

# PLSS/GCDB Needs and Plans

For the ISPLS Board  
on behalf of the Cadastral  
Reference Working Group

Sheldon Bluestein  
May 31, 2008

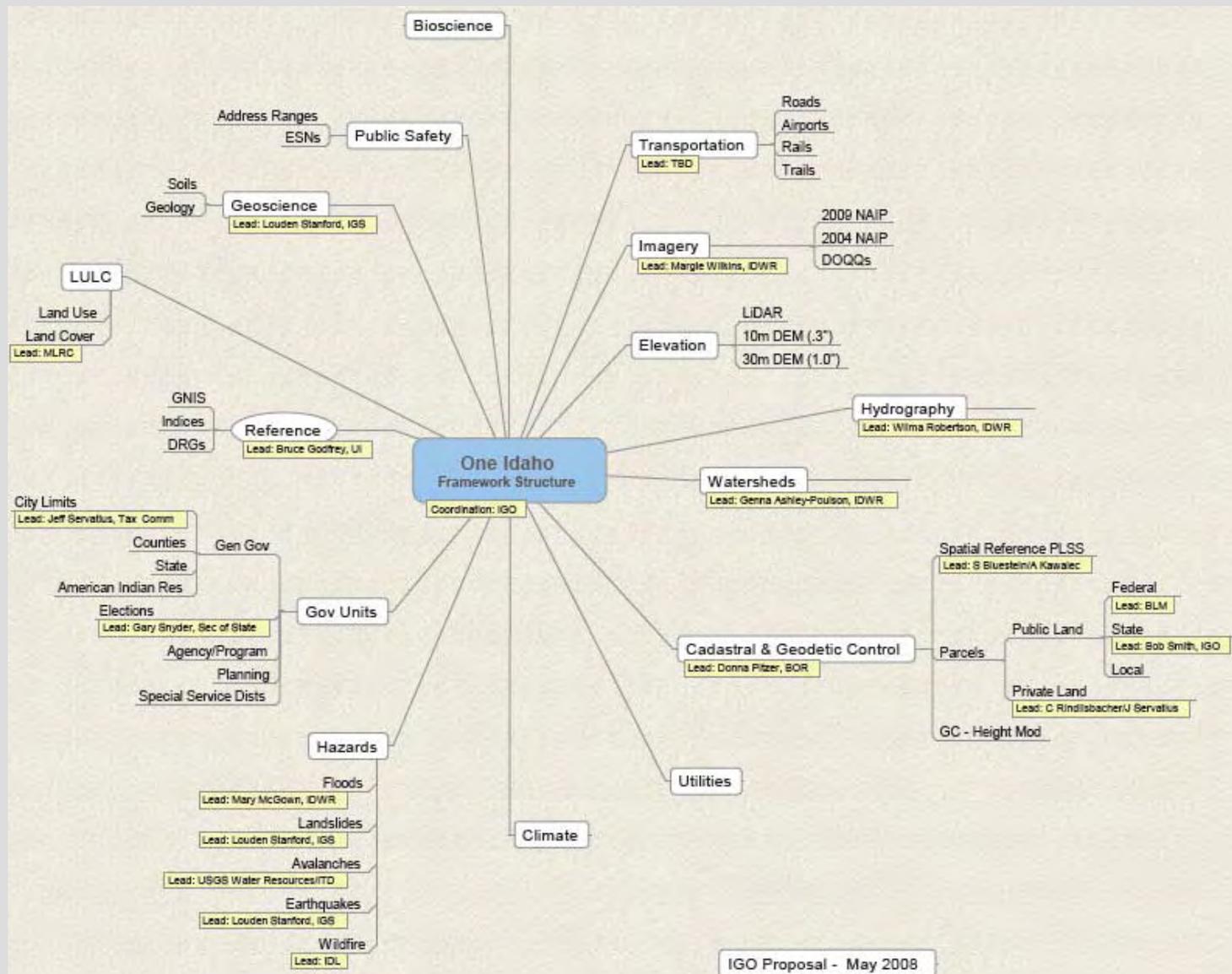
# Today's plan

- Talk about Gail and the gang
- Discuss uses of PLSS
  - Cartographic
  - Cadastral
- Review needs for PLSS data
- Review present sources of digital PLSS data
  - USGS, BLM, other
- Review work in progress: IGO/ISTC project
- Solutions to the “PLSS Problem”

# The Idaho Geospatial Office

- “IGO”
- Leader is state Geospatial Information Officer (GIO)
  - First Liza Fox
  - Then Nathan Bentley
  - Now Gail Ewart
- Staff is expanding with transfer(s) from other state agencies

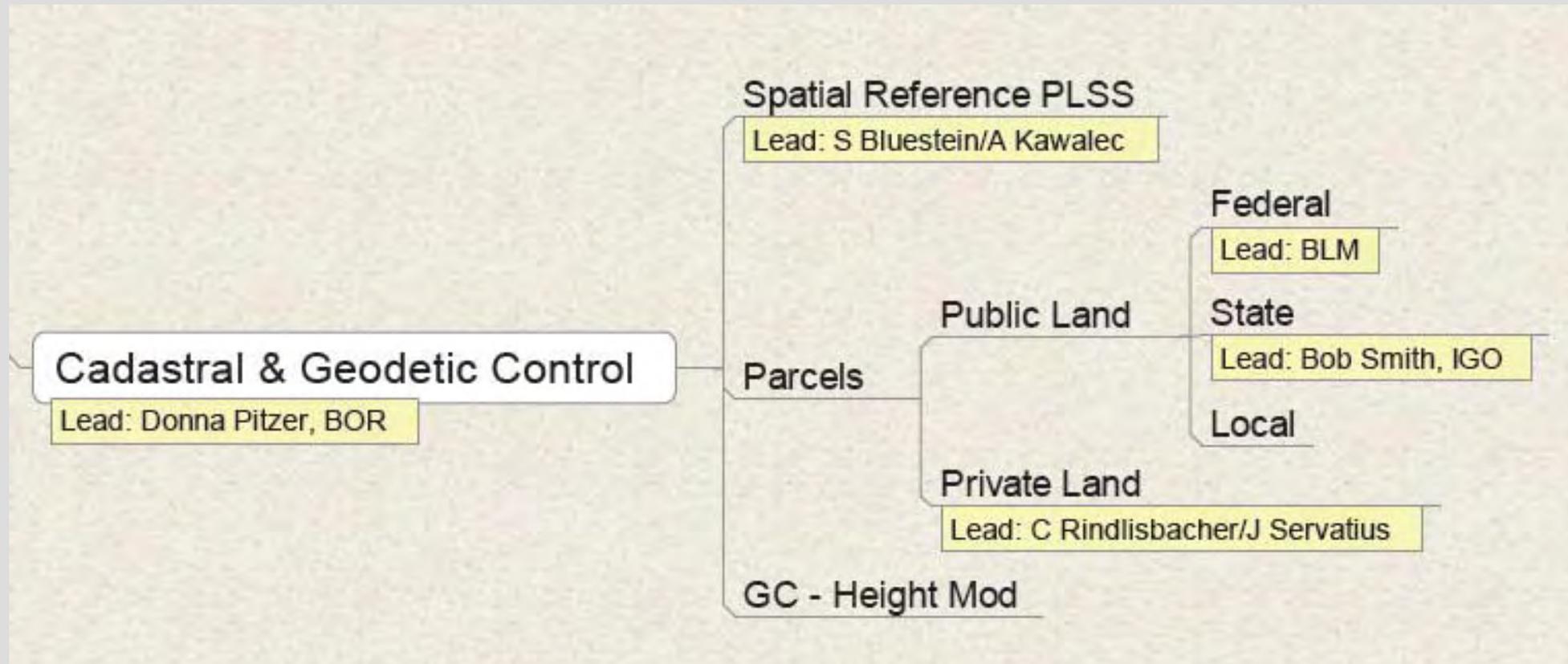
# IGO's Framework Structure



# IGO Statewide Meetings

- Strategic planning for IGO, Framework
- 8:15 am to 3:15 pm
- Meeting dates and places
  - June 10: McCall, Payette NF S.O.
  - June 11: Lewiston, Brammer Building
  - June 12: Post Falls, U of I Research Park
  - June 24: Nampa, Civic Center
  - June 25: Twin Falls, CSI Taylor Bldg
  - June 26: Pocatello, ISU Pond SUB

# IGO's Cadastral Framework



# The new Spatial Reference/PLSS effort

- From a cartographic/GIS standpoint, a better statewide PLSS layer is needed
- From a cadastral cartographic (county assessor) standpoint, a much better PLSS layer is needed
  - Is 1:24,000 topo map info good enough?
  - Can we use the existing BLM GCDB?
  - Can we enhance the BLM's GCDB with better data and/or more control?
  - Do we just need survey grade GPS coordinates on every darned corner?
- I'm here to inform the ISPLS and get their feedback and, hopefully, participation

# “The Sheldon Plan”

- “They” (Craig Rindlisbacher & other Easterners) have resurrected an old concept
  - Add a fee (\$3?) to each property-related document which is recorded
  - Some \$\$ stays in counties with approved plans
  - Some \$\$ goes to central/regional committees with power to send \$\$\$\$ to needy counties to create data, buy equipment, do pilot programs, etc.
  - \$\$ may be spent in-house, through contracts, **however** they want as long as results are achieved
  - Enhanced, *free* public access to the data
  - 10 year sunset
  - R.H. plan

# Potential surveyor role(s)

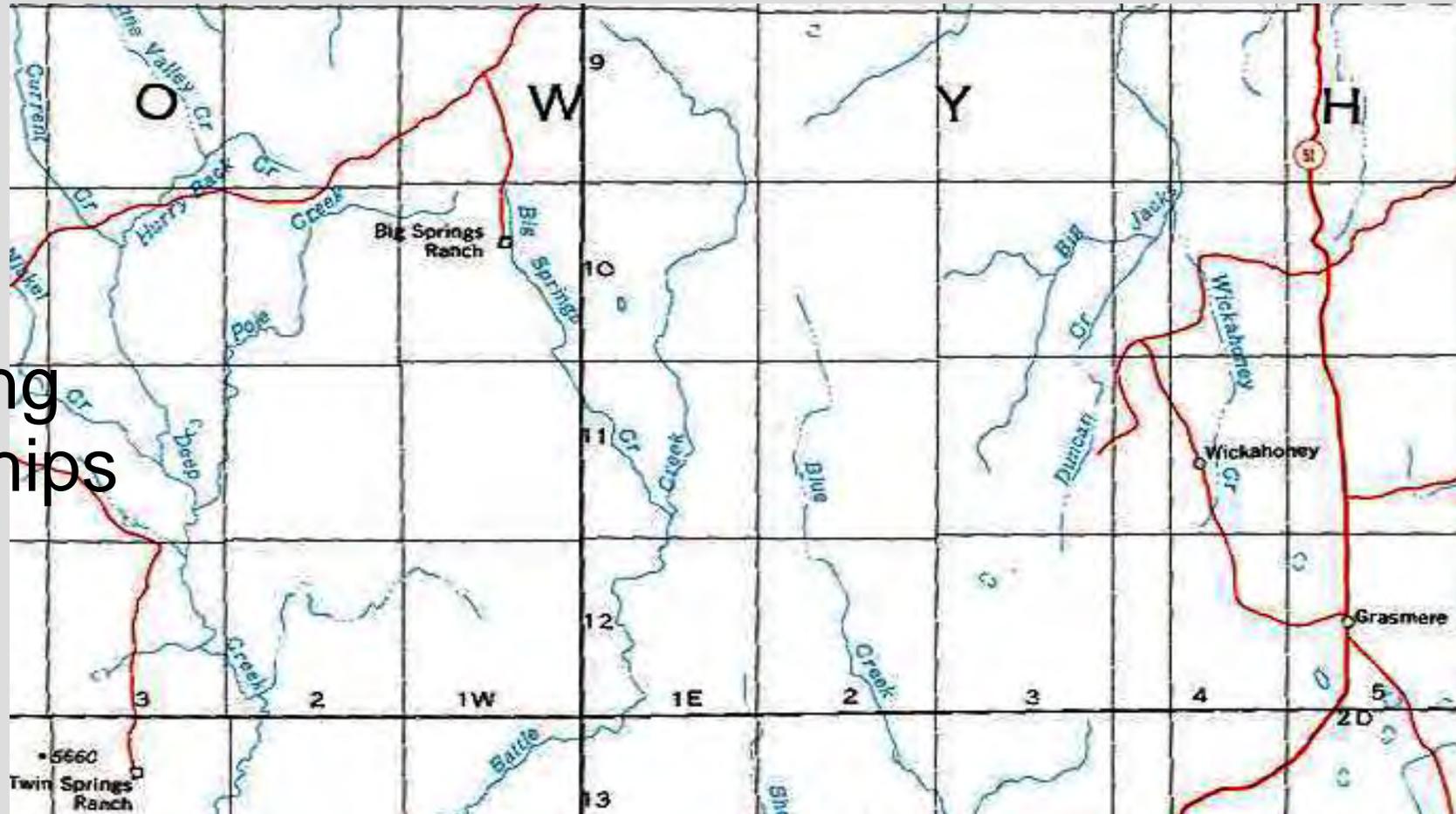
- Improvement of PLSS is vital
- Counties acquiring GPS control on PLSS will want assistance
- Surveyors doing work for counties might want assistance
- GCDB improvement should be Q.C.'d by a surveyor
- An oft-mentioned goal of a statewide coordinate database would require maintenance & Q.C.
- Does this mean an “Idaho State Surveyor” or an “IGO staff surveyor”?????

# Uses of PLSS

- At small scale, cartographic
- At larger scales, cadastral
- And somewhere in the middle, both

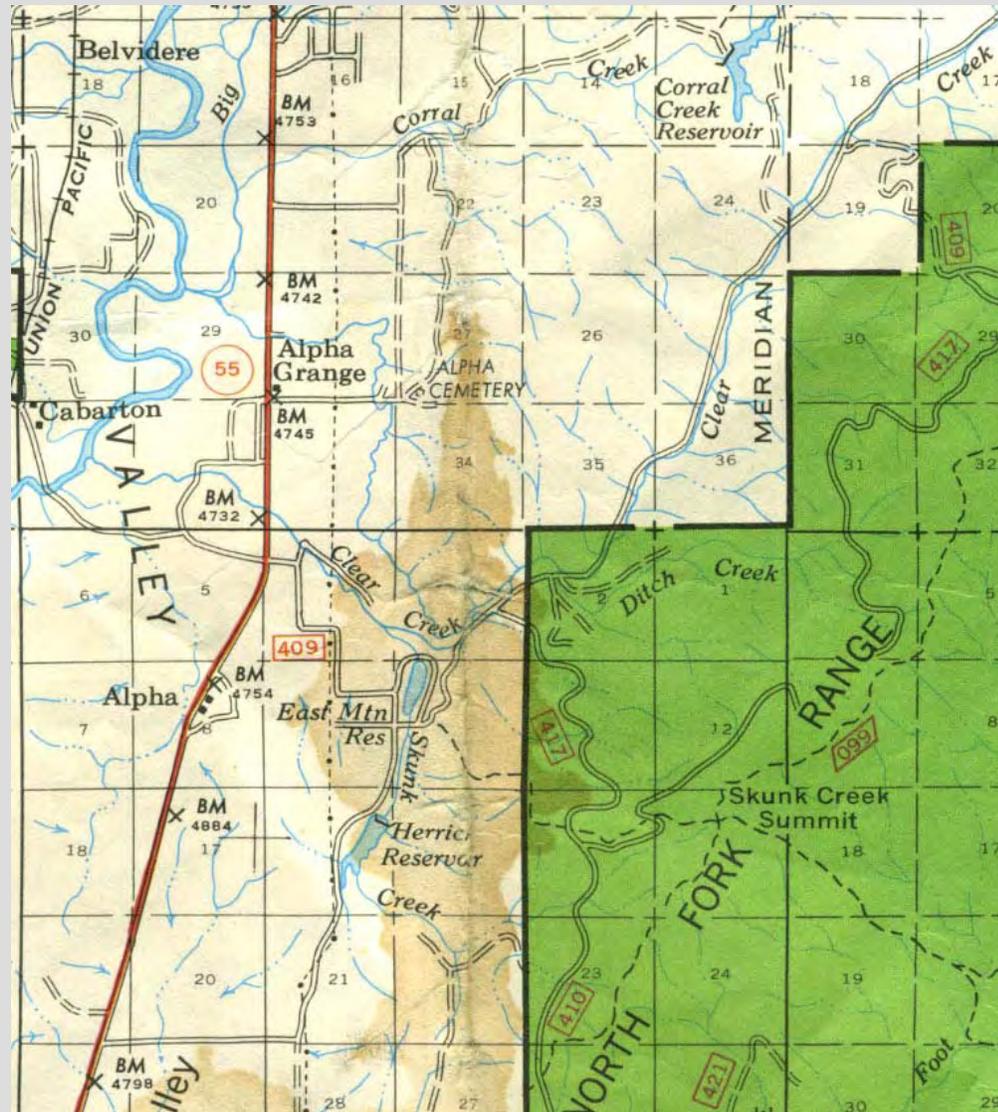
# Uses of PLSS: small-scale cartographic

USGS  
500K  
state  
map  
showing  
townships



# Uses of PLSS: small-scale cartographic

Forest Service map showing sections



# Uses of PLSS: cartographic

Remember Conrad:

*“Now when I was a little chap I had a passion for maps... At that time there were many blank spaces on the earth...”*

*“[Africa] had got filled since my boyhood with rivers and lakes and names. It had ceased to be a blank space of delightful mystery—a white patch for a boy to dream gloriously over.”*

# Uses of PLSS: cartographic

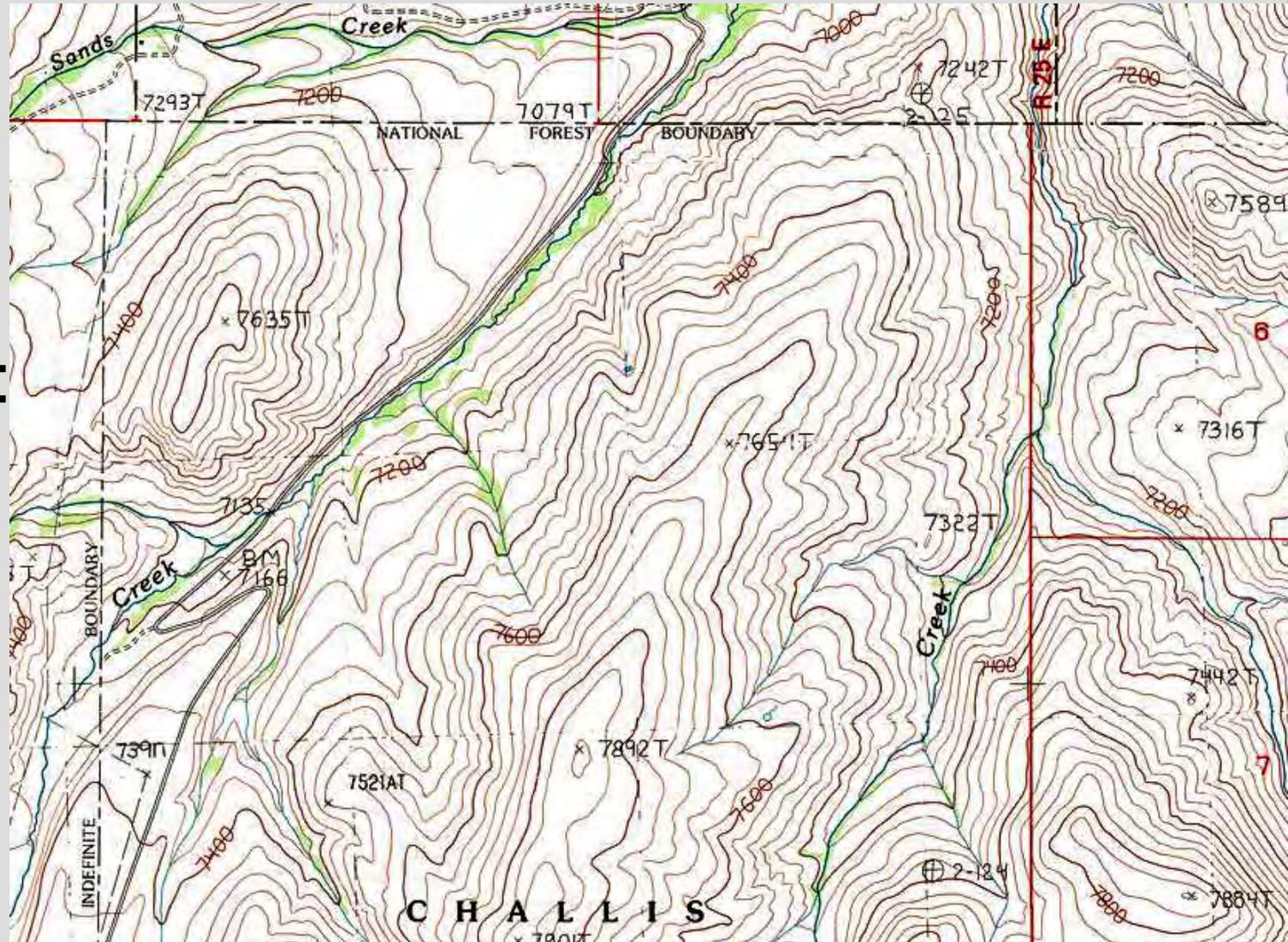
Remember Conrad:

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*“[Africa] had got filled since my boyhood with rivers and lakes and names. It had ceased to be a blank space of delightful mystery—a white patch for a boy to dream gloriously over. It had become a place of darkness.”*

# Uses of PLSS: middle-scale cartographic and/or cadastral

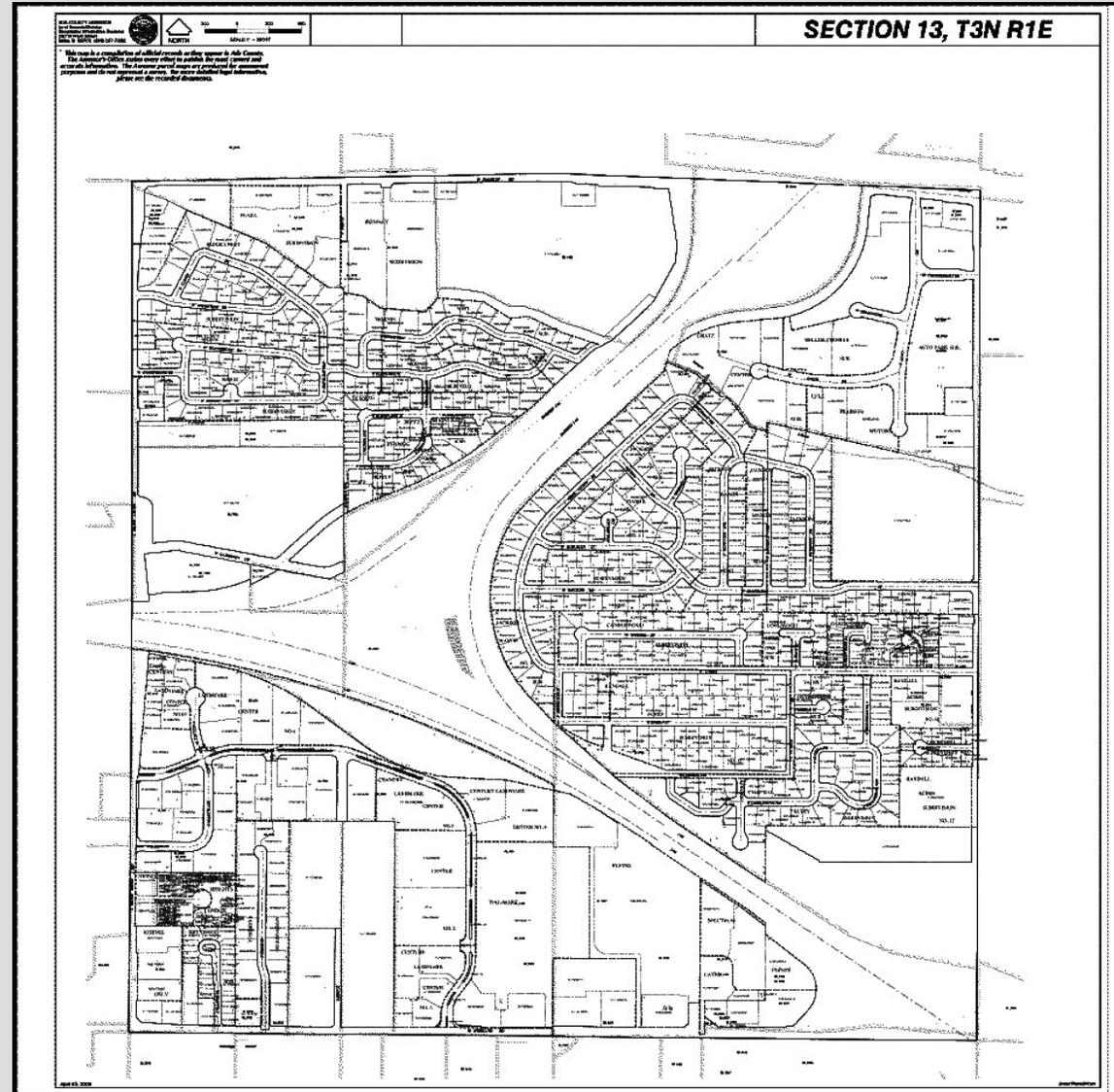
USGS map with coincident boundaries: township, section, county, Forest Service



# Use of PLSS: cadastral

As part  
of legal  
description

(Remember  
the four  
types of  
legal  
description)



# Use of PLSS: Cadastral

## Idaho Code 63-209

### ASSESSOR'S PLAT RECORD

The assessor must have prepared a full, accurate and complete plat record of all parcels of real property within his county. **Township, range and section lands shall be platted thereon in such manner as to correspond with the technical description of such lands as described by the government survey thereof.**

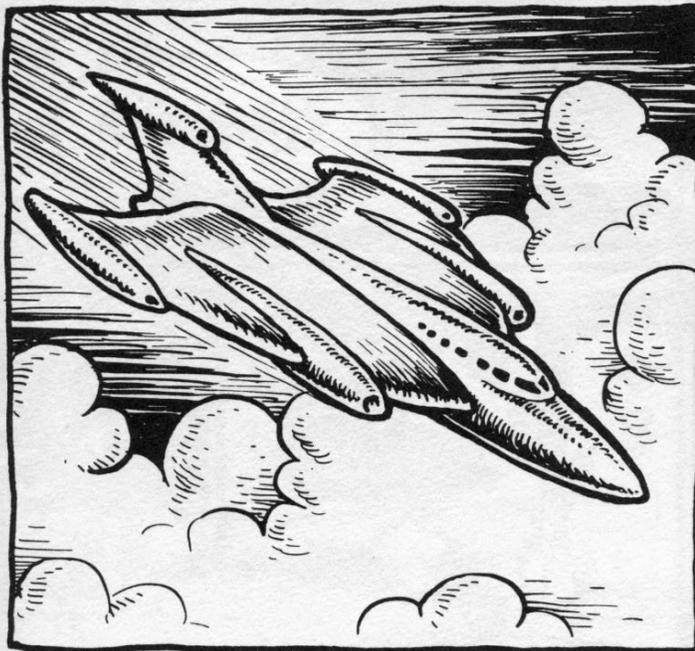
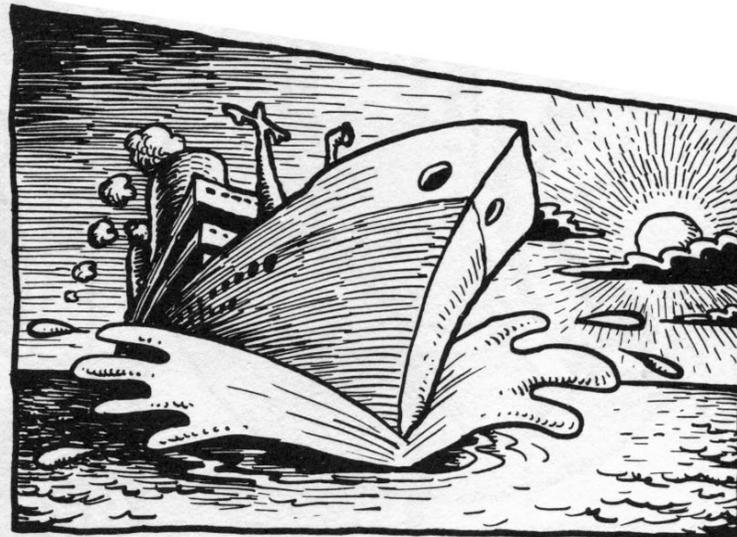
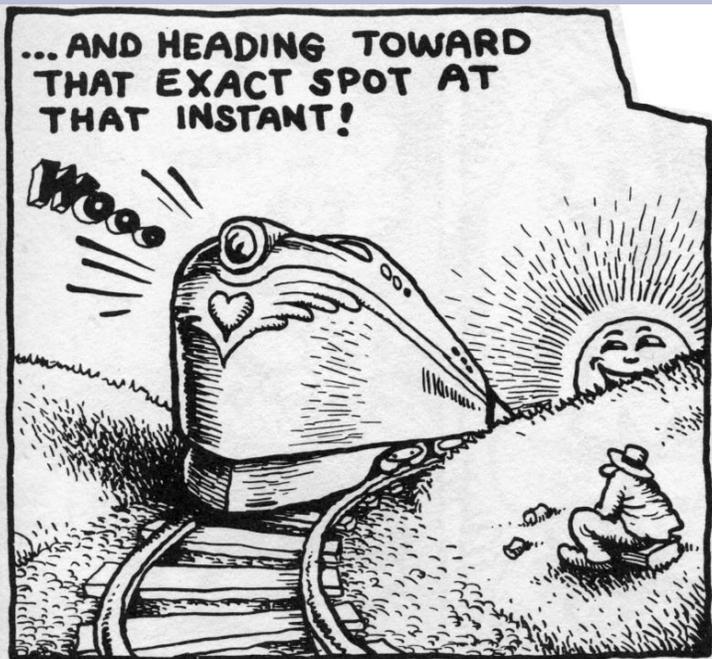
And, State agencies are dependent on PLSS for locating their boundaries

And, Federal agencies must use GCDB for their depiction of PLSS...

# Need for accurate, precise PLSS for Assessor mapping

- Remember the days of paper maps drawn on pre-printed square sections??
- Mapping government ownerships in remote areas, or 40-acre-plus farm or range ownership areas can get by with low accuracy...
- But any large scale (100 or 200—1:1200 or 1:2400) cadastral maps must be based on an accurate *and* precise PLSS framework—or the work will eventually need remapping...
- And with surveyors surveying to 1 in 5000, Assessors can't remain far behind...

# In PLSS, everything is connected to everything...

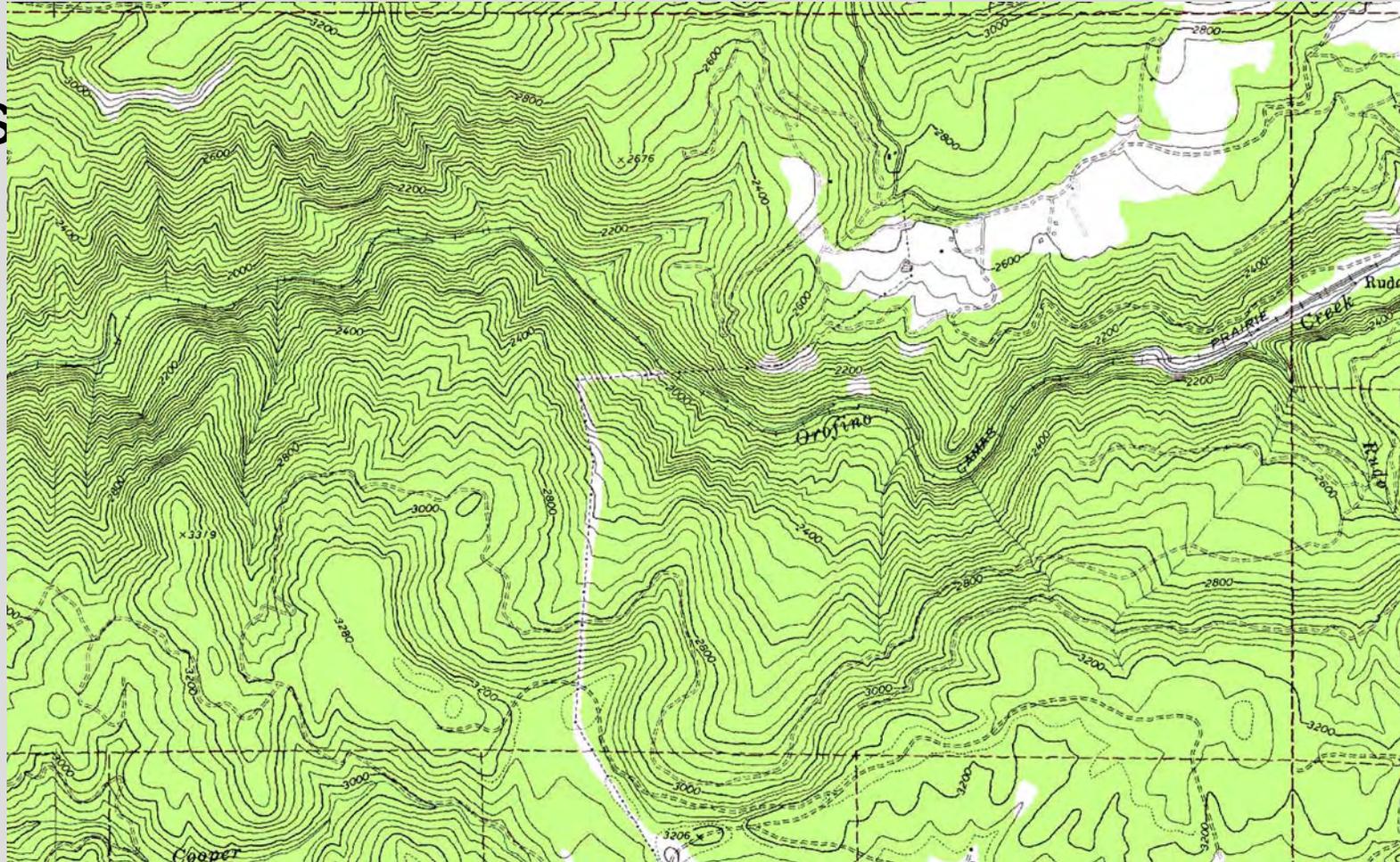


# Sources of PLSS data

- USGS DLG: the original digital version of the topographic map
- DLG is a frustrating format
  - One line can have many attributes (earlier example of township line/section line/county line/national forest boundary)
  - Even when a section line is defined by 3 points—a section corner, a quarter corner, and a section corner—DLG may break it into many short segments
- DLG is a useful data source
  - Shows found corners
  - Generally shows correct PLSS topology
  - Gives a sense of accuracy through solid, dashed, omitted lines

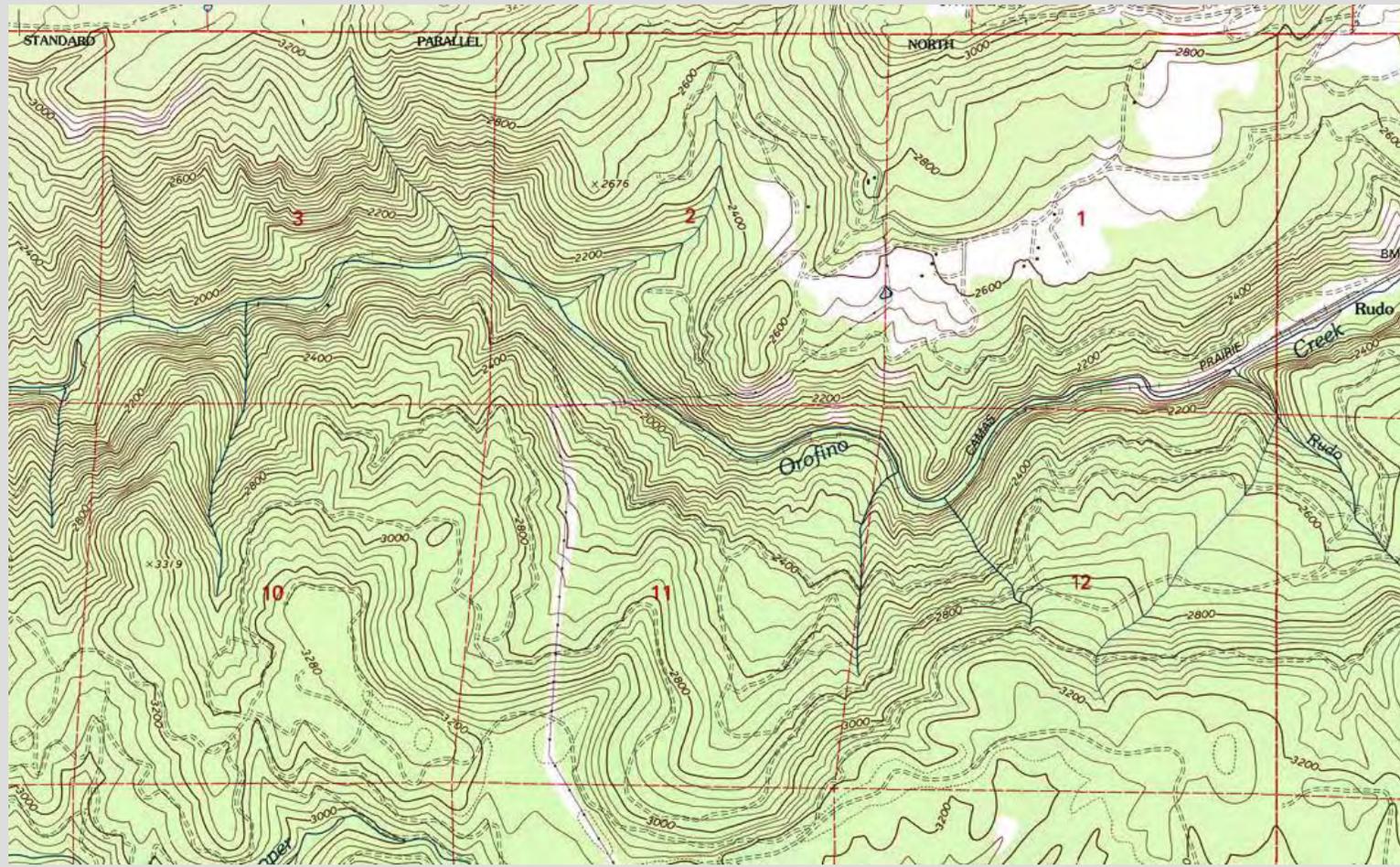
# Sources of PLSS data

DLG  
attributes  
from  
24K  
topo  
in  
problem  
area  
**(USGS)**



# Sources of PLSS data

CFF  
attributes  
from  
24K  
topo  
in  
problem  
area  
**(USFS)**



# Sources of PLSS data

- BLM GCDB (geographic coordinate database)
- Primary source for Inside Idaho's statewide PLSS files
- Source for [www.geocommunicator.gov](http://www.geocommunicator.gov)'s township files
- State program virtually complete
  - Difficult mining townships still not complete
  - Protractions (of so-far-unsurveyed-and-probably-never-to-be-surveyed townships) not complete
- Some maintenance being done

# Sources of PLSS data

- What's good about GCDB
  - Incorporates GLO/BLM cadastral survey record information, including meander lines
  - Breaks sections down to sixteenth sections, government lots, mineral surveys, tracts, etc.
  - Complete for “civilized” parts of the state
  - Where there are found corners on 24K maps, or more recent BLM surveys (with control), GCDB has good agreement with ground (and NAIP)
  - Provides a model into which updated data can be entered

# Sources of PLSS data

- What's bad about GCDB
  - Original GCDB control was limited to:
    - USGS 24K found corners (not based on DLG, but digitized off paper maps); if map met National Map Accuracy Standards, 90% of found corners were within 40 feet of true ground position
    - Newer BLM surveys with lat/long corner ties
    - Information from Forest Service surveys
    - National Geodetic Survey control where linked to PLSS
  - Thus, in Idaho, most ROS and plat information was not included

# Sources of PLSS data

- What's bad about GCDB
  - *Original GCDB control was limited*
  - In some areas, GCDB has poor agreement with “section line roads”
  - GCDB data was created three ways
    - Original PCCS
    - GMM
    - GMM with regional adjustments
    - And soon, NILS with flexible adjustments
  - IGO/ISTC project found some “bad” townships
  - GCDB data poorly maintained
    - Not at all where BLM has no interests
    - Slowly where it does
  - Assessors didn't understand what they got...

# Sources of PLSS data

- Other sources
  - Federal
    - USFS
    - Corps of Engineers
    - Bureau of Reclamation
    - ??
  - State
    - Lands
    - Transportation
    - Parks & Rec
  - Cities
    - Engineers (IdF, Poky)
    - ??
- Counties
  - County surveyors & Assessors (Ada, Koot, Canyon)
  - Recorders
    - Plats
    - Records of survey
- Utilities
  - Power
  - Water and sewer
  - ??
- Private
  - Surveyors
  - Engineers
  - ??

# Work in progress: the IGO/ISTC PLSS project

- Complements BLM statewide PLSS layers now on Inside Idaho
- Includes section corners and lines only (no quartercorners or section breakdowns)
- Based primarily on cleaned-up USGS DLG
- When visually compared to NAIP, often better agreement than GCDB
  - Section-line road intersections
  - Obvious field lines
- comments

# Solving the PLSS problem

- What is the PLSS problem (in Idaho)?
  - Many (most) parcel descriptions are based on the PLSS
  - The demand for accurate depiction and location of these parcels is increasing as their value increases
  - Pressure is rising as GPS enables ever-more-powerful synergy between digital maps and on-the-ground location (even by amateurs!!)
  - Although some local, state, and federal agencies have invested \$\$\$ in digital parcel maps, many are mapping and locating parcels based on uncertain PLSS

# Solving the PLSS problem

- Inherent, unsolvable(?) problems
  - Multiple monuments for a corner
  - Creep on moving hillsides
  - “Creep” on moving planet
- Four solutions to improving PLSS
  - Update GCDB with recorded surveys and plats
  - Update GCDB with recorded documents **and** GPS where needed
  - Acquire GPS coordinates on all(?) corners
  - Maintain and improve by requiring new surveys, plats, etc., to tie in to GPS'd corners, and as needed get new GPS corner data; and update GCDB with that new info

# Solving the PLSS problem

- Legal framework of surveyor work
  - I.C. 55-1907 says if GPS is used for coordinates in a ROS, “current national geodetic survey procedures” must be used
  - I.C. 55-1706 says no boundary coordinates can be presented unless they have been established according to “nationally prescribed standards...” and tied to horizontal control stations within five kilometers
  - I.C. 50-1304 allows cities or counties to require coordinates

# Solving the PLSS problem

- Group consensus from May 23rd:
  - The IGO/ISTC PLSS project is a step forward, designed to complement—not replace—the BLM statewide sections currently on Inside Idaho
  - The GCDB provides the best solution to the PLSS problem
  - Need to study the models of other states like Montana
  - GCDB must be enhanced with better data
    - This implies the need for a statewide coordinate database (based on FGDC model?)
    - This also implies the need for a State Surveyor (or “IGO staff surveyor”)

# Well, ISPLS...

- It **does** involve you...
- ?
- ?
- ?
- ?
- ?