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Colonia Population and Housing Estimation

There is a great need for information on New Mexico colonias, small, under-represented communities that are often characterized by poor socioeconomic conditions. This lack of formal information has hindered attempts by state and local government agencies to secure federal funding to improve infrastructure in colonias and has hampered community planners to allocate resources to serve colonia populations. As part of the effort to compile information about colonias, the Bureau of Business and Economic Research (BBER) at the University of New Mexico has developed a technique for tabulating U.S. Census Bureau data for approximate colonia geography through a project funded by the New Mexico Mortgage Finance Authority (MFA). The technique is explained in this article, and is then demonstrated by estimating the population and count of households for a specific colonia, Rancho Grande in Catron County.

The process for tabulating 2010 Census Summary File 1 data (which includes population and household counts) is comprised of several general steps. First, New Mexico colonias are identified and located. Second, the region where the colonia is located is examined through ortho-photography (aerial imagery) with 2010 Census block boundaries overlaid using a geographic information system (GIS).¹ Finally, blocks that cover the extent of the colonia are selected and their Summary File 1 data are aggregated.

Colonia Identification -- There are specific criteria that must be met before a community is designated as a colonia by the U.S. Department of Housing and Urban Development (HUD). The community must be in Arizona, California, New Mexico, or Texas, within 150 miles of the U.S.-Mexico border, must not be within a metropolitan statistical area with a population greater than 1 million, and must lack potable water supply, adequate sewage system, and decent, safe, and sanitary housing.² There are 142 HUD designated colonias in southern New Mexico across

¹ BBER uses Esri's suite of GIS software, which includes ArcMap and ArcCatalog.

² U.S. House of Representatives, Office of the Law Revision Council, 2006. *The United States Code*, Title 42, Chapter 8A, Subchapter III, §1479 (f)(8), <http://frwebgate2.access.gpo.gov/cgi-bin/PDFgate.cgi?WAISdocID=YNBoSA/0/2/0&WAIAction=retrieve>, accessed 2010 July 31.

11 counties.³ The majority of colonias are located in Catron, Dona Ana, and Grant counties. Once the colonia has been identified, the next step is to locate it.

Colonia Location -- Colonias can be located through various sources. New Mexico State University (NMSU) located and assigned latitude and longitude coordinates for 109 colonias in a previous study funded by the MFA and the North American Development Bank. NMSU provided BBER with the 109 point locations in a GIS file that was read into a map. BBER used the point location to pan to the specific area and visually assess the extent of the colonia in a GIS. Google Maps and/or local knowledge could also be used to locate the majority of the remaining colonias.

Census Block Selection – The 2010 Census block boundaries are overlaid onto ortho-photography and blocks are selected that cover the extent of the colonia.⁴ Physical development in terms of housing units, other buildings, and the road network can be seen via ortho-photography and is used to define the extent of the colonia.⁵ In the interior of most colonias, blocks provide tight, comprehensive coverage. But, along the exterior edges within the colonias, blocks often cover both the fringe of the colonia along with large areas of undeveloped land. Care was taken to select blocks on the exterior so as not to include development outside the colonia.

2010 Census block boundaries are used because they are the smallest geographic unit the U.S. Census Bureau uses to tabulate Summary File 1 data and they provide the tightest coverage of the colonia. In addition to total counts of population and households, Summary File 1 data include population counts by age, sex, race, Hispanic/Latino origin, household relationship, and whether the residence is owned or rented. An Example – The case of Rancho Grande in Catron County illustrates the process BBER used to estimate 2010 Census population and household

³ U.S. Department of Housing and Urban Development, *Information for ... Designated Colonias in New Mexico*, <http://www.hud.gov/local/nm/groups/coloniasnm.cfm>, accessed 2011 December 1.

⁴ Block boundaries are from U.S. Census Bureau's TIGER files, which can be accessed at UNM Resource Geographic Information System (RGIS) Program Clearinghouse website at <http://rgisbeta.unm.edu/browsedata>. This UNM site is managed by Earth Data Analysis Center (EDAC) as part of the RGIS program (a joint effort of EDAC and BBER).

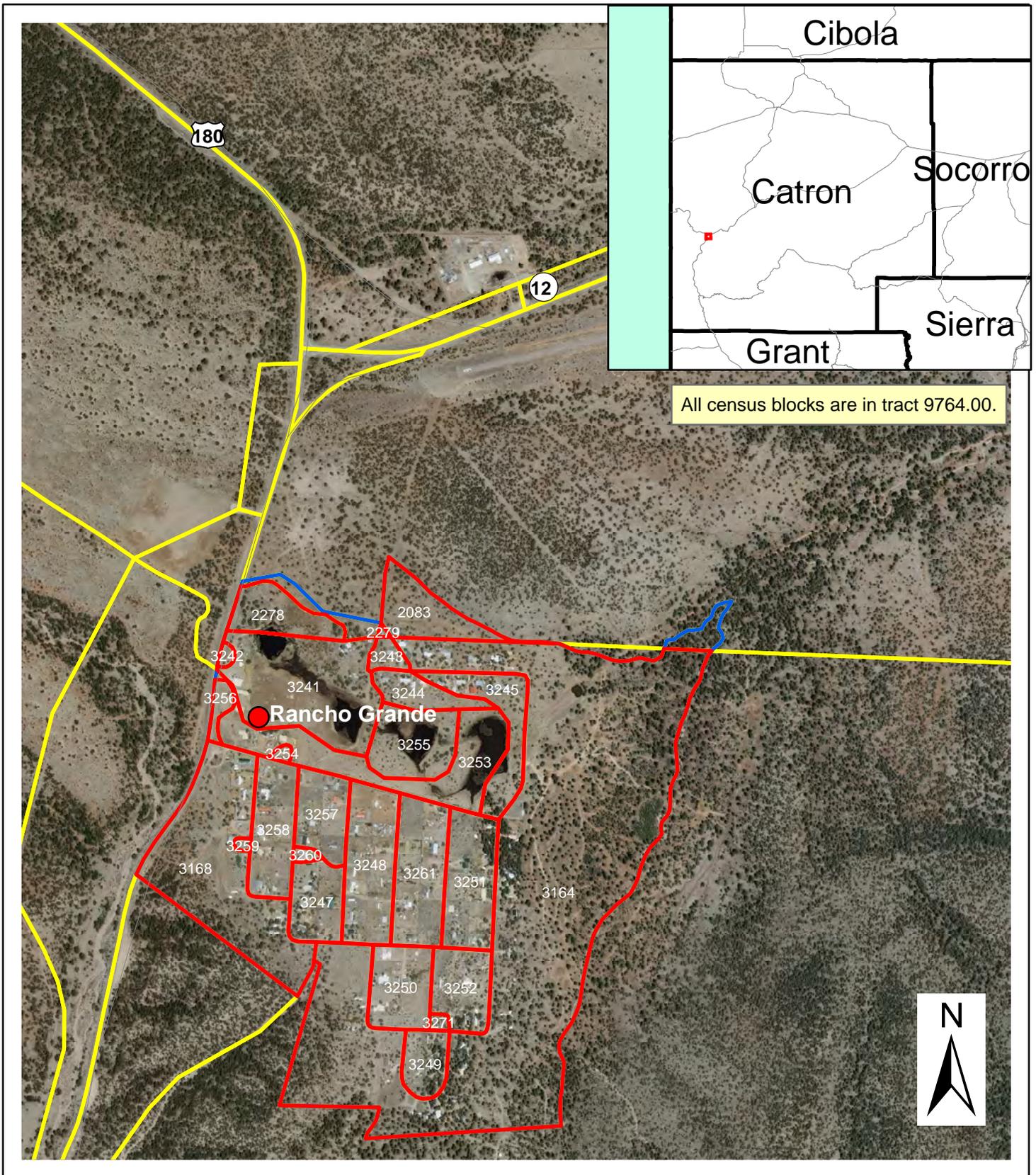
⁵ The ortho-photography was also queried through the RGIS Clearinghouse site. The type of ortho-photography used was Digital Orthophoto Quarter Quadrangle and was queried through the RGIS Web Map Service (WMS) located at http://edacdata2.unm.edu/cgi-bin/mapserv?map=doqq05/doqq05_geogcs_arcgis.map&

data for colonias. BBER used the NMSU study location to pan and zoom to the correct area in the ortho-photograph. The map (shown below) shows Rancho Grande is located south of the intersection of US Highway 180 and State Highway 12 in Catron County. The 2010 Census block boundaries (shown in red and yellow) were overlaid onto the ortho-photography. The red block boundaries are those blocks selected by BBER that capture the geographic extent of the colonia and are labeled by their block identifier.⁶ In this case, all blocks are in the same 2010 Census tract (tract 9764.00). The tightly grouped blocks that form the interior of the colonia nicely capture the physical development of the colonia. However, the blocks on the exterior of the colonia cover the fringe of the colonia along with large areas of undeveloped land. If there had been another community nearby a block encroached upon, that block might not have been selected or that block's population and household count would have to be split to account for both communities.

Having selected and tabulated the census blocks, BBER estimates there are about 142 people and 69 households in the Rancho Grande colonia. The table (http://bber.unm.edu/colonias/Colonias_2010Census.xls) list the 2010 Census population and housing estimates BBER tabulated for 82 New Mexico colonias and the shape file (http://bber.unm.edu/colonias/NM_Candidate_Colonia_Blocks.zip) contains the candidate blocks BBER selected for each colonia. Other 2010 Census Summary File 1 data can be tabulated for the colonia as well.

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⁶ U.S. Census block identifiers are unique to the Census tracts they are in, and in turn tracts are unique to the County in which they are located. Since Rancho Grande is located in Catron County in tract 976400 and the block identifiers are unique.



Rancho Grande

- NMSU Colonia Study Location
- Candidate Colonia Blocks
- Census Designated Places
- Other Census Blocks
- Arizona

