

## Draft Habitat Suitability Model Overview

### Description

The Habitat Suitability Model attempts to identify areas within the Town's jurisdictional limits that exhibit characteristics consistent with criteria defining natural habitat. The criteria are diverse and were separated into one of three sub-models: Natural Habitat, Hydrology and Land Use/Land Cover.

Within the criterion data the values have been reclassified to a 1-10 suitability scale. For example: In the hydrology model, proximity to a stream is represented as a linear distance while hydric soils data are represented as a percentage of the delineated soil area. To incorporate these datasets into the model, the two dissimilar units- linear distance and area percentage- must be reclassified (binned) to a 1-10 scale where 1 is least suitable and 10 is most suitable as natural habitat.

For each criterion dataset, the entire area of the Town jurisdictional limits is represented as a continuous grid of 30m x 30m cells, which is approximately 1/5 of an acre per grid cell, and each grid cell is assigned a suitability value. A helpful visualization could be several pieces of graph paper where each sheet has a different grid cell fill-pattern based on habitat suitability values. After the original values in each criterion were individually reclassified to the 1-10 suitability scale, they were assigned an overall percentage weight of influence on their respective sub-model. The classified, weighted layers are then incorporated to produce a suitability grid where each criterion influences the overall suitability value of each grid cell based the suitability classifications within the cell and the overall weight of the criterion layer.

Once the sub-models are run, the result is a suitability grid for each of the model themes. The sub-model results are then weighted relative to each other and incorporated in the same manner as the individual layers to produce a composite suitability grid surface that incorporates all the classified, weighted criteria.

### Habitat Sub-model (50% Total Weight)

The habitat model is reliant on existing habitat data derived from local, state, and national habitat analyses from public and private sectors. The layers used in this sub-model, data classification methods, and sub-model weights are shown in Table I.

*Table I*

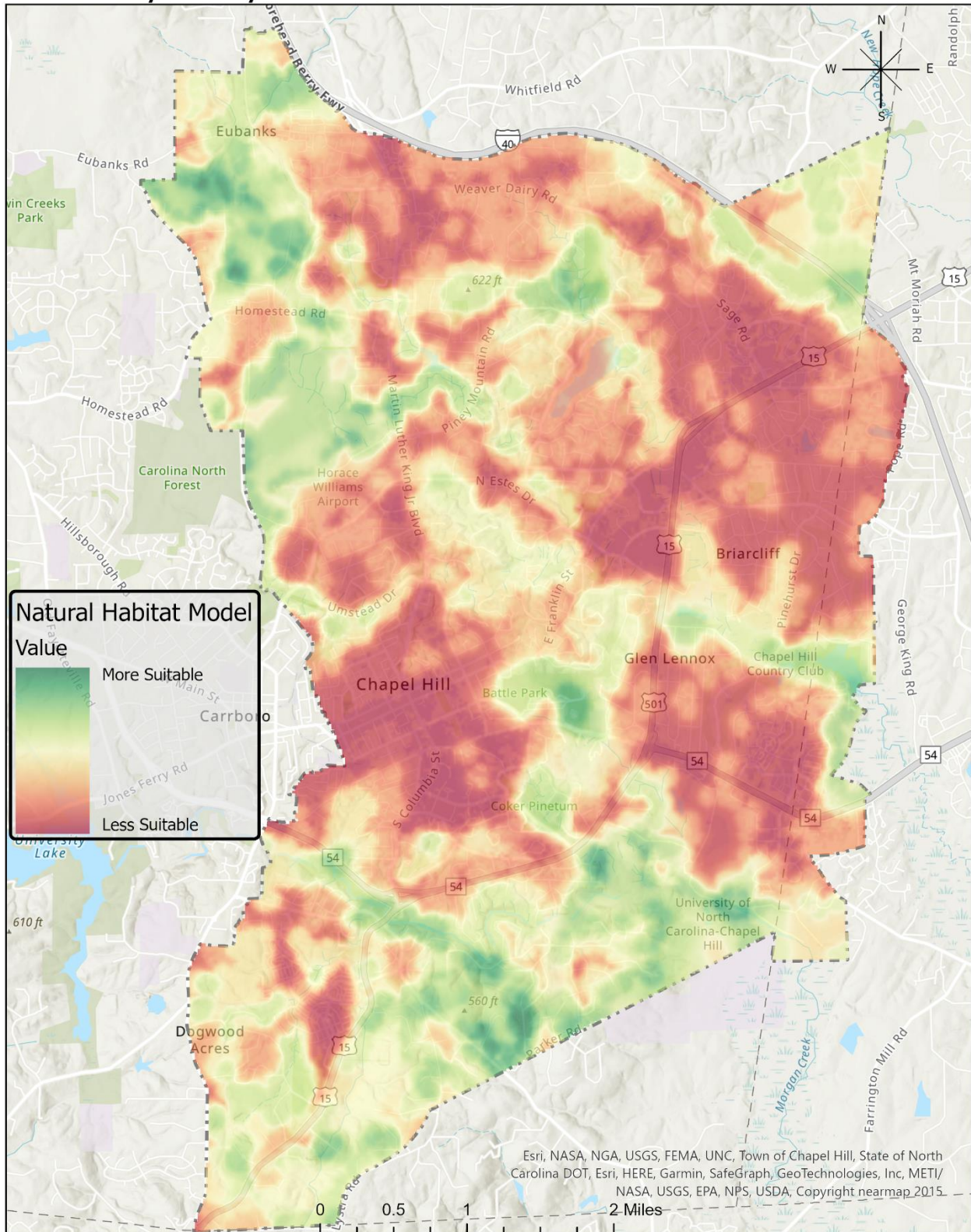
Source	Data	Suitability Class Intervals or Range	Sub-model Weight
Eno-New Hope Landscape Conservation Plan	Habitat Corridors (proximity in feet)	Start: 0 Mid: 660 Max: 1320	18%
Eno-New Hope Landscape Conservation Plan	Habitat Patches (proximity in feet)	Start: 0 Mid: 350 Max: 700	18%
NC Natural Heritage Program	Element Occurrences (proximity in feet)	Start: 0 Mid: 660 Max: 1320	16%

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Environmental Systems Research Institute (ESRI)	Habitat Cores (proximity in feet)	Start: 0 Mid: 500 Max: 1000	12%
Environmental Systems Research Institute (ESRI)	Habitat Fragments (proximity in feet)	Start: 0 Mid: 350 Max: 700	16%
Environmental Systems Research Institute (ESRI)	Habitat Corridors (proximity in feet)	Start: 0 Mid: 660 Max: 1320	10%
Environmental Systems Research Institute (ESRI)	Habitat Cost Surface	0-255 @ 25 pt intervals	10%

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## Suitability Analysis- Draft Natural Habitat Model



**Hydrology Sub-model (30% Total Weight)**

The hydrology sub-model is comprised of local and federal datasets to represent riparian, wetland, and aquatic habitat. The layers used in this sub-model, data classification method, and overall weights are shown in Table II.

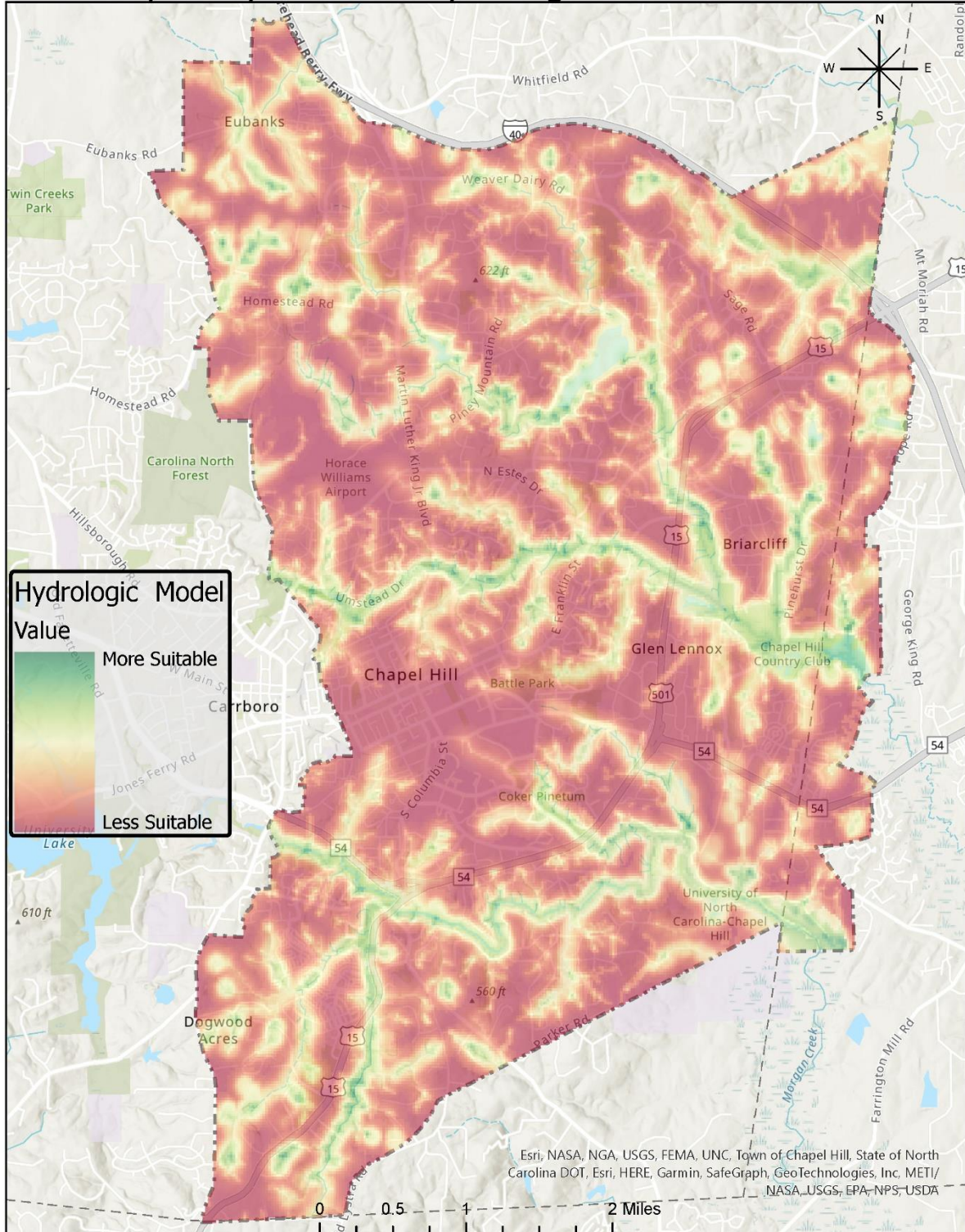
*Table II*

<b>Source</b>	<b>Data</b>	<b>Class Intervals or Range</b>	<b>Sub-model Weight</b>
US Fish and Wildlife Service	Wetlands (proximity in feet)	Start: 0 Mid: 350 Max: 700	20%
Town of Chapel Hill	Perennial Streams (proximity in feet)	Start: 0 Mid: 350 Max: 700	18%
Town of Chapel Hill	Intermittent Streams (proximity in feet)	Start: 0 Mid: 100 Max: 350	16%
Town of Chapel Hill	Ephemeral Streams (proximity in feet)	Start: 0 Mid: 75 Max: 150	10%
Town of Chapel Hill	Waterbodies (proximity in feet)	Start: 0 Mid: 350 Max: 700	10%
NRCS Soil Survey	Hydric Soils (percent hydric)	90%, 40%, 5%, 3%, 1%.	16%



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## Suitability Analysis- Draft Hydrologic Model



**Land Use/Land Cover Sub-model (20% Total Weight)**

The land use/ land cover sub-model incorporates national, state, and local data to identify areas that are currently managed for biodiversity or have uses conducive to open space. The layers used in this sub-model, data classification method, and overall weights are shown in Table III.

*Table III*

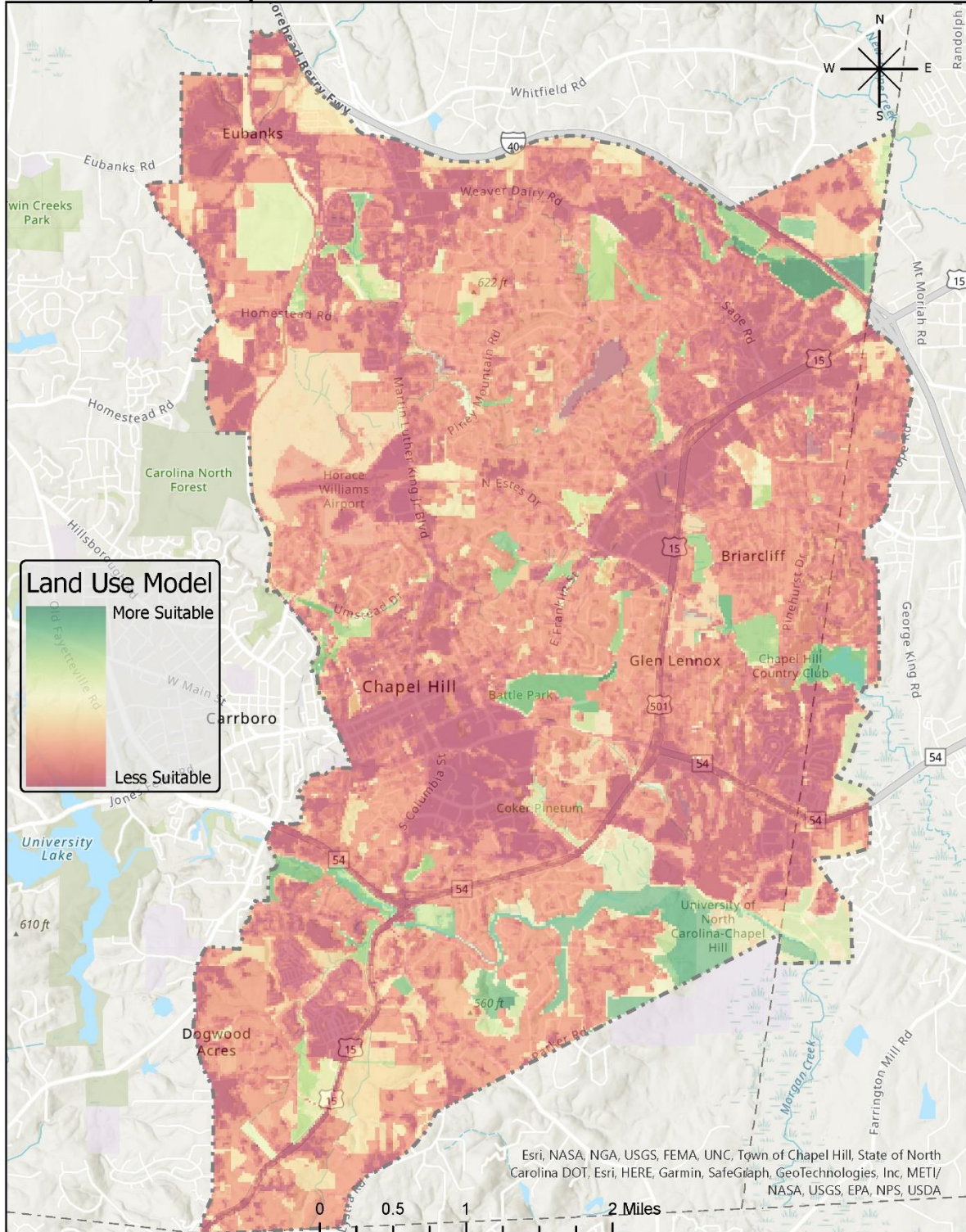
<b>Source</b>	<b>Data</b>	<b>Class Intervals or Range</b>	<b>Sub-model Weight</b>
NC Natural Heritage Program	Managed Areas	GAP Scores 1,2,3 (10,9,8)	20%
NC Natural Heritage Program	Natural Areas	GAP Scores 1,2,3 (10,9,8)	20%
MRLC National Land Cover Dataset	Tree Canopy (percent cover)	0-100% with 10% intervals (1-10)	16%
Town of Chapel Hill	Parks and Open Space	POS Use Score: 10,8,7,5,1	18%
Town of Chapel Hill	Non-Impervious* parcels	Presence/Absence Binary (5/1)	10%
Town of Chapel Hill	Existing Land Uses Supporting Natural Areas	Land Use Score: 10,8,7,5,1	16%

*\*Non-impervious parcels include parcels with no impervious surfaces as well as large parcels with minimal/nominal areas of impervious surfaces for accessibility.*



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## Suitability Analysis- Draft Land Use Model



Draft Composite Surface (First Iteration)



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## Suitability Analysis- Draft Natural Area Model

