

HISTORICAL RESOURCES EVALUATION REPORT

Hammond Bridge Replacement Project

Humboldt County, California

Federal Aid Project No. RPSTPLE-5904(123)

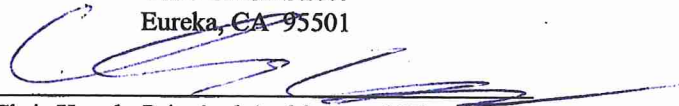
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June 2014

SUMMARY OF FINDINGS

The County of Humboldt (County), in coordination with the California Department of Transportation (Caltrans), is proposing to replace the Hammond Bridge over the Mad River, which is located south of McKinleyville and northwest of Arcata. This steel girder and truss bridge, built in the 1920s and reassembled at its current site in 1941, is a former railroad bridge that is now used as a pedestrian and bicycle crossing on the Hammond Trail. The project vicinity and location are illustrated in **Figures 1 and 2** in **Appendix A**. This bridge has not previously been evaluated for its potential historic significance. The County prepared an Area of Potential Effects (APE) map (**Figure 3, Appendix A**) that includes the Hammond Bridge and areas immediately adjacent to the structure's abutments. No other historic architectural / built environment resources except for the bridge are within the APE.

JRP Historical Consulting, LLC (JRP) prepared this Historical Resources Evaluation Report (HRER). The Hammond Bridge is the only property in the APE that required evaluation. This bridge does not appear to meet the criteria for listing in the NRHP. This conclusion is pursuant with Stipulation VIII.C of the *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (Section 106 PA). Additionally, pursuant to Section 15064.5(a)(2)-(3) of the California Environmental Quality Act (CEQA), using criteria outlined in Section 5024.1 of the California Public Resources Code, the Hammond Bridge does not appear to be a historical resource for the purposes of CEQA compliance. The bridge evaluation is presented herein and on the DPR 523 form in **Appendix B**.

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ATTACHMENTS

Appendix A

- Figure 1 Project Vicinity and Site Map
- Figure 2 Project Location Map
- Figure 3 Area of Potential Effects (APE) Map

Appendix B

State of California Department of Parks and Recreation (DPR) 523 Forms

Appendix C

Letter to Interested Parties

1. PROJECT DESCRIPTION

The Federal Highway Administration and California Department of Transportation (Caltrans), in conjunction with Humboldt County Public Works Department (County), propose to replace the existing Hammond Bridge with a new bridge to be built immediately to the east of the existing bridge. The Hammond Bridge is located north of the community of Arcata, Humboldt County, California. The proposed project Area of Potential Effects (APE) includes the bridge alignment with staging areas on both sides of the river. The project is situated along the western boundary of Section 7, Township 6 North, Range 1 East (Humboldt Base and Meridian), and is shown on the 7.5 USGS Topographic Quadrangle Map, Arcata North, California 1972 and Tyee City 1972. The UTM coordinates for the center of the bridge at the crossing of Mad River are (NAD 83, UTM Zone 10) 405,669mE, 4,530,956mN. The elevation of this location is approximately 20 feet above sea level.

The Hammond Bridge is a 540-foot-long structure with two main spans and four approach spans. The main spans are composed of steel through girder and steel through-truss sections. The main spans were moved to the site in 1941 and assembled along with timber truss approach spans to form a railroad bridge for hauling logs. In 1983 the bridge was converted to a bicycle–pedestrian bridge by reconstructing the approach spans with steel girder sections and installing a concrete deck. Much of the bridge is currently in poor condition due to severe corrosion of steel members and the structure’s remaining life is only a few years. Rehabilitation of the existing bridge is not an economically feasible option.

The existing bridge is located within Humboldt County right-of-way. The right-of-way corridor is considered to be wide enough to accommodate the proposed replacement structure; however, existing right of way limits needs to be thoroughly researched and determined. The plan is to construct the new bridge next to the existing bridge and upon completion of the new bridge the old bridge will be dismantled and/or demolished.

General Construction Details

The County is analyzing three bridge alternatives. While the type and design for the new bridge has not been determined, there are some ideas on the general construction details. Construction of the new bridge will most likely occur adjacent to the old bridge, allowing the old bridge to remain open to pedestrians and trail users. It is believed there is sufficient County right-of-way available to construct the new bridge alongside the old bridge before finally dismantling and/or demolishing the old bridge. New piers will need to be constructed and it is likely that the new bridge will be constructed in two phases; with the new piers and abutments being constructed during the summer, and then erection of the superstructure occurring during the following summer months.

Once the consultant develops an approved final design, the County will have a better understanding of environmental impacts. Since the project does involve construction activities over and within the Mad River (a perennial water course), extra precaution and analysis will be required to examine potential impacts and corresponding avoidance measures. Temporary falsework and a temporary work bridge are feasible for construction of a cast-in-place tied-arch superstructure crossing the Mad River. Falsework and work bridge support can be provided by driven temporary piles. Environmental constraints due to special status species may limit time periods when piles can be installed and when they can be removed and similarly for cofferdams needed for construction of in-channel pier foundations. However, the time constraints are usually sufficient to allow for the construction and work above water is typically allowed once the piles or cofferdams are in place.

Soil mapping for the project area shows that the soils are characterized as “Ferndale Soils” with Fe2 soil type. Fe2 is characterized as a silt loam with 0-3 percent slopes and is favorable to holding moisture. These soil conditions also tend to favor agricultural and farming use on the land, which is indicative of the project area which is surrounded by agricultural farmlands currently in use. The Humboldt County General Plan has identified the surrounding land as being “Prime” agricultural lands due to it being suited for a wide range of agricultural crops. It should be noted that this classification is different from the USDA Land Capability Classification System. Staging and stockpiling will occur within these agricultural areas.

It is likely that some trees and riparian foliage will need to be removed in preparation and construction of the new bridge. It is presumed that mitigation, or permitting conditions, will require revegetation for impacts to vegetated and riparian areas.

The Hammond Bridge replacement project will not require a detour of any kind. The bridge is only used by non-motorized pedestrian use and no vehicles can access the bridge. Additionally, the new bridge is being proposed to be constructed adjacent to the existing bridge so that the old bridge can remain open to pedestrian use. There may be temporary closures of the bridge or adjoining roadways (Mad River Road and Fischer Road) during construction activities, but no detours are being proposed. Temporary access roads to the river channel are generally existing but will require improvement.

The project will require the contractor to submit a Water Pollution Control Plan (WPCP) or Stormwater Pollution Protection Plan (SWPPP) for approval before construction begins. Adequate implementation of BMPs, monitoring, and reporting methodologies will be required.

As a general rule, to minimize erosion, sediment, and pollutant contribution to the Mad River, best management practices such as the following measures will be part of the project pollution control and prevention plans:

- Construction will be done during summer months when the chance of precipitation is lowest.
- Construction equipment will be cleaned and inspected prior to use. Equipment maintenance and fueling will be done at designated staging areas.
- On-site stockpiles will be isolated with silt fence, filter fabric, and/or straw bales/fiber rolls.
- Silt fence or fiber rolls will be placed below the project areas to contain loose rolling rocks and sediment. Silt fence/fiber rolls will be kept in place and maintained during the entire project. Any sediment caught by the fence or rolls will be removed before the fence/rolls are pulled.
- Ground disturbed by construction work will be revegetated with fast-growing native grasses and sterile hybrids and mulched when work is complete.
- The site will be monitored by Public Works personnel during winter rains and any evidence of erosion (rilling, gullies, etc.) will be repaired immediately. In addition, areas where revegetation is not successful will be reseeded and re-mulched to ensure vegetative ground cover.

2. RESEARCH AND FIELD METHODS

Survey and evaluation for this project included research for developing a general historic context relative to the project location, as well as resource-specific research for the subject property within the APE to confirm dates of construction, review its land use history, establish the property's physical history, and to place the property into appropriate historic context. Historian Jerry Rohde contributed to the historic context section of this report and conducted research at the Humboldt County Historical Society, Humboldt State University Library Special Collections, and the Humboldt County Public Works Department Natural Resources Division. In addition, JRP conducted research at University of California Davis Shields Library, Humboldt County Natural Resources Planning Department, JRP's in-house library, and in online sources. JRP also examined standard sources of information that identify known and potential historic resources to determine whether any buildings, structures, objects, districts, or sites had been previously recorded or evaluated in or near the APE. This included review of the California Historical Resources database (includes State Landmarks, California Register of Historical Resources, and Points of Interest), National Register of Historic Places database as well as the results of a California Historical Resources Information System records search conducted on January 10, 2014 at the Northwest California Information Center by James Roscoe and Kimberly Roscoe, as presented in the Archaeological Survey Report (ASR) for this project. The records center search did not identify any previously recorded or potential built environment historic resources in or near the APE.¹

JRP staff conducted a field survey of the APE on September 25, 2013, and recorded the Hammond Bridge on a DPR 523 form provided in **Appendix B**. JRP staff did not identify any other buildings, structures, or objects in the APE that required recordation. The APE is illustrated in **Appendix A, Figure 3**.

JRP identified potential local interested parties for this project and sent notification letters on September 6, 2013. Recipients of the letter were the Humboldt County Historical Society, Clarke Historical Museum, and the Historical Sites Society of Arcata. JRP received no responses to these letters. As a follow-up to the letters, JRP called the three interested parties on June 2, 2014

¹ Department of Parks and Recreation, *California Inventory of Historic Resources*, (Sacramento: Department of Parks and Recreation, March 1976); Office of Historic Preservation, *California Historical Landmarks* (Sacramento: California State Parks, 1996); and Office of Historic Preservation, *California Points of Historical Interest* (Sacramento: California State Parks, May 1992); National Park Service, National Register Information System, online database: <http://nrhp.focus.nps.gov/natreg/docs/Download.html> (accessed September 2013); Office of Historic Preservation, *California Historical Resources*, Available at <http://ohp.parks.ca.gov/ListedResources/?view=county&criteria=17>, Accessed April 2012; James Roscoe, William Rich and Jerry Rohde (Roscoe and Associates), An Archaeological Survey Report for the Hammond Bridge Replacement Project, Located in McKinleyville, Humboldt County, California, prepared for Humboldt County Public Works Department, February 2014, 17.

and June 6, 2014 and spoke to representatives of the Humboldt County Historical Society, Clarke Historical Museum who confirmed that they had no comments or concerns regarding the Hammond Bridge Replacement Project. JRP was unable to reach representatives of the Historical Sites Society of Arcata, but left a detailed voicemail message with a request contact JRP if the organization had any concerns or comments regarding the project. JRP did not receive any return calls from the Historical Sites Society of Arcata. See **Appendix C** for a copy the letter to interested parties.

3. HISTORICAL OVERVIEW

The Hammond Bridge spans the Mad River in a rural part of Humboldt County north of Humboldt Bay and Eureka, about four miles northwest of Arcata, and one and a half miles south of McKinleyville. The bridge is about two miles from the mouth of the river at the Pacific Ocean on a flat coastal plain – only about 10 feet above sea level – known as the Arcata Bottoms. The primary land use in the immediate area around the bridge is, and has been, agriculture, specifically grazing dairy cattle. In the greater region, logging and lumber milling have played a major role in its development. The current Hammond Bridge was built in 1941 by the Hammond Redwood Company on the company's Humboldt Northern Railroad line, replacing an earlier bridge (**Illustration 1**) constructed in 1905 by the Dolbeer & Carson Lumber Company. The Hammond Redwood Company formed in 1933 following a merger between the Hammond Lumber Company and Little River Redwood Company, the latter of which had acquired the Humboldt Northern Railroad from Dolbeer & Carson in 1925. These lumber companies were among the most successful in the Humboldt Bay area during the late nineteenth and early twentieth centuries. The Hammond Bridge was along one of multiple railroad lines that delivered timber harvested from the vast region north of Arcata and east of McKinleyville (northward past Trinidad) to mills and shipping hubs around Humboldt Bay. The histories of these companies, and others, are intertwined by competition, business agreements, and buy-outs. This section provides historical background regarding the region's lumber industry and historic context specifically related to the construction and history of the Hammond Bridge, as well as historic context regarding truss bridge design. **Illustrations 2, 3, and 4** show the location of relevant towns, land ownership, logging railroads, and other geographic features.

3.1. Development of Redwood Logging and Logging Railroads in Northwestern Humboldt County

Redwood logging in Humboldt County began in the 1850s in the Humboldt Bay region and immediately established itself as the backbone of the economy. During this initial era, early arrivals to the county formed companies, acquired vast tracts of timberland, and built their own mills. The difficulty of transporting the region's massive redwoods posed a challenge to early loggers and imposed limits on the trees that could be harvested. At the time, cut timber was removed either by oxen or floated down waterways.

One early lumber entrepreneur was John Vance who arrived in the county in the early 1850s and helped set up the Ryan and Duff Mill, the first successful mill on Humboldt Bay. Vance struck out on his own in 1856, purchasing the Ridgeway and Flanders Mill at the foot of G Street in Eureka and buying valuable Eureka waterfront property on Humboldt Bay the following year. Vance continued to acquire property by taking advantage of a drop in lumber prices to buy large timber tracts throughout the region. His endeavors proved successful and in 1874 he began building a second mill, the Big Bonanza, on the Mad River at Essex, northeast of Arcata. By the

1870s, railroads had become the preferred method to transport logs and cut lumber, and Vance built the Humboldt & Mad River Railroad from Essex to Mad River Slough at the north end of Humboldt Bay. At the slough, Vance's stern wheel riverboat, the *Antelope*, carried the Big Bonanza's lumber to his wharf in Eureka. Following the death of John Vance in 1892, his nephew, John M. Vance, took over control of the lumber operation and formed the John Vance Mill & Lumber Company (Vance Mill & Lumber), which later became the Hammond Lumber Company discussed below.²

The Vance Mill & Lumber mill at the foot of G Street in Eureka burned in 1892, and the company built a new mill on the peninsula across the bay to the west at the newly established town of Samoa. The Redwood Land and Investment Company, comprised of various local businessmen, purchased 240 acres and 6,000 feet of waterfront on this peninsular across from Eureka and subdivided the land into lots in 1892 in the hopes of starting a town. By the following year the enterprise was largely a bust, and Vance Mill & Lumber purchased the majority of the town's lots and within a few years its Samoa mill was cutting 60,000 board feet of lumber per day and had 320 workers. As part of this development, Vance Mill & Lumber incorporated the Eureka & Klamath River Railroad (Eureka & Klamath) in 1893, which replaced the Humboldt & Mad River Railroad. The new railroad ran along a slightly different route from the earlier line, crossing the Mad River upstream from the previous crossing, and continuing southwest across the Arcata Bottoms and Mad River Slough, and south down the Samoa Peninsula to the mill at Samoa. By this period, Vance Mill & Lumber owned thousands of acres of timber land north and east of McKinleyville in the Little River drainage and lower Lindsay Creek drainage, as well as in the area north of Fortuna (south of Eureka).³

Another large company operating at this time was the Dolbeer & Carson Lumber Company (Dolbeer & Carson), which owned a mill in Eureka and also had large timber tracts in the upper Lindsay Creek drainage near Fieldbrook (east of McKinleyville) and in the area south of Bayside to the east of Humboldt Bay, as well as southeast of Humboldt Bay on Salmon Creek and along the North Fork of Elk River. In 1895, Dolbeer & Carson signed a 10-year agreement with Vance Mill & Lumber to have the Eureka & Klamath haul Dolbeer & Carson's logs from their camp in the Fieldbrook area to Cole's Landing (later called Carson's), which was located a short distance north of Samoa on the western edge of Humboldt Bay. From this landing the logs were dumped

² Lynwood Carranco, *Redwood Lumber Industry* (San Marino, CA: Golden West Books, 1982), 144-145, 196; Lynwood Carranco and Henry L. Sorensen, *Steam in the Redwoods* (Caldwell, ID: Caxton Printers, 1988), 33.

³ Carranco and Sorensen, *Steam in the Redwoods*, 33, 36-37; Carranco, *Redwood Lumber Industry*, 145; J. N. Lentell, *Official Map of Humboldt County California* (San Francisco, CA.: J. N. Lentell, 1898); Carranco, *Redwood Lumber Industry*, 197, 201-202; Leigh H. Irvine, *History of Humboldt County, California, with Biographical Sketches* (Los Angeles, CA: Historic Record Co., 1915), 140, 643, 1240; Virginia M. Fields, *100 Years of Humboldt County Culture and Artistry: 1850 to 1950* (Eureka, CA: Time Printing Company, 1986), 53; Lynwood Carranco, *Redwood Lumber Industry*, 63-66, 101.

into the bay and floated eastward to the Dolbeer & Carson mill in Eureka. By the following year, there were 20 railcars running daily to Cole's Landing on the Eureka & Klamath.⁴

Around this same time began the so-called "second wave" of Humboldt County lumber mill owners. The first wave was defined by local lumber barons like John Vance, while the second wave was characterized by capitalists from out of state coming in and acquiring the assets of the pioneer companies. Andrew Benino Hammond, who had established successful lumber operations in Montana and also owned two railroads, was one such entrepreneur. Hammond burst onto the Humboldt County scene in 1900, when he purchased the venerable Vance Mill & Lumber Company for an attention-getting \$1,000,000. The acquisition included Vance's sawmill at Samoa, a shingle and shake mill, several thousand acres of redwood timber, a shipping fleet consisting of a steam vessel and several lumber schooners, about 1,200 feet of valuable waterfront property, and the Eureka & Klamath. The Samoa mill was the largest redwood lumber mill in operation at the time. In addition to the mill, Hammond also acquired town lots in Samoa and established a company town. Hammond changed the name of his latest lumber operation to the Vance Redwood Lumber Company and continued to acquire land, purchasing over 36,000 acres of timberland from the American Lumber Company on Redwood and Prairie creeks in northwestern Humboldt County in 1902.⁵ That same year the company also extended the Eureka & Klamath to Camp 5 in the Little River drainage, making the rail line between Camp 5 and Samoa 20 miles. By 1904, Hammond's holdings in Humboldt County were valued at \$4,000,000, tying it with the Pacific Lumber Company for first place in the county.⁶ In 1912, he reorganized his corporation and re-named it the Hammond Lumber Company, at the time "the largest timber holder in the Redwood Empire," and the fifth largest in California, with 94,760 acres.⁷ Soon thereafter the Hammond facilities at Samoa were described as follows:

The Hammond Lumber Company owns the town and operates immense saw mills, moulding mills, etc., employing some 500 men. The company has built a number of substantial houses for the workmen, and the population numbers about 250. Other workmen reside in Eureka. There is an hourly ferry service between the peninsula and the mainland....The distance from Eureka to the wharf line at Samoa is approximately a mile and a half.⁸

⁴ Stanley T. Borden, "Oregon & Eureka Railroad," *Western Railroader*, November 1958: 6; Kathy M. Tahja, *Logging Railroads of Humboldt and Mendocino Counties* (Charleston, SC: Arcadia Publishing, 2013), 47; Borden, "Oregon & Eureka Railroad," 7; J. N. Lentell, *Official Map of Humboldt County California* (San Francisco, CA.: J. N. Lentell, 1898).

⁵ Borden, "Oregon & Eureka Railroad," 7-8.

⁶ Carranco, *Redwood Lumber Industry*, 155; Borden, "Oregon & Eureka Railroad," 7-8; Carranco, *Redwood Lumber Industry*, 155; Mengel, "A History of the Samoa Division....," 47; Carranco and Sorensen, *Steam in the Redwoods*, 44; Lowell S. Mengel II, "A History of the Samoa Division of Louisiana-Pacific Corporation and its Predecessors, 1853 – 1973," 57 (Photocopy available at Special Collections, Humboldt State University Library).

⁷ Carranco, *Redwood Lumber Industry*, 159; Mengel, "A History of the Samoa Division," 70-71.

⁸ Irvine, *History of Humboldt County, California*, 423.

Soon after Hammond's acquisition of Vance Mill & Lumber, Dolbeer & Carson chose not to renew its agreement to use the Eureka & Klamath, but decided to build its own railroad. This led to construction of the Humboldt Northern Railway (later became Humboldt Northern Railroad) (Humboldt Northern) on which the Hammond Bridge was later built. This railroad line extended from Cole's Landing on Humboldt Bay to Dow's Prairie (north of McKinleyville) and eventually to Fieldbrook / Lindsay Creek, with a branch line to Arcata.⁹ William Carson incorporated the Humboldt Northern in October 1904 "for the purpose of building a railroad to the Carson timber holdings in the northern end of the county, and eventually on to Crescent City" and filed 17 condemnation suits to gain rights-of-way along its new line.¹⁰ The Harbor Commission granted the Humboldt Northern "permission to bridge Mad River" in 1905 at the location of the current Hammond Bridge (**Illustration 1**).¹¹ The 1905 structure had three 150 foot long Howe Truss spans with a 944 foot long trestle on the south and a 1,775 foot long trestle on the north for a total length of 2,869 feet. The Howe truss spans formed a single long covered bridge with a roof and side walls to protect the timber and steel fastenings from the weather.¹²



Illustration 1. Undated photo of covered bridge at location of current Hammond Bridge. (Courtesy of Jerry Rhode.)

⁹ Carranco and Sorensen, *Steam in the Redwoods*, 49; Mengel, "A History of the Samoa Division," 55.

¹⁰ "Humboldt Northern Railroad Co.," *Blue Lake Advocate*, October 29, 1904.

¹¹ "Will Bridge Mad River," *Blue Lake Advocate*, April 15, 1905.

¹² J. W. Peterson and R. B. McIntosh, "A Golden Salute," *Redwood Log*, 9, No. 8 (1956): 1-2.

During its construction, 24,280 lineal feet of piling, 325 board-feet of timbers and 19,300 pounds of iron were used. Challenges of the bridge construction were the three different grades of the bridge and the north trestle portion built on a reverse curve.¹³ The south trestle portion was constructed on a 1.75 percent grade while the main spans part of the north trestle was constructed on a level grade and the remaining north trestle was finished on a 1 percent grade. The north trestle section contained 790 feet of a four degree reverse curve with a spiral on each end. The northern trestle continued across the Mad River floodplain until it reached the benchland south of School Road in McKinleyville.¹⁴

In its first few years the new Humboldt Northern line was completed from Samoa to about two miles north of McKinleyville, but did not yet reach the Dolbeer & Carson logging operations in the Fieldbrook / Lindsay Creek area. The line continued to push northward across Strawberry Creek and onto the northern portion of Dow's Prairie, where the tracks turned eastward.¹⁵ At this point just north of Strawberry Creek, the Humboldt Northern connected with the line of the Little River Redwood Company (Little River Redwood).

Little River Redwood was incorporated in 1892 by lumbermen from Ottawa, Canada and western New York who bought 3,400 acres of redwood timberland in the Little River drainage in an area sandwiched between Vance Mill & Lumber lands and a Dolbeer & Carson tract. Little River Redwood also bought a 160-acre tract of land adjacent to their holdings from John Bulwinkle and in 1908, the company built a mill on the property, and established a small town called Bulwinkle (later Crannell) (north of McKinleyville) near the mill. In 1907-1908 the company also constructed its own railroad, which brought logs to the mill from the timber tracts to the east and a line carrying milled lumber south to a junction with the Humboldt Northern just north of Strawberry Creek, where the Little River Redwood Company had a lumber yard. Thereafter, the Humboldt Northern also carried Little River Redwood lumber to its loading wharf on Humboldt Bay served by a spur track from the Humboldt Northern.¹⁶

¹³ A reverse curve is the same as an S-curve. It is a section of railroad where there is a curve in one direction immediately followed by a curve in the opposite direction.

¹⁴ J. W. Peterson and R. B. McIntosh, "A Golden Salute," *Redwood Log*, 9, No. 8 (1956): 1-2.

¹⁵ "Progress in Railroad Building," *Arcata Union*, February 10, 1906; Mengel, "A History of the Samoa Division," 55.

¹⁶ George Knab and Lynwood Carranco, "A Lumberman's Odyssey in the Land of the Redwoods," *Humboldt Historian* (January-February 1981): 3; Denny & Co. *Denny's Official Map of the County of Humboldt, California* (San Francisco, CA: Edward Denny & Co., 1911); Lentell, *Official Map of Humboldt County, California*. The name is frequently spelled Bullwinkle or Bullwinkel and John is sometimes confused with his neighbor, Conrad Bulwinkle; "Little River Redwood Company A Model Milling Institution," *Blue Lake Advocate*, January 4, 1908; Delores L. Boehl, "A Thriving Town Called Crannell," *Humboldt Historian* (March-April 1985): 27; Carranco and Sorensen, *Steam in the Redwoods*, 52-53, 212; "Little River Road Near Completion," *Daily Humboldt Standard*, March 20, 1908: 3; "Railroad Completed," *Ferndale Enterprise*, May 19, 1908: 1; "Map Showing Proposed Log Deck Areas for New Samoa Mill, 1964," Archived Map #1999.04.0110, 1964. Special Collections, Humboldt State University Library, Arcata.

It is uncertain when the Humboldt Northern completed its line all the way to Lindsay Creek. In 1911, the line went as far as Section 16, T7N/R1E, HM, northwest of Fieldbrook. This took the Humboldt Northern into the northwestern portion of the Dolbeer & Carson timber tract. By 1921, the Humboldt Northern had reached its ultimate terminus near the center of the line between sections 13 and 14, T7N/R1E, HM, about three-quarters of a mile east of the Northwestern Pacific line that ran alongside Lindsay Creek (**Illustration 2** and **Illustration 3**).¹⁷

Dolbeer and Carson sold the Humboldt Northern in 1925 to Little River Redwood, which built a new line west from Crannell (formerly Bulwinkle) to Clam Beach on the coast, where it turned south and ran along the beach before turning inland to connect with the old Humboldt Northern line about a mile north of the Mad River crossing. The new line gave Little River Redwood a shorter route to Humboldt Bay and it ceased using the section of the line that cut northwest into the Lindsay Creek watershed (**Illustration 4**).¹⁸

While the Little River Redwood had extensive holdings during this period, including a sawmill at Crannell, thousands of acres of redwood timberlands, a planning mill and docks at Fairhaven (south of Samoa), and two steamships, the company lost \$4,000,000 in seven years. Faced with bankruptcy, Little River Redwood merged with the Hammond Lumber Company in 1931, forming the Hammond and Little River Redwood Company with Hammond's directors assuming control of the entire operation. Soon after the merger, the former Little River Redwood mill in Crannell was closed and in 1933 the company name was changed to the Hammond Redwood Company (Hammond Redwood).¹⁹

Prior to the merger Hammond Lumber had assembled vast timber tracts and expanded its railroad operations. By the 1920s Hammond Lumber had timber tracts on the lower stretches of Prairie Creek and Redwood Creek, Little River, and the Big Lagoon tract (as well as along the Van Duzen River and Eel River).²⁰ To reach lands north of McKinleyville, Hammond purchased the abandoned Northwestern Pacific Railroad line from Little River Junction to Trinidad, and also a short branch line that ran along Little River. Like Little River Redwood, Hammond Lumber made Crannell a base of operations for the company's vast holdings in this area, served by an expanded the rail system to the north and east, eventually totaling 48 miles of track and nearly reaching Big Lagoon (north of Trinidad). Between 1934 and 1945, trains made as many as

¹⁷ Denny & Co., *Denny's Official Map of the County of Humboldt, California*, 1911; Belcher Abstract & Title Co., *Atlas of Humboldt Co., Cal.*, 8.

¹⁸ Mengel, "A History of the Samoa Division," 107-108; Borden, "Oregon & Eureka Railroad," 15; Carranco, *Redwood Lumber Industry*, 159; Knab and Carranco, "A Lumberman's Odyssey," 3; Carranco and Sorensen, *Steam in the Redwoods*, 58.

¹⁹ Knab and Carranco, "A Lumberman's Odyssey," 3; Carranco, *Redwood Lumber Industry*, 159; Carranco and Sorensen, *Steam in the Redwoods*, 60.

²⁰ Irvine. *History of Humboldt County, California*, 423; Belcher Abstract & Title Company, *Atlas of Humboldt County*, 1, 2, 6, 8, 9, 13.

three trips daily from Crannell to the log dump at the mill in Samoa, crossing the Mad River, bringing from 120 to 140 cars loaded with logs. A large forest fire in 1945 destroyed many of the Hammond Redwood rail lines between Big Lagoon and Crannell. These lines were never repaired and Hammond shifted to trucks for log transport to Crannell, where they were loaded onto the railroad.²¹

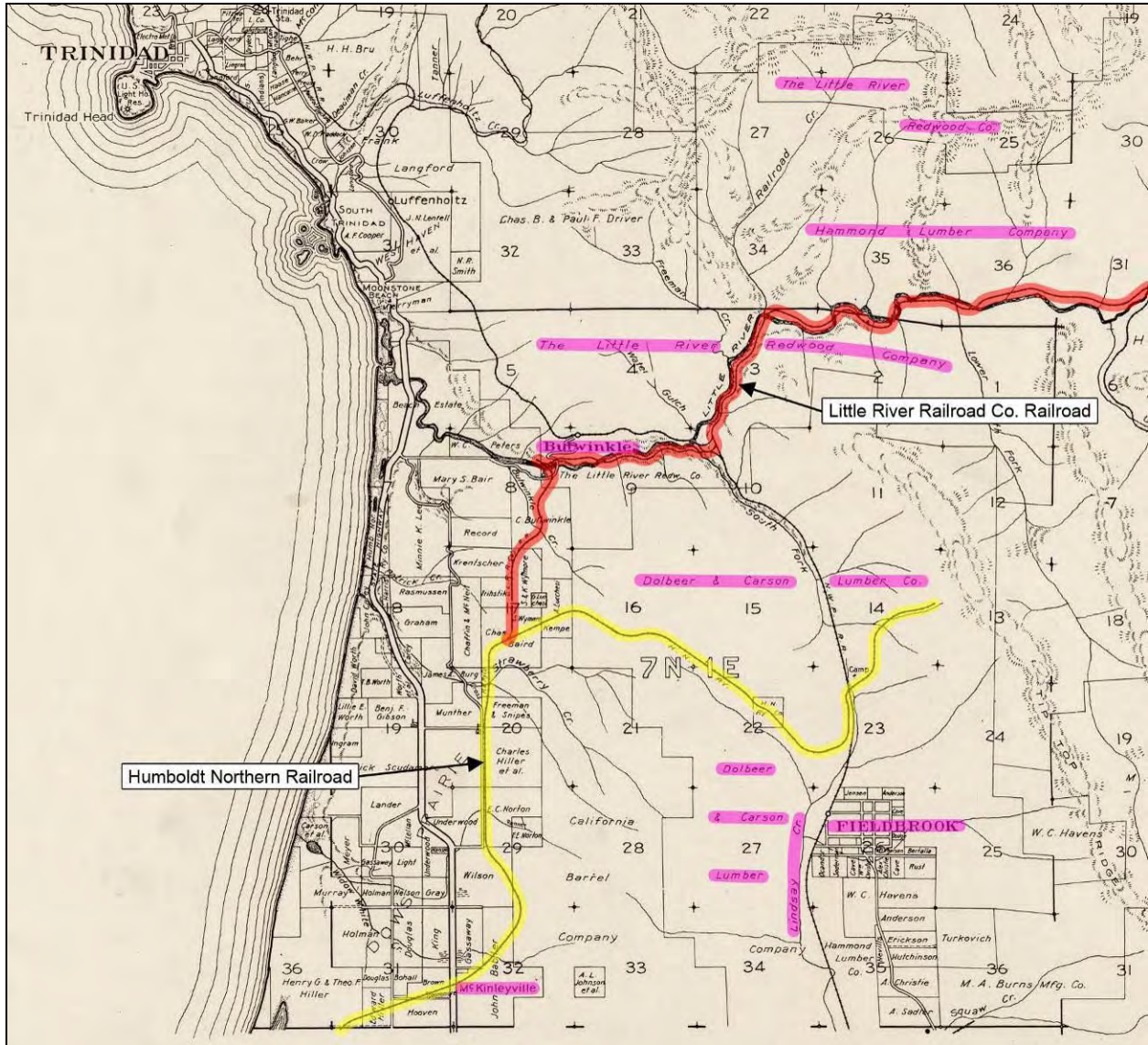


Illustration 2. Section of 1921 *Atlas of Humboldt County* north of Arcata. Relevant place names and property owner names are highlighted in pink.

²¹ Carranco and Sorensen, *Steam in the Redwoods*, 61, 66, 218-219.

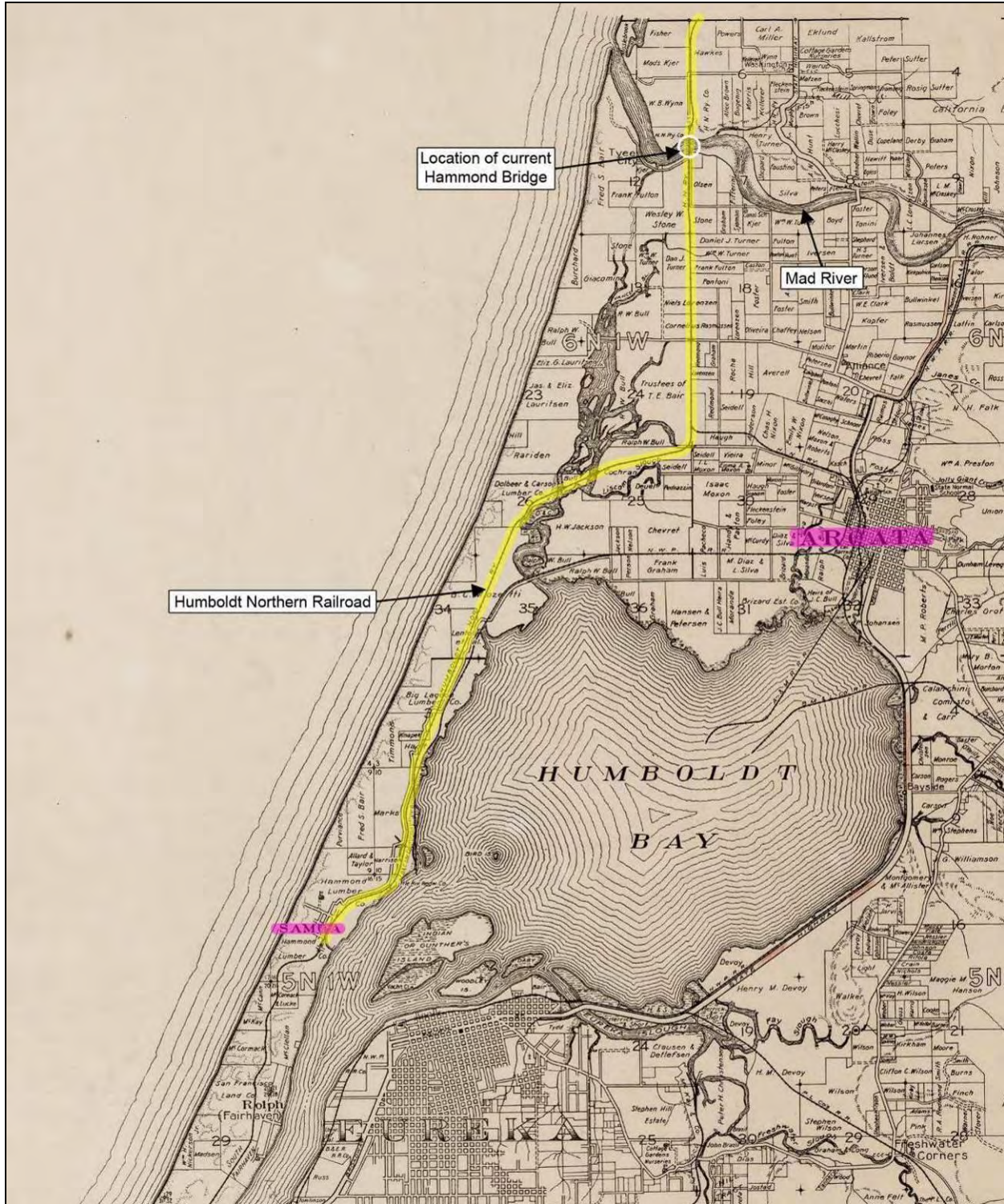


Illustration 3. Section of 1921 Atlas of Humboldt County showing Humboldt Bay area. Relevant place names are highlighted in pink.



Illustration 4. This 1941 *Eureka Quadrangle* shows the realigned Humboldt Northern running along the sand dunes of Clam Beach.

3.2. Construction of the Hammond Bridge

Among Hammond Redwood’s holdings was the covered bridge and trestle over the Mad River that was built by Dolbeer and Carson in 1905 and Little River Redwood acquired in 1925. In 1940, Hammond Redwood officials inspected the old bridge and found it structurally inadequate to carry the traffic loads required and decided to replace it with “some kind of steel bridge on concrete piers.” The company located a surplus bridge it owned in Oregon. The bridge was a 250-foot through truss span over the Nehalem River at Foss, Oregon designed in 1927-1928 by Wallace Bridge & Structural Steel Company of Seattle, Washington (**Illustration 5**). The exact date of its original installation at Foss is not known, but it is presumed to be 1928. The truss bridge was dismantled and shipped by rail to Samoa for reconstruction at the Mad River crossing. To complete the span over the Mad River a 120-foot through-girder bridge owned by the Feather River Pine Mills was also shipped from Oroville, California. The 120-foot steel girders were 10 feet high and shipped without dismantling by loading each girder on three railroad cars. This bridge weighed approximately 120 tons.²²

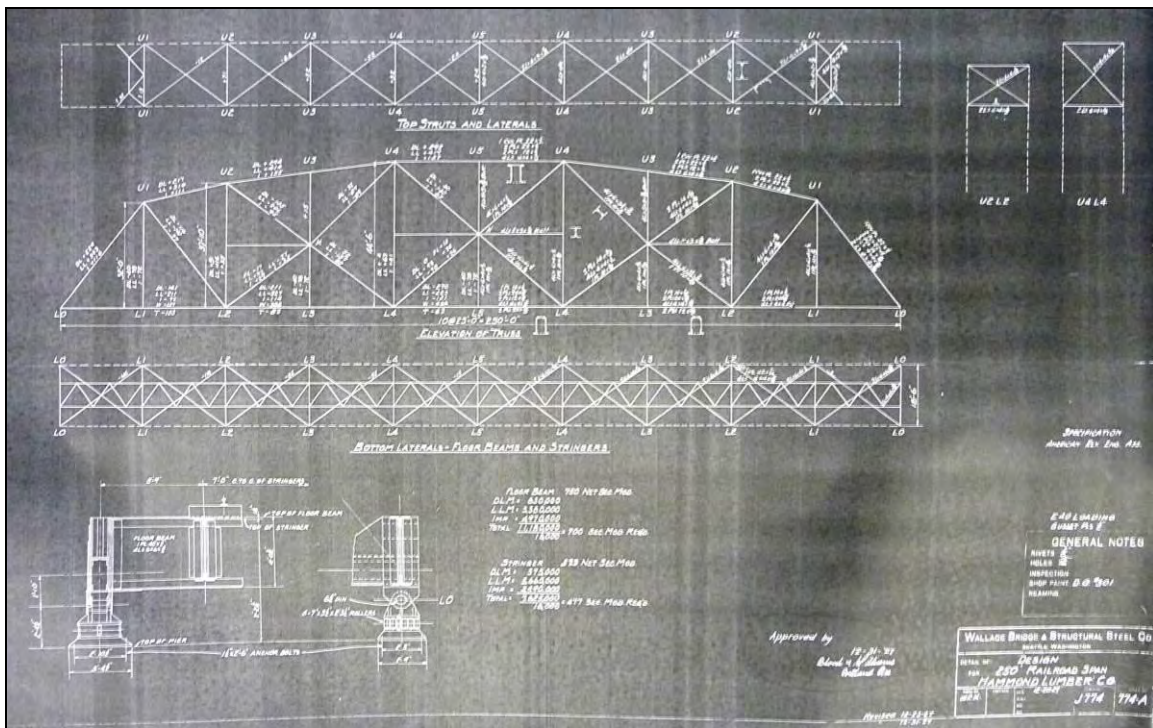


Illustration 5. Original plans for the through truss span, dated December 20, 1927. (Courtesy of Humboldt County Office of Natural Resources Planning.)

Hammond Redwood began work on the new bridge in the spring of 1941:

It was necessary to excavate and drive piling for the three piers. Approximately 132 piling were driven and about 600 yards of concrete were poured for these piers, the

²² Peterson and McIntosh, “A Golden Salute,” 2.

center pier alone requiring 350 yards of concrete. These piers were completed during the summer of 1941 and we were ready for erection of the spans which had in the meantime arrived at Samoa. In order to maintain logging traffic on the railroad while the spans were being completed it was necessary to build a by-pass trestle or “shoo-fly” alongside the existing bridge. This was a simple pile trestle which was very useful during the bridge construction as well as for carrying the log trains. It was also necessary to drive piling and erect false work under the old bridge to facilitate dismantling and to aid in the erection of the new spans. During the remainder of the summer and the fall of 1941 work was speeded on the steel erection and the bridge was completed before winter weather set in.²³

Three men, “all well-seasoned Hammond Redwood Company bridge builders,” formed the erection crew. Wes Walsh operated a Brownhurst locomotive crane, Al Thoma was the “hook-on man” who fastened the bridge sections together, and Billy McLynn was his assistant. The hand tools consisted of “a hammer, spanner wrench and a spud.” During assembly, a section of bridge was attached to one end of a cable the other end of which was attached to the crane. Thoma “would grab hold of the cable, ride the piece up and position it. When bolting the sections in place he would use a ‘monkey chair’, more a trapeze than anything else. He tied himself into his seat to keep his hands free.”²⁴ The truss bridge had arrived from Oregon in sections that were deposited at the south bank of the Mad River on a gravel bar next to the covered bridge. Each piece of the bridge had been marked with either a “left” or a “right” to designate its location on the original bridge. Thoma claimed the reconstruction crew had no overall diagram or instructions to work from when reassembling the pieces, although a copy of bridge plans are now on file at the Humboldt County Natural Resources Division office. The truss portion of the bridge was made from “high-quality” steel. However, it came without a deck, and the steel used for the replacement deck was reportedly of lower quality.²⁵

When the crew had assembled both ends of the bridge and were ready to join the halves together at the bridge’s center, they found that the key gusset plates did not match up—the structure needed camber (a slight upward convexity) for the plates to properly align. The bridge was jacked up to get the key gusset plates to match so that Thoma could bolt them. An extra piling was then added to retain the camber, and the concrete piers upon which the bridge finally rested had to have their height increased so that the camber would be permanent.²⁶

²³ Peterson and McIntosh, “A Golden Salute,” 2.

²⁴ Ray Hillman, “The Hammond Bridge,” *Whistle Punk* 16 (June 1993): 2-3; Al Thoma was one of three workers who did most of the truss bridge assembly. About 50 years afterward he described the reconstruction of the bridge to local historian Ray Hillman.

²⁵ Hillman, “The Hammond Bridge,” 2-3; Ray Hillman, telephone interview with Jerry Rohde, September 3, 2013.

²⁶ Hillman, interview with Jerry Rohde.

Near the end of the reassembly the crew suffered a distraction. As Thoma described it:

...he saw the ground waves of an earth quake coming down the Mad River, four or five feet high, as he was hanging from the “monkey chair” at the end of a boom. As the newly-bolted bridge plates banged around, he could only hope they would hold together, and fortunately, they did.²⁷

The bolts that Thoma used were temporary fasteners, used to allow for a certain necessary “play” in the bridge during its assembly. After the bridge had been erected, Hammond Redwood contracted with Mercer-Fraser Company of Eureka to replace the bolts with rivets. This locked the bridge sections more firmly in place.²⁸

When the new bridge installation was completed the new elements consisted of the 250-foot steel through-truss span, 120-foot through-girder span, and an 80-foot wood trestle added to the north end. This new combination maintained the 450-foot total distance of the 1905 bridge and allowed the new bridge to connect with 1905 wood trestles at the north and south ends (**Illustration 6**). The only elements of the 1905 bridge remaining were portions of the steel encased concrete piles that were removed to roughly the level of the water.²⁹



Illustration 6. Aerial photo from 1953 showing bridge and trestle sections on each side. This view is looking southeast.³⁰

A 1949 report provides information about Hammond Redwood’s use of the Humboldt Northern rail line in the period following construction of the Hammond Bridge. Chet Schwarzkopf, a local newspaper reporter, reported about his ride on the line, which he referred to as the “Samoa-

²⁷ Elaine Weinreb, “Uncertain future for Hammond Bridge” *McKinleyville Press*, August 12, 2008: A1.

²⁸ Hillman, interview with Rohde.

²⁹ Peterson and McIntosh, “A Golden Salute,” 2.

³⁰ Merle Shuster, Humboldt Room Photograph Collection # 2001.01.2029, Special Collections, Humboldt State University Library.

Crannell train.” Schwarzkopf did not mention the Hammond Bridge in his account, but did note that the train hauled more than logs, stopping at the base of the bluffs below the McKinleyville airport at Navy Siding, which was “equipped with pipelines and a heavy pump” where tank cars were dropped off and their loads of gasoline were pumped up to the airport. The train then crossed Highway 101 on an overhead bridge and completed the 17-mile trip to Crannell. The train made two round-trips a day, running five (previously six) days a week.³¹ After the 1945 fire of the Hammond Redwood rail lines south of Big Lagoon, noted above, the Crannell terminus served as the location where logs were transferred from logging trucks that were too wide for use on public highways onto the trains. Schwarzkopf described the trip to Samoa with a load of 44 railcars carrying logs and weighing “at least a 1,200 tons.” The train climbed two grades on the way to Samoa, one to reach the 101 Highway overpass west of Crannell and another to go from the beach to the benchland west of McKinleyville. At the Hammond Bridge “the train stops for a quick inspection” and took on water and continued to the Samoa mill’s log dump where it unloaded in 20 minutes.³²

The Hammond Bridge has been adequately built to withstand the heavy loads of the timber trains, reportedly able to carry a maximum load of 5,590 tons. In December 1955, the structure displayed a different type of strength when it was “seriously threatened by high waters” but remained intact. The following year the bridge’s strength was touted as follows:

Today this bridge carries approximately 250,000 to 300,000 board feet of logs per day to Samoa and continues to be one of the main lines furnishing logs to Plants No. 1 and No. 2. Should disaster overcome this bridge, as nearly took place in last winter’s flood, it would take quite a fleet of trucks a day to carry on.³³

During this time period, Hammond Redwoods’s Crannell operation was gradually being phased out and replaced by the Big Lagoon camp. Crannell was eventually abandoned. Hammond Redwood sold all of its assets to the Georgia-Pacific Corporation of Atlanta, Georgia in 1956, including the mill at Samoa, and became a subsidiary called the Hammond-California Redwood Company. At the time Hammond Redwood owned about 120,000 acres of timberland in Humboldt County and mills at Samoa, Eureka, Big Lagoon, and Orick.³⁴

3.3. Decommissioning the Hammond Bridge and Construction of Hammond Trail

Georgia-Pacific (GP) stopped hauling logs and lumber on the Humboldt Northern line in 1961. The Hammond Bridge ceased to be used for rail traffic and the track and ties from Crannell to

³¹ Chet Schwarzkopf, “Logging Railroad One Of Humboldt’s Skilled Jobs,” *Humboldt Times*, May 1, 1949: 23.

³² Schwarzkopf, “Logging Railroad One Of Humboldt’s Skilled Jobs,” 23, 25.

³³ Weinreb, “Uncertain future for Hammond Bridge,” A1; Mengel, “A History of the Samoa Division,” 163; Peterson and McIntosh, “A Golden Salute,” 3.

³⁴ Mengel, “A History of the Samoa Division,” 149; “Hammond’s Sold!,” *Humboldt Times*, 24 May 1956, 1; “The 40-Year-Old Samoa Pulp Plant May Be in its Death Throes,” *The Times-Standard*, 17 September 2009.

Samoa were removed between 1963 and 1966. The Hammond Bridge over the Mad River was left intact, but the long wooden trestles at either end were removed.³⁵ In 1972, the Louisiana-Pacific Corporation (LP), a subsidiary of GP, acquired the GP holdings, including the railroad right-of-way. LP granted a right-of-way and easement to the Humboldt Bay Wastewater Authority (HBWA) in 1977, which allowed HBWA to construct a pipeline across the Hammond Bridge to transport sewage from the McKinleyville Community Services District's sewer system, which began operating 1978. The pipeline carried McKinleyville's sewage south across the Mad River to the City of Arcata's treatment plant.³⁶

The Hammond Bridge acquired its current use in the early 1980s. In 1981, LP conveyed an easement deed to the County of Humboldt for the purpose of constructing and maintaining a multi-purpose trail over the bridge. The Humboldt County Board of Supervisors executed an agreement with the HBWA and the McKinleyville Community Services District for the county's use of the bridge "as part of the Hammond Trail." The agreement noted that the "bridge is no longer used for railroad purposes and is primarily used to carry a sewer interceptor line...across the Mad River." The agreement also noted that the bridge was then owned by the HBWA, and that HBWA would transfer title to bridge to the McKinleyville Community Services District upon termination of the HBWA, which occurred in 1982.³⁷ The Humboldt County Department of Public Works completed the "Hammond Trail" multipurpose path across Mad River in 1983. The project included the construction of new approach embankments at each end of the bridge and new approach bridges that connected the embankments with the structure that had been installed in 1941. The approach bridges had concrete abutments, piers, and steel girder decks. The bridge's wooden handrail, walkway, and remaining crossties were removed. New I-beams were laid on top of the original bridge beams followed by 20-gauge bridgeform and a layer of structural concrete with a rough broom finish. The bridge's structural steel was cleaned and

³⁵ Hammond-California Redwood Company, Bargain and Sale Deed to Georgia-Pacific Corporation, Humboldt County Official Records (692)108. Copy in Hammond Bridge files, Humboldt County Natural Resources Office; Carranco and Sorensen, *Steam in the Redwoods*, 67, 69; "County 'Not Interested' in GP's Offer Of Manila Right-of-Way," *Humboldt Times*, March 3, 1965, 2; Carranco and Sorensen, *Steam in the Redwoods*, 69.

³⁶ Georgia-Pacific Corporation, Deed to Louisiana-Pacific Corporation, Humboldt County Official Records (1170)554. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Carranco, *Redwood Lumber Industry*, 166; Louisiana-Pacific Corporation, Grant of Easement to Humboldt Bay Wastewater Authority, Humboldt County Official Records (1452)10. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Jack Durham, "McKinleyville pursues massive sewer upgrade" *McKinleyville Press*, January 23, 2013.

³⁷ Louisiana-Pacific Corporation, Easement Deed to County of Humboldt, Humboldt County Official Records (1643) 1053. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Humboldt Bay Wastewater Authority, Grant of Easement to McKinleyville Community Services District, Humboldt County Official Records (1663) 337. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Humboldt County Board of Supervisors, "Agreement for use of Mad River Bridge as part of Hammond Trail," August 4, 1981. Copy in Hammond Bridge files, Humboldt County Natural Resources office.

painted and the sewer pipeline, which was on the outside of the downriver side of the bridge, remained in place.³⁸ (See **Photographs 1 – 4.**)

In 1991 the Humboldt County Board of Supervisors entered into a revised agreement with the McKinleyville Community Services District regarding the two entities' responsibilities for the bridge. HBWA no longer existed and the McKinleyville Community Services District was now the owner of the bridge. The county agreed that bridge maintenance would be on a 10-year cycle and that the county would pay one-half the maintenance cost.³⁹ The bridge has continued to be used by pedestrian and cyclists. The structure has also continued to deteriorate.

3.4. Steel Truss Bridge Engineering, Design and Construction

Steel truss bridges were built in great numbers on California roads and highways starting in the late nineteenth century. After the end of World War I, newer materials and designs, especially concrete arches and girders, began to replace steel trusses for new bridge construction. In the 1930s, 1940s, and 1950s, steel trusses continued to play an important role in bridge construction in California, particularly in Northern California. Of the steel truss bridges remaining in the state from this period, the most common truss type is the Warren truss. This is followed by the Pratt truss and its variables such as the Parker truss and Camelback truss. The other notable truss type used during this period was the Bailey truss, a type developed by the military during World War II. The greatest concentration of existing steel truss bridges are in the northern portion of the state. The concentration of this bridge type in Northern California can be attributed to the ease and lower expense of transporting dismantled steel bridges relative to concrete.⁴⁰

In general, truss bridges are classified by the position of the deck, or roadway, in relation to the trusses. Through truss bridges carry the deck on the lower chord, or support, with lateral supports overhead. The through truss configuration was used for large structures with long spans, but because it was closed overhead, the vertical clearance was restrictive. A variation on the through bridge is the pony truss bridge which carries the deck on the lower chord, but has no lateral overhead supports.

³⁸ County of Humboldt, Department of Public Works, "Project Plans for Construction of 'Hammond Trail' Multipurpose Path across Mad River." Copy in Hammond Bridge files, Humboldt County Natural Resources office; County of Humboldt, Department of Public Works, "Project Plans for Construction of 'Hammond Trail' Multipurpose Path across Mad River."

³⁹ Humboldt County Board of Supervisors, "Agreement for use of Mad River Bridge as part of Hammond Trail," July 30, 1991. Copy in Hammond Bridge files, Humboldt County Natural Resources office.

⁴⁰ Carl W. Condit, *American Building Art: The Twentieth Century*, (New York: Oxford University Press, 1961), 207-211; JRP Historical Consulting and Caltrans, "Caltrans Historic Bridge Inventory Update: Metal Truss, Moveable, and Steel Arch Bridges," Sacramento, CA: California Department of Transportation, 2004; California Department of Transportation, *Historic Highway Bridges of California* (Sacramento, 1990), 43-48.



Photograph 1. Two main spans of the Hammond Bridge. Note the two piles just above the water surface from the original bridge, camera facing southeast, September 25, 2013.



Photograph 2. Span 3 showing deck and sewage line at right, camera facing south, September 25, 2013.



Photograph 3. North bridge approach built in 1983, camera facing southeast, September 25, 2013.



Photograph 4. North bridge approach built in 1983, camera facing southwest, September 25, 2013.

Pony trusses were more commonly used for smaller bridges with short spans. Deck truss bridges carry the deck on the top chord with the truss below. Deck trusses were increasingly used during the 1930s, 1940s, and 1950s, as they could be built to carry greater loads and caused no problem with vertical clearance.

The Hammond Bridge is a Parker Truss bridge, which is a variation of the Pratt Truss. Historian Carl Condit called the Pratt the “first scientifically designed truss.” It was invented by Thomas Pratt, a Boston-born architect-engineer, and Caleb Pratt, his father. Thomas Pratt was active in bridge design from the 1830s through the mid-1870s. He patented the Pratt truss form in 1844, describing the design as useful in wood and iron, or in iron alone. The truss was distinctive in that it included vertical compression members and diagonal tension members. As Thomas Pratt had foreseen, this form was especially adaptable to the all-metal bridges that were built in the United States in large numbers after the end of the Civil War, first in iron and later in steel.⁴¹

In time, variations developed building upon the basic Pratt design, but with improvements to facilitate longer spans and greater loads. These variations were also given proper names, reflecting their inventor or place of origin. The three most important variations on the Pratt truss were the Parker truss, the Pennsylvania Petit, and the Baltimore Petit design. Railroad companies erected Pratt truss bridges in great numbers, and this bridge type was also used on many highways during the late nineteenth and early twentieth century.⁴²

In the 1870s, as trains began to carry larger and heavier loads, engineers devised variations on the Pratt truss which enabled them to span longer distances and carry greater loads. The Parker truss was advancement in bridge engineering at the time as an evolution of the Pratt truss. This truss type, developed by C.H. Parker around 1870, is a Pratt truss with a polygonal top chord. Stronger than a regular Pratt truss because of its arched top chord, the Parker truss was used for longer spans and remained popular well into the twentieth century. Similarly, the Camelback truss is a variation on the Parker truss, as its arched top is formed by exactly five slopes rather than a single or multiple arched top chord. The Camelback’s design was popular across the United States because of its economical cost and improved stress distribution. This design created lighter structures without losing strength and was often the most economical truss for many railroad and highway spans.⁴³ Railroads also took advantage of a new truss that utilized sub-struts and sub-ties to provide additional support. The Baltimore and Ohio Railroad initially built several of this new form, which earned it the name “Baltimore Petit,” in 1871. In 1875, the

⁴¹ Carl W. Condit, *American Building Art: The Nineteenth Century*, (New York: Oxford University Press, 1960), 109.

⁴² T. Allan Comp and Donald C. Jackson, “Bridge Truss Types: A Guide to Dating and Identifying,” *American Association for State and Local History Technical Leaflet 95*, *History News* 32 (1977): 1-12.

⁴³ T. Allan Comp and Donald Jackson, “*Bridge Truss Types*,” 1-12.

Pennsylvania Railroad added an arched top chord and called its version the “Pennsylvania Petit.” Other railroad lines gradually adopted these two styles, and later these truss types were adapted for highway use.⁴⁴

Girder bridges have been built for railroads since the mid-nineteenth century. Innovation of girder bridges came in response to a need for bridges stronger than basic wood beam bridges which preceded it. The additional strength of a girder bridge is derived from its deeper cross section relative to wood beam bridges. Two main girder types evolved: deck girder and through girder. In the deck girder design, the railroad is laid above the side girders. In the through girder design, the track is laid between the side girders, which extend above the tracks. Through girder bridges were often preferred when clearance under the bridge was a concern. Girder bridges remained a popular choice in railroad construction because they were simple, inexpensive, and easy to install.⁴⁵

3.5. Other Extant Steel Truss Railroad Bridges in Humboldt County

There are multiple extant steel truss railroad bridges in Humboldt County to which the Hammond Bridge can be compared. Four are on the former Northwestern Pacific Railroad and were built by the Mercer-Fraser Company of Eureka. Another bridge, also built by Mercer-Fraser, is on the former Arcata & Mad River Railroad that spans the Mad River upstream from the Hammond Bridge. All five of these bridges were built between 1910 and 1914 and none are currently in use.⁴⁶

The four bridges on the former Northwestern Pacific line were constructed as the railroad was being built through Humboldt County. These are the Cain Rock Bridge, South Fork Bridge, Larabee Creek Bridge, and Van Duzen River Bridge. All include through steel truss spans that have pin connections, which were large bolt connections, the technology of which was replaced by rivet technology in subsequent decades. The Cain Rock Bridge, constructed in 1913, is located at railroad milepost 206.51 and crosses the Eel River approximately two miles south of the town of Alderpoint. It consists of three 200-foot truss spans and eight deck plate girder spans. The South Fork Bridge is located at railroad milepost 237.75. It crosses the main Eel River immediately upstream from the confluence with the South Fork Eel and consists of one 180-foot and one 200-foot truss span dating from 1910 and two 200-foot riveted truss spans dating from 1965 (**Photograph 5**). It is immediately north of the site of the former town of South Fork. The

⁴⁴ T. Allan Comp and Donald Jackson, “*Bridge Truss Types*,” 1-12; California Department of Transportation, *Historic Highway Bridges of California* (Sacramento, CA: California Department of Transportation, 1990), 45; Carl W. Condit, *American Building: Materials and Techniques From the First Colonial Settlements to the Present* (Chicago, IL: University of Chicago Press, 1968), 143.

⁴⁵ Anthony J. Bianculli, *Trains and Technology: The American Railroad in the Nineteenth Century, Volume 4: Bridges and Tunnels, Signals* (Newark, Delaware: University of Delaware Press, 2003), 27, 28.

⁴⁶ Irvine, *History of Humboldt County, California*, 423.

two newer spans replaced sections washed out by the 1964 flood. The Larabee Creek Bridge is located at milepost 242.00 and is comprised of two 150-foot truss dating from 1910. It is located immediately east of Larabee Road in the small community of Larabee. The Van Duzen River Bridge is located at milepost 261.78 and consists of three truss spans of 160 feet each and nine 30-foot precast concrete spans. The truss spans date from 1913 and the concrete spans from 1970. The bridge is directly east of Highway 101 approximately one mile south of the town of Alton.⁴⁷

The Mad River Bridge spans the Mad River on the line of the former Arcata & Mad River Railroad. The Arcata & Mad River Railroad ran from a wharf at the northern end of Humboldt Bay eastward to the lumber mill town of Korbel, east of Blue Lake. The line delivered supplies and goods to these communities in the lower Mad River area and hauled out lumber products. The wooden bridge at this crossing was replaced in 1914 by the current steel truss bridge which consists of three, 165-foot spans with concrete piers. The bridge is a short distance south of Highway 299 near the community of Glendale.⁴⁸



Photograph 5. South Fork Bridge on the Eel River, camera facing east, September 26, 2013.

⁴⁷ David R. Anderson. “North Coast Rail Authority Capital Assessment Report” (Santa Ana, CA: Willdan/HNTB, 2002), Table 10-B, Table 10-C; Fred A. Stindt and Guy L. Dunscomb, *The Northwestern Pacific Railroad* (Kelseyville, CA: Fred A. Stindt, 1987), 112, 113; Irvine. *History of Humboldt County, California*, 420.

⁴⁸ Stanley T. Borden, “Arcata & Mad River,” *Western Railroader*, 17 no. 8 (1954); James Roscoe and Susie Van Kirk, “A Cultural Resources Study of Proposed Gravel Extraction Areas on the Mad River, Humboldt County, California,” (Eureka: Humboldt County Planning Department, 1993), 11; Irvine. *History of Humboldt County, California*, 423.

4. FINDINGS AND CONCLUSIONS

The Hammond Bridge is the only property in the APE that required evaluation for this project. This property does not appear to meet the criteria for listing in the NRHP or CRHR because it lacks historic significance. The bridge has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlines in Section 5024.1 of the California Public Resources Code. For CEQA compliance, the Hammond Bridge does not qualify as a historical resource.

Evaluation

The Hammond Bridge does not have important associations with significant historic events, patterns, or trends of development (NRHP Criterion A/CRHR Criterion 1). This bridge is associated with the development of the timber industry in the Humboldt Bay region. While the timber industry was integral to the development of this region, and this railroad line was owned by some prominent lumber companies and served some of the biggest mills, the Hammond Bridge does not have strong or important associations with that development. The Hammond Bridge was built in 1941 by the Hammond Redwood Company on the company's Humboldt Northern Railroad line. It was a replacement of an earlier bridge constructed in 1905 as part of the original Humboldt Northern Railroad line, then owned by Dolbeer & Carson Lumber Company. As such, the Hammond Bridge was built long after the establishment of the timber industry in the area and after the large-scale development of timber resources in the area north of Arcata, which was facilitated by the construction of the Humboldt Northern Railroad in 1905. The Hammond Bridge was along one of multiple rail lines in the region and its construction merely allowed for the continuation of patterns and practices that had been occurring for decades and is not, therefore, historically significant within the context of the development of the timber and milling industry in this area.

Under NRHP Criterion B/CRHR Criterion 2, this property is not significant for an association with the lives of persons important to history. This bridge is associated with Andrew Hammond, the owner of the Hammond Redwood Company when this bridge was built. Hammond was a lumber entrepreneur who had established successful lumber operations in Montana before pursuing interests in Humboldt County beginning in 1900 and again attaining success with the Hammond Redwood Company. To be eligible under this criterion, a property must have strong associations and best represent a person's important contributions to history. While Andrew Hammond could potentially be considered a person important to history, he owned many other properties such as saw mills and the Hammond Bridge is not an important structure that illustrates his achievements and historic contributions.

The Hammond Bridge is not significant as an important example of a type, period, or method of construction, it does not possess high artistic qualities, and is not the work of a master (NRHP Criterion C/CRHR Criterion 3). The historic elements of the bridge are the utilitarian through

truss section and the through girder section. The through truss section was designed in 1927-1928 by Wallace Bridge & Structural Steel Company of Seattle, Washington and moved to its current location in 1941. The through girder section was taken from another bridge and assembled at this location with the truss. Innovation and common use of both the through truss and through girder type bridges for railroads occurred in the nineteenth century, preceding the fabrication of these sections of the Hammond Bridge by decades. In addition, there are five other extant steel truss bridges in Humboldt County as discussed in the historic context. All of these five bridges are older than the Hammond Bridge and use pin-connections to join the elements of the bridge, rather than rivets that are a later fastening technology. The Hammond Bridge, therefore, is not important for its design, type or engineering and is not a rare example of the steel truss bridge in Humboldt County. In addition, this property is not significant as a source or likely source of important information regarding historic construction materials or technologies (NRHP Criterion D or CRHR Criterion 4).

In addition to lacking historical significance, the Hammond Bridge has undergone several alterations over the years that diminished its historic integrity. The bridge was moved from its original location, but it has not been moved since construction in this location. Alterations that have diminished bridge's integrity of design, materials, and workmanship include the removal of its railroad features, including the trestle that flanked either end of the river crossing, as well as its tracks and ties. Furthermore these aspects of integrity have been diminished with construction in the early 1980s of Spans 1, 2, 5 and 6; construction of earthen approaches; construction of new abutments and column piers; installation of wood and steel floor beams on Spans 3 and 4, installation of a new deck and conversion to a bicycle/pedestrian bridge; and the installation of sewage pipe. Although the bridge retains integrity of setting, its integrity has been diminished in other aspects including feeling and association as the bridge illustrates only a modest connection to and expression of its historic use as a railroad bridge.

Below the current bridge and extending just above the water-line are remnants of the original steel encased concrete piles from the 1905 bridge. These pile remnants are associated with the original Humboldt Northern Railroad line and the Dolbeer & Carson Lumber Company operations. The pile remnants are components of the demolished 1905 bridge and the piles themselves have been largely demolished. As such, they lack integrity of design, materials and workmanship, feeling and association. In addition, these piles do not have strong associations with the lives of persons important to history and are not important for their engineering or design. These piles, therefore, are not eligible for listing in the NRHP or CRHR.

Conclusions

The following summarizes the conclusions of this report:

- Properties listed in the NRHP: **None**
- Properties previously determined eligible for the National Register: **None**
- Properties previously determined ineligible for the NRHP: **None**
- Properties determined eligible for the NRHP as a result of current study: **None**
- Properties determined not eligible for the NRHP as a result of current study: **None**

Name	Address/Location	County	OHP Status Code	Map Reference
Hammond Bridge	Mad River	Humboldt	6Z	N/A

- Resources that are historical resources for the purposes of CEQA: **None**
- Resources that are not historical resources under CEQA, per CEQA guidelines §15064.5, because they do not meet the CRHR criteria outlined in PRC §5024.1:

Name	Address/Location	County	OHP Status Code	Map Reference
Hammond Bridge	Mad River	Humboldt	6Z	N/A

Steven J. Melvin, who meets the Professionally Qualified Staff Standards in Section 106 PA Attachment 1 as an Architectural Historian, has determined that the only other properties present within the APE meet the criteria for Section 106 PA Attachment 4 (Properties Exempt from Evaluation).

5. PREPARERS' QUALIFICATIONS

This HRER was conducted under the general direction of Christopher D. McMorris (M.S., Historic Preservation, Columbia University, New York), a partner of JRP with 15 years of experience conducting these types of studies. Mr. McMorris provided overall project direction and guidance, and reviewed and edited this report. Based on his level of experience and education, Mr. McMorris qualifies as both an architectural historian and historian under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

JRP Staff Architectural Historian Steven J. Melvin (M.A., Public History, California State University, Sacramento) was the lead historian for this project. Mr. Melvin conducted fieldwork and research, wrote the contextual statement and property evaluation, and prepared the HRER and DPR 523 form. Mr. Melvin qualifies as an architectural historian and historian under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

Jerry Rohde (M.A., Awareness, California State College, San Bernardino) is an independent historian who conducted research and prepared text included in the historic context in this report. Mr. Rohde's experience includes writing several Humboldt County guidebooks and being a regular contributor to the Humboldt County Historical Society's *Humboldt Historian*. Mr. Rohde is also affiliated with the Cultural Resources Facility, Department of Anthropology, Humboldt State University. He qualifies as a historian under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

JRP Research Assistant Heather Miller (M.A., Public History, California State University, Sacramento – in progress) assisted in fieldwork, research, and preparation of the HRER and DPR 523 form.

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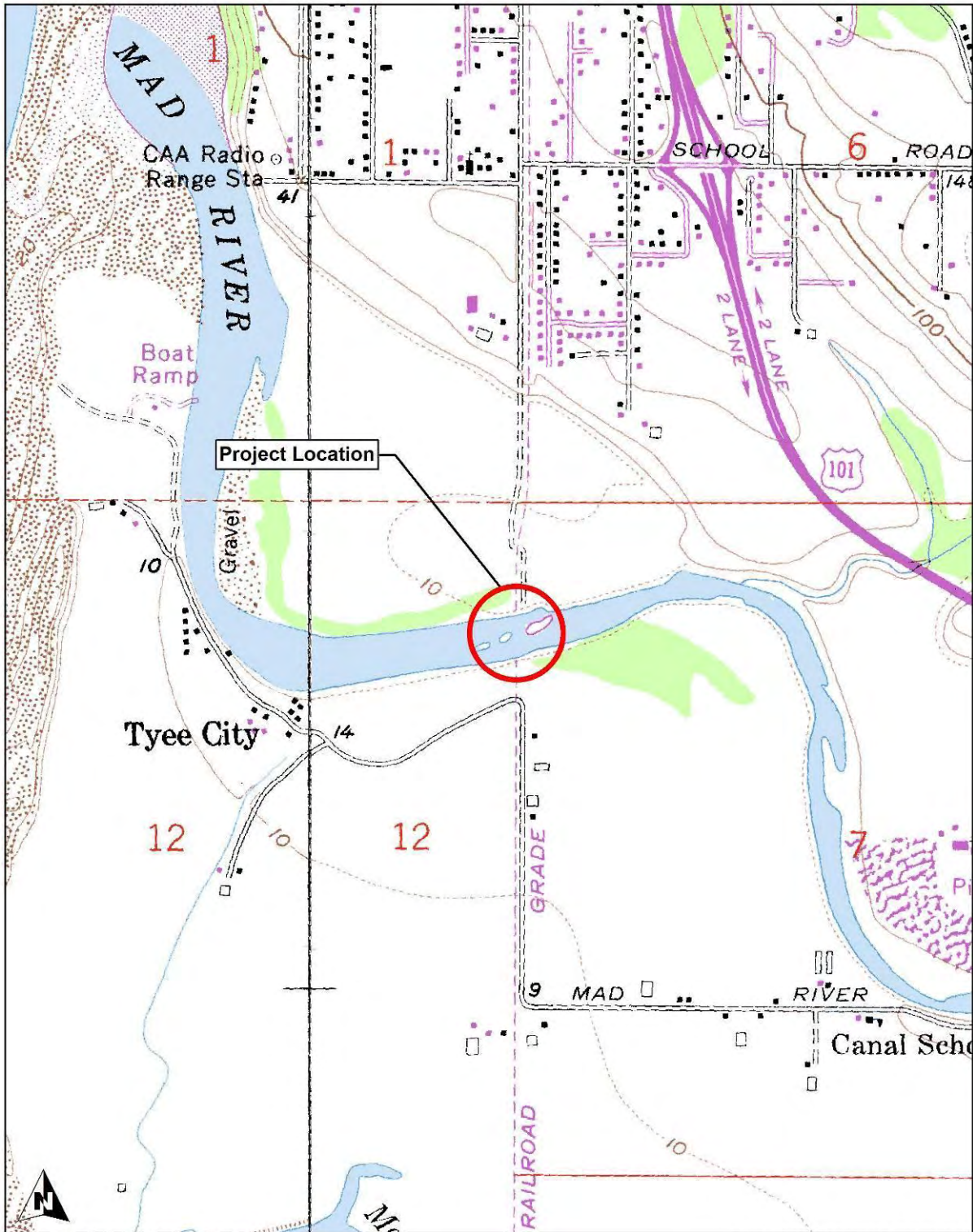
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APPENDIX A

Figures



Figure 1. Project Vicinity and Site Map



Source: U.S. Geological Survey, 7.5 minute series, Arcata North, CA (1959, photorevised 1972), and Tye City, CA (1959, photorevised 1972).

Figure 2. Project Location



<p>LOCAL AGENCY APPROVAL  HUMBOLDT COUNTY ENVIRONMENTAL REP. DATE: 02/24/14</p>	<p>CALTRANS APPROVAL  CALTRANS DISTRICT 1 PROFESSIONALLY QUALIFIED STAFF DATE: 2/25/14</p>	<p>CALTRANS DLAE APPROVAL  COUNTY LOCAL ASSISTANCE DIVISION DATE: 2/25/14</p>	<p>COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS NATURAL RESOURCES DIVISION 1108 SECOND STREET • EUREKA • CA • 95501 TEL (707) 445-7741 • FAX (707) 445-7469</p>	<p>HAMMOND TRAIL BRIDGE REPLACEMENT RPSTPLE 59041231 AREA OF POTENTIAL EFFECT MAP</p> <p>SHEET 1 OF 1 SHEETS</p>
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Figure 3. Area of Potential Effects (APE)

APPENDIX B

DPR 523 Forms

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 25

*Resource Name or #: (Assigned by recorder) Hammond Bridge

P1. Other Identifier: Hammond Trail Bridge

*P2. Location: Not for Publication Unrestricted
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*a. County: Humboldt

*b. USGS 7.5' Quad: Arcata North Date: 1959 (photorevised 1988) T: 6N; R: 1W; Sec: 12; **H.B.M.**

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Bridge over Mad River between of Mad River Road and Fischer Road on the Hammond Trail

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Hammond Bridge over the Mad River is a former railroad bridge and is now a bicycle / pedestrian bridge comprised of six spans totaling about 540 feet (**Photograph 1**). Spans 1 and 2, on the north side, and 5 and 6 on the south side are the approaches to the two main spans: Spans 3 and 4. Span 4 is a Parker through-truss bridge 250 feet long (**Photographs 2 – 8**). It is made of riveted steel with steel stringers, steel and wood floor beams and cross-bracing along the bottom. At its highest point the bridge is 44 feet, 6 inches high and is 18 feet, 6 inches wide. Span 3 is a riveted steel through-plate girder span 130 feet long with ten foot high girders. On the inside of the girders are triangular steel gusset plates. This span has steel stringers, steel and wood floor beams and cross-bracing along the bottom. Supporting Spans 3 and 4 are three concrete pier walls (**Photographs 9 – 12**). (See Continuation Sheet.)

*P3b. Resource Attributes: (List attributes and codes) HP19—Bridge

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) **Photograph 1. Spans 3 (foreground) and 4, camera facing southeast, September 25, 2013.**

*P6. Date Constructed/Age and Sources:
 Historic Prehistoric Both
1928, 1941, 1983 (Redwood Log; Humboldt County)

*P7. Owner and Address:
Humboldt County
Public Works Department
1106 2nd Street
Eureka, CA 95501

*P8. Recorded by: (Name, affiliation, address)
Steven J. Melvin and Heather Miller
JRP Historical Consulting, LLC
2850 Spafford Street
Davis, CA 95618

*P9. Date Recorded:
September 25, 2013

*P10. Survey Type: (Describe)
Intensive



*P11. Report Citation: (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, "Historical Resources Evaluation Report, Hammond Bridge Replacement Project, Humboldt County, California," 2014.

*Attachments: None Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record
 District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record
 Other (list) _____

DPR 523A (1/95)

*Required Information

B1. Historic Name: Humboldt Northern Railroad Bridge

B2. Common Name: Hammond Bridge; Hammond Trail Bridge

B3. Original Use: railroad bridge B4. Present Use: bicycle / pedestrian bridge

*B5. Architectural Style: through truss, through girder, rolled girder

*B6. Construction History: (Construction date, alteration, and date of alterations) Span 4: 1928; Span 3: unknown; Spans 1, 2, 5, 6: 1983; installation of sewage pipe: 1978; conversion from railroad to bike/ped bridge in 1983 including removal of trestle, removal of railroad tracks and ties; construction of new abutments and column piers for approach sections, installation of wood and steel floor beams on Spans 3 and 4, installation of new deck, construction of earthen approaches.

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Span 4: Wallace Bridge and Structural Steel Company; Span 3: unknown; Spans 1, 2, 5, 6: County of Humboldt

b. Builder: Hammond Redwood Company

*B10. Significance: Theme Logging/Railroad Area Humboldt County

Period of Significance 1941 Property Type Bridge/Structure Applicable Criteria n/a

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The Hammond Bridge does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), nor does it appear to be an historical resource for the purposes of California Environmental Quality Act (CEQA). This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code.

(See Continuation Sheet.)

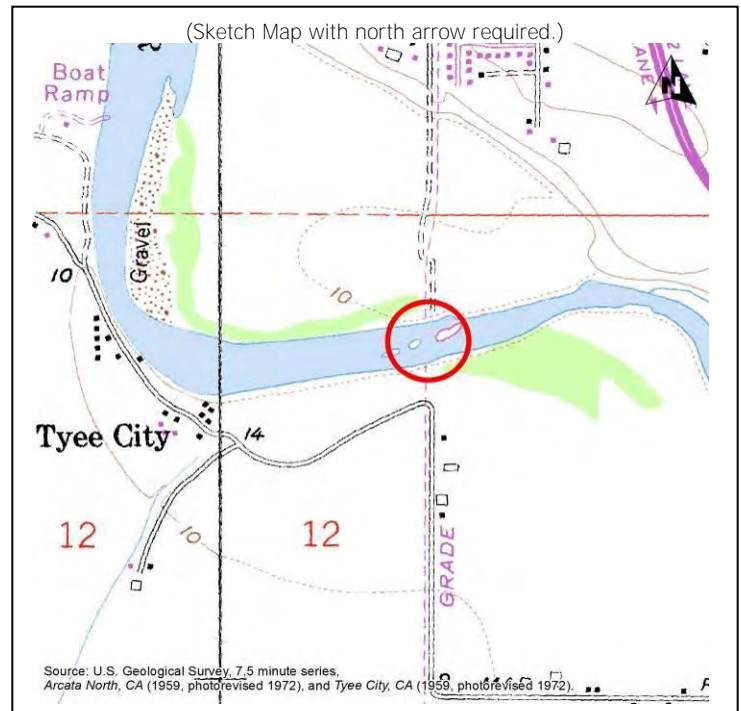
B11. Additional Resource Attributes: _____

*B12. References: Irvine, *History of Humboldt County*; Belcher, *Atlas of Humboldt Co.*; Carranco, *Redwood Lumber Industry*; Carranco and Sorensen, *Steam in the Redwoods*; Mengel, "A History of the Samoa Division"; Denny & Co., *Official Map of the County of Humboldt*; Knab and Carranco, "A Lumberman's Odyssey"; Hillman, "The Hammond Bridge"; Hammond Bridge files, Humboldt County Natural Resources Office; See also footnotes.

B13. Remarks:

*B14. Evaluator: Steven J. Melvin

*Date of Evaluation: October 2013



P3a. Description (continued):

Spans 1, 2, 5 and 6 are identical in design and function as the approaches to the main spans (**Photographs 13 – 17**). Each of these is a 40 feet long rolled steel girder span with steel floor beams. They are supported in the center by concrete columns with hammerhead bent caps and at each end by concrete abutments and concrete pier walls. These two pier walls of the bridge also support the north end of Span 3 and the south end of Span 4.

The bridge deck is 8 feet wide and made of a non-composite reinforced concrete (**Photograph 3**). The concrete is poured on corrugated metal floor decking. On Spans 3 and 4, the deck rests on eight-by-eight timber floor beams spaced 16 to 20 feet apart with smaller steel beams at six foot intervals which are supported by the bridge girders and beams (**Photograph 6**). On both sides of the deck is a chain link fence about eight feet high. The bridge also carries a 16-inch iron sewer pipeline which runs adjacent to the deck on the west side.

The current condition of the bridge is generally poor. Throughout the bridge there is moderate to severe rust and corrosion. The most acute corrosion is on the through-plate girder and through-truss sections of the bridge. On these sections the deterioration of material has advanced to such an extent that significant section loss has occurred in the girders, gusset plates, floor beams, stringers, connection panels and cross bracing.

Remnants of the original steel encased concrete piles are visible below the bridge just above the water surface (**Photographs 1 and 2**). There are two piles below Span 3 and two below Span 4. Another pile is next to the west side of the north approach span. These cylindrical piles are about five feet in diameter and are composed of concrete encased in steel. The piles have been demolished down to a point just above the water line. Also in the river channel near the bridge are several clusters of small wood piles. The origins of these piles could not be confirmed, but possible origins include: falsework, pier deflector, streambank deflector, and shoofly piers.

B10. Significance (continued):

Historic Context

The Hammond Bridge spans the Mad River in a rural part of Humboldt County north of Humboldt Bay and Eureka, about four miles northwest of Arcata and one and a half miles south of McKinleyville. The bridge is about two miles from the mouth of the river at the Pacific Ocean on a flat coastal plain, only about 10 feet above sea level, known as the Arcata Bottoms. The primary land use in the immediate area around the bridge is, and has been, agriculture, specifically grazing dairy cattle. In the greater region, logging and lumber milling have played a major role in its development. The current Hammond Bridge was built in 1941 by the Hammond Redwood Company on the company's Humboldt Northern Railroad line, replacing an earlier bridge (**Illustration 1**) constructed in 1905 by the Dolbeer & Carson Lumber Company. Hammond Redwood Company formed in 1933 following a merger between the Hammond Lumber Company and Little River Redwood Company, the latter of which had acquired the Humboldt Northern Railroad from Dolbeer & Carson in 1925. These lumber companies were among the most successful in the Humboldt Bay area during the late nineteenth and early twentieth centuries. The Hammond Bridge was along one of multiple railroad lines that delivered timber harvested from the vast region north of Arcata and east of McKinleyville (northward past Trinidad) to mills and shipping hubs around Humboldt Bay. The histories of these companies, and others, are intertwined by competition, business agreements, and buy-outs. This section provides historical background regarding the region's lumber industry and historic context specifically related to the construction and history of the Hammond Bridge, as well as historic context regarding truss bridge design. **Illustrations 2, 3, and 4** show the location of relevant towns, land ownership, logging railroads, and other geographic features.¹

¹ Humboldt County local historian Jerry Rohde contributed to the writing of this historic context, providing much of the research and text related to railroad history and the construction of Hammond Bridge.

Development of Redwood Logging and Logging Railroads in Northwestern Humboldt County

Redwood logging in Humboldt County began in the 1850s in the Humboldt Bay region and immediately established itself as the backbone of the economy. During this initial era, early arrivals to the county formed companies, acquired vast tracts of timberland, and built their own mills. The difficulty of transporting the region's massive redwoods posed a challenge to early loggers and imposed limits on the trees that could be harvested. At the time, cut timber was removed either by oxen or floated down waterways.

One early lumber entrepreneur was John Vance who arrived in the county in the early 1850s and helped set up the Ryan and Duff Mill, the first successful mill on Humboldt Bay. Vance struck out on his own in 1856, purchasing the Ridgeway and Flanders Mill at the foot of G Street in Eureka and buying valuable Eureka waterfront property on Humboldt Bay the following year. Vance continued to acquire property by taking advantage of a drop in lumber prices to buy large timber tracts throughout the region. His endeavors proved successful and in 1874 he began building a second mill, the Big Bonanza, on the Mad River at Essex, northeast of Arcata. By the 1870s, railroads had become the preferred method to transport logs and cut lumber, and Vance built the Humboldt & Mad River Railroad from Essex to Mad River Slough at the north end of Humboldt Bay. At the slough, Vance's stern wheel riverboat, the *Antelope*, carried the Big Bonanza's lumber to his wharf in Eureka. Following the death of John Vance in 1892, his nephew, John M. Vance, took over control of the lumber operation and formed the John Vance Mill & Lumber Company (Vance Mill & Lumber), which later became the Hammond Lumber Company as discussed below.²

The Vance Mill & Lumber mill at the foot of G Street in Eureka burned in 1892, and the company built a new mill on the peninsula across the bay to the west at the newly established town of Samoa. The Redwood Land and Investment Company, comprised of various local businessmen, purchased 240 acres and 6,000 feet of waterfront on this peninsular across from Eureka and subdivided the land into lots in 1892 in the hopes of starting a town. By the following year the enterprise was largely a bust, and Vance Mill & Lumber purchased the majority of the town's lots and within a few years its Samoa mill was cutting 60,000 board feet of lumber per day and had 320 workers. As part of this development, Vance Mill & Lumber incorporated the Eureka & Klamath River Railroad (Eureka & Klamath) in 1893, which replaced the Humboldt & Mad River Railroad. The new railroad ran along a slightly different route from the earlier line, crossing the Mad River upstream from the previous crossing, and continuing southwest across the Arcata Bottoms and Mad River Slough, and south down the Samoa Peninsula to the mill at Samoa. By the period, Vance Mill & Lumber owned thousands of acres of timber land north and east of McKinleyville in the Little River drainage and lower Lindsay Creek drainage, as well as in the area north of Fortuna (south of Eureka).³

Another large company operating at the time was the Dolbeer & Carson Lumber Company (Dolbeer & Carson) which owned a mill in Eureka and also had large timber tracts, including in the upper Lindsay Creek drainage near Fieldbrook (east of McKinleyville) and in the area south of Bayside to the east of Humboldt Bay, as well as southeast of Humboldt Bay on Salmon Creek and along the North Fork of Elk River. In 1895, Dolbeer & Carson signed a 10-year agreement with Vance Mill & Lumber to have the Eureka & Klamath haul Dolbeer & Carson's logs from their camp in the Fieldbrook area to Cole's Landing (later called Carson's), which was located a short distance north of Samoa on the western edge of Humboldt

² Lynwood Carranco, *Redwood Lumber Industry* (San Marino, CA: Golden West Books, 1982), 144-145, 196; Lynwood Carranco and Henry L. Sorensen, *Steam in the Redwoods* (Caldwell, ID: Caxton Printers, 1988), 33.

³ Carranco and Sorensen, *Steam in the Redwoods*, 33, 36-37; Carranco, *Redwood Lumber Industry*, 145; J. N. Lentell, *Official Map of Humboldt County California* (San Francisco, CA.: J. N. Lentell, 1898); Carranco, *Redwood Lumber Industry*, 197, 201-202; Leigh H. Irvine, *History of Humboldt County, California, with Biographical Sketches* (Los Angeles, CA: Historic Record Co., 1915), 140, 643, 1240; Virginia M. Fields, *100 Years of Humboldt County Culture and Artistry: 1850 to 1950* (Eureka, CA: Time Printing Company, 1986), 53; Lynwood Carranco, *Redwood Lumber Industry*, 63-66, 101.

Bay. From this landing the logs were dumped into the bay and floated eastward to the Dolbeer & Carson mill in Eureka. By the following year, there were 20 railcars running daily to Cole's Landing on the Eureka & Klamath.⁴

Around this same time began the so-called "second wave" of Humboldt County lumber mill owners. The first wave was defined by local lumber barons like John Vance, while the second wave was characterized by capitalists from out of state coming in and acquiring the assets of the pioneer companies. Andrew Benino Hammond, who had established successful lumber operations in Montana and also owned two railroads, was one such entrepreneur. Hammond burst onto the Humboldt County scene in 1900, when he purchased the venerable Vance Mill & Lumber Company for an attention-getting \$1,000,000. The acquisition included Vance's sawmill at Samoa, a shingle and shake mill, several thousand acres of redwood timber, a shipping fleet consisting of a steam vessel and several lumber schooners, about 1,200 feet of valuable waterfront property, and the Eureka & Klamath. The Samoa mill was the largest redwood lumber mill in operation at the time. In addition to the mill, Hammond also acquired town lots in Samoa and established a company town. Hammond changed the name of his latest lumber operation to the Vance Redwood Lumber Company and continued to acquire land, purchasing over 36,000 acres of timberland from the American Lumber Company on Redwood and Prairie creeks in northwestern Humboldt County in 1902.⁵ That same year the company also extended the Eureka & Klamath to Camp 5 in the Little River drainage, making that line between Camp 5 and Samoa 20 miles. By 1904, Hammond's holdings in Humboldt County were valued at \$4,000,000, tying it with the Pacific Lumber Company for first place in the county.⁶ In 1912, he reorganized his corporation and re-named it the Hammond Lumber Company, at the time "the largest timber holder in the Redwood Empire," and the fifth largest in California, with 94,760 acres.⁷ Soon thereafter the Hammond facilities at Samoa were described as follows:

The Hammond Lumber Company owns the town and operates immense saw mills, moulding mills, etc., employing some 500 men. The company has built a number of substantial houses for the workmen, and the population numbers about 250. Other workmen reside in Eureka. There is an hourly ferry service between the peninsula and the mainland....The distance from Eureka to the wharf line at Samoa is approximately a mile and a half.⁸

Soon after Hammond's acquisition of Vance Mill & Lumber, Dolbeer & Carson chose not to renew its agreement to use the Eureka & Klamath, but decided to build its own railroad. This led to construction of the Humboldt Northern Railway (later became Humboldt Northern Railroad) (Humboldt Northern) on which the Hammond Bridge was later built. This railroad line extended from Cole's Landing on Humboldt Bay to Dow's Prairie (north of McKinleyville) and eventually to Fieldbrook / Lindsay Creek, with a branch line to Arcata.⁹ William Carson incorporated the Humboldt Northern in October 1904 "for the purpose of building a railroad to the Carson timber holdings in the northern end of the county, and eventually on to Crescent City" and filed 17 condemnation suits to gain rights-of-way along its new line.¹⁰ The Harbor Commission granted the Humboldt Northern "permission to bridge Mad River" in April 1905 at the location of the current Hammond Bridge (**Illustration 1**).¹¹ The 1905 structure had three 150 foot long Howe Truss spans with a 944 foot long trestle on the

⁴ Stanley T. Borden, "Oregon & Eureka Railroad," *Western Railroader*, November 1958: 6; Kathy M. Tahja, *Logging Railroads of Humboldt and Mendocino Counties* (Charleston, SC: Arcadia Publishing, 2013), 47; Borden, "Oregon & Eureka Railroad," 7; J. N. Lentell, *Official Map of Humboldt County California* (San Francisco, CA.: J. N. Lentell, 1898).

⁵ Borden, "Oregon & Eureka Railroad," 7-8.

⁶ Carranco, *Redwood Lumber Industry*, 155; Borden, "Oregon & Eureka Railroad," 7-8; Carranco, *Redwood Lumber Industry*, 155; Mengel, "A History of the Samoa Division...", 47; Carranco and Sorensen, *Steam in the Redwoods*, 44; Lowell S. Mengel II, "A History of the Samoa Division of Louisiana-Pacific Corporation and its Predecessors, 1853 – 1973," 57 (Photocopy available at Special Collections, Humboldt State University Library).

⁷ Carranco, *Redwood Lumber Industry*, 159; Mengel, "A History of the Samoa Division," 70-71.

⁸ Irvine, *History of Humboldt County, California*, 423.

⁹ Carranco and Sorensen, *Steam in the Redwoods*, 49; Mengel, "A History of the Samoa Division," 55.

¹⁰ "Humboldt Northern Railroad Co.," *Blue Lake Advocate*, October 29, 1904.

¹¹ "Will Bridge Mad River," *Blue Lake Advocate*, April 15, 1905.

south and a 1,775 foot long trestle on the north for a total length of 2,869 feet. The Howe truss spans formed a single long covered bridge with a roof and side walls to protect the timber and steel fastenings from the weather.¹²

During its construction, 24,280 lineal feet of piling, 325 board-feet of timbers and 19,300 pounds of iron were used. Challenges of the bridge construction were the three different grades of the bridge and the north trestle portion built on a reverse curve.¹³ The south trestle portion was constructed on a 1.75 percent grade while the main spans part of the north trestle was constructed on a level grade and the remaining north trestle was finished on a 1 percent grade. The north trestle section contained 790 feet of a four degree reverse curve with a spiral on each end. The northern trestle continued across the Mad River floodplain until it reached the benchland south of School Road in McKinleyville.¹⁴



Illustration 1. Undated photo of covered bridge at location of current Hammond Bridge.
(Courtesy of Jerry Rhode.)

In its first few years the new Humboldt Northern line was completed from the Samoa Peninsula to about two miles beyond McKinleyville, but did not yet reach the Dolbeer & Carson logging operations in the Fieldbrook / Lindsay Creek area. The line continued to push northward across Strawberry Creek and onto the northern portion of Dow's Prairie, where the tracks turned eastward.¹⁵ At this point just north of Strawberry Creek, the Humboldt Northern connected with the line of the Little River Redwood Company (Little River Redwood).

Little River Redwood was incorporated in 1892 by lumbermen from Ottawa, Canada and western New York who bought 3,400 acres of redwood timberland in the Little River drainage in an area sandwiched between Vance Mill & Lumber lands and a Dolbeer & Carson tract. Little River Redwood also bought a 160-acre tract of land adjacent to their holdings from John Bulwinkle and in 1908, the company built a mill on the property, and established a small town called Bulwinkle (later Crannell) (north of McKinleyville) near the mill that included a cookhouse and bunk houses. In 1907-1908 the company also constructed its own railroad, which brought logs to the mill from the timber tracts to the east and a line carrying milled lumber south to a junction with the Humboldt Northern just north of Strawberry Creek, where the Little River Redwood Company had a lumber yard. In March 1908, the *Daily Humboldt Standard* reported that work on this spur line was "progressing splendidly" and that workers will have soon completed "grading work as far as the 'Carson' [Humboldt Northern] road...and the big trestle...." On May 19, 1908, the *Ferndale Enterprise* reported that "the gap between

¹² J. W. Peterson and R. B. McIntosh, "A Golden Salute," *Redwood Log*, 9, No. 8 (1956): 1-2.

¹³ A reverse curve is the same as an S-curve. It is a section of railroad where there is a curve in one direction immediately followed by a curve in the opposite direction.

¹⁴ J. W. Peterson and R. B. McIntosh, "A Golden Salute," *Redwood Log*, 9, No. 8 (1956): 1-2.

¹⁵ "Progress in Railroad Building," *Arcata Union*, February 10, 1906; Mengel, "A History of the Samoa Division," 55.

Bullwinkle [sic] and the Humboldt Northern Railroad at Dow's Prairie has been closed and today the first train will be run over the new road and down to the tide water at the Dolbeer & Carson shingle mill." Thereafter, the Humboldt Northern also carried Little River Redwood lumber to its loading wharf on Humboldt Bay served by a spur track from the Humboldt Northern.¹⁶

It is uncertain when the Humboldt Northern completed its line all the way to Lindsay Creek. In 1911, the line went as far as Section 16, T7N/R1E, HM, northwest of Fieldbrook. This took the Humboldt Northern into the northwestern portion of the Dolbeer & Carson timber tract. By 1921, the Humboldt Northern had reached its ultimate terminus near the center of the line between sections 13 and 14, T7N/R1E, HM, about three-quarters of a mile east of the Northwestern Pacific line that ran alongside Lindsay Creek (**Illustration 2** and **Illustration 3**).¹⁷

Dolbeer and Carson sold the Humboldt Northern in 1925 to Little River Redwood, which built a new line west from Crannell (formerly Bulwinkle) to Clam Beach on the coast, where it turned south and ran along the beach before turning inland to connect with the old Humboldt Northern line about a mile north of the Mad River crossing. The new line gave Little River Redwood a shorter route to Humboldt Bay and it ceased using the section of the line that cut northwest into the Lindsay Creek watershed (**Illustration 4**).¹⁸

While the Little River Redwood had extensive holdings during this period, including a sawmill at Crannell, thousands of acres of redwood timberlands, a planning mill and docks at Fairhaven (south of Samoa), and two steamships, the company lost \$4,000,000 in seven years. Faced with bankruptcy, Little River Redwood merged with the Hammond Lumber Company in 1931, forming the Hammond and Little River Redwood Company with Hammond's directors assuming control of the entire operation. Soon after the merger, the former Little River Redwood mill in Crannell was closed and in 1933 the company name was changed to the Hammond Redwood Company (Hammond Redwood).¹⁹

Prior to the merger Hammond Lumber had assembled vast timber tracts and expanded its railroad operations. By the 1920s Hammond Lumber had timber tracts on the lower stretches of Prairie Creek and Redwood Creek, Little River, and the Big Lagoon tract (as well as along the Van Duzen River and Eel River).²⁰ To reach lands north of McKinleyville, Hammond purchased the abandoned Northwestern Pacific Railroad line from Little River Junction to Trinidad, and also a short branch line that ran along Little River. Like Little River Redwood, Hammond Lumber made Crannell a base of operations for the company's vast holdings in this area, served by an expanded the rail system to the north and east, eventually totaling 48 miles of track and nearly reaching Big Lagoon (north of Trinidad). Between 1934 and 1945, trains made as many as three trips daily from Crannell to the log dump at the Samoa Mill, bringing from 120 to 140 cars loaded with logs. A large forest fire in 1945 destroyed many of the Hammond Redwood rail lines south of Big Lagoon. These lines were never repaired and Hammond shifted to trucks for log transport to Crannell, where they were loaded onto the railroad.²¹

¹⁶ George Knab and Lynwood Carranco, "A Lumberman's Odyssey in the Land of the Redwoods," *Humboldt Historian* (January-February 1981): 3; Denny & Co. *Denny's Official Map of the County of Humboldt, California* (San Francisco, CA: Edward Denny & Co., 1911); Lentell, *Official Map of Humboldt County, California*. The name is frequently spelled Bullwinkle or Bullwinkel and John is sometimes confused with his neighbor, Conrad Bulwinkle; "Little River Redwood Company A Model Milling Institution," *Blue Lake Advocate*, January 4, 1908; Delores L. Boehl, "A Thriving Town Called Crannell," *Humboldt Historian* (March-April 1985): 27; Carranco and Sorensen, *Steam in the Redwoods*, 52-53, 212; "Little River Road Near Completion," *Daily Humboldt Standard*, March 20, 1908: 3; "Railroad Completed," *Ferndale Enterprise*, May 19, 1908: 1; "Map Showing Proposed Log Deck Areas for New Samoa Mill, 1964," Archived Map #1999.04.0110, 1964. Special Collections, Humboldt State University Library, Arcata.

¹⁷ Denny & Co., *Denny's Official Map of the County of Humboldt, California*, 1911; Belcher Abstract & Title Co., *Atlas of Humboldt Co., Cal.*, 8.

¹⁸ Mengel, "A History of the Samoa Division," 107-108; Borden, "Oregon & Eureka Railroad," 15; Carranco, *Redwood Lumber Industry*, 159; Knab and Carranco, "A Lumberman's Odyssey," 3; Carranco and Sorensen, *Steam in the Redwoods*, 58.

¹⁹ Knab and Carranco, "A Lumberman's Odyssey," 3; Carranco, *Redwood Lumber Industry*, 159; Carranco and Sorensen, *Steam in the Redwoods*, 60.

²⁰ Irvine. *History of Humboldt County, California*, 423; Belcher Abstract & Title Company, *Atlas of Humboldt County*, 1, 2, 6, 8, 9, 13.

²¹ Carranco and Sorensen, *Steam in the Redwoods*, 61, 66, 218-219.

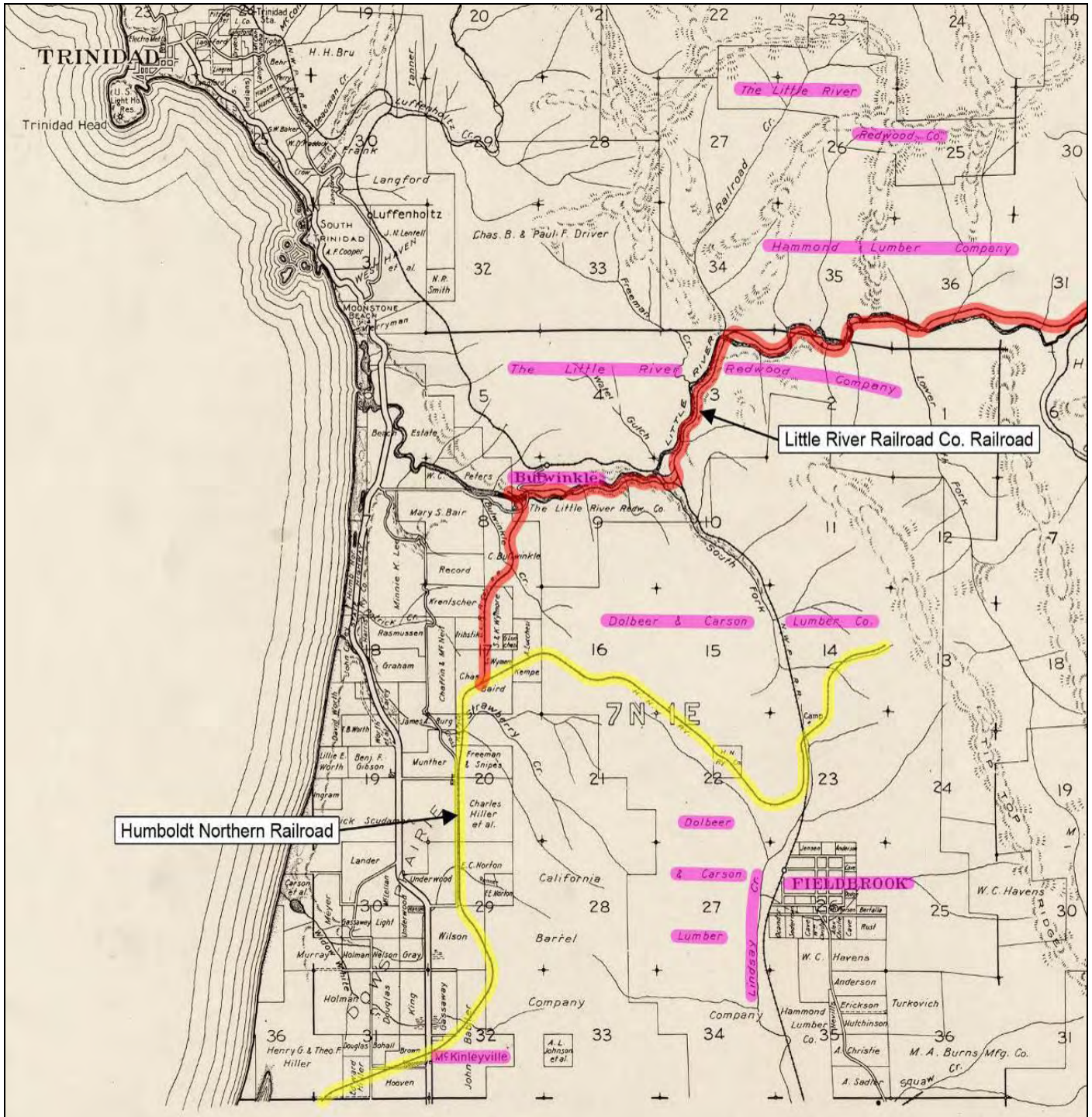


Illustration 2. Section of 1921 Atlas of Humboldt County north of Arcata. Relevant place names and property owner names are highlighted in pink.

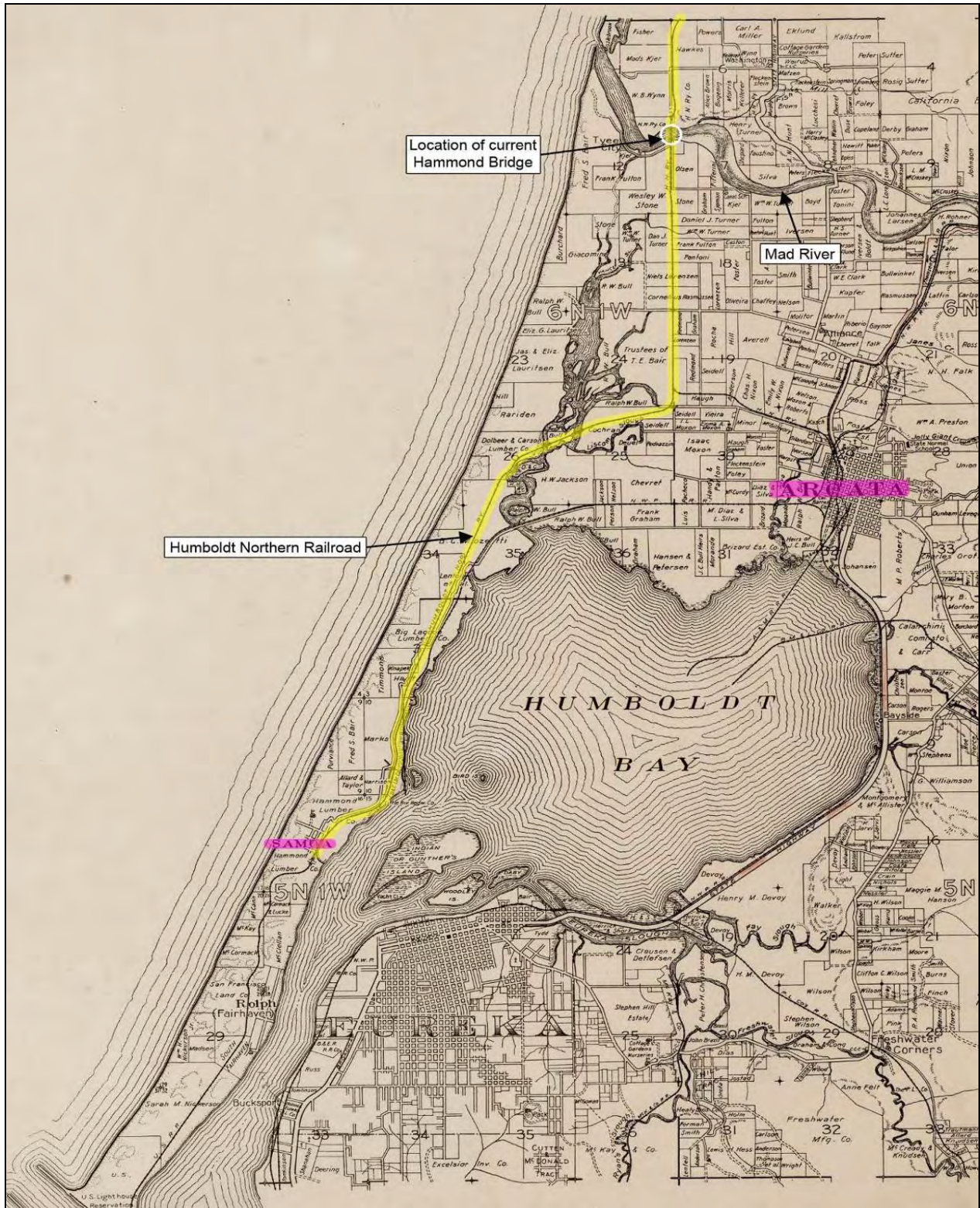


Illustration 3. Section of 1921 *Atlas of Humboldt County* showing Humboldt Bay area. Relevant place names are highlighted in pink.



Illustration 4. This 1941 Eureka Quadrangle shows the realigned Humboldt Northern running along the sand dunes of Clam Beach.

Construction of the Hammond Bridge

Among Hammond Redwood's holdings was the covered bridge and trestle over the Mad River that was built by Dolbeer and Carson in 1905 that Little River Redwood acquired in 1925. In 1940, Hammond Redwood officials inspected the old bridge and found it structurally inadequate to carry the traffic loads required and decided to replace it with "some kind of steel bridge on concrete piers." The company located a surplus bridge it owned in Oregon. The bridge was a 250-foot through truss span over the Nehalem River at Foss, Oregon designed in 1927-1928 by Wallace Bridge & Structural Steel Company of Seattle, Washington (**Illustration 5**). The exact date of its original installation at Foss is not known, but it is presumed to be 1928. The truss bridge was dismantled and shipped by rail to Samoa for reconstruction at the Mad River crossing. To complete the span over the Mad River a 120-foot through-girder bridge owned by the Feather River Pine Mills was also

shipped from Oroville, California. The 120-foot steel girders were 10 feet high and shipped without dismantling by loading each girder on three railroad cars. This bridge weighed approximately 120 tons.²²

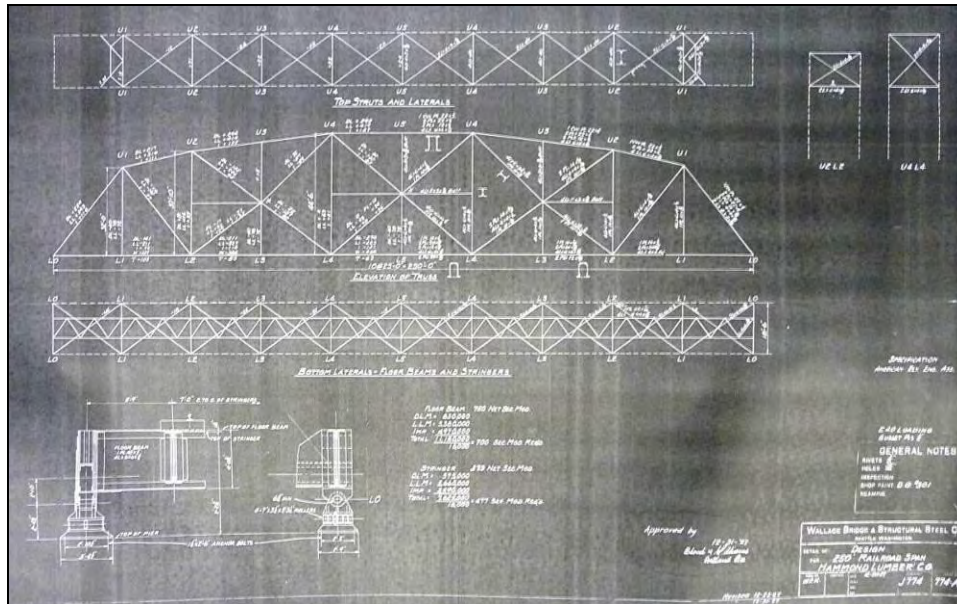


Illustration 5. Original plans for the through truss span, dated December 20, 1927.
 (Courtesy of Humboldt County Office of Natural Resources Planning.)

Hammond Redwood began work on the new bridge in the spring of 1941:

It was necessary to excavate and drive piling for the three piers. Approximately 132 piling were driven and about 600 yards of concrete were poured for these piers, the center pier alone requiring 350 yards of concrete. These piers were completed during the summer of 1941 and we were ready for erection of the spans which had in the meantime arrived at Samoa. In order to maintain logging traffic on the railroad while the spans were being completed it was necessary to build a by-pass trestle or “shoo-fly” alongside the existing bridge. This was a simple pile trestle which was very useful during the bridge construction as well as for carrying the log trains. It was also necessary to drive piling and erect false work under the old bridge to facilitate dismantling and to aid in the erection of the new spans. During the remainder of the summer and the fall of 1941 work was speeded on the steel erection and the bridge was completed before winter weather set in.²³

Three men, “all well-seasoned Hammond Redwood Company bridge builders,” formed the erection crew. Wes Walsh operated a Brownhurst locomotive crane, Al Thoma was the “hook-on man” who fastened the bridge sections together, and Billy McLynn was his assistant. The hand tools consisted of “a hammer, spanner wrench and a spud.” During assembly, a section of bridge was attached to one end of a cable the other end of which was attached to the crane. Thoma “would grab hold of the cable, ride the piece up and position it. When bolting the sections in place he would use a ‘monkey chair’”, more a trapeze than anything else. He tied himself into his seat to keep his hands free.”²⁴ The truss bridge had arrived from Oregon in sections that were deposited at the south bank of the Mad River on a gravel bar next to the covered bridge. Each piece of

²² Peterson and McIntosh, “A Golden Salute,” 2.

²³ Peterson and McIntosh, “A Golden Salute,” 2.

²⁴ Ray Hillman, “The Hammond Bridge,” *Whistle Punk* 16 (June 1993): 2-3; Al Thoma was one of three workers who did most of the truss bridge assembly. About 50 years afterward he described the reconstruction of the bridge to local historian Ray Hillman.

the bridge had been marked with either a “left” or a “right” to designate its location on the original bridge. Thoma claimed the reconstruction crew had no overall diagram or instructions to work from when reassembling the pieces, although a copy of bridge plans are now on file at the Humboldt County Natural Resources Division office. The truss portion of the bridge was made from “high-quality” steel. However, it came without a deck, and the steel used for the replacement deck was reportedly of lower quality.²⁵

When the crew had assembled both ends of the bridge and were ready to join the halves together at the bridge’s center, they found that the key gusset plates did not match up—the structure needed camber (a slight upward convexity) for the plates to properly align. The bridge was jacked up to get the key gusset plates to match so that Thoma could bolt them. An extra piling was then added to retain the camber, and the concrete piers upon which the bridge finally rested had to have their height increased so that the camber would be permanent.²⁶

Near the end of the reassembly the crew suffered a distraction. As Thoma described it:

...he saw the ground waves of an earth quake coming down the Mad River, four or five feet high, as he was hanging from the “monkey chair” at the end of a boom. As the newly-bolted bridge plates banged around, he could only hope they would hold together, and fortunately, they did.²⁷

The bolts that Thoma used were temporary fasteners, used to allow for a certain necessary “play” in the bridge during its assembly. After the bridge had been erected, Hammond Redwood contracted with Mercer-Fraser Company of Eureka to replace the bolts with rivets. This locked the bridge sections more firmly in place.²⁸

When the new bridge installation was completed the new elements consisted of the 250-foot steel through-truss span, 120-foot through-girder span, and an 80-foot wood trestle added to the north end. This new combination maintained the 450-foot total distance of the 1905 bridge and allowed the new bridge to connect with 1905 wood trestles at the north and south ends (**Illustration 6**).²⁹



Illustration 6. Aerial photo from 1953 showing bridge and trestle sections on each side. This view is looking southeast.³⁰

²⁵ Hillman, “The Hammond Bridge,” 2-3; Ray Hillman, telephone interview with Jerry Rohde, September 3, 2013.

²⁶ Hillman, interview with Jerry Rohde.

²⁷ Elaine Weinreb, “Uncertain future for Hammond Bridge” *McKinleyville Press*, August 12, 2008: A1.

²⁸ Hillman, interview with Rohde.

²⁹ Peterson and McIntosh, “A Golden Salute,” 2.

³⁰ Merle Shuster, Humboldt Room Photograph Collection # 2001.01.2029, Special Collections, Humboldt State University Library.

A 1949 report provides information about Hammond Redwood's use of the Humboldt Northern rail line in the period following construction of the Hammond Bridge. Chet Schwarzkopf, a local newspaper reporter, reported about his ride on line, which he referred to as the "Samoa-Crannell train." Schwarzkopf did not mention the Hammond Bridge in his account, but did note that the train hauled more than logs, stopping at the base of the bluffs below the McKinleyville airport at Navy Siding, which was "equipped with pipelines and a heavy pump" where tank cars were dropped off and their loads of gasoline were pumped up to the airport. The train then crossed Highway 101 on an overhead bridge and completed the 17-mile trip to Crannell. The train made two round-trips a day, running five (previously six) days a week.³¹ After the 1945 fire of the Hammond Redwood rail lines south of Big Lagoon, noted above, the Crannell terminus served as the location where logs were transferred from logging trucks that were too wide for use on public highways onto the trains. Schwarzkopf described the trip to Samoa with a load of 44 railcars carrying logs and weighing "at least a 1,200 tons." The train climbed two grades on the way to Samoa, one to reach the 101 Highway overpass west of Crannell and another to go from the beach to the benchland west of McKinleyville. At the Hammond Bridge "the train stops for a quick inspection" and took on water and continued to the Samoa mill's log dump where it unloaded in 20 minutes.³²

The Hammond Bridge has been adequately built to withstand the heavy loads of the timber trains, reportedly able to carry a maximum load of 5,590 tons. In December 1955, the structure displayed a different type of strength when it was "seriously threatened by high waters" but remained intact. The following year the bridge's strength was touted as follows:

Today this bridge carries approximately 250,000 to 300,000 board feet of logs per day to Samoa and continues to be one of the main lines furnishing logs to Plants No. 1 and No. 2. Should disaster overcome this bridge, as nearly took place in last winter's flood, it would take quite a fleet of trucks a day to carry on.³³

During this time period, Hammond Redwoods's Crannell operation was gradually being phased out and replaced by the Big Lagoon camp. Crannell was eventually abandoned. Hammond Redwood sold all of its assets to the Georgia-Pacific Corporation of Atlanta, Georgia in 1956, including the mill at Samoa, and became a subsidiary called the Hammond-California Redwood Company. At the time Hammond Redwood owned about 120,000 acres of timberland in Humboldt County and mills at Samoa, Eureka, Big Lagoon, and Orick.³⁴

Decommissioning the Hammond Bridge and Construction of Hammond Trail

Georgia-Pacific (GP) stopped hauling logs and lumber on the Humboldt Northern line in 1961. The Hammond Bridge ceased to be used for rail traffic and the track and ties from Crannell to Samoa were removed between 1963 and 1966. The Hammond Bridge over the Mad River was left intact, but the long wooden trestles at either end were removed.³⁵ In 1972, the Louisiana-Pacific Corporation (LP), a subsidiary of GP, acquired the GP holdings, including the railroad right-of-way. LP granted a right-of-way and easement to the Humboldt Bay Wastewater Authority (HBWA) in 1977, which allowed HBWA to construct a pipeline across the Hammond Bridge to transport sewage from the McKinleyville Community Services District's sewer system, which began operating 1978. The pipeline carried McKinleyville's sewage south across the Mad River to the City of Arcata's treatment plant.³⁶

³¹ Chet Schwarzkopf, "Logging Railroad One Of Humboldt's Skilled Jobs," *Humboldt Times*, May 1, 1949: 23.

³² Schwarzkopf, "Logging Railroad One Of Humboldt's Skilled Jobs," 23, 25.

³³ Weinreb, "Uncertain future for Hammond Bridge," A1; Mengel, "A History of the Samoa Division," 163; Peterson and McIntosh, "A Golden Salute," 3.

³⁴ Mengel, "A History of the Samoa Division," 149; "Hammond's Sold!," *Humboldt Times*, 24 May 1956, 1; "The 40-Year-Old Samoa Pulp Plant May Be in its Death Throes," *The Times-Standard*, 17 September 2009.

³⁵ Hammond-California Redwood Company, Bargain and Sale Deed to Georgia-Pacific Corporation, Humboldt County Official Records (692)108. Copy in Hammond Bridge files, Humboldt County Natural Resources Office; Carranco and Sorensen, *Steam in the Redwoods*, 67, 69; "County 'Not Interested' in GP's Offer Of Manila Right-of-Way," *Humboldt Times*, March 3, 1965, 2; Carranco and Sorensen, *Steam in the Redwoods*, 69.

³⁶ Georgia-Pacific Corporation, Deed to Louisiana-Pacific Corporation, Humboldt County Official Records (1170)554. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Carranco, *Redwood Lumber Industry*, 166; Louisiana-Pacific
DPR 523B (1/95)

The Hammond Bridge acquired its current use in the early 1980s. In 1981, LP conveyed an easement deed to the County of Humboldt for the purpose of constructing and maintaining a multi-purpose trail over the bridge. The Humboldt County Board of Supervisors executed an agreement with the HBWA and the McKinleyville Community Services District for the county's use of the bridge "as part of the Hammond Trail." The agreement noted that the "bridge is no longer used for railroad purposes and is primarily used to carry a sewer interceptor line...across the Mad River." The agreement also noted that the bridge was then owned by the HBWA, and that HBWA would transfer title to bridge to the McKinleyville Community Services District upon termination of the HBWA, which occurred in 1982.³⁷ The Humboldt County Department of Public Works completed the "Hammond Trail" multipurpose path across Mad River in 1983. The project included the construction of new approach embankments at each end of the bridge and new approach bridges that connected the embankments with the structure that had been installed in 1941. The approach bridges had concrete abutments, piers, and steel girder decks. The bridge's wooden handrail, walkway, and remaining crossties were removed. New I-beams were laid on top of the original bridge beams followed by 20-gauge bridgeform and a layer of structural concrete with a rough broom finish. The bridge's structural steel was cleaned and painted and the sewer pipeline, which was on the outside of the downriver side of the bridge, remained in place.³⁸

In 1991 the Humboldt County Board of Supervisors entered into a revised agreement with the McKinleyville Community Services District regarding the two entities' responsibilities for the bridge. HBWA no longer existed and the McKinleyville Community Services District was now the owner of the bridge. The county agreed that bridge maintenance would be on a 10-year cycle and that the county would pay one-half the maintenance cost.³⁹

Steel Truss Bridge Engineering, Design and Construction

Steel truss bridges were built in great numbers on California roads and highways starting in the late nineteenth century. After the end of World War I, newer materials and designs, especially concrete arches and girders, began to replace steel trusses for new bridge construction. In the 1930s, 1940s, and 1950s, steel trusses continued to play an important role in bridge construction in California, particularly in Northern California. Of the steel truss bridges remaining in the state from this period, the most common truss type is the Warren truss. This is followed by the Pratt truss and its variables such as the Parker truss and Camelback truss. The other notable truss type used during this period was the Bailey truss, a type developed by the military during World War II. The greatest concentration of existing steel truss bridges are in the northern portion of the state. The concentration of this bridge type in Northern California can be attributed to the ease and lower expense of transporting dismantled steel bridges relative to concrete.⁴⁰

In general, truss bridges are classified by the position of the deck, or roadway, in relation to the trusses. Through truss bridges carry the deck on the lower chord, or support, with lateral supports overhead. The through truss configuration was

Corporation, Grant of Easement to Humboldt Bay Wastewater Authority, Humboldt County Official Records (1452)10. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Jack Durham, "McKinleyville pursues massive sewer upgrade" *McKinleyville Press*, January 23, 2013.

³⁷ Louisiana-Pacific Corporation, Easement Deed to County of Humboldt, Humboldt County Official Records (1643) 1053. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Humboldt Bay Wastewater Authority, Grant of Easement to McKinleyville Community Services District, Humboldt County Official Records (1663) 337. Copy in Hammond Bridge files, Humboldt County Natural Resources office; Humboldt County Board of Supervisors, "Agreement for use of Mad River Bridge as part of Hammond Trail," August 4, 1981. Copy in Hammond Bridge files, Humboldt County Natural Resources office.

³⁸ County of Humboldt, Department of Public Works, "Project Plans for Construction of 'Hammond Trail' Multipurpose Path across Mad River." Copy in Hammond Bridge files, Humboldt County Natural Resources office; County of Humboldt, Department of Public Works, "Project Plans for Construction of 'Hammond Trail' Multipurpose Path across Mad River."

³⁹ Humboldt County Board of Supervisors, "Agreement for use of Mad River Bridge as part of Hammond Trail," July 30, 1991. Copy in Hammond Bridge files, Humboldt County Natural Resources office.

⁴⁰ Carl W. Condit, *American Building Art: The Twentieth Century*, (New York: Oxford University Press, 1961), 207-211; JRP Historical Consulting and Caltrans, "Caltrans Historic Bridge Inventory Update: Metal Truss, Moveable, and Steel Arch Bridges," Sacramento, CA: California Department of Transportation, 2004; California Department of Transportation, *Historic Highway Bridges of California* (Sacramento, 1990), 43-48.

used for large structures with long spans, but because it was closed overhead, the vertical clearance was restrictive. A variation on the through bridge is the pony truss bridge which carries the deck on the lower chord, but has no lateral overhead supports. Pony trusses were more commonly used for smaller bridges with short spans. Deck truss bridges carry the deck on the top chord with the truss below. Deck trusses were increasingly used during the 1930s, 1940s, and 1950s, as they could be built to carry greater loads and caused no problem with vertical clearance.

The Hammond Bridge is a Parker Truss bridge, which is a variation of the Pratt Truss. Historian Carl Condit called the Pratt the “first scientifically designed truss.” It was invented by Thomas Pratt, a Boston-born architect-engineer, and Caleb Pratt, his father. Thomas Pratt was active in bridge design from the 1830s through the mid-1870s. He patented the Pratt truss form in 1844, describing the design as useful in wood and iron, or in iron alone. The truss was distinctive in that it included vertical compression members and diagonal tension members. As Thomas Pratt had foreseen, this form was especially adaptable to the all-metal bridges that were built in the United States in large numbers after the end of the Civil War, first in iron and later in steel.⁴¹

In time, variations developed building upon the basic Pratt design, but with improvements to facilitate longer spans and greater loads. These variations were also given proper names, reflecting their inventor or place of origin. The three most important variations on the Pratt truss were the Parker truss, the Pennsylvania Petit, and the Baltimore Petit design. Railroad companies erected Pratt truss bridges in great numbers, and this bridge type was also used on many highways during the late nineteenth and early twentieth century.⁴²

In the 1870s, as trains began to carry larger and heavier loads, engineers devised variations on the Pratt truss which enabled them to span longer distances and carry greater loads. The Parker truss was advancement in bridge engineering at the time as an evolution of the Pratt truss. This truss type, developed by C.H. Parker around 1870, is a Pratt truss with a polygonal top chord. Stronger than a regular Pratt truss because of its arched top chord, the Parker truss was used for longer spans and remained popular well into the twentieth century. Similarly, the Camelback truss is a variation on the Parker truss, as its arched top is formed by exactly five slopes rather than a single or multiple arched top chord. The Camelback’s design was popular across the United States because of its economical cost and improved stress distribution. This design created lighter structures without losing strength and was often the most economical truss for many railroad and highway spans.⁴³ Railroads also took advantage of a new truss that utilized sub-struts and sub-ties to provide additional support. The Baltimore and Ohio Railroad initially built several of this new form, which earned it the name “Baltimore Petit,” in 1871. In 1875, the Pennsylvania Railroad added an arched top chord and called its version the “Pennsylvania Petit.” Other railroad lines gradually adopted these two styles, and later these truss types were adapted for highway use.⁴⁴

Girder bridges have been built for railroads since the mid-nineteenth century. Innovation of girder bridges came in response to a need for bridges stronger than basic wood beam bridges which preceded it. The additional strength of a girder bridge is derived from its deeper cross section relative to wood beam bridges. Two main girder types evolved: deck girder and through girder. In the deck girder design, the railroad is laid above the side girders. In the through girder design, the track is laid between the side girders, which extend above the tracks. Through girder bridges were often preferred when clearance under the bridge was a concern. Girder bridges remained a popular choice in railroad construction because they were simple, inexpensive, and easy to install.⁴⁵

⁴¹ Carl W. Condit, *American Building Art: The Nineteenth Century*, (New York: Oxford University Press, 1960), 109.

⁴² T. Allan Comp and Donald C. Jackson, “Bridge Truss Types: A Guide to Dating and Identifying,” *American Association for State and Local History Technical Leaflet 95, History News* 32 (1977): 1-12.

⁴³ T. Allan Comp and Donald Jackson, “*Bridge Truss Types*,” 1-12.

⁴⁴ T. Allan Comp and Donald Jackson, “*Bridge Truss Types*,” 1-12; California Department of Transportation, *Historic Highway Bridges of California* (Sacramento, CA: California Department of Transportation, 1990), 45; Carl W. Condit, *American Building: Materials and Techniques From the First Colonial Settlements to the Present* (Chicago, IL: University of Chicago Press, 1968), 143.

⁴⁵ Anthony J. Bianculli, *Trains and Technology: The American Railroad in the Nineteenth Century, Volume 4: Bridges and Tunnels, Signals* (Newark, Delaware: University of Delaware Press, 2003), 27, 28.

Other Extant Steel Truss Railroad Bridges in Humboldt County

There are multiple extant steel truss railroad bridges in Humboldt County to which the Hammond Bridge can be compared. Four are on the former Northwestern Pacific Railroad and were built by the Mercer-Fraser Company of Eureka. Another bridge, also built by Mercer-Fraser, is on the former Arcata & Mad River Railroad that spans the Mad River upstream from the Hammond Bridge. All five of these bridges were built between 1910 and 1914 and none are currently in use.⁴⁶

The four bridges on the former Northwestern Pacific line were constructed as the railroad was being built through Humboldt County. These are the Cain Rock Bridge, South Fork Bridge, Larabee Creek Bridge, and Van Duzen River Bridge. All include through steel truss spans that have pin connections, which were large bolt connections, the technology of which was replaced by rivet technology in subsequent decades. The Cain Rock Bridge, constructed in 1913, is located at railroad milepost 206.51 and crosses the Eel River approximately two miles south of the town of Alderpoint. It consists of three 200-foot truss spans and eight deck plate girder spans. The South Fork Bridge is located at railroad milepost 237.75. It crosses the main Eel River immediately upstream from the confluence with the South Fork Eel and consists of one 180-foot and one 200-foot truss span dating from 1910 and two 200-foot riveted truss spans dating from 1965. It is immediately north of the site of the former town of South Fork. The two newer spans replaced sections washed out by the 1964 flood. The Larabee Creek Bridge is located at milepost 242.00 and is comprised of two 150-foot truss dating from 1910. It is located immediately east of Larabee Road in the small community of Larabee. The Van Duzen River Bridge is located at milepost 261.78 and consists of three truss spans of 160 feet each and nine 30-foot precast concrete spans. The truss spans date from 1913 and the concrete spans from 1970. The bridge is directly east of Highway 101 approximately one mile south of the town of Alton.⁴⁷

The Mad River Bridge spans the Mad River on the line of the former Arcata & Mad River Railroad. The Arcata & Mad River Railroad ran from a wharf at the northern end of Humboldt Bay eastward to the lumber mill town of Korbek, east of Blue Lake. The line delivered supplies and goods to these communities in the lower Mad River area and hauled out lumber products. The wooden bridge at this crossing was replaced in 1914 by the current steel truss bridge which consists of three, 165-foot spans with concrete piers. The bridge is a short distance south of Highway 299 near the community of Glendale.⁴⁸

Evaluation

The Hammond Bridge does not have important associations with significant historic events, patterns, or trends of development (NRHP Criterion A/CRHR Criterion 1). This bridge is associated with the development of the timber industry in the Humboldt Bay region. While the timber industry was integral to the development of this region, and this railroad line was owned by some prominent lumber companies and served some of the biggest mills, the Hammond Bridge does not have strong or important associations with that development. The Hammond Bridge was built in 1941 by the Hammond Redwood Company on the company's Humboldt Northern Railroad line. It was a replacement of an earlier bridge constructed in 1905 as part of the original Humboldt Northern Railroad line, then owned by Dolbeer & Carson Lumber Company. As such, the Hammond Bridge was built long after the establishment of the timber industry in the area and after the large-scale development of timber resources in the area north of Arcata, which was facilitated by the construction of the Humboldt Northern Railroad in 1905. The Hammond Bridge was along one of multiple rail lines in the region and its construction merely allowed for the continuation of patterns and practices that had been occurring for decades and is not, therefore, historically significant within the context of the development of the timber and milling industry in this area.

⁴⁶ Irvine, *History of Humboldt County, California*, 423.

⁴⁷ David R. Anderson. "North Coast Rail Authority Capital Assessment Report" (Santa Ana, CA: Willdan/HNTB, 2002), Table 10-B, Table 10-C; Fred A. Stindt and Guy L. Dunscomb, *The Northwestern Pacific Railroad* (Kelseyville, CA: Fred A. Stindt, 1987), 112, 113; Irvine. *History of Humboldt County, California*, 420.

⁴⁸ Stanley T. Borden, "Arcata & Mad River," *Western Railroader*, 17 no. 8 (1954); James Roscoe and Susie Van Kirk, "A Cultural Resources Study of Proposed Gravel Extraction Areas on the Mad River, Humboldt County, California," (Eureka: Humboldt County Planning Department, 1993), 11; Irvine. *History of Humboldt County, California*, 423.

Under NRHP Criterion B/CRHR Criterion 2, this property is not significant for an association with the lives of persons important to history. This bridge is associated with Andrew Hammond, the owner of the Hammond Redwood Company when this bridge was built. Hammond was a lumber entrepreneur who had established successful lumber operations in Montana before pursuing interests in Humboldt County beginning in 1900 and again attaining success with the Hammond Redwood Company. To be eligible under this criterion, a property must have strong associations and best represent a person's important contributions to history. While Andrew Hammond could potentially be considered a person important to history, he owned many other properties such as saw mills and the Hammond Bridge is not an important structure that illustrates his achievements and historic contributions.

The Hammond Bridge is not significant as an important example of a type, period, or method of construction, it does not possess high artistic qualities, and is not the work of a master (NRHP Criterion C/CRHR Criterion 3). The historic elements of the bridge are the utilitarian through truss section and the through girder section. The through truss section was designed in 1927-1928 by Wallace Bridge & Structural Steel Company of Seattle, Washington and moved to its current location in 1941. The through girder section was taken from another bridge and assembled at this location with the truss. Innovation and common use of both the through truss and through girder type bridges for railroads occurred in the nineteenth century, preceding the fabrication of these sections of the Hammond Bridge by decades. In addition, there are five other extant steel truss bridges in Humboldt County as discussed in the historic context. All of these five bridges are older than the Hammond Bridge and use pin-connections to join the elements of the bridge, rather than rivets that are a later fastening technology. The Hammond Bridge, therefore, is not important for its design, type or engineering and is not a rare example of the steel truss bridge in Humboldt County. In addition, this property is not significant as a source or likely source of important information regarding historic construction materials or technologies (NRHP Criterion D or CRHR Criterion 4).

In addition to lacking historical significance, the Hammond Bridge has undergone several alterations over the years that diminished its historic integrity. The bridge was moved from its original location, but it has not been moved since construction in this location. Alterations that have diminished bridge's integrity of design, materials, and workmanship include the removal of its railroad features, including the trestle that flanked either end of the river crossing, as well as its tracks and ties. Furthermore these aspects of integrity have been diminished with construction in the early 1980s of Spans 1, 2, 5 and 6; construction of earthen approaches; construction of new abutments and column piers; installation of wood and steel floor beams on Spans 3 and 4, installation of a new deck and conversion to a bicycle/pedestrian bridge; and the installation of sewage pipe. Although the bridge retains integrity of setting, its integrity has been diminished in other aspects including feeling and association as the bridge illustrates only a modest connection to and expression of its historic use as a railroad bridge.

Below the current bridge and extending just above the water-line are remnants of the original steel encased concrete piles from the 1905 bridge. These pile remnants are associated with the original Humboldt Northern Railroad line and the Dolbeer & Carson Lumber Company operations. The pile remnants are components of the demolished 1905 bridge and the piles themselves have been largely demolished. As such, they lack integrity of design, materials and workmanship, feeling and association. In addition, these piles do not have strong associations with the lives of persons important to history and are not important for their engineering or design. Also in the river channel near the bridge are several clusters of small wood piles which are possible remnants from falsework, pier deflectors, streambank deflectors, and/or shoofly piers. These piles, similarly, lack strong associations with important historic events and persons and are not important for their engineering or design and lack integrity of design, materials and workmanship, feeling and association. Therefore, neither the remnant steel encased concrete piles nor the remnant wood piles are eligible for listing in the NRHP or CRHR.

Photographs (continued):



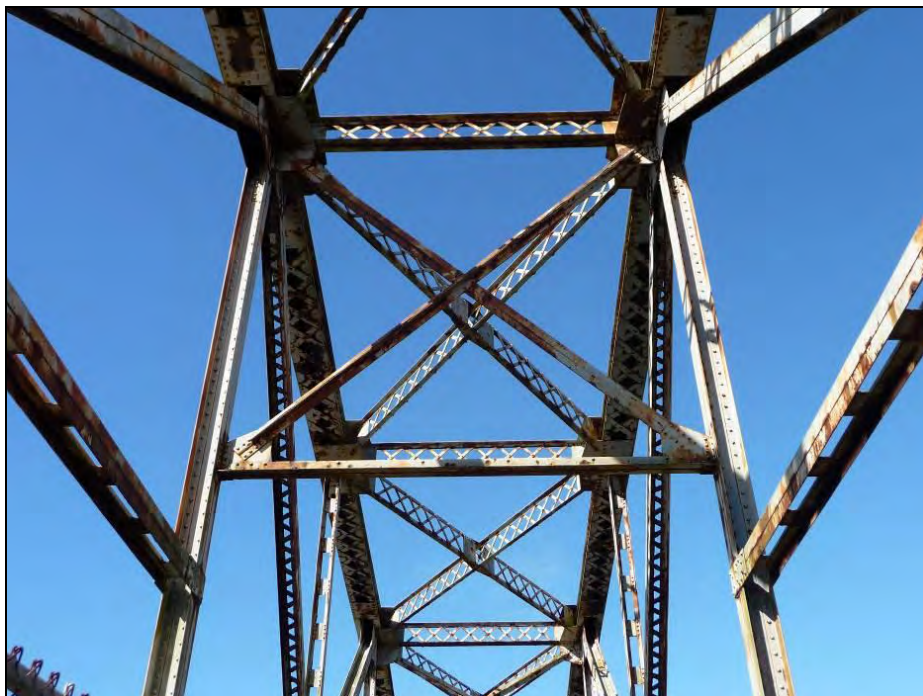
Photograph 2: Span 4, camera facing northwest, September 25, 2013.



Photograph 3: Span 4, camera facing north, September 25, 2013.



Photograph 4: Span 4, camera facing northeast, September 25, 2013.



Photograph 5: Span 4, camera facing north, September 25, 2013.



Photograph 6: Span 4 below deck, camera facing northwest, September 25, 2013.



Photograph 7: Span 4, camera facing north, September 25, 2013.



Photograph 8: Intersection of Span 4 and Span 5, camera facing north, September 25, 2013.



Photograph 9: Span 3, camera facing northwest, September 25, 2013.



Photograph 10: Span 3, camera facing south, September 25, 2013.



Photograph 11: Span 3 below deck, camera facing east, September 25, 2013.



Photograph 12: Intersection of Span 2 and Span 3 camera facing east, September 25, 2013.



Photograph 13: Span 1 and Span 2 camera facing southeast, September 25, 2013.



Photograph 14: Span 1 and Span 2 camera facing north, September 25, 2013.



Photograph 15: Span 1 and Span 2 below deck, camera facing south, September 25, 2013.



Photograph 16: Intersection of Span 2 and Span 3, camera facing south, September 25, 2013.



Photograph 17: Bridge approach from north, camera facing southwest, September 25, 2013.

APPENDIX C

Letter to Interested Parties



2850 Spafford Street • Davis, CA 95618 • (530) 757-2521 • (530) 757-2566 Fax • www.jrphistorical.com

Stephen R. Wee, Principal / President
Rand F. Herbert, Principal / Vice President
Meta Bunse, Partner
Christopher D. McMorris, Partner

September 6, 2013

Humboldt County Historical Society
703 8th Street
Eureka, CA 95501

Historical Sites Society of Arcata
P.O. Box 4521
Arcata, CA 95518

Clarke Historical Museum
240 E. Street
Eureka, CA 95501

To Whom It May Concern:

The Hammond Bridge over the Mad River is a former railroad bridge that is now used as a pedestrian / bicycle crossing on the Hammond Trail. (See enclosed map). This bridge is a steel girder and truss bridge built at a different location in the 1920s and reassembled at its current site in 1942. The County of Humboldt retained a bridge engineer to evaluate the physical condition of the bridge, and determined based on this evaluation that rehabilitation is not feasible. Therefore demolition and replacement of the bridge are being considered to preserve a crossing over the Mad River for the Hammond Trail. A project to replace the bridge would require federal and/or state funding, and thus the project is expected to require compliance documentation under Section 106 of the National Historic Preservation Act and its regulations in Title 36 Code of Federal Regulations Part 800, and compliance with the California Environmental Quality Act (CEQA) as it pertains to historical resources. JRP Historical Consulting, LLC has been retained to assist the County with Section 106 compliance and CEQA compliance for historical resources.

If you or your organization has any information or concerns regarding historic resources that could be affected by this project, please respond in writing to the address provided above, or via email at cmcmorris@jrphistorical.com, within the next thirty days. Thank you.

Sincerely,

Christopher McMorris
Partner / Architectural Historian

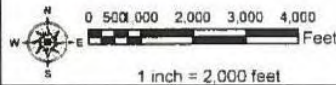


Figure 1 - Site Map
Hammond Bridge Replacement Project

Long 124°7'12.786"W
 Lat. 40°55'26.426"N



Imagery ESRI/Bing
 Prepared: March 12, 2012
 Humboldt County Public Works



Lower Mad River between
 McKinleyville and Arcata
 Humboldt County