Abstract:
Permeable Landscapes for Species of Greatest Conservation Need.

Project Summary
Landscape permeability is the ability of a heterogeneous land area to provide for passage of animals, equivalent to what some authors call "habitat connectivity." In this project we will evaluate and map the relative landscape permeability across a region of thirteen states, and determine how permeability coincides with the locations and habitat of species of greatest conservation concern. The analysis will be based new analytical tools (e.g. Circuitscape and Resistant Kernel models) applied to the Northeast Regional Habitat Map, and corroborated with species locations and land cover maps. We aim to identify where the most important regional movement concentrations are, particularly those areas where movements may be funneled due to constriction in the landscape. Using this information, we will measure the amount of flow, permeability and resistance present in the region's roads and secured-lands network. The project will be by guided by a thirteen-state steering committee. We propose to spend the first quarter preparing the permeability data sets, the second quarter analyzing the patterns relative to species and habitats, the third quarter evaluating roads and secured lands, and the last quarter preparing the final products.

Product: A data set showing the relative permeability of the landscape, and patterns of potential movement flows, across a region of thirteen states; and a report detailing how landscape permeability coincides with the locations and habitat of species of greatest conservation concern. Analytical products will include: 1) the identification of regionally important regional movement concentrations - areas where movements may be funneled due to constriction in the landscape; 2) an analysis of the region's secured land network with respect to how it contributes to maintaining landscape permeability and a scoring of each tract with respect to connectivity; 3) Ranking and scoring of all major roads with respect to how much potential movement they restrict, and estimates of the increase to landscape permeability gained by mitigating the effects of each barrier.

Timeline:

May-June 2012	Revise the landcover map including Maritime Canada, Automate circuitscape software
July-August 2012	Run resistant kernel model for region, Test run circuitscape for region and various scales
Sept - December 2012	Compile species locations, road kill data, traffic volumn and other useful data for testing the permeability models, Explore relationship of linkages and barriers with respect to species and habitats. Establish a review committee and present information to them
January - June 2013	Run the circuitscape analysis at multiple scales. Analyze permeability with respect to roads and secured lands. Present results to committee
July – Sept 2013	Finalize all analysis and results. Present to Committee
Oct – November 2013	Prepare final report and datasets.
November-December 2013	Complete final deliverables

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NORTHEAST REGIONAL CONSERVATION NEEDS GRANT QUARTERLY REPORT

<u>Grant Number</u>: 2011-05

<u>Grant Title</u>: Permeable Landscapes for Species of Greatest Conservation Need.

<u>Grant Receipt</u>: The Nature Conservancy

<u>Grant Contact Name</u>: Mark Anderson

<u>Report #</u> 2

<u>Were planned goals/objectives achieved last quarter</u>?
This was our first quarter of the project; the award period began on March 1, 2012.

<u>Regional Conservation Need Addressed</u>: RCN Topic 4: Identification of Regional Focal Areas and Corridors for the Conservation of Species of Great Conservation Need in the Northeast

<u>Progress Achieved</u>:

Goal: **Compile and Revise the Land cover map for the LCC region:** The first step in this project was to compile up-to-date map of land cover and roads for the whole region including Canada. We have completed this step.

To create the new map we investigated a variety of sources and compiled the most recent and accurate data available. This included:

US: NLCD 2006 – Land cover
New Bruswick - Non Industrial Forest Owners
Nova Scotia - Forest Resource map
Southern Quebec – Land cover.

For the remaining areas we used the existing map (compiled in 2006) that covered northern Quebec, PEI, and the industrial forest areas of New Brunswick (Irving and Acadian Timberlands). We signed a data sharing agreement with New Brunswick for use of the non-industrial data. We agreed on a region-wide classification and coding scheme based on the 2006 scheme (Greg Kehm's work) with just a few slight variations. We started by trying to translate everything to NLCD06 codes, but had to go with the slightly more general 2006 codes to match up the US and Canada. We updated Kehm's original excel workbook to reflect changes and new data sources.

Goal 2: **Automate the Circuitscape Software to perform repeated runs**: In order to explore the impacts of various barriers and resistance weight, we wrote a program to automate the circuit scape flow concentration analysis. This analysis was originally done manually and was very labor intensive. The automated version will allow us to rapidly test the effects of various decisions and look at their impacts of species habitat.

Difficulties Encountered: None yet.

Activities Anticipated Next Quarter:
- Finalize road data in US and Canada
- Run resistant kernel analysis for the region
- Experiment with circuitscape analysis for the region.

Costs:
        Are you within the approved budget plan? Yes

        Are you within approved budget categories? Yes

Signature: Mark Anderson, Director of Conservation Science

Date: July 25, 2012