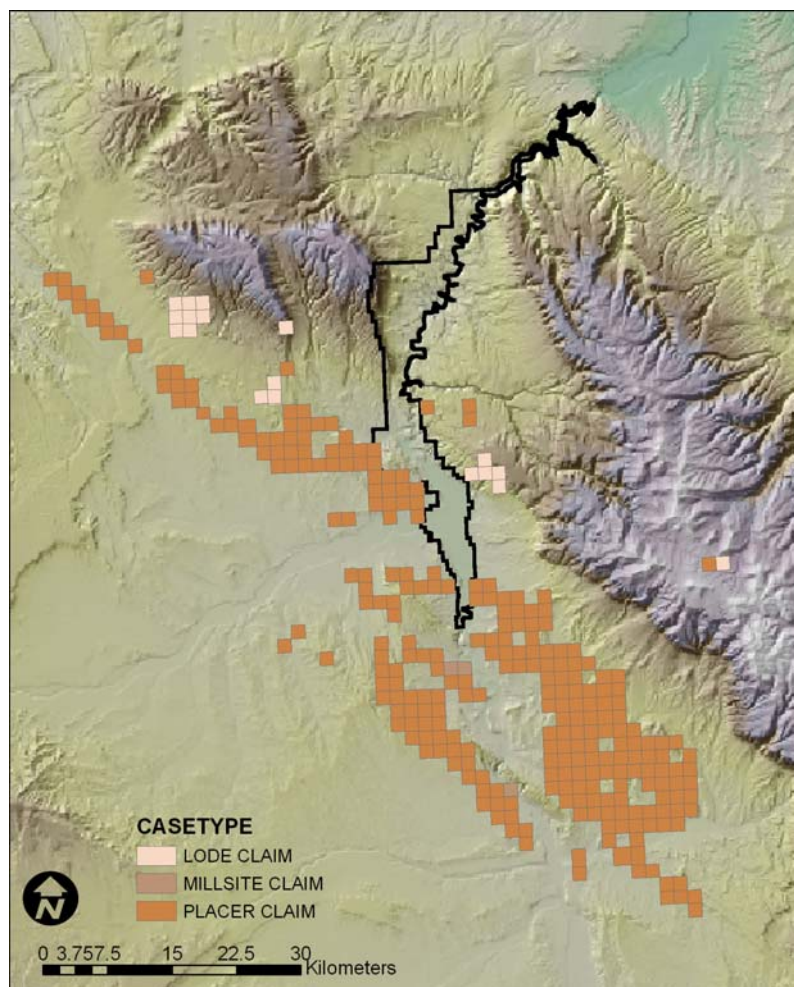




Geologic Resource Extraction in the Areas Surrounding Bighorn Canyon NRA, Grand Teton NP, and Yellowstone NP

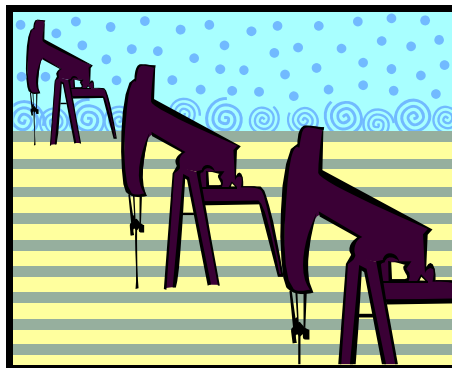
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Mammoth Hot Springs, WY 82190



Active mining claims within 20 miles of Bighorn
Canyon National Recreation area boundary

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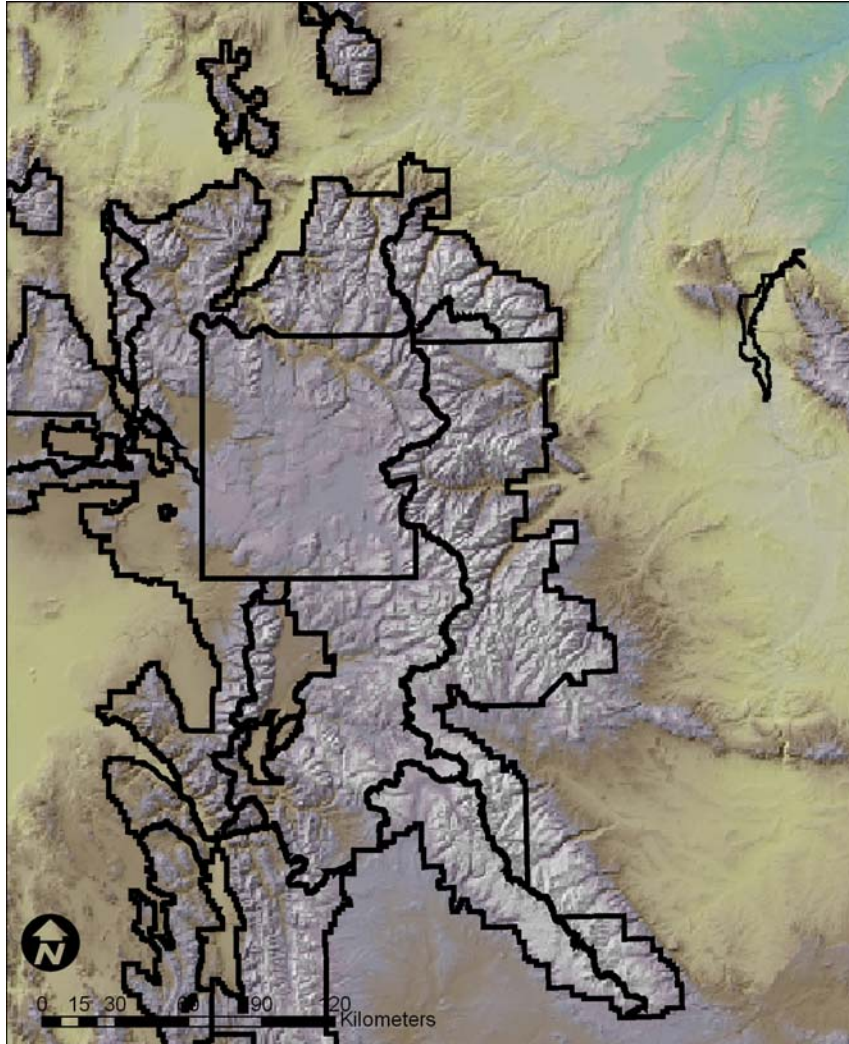


INTRODUCTION

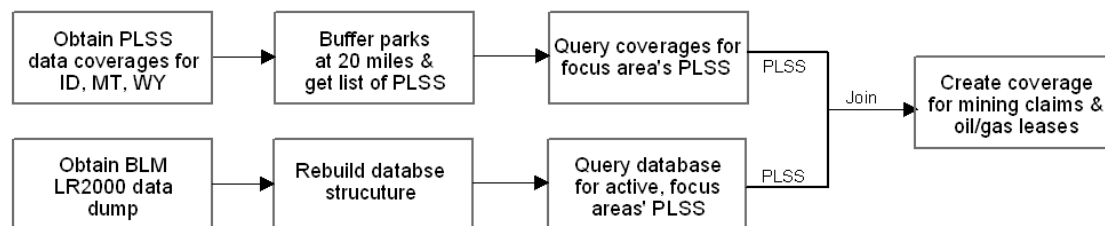
The Vital Signs Monitoring program is designed to assess and monitor the health of park ecosystems. A key part of the program is identifying and understanding outside threats to these ecosystems. This project will fill a very large, and potentially serious, information gap in our understanding of the potential for external activities to impact park resources.

Geologic resource extraction in the areas surrounding the three park units, Yellowstone National Park (YELL), Grand Teton National Park (GRTE), and Bighorn Canyon National Recreation Area (BICA), has the potential to negatively impact the resources that each park is mandated to protect. The first step in understanding and anticipating these impacts is to document the type of impact and the location where it might occur. Most of this information has not been easily available to park managers. This project documented the type and location of potential activity from mining (sand and gravel extraction, mining claims and leases), oil and gas leases, and geothermal leases.

The best overall source of data was the LR2000 database from the Bureau of Land Management (BLM). We imported these data into a desktop relational database and linked it to a geographic information system (GIS) layer created from the public land survey system (PLSS). The resulting GIS database allows us to view and analyze the spatial distribution of geologic resource extraction near park boundaries.



METHODS



Study Area

The study area was chosen based on known topography and mining activity in the area. We decided on a study area that included each park unit and a 20 mile buffer surrounding the park boundary. The study area boundary was overlaid on a GIS coverage of the public land survey system (PLSS). From this subset of the PLSS coverage, we created a list of township, range and sections with 20 miles of each park. We used the list to query the BLM-LR2000 database for active mining claims that fell within the study area. Using the PLSS information a unique ID (called 'Location') was created to link the mining claim data back to each location in the GIS coverage.

Main steps

1. Create buffer around Yellowstone National Park, Grand Teton National Park and Bighorn Canyon
2. Obtain PLSS coverage's for each state
3. Clip out necessary TRS for coverage
4. Using TRS create a unique ID (called 'Location') to link data back to shape file

Data Mining

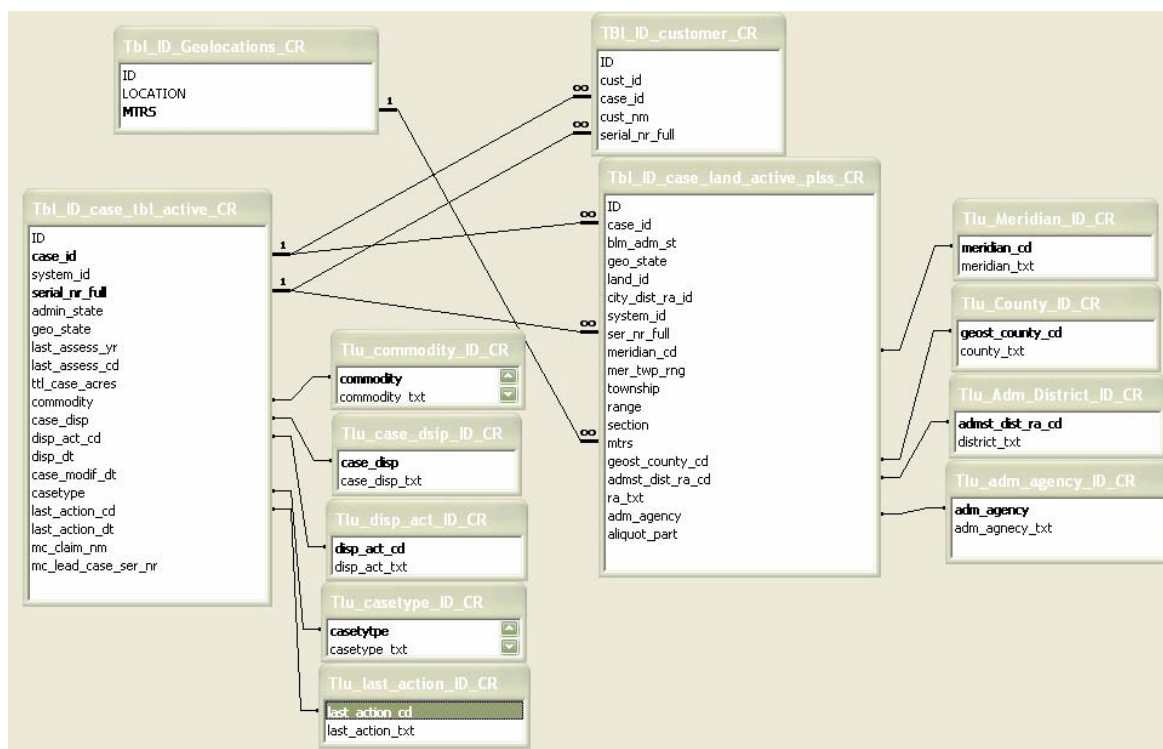
Lianne Terrill began the project in the summer of 2002 by visiting regional BLM offices and local county courthouses to determine what data were available. She was usually referred to hard copy, master title plots (MTP) and spent many hours searching through archived records. When useful information was found, she recorded it and made copies of the MTPs. The original plan was to transfer this information into a GIS database structure. This method of data mining proved to be too costly and time consuming though, so it was abandoned in favor of using information from a national database.

The Denver BLM office maintains a large Oracle database called LR2000 (see Appendix B), which contains much of the pertinent information for mining claims, oil/gas leases and geothermal leases. Unfortunately, the database is missing some information. Commodity information (for example bentonite, gypsum, platinum, etc.), is included for Wyoming, but not for Idaho and Montana. The missing commodity data might be available from local BLM offices or courthouses.

At first we tried to query the database on-line but this effort proved tedious and time consuming. To avoid this problem, we requested an export of all data from Idaho, Montana, and Wyoming. Unfortunately, due to the size and complexity of their database we had to obtain their exported data as multiple (25) text files per state.

Desktop Database Construction

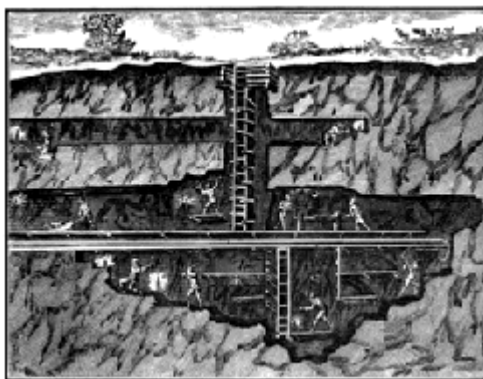
The text files were imported into a desktop relational database (Microsoft Access). Using queries, we recreated the LR2000 structure for each state. We also used queries to eliminate many columns of data that weren't pertinent to this study.



The tables were then exported in .dbf format, imported into an ArcGIS geodatabase, and joined to the PLSS coverages based on the Location field. The resulting geodatabases for each state contain all of the active resource extraction sites within a 20 mile buffer of each park.

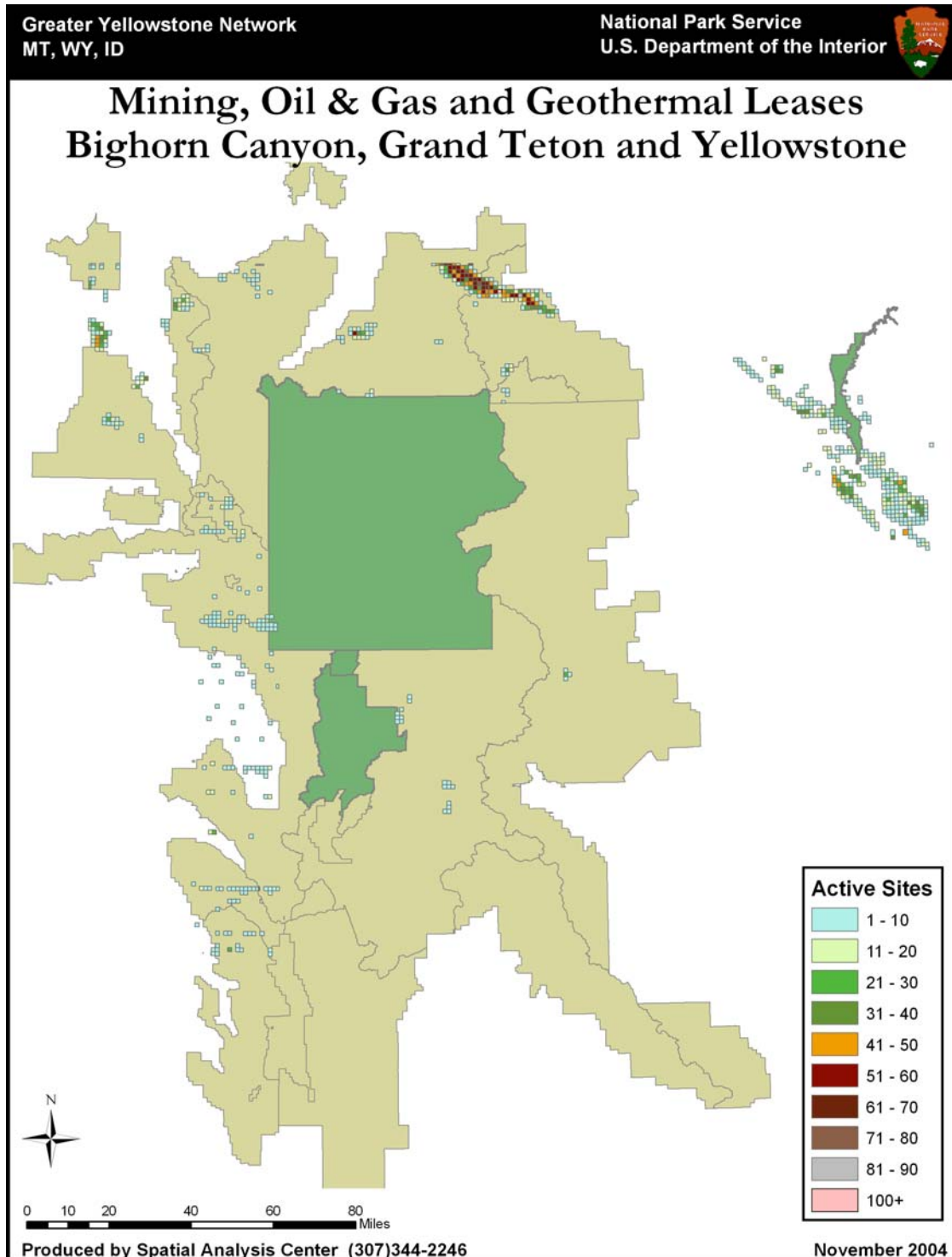
Main steps

1. Obtain active mining claim information from BLM LR2000 database by querying target area TRS
2. Using mining claim number from LR2000 summary table to look up commodity information from BLM LR2000 database one record at a time.
3. Bring all of the data together in a dbf table with a 'Location' field to link back to PLSS shape file



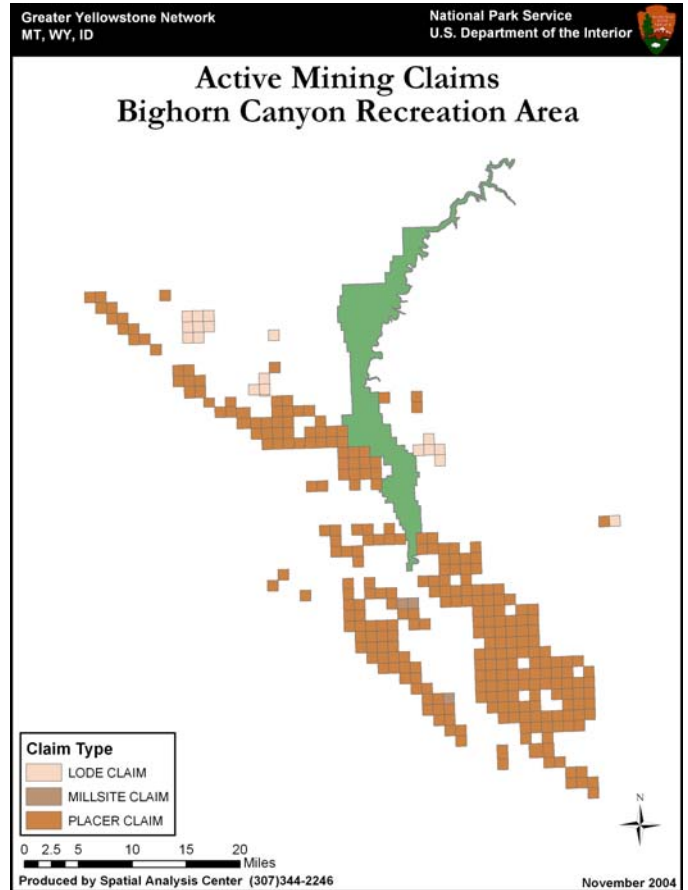
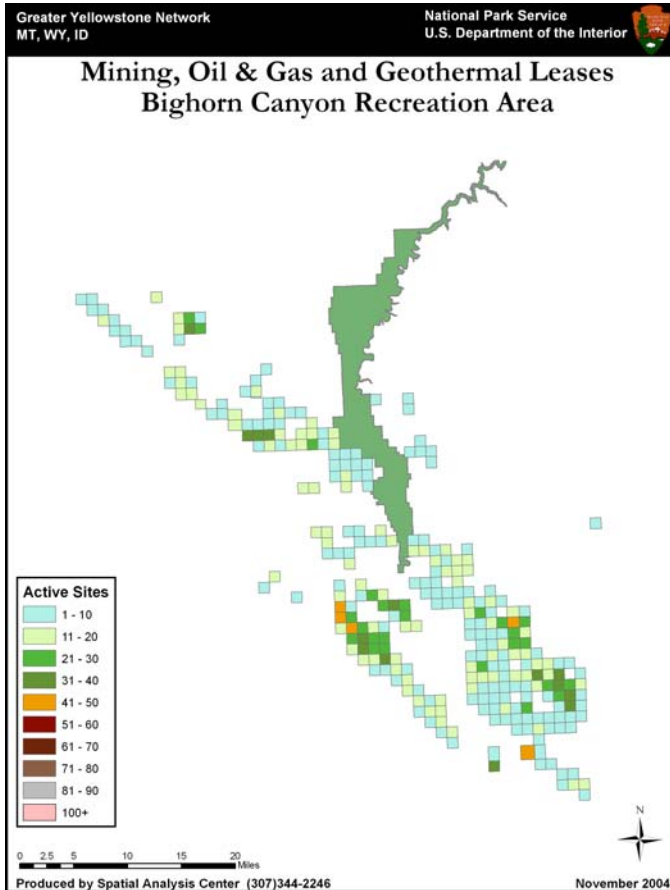
RESULTS

There are over 10,000 active mining claims or geothermal/oil/gas leases within 20 miles of a park (BICA, GRTE, or YELL) boundary. Most of the activity is concentrated northeast of Yellowstone or south of Bighorn Canyon.



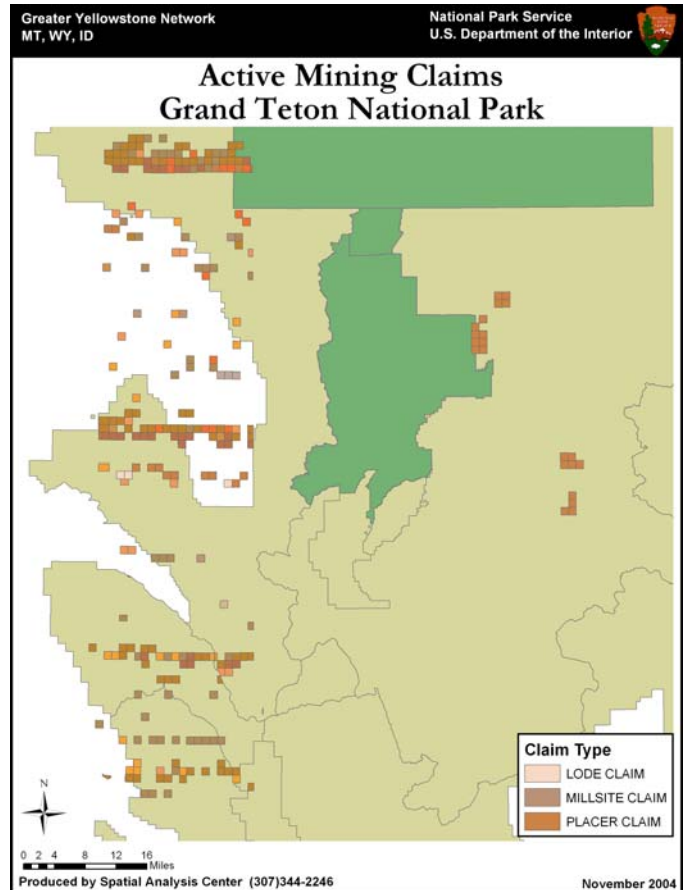
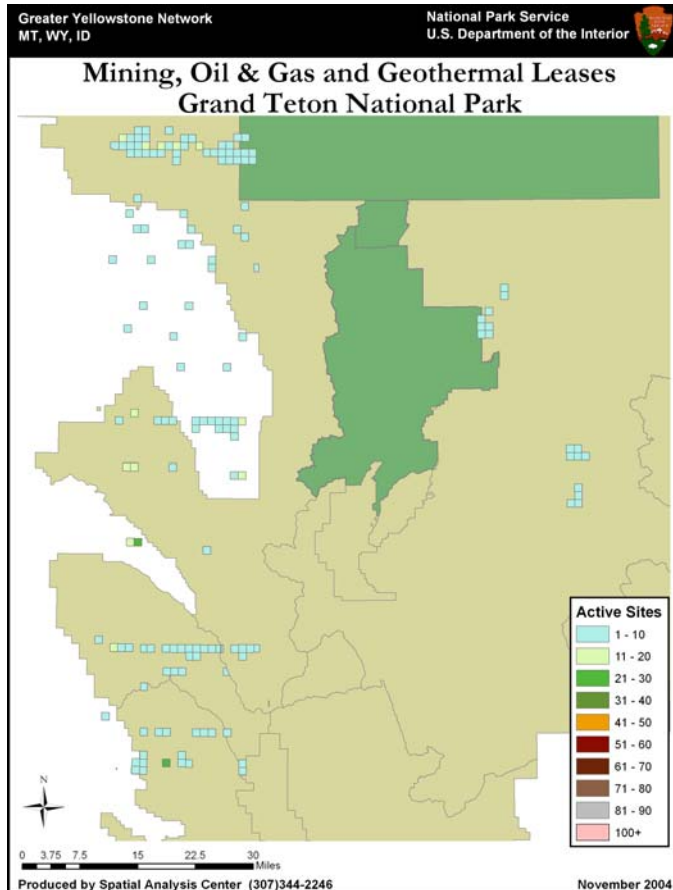
BIGHORN CANYON RECREATION AREA

A large portion of the active mining claims within the study area are concentrated around Bighorn Canyon. Within twenty miles of the recreation area there are over 3,600 active sites. The majority of this activity is concentrated around the southern section of the recreation area and consists mainly of placer claims (over 1500). The remainder of the active sites are load claims (over 550), oil & gas leases (182) and a mix of fiber optics and gypsum claims. See Appendix A for term definitions.



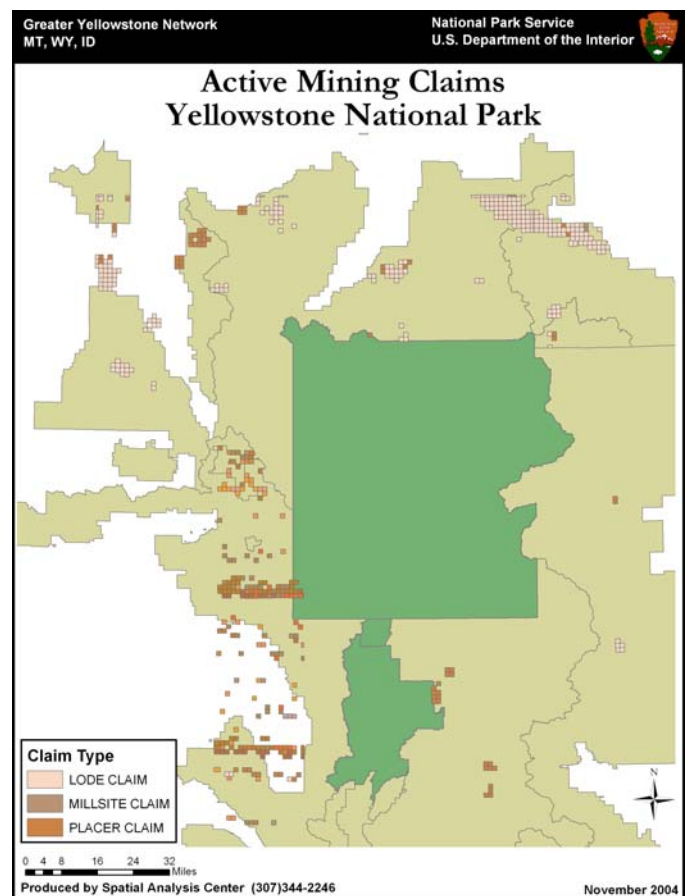
GRAND TETON NATIONAL PARK

Grand Teton National Park has 700 active sites within 20 miles of its boundary. The majority of these sites are associated with the Island Park Known Geothermal Resource Area (IPKGRA) just west of Yellowstone's boundary. The remaining sites to the northwest are placer (100) and lode claims (30). There are 19 placer claims on the park's eastern boundary. To the west of the park, there are lode and placer claims.



YELLOWSTONE NATIONAL PARK

Within 20 miles of Yellowstone National Park there were over 6,300 active sites. A large portion of this activity (over 4,000 sites) is concentrated to the northeast of the park. The majority of these claims are lode claims. The rest of the sites in the group are a mix of oil & gas leases, mill-site claims, placer claims, and tunnel sites. Closer to the park's northeast entrance, there are 86 lode claims and four placer claims. On Yellowstone's northern boundary there is a placer claim and 20 lode claims. The large concentration of sites just outside the boundary to the southwest is generally associated with the Island Park Known Geothermal Resource Area (IPKGRA). This is an area with geothermal leases, but where drilling is not permitted. Other sites near the southwestern corner include easements, rights-of-way and gravel extraction sites.



COST SUMMARY

Category	Description	GRYN	YELL
Salaries			
GS 05 technician (Lianne Terrill & Jim Napoli)	8 pp	\$ 5,800	\$ 3,000
Travel (hotel, per diem)	includes vehicle	\$ 1,800	\$ 1,250
TOTAL		\$ 7,600	\$ 4,250



APPENDIX A

PERTINENT TERMS/DEFINITIONS

- **Commodities:** An economic good. In this case a product of agriculture or mining as an article of commerce.
- **Expired Lease:** Represents an area that as an expired oil and gas lease claim
- **Filings:** In some data report cases this term was used instead of commodity but means the same thing in this case (see commodities)
- **Land Patents:** Up until 1950's individuals could go anywhere in National Forest land and claim land as theirs (as private land) as long as it was updated and added to. This possession gave them the ownership of surface and mineral rights.
- **Lode Claim (LC):** Mined hard rock claim looking for underground deposits in veins, shafts or adits
- **Millsite Claim:** Usually present at a placer/load claim at which minerals need to be crushed and concentrated
- **Oil & Gas Lease (OG LSE):** Oil and gas are being leased in the designated PLSS
- **Oil & Gas Lease Application:** There is currently an application being processed for the claim application of the PLSS's oil and gas leases
- **Placer Claim:** Heavy metal found in stream gradients and sediments. Usually are surface/hydrology-mining claims and have a wide area of disturbance.

Geodatabase Attribute Descriptions:

- **TRS:** PLSS location (Township, Range and Section) derived from downloaded shapefiles
- **LOCATION:** the PLSS location of the claim derived from the LR2000 database to be used as a unique ID to link mining claim information back to the spatial data
- **CASE_ID:** mining claim case ID assigned by the BLM
- **SERIAL_NR:** mining claim serial number assigned by the BLM
- **MC_CLAIM_N:** name of mining claim
- **GEO_STATE:** state that the claim falls within
- **CASETYPE:** the mining claim's case type
- **COMMODITY:** mining claim's commodity type
- **DISP_ACT_C:** mining claim's last disposition action
- **TTL_CASE_A:** total acres that the claim covers
- **MTRS:** PLSS location of the claim (meridian, township, range, section)
- **MERIDIAN_C:** the PLSS meridian that the claim falls within
- **GEOST_COUN:** County that the mining claim falls within
- **ADMST_DIST:** administrative district that the mining claim falls within
- **ADM_AGENCY:** administrative agency that monitors the claim
- **LAST_ASSES:** Last year that the mining claim was assessed

APPENDIX B

LR2000 WEBSITE/DATABASE

(<http://www.blm.gov/lr2000/>)

This website was designed for those who work in the oil and gas industry, title companies, utilities, state and local governments, etc. that require access to BLM land and mineral records. Previously the only way a person could access this information was to visit one of the BLM Information Access Centers. This website enables users to access the same information over the Internet.

The system provides access to Case Recordation, Legal Land Description (LLD), and Mining Claim Recordation.

- **Case Recordation (CR)** contains information on leases, permits, contracts, grants, agreements, mineral patents, etc. issued by the BLM from 1982 to present. Authorizations are issued for the following activities: oil and gas, coal and other minerals, sand, gravel, rights-of-way, land exchanges and acquisitions, land use withdrawals, land classifications, land claims, land sales, etc. Information on the use authorization includes customer data, location, date of issuance, the actions that have taken place, and other applicable information.
- **Legal Land Description (LLD)** contains cadastral survey data including meridian, township, range, section, survey type (aliquot part, lots, homestead survey, mineral survey, tracts, parcels, etc.), acreage, and geopolitical information including the geographic state, county, field office, and surface management agency (BLM, Forest Service, etc.). The surface management agency in LLD is coded as BLM, even when the land is privately owned, unless the land is located within a National Park, National Forest, etc.
- **Mining Claim Recordation (MC)** contains information on unpatented mining claims located on federal lands since 1976 including claimant name, approximate location, and other applicable information.

