Atlin-Taku Planning Area: **Regional Connectivity Analysis**

Regional Scale Connectivity

We developed a model of connectivity potential across the Taku River Tlingit Territory. This analysis predicts where animals are likely to move, given assumptions about what may be important in determining movement decisions. For the analysis, we used grizzly bear as the focal species. Grizzly bears and other wide-ranging species make ideal umbrella species for analyses of connectivity, as their daily and seasonal movements can be long and cover diverse landscapes. Our movement modeling uses a widely accepted analyses approach called "least-cost path modeling" to identify the most cost-effective route connecting two points. The "cost" of movement is modeled as a combination of total distance, topography and habitat values. While referred to as "cost", we do not have actual energetic estimates or costs, but use the terminology and the approach as an effective and widely-used modeling framework for identifying routes that may be selected by a diversity of species, assuming a common suite of decision rules. For example, under our least-cost modeling approach, shorter distances are preferred (e.g., the shortest distance would be a straight line between any two points), but this is moderated by the cost of traversing across steep topography and a preference for higher quality habitats. This model does not include avoidance of human infrastructure.

A total of 174 points were randomly selected across the territory, and least-cost paths between subsets of these random points were calculated through a series of modeling iterations using 9 to 15 randomly selected points, for a total of 2,564 paths across the Territory. Each path has a highest "cost" that was accepted, and from that highest cost value, we could identify adjacent areas that form a corridor representing cost values equal to or less than the highest cost encountered by the individual path. We completed this for each path, and overlaid all the identified corridors to rank areas by the number of overlapping corridors.

The total number of times an area was identified as within a corridor provides an index of its relative importance for regional connectivity, and provides a regional picture of which areas of the Territory are likely important for connectivity. Here we show the index (standardizes to range between 0 and 1, with 1 indicating the highest number of overlapping corridors), and how it provides this regional picture of connectivity or "landscape permeability".

Map Key

- *Model source locations*
- *Modeled least cost paths between source locations*

Modeled value for regional scale connectivity

Highest — *Lowest*

- *Taku River Tlingit territory*
- *Atlin-Taku planning area*
- *Taku River drainage divide*
- *Protected areas*

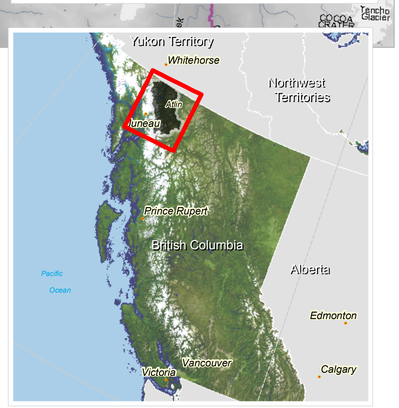
Roads

- *Paved or main roads*
- *Gravel or secondary roads*
- *Unimproved roads*
- *Rivers*
- *Lakes*

0 2.5 5 10 Kms

Projection: BC Albers equal area conic
Datum: North American Datum of 1983
Data sources: TRTFN, BC WLAP, GeoGratis

TAKU RIVER TLINGIT FIRST NATION



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