

**Subject: Using the Northwest Ordinance township map method to redistrict.....**

**Date:** Friday, May 13, 2011 10:59 AM

**From:** Tom Dorich

**To:** <votersfirstact@crc.ca.gov>

**Conversation:** Using the Northwest Ordinance township map method to redistrict.....

Here's some formal info on the township system. Note the graphics didn't cut-and-past.  
Search [nationalatlas.gov](http://nationalatlas.gov)

[About](#) | [Fact Sheets](#) | [Contact Us](#) | [Partners](#) | [Products](#) | [Site Map](#) | [FAQ](#) | [Help](#) |

[Home](#) › [Articles](#) › [PLSS](#)

[Boundaries](#)  
[Map Maker](#)  
[Public Land Survey System](#)  
[Map Layer](#)  
[Public Land Survey System](#)

[Article](#)  
[The Public Land Survey System \(PLSS\)](#)  
[What is the PLSS?](#)  
[History](#)  
[Commonly Used Terms](#)  
[Related Links](#)

#### What is the PLSS?

The Public Land Survey System (PLSS) is a way of subdividing and describing land in the United States. All lands in the public domain are subject to subdivision by this rectangular system of surveys, which is regulated by the U.S. Department of the Interior, Bureau of Land Management (BLM).

National Atlas of the United States® The PLSS is used to divide public domain lands, which are lands owned by the Federal government for the benefit of the citizens of the United States. The original public domain included the land ceded to the Federal Government by the thirteen original States, supplemented with acquisitions from native Indians and foreign powers. It encompasses major portions of the land area of 30 southern and western States. Since the original PLSS surveys were completed, much of the land that was originally part of the public domain has been transferred to private ownership and in some areas the PLSS has been extended, following similar rules of division, into non-public domain areas. PLSS rules of division are explained below. For areas that were once part of the public domain, legal land descriptions are usually written in terms of PLSS descriptions.

The PLSS typically divides land into 6-mile-square townships, which is the level of information included in the National Atlas. Townships are subdivided into 36 one-mile-square sections. Sections can be further subdivided into quarter sections, quarter-quarter sections, or irregular government lots. Normally, a permanent monument, or marker, is placed at each section corner. Monuments are also placed at quarter-section

corners and at other important points, such as the corners of government lots. Today permanent monuments are usually inscribed tablets set on iron rods or in concrete. The original PLSS surveys were often marked by wooden stakes or posts, marked trees, pits, or piles of rock, or other less-permanent markers.

The PLSS actually consists of a series of separate surveys. Most PLSS surveys begin at an initial point, and townships are surveyed north, south, east, and west from that point. The north-south line that runs through the initial point is a true meridian and is called the Principal Meridian. There are 37 Principal Meridians, each is named, and these names are used to distinguish the various surveys. The east-west line that runs through the initial point is called a base line. This line is perpendicular to the Principal Meridian.

Source: Principal Meridians and Base Lines, Bureau of Land Management

Each township is identified with a township and range designation. Township designations indicate the location north or south of the baseline, and range designations indicate the location east or west of the Principal Meridian. For example, a township might be identified as Township 7 North, Range 2 West, which would mean that it was in the 7th tier of townships north of a baseline, and in the 2nd column of townships west of a baseline. A legal land description of a section includes the State, Principal Meridian name, Township and Range designations with directions, and the section number: Nebraska, Sixth Principal Meridian T7N, R2W, sec5.

While the original PLSS surveys were supposed to conform to official procedures, some errors were made due either to honest mistakes or to fraudulent surveys. Existing surveys are considered authoritative, and any new surveys must work from existing corners and surveys, in spite of errors in the original surveys and variations from the ideal. This sometimes results in sections that are far from square, or that contain well over or under 640 acres.

The early surveys in Ohio and Indiana were done when the system currently in use had not yet been fully developed. While these surveys have townships that are 6 miles square, the numbering system used and the types of starting points for the surveys are different from those used elsewhere in the United States. These surveys are also named, although the names are not based on Principal Meridians. Further information on these irregular surveys can be found in the references listed at the end of this article. In particular, see the Background Information on the Public Land Survey System.

Source: Principal Meridians and Base Lines, Bureau of Land Management

In Louisiana, parcels of land known as arpent sections or French arpent land grants also pre-date the PLSS, but are treated as PLSS sections. An arpent is a French measurement of approximately 192 feet, and a square arpent (also referred to as an arpent) is about 0.84 acres. French arpent land divisions are long narrow parcels of land usually found along the navigable streams of southern Louisiana, and also found along major waterways in other areas. This system of land subdivision was begun by French settlers in the 1700s, according to typical French practice at the time and was continued by both the Spanish and by the American government after the acquisition of the Louisiana Purchase. A typical French arpent land division is 2 to 4 arpents wide along the river by 40 to 60 arpents deep, while the Spanish arpent land divisions tend to be 6 to 8 arpents wide by 40 arpents deep. This method of land division provided each land-owner with river frontage

as well as land suitable for cultivation and habitation. These areas are given numbers just like standard sections, although the section numbers frequently exceed the normal upper limit of 36.

French arpent land division influence in Louisiana.

Source: U.S. Geological Survey

[back to top](#)

[History](#)

Originally proposed by Thomas Jefferson, the PLSS began shortly after the Revolutionary War, when the Federal government became responsible for large areas west of the thirteen original colonies. The government wished both to distribute land to Revolutionary War soldiers in reward for their service, as well as to sell land as a way of raising money for the nation. Before this could happen, the land needed to be surveyed. The Land Ordinance of 1785 which provided for the systematic survey and monumentation of public domain lands, and the Northwest Ordinance of 1787 which established a rectangular survey system designed to facilitate the transfer of Federal lands to private citizens, were the beginning of the PLSS. Under Congressional mandate, cadastral surveys (surveys of the boundaries of land parcels) of public lands were undertaken to create parcels suitable for disposal by the Government. The extension of the rectangular system of surveys over the public domain has been in progress since 1785, and, where it applies, the PLSS forms the basis for most land transfers and ownership today. The Manual of Instructions for the Survey of the Public Lands Of The United States, 1973 documents current official procedures for PLSS surveys.

Certain lands were excluded from the public domain and were not subject to survey and disposal. These lands include the beds of navigable bodies of water, national installations such as military reservations and national parks, and areas such as land grants that had already passed to private ownership prior to subdivision by the Government. France, Spain, and Mexico all conferred land grants in territory they claimed; many of these grants were confirmed by the U.S Government when the territory in which they were situated was acquired by the United States, and the land was then excluded from the public domain.

Over the past two centuries, almost 1.5 billion acres have been surveyed into townships and sections. The BLM is the Federal Government's official record keeper for over 200 years' worth of cadastral survey records and plats. In addition, BLM is still completing numerous new surveys each year, mostly in Alaska, as well as conducting resurveys to restore obliterated or lost original survey corners.

back to top

Commonly Used Terms

Aliquot part—The standard subdivisions of a section, such as a half section, quarter section, or quarter-quarter section.

Base line—A parallel of latitude, or approximately a parallel of latitude, running through an arbitrary point chosen as the starting point for all sectionalized land within a given area.

Cadastral—Having to do with the boundaries of land parcels.

Government lot—A subpart of a section which is not described as an aliquot part of the section, but which is designated by number, for example, Lot 3. A lot may be regular or irregular in shape, and its acreage may vary from that of regular aliquot parts. These lots frequently border water areas excluded from the PLSS.

Initial point—The starting point for a survey.

Land Grant—A land grant is an area of land to which title was conferred by a predecessor government and confirmed by the U.S Government after the territory in which it is situated was acquired by the United States. These lands were never part of the original public domain and were not subject to subdivision by the PLSS.

Principal meridian—A meridian line running through an arbitrary point chosen as a starting point for all sectionalized land within a given area.

Public domain—Land owned by the Federal government for the benefit of the citizens. The original public domain included the lands that were turned over to the Federal Government by the Colonial States and the areas acquired later from the native Indians or foreign powers. Sometimes used interchangeably with Public lands.

Public lands—Lands in public ownership, therefore owned by the Federal government. Sometimes used interchangeably with Public domain.

Range—A vertical column of townships in the PLSS.

Section—A one-square-mile block of land, containing 640 acres, or approximately one thirty-sixth of a township. Due to the curvature of the Earth, sections may occasionally be slightly smaller than one square mile.

Township—An approximately 6-mile square area of land, containing 36 sections. Also, a horizontal row of townships in the PLSS.

[back to top](#)

Related Links

- Bureau of Land Management
- The Bureau of Land Management's (BLM) Geographic Coordinate Data Base (GCDB)
- Bureau of Land Management Cadastral Survey information
- Information on planned updates to the Manual of Surveying Instructions, 1973
- Map of Principal Meridians and base lines in the United States
- Search for a place based on the PLSS description

References

BLM Cadastral Survey, History

Federal Land Policy and Management Act of 1976, As Amended

Land Survey Information System

PLSS Standards, Standards for Digital Line Graphs, Part 3: Attribute Coding Appendix 3.11.A - Background Information on the Public Land Survey System

[back to top](#)

National Atlas of the United States®

and The National Atlas of the United States of America®

are registered trademarks of the United States Department of the Interior

Township and Range System

Accuracy of map location can be enhanced for any area surveyed under the township and range system of the Bureau of Land Management. The combination of a topographic map and this system can be used to locate features within a few acres and is a primary means of subdividing tracts of land for sale. The organization of the township-section system is based on the definition of base lines and principle meridians (see Figure 7.3A). The position of a base line and meridian within a region may or may not coincide with latitude and longitude. Townships are areas of 6 miles on a side (36 sq. mi), bordered on the east and west by range lines and on the north and south by township lines. Each township is subdivided into 36 sections of 1 mile on a side (Figure 7.3B). The numbering of township and range lines begins with respect to regional base lines and meridians (Figure 7.3A). Notice that the numbering system of sections follows a slightly unusual but consistent

pattern. In areas surveyed under this system, roads and fence-lines typically lie in north-south and east-west orientation. Roads normally define the boundaries of sections (1 mi sq. and 640 acres) and fences may mark half-sections ( $\frac{1}{2}$  mi sq. and 160 acres), quarter-sections ( $\frac{1}{4}$  mi sq and 40 acres), etc. The designation for quarter-sections are

the quadrants of a compass (NE, SE, SW, NW). if greater accuracy is desired, quarter-sections can be subdivided quarters and so forth. The correct statement for the location of the quarter-quarter-section indicated in Figure 7.3D would be: the northeast quarter of the southeast quarter of section 36, township 2 north, range 2 east, county name (e.g. Potter County), state (e.g. Texas). In the state of Texas, this system applies only to the panhandle region of northwest Texas. The panhandle region of Texas was surveyed under this system, but the remainder of the state was surveyed or boundaries decided on the basis of the Spanish land grant system. All of the midcontinent north of Texas has been surveyed under the township and range system.

Figure 7.3

.

.

.

Back to lab 7 intro

Privacy Statement, Disclaimer, Accessibility, FOIA  
[http://www.nationalatlas.gov/articles/boundaries/a\\_plss.html](http://www.nationalatlas.gov/articles/boundaries/a_plss.html)  
Last modified: Wednesday, 26-Jan-2011 18:35:58 CST

Regards,

TD