Conservation 2050 – Channel Complexity and Floodplain Forest

Technical Details

Three attributes in the GIS table and the Excel spreadsheet represent a future condition ca. 2050. The data for these attributes are from the Pacific Northwest Ecosystem Research Consortium (PNW-ERC) and were created as part of a 5 year project in the Willamette River Basin (Hulse et al. 2002, 2004). PNW-ERC researchers worked with stakeholders (the Possible Futures Working Group) and technical support groups to develop three plausible, spatially explicit alternative futures: Conservation 2050, Plan Trend 2050 and Development 2050, each mapped at 10 year increments. The Conservation 2050 landscape, which prioritizes ecological services, provides a shared vision that can be used to guide spatially and temporally explicit conservation and restoration decisions and track change toward a targeted outcome.

Two of the three Conservation 2050 attributes, channel length and channel area, are measures of channel complexity. The field names for these in the GIS attribute table are *CHLEN50* and *CHAREA50*; the corresponding column names in the Excel spreadsheet are *Cons 2050 Channel Length* and *Cons 2050 Channel Area*. Channel length is reported in meters and channel area is reported in acres for each 100m slice. The third Conservation 2050 attribute is floodplain forest which is reported in acres for each 100m slice. The floodplain forest GIS attribute is *FPF2050* and the Excel spreadsheet column is *Cons 2050 Floodplain Forest*.

Conservation 2050 channel complexity measures

The PNW-ERC Conservation 2050 scenario identified and mapped locations in which historical channels were assumed to be restored via reconnection to the existing Willamette River. These restored historic channel locations, together with the 2009 NAIP imagery were used as source data to create channel center lines ca. 2050. These lines were added to the THAL2000 coverage with an attribute designation that identified them as the source of the s100_wm_v4 channel complexity attributes for Conservation 2050 scenario. Because these added channel delineations are intended to represent the results of restoration projects lying largely within agricultural lands, their placement was, to the best of researchers' ability, made consistent with the anticipated agreements with landowners concerning the restoration of ecosystem services.

Thus, the source datasets were used as general placement guides while the precise locations of restored channels were responsive, where possible, to considerations of landowner preference. Remnant water features present in the 2009 NAIP imagery but not present in the PNW-ERC Conservation 2050 map were delineated. In locations where these remnant features were within 100 meters of the Willamette mainstem, a new centerline was drawn to connect them to the mainstem network.

Conservation 2050 floodplain forest

The data for floodplain forest ca. 2050 come from the spatially explicit (ArcGIS grid) representation of land use/ land cover for the Conservation 2050 scenario (Hulse et al. 2002, page 90). The development of future land use/ land cover for the 2050 scenarios began with a representation of the landscape ca. 1990 (Hulse et al. 2002, page 78). Landsat satellite thematic mapper images serve as the foundational data for the representation of the 1990 landscape. This is a gridded representation with each grid cell (pixel) representing 30m X 30m on the ground.

Specific land use/ land cover classes represent floodplain forest in the ca.1990 and Conservation 2050 landscapes. These classes are:
Forest closed hardwood (53)
Forest closed mixed (54)
Upland forest semi-closed conifer (55)
Conifers 0 – 20 yrs. (56)
Forest closed conifer 21 – 40 yrs. (57)
Forest closed conifer 41 – 60 yrs. (58)
Forest closed conifer 61 – 80 yrs. (59)
Forest closed conifer 81 – 200 yrs. (60)
Forest closed conifer older than 200 yrs. (61)
Upland forest semi-closed hardwood (62)
Natural grassland (86)
Natural shrub (87)
Flooded/ marsh (89)
Oak savanna (98)
Wet shrub (101)

A 30m X 30m grid cell is also used to represent floodplain forest ca. 2010 for 100m slices 1 – 7907. The availability of LiDAR data and image processing software made it possible to represent ca. 2010 floodplain forest in 100m slices 7908-22907 using a 6ft X 6ft cell size (ise.uoregon.edu/slices/lulc.html). Differences in available technology and data processing mean that there will be discrepancies between the representation of land use/ land cover ca. 1990 which served as the starting point for Conservation 2050 and the more recent representation ca. 2010. Conservation 2050 offers a spatially explicit vision for the future but the representation is intended to serve broadly as a guide to decision making about conservation and restoration in the Willamette River Basin, not to determine site specific configurations for these activities.

Hulse, D., S. Gregory and J. Baker, editors. 2002. *Willamette River Basin Planning Atlas: Trajectories of Environmental and Ecological Change*. Corvallis, Oregon. Oregon State University Press. Available in PDF at: http://oregonstate.edu/dept/pnw-erc/.

Hulse, D., A. Branscomb, S. Payne. 2004. Envisioning alternatives: using citizen guidance to map future land and water use. *Ecological Applications* Vol. 14 No. 2. ISSN 1051-0761.