Monitoring Land Use Adjacent to Parks

Importance

One of the highest priority management concerns for parks in the GULN is changing land use outside of the park boundaries and the potential impacts of those changes on park natural resources. Increased development around the parks can increase the presence of invasive species, contribute to fragmentation of habitats, alter water and air quality, impact park viewscapes and soundscapes, increase litter and debris within the park, and increase visitor impacts. Current information about the type and intensity of adjacent land usage is valuable to park managers. Therefore, Adjacent Land Use was selected as a high priority vital sign for the GULN monitoring program.

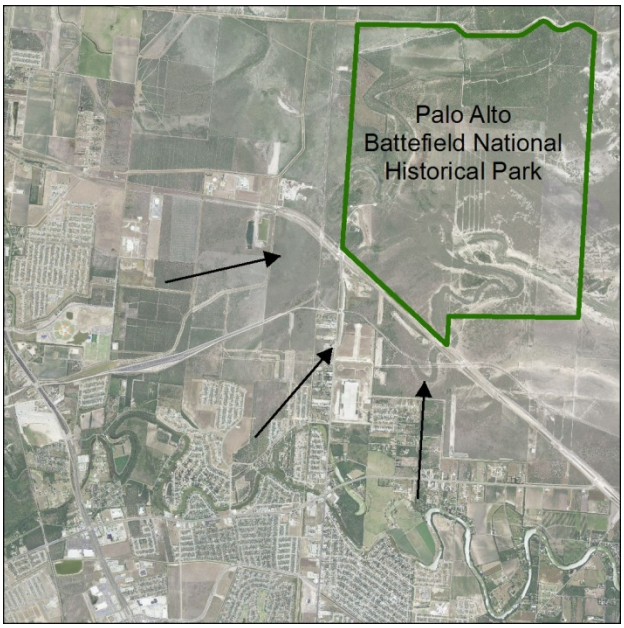
Conceptually, two general types of approaches may be considered for assessing changes in land use

- Historical approaches, where one documents land use changes that have already occurred, using techniques such as aerial and satellite imagery and written records
- Predictive approaches, where one assesses evidence for upcoming development by tracking such activity as changes in parcel ownership, changes in planning unit (such as zoning or Tax Increment Financing (TIF) districts), and building permits to forecast near-future development.

The historic approach, widely used by land managers, is the basis for the NPS service-wide NPScape Project (*http://science.nature.nps.gov/im/monitor/npscape)*. GULN has developed a more real-time, or predictive, approach and methodology that augments the monitoring of historic changes in land use by providing network parks with current local-scale GIS-based datasets. This approach arms park managers with data to help detect and prepare for planned development that has a high probability of occurring in the near future on adjacent lands. In addition to early detection of land conversion, this approach gives park managers access to basic local datasets like land ownership and current land use permitting.

Key reasons for monitoring to detect parcel changes and planned development of lands adjacent to network parks

- Changes in land use, type and intensity inevitably lead to changes in threats that transfer across boundaries to impact park resources
- Natural and cultural resources are specifically identified in park founding legislation and as key management objectives of the parks, and these resources are vulnerable to threats originating from adjacent land use.



Development from Brownsville TX sprawls toward PAAL

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The earliest and most-precise possible data related to adjacent land ownership, property dimensions (parcel subdivision and merging), designated land use and zoning, and permitting provide park management with an opportunity to stay informed about changes in real property and land use activities.

Basic Approach

Land use changes adjacent to parks can impact resources in a variety of ways. Consequently, many approaches have been taken to record and measure land use change on a variety of scales. To help distill varied datasets into a consistent format, GULN developed an Adjacent Lands Information System (ALIS). ALIS is a collection of rapid-fire GIS-based systems to help: organize disparate public datasets, assess land-use change, and present results. Data processing and presentation are streamlined primarily through the use of ArcGIS Geoprocessing Models. The system has variable outcomes for each park unit due to variations in data quality and data availability. Largely centered on municipal parcel, zoning, and permitting information, the system is capable of highlighting changes in GIS attributes and geometry occurring near parks. In addition to identifying changes, these organized datasets can help park Resource Managers relatively quickly answer basic questions like:

- How many adjacent landowners surround my park?
- Who are these landowners, in the event that they need to be contacted regarding an on-park management activity?
- How are local parcel dimensions changing over time, e.g., Are parcels being split or combined?
- What is the designated, or zoned, land use for a given parcel?

Although GIS-based systems offer an efficient and consistent framework for data processing, the availability of these data rely on creating and maintaining contact with local governments like County Appraisal Districts and Planning and Zoning offices. Since many local governments need to be contacted for updated data (e.g., Natchez Trace Parkway intersects with 25 counties across 3 states), current lists of local government contacts, available datasets and communication notes are maintained to help keep track of "who has what".

As of the end of FY 2013, GULN has implemented ALIS on 5 parks: Palo Alto Battlefield (PAAL), San Antonio Missions (SAAN), Big Thicket (BITH), Jean Lafitte (JELA) and Natchez Trace (NATR). For more detailed information about park projects see https://irma.nps.gov/App/Reference/GroupedProducts?parentReferenceCode=2191479

Legal Subdivision, shown in black parcel boundaries, indicates forthcoming development (photo date 2006). Roads and Homes in next image confirm land conversion (photo date 2010).