

DRAFT FOR DISCUSSION PURPOSES ONLY

CAROLINA NORTH Landscape, Natural Habitat, and Water Quality Draft Metrics December 12, 2006

- **Create a space with more biodiversity than it has today.**
 - Restore degraded areas that are to remain as conservation areas (e.g., Crow Branch, landfill, beaver pond)
 - Control invasive species by developing and implementing an invasive species management plan
 - Replace and plant more trees than are cleared, using a variety of native species and like-caliper.
 - Establish baseline inventories of indicator species (flora and fauna) to track over time. Conduct annual surveys to compare against baseline conditions and employ adaptive management techniques to maintain or increase species diversity and abundance. Prepare annual reports summarizing findings and recommended management actions.
 - Establish green roofs on all structures that facilitate plants that support pollinator and avian species.
 - Incorporate habitat structures into buildings including bird/bat houses, living walls, and....
 - Use a diversity of native plants and strata in all landscape plantings.
- **Understand and educate people that the CN campus will look different than the main campus, with an emphasis on providing and celebrating natural and native ecosystems that are integrated throughout the site.**
 - Establish an education and outreach initiative that explains sustainability goals and metrics Carolina North will be targeting
 - Actively recruit educators and researchers based on the founding sustainability principles
- **Identify existing site features that we want to celebrate, protect, and enhance and design for better access to experience their value.**
 - Use the ecological assessment data and gather additional data as needed to identify stream, forest, and other sensitive areas to protect.
 - Establish appropriate buffers around these features.
 - Provide well planned and maintained access trails for pedestrians and bikers to experience these sites
 - Design view corridors from campus structures to these special features where possible.

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- **Integrate research, education, and outreach in both built and non-built conditions. Pursue these opportunities during planning, construction, and post-construction phases.**
 - Actively engage students and faculty in a formal data collection and assessment initiative to record existing site features and conditions prior to construction to establish a baseline condition to serve as a foundation to future research.
 - Work with undergraduate and graduate faculty to establish a research plan for Carolina North that includes studying protected, restored, and developed areas.
 - Coordinate research efforts with broader Bolin Creek watershed assessment and restoration efforts.
- **Maintain/enhance community and ecosystem connectivity by preserving viewscales, integrating ecological function throughout the built environment, and creating a natural and functional transition to the non-built environment. Provide for dedicated green space in the built environment.**
 - Maintain and preserve the natural connectivity of Bolin Creek by protecting a 150 meter wide corridor throughout the Carolina North property.
 - A 25-foot minimum edge transition shall be established from the edge of any stream/forest buffer. This transition zone will be planted with native shrub/grassland plant community. Reforestation up to the face of a building is also acceptable as an alternative form of transition zone vegetation.
 - Design and construct all new lawns with connected tree canopies.
 - Identify all existing trees within the proposed disturbance footprint with a caliper larger than 6", and preserve 100% of them, or replace in-kind by caliper. Replacement in-kind shall be additive. For example, if a 6" caliper tree is removed, it can be replaced by six, 1" caliper trees. Additive in-kind replacement facilitates reforestation by providing the opportunity for the future growth of six, 6" trees as opposed to larger caliper tree that was planted as a 1:1 replacement. Replanting should occur within one year of the initial disturbance.
 - Plant street trees with a mix of native trees that consist of 80% canopy to 20% understory throughout the built Campus.
 - Locate and/or design development so that a public space, such as a park, plaza, or open greenspace, etc., lies within 100 yards of the all the entrances to the project's residential and teaching/research buildings.
- **Restore disturbed ecological systems concurrent with development activities.**
 - Restoration actions should be initiated within one year of initial disturbance.
 - Inventory areas of invasive species on site.
 - Remove invasive plants and replace with native plants.
 - Manage the areas where invasive plants have been removed to prevent their reoccurrence.

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- **Protect sensitive natural areas by thoughtful planning, design and maintenance of access around them.**
 - Identify key sensitive natural areas that should have no or limited access and design trail system to avoid these areas along with educational signage identifying the sensitive nature of the area.
 - As a corollary, identify less sensitive natural areas that provide good educational opportunities and design appropriate access trails and signage.
- **Protect, enhance and restore native soil properties to support indigenous plant growth, native soil fauna, enhance natural hydrologic process and support overall ecosystem function.**
 - Salvage and stockpile topsoil from areas to be disturbed. Soil stockpiles shall be no more than 4 feet high and shall be covered with 4 inches of straw until reused. Test stockpiled soil for soil organic matter content, fertility and structure.
 - Soil amendments including fertilizers shall consist of organic products exclusive of peat moss. Spread salvaged topsoil on disturbed pervious areas to a minimum depth of 6 inches.
 - Where insufficient topsoil exists, use imported or site manufactured topsoil that meets appropriate horticultural specifications as put forth by NC Department of Agriculture and Consumer Services or comparable entity. Testing is required to verify compliance with specifications.
 - Establish protocols above and beyond typical construction specifications for soil storage that ensure its biotic vitality and its healthy soil structure.
 - Prevent soil compaction in areas designated to receive stormwater for recharge and infiltration.
 - Develop a soils management protocol to monitor and amend soils annually.
- **Minimize erosion to protect habitat and reduce stress on natural water systems by preserving steep slopes in a natural, vegetated state.**
 - Do not develop sites on slopes greater than 15% OR if slopes greater than 15% are disturbed, employ redundant and effective erosion and sediment control techniques that are inspected several times a week.
- **Replicate the natural, undisturbed hydrologic function of the land.**
 - At a minimum, meet the stormwater management criteria of the Town of Chapel Hill for new development. In addition, treatment strategies shall be capable of limiting nitrogen export to 4.8 lb/acre/yr and phosphorus export to 0.8 lb/acre/year in accordance with the Jordan Lake Watershed Draft Criteria established by the North Carolina State Environmental Management Commission.
 - Manage runoff from the built environment close to its source.
 - Provide water quality treatment for all impervious areas. Alternatively, capture and reuse the runoff from impervious areas.

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- **Use native plant species for a healthy ecosystem that will conserve native wildlife, decrease the amount of water needed for landscape maintenance, reduce long-term maintenance, reduce soil erosion by production of long root systems, and protect water quality by controlling erosion and moderating floods and drought.**
 - Use native plant species for all exterior vegetation.
 - Develop a list/database of native plants including recommendations for plant types based on key site factors.
 - Plants considered invasive by Southeast Exotic Pest Plant Council should not be used.
 - Require planting plans prepared by registered landscape architects for all exterior landscape areas.
 - Establish a composting program and on site location that provides for all fertilization and mulching needs on site. Organic fertilizer should be used if additional fertilizer is needed.
- **Reduce the heat island effect by preserving forest patches, reforesting areas, and planting street, courtyard, and plaza trees.**
 - Establish a canopy cover of 40-50% in the built areas over the campus buildout period of 50 years.
 - Provide shade (within 25 years) for at least 70% of sidewalks, paths, and parking lots and 30% for streets, plazas, etc.
 - Incorporate trees into onsite stormwater management practices as a means to meet the canopy target.
 - Provide healthy planting zones that include adequate soil volumes for target species.
- **Build on existing disturbed areas before considering natural landscapes and allow natural site features to influence building siting and utility location.**
 - Locate initial phases of development on disturbed areas such as the runway, maintenance facility, parking lots, and landfill.
 - Concentrate site disturbance on no more than XX% of site.

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- **Plan for and design staging and stockpile areas associated with construction activities to avoid impacts to natural areas.**
 - Use existing disturbed areas as staging and stockpiling areas.
 - Do not clear natural areas for purposes of staging and stockpiling
 - Maintain a minimum 25-foot buffer between staging areas and any natural areas
 - Employ perimeter erosion and sediment control measures on all staging and stockpiling areas.
- **Avoid disturbance to natural areas during construction and minimize disturbance in construction areas by providing tree protection and minimizing soil compaction.**
 - Limit site disturbance including earthwork and clearing of vegetation to 40 feet from the edge of the building or hardscape feature.
 - Limit total contiguous area cleared at one time to ten acres.
- **Quantify and understand the existing natural capital of the site to inform the planning process and associated conservation/development strategies.**
 - Quantify forest stand value in terms of hardwood resources, carbon sequestration credits, and more under current conditions.
 - Partner with faculty and staff to research and develop a quantification of other site resources with respect to embodied energy (aka emergy), carbon sequestration potential, and other natural capital currency.
 - Develop a masterplan that never decreases the site natural capital and works to increase the natural capital of the site 5% each 10-yr increment of the buildout period (assumed to be 50 yrs).
- **Plan for and design east-west access routes and paths across existing rail corridor and Seawell School Rd. Consider scenarios where rail line no longer exists or has been relocated.**
 - Develop a suite of design alternatives that illustrate crossing options that limit disturbance to natural areas, provide for a continuous, unimpeded route, and limits the types and frequency of motorized vehicle access.
- **Maintenance of natural systems should be included as part of the site's operating budget. Maintenance of the natural systems should take an adaptive management approach.**
 - Establish and sustain an active forest management program that considers harvesting of timber for use in site construction. [Note this was a goal articulated at the Nov 27-29 work session].
- **Employ environmentally sound maintenance practices to support biodiversity and protect at-risk ecosystems.**
 - Develop and adopt an integrated organic pest management program.
 - Eliminate reliance on commercial pesticide and herbicide use after 10 years.

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- **Incorporate edible landscapes throughout developed areas.**
 - Establish targeted planting areas integrated throughout the built campus where fruits, nuts, vegetables, and herbs are grown and made available to the community. Use these areas to introduce the community sustainability concepts and integrate into research initiatives.
- **Identify and create community garden areas that provide a food source, social gathering place, and research opportunities.**
 - Dedicate up to 5 acres of land to support community gardens initiatives.
 - Establish a set of stewardship and management standards required for stakeholders to actively cultivate land. Annually review land stewardship practices and enforce management standards that are not being met.