LOGGING CHUTE SYSTEMS IN NORTHEASTERN CALIFORNIA:

A CASE STUDY ON PLUMAS NATIONAL FOREST

Mary L. Maniery
PAR Environmental Services, Inc.
P.O. Box 160756
Sacramento, CA 95816-0756

ABSTRACT

The use of chutes to transport logs during timber operations was extensive from the late 1800s into the 1930s. At the end of the logging season, the chutes and associated trestles were abandoned in place. An historical perspective of the types of chutes commonly used in California and specific techniques employed during chute logging operations is offered. These data are then applied to a chute system discovered in 1983 during an archaeological reconnaissance on a portion of Plumas National Forest, Plumas County, California.

DISCUSSION

In recent years archaeological and historical studies have focused on the use of railroads as a means of transporting timber from the woods to the mills (Hunt 1982; Myrick 1962; Warren 1971). Although railroad logging was an important innovation in the California lumber industry, the use of chutes to transport logs was used extensively prior to the 1930s, especially between 1900 and 1920.

Chute or slide logging had its beginnings in Europe in the 1600s. The method was brought to the colonies and put into practice by the large lumber companies of the Great Lakes, northeastern states and Canada. These chutes were primarily gravity chutes, used to transport logs down steep inclines to waiting ships or mills (Bryant 1913:233-234; Koroleff and Bryant 1932:16-19). As the industry expanded to California, this type of "gravity" or "running" chute was adapted to the Sierran environment and replaced by "trailing" or "hauling" chutes.

Early reports from 1912 to 1919 indicate that four types of "trailing" chutes were popular in northeastern California. The first type, ridge or cross-country, was constructed on the crest of a long ridge with an even grade and gentle slopes, or cross-country, using ridges and benches as much as possible to maintain a fairly consistent and even grade. This was the most expensive class of chute because of the added need for cribwork trestles over drainages and grading on flat, level surfaces (Berry 1917; Bryant 1913; Orr 1919). The second class, creek or drainage chutes, was built either in the bottom of a creek or just above it along the banks. This type was very popular when using horses but became less common with increased dependence on steam donkey engines. By 1918, the use of creek bottom chutes for lengthy distances was almost totally abandoned (Orr 1919).

The third type, side-hill chutes, was constructed in areas where the first two classes were not feasible. This class required cutting into the hillside and then building the chute on the newly created level grade. Trestles were used to traverse drainages. These three chute types were most often built in conjunction with steam donkey engines (Orr 1919; Show 1926).

The fourth class, horse chutes, differed slightly in construction from the others and was built to accommodate horses pulling the logs. Horse-power usually required building some type of rough road alongside the chute. When crossing drainages and gullies a temporary bridge was often constructed to accommodate the horse teams. An alternative method involved attaching rope, cables, or chains to the logs on one side of the drainage and positioning a horse team on the other side, pulling the logs across the creek in the chute. This eliminated the need for a bridge (Berry 1917:35-36; Orr 1919).

Construction on chutes usually began in early spring before the logging season got underway. The route was staked out by "eyeballing" the most even and gradual grade or by using a compass and transit. Grading varied from merely clearing the ground in flat areas to cutting through ridge tops to maintain an even grade. This work was all done by hand with shovels and picks (Koroleff and Bryant 1932; Orr 1919).

Poles were cut from stands along the proposed routes and were put in place by Dolbeer donkey engines or horses. Length and size of poles were determined by towing method, but young, straight white firs were the preferred material. Chute hauling by horse required poles 50 to 60 feet long with a top diameter of eight to nine inches. These were laid in parallel rows five inches apart, notched and joined on the ends, with the small end always facing downgrade. The inner surface was hewed with a broad axe to form a trough that averaged 16 inches wide on top and 8 inches on the bottom (Berry 1917:35; Bryant 1913:230-232).

In contrast, chutes constructed for steam donkey hauling were stronger and heavier. Poles were usually cut into 60 to 70 foot lengths with a top diameter of 10 to 12 inches. These were also notched, joined together and hewed. After hewing the inner surface measured 10 inches on the bottom and 30 inches wide at top, almost double that used for horses.

Chutes used with donkey engines also required more support.

Cross skids were placed at 10 foot intervals in any slight depression and chute poles were imbedded into the ground or braced. Dirt and rocks were shoveled along the sides of the imbedded poles for added support. Cribwork trestles were constructed as needed over drainages. Dead trees and snags were used for foundations of the cribwork, rather than marketable timber. One or more branch chutes were sometimes built extending into pockets of timber away from the main chute. Logs were then towed down the branches into the main chute and on to the landing (Berry 1917:36-37; Bryant 1913:231-233; Koroleff and Bryant 1932:17-27; Orr 1919).

In the early 1900s the Dolbeer steam donkey engine was used increasingly for yarding, chute hauling and loading logs onto railroad cars or trucks. Using the steam donkey was quicker, easier and cheaper than relying solely on horses. By 1917, however, Dolbeers were going out of use because of the high cost of labor and the limitation of yarding distances, and were used primarily in chute construction and hauling. Larger steam yarders were put into the woods (Berry 1917:37-39; Show 1926:26-28).

The yarders required a stronger wire cable than the Dolbeers. Dolbeers had a seven-eighths to one-inch diameter main-line and a three-eighths-inch diameter back-line. Yarders, however, had a main-line that varied from one to one-and-one-quarter inches depending on the size of the machine, and a universal back-line diameter of five-eighths inches. The average wire rope was made of six strands of 19 steel wires wrapped around a hemp center. A thicker rope of eight strands of 19 wires was used increasingly for chokers after 1915 (Berry 1917:26-27).

After bucking or cutting logs were yarded by being attached to the mainline and dragged across the ground or elevated on cables and, after 1917, sometimes transported through the air (called high lead [Brown 1934; Show 1926:29-30]). They were loaded through the frogger (a V-shaped opening composed of large logs) into the chute in trains or turns of 10 to 40 logs, and a hook or brace was attached to the second to the last log in the train. A steam donkey was stationed at landings along the route for long chutes or at the terminal point of small chutes, and tow lines were attached to the turn to haul it to the main landing.

A greaser rode the first log in the train. His job was to dab on chute grease (crude petroleum supplied in 40 gallon barrels) at low or adverse grades to overcome friction. The job of the trailer entailed riding the last log in the turn to regulate speed by manipulating the cable and hook attached to the log. An average train traveled two to five miles an hour. After reaching the landing logs were either loaded onto horse drawn trucks or railroad cars and hauled to the mill for processing (Berry 1917:40; Bryant 1913:239; Orr 1919; Show 1926:30).

Horse logging operations, in contrast, relied on heavy draft chains connecting the logs to a team of horses. Logs were dragged from the woods to the frog, again a V-shaped opening. From there they were loaded onto the chute in trains of six to eight logs, braced with cable or chains, hooked up to the team and hauled down the chute to the landing. At the landing logs were rolled up skids onto the trucks by means of a chain or cable attached to the steam donkey or team pulling from the opposite side. This was called cross hauling. The trucks were then pulled by horse teams to the mills. By the early 1900s larger companies had converted to using donkey engines to move the logs onto the trucks (Bryant 1913; Koroleff and Bryant 1932).

Chute logging by donkey engine was a very popular method of moving logs from the yard to the landing, especially between 1900 and 1915. One early report noted a tendency for larger companies to reduce the mileage of railroad spurs with a liberal construction of chutes. Chute systems and trestles were made to last only as long as logging operations in a particular area, usually two seasons and rarely more than four. As trees were logged the chutes were abandoned and left to rot in the woods. Sometimes, logs used in trestles or chute poles were transported to the mills for processing, but this was rare (Berry 1917; Koroleff and Bryant 1932; Orr 1919).

Remnants of chute systems have been located and recorded throughout the forests of northeastern California. With the information available in early reports and forestry textbooks it is possible to determine the type of chute, method of logging (horse versus donkey engine), relative size of operation and equipment used by analyzing the physical remains of the chute and associated material.

In October, 1983, an extensive chute system was located and recorded during a cultural resource inventory near Portola on Plumas National Forest (Figure 1). Perhaps due to its location on the eastern Sierra slope and related drier climatic conditions, the majority of the system is well preserved. A two mile-long main chute, five branch chutes and six trestles were recorded, as well as one large and two small logging camps. The visibility and integrity of this system allowed identification of the system based on combined information of historic research and artifactual material.

The main chute follows a cross-country pattern. It was constructed along saddles and ridges on an almost imperceptible downslope of less than three percent. The majority of the chute was imbedded in the ground and covered with duff. These imbedded poles are the least obvious and most deteriorated. Cross skids and cuts are present in saddles and on one flat ridgetop, and trestles were constructed across two drainages. Along every stretch of level or flat terrain barrel hoops and slats are

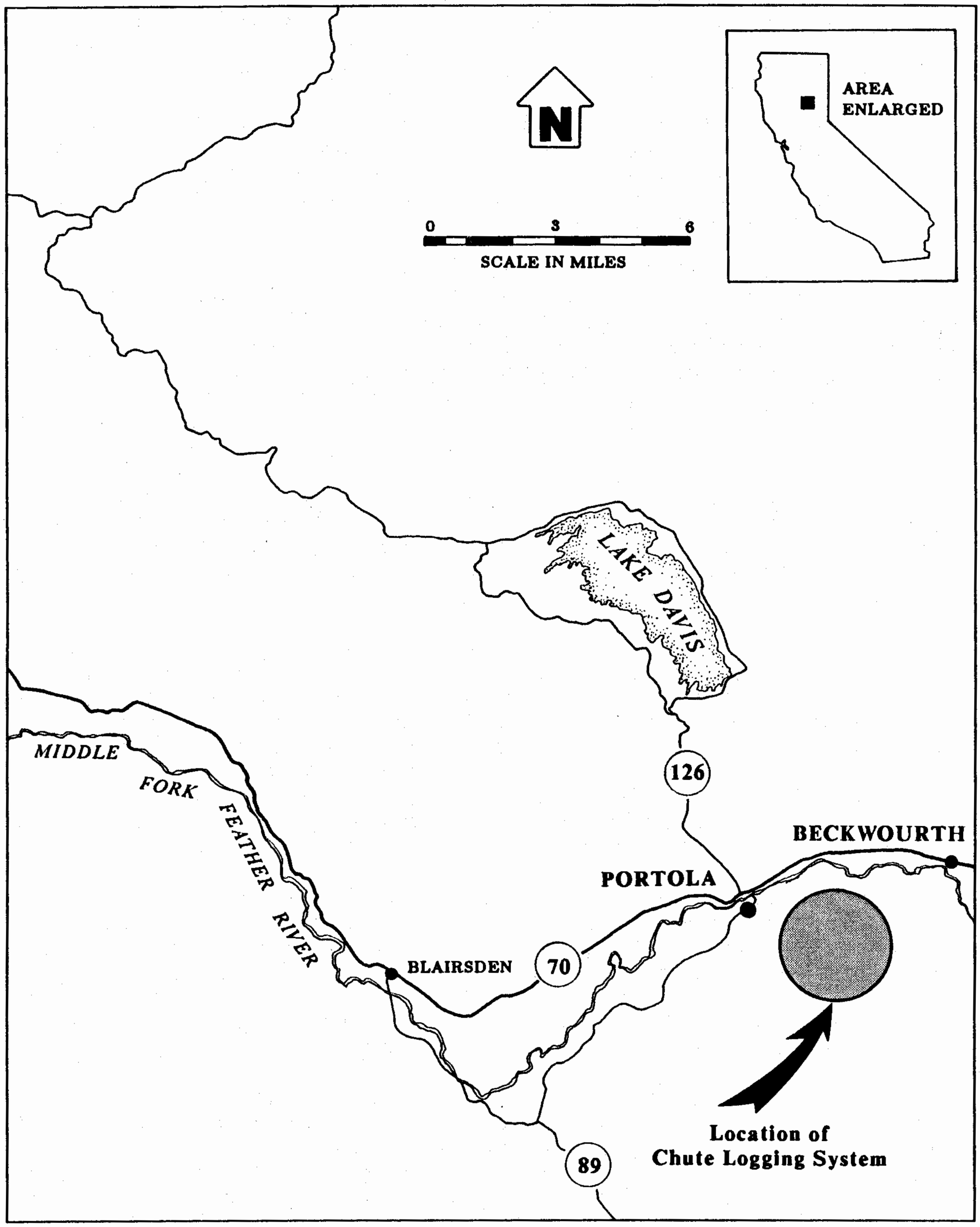

Figure 1. Location Map.

strewn along the chute, remnants of the grease used to oil the chute. The main chute is very straight and extends from the woods almost to the Middle Fork Feather River near the Western Pacific Railroad tracks, a drop of 400 feet in elevation.

Two areas tentatively identified as yardings are near the chute. These are large, flat areas cleared of vegetation; both are disturbed and torn up. In each place the chute is hard to discern and seems almost to disappear. Wire rope or cable is very common in both regions.

Two of the branch chutes are also of the cross-country type. They are along flat benches and ridges, a feed into the main chute, and average one-quarter mile in length. Two other branches are classified as side-hill chutes. Both cut across a side slope, have been extensively graded in places and are braced with cross skids. These are almost a half-mile long. There are two major cribwork trestles on each chute, crossing seasonal streams.

The fifth branch is a creek bottom chute. It was identified by cribwork trestle remains in the drainage and by several areas with poles above the bank and a cut graded flat. Most of this branch has been washed away, however, and is very ephemeral. It appears to be about one-eighth mile in length.

The main chute and four branches, with the exception of the one in the creek, have portions that are distinct and intact. Measurements taken in those areas included pole length and inner surface of hewed chutes. The poles average 60 feet in length, have a top diameter of 10 inches and a hewed top width of 25 inches. After allowing for wear and tear on the chutes by logging and further disintegration through weathering, the measurements match fairly well with those given in early reports for steam donkey chutes.

In addition, most places along the chute are not level or wide enough to accommodate a team of horses, nor is there evidence of a road. Wire rope or cable is present in many areas along the system and in the adjacent woods. These are all of braided steel, 6 to 8 strands and vary from five-eighths to one inch in diameter. This size cable was most often used with Dolbeer donkeys, small yarders or as chokers.

Tentative identification of the chute indicates that it was constructed with steam donkey engines, machines used throughout the logging. It is possible, however, that a small yarder supplemented the donkeys, hauling the logs from the woods to the frogger. A greaser rode the log train to the landing, liberally applying oil to the chute along level stretches. A portable logging camp was set up near the job site, probably in the area of the yarding operations. This camp is represented by a large trash deposit and an adjacent flat and cleared area next to a spring. Two smaller, temporary camps are situated at the junction of the main chute and branches, perhaps to facilitate operations and save over a mile walk to work.

The complexity of the system and care in construction indicates the expenditure of a considerable amount of time and money. In the early 1900s, only a large logging company could afford the capital outlay of expenses required in construction and maintenance of such a system using steam donkeys. A minimum of 15 men was usually necessary in chute building. It is probable that the branches were built as needed throughout the logging period, extending over several seasons.

Historic records indicate that railroad spurs and large yarders replaced the Dolbeer donkey and chute methods during the 1920s. By 1932 the use of chutes was rare, confined mainly to small-time operators or places were tracks could not feasibly be laid. Historic artifacts (bottles, cans, ceramics) along this chute and in the camps, combined with small-sized cables and types of chutes, suggest a pre-1915 date for this system. Records on file at Plumas National Forest and the Plumas County Museum support this assumption, indicating that this region was logged around 1906 by the Roberts Lumber Company.

CONCLUSIONS

In the example given above, close attention was paid to details such as wire rope construction and measurements, chute dimensions and the physical layout of the chute, thus allowing for an understanding of logging methods. Technically, similar conclusions can be reached at any given chute system in northern California as to method of construction, class of chute and type of equipment used in: 1) building the system; 2) yarding; 3) hauling the logs; and 4) loading the logs at the landing. The ephemeral nature of chutes, especially in areas of heavy rainfall, indicate that attention should be given to differences in slope or terrain while working in known historically logged regions. Sometimes a graded or leveled path, thought to be a road, is all that remains of a major chute system. Care should be taken at the survey level to inspect leveled grades for remnants of imbedded poles or barrel hoops and slats. Drainages and creek bottoms should also be examined for large "rounds" of logs used in trestle construction. Often the cribwork has collapsed and only the cut logs scattered in a creek remain of the trestle. Cables wrapped around trees and other hardware imbedded in the trunks above eye level are often all that remains of the high lead technique and other methods employed to lift logs into chutes. Careful inspection of ground, trees and creek beds for these characteristics, particularly in areas believed to have been logged before the 1930s, should allow tentative identification of types of chutes, logging operations and techniques employed, and may aid in determining the age and significance of a given site.

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