

## Method 1

## Active River Area (ARA)

### Definition of corridor:

The "active river area" is that space which is essential to processes of habitat formation and river disturbance regimes.

### Description of method, inputs and outputs:

This GIS-based tool is designed to map all of the areas that are important to the sediment and water processes in a river at a large scale. Analysis is very basic but incorporates fluvial processes, groundwater processes, and sediment processes. Each process is modeled using a separate set of GIS steps and the resulting maps are combined. The region of both active river migration and movement of materials into the river is mapped using three basic GIS-based analyses:

1. Each map cell is given a "cost-distance" value based on the path that water from the centerline would need to take to reach that spot. Cells below a certain cost-distance are deemed to be within the "ARA".
  - a. Data needs: DEM, centerline.
2. Low-gradient areas with high levels of flow accumulation (high moisture-index areas) are mapped. Cells with a moisture-index above a threshold are deemed to be within the "ARA".
  - a. Data needs: DEM, Existing wetland maps optional.
3. Areas within a 30 to 60 meter buffer of rivers above a certain elevation are considered material contribution areas, and fall within the active river area.
  - a. Data needs: DEM, centerline

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| <b>Output:</b>   |  | <b>Technology needs:</b>   |   |
| <input checked="" type="checkbox"/> Binary map (in the zone of risk or not)<br><input type="checkbox"/> Graded map (maps levels of risk)   |  | <input checked="" type="checkbox"/> GIS<br><input type="checkbox"/> Specific model   |   |
| <b>What is assessed:</b>   |  | <b>Data Sources:</b>   |   |
| <u>Channel-scale</u><br><input type="checkbox"/> Width (bankfull)<br><input type="checkbox"/> Depth<br><input type="checkbox"/> Slope<br><input checked="" type="checkbox"/> Planform<br><input type="checkbox"/> Erodibility of Banks/Bed<br><input type="checkbox"/> Grain Size<br><input type="checkbox"/> Stream Power | <u>Landscape-scale</u><br><input type="checkbox"/> Vegetation<br><input type="checkbox"/> Hydrology (streamflow, channel forming flow, flood)<br><input type="checkbox"/> Erodibility of floodplain<br><input type="checkbox"/> Width (flood prone area) | <input type="checkbox"/> Imagery (± channel geometry) (± vegetation) (± land use) (± infrastructure)<br><input checked="" type="checkbox"/> Topographic Maps (± LiDAR DEM)<br><input type="checkbox"/> Geologic Maps<br><input type="checkbox"/> Soil Maps/ database (± Surficial Geology) | <input type="checkbox"/> Streamflow data<br><input type="checkbox"/> Field measurements (± Channel geometry) (± Erosional Forms) (± Sedimentary Forms) (± Bankfull indicators) (± Vegetation)<br><input type="checkbox"/> Historical Information<br><input checked="" type="checkbox"/> Land use maps (± vegetation) (± wetlands) |

**Developer/Year:** The Nature Conservancy, 2010

### Citation(s) for primary method or descriptive publication(s):

Smith, M.P., Schiff, R., Olivero, A., and MacBroom, J. 2008. The Active River Area: A Conservation Framework for Protecting Rivers and Streams. The Nature Conservancy, Boston, MA.