



In Cooperation with the Arizona Game & Fish Department

## Open Space Changes in Yavapai and Southern Mohave Counties, Arizona

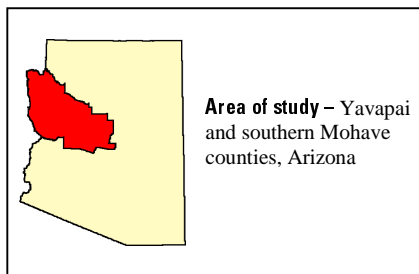
Habitat fragmentation as a result of development is a potential threat to big game in the Southwest. The Arizona Game and Fish Department and the USGS are working together to quantify the amount and management status of open space in areas that are habitat for large ungulates (elk, desert bighorn, mule deer, pronghorn and white-tailed deer).

### Habitat

Large acreage and open space that is now included in a mosaic of ranches and associated grazing leases are critical habitat for these large ungulates. In the Yavapai and southern Mohave counties of central-western Arizona, human development has fragmented ungulate habitat; however, the amount and location of change have not been documented. Also, conversion of ranch lands to non-grazing uses may be accompanied by changes in state and federal lands due to different grazing allotment allocations.

### Goals

The project goals are to study and evaluate the change in big game habitat and to provide data that can be used by the agency in managing these species determine. These goals will be accomplished by analyzing the amount and management status of change in open space and by documenting where these changes have occurred.



### Research

#### Remote Sensing and Mapping

Satellite images are one of the relatively inexpensive, efficient tools available for large regional habitat assessment and monitoring. The USGS has used Landsat Thematic Mapper satellite imagery (see back) from June 1984 and June 1997 to create an image map of the study area that shows surface change during that time. Scientists are converting this image map to a computerized surface change map, which is a geographic information system-based map that shows the magnitude of surface change.

#### Information

Scientists are also developing an open space database for Yavapai and southern Mohave counties. This digital database contains information on the type of land ownership (private, state or federal), allotment assignment for public grazing lands, and the location of ranches.

#### Analysis

Researchers will use both the surface change image map and the open space database to evaluate and analyze surface changes in big game habitat. The map and database help answer the questions concerning the amount and quality of open space land available to big game ungulates. These questions include:

- What is the amount of surface change in big game habitat during the 13-year interval studied?
- How much of the change is high intensity change?
- What corridors and critical areas for big game habitat have changed the least?

Observations at selected sites in the study area will be used to classify and describe the surface changes interpreted from the image map.

### For More Information

Researchers are developing their final analysis and products. The project is to be completed in December 1999.



This tagged, radio-collared pronghorn is one of the many native ungulates of Arizona.  
*Photo courtesy Arizona Game and Fish Department*

For more information on the surface change image map, contact Pat Chavez, Geologic Division, Flagstaff Field Center, Flagstaff, Arizona, [pchavez@usgs.gov](mailto:pchavez@usgs.gov), (520) 556-7221.

For information on the open space database and habitat analysis, contact Dr. Kathryn Thomas, Biological Resources Division, Forest and Rangeland Ecosystem Science Center, Colorado Plateau Field Station, Flagstaff, Arizona, [kat@usgs.nau.edu](mailto:kat@usgs.nau.edu), (520) 556-7466.

**1997 Landsat TM Mosaic  
Yavapai and Southern Mohave Counties:**

This mosaic was generated using 1997 Landsat TM satellite data. Spectral bands 2 (green), 3 (red), and 4 (near-infrared) were used to generate the color composite. Vegetation is red due to its high reflectance in the near-infrared spectral band, which was used as the red component in the color composite.

