

CULTURAL HISTORY

The United States Public Land Survey System

By Neal McLain

This is the first in an intermittent series of columns about the United States Public Land Survey System (USPLSS). The USPLSS (or just PLSS) was established in 1785 by the Second Continental Congress to govern the survey and sale of public lands owned by the United States Government. As the United States expanded westward, the PLSS was extended to cover surveys in new territories, eventually affecting 30 so-called "public land states." Most public land states are located north and west of the Ohio and Mississippi Rivers.



I will begin by noting that Texas is *not* one of the 30 public land states; consequently, the PLSS does not apply in Texas.

So why am I writing about something that doesn't apply in Texas?

Because Texas voluntarily adopted many of the PLSS procedures to govern the sale of its own public lands. Thus, an understanding the PLSS helps us understand the procedures adopted by our own state government.

With that introduction, here goes:

TWO FUNDAMENTAL DOCUMENTS

This story begins in the year 1785. Note that date: seventeen eighty-five — just four years after the end of the Revolutionary War, and three years before the United States Constitution even existed. The United States was still a loose confederation of thirteen independent states. The federal government, to the extent that it existed at all, consisted of the Second Continental Congress operating under the limited powers granted to it by the *Articles of Confederation*.^[2]

The United States Public Lands Survey System

But even at that early date, the westward expansion of the United States was already well under way. Since the late 1600s, pioneers had been moving up the river valleys of the Appalachians, establishing farms and communities along the way. Beyond the Appalachians lay the Great Valley of the Appalachians, a broad fertile valley stretching from New York to the Carolinas; by the mid-1700s, much of the Great Valley had already been settled by European immigrants and second-generation colonists.

All of this expansion had taken place on lands claimed by the original thirteen states. The federal government had had little to do with it, and had not derived any revenue from the sale of lands.

But after Revolutionary War, the Continental Congress began to assert control over future expansion. The original thirteen states still claimed ownership of lands extending as far west as the Ohio and the Mississippi Rivers. But the federal government owned most of the lands northwest of the Ohio River in what was known as the Northwest Territory. We know this area today as the states of Illinois, Indiana, Michigan, Ohio Wisconsin, and part of Minnesota.



Credit: Wikipedia [3]

The Continental Congress had many reasons for wanting to control development in the Northwest Territory:

- It wanted to ensure that the United States — not France, Spain, Great Britain, or some independent government — would enjoy the benefits of the westward expansion.
- It saw the sale of western lands as a source of revenue.
- And, perhaps most importantly, it wanted to ensure that the democratic form of government — for which it had just fought a long and bloody war — would be extended into new territories.

The United States Public Lands Survey System

To implement its strategy, the Continental Congress enacted two ordinances that stand to this day as the fundamental documents governing the westward expansion of the United States:

- The LAND ORDINANCE OF 1785

An Ordinance for ascertaining the mode of disposing of Lands in the Western Territory. ^[4]

This act dealt with the practical issue of how to subdivide almost 250,000 square miles of uncharted land into salable parcels. It specified the procedure for qualifying surveyors, and the point at which the surveys were to begin ("on the River Ohio, north from the western termination of a line, which has been run as the southern boundary of the State of Pennsylvania...").

It also specified the procedure for subdividing the land: "townships of six miles square, by lines running due north and south, and others crossing these at right angles, as near as may be, unless where the boundaries of the late Indian purchases may render the same impracticable."

- The NORTHWEST ORDINANCE OF 1787

An ordinance for the government of the Territory of the United States northwest of the River Ohio. ^[5]

This act dealt with political issues: it specified how new territories were to be created and governed, and it guaranteed that new territories would be admitted as states on an equal footing with the original thirteen states. It also established guarantees designed to encourage settlement in the new territories: assured civil liberties, secure land titles, religious freedom, local self-governance, and the prohibition of slavery.

CONGRESSIONAL TOWNSHIPS

Note the following words from the Land Ordinance of 1785: the Northwest Territory was to be subdivided into "townships of six miles square, by lines running due north and south, and others crossing these at right angles..."

The term "township" (or "town") means different things in different states. Even within the same state, it may have different meanings depending on the context in which it is used. For the purpose of this column, we will consider only one of its meanings: "Congressional Township."



Photo: Wikipedia [6]

The USPLSS Point of Beginning

The United States Public Lands Survey System

A Congressional township is simply a 6-mile x 6-mile (approximately) parcel of land. Congressional townships do not have names; they're identified by alphanumeric designations such as T7N-R3E. The use of the word "township" does not imply anything about land ownership, land use, population, ecology, terrain, or government.

To make things even more confusing, Congressional townships are often called "towns." But they're not "towns" in the traditional sense.

For purpose of this column, "town" means a Congressional township.

A BLUEPRINT FOR FURTHER EXPANSION

The plan that the Second Continental Congress adopted for the Northwest Territory came to be known as the *United States Public Lands Survey System*, and formed the blueprint for further westward expansion. Subsequent Congresses adopted the same plan for the subdivision of the Louisiana Purchase, and for new territories acquired thereafter. With several exceptions, Congressional townships now cover most of the land area of the United States.

The principal exceptions are:

- The original thirteen states (Connecticut, Delaware, Georgia, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, and Virginia). These states had been settled before the Continental Congress existed.
 - Four states that were parts of other states when the Land Ordinance was adopted: Kentucky (originally part of Virginia), Maine (originally part of Massachusetts), Tennessee (originally part of North Carolina), and West Virginia (originally part of Virginia).
 - The states of Hawaii, Texas, and Vermont. Before annexation to the United States, these states had been independent sovereign nations with existing internal land subdivision systems.
 - Much of Alaska. Some surveys continue in Alaska to this day, but large tracts have been set aside as wilderness reserve and may never be surveyed.
 - Two large parcels in Ohio originally claimed by Connecticut and Virginia. Connecticut claimed over 3 million acres in northeast Ohio as its "Western Reserve," based on an old charter granted by England's King Charles II. ^[7] Virginia claimed over 4 million acres in south central Ohio as its "Virginia Military District" to satisfy its military land bounties — land promised to veterans of the French and Indian War and the Revolutionary War. ^[8]
- Indian Treaty Boundaries
 - Innumerable smaller parcels and prior grants in all states that had been surveyed before the PLSS surveys began.

The United States Public Lands Survey System



THE SURVEYS

The actual surveys were made by contract surveyors operating under the supervision of various Government bureaucracies, the most famous of which was the General Land Office, immortalized in the phrase "Land Office business."

From all accounts, the survey teams had a difficult time of it. Since the very purpose of the PLSS was to survey the land for potential sale, the surveys were conducted before the land was cleared. The tools were primitive — distances were measured with a "Gunter's Chain" and angles were measured with a compass or plane table. One can imagine the difficulty of running a steel chain along the ground in dense underbrush.

Service vehicles were horses or burros; housing was an impromptu campsite; the food supply was live-off-the-land. Hostile Indians, disease, dangerous animals, and bad weather undoubtedly made things even worse.

Yet in spite of it all, the surveys were completed, and the maps were duly filed with the General Land Office. Most arable farmland eventually passed into private ownership, either through sale, or later, under the Homestead Act of 1862, by outright grant to any party willing to occupy the land "for the purpose of actual settlement and cultivation." Non-arable land remained in the public domain, where much of it remains to this day.

 <p>Photo: Museum of Surveying [9]</p>	<p>Gunter's Chain (1620s-1900) W. & L. E. Gurley, Troy, New York.</p> <p>Two-pole, 33-foot chain made with 50 links each ending in brazed, or soldered, loops. Brass handles connected to the chain with threaded links attached by adjustable nuts. Metal tally tags mark every 10 links on the chain. Accuracy ± 1" in good conditions.</p> <p>Edmund Gunter invented the Gunter's chain during the 1620s. The original chain was 66 feet long; to measure a mile, the survey crew would lay out a length of 80 chains. Following the Land Ordinance of 1785, the Commissioner of the General Land Office instructed surveyors working the territories to use the chain in their measurements, but generally allowed the surveyors to use a half chain, such as the 33-foot chain shown here.</p>
 <p>Photo: Museum of Surveying [10]</p>	<p>Compass (1607-1880s) E & G. W. Blunt, New York, New York.</p> <p>Reads directly to 30 minutes on graduated circle; 1 minute vernier.</p> <p>This brass vernier compass has a five-inch needle and a silvered face with both cardinal and ordinal directions marked. East and west are reversed to make the compass self-reading. The 1-minute vernier is located on the north end of the compass. A level bubble aligns north-south along the southern arm of the compass base and a second aligns east-west on the northern arm. The sight vanes are 6.25 inches in height.</p>
<p style="text-align: center;">Typical surveyors' tools used by the PLSS surveyors from the late 1700s until the mid-20th Century.</p>	

The United States Public Lands Survey System

[1] **The Public Land Survey System (PLSS).** United States Department of the Interior: National Atlas of the United States, 2009. <http://www.nationalatlas.gov/articles/boundaries/a_plss.html>

[2] **Articles of Confederation: March 1, 1781.** Agreed to by [The Second Continental] Congress November 15, 1777; ratified and in force, March 1, 1781. Documents Illustrative of the Formation of the Union of the American States. Government Printing Office, 1927. House Document No. 398. Selected, Arranged and Indexed by Charles C. Tansill. Available online at The Avalon Project website. <http://avalon.law.yale.edu/18th_century/artconf.asp>

[3] **Northwest-territory-usa-1787.png.** Wikipedia, The Free Encyclopedia. Reproduced under the Creative Commons Attribution ShareAlike 3.0 License. <<http://en.wikipedia.org/wiki/File:Northwest-territory-usa-1787.png>>

[4] **Land Ordinance of 1785: An Ordinance for ascertaining the mode of disposing of Lands in the Western Territory.** In Congress, May 20, 1785. A Century of Lawmaking for a New Nation: U.S. Congressional Documents and Debates, 1774 - 1875. Washington: The Library of Congress. Available online at The Library of Congress website. <<http://tinyurl.com/Land-Ordinance-1895>>

[5] **Northwest Ordinance; July 13, 1787. An Ordinance for the government of the Territory of the United States northwest of the River Ohio.** Documents Illustrative of the Formation of the Union of the American States. Government Printing Office, 1927. House Document No. 398. Selected, Arranged and Indexed by Charles C. Tansill. Available online at The Avalon Project website. <http://avalon.law.yale.edu/18th_century/nworder.asp>

[6] **Beginning Point of the U.S. Public Land Survey front.jpg.** Streetside view of the Beginning Point of the U.S. Public Land Survey, a monument marking the site that served as the basis for the entire Public Land Survey System. Located on the Ohio/Pennsylvania border east of downtown East Liverpool, Ohio, it is split between the city of East Liverpool and the borough of Ohioville in Beaver County, Pennsylvania. Erected in 1881 by a joint commission of Ohio and Pennsylvania surveyors, the monument was declared a National Historic Landmark in 1966. The road on which it lies is Ohio State Route 39 and Pennsylvania Route 68. Wikipedia, The Free Encyclopedia. Public domain photo. <http://en.wikipedia.org/wiki/File:Beginning_Point_of_the_U.S._Public_Land_Survey_front.jpg>

[7] Thomas Aquinas Burke. **Ohio Lands: A Short History**, 8. Columbus: Ohio Auditor of State, 1996. Connecticut retained the Western Reserve by Deed of Cession in 1786. Most of the Western Reserve was sold to the Connecticut Land Company, which subdivided it for resale. The Connecticut legislature retained about 500,000 acres as "Fire Lands," lands to be granted to citizens whose properties had been destroyed by fire when British forces invaded Connecticut during the Revolutionary War. The names "Western Reserve" and "Firelands" are well-known in the area today, occasionally reappearing in the names of local businesses and institutions: Western Reserve Motorcycle Club; Case Western Reserve University; Firelands Electric Company; Firelands Regional Medical Center.

[8] **Ohio Lands**, 4. Virginia granted over 16,000 parcels to veterans of the French and Indian War and the Revolutionary War. The size of each parcel was based on the veteran's rank and the length of service. The largest single parcel, exceeding 23,000 acres, was granted to General George Washington, but Washington never exercised it. After leaving the presidency, he returned to his home at Mount Vernon where he lived until his death in 1799 at age 67.

[9] **Gunter's Chain, 1620s-1900.** Museum of Surveying Photo Gallery, MSPS Institute, Lansing, n.d. <http://www.mimuseumofsurveying.org/Gallery_Pages/Timeline_Gunter%27s_Chain.htm>

[10] **Compass, 1607-1880s.** Museum of Surveying Photo Gallery, MSPS Institute, Lansing, n.d. <http://www.mimuseumofsurveying.org/Gallery_Pages/Timeline_Compass.htm>