Habitat Volume Model (HabVol)

Bug Report and Fix #2

Report #2. Bug fix for special case (edge of habitat) calculations, "pie problem"

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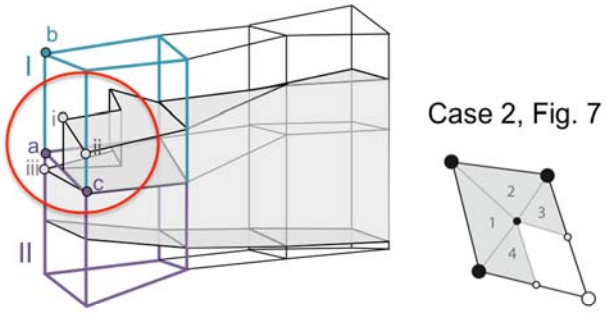
Problem: in special case circumstances where suitable habitat does not exist ("no-habitat" scenarios) at both the top and bottom nodes of one or more horizontal corners of the grid cell (see Fig. 7 of Smith et al. *in press*, Computers and Geosciences), calculations of habitat volume in the grid cell below such a cell can result in a pie-shaped wedge of volume which is not calculated but should be. (see Illustration below).

Fix: When one of the special cases of Fig. 7 of Smith et al. *in press* occurs, and habitat exists at a portion of the lower and/or upper cell boundary, the upper and lower interfaces of the habitat in the cells below and above the special-case cell, respectively, will be determined, and the vertical edges of the special-case habitat volume will be extended downward or upward to meet those interfaces. For example, in the scenario below, instead of using the point on the line between *a* and *c* to define the bottom of the volume in Cell *I* (see illustration below), a point on the line between *iii* and *c* directly under *i* will be used. This fix is slated for HabVol v.2 release.

Potential problem with handling of no-habitat scenarios (e.g., case 2 in Fig. 7)



Case 2, Fig. 7

Cell I: No suitable habitat at nodes *a* or *b*. Habitat is treated according to case 2 in Fig. 7, creating "L" shape. Boundary point *i* is the midpoint between boundary point *ii* and node *b*.
Cell II: Suitable habitat is found at three of the upper nodes, but not node *a*. Upper bound *iii* is found through interpolation. Habitat edge line is drawn from *iii* to *c*. This creates a gap in habitat between cells I and II.