**QGIS workflow for PR boa habitat analysis**

12 June 2019

QGIS project: prboa\_habitat.qgz

Data sources:

* **prgap\_landcover** – raster layer obtained from USGS ([link](https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/land-cover-data-download?qt-science_center_objects=0#qt-science_center_objects)), includes 70 land cover classifications in 15 m2 cells
* **epicrates\_inornatus\_habitat** – raster layer obtained from FWS (J.P. Zegarra email) including suitable habitat based on PR GAP Analysis in 15 m2 cells (0 = NA, 1 = not suitable, 2 = suitable)
* **10n090w\_20101117\_gmted\_mea075** – Global Multi-resolution Terrain Elevation Data 2010 (GMTED2010) in 7.5 arc-second resolution ([link](https://www.usgs.gov/centers/eros/science/usgs-eros-archive-digital-elevation-global-multi-resolution-terrain-elevation?qt-science_center_objects=0#qt-science_center_objects)) (mean elevation layer)

Output layers:

* **habitat –** raster layer of habitat (1) and non-habitat (0)
* **development** – raster layer of developed (1) and non-developed (0)
* **habitat buffers 160** – raster layer of buffers around habitat cells (1 = overlaps development, 0 = does not overlap development)

*Note: need to open QGIS Desktop with GRASS (in OSGeo4W folder within Programs) to use GRASS tools*

Workflow:

1. Align all raster layers
   * Raster 🡪 Align Rasters
   * Add 10n090w\_20101117\_gmted\_mea075, prgap\_landcover, and epicrates\_inornatus\_habitat
   * Reference layer = epicrates\_inornatus\_habitat
   * Clip to Extent = TRUE
   * New layers – **elevation**, **landcover**, and **all\_habitat**
2. Create raster layer that only includes suitable habitat, removing habitat above 700m
   * Raster Calculator – (all\_habitat = 2) AND (elevation <= 700)
   * New layer – **habitat** (0 = not habitat, 1 = habitat)
   * *Remember to set reference layer in Raster Calculator*
3. Create raster layer with developed areas only (high and low development categories)
   * Raster Calculator – landcover = 63 OR landcover = 64
   * New layer – **development** (0 = not developed, 1 = developed)
4. Create buffers of 160m radius around habitat cells (corresponds to home range of ~8 ha)
   * GRASS r.buffer:
     + Input – habitat
     + Distance – 160
     + Units – meters
     + Ignore zero data cells = TRUE
   * New layer – **Buffer 160** (2 = habitat buffer)
5. Determine whether buffers include development
   * Raster Calculator – (Buffer 160 = 2)\*(development)
   * New layer – **habitat buffers 160** (0 = natural habitat, 1 = urban habitat)
6. Calculate total area of habitat
   * Raster layer unique values report
   * Input layer – habitat
   * Save to file – habitat\_area.html
   * Result: 3,790,291,050 m2 = 379,029 ha of habitat
7. Calculate proportion of buffer cells that contain development
   * Raster layer unique values report
   * Input layer – habitat buffers 160
   * Save to file – buffer\_count.html
   * Resulting report counts the number of cells with each value

|  |  |  |
| --- | --- | --- |
| Value | Count | Proportion |
| 0 (natural) | 28,500,156 | 0.913 |
| 1 (urban) | 2,731,309 | 0.087 |
| Total | 31,231,465 | 1 |