Initializing the Comparative Subwatershed Analysis (Step 2)
Discussion Paper

A. James, April 23, 2012

The identification and comparative analysis of subwatersheds in RBC is an essential step needed in order to develop a priority subwatershed list. This will be needed to move forward with specific mitigation and restoration projects in the basin. The comparative analysis can be addressed in two phases. Phase 1 should begin immediately with a discussion about the number of subwatersheds that is appropriate for RBC and the criteria to use for delineate watershed boundaries. A series of maps are presented below to facilitate this discussion. Phase 2 will be a more careful identification and comparison of subwatershed characteristics, based on a revised delineation of watershed divides and channels and the acquisition of new data. Existing subwatershed divides (from John Wooten's 2008 MS thesis) are based on old digital elevation models (DEMs), and the only channel map in our possession is a woefully inappropriate single channel derived from the National Hydrologic Dataset that shows the lower creek flowing through the quarry. Both divides and channels will need to be remapped with new LiDAR data before precise identification of subwatersheds will be possible. If watershed boundaries shift substantially, that may require a reassessment of the comparative findings. Phase 2 will occur some time in May.

Beyond the two initial phases of the comparative subwatershed analysis, the topographically derived watershed boundaries should ultimately be checked against potential extrabasin transfers by storm drains that cross subwatershed divides. It may be a long time, however, before maps of the storm sewer system are available, so we should not wait for that analysis or for the anticipated influx of hydrologic and spatial data over the next couple months. While the new data could be relevant to comparing and prioritizing subwatersheds, we will be wise to make initial decisions now with the data available, knowing that some revisions may be justified later.

Criteria for evaluating subwaters. Since many of the issues confronting the RBW Alliance arise from flooding and water-quality problems, some possible criteria for evaluating subwatersheds include the nature of land use and development in various areas of the basin. Two characteristics are suggested for consideration in this preliminary phase one comparative analysis: zoning and percent areas covered by impervious surface. Zoning classes, subwatersheds, and impervious surfaces are available from Wooten (2008). His impervious surfaces were mapped using color orthophotos (15 cm resolution) acquired in January 2007. If we are agreed that these are pertinent criteria, we can discuss the maps (below) on Wednesday.

As an initial step in the comparative analysis, a preliminary GIS has been constructed from standard GIS products available from Richland County and Wooten's thesis. The attached maps have been derived from that dataset for our discussion.

References

Wooten, John. 2008. Assessing the Restoration Feasibility of Rocky Branch Creek: An Integrated Watershed Management Approach. M.S. Thesis, MEERM program, USC.

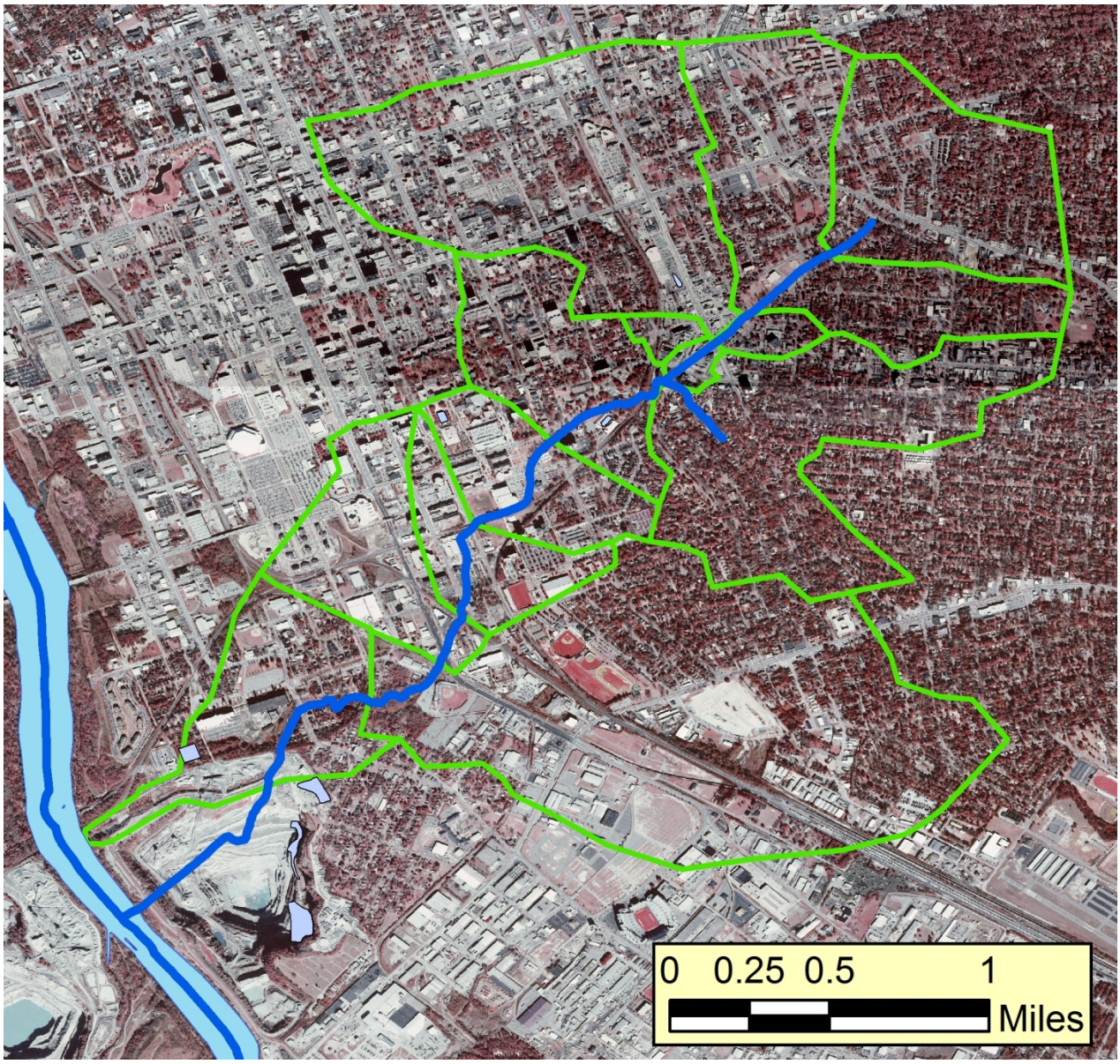

Figure 1. Preliminary subwatershed divides superimposed over 2006 DOQ. Divides from Wooten; channels from NHD.

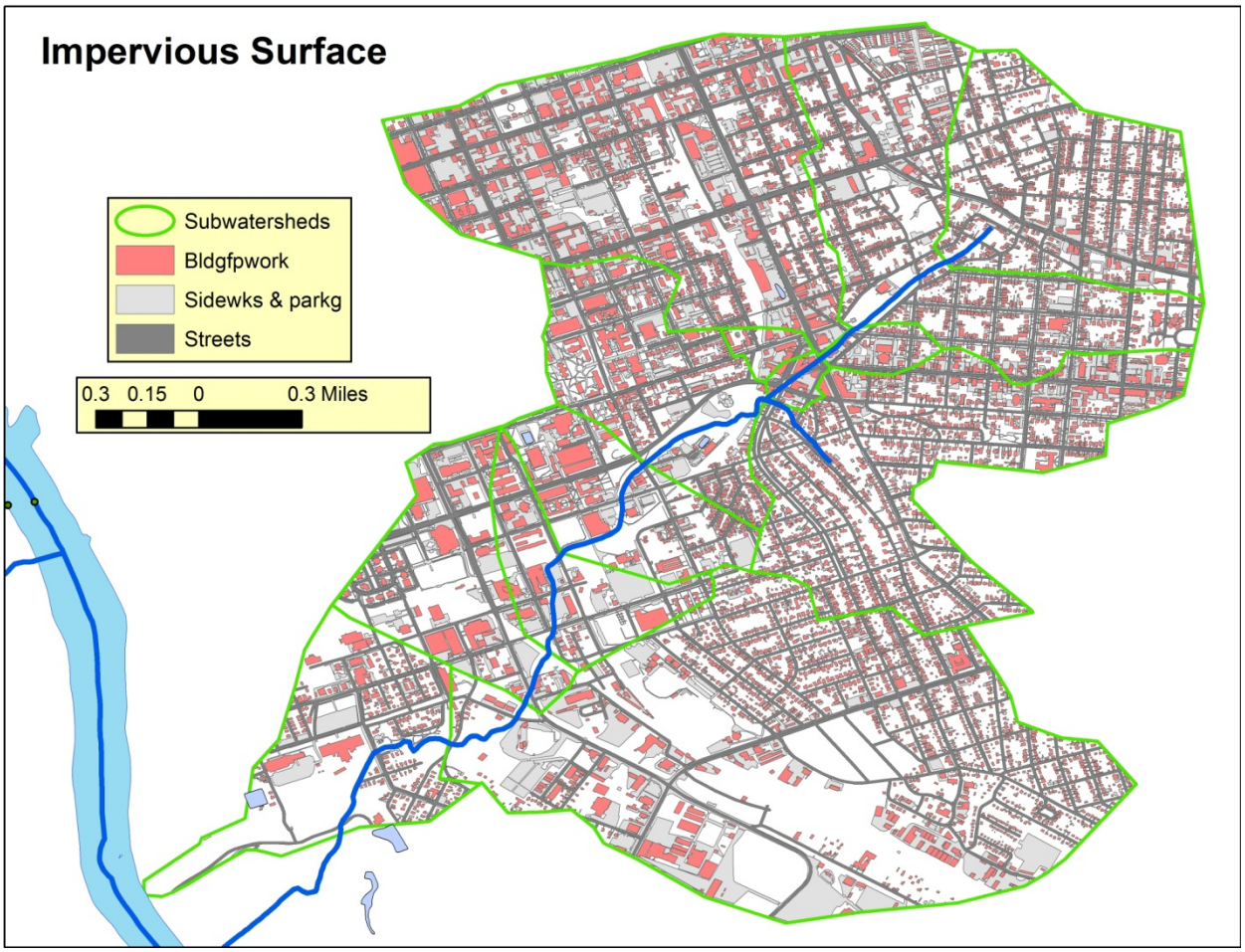

Figure 2. Impervious surfaces from Wooten analysis of 2007 Pictometry data.

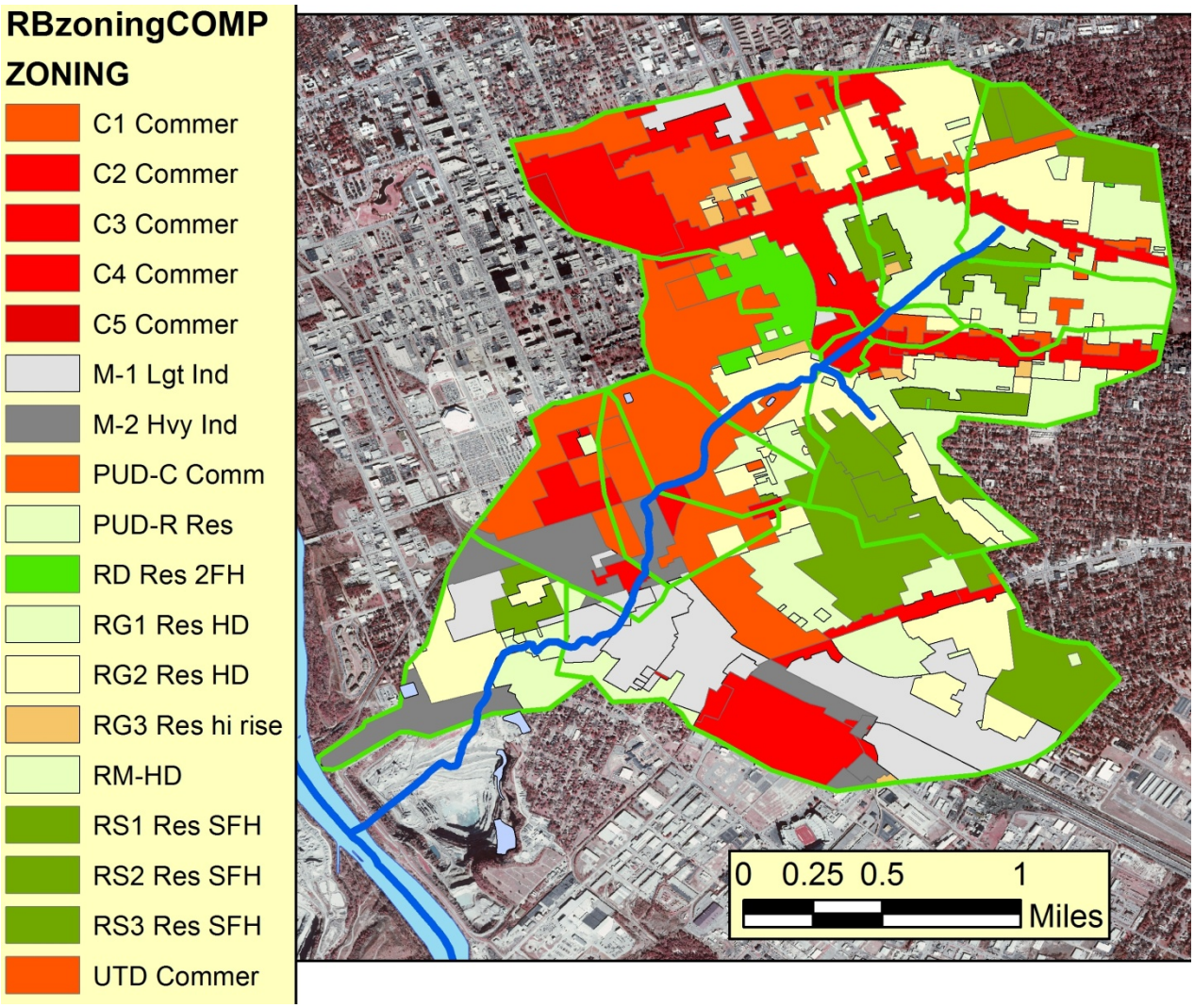

Figure 3. Map of zoning for City of Columbia and Richland County, from Wooten 2008. See Table 1 and Wooten thesis for details on zoning definitions.

Table 1. Zoning classifications and descriptions including Richland County equivalents. (source: Wooten, 2008)

Zoning Code	Zoning Classification	Description	Richland County Equivalent
RS-1	Single-Family Residential	Minimum lot area 1,393.5 m^2 (15,000 ft^2); minimum lot width 27.4 m (90 ft)	
RS-2	Single-Family Residential	Minimum lot area 789.7 m^2 (8,500 ft^2); minimum lot width 18.3 m (60 ft)	
RS-3	Single-Family Residential	Minimum lot area 464.5 m^2 (5,000 ft^2); minimum lot width 15.2 (50 ft)	
RD	Two-Family Residential	Minimum lot area of 464.5 m^2 (5,000 ft^2) for the first dwelling unit and 232.3 m^2 (2,500 ft^2) for the second	
RG-1	General Residential	Medium to high density residential (single-family attached and detached (also includes PUD-R) Minimum lot area of 464.5 m^2 (5,000 ft^2) for the first dwelling unit and 334.5 m^2 (3600 ft^2) for the second	RM-MD RM-HD
RG-2	General Residential	Medium to high density residential (multi family, non-high rise) Minimum lot area of 464.5 m^2 (5,000 ft^2) for the first dwelling unit and 232.3 m^2 (2,500 ft^2) for the second	
RG-3	General Residential	High density residential (high rise and townhouses)	
GC	Commercial	All commercial (includes UTD and PUD-C)	GC
M-1	Light Industrial	Wholesaling, distribution, storage, processing, light manufacturing and general commercial uses	M-1
M-2	Heavy Industrial	Uses of a manufacturing and industrial nature	HI

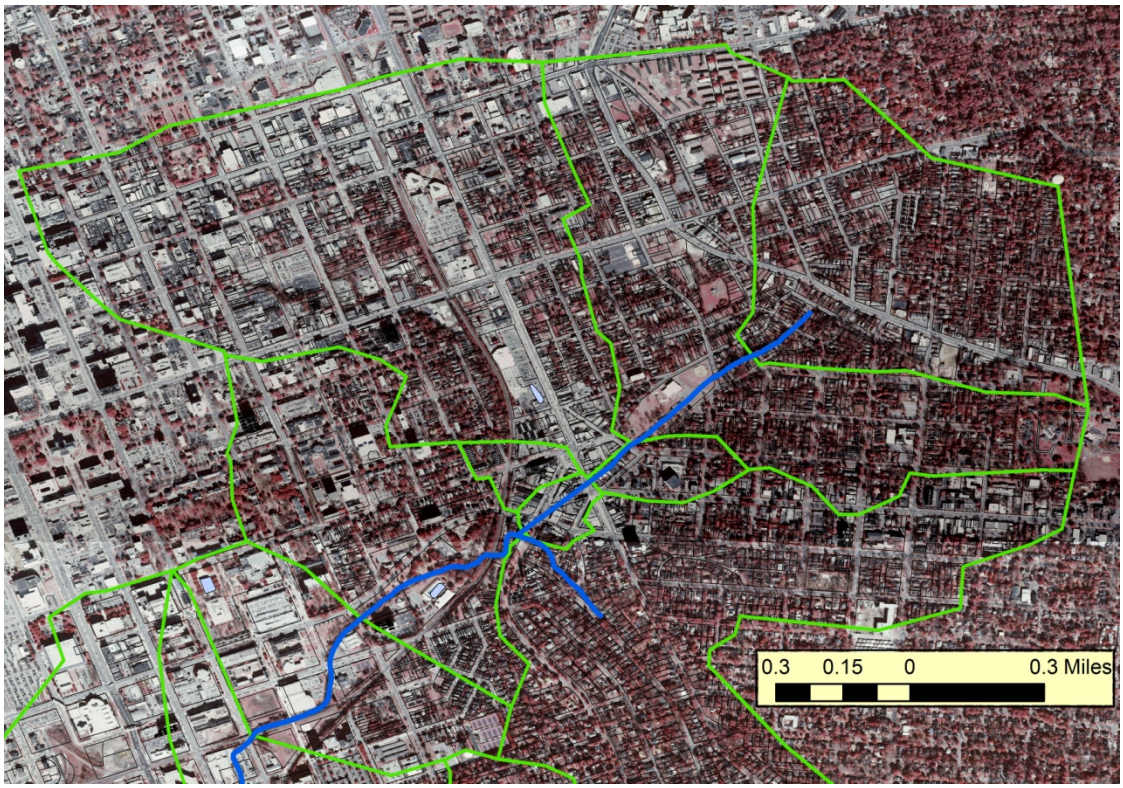

Figure 4. Subwatersheds in upper RBC. Parcel map superimposed.

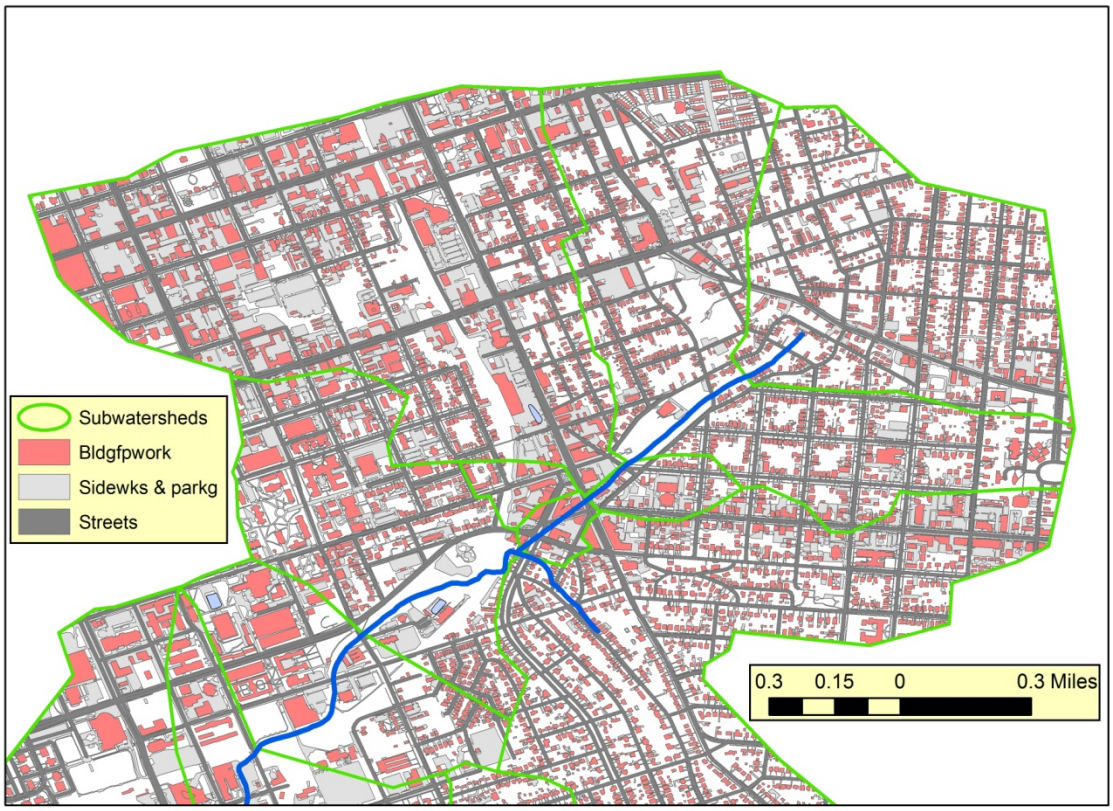

Figure 6. Impervious surfaces in upper basin.