts. A decision-support approach, based on GIS, can help such organizations better prioritize where they should spend their time and money.

### **The Role of GIS in Conservation Organizations**

The conservation community has clearly embraced GIS as a useful tool, using it prolifically to protect a wide range of cultural, historic, and biological/environmental targets. Over 85% of survey respondents indicated that they use GIS in their job, and nearly all (59/61), including those who are not GIS users themselves, believe that it is a useful tool for their organization. Over half (57%) reported that GIS is always or frequently used in making organizational decisions involving conservation strategy. This suggests that the concept of geospatial analysis is firmly in practice across many conservation organizational cultures.

Despite the prolific use of GIS by conservation organizations, most analyses are done “in-house” by employees, rather than consultants. This survey did not ask about the satisfaction level of or confidence in results produced in-house vs. by outside consultants. In retrospect, such a question might have helped to illuminate the skill level of in-house GIS competency. Such knowledge would be helpful in gauging conservation organization’s readiness to proceed with a more complex MCDS-GIS method of ranking. Lack of GIS expertise on staff was among the top four identified

barriers to using GIS. Any movement to grow the use of MCDS-GIS on a broad scale by conservation organizations must overcome this barrier, whether real or perceived.

I conclude from these results that the conservation community has taken a strong first step into using GIS as a parcel prioritization tool. However, issues of time, cost, and staff expertise may be preventing a more thorough application of multicriteria modeling to the parcel prioritization problem. A MCDS-GIS method remains on the cutting edge of what most conservation organizations are prepared or ready to attempt on their own at the present time.

### Conceptual Model

Based on the steps taken in this thesis, a conceptual model outlining a generalized method can be applied even by organizations with differing missions and working in varied landscapes. The sequence of steps is shown in Table 6.1 and discussion of each step follows.

TABLE 6.1 SEQUENCE OF STEPS IN A CONCEPTUAL MODEL

Order	Activity
1	Identify study area boundaries
2	Articulate priorities in plain language
3	Translate priorities into measurable proxies
4	Acquire and organize source data
5	Model distribution of each proxy across the study area as raster cells
6	Identify relative weights of each priority
7	Combine values and weights to produce a summary distribution
8	Aggregate distributions to parcels or other zones of conservation action
9	Apply constraints to mask out parcels not for sale or easement
10	Sort and rank parcels by highest mean value of aggregated zones

### ***Identify study area boundaries***

In this study, the study area and boundaries were defined by a previous delineation by TNC. However, as a general rule, study area boundaries that share an edge with a parcel boundary are desirable to avoid aggregating to a polygon in the GIS that does not directly correspond in shape to one in reality. Utilizing political boundaries (e.g. county or state political boundaries), roads, and natural features like ridgelines and bodies of water will often, though not always, avoid the possibility of split parcels.

### ***Articulate priorities in plain language***

Many conservation organizations have already undergone extensive process of articulating their mission, vision, and values. Even those who have not done so in a formal way often possess such language in the form of founding documents. It is helpful, prior to any meeting in person with the organizational leadership to discuss naming priorities, to see these documents. In a “brainstorming” session, these can be useful starting points to articulating organizational priorities for a particular study area.

### ***Translate Priorities into Measurable Proxies***

Not all articulated priorities are measurable. Many are subjective and require the use of proxy measurement. Familiarity with available datasets as well as their quality is important to selecting appropriate proxies. Stakeholder assistance in operationalizing proxies is crucial to later buy-in of results. Model accuracy benefits when an organization is able to be specific and detailed when describing their priorities and reasons why those are important.

### ***Acquire and Organize source data***

Every area will require different data sources, as various local, state, federal, and private agencies cover different geographic areas. However, at a minimum, this type of analysis should expect to use land cover, elevation, hydrology, and data from the state's IUCN tracking agency for rare and endangered species. Vector data for parcels are not available from a national source for free, though are often available for purchase from vendors. Parcel data are often "public" yet protected from wide distribution and must be requested from the county. The same is true for biologically sensitive data, which may require execution of a legal data-sharing agreement. Although more and more data are now available online, there is still much to be gained by calling a GIS data manager directly to describe what is desired. Often, not all available data are presented for download and must be personally requested. Storing all data in a predefined ESRI geodatabase feature data set enforces a common spatial reference, even though data are received in a variety of systems (Zeiler, 2010).

### ***Model distribution of each proxy across the study area as raster cells***

There is no better preparation for this step than to become familiar with the Modelbuilder environment and the many options available within ArcToolbox. Often, there are many different ways to approach modeling a conservation target, though some may take longer to compute than others (Allen, 2011). Every model will be run many times during development so modeling in the most efficient manner possible is in the programmer's interest.

### ***Identify relative weights of each priority***

This step owes its foundation to the Analytic Hierarchy Process. The human brain is optimized to make binomial choices, rather than perform the matrix calculus necessary to properly differentiate multiple criteria. By reducing a large, complex task to a series of binomial choices, it is possible to produce highly detailed values of relative weights (Saaty, 1990).

### ***Combine values and weights to produce a summary distribution***

Weighted Linear Combination is a straightforward, easily computable method for producing a single image to show the net result of priorities across a study area (Malczewski, 2000, 2011). It allows all factors to trade off equally. For instances where this may not be desired, an order weighted average (OWA) combination method may be used to select either a more risky or risk averse combination of factors.

### ***Aggregate distributions to parcels or other zones of conservation action***

Because the raster resolution (individual cell size) is smaller than the implementation unit (parcel), results must be aggregated. The mean of all cell values inside an enclosing parcel polygon is but one way to summarize that parcel's value. The median could be used instead of the mean as a way of controlling against outlier values. Minimum or maximum values might also be chosen to assign a value to the parcel. Using maximum values would be consistent with an OWA strategy of risk aversion and is a very conservative approach toward decision making. Mean was chosen in this analysis as a way of allowing cells of high importance to exert their influence on the priority of individual parcels.

### ***Apply constraints to mask out parcels not for sale or easement***

Within the study area are a large number of cells enclosed by public lands or otherwise already conserved, such as by a conservation easement. As those zones are not available for the type of action envisioned by the land protection strategy, they ought to be removed. A similar constraint might be applied if the organization had prior knowledge of landowners not willing to entertain a sale or easement.

### ***Sort and rank parcels by highest mean value of aggregated zones***

This final step is essentially to produce two outputs for differing audiences. The first is the raw list of ranked parcels, including their identifiable number and county. Such a list is useful to conservation organizations as a “most wanted” type of quick reference. The same data, joined to parcel data, and symbolized on a map, are used to observe clusters of high priority areas so that conservationists can concentrate their efforts on protecting those areas.

## **Size and Significance**

Ranking of parcels by size alone is a common shorthand method for quickly evaluating conservation value (Virginia Outdoors Foundation 2009). This analysis shows that though size is positively correlated with the results of a multi-criteria method of analysis, it does not account for all of the conservation value inherent in a parcel (as defined by the TNC priorities).

The dominant paradigm of evaluating parcels based on area alone carries the risk of missing highly ranked parcels of smaller size. Likewise, it carries a false positive” risk of identifying large parcels that do not contain high amounts of

conservation value. Ranking by MCDS and then constraining or further ranking the results by size offers conservation organizations the opportunity to better understand the relationship of size and value within their service area and consequently choose to conserve those that satisfy multiple criteria.

Ranking by size is a quick, yet incomplete, process; while ranking by proxy, pairwise comparison and weighted linear combination is a much more burdensome, yet thorough, method (Pressey and Nichols 1989, Regan, et. al 2007, Strager 2002, Strager and Rosenberger 2007, Li and Nigh 2011). However, that considerable burden is lessened when viewed through a long term perspective. The additional time and effort necessary to produce a MCDS-GIS is temporary, while the better land protection choices it enables when implemented are lasting, if not permanent. Nevertheless, conservation organizations must each evaluate for themselves on what time scale the benefit of such knowledge is worth the investment of time and organizational resources.

### **The Burden of Complexity**

The conceptual model (Table 6.1) is an alternative to the much simpler ranking method of preferring larger parcels over smaller ones. Though an area-based method undoubtedly identifies areas of significant conservation priority, it likely misses other areas of equal or greater priority. Selections based on the “bigger-is-better” method reflect the economic realities of land protection by purchase or easement. Real estate transactions have certain fixed costs that do not decrease just because the parcel is smaller. Legal preparation of a purchase agreement takes just as much time, whether the parcel covers one acre or a hundred. It is only reasonable that frugal conservation



organizations and governments have tended to prioritize larger parcels simply because doing so is a more efficient use of the transaction itself.

This analysis sought to create a method by which the barriers to prioritization based on ecological realities are lowered, in order to successfully compete with methods based on economic ones. It is only when GIS-based methods are economically competitive that they will be seen as viable, despite any promise or evidence that they produce results more in line with organizational priorities. The unfortunate truth is that including complex realities of a landscape (like species counts) may require costly fieldwork; data proxies are only approximations, and GIS modeling remains a tool for those with specialty training (Li and Nigh, 2011).

The good news is, that despite the barriers and complexity, conservation organizations have begun to make use of the technology for prioritization purposes. More than 75% of individuals surveyed in this study indicated that their organization was using GIS to help them make ranking decisions about where to act at the parcel level. This study contributes to the growing trend.

The survey shows that the conservation community has begun to realize that prioritization is important. Moreover, they are using GIS and spatially connected data as tools to help understand where their organizational conservation values are distributed across their service areas. A quantitative, data-driven approach to conservation prioritization is still an immature science. However, the adoption of such methods by practitioners, in addition to academics, is encouraging for the prospect of better, more data-driven, conservation choices in the near future.

## **Limitations**

The method developed in this thesis was based entirely on desktop analysis within the simulated environment of the GIS. Though the desktop approach makes it possible for a single analyst to produce results, uncertainty exists regarding the precision and accuracy of input data collected through secondary sources. No field verification of data, either inputs or outputs, was performed. Increased confidence in the methods and analysis presented here could be improved through continued monitoring and measurement of the proxies via fieldwork and actual purchase or easement of parcels in the study area.

Finally, this study is necessarily limited to results within a specific location. To understand if there is a universal correlation between ranking by size and ranking by conservation value, many more local-scale prioritization analyses are required to compare the correlations they report.

## **Future research**

Future research should consider the second and third implementation methods of TNC's overall strategy; restoration and land management advocacy. Both will require their own set of weighted eigenvectors, but the base layers on which to apply them are already reported in objective 2. Like land protection, restoration should be aggregated at the parcel level but management advocacy requires a new set of zonal polygons be developed based on the USFS land management units for High Knob.

Beyond High Knob, future research on how GIS is used by the Land Trust and conservation community should focus specifically on the organizational management of

decision-making processes. For example, what are the acceptable limits of the tradeoff between investment in time for GIS-based analysis and the better planning they enable? Further investigation is warranted to understand the level of technical skill required in an organization in order to be able to responsibly “do” conservation using MCDS. Must every conservationist be a skilled GIS user?

Finally, the opportunity exists to repeat the comparison of MCDS-GIS vs. size-based prioritization. This study found a .57 correlation between the two. Repeating this comparison for study areas within the ecoregion and beyond might establish norms for how this correlation varies geographically. Quantifying the relationship between MCDS-GIS and size-based prioritization methods offers the conservation community more understanding about the inadequacy of the latter.

### **Conclusion: The nature of decision-making**

Decision making processes that are based on best available information, organized to accentuate the most pertinent data, and presented in a way that minimizes the number of available choices, will tend to produce better decisions. While the GIS-based parcel priority method described herein seeks to do just that, it is still nothing more than an aid and support to decision making. Humans are the only real decision makers and ultimately must decide what course of action to pursue and where best to undertake it. GIS can be a useful tool for more meaningful decision-making, but in the end, conservation is a human activity dependent on choices made by individuals.

### **Evaluation by TNC**

A letter from TNC's Director of the Clinch Valley Program, evaluating and discussing this project from their perspective, is included in Appendix E.

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# Appendix A: Data Sharing Agreements

## Virginia Outdoors Foundation

### Virginia Outdoors Foundation License for Use of Digital VOF Easement Data

The Virginia Outdoors Foundation hereby grants a revocable license to LINK ELMORE (Licensee) to use the following data: VOF Easement Shapefiles and Metadata; and EMA Database County Parcel Report.

Use of these data is subject to the following conditions:

1. The license is nonexclusive and revocable.
2. The license is nontransferable, and any attempted transfer is void.
3. The license conveys no rights for Licensee to release or distribute these data, or derivative works containing these data, in any electronic/magnetic or machine-readable form.
4. Licensee shall identify "Virginia Outdoors Foundation" as data source on any map or publication using VOF data. Licensee shall also include the date the data was provided.
5. Licensee shall provide VOF with a list of any reports or printed materials prepared using VOF Easement data, and will provide a sample copy of such material if requested by VOF.
6. Although VOF maintains high standards of data quality control, VOF makes no warranty as to the fitness of the data for any purpose, nor that the data are necessarily accurate or complete.
7. Licensee understands and acknowledges that these data are provided for planning and assessment purposes only. Specific projects or activities should be reviewed

for potential environmental impacts with appropriate regulatory agencies. If ground-disturbing activities are proposed in the vicinity of indicated open-space easements, VOF shall be contacted for a site-specific review of the project area.

8. Licensee understands and acknowledges that the accuracy of these data is time-limited. Licensee agrees to use VOF-provided data only for the term specified by VOF, and to incorporate all updates provided by VOF. Under no circumstances shall Licensee continue using VOF-provided open-space easement data for more than six months following its generation.

9. Licensee will indemnify and hold VOF and its officers and employees harmless against any claims by third parties arising out of the use by Licensee of the data provided hereunder.

10. This License is the entire agreement between the parties with respect to the subject matter hereof. It shall be construed in accordance with the law of the Commonwealth of Virginia and may be amended only in writing signed by both parties.

By accepting the VOF data, Licensee agrees to abide by all of the above conditions. Licensee shall sign this license and return it to VOF to indicate receipt and acknowledgment of the terms of this license.

Licensee signature

Date

Licensee title

Licensee agency/company

Approved:

Virginia Outdoors Foundation

Date

# Virginia Department of Conservation and Recreation

Douglas W. Domenech  
Secretary of Natural Resources



David A. Johnson  
Director

## COMMONWEALTH of VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage  
217 Governor Street  
Richmond, Virginia 23219-2010  
(804) 786-7951 FAX (804) 371-2674

### License for Use of Digital Data provided by the Virginia Department of Conservation and Recreation Natural Heritage Program

The Virginia Department of Conservation and Recreation's Natural Heritage Program (DCR) hereby grants a revocable license to *Link Elmore – VA Tech Department of Geography* (Licensee) to use the following data: Natural Heritage Screening Coverage (Tier II) and for creation of a GIS model using multicriteria analysis to identify and prioritize parcels in the High Knob area for conservation easement protection. These data can only be utilized for this project and DCR requests a copy of the GIS conservation planning tool and mapped list of specific real estate conservation easement or acquisition parcels upon completion of the project.

#### Use of these data is subject to the following conditions:

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*State Parks • Soil and Water Conservation • Natural Heritage • Outdoor Recreation Planning  
Chesapeake Bay Local Assistance • Dam Safety and Floodplain Management • Land Conservation*



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9. Licensee understands and acknowledges that the accuracy of these data is time-limited. Licensee agrees to use DCR-provided data only for the term specified by DCR, and to incorporate all updates provided by DCR. By the following date: 8/13 (which shall be no later than one year following the issuance of this license), Licensee will either
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  - b. complete arrangements with DCR to renew the subscription. These arrangements will include an updated license.
  
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By accepting the DCR data, Licensee agrees to abide by all of the above conditions. Licensee shall sign this license and return it to DCR to indicate receipt and acknowledgment of the terms of this license.

 Digitally signed by jlelmore  
DN: cn=jlelmore, o=Virginia, st=Blackburg,  
ou=Virginia Polytechnic Institute and State  
University, ou=Communications Network,  
serialNumber=Access Control,  
cn=jlelmore, serialNumber=12  
Date: 2011.08.22 16:11:18 -0400

\_\_\_\_\_  
Signature

date

\_\_\_\_\_  
Graduate Student

for

\_\_\_\_\_  
Title

agency/company

\_\_\_\_\_  
jlelmore@vt.edu

e-mail address

Approved:

\_\_\_\_\_  
Thomas L. Smith, Director  
DCR Division of Natural Heritage

date

## **Appendix B: IRB Documentation**

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**MEMORANDUM**

**DATE:** June 1, 2010

**TO:** Lynn Resler, James Elmore

**FROM:** Virginia Tech Institutional Review Board (FWA00000572, expires June 13, 2011)

**PROTOCOL TITLE:** GIS Parcel Ranking Implementation Assessment Survey

**IRB NUMBER:** 10-310

Effective June 1, 2010, the Virginia Tech IRB Chair, Dr. David M. Moore, approved the new protocol for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

**PROTOCOL INFORMATION:**

Approved as: **Expedited, under 45 CFR 46.110 category(ies) 7**

Protocol Approval Date: **6/1/2010**

Protocol Expiration Date: **5/31/2011**

Continuing Review Due Date\*: **5/17/2011**

\*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

**FEDERALLY FUNDED RESEARCH REQUIREMENTS:**

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

*Invent the Future*

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY  
*An equal opportunity, affirmative action institution*

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

\*Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office ([irbadmin@vt.edu](mailto:irbadmin@vt.edu)) immediately.

cc: File



**MEMORANDUM**

**DATE:** May 10, 2011

**TO:** Lynn Resler, James Elmore

**FROM:** Virginia Tech Institutional Review Board (FWA00000572, expires October 26, 2013)

**PROTOCOL TITLE:** GIS Parcel Ranking Implementation Assessment Survey

**IRB NUMBER:** 10-310

Effective June 1, 2011, the Virginia Tech IRB Chair, Dr. David M. Moore, approved the continuation request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

**PROTOCOL INFORMATION:**

Approved as: **Expedited, under 45 CFR 46.110 category(ies) 7**

Protocol Approval Date: **6/1/2011 (protocol's initial approval date: 6/1/2010)**

Protocol Expiration Date: **5/31/2012**

Continuing Review Due Date\*: **5/17/2012**

\*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

**FEDERALLY FUNDED RESEARCH REQUIREMENTS:**

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

*Invent the Future*

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

\*Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office ([irbadmin@vt.edu](mailto:irbadmin@vt.edu)) immediately.

cc: File

## Appendix C: Text of Online Survey

This survey seeks information about how conservation organizations use computer Geographic Information Systems (GIS) to assist decision makers in achieving their mission.

The study is being conducted by Link Elmore, a graduate student at Virginia Tech University in the Department of Geography ([jlelmore@vt.edu](mailto:jlelmore@vt.edu)), under the faculty advisement of Dr. Lynn Resler.

For the purposes of this survey, "strategic conservation" refers specifically to the use of data-driven processes to prioritize, rank, or identify conservation targets or goals. For example, a land trust might use GIS to choose which are the "preferred" parcels in their area, in order to approach landowners about a conservation easement.

### **Strategic Conservation and Geographic Information Systems (GIS)**

**My organization is a:**

Land Trust

Nonprofit agency (other than a land trust)

Government agency

Consulting firm (private, for profit)

Research institution

Educational/teaching institution

Lobbying/Advocacy group

other/specify:

**My primary role within my organization is:**

Administrative

Conservation specialist

GIS specialist

Stewardship/Monitoring

Scientist

Historian

Public Relations/Marketing

Educator/Outreach

Fundraising/Development

other/specify:

**GIS analysis for my organization is performed by:**

Employees

Volunteers

Interns

Outside consultants

other:



**Do you personally use GIS in your role with the organization?**

Yes

No

**I consider GIS to be a vital tool for fulfilling my organization's goals.**

True

False

**My organization uses GIS to practice strategic conservation in order to protect the following resources:**

None (we do not use GIS)

Biodiversity (general)

Species-specific protections

Cultural resources

Historic landmarks

Forest resources

Agricultural lands

Water resources

Undeveloped/open spaces

Renewable energy resources

Viewshed protection

Ecosystem services

other:

**My organization bases decisions about conservation strategy on GIS analysis:**

Always

Frequently

Sometimes

Seldom

Never

**Does your organization use GIS specifically to target or rank individual parcels, areas, or zones for strategic conservation action?**

Yes

No

**What best represents the operational unit or geographic scale most often targeted for strategic conservation action by your organization?**

Real estate parcels

Political unit (county, municipality, state)

Management unit (a sub-division of public lands or other large designated area)

Watershed

Body of water (river, lake, ocean)

Viewshed

Eco-region

Species-specific habitat

other/specify:

**Would you characterize your organization's implementation of GIS to meet strategic conservation goals as:**

Effective

Not effective

Not applicable

comment:

**What are the barriers your organization faces in pursuing GIS-based strategic conservation?**

Cost of software/hardware

Lack of GIS expertise on staff

Limited access to relevant data layers

Not relevant/applicable to our mission/goals

GIS does not produce meaningful results for strategic conservation action

Time constraints

Specific needs mandate a customized GIS application

Lack of/limited access to the internet

User interface/design limitations in the software

other:

**May we contact you for a brief follow-up interview? If so, please provide your contact information below. Feel free to add any comments you feel may be helpful to better understand your responses above.**

Thank you for participating. Please contact Link Elmore at [jlelmore@vt.edu](mailto:jlelmore@vt.edu) if you have any questions.

### Survey Responses

Question/ Response options	Number of responses
<b>Question 1: My organization is a:</b>	
Land Trust	42
Nonprofit agency (other than a land trust)	4
Government agency- Federal	0
Government agency- State	5

Government agency- Municipal	6
Consulting firm (private, for profit)	3
Research institution	1
Educational/teaching institution	1
Lobbying/Advocacy group	0
Other/specify	2
<b>Question 2: My primary role within my organization is:</b>	
Administrative	9
Conservation specialist	25
GIS specialist	17
Stewardship/Monitoring	20
Scientist	2
Historian	0
Public Relations/Marketing	4
Educator/Outreach	4
Fundraising/Development	2
Other/specify:	9
<b>Question 3: Do you personally use GIS in your role with the organization?</b>	
Yes	52
No	9
<b>Question 4: GIS Analysis for my organization is performed by:</b>	
Employees	55
Volunteers	8
Interns	11
Outside consultants	9
Other	3

<b>Question 5: I consider GIS to be a vital tool for fulfilling my organization's goals.</b>	
TRUE	59
FALSE	1
No answer	1
<b>Question 6: My organization uses GIS to practice strategic conservation in order to protect the following resources:</b>	
None (we do not use GIS)	1
Biodiversity (general)	42
Species-specific protections	31
Cultural resources	19
Historic landmarks	13
Forest resources	35
Agricultural lands	41
Water resources	52
Undeveloped/open spaces	44
Renewable energy resources	4
Viewshed protection	33
Ecosystem services	17
Other	5
<b>Question 7: My organization bases decision (either in whole or in part) about conservation strategy on GIS analysis:</b>	
Always	14
Frequently	22
Sometimes	17
Seldom	5
Never	2
No answer	1

<b>Question 8: Does your organization use GIS specifically to target or rank individual parcels, areas, or zones for strategic conservation action?</b>	
Yes	47
No	14
<b>Question 9: What best represents the operational unit or geographic scale most often targeted for strategic conservation action by your organization?</b>	
Real estate parcels	44
Political unit (county, municipality, state)	10
Management unit (a sub-division of public lands or other large designated area)	5
Watershed	21
Body of water (river, lake, ocean)	8
Viewshed	7
Eco-region	6
Species-specific habitat	4
Other/specify:	1
<b>Question 10: Would you characterize your organization's implementation of GIS to meet strategic conservation goals as:</b>	
Effective	52
Not effective	6
Not applicable	3

## Appendix D: Software and Data Sources

### Software

Eastman, J.R., IDRISI Taiga. Worcester, MA: Clark University, 2009.

ESRI. ArcGIS Desktop: Release 10. Redlands, CA: Environmental Systems Research Institute. Software, 2011.

SAS Institute. JMP Version 9. Cary, NC, 1989-2010.

### Data Sources

City of Norton, VA. Real Estate Parcels database, 2009.

Lee County, VA. Tax parcel database, 2010.

The Nature Conservancy. High Knob Forest Matrix, 2009.

----- . Ecological Land Units, 2011.

Scott County, Virginia. Real Estate Parcels database, 2009.

Stephen Shoulders, Emory & Henry College. Manual digitization of Lee County, VA parcels within study area, 2010.

United States Forest Service. George Washington and Jefferson National Forest boundary file, 2009.

----- . Roads in George Washington and Jefferson National Forests, 2009.

----- . Special Biological Areas in George Washington and Jefferson National Forests, 2009.

----- . Streams in George Washington and Jefferson National Forests, 2009.

United States Geological Survey. Digital Elevation Model from Newell, M.R., 2008, *The National Map* products and services directory: U.S. Geological Survey Fact Sheet 2008-3065, 4 p

----- . National Land Cover Dataset from Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, *PE&RS*, Vol. 77(9):858-864.



Virginia Department of Conservation and Recreation, Natural Heritage Database,  
Element Occurrence files, January 2012.

Virginia Department of Environmental Quality. 303D Impaired Waters database, 2011.

Virginia Department of Mines, Minerals, and Energy, Oil/Gas Drilling locations, 2010

Virginia Geographic Information Network, Road Center Lines files, 2011.

Virginia Outdoors Foundation, Conservation Easements Database, 2010

Wise County, Virginia, Real Estate Parcels Database, 2011

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## Appendix E: Evaluation by TNC



Clinch Valley Program  
146 East Main Street  
Abingdon, VA 24210

Tel: (276) 676-2209  
Fax: (276) 676-3819

[nature.org](http://nature.org)

April 1, 2012

Mr. Link Elmore  
520 Court St.  
Abingdon, VA 24210

Re: Masters Degree Project on High Knob (Wise/Scott Counties, Virginia)

Dear Link:

Please allow me to express my gratitude as well as commend you on a job well done on your thesis project! Your work with The Nature Conservancy to analyze our conservation prioritization process and help establish criteria for selecting strategic land protection opportunities in the High Knob area will shape our work in this important area in the coming years.

The Conservancy sets its priorities at the ecoregional scale through a science driven process known as *Conservation by Design (CBD)*. In the Central Appalachians, our organization has used *CBD* established a portfolio of forest, freshwater, and karst areas that if effectively conserved can support the maintenance of biodiversity in this remarkable region. The High Knob area, located in Scott and Wise Counties, Virginia, is a high priority matrix forest block in the Central Appalachians where we intend to work with the U.S. Forest Service and other partners to conserve forest diversity. Within High Knob, the Conservancy maintains data on a variety of important ecological features including but not limited to core forests, rare species, important karst areas, special biological areas, and significant stream tributaries that are part of the Clinch-Powell River watershed.

Prior to your thesis work, the Conservancy has primarily acted in response to emerging tract level conservation opportunities in High Knob. Through your interviews, collection of qualitative data, modeling, and systematic analysis of our stated conservation preferences and decision making factors, we now have a methodology for applying a more strategic framework to our prioritization of properties. After meeting with our staff to collectively identify those factors we use to implement land protection strategies, your work to assess and weight those factors in a GIS has created a layer of conservation preferences that identifies properties within High Knob that are most aligned with our desired conservation outcomes. This set of tract priorities will allow us to become more *proactive* with landowners and target those properties that most contribute to our mission.

As we have discussed, the prioritization model that you developed for our land protection work tracts closely with the biodiversity values that characterize each property within High Knob. It also illuminates the importance of tract size and underlying abiotic factors which the Conservancy maps as Ecological Land Units (ELUs). I found it interesting that in your summary

prioritization map, tracts in the Powell River watershed generally clustered as a higher priority than many tracts that drain into the globally significant Clinch River. Upon our discussion and review of these findings, it is apparent that the weight of cave features and core forest helped drive the relative value of these Powell River drainage tracts. Your finding that there are also many high priority tracts of a relative small size was also illuminating. It appears to me that these smaller tracts' adjacency to the U.S. Forest Service's "special biological areas" played a key factor in their relatively high ranking. It will be difficult for the Conservancy to try and protect these small tracts with traditional tools such as acquisition or conservation easements. However, their value suggests a need for us to explore other strategies that can encourage private owners of these small tracts to manage their properties with sensitivity towards the "special biological areas" of which they are likely a part.

Although you are not able to include prioritization models related to land restoration in your thesis project, I think it would be useful exercise for the Conservancy to use your framework to run these models and set our priorities for prescribed fire, riparian plantings, and invasives species management as appropriate. Our restoration goals for High Knob are not well defined at this time, and clarity on these priorities will be very important if we are to effectively engage the U.S. Forest Service (the major landowner in High Knob) in the future.

Thank you again for your thoughtful, consistent, and helpful work on this project. I wish you the best in your thesis defense and if I can be of any assistance to you in the future, do not hesitate to be in touch.

Best,



Brad Kreps  
The Nature Conservancy  
Clinch Valley Program Director

## Appendix F: Modelbuilder Exports as Python Scripts

Each customized model referenced in the text was built using the ESRI Modelbuilder environment. The Python scripts below are exported from the models as a way of more fully documenting their component tools, sequence, and parameters than is possible using Modelbuilder's graphical flowchart.

### Bio1:Rare Species

```
# -----  
# Bio1.py  
# Created on: 2012-05-07 09:22:07.00000  
# (generated by ArcGIS/ModelBuilder)  
# Description:  
# Creates a raster of cells containing counts of globally rare or threatened species or  
# biological communities.  
# -----  
# Import arcpy module  
import arcpy  
# Check out any necessary licenses  
arcpy.CheckOutExtension("spatial")  
# Set Geoprocessing environments  
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"  
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543  
3529739.20190136"  
# Local variables:  
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"  
nhr_screen_SPC_Clip = "W:\\Ptolemy\\ThesisData\\Default.gdb\\nhr_screen_SPC_Clip"
```

```

nhr_screen_SPC_Clip_PolygonT =
"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\nhr_screen_SPC_Clip_PolygonT
"

raster3 = "C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\RasterCalculator"

Biodiversity1_RareThreatened_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Biodiversity1_RareThreatened_Final"

# Process: Polygon to Raster (2)

arcpy.PolygonToRaster_conversion(nhr_screen_SPC_Clip, "COUNT_relates",
nhr_screen_SPC_Clip_PolygonT, "CELL_CENTER", "COUNT_relates",
ned_mosaic_Clip)

# Process: Raster Calculator

arcpy.gp.RasterCalculator_sa("Con(IsNull(\\\"%nhr_screen_SPC_Clip_PolygonT%\\\"),0,\\\"
%nhr_screen_SPC_Clip_PolygonT%\\\"), raster3)

# Process: Fuzzy Membership

arcpy.gp.FuzzyMembership_sa(raster3, Biodiversity1_RareThreatened_Final, "LINEAR
0 147", "NONE")

```

## **Bio2: Karst and Caves**

```

# -----
# Bio2.py
# Created on: 2012-05-07 09:29:50.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of areas overlaying limestone karst geology or that contain an
entrance to a biosignificant cave.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments

```

```

arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"

arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"

# Local variables:

ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"

HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"

va_cvp_signif_caves_2006_shp =
"W:\\Ptolemy\\ThesisData\\Jan2012Data\\caves\\va_cvp_signif_caves_2006.shp"

nhr_screen_SPC = "W:\\Ptolemy\\ThesisData\\Default.gdb\\nhr_screen_SPC"

Output_Layer__2_ = "nhr_screen_SPC_Layer"

NHR_Screen_Layer = "nhr_screen_SPC_Layer"

NHR_Screen_PolygonToRaster1 =
"C:\\Users\\lelmore\\Documents\\ArcGIS\\Default.gdb\\nhr_screen_SPC_PolygonToRast
"

Biodiversity2_Geology_Final =
"C:\\Users\\lelmore\\Documents\\ArcGIS\\Default.gdb\\Extract_nhr_1"

va_cvp_signif_caves_2006_Pro4 =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\va_cvp_signif_caves_2006_Pro4"

va_cvp_signif_caves_2006_Pro2 =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\va_cvp_signif_caves_2006_Pro2"

Output_raster = "C:\\Users\\lelmore\\Documents\\ArcGIS\\Default.gdb\\Extract_va_c1"

raster2 = "C:\\Users\\lelmore\\Documents\\ArcGIS\\Default.gdb\\RasterCalculator1"

raster1 = "C:\\Users\\lelmore\\Documents\\ArcGIS\\Default.gdb\\RasterCalculator2"

Output_raster__2_ =
"C:\\Users\\lelmore\\Documents\\ArcGIS\\Default.gdb\\Plus_RasterC1"

Biodiversity2_Geology_Final__3_ =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Biodiversity2_Geology_Final"

# Process: Project

arcpy.Project_management(va_cvp_signif_caves_2006_shp,
va_cvp_signif_caves_2006_Pro4,

```

```
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.666666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.3333333333
334],UNIT['Foot_US',0.3048006096012192]]", "",
"GEOGCS['GCS_North_American_1983',DATUM['D_North_American_1983',SPHEROI
D['GRS_1980',6378137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.
0174532925199433]]")
```

```
# Process: Polygon to Raster (2)
```

```
arcpy.PolygonToRaster_conversion(va_cvp_signif_caves_2006_Pro4, "OBJECTID",
va_cvp_signif_caves_2006_Pro2, "CELL_CENTER", "NONE", ned_mosaic_Clip)
```

```
# Process: Extract by Mask (2)
```

```
arcpy.gp.ExtractByMask_sa(va_cvp_signif_caves_2006_Pro2, HighKnobForestMatrix,
Output_raster)
```

```
# Process: Raster Calculator (2)
```

```
arcpy.gp.RasterCalculator_sa("Con(IsNull(\"%Output raster%\"),0,1)", raster2)
```

```
# Process: Make Feature Layer (2)
```

```
arcpy.MakeFeatureLayer_management(nhr_screen_SPC, Output_Layer__2_, "", "",
"OBJECTID OBJECTID VISIBLE NONE;Shape Shape VISIBLE NONE;NHR_ID
NHR_ID VISIBLE NONE;SITENAME SITENAME VISIBLE NONE;BRANK BRANK
VISIBLE NONE;BR_SIGNIF BR_SIGNIF VISIBLE NONE;LEGSTATUS LEGSTATUS
VISIBLE NONE;ACRES ACRES VISIBLE NONE;SITE_DESC SITE_DESC VISIBLE
NONE;TYPE TYPE VISIBLE NONE;FWS_SOC FWS_SOC VISIBLE
NONE;Count_Spec Count_Spec VISIBLE NONE;Shape_Length Shape_Length
VISIBLE NONE;Shape_Area Shape_Area VISIBLE NONE")
```

```
# Process: Select Layer By Attribute (2)
```

```
arcpy.SelectLayerByAttribute_management(Output_Layer__2_, "NEW_SELECTION",
 "\"SITE_DESC\" = 'Site encompasses land containing one or more biologically
significant karst resources.'")
```

```
# Process: Polygon to Raster
```

```
arcpy.PolygonToRaster_conversion(NHR_Screen_Layer, "OBJECTID",
NHR_Screen_PolygonToRaster1, "CELL_CENTER", "NONE", ned_mosaic_Clip)
```



```

# Process: Extract by Mask
arcpy.gp.ExtractByMask_sa(NHR_Screen_PolygonToRaster1, HighKnobForestMatrix,
Biodiversity2_Geology_Final)
# Process: Raster Calculator
arcpy.gp.RasterCalculator_sa("Con(IsNull(\"%Biodiversity2_Geology_Final%\"),0,1)",
raster1)
# Process: Plus
arcpy.gp.Plus_sa(raster2, raster1, Output_raster__2_)
# Process: Fuzzy Membership
arcpy.gp.FuzzyMembership_sa(Output_raster__2_, Biodiversity2_Geology_Final__3_,
"LINEAR 0 2", "NONE")

```

### **Bio3: ELU Rarity**

```

# -----
# Bio3.py
# Created on: 2012-05-07 09:30:09.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of ecological management unit (ELU) rarity within the High Knob
Matrix, weighted by their frequency of occurrence at the (smaller-scale) Central
Appalachian Integrated Landscape.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")

# Load required toolboxes
arcpy.ImportToolbox("Model Functions")

```

# Local variables:

csvr\_elu30\_ProjectRaster =

"W:\\Ptolemy\\ThesisData\\Default.gdb\\csvr\_elu30\_ProjectRaster"

Biodiversity1\_RareThreatened\_Final = "Biodiversity1\_RareThreatened\_Final"

FuzzyMe\_Look1 =

"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\FuzzyMe\_Look1"

Biodiversity3\_ELU\_prelim =

"W:\\Ptolemy\\ThesisData\\Default.gdb\\Biodiversity3\_ELU\_prelim"

ELU\_ProjectRaster\_\_2\_ =

"W:\\Ptolemy\\ThesisData\\Default.gdb\\csvr\_elu30\_ProjectRaster"

csvr\_elu30\_ProjectRaster\_Sta =

"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\csvr\_elu30\_ProjectRaster\_Sta"

Lookup\_csvr\_1 =

"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\Lookup\_csvr\_1"

elu30\_csvr\_spcc\_\_2\_ =

"W:\\Ptolemy\\ThesisData\\Default.gdb\\csvr\_elu30\_ProjectRaster"

Biodiversity3\_ELU\_Final =

"W:\\Ptolemy\\ThesisData\\Result.gdb\\Biodiversity3\_ELU\_Final"

# Process: Summary Statistics

arcpy.Statistics\_analysis(csvr\_elu30\_ProjectRaster, csvr\_elu30\_ProjectRaster\_Sta,  
"COUNT SUM", "")

# Process: Get Field Value

arcpy.GetFieldValue\_mb(csvr\_elu30\_ProjectRaster\_Sta, "SUM\_COUNT", "Double",  
"0")

# Process: Add Field

arcpy.AddField\_management(csvr\_elu30\_ProjectRaster, "PerCentGlobal", "DOUBLE",  
"", "", "", "", "NULLABLE", "NON\_REQUIRED", "")

# Process: Calculate Field

arcpy.CalculateField\_management(ELU\_ProjectRaster\_\_2\_, "PerCentGlobal", "[Count]  
/Value%", "VB", "")

```

# Process: Lookup
arcpy.gp.Lookup_sa(elu30_csrsv_spcc__2_, "PerCentGlobal", Lookup_csrsv_1)

# Process: Fuzzy Membership
arcpy.gp.FuzzyMembership_sa(Lookup_csrsv_1, FuzzyMe_Look1, "SMALL
5.67092857686671E-02 5", "NONE")

# Process: Extract by Mask
tempEnvironment0 = arcpy.env.snapRaster
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
tempEnvironment1 = arcpy.env.extent
arcpy.env.extent = "DEFAULT"

arcpy.gp.ExtractByMask_sa(FuzzyMe_Look1, Biodiversity1_RareThreatened_Final,
Biodiversity3_ELU_prelim)

arcpy.env.snapRaster = tempEnvironment0
arcpy.env.extent = tempEnvironment1

# Process: Fuzzy Membership (2)
arcpy.gp.FuzzyMembership_sa(Biodiversity3_ELU_prelim, Biodiversity3_ELU_Final,
"LINEAR 3.03022414445877E-02 1", "NONE")

```

### **Spatial 1: Parcel Size**

```

# -----
# Spatial1.py
# Created on: 2012-05-07 09:30:29.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of cells containing values between 0 and 1 for membership based on
the acreage of the corresponding parcel. Fuzzy values are based on a linear scale
(skewed in display by the large USFS parcels). Cells contained by parcels with more
acreage are closer to 1. Smaller parcels will contain cells with values closer to 0.
# -----
# Import arcpy module

```

```

import arcpy

# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")

# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"

arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"

# Local variables:
HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
LeeParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
NortonParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"
ScottParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
WiseParcels2011 = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"

Output_Dataset =
"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\WiseParcels2011_Merge2"

ZonalGe_Wise1 =
"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\ZonalGe_Wise1"

Output_raster__2_ =
"C:\\Users\\lmore\\Documents\\ArcGIS\\Default.gdb\\Extract_Zona1"

Spatial1_Parcel_Size_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial1_Parcel_Size_Final"

# Process: Merge

arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011;W:\\
\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\N
ortonParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels", Output_Dataset,
"OBJECTID_1 \\OBJECTID_1" true false false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-

```

```

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1;PARCEL_ID \"PARCEL_ID\" true false false 16 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-
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\"MAP_NO\" true false false 45 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NO,-1,-
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\"CHECK2\" true false false 200 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,CHECK2,-1,-
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\"NEWFIELD1\" true false false 8 Double 0 0
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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,ACCOUNT,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,ACCOUNT,-1,-1;Calculatio
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\"hotlink_pl\" true false false 50 Text 0 0
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1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,hotlink_pl,-1,-1;X \"X\" true
false false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,X,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,X,-1,-
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1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,X,-1,-1;Y \"Y\" true false false 8
Double 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,Y,-1,-
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false 10 Text 0 0
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true true false 8 Date 0 0
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```

```

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1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape_Length,-1,-
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```

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1;PARCEL\_TYP \"PARCEL\_TYP\" true true false 30 Text 0 0  
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1;PARCEL\_NUM \"PARCEL\_NUM\" true true false 25 Text 0 0  
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1;MAINTENANC \"MAINTENANC\" true true false 50 Text 0 0  
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\"PrevOwne\_2\" true true false 254 Text 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PrevOwne\_2,-1,-1;PrevOwne\_3  
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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PrevOwne\_3,-1,-  
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\"PrevOwne\_4\" true true false 254 Text 0 0  
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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,YearRemode,-1,-  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,YearAssess,-1,-1;Residentia  
\"Residentia\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Residentia,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Residentia,-1,-1;Commercial  
\"Commercial\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Commercial,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Commercial,-1,-1;PropertyDe  
\"PropertyDe\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyDe,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyDe,-1,-1;NumStories  
\"NumStories\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumStories,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumStories,-1,-1;NumRooms  
\"NumRooms\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumRooms,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumRooms,-1,-1;NumBedroom  
\"NumBedroom\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumBedroom,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumBedroom,-1,-1;NumBaths  
\"NumBaths\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumBaths,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumBaths,-1,-1;NumFirepla  
\"NumFirepla\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumFirepla,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumFirepla,-1,-1;NumChimney  
\"NumChimney\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumChimney,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NumChimney,-1,-1;SplitLevel  
\"SplitLevel\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SplitLevel,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SplitLevel,-1,-1;SplitFoyer  
\"SplitFoyer\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SplitFoyer,-1,-

1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SplitFoyer,-1,-1;CentralHea  
\"CentralHea\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CentralHea,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CentralHea,-1,-1;CentralAir  
\"CentralAir\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CentralAir,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CentralAir,-1,-1;TypeRoof  
\"TypeRoof\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeRoof,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeRoof,-1,-1;TypeExteri  
\"TypeExteri\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeExteri,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeExteri,-1,-1;ExteriorCo  
\"ExteriorCo\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ExteriorCo,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ExteriorCo,-1,-1;TypeFounda  
\"TypeFounda\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFounda,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFounda,-1,-1;TypeBaseme  
\"TypeBaseme\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeBaseme,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeBaseme,-1,-1;TypeFloor  
\"TypeFloor\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFloor,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFloor,-1,-1;TypeWalls  
\"TypeWalls\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-1;TypeFuel  
\"TypeFuel\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFuel,-1,-  
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\"ClassCode\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-1;Zoning  
\"Zoning\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Zoning,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Zoning,-1,-1;Neighborho  
\"Neighborho\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-1;PropertyUs  
\"PropertyUs\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyUs,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyUs,-1,-1;DescMainBu  
\"DescMainBu\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainBu,-1,-

1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainBu,-1,-1;SqFtMainAr  
 \"SqFtMainAr\" true true false 254 Text 0 0  
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 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainLa,-1,-1;SizeLandFI  
 \"SizeLandFI\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandFI,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandFI,-1,-1;SizeLandCo  
 \"SizeLandCo\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandCo,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandCo,-1,-1;PublicWate  
 \"PublicWate\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicWate,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicWate,-1,-1;PublicSewe  
 \"PublicSewe\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicSewe,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicSewe,-1,-1;Well \"Well\"  
 true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Well,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Well,-1,-1;Spring \"Spring\" true  
 true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Spring,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Spring,-1,-1;SepticTank  
 \"SepticTank\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SepticTank,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SepticTank,-1,-1;Undergroun  
 \"Undergroun\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Undergroun,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Undergroun,-1,-1;PavedRoad  
 \"PavedRoad\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PavedRoad,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PavedRoad,-1,-1;DirtRoad  
 \"DirtRoad\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DirtRoad,-1,-  
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 \"NoRoad\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NoRoad,-1,-  
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 \"CurbsGutte\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CurbsGutte,-1,-  
 1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CurbsGutte,-1,-1;Sidewalks  
 \"Sidewalks\" true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Sidewalks,-1,-

1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Sidewalks,-1,-1;Topography  
\"Topography\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Topography,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Topography,-1,-1;Temp\_1  
\"Temp\_1\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Temp\_1,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Temp\_1,-1,-1;MAP\_TAXMAP  
\"MAP\_TAXMAP\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_TAXMAP,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_TAXMAP,-1,-  
1;MAP\_DBL CIR \"MAP\_DBL CIR\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBL CIR,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBL CIR,-1,-1;MAP\_BLK  
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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLK,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLK,-1,-1;MAP\_LOT  
\"MAP\_LOT\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_LOT,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_LOT,-1,-1;UPDATED\_BY  
\"UPDATED\_BY\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATED\_BY,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATED\_BY,-1,-  
1;YEAR\_UPDAT \"YEAR\_UPDAT\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,YEAR\_UPDAT,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,YEAR\_UPDAT,-1,-  
1;QUARTER\_UP \"QUARTER\_UP\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,QUARTER\_UP,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,QUARTER\_UP,-1,-  
1;UPDATE\_TYP \"UPDATE\_TYP\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATE\_TYP,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATE\_TYP,-1,-  
1;LINK\_STATU \"LINK\_STATU\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,LINK\_STATU,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,LINK\_STATU,-1,-  
1;WVS\_COMMENT \"WVS\_COMMENT\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_COMMENT,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_COMMENT,-1,-  
1;WVS\_SPATIA \"WVS\_SPATIA\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_SPATIA,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_SPATIA,-1,-  
1;MAP\_BLOCK\_ \"MAP\_BLOCK\_\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLOCK\_,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLOCK\_,-1,-  
1;MAP\_DBL C\_1 \"MAP\_DBL C\_1\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBL C\_1,-1,-

```

1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP_DBLC_1,-1,-1;MapOwner
"MapOwner" true true false 100 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MapOwner,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MapOwner,-1,-1;Id "Id" true true
false 4 Long 0 0 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Id,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Id,-1,-1;Sheet1__FID
"Sheet1__FID" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__FID,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__FID,-1,-
1;Sheet1__Account__ "Sheet1__Account__" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Account__, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Account__, -1,-
1;Sheet1__Seq_ "Sheet1__Seq_" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Seq_, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Seq_, -1,-
1;Sheet1__District "Sheet1__District" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__District, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__District, -1,-
1;Sheet1__Name "Sheet1__Name" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Name, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Name, -1,-
1;Sheet1__Name_2 "Sheet1__Name_2" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Name_2, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Name_2, -1,-
1;Sheet1__Addr_1 "Sheet1__Addr_1" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Addr_1, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Addr_1, -1,-
1;Sheet1__Addr_2 "Sheet1__Addr_2" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Addr_2, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Addr_2, -1,-
1;Sheet1__City_State "Sheet1__City_State" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__City_State, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__City_State, -1,-
1;Sheet1__Zip_1 "Sheet1__Zip_1" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Zip_1, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Zip_1, -1,-
1;Sheet1__Zip_2 "Sheet1__Zip_2" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Zip_2, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Zip_2, -1,-
1;Sheet1__Map__ "Sheet1__Map__" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Map__, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Map__, -1,-
1;Sheet1__Desc_1 "Sheet1__Desc_1" true true false 255 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Desc_1, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Desc_1, -1,-

```

1;Sheet1\_\_Desc\_2 \"Sheet1\_\_Desc\_2\" true true false 255 Text 0 0  
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1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_2,-1,-  
1;Sheet1\_\_Desc\_3 \"Sheet1\_\_Desc\_3\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_3,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_3,-1,-  
1;Sheet1\_\_Desc\_4 \"Sheet1\_\_Desc\_4\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_4,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_4,-1,-  
1;Sheet1\_\_Class\_Code \"Sheet1\_\_Class\_Code\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Class\_Code,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Class\_Code,-1,-  
1;Sheet1\_\_Year\_Built \"Sheet1\_\_Year\_Built\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Year\_Built,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Year\_Built,-1,-  
1;Sheet1\_\_Year\_Rmld \"Sheet1\_\_Year\_Rmld\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Year\_Rmld,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Year\_Rmld,-1,-  
1;Sheet1\_\_Info \"Sheet1\_\_Info\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Info,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Info,-1,-  
1;Sheet1\_\_Stories \"Sheet1\_\_Stories\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Stories,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Stories,-1,-  
1;Sheet1\_\_Rooms \"Sheet1\_\_Rooms\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Rooms,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Rooms,-1,-  
1;Sheet1\_\_Bedrooms \"Sheet1\_\_Bedrooms\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Bedrooms,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Bedrooms,-1,-  
1;Sheet1\_\_Baths \"Sheet1\_\_Baths\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Baths,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Baths,-1,-  
1;Sheet1\_\_Half\_Baths \"Sheet1\_\_Half\_Baths\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Half\_Baths,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Half\_Baths,-1,-  
1;Sheet1\_\_Fireplaces \"Sheet1\_\_Fireplaces\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Fireplaces,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Fireplaces,-1,-  
1;Sheet1\_\_Chimneys \"Sheet1\_\_Chimneys\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Chimneys,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Chimneys,-1,-  
1;Sheet1\_\_Dwelling\_Type \"Sheet1\_\_Dwelling\_Type\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Type,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Type,-1,-

1;Sheet1\_\_Grade \"Sheet1\_\_Grade\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Grade,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Grade,-1,-  
1;Sheet1\_\_Land\_Value \"Sheet1\_\_Land\_Value\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Land\_Value,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Land\_Value,-1,-  
1;Sheet1\_\_Dwelling\_Value \"Sheet1\_\_Dwelling\_Value\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Value,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Value,-1,-  
1;Sheet1\_\_Improvement\_Value \"Sheet1\_\_Improvement\_Value\" true true false 8  
Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Improvement\_Value,  
-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Improvement\_Value,-  
1,-1;Sheet1\_\_Commercial\_Dwelling\_Value \"Sheet1\_\_Commercial\_Dwelling\_Value\"  
true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Commercial\_Dwelling  
g\_Value,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Commercial\_Dwelling\_Val  
ue,-1,-1;Sheet1\_\_Total\_Value \"Sheet1\_\_Total\_Value\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Total\_Value,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Total\_Value,-1,-  
1;Sheet1\_\_Dwelling\_Condition \"Sheet1\_\_Dwelling\_Condition\" true true false 255 Text  
0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Condition,-  
1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Condition,-1,-  
1;Sheet1\_\_Commercial \"Sheet1\_\_Commercial\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Commercial,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Commercial,-1,-  
1;Sheet1\_\_Consideration\_Amount \"Sheet1\_\_Consideration\_Amount\" true true false 8  
Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Consideration\_Amou  
nt,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Consideration\_Amount,-  
1,-1;Sheet1\_\_Acres \"Sheet1\_\_Acres\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Acres,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Acres,-1,-  
1;Sheet1\_\_Plat\_Book \"Sheet1\_\_Plat\_Book\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Plat\_Book,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Plat\_Book,-1,-  
1;Sheet1\_\_Plat\_Page \"Sheet1\_\_Plat\_Page\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Plat\_Page,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Plat\_Page,-1,-  
1;Sheet1\_\_Deed\_Book \"Sheet1\_\_Deed\_Book\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Deed\_Book,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Deed\_Book,-1,-

```

1;Sheet1__Deed_Page \"Sheet1__Deed_Page\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Deed_Page,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Deed_Page,-1,-
1;Sheet1__Will_Book \"Sheet1__Will_Book\" true true false 255 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Will_Book,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Will_Book,-1,-
1;Sheet1__Will_Page \"Sheet1__Will_Page\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Will_Page,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Will_Page,-1,-
1;Sheet1__Recorded_Date \"Sheet1__Recorded_Date\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Recorded_Date,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Recorded_Date,-1,-
1;Sheet1__Inst_Type \"Sheet1__Inst_Type\" true true false 255 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Type,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Type,-1,-
1;Sheet1__Inst_Year \"Sheet1__Inst_Year\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Year,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Year,-1,-
1;Sheet1__Instrument__ \"Sheet1__Instrument__\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Instrument__, -1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Instrument__, -1,-
1;CountyName \"CountyName\" true true false 50 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,CountyName,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,CountyName,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CountyName,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,CountyName,-1,-1")

```

```
# Process: Zonal Geometry
```

```
arcpy.gp.ZonalGeometry_sa(Output_Dataset, "OBJECTID", ZonalGe_Wise1, "AREA",
ned_mosaic_Clip)
```

```
# Process: Extract by Mask
```

```
arcpy.gp.ExtractByMask_sa(ZonalGe_Wise1, HighKnobForestMatrix,
Output_raster__2_)
```

```
# Process: Fuzzy Membership
```

```
arcpy.gp.FuzzyMembership_sa(Output_raster__2_, Spatial1_Parcel_Size_Final,
"LINEAR # 14798573", "NONE")
```

## Spatial 2: Adjacent to Protected

```
# -----
```

```
# Spatial2.py
```



```

# Created on: 2012-05-07 09:30:49.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of integer values (1,0) indicating whether the cell is contained by a
# parcel that is adjacent to protected land.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
# Local variables:
LeeParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
NortonParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"
ScottParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
WiseParcels2011 = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"
HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"
USFS_Land = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land"
VOF_Easements = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements"
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
Output_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge2"
Output_Dataset__2_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Land_Merge"
Output_Feature_Class =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge2_Clip"

```

```

Output_Feature_Class__2_ =
"W:\Ptolemy\ThesisData\Default.gdb\USFS_Land_Merge_Clip"

Output_Layer = "WiseParcels2011_Merge2_Clip_"

Output_Layer__2_ = "USFS_Land_Merge_Clip_Layer"

WiseParcels2011_Merge2_Clip_ = "WiseParcels2011_Merge2_Clip_"

WiseParcels2011_Merge2_Clip__2_ = "WiseParcels2011_Merge2_Clip_"

Feature_Wise1 = "W:\Ptolemy\ThesisData\Default.gdb\Feature_Wise1"

Spatial2_AdjacentProtected_Final =
"W:\Ptolemy\ThesisData\Result.gdb\Spatial2_AdjacentProtected_Final"

```

```
# Process: Merge
```

```

arcpy.Merge_management("W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011;W:\
Ptolemy\HighKnob.gdb\Parcels\ScottParcels;W:\Ptolemy\HighKnob.gdb\Parcels\N
ortonParcels;W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels", Output_Dataset,
"OBJECTID_1 \"OBJECTID_1\" true false false 4 Long 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,OBJECTID_1,-1,-
1;MAP_NUMBER \"MAP_NUMBER\" true false false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,MAP_NUMBER,-1,-
1;PARCEL_ID \"PARCEL_ID\" true false false 16 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,PARCEL_ID,-1,-
1;MAP_NO \"MAP_NO\" true false false 45 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,MAP_NO,-1,-
1;CHECK2 \"CHECK2\" true false false 200 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,CHECK2,-1,-
1;NEWFIELD1 \"NEWFIELD1\" true false false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,NEWFIELD1,-1,-1;PLAT
\"PLAT\" true false false 47 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,PLAT,-1,-1;ACCOUNT
\"ACCOUNT\" true false false 9 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,ACCOUNT,-1,-
1;Calculatio \"Calculatio\" true false false 2 Short 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Calculatio,-1,-1;Hotlink
\"Hotlink\" true false false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Hotlink,-1,-1;hotlink_pl
\"hotlink_pl\" true false false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,hotlink_pl,-1,-1;X \"X\"
true false false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,X,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,X,-1,-1;Y \"Y\" true false false 8
Double 0 0 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Y,-1,-

```

1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Y,-1,-1;Status "Status" true false  
false 10 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Status,-1,-1;Date\_  
"Date\_" true true false 8 Date 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Date\_,-1,-1;Tech  
"Tech" true false false 10 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Tech,-1,-1;Comment  
"Comment" true false false 50 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Comment,-1,-  
1;DEED\_USED "DEED\_USED" true false false 10 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,DEED\_USED,-1,-  
1;Assessment "Assessment" true false false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Assessment,-1,-  
1;Shape\_Leng "Shape\_Leng" true false false 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Shape\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,SHAPE\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Leng,-1,-  
1;SHAPE\_Length "SHAPE\_Length" false true true 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,SHAPE\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Shape\_Length,-1,-1;SHAPE\_Area  
"SHAPE\_Area" false true true 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,SHAPE\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Shape\_Area,-1,-1;CountyName  
"CountyName" true true false 50 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,CountyName,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,CountyName,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CountyName,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,CountyName,-1,-1;ACCOUNT\_NU  
"ACCOUNT\_NU" true true false 4 Long 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,ACCOUNT\_NU,-1,-  
1;DISTRICT "DISTRICT" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,DISTRICT,-1,-1;MAP\_NUM  
"MAP\_NUM" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,MAP\_NUM,-1,-1;CALC\_AC  
"CALC\_AC" true true false 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,CALC\_AC,-1,-1;SUBCODE  
"SUBCODE" true true false 6 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,SUBCODE,-1,-  
1;LRK\_NUMBER "LRK\_NUMBER" true true false 4 Long 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,LRK\_NUMBER,-1,-  
1;PARCEL\_TYP "PARCEL\_TYP" true true false 30 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,PARCEL\_TYP,-1,-1;PARCEL\_NUM \"PARCEL\_NUM\" true true false 25 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,PARCEL\_NUM,-1,-1;MAINTENANC \"MAINTENANC\" true true false 50 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,MAINTENANC,-1,-1;GPIN \"GPIN\" true true false 10 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,GPIN,-1,-1;AccountNum \"AccountNum\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,AccountNum,-1,-1;CAMA\_LINK \"CAMA\_LINK\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CAMA\_LINK,-1,-1;MAP\_PIN \"MAP\_PIN\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_PIN,-1,-1;OwnerName \"OwnerName\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerName,-1,-1;OwnerAddr1 \"OwnerAddr1\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerAddr1,-1,-1;OwnerAddr2 \"OwnerAddr2\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerAddr2,-1,-1;OwnerCityS \"OwnerCityS\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerCityS,-1,-1;OwnerZip \"OwnerZip\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerZip,-1,-1;DeedBook \"DeedBook\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DeedBook,-1,-1;ValueImpro \"ValueImpro\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueImpro,-1,-1;ValueLand \"ValueLand\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueLand,-1,-1;Considerat \"Considerat\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Considerat,-1,-1;DateTransf \"DateTransf\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DateTransf,-1,-1;PrevOwner1 \"PrevOwner1\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwner1,-1,-1;PrevOwne\_1 \"PrevOwne\_1\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_1,-1,-1;PrevOwne\_2 \"PrevOwne\_2\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_2,-1,-1;PrevOwne\_3 \"PrevOwne\_3\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_3,-1,-1;PrevOwne\_4 \"PrevOwne\_4\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_4,-1,-1;Prev1DeedB \"Prev1DeedB\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Prev1DeedB,-1,-

1;Prev1Consi \"Prev1Consi\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Prev1Consi,-1,-  
1;TaxMapNum \"TaxMapNum\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TaxMapNum,-1,-  
1;StreetNum \"StreetNum\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetNum,-1,-  
1;StreetName \"StreetName\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetName,-1,-1;ZipCode  
\"ZipCode\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ZipCode,-1,-1;YearBuilt  
\"YearBuilt\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearBuilt,-1,-  
1;YearRemode \"YearRemode\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearRemode,-1,-  
1;YearAssess \"YearAssess\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearAssess,-1,-  
1;Residentia \"Residentia\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Residentia,-1,-  
1;Commercial \"Commercial\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Commercial,-1,-  
1;PropertyDe \"PropertyDe\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PropertyDe,-1,-  
1;NumStories \"NumStories\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumStories,-1,-  
1;NumRooms \"NumRooms\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumRooms,-1,-  
1;NumBedroom \"NumBedroom\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumBedroom,-1,-  
1;NumBaths \"NumBaths\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumBaths,-1,-  
1;NumFirepla \"NumFirepla\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumFirepla,-1,-  
1;NumChimney \"NumChimney\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumChimney,-1,-  
1;SplitLevel \"SplitLevel\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SplitLevel,-1,-1;SplitFoyer  
\"SplitFoyer\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SplitFoyer,-1,-1;CentralHea  
\"CentralHea\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralHea,-1,-1;CentralAir  
\"CentralAir\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralAir,-1,-1;TypeRoof  
\"TypeRoof\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeRoof,-1,-1;TypeExteri  
\"TypeExteri\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeExteri,-1,-1;ExteriorCo  
\"ExteriorCo\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ExteriorCo,-1,-  
1;TypeFounda \"TypeFounda\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFounda,-1,-  
1;TypeBaseme \"TypeBaseme\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeBaseme,-1,-  
1;TypeFloor \"TypeFloor\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFloor,-1,-1;TypeWalls  
\"TypeWalls\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-1;TypeFuel  
\"TypeFuel\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFuel,-1,-1;ClassCode  
\"ClassCode\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-1;Zoning  
\"Zoning\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Zoning,-1,-1;Neighborho  
\"Neighborho\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-  
1;PropertyUs \"PropertyUs\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyUs,-1,-  
1;DescMainBu \"DescMainBu\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainBu,-1,-  
1;SqFtMainAr \"SqFtMainAr\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SqFtMainAr,-1,-  
1;DescMainLa \"DescMainLa\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainLa,-1,-  
1;SizeLandFI \"SizeLandFI\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandFI,-1,-  
1;SizeLandCo \"SizeLandCo\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandCo,-1,-  
1;PublicWate \"PublicWate\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicWate,-1,-  
1;PublicSewe \"PublicSewe\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicSewe,-1,-1;Well  
\"Well\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Well,-1,-1;Spring \"Spring\"  
true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Spring,-1,-1;SepticTank  
\"SepticTank\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SepticTank,-1,-  
1;Undergroun \"Undergroun\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Undergroun,-1,-  
1;PavedRoad \"PavedRoad\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PavedRoad,-1,-1;DirtRoad

\DirtRoad\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DirtRoad,-1,-1;NoRoad  
 \NoRoad\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,NoRoad,-1,-1;CurbsGutte  
 \CurbsGutte\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CurbsGutte,-1,-1;Sidewalks  
 \Sidewalks\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Sidewalks,-1,-  
 1;Topography \Topography\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Topography,-1,-1;Temp\_1  
 \Temp\_1\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Temp\_1,-1,-  
 1;MAP\_TAXMAP \MAP\_TAXMAP\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_TAXMAP,-1,-  
 1;MAP\_DBLCIR \MAP\_DBLCIR\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBLCIR,-1,-  
 1;MAP\_BLK \MAP\_BLK\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLK,-1,-1;MAP\_LOT  
 \MAP\_LOT\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_LOT,-1,-  
 1;UPDATED\_BY \UPDATED\_BY\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATED\_BY,-1,-  
 1;YEAR\_UPDAT \YEAR\_UPDAT\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,YEAR\_UPDAT,-1,-  
 1;QUARTER\_UP \QUARTER\_UP\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,QUARTER\_UP,-1,-  
 1;UPDATE\_TYP \UPDATE\_TYP\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATE\_TYP,-1,-  
 1;LINK\_STATU \LINK\_STATU\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,LINK\_STATU,-1,-  
 1;WVS\_COMMENT \WVS\_COMMENT\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_COMMENT,-1,-  
 1;WVS\_SPATIA \WVS\_SPATIA\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_SPATIA,-1,-  
 1;MAP\_BLOCK\_ \MAP\_BLOCK\_\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLOCK\_,-1,-  
 1;MAP\_DBLC\_1 \MAP\_DBLC\_1\ true true false 254 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBLC\_1,-1,-  
 1;MapOwner \MapOwner\ true true false 100 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MapOwner,-1,-1;Id \Id\  
 true true false 4 Long 0 0 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Id,-  
 1,-1;Sheet1\_\_FID \Sheet1\_\_FID\ true true false 8 Double 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_FID,-1,-  
 1;Sheet1\_\_Account\_ \Sheet1\_\_Account\_\ true true false 8 Double 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Account\_,-1,-

1;Sheet1\_\_Seq\_ \"Sheet1\_\_Seq\_\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Seq\_,-1,-  
1;Sheet1\_\_District \"Sheet1\_\_District\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_District,-1,-  
1;Sheet1\_\_Name \"Sheet1\_\_Name\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Name,-1,-  
1;Sheet1\_\_Name\_2 \"Sheet1\_\_Name\_2\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Name\_2,-1,-  
1;Sheet1\_\_Addr\_1 \"Sheet1\_\_Addr\_1\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Addr\_1,-1,-  
1;Sheet1\_\_Addr\_2 \"Sheet1\_\_Addr\_2\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Addr\_2,-1,-  
1;Sheet1\_\_City\_State \"Sheet1\_\_City\_State\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_City\_State,-1,-  
1;Sheet1\_\_Zip\_1 \"Sheet1\_\_Zip\_1\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Zip\_1,-1,-  
1;Sheet1\_\_Zip\_2 \"Sheet1\_\_Zip\_2\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Zip\_2,-1,-  
1;Sheet1\_\_Map\_ \"Sheet1\_\_Map\_\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Map\_,-1,-  
1;Sheet1\_\_Desc\_1 \"Sheet1\_\_Desc\_1\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_1,-1,-  
1;Sheet1\_\_Desc\_2 \"Sheet1\_\_Desc\_2\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_2,-1,-  
1;Sheet1\_\_Desc\_3 \"Sheet1\_\_Desc\_3\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_3,-1,-  
1;Sheet1\_\_Desc\_4 \"Sheet1\_\_Desc\_4\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Desc\_4,-1,-  
1;Sheet1\_\_Class\_Code \"Sheet1\_\_Class\_Code\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Class\_Code,-1,-  
1;Sheet1\_\_Year\_Built \"Sheet1\_\_Year\_Built\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Year\_Built,-1,-  
1;Sheet1\_\_Year\_Rmld \"Sheet1\_\_Year\_Rmld\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Year\_Rmld,-1,-  
1;Sheet1\_\_Info \"Sheet1\_\_Info\" true true false 255 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Info,-1,-  
1;Sheet1\_\_\_\_Stories \"Sheet1\_\_\_\_Stories\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_\_\_Stories,-1,-  
1;Sheet1\_\_\_\_Rooms \"Sheet1\_\_\_\_Rooms\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_\_\_Rooms,-1,-  
1;Sheet1\_\_\_\_Bedrooms \"Sheet1\_\_\_\_Bedrooms\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_\_\_Bedrooms,-1,-  
1;Sheet1\_\_\_\_Baths \"Sheet1\_\_\_\_Baths\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_\_\_Baths,-1,-  
1;Sheet1\_\_\_\_Half\_Baths \"Sheet1\_\_\_\_Half\_Baths\" true true false 8 Double 0 0



,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Half\_Baths,-1,-1;Sheet1\_\_Fireplaces \"Sheet1\_\_Fireplaces\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Fireplaces,-1,-1;Sheet1\_\_Chimneys \"Sheet1\_\_Chimneys\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Chimneys,-1,-1;Sheet1\_\_Dwelling\_Type \"Sheet1\_\_Dwelling\_Type\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Dwelling\_Type,-1,-1;Sheet1\_\_Grade \"Sheet1\_\_Grade\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Grade,-1,-1;Sheet1\_\_Land\_Value \"Sheet1\_\_Land\_Value\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Land\_Value,-1,-1;Sheet1\_\_Dwelling\_Value \"Sheet1\_\_Dwelling\_Value\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Dwelling\_Value,-1,-1;Sheet1\_\_Improvement\_Value \"Sheet1\_\_Improvement\_Value\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Improvement\_Value,-1,-1;Sheet1\_\_Commercial\_Dwelling\_Value \"Sheet1\_\_Commercial\_Dwelling\_Value\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial\_Dwelling\_Value,-1,-1;Sheet1\_\_Total\_Value \"Sheet1\_\_Total\_Value\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Total\_Value,-1,-1;Sheet1\_\_Dwelling\_Condition \"Sheet1\_\_Dwelling\_Condition\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Dwelling\_Condition,-1,-1;Sheet1\_\_Commercial \"Sheet1\_\_Commercial\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial,-1,-1;Sheet1\_\_Consideration\_Amount \"Sheet1\_\_Consideration\_Amount\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Consideration\_Amount,-1,-1;Sheet1\_\_Acres \"Sheet1\_\_Acres\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Acres,-1,-1;Sheet1\_\_Plat\_Book \"Sheet1\_\_Plat\_Book\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Book,-1,-1;Sheet1\_\_Plat\_Page \"Sheet1\_\_Plat\_Page\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Page,-1,-1;Sheet1\_\_Deed\_Book \"Sheet1\_\_Deed\_Book\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Book,-1,-1;Sheet1\_\_Deed\_Page \"Sheet1\_\_Deed\_Page\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Page,-1,-1;Sheet1\_\_Will\_Book \"Sheet1\_\_Will\_Book\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Book,-1,-1;Sheet1\_\_Will\_Page \"Sheet1\_\_Will\_Page\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Page,-1,-1;Sheet1\_\_Recorded\_Date \"Sheet1\_\_Recorded\_Date\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Recorded\_Date,-1,-

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1;Sheet1__Inst_Type \"Sheet1__Inst_Type\" true true false 255 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Type,-1,-
1;Sheet1__Inst_Year \"Sheet1__Inst_Year\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Year,-1,-
1;Sheet1__Instrument__ \"Sheet1__Instrument__\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Instrument__, -1,-1")
```

# Process: Clip

```
arcpy.Clip_analysis(Output_Dataset, HighKnobForestMatrix, Output_Feature_Class, "")
```

# Process: Make Feature Layer

```
arcpy.MakeFeatureLayer_management(Output_Feature_Class, Output_Layer, "", "",
"OBJECTID_1 OBJECTID_1 VISIBLE NONE;MAP_NUMBER MAP_NUMBER VISIBLE
NONE;PARCEL_ID PARCEL_ID VISIBLE NONE;MAP_NO MAP_NO VISIBLE
NONE;CHECK2 CHECK2 VISIBLE NONE;NEWFIELD1 NEWFIELD1 VISIBLE
NONE;PLAT PLAT VISIBLE NONE;ACCOUNT ACCOUNT VISIBLE NONE;Calculatio
Calculatio VISIBLE NONE;Hotlink Hotlink VISIBLE NONE;hotlink_pl hotlink_pl VISIBLE
NONE;X X VISIBLE NONE;Y Y VISIBLE NONE;Status Status VISIBLE NONE;Date_
Date_ VISIBLE NONE;Tech Tech VISIBLE NONE;Comment Comment VISIBLE
NONE;DEED_USED DEED_USED VISIBLE NONE;Assessment Assessment VISIBLE
NONE;Shape_Leng Shape_Leng VISIBLE NONE;SHAPE_Length SHAPE_Length
VISIBLE NONE;SHAPE_Area SHAPE_Area VISIBLE NONE;CountyName
CountyName VISIBLE NONE;ACCOUNT_NU ACCOUNT_NU VISIBLE
NONE;DISTRICT DISTRICT VISIBLE NONE;MAP_NUM MAP_NUM VISIBLE
NONE;CALC_AC CALC_AC VISIBLE NONE;SUBCODE SUBCODE VISIBLE
NONE;LRK_NUMBER LRK_NUMBER VISIBLE NONE;PARCEL_TYP PARCEL_TYP
VISIBLE NONE;PARCEL_NUM PARCEL_NUM VISIBLE NONE;MAINTENANC
MAINTENANC VISIBLE NONE;GPIN GPIN VISIBLE NONE;AccountNum AccountNum
VISIBLE NONE;CAMA_LINK CAMA_LINK VISIBLE NONE;MAP_PIN MAP_PIN
VISIBLE NONE;OwnerName OwnerName VISIBLE NONE;OwnerAddr1 OwnerAddr1
VISIBLE NONE;OwnerAddr2 OwnerAddr2 VISIBLE NONE;OwnerCityS OwnerCityS
VISIBLE NONE;OwnerZip OwnerZip VISIBLE NONE;DeedBook DeedBook VISIBLE
NONE;ValueImpro ValueImpro VISIBLE NONE;ValueLand ValueLand VISIBLE
NONE;Considerat Considerat VISIBLE NONE;DateTransf DateTransf VISIBLE
NONE;PrevOwner1 PrevOwner1 VISIBLE NONE;PrevOwne_1 PrevOwne_1 VISIBLE
NONE;PrevOwne_2 PrevOwne_2 VISIBLE NONE;PrevOwne_3 PrevOwne_3 VISIBLE
NONE;PrevOwne_4 PrevOwne_4 VISIBLE NONE;Prev1DeedB Prev1DeedB VISIBLE
NONE;Prev1Consi Prev1Consi VISIBLE NONE;TaxMapNum TaxMapNum VISIBLE
NONE;StreetNum StreetNum VISIBLE NONE;StreetName StreetName VISIBLE
NONE;ZipCode ZipCode VISIBLE NONE;YearBuilt YearBuilt VISIBLE
NONE;YearRemode YearRemode VISIBLE NONE;YearAssess YearAssess VISIBLE
NONE;Residentia Residentia VISIBLE NONE;Commercial Commercial VISIBLE
NONE;PropertyDe PropertyDe VISIBLE NONE;NumStories NumStories VISIBLE
NONE;NumRooms NumRooms VISIBLE NONE;NumBedroom NumBedroom VISIBLE
```

NONE;NumBaths NumBaths VISIBLE NONE;NumFirepla NumFirepla VISIBLE  
 NONE;NumChimney NumChimney VISIBLE NONE;SplitLevel SplitLevel VISIBLE  
 NONE;SplitFoyer SplitFoyer VISIBLE NONE;CentralHea CentralHea VISIBLE  
 NONE;CentralAir CentralAir VISIBLE NONE;TypeRoof TypeRoof VISIBLE  
 NONE;TypeExteri TypeExteri VISIBLE NONE;ExteriorCo ExteriorCo VISIBLE  
 NONE;TypeFounda TypeFounda VISIBLE NONE;TypeBaseme TypeBaseme VISIBLE  
 NONE;TypeFloor TypeFloor VISIBLE NONE;TypeWalls TypeWalls VISIBLE  
 NONE;TypeFuel TypeFuel VISIBLE NONE;ClassCode ClassCode VISIBLE  
 NONE;Zoning Zoning VISIBLE NONE;Neighborho Neighborho VISIBLE  
 NONE;PropertyUs PropertyUs VISIBLE NONE;DescMainBu DescMainBu VISIBLE  
 NONE;SqFtMainAr SqFtMainAr VISIBLE NONE;DescMainLa DescMainLa VISIBLE  
 NONE;SizeLandFI SizeLandFI VISIBLE NONE;SizeLandCo SizeLandCo VISIBLE  
 NONE;PublicWate PublicWate VISIBLE NONE;PublicSewe PublicSewe VISIBLE  
 NONE;Well Well VISIBLE NONE;Spring Spring VISIBLE NONE;SepticTank SepticTank  
 VISIBLE NONE;Undergroun Undergroun VISIBLE NONE;PavedRoad PavedRoad  
 VISIBLE NONE;DirtRoad DirtRoad VISIBLE NONE;NoRoad NoRoad VISIBLE  
 NONE;CurbsGutte CurbsGutte VISIBLE NONE;Sidewalks Sidewalks VISIBLE  
 NONE;Topography Topography VISIBLE NONE;Temp\_1 Temp\_1 VISIBLE  
 NONE;MAP\_TAXMAP MAP\_TAXMAP VISIBLE NONE;MAP\_DBL CIR MAP\_DBL CIR  
 VISIBLE NONE;MAP\_BLK MAP\_BLK VISIBLE NONE;MAP\_LOT MAP\_LOT VISIBLE  
 NONE;UPDATED\_BY UPDATED\_BY VISIBLE NONE;YEAR\_UPDAT YEAR\_UPDAT  
 VISIBLE NONE;QUARTER\_UP QUARTER\_UP VISIBLE NONE;UPDATE\_TYP  
 UPDATE\_TYP VISIBLE NONE;LINK\_STATU LINK\_STATU VISIBLE  
 NONE;WVS\_COMMEN WVS\_COMMEN VISIBLE NONE;WVS\_SPATIA WVS\_SPATIA  
 VISIBLE NONE;MAP\_BLOCK\_ MAP\_BLOCK\_ VISIBLE NONE;MAP\_DBLC\_1  
 MAP\_DBLC\_1 VISIBLE NONE;MapOwner MapOwner VISIBLE NONE;Id Id VISIBLE  
 NONE;Sheet1\_\_FID Sheet1\_\_FID VISIBLE NONE;Sheet1\_\_Account\_\_  
 Sheet1\_\_Account\_\_ VISIBLE NONE;Sheet1\_\_Seq\_ Sheet1\_\_Seq\_ VISIBLE  
 NONE;Sheet1\_\_District Sheet1\_\_District VISIBLE NONE;Sheet1\_\_Name  
 Sheet1\_\_Name VISIBLE NONE;Sheet1\_\_Name\_2 Sheet1\_\_Name\_2 VISIBLE  
 NONE;Sheet1\_\_Addr\_1 Sheet1\_\_Addr\_1 VISIBLE NONE;Sheet1\_\_Addr\_2  
 Sheet1\_\_Addr\_2 VISIBLE NONE;Sheet1\_\_City\_State Sheet1\_\_City\_State VISIBLE  
 NONE;Sheet1\_\_Zip\_1 Sheet1\_\_Zip\_1 VISIBLE NONE;Sheet1\_\_Zip\_2 Sheet1\_\_Zip\_2  
 VISIBLE NONE;Sheet1\_\_Map\_\_ Sheet1\_\_Map\_\_ VISIBLE NONE;Sheet1\_\_Desc\_1  
 Sheet1\_\_Desc\_1 VISIBLE NONE;Sheet1\_\_Desc\_2 Sheet1\_\_Desc\_2 VISIBLE  
 NONE;Sheet1\_\_Desc\_3 Sheet1\_\_Desc\_3 VISIBLE NONE;Sheet1\_\_Desc\_4  
 Sheet1\_\_Desc\_4 VISIBLE NONE;Sheet1\_\_Class\_Code Sheet1\_\_Class\_Code VISIBLE  
 NONE;Sheet1\_\_Year\_Built Sheet1\_\_Year\_Built VISIBLE NONE;Sheet1\_\_Year\_Rmld  
 Sheet1\_\_Year\_Rmld VISIBLE NONE;Sheet1\_\_Info Sheet1\_\_Info VISIBLE  
 NONE;Sheet1\_\_\_\_Stories Sheet1\_\_\_\_Stories VISIBLE NONE;Sheet1\_\_\_\_Rooms  
 Sheet1\_\_\_\_Rooms VISIBLE NONE;Sheet1\_\_\_\_Bedrooms Sheet1\_\_\_\_Bedrooms  
 VISIBLE NONE;Sheet1\_\_\_\_Baths Sheet1\_\_\_\_Baths VISIBLE  
 NONE;Sheet1\_\_\_\_Half\_Baths Sheet1\_\_\_\_Half\_Baths VISIBLE  
 NONE;Sheet1\_\_\_\_Fireplaces Sheet1\_\_\_\_Fireplaces VISIBLE  
 NONE;Sheet1\_\_\_\_Chimneys Sheet1\_\_\_\_Chimneys VISIBLE

NONE;Sheet1\_\_Dwelling\_Type Sheet1\_\_Dwelling\_Type VISIBLE  
 NONE;Sheet1\_\_Grade Sheet1\_\_Grade VISIBLE NONE;Sheet1\_\_Land\_Value  
 Sheet1\_\_Land\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Value  
 Sheet1\_\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Improvement\_Value  
 Sheet1\_\_Improvement\_Value VISIBLE NONE;Sheet1\_\_Commercial\_Dwelling\_Value  
 Sheet1\_\_Commercial\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Total\_Value  
 Sheet1\_\_Total\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Condition  
 Sheet1\_\_Dwelling\_Condition VISIBLE NONE;Sheet1\_\_Commercial  
 Sheet1\_\_Commercial VISIBLE NONE;Sheet1\_\_Consideration\_Amount  
 Sheet1\_\_Consideration\_Amount VISIBLE NONE;Sheet1\_\_Acres Sheet1\_\_Acres  
 VISIBLE NONE;Sheet1\_\_Plat\_Book Sheet1\_\_Plat\_Book VISIBLE  
 NONE;Sheet1\_\_Plat\_Page Sheet1\_\_Plat\_Page VISIBLE NONE;Sheet1\_\_Deed\_Book  
 Sheet1\_\_Deed\_Book VISIBLE NONE;Sheet1\_\_Deed\_Page Sheet1\_\_Deed\_Page  
 VISIBLE NONE;Sheet1\_\_Will\_Book Sheet1\_\_Will\_Book VISIBLE  
 NONE;Sheet1\_\_Will\_Page Sheet1\_\_Will\_Page VISIBLE  
 NONE;Sheet1\_\_Recorded\_Date Sheet1\_\_Recorded\_Date VISIBLE  
 NONE;Sheet1\_\_Inst\_Type Sheet1\_\_Inst\_Type VISIBLE NONE;Sheet1\_\_Inst\_Year  
 Sheet1\_\_Inst\_Year VISIBLE NONE;Sheet1\_\_Instrument\_\_ Sheet1\_\_Instrument\_\_  
 VISIBLE NONE;Shape\_length Shape\_length VISIBLE NONE;Shape\_area Shape\_area  
 VISIBLE NONE")

# Process: Merge (2)

```

arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land;W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements", Output_Dataset__2_, "LABEL \"LABEL\" true true false 54 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,LABEL,-1,-1;BNDACCURAC \"BNDACCURAC\" true true false 19 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,BNDACCURAC,-1,-1;LANDLINK \"LANDLINK\" true true false 94 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,LANDLINK,-1,-1;MAAGENCY \"MAAGENCY\" true true false 40 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MAAGENCY,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,MAAGENCY,-1,-1;MATYPE \"MATYPE\" true true false 32 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MATYPE,-1,-1;MANAME \"MANAME\" true true false 47 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MANAME,-1,-1;TOTALACRE \"TOTALACRE\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,TOTALACRE,-1,-1;TRACTACRE \"TRACTACRE\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,TRACTACRE,-1,-1;GISACRE \"GISACRE\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,GISACRE,-1,-1;MALEVEL \"MALEVEL\" true true false 9 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MALEVEL,-1,-1;OWNER

```

```

\OWNER\ true true false 42 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\USFS_Land,OWNER,-1,-1;ORIGFORMAT
\ORIGFORMAT\ true true false 17 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\USFS_Land,ORIGFORMAT,-1,-
1;BNDORIGIN \BNDORIGIN\ true true false 35 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\USFS_Land,BNDORIGIN,-1,-
1;PUBACCESS \PUBACCESS\ true true false 35 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\USFS_Land,PUBACCESS,-1,-
1;Shape_Length \Shape_Length\ false true true 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\USFS_Land,Shape_Length,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Shape_Length,-1,-
1;Shape_Area \Shape_Area\ false true true 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\USFS_Land,Shape_Area,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Shape_Area,-1,-1;AREA
\AREA\ true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,AREA,-1,-1;PERIMETER
\PERIMETER\ true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,PERIMETER,-1,-
1;OWNED \OWNED\ true true false 2 Short 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,OWNED,-1,-
1;POLYGONID \POLYGONID\ true true false 4 Long 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,POLYGONID,-1,-
1;ACRES \ACRES\ true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,ACRES,-1,-1;HECTARES
\HECTARES\ true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,HECTARES,-1,-
1;CreateDate \CreateDate\ true true false 8 Date 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,CreateDate,-1,-1;FName
\FName\ true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,FName,-1,-1;LName
\LName\ true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,LName,-1,-1;ModifyDate
\ModifyDate\ true true false 8 Date 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,ModifyDate,-1,-
1;Mod_FName \Mod_FName\ true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Mod_FName,-1,-
1;Mod_LName \Mod_LName\ true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Mod_LName,-1,-
1;SourceData \SourceData\ true true false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,SourceData,-1,-
1;Comments \Comments\ true true false 150 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Comments,-1,-1;MCF
\MCF\ true true false 10 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,MCF,-1,-1)

```

# Process: Clip (2)

```
arcpy.Clip_analysis(Output_Dataset__2_, HighKnobForestMatrix,  
Output_Feature_Class__2_, "")
```

# Process: Make Feature Layer (2)

```
arcpy.MakeFeatureLayer_management(Output_Feature_Class__2_,  
Output_Layer__2_, "", "", "LABEL LABEL VISIBLE NONE;BNDACCURAC  
BNDACCURAC VISIBLE NONE;LANDLINK LANDLINK VISIBLE NONE;MAAGENCY  
MAAGENCY VISIBLE NONE;MATYPE MATYPE VISIBLE NONE;MANAME MANAME  
VISIBLE NONE;TOTALACRE TOTALACRE VISIBLE NONE;TRACTACRE  
TRACTACRE VISIBLE NONE;GISACRE GISACRE VISIBLE NONE;MALEVEL  
MALEVEL VISIBLE NONE;OWNER OWNER VISIBLE NONE;ORIGFORMAT  
ORIGFORMAT VISIBLE NONE;BNDORIGIN BNDORIGIN VISIBLE  
NONE;PUBACCESS PUBACCESS VISIBLE NONE;Shape_Length Shape_Length  
VISIBLE NONE;Shape_Area Shape_Area VISIBLE NONE;AREA AREA VISIBLE  
NONE;PERIMETER PERIMETER VISIBLE NONE;OWNED OWNED VISIBLE  
NONE;POLYGONID POLYGONID VISIBLE NONE;ACRES ACRES VISIBLE  
NONE;HECTARES HECTARES VISIBLE NONE;CreateDate CreateDate VISIBLE  
NONE;FName FName VISIBLE NONE;LName LName VISIBLE NONE;ModifyDate  
ModifyDate VISIBLE NONE;Mod_FName Mod_FName VISIBLE NONE;Mod_LName  
Mod_LName VISIBLE NONE;SourceData SourceData VISIBLE NONE;Comments  
Comments VISIBLE NONE;MCF MCF VISIBLE NONE;Shape_length Shape_length  
VISIBLE NONE;Shape_area Shape_area VISIBLE NONE")
```

# Process: Select Layer By Location

```
arcpy.SelectLayerByLocation_management(Output_Layer, "WITHIN_A_DISTANCE",  
Output_Layer__2_, "1 Yards", "NEW_SELECTION")
```

# Process: Select Layer By Location (2)

```
arcpy.SelectLayerByLocation_management(WiseParcels2011_Merge2_Clip_,  
"HAVE_THEIR_CENTER_IN", Output_Feature_Class__2_, "",  
"REMOVE_FROM_SELECTION")
```

# Process: Feature to Raster

```
arcpy.FeatureToRaster_conversion(WiseParcels2011_Merge2_Clip__2_,  
"OBJECTID_1", Feature_Wise1, ned_mosaic_Clip)
```

# Process: Reclassify

```
arcpy.gp.Reclassify_sa(Feature_Wise1, "VALUE", "0 37960 1;NODATA 0",  
Spatial2_AdjacentProtected_Final, "DATA")
```

## Spatial 3: Core Forest

```
# -----  
# Spatial3.py  
# Created on: 2012-05-07 09:31:05.00000  
# (generated by ArcGIS/ModelBuilder)  
# Description:  
# Creates a raster of cells with forested land cover greater than 20m from the TNC High  
# Knob Matrix boundary, oil/natural gas well pads, and roads.  
# -----  
# Set the necessary product code  
# import arcinfo  
# Import arcpy module  
import arcpy  
# Check out any necessary licenses  
arcpy.CheckOutExtension("spatial")  
# Set Geoprocessing environments  
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"  
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543  
3529739.20190136"  
# Local variables:  
HighKnobForestMatrix =  
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"  
nlcd2006_highknob_Albers =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers"  
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"  
DMME_ActiveWells = "W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells"  
DMME_Permitted_Undrilled =  
"W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled"
```

DMME\_Plugged\_Wells =  
"W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells"

DMME\_Released\_Permits =  
"W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Released\_Permits"

Roads\_VGIN = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN"

USFS\_Roads = "W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS\_Roads"

HighKnobForestMatrix\_\_2\_ =  
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"

Output\_Feature\_Class =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix\_Polygon"

HighKnobForestMatrix\_Polygon1 =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix\_Polygon1"

nlcd2006\_highknob\_Albers\_Pro =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006\_highknob\_Albers\_Pro"

Output\_Raster\_Dataset =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006\_highknob\_Albers\_Pro"

Forested = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Forested"

FocalSt\_Fore2 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FocalSt\_Fore2"

Reclass\_Time2 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass\_Time2"

Spatial3\_CoreForest\_prelim =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial3\_CoreForest\_prelim"

Output\_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME\_ActiveWells\_Merge1"

Output\_Dataset\_\_2\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN\_Merge"

Roads\_VGIN\_Merge\_Buffer =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN\_Merge\_Buffer"

DMME\_ActiveWells\_Merge1\_Buff =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME\_ActiveWells\_Merge1\_Buff"

Output\_Dataset\_\_3\_ =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN\_Merge\_Buffer\_Merg"

Output\_Feature\_Class\_\_2\_ =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN\_Merge\_Buffer\_Merg1"



```

Output_Raster_Dataset__2_ =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Merge_Buffer_Merg2"

Reclass_Road1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_Road1"

HighKnobForestMatrix_Buffer1 =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix_Buffer1"

HighKnobForestMatrix_Buffer12 =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix_Buffer12"

Reclass_High1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_High1"

Output_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Times_Reclas1"

Spatial3_CoreForest_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial3_CoreForest_Final"

# Process: Project Raster

arcpy.ProjectRaster_management(nlcd2006_highknob_Albers,
nlcd2006_highknob_Albers_Pro,
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.666666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.33333333333
334],UNIT['Foot_US',0.3048006096012192]]", "NEAREST", ned_mosaic_Clip, "", "",
"PROJCS['Albers_Conical_Equal_Area',GEOGCS['GCS_North_American_1983',DATU
M['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.257222101]],PRI
MEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['Albers'],PA
RAMETER['false_easting',0.0],PARAMETER['false_northing',0.0],PARAMETER['central
_meridian',-
96.0],PARAMETER['standard_parallel_1',29.5],PARAMETER['standard_parallel_2',45.5
],PARAMETER['latitude_of_origin',23.0],UNIT['Meter',1.0]]")

# Process: Calculate Statistics

arcpy.CalculateStatistics_management(nlcd2006_highknob_Albers_Pro, "1", "1", "")

# Process: Reclassify

arcpy.gp.Reclassify_sa(Output_Raster_Dataset, "Value", "0 40 NODATA;41 43 1;44 90
NODATA;91 92 1;93 99 NODATA", Forested, "DATA")

# Process: Focal Statistics

```

```
arcpy.gp.FocalStatistics_sa(Forested, FocalSt_Fore2, "Circle 65.6 MAP", "MINIMUM", "DATA")
```

```
# Process: Buffer (4)
```

```
arcpy.Buffer_analysis(HighKnobForestMatrix, HighKnobForestMatrix_Buffer1, "8 Miles", "OUTSIDE_ONLY", "ROUND", "ALL", "")
```

```
# Process: Polygon to Raster (2)
```

```
arcpy.PolygonToRaster_conversion(HighKnobForestMatrix_Buffer1, "OBJECTID", HighKnobForestMatrix_Buffer12, "CELL_CENTER", "NONE", ned_mosaic_Clip)
```

```
# Process: Reclassify (3)
```

```
arcpy.gp.Reclassify_sa(HighKnobForestMatrix_Buffer12, "Value", "1 0;NODATA 1", Reclass_High1, "DATA")
```

```
# Process: Merge (2)
```

```
arcpy.Merge_management("W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN;W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads", Output_Dataset__2_, "V_LEID \\\"V_LEID\\\" true true false 8 Double 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,V_LEID,-1,-1;V_FIPS \\\"V_FIPS\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,V_FIPS,-1,-1;V_ORGNAM \\\"V_ORGNAM\\\" true true false 60 Text 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,V_ORGNAM,-1,-1;ROUTENUMBE \\\"ROUTENUMBE\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,ROUTENUMBE,-1,-1;V_UCHGDT \\\"V_UCHGDT\\\" true true false 8 Date 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,V_UCHGDT,-1,-1;V_ROADTYPE \\\"V_ROADTYPE\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,V_ROADTYPE,-1,-1;DISPLAYCLA \\\"DISPLAYCLA\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,DISPLAYCLA,-1,-1;Shape_Length \\\"Shape_Length\\\" false true true 8 Double 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,Shape_Length,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,Shape_Length,-1,-1;Length_Mi \\\"Length_Mi\\\" true true false 8 Double 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN,Length_Mi,-1,-1;FNODE_ \\\"FNODE_\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,FNODE_,-1,-1;TNODE_ \\\"TNODE_\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TNODE_,-1,-1;LPOLY_ \\\"LPOLY_\\\" true true false 4 Long 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,LPOLY_,-1,-1;RPOLY_
```

```

\RPOLY_\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,RPOLY_,-1,-
1;LENGTH \"LENGTH\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,LENGTH,-1,-
1;TRAVEL_ROU \"TRAVEL_ROU\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAVEL_ROU,-1,-
1;TRAVEL_R_1 \"TRAVEL_R_1\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAVEL_R_1,-1,-
1;ROAD \"ROAD\" true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ROAD,-1,-1;TRL
\"TRL\" true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL,-1,-1;SPU \"SPU\"
true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SPU,-1,-1;EDIT_DATE
\"EDIT_DATE\" true true false 8 Date 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,EDIT_DATE,-1,-
1;ORIGIN \"ORIGIN\" true true false 3 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ORIGIN,-1,-
1;SOURCE_COD \"SOURCE_COD\" true true false 2 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SOURCE_COD,-1,-
1;R_T_OWNER \"R_T_OWNER\" true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,R_T_OWNER,-1,-
1;RTE_NO \"RTE_NO\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,RTE_NO,-1,-
1;ROAD_NAME \"ROAD_NAME\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ROAD_NAME,-1,-
1;TRL_NO \"TRL_NO\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL_NO,-1,-
1;TRL_NO_ALT \"TRL_NO_ALT\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL_NO_ALT,-1,-
1;TRAIL_NAME \"TRAIL_NAME\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAIL_NAME,-1,-
1;CLOSURE_ST \"CLOSURE_ST\" true true false 1 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,CLOSURE_ST,-1,-
1;ROAD_TEMPL \"ROAD_TEMPL\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ROAD_TEMPL,-1,-
1;MAINTENANC \"MAINTENANC\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,MAINTENANC,-1,-
1;FUNCTIONAL \"FUNCTIONAL\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,FUNCTIONAL,-1,-
1;TRAIL_CLAS \"TRAIL_CLAS\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAIL_CLAS,-1,-
1;MGMT_OBJEC \"MGMT_OBJEC\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,MGMT_OBJEC,-1,-
1;ACCESS \"ACCESS\" true true false 20 Text 0 0

```

```
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ACCESS,-1,-
1;SURFACE_TY "SURFACE_TY" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,SURFACE_TY,-1,-
1;SURFACE_CO "SURFACE_CO" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,SURFACE_CO,-1,-
1;BLAZES "BLAZES" true true false 4 Long 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,BLAZES,-1,-
1;CONDITION "CONDITION" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,CONDITION,-1,-
1;BLAZES_NEE "BLAZES_NEE" true true false 4 Long 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,BLAZES_NEE,-1,-
1;HIKE "HIKE" true true false 1 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,HIKE,-1,-1;BIKE
"BIKE" true true false 1 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,BIKE,-1,-1;HORSE
"HORSE" true true false 1 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,HORSE,-1,-
1;MOTORIZED "MOTORIZED" true true false 1 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,MOTORIZED,-1,-
1;TRL_NO_PRO "TRL_NO_PRO" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRL_NO_PRO,-1,-
1;SCL "SCL" true true false 2 Short 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,SCL,-1,-1;PRIM
"PRIM" true true false 2 Short 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,PRIM,-1,-1")
```

# Process: Buffer (2)

```
arcpy.Buffer_analysis(Output_Dataset__2_, Roads_VGIN_Merge_Buffer, "20 Meters",
"FULL", "ROUND", "ALL", "")
```

# Process: Merge

```
arcpy.Merge_management("W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells
;W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled;W:\Ptolemy\HighK
nob.gdb\Features\DMME_Plugged_Wells;W:\Ptolemy\HighKnob.gdb\Features\DMME
E_Released_Permits", Output_Dataset, "FiStPlaneX "FiStPlaneX" true true false 8
Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlaneX,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlaneX,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlaneX,-1,-
1;FiStPlaneY "FiStPlaneY" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlaneY,-1,-
1;FiOper "FiOper" true true false 50 Text 0 0
```

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiOper,-1,-1;FiNo  
 \\\"FiNo\\\" true true false 7 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiNo,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiNo,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiNo,-1,-1;FiOperatio  
 \\\"FiOperatio\\\" true true false 50 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiOperatio,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiOperatio,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiOperatio,-1,-  
 1;FiStatDt \\\"FiStatDt\\\" true true false 23 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiStatDt,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiStatDt,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiStatDt,-1,-1;FiPriority  
 \\\"FiPriority\\\" true true false 1 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiPriority,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiPriority,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiPriority,-1,-  
 1;FilnspDue \\\"FilnspDue\\\" true true false 10 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FilnspDue,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FilnspDue,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FilnspDue,-1,-1;FiElev  
 \\\"FiElev\\\" true true false 4 Float 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiElev,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiElev,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiElev,-1,-  
 1;FiStPlan\_1 \\\"FiStPlan\_1\\\" true true false 8 Double 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiStPlan\_1,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiStPlan\_1,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiStPlan\_1,-1,-  
 1;FiStPlan\_2 \\\"FiStPlan\_2\\\" true true false 8 Double 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,FiStPlan\_2,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,FiStPlan\_2,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,FiStPlan\_2,-1,-  
 1;CoName \\\"CoName\\\" true true false 50 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,CoName,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,CoName,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,CoName,-1,-  
 1;TblCnName \\\"TblCnName\\\" true true false 14 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,TblCnName,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,TblCnName,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,TblCnName,-1,-  
 1;TblQuDesc \\\"TblQuDesc\\\" true true false 20 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells,TblQuDesc,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled,TblQuDesc,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells,TblQuDesc,-1,-

```

1;TblInCode \"TblInCode\" true true false 3 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,TblInCode,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,TblInCode,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Plugged_Wells,TblInCode,-1,-
1;TblOpDesc \"TblOpDesc\" true true false 25 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,TblOpDesc,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,TblOpDesc,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Plugged_Wells,TblOpDesc,-1,-
1;TblPsDesc \"TblPsDesc\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,TblPsDesc,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,TblPsDesc,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Plugged_Wells,TblPsDesc,-1,-
1;FiDrComp \"FiDrComp\" true true false 23 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,FiDrComp,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,FiDrComp,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Plugged_Wells,FiDrComp,-1,-
1;FiWellComp \"FiWellComp\" true true false 23 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,FiWellComp,-1,-
1;FiFarm \"FiFarm\" true true false 25 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,FiFarm,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,FiFarm,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Plugged_Wells,FiFarm,-1,-
1;OBJECTID \"OBJECTID\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,OBJECTID,-
1,-1;Id \"Id\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Id,-1,-
1;Permit_Num \"Permit_Num\" true true false 10 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Permit_Num,-
1,-1;Easting \"Easting\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Easting,-1,-
1;Northing \"Northing\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Northing,-1,-
1;Status \"Status\" true true false 2 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Status,-1,-
1;Verified \"Verified\" true true false 3 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Verified,-1,-
1")

```

# Process: Buffer (3)

```

arcpy.Buffer_analysis(Output_Dataset, DMME_ActiveWells_Merge1_Buff, "20 Meters",
"FULL", "ROUND", "ALL", "")

```

# Process: Polygon To Line

```
arcpy.PolygonToLine_management(HighKnobForestMatrix, Output_Feature_Class, "IDENTIFY_NEIGHBORS")
```

```
# Process: Buffer
```

```
arcpy.Buffer_analysis(Output_Feature_Class, HighKnobForestMatrix_Polygon1, "20 Meters", "FULL", "ROUND", "ALL", "")
```

```
# Process: Merge (3)
```

```
arcpy.Merge_management("W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Merge_Buffer;W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME_ActiveWells_Merge1_Buff;W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix_Polygon1", Output_Dataset__3_, "Shape_Length \"Shape_Length\" false true true 8 Double 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Merge_Buffer,Shape_Length,-1,-1,W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME_ActiveWells_Merge1_Buff,Shape_Length,-1,-1,W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix_Polygon1,Shape_Length,-1,-1;Shape_Area \"Shape_Area\" false true true 8 Double 0 0 ,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Merge_Buffer,Shape_Area,-1,-1,W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME_ActiveWells_Merge1_Buff,Shape_Area,-1,-1,W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix_Polygon1,Shape_Area,-1,-1")
```

```
# Process: Clip
```

```
arcpy.Clip_analysis(Output_Dataset__3_, HighKnobForestMatrix__2_, Output_Feature_Class__2_, "")
```

```
# Process: Polygon to Raster
```

```
arcpy.PolygonToRaster_conversion(Output_Feature_Class__2_, "Shape_Length", Output_Raster_Dataset__2_, "CELL_CENTER", "NONE", ned_mosaic_Clip)
```

```
# Process: Reclassify (2)
```

```
arcpy.gp.Reclassify_sa(Output_Raster_Dataset__2_, "Value", "1 9999999 NODATA;NODATA 1", Reclass_Road1, "DATA")
```

```
# Process: Times
```

```
arcpy.gp.Times_sa(Reclass_High1, Reclass_Road1, Output_raster)
```

```
# Process: Reclassify (4)
```

```
arcpy.gp.Reclassify_sa(Output_raster, "Value", "0 NODATA;0 1 1", Reclass_Time2, "DATA")
```

```
# Process: Extract by Mask
```

```
arcpy.gp.ExtractByMask_sa(FocalSt_Fore2, Reclass_Time2, Spatial3_CoreForest_prelim)
```

```
# Process: Reclassify (5)
```

```
arcpy.gp.Reclassify_sa(Spatial3_CoreForest_prelim, "VALUE", "1 1;NODATA 0", Spatial3_CoreForest_Final, "DATA")
```

### **Spatial 4: Proximity to Protected Lands**

```
# -----
```

```
# Spatial4.py
```

```
# Created on: 2012-05-07 09:31:19.00000
```

```
# (generated by ArcGIS/ModelBuilder)
```

```
# Description:
```

```
# Creates a raster containing values indicating the Euclidean distance to reach a cell with a protected status. The final result is calculated as a fuzzy membership between 0 and 1. The closer to 1, the shorter the distance required to reach a protected cell.
```

```
# -----
```

```
# Import arcpy module
```

```
import arcpy
```

```
# Check out any necessary licenses
```

```
arcpy.CheckOutExtension("spatial")
```

```
# Set Geoprocessing environments
```

```
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
```

```
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543 3529739.20190136"
```

```
arcpy.env.mask = "High Knob Forest Matrix Boundary"
```

```
# Local variables:
```

```
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
```



```

HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"

USFS_Land = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land"

VOF_Easements = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements"

Output_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Land_Merge1"

Feature_USFS1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Feature_USFS1"

Reclass_Feat2 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_Feat2"

Output_distance_raster__3_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\EucDist_Recl1"

Output_direction_raster = ""

EucDist_Recl1_Clip = "W:\\Ptolemy\\ThesisData\\Default.gdb\\EucDist_Recl1_Clip"

Spatial4_Proximity_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial4_Proximity_Final"

Output_Feature_Class =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Land_Merge1_Clip1"

# Process: Merge

arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land;W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements", Output_Dataset, "LABEL \\\"LABEL\\\" true true false 54 Text 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,LABEL,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,LABEL,-1,-1;BNDACCURAC \\\"BNDACCURAC\\\" true true false 19 Text 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,BNDACCURAC,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,BNDACCURAC,-1,-1;LANDLINK \\\"LANDLINK\\\" true true false 94 Text 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,LANDLINK,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,LANDLINK,-1,-1;MAAGENCY \\\"MAAGENCY\\\" true true false 40 Text 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MAAGENCY,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,MAAGENCY,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MAAGENCY,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,MAAGENCY,-1,-1;MATYPE \\\"MATYPE\\\" true true false 32 Text 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MATYPE,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MATYPE,-1,-1;MANAME \\\"MANAME\\\" true true false 47 Text 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MANAME,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MANAME,-1,-1;TOTALACRE

```

```

\"TOTALACRE\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,TOTALACRE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,TOTALACRE,-1,-1;TRACTACRE
\"TRACTACRE\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,TRACTACRE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,TRACTACRE,-1,-1;GISACRE
\"GISACRE\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,GISACRE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,GISACRE,-1,-1;MALEVEL
\"MALEVEL\" true true false 9 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MALEVEL,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,MALEVEL,-1,-1;OWNER
\"OWNER\" true true false 42 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,OWNER,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,OWNER,-1,-1;ORIGFORMAT
\"ORIGFORMAT\" true true false 17 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,ORIGFORMAT,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,ORIGFORMAT,-1,-1;BNDORIGIN
\"BNDORIGIN\" true true false 35 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,BNDORIGIN,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,BNDORIGIN,-1,-1;PUBACCESS
\"PUBACCESS\" true true false 35 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,PUBACCESS,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,PUBACCESS,-1,-1;Shape_Length
\"Shape_Length\" false true true 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,Shape_Length,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,Shape_Length,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,Shape_Length,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,Shape_Length,-1,-
1;Shape_Area \"Shape_Area\" false true true 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,Shape_Area,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,Shape_Area,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land,Shape_Area,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,Shape_Area,-1,-1;AREA
\"AREA\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,AREA,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,AREA,-1,-1;PERIMETER
\"PERIMETER\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,PERIMETER,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,PERIMETER,-1,-1;OWNED
\"OWNED\" true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,OWNED,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,OWNED,-1,-1;POLYGONID
\"POLYGONID\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Zones\\VOF_Easements,POLYGONID,-1,-

```

```

1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,POLYGONID,-1,-1;ACRES
"ACRES" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,ACRES,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,ACRES,-1,-1;HECTARES
"HECTARES" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,HECTARES,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,HECTARES,-1,-1;CreateDate
"CreateDate" true true false 8 Date 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,CreateDate,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,CreateDate,-1,-1;FName
"FName" true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,FName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,FName,-1,-1;LName "LName"
true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,LName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,LName,-1,-1;ModifyDate
"ModifyDate" true true false 8 Date 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,ModifyDate,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,ModifyDate,-1,-1;Mod_FName
"Mod_FName" true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Mod_FName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Mod_FName,-1,-
1;Mod_LName "Mod_LName" true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Mod_LName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Mod_LName,-1,-1;SourceData
"SourceData" true true false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,SourceData,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,SourceData,-1,-1;Comments
"Comments" true true false 150 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Comments,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,Comments,-1,-1;MCF "MCF"
true true false 10 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,MCF,-1,-
1,W:\Ptolemy\HighKnob.gdb\Zones\VOF_Easements,MCF,-1,-1")

```

# Process: Feature to Raster

```
arcpy.FeatureToRaster_conversion(Output_Dataset, "OBJECTID", Feature_USFS1,
ned_mosaic_Clip)
```

# Process: Reclassify

```
arcpy.gp.Reclassify_sa(Feature_USFS1, "Value", "1 29 1", Reclass_Feat2, "DATA")
```

# Process: Euclidean Distance

```
arcpy.gp.EucDistance_sa(Reclass_Feat2, Output_distance_raster__3_, "",
ned_mosaic_Clip, Output_direction_raster)
```

```
# Process: Clip (2)
```

```
arcpy.Clip_management(Output_distance_raster__3_, "3114043.9256 1052446.3657
3151189.778 1075485.2434", EucDist_Recl1_Clip, HighKnobForestMatrix, "",
"ClippingGeometry")
```

```
# Process: Fuzzy Membership
```

```
arcpy.gp.FuzzyMembership_sa(EucDist_Recl1_Clip, Spatial4_Proximity_Final, "SMALL
1370.60144042969 5", "NONE")
```

```
# Process: Clip
```

```
arcpy.Clip_analysis(Output_Dataset, HighKnobForestMatrix, Output_Feature_Class, "")
```

## **Spatial 5: Special Biological Areas**

```
# -----
```

```
# Spatial5.py
```

```
# Created on: 2012-05-07 09:31:37.00000
```

```
# (generated by ArcGIS/ModelBuilder)
```

```
# Description:
```

```
# Creates a raster of cells designated by USFS as Special Biological Areas.
```

```
# -----
```

```
# Import arcpy module
```

```
import arcpy
```

```
# Check out any necessary licenses
```

```
arcpy.CheckOutExtension("spatial")
```

```
# Set Geoprocessing environments
```

```
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
```

```
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
```

```
# Local variables:
```

```

SpecialBiologicalAreas = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\SpecialBiologicalAreas"
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
Feature_Spec1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Feature_Spec1"
Spatial5_Special_Biological_Areas_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial5_Special_Biological_Areas_Final"
# Process: Feature to Raster
arcpy.FeatureToRaster_conversion(SpecialBiologicalAreas, "OBJECTID",
Feature_Spec1, ned_mosaic_Clip)
# Process: Reclassify
arcpy.gp.Reclassify_sa(Feature_Spec1, "VALUE", "1 20 1;NODATA 0",
Spatial5_Special_Biological_Areas_Final, "DATA")

```

### **Spatial 6: Fragmentation**

```

# -----
# Spatial6.py
# Created on: 2012-05-07 09:31:53.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster showing areas of high fragmentation by roads and gas well sites.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
# Local variables:

```

HighKnobForestMatrix =  
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"  
USFS\_Roads = "W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS\_Roads"  
DMME\_ActiveWells = "W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_ActiveWells"  
DMME\_Permitted\_Undrilled =  
"W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Permitted\_Undrilled"  
DMME\_Plugged\_Wells =  
"W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Plugged\_Wells"  
DMME\_Released\_Permits =  
"W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME\_Released\_Permits"  
ned\_mosaic\_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned\_mosaic\_Clip"  
nlcd2006 = "W:\\Ptolemy\\ThesisData\\nlcd2006"  
Roads\_VGIN = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN"  
ned\_mosaic\_Clip\_\_2\_ = "W:\\Ptolemy\\HighKnob.gdb\\ned\_mosaic\_Clip"  
ned\_mosaic\_Clip\_\_3\_ = "W:\\Ptolemy\\HighKnob.gdb\\ned\_mosaic\_Clip"  
ned\_mosaic\_Clip\_\_4\_ = "W:\\Ptolemy\\HighKnob.gdb\\ned\_mosaic\_Clip"  
HighKnobForestMatrix\_\_2\_ =  
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"  
HighKnobForestMatrix\_\_3\_ =  
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"  
ned\_mosaic\_Clip\_\_5\_ = "W:\\Ptolemy\\HighKnob.gdb\\ned\_mosaic\_Clip"  
FocalSt\_Regi1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FocalSt\_Regi1"  
Output\_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract\_Foca1"  
Output\_Raster\_Dataset\_\_2\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Times\_Times\_1"  
Reclass\_Time1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass\_Time1"  
Output\_raster\_\_5\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Times\_Times\_1"  
nlcd2006\_ProjectRaster =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006\_ProjectRaster"  
Extract\_Recl3 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract\_Recl3"

RegionG\_Extr5 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\RegionG\_Extr5"  
 Output\_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME\_ActiveWells\_Merge"  
 Output\_Dataset\_\_2\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS\_Roads\_Merge"  
 USFS\_Roads\_Merge\_Buffer1 =  
 "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS\_Roads\_Merge\_Buffer1"  
 Roads\_VGIN\_Project = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads\_VGIN\_Project"  
 USFS\_Roads\_Merge\_Buffer1\_Pol =  
 "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS\_Roads\_Merge\_Buffer1\_Pol2"  
 Feature\_USFS4\_ProjectRaster =  
 "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS\_Roads\_Merge\_Buffer1\_Pol3"  
 Output\_raster\_\_3\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract\_USFS1"  
 Reclass\_Extr2 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass\_Extr2"  
 Output\_raster\_\_2\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Times\_nlcd201"  
 Spatial6\_Fragmentation\_Final =  
 "W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial6\_Fragmentation\_Final"  
 DMME\_ActiveWells\_Merge\_Buffe =  
 "W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME\_ActiveWells\_Merge\_Buffe"  
 DMME\_ActiveWells\_Merge\_Buffe1 =  
 "W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME\_ActiveWells\_Merge\_Buffe3"  
 DMME\_ActiveWells\_Merge\_Buffe2 =  
 "W:\\Ptolemy\\ThesisData\\Default.gdb\\DMME\_ActiveWells\_Merge\_Buffe4"  
 Output\_raster\_\_4\_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract\_DMME1"  
 Reclass\_Extr3 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass\_Extr3"

# Process: Project Raster (2)

```

arcpy.ProjectRaster_management(nlcd2006, nlcd2006_ProjectRaster,
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.666666666],PARAMETER['False_Northing',3280833.3333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.3333333333333
  
```

```

334],UNIT['Foot_US',0.3048006096012192]]", "NEAREST", ned_mosaic_Clip__3_, "",
"",
"PROJCS['Albers_Conical_Equal_Area',GEOGCS['GCS_North_American_1983',DATU
M['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.257222101]],PRI
MEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['Albers'],PA
RAMETER['false_easting',0.0],PARAMETER['false_northing',0.0],PARAMETER['central
_meridian',-
96.0],PARAMETER['standard_parallel_1',29.5],PARAMETER['standard_parallel_2',45.5
],PARAMETER['latitude_of_origin',23.0],UNIT['Meter',1.0]]")

```

# Process: Project

```

arcpy.Project_management(Roads_VGIN, Roads_VGIN_Project,
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.666666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.33333333333
334],UNIT['Foot_US',0.3048006096012192]]", "",
"PROJCS['Lambert_Conformal_Conic_Virginia',GEOGCS['GCS_North_American_1983'
,DATUM['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.25722210
1]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['La
mbert_Conformal_Conic'],PARAMETER['False_Easting',0.0],PARAMETER['False_Nort
hing',0.0],PARAMETER['Central_Meridian',-
79.5],PARAMETER['Standard_Parallel_1',37.0],PARAMETER['Standard_Parallel_2',39.
5],PARAMETER['Latitude_Of_Origin',36.0],UNIT['Meter',1.0]]")

```

# Process: Merge (2)

```

arcpy.Merge_management("W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Proje
ct;W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads", Output_Dataset__2_,
"V_LEID \"V_LEID\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_LEID,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_LEID,-1,-1;V_FIPS
\"V_FIPS\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_FIPS,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_FIPS,-1,-
1;V_ORGNAM \"V_ORGNAM\" true true false 60 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_ORGNAM,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_ORGNAM,-1,-
1;ROUTENUMBE \"ROUTENUMBE\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,ROUTENUMBE,-
1,-1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,ROUTENUMBE,-1,-

```



```

1;V_UCHGDT \"V_UCHGDT\" true true false 8 Date 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_UCHGDT,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_UCHGDT,-1,-
1;V_ROADTYPE \"V_ROADTYPE\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_ROADTYPE,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,V_ROADTYPE,-1,-
1;DISPLAYCLA \"DISPLAYCLA\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,DISPLAYCLA,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,DISPLAYCLA,-1,-
1;Shape_Length \"Shape_Length\" false true true 8 Double 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,Shape_Length,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,Shape_Length,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,Shape_Length,-1,-
1,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,Shape_Length,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,Shape_Length,-1,-
1;FNODE_ \"FNODE_\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,FNODE_,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,FNODE_,-1,-1;TNODE_
\"TNODE_\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TNODE_,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TNODE_,-1,-1;LPOLY_
\"LPOLY_\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,LPOLY_,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,LPOLY_,-1,-1;RPOLY_
\"RPOLY_\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,RPOLY_,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,RPOLY_,-1,-1;LENGTH
\"LENGTH\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,LENGTH,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,LENGTH,-1,-
1;TRAVEL_ROU \"TRAVEL_ROU\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAVEL_ROU,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAVEL_ROU,-1,-
1;TRAVEL_R_1 \"TRAVEL_R_1\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAVEL_R_1,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRAVEL_R_1,-1,-1;ROAD
\"ROAD\" true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ROAD,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ROAD,-1,-1;TRL \"TRL\" true
true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL,-1,-1;SPU \"SPU\" true
true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SPU,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SPU,-1,-1;EDIT_DATE

```

```

\ "EDIT_DATE" true true false 8 Date 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,EDIT_DATE,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,EDIT_DATE,-1,-1;ORIGIN
\ "ORIGIN" true true false 3 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ORIGIN,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ORIGIN,-1,-
1;SOURCE_COD \ "SOURCE_COD" true true false 2 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,SOURCE_COD,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,SOURCE_COD,-1,-
1;R_T_OWNER \ "R_T_OWNER" true true false 2 Short 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,R_T_OWNER,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,R_T_OWNER,-1,-1;RTE_NO
\ "RTE_NO" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,RTE_NO,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,RTE_NO,-1,-1;ROAD_NAME
\ "ROAD_NAME" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ROAD_NAME,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ROAD_NAME,-1,-1;TRL_NO
\ "TRL_NO" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRL_NO,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRL_NO,-1,-1;TRL_NO_ALT
\ "TRL_NO_ALT" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRL_NO_ALT,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRL_NO_ALT,-1,-
1;TRAIL_NAME \ "TRAIL_NAME" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRAIL_NAME,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRAIL_NAME,-1,-
1;CLOSURE_ST \ "CLOSURE_ST" true true false 1 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,CLOSURE_ST,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,CLOSURE_ST,-1,-
1;ROAD_TEMPL \ "ROAD_TEMPL" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ROAD_TEMPL,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,ROAD_TEMPL,-1,-
1;MAINTENANC \ "MAINTENANC" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,MAINTENANC,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,MAINTENANC,-1,-
1;FUNCTIONAL \ "FUNCTIONAL" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,FUNCTIONAL,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,FUNCTIONAL,-1,-
1;TRAIL_CLAS \ "TRAIL_CLAS" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRAIL_CLAS,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,TRAIL_CLAS,-1,-
1;MGMT_OBJEC \ "MGMT_OBJEC" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,MGMT_OBJEC,-1,-
1,W:\Ptolemy\HighKnob.gdb\BaseLayers\USFS_Roads,MGMT_OBJEC,-1,-

```

```

1;ACCESS \"ACCESS\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ACCESS,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,ACCESS,-1,-
1;SURFACE_TY \"SURFACE_TY\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SURFACE_TY,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SURFACE_TY,-1,-
1;SURFACE_CO \"SURFACE_CO\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SURFACE_CO,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SURFACE_CO,-1,-
1;BLAZES \"BLAZES\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,BLAZES,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,BLAZES,-1,-1;CONDITION
\"CONDITION\" true true false 20 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,CONDITION,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,CONDITION,-1,-
1;BLAZES_NEE \"BLAZES_NEE\" true true false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,BLAZES_NEE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,BLAZES_NEE,-1,-1;HIKE
\"HIKE\" true true false 1 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,HIKE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,HIKE,-1,-1;BIKE \"BIKE\" true
true false 1 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,BIKE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,BIKE,-1,-1;HORSE
\"HORSE\" true true false 1 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,HORSE,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,HORSE,-1,-1;MOTORIZED
\"MOTORIZED\" true true false 1 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,MOTORIZED,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,MOTORIZED,-1,-
1;TRL_NO_PRO \"TRL_NO_PRO\" true true false 30 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL_NO_PRO,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,TRL_NO_PRO,-1,-1;SCL
\"SCL\" true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SCL,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,SCL,-1,-1;PRIM \"PRIM\"
true true false 2 Short 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,PRIM,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads,PRIM,-1,-1;Length_Mi
\"Length_Mi\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN_Project,Length_Mi,-1,-1)

```

# Process: Buffer

```

arcpy.Buffer_analysis(Output_Dataset__2_, USFS_Roads_Merge_Buffer1, "14 Meters",
"FULL", "ROUND", "NONE", "")

```

# Process: Polygon to Raster

```
arcpy.PolygonToRaster_conversion(USFS_Roads_Merge_Buffer1, "OBJECTID",  
USFS_Roads_Merge_Buffer1_Pol, "CELL_CENTER", "NONE", ned_mosaic_Clip__4_)
```

# Process: Project Raster

```
arcpy.ProjectRaster_management(USFS_Roads_Merge_Buffer1_Pol,  
Feature_USFS4_ProjectRaster,  
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_  
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63  
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994  
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291  
6.666666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr  
al_Meridian',-  
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar  
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.3333333333  
334],UNIT['Foot_US',0.3048006096012192]]", "NEAREST", ned_mosaic_Clip__2_, "",  
"", "")
```

# Process: Extract by Mask (2)

```
arcpy.gp.ExtractByMask_sa(Feature_USFS4_ProjectRaster,  
HighKnobForestMatrix__2_, Output_raster__3_)
```

# Process: Reclassify

```
arcpy.gp.Reclassify_sa(Output_raster__3_, "VALUE", "0 99999999 0;NODATA 1",  
Reclass_Extr2, "NODATA")
```

# Process: Times

```
arcpy.gp.Times_sa(nlcd2006_ProjectRaster, Reclass_Extr2, Output_raster__2_)
```

# Process: Merge

```
arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells  
;W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled;W:\\Ptolemy\\HighK  
nob.gdb\\Features\\DMME_Plugged_Wells;W:\\Ptolemy\\HighKnob.gdb\\Features\\DMM  
E_Released_Permits", Output_Dataset, "FiStPlaneX \\\"FiStPlaneX\\\" true true false 8  
Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,FiStPlaneX,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,FiStPlaneX,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Plugged_Wells,FiStPlaneX,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_ActiveWells,FiStPlaneX,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Permitted_Undrilled,FiStPlaneX,-1,-
```

```

1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlaneX,-1,-
1;FiStPlaneY \"FiStPlaneY\" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlaneY,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlaneY,-1,-
1;FiOper \"FiOper\" true true false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiOper,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiOper,-1,-1;FiNo \"FiNo\"
true true false 7 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiNo,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiNo,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiNo,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiNo,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiNo,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiNo,-1,-1;FiOperatio
\"FiOperatio\" true true false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiOperatio,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiOperatio,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiOperatio,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiOperatio,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiOperatio,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiOperatio,-1,-
1;FiStatDt \"FiStatDt\" true true false 23 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStatDt,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStatDt,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStatDt,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStatDt,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStatDt,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStatDt,-1,-1;FiPriority
\"FiPriority\" true true false 1 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiPriority,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiPriority,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiPriority,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiPriority,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiPriority,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiPriority,-1,-
1;FilnspDue \"FilnspDue\" true true false 10 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FilnspDue,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FilnspDue,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FilnspDue,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FilnspDue,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FilnspDue,-1,-

```

```

1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiInspDue,-1,-1;FiElev
\FiElev" true true false 4 Float 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiElev,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiElev,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiElev,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiElev,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiElev,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiElev,-1,-
1;FiStPlan_1 "FiStPlan_1" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlan_1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlan_1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlan_1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlan_1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlan_1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlan_1,-1,-
1;FiStPlan_2 "FiStPlan_2" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlan_2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlan_2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlan_2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiStPlan_2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiStPlan_2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiStPlan_2,-1,-
1;CoName "CoName" true true false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,CoName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,CoName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,CoName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,CoName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,CoName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,CoName,-1,-
1;TblCnName "TblCnName" true true false 14 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblCnName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblCnName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblCnName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblCnName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblCnName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblCnName,-1,-
1;TblQuDesc "TblQuDesc" true true false 20 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblQuDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblQuDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblQuDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblQuDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblQuDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblQuDesc,-1,-
1;TblInCode "TblInCode" true true false 3 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblInCode,-1,-

```

```

1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblInCode,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblInCode,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblInCode,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblInCode,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblInCode,-1,-
1;TblOpDesc \"TblOpDesc\" true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblOpDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblOpDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblOpDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblOpDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblOpDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblOpDesc,-1,-
1;TblPsDesc \"TblPsDesc\" true true false 30 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblPsDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblPsDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblPsDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,TblPsDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,TblPsDesc,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,TblPsDesc,-1,-
1;FiDrComp \"FiDrComp\" true true false 23 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiDrComp,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiDrComp,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiDrComp,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiDrComp,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiDrComp,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiDrComp,-1,-
1;FiWellComp \"FiWellComp\" true true false 23 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiWellComp,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiWellComp,-1,-1;FiFarm
\"FiFarm\" true true false 25 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiFarm,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiFarm,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiFarm,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_ActiveWells,FiFarm,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Permitted_Undrilled,FiFarm,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Plugged_Wells,FiFarm,-1,-
1;OBJECTID \"OBJECTID\" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_Released_Permits,OBJECTID,-
1,-1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Released_Permits,OBJECTID,-1,-
1;Id \"Id\" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_Released_Permits,Id,-1,-
1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Released_Permits,Id,-1,-
1;Permit_Num \"Permit_Num\" true true false 10 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Features\DMME_Released_Permits,Permit_Num,-
1,-1,W:\Ptolemy\HighKnob.gdb\Features\DMME_Released_Permits,Permit_Num,-1,-

```

```

1;Easting \"Easting\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Easting,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Easting,-1,-
1;Northing \"Northing\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Northing,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Northing,-1,-
1;Status \"Status\" true true false 2 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Status,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Status,-1,-
1;Verified \"Verified\" true true false 3 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Verified,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Features\\DMME_Released_Permits,Verified,-1,-1")

```

```
# Process: Buffer (2)
```

```
arcpy.Buffer_analysis(Output_Dataset, DMME_ActiveWells_Merge_Buffe, "35 Meters",
"FULL", "ROUND", "NONE", "")
```

```
# Process: Polygon to Raster (2)
```

```
arcpy.PolygonToRaster_conversion(DMME_ActiveWells_Merge_Buffe, "OBJECTID_1",
DMME_ActiveWells_Merge_Buffe1, "CELL_CENTER", "NONE", ned_mosaic_Clip)
```

```
# Process: Project Raster (3)
```

```
arcpy.ProjectRaster_management(DMME_ActiveWells_Merge_Buffe1,
DMME_ActiveWells_Merge_Buffe2,
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.666666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.33333333333
334],UNIT['Foot_US',0.3048006096012192]]", "NEAREST", ned_mosaic_Clip__5_, "",
"", "")
```

```
# Process: Extract by Mask (3)
```

```
arcpy.gp.ExtractByMask_sa(DMME_ActiveWells_Merge_Buffe2,
HighKnobForestMatrix, Output_raster__4_)
```

```
# Process: Reclassify (3)
```

```
arcpy.gp.Reclassify_sa(Output_raster__4_, "VALUE", "1 999999 0;NODATA 1",
Reclass_Extr3, "DATA")
```



```

# Process: Times (2)
arcpy.gp.Times_sa(Output_raster__2_, Reclass_Extr3, Output_raster__5_)
# Process: Calculate Statistics (2)
arcpy.CalculateStatistics_management(Output_raster__5_, "1", "1", "")
# Process: Reclassify (2)
arcpy.gp.Reclassify_sa(Output_Raster_Dataset__2_, "VALUE", "0
40.030359781645586 0;40.030359781645586 44.550795839010746
1;44.550795839010746 90.143631386342122 0;90.143631386342122
91.20310858728709 1;91.20310858728709 255 0", Reclass_Time1, "DATA")
# Process: Extract by Attributes
arcpy.gp.ExtractByAttributes_sa(Reclass_Time1, "\"Value\" = 1", Extract_Recl3)
# Process: Region Group
arcpy.gp.RegionGroup_sa(Extract_Recl3, RegionG_Extr5, "EIGHT", "WITHIN",
"ADD_LINK", "")
# Process: Focal Statistics
arcpy.gp.FocalStatistics_sa(RegionG_Extr5, FocalSt_Regi1, "Circle 100 MAP",
"VARIETY", "DATA")
# Process: Extract by Mask
arcpy.gp.ExtractByMask_sa(FocalSt_Regi1, HighKnobForestMatrix__3_,
Output_raster)
# Process: Fuzzy Membership
arcpy.gp.FuzzyMembership_sa(Output_raster, Spatial6_Fragmentation_Final, "LINEAR
1 4", "NONE")

```

## **Threat1: Commercial Development**

```

# -----
# Threat1.py
# Created on: 2012-05-07 09:32:47.00000
# (generated by ArcGIS/ModelBuilder)
# Description:

```

```

# Selects parcels with average slope < 10%, adjacent to a class 1-4 road (VDOT).
# -----
# Import arcpy module
import arcpy

# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")

# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"

arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"

# Local variables:
USFS_intersectingHighKnobMatrix_shp = "W:\\Ptolemy\\ThesisData\\GIS Data\\USFS
from TNC\\USFS_intersectingHighKnobMatrix.shp"

LeeParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
NortonParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"
ScottParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
WiseParcels2011 = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"
Roads_VGIN = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN"
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
Parcels_Merge_Layer = "Parcels_Merge_Layer"
Roads_VGIN_Layer = "Roads_VGIN_Layer"
Output_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Slope_ned_mo1"
Flat_areas = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Flat_areas"
AllParcels_Clip_Merge__3_ = "Parcels_Merge_Layer"
Commercial_Dev_Risk_High =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Commercial_Dev_Risk_High"
AllParcels_Clip_Merge__2_ = "Parcels_Merge_Layer"

```

```

Threatened1_Development_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened1_Development_Final"

Output_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge"

# Process: Slope
arcpy.gp.Slope_sa(ned_mosaic_Clip, Output_raster, "DEGREE", "1")

# Process: Extract by Attributes
arcpy.gp.ExtractByAttributes_sa(Output_raster, "\\VALUE\\ < 10", Flat_areas)

# Process: Merge
arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011;W:\\
\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\N
ortonParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels", Output_Dataset,
"OBJECTID_1 \\OBJECTID_1" true false false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-
1;MAP_NUMBER \\MAP_NUMBER" true false false 50 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NUMBER,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NUMBER,-1,-
1;PARCEL_ID \\PARCEL_ID" true false false 16 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-1;MAP_NO
\\MAP_NO" true false false 45 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NO,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NO,-1,-1;CHECK2
\\CHECK2" true false false 200 Text 0 0
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1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,CHECK2,-1,-1;NEWFIELD1
\\NEWFIELD1" true false false 8 Double 0 0
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\\PLAT" true false false 47 Text 0 0
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\\ACCOUNT" true false false 9 Text 0 0
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\\Calculatio" true false false 2 Short 0 0
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\\Hotlink" true false false 50 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,Hotlink,-1,-

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false false 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,X,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,X,-1,-  
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Double 0 0 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Y,-1,-  
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false 10 Text 0 0  
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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueLand,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueLand,-1,-1;Considerat \\\"Considerat\\\" true true false 254 Text 0 0

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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetName,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetName,-1,-1;ZipCode\\\"ZipCode\" true true false 254 Text 0 0

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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralHea,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralHea,-1,-1;CentralAir \\\"CentralAir\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralAir,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralAir,-1,-1;TypeRoof \\\"TypeRoof\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeRoof,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeRoof,-1,-1;TypeExteri \\\"TypeExteri\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeExteri,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeExteri,-1,-1;ExteriorCo \\\"ExteriorCo\\\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-1;TypeFuel \"TypeFuel\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-1;Zoning \"Zoning\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-1;PropertyUs \"PropertyUs\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SqFtMainAr,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SqFtMainAr,-1,-1;DescMainLa \"DescMainLa\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainLa,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainLa,-1,-1;SizeLandFI \"SizeLandFI\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandCo,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandCo,-1,-1;PublicWate \"PublicWate\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicSewe,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PublicSewe,-1,-1;Well \"Well\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Well,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Well,-1,-1;Spring \"Spring\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Spring,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Spring,-1,-1;SepticTank \"SepticTank\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SepticTank,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SepticTank,-1,-1;Undergroun \\\"Undergroun\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Undergroun,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Undergroun,-1,-1;PavedRoad \\\"PavedRoad\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PavedRoad,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PavedRoad,-1,-1;DirtRoad \\\"DirtRoad\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DirtRoad,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DirtRoad,-1,-1;NoRoad \\\"NoRoad\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NoRoad,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NoRoad,-1,-1;CurbsGutte \\\"CurbsGutte\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CurbsGutte,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CurbsGutte,-1,-1;Sidewalks \\\"Sidewalks\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Sidewalks,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Sidewalks,-1,-1;Topography \\\"Topography\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Topography,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Topography,-1,-1;Temp\_1 \\\"Temp\_1\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Temp\_1,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Temp\_1,-1,-1;MAP\_TAXMAP \\\"MAP\_TAXMAP\\\" true true false 254 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_TAXMAP,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_TAXMAP,-1,-1;MAP\_DBLCIR \\\"MAP\_DBLCIR\\\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,QUARTER\_UP,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,QUARTER\_UP,-1,-1;UPDATE\_TYP \"UPDATE\_TYP\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATE\_TYP,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,UPDATE\_TYP,-1,-1;LINK\_STATU \"LINK\_STATU\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,LINK\_STATU,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,LINK\_STATU,-1,-1;WVS\_COMMENT \"WVS\_COMMENT\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_COMMENT,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,WVS\_COMMENT,-1,-1;WVS\_SPATIA \"WVS\_SPATIA\" true true false 254 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLOCK\_,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_BLOCK\_,-1,-1;MAP\_DBLC\_1 \"MAP\_DBLC\_1\" true true false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBLC\_1,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,MAP\_DBLC\_1,-1,-1;MapOwner \"MapOwner\" true true false 100 Text 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Id,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Id,-1,-1;Sheet1\_\_FID \"Sheet1\_\_FID\" true true false 8 Double 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Name\_2,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Name\_2,-1,-1;Sheet1\_\_Addr\_1 \"Sheet1\_\_Addr\_1\" true true false 255 Text 0 0

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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Addr\_1,-1,-  
1;Sheet1\_\_Addr\_2 \"Sheet1\_\_Addr\_2\" true true false 255 Text 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Addr\_2,-1,-  
1;Sheet1\_\_City\_State \"Sheet1\_\_City\_State\" true true false 255 Text 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_City\_State,-1,-  
1;Sheet1\_\_Zip\_1 \"Sheet1\_\_Zip\_1\" true true false 8 Double 0 0  
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1;Sheet1\_\_Zip\_2 \"Sheet1\_\_Zip\_2\" true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Zip\_2,-1,-  
1;Sheet1\_\_Map\_\_ \"Sheet1\_\_Map\_\_\" true true false 255 Text 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Map\_\_, -1,-  
1;Sheet1\_\_Desc\_1 \"Sheet1\_\_Desc\_1\" true true false 255 Text 0 0  
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1;Sheet1\_\_Desc\_2 \"Sheet1\_\_Desc\_2\" true true false 255 Text 0 0  
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1;Sheet1\_\_Desc\_3 \"Sheet1\_\_Desc\_3\" true true false 255 Text 0 0  
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1;Sheet1\_\_Desc\_4 \"Sheet1\_\_Desc\_4\" true true false 255 Text 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Desc\_4,-1,-  
1;Sheet1\_\_Class\_Code \"Sheet1\_\_Class\_Code\" true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Class\_Code,-1,-  
1;Sheet1\_\_Year\_Built \"Sheet1\_\_Year\_Built\" true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Year\_Built,-1,-  
1;Sheet1\_\_Year\_Rmld \"Sheet1\_\_Year\_Rmld\" true true false 8 Double 0 0  
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1;Sheet1\_\_Info \"Sheet1\_\_Info\" true true false 255 Text 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_\_\_Stories,-1,-  
1;Sheet1\_\_\_\_Rooms \"Sheet1\_\_\_\_Rooms\" true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Rooms,-1,-  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Baths,-1,-  
1;Sheet1\_\_Half\_Baths \"Sheet1\_\_Half\_Baths\" true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Chimneys,-1,-  
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Double 0 0  
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-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Improvement\_Value,-  
1,-1;Sheet1\_\_Commercial\_Dwelling\_Value \"Sheet1\_\_Commercial\_Dwelling\_Value\"  
true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial\_Dwelling\_Val  
ue,-1,-1;Sheet1\_\_Total\_Value \"Sheet1\_\_Total\_Value\" true true false 8 Double 0 0  
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Total\_Value,-1,-  
1;Sheet1\_\_Dwelling\_Condition \"Sheet1\_\_Dwelling\_Condition\" true true false 255 Text  
0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Dwelling\_Condition,-  
1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Dwelling\_Condition,-1,-  
1;Sheet1\_\_Commercial \"Sheet1\_\_Commercial\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial,-1,-1;Sheet1\_\_Consideration\_Amount \"Sheet1\_\_Consideration\_Amount\" true true false 8 Double 0 0

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,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Acres,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Acres,-1,-1;Sheet1\_\_Plat\_Book \"Sheet1\_\_Plat\_Book\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Book,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Book,-1,-1;Sheet1\_\_Plat\_Page \"Sheet1\_\_Plat\_Page\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Page,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Page,-1,-1;Sheet1\_\_Deed\_Book \"Sheet1\_\_Deed\_Book\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Book,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Book,-1,-1;Sheet1\_\_Deed\_Page \"Sheet1\_\_Deed\_Page\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Page,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Page,-1,-1;Sheet1\_\_Will\_Book \"Sheet1\_\_Will\_Book\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Book,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Book,-1,-1;Sheet1\_\_Will\_Page \"Sheet1\_\_Will\_Page\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Page,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Page,-1,-1;Sheet1\_\_Recorded\_Date \"Sheet1\_\_Recorded\_Date\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Recorded\_Date,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Recorded\_Date,-1,-1;Sheet1\_\_Inst\_Type \"Sheet1\_\_Inst\_Type\" true true false 255 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Inst\_Type,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Inst\_Type,-1,-1;Sheet1\_\_Inst\_Year \"Sheet1\_\_Inst\_Year\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Inst\_Year,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Inst\_Year,-1,-1;Sheet1\_\_Instrument\_\_ \"Sheet1\_\_Instrument\_\_\" true true false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Instrument\_\_,,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Instrument\_\_,,-1,-1;CountyName \"CountyName\" true true false 50 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,CountyName,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,CountyName,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CountyName,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,CountyName,-1,-1")

# Process: Make Feature Layer

```
arcpy.MakeFeatureLayer_management(Output_Dataset, Parcels_Merge_Layer, "", "",  
"OBJECTID_1 OBJECTID_1 VISIBLE NONE;MAP_NUMBER MAP_NUMBER VISIBLE  
NONE;PARCEL_ID PARCEL_ID VISIBLE NONE;MAP_NO MAP_NO VISIBLE  
NONE;CHECK2 CHECK2 VISIBLE NONE;NEWFIELD1 NEWFIELD1 VISIBLE  
NONE;PLAT PLAT VISIBLE NONE;ACCOUNT ACCOUNT VISIBLE NONE;Calculatio  
Calculatio VISIBLE NONE;Hotlink Hotlink VISIBLE NONE;hotlink_pl hotlink_pl VISIBLE  
NONE;X X VISIBLE NONE;Y Y VISIBLE NONE;Status Status VISIBLE NONE;Date_  
Date_ VISIBLE NONE;Tech Tech VISIBLE NONE;Comment Comment VISIBLE  
NONE;DEED_USED DEED_USED VISIBLE NONE;Assessment Assessment VISIBLE  
NONE;Shape_Leng Shape_Leng VISIBLE NONE;SHAPE_Length SHAPE_Length  
VISIBLE NONE;SHAPE_Area SHAPE_Area VISIBLE NONE;ACCOUNT_NU  
ACCOUNT_NU VISIBLE NONE;DISTRICT DISTRICT VISIBLE NONE;MAP_NUM  
MAP_NUM VISIBLE NONE;CALC_AC CALC_AC VISIBLE NONE;SUBCODE  
SUBCODE VISIBLE NONE;LRK_NUMBER LRK_NUMBER VISIBLE  
NONE;PARCEL_TYP PARCEL_TYP VISIBLE NONE;PARCEL_NUM PARCEL_NUM  
VISIBLE NONE;MAINTENANC MAINTENANC VISIBLE NONE;GPIN GPIN VISIBLE  
NONE;AccountNum AccountNum VISIBLE NONE;CAMA_LINK CAMA_LINK VISIBLE  
NONE;MAP_PIN MAP_PIN VISIBLE NONE;OwnerName OwnerName VISIBLE  
NONE;OwnerAddr1 OwnerAddr1 VISIBLE NONE;OwnerAddr2 OwnerAddr2 VISIBLE  
NONE;OwnerCityS OwnerCityS VISIBLE NONE;OwnerZip OwnerZip VISIBLE  
NONE;DeedBook DeedBook VISIBLE NONE;ValueImpro ValueImpro VISIBLE  
NONE;ValueLand ValueLand VISIBLE NONE;Considerat Considerat VISIBLE  
NONE;DateTransf DateTransf VISIBLE NONE;PrevOwner1 PrevOwner1 VISIBLE  
NONE;PrevOwne_1 PrevOwne_1 VISIBLE NONE;PrevOwne_2 PrevOwne_2 VISIBLE  
NONE;PrevOwne_3 PrevOwne_3 VISIBLE NONE;PrevOwne_4 PrevOwne_4 VISIBLE  
NONE;Prev1DeedB Prev1DeedB VISIBLE NONE;Prev1Consi Prev1Consi VISIBLE  
NONE;TaxMapNum TaxMapNum VISIBLE NONE;StreetNum StreetNum VISIBLE  
NONE;StreetName StreetName VISIBLE NONE;ZipCode ZipCode VISIBLE  
NONE;YearBuilt YearBuilt VISIBLE NONE;YearRemode YearRemode VISIBLE  
NONE;YearAssess YearAssess VISIBLE NONE;Residentia Residentia VISIBLE  
NONE;Commercial Commercial VISIBLE NONE;PropertyDe PropertyDe VISIBLE  
NONE;NumStories NumStories VISIBLE NONE;NumRooms NumRooms VISIBLE  
NONE;NumBedroom NumBedroom VISIBLE NONE;NumBaths NumBaths VISIBLE  
NONE;NumFirepla NumFirepla VISIBLE NONE;NumChimney NumChimney VISIBLE  
NONE;SplitLevel SplitLevel VISIBLE NONE;SplitFoyer SplitFoyer VISIBLE  
NONE;CentralHea CentralHea VISIBLE NONE;CentralAir CentralAir VISIBLE  
NONE;TypeRoof TypeRoof VISIBLE NONE;TypeExteri TypeExteri VISIBLE  
NONE;ExteriorCo ExteriorCo VISIBLE NONE;TypeFounda TypeFounda VISIBLE  
NONE;TypeBaseme TypeBaseme VISIBLE NONE;TypeFloor TypeFloor VISIBLE  
NONE;TypeWalls TypeWalls VISIBLE NONE;TypeFuel TypeFuel VISIBLE  
NONE;ClassCode ClassCode VISIBLE NONE;Zoning Zoning VISIBLE  
NONE;Neighborho Neighborho VISIBLE NONE;PropertyUs PropertyUs VISIBLE  
NONE;DescMainBu DescMainBu VISIBLE NONE;SqFtMainAr SqFtMainAr VISIBLE
```

NONE;DescMainLa DescMainLa VISIBLE NONE;SizeLandFI SizeLandFI VISIBLE  
 NONE;SizeLandCo SizeLandCo VISIBLE NONE;PublicWate PublicWate VISIBLE  
 NONE;PublicSewe PublicSewe VISIBLE NONE;Well Well VISIBLE NONE;Spring  
 Spring VISIBLE NONE;SepticTank SepticTank VISIBLE NONE;Undergroun  
 Undergroun VISIBLE NONE;PavedRoad PavedRoad VISIBLE NONE;DirtRoad  
 DirtRoad VISIBLE NONE;NoRoad NoRoad VISIBLE NONE;CurbsGutte CurbsGutte  
 VISIBLE NONE;Sidewalks Sidewalks VISIBLE NONE;Topography Topography  
 VISIBLE NONE;Temp\_1 Temp\_1 VISIBLE NONE;MAP\_TAXMAP MAP\_TAXMAP  
 VISIBLE NONE;MAP\_DBL CIR MAP\_DBL CIR VISIBLE NONE;MAP\_BLK MAP\_BLK  
 VISIBLE NONE;MAP\_LOT MAP\_LOT VISIBLE NONE;UPDATED\_BY UPDATED\_BY  
 VISIBLE NONE;YEAR\_UPDAT YEAR\_UPDAT VISIBLE NONE;QUARTER\_UP  
 QUARTER\_UP VISIBLE NONE;UPDATE\_TYP UPDATE\_TYP VISIBLE  
 NONE;LINK\_STATU LINK\_STATU VISIBLE NONE;WVS\_COMMEN WVS\_COMMEN  
 VISIBLE NONE;WVS\_SPATIA WVS\_SPATIA VISIBLE NONE;MAP\_BLOCK\_  
 MAP\_BLOCK\_ VISIBLE NONE;MAP\_DBLC\_1 MAP\_DBLC\_1 VISIBLE  
 NONE;MapOwner MapOwner VISIBLE NONE;Id Id VISIBLE NONE;Sheet1\_\_FID  
 Sheet1\_\_FID VISIBLE NONE;Sheet1\_\_Account\_\_ Sheet1\_\_Account\_\_ VISIBLE  
 NONE;Sheet1\_\_Seq\_ Sheet1\_\_Seq\_ VISIBLE NONE;Sheet1\_\_District  
 Sheet1\_\_District VISIBLE NONE;Sheet1\_\_Name Sheet1\_\_Name VISIBLE  
 NONE;Sheet1\_\_Name\_2 Sheet1\_\_Name\_2 VISIBLE NONE;Sheet1\_\_Addr\_1  
 Sheet1\_\_Addr\_1 VISIBLE NONE;Sheet1\_\_Addr\_2 Sheet1\_\_Addr\_2 VISIBLE  
 NONE;Sheet1\_\_City\_State Sheet1\_\_City\_State VISIBLE NONE;Sheet1\_\_Zip\_1  
 Sheet1\_\_Zip\_1 VISIBLE NONE;Sheet1\_\_Zip\_2 Sheet1\_\_Zip\_2 VISIBLE  
 NONE;Sheet1\_\_Map\_\_ Sheet1\_\_Map\_\_ VISIBLE NONE;Sheet1\_\_Desc\_1  
 Sheet1\_\_Desc\_1 VISIBLE NONE;Sheet1\_\_Desc\_2 Sheet1\_\_Desc\_2 VISIBLE  
 NONE;Sheet1\_\_Desc\_3 Sheet1\_\_Desc\_3 VISIBLE NONE;Sheet1\_\_Desc\_4  
 Sheet1\_\_Desc\_4 VISIBLE NONE;Sheet1\_\_Class\_Code Sheet1\_\_Class\_Code VISIBLE  
 NONE;Sheet1\_\_Year\_Built Sheet1\_\_Year\_Built VISIBLE NONE;Sheet1\_\_Year\_Rmld  
 Sheet1\_\_Year\_Rmld VISIBLE NONE;Sheet1\_\_Info Sheet1\_\_Info VISIBLE  
 NONE;Sheet1\_\_\_\_Stories Sheet1\_\_\_\_Stories VISIBLE NONE;Sheet1\_\_\_\_Rooms  
 Sheet1\_\_\_\_Rooms VISIBLE NONE;Sheet1\_\_\_\_Bedrooms Sheet1\_\_\_\_Bedrooms  
 VISIBLE NONE;Sheet1\_\_\_\_Baths Sheet1\_\_\_\_Baths VISIBLE  
 NONE;Sheet1\_\_\_\_Half\_Baths Sheet1\_\_\_\_Half\_Baths VISIBLE  
 NONE;Sheet1\_\_\_\_Fireplaces Sheet1\_\_\_\_Fireplaces VISIBLE  
 NONE;Sheet1\_\_\_\_Chimneys Sheet1\_\_\_\_Chimneys VISIBLE  
 NONE;Sheet1\_\_Dwelling\_Type Sheet1\_\_Dwelling\_Type VISIBLE  
 NONE;Sheet1\_\_Grade Sheet1\_\_Grade VISIBLE NONE;Sheet1\_\_Land\_Value  
 Sheet1\_\_Land\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Value  
 Sheet1\_\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Improvement\_Value  
 Sheet1\_\_Improvement\_Value VISIBLE NONE;Sheet1\_\_Commercial\_Dwelling\_Value  
 Sheet1\_\_Commercial\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Total\_Value  
 Sheet1\_\_Total\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Condition  
 Sheet1\_\_Dwelling\_Condition VISIBLE NONE;Sheet1\_\_Commercial  
 Sheet1\_\_Commercial VISIBLE NONE;Sheet1\_\_Consideration\_Amount  
 Sheet1\_\_Consideration\_Amount VISIBLE NONE;Sheet1\_\_Acres Sheet1\_\_Acres



```
VISIBLE NONE;Sheet1__Plat_Book Sheet1__Plat_Book VISIBLE
NONE;Sheet1__Plat_Page Sheet1__Plat_Page VISIBLE NONE;Sheet1__Deed_Book
Sheet1__Deed_Book VISIBLE NONE;Sheet1__Deed_Page Sheet1__Deed_Page
VISIBLE NONE;Sheet1__Will_Book Sheet1__Will_Book VISIBLE
NONE;Sheet1__Will_Page Sheet1__Will_Page VISIBLE
NONE;Sheet1__Recorded_Date Sheet1__Recorded_Date VISIBLE
NONE;Sheet1__Inst_Type Sheet1__Inst_Type VISIBLE NONE;Sheet1__Inst_Year
Sheet1__Inst_Year VISIBLE NONE;Sheet1__Instrument__ Sheet1__Instrument__
VISIBLE NONE;CountyName CountyName VISIBLE NONE")
```

```
# Process: Make Feature Layer (2)
```

```
arcpy.MakeFeatureLayer_management(Roads_VGIN, Roads_VGIN_Layer,
"\DISPLAYCLA" = 1 OR \DISPLAYCLA" = 2 OR \DISPLAYCLA" = 3 OR
\DISPLAYCLA" = 4", "", "OBJECTID OBJECTID VISIBLE NONE;Shape Shape
VISIBLE NONE;V_LEID V_LEID VISIBLE NONE;V_FIPS V_FIPS VISIBLE
NONE;V_ORGNAM V_ORGNAM VISIBLE NONE;ROUTENUMBE ROUTENUMBE
VISIBLE NONE;V_UCHGDT V_UCHGDT VISIBLE NONE;V_ROADTYPE
V_ROADTYPE VISIBLE NONE;DISPLAYCLA DISPLAYCLA VISIBLE
NONE;Shape_Length Shape_Length VISIBLE NONE;Length_Mi Length_Mi VISIBLE
NONE")
```

```
# Process: Select Layer By Location
```

```
arcpy.SelectLayerByLocation_management(Parcels_Merge_Layer, "INTERSECT",
Roads_VGIN_Layer, "", "NEW_SELECTION")
```

```
# Process: Select Layer By Location (2)
```

```
arcpy.SelectLayerByLocation_management(AllParcels_Clip_Merge__2_,
"INTERSECT", USFS_intersectingHighKnobMatrix_shp, "",
"REMOVE_FROM_SELECTION")
```

```
# Process: Extract by Mask
```

```
arcpy.gp.ExtractByMask_sa(Flat_areas, AllParcels_Clip_Merge__3_,
Commercial_Dev_Risk_High)
```

```
# Process: Reclassify
```

```
arcpy.gp.Reclassify_sa(Commercial_Dev_Risk_High, "Value", "0.001 10 1;NODATA 0",
Threatened1_Development_Final, "DATA")
```

## **Threat2: Residential Development**

```
# -----
```

```

# Threat2.py
# Created on: 2012-05-07 09:33:07.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Selects and rasterizes cells adjacent to class 1 or two road that fall within the
viewshed of scenic features.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
# Local variables:
LeeParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
NortonParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"
ScottParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
WiseParcels2011 = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"
HighKnobForestMatrix =
"W:\\Ptolemy\\ThesisData\\Thesis_GIS\\Elmore_Thesis.mdb\\HighKnobForestMatrix"
Roads_VGIN = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN"
USFS_Land = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land"
ned_mosaic_Clip__2_ = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
Output_Layer__2_ = "WiseParcels2011_Merge_Clip_L"
Roads_VGIN_Layer = "Roads_VGIN_Layer"
Output_raster__2_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Slope_ned_mo2"

```

```

Flat_areas_Res = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Flat_areas_Res"
AllParcels_Clip_Merge__3_ = "WiseParcels2011_Merge_Clip_L"
Res_Dev_Risk_High = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Res_Dev_Risk_High"
Output_Layer_Name = "WiseParcels2011_Merge_Clip_L"
Output_Layer__3_ = "USFS_Land_Clip_Layer"
Output_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge"
Output_Layer = "WiseParcels2011_Merge_Layer"
Output_Feature_Class =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge_Clip"
Output_Feature_Class__2_ =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Land_Clip"
Threatened2_Res_Dev_Final =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Threatened2_Res_Dev_Final"
# Process: Slope
arcpy.gp.Slope_sa(ned_mosaic_Clip__2_, Output_raster__2_, "DEGREE", "1")
# Process: Extract by Attributes
arcpy.gp.ExtractByAttributes_sa(Output_raster__2_, "\"VALUE\" < 10", Flat_areas_Res)
# Process: Merge (2)
arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011;W:\\
\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\N
ortonParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels", Output_Dataset,
"OBJECTID_1 \"OBJECTID_1\" true false false 4 Long 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-
1;MAP_NUMBER \"MAP_NUMBER\" true false false 50 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NUMBER,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NUMBER,-1,-
1;PARCEL_ID \"PARCEL_ID\" true false false 16 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-1;MAP_NO
\"MAP_NO\" true false false 45 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NO,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NO,-1,-1;CHECK2
\"CHECK2\" true false false 200 Text 0 0

```

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,CHECK2,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,CHECK2,-1,-1;NEWFIELD1 \"NEWFIELD1\" true false false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,NEWFIELD1,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,NEWFIELD1,-1,-1;PLAT \"PLAT\" true false false 47 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,PLAT,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,PLAT,-1,-1;ACCOUNT \"ACCOUNT\" true false false 9 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,ACCOUNT,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,ACCOUNT,-1,-1;Calculatio \"Calculatio\" true false false 2 Short 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Calculatio,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Calculatio,-1,-1;Hotlink \"Hotlink\" true false false 50 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Hotlink,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Hotlink,-1,-1;hotlink\_pl \"hotlink\_pl\" true false false 50 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,hotlink\_pl,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,hotlink\_pl,-1,-1;X \"X\" true false false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,X,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,X,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,X,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,X,-1,-1;Y \"Y\" true false false 8 Double 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Y,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Y,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Y,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Y,-1,-1;Status \"Status\" true false false 10 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Status,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Status,-1,-1;Date\_ \"Date\_\" true true false 8 Date 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Date\_,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Date\_,-1,-1;Tech \"Tech\" true false false 10 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Tech,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Tech,-1,-1;Comment \"Comment\" true false false 50 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Comment,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Comment,-1,-1;DEED\_USED \"DEED\_USED\" true false false 10 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,DEED\_USED,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,DEED\_USED,-1,-1;Assessment \"Assessment\" true false false 254 Text 0 0

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Assessment,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Assessment,-1,-  
1;Shape\_Leng \"Shape\_Leng\" true false false 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Shape\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,SHAPE\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,Shape\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,SHAPE\_Leng,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Leng,-1,-  
1;SHAPE\_Length \"SHAPE\_Length\" false true true 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,SHAPE\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,SHAPE\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Length,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Shape\_Length,-1,-1;SHAPE\_Area  
\"SHAPE\_Area\" false true true 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,SHAPE\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,SHAPE\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Shape\_Area,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Shape\_Area,-1,-1;ACCOUNT\_NU  
\"ACCOUNT\_NU\" true true false 4 Long 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,ACCOUNT\_NU,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,ACCOUNT\_NU,-1,-1;DISTRICT  
\"DISTRICT\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,DISTRICT,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,DISTRICT,-1,-1;MAP\_NUM  
\"MAP\_NUM\" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,MAP\_NUM,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,MAP\_NUM,-1,-1;CALC\_AC  
\"CALC\_AC\" true true false 8 Double 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,CALC\_AC,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,CALC\_AC,-1,-1;SUBCODE  
\"SUBCODE\" true true false 6 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,SUBCODE,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,SUBCODE,-1,-1;LRK\_NUMBER  
\"LRK\_NUMBER\" true true false 4 Long 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,LRK\_NUMBER,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,LRK\_NUMBER,-1,-

1;PARCEL\_TYP \"PARCEL\_TYP\" true true false 30 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,PARCEL\_TYP,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,PARCEL\_TYP,-1,-  
1;PARCEL\_NUM \"PARCEL\_NUM\" true true false 25 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,PARCEL\_NUM,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,PARCEL\_NUM,-1,-  
1;MAINTENANC \"MAINTENANC\" true true false 50 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,MAINTENANC,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,MAINTENANC,-1,-1;GPIN  
\"GPIN\" true true false 10 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,GPIN,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,GPIN,-1,-1;AccountNum  
\"AccountNum\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,AccountNum,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,AccountNum,-1,-1;CAMA\_LINK  
\"CAMA\_LINK\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CAMA\_LINK,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CAMA\_LINK,-1,-1;MAP\_PIN  
\"MAP\_PIN\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_PIN,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_PIN,-1,-1;OwnerName  
\"OwnerName\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerName,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerName,-1,-1;OwnerAddr1  
\"OwnerAddr1\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerAddr1,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerAddr1,-1,-1;OwnerAddr2  
\"OwnerAddr2\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerAddr2,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerAddr2,-1,-1;OwnerCityS  
\"OwnerCityS\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerCityS,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerCityS,-1,-1;OwnerZip  
\"OwnerZip\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerZip,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,OwnerZip,-1,-1;DeedBook  
\"DeedBook\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DeedBook,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DeedBook,-1,-1;ValueImpro  
\"ValueImpro\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueImpro,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueImpro,-1,-1;ValueLand  
\"ValueLand\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueLand,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ValueLand,-1,-1;Considerat

\"Considerat\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Considerat,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Considerat,-1,-1;DateTransf  
 \"DateTransf\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DateTransf,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DateTransf,-1,-1;PrevOwner1  
 \"PrevOwner1\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwner1,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwner1,-1,-1;PrevOwne\_1  
 \"PrevOwne\_1\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_1,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_1,-1,-1;PrevOwne\_2  
 \"PrevOwne\_2\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_2,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_2,-1,-1;PrevOwne\_3  
 \"PrevOwne\_3\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_3,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_3,-1,-1;PrevOwne\_4  
 \"PrevOwne\_4\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_4,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PrevOwne\_4,-1,-1;Prev1DeedB  
 \"Prev1DeedB\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Prev1DeedB,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Prev1DeedB,-1,-1;Prev1Consi  
 \"Prev1Consi\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Prev1Consi,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Prev1Consi,-1,-1;TaxMapNum  
 \"TaxMapNum\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TaxMapNum,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TaxMapNum,-1,-1;StreetNum  
 \"StreetNum\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetNum,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetNum,-1,-1;StreetName  
 \"StreetName\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetName,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,StreetName,-1,-1;ZipCode  
 \"ZipCode\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ZipCode,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,ZipCode,-1,-1;YearBuilt  
 \"YearBuilt\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearBuilt,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearBuilt,-1,-1;YearRemode  
 \"YearRemode\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearRemode,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearRemode,-1,-1;YearAssess

\"YearAssess\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearAssess,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YearAssess,-1,-1;Residentia  
 \"Residentia\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Residentia,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Residentia,-1,-1;Commercial  
 \"Commercial\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Commercial,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Commercial,-1,-1;PropertyDe  
 \"PropertyDe\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PropertyDe,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PropertyDe,-1,-1;NumStories  
 \"NumStories\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumStories,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumStories,-1,-1;NumRooms  
 \"NumRooms\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumRooms,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumRooms,-1,-1;NumBedroom  
 \"NumBedroom\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumBedroom,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumBedroom,-1,-1;NumBaths  
 \"NumBaths\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumBaths,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumBaths,-1,-1;NumFirepla  
 \"NumFirepla\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumFirepla,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumFirepla,-1,-1;NumChimney  
 \"NumChimney\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumChimney,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NumChimney,-1,-1;SplitLevel  
 \"SplitLevel\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SplitLevel,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SplitLevel,-1,-1;SplitFoyer  
 \"SplitFoyer\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SplitFoyer,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SplitFoyer,-1,-1;CentralHea  
 \"CentralHea\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralHea,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralHea,-1,-1;CentralAir  
 \"CentralAir\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralAir,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CentralAir,-1,-1;TypeRoof  
 \"TypeRoof\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeRoof,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,TypeRoof,-1,-1;TypeExteri



\ "TypeExteri" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeExteri,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeExteri,-1,-1;ExteriorCo  
\ "ExteriorCo" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ExteriorCo,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ExteriorCo,-1,-1;TypeFounda  
\ "TypeFounda" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFounda,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFounda,-1,-1;TypeBaseme  
\ "TypeBaseme" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeBaseme,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeBaseme,-1,-1;TypeFloor  
\ "TypeFloor" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFloor,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFloor,-1,-1;TypeWalls  
\ "TypeWalls" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeWalls,-1,-1;TypeFuel  
\ "TypeFuel" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFuel,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,TypeFuel,-1,-1;ClassCode  
\ "ClassCode" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ClassCode,-1,-1;Zoning  
\ "Zoning" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Zoning,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Zoning,-1,-1;Neighborho  
\ "Neighborho" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,Neighborho,-1,-1;PropertyUs  
\ "PropertyUs" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyUs,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyUs,-1,-1;DescMainBu  
\ "DescMainBu" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainBu,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainBu,-1,-1;SqFtMainAr  
\ "SqFtMainAr" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SqFtMainAr,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SqFtMainAr,-1,-1;DescMainLa  
\ "DescMainLa" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainLa,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,DescMainLa,-1,-1;SizeLandFI  
\ "SizeLandFI" true true false 254 Text 0 0  
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandFI,-1,-  
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,SizeLandFI,-1,-1;SizeLandCo

\"SizeLandCo\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SizeLandCo,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SizeLandCo,-1,-1;PublicWate  
 \"PublicWate\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PublicWate,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PublicWate,-1,-1;PublicSewe  
 \"PublicSewe\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PublicSewe,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PublicSewe,-1,-1;Well \"Well\"  
 true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Well,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Well,-1,-1;Spring \"Spring\" true  
 true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Spring,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Spring,-1,-1;SepticTank  
 \"SepticTank\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SepticTank,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,SepticTank,-1,-1;Undergroun  
 \"Undergroun\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Undergroun,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Undergroun,-1,-1;PavedRoad  
 \"PavedRoad\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PavedRoad,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,PavedRoad,-1,-1;DirtRoad  
 \"DirtRoad\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DirtRoad,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,DirtRoad,-1,-1;NoRoad  
 \"NoRoad\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NoRoad,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,NoRoad,-1,-1;CurbsGutte  
 \"CurbsGutte\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CurbsGutte,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CurbsGutte,-1,-1;Sidewalks  
 \"Sidewalks\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Sidewalks,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Sidewalks,-1,-1;Topography  
 \"Topography\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Topography,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Topography,-1,-1;Temp\_1  
 \"Temp\_1\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Temp\_1,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,Temp\_1,-1,-1;MAP\_TAXMAP  
 \"MAP\_TAXMAP\" true true false 254 Text 0 0  
 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_TAXMAP,-1,-  
 1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_TAXMAP,-1,-

1;MAP\_DBL CIR \"MAP\_DBL CIR\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_DBL CIR,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_DBL CIR,-1,-1;MAP\_BLK  
\"MAP\_BLK\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_BLK,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_BLK,-1,-1;MAP\_LOT  
\"MAP\_LOT\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_LOT,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_LOT,-1,-1;UPDATED\_BY  
\"UPDATED\_BY\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,UPDATED\_BY,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,UPDATED\_BY,-1,-  
1;YEAR\_UPDAT \"YEAR\_UPDAT\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YEAR\_UPDAT,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,YEAR\_UPDAT,-1,-  
1;QUARTER\_UP \"QUARTER\_UP\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,QUARTER\_UP,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,QUARTER\_UP,-1,-  
1;UPDATE\_TYP \"UPDATE\_TYP\" true true false 254 Text 0 0  
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1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,UPDATE\_TYP,-1,-  
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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,LINK\_STATU,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,LINK\_STATU,-1,-  
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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,WVS\_COMMENT,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,WVS\_COMMENT,-1,-  
1;WVS\_SPATIA \"WVS\_SPATIA\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,WVS\_SPATIA,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,WVS\_SPATIA,-1,-  
1;MAP\_BLOCK\_ \"MAP\_BLOCK\_\" true true false 254 Text 0 0  
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1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_BLOCK\_,-1,-  
1;MAP\_DBL C\_1 \"MAP\_DBL C\_1\" true true false 254 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_DBL C\_1,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MAP\_DBL C\_1,-1,-1;MapOwner  
\"MapOwner\" true true false 100 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,MapOwner,-1,-  
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false 4 Long 0 0 ,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Id,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Id,-1,-1;Sheet1\_\_FID  
\"Sheet1\_\_FID\" true true false 8 Double 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_FID,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_FID,-1,-  
1;Sheet1\_\_Account\_ \"Sheet1\_\_Account\_\" true true false 8 Double 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Account\_\_,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Account\_\_,-1,-1;Sheet1\_\_Seq\_ \"Sheet1\_\_Seq\_\" true true false 8 Double 0 0

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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Name,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Name,-1,-1;Sheet1\_\_Name\_2 \"Sheet1\_\_Name\_2\" true true false 255 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Name\_2,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Name\_2,-1,-1;Sheet1\_\_Addr\_1 \"Sheet1\_\_Addr\_1\" true true false 255 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Addr\_1,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Addr\_1,-1,-1;Sheet1\_\_Addr\_2 \"Sheet1\_\_Addr\_2\" true true false 255 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Addr\_2,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Addr\_2,-1,-1;Sheet1\_\_City\_State \"Sheet1\_\_City\_State\" true true false 255 Text 0 0

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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Stories,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Stories,-1,-1;Sheet1\_\_Rooms \"Sheet1\_\_Rooms\" true true false 8 Double 0 0

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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Chimneys,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Chimneys,-1,-1;Sheet1\_\_Dwelling\_Type \"Sheet1\_\_Dwelling\_Type\" true true false 255 Text 0 0

,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Type,-1,-1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1\_\_Dwelling\_Type,-1,-1;Sheet1\_\_Grade \"Sheet1\_\_Grade\" true true false 255 Text 0 0

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Double 0 0  
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 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial\_Dwelling\_Value,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Commercial\_Dwelling\_Value,-1,-1;Sheet1\_\_Total\_Value \"Sheet1\_\_Total\_Value\" true true false 8 Double 0 0  
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 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Book,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Book,-1,-1;Sheet1\_\_Plat\_Page \"Sheet1\_\_Plat\_Page\" true true false 8 Double 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Page,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Plat\_Page,-1,-1;Sheet1\_\_Deed\_Book \"Sheet1\_\_Deed\_Book\" true true false 8 Double 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Book,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Book,-1,-1;Sheet1\_\_Deed\_Page \"Sheet1\_\_Deed\_Page\" true true false 8 Double 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Page,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Deed\_Page,-1,-1;Sheet1\_\_Will\_Book \"Sheet1\_\_Will\_Book\" true true false 255 Text 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Book,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Book,-1,-1;Sheet1\_\_Will\_Page \"Sheet1\_\_Will\_Page\" true true false 8 Double 0 0  
 ,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Page,-1,-1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1\_\_Will\_Page,-1,-1;Sheet1\_\_Recorded\_Date \"Sheet1\_\_Recorded\_Date\" true true false 8 Double 0 0

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1;Sheet1__Inst_Type \"Sheet1__Inst_Type\" true true false 255 Text 0 0
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1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Inst_Year,-1,-
1;Sheet1__Instrument__ \"Sheet1__Instrument__\" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Instrument__, -1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Instrument__, -1,-
1;CountyName \"CountyName\" true true false 50 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\WiseParcels2011,CountyName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,CountyName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,CountyName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,CountyName,-1,-1")
```

# Process: Make Feature Layer

```
arcpy.MakeFeatureLayer_management(Output_Dataset, Output_Layer, "", "",
"OBJECTID_1 OBJECTID_1 VISIBLE NONE;MAP_NUMBER MAP_NUMBER VISIBLE
NONE;PARCEL_ID PARCEL_ID VISIBLE NONE;MAP_NO MAP_NO VISIBLE
NONE;CHECK2 CHECK2 VISIBLE NONE;NEWFIELD1 NEWFIELD1 VISIBLE
NONE;PLAT PLAT VISIBLE NONE;ACCOUNT ACCOUNT VISIBLE NONE;Calculatio
Calculatio VISIBLE NONE;Hotlink Hotlink VISIBLE NONE;hotlink_pl hotlink_pl VISIBLE
NONE;X X VISIBLE NONE;Y Y VISIBLE NONE;Status Status VISIBLE NONE;Date_
Date_ VISIBLE NONE;Tech Tech VISIBLE NONE;Comment Comment VISIBLE
NONE;DEED_USED DEED_USED VISIBLE NONE;Assessment Assessment VISIBLE
NONE;Shape_Leng Shape_Leng VISIBLE NONE;SHAPE_Length SHAPE_Length
VISIBLE NONE;SHAPE_Area SHAPE_Area VISIBLE NONE;ACCOUNT_NU
ACCOUNT_NU VISIBLE NONE;DISTRICT DISTRICT VISIBLE NONE;MAP_NUM
MAP_NUM VISIBLE NONE;CALC_AC CALC_AC VISIBLE NONE;SUBCODE
SUBCODE VISIBLE NONE;LRK_NUMBER LRK_NUMBER VISIBLE
NONE;PARCEL_TYP PARCEL_TYP VISIBLE NONE;PARCEL_NUM PARCEL_NUM
VISIBLE NONE;MAINTENANC MAINTENANC VISIBLE NONE;GPIN GPIN VISIBLE
NONE;AccountNum AccountNum VISIBLE NONE;CAMA_LINK CAMA_LINK VISIBLE
NONE;MAP_PIN MAP_PIN VISIBLE NONE;OwnerName OwnerName VISIBLE
NONE;OwnerAddr1 OwnerAddr1 VISIBLE NONE;OwnerAddr2 OwnerAddr2 VISIBLE
NONE;OwnerCityS OwnerCityS VISIBLE NONE;OwnerZip OwnerZip VISIBLE
NONE;DeedBook DeedBook VISIBLE NONE;ValueImpro ValueImpro VISIBLE
NONE;ValueLand ValueLand VISIBLE NONE;Considerat Considerat VISIBLE
NONE;DateTransf DateTransf VISIBLE NONE;PrevOwner1 PrevOwner1 VISIBLE
NONE;PrevOwne_1 PrevOwne_1 VISIBLE NONE;PrevOwne_2 PrevOwne_2 VISIBLE
NONE;PrevOwne_3 PrevOwne_3 VISIBLE NONE;PrevOwne_4 PrevOwne_4 VISIBLE
NONE;Prev1DeedB Prev1DeedB VISIBLE NONE;Prev1Consi Prev1Consi VISIBLE
NONE;TaxMapNum TaxMapNum VISIBLE NONE;StreetNum StreetNum VISIBLE
```

NONE;StreetName StreetName VISIBLE NONE;ZipCode ZipCode VISIBLE  
NONE;YearBuilt YearBuilt VISIBLE NONE;YearRemode YearRemode VISIBLE  
NONE;YearAssess YearAssess VISIBLE NONE;Residentia Residentia VISIBLE  
NONE;Commercial Commercial VISIBLE NONE;PropertyDe PropertyDe VISIBLE  
NONE;NumStories NumStories VISIBLE NONE;NumRooms NumRooms VISIBLE  
NONE;NumBedroom NumBedroom VISIBLE NONE;NumBaths NumBaths VISIBLE  
NONE;NumFirepla NumFirepla VISIBLE NONE;NumChimney NumChimney VISIBLE  
NONE;SplitLevel SplitLevel VISIBLE NONE;SplitFoyer SplitFoyer VISIBLE  
NONE;CentralHea CentralHea VISIBLE NONE;CentralAir CentralAir VISIBLE  
NONE;TypeRoof TypeRoof VISIBLE NONE;TypeExteri TypeExteri VISIBLE  
NONE;ExteriorCo ExteriorCo VISIBLE NONE;TypeFounda TypeFounda VISIBLE  
NONE;TypeBaseme TypeBaseme VISIBLE NONE;TypeFloor TypeFloor VISIBLE  
NONE;TypeWalls TypeWalls VISIBLE NONE;TypeFuel TypeFuel VISIBLE  
NONE;ClassCode ClassCode VISIBLE NONE;Zoning Zoning VISIBLE  
NONE;Neighborho Neighborho VISIBLE NONE;PropertyUs PropertyUs VISIBLE  
NONE;DescMainBu DescMainBu VISIBLE NONE;SqFtMainAr SqFtMainAr VISIBLE  
NONE;DescMainLa DescMainLa VISIBLE NONE;SizeLandFI SizeLandFI VISIBLE  
NONE;SizeLandCo SizeLandCo VISIBLE NONE;PublicWate PublicWate VISIBLE  
NONE;PublicSewer PublicSewer VISIBLE NONE;Well Well VISIBLE NONE;Spring  
Spring VISIBLE NONE;SepticTank SepticTank VISIBLE NONE;Undergroun  
Undergroun VISIBLE NONE;PavedRoad PavedRoad VISIBLE NONE;DirtRoad  
DirtRoad VISIBLE NONE;NoRoad NoRoad VISIBLE NONE;CurbsGutte CurbsGutte  
VISIBLE NONE;Sidewalks Sidewalks VISIBLE NONE;Topography Topography  
VISIBLE NONE;Temp\_1 Temp\_1 VISIBLE NONE;MAP\_TAXMAP MAP\_TAXMAP  
VISIBLE NONE;MAP\_DBLCIR MAP\_DBLCIR VISIBLE NONE;MAP\_BLK MAP\_BLK  
VISIBLE NONE;MAP\_LOT MAP\_LOT VISIBLE NONE;UPDATED\_BY UPDATED\_BY  
VISIBLE NONE;YEAR\_UPDAT YEAR\_UPDAT VISIBLE NONE;QUARTER\_UP  
QUARTER\_UP VISIBLE NONE;UPDATE\_TYP UPDATE\_TYP VISIBLE  
NONE;LINK\_STATU LINK\_STATU VISIBLE NONE;WVS\_COMMEN WVS\_COMMEN  
VISIBLE NONE;WVS\_SPATIA WVS\_SPATIA VISIBLE NONE;MAP\_BLOCK\_  
MAP\_BLOCK\_ VISIBLE NONE;MAP\_DBLC\_1 MAP\_DBLC\_1 VISIBLE  
NONE;MapOwner MapOwner VISIBLE NONE;Id Id VISIBLE NONE;Sheet1\_\_FID  
Sheet1\_\_FID VISIBLE NONE;Sheet1\_\_Account\_\_ Sheet1\_\_Account\_\_ VISIBLE  
NONE;Sheet1\_\_Seq\_ Sheet1\_\_Seq\_ VISIBLE NONE;Sheet1\_\_District  
Sheet1\_\_District VISIBLE NONE;Sheet1\_\_Name Sheet1\_\_Name VISIBLE  
NONE;Sheet1\_\_Name\_2 Sheet1\_\_Name\_2 VISIBLE NONE;Sheet1\_\_Addr\_1  
Sheet1\_\_Addr\_1 VISIBLE NONE;Sheet1\_\_Addr\_2 Sheet1\_\_Addr\_2 VISIBLE  
NONE;Sheet1\_\_City\_State Sheet1\_\_City\_State VISIBLE NONE;Sheet1\_\_Zip\_1  
Sheet1\_\_Zip\_1 VISIBLE NONE;Sheet1\_\_Zip\_2 Sheet1\_\_Zip\_2 VISIBLE  
NONE;Sheet1\_\_Map\_\_ Sheet1\_\_Map\_\_ VISIBLE NONE;Sheet1\_\_Desc\_1  
Sheet1\_\_Desc\_1 VISIBLE NONE;Sheet1\_\_Desc\_2 Sheet1\_\_Desc\_2 VISIBLE  
NONE;Sheet1\_\_Desc\_3 Sheet1\_\_Desc\_3 VISIBLE NONE;Sheet1\_\_Desc\_4  
Sheet1\_\_Desc\_4 VISIBLE NONE;Sheet1\_\_Class\_Code Sheet1\_\_Class\_Code VISIBLE  
NONE;Sheet1\_\_Year\_Built Sheet1\_\_Year\_Built VISIBLE NONE;Sheet1\_\_Year\_Rmld  
Sheet1\_\_Year\_Rmld VISIBLE NONE;Sheet1\_\_Info Sheet1\_\_Info VISIBLE



NONE;Sheet1\_\_\_\_Stories Sheet1\_\_\_\_Stories VISIBLE NONE;Sheet1\_\_\_\_Rooms  
Sheet1\_\_\_\_Rooms VISIBLE NONE;Sheet1\_\_\_\_Bedrooms Sheet1\_\_\_\_Bedrooms  
VISIBLE NONE;Sheet1\_\_\_\_Baths Sheet1\_\_\_\_Baths VISIBLE  
NONE;Sheet1\_\_\_\_Half\_Baths Sheet1\_\_\_\_Half\_Baths VISIBLE  
NONE;Sheet1\_\_\_\_Fireplaces Sheet1\_\_\_\_Fireplaces VISIBLE  
NONE;Sheet1\_\_\_\_Chimneys Sheet1\_\_\_\_Chimneys VISIBLE  
NONE;Sheet1\_\_Dwelling\_Type Sheet1\_\_Dwelling\_Type VISIBLE  
NONE;Sheet1\_\_Grade Sheet1\_\_Grade VISIBLE NONE;Sheet1\_\_Land\_Value  
Sheet1\_\_Land\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Value  
Sheet1\_\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Improvement\_Value  
Sheet1\_\_Improvement\_Value VISIBLE NONE;Sheet1\_\_Commercial\_Dwelling\_Value  
Sheet1\_\_Commercial\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Total\_Value  
Sheet1\_\_Total\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Condition  
Sheet1\_\_Dwelling\_Condition VISIBLE NONE;Sheet1\_\_Commercial  
Sheet1\_\_Commercial VISIBLE NONE;Sheet1\_\_Consideration\_Amount  
Sheet1\_\_Consideration\_Amount VISIBLE NONE;Sheet1\_\_Acres Sheet1\_\_Acres  
VISIBLE NONE;Sheet1\_\_Plat\_Book Sheet1\_\_Plat\_Book VISIBLE  
NONE;Sheet1\_\_Plat\_Page Sheet1\_\_Plat\_Page VISIBLE NONE;Sheet1\_\_Deed\_Book  
Sheet1\_\_Deed\_Book VISIBLE NONE;Sheet1\_\_Deed\_Page Sheet1\_\_Deed\_Page  
VISIBLE NONE;Sheet1\_\_Will\_Book Sheet1\_\_Will\_Book VISIBLE  
NONE;Sheet1\_\_Will\_Page Sheet1\_\_Will\_Page VISIBLE  
NONE;Sheet1\_\_Recorded\_Date Sheet1\_\_Recorded\_Date VISIBLE  
NONE;Sheet1\_\_Inst\_Type Sheet1\_\_Inst\_Type VISIBLE NONE;Sheet1\_\_Inst\_Year  
Sheet1\_\_Inst\_Year VISIBLE NONE;Sheet1\_\_Instrument\_\_ Sheet1\_\_Instrument\_\_  
VISIBLE NONE;CountyName CountyName VISIBLE NONE")

# Process: Clip

arcpy.Clip\_analysis(Output\_Layer, HighKnobForestMatrix, Output\_Feature\_Class, "")

# Process: Make Feature Layer (3)

arcpy.MakeFeatureLayer\_management(Output\_Feature\_Class, Output\_Layer\_\_2\_, "",  
"", "OBJECTID\_1 OBJECTID\_1 VISIBLE NONE;MAP\_NUMBER MAP\_NUMBER  
VISIBLE NONE;PARCEL\_ID PARCEL\_ID VISIBLE NONE;MAP\_NO MAP\_NO VISIBLE  
NONE;CHECK2 CHECK2 VISIBLE NONE;NEWFIELD1 NEWFIELD1 VISIBLE  
NONE;PLAT PLAT VISIBLE NONE;ACCOUNT ACCOUNT VISIBLE NONE;Calculatio  
Calculatio VISIBLE NONE;Hotlink Hotlink VISIBLE NONE;hotlink\_pl hotlink\_pl VISIBLE  
NONE;X X VISIBLE NONE;Y Y VISIBLE NONE;Status Status VISIBLE NONE;Date\_  
Date\_ VISIBLE NONE;Tech Tech VISIBLE NONE;Comment Comment VISIBLE  
NONE;DEED\_USED DEED\_USED VISIBLE NONE;Assessment Assessment VISIBLE  
NONE;Shape\_Leng Shape\_Leng VISIBLE NONE;SHAPE\_Length SHAPE\_Length  
VISIBLE NONE;SHAPE\_Area SHAPE\_Area VISIBLE NONE;ACCOUNT\_NU  
ACCOUNT\_NU VISIBLE NONE;DISTRICT DISTRICT VISIBLE NONE;MAP\_NUM  
MAP\_NUM VISIBLE NONE;CALC\_AC CALC\_AC VISIBLE NONE;SUBCODE  
SUBCODE VISIBLE NONE;LRK\_NUMBER LRK\_NUMBER VISIBLE

NONE;PARCEL\_TYP PARCEL\_TYP VISIBLE NONE;PARCEL\_NUM PARCEL\_NUM VISIBLE NONE;MAINTENANC MAINTENANC VISIBLE NONE;GPIN GPIN VISIBLE NONE;AccountNum AccountNum VISIBLE NONE;CAMA\_LINK CAMA\_LINK VISIBLE NONE;MAP\_PIN MAP\_PIN VISIBLE NONE;OwnerName OwnerName VISIBLE NONE;OwnerAddr1 OwnerAddr1 VISIBLE NONE;OwnerAddr2 OwnerAddr2 VISIBLE NONE;OwnerCityS OwnerCityS VISIBLE NONE;OwnerZip OwnerZip VISIBLE NONE;DeedBook DeedBook VISIBLE NONE;ValueImpro ValueImpro VISIBLE NONE;ValueLand ValueLand VISIBLE NONE;Considerat Considerat VISIBLE NONE;DateTransf DateTransf VISIBLE NONE;PrevOwner1 PrevOwner1 VISIBLE NONE;PrevOwne\_1 PrevOwne\_1 VISIBLE NONE;PrevOwne\_2 PrevOwne\_2 VISIBLE NONE;PrevOwne\_3 PrevOwne\_3 VISIBLE NONE;PrevOwne\_4 PrevOwne\_4 VISIBLE NONE;Prev1DeedB Prev1DeedB VISIBLE NONE;Prev1Consi Prev1Consi VISIBLE NONE;TaxMapNum TaxMapNum VISIBLE NONE;StreetNum StreetNum VISIBLE NONE;StreetName StreetName VISIBLE NONE;ZipCode ZipCode VISIBLE NONE;YearBuilt YearBuilt VISIBLE NONE;YearRemode YearRemode VISIBLE NONE;YearAssess YearAssess VISIBLE NONE;Residentia Residentia VISIBLE NONE;Commercial Commercial VISIBLE NONE;PropertyDe PropertyDe VISIBLE NONE;NumStories NumStories VISIBLE NONE;NumRooms NumRooms VISIBLE NONE;NumBedroom NumBedroom VISIBLE NONE;NumBaths NumBaths VISIBLE NONE;NumFirepla NumFirepla VISIBLE NONE;NumChimney NumChimney VISIBLE NONE;SplitLevel SplitLevel VISIBLE NONE;SplitFoyer SplitFoyer VISIBLE NONE;CentralHea CentralHea VISIBLE NONE;CentralAir CentralAir VISIBLE NONE;TypeRoof TypeRoof VISIBLE NONE;TypeExteri TypeExteri VISIBLE NONE;ExteriorCo ExteriorCo VISIBLE NONE;TypeFounda TypeFounda VISIBLE NONE;TypeBaseme TypeBaseme VISIBLE NONE;TypeFloor TypeFloor VISIBLE NONE;TypeWalls TypeWalls VISIBLE NONE;TypeFuel TypeFuel VISIBLE NONE;ClassCode ClassCode VISIBLE NONE;Zoning Zoning VISIBLE NONE;Neighborho Neighborho VISIBLE NONE;PropertyUs PropertyUs VISIBLE NONE;DescMainBu DescMainBu VISIBLE NONE;SqFtMainAr SqFtMainAr VISIBLE NONE;DescMainLa DescMainLa VISIBLE NONE;SizeLandFI SizeLandFI VISIBLE NONE;SizeLandCo SizeLandCo VISIBLE NONE;PublicWate PublicWate VISIBLE NONE;PublicSewer PublicSewer VISIBLE NONE;Well Well VISIBLE NONE;Spring Spring VISIBLE NONE;SepticTank SepticTank VISIBLE NONE;Undergroun Undergroun VISIBLE NONE;PavedRoad PavedRoad VISIBLE NONE;DirtRoad DirtRoad VISIBLE NONE;NoRoad NoRoad VISIBLE NONE;CurbsGutte CurbsGutte VISIBLE NONE;Sidewalks Sidewalks VISIBLE NONE;Topography Topography VISIBLE NONE;Temp\_1 Temp\_1 VISIBLE NONE;MAP\_TAXMAP MAP\_TAXMAP VISIBLE NONE;MAP\_DBLCIR MAP\_DBLCIR VISIBLE NONE;MAP\_BLK MAP\_BLK VISIBLE NONE;MAP\_LOT MAP\_LOT VISIBLE NONE;UPDATED\_BY UPDATED\_BY VISIBLE NONE;YEAR\_UPDAT YEAR\_UPDAT VISIBLE NONE;QUARTER\_UP QUARTER\_UP VISIBLE NONE;UPDATE\_TYP UPDATE\_TYP VISIBLE NONE;LINK\_STATU LINK\_STATU VISIBLE NONE;WVS\_COMMEN WVS\_COMMEN VISIBLE NONE;WVS\_SPATIA WVS\_SPATIA VISIBLE NONE;MAP\_BLOCK\_ MAP\_BLOCK\_ VISIBLE NONE;MAP\_DBLC\_1 MAP\_DBLC\_1 VISIBLE NONE;MapOwner MapOwner VISIBLE NONE;Id Id VISIBLE NONE;Sheet1 \_\_FID

Sheet1\_\_FID VISIBLE NONE;Sheet1\_\_Account\_\_ Sheet1\_\_Account\_\_ VISIBLE NONE;Sheet1\_\_Seq\_Sheet1\_\_Seq\_ VISIBLE NONE;Sheet1\_\_District Sheet1\_\_District VISIBLE NONE;Sheet1\_\_Name Sheet1\_\_Name VISIBLE NONE;Sheet1\_\_Name\_2 Sheet1\_\_Name\_2 VISIBLE NONE;Sheet1\_\_Addr\_1 Sheet1\_\_Addr\_1 VISIBLE NONE;Sheet1\_\_Addr\_2 Sheet1\_\_Addr\_2 VISIBLE NONE;Sheet1\_\_City\_State Sheet1\_\_City\_State VISIBLE NONE;Sheet1\_\_Zip\_1 Sheet1\_\_Zip\_1 VISIBLE NONE;Sheet1\_\_Zip\_2 Sheet1\_\_Zip\_2 VISIBLE NONE;Sheet1\_\_Map\_\_ Sheet1\_\_Map\_\_ VISIBLE NONE;Sheet1\_\_Desc\_1 Sheet1\_\_Desc\_1 VISIBLE NONE;Sheet1\_\_Desc\_2 Sheet1\_\_Desc\_2 VISIBLE NONE;Sheet1\_\_Desc\_3 Sheet1\_\_Desc\_3 VISIBLE NONE;Sheet1\_\_Desc\_4 Sheet1\_\_Desc\_4 VISIBLE NONE;Sheet1\_\_Class\_Code Sheet1\_\_Class\_Code VISIBLE NONE;Sheet1\_\_Year\_Built Sheet1\_\_Year\_Built VISIBLE NONE;Sheet1\_\_Year\_Rmld Sheet1\_\_Year\_Rmld VISIBLE NONE;Sheet1\_\_Info Sheet1\_\_Info VISIBLE NONE;Sheet1\_\_\_\_Stories Sheet1\_\_\_\_Stories VISIBLE NONE;Sheet1\_\_\_\_Rooms Sheet1\_\_\_\_Rooms VISIBLE NONE;Sheet1\_\_\_\_Bedrooms Sheet1\_\_\_\_Bedrooms VISIBLE NONE;Sheet1\_\_\_\_Baths Sheet1\_\_\_\_Baths VISIBLE NONE;Sheet1\_\_\_\_Half\_Baths Sheet1\_\_\_\_Half\_Baths VISIBLE NONE;Sheet1\_\_\_\_Fireplaces Sheet1\_\_\_\_Fireplaces VISIBLE NONE;Sheet1\_\_\_\_Chimneys Sheet1\_\_\_\_Chimneys VISIBLE NONE;Sheet1\_\_Dwelling\_Type Sheet1\_\_Dwelling\_Type VISIBLE NONE;Sheet1\_\_Grade Sheet1\_\_Grade VISIBLE NONE;Sheet1\_\_Land\_Value Sheet1\_\_Land\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Value Sheet1\_\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Improvement\_Value Sheet1\_\_Improvement\_Value VISIBLE NONE;Sheet1\_\_Commercial\_Dwelling\_Value Sheet1\_\_Commercial\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Total\_Value Sheet1\_\_Total\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Condition Sheet1\_\_Dwelling\_Condition VISIBLE NONE;Sheet1\_\_Commercial Sheet1\_\_Commercial VISIBLE NONE;Sheet1\_\_Consideration\_Amount Sheet1\_\_Consideration\_Amount VISIBLE NONE;Sheet1\_\_Acres Sheet1\_\_Acres VISIBLE NONE;Sheet1\_\_Plat\_Book Sheet1\_\_Plat\_Book VISIBLE NONE;Sheet1\_\_Plat\_Page Sheet1\_\_Plat\_Page VISIBLE NONE;Sheet1\_\_Deed\_Book Sheet1\_\_Deed\_Book VISIBLE NONE;Sheet1\_\_Deed\_Page Sheet1\_\_Deed\_Page VISIBLE NONE;Sheet1\_\_Will\_Book Sheet1\_\_Will\_Book VISIBLE NONE;Sheet1\_\_Will\_Page Sheet1\_\_Will\_Page VISIBLE NONE;Sheet1\_\_Recorded\_Date Sheet1\_\_Recorded\_Date VISIBLE NONE;Sheet1\_\_Inst\_Type Sheet1\_\_Inst\_Type VISIBLE NONE;Sheet1\_\_Inst\_Year Sheet1\_\_Inst\_Year VISIBLE NONE;Sheet1\_\_Instrument\_\_ Sheet1\_\_Instrument\_\_ VISIBLE NONE;CountyName CountyName VISIBLE NONE;Shape\_length Shape\_length VISIBLE NONE;Shape\_area Shape\_area VISIBLE NONE")

# Process: Make Feature Layer (2)

```
arcpy.MakeFeatureLayer_management(Roads_VGIN, Roads_VGIN_Layer,
"\DISPLAYCLA\" = 1 OR \"DISPLAYCLA\" = 2 OR \"DISPLAYCLA\" = 3 OR
\"DISPLAYCLA\" = 4", "", "OBJECTID OBJECTID VISIBLE NONE;Shape Shape
VISIBLE NONE;V_LEID V_LEID VISIBLE NONE;V_FIPS V_FIPS VISIBLE
```

```
NONE;V_ORGNAM V_ORGNAM VISIBLE NONE;ROUTENUMBE ROUTENUMBE  
VISIBLE NONE;V_UCHGDT V_UCHGDT VISIBLE NONE;V_ROADTYPE  
V_ROADTYPE VISIBLE NONE;DISPLAYCLA DISPLAYCLA VISIBLE  
NONE;Shape_Length Shape_Length VISIBLE NONE;Length_Mi Length_Mi VISIBLE  
NONE")
```

```
# Process: Select Layer By Location
```

```
arcpy.SelectLayerByLocation_management(Output_Layer__2_, "INTERSECT",  
Roads_VGIN_Layer, "", "NEW_SELECTION")
```

```
# Process: Clip (2)
```

```
arcpy.Clip_analysis(USFS_Land, HighKnobForestMatrix, Output_Feature_Class__2_,  
"")
```

```
# Process: Make Feature Layer (4)
```

```
arcpy.MakeFeatureLayer_management(Output_Feature_Class__2_,  
Output_Layer__3_, "", "", "OBJECTID OBJECTID VISIBLE NONE;Shape Shape  
VISIBLE NONE;LABEL LABEL VISIBLE NONE;BNDACCURAC BNDACCURAC  
VISIBLE NONE;LANDLINK LANDLINK VISIBLE NONE;MAAGENCY MAAGENCY  
VISIBLE NONE;MATYPE MATYPE VISIBLE NONE;MANAME MANAME VISIBLE  
NONE;TOTALACRE TOTALACRE VISIBLE NONE;TRACTACRE TRACTACRE  
VISIBLE NONE;GISACRE GISACRE VISIBLE NONE;MALEVEL MALEVEL VISIBLE  
NONE;OWNER OWNER VISIBLE NONE;ORIGFORMAT ORIGFORMAT VISIBLE  
NONE;BNDORIGIN BNDORIGIN VISIBLE NONE;PUBACCESS PUBACCESS VISIBLE  
NONE;Shape_Length Shape_Length VISIBLE NONE;Shape_Area Shape_Area  
VISIBLE NONE;Shape_length Shape_length VISIBLE NONE;Shape_area Shape_area  
VISIBLE NONE")
```

```
# Process: Select Layer By Location (2)
```

```
arcpy.SelectLayerByLocation_management(Output_Layer_Name, "INTERSECT",  
Output_Layer__3_, "", "REMOVE_FROM_SELECTION")
```

```
# Process: Extract by Mask
```

```
arcpy.gp.ExtractByMask_sa(Flat_areas_Res, AllParcels_Clip_Merge__3_,  
Res_Dev_Risk_High)
```

```
# Process: Reclassify
```

```
arcpy.gp.Reclassify_sa(Res_Dev_Risk_High, "Value", "0.001 10 1;NODATA 0",  
Threatened2_Res_Dev_Final, "DATA")
```

## **Threat 2b: Development (combines Threat 1 and Threat 2)**

```
# -----
```

```

# Threat2b.py
# Created on: 2012-05-07 09:32:16.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Combines the outputs of Threatened1 and Threatened2 into a single raster.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
# Local variables:
Threatened1_Development_Final =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Threatened1_Development_Final"
Threatened2_Res_Dev_Final =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Threatened2_Res_Dev_Final"
Reclass_Thre1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_Thre1"
Reclass_Thre2 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_Thre2"
Threatened2b_Potential_Development =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened2b_Potential_Development"
# Process: Reclassify
arcpy.gp.Reclassify_sa(Threatened2_Res_Dev_Final, "Value", "0 0;1 1;NODATA -1",
Reclass_Thre1, "DATA")
# Process: Reclassify (2)

```

```
arcpy.gp.Reclassify_sa(Threatened1_Development_Final, "Value", "0 0;1 1;NODATA -
1", Reclass_Thre2, "DATA")
```

```
# Process: Boolean Or
```

```
arcpy.gp.BooleanOr_sa(Reclass_Thre1, Reclass_Thre2,
Threatened2b_Potential_Development)
```

### **Threat 3: Conversion of Undeveloped Land**

```
# -----
```

```
# Threat3.py
```

```
# Created on: 2012-05-07 09:33:21.00000
```

```
# (generated by ArcGIS/ModelBuilder)
```

```
# Description:
```

```
# Creates a raster of cells with undeveloped land use classifications.
```

```
# -----
```

```
# Import arcpy module
```

```
import arcpy
```

```
# Check out any necessary licenses
```

```
arcpy.CheckOutExtension("spatial")
```

```
# Set Geoprocessing environments
```

```
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
```

```
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
```

```
# Local variables:
```

```
nlcd2006_highknob_Albers =
```

```
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers"
```

```
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
```

```
HighKnobForestMatrix =
```

```
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"
```

```
Output_Raster_Dataset =
```

```
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers_Pro"
```

```

Threatened3_LandUse =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Threatened3_LandUse"

nlcd2006_highknob_Albers_Pro =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers_Pro"

Threatened3_LandUse_prelim =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Threatened3_LandUse_prelim"

Threatened3_LandUse_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened3_LandUse_Final"

# Process: Project Raster

arcpy.ProjectRaster_management(nlcd2006_highknob_Albers,
nlcd2006_highknob_Albers_Pro,
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.66666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.3333333333
334],UNIT['Foot_US',0.3048006096012192]]", "NEAREST", ned_mosaic_Clip, "", "",
"PROJCS['Albers_Conical_Equal_Area',GEOGCS['GCS_North_American_1983',DATU
M['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.257222101]],PRI
MEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['Albers'],PA
RAMETER['false_easting',0.0],PARAMETER['false_northing',0.0],PARAMETER['central
_meridian',-
96.0],PARAMETER['standard_parallel_1',29.5],PARAMETER['standard_parallel_2',45.5
],PARAMETER['latitude_of_origin',23.0],UNIT['Meter',1.0]]")

# Process: Calculate Statistics

arcpy.CalculateStatistics_management(nlcd2006_highknob_Albers_Pro, "1", "1", "")

# Process: Reclassify

arcpy.gp.Reclassify_sa(Output_Raster_Dataset, "Value", "0 20 1;21 23 NODATA;24 84
1;85 NODATA;86 93 1", Threatened3_LandUse, "DATA")

# Process: Extract by Mask

arcpy.gp.ExtractByMask_sa(Threatened3_LandUse, HighKnobForestMatrix,
Threatened3_LandUse_prelim)

```

```
# Process: Reclassify (2)
```

```
arcpy.gp.Reclassify_sa(Threatened3_LandUse_prelim, "VALUE", "1 1;NODATA 0",  
Threatened3_LandUse_Final, "DATA")
```

### **Threat 4: Small Scale Development**

```
# -----
```

```
# Threat4.py
```

```
# Created on: 2012-05-07 09:33:39.00000
```

```
# (generated by ArcGIS/ModelBuilder)
```

```
# Description:
```

```
# Creates a feature class of parcels having road access and intersecting USFS land  
within a 100m buffer of a ridgeline over 3000 feet. This feature class is then rasterized  
for use in IDRISI.
```

```
# -----
```

```
# Import arcpy module
```

```
import arcpy
```

```
# Check out any necessary licenses
```

```
arcpy.CheckOutExtension("spatial")
```

```
# Set Geoprocessing environments
```

```
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
```

```
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543  
3529739.20190136"
```

```
# Local variables:
```

```
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
```

```
LeeParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
```

```
NortonParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"
```

```
ScottParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
```

```
WiseParcels2011 = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"
```

```
USFS_Land = "W:\\Ptolemy\\HighKnob.gdb\\Zones\\USFS_Land"
```



```

Roads_VGIN__2_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Roads_VGIN"
USFS_Roads = "W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\USFS_Roads"
FlowDir_ned_1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FlowDir_ned_2"
Output_drop_raster = ""
FlowAcc_Flow3 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FlowAcc_Flow3"
rastercalc1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\rastercalc1"
Reclass_Flow3 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_Flow3"
Output_Dataset = "W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge"
Parcels_Merge_Layer__5_ = "Parcels_Merge_Layer"
Parcels_Merge_Layer = "Parcels_Merge_Layer"
FocalSt_Recl1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FocalSt_Recl1"
WiseParcels2011_Merge_CopyFe4 =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge_CopyFe4"
SmallScaleDevSelections =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\SmallScaleDevSelections"
Parcels_Merge_Layer__4_ = "Parcels_Merge_Layer"
rastercalc3 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\rastercalc3"
Threatened4_SmallScaleDev_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened4_SmallScaleDev_Final"
Parcels_Merge_Layer__2_ = "Parcels_Merge_Layer"
# Process: Flow Direction
arcpy.gp.FlowDirection_sa(ned_mosaic_Clip, FlowDir_ned_1, "FORCE",
Output_drop_raster)
# Process: Flow Accumulation
arcpy.gp.FlowAccumulation_sa(FlowDir_ned_1, FlowAcc_Flow3, "", "INTEGER")
# Process: Reclassify
arcpy.gp.Reclassify_sa(FlowAcc_Flow3, "VALUE", "0 1;1 11308 0", Reclass_Flow3,
"DATA")

```

# Process: Focal Statistics

```
arcpy.gp.FocalStatistics_sa(Reclass_Flow3, FocalSt_Recl1, "Rectangle 5 5 CELL",  
"MAJORITY", "DATA")
```

# Process: Raster Calculator

```
arcpy.gp.RasterCalculator_sa("Con(\'%ned_mosaic_Clip%\' >  
914,\'%FocalSt_Recl1%\',0)", rastercalc1)
```

# Process: Merge

```
arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011;W:\\  
Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\N  
ortonParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels", Output_Dataset,  
"OBJECTID_1 \"OBJECTID_1\" true false false 4 Long 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,OBJECTID_1,-1,-  
1;MAP_NUMBER \"MAP_NUMBER\" true false false 50 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NUMBER,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,MAP_NUMBER,-1,-  
1;PARCEL_ID \"PARCEL_ID\" true false false 16 Text 0 0  
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-  
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,PARCEL_ID,-1,-1;MAP_NO  
\"MAP_NO\" true false false 45 Text 0 0  
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1;PARCEL_NUM \PARCEL_NUM\ true true false 25 Text 0 0
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1,W:\Ptolemy\HighKnob.gdb\Parcels\ScottParcels,PARCEL_NUM,-1,-
1;MAINTENANC \MAINTENANC\ true true false 50 Text 0 0
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,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Year,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Inst_Year,-1,-
1;Sheet1__Instrument__ \"Sheet1__Instrument__\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Instrument__, -1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,Sheet1__Instrument__, -1,-
1;CountyName \"CountyName\" true true false 50 Text 0 0
,First,#,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011,CountyName,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels,CountyName,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels,CountyName,-1,-
1,W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels,CountyName,-1,-1")

```

# Process: Make Feature Layer

arcpy.MakeFeatureLayer\_management(Output\_Dataset, Parcels\_Merge\_Layer, "", "",  
"OBJECTID\_1 OBJECTID\_1 VISIBLE NONE;MAP\_NUMBER MAP\_NUMBER VISIBLE  
NONE;PARCEL\_ID PARCEL\_ID VISIBLE NONE;MAP\_NO MAP\_NO VISIBLE  
NONE;CHECK2 CHECK2 VISIBLE NONE;NEWFIELD1 NEWFIELD1 VISIBLE  
NONE;PLAT PLAT VISIBLE NONE;ACCOUNT ACCOUNT VISIBLE NONE;Calculatio  
Calculatio VISIBLE NONE;Hotlink Hotlink VISIBLE NONE;hotlink\_pl hotlink\_pl VISIBLE  
NONE;X X VISIBLE NONE;Y Y VISIBLE NONE;Status Status VISIBLE NONE;Date\_  
Date\_ VISIBLE NONE;Tech Tech VISIBLE NONE;Comment Comment VISIBLE  
NONE;DEED\_USED DEED\_USED VISIBLE NONE;Assessment Assessment VISIBLE  
NONE;Shape\_Leng Shape\_Leng VISIBLE NONE;SHAPE\_Length SHAPE\_Length  
VISIBLE NONE;SHAPE\_Area SHAPE\_Area VISIBLE NONE;ACCOUNT\_NU  
ACCOUNT\_NU VISIBLE NONE;DISTRICT DISTRICT VISIBLE NONE;MAP\_NUM  
MAP\_NUM VISIBLE NONE;CALC\_AC CALC\_AC VISIBLE NONE;SUBCODE  
SUBCODE VISIBLE NONE;LRK\_NUMBER LRK\_NUMBER VISIBLE  
NONE;PARCEL\_TYP PARCEL\_TYP VISIBLE NONE;PARCEL\_NUM PARCEL\_NUM  
VISIBLE NONE;MAINTENANC MAINTENANC VISIBLE NONE;GPIN GPIN VISIBLE  
NONE;AccountNum AccountNum VISIBLE NONE;CAMA\_LINK CAMA\_LINK VISIBLE  
NONE;MAP\_PIN MAP\_PIN VISIBLE NONE;OwnerName OwnerName VISIBLE  
NONE;OwnerAddr1 OwnerAddr1 VISIBLE NONE;OwnerAddr2 OwnerAddr2 VISIBLE  
NONE;OwnerCityS OwnerCityS VISIBLE NONE;OwnerZip OwnerZip VISIBLE  
NONE;DeedBook DeedBook VISIBLE NONE;ValueImpro ValueImpro VISIBLE  
NONE;ValueLand ValueLand VISIBLE NONE;Considerat Considerat VISIBLE  
NONE;DateTransf DateTransf VISIBLE NONE;PrevOwner1 PrevOwner1 VISIBLE  
NONE;PrevOwne\_1 PrevOwne\_1 VISIBLE NONE;PrevOwne\_2 PrevOwne\_2 VISIBLE  
NONE;PrevOwne\_3 PrevOwne\_3 VISIBLE NONE;PrevOwne\_4 PrevOwne\_4 VISIBLE  
NONE;Prev1DeedB Prev1DeedB VISIBLE NONE;Prev1Consi Prev1Consi VISIBLE  
NONE;TaxMapNum TaxMapNum VISIBLE NONE;StreetNum StreetNum VISIBLE  
NONE;StreetName StreetName VISIBLE NONE;ZipCode ZipCode VISIBLE  
NONE;YearBuilt YearBuilt VISIBLE NONE;YearRemode YearRemode VISIBLE  
NONE;YearAssess YearAssess VISIBLE NONE;Residentia Residentia VISIBLE  
NONE;Commercial Commercial VISIBLE NONE;PropertyDe PropertyDe VISIBLE  
NONE;NumStories NumStories VISIBLE NONE;NumRooms NumRooms VISIBLE  
NONE;NumBedroom NumBedroom VISIBLE NONE;NumBaths NumBaths VISIBLE  
NONE;NumFirepla NumFirepla VISIBLE NONE;NumChimney NumChimney VISIBLE  
NONE;SplitLevel SplitLevel VISIBLE NONE;SplitFoyer SplitFoyer VISIBLE  
NONE;CentralHea CentralHea VISIBLE NONE;CentralAir CentralAir VISIBLE  
NONE;TypeRoof TypeRoof VISIBLE NONE;TypeExteri TypeExteri VISIBLE  
NONE;ExteriorCo ExteriorCo VISIBLE NONE;TypeFounda TypeFounda VISIBLE  
NONE;TypeBaseme TypeBaseme VISIBLE NONE;TypeFloor TypeFloor VISIBLE  
NONE;TypeWalls TypeWalls VISIBLE NONE;TypeFuel TypeFuel VISIBLE  
NONE;ClassCode ClassCode VISIBLE NONE;Zoning Zoning VISIBLE  
NONE;Neighborho Neighborho VISIBLE NONE;PropertyUs PropertyUs VISIBLE  
NONE;DescMainBu DescMainBu VISIBLE NONE;SqFtMainAr SqFtMainAr VISIBLE  
NONE;DescMainLa DescMainLa VISIBLE NONE;SizeLandFI SizeLandFI VISIBLE  
NONE;SizeLandCo SizeLandCo VISIBLE NONE;PublicWate PublicWate VISIBLE

NONE;PublicSewer PublicSewer VISIBLE NONE;Well Well VISIBLE NONE;Spring  
 Spring VISIBLE NONE;SepticTank SepticTank VISIBLE NONE;Underground  
 Underground VISIBLE NONE;PavedRoad PavedRoad VISIBLE NONE;DirtRoad  
 DirtRoad VISIBLE NONE;NoRoad NoRoad VISIBLE NONE;CurbsGutter CurbsGutter  
 VISIBLE NONE;Sidewalks Sidewalks VISIBLE NONE;Topography Topography  
 VISIBLE NONE;Temp\_1 Temp\_1 VISIBLE NONE;MAP\_TAXMAP MAP\_TAXMAP  
 VISIBLE NONE;MAP\_DBLCLIN MAP\_DBLCLIN VISIBLE NONE;MAP\_BLK MAP\_BLK  
 VISIBLE NONE;MAP\_LOT MAP\_LOT VISIBLE NONE;UPDATED\_BY UPDATED\_BY  
 VISIBLE NONE;YEAR\_UPDAT YEAR\_UPDAT VISIBLE NONE;QUARTER\_UP  
 QUARTER\_UP VISIBLE NONE;UPDATE\_TYP UPDATE\_TYP VISIBLE  
 NONE;LINK\_STATU LINK\_STATU VISIBLE NONE;WVS\_COMMENT WVS\_COMMENT  
 VISIBLE NONE;WVS\_SPATIA WVS\_SPATIA VISIBLE NONE;MAP\_BLOCK\_  
 MAP\_BLOCK\_ VISIBLE NONE;MAP\_DBLCLIN\_1 MAP\_DBLCLIN\_1 VISIBLE  
 NONE;MapOwner MapOwner VISIBLE NONE;Id Id VISIBLE NONE;Sheet1\_\_FID  
 Sheet1\_\_FID VISIBLE NONE;Sheet1\_\_Account\_\_ Sheet1\_\_Account\_\_ VISIBLE  
 NONE;Sheet1\_\_Seq\_ Sheet1\_\_Seq\_ VISIBLE NONE;Sheet1\_\_District  
 Sheet1\_\_District VISIBLE NONE;Sheet1\_\_Name Sheet1\_\_Name VISIBLE  
 NONE;Sheet1\_\_Name\_2 Sheet1\_\_Name\_2 VISIBLE NONE;Sheet1\_\_Addr\_1  
 Sheet1\_\_Addr\_1 VISIBLE NONE;Sheet1\_\_Addr\_2 Sheet1\_\_Addr\_2 VISIBLE  
 NONE;Sheet1\_\_City\_State Sheet1\_\_City\_State VISIBLE NONE;Sheet1\_\_Zip\_1  
 Sheet1\_\_Zip\_1 VISIBLE NONE;Sheet1\_\_Zip\_2 Sheet1\_\_Zip\_2 VISIBLE  
 NONE;Sheet1\_\_Map\_\_ Sheet1\_\_Map\_\_ VISIBLE NONE;Sheet1\_\_Desc\_1  
 Sheet1\_\_Desc\_1 VISIBLE NONE;Sheet1\_\_Desc\_2 Sheet1\_\_Desc\_2 VISIBLE  
 NONE;Sheet1\_\_Desc\_3 Sheet1\_\_Desc\_3 VISIBLE NONE;Sheet1\_\_Desc\_4  
 Sheet1\_\_Desc\_4 VISIBLE NONE;Sheet1\_\_Class\_Code Sheet1\_\_Class\_Code VISIBLE  
 NONE;Sheet1\_\_Year\_Built Sheet1\_\_Year\_Built VISIBLE NONE;Sheet1\_\_Year\_Rmld  
 Sheet1\_\_Year\_Rmld VISIBLE NONE;Sheet1\_\_Info Sheet1\_\_Info VISIBLE  
 NONE;Sheet1\_\_Stories Sheet1\_\_Stories VISIBLE NONE;Sheet1\_\_Rooms  
 Sheet1\_\_Rooms VISIBLE NONE;Sheet1\_\_Bedrooms Sheet1\_\_Bedrooms  
 VISIBLE NONE;Sheet1\_\_Baths Sheet1\_\_Baths VISIBLE  
 NONE;Sheet1\_\_Half\_Baths Sheet1\_\_Half\_Baths VISIBLE  
 NONE;Sheet1\_\_Fireplaces Sheet1\_\_Fireplaces VISIBLE  
 NONE;Sheet1\_\_Chimneys Sheet1\_\_Chimneys VISIBLE  
 NONE;Sheet1\_\_Dwelling\_Type Sheet1\_\_Dwelling\_Type VISIBLE  
 NONE;Sheet1\_\_Grade Sheet1\_\_Grade VISIBLE NONE;Sheet1\_\_Land\_Value  
 Sheet1\_\_Land\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Value  
 Sheet1\_\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Improvement\_Value  
 Sheet1\_\_Improvement\_Value VISIBLE NONE;Sheet1\_\_Commercial\_Dwelling\_Value  
 Sheet1\_\_Commercial\_Dwelling\_Value VISIBLE NONE;Sheet1\_\_Total\_Value  
 Sheet1\_\_Total\_Value VISIBLE NONE;Sheet1\_\_Dwelling\_Condition  
 Sheet1\_\_Dwelling\_Condition VISIBLE NONE;Sheet1\_\_Commercial  
 Sheet1\_\_Commercial VISIBLE NONE;Sheet1\_\_Consideration\_Amount  
 Sheet1\_\_Consideration\_Amount VISIBLE NONE;Sheet1\_\_Acres Sheet1\_\_Acres  
 VISIBLE NONE;Sheet1\_\_Plat\_Book Sheet1\_\_Plat\_Book VISIBLE  
 NONE;Sheet1\_\_Plat\_Page Sheet1\_\_Plat\_Page VISIBLE NONE;Sheet1\_\_Deed\_Book

```
Sheet1__Deed_Book VISIBLE NONE;Sheet1__Deed_Page Sheet1__Deed_Page
VISIBLE NONE;Sheet1__Will_Book Sheet1__Will_Book VISIBLE
NONE;Sheet1__Will_Page Sheet1__Will_Page VISIBLE
NONE;Sheet1__Recorded_Date Sheet1__Recorded_Date VISIBLE
NONE;Sheet1__Inst_Type Sheet1__Inst_Type VISIBLE NONE;Sheet1__Inst_Year
Sheet1__Inst_Year VISIBLE NONE;Sheet1__Instrument__ Sheet1__Instrument__
VISIBLE NONE;CountyName CountyName VISIBLE NONE")
```

```
# Process: Select Layer By Location (2)
```

```
arcpy.SelectLayerByLocation_management(Parcels_Merge_Layer, "INTERSECT",
Roads_VGIN__2_, "10 Meters", "NEW_SELECTION")
```

```
# Process: Select Layer By Location (3)
```

```
arcpy.SelectLayerByLocation_management(Parcels_Merge_Layer__2_, "INTERSECT",
USFS_Roads, "10 Meters", "ADD_TO_SELECTION")
```

```
# Process: Select Layer By Location
```

```
arcpy.SelectLayerByLocation_management(Parcels_Merge_Layer__5_, "INTERSECT",
USFS_Land, "10 Meters", "SUBSET_SELECTION")
```

```
# Process: Copy Features (2)
```

```
arcpy.CopyFeatures_management(Parcels_Merge_Layer__4_,
WiseParcels2011_Merge_CopyFe4, "", "0", "0", "0")
```

```
# Process: Polygon to Raster (2)
```

```
arcpy.PolygonToRaster_conversion(WiseParcels2011_Merge_CopyFe4, "OBJECTID",
SmallScaleDevSelections, "CELL_CENTER", "NONE", ned_mosaic_Clip)
```

```
# Process: Raster Calculator (2)
```

```
arcpy.gp.RasterCalculator_sa("Con(IsNull(\"%SmallScaleDevSelections%\"),0,1)",
rastercalc3)
```

```
# Process: Raster Calculator (3)
```

```
arcpy.gp.RasterCalculator_sa("\"%rastercalc1%\" * \"%rastercalc3%\"",
Threatened4_SmallScaleDev_Final)
```

## **Threat5: Forested Riparian**

```
# -----
```

```
# Threat5.py
```

```
# Created on: 2012-05-07 09:33:53.00000
```



```

# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of cells composed of forested land cover within 20m of stream.
# -----
# Import arcpy module
import arcpy

# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")

# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"

arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"

# Local variables:
nlcd2006_highknob_Albers =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers"
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
USFS_Streams = "W:\\Ptolemy\\HighKnob.gdb\\Hydro\\USFS_Streams"
HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"
nlcd2006_highknob_Albers_Pro =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers_Pro"
Output_Raster_Dataset =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\nlcd2006_highknob_Albers_Pro"
Forested = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Forested"
Output_raster__2_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Reclass_rast1"
Threatened5_ForestedRiparian_prelim =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Threatened5_ForestedRiparian_prelim"
USFS_Streams_Buffer =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Streams_Buffer"

```

```

Output_Raster_Dataset__2_ =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Streams_Buffer_PolygonT"

rastercalc_riparian = "W:\\Ptolemy\\ThesisData\\Default.gdb\\rastercalc_riparian"

Threatened5_ForestedRiparian_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened5_ForestedRiparian_Final"

# Process: Buffer

arcpy.Buffer_analysis(USFS_Streams, USFS_Streams_Buffer, "20 Meters", "FULL",
"ROUND", "ALL", "")

# Process: Polygon to Raster

arcpy.PolygonToRaster_conversion(USFS_Streams_Buffer, "OBJECTID",
Output_Raster_Dataset__2_, "CELL_CENTER", "NONE", ned_mosaic_Clip)

# Process: Project Raster

arcpy.ProjectRaster_management(nlcd2006_highknob_Albers,
nlcd2006_highknob_Albers_Pro,
"PROJCS['NAD_1983_StatePlane_Virginia_South_FIPS_4502_Feet',GEOGCS['GCS_
North_American_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',63
78137.0,298.257222101]],PRIMEM['Greenwich',0.0],UNIT['Degree',0.01745329251994
33]],PROJECTION['Lambert_Conformal_Conic'],PARAMETER['False_Easting',1148291
6.666666666],PARAMETER['False_Northing',3280833.333333333],PARAMETER['Centr
al_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',36.76666666666667],PARAMETER['Standar
d_Parallel_2',37.96666666666667],PARAMETER['Latitude_Of_Origin',36.33333333333
334],UNIT['Foot_US',0.3048006096012192]]", "NEAREST", ned_mosaic_Clip, "", "",
"PROJCS['Albers_Conical_Equal_Area',GEOGCS['GCS_North_American_1983',DATU
M['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.257222101]],PRI
MEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['Albers'],PA
RAMETER['false_easting',0.0],PARAMETER['false_northing',0.0],PARAMETER['central
_meridian',-
96.0],PARAMETER['standard_parallel_1',29.5],PARAMETER['standard_parallel_2',45.5
],PARAMETER['latitude_of_origin',23.0],UNIT['Meter',1.0]]")

# Process: Calculate Statistics

arcpy.CalculateStatistics_management(nlcd2006_highknob_Albers_Pro, "1", "1", "")

# Process: Reclassify

arcpy.gp.Reclassify_sa(Output_Raster_Dataset, "Value", "0 40 NODATA;41 43 1;44 99
NODATA", Forested, "DATA")

# Process: Raster Calculator

```

```

arcpy.gp.RasterCalculator_sa("\%Output Raster Dataset (2)%\" + \"%Forested%\"",
rastercalc_riparian)
# Process: Reclassify (2)
arcpy.gp.Reclassify_sa(rastercalc_riparian, "Value", "2 1", Output_raster__2_, "DATA")
# Process: Extract by Mask
arcpy.gp.ExtractByMask_sa(Output_raster__2_, HighKnobForestMatrix,
Threatened5_ForestedRiparian_prelim)
# Process: Reclassify (3)
arcpy.gp.Reclassify_sa(Threatened5_ForestedRiparian_prelim, "VALUE", "1
1;NODATA 0", Threatened5_ForestedRiparian_Final, "DATA")

```

### **Water 1: Drains to Clinch**

```

# -----
# Water1.py
# Created on: 2012-05-07 09:34:12.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of cells that drain to the Clinch River.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
# Local variables:
dem_large = "W:\\Ptolemy\\ThesisData\\Default.gdb\\dem_large"

```

```

HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"
Output_surface_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Fill_dem_lar1"
FlowDir_dem_2 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FlowDir_Fill1"
Output_drop_raster = ""
Output_raster__3_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Basin_FlowDi2"
Output_raster__4_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract_Basi1"
Extract_Extr1 = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract_Extr1"
Output_Raster_Dataset =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Extract_Extr1_Resample"
Watershed1_Clinch_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Watershed1_Clinch_Final"
# Process: Fill
arcpy.gp.Fill_sa(dem_large, Output_surface_raster, "")
# Process: Flow Direction
arcpy.gp.FlowDirection_sa(Output_surface_raster, FlowDir_dem_2, "FORCE",
Output_drop_raster)
# Process: Basin
arcpy.gp.Basin_sa(FlowDir_dem_2, Output_raster__3_)
# Process: Extract by Mask
arcpy.gp.ExtractByMask_sa(Output_raster__3_, HighKnobForestMatrix,
Output_raster__4_)
# Process: Extract by Attributes
arcpy.gp.ExtractByAttributes_sa(Output_raster__4_, "\\Value\\" = 5390", Extract_Extr1)
# Process: Resample
arcpy.Resample_management(Extract_Extr1, Output_Raster_Dataset,
ned_mosaic_Clip, "NEAREST")
# Process: Reclassify

```

```
arcpy.gp.Reclassify_sa(Output_Raster_Dataset, "Value", "5390 1;NODATA 0",  
Watershed1_Clinch_Final, "DATA")
```

## Water 2: Riparian Stream Buffer

```
# -----  
# Water2.py  
# Created on: 2012-05-07 09:34:27.00000  
# (generated by ArcGIS/ModelBuilder)  
# Description:  
# Creates a raster of all cells in each parcel having the value of the total acreage of  
# riparian buffered (15 foot) streams in that parcel. Further refined into a fuzzy  
# membership 0-1.  
# -----  
# Import arcpy module  
import arcpy  
# Set Geoprocessing environments  
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"  
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543  
3529739.20190136"  
# Local variables:  
USFS_Streams = "W:\\Ptolemy\\HighKnob.gdb\\Hydro\\USFS_Streams"  
HighKnobForestMatrix =  
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"  
ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"  
Output_Feature_Class = "W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Streams_Clip"  
USFS_Streams_Clip_Buffer =  
"W:\\Ptolemy\\ThesisData\\Default.gdb\\USFS_Streams_Clip_Buffer"  
Watershed2_Riparian_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Watershed2_Riparian_Final"  
# Process: Clip
```

```

arcpy.Clip_analysis(USFS_Streams, HighKnobForestMatrix, Output_Feature_Class, "")
# Process: Buffer

arcpy.Buffer_analysis(Output_Feature_Class, USFS_Streams_Clip_Buffer, "60 Feet",
"FULL", "ROUND", "ALL", "")
# Process: Feature to Raster (2)

arcpy.FeatureToRaster_conversion(USFS_Streams_Clip_Buffer, "OBJECTID",
Watershed2_Riparian_Final, ned_mosaic_Clip)

```

### **Water 3: Impaired Drainage**

```

# -----
# Water3.py
# Created on: 2012-05-07 09:34:45.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# Creates a raster of cells that drain to 303D listed (impaired aquatic habitat) streams.
# -----
# Import arcpy module
import arcpy
# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")
# Set Geoprocessing environments
arcpy.env.snapRaster = "Biodiversity1_RareThreatened_Final"
arcpy.env.extent = "10216035.5455512 3450469.45106983 10339392.0716543
3529739.20190136"
arcpy.env.mask = "High Knob Forest Matrix Boundary"

# Local variables:

```

```

VA_2010_AUS_RIVERINE_FINAL =
"W:\\Ptolemy\\HighKnob.gdb\\Hydro\\VA_2010_AUS_RIVERINE_FINAL"

HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"

ned_mosaic_Clip = "W:\\Ptolemy\\HighKnob.gdb\\ned_mosaic_Clip"

dem_large = "W:\\Ptolemy\\ThesisData\\Default.gdb\\dem_large"

Output_Layer = "VA_2010_AUS_RIVERINE_FINAL_L"

VA_2010_AUS_RIVERINE_FINAL_L2 = "VA_2010_AUS_RIVERINE_FINAL_L"

Output_Layer__2_ = "VA_2010_AUS_RIVERINE_FINAL_L1"

Output_Layer_Name = "VA_2010_AUS_RIVERINE_FINAL_L1"

Output_Layer__3_ = "VA_2010_AUS_RIVERINE_FINAL_L2"

Output_flow_direction_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\FlowDir_Fill2"

Output_raster__2_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Feature_VA_21"

Output_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Watersh_Flow2"

Output_surface_raster = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Fill_dem_lar2"

Output_drop_raster = ""

Watershed3_Impaired_prelim =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\Watershed3_Impaired_prelim"

Output_raster__3_ = "W:\\Ptolemy\\ThesisData\\Default.gdb\\Basin_FlowDi3"

Watershed3_Impaired_Final =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Watershed3_Impaired_Final"

# Process: Fill

arcpy.gp.Fill_sa(dem_large, Output_surface_raster, "")

# Process: Flow Direction

arcpy.gp.FlowDirection_sa(Output_surface_raster, Output_flow_direction_raster,
"NORMAL", Output_drop_raster)

# Process: Basin

arcpy.gp.Basin_sa(Output_flow_direction_raster, Output_raster__3_)

```

# Process: Make Feature Layer

```
arcpy.MakeFeatureLayer_management(VA_2010_AUS_RIVERINE_FINAL,
Output_Layer, "", "", "OBJECTID OBJECTID VISIBLE NONE;Shape Shape VISIBLE
NONE;ID305B ID305B VISIBLE NONE;MILES MILES VISIBLE NONE;CYCLE CYCLE
VISIBLE NONE;STATE STATE VISIBLE NONE;WATER_NAME WATER_NAME
VISIBLE NONE;IMP_CAUSE IMP_CAUSE VISIBLE NONE;SOURCE SOURCE
VISIBLE NONE;CATEGORY CATEGORY VISIBLE NONE;AQU_LIFE AQU_LIFE
VISIBLE NONE;FISH_CONSU FISH_CONSU VISIBLE NONE;PWS PWS VISIBLE
NONE;RECREATION RECREATION VISIBLE NONE;WILDLIFE WILDLIFE VISIBLE
NONE;Shape_Length Shape_Length VISIBLE NONE")
```

# Process: Select Layer By Attribute

```
arcpy.SelectLayerByAttribute_management(Output_Layer, "NEW_SELECTION",
"\\"CATEGORY\\" = '5F' OR \\"CATEGORY\\" = '5D' OR \\"CATEGORY\\" = '5C' OR
\\"CATEGORY\\" = '5A' OR \\"CATEGORY\\" = '4C' OR \\"CATEGORY\\" = '4B' OR
\\"CATEGORY\\" = '4A'")
```

# Process: Make Feature Layer (2)

```
arcpy.MakeFeatureLayer_management(VA_2010_AUS_RIVERINE_FINAL_L2,
Output_Layer__2_, "", "", "OBJECTID OBJECTID VISIBLE NONE;Shape Shape
VISIBLE NONE;ID305B ID305B VISIBLE NONE;MILES MILES VISIBLE NONE;CYCLE
CYCLE VISIBLE NONE;STATE STATE VISIBLE NONE;WATER_NAME
WATER_NAME VISIBLE NONE;IMP_CAUSE IMP_CAUSE VISIBLE NONE;SOURCE
SOURCE VISIBLE NONE;CATEGORY CATEGORY VISIBLE NONE;AQU_LIFE
AQU_LIFE VISIBLE NONE;FISH_CONSU FISH_CONSU VISIBLE NONE;PWS PWS
VISIBLE NONE;RECREATION RECREATION VISIBLE NONE;WILDLIFE WILDLIFE
VISIBLE NONE;Shape_Length Shape_Length VISIBLE NONE")
```

# Process: Select Layer By Location

```
arcpy.SelectLayerByLocation_management(Output_Layer__2_, "INTERSECT",
HighKnobForestMatrix, "", "NEW_SELECTION")
```

# Process: Make Feature Layer (3)

```
arcpy.MakeFeatureLayer_management(Output_Layer_Name, Output_Layer__3_, "", "",
"OBJECTID OBJECTID VISIBLE NONE;Shape Shape VISIBLE NONE;ID305B ID305B
VISIBLE NONE;MILES MILES VISIBLE NONE;CYCLE CYCLE VISIBLE NONE;STATE
STATE VISIBLE NONE;WATER_NAME WATER_NAME VISIBLE NONE;IMP_CAUSE
IMP_CAUSE VISIBLE NONE;SOURCE SOURCE VISIBLE NONE;CATEGORY
CATEGORY VISIBLE NONE;AQU_LIFE AQU_LIFE VISIBLE NONE;FISH_CONSU
FISH_CONSU VISIBLE NONE;PWS PWS VISIBLE NONE;RECREATION
RECREATION VISIBLE NONE;WILDLIFE WILDLIFE VISIBLE NONE;Shape_Length
Shape_Length VISIBLE NONE")
```



```

# Process: Feature to Raster

arcpy.FeatureToRaster_conversion(Output_Layer__3_, "ID305B", Output_raster__2_,
ned_mosaic_Clip)

# Process: Watershed

arcpy.gp.Watershed_sa(Output_flow_direction_raster, Output_raster__2_,
Output_raster, "VALUE")

# Process: Reclassify

arcpy.gp.Reclassify_sa(Output_raster, "VALUE", "1 14 1;NODATA 0",
Watershed3_Impaired_prelim, "DATA")

# Process: Resample

arcpy.Resample_management(Watershed3_Impaired_prelim,
Watershed3_Impaired_Final, ned_mosaic_Clip, "NEAREST")

```

### **Weighted Linear Combination (WLC)**

```

# -----
# WLC.py
# Created on: 2012-05-07 09:35:07.00000
# (generated by ArcGIS/ModelBuilder)
# Usage: WLC <Iteration> <Bio1Weight> <Bio2Weight> <Bio3Weight>
<Spatial1Weight> <Spatial2Weight> <Spatial3Weight> <Spatial4Weight>
<Spatial5Weight> <Spatial6Weight> <Threat2bWeight> <Threat3Weight>
<Threat4Weight> <Threat5Weight> <Water1Weight> <Water2Weight>
<Water3Weight>
# Description:
# -----
# Import arcpy module

import arcpy

# Check out any necessary licenses

arcpy.CheckOutExtension("spatial")

# Script arguments

Iteration = arcpy.GetParameterAsText(0)

```

if Iteration == '#' or not Iteration:

Iteration = "W:\\Ptolemy\\ThesisData\\Result.gdb\\Iteration" # provide a default value if unspecified

Bio1Weight = arcpy.GetParameterAsText(1)

if Bio1Weight == '#' or not Bio1Weight:

Bio1Weight = "0" # provide a default value if unspecified

Bio2Weight = arcpy.GetParameterAsText(2)

if Bio2Weight == '#' or not Bio2Weight:

Bio2Weight = "0" # provide a default value if unspecified

Bio3Weight = arcpy.GetParameterAsText(3)

if Bio3Weight == '#' or not Bio3Weight:

Bio3Weight = "0" # provide a default value if unspecified

Spatial1Weight = arcpy.GetParameterAsText(4)

if Spatial1Weight == '#' or not Spatial1Weight:

Spatial1Weight = "0" # provide a default value if unspecified

Spatial2Weight = arcpy.GetParameterAsText(5)

if Spatial2Weight == '#' or not Spatial2Weight:

Spatial2Weight = "0" # provide a default value if unspecified

Spatial3Weight = arcpy.GetParameterAsText(6)

if Spatial3Weight == '#' or not Spatial3Weight:

Spatial3Weight = "0" # provide a default value if unspecified

Spatial4Weight = arcpy.GetParameterAsText(7)

if Spatial4Weight == '#' or not Spatial4Weight:

Spatial4Weight = "0" # provide a default value if unspecified

Spatial5Weight = arcpy.GetParameterAsText(8)

if Spatial5Weight == '#' or not Spatial5Weight:

```
Spatial5Weight = "0" # provide a default value if unspecified
Spatial6Weight = arcpy.GetParameterAsText(9)
if Spatial6Weight == '#' or not Spatial6Weight:
    Spatial6Weight = "0" # provide a default value if unspecified
Threat2bWeight = arcpy.GetParameterAsText(10)
if Threat2bWeight == '#' or not Threat2bWeight:
    Threat2bWeight = "0" # provide a default value if unspecified
Threat3Weight = arcpy.GetParameterAsText(11)
if Threat3Weight == '#' or not Threat3Weight:
    Threat3Weight = "0" # provide a default value if unspecified
Threat4Weight = arcpy.GetParameterAsText(12)
if Threat4Weight == '#' or not Threat4Weight:
    Threat4Weight = "0" # provide a default value if unspecified
Threat5Weight = arcpy.GetParameterAsText(13)
if Threat5Weight == '#' or not Threat5Weight:
    Threat5Weight = "0" # provide a default value if unspecified
Water1Weight = arcpy.GetParameterAsText(14)
if Water1Weight == '#' or not Water1Weight:
    Water1Weight = "0" # provide a default value if unspecified
Water2Weight = arcpy.GetParameterAsText(15)
if Water2Weight == '#' or not Water2Weight:
    Water2Weight = "0" # provide a default value if unspecified
Water3Weight = arcpy.GetParameterAsText(16)
if Water3Weight == '#' or not Water3Weight:
    Water3Weight = "0" # provide a default value if unspecified
# Local variables:
```

Biodiversity1\_RareThreatened\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Biodiversity1\_RareThreatened\_Final"

Biodiversity2\_Geology\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Biodiversity2\_Geology\_Final"

Biodiversity3\_ELU\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Biodiversity3\_ELU\_Final"

IterationPrelim = Bio1Weight

Spatial1\_Parcel\_Size\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial1\_Parcel\_Size\_Final"

Spatial2\_AdjacentProtected\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial2\_AdjacentProtected\_Final"

Spatial3\_CoreForest\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial3\_CoreForest\_Final"

Spatial4\_Proximity\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial4\_Proximity\_Final"

Spatial5\_Special\_Biological\_Areas\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial5\_Special\_Biological\_Areas\_Final"

Spatial6\_Fragmentation\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Spatial6\_Fragmentation\_Final"

Threatened2b\_Potential\_Development =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened2b\_Potential\_Development"

Threatened3\_LandUse\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened3\_LandUse\_Final"

Threatened4\_SmallScaleDev\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened4\_SmallScaleDev\_Final"

Threatened5\_ForestedRiparian\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Threatened5\_ForestedRiparian\_Final"

Watershed1\_Clinch\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Watershed1\_Clinch\_Final"

Watershed2\_Riparian\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Watershed2\_Riparian\_Final"

Watershed3\_Impaired\_Final =  
"W:\\Ptolemy\\ThesisData\\Result.gdb\\Watershed3\_Impaired\_Final"

```
HighKnobForestMatrix_Buffer =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\HighKnobForestMatrix_Buffer"
```

```
# Process: Raster Calculator
```

```
arcpy.gp.RasterCalculator_sa("Con(IsNull(\"%Biodiversity1_RareThreatened_Final%\"),
0.0,\"%Biodiversity1_RareThreatened_Final%\" * %Bio1Weight%) +
Con(IsNull(\"%Biodiversity2_Geology_Final%\"),0.0,\"%Biodiversity2_Geology_Final%\"
* %Bio2Weight%) +
Con(IsNull(\"%Biodiversity3_ELU_Final%\"),0.0,\"%Biodiversity3_ELU_Final%\" *
%Bio3Weight%) +
Con(IsNull(\"%Spatial1_Parcel_Size_Final%\"),0.0,\"%Spatial1_Parcel_Size_Final%\" *
%Spatial1Weight%) +
Con(IsNull(\"%Spatial2_AdjacentProtected_Final%\"),0.0,\"%Spatial2_AdjacentProtecte
d_Final%\" * %Spatial2Weight%) +
Con(IsNull(\"%Spatial3_CoreForest_Final%\"),0.0,\"%Spatial3_CoreForest_Final%\" *
%Spatial3Weight%) +
Con(IsNull(\"%Spatial4_Proximity_Final%\"),0.0,\"%Spatial4_Proximity_Final%\" *
%Spatial4Weight%) +
Con(IsNull(\"%Spatial5_Special_Biological_Areas_Final%\"),0.0,\"%Spatial5_Special_Bi
ological_Areas_Final%\" * %Spatial5Weight%) +
Con(IsNull(\"%Spatial6_Fragmentation_Final%\"),0.0,\"%Spatial6_Fragmentation_Final
%\" * %Spatial6Weight%) +
Con(IsNull(\"%Threatened2b_Potential_Development%\"),0.0,\"%Threatened2b_Potenti
al_Development%\" * %Threat2bWeight%) +
Con(IsNull(\"%Threatened3_LandUse_Final%\"),0.0,\"%Threatened3_LandUse_Final%\"
* %Threat3Weight%) +
Con(IsNull(\"%Threatened4_SmallScaleDev_Final%\"),0.0,\"%Threatened4_SmallScale
Dev_Final%\" * %Threat4Weight%) +
Con(IsNull(\"%Threatened5_ForestedRiparian_Final%\"),0.0,\"%Threatened5_Forested
Riparian_Final%\" * %Threat5Weight%) +
Con(IsNull(\"%Watershed1_Clinch_Final%\"),0.0,\"%Watershed1_Clinch_Final%\" *
%Water1Weight%) +
Con(IsNull(\"%Watershed2_Riparian_Final%\"),0.0,\"%Watershed2_Riparian_Final%\" *
%Water2Weight%) +
Con(IsNull(\"%Watershed3_Impaired_Final%\"),0.0,\"%Watershed3_Impaired_Final%\"
* %Water3Weight%)", IterationPrelim)
```

```
# Process: Extract by Mask
```

```
arcpy.gp.ExtractByMask_sa(IterationPrelim, HighKnobForestMatrix_Buffer, Iteration)
```

### **Aggregation by Parcel (with Constraints)**

```
# -----
```

```
# AggregationByParcel.py
```

```

# Created on: 2012-05-07 09:35:33.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# -----
# Import arcpy module
import arcpy

# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")

# Local variables:
LeeParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
NortonParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"
ScottParcels = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
WiseParcels2011 = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"
HighKnobForestMatrix =
"W:\\Ptolemy\\HighKnob.gdb\\BaseLayers\\HighKnobForestMatrix"
Priority_for_Land_Protection = "Priority for Land Protection"
Tables = "W:\\Ptolemy\\ThesisData\\Tables"
MergedParcels = "W:\\Ptolemy\\ThesisData\\Default.gdb\\MergedParcels"
Output_Feature_Class =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge4_Clip"
ParcelsWithScores = "W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores"
ZonalStatsLandProtection =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\ZonalStatsLandProtection"
WiseParcels2011_Merge1_Clip =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge4_Clip"
WiseParcels2011__2_ = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011"
ScottParcels__2_ = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels"
NortonParcels__2_ = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels"

```

```

LeeParcels__2_ = "W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels"
WiseParcels2011_Merge4_Clip__2_ = "WiseParcels2011_Merge4_Clip_"
WiseParcels2011_Merge1_Clip_ =
"W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores"
Output_Layer = "WiseParcels2011_Merge4_Clip_"
WiseParcels2011_Merge1_Clip__2_ =
"W:\\Ptolemy\\ThesisData\\Default.gdb\\WiseParcels2011_Merge4_Clip_"
ParcelsWithScores_Layer1 = "WiseParcels2011_Merge4_Clip_"
WiseParcels2011_Merge4_Clip_ = "WiseParcels2011_Merge4_Clip_"
# Process: Add Field (2)
arcpy.AddField_management(WiseParcels2011, "CountyName", "TEXT", "", "", "50", "",
"NULLABLE", "NON_REQUIRED", "")
# Process: Calculate Field (2)
arcpy.CalculateField_management(WiseParcels2011__2_, "CountyName", "\"Wise\"",
"VB", "")
# Process: Add Field (3)
arcpy.AddField_management(ScottParcels, "CountyName", "TEXT", "", "", "50", "",
"NULLABLE", "NON_REQUIRED", "")
# Process: Calculate Field (3)
arcpy.CalculateField_management(ScottParcels__2_, "CountyName", "\"Scott\"", "VB",
"")
# Process: Add Field (4)
arcpy.AddField_management(NortonParcels, "CountyName", "TEXT", "", "", "50", "",
"NULLABLE", "NON_REQUIRED", "")
# Process: Calculate Field (4)
arcpy.CalculateField_management(NortonParcels__2_, "CountyName", "\"Norton\"",
"VB", "")
# Process: Add Field (5)
arcpy.AddField_management(LeeParcels, "CountyName", "TEXT", "", "", "50", "",
"NULLABLE", "NON_REQUIRED", "")

```

# Process: Calculate Field (5)

```
arcpy.CalculateField_management(LeeParcels__2_, "CountyName", "\"Lee\"", "VB", "")
```

# Process: Merge

```
arcpy.Merge_management("W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels;W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels", MergedParcels, "MAP_NUMBER \"MAP_NUMBER\" true false false 50 Text 0 0", First, #, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels, MAP_NUM, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, MAP_NUMBER, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels, Sheet1__Map__, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, CAMA_LINK, -1, -1; PARCEL_ID \"PARCEL_ID\" true false false 16 Text 0 0", First, #, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, PARCEL_ID, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, PARCEL_ID, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, PARCEL_ID, -1, -1; ACCOUNT \"ACCOUNT\" true false false 9 Text 0 0", First, #, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, ACCOUNT, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, ACCOUNT, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, ACCOUNT, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels, Sheet1__Account__, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels, ACCOUNT_NU, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, AccountNum, -1, -1; Comment \"Comment\" true false false 150 Text 0 0", First, #, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, Comment, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, Comment, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, MapOwner, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, WVS_COMMENT, -1, -1; WebURL \"WebURL\" true false false 254 Text 0 0", First, #, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, Assessment, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, Assessment, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, Assessment, -1, -1; CountyName \"CountyName\" true true false 50 Text 0 0", First, #, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\WiseParcels2011, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\ScottParcels, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\NortonParcels, CountyName, -1, -1, W:\\Ptolemy\\HighKnob.gdb\\Parcels\\LeeParcels, CountyName, -1, -1; OwnerName \"OwnerName\" true true false 254 Text 0 0
```



```

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Name,-1,-1;OwnerAddr1
"OwnerAddr1" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerAddr1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerAddr1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerAddr1,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Addr_1,-1,-1;OwnerAddr2
"OwnerAddr2" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerAddr2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerAddr2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerAddr2,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Addr_2,-1,-1;OwnerCityS
"OwnerCityS" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerCityS,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerCityS,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerCityS,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__City_State,-1,-1;OwnerZip
"OwnerZip" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerZip,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerZip,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,OwnerZip,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Zip_1,-1,-1;ValueImpro
"ValueImpro" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ValueImpro,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ValueImpro,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ValueImpro,-1,-1;ValueLand
"ValueLand" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ValueLand,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ValueLand,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ValueLand,-1,-1;StreetNum
"StreetNum" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,StreetNum,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,StreetNum,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,StreetNum,-1,-1;StreetName
"StreetName" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,StreetName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,StreetName,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,StreetName,-1,-1;ZipCode
"ZipCode" true true false 254 Text 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ZipCode,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ZipCode,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,ZipCode,-1,-1;PropertyDe
"PropertyDe" true true false 254 Text 0 0

```

```

,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyDe,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyDe,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\NortonParcels,PropertyDe,-1,-1;Total_Value
\"Total_Value\" true true false 8 Double 0 0
,First,#,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Total_Value,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Total_Value,-1,-
1,W:\Ptolemy\HighKnob.gdb\Parcels\LeeParcels,Sheet1__Total_Value,-1,-1")

# Process: Clip

arcpy.Clip_analysis(MergedParcels, HighKnobForestMatrix, Output_Feature_Class, "")

# Process: Add Field

arcpy.AddField_management(Output_Feature_Class, "uniqueID", "LONG", "", "", "", "",
"NULLABLE", "NON_REQUIRED", "")

# Process: Calculate Field

arcpy.CalculateField_management(WiseParcels2011_Merge1_Clip, "uniqueID",
"[OBJECTID]", "VB", "")

# Process: Make Feature Layer

arcpy.MakeFeatureLayer_management(WiseParcels2011_Merge1_Clip__2_,
Output_Layer, "", "", "MAP_NUMBER MAP_NUMBER VISIBLE NONE;PARCEL_ID
PARCEL_ID VISIBLE NONE;ACCOUNT ACCOUNT VISIBLE NONE;Comment
Comment VISIBLE NONE;WebURL WebURL VISIBLE NONE;CountyName
CountyName VISIBLE NONE;OwnerName OwnerName VISIBLE NONE;OwnerAddr1
OwnerAddr1 VISIBLE NONE;OwnerAddr2 OwnerAddr2 VISIBLE NONE;OwnerCityS
OwnerCityS VISIBLE NONE;OwnerZip OwnerZip VISIBLE NONE;ValueImpro
ValueImpro VISIBLE NONE;ValueLand ValueLand VISIBLE NONE;StreetNum
StreetNum VISIBLE NONE;StreetName StreetName VISIBLE NONE;ZipCode ZipCode
VISIBLE NONE;PropertyDe PropertyDe VISIBLE NONE;Total_Value Total_Value
VISIBLE NONE;Shape_length Shape_length VISIBLE NONE;Shape_area Shape_area
VISIBLE NONE;uniqueID uniqueID VISIBLE NONE")

# Process: Select Layer By Attribute

arcpy.SelectLayerByAttribute_management(Output_Layer, "NEW_SELECTION",
"\uniqueID > 0")

# Process: Select Layer By Attribute (2)

arcpy.SelectLayerByAttribute_management(ParcelsWithScores_Layer1,
"REMOVE_FROM_SELECTION", "\MAP_NUMBER = 'JEFFERSON NATIONAL
FOREST' OR \MAP_NUMBER = 'Jefferson National Forest' OR \MAP_NUMBER =

```

```
'FOREST' OR \"uniqueID\" = 1731 OR \"uniqueID\" = 1905 OR \"uniqueID\" = 2520 OR  
\"uniqueID\" = 328")
```

```
# Process: Select Layer By Attribute (3)
```

```
arcpy.SelectLayerByAttribute_management(WiseParcels2011_Merge4_Clip_  
"REMOVE_FROM_SELECTION", "\"PARCEL_ID\" = '009018' OR \"PARCEL_ID\" =  
'009019' OR \"PARCEL_ID\" = '009408' OR \"PARCEL_ID\" = '009476' OR  
\"PARCEL_ID\" = '009807' OR \"PARCEL_ID\" = '009851' OR \"PARCEL_ID\" =  
'010235' OR \"PARCEL_ID\" = '010264' OR \"PARCEL_ID\" = '010515' OR  
\"PARCEL_ID\" = '010597' OR \"PARCEL_ID\" = '010598' OR \"PARCEL_ID\" =  
'010599' OR \"PARCEL_ID\" = '010611' OR \"PARCEL_ID\" = '010612' OR  
\"PARCEL_ID\" = '010768' OR \"PARCEL_ID\" = '010807' OR \"PARCEL_ID\" =  
'011015' OR \"PARCEL_ID\" = '011147' OR \"PARCEL_ID\" = '011148' OR  
\"PARCEL_ID\" = '011158' OR \"PARCEL_ID\" = '011233' OR \"PARCEL_ID\" =  
'011266' OR \"PARCEL_ID\" = '011267' OR \"PARCEL_ID\" = '011279' OR  
\"PARCEL_ID\" = '011282' OR \"PARCEL_ID\" = '011283' OR \"PARCEL_ID\" =  
'011287' OR \"PARCEL_ID\" = '011294' OR \"PARCEL_ID\" = '011298' OR  
\"PARCEL_ID\" = '011311' OR \"PARCEL_ID\" = '011426' OR \"PARCEL_ID\" =  
'011727' OR \"PARCEL_ID\" = '011733' OR \"PARCEL_ID\" = '011742' OR  
\"PARCEL_ID\" = '011798' OR \"PARCEL_ID\" = '011799' OR \"PARCEL_ID\" =  
'011890' OR \"PARCEL_ID\" = '011891' OR \"PARCEL_ID\" = '012035' OR  
\"PARCEL_ID\" = '012036' OR \"PARCEL_ID\" = '012037' OR \"PARCEL_ID\" =  
'012171' OR \"PARCEL_ID\" = '012174' OR \"PARCEL_ID\" = '012256' OR  
\"PARCEL_ID\" = '012384' OR \"PARCEL_ID\" = '012414' OR \"PARCEL_ID\" =  
'012518' OR \"PARCEL_ID\" = '012733' OR \"PARCEL_ID\" = '012734' OR  
\"PARCEL_ID\" = '012736' OR \"PARCEL_ID\" = '012754' OR \"PARCEL_ID\" =  
'012838' OR \"PARCEL_ID\" = '012842' OR \"PARCEL_ID\" = '031629' OR  
\"PARCEL_ID\" = '031668'")
```

```
# Process: Copy Features
```

```
arcpy.CopyFeatures_management(WiseParcels2011_Merge4_Clip___2_  
ParcelsWithScores, "", "0", "0", "0")
```

```
# Process: Zonal Statistics as Table
```

```
arcpy.gp.ZonalStatisticsAsTable_sa(ParcelsWithScores, "uniqueID",  
Priority_for_Land_Protection, ZonalStatsLandProtection, "DATA", "ALL")
```

```
# Process: Join Field
```

```
arcpy.JoinField_management(ParcelsWithScores, "uniqueID",  
ZonalStatsLandProtection, "UNIQUEID",  
"COUNT;MIN;MAX;RANGE;MEAN;STD;SUM")
```

```
# Process: Table to Table
```

```

arcpy.TableToTable_conversion(WiseParcels2011_Merge1_Clip_, Tables,
"LandProtectionReport.dbf", "\"uniqueID\" > 0", "MAP_NUMBER \"MAP_NUMBER\" true
false false 50 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,MAP_NUMBER,-1,-
1;PARCEL_ID \"PARCEL_ID\" true false false 16 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,PARCEL_ID,-1,-
1;ACCOUNT \"ACCOUNT\" true false false 9 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,ACCOUNT,-1,-
1;Comment \"Comment\" true false false 150 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,Comment,-1,-
1;WebURL \"WebURL\" true false false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,WebURL,-1,-
1;CountyName \"CountyName\" true true false 50 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,CountyName,-1,-
1;OwnerName \"OwnerName\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,OwnerName,-1,-
1;OwnerAddr1 \"OwnerAddr1\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,OwnerAddr1,-1,-
1;OwnerAddr2 \"OwnerAddr2\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,OwnerAddr2,-1,-
1;OwnerCityS \"OwnerCityS\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,OwnerCityS,-1,-
1;OwnerZip \"OwnerZip\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,OwnerZip,-1,-
1;ValueImpro \"ValueImpro\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,ValueImpro,-1,-
1;ValueLand \"ValueLand\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,ValueLand,-1,-
1;StreetNum \"StreetNum\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,StreetNum,-1,-
1;StreetName \"StreetName\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,StreetName,-1,-
1;ZipCode \"ZipCode\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,ZipCode,-1,-
1;PropertyDe \"PropertyDe\" true true false 254 Text 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,PropertyDe,-1,-
1;Total_Value \"Total_Value\" true true false 8 Double 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,Total_Value,-1,-
1;Shape_length \"Shape_length\" true true false 0 Double 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,Shape_length,-1,-
1;Shape_area \"Shape_area\" true true false 0 Double 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,Shape_area,-1,-
1;uniqueID \"uniqueID\" true true false 0 Long 0 0
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,uniqueID,-1,-
1;COUNT \"COUNT\" true true false 4 Long 0 0

```

```
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,COUNT,-1,-1;MIN  
\"MIN\" true true false 4 Float 0 0  
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,MIN,-1,-1;MAX  
\"MAX\" true true false 4 Float 0 0  
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,MAX,-1,-1;RANGE  
\"RANGE\" true true false 4 Float 0 0  
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,RANGE,-1,-1;MEAN  
\"MEAN\" true true false 4 Float 0 0  
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,MEAN,-1,-1;STD  
\"STD\" true true false 4 Float 0 0  
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,STD,-1,-1;SUM  
\"SUM\" true true false 4 Float 0 0  
,First,#,W:\\Ptolemy\\ThesisData\\Result.gdb\\ParcelsWithScores,SUM,-1,-1, \"")
```