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U.S. Coast and Geodetic Survey building, 1871–1929

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Richard D. Cutts and the Coast Survey Map of Fort Clatsop

ON JULY 27, 1805, Meriwether Lewis climbed to the top of a limestone cliff and looked out across the valley of the Missouri River. Within this valley of “extensive and beautiful plains and meadows which appear to be surrounded in every direction with distant and lofty mountains,” he saw that three forks of the river flowed into one.¹ Lewis decided to name the Missouri forks after Thomas Jefferson, James Madison, and Albert Gallatin, honoring the three government leaders who had made his expedition possible.

Forty-seven years later, the nephew of James Madison stood on the banks of a tributary of the Columbia River near the Pacific Coast and drew a map that memorialized Meriwether Lewis, William Clark, and the other members of the Corps of Discovery. Richard D. Cutts, west coast chief of an internationally acclaimed team of surveyors and scientists, was completing the first triangulation of the lower Columbia River for the United States Coast Survey. His measurements and monuments would set the foundation for the accurate charting of the channels and landmarks of this waterway. Cutts’s 1852 map of the Lewis and Clark River Station brings together the work of two preeminent teams of surveyors established by Thomas Jefferson: the Corps of Discovery and the U.S. Coast Survey.²

Long before he became president in 1801, Thomas Jefferson took a serious interest in the mapping of North America. An experienced surveyor himself, he helped organize several expeditions to the West in search of a water route to the Pacific. After Meriwether Lewis and William Clark traced routes through the interior, Jefferson looked to the task of mapping the



The U.S. Coast and Geodetic Survey, as the agency was known after 1878, was housed in this building on New Jersey Avenue in Washington, D.C., between 1871 and 1929. Cutts headed the offices during the later years of his career. The agency is now part of the National Oceanic and Atmospheric Administration (NOAA).

coasts, rivers, and harbors of the United States in order to expand commerce and industry. On February 10, 1807, Jefferson signed a bill creating what was to be known as the U.S. Coast Survey.³

In 1852, Richard Cutts may not have realized that few maps depicted the location of Lewis and Clark's Fort Clatsop. As he mapped the Lewis and Clark River Station on the lower Columbia, he carefully recorded details, following the high standards set by the U.S. Coast Survey.⁴ Along with recording diverse observations of natural science, Cutts and others with the Coast Survey were tasked with documenting the history of exploration on the Pacific Coast and assessing locations of fortifications in California and the Oregon Territory.⁵ Fort Clatsop — the first land-based presence of the United States on the Northwest coast and the first U.S. fortification on the Columbia River — would have been a key structure for the Cutts survey to map.

In a recent article on the Cutts map ("Cartographic Representations: A Controversy in Mapping Lewis and Clark's Fort Clatsop," *OHQ*, Winter

2004), Kenneth W. Karsmizki argues that Cutts did not depict the actual location of remains of Fort Clatsop in the 1852 map. He indicates that Cutts's map legend is ambiguous and argues that Cutts plotted what locals referred to as the site of the fort rather than the remains of the fort itself. Karsmizki concludes that the "Log Hut" marked on the map referred to a settler's house, not the log remains of Fort Clatsop that nearby residents observed before and after the Cutts map was made.⁶

I came across the original Cutts map at the National Archives in March 1999 while researching Coast Survey documents relating to Native American history in Oregon. Although I thought it likely that researchers had already examined these records as part of ongoing investigations at Fort Clatsop National Memorial, I electronically scanned the map. On returning to Oregon, I initially shared the map with Jim Thomson, director of archaeological investigations at Fort Clatsop, who recognized it as a new addition to evidence locating the fort.⁷ Subsequently, Karsmizki, who had been researching the history of the fort for the National Park Service (NPS), did follow-up research at the National Archives. He more closely examined the notebooks of the Cutts expedition to the Columbia River and identified the mapmaker and the date of the map. He also researched Cutts's correspondence with Coast Survey Superintendent Alexander Bache.⁸

Karsmizki's dismissal of the Cutts map as a depiction of the location of the remains of Fort Clatsop is based largely on his interpretation of findings in two sets of U.S. Coast Survey archival records and on land survey records. Numerous other published documents support a different interpretation. Biographical information about Cutts and the writings of Cutts and his associates at the Coast Survey shed light on the skills, knowledge, and motivations of the individual who produced this unique map. Detailed observer accounts describe the condition of the fort remains in 1851 and 1853. Together, these documents indicate that Cutts accurately mapped the remains of Fort Clatsop as the logs of a single hut or cabin. Moreover, the location of the fort on the 1852 Cutts map is in agreement with the findings of numerous scholars who point to a specific location within the boundaries of the Fort Clatsop National Memorial.⁹

Memorializing Fort Clatsop

Members of the Lewis and Clark Expedition left few physical traces of their presence at campsites along the routes they followed. The site of Fort

Clatsop was an exception. Because of the extremely wet winter conditions and the duration of their stay at the Pacific coast, the captains decided to build two multi-room cabins with a central parade ground, enclosed by a palisade of logs. No other structure built by the Corps of Discovery was as substantial. The fort gradually deteriorated in the wet climate of northwestern Oregon, but remains were still visible in the 1850s.

Though many individuals observed the fort during the mid-nineteenth century, Cutts is the only one known to have formally surveyed its location. Several maps were made of the site over the decades, but the mapmakers did not visit the site and their maps are clearly inaccurate. Oral accounts by observers who visited the site while remains were still visible are much more consistent. Archaeological work performed by Douglas Wilson and Robert Cromwell of the NPS in 2002 has revealed the location of historic structures that were located near the fort remains, although artifacts definitely associated with Lewis and Clark's fort have not been identified.¹⁰ Their findings, in combination with observers' accounts and the Cutts map, provide the best information about the fort's location — a location that conforms generally to the plot of Fort Clatsop on William Clark's sketch of the shoreline at the mouth of the Columbia River.¹¹

Beginning with the efforts of the Oregon Historical Society more than a century ago, historians have documented observer accounts of the remains of Fort Clatsop. NPS historian John Hussey's 1957 report on the subject is the most comprehensive.¹² Individuals associated with the Pacific and Northwest fur companies described the deteriorating condition of the log buildings within a few years of the explorers' departure. In 1813, for example, North West Company trader Alexander Henry canoed to the site and reported that a small group of Clatsops were living there in two houses. Much of the wood from the fort had been removed for other uses, and willows were growing inside the fort walls. John Townsend, a naturalist with Nathaniel Wyeth's 1834 expedition to the Columbia River, visited the remains and noted that the logs of the fort "are still perfect, but the roof of bark has disappeared, and the whole vicinity is overgrown with thorn and wild currant bushes."¹³

Through the 1840s and 1850s, visitors, settlers, and Clatsop people observed the remains of Fort Clatsop. Some reported that they were unable to see any remains, but dense brush cover and earlier removal of the upper courses of logs probably explain these instances. The fort grounds were part of an early donation land claim, and the landowner, Carlos Shane, was interviewed by the Oregon Historical Society (OHS) in 1900. Shane's

testimony is explicit, providing the most accurate description of the fort's remains and their location.

I came to Oregon in 1846, and in 1850 I located a donation land claim on a tract of land which included the site of Fort Clatsop; I built a house on the land in 1851 and occupied it until 1853. A few feet from where I built my house there were at that time the remains of two of the Lewis and Clark cabins. They lay east and west, parallel with each other, and ten or fifteen feet apart. Each cabin was sixteen by thirty feet; three rounds of the south cabin and two rounds of the north cabin were then standing. In the south cabin stood the remains of a large stump. The location of the old stockade was indicated by second growth timber, while all around it was the original growth, or the stumps of trees which had been cut. In clearing away for my house I set fire to the remains of the old cabins and endeavored to burn them.¹⁴

Shane described a structure very much like the one William Clark drew in his elkskin journal.¹⁵ Clark's diagram indicates the fort consisted of two rectangular, parallel cabins approximately fifty feet long and fourteen to sixteen feet wide, having a total of seven rooms, or "huts," and a central parade ground twenty feet wide. Clark's elkskin journal was not available even to scholars until four years after Shane's interview. As Hussey observed, accounts that were publicly available in 1900 "spoke only of 7 huts or houses and of pickets and gates, permitting historians to gain the impression that Fort Clatsop consisted of a group of cabins surrounded by a stockade."¹⁶ Shane must have observed the remains of the fort, and because he was clearing the area near his home, he may have seen more of the foundations than most who visited the site on the bluff near the Lewis and Clark River. Many consider Shane's testimony to be the most direct evidence that the fort remains were located near the modern-day replica, within the boundaries of the national memorial. The site of the fort replica was chosen in part based on this testimony.¹⁷

Another firsthand account recorded in 1900 by OHS corroborated Shane's testimony. Preston W. Gillette settled in the area in 1852 and in 1853 made a donation land claim near the Lewis and Clark River. He first visited the Fort Clatsop site in 1853, after Shane had burned much of the fort's log foundation:

In October, 1853, . . . I visited the site of Fort Clatsop and saw a section of two logs, each eight or ten feet long, crossed at right angles, which had manifestly been the foundation logs of one of the Lewis and Clark cabins. The ends of the logs were charred, showing that they had been burned. The extent of the stockade was shown by the fact that its site was covered with second growth timber, while all around it stood the trees of the original growth, or the stumps of such as had been cut. Carlos



On December 24, 1805, at Fort Clatsop, Meriwether Lewis reported in his journal, “hard rain at Different times last night and all this day without intermission. men all employd in finishing their huts and moveing into them.” The fort replica shown here was built by the local community in 1955. Fort Clatsop National Memorial was created in 1958.

W. Shane sold his place to his brother, Frankland Shane, in 1853, and the latter was occupying it at the time of my visit.¹⁸

Gillette’s account indicates that after Shane burned the fort, only the log remains of a single cabin (or hut) were present. A second observation in 1853 confirms this. George Gibbs lived at Astoria from 1849 to 1860. During that time he was a customs officer and a surveyor for the Northwest Boundary Commission and Pacific Railroad Survey, and he had ties to the Smithsonian Institution and the Bureau of Indian Affairs, for which he prepared numerous ethnological and historical government reports. Gibbs described the remains of Fort Clatsop in more than one document, including both Indian testimony of the history of the site and his own firsthand view of the remains in the spring of 1853:

I took a run the other day up the Lewis & Clark's river as it is called to the place of the W[inter] encampment, which long as I have been here I never visited before. The site of their log hut is still visible, the foundation logs rotting where they lay. Their old trail to the coast is just visible being much overgrown with brush. . . . Indians are still living who knew them.¹⁹

Gibbs's use of the term *log hut* to describe one of the fort buildings suggests that he was the only one of these three observers to have read Meriwether Lewis's journal, edited by Nicholas Biddle and published in 1814. The term is also used to describe these buildings in the manuscript journals of Lewis and Clark.²⁰ Elsewhere, Gibbs wrote that the remains of Fort Clatsop were "about" two miles above the mouth of the Lewis and Clark River, the same distance given in the Coast Survey map legend.²¹

The Indians Gibbs mentioned likely included Celiast Smith, mother of Silas B. Smith, the attorney who confirmed Shane's statement about the location of the fort. Silas Smith was the grandson of Clatsop chief Coboway, who was so respected by Lewis and Clark that they left Fort Clatsop to him (a gesture that today seems ironic, given that the fort was on Clatsop land).²² Shane, Gillette, Gibbs, and the Smiths were likely among the people Richard Cutts interviewed about Fort Clatsop during the summer of 1852 when he set a mapping station at the Lewis and Clark River for the triangulation of the lower Columbia.

Richard Dominicus Cutts, Surveyor, Scientist, Diplomat, and General

A graduate of Georgetown University, Cutts served with the Northeast Boundary Survey before joining the U.S. Coast Survey in 1843, at the age of twenty-six. By 1846, he was an assistant, and in 1850 he sailed west to become the senior member of the Coast Survey on the Pacific seaboard. The Coast Survey assistants were among the most accomplished scientists in the United States.²³ Cutts answered directly to Alexander Bache, superintendent of the Coast Survey, who was recognized as the leader of the American scientific community.²⁴ As observed by a later superintendent, Julius Hilgard, Cutts's role during these early years with the Coast Survey was to "raise the standards of topographical work, which he did with eminent success." Among Cutts's many published works are several editions of the field manuals that other assistants followed when triangulating the nation's shorelines, harbors, and inland regions.²⁵

In the early 1850s, Cutts worked with the joint army and navy commission responsible for assessing sites for Pacific coast forts and military bases,



Coast survey teams chose prominent shoreline points for mapping stations. Plane table mapping, shown here at Prince William Sound in 1910, followed triangulation. Points were relocated using the surveyors' notebooks with descriptions of stations.

and he also determined locations for lighthouses. Bache wrote of Cutts's capabilities as the leader of the challenging survey of the Pacific seaboard: "The circumstances of the work pointed to his selection as peculiarly fitted for the superintendence of mixed operations, versed as he is by experience in every branch of the duties of the coast survey."²⁶ Cutts believed in the excellence of the agency and suggested to Bache the necessity for a U.S. Coast Survey reconnaissance rather than a private party survey of the route from Panama to California, which was heavily traveled after 1848. "The work should be the work of a nation," Cutts argued, "so that the results should command from all implicit confidence."²⁷



A theodolite is a survey instrument used to accurately map topography and property lines. Thomas Jefferson's theodolite, pictured here, is preserved at Monticello. Jefferson learned surveying in his youth and continued to use his skills throughout his life, mapping and measuring properties in Virginia.

Geographical research dominated the sciences for much of the nineteenth century, and Cutts was one of the field's most distinguished researchers. Recognized by more than one U.S. president for his accomplishments, Cutts represented the nation at international scientific meetings and was one of the few members of the Coast Survey to serve in a diplomatic capacity with the State Department. He applied his knowledge of cartography during the Civil War and rose to the rank of brevet brigadier general as aide-de-camp to General Henry Halleck, commander of Lincoln's armies.²⁸ Cutts returned to the Coast Survey offices after the war and eventually was named first assistant to the superintendent. He wrote essays, monographs, and reports on triangulation, universal time, precision instrumentation, meteorology, and field techniques. Over the course of his career, he charted

the shores of the nation and documented the locations of hundreds of sites of historic, economic, scientific, and political significance.

As a surveyor, Cutts followed in the footsteps of Lewis and Clark, and he was undoubtedly familiar with William Clark's remarkable maps of the West. Like the captains, he worked with knowledgeable Indian leaders in charting the treacherous shoreline of the Pacific coast and canoed on waters that had seen no other type of vessel. Cutts likely had a deep appreciation for the expedition, developed during the summers he spent with James and Dolley Madison. Cutts's father, Massachusetts Congressman

Richard Cutts, married Anna Payne, Dolley Madison's sister, in 1804, and the two couples often entertained together. James Madison and Thomas Jefferson were friends and political allies, and Meriwether Lewis was part of Jefferson's inner circle while the westward expedition was being planned. Historian Stephen Ambrose described life at the president's house during the two years Meriwether Lewis lived there:

Jefferson was a widower. His two daughters were married and had their husbands, children, and own affairs to look after. Secretary of State James Madison and his wife, Dolley, stayed with Jefferson in the President's House for several weeks in May 1801, and Dolley Madison often acted as hostess for dinner parties. . . .

Lewis took his meals with the president, and was almost always present when he entertained, which was four or five nights a week. The dinner parties were small affairs, usually two or three guests, sometimes six to eight, never more than a dozen.²⁹

In their youth, Richard Cutts and his sister, Mary, frequently stayed with the Madisons at Montpelier in Virginia, where they heard firsthand about the planning, departure, and return of the Lewis and Clark Expedition. Shortly before Lewis and Clark's departure, Dolley Madison and her friends donated supplies, including some of the writing accoutrements used by the expedition, and they followed preparations for the departure with great interest.³⁰

Although Jefferson and Madison had different views on the role of the West in the future of the country, Madison shared Jefferson's outlook on the need for western expansion.³¹ As president, he continued to encourage the growth of the continental surveys that Jefferson initiated. With his familial ties to these two administrations, it is likely that Cutts held a great appreciation for Jefferson's and Madison's vision of a surveyed West and for the remarkable expedition of Meriwether Lewis and William Clark.

Coast Survey Triangulation and Cartographic Precision

In his *OHQ* article on the Cutts map, Kenneth Karsmizki asked: "Why did Cutts overlook some structures but include the 'Log Hut' and nearby structure?" Cutts's "selectivity," he concluded, "has created somewhat of a cartographic controversy."³² The answer to Karsmizki's question can be found in Cutts's own writings and in U.S. Coast Survey publications about the Coast Survey mapping strategy.

Like many other surveys Cutts conducted during his forty years of service with the Coast Survey, his triangulation mapping of the lower

Columbia River became the cornerstone of nautical charts used for several decades. Cutts literally wrote the book on triangulation procedures used by the Coast Survey, and he and his associates were dedicated to precise mapping.³³ In his work in California and Oregon, for example, Cutts used three types of theodolites — telescopic instruments for measuring horizontal and vertical angles — with diameters up to 30 inches.³⁴ In the right hands, these instruments could be used for extremely accurate triangulation.³⁵

Cutts applied that precision on the Columbia Survey as well. In June 1852, Cutts and his team sailed on the schooner *Baltimore* from San Francisco to Astoria and began the precision mapping of the lower Columbia River. In his annual report for that year, Bache described the work of the Columbia survey:

The season of the year being favorable for work in Oregon about the end of May, Assistant Cutts proceeded to the mouth of the Columbia river, Oregon Territory . . . and, with the assistance of Sub-Assistant Ruth, commenced the triangulation of the river from Bunce's to Cathlamet Point, to its mouth, a distance of about thirty-five miles, embracing the difficult portion of the navigation of the river. This triangulation rests upon a base of about two miles in length, lying on Baker's Bay. . . .

Assistant Cutts made observations at Tongue Point Neck. The astronomical station at Cape Disappointment is connected with the triangulation of the Columbia River. . . .

The computations of the work of this party are made and duplicated as they advance, and then turned into the office.³⁶

During the course of mapping the lower Columbia River, Cutts's team built 90 signals, occupied 64 stations, and determined 362 angles.

In Cutts's era, triangulation surveys involved the use of a theodolite on a tripod to set permanently marked mapping stations. Surveyors used chains or iron bars to carefully measure a baseline of known distance. Initial mapping stations were centered on the end points of the baseline, and other mapping stations were set within sight of the baseline. Using the theodolite, the angles between the lines connecting mapping stations could be precisely measured. These measurements allowed the surveyor, using trigonometric computations, to accurately plot mapping station points several miles from the baseline. Sequential stations were sighted and set, then occupied by the surveyor as the mapping proceeded along shore or inland. Records were kept in the surveyor's notebook (duplicated in the field), and a large map of the triangulation area was drawn as the fieldwork proceeded.³⁷

In *Memoranda Relating to the Field-Work of the Secondary Triangulation*, Cutts described the process of selecting triangulation stations:

A careful reconnaissance invariably precedes the selection of new points for the continuation of the geodetic work of the survey. . . . if the hills are densely wooded and tolerably uniform in height, the greatest care and skill are needed to select such intervisible points as are most favorably situated . . . for the extension of the triangulation. . . .

Considerations for choosing mapping stations included

the sweep of the horizon, or the area to be surveyed, with a view to the easy determination of intermediate stations, and of light-houses, spires, chimneys, or other prominent objects not more than two or three miles apart, for the special use of the plane table and hydrographical parties.”³⁸

During triangulation work, surveyors kept a notebook of mapping signal station descriptions to record nearby features and allow future surveyors to relocate the mapping stations and monuments. Notebooks were to include “a description, and generally a sketch of each triangulation-point, showing the manner in which it has been marked, and the bearings and distances of any objects near at hand, by which its location can be found.” Landmarks to be mapped—which might include “prominent chimneys, the apex of gables of buildings, flag-staffs, lone trees” etcetera—were those within line of sight of the mapping station.³⁹

The 1852 Cutts map appears in such a notebook. A description at the top of the page reads:

Lewis and Clark River

This signal is situated at the mouth of Lewis and Clark River, west side — on a P. of marsh or low ground — 40 feet from H.W.M [high water mean]. The line of bushes and trees commence 40 yards south of signal.

The position of signal is secured by a bottle, sunk three feet in the ground — and also by three stubs with a copper tack in each — 6 feet from the centre of station. Land unclaimed.⁴⁰

At the time of the Cutts survey, few buildings stood within sight of the mapping station near the mouth of the Lewis and Clark River. Cutts’s map of the station shows the signal itself, three nearby monuments (or “stubs”), a building on a nearby hill that would be useful for relocating the signal, a second building two miles south of the signal, and the “Log Hut.” These are indicated, respectively, by a triangle, three dots, two shaded rectangles, and an open rectangle. Open rectangles appear on other Coast

Survey station maps of the period to indicate compounds, fort palisades, corrals, and other walled, roofless structures, as well as city blocks. Roofed buildings are typically shown as shaded rectangles. The two roofed buildings marked on the Cutts map appear to be the house of Joseph and Sarah Jeffers to the north and Richard Moore's sawmill to the south.⁴¹

Next to the open rectangle, a legend reads:

Log Hut
Lewis and Clark
wintered in 1805

To the left side of the mapped area, another legend mentions this structure and gives the scale of the map:

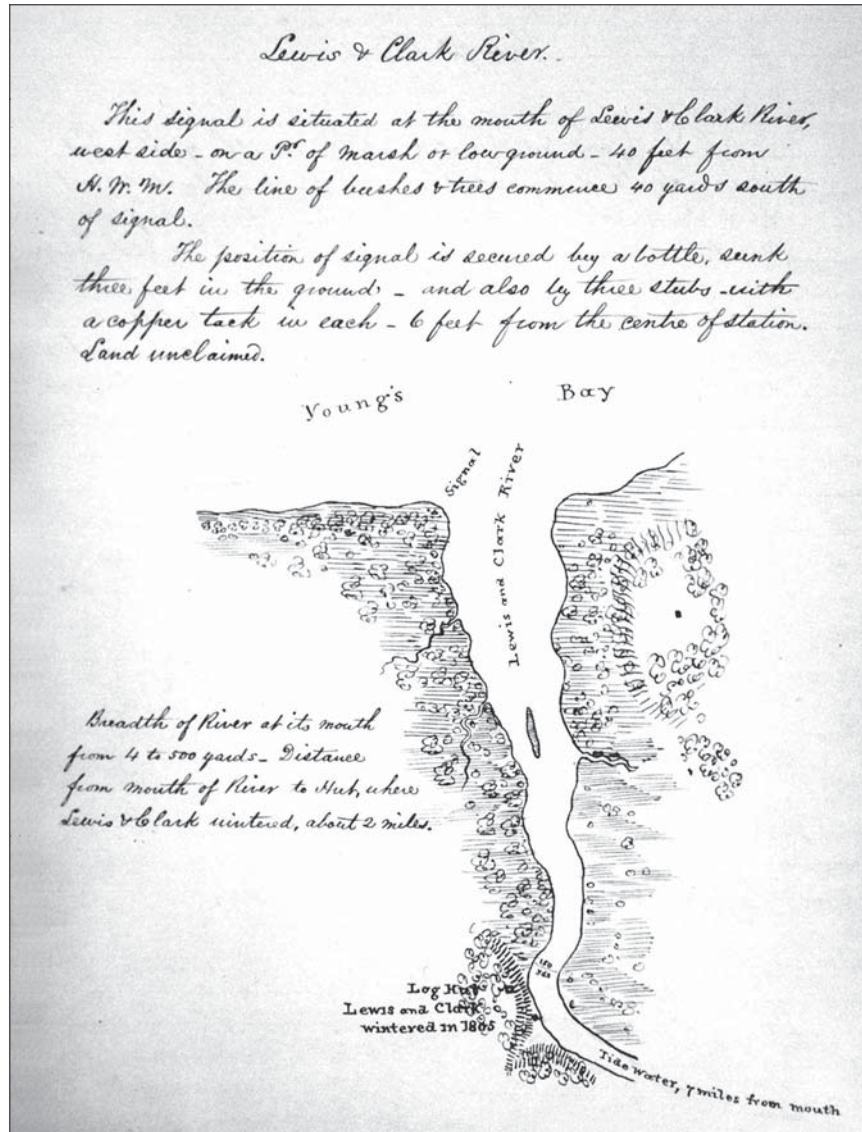
Breadth of River at its mouth
from 4 to 500 yards — Distance
from mouth of River to Hut, where
Lewis and Clark wintered, about 2 miles.

It is clear from the choice of words that Cutts was mapping an actual structure, not a site or reported location. The firsthand accounts of the remains of Fort Clatsop as a structure with no roof help explain why Cutts designated the structure with an open rectangle, signifying a walled area lacking a roof. Cutts's choice of symbol and wording match depictions of the condition of the "log hut" given by his contemporaries.⁴²

The Shane, Gibbs, and Gillette accounts also explain why Cutts referred to the remains as a single hut. Shane admitted having burned the fort buildings in 1851, and Gillette and Gibbs described the log foundation of a single cabin or hut. The single, roofless log hut depicted on Cutts's map fits with both these descriptions of the remains of the fort after they were burned.

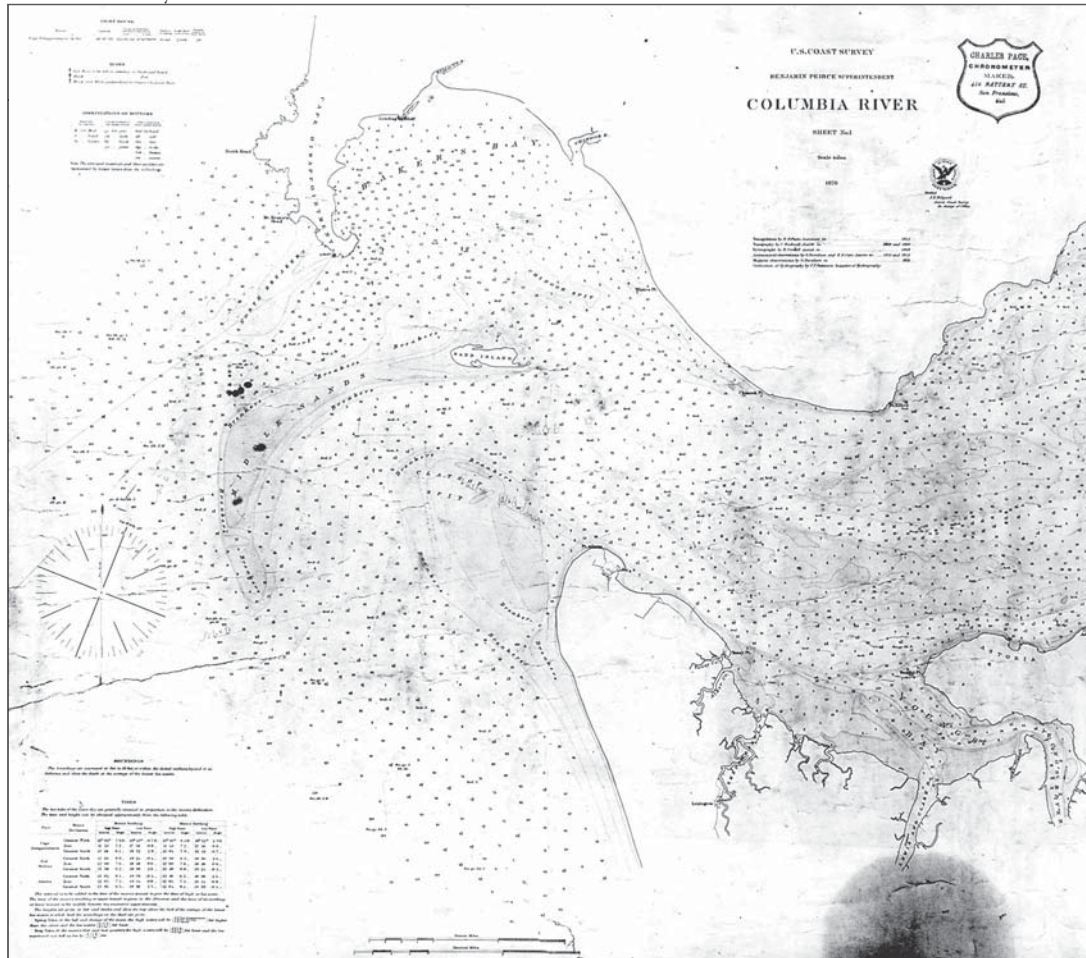
It is highly unlikely that Cutts would have used the term *hut* to designate the house that Carlos Shane had recently built. Coast Survey staff normally used the word *house* in map legends to denote residences. On the other maps within Cutts's Columbia River Descriptions of Stations notebook, for example, ten structures are labeled, including a "mill," a "wharf," an "Indian lodge," and four buildings labeled "house." Six of these structures were designated by the name of the owner.⁴³ Cutts's use of the term *hut*, like that of George Gibbs, suggests that he was familiar with the description of Fort Clatsop in Meriwether Lewis's published journal.

Those more familiar with cadastral and land record surveys might consider the Coast Survey maps in the description of stations notebooks unusually selective in their inclusion of structures. In fact, the agency's



The Lewis and Clark River Station page in Cutts's Description of Stations notebook (above) included details that would facilitate relocation of the mapping station. It also recorded the location of Fort Clatsop and details of the fort's riverbank setting beyond the area being mapped for the nautical chart. This page from Cutts's original notebook is the map that Scott Byram found at the National Archives and electronically scanned before he returned to Oregon (see Oregonian, March 20, 1999).

An article published in the Winter 2004 Oregon Historical Quarterly — "Cartographic Representations: A Controversy in Mapping Lewis and Clark's Fort Clatsop," by Kenneth W. Karsmizki — incorrectly indicated that Byram found a duplicate copy of this map. The difference between the two maps can be seen in the handwritten note to the left of the river. The original map has the wording "4 to 500 yards," while the duplicate has "4 to 5000 yards." OHQ's editors regret the confusion.



Cutts's 1852 triangulation of the lower Columbia River served as the basis for nautical charts for several decades. This original U.S. Coast Survey map, "Columbia River Sheet no. 1, 1870," for example, cites the Cutts triangulation. Navigators of coastal waters still use charts similar to this one.

cartography was systematic. Unlike cadastral surveyors, Cutts was not attempting to document the full extent of settlement across the land. His primary goal was to map the station and landmarks that were within a line of sight with each other. While the Jeffers house likely would have been visible from the mapping station, neither the Moore Mill nor the log hut would have been useful for tracing the location of the station at the river mouth. They must have been plotted for other reasons. The Moore Mill was a shoreline landmark that could be used to locate the

log hut, and Cutts most likely mapped it for that purpose. Depending on the extent of forest cover at the time, the mill and the Jeffers house may have been in line of sight, making their relative locations retracable. The mill was also by the boat landing used by those who visited the Fort Clatsop site.

The characteristics of the map and the context of the survey indicate that Cutts mapped the hut because he recognized it as Lewis and Clark's fort and thus a historic place of national significance. It is evident that Cutts and his team spent considerable time recording the setting of the hut, even though its position was of little use for relocating the mapping station. Cutts mapped and described the nearby channel of the Lewis and Clark River in detail — including the channel width adjacent to the fort — in contrast with the five other Columbia River tributaries depicted on station maps in his notebook. His emphasis on the historic structure also includes the dual legends clearly designating the fort's remains.⁴⁴

MAPS ARE MADE for a variety of purposes, and the interpretation of a map as a historic record benefits from careful consideration of the characteristics of the mapmaker and the duties he or she carried out in producing the map. Land survey maps are prepared to show the extent of owned properties, town plats show urban development areas, and nautical charts show features of waterways and harbors. Every map is produced in a specific political, administrative, cultural, and economic context.

In evaluating the historical significance of the 1852 Cutts map of the Lewis and Clark River Station, the relevant context includes the knowledge, expertise, and perspective of the mapmaker, the established methods of Coast Survey triangulation, and observer descriptions of the Fort Clatsop remains. Given what is known about Richard D. Cutts, U.S. Coast Survey goals and procedures, and the condition of Fort Clatsop before and after the 1852 survey, there is every reason to conclude that the map accurately depicts the location of the remains of Lewis and Clark's log fort.

As "the work of a nation," U.S. Coast Survey maps were prepared within a context of scientific research and national interest. Richard Cutts recognized the unique significance of Fort Clatsop, and his scale drawing of the fort's riverbank setting is a noteworthy contribution to our national heritage. We who appreciate this heritage are fortunate that, in 1852, the superintendent of the U.S. Coast Survey sent one of the most accomplished surveyor-scientists of the era to chart the Columbia River.

Notes

My research for this article benefited from advice and contributions from Dr. Jon Erlandson of the University of Oregon, Dr. John Cloud and Capt. Skip Theberge of NOAA, and Dr. Doug Wilson, Mr. Bob Cronwell, and Mr. Jim Thomson at the National Park Service.

1. Gary Moulton, ed., *The Journals of the Lewis and Clark Expedition*, vol. 4 (Lincoln: University of Nebraska Press, 1988), 434.

2. R.D. Cutts, *Descriptions of Stations, Columbia River, Oregon* (original and duplicate) box 160, GA Series, Descriptions of Stations (U.S. Coast Survey), E 128 Scientific Records, PI 105, Record Group 23, National Archives II, College Park, Maryland.

3. See John Logan Allen, "Imagining the West: The View from Monticello," in *Thomas Jefferson and the Changing West*, ed. James P. Ronda (Lincoln: University of Nebraska Press, 1997); NOAA, National Geodetic Survey, "Lewis and Clark Bicentennial," www.ngs.noaa.gov/LewisAndClark/information.html (accessed May 27, 2005).

4. Hugh Richard Slotten, *Patronage, Practice, and the Culture of American Science: Alexander Dallas Bache and the U.S. Coast Survey* (New York: Cambridge University Press, 1994); F.A.P. Barnard, *Report on the History and Progress of the American Coast Survey up to the Year 1858* (n.p.: American Association for the Advancement of Science, 1858); NOAA History, "Profiles in Time: Giants of Science," www.history.noaa.gov/giants_index.html (accessed May 27, 2005).

5. See U.S. Coast Survey, *Report of the Superintendent of the U.S. Coast Survey, 1852* (Washington, D.C.: The Survey, 1852), appendix 25, p. 123; Capt. Albert E. Theberge, *The Coast Survey 1807–1867*, History of the Commissioned Corps of the National Oceanic and Atmospheric Administration, vol. 1 (Washington, D.C., NOAA, 1998–), 354, available online at www.lib.noaa.gov/edocs/BACHE6.htm (accessed May 27, 2005).

6. Kenneth W. Karsmizki, "Cartographic Representations: A Controversy in Mapping Lewis and Clark's Fort Clatsop," *Oregon Historical Quarterly* 105:4 (Winter 2004): 583–6. The article implied that I spoke with the *Oregonian* before I got in touch with the NPS. After speaking with Jim Thomson of the NPS on my return from my research trip, I learned that the map offered a new contribution to research, and the story reached the media after that.

7. Cutts, *Descriptions of Stations*; Scott Byram, letters to James Thomson, NPS regional archaeologist, March 11, 1999, April 25, 1999.

8. Kenneth Karsmizki, e-mail message to Cindy Orlando, Jim Thomson, and Scott Byram, May 26, 1999. Karsmizki also identified a duplicate of the Cutts map nearly identical to the original identified in March 1999.

9. John A. Hussey, "Critical Analysis of the Site," *Fort Clatsop National Memorial Suggested Historical Area Report* (San Francisco: NPS, Region 4, 1957), available online at www.cr.nps.gov/history/online_books/focl/hussey2/section1c.htm (accessed May 27, 2005). See also NPS, Fort Clatsop, "Archaeological Research," www.nps.gov/focl/html/archaeology/index.html (accessed May 27, 2005).

10. Dr. Douglas Wilson, NPS archaeologist, Fort Vancouver, personal communication.

11. William Clark, *Sketch Map of the Mouth of the Columbia River, Northern and Southern Parts*, 1806, Yale Collection of Western Americana, Beinecke Rare Book and Manuscript Library, New Haven, Conn.

12. Hussey, *Fort Clatsop Historical Report*. See also Fort Clatsop National Memorial Web site, www.nps.gov/focl/ (accessed May 27, 2005).

13. Alexander Henry, *New Light on the Early History of the Greater Northwest: The Manuscript Journals of Alexander Henry and of David Thompson . . .*, 3 vols. (New York: F.P. Harper, 1897), 2:771–2; John K. Townsend, "Narrative of a Journey across the Rocky Mountains," in R.G. Thwaites, ed., *Early Western Travels*, vol. 21 (Cleveland: A. H. Clark, 1905), 362–3.

14. Testimony of Carlos W. Shane and Silas B. Smith, "Report of the Committee on Memorials," *Proceedings of the Oregon Historical Society*, 1900, 20–1.

15. William Clark's diagram of Fort Clatsop appears in his elkskin journal, American Philosophical Society, Philadelphia.

16. Reuben Thwaites published drawings from the newly relocated journal in *Scribner's Magazine*, June 1904; Hussey, *Fort Clatsop Historical Report*.

17. Hussey, *Fort Clatsop Historical Report*.

18. Testimony of P.W. Gillette, "Report of the Committee on Memorials," *Proceedings of the Oregon Historical Society*, 1900, 19.

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20. Meriwether Lewis, *History of the Expedition under the Command of Captains Lewis and Clark* . . . , ed. Nicholas Biddle (Philadelphia: Bradford and Inskeep; New York, Inskeep, 1814); Hussey, *Fort Clatsop Historical Report*.
21. *Ibid.*
22. George Gibbs, "Tribes of Western Washington and Northwestern Oregon," in U. S. Geographical and Geological Survey of the Rocky Mountain Region, *Contributions to North American Ethnology*, 2 vols. in 3 (Washington, D.C.: The Survey, 1877–1890), 1:238.
23. Slotten, *Patronage, Practice, and the Culture*, 6, 37, 136, 143.
24. Barnard, *Report*.
25. Superintendent Julius Hilgard, Richard Cutts obituary, in U.S. Coast Survey, *Report of the Superintendent of the U.S. Coast Survey, 1883* (Washington, D.C.: GPO, 1883), 14–15; R.D. Cutts, "Geodetic Miscellany. Section III, Legislative History of the Southern Boundary of Virginia," 1869, NOAA Central Library, Silver Spring, Md.; Andrew Johnson and R.D. Cutts, *Message from the President of United States . . . in relation to the resources and extent of the fishing-grounds of the North Pacific Ocean . . .* (Washington, D.C.: GPO, 1872); R.D. Cutts, *Report on Instruments of Precision* (Washington, D.C.: GPO, 1875); Richard D. Cutts, "An Initial Meridian and Universal Time," *Bulletin of the Philosophical Society of Washington* 6 (1884): 106–10.
26. U.S. Coast Survey, *Report, 1852*, appendix 25, p. 123; Theberge, *Coast Survey*, 354.
27. Richard D. Cutts to Superintendent, April 4, 1852, in U.S. Coast Survey, *Report, 1852*, 130.
28. Cutts determined the offshore boundaries of river entrances for a fisheries treaty between the United States and Great Britain. On Halleck and his staff, see Stephen Ambrose, *Halleck, Lincoln's Chief of Staff* (Baton Rouge: Louisiana State University Press, 1962). On Cutts's association with Halleck, see Theberge, *Coast Survey*, 606–7.
29. Stephen E. Ambrose, *Undaunted Courage: Meriwether Lewis, Thomas Jefferson, and the Opening of the American West* (New York: Simon and Schuster, 1996), 62.
30. In 1850, Mary Cutts wrote of Dolley Madison's enthusiasm for the expedition in the first book-length biography of the first lady. See Mary Estelle Elizabeth Cutts, *Memoirs*, c1850 (1855), manuscript memoir about James and Dolley Madison, Mary Cutts papers, Library of Congress, Washington, D.C.. See also "The Lewis and Clark Expedition," James Madison's Montpelier, www.montpelier.org/history/expedition.cfm (accessed May 27, 2005). Cutts also had ties to Thomas Jefferson and Monticello through his marriage, in 1845, to Martha Jefferson Hackley, the granddaughter of Thomas Mann Randolph, who was raised by Jefferson's father and was like a brother to the president. Randolph family bible records, 1761–1838, Mss 6:4 R1587:6; Virginia Historical Society, Richmond, Va.
31. Helen M. Ingram and Mary G. Wallace, "An Empire of Liberty: Thomas Jefferson and Governing Natural Resources in the West," in Ronda, ed., *Thomas Jefferson and the Changing West*, 97.
32. Karsmizki "Cartographic Representations," 581, 582.
33. Richard D. Cutts, "Memoranda Relating to the Field-Work of the Secondary Triangulation," in *Report of the Superintendent of the United States Coast Survey, Showing the Progress of the Survey during the Year 1868*, appendix 7, House Exec. Doc. 71, 40th Congress, 3rd Session.
34. Ellen Yu, *Geodetic investigation of the Hayward Earthquake of 1868* (master's thesis, Stanford University, 1995).
35. For an example of commentary about the accuracy of Cutts's work, see T.J. Maher, "The Coast Survey on the Pacific Coast," NOAA History, www.history.noaa.gov/stories_tales/pacifichistory.html (accessed May 27, 2005).
36. Excerpt from Bache's report, and Richard D. Cutts to Superintendent, June 11, 20, 1852, in U.S. Coast Survey, *Report, 1852*, p. 51 and appendix 20, pp. 107–8.
37. For general information on Coast Survey triangulation procedures, see Joseph F. Dracup, *Geodetic Surveys: The Beginning and the Next One Hundred Years, 1807–1940*, available online at www.history.noaa.gov/stories_tales/geodetic3.html (accessed May 27, 2005).
38. Cutts, "Memoranda," 109–10.
39. *General Instructions Hydrographic Surveys Division in Regard to Inshore Hydrographic Work of the Coast Survey, 1878* (Washington D.C.: GPO, 1878), 4.
40. Cutts, *Descriptions of Stations*.
41. See Hussey, *Fort Clatsop Historical Report*; Karsmizki, "Cartographic Representations."
42. Hussey, *Fort Clatsop Historical Report*.
43. Cutts, *Descriptions of Stations*.
44. Land record surveyors working at the same locality during this period mapped numerous residences but not the fort remains. As one might expect, their maps also show little detail of the shoreline and topography.

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