

**United States Department of the Interior
National Park Service****National Register of Historic Places Multiple Property Documentation Form**

This form is used for documenting property groups relating to one or several historic contexts. See instructions in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 16B). Complete each item by entering the requested information.

 X New Submission Amended Submission

A. Name of Multiple Property Listing**DRAFT**

Northern California Doghole Ports Maritime Cultural Landscape

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

Northern California Lumber Industry in Sonoma and Mendocino Counties, 1860-1940

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D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.

Signature of certifying official

Title

Date

State or Federal Agency or Tribal government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper

Date of Action

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E. Statement of Historic Contexts

The arrival of Russian colonial interests on the Northern California coast in 1812 fundamentally changed how people regarded the area. In comparison to the indigenous culture of the Kashia Pomo that had resided there for millennia and considered themselves part of the land, European world views and the Russian settlement at Fort Ross' connection to the world economic system meant that the Redwood Coast became a place to secure exportable commodities. Sea otters became the first casualty of this perspective and the extirpation of this animal amongst other factors led to the departure of Russian colonists from the area in 1841. The power vacuum, from a European or Euro-American perspective, created opportunities for new people to further exploit the area's natural resources. Californios, as early Hispanic residents of California were known, Americans, and Europeans began to subdivide the area for their purposes (Pitt 1966).

The Gold Rush of 1849 and the subsequent boom introduced tremendous demand for lumber and food stuffs leading to ranches and lumber mills to grow food and harvest the massive groves of timber that grew along the appropriately named Redwood Coast. The "Timber Rush," only second in comparison to the Gold Rush, had a massive impact on California's development and commercial growth during the nineteenth and early twentieth centuries (LeBaron 1988). As the major port on the Pacific, and with expanding maritime trade linking San Francisco to global markets, San Francisco served as the initial market and distributor of the coast's extensive timber resources as they were harvested. A January 1879 editorial in the San Francisco *Journal of Commerce* noted that San Francisco "has no rival in her commercial relations.... The coasting voyages both north and south begin and end here. The lumber, grain, wool and other produce is shipped to us for sale and reshipment, and every little chute, roadstead or landing sends its products to and receives it supplies from San Francisco...." (Martin 1983:52).

Euro-American explorers of the coastal redwood forests in the early 1850s north of San Francisco in Sonoma and Mendocino Counties found massive trees that could be lucratively harvested, initially to build California, and then to sell to other markets beyond the state. Reaching the port of San Francisco with timber could not be accomplished by land. The rugged shoreline had few roads, and those connected individual ranches. With no long-distance railroads, the most cost-effective and quickest way to move the lumber to market in San Francisco was by sea. The only way to ship lumber products was via the Pacific Ocean, beginning in the 1850s and continuing well into the next century. As the San Francisco *Journal of Commerce* noted in January 1879, "no railroads yet interfere with the coastal trade.... The winds serve the vessels cheaper than the coal does the engine, and canvas yet retains its supremacy over iron in the carrying trade in this part of the world" (Martin 1983:52). Enterprising men rigged a network of chutes and cables extending from the bluffs down into small coves, allowing material to be transferred from shore to waiting ship. In time, these smaller

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landings and chutes gave way to more centralized nodes of distribution, again by slinging lumber down coastal bluffs to ships anchored immediately offshore.

The system employed schooners as the most common type of American small craft. Built locally of native Douglas fir, hundreds of Pacific coast schooners worked the coast, many of them individually owned, commanded by their owner, and sufficiently small to work in and out of small coast ports. Their trade was not limited to lumber. They operated in the maritime trades as “tramps,” working at a variety of trades, carrying many types of cargo, and regularly calling at the Sonoma and Mendocino ranches and farms, coastal ranches south of San Francisco, along the ports of San Francisco Bay, and up the rivers to Napa, Sacramento, and Stockton. They were as ubiquitous as the large trucks that became part of the flow of commerce on highways. Their fore-and-aft rig and ability to tack made them particularly maneuverable, and their stout, deep hulls allowed for stowage of cargo below as well as on deck, which meant a greater potential for profit by the schooner’s owner. Beginning in the 1850s, the two-masted coastal schooner dominated the coastal California trade, lasting well into the 1890s. Known as the “outside porters,” hundreds were employed in the 1880s, and in that time, one captain counted “over fifty outbound schooners becalmed in the lee of Point Reyes” on their way up to the Sonoma and Mendocino coast ports (Martin 1983:51).

By the 1890s, larger three-masted schooners entered the coastal trade, and most were too large to call at smaller ports. At the same time, the 1880s introduction of the steam schooner and the use of mechanical power to maneuver allowed for easier access to some ports, as well as increased cargo capacity. The evolution of coastal shipping from smaller, more numerous two-masted schooners to fewer, larger sail and steam schooners both responded to and helped drive the move from a larger number of smaller to larger ports on the coast, such as Point Arena and Gualala. They also shifted the offloading of product from the closer port of San Francisco to other more distant ports such as Seattle and Los Angeles, and to markets as distant as Australia and Asia.

These landings, known regionally and colloquially as “doghole ports,” essentially defined the Northern California coastal maritime landscape of the mid-to late nineteenth and the early twentieth centuries. Their main operational period was 1860 to 1940. Doghole ports were considered by mariners to be “landings,” although in most cases vessels did not tie-up to pier or dock structures extending from shore, rather they moored-up some distance from shore. The network of doghole ports were essential components to successful lumbering ventures and community development. Engineering and technological development made partially hospitable coves into centers of commerce. Similarly, early primitive logging methods used to process redwoods evolved to include steam engineering and greater mechanization to access, cut down, mill, and ship out timber products provided Sonoma and Mendocino Counties on the map for their economic influence within California and the nation. Doghole ports were key to the

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industry for over seventy years until roads and railroads replaced water as the main shipping outlet. Retired National Park Service historian Stephen Canright described the area's perils and potential,

The coastline between Bodega Bay and Humboldt Bay presented special problems to coastal shipping. On this whole stretch there was nothing that could really be described as a harbor. The coast presents an almost unbroken line of rocky bluffs, with only a narrow strip of beach at their foot. This forbidding coast fronts more than half of the coastal redwood region. So rich were the resources of timber, that their exploitation was virtually a necessity. Both the technology and the nerve required for shipping operations on this coast arose to make it possible (Canright 1977:16).

Sonoma and Mendocino occupied some of the most productive regions for the lumbering of coastal redwoods. Sonoma as a county was formed in 1850 and occupies an area of 1,768 square miles with seventy-six miles of coastline. The major coastal feature is the Russian River, the county's only river. Sonoma County was well-known for its diversity of resources and productiveness of its soil, leading to farming and ranching activities on the inland side of the coastal mountain range. Historical research and archaeological field work has identified fourteen doghole ports associated primarily with timber extraction, farms, and ranches that are situated along the Sonoma County coast from Duncan's Landing within Sonoma Coast State Park to Del Mar Landing within The Sea Ranch community.

The Gualala River defines the border between Sonoma and Mendocino Counties. Mendocino County's geopolitical extent was established in 1850. It occupies an area of 3,878 square miles with 100 miles of coastline. This stretch of terrain is also referred to as the Lost Coast due to its isolation. Unlike its southern border, Mendocino County's northern border with Humboldt County does not follow a geographic feature; it was chosen politically. Since its Euro-American settlement, Mendocino County developed through timbering and ranching focused at forty-three doghole ports between Gualala at the south and Needle Rock at the north within Sinkyone Wilderness State park. In total, fifty-seven doghole ports make up the transportation network and subject of this MPS. Each doghole port was adapted to and utilized the landscape's individual terrain and submerged as well as above water features. All had several similarities. Each was a less than ideal port situated where geographic features and natural resource availability dictated the placement of a port. Market economics as well as the plans of individual ranchers, farmers and smaller companies are reflected in the initial establishment of the doghole ports. Those plans, including taking more of a share and growing profit, led to increased capitalization of doghole infrastructure, as well as in some cases over-capitalization to capture a greater market share.

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Each port used a chute system, employing either a trough or wire or a combination of both to sling materials to and from the coastal bluffs to the decks of waiting ships, and/or a pier to move materials from shore to vessel. Doghole ports did not offer shelter for vessels to reside long term, rather they only provided enough infrastructure and protection for loading and unloading. Many were used only seasonally, between May and October, when prevailing winds and waves made it possible to risk close proximity to the rugged shoreline. Doghole ports supported a sawmill or group of sawmills, typically located near one of the gulches, rivers, or creeks, that relied on a local system of roads, tramways, and railroads to be economically successful. Vessels provided connectivity between ports until railroads and trucking along the coast road started in the 1930s leading to the demise of the doghole port transportation network. At that late stage, the smaller dogholes had closed, some abandoned, as corporate entities assumed control of the timber resources, and concentrated loading and shipping at fewer, larger dogholes capable of accommodating larger vessels. This was the final chapter in the use of the coast as a marine highway that connected local communities and their goods for market.

The doghole ports within Sonoma and Mendocino Counties eligible under this MPS are listed from north to south. A description of each doghole port is included at the end of this section and a location map is included in Additional Documentation.

Needle Rock Landing
Bear Harbor Landing
Northport Landing
Monroe Landing
Devilbliss Landing
Rockport Landing
Hardy Creek Landing
Union Landing
Westport Landing
Kibesilah Landing
Newport Landing
Laguna Landing
Fort Bragg Landing
Noyo Landing
Pallas Bay Landing
Bromley Gulch Landing
Caspar Landing
Russian Gulch Landing
Mendocino Landing
Little River Landing

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Big Gulch Landing
Albion Landing
Henley's Landing
Whitesboro Landing
Navarro Landing
Cuffey's Cove Landing
Chisholm Landing
Greenwood Creek Landing
unnamed landing
Uncle Abe's Landing
Bridgeport Landing
New Haven Landing
Arena Cove Landing
Buster's Landing
Scott's Landing
Saunders' Landing
Iverson's Landing
Steen's Landing
Nip and Tuck Landing
Fish Rock Landing
Collin's Landing
Bourn's Landing
Gualala Landing
Joe Tongue's Landing
Del Mar Landing
Bihler Landing
Stewart's Point Landing
Fisk's Mill Landing
Salt Point Landing
Walsh Landing
Stockhoff Cove Landing
Stillwater Cove Landing
Timber Cove Landing
Fort Ross Landing
Russian Gulch Landing
Rule's Landing
Duncan's Landing

The origin of the term doghole is not conclusively known. Historians have suggested that a sailor

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entering one these tiny retreats may have coined the term. Terrance Ryan opined that mariners possibly nicknamed them doghole ports since they were so small that a dog could barely turn around in them (Ryan 2010:142). Another theory on the origin of the name comes from staff at the Guest House Museum in Fort Bragg, California who believes that sailors could determine where they were by barking dogs on the ranches adjacent to the ports. Each dog's vocalization was distinctive to the property (Mark Hancock 2017, elec. comm.). The term is also thought to be a derogatory reference to the quality of shelter offered by these ports (Carranco and Labbee 1975:32).

Doghole Ports as a Maritime Cultural Landscape

Considered collectively, the doghole ports comprise a maritime cultural landscape. Analysis with this maritime cultural landscape approach looks at historic contexts and the way people used and related to the marine environment and its resources without distinctions between natural and cultural resources and terrestrial and underwater sites. Maritime cultural landscapes expand on the traditional and more widely used cultural landscape approach taking an even more expansive viewpoint that integrates the maritime world,

At the most basic, cultural landscapes are specific places where a combination of human activity and natural forces have left a discernable mark on the world... Retaining the intangible as well as the tangible parts of human culture, cultural landscapes can do what natural sciences alone cannot. They convey the human meaning of places (Jensen et al. 2011).

Westerdahl defined a maritime cultural landscape as, "human utilization of maritime space by boat, settlement, fishing, hunting, and shipping and its attendant subcultures" (Westerdahl 1992). It, "comprises the whole network of sailing routes, old as well as new, with ports and harbors along the coast, and its related constrictions and remains of human activity, underwater as well as terrestrial" (Westerdahl 1992). It is an organized collection of terrestrial and submerged sites that show the relationship between humans and the water where the landscape's significance cannot be understood without looking at the sites together and in reference to each other (Ford 2011).

As the doghole ports connect the land and the sea, so does the maritime cultural landscape approach represent a better way to understand the interconnected nature of the submerged and terrestrial features. Instead of focusing on disparate sites either on land or underwater, this MPS documents the interrelationship of historic settlements, archaeological sites, and the marine environment using the concept of the cultural landscape to reveal the inherent maritime nature of human activity along the coast. Investigation of underwater and terrestrial archaeological

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resources and intangible components such as the origin of place names, such as doghole ports named for the ranches and families they once served, oral histories, shipwrecks, and vessel grounding sites requires the maritime cultural landscape's holistic approach to make meaningful associations that reveal the area's past. It also recognizes the impacts and effects of the larger maritime world on a coast and in communities that are more than just places that overlook the sea.

Life, industry, and society on the Redwood Coast was shaped by interaction with the sea for thousands of years. Doghole ports and the lumber industry context are just one example of this interaction. This MPS focuses on the latter aspects of that human interaction beginning in the mid-nineteenth century and continuing into the early twentieth century, the lifespan of the doghole ports use supporting the lumber industry. Individual site or district nominations submitted under cover of this MPS will provide more details on the tangible and intangible features present at a particular doghole port. While the specific features may vary from port to port, the larger list of features includes the following.

Tangible Doghole Ports Maritime Cultural Landscape Features

- Shipwrecks
- Lighthouses and Navigational Landmarks/Aides
- Mooring Hardware and Anchors
- Lumber Chutes
- Piers
- Buildings, Footings, and Clearings
- Walls, Fences, Roads, Rail Beds
- Logging Camps
- Timber Mills and Processing Locations
- Tree Stumps
- Cleared Fields for Agricultural Crops or Livestock
- Geography and Coastal/Underwater Terrain
- Salvaged Anchors
- Historic Charts, Maps, and Archival Materials

Intangible Doghole Ports Maritime Cultural Landscape Features

- Oral Histories/Traditions
- Origin of Place Names
- Shipping Routes

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- Temporary Grounding Sites
- Salvage Activities
- Human/Community Relationship with the Sea
- Cultural Tourism
- Marine Protected Areas and State Parks

Small Scale Lumbering (1849-1860)

“Lumbering was a pioneering industry in California. The State provided a fortunate combination of rich timber resources with a natural highway, the Pacific Ocean, for bringing the products to the developing population centers” (Canright 1977:1). Doghole ports were necessary for coastal industry development, lumbering being the primary one. This vital connection was essential for the coastal communities to engage in regional commerce. It connected their ranches and communities to the market that was San Francisco; their goods, ranging from produce, fruit, hides, cheese, and butter to lumber, were exchanged for commodities otherwise not available. While the need to feed the burgeoning population of San Francisco and environs had inspired initial maritime trade along the coast during the Gold Rush, it was lumber and other timber products that bolstered that trade into industrial proportions.

The Colonial Spanish activities in California used redwood for vessel repair and buildings yet did not develop into a full industry at the time. Similarly, timbering activities by the Russian colonists north of San Francisco in the early 1800s was on a small scale, mostly serving local needs. Construction of the first steam sawmill near Bodega Bay in 1844 by Captain Stephen Smith spurred lumber production to a new level and led to the increasing interest in Sonoma and Mendocino Counties (Canright 1977:4). After the Russian-American Company sold its enterprise at Fort Ross to John Sutter in 1841, the coastal tract of land in Sonoma, claimed by John Sutter and Mexico, was principally granted to two different enterprises. One, the Muñiz Rancho, extended from the Russian River to Stillwater Cove and a second, the German (or Herman) Rancho, for the area between Ocean Cove and the Gualala River. Similarly, in Mendocino, two large Mexican land grants were given out, one to William Richardson in 1844, which covered the coast from Big River to Mal Paso, north of Point Arena, and a second to Rafael Garcia in 1846 starting north of Richardson’s property extending north to the Garcia River (Sullenberger 1980).

While the initial land interest was for agriculture and ranching, the settlers soon realized the value of the timber on their lands. Richardson financed the building of dams and sawmills on the Albion and Noyo Rivers. The cut lumber was most likely used to construct buildings for homestead development rather than trade (Sullenberger 1980). The end of the Mexican War in

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1848 led to American ownership of California. The discovery of gold, and the rise of San Francisco as the principal American Pacific port, created a tremendous demand for lumber to build up the city as it expanded from a settlement of several hundred to a fluctuating population as high as 40,000 by 1850 (Berry 1984:21). Gold provided the means by which California, and specifically San Francisco, were absorbed into the expanding global economic system, introducing a rush largely by ships that built up San Francisco as the entrepôt that at first served as the nexus for goods that flowed up the bay and the rivers that fed it to the gold mining regions. As San Francisco grew as a city, its own needs commanded trade to sustain the city's inhabitants and businesses, which "allowed the new city to prosper without relying solely on its links to the gold mines" (Delgado 2009:49). San Francisco as a transshipment center served as the means by which regional, national, and international markets obtained at first California, and in time Pacific coast, commodities like gold, lumber and wheat.

Starting in 1849, ships from around the world imported milled lumber to build San Francisco. An analysis of incoming cargoes handled by San Francisco commission merchants Mickle & Co. from 1849 to 1851 documented for that one firm (of many) alone, regular cargoes of lumber, one of them 250,000 ft of "superior planed and matched pine boards, of all sizes, 100,000 best shaved shingles" and "two prefabricated "two story frame houses" (Delgado 2009:109). In addition to imports, local San Francisco Bay area redwoods, harvested since Spanish Mexican times, were logged, primarily to provide the pilings for the extensive wharves that formed the basis of the expanding port. That supply quickly ran out.

At that time, the Redwood Coast, stretching from just north of San Francisco for several hundred miles, was gradually visited and explored by new arrivals brought by the gold rush, and their reports of the large forests and open coastal meadows encouraged settlement. The need for lumber, however, was the primary motivation to explore new lands and expand Anglo American settlement into areas not yet exploited. The establishment of lumber trade as a business began with the land leases and grants to business minded Americans and immigrants, many who had a background in the business. Landowners subsequently leased out logging rights, leading to the beginning of the industry in the 1850s. Within two years, by 1851, lumber was being shipped from British Columbia, Puget Sound, and Humboldt Bay as entrepreneurs established sawmills in those vast forests to feed the San Francisco market, especially in the wake of disastrous fires that levelled much of the city in May 1850 and again in May 1851. At the same time, the lumber trade commenced in Northern California. Loggers staked out their own claims and ran small scale individual operations, and soon learned it was a hard proposition. The independent logger had a hard time supplying enough material in a cost-effective manner for commercial outlets therefore it was tough to be profitable.

The wreck of the American brig *Frolic* stimulated American interest in the Mendocino County

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forests. The vessel wrecked at Point Cabrillo in 1850 while sailing from China to San Francisco. A salvage party from Bodega Bay traversed the coastline on its way to profit from the ship's spilled cargo and found land filled with massive virgin forests. By 1852, a group of men led by Harry Meiggs of San Francisco set up a sawmill, shipped from the east coast over the Isthmus of Panama, and began lumbering operations at Big River (Carpenter and Millberry 1914). This coincided with the great migration of people moving west to strike it rich and set up homesteads. Following the publication of the gold discovery and resulting influx of people into California searching for gold, growing Northern California communities needed lumber for the construction of buildings along with wood products for farming, ranching, and railroad infrastructure. Migrants from Europe, Canada, and the U.S. East Coast brought the knowledge of lumbering techniques necessary to spur the industry's growth.

Recognition of the wealth to be made from lumbering the great redwood forests was dependent upon, "the concepts of rugged pioneering skill and industrial development walking hand in hand. The timber trade's story of evolution, garbed in the complex fabric of corporate dealings, is populated with one example after another of successful exploitation of a major natural resource" (Carranco 1982:9). Small scale lumbering efforts continued throughout the nineteenth century. A more coordinated and complex system, including the use of doghole ports, provided the capital for more organized and corporate efforts. Real profits from lumbering necessitated control of all parts of the operations, from tree felling, to sawmills, to the chutes at doghole ports, the vessels, and the dealers at the main markets of San Francisco.

Lumber Industry on a Commercial Scale (1860-1920)

The Coastal Redwood Belt

The commercial exploitation of the Redwood forests within Sonoma and Mendocino Counties did not begin until the 1860s when technological developments permitted the large scale harvesting and processing of trees. San Francisco had exhausted all of the easily accessible forests by then so other sources were needed. *Sequoia sempervirens*, also known as the coastal redwood, coast redwood, or California redwood, was the tree of choice for loggers north of San Francisco. Smaller in diameter than the Sierra redwood, timbermen harvested coast redwoods 30 ft in diameter and 370 ft tall. These massive trees only grow within a narrow ecological and climatological band approximately 500 miles long from Monterey to the Oregon border and rarely grow more than 30 miles inland from the coast or at elevations above 2,000 ft (Carranco 1982:13). Redwood trees grew to massive proportions in the drainages and slopes of coastal mountains where they thrive in the cool sea air and moisture rich foggy climate. Their tall, thick, straight-grained trunks made them ideal for easy sawing, splitting, and milling. Redwoods, categorized as a softwood, are low in flammable resins and have high tannins helping to repel insects or decay. For those seeking to profit from their harvest, the only problem with the

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feasibility of commercial operations in Northern California was that the land was isolated and conditions hard for building the infrastructure needed to get the products to San Francisco. The rugged topography meant that the only way to move lumber and other materials to market on a large scale was by the oceanic highway, taking advantage of the few partially sheltered coves to load lumber. While coast redwoods were the most sought-after species, other lumbermen also harvested Douglas fir (used extensively in shipbuilding), grand fir, Bishop pine, Cyprus, and Tan oak (used in leather tanning).

A review of California's natural resources and industries, published in 1868, noted that Sonoma County had thirteen sawmills in operation, which annually produced twelve million board ft of lumber "primarily for local consumption, though considerable quantities are exported from Bodega, Fort Ross, Timber Cove and other points in the northern section of the county" (Cronise 1868:166). In Mendocino County, "covered with an almost unbroken and nearly impenetrable forest of redwood and pine," seven sawmills had produced forty-six million ft of lumber, while nine small mills had produced two million ft of lumber "chiefly for local consumption" (Cronise 1868:190-191). The lumber trade "of this region is the chief resource of this county, giving employment to nearly one half of its population and to about forty schooners of from one hundred to two hundred tons burden" (Cronise 1868:191). The lumber produced was a "large quantity of posts, rails, railroad ties, pickets, shingles and other split lumber" (Cronise 1868:1901). Mendocino County lumber sold in San Francisco for twenty dollars a thousand ft rough, and thirty dollars per thousand ft dressed, and in 1867, grossed \$9,6000,000 in revenue (Cronise 1868:192).

During the Civil War, the lumber industry in Mendocino in particular had moved from small operations to those on a larger scale. Wealthy individuals and organized companies penetrated the forests with an investment of capital and men. In 1868, the largest mills at Albion (**Figure 6**), Noyo, Gualala, Little River, Navarro, Caspar and Mendocino were all large steam-driven plants, while "the other mills of this county are of small capacity, and mainly run by water power" (Cronise 1868:191). Doghole ports provided the means for the production of these operations to reach San Francisco and profit,

each of the principal mills is located near the mouth of a creek or river—such creeks and estuaries occurring at irregular intervals of ten or fifteen miles along the whole coast of the country, and affording unusual facilities for conducting an extensive lumber trade (Cronise 1868:191).

The transshipment industry became more organized with fixed charges and taxes established for use of the chutes (*Pacific Rural Press* September 8, 1888). Chutes and piers fell into two categories, either private or public. The ones "doing public business were commonly franchised

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and licensed on the county level. The county government also regulated the chuteage fees charged by franchisees” (Douglass 2002:164). For example, in Mendocino 1891 the county fee for chuteage for a railroad tie was 1.5 to 3 cents depending on its size (*Republican Press* April 15, 1892:2). The fee varied upon market conditions. Contemporary sources confirm chute franchises in Mendocino, and not in Sonoma (Douglass 2002:164). Industry productivity was tied to technological advancements in moving wood along its production cycle. During the 1880s, the use of steam power in the mills, rail networks, and steam schooners marked a high point in the lumber production outputs. Table 1 provides quantities of redwood lumber produced by California counties north of San Francisco.

Table 1. Redwood region lumber production by county by millions of board ft (Cox 1974:302).

	Sonoma	Mendocino	Humboldt	Del Norte	Total for California
1881	3,918	54,037	71,068	1,440	130,505
1883	18,948	39,324	61,200	4,262	250,000
1885	4,400	74,050	82,300	4,050	215,000
1886	7,140	88,393	93,147	14,515	248,439
1894	9,901	82,011	110,898	-	-
1895	8,289	110,062	127,037	4,008	-

By the turn of the twentieth century, the lumber business was less of a local operation and more of a larger industry with San Francisco and national investors pumping in vital capital. This was especially true in Mendocino County. In general, the magnitude of lumbering in Sonoma County was on a smaller scale than in Mendocino County. Mendocino had geographic advantages such more expansive and easier to access redwood forests, larger areas for mills, and terrain that was better suited for logging railroad lines and roads. Mendocino’s doghole ports were bigger, more open, and could accommodate larger vessels making them able to load more products and accommodate larger steam schooners or steamers. Another advantage for Mendocino was the number of rivers compared to Sonoma. Russian River was the only large river in Sonoma County while Mendocino had six; Gualala, Garcia, Navarro, Big River, Noyo, and Ten-Mile. Plentiful access to water was one of the key aspects to successful mill operations. In the larger context of California, Oregon, and Washington, Mendocino was smaller than Humboldt County and the Pacific Northwest in regard to the overall production and export of timber products for those areas had even more suitable harbors. The northern region had more traditional harbors with piers making them able to load large sailing and steamships for domestic and foreign markets.

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With vast tracks of forest, large scale lumbering operations became increasingly corporate. The Union Lumber Company, formed in 1884 as the Fort Bragg Redwood Company, was cutting one third of all the lumber in Mendocino County by 1896. Sixteen years later the company was the sixth largest lumber company on the California coast. As mills closed, they were consolidated, and many were brought under Union Lumber Company control. The company also invested in many of the railroad and steamship companies, as well as much of the prime timber acreage (Sullenberger 1982:65). Their influence in the industry was massive with their assets including a fleet of vessels servicing numerous doghole ports. The Union Lumber Company mill in Fort Bragg continued to operate until 2002, after the company was bought by Georgia Pacific in 1973. The area is undergoing redevelopment, incorporating aspects of its historic past.

In 1916, timbermen formed the California Redwood Association, headquartered in San Francisco, to promote the use of redwood, represent the companies, gather statistical information, conduct research, and extend trade opportunities. In 1923, the association represented eleven companies, representing thirteen mills with an output of about 500,000,000 board ft a year. They marketed twenty-five percent of the output to states east of the Sierra Nevada Mountains, ten percent to foreign markets, and the rest to markets within California (Brown 1923:247). The establishment of a trade organization coincided with the evolution of the industry to a more centralized commercial operation. The era of small individual mills was ending since they could not compete. Reports of the Bureau of Census and the U.S. Forest Service documented lumber production by species from 1899 and 1920. U.S. redwood lumber production peaked in 1906 with 659,678 million board ft. The lowest production was reportedly in 1899 when only 360,167 million board ft were produced. On average, around 400,000 to 500,000 million board ft were produced each year. (Bryant 1922:508-509).

Products and Markets

Redwood's characteristics of being soft, fine-grained, durable, and easily worked made it suitable for many uses. Several key products were the focus of redwood commercial harvesting. Rot resistant properties made redwood useful for applications that put it in contact with damp ground or wet weather conditions. The wood resisted warping, splitting, and swelling better than other wood varieties. These traits made it ideal for fence posts, grape stakes, railroad ties, and shingles, which were the most common products shipped from the doghole ports. Redwood had a straight grain and provided good insulation for heat and sound, was fire and pest resistant, and held paint or stain well. It was often left untreated to develop its distinctive weathered silver-gray color in exterior building applications. Toward the end of the use of doghole ports in the 1920s, the overall most sought-after products in the U.S. included planing mill products, caskets, tanks, silos, and wood pipes (Brown 1923:174).

Lumber is defined as timber that has been sawed or split from a log that was manufactured for

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use mainly in buildings. A board is a piece of sawn lumber 1.0 inch thick with varying lengths and widths. By comparison, a timber is sawn material 4.0 inches or greater in thickness by 4.0 inches or greater in width (Bryant 1922:466). Redwood lumber was prized for buildings, floors, streets, water and tannery tanks, and in winery tanks. San Francisco's building codes of 1903 required redwood be placed as an insulating firebreak in common walls between buildings and is said to have spared a great deal of the city during the 1906 earthquake-induced fires. The wood products from Sonoma and Mendocino Counties' virgin forests, shipped out of the doghole ports, literally built San Francisco, Marin, and the East Bay. San Francisco burned six times between 1849 and 1851 and again as a result of the 1906 earthquake requiring increased demand for redwood building materials (Farmer 2013: 49).

Redwood was considered a superior wood for making railroad ties or crossties. Laid perpendicular to the railroad rails, ties transferred the load to the rail bed foundation. Railroad tie lengths varied from 8.0 to 9.0 ft with an average width of 6.0 inches. The growth and maintenance of the entire railway system in the United States and abroad in the mid-nineteenth and early twentieth century caused great demand for a constant supply of railroad ties. A historical account of Sonoma County recalled,

Sonoma and Mendocino counties furnished the ties for the Central Pacific Railroad. Every Eastern train the crossed the Sierra rolls over the product of the forests of Sonoma. The redwood is also used for the ties on the Southern Pacific, and ties from this county are now laid on the desert of Colorado. They have gone further, having been shipped to South America for that wonderful railroad which leads from Lima, in Peru, to the summit of the Andes... (Thompson 1877:29).

Redwood coast sawmills produced tremendous quantities of shingles, shakes, and laths. All three materials were associated with building construction. A shingle is sawn on both sides while a shake is split by hand. A lath is the thin narrow strip of wood used under roof shingles or on lath and plaster walls/ceilings to hold the plaster. A shingle machine invented in 1880 mechanized the otherwise very laborious shingle cutting process. All the principal mills on the Pacific Coast utilized the machine which could turn out almost 4,000 shingles an hour (*Petaluma Courier* December 29, 1880). One of the main markets for shingles in 1900 was the Eastern United States.

Another notable product was stave bolts, or a section of log prepared for the production of barrel staves. Coopers bought the raw bolts, shipped by the cord, and then made staves by hand for the size barrel needed. Material to make fences took up another large chunk of the products shipped out from the doghole ports. Redwood posts and pickets, the vertical slates placed between the structural posts, were desired products especially with the expansion of ranching and dairying.

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Pickets came in plain, fancy, or pointed designs, making them suitable to utilitarian or more ornamental uses. As with shingles, a machine was also used for making pickets to reduce labor costs. One of the common redwood products noted in ship cargoes and county statistics was firewood, also known as cordwood, and likely included redwood not suitable for more refined lucrative uses.

Tanoaks or tanbark-oaks grew alongside coast redwoods and were equally prized. The tannin-rich bark from the tree was used by tanneries in San Francisco for tanning leather and was not supplanted until chemists developed a synthetic version in the twentieth century. Crews peeled large sheets of bark from the trees and the rest of the trees were either used by the lumbermen in camps as firewood or left to rot. The tanoak bark had a high percentage of tannins compared to other oak species and leather processed with its bark was considered superior, especially heavier leathers used for belts, harnesses, saddles, and shoe soles (Huber and Philip 1992:1). Newspaper accounts of vessel cargoes reveal that tanbark was one of the main products shipped from doghole ports. The utilization of wire chutes beginning in the 1870s spurred on the trade as earlier trough chutes were not suitable for moving the loose or bagged material. The tanbark supply was so important that tanneries obtained timber rights and owned a stake in the doghole ports chutes. The San Francisco tannery company Funcke & Wasserman operated the Salt Point Landing and nearby lands, thereby controlling the entire market and supply chain from forest to chute to tannery. In addition to the tanbark, tanneries also needed a large supply of firewood to process hides. After the bark was peeled from the tan oak trees the tree was cut down and used for firewood. Firewood was referred to in San Francisco shipping lists as cordwood or wood and was shipped from the Redwood Coast doghole ports in large amounts. It was much cheaper to harvest tan bark and cordwood since a sawmill was not necessary. It was simply peeled from the tree or hand chopped and then shipped out the hides (Rudy 2009).

San Francisco was the main domestic market for lumber products shipped from the doghole ports. The city and its port served as the nexus for shipping that led to the dominance of American trade and development of the surrounding territory (Delgado 2009). Abundant gold provided San Francisco's entrepreneurial mercantile class with the resources for the port's development. This included creating a working waterfront on what had been a shallow, muddy cove, establishing maritime industries, rebuilding the city and portions of the waterfront after disastrous fires, and in time filling the former cove and building a seawall to hold that fill in place (Delgado 2009: 52-60, 80-81, 84-89). The city's waterfront was extensively connected and influenced by the lumber trade due to the massive amount of products arriving at its wharves. Many of the larger companies or dealers had their own vessels, wharfs, warehouses, and lumber yards to handle their materials including Henry Meiggs who built Meiggs Wharf, a 2,000-ft-long wharf stretching out from Powell Street. Businesses, such as commission merchants, planing mills, coppers, and tanneries, set up shops near the lumber docks to be close to the incoming

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shipments and reduce the need for extensive movement of heavy lumber (Olmsted and Pastron 1977). This intensive capitalization and rapid pace of trade made San Francisco a major player in the global economy. This in turn meant that San Francisco's merchants dominated regional trade, with the city serving as the "imperial heart of a vast trading network" (Robbins 1994:173).

Commodities harvested from the Redwood Coast and shipped from the doghole ports through San Francisco reached expanding markets up and down the coast, across the Pacific, and internationally. Increasing levels of lumber production coincided with increasing two-way trade between the West Coast and Hawaii, Australia, China, and South America in the 1870s and 1880s (Douglass 2002:20-21). In 1888, the top five foreign destinations for California lumber, accounting for ninety-one percent of the total exports in value, were Australia, Great Britain, Mexico, Central America, and Hawaii with a total value of \$531,943 and over nineteen million board ft (Potter 1890:11998). These overseas markets provided for the demand that allowed doghole port infrastructure to become increasingly industrial, and convinced San Francisco interests to invest in the industry.

In this context, the rise of doghole ports and the evolution of the Sonoma and Mendocino Counties coast maritime cultural landscape is intricately tied to San Francisco. At the same time, goods shipped through San Francisco to the doghole ports on the coast made up the second largest aspect of the coastal trade. In 1889, the largest trade was in lumber (4,239,656 tons shipped), followed by general cargo (1,754,001 tons). After that came agricultural produce shipped from dogholes at 1,152,100 tons), coal, quarried stone, and fish and animal products (Martin 1983:52). As to the nature of the general cargo trade, one outbound cargo list from San Francisco to the "outside ports" of the coast included a single pail, a "lot of household goods, 2 cases millinery, 150 empty oil cans, 2 cases old books" and other items including a case of patent medicine (Martin 1983:54).

Community Development

Doghole port operations were not isolated or independent ventures; rather they were units in a larger landscape that linked lumber mills with the coastal shipment points. The resulting economic based communities founded at these transshipment points were social outposts. Monetary and communication opportunities led to community development and town formation around many doghole ports. Landowners built houses and families grew as several generations participated in the businesses and lived in the area for decades. Population density near doghole ports led to associated facilities such as stores, saloons, hotels, boarding houses, schools, post offices, barns, livery, and blacksmith shops to support the residents and visitors. Mill workers and tie or tanbark camp men frequented the saloons on the weekends to drink and dance along with spending their hard-earned money. Immigrants from Germany, Sweden, Italy, Ireland, Mexico, Russia, and China who worked the forests made the coastal towns a melting pot. The

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native Kashia Pomo also participated in the industries, supported the local businesses, and further diversified the overall community. The overlapping activities of lumbering, ranching, and farming all relied on the doghole port communities for sustainability and economic success.

Sonoma County held fourteen townships and Mendocino County had sixty townships during the doghole port period of significance. In 1873, the “shipping points in Sonoma County in order north of the mouth of the Russian River” were listed as Duncans Mills, “exporting lumber and produce,” while “Timber Cove, Stillwater Cove, Salt Point, Fisk’s Mill and Fishermen’s Bay export lumber, produce, railroad ties, posts, cordwood and bark” (*Humboldt Times*, April 5, 1873). In 1880, Sonoma had four post offices located at the doghole ports of Duncans Mills, Timber Cove, Fort Ross, and Fisherman’s Bay (Stewarts Point). The opening of post offices at those places between 1862 and 1877 was an indicator that these communities were large enough to warrant this service (Munro-Fraser 1880:131). By 1911, Sonoma had a population of 48,394 and its population centers had shifted slightly as indicated by post offices at Duncans Mills (population 185), Stewarts Point (population 120), Fort Ross (population 63), and Black Point/Bihler’s Landing (Gregory 1911:247).¹

Mendocino County’s population around the same time was 23,929, centered closer to the coast compared to the inland ranches where a majority of Sonoma’s residents lived. With many more developed and populated towns including Albion, Caspar, Fort Bragg, Gualala, Mendocino, Navarro, and Point Arena, Mendocino County far out produced Sonoma County on the scale of its lumber activities, mainly due to its more accessible doghole ports. Point Arena alone had a population of 476 inhabitants in 1908 with nine saloons, three general stores, three hotels, three churches, a harness shop, two blacksmith shops, two barbers, one livery stable, one hardware store, three confectionary stores, a butcher shop, fire company, water works, electric lighting, grammar school and high school. Fort Bragg, north of Point Arena, was the largest and busiest town in the county with a population of 2,403. Its roots date back to 1857 as the site of an Indian reservation, later a military installation, and finally a mill town starting in the 1880s. It boasted all the businesses one would see in a growing area with additional luxuries of a newspaper, hospital, and two moving picture theaters (Carpenter and Millberry 1914).

Transportation Network: From Forests to Sawmills to Ships and Beyond

Lumbermen began by cutting down individual trees with an axe, hand saw, or steam powered reciprocating saw. Using only axes, two choppers might work for a week to bring down a single redwood. It was common to use an axe for the initial undercut and then a long saw for the back cut. The technology to fell trees did not change much, and even into the 1930s the simple axe

¹ Over time, Duncan’s Landing retained its apostrophe, while Duncans Mills and Duncans Point did not.

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and long saw were the main tools (power driven saws came on scene around 1935 and reduced the operating costs by forty percent). Once on the ground, a sawyer determined how to best utilize the tree, the bark was peeled off, and the tree broken down into more readily moveable 12 to 20-ft long logs as a complete tree was too big to move in one piece. Depending upon the operation, these logs were further refined into lumber, ties, or shingle bolts closer to the harvest point or moved to shore-side sawmills. Timber camps setup in the forest housed and fed the loggers; the whole operation moved when the timber supply dwindled.

Moving the massive redwood logs was logistically challenging. In addition to human muscle, teams of horses, mules, and oxen were used and eventually supplanted by steam powered locomotives and donkey engine powered winches. Log roads and tramways with rails allowed skids and cars to be pulled from the forest to a mill and then from the mill to the doghole port's chute. Ideally, lumber mills were situated along a river where trees could be cut, pushed into the water, and floated downriver for storage and processing. Mendocino County's rivers greatly aided this process, while Sonoma County's lack of sizeable waterways impeded lumbering away from the coast. As technology progressed in the industry, lumbermen were able to cut down larger trees and move them greater distances, increasing the magnitude of exploitation (Douglass 2002:12-15). One 300-ft high, 20-ft diameter tree yielded around 80,000 board ft of lumber so it took some time to cut down and process the tree for the next step (Carranco 1982:21). These vital arteries were no easy feat with clearing and grading the land, digging chutes, laying skids or rail tracks, and building bridges across creeks. This infrastructure building was the most expensive and demanding aspect of early lumbering (Carranco 1982:51). Once the logs were moved down the grades, following the creeks and gulches, they met the sawmills.

A sawmill was the heart of the lumbering operation that processed and organized the material for further shipment. At first, mills relied on waterpower. Steam, and eventually electricity, became the more suitable choice because of the limited water supply options and immense energy needed to cut through large logs. Once the logs were at the mill, they were reduced in size by a rip saw and then pulled into the mill facility and cut with a double circular saw or band saw. Logs sat on a carriage that moved back and forth and rotated the log into the position suitable for cutting. Lumber such as boards and planks were cut to the desired sizes and stacked in the yard. A planing machine further finished the pieces. The exact cutting methods for logs varied based on the products. Shingles were cut from a larger bolt and then trimmed and packed in bunches. Where feasible, mill operators dried the wood products to increase quality. As with the doghole ports, the mills were of all different scales with some small and independently run and others much larger and part of a more extensive enterprise. Their capacity varied greatly based on wood supply, mill size, market demand, and access to a doghole port. The lumber camps moved as the trees were harvested. Sawmills were stationary and became a focal point for community development where families and other business resided. Each doghole port had a connection

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through a simple road, tramway, or railroad to at least one sawmill who supplied the products.

The largest mill, and town, in Sonoma County during the doghole port period was Duncans Mills near the Russian River, within Ocean Township. In 1873, the *Humboldt Times*, reporting on the mills of Sonoma County, noted its capacity was 25,000 board ft a day (*Humboldt Times*, April 5, 1873). By 1880, the township had several mills with a capacity of 150,000 board ft a day, the largest in the county. Access to railroads and the doghole ports of Duncan's Landing, Rule's Landing, and Russian Gulch Landing all contributed to the township's predominance in the industry (Munro-Fraser 1880). Salt Point Township, the next township to the north within Sonoma County, had several sawmills. None of them rose to the same level as those around Duncans Mills. Mendocino County's lumber mills were numerous, with at least eighteen identified as being noteworthy by historian Lynwood Carranco around Big River, Noyo, Albion, Caspar, Gualala, Little River, Point Arena, Greenwood, Cottoneva, Newport, Bear Harbor, and Fort Bragg (Carranco 1982: 204-210). In 1873, the Mendocino mills had a capacity from 10 to 25,000 ft per 12 hours with a one-time high point of 300,000 ft. The annual average production from the mills was over 45 million ft (Menefee 1873:333).

Northern California coastal maps from the late nineteenth century reveal a system of roads, tramways, and rail lines connecting the mills to doghole ports and towns. Before steam engines, horse drawn carts carried milled products to storage yards adjacent to lumber chutes. Lines ran all the way down to the bluff or pier end where loads were moved down to waiting vessels using the chutes. The advent of commercial lumbering in the 1860s required an investment in the transportation network, both horse and steam powered, as a vital component to a business' success. An article in the *Mendocino Beacon* in 1882 noted that "no less than eight landings are in operation or in process of construction" between Noyo and the "County line north," and that with "the more outlets by sea the more demand there is for a wagon road along the shore" (*Mendocino Beacon*, March 18, 1882). Archaeological surveys have documented road and rail beds at several doghole ports.

The lumber industry's success was also linked to the vessels servicing the doghole ports. While some of the timber harvested was used locally, mill operators intended for most of their output to reach San Francisco through the doghole ports,

San Francisco was an importer, finisher, consumer, and exporter of redwood. Redwood came from across the Bay and up and down the Coast. In turn the rough or finished product was exported to the East Coast, Mexico, the Sandwich Islands (Hawaii), South America, the South Pacific, and Australia (Ryan 2010:154-155).

Most mill operators and doghole port owners partnered with San Francisco agents to assist with

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shipping the products and then selling them through a wholesale dealer. Independent vessels were frequently used at first. Doghole port and mill operators recognized they could cut costs and retain more profits if they owned or managed their own vessels. The Calls at Fort Ross built a small fleet as did the Richardsons at Stewart's Point to service their respective doghole ports. If more capacity was needed, vessels could be chartered. Smaller operations without their own vessels chartered a vessel or a portion of a vessel through a commission merchant or dealer.

The "shipping intelligence" columns of San Francisco's *Daily Alta California* and other regional newspapers documented the lumber shipping activities revealing vessel use patterns as individual schooners called at Sonoma and Mendocino doghole ports. Some schooners loaded at a single doghole before returning to San Francisco Bay, others made multiple port visits loading lumber, tanbark and ranch products until fully laden. Schooners servicing the doghole ports also loaded produce and dairy products, including eggs, cheese and butter, from ranches in Marin County, just north of San Francisco Bay, and from Santa Cruz County, south of the bay. The goods were not always intended for San Francisco; they also called at Benicia, Stockton, and Sacramento, heading up San Francisco Bay and thence the San Joaquin and Sacramento Rivers. The schooners were often itinerant, captain- or family-owned craft that in time evolved into company fleets, and at that junction, from two- to three-masted, and finally steam-powered vessels. The doghole port schooner's evolution is more than a change in size, rig, and mode of power. It is part of an increasingly industrialized and consolidated, corporate trade that in time closed smaller dogholes and focused on a handful of centralized ports such as Russian Gulch, Stewart Point, Point Arena, and Fort Bragg that served the large, steam-powered vessels.

Loading Methods: Engineering the Land-Sea Interface

Sonoma and Mendocino Counties' cliff-lined coastline was generally inhospitable to traditional maritime infrastructure. The unsheltered coves with 50-ft high cliffs and generally southwestern facing mouths were the only option for vessels to stop at with some protection. Limited natural or manmade harbor facilities existed to aid the lumber industry; therefore, vessels secured themselves to the cliffs in nooks along the coast to load. Historical research has identified fifty-seven locations between Duncan's Landing to the south and Needle Rock to the north that exported forest, farm, and ranch products. Contemporary observers opined that Mendocino County had the most seaports and fewest real harbors of any place in California. This is all tied to the development of doghole ports as the best method to move and load finished products from the lumber industry to waiting vessels. "From end to end its coast is dotted with sawmills, and each one is a shipping point in itself, yet not one can boast of anything more than an open roadstead for a harbor" (Gallagher 1897). Because these indentations along the shoreline did not support regular port facilities, they were set up with "glorified playground slides" at first and later with cable systems, similar to a zip line, to move items from shore to vessels. The chutes, of

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either trough or wire type were positioned ideally on the northern side of the coves as much protection as possible from incoming seas and winds (Tooker 1968:2; Gallagher 1897).

A doghole port could have a simple setup with one chute or it could have multiple chutes. If the property remained profitable a trough chute might be replaced with a wire chute over time. Large more lucrative ports might have more than one chute to accommodate additional vessels during good weather windows. The operation's complexity was tied to the business and if the owners were an individual or a more organized venture. Due to the varying suitability of the coastal topography and the proximity of timber resources, a number of these smaller ports proved transitory. Some were abandoned when the surrounding area was denuded of trees and lacked sustaining farming or ranching activity. Others proved too difficult and dangerous to use or were too frequently damaged by storms that required constant replacement of infrastructure. Eventually, a handful of ports, some maintained by private ranchers and entrepreneurs, others by companies that invested in industrial facilities—piers, wire chutes, rail lines, and steam winches—remained in use into the 1920s.

Trough Chute

Starting in the 1850s, lumbermen developed trough chutes, also known as slide or apron chutes, to export their production (**Figures 1, 2, 5**). This apparatus became the most common method of loading lumber onto a waiting vessel along the Northern California coast. Trough chutes were used when there was sufficient water depth to allow a vessel to anchor or moor relatively near a cliff or headland. Author John Hittel attributed the invention of the slide (trough) chute to the California coast (Hittell 1882:430).

A trough chute was comprised of wooden A-frames or towers built into the shore's rocky outcroppings that supported a narrow wooden trough held in place with rope, chains, wire cable, and iron rods. Rebates in the rocks were cut out to hold the tower's legs creating a stable foundation. A chute often extended out 200 to 300 ft with a long arm, called a swing apron, projecting out over the water another 40 to 90 ft (Potter 1890:11997-11998). If the chute needed to pass over semi-submerged rocks at the shoreline, a series of towers were built to extend its reach and provide stability. The chute was held in place against wind and wave by wire cables secured to the cliffs with iron pins and eyebolts. The old cables from the cable railways in cities were reused for chute bracing (*Pacific Rural Press* September 8, 1888). A system of wooden pulleys and wire cables raised and lowered the apron as lumber and other products were slid down the chute to the vessel. The chute was simply a wooden slide that looked like half a suspension bridge (Canright 1977:17). Chute builders aimed to create a 30-degree down angle for the slide to move the lumber at a rate of speed that was controllable. The angle started off steeper at the top and ended almost level or even ascending slightly by the apron's end (*Pacific Rural Press* September 20, 1884). At the chute's terminus, a movable plank or clapper could be

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raised or lowered from shore or by the moored vessel. This device regulated the flow of materials as they moved down the chute. Except for the first pieces, lumber was not slid down individually. Rather, chute operators loaded it with material so that the entire length of the apron was filled up, reducing the likelihood of a timber racing down and injuring the men at the other end. The apron's end typically sat at a height of five to ten ft above a vessel's rail and could be adjusted based on the lumber's weight, tides, or sea conditions.

Seven to ten men operated the chute moving lumber from the storage yard to the chute's mouth and then stowing it onboard the vessel after it had passed down the chute. It typically took two days to fully load a smaller-sized vessel. A good day's work might involve moving 50,000 board ft. Lumber was not the only item the chutes moved. If other materials such as general freight needed to be slid down, it was bundled and put on a sled. Horses then pulled the sled back up and helped discharge any imported merchandise or goods needed for the local communities (*Pacific Rural Press* September 8, 1888). Trough chutes varied in size and complexity as each was adapted to a doghole port's specific topographic configuration. A chute cost from \$2,000 to \$6,000 to construct. Trough chutes were gradually replaced by wire chutes that had a smaller footprint, were more versatile, and a less complex apparatus making them cheaper and easier to assemble and maintain. Despite the wire chute's advantages and widespread use by the 1880s, trough chutes remained in operation until after 1900 (Tooker 1968:2).

Wire Chute

During 1870, the wire or trapeze chute came into use, eventually replacing the trough chute (Jackson 1977:14). The most common type of wire chute was known as the gravity or St. Ores wire developed by Will St. Ores and his brother George who lived in Gualala (**Figures 3, 4**) (Sullenberger 1980:54). Some contemporary sources indicated that the first wire chute was located at Walsh Landing in Sonoma (*San Francisco Chronicle* May 6, 1894:20). Other sources claimed the first wire chute was either at Gualala Landing or Collin's Landing followed by [the first] Rule's Landing and Northport (Tooker 1977). The cost of installing a wire chute was about \$6,000. Historian Richard Tooker wrote that, "It is no coincidence that the cable car and the wire chute date from the same decade, the 1870s, for it was after the Civil War that wire rope of practical quality became readily available in California" (Tooker 1968:2). After a period of experimentation, the practical use of wire chutes grew at a fast pace. Wire chutes were used in places too rough to accommodate a trough chute and allowed the receiving vessels to be moored further offshore in deeper water. Unlike a trough chute, lumber did not jam up a wire chute. A wire chute could even be moved and relocated to another doghole port if demand arose at a new location.

Wire chutes required a flat spot near the bluff's edge. Chute builders cut a wide, shallow, trench in the ground leading toward the bluff edge and erected a wooden platform over the trench. The

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heavily built chute framing held a shaft with two differently sized drums of wire rope over top of the platform high enough so as to not interfere with the men operating the chute. A series of sheaves mounted on the platform frame tensioned and controlled the wire rope passing from the deadman behind the platform through to a block hanging over the outer seaward side. The block's height (and in turn the wire's height) could be adjusted. The platform's floor had a hinged section where the load was placed. Once released, the section pivoted down allowing the load to swing free and its weight to be borne by the wire. A counterweight under the platform allowed the pivot section to return to level after the load was sent down (Tooker 1968:3).

In addition to the main suspension wire, two other wires were wound around drums at the platform's apex. Each drum had a different size wire. Common wire sizes were 1.5-inch or 2.0-inch made from galvanized iron or steel. The larger drum had the haul back line for the traveler or carrier that held the lumber as it slid down to the ship. The smaller drum's wire ran to a counterweight hung below the platform that ran to the beach below. As the counterweight fell, it rotated the drum and brought the empty traveler back to the cliff top. When a vessel was loading, gravity and the cargoes' weight wound the counterweight back up. Each drum's size was dependent on the distance the traveler had to run to reach the vessel with the most common ratio being two to one (Tooker 1968:3-4).

The main suspension wire was not secured to the waiting vessel; instead it stretched from the platform to a secure anchor point beyond the loading area. This anchor point was sometimes secured to a very heavy anchor underwater, to a submerged or semi-submerged rock with a pin across the cove. The wire's total length extended as much as 800 ft. When a vessel came in to load, it first picked up moorings and ran lines to anchor points on shore to hold its position. The chute's suspension wire was hauled out to the waiting vessel, hung from its boom, and then connected to another segment of wire permanently installed at the offshore anchor point. The suspension wire was then hauled tight at the platform. Cargo loads were bundled into appropriate packages in the adjoining lumberyard and moved onto the chute's platform on tracks where it was then attached to the traveler. As the hinged segment fell away, gravity did the work of moving the load to the vessel. A braking system at the chute head controlled the descent. In addition to the counterbalance system described earlier, donkey engines were attached to the drums to assist with the traveler's return. This was particularly helpful for discharging supplies for the doghole port community (Tooker 1968:4).

Wire chute operations were much simpler and faster than a trough chute, and had the advantage of allowing cargo to be moved easily in both directions. Instead of loading board by board with a trough chute, a wire chute sent a larger bundle of boards all at once. Crews could load 150,000 ft of lumber in a day using the wire chute system, a good cargo for a schooner and about a half a cargo on a steam schooner (Gallagher 1897). Another advantage of the wire chute was related to

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shipping tanbark, used for tanning leather. Trough chutes wasted material as the small lightweight pieces often fell off the trough chute. With a wire chute, tanbark could be tied into bales to better contain the shipment (*San Francisco Chronicle*, May 6, 1894). Produce and other loose items were similarly packed into crates and then attached to the traveler. Passengers and crew traveling to and from a doghole port no longer had to scramble up or down the trough chute or be ferried out to the vessel; they could instead ride the wire in a basket, box, or swing.

Operations shifted from trough to wire chutes beginning in the 1880s and 1890s. The lumber industry's downturn in the 1890s slowed adoption of wire chutes until business rebounded. If the trough chutes were still in good shape they were used until their lifespan was exhausted. The advent of the steam schooner accelerated the move to wire chutes. The deeper draft of these vessels as compared to the small coasting schooner meant they could not come in close enough to access the trough chutes which had a limited reach. The wire chute could be extended much farther from shore and better accommodated the steam schooners and eventually smaller steamships (Tooker 1968:4, 7). This major advantage pushed the longevity of doghole ports to meet the changing market demands and technological advancements.

Piers

Traditional transshipment facilities of piers and wharfs were few and far between on the Northern California coast due to the terrain and rough sea conditions. Loading by chutes was slow and dangerous so if possible, a doghole port would have a pier or wharf (**Figure 6**). Although the terms pier and wharf are sometimes used interchangeably, they have different characteristics. A wharf is a fixed, solid, raised platform of stone or concrete cribbing, running parallel to shore, which provides an area for a ship to dock. A pier is a wooden structure on pilings that extends out into the water perpendicular or at an angle to shore that can also be used as a landing place for vessels. A wharf may contain piers. If a doghole port could have one of these structures a vessel could more simply tie up and use its gear or a derrick to move materials, a much easier operation. Based on historical photos and descriptions, the doghole ports within this MPS only had piers, even if they were called a wharf in historic and contemporary accounts. The only locations in Sonoma County known to have a pier were at Fort Ross and Salt Point, while eighteen locations within Mendocino County each had one. Westport Landing had two piers and Bourn's Landing even had three piers.

These numbers do not necessarily reflect that a pier was present throughout the doghole ports active life; rather a pier may have been built and used for a period of time and not necessarily maintained. If they were destroyed it was common not to rebuild them. These structures required protection from the open ocean to construct, something in very short supply in the area and were only built when a port's topography allowed access by a road or tramway. Piers were also costly to maintain and easily destroyed by heavy weather if it was built in an area subject to weather

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and sea conditions, as most doghole ports were. A pier was not always the sole loading method at a port; it was most frequently used in conjunction with a chute system to allow increased vessel access. In at least two locations, Albion and Fort Bragg, a wire chute was located at the end of a pier. Material was moved via railcar down the pier and further out into the water and then either loaded by wire or to a vessel directly tied to the pier. The pier extended the wire chute further from shore to clear any obstructions and allow deeper drafted vessels to access the port. This was done at locations such as Caspar, Westport, Rockport, and several other landings (Canright 1977:17). Overall, piers were only used at a third of all the doghole ports in Sonoma and Mendocino Counties and were not the main loading method; these were a secondary asset if the doghole port's position and topography allowed.

Mooring Infrastructure

Moorings played a critical role in doghole ports to stabilize a waiting vessels. A mariner's chief concern while at the chute was grounding on shore or the rocks or against a cliff. A system of underwater and land-based moorings were installed at the doghole ports to ensure the vessels were in the correct orientation best suitable for taking on a cargo. Buoys and anchors with heavy ground chains were also positioned at several locations within and just outside the coves to accommodate several vessels. The submerged components included large anchors placed on the seafloor with a log measuring as much as 50 ft long at the surface to hold up the chain/wire rope. These underwater features were overhauled yearly to monitor for corrosion and wear and tear, and then replaced as needed. Metal eyebolts, ringbolts, and staples set in the cliffs and offshore rocks were used to secure mooring lines. Vessels at the chute might even be secured by several underwater anchors as well as with lines to shore to keep them in one place. It could take several days to load a cargo so a four-point anchoring system was common with lines running from the port and starboard bow along with the port and starboard quarters. Each doghole port's mooring system was dictated by several factors including chute type, number of chutes, chute position, and topographic constraints. No two setups were the same. They were unique and worked with the landscape as much as possible to provide shelter for vessels with optimal chute engineering.

Other Shipping Methods

Two additional shipment methods were employed in Mendocino County only. In some locations, vessels did not load under a chute or at a pier, instead a smaller vessel such as a barge or lighter moved the freight from shore to a waiting vessel anchored further out of the cove. This was done when a vessel's draft was too deep and unable to enter the landing, or when there was no other infrastructure available on land. At Little River, lighters loaded and offloaded goods from a swing derrick placed on a platform at cliff top between the chutes. Other landings where lighters operated at one time were at Mendocino, Albion, Navarro, and Noyo Anchorage (Davidson 1889:280, 284, 288). Lightering was extremely labor intensive and slow due to the repeated loading and unloading. Overall, lightering was not a practical solution to lumber transshipment

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and was only minimally used (Jackson 1977:14).

Beginning in the 1880s, the idea of using steam tugs to haul schooners with their lumber cargos down the coast in response to a building boom “and extension of the railroads” in Southern California led “one company, which has large contracts” to charter the tug *Sea Lion*, “and she is used to tow vessels up and down the coast. Last week she sailed from San Francisco with three schooners in tow for Mendocino ports to load lumber and railroad ties” (*Weekly Humboldt Times*, May 19, 1887). That led to the suggestion of “barges, instead of schooners...they would need to be large enough to carry, say, 500,000 ft, and at the same time be so light of draught as to cross our bar without difficulty” (*Weekly Humboldt Times*, May 19, 1887).

The barge idea never took off. Three attempts were made at using log rafts to move logs from Noyo and Fort Bragg to San Francisco in the early 1890s. Lumbermen bundled whole logs into a 300-ft long cigar-shaped structure onshore before launching them into the water. Captain Hugh Roderick Robertson of New Brunswick, Canada, developed the idea, known as a Robertson Raft. Secured with heavy chains and cables, red and green navigation lights, a pilothouse, and crude steering mechanism completed the raft. A small steamer towed the rafts down the coast. It was thought this would be an eighty percent cheaper way of moving logs and a safer way of transportation. The experiments with the rafts proved a failure as two of the three broke apart. The idea was abandoned although lumber companies in the Pacific Northwest did successfully send log rafts to San Diego through 1941 with only one out of one hundred rafts breaking up in transit (Carranco and Labbee 1975; Hurst 2017).

Landscape Alteration

In order to create a suitable landing, builders altered the natural landscape to optimize transshipment. The landscape modifications sought to overcome the area’s rugged topography with a transportation network. Network components required significant landscape modification for railway roadbeds, log skid roads, retaining walls, building site and storage yards grading. Extant features reveal how humans altered the natural topography to best utilize the natural grades and terraces adjacent to the coastal landings.

Doghole port construction included:

- Stabilization of the bluff using retaining timbers
- Clearing for buildings to support the chute operations and store goods
- Grading areas for roadbeds and rail beds that were reinforced with rock walls, timbers and railroad ties
- Cutting notches/sockets in the rocks and cliffs for the trough chute A-frame supports

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- Flattening for a base at the cliff edge for the wire chute winch house
- Drilling holes in rocks for the mooring and chute hardware, cables, and chains
- Installing pilings for piers and wharves
- Blasting of offshore rocks for landing infrastructure

The doghole ports maritime cultural landscape reveals the multitude of ways that people interacted with coastal and marine environments. Doghole port utilization can be traced through the analysis of archaeological remains. Where artefactual material is no longer extant, landscape modification can reveal technological innovation exemplified by changing chute types. The location and characteristics of each type of chute can be determined by looking at how the landscape was modified. Other information that can be obtained from assessing landscape alteration are the support buildings, roads and railways servicing the port. This evidence can assist with understanding how the doghole port functioned, at what scale, and during what time period.

Vessel Types

The Redwood Coast lumber trade required vessels with specific characteristics. Very few of the Northern California doghole ports could accommodate large vessels due to shallow water depths and limited space for maneuvering. Two vessel types ruled the lumber and merchant trade along the Sonoma and Mendocino coast, the two-masted schooner and steam schooner. While some smaller steamships serviced the doghole ports, mainly in Mendocino County, most were too large to access the doghole ports and focused their trade at bigger ports farther up the coast in Humboldt and Del Norte Counties and in the Pacific Northwest.

The small, wooden-hulled two-masted single-decked schooner of less than 200 tons burthen was well suited to the task. Vessels over 200 tons were generally too big to enter most doghole ports (Jackson 1977:10). Its size, wide beam, maneuverability, and shallow draft made it handy and profitable to transport lumber. Typically built of Douglas fir (also called Oregon pine) due to its availability, its fore and aft rigged sails efficiently used the generally onshore winds in the area. The schooner's flat, heavy bottom and light rig permitted them to sail without ballast, a time saving advantage (Canright 1977:12). Ship captains and crew engaged in the lumber trade were mainly from Sweden, Finland, Denmark, or Norway and dubbed "California's Scandinavian Navy" (McNairn and MacMullen 1945). Their experience on the rough northern seas of their homelands prepared them for California coastal service and navigation in and out of the tight coves. Crews numbered between four and seven in number, considerably less than deep water sailing vessels.

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The two-masted schooner, the most common American vessel of the nineteenth century, dominated the lumber trade between the 1850s and 1890s with 300 vessels ranging from 50 to 300 tons servicing the industry (**Figures 1, 2, 3, 5**) (Ryan 2010:142-144). All came from regional shipyards; West Coast shipbuilders launched over 540 sailing vessels of 100 gross tons or greater between 1850 and 1905 (Lyman 1941:3). While larger three and four-masted schooners did engage in the lumber trade, they mainly concentrated on longer coastal and overseas voyages since they were too big for the doghole ports. The smaller schooners controlled the doghole port traffic and moved products from the Sonoma and Mendocino coast to San Francisco where it was sold and loaded onto larger vessels. The 219-foot long three-masted National Historic Landmark schooner *C. A. Thayer*, launched in 1895 with a capacity of 453 gross tons, is an example of the larger sized vessels and is the only West Coast lumber schooner still afloat. *C. A. Thayer* is homeported at the San Francisco Maritime National Historical Park (National Park Service 2020).

As demand for lumber increased in the 1880s, a new vessel type was needed to more reliably carry increased tonnage. The steam schooner emerged as the next answer in coastal trade (**Figure 4**). At first, wooden schooners were modified and outfitted with a larger aft deckhouse, an engine, boilers, and propeller before shipyards refined their hull designs to capitalize on steam propulsion. In general, steam schooners had a bluff bow, shallow draft, and were schooner rigged. The addition of an engine, commonly a small compound steam engine, to a sailing vessel greatly assisted its maneuverability in tight ports and opened opportunities to carry perishable items. A small aft deckhouse accommodated the engine space and smokestack and also provided the crew with protection from the weather. With the deckhouse located at the stern the main deck was wide open for holding deck cargo. The modified sailing vessels were replaced by purpose-built steam schooners that still retained masts and sails for cargo handling and auxiliary power. It is not known which schooner was the first to be fitted with an engine on the Pacific Coast; the title was shared between *Beda*, *Surprise*, *Laguna*, *Newport*, and *Alex Duncan* (Carranco 1982; McNair and MacMullen 1973).

By 1887, there were about twenty steam schooners operating on the West Coast, and eventually more than 230 were built of varying sizes. A steam schooner could carry from 75,000 to 1,500,000 board ft of lumber per trip (Carranco 1982:106). Sailing vessels were slowly pushed out of the market by the efficiency of the steam schooner, which could carry more cargo and stick to a schedule not dictated by the wind. Steam schooners were more maneuverable and less dependent on favorable weather to sail (Ryan 2010:151-152). Historians consider the 129-ft long *Newsboy* launched in 1888 by Boole and Beaton of San Francisco, California, to be the first purpose-built steam schooner. It carried lumber and passengers along the California coast until sinking while crossing the Humboldt River Bar in 1906 (Newell and Williamson 1960). The West Coast steam schooner was a unique vernacular vessel type specific to the region and to the

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lumber trade it serviced. No surviving examples remain afloat. Many wrecked at the doghole ports with the potential for those remains to be located and studied. In 2013, the National Park Service dismantled and broke up the final survivor, the 216-foot-long National Historic Landmark steam schooner *Wapama* (Knauth 2017).

Schooners were constructed up and down the coast in small yards, "...virtually wherever there was level space, suitable timber, and enough water to launch" (Canright 1977:12). While there were many California shipbuilders who built vessels for the lumber trade, the most well-known was Hans Ditlev Bendixsen. He first operated his business in Eureka, California, until 1875 before moving to the adjacent community of Fairhaven on Humboldt Bay. He constructed the finest vessels on the Pacific Coast, designed to maximize carrying capacity, a necessity of the lumber trade. From sailing vessels of all types to steam schooners, Bendixsen's name is tied to the success of the doghole ports and he is credited with building 115 vessels (Phillips 2019). Other shipbuilders associated with the lumber trade include Matthew Turner of San Francisco and Benicia who launched 219 vessels. He worked between 1868 and 1905 and is known as one of the most prolific builders within the United States and especially the Pacific Coast (Jackson 1977:6). Turner's main focus was deep water sail and his ships, brigs, and multi-masted schooners carried cargoes of California lumber to ports around the world. Thomas Peterson of San Francisco is also a well-known shipbuilder nicknamed the Dean of Mendocino County shipbuilders. He built thirty-four vessels, many of them two-masted schooners, the type that frequented the doghole ports (Jackson 1977:7-8). Within the geographical area of this MPS, Captain Charles Fletcher and James Kennedy built schooners on the Navarro River including *Sea Nymph*, the first Mendocino County built schooner from 1862. Fletcher arrived in Mendocino County around 1851 and was one of the first Euro-American to settle on the Navarro River. Eight lumber schooners are attributed to Fletcher including *Nevarra*, *Ocean Pearl*, *Ocean Spray*, *Ino*, and *Maggie Johnson*. His development of the area laid the foundations for future construction of a lumber mill, mill town, and doghole port facilities (Roland 2009).

Secondary Doghole Port Uses

Doghole ports diversified beyond shipping wood products as adjacent communities developed additional industries. As the connectivity between the Redwood Coast and San Francisco improved, migrants into the area focused on economic opportunities beyond the lumber industry. While Mendocino County's focus remained largely on the lumber industry with larger operations, Sonoma's ports began supporting farming, ranching, and dairying. Enterprising Redwood Coast residents took advantage of their surroundings and regular visitation of lumber ships to become a vital component of San Francisco's commercial network. The complexity of the maritime cultural landscape is evident in the wide assortment of products leaving the doghole ports and the archaeological remains present that represent those activities.

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Livestock Ranching

Second to lumbering, raising livestock was a significant component to the doghole port community and economy. The large ranchos with mild climates, grasslands, and expansive land tracks made the environment well suited to ranching. It may have even been the chief source of income for landowners, even over the timber interests and doghole ports trade, particularly in Sonoma County (Gregory 1911:522). Ranchers supported herds of stock and beef cattle, sheep, goats, hogs, and poultry that grazed all along the coastal terrain. In addition to the meat, wool was collected and tallow and hides were shipped to San Francisco for tanning. Ranching began in the region with the Spanish and Mexican settlers prior to the Gold Rush and continued with the land grants and immigration of other European settlers. Often times cattle were part of the land sales as well. Individuals owned thousands of acres and sold tremendous amounts of butchered beef to the lumber mill camps and other locals. Live calves and pigs were small enough to be shipped by schooner out of the doghole ports. In Sonoma County, cattle ranching was the principal livestock activity until the 1870s when sheep ranching and dairying took hold (Rudy 2009).

One of the well-known ranch operations became the location of The Sea Ranch in northern Sonoma County. Ernst Rufus petitioned California's Mexican Governor Pío Pico for 17,000 acres of Sonoma coastline between Salt Point and the Gualala River. Rufus received the "Rancho de Hermann" or German Rancho in 1846. He split the property amongst himself, William Benitez, Frederic Hugal, and Henry Hagler. Rufus, Hagler, and Hugal worked together to construct the necessary buildings and infrastructure for a working ranch before all sold their holdings in the German Rancho to William Benitz and Charles Meyer in 1849 (Munro-Fraser 1880b). In 1857, William Bihler controlled over 4,000 acres of the German Rancho and a large tract of the Rancho Huichica in the adjacent Napa County. Over the next 40 years, Bihler's workers Chris Stengel and Adam Knipp slowly acquired Bihler's property that eventually supplied the Gualala Mill with over a ton of beef each week. In 1903, the land was sold to William and George Bender. The Knipp and Stengel Ranch Barn (NRIS #87000005), dating to the 1880s, represents the last standing building of a major coastal cattle empire (Clark 2009). In later years sheep replaced cattle as the main livestock herd. Sheep were easier to raise since they were more docile, required less water and room, were hardier, liked the foggy coastal climates, and thrived in areas where grasses and terrain were not suitable for cows. Mendocino County ranching statistics for 1880 revealed the clear dominance of sheep ranching. In that year, ranches held 6,462 beef and stock cattle, valued at \$63,759, while 244,516 sheep, valued at \$432,279, grazed throughout the area (Palmer 1880: 260-261).

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Dairying

Doghole ports provided Redwood Coast inhabitants with an efficient and timely means to sell perishable dairy products. Regular visits from San Francisco bound lumber vessels made it possible to deliver butter to the city. Specially designed double-walled boxes kept the butter cool during transport. An 1875 article in the *Sonoma Democrat* newspaper summarized Sonoma County's wealth and provided an annual value of eighteen products the county produced and exported. The most valuable products, known to move through the doghole ports, included butter at \$420,000 (1,400,000 pounds) and lumber at \$400,000 (40,000,000 board ft). In total, Sonoma County's forest, ranch, and mine enterprises realized \$5,522,800 with butter and lumber making up 7% each of the annual value (*Sonoma Democrat* January 2, 1875). The Fort Ross dairy herd produced on average over eleven tons of butter a year between 1887 and 1899, much of it shipped out to San Francisco through its chute (Rudy 2009:74). Other doghole ports known to ship dairy included Arena Cove, Greenwood Creek Landing, Little River, Mendocino, and Fort Bragg (Davidson 1889).

Farming

Doghole ports supported the agricultural pursuits of Sonoma and Mendocino farmers. The climate and fertile soil near the coast supported raising crops for household and local consumption and export. The primary agricultural products were field crops (wheat, barley, oats, rye, corn, hay, hops, and potatoes) and fruit (apple, pear, fig, plum, peach, quince, and grapes) (Palmer 1880:261). Much of the agricultural production fed the animals and people engaged in lumbering. The *Coast Pilot* from 1889 noted that potatoes were the primary good moved out of Bridgeport Landing followed by a variety of wood materials. Other ports known to ship produce noted in the *Coast Pilot* were Fort Ross, Salt Point Landing, and Timber Cove Landing (Davidson 1889:274). In particular, Fort Ross's apples were a prized fruit exported seasonally. The Fort Ross apple orchards were started by the first Russian colonists in 1814 and expanded during the ranch era along with other fruit trees. Four trees from the Russian period survive, three cherry and a single apple (Fort Ross Conservancy 2019). Timber Cove and Bihler's Landing were also known for their apple orchards (Rudy 2009).

Quarrying

A small component of the doghole ports history was the shipment of stone from local quarrying operations. For approximately ten years, as the lumber industry was just beginning to take hold, Salt Point Landing shipped sandstone. Newspapers indicated that as early as 1855 stone was cut on site and transported from a pier there for use in San Francisco's streets and buildings along with Mare Island Navy Yard. Salt Point stone was used in the nearby Salt Point Hotel as well. William Benitz cut stone at Fort Ross and shipped out at least two loads by water in 1860, most likely lightered out to the waiting vessel(s). Evidence of quarrying can be seen in the stone around Salt Point (Rudy 2009). Quarrying contributed to Redwood Coast's maritime cultural

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landscape; its tangible evidence is visible in the tool marks, cut stone, and piles of discarded chips present on Salt Point State Park's rocky outcroppings. Numerous pieces of cut stone lie on the seafloor of Gerstle Cove. Quarrying adds additional context to humanity's interaction with the landscape.

Mercantile Exchange

Inbound commodities arrived on a much smaller scale than the production associated with lumbering, ranching, dairying, and farming. Businesses and households took advantage of the regular arrivals to procure the necessities for everyday life and commercial exchange they could not produce for themselves. Surviving contemporary sources generally documented only the outbound shipments from the doghole ports, so infrequent reports of inbound products provide an incomplete glimpse at what was considered an important trade for the residents of the doghole communities. It is likely that a great variety of merchandise and sundries came through the doghole ports. The need was so great for freight and passenger service that George Call, owner of the Fort Ross Landing, operated three auxiliary gas schooners between San Francisco, Bodega Bay, and Fort Ross between 1897 and the 1920s. A list of consigned freight from a 1906 trip revealed the types of items carried to Fort Ross included hardware, candy, medicine, merchandise, seeds, oats, and tobacco. Other inbound items included anything that people could not grow or make at home, up to and including pianos (Steve Pearce 2017, pers. comm.; Fort Ross Interpretive Association 1998).

Passenger/Information Transportation

Doghole ports also functioned as passenger transportation centers. Similarly, the Redwood Coast's isolated communities relied greatly on the waterborne communication for business and personal purposes. In Sonoma County, exchange of information and persons with San Francisco and the wider world was possible through the North Pacific Coast Railroad to Duncans Mills, beginning in the 1870s, and then via stage the rest of the way up the coast. Railroad interconnection into Mendocino County took much longer. The California Western Railroad interconnected with the Northwestern Pacific Railroad in 1911. Transit by water was more comfortable and quicker through most of the doghole ports period of activity. George Call, of Fort Ross, charged passengers a fare of \$1.00 on his vessels, a cheaper fare than the combination of rail, ferry, and stage that was the alternative (Fort Ross Interpretive Association 1998). Due to the lack of extensive roads and railways, vessels were one of the main ways to travel and stay connected to family, friends, and business networks in the city. Historic photos show people sitting in large baskets or wooden boxes and on cradles or wood planks hanging from the wire chute's traveler, undoubtedly an adventure to move between vessel and shore.

Traveler services developed through the nineteenth and early twentieth centuries with the opening of hotels to support business travel and vacationers seeking solace and adventures in

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hunting, fishing, and visiting the beach. Travelers spent money in the local community and provided a little extra income to supplement that earned from the lumbermen who boarded at many of the hotels. Doghole ports served as gateways to those escaping the city and provided increased awareness of the natural bounty offered by Sonoma and Mendocino Counties. Within Sonoma County eleven hotels operated between 1870 and 1920. Most mill towns in Mendocino County had a boarding house or hotel as well; the exact number is unknown. Access to the area by automobile occurred around 1915 and began to disrupt the established waterborne transportation system (Rudy 2009).

Shipwrecks

The Redwood Coast's rugged, exposed coastline claimed many vessels engaged in the doghole ports trade. It was equally dangerous sailing the coast, or within the confines of a port. A small miscalculation by the captain could result in his ship hitting submerged rocks. Storms quickly developed offshore forcing captains transiting the coast to seek refuge at the doghole ports. The shelter provided was minimal, and ships frequently broke free from the moorings or their own anchors only to be pushed ashore. Some landed on sandy beaches, providing the opportunity to be refloated. More often than not, vessels would break apart on the rocks resulting in a total loss. Due to each doghole port's unique character, specific captains and vessels specialized in particular locations. Their familiarity allowed them to moor safely and navigate a port's hazards, thereby lessening the chances of an incident. This aspect increased the incentive for chute owners to own and operate vessels (Historic American Engineering Record n.d.:7; Ryan 2010:146).

Historical sources indicate over 150 vessels wrecked at or near the fifty-seven doghole ports within Sonoma and Mendocino Counties. The vessels range from schooners to steam schooners and steamships, all indicative of the regular trade that occurred at doghole ports (**Figures 7, 8**). Vessel losses at Stewarts Point provide an example of the risks mariners faced. Between 1866 and 1894 at least sixteen vessels, mainly schooners, wrecked at Stewarts Point. Recreational diver surveys and archaeological fieldwork located and documented several of vessels at doghole ports, contributing to the knowledge about the diverse resources present within the maritime landscape. Shipwrecks associated with the doghole ports include *Albion* at Stewarts Point, *Maggie Ross* at Russian Gulch, *Klamath* at Del Mar (**Figure 7**), *West Coast* at Point Arena, and *Noyo* at Point Arena. Several additional shipwrecks located at or near doghole ports are not directly associated with the lumber or associated trade, part of the larger maritime activity up and down the coast. These include *Pomona* and *Riga* at Fort Ross, *Windermere* north of Fort Ross, *Joseph S. Spinney* and *Whitelaw* south of Fort Ross, and *Norlina* at Gerstle Cove (Marx 2019). Ship captains may have steered their wounded vessels to a known doghole port in hopes of finding salvation and aid for their crew along the isolated coastline.

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Wooden lumber schooner and steam schooner hulls were generally not able to sustain impacts with submerged rocks or the rock-fringed coastline. A captain could rarely find a safe place to beach his vessel so the odds were that an incident would result in a total loss. As a result, an active wrecking and salvage community responded to shipwrecks in Northern California. A combination of professional outfits and local citizens profited from the misfortune of many ship owners. The most active salvage venture was run by Captain Thomas P.H. Whitelaw of San Francisco. One of the largest ship owners along the coast, Whitelaw was internationally renowned as a “Master Wrecker” and “The Great Wrecker of the Pacific” who frequented the Sonoma and Mendocino doghole ports throughout his career. Whitelaw salvaged over 300 vessels with a group of skilled divers and wrecking equipment (Powers 2009). If possible, he plugged, patched, or pulled free a stranded vessel. If it was a total loss, the work would then focus on removing items of value and settling up with insurance agents. He worked on many doghole port casualties such as the coastal steamer *Pomona* at Fort Ross and the steam schooner *Maggie Ross* at Russian Gulch. Whitelaw also provided maintenance services to the lumber chute owners who had his vessels regularly raise and maintain their mooring anchors and chains (Faycurry 2018).

Locals supplemented their normal businesses by taking advantage of stranded vessels. While their techniques were not as organized as those of professional salvors, they recovered and reused what they could or sold it for scrap. If at all possible, the isolated communities did not let any parts of a ship go to waste. The 201.5-ft long steam schooner *Klamath* wrecked near Del Mar Landing and was subject to heavy salvage by locals (**Figure 7**). *Klamath* wrecked during a storm on the night of February 4, 1921 when it hit the rocks en-route from San Francisco to Portland, Oregon, in ballast with thirty-four officers and men and nineteen passengers. The vessel broke its back, split in two, and was a total loss. No lives were lost during the incident as a breeches buoy was rigged to shore to transport everyone to safety. While efforts were made to float the vessel, valued at \$200,000, the treacherous place where it wrecked was too inaccessible, and it was abandoned.

The wreck was offered for sale, with H.A. Richardson and Sons of Stewart’s Point being the highest bidders. The Richardson family operated a highly successful doghole port and ranch at Stewarts Point and still owns the coastal property. They placed a small donkey engine on the bluff and used a winch to pull off material from *Klamath*. For several months the salvage operation went on until nothing more could be removed. Some of the items from *Klamath* are still on the Richardson property, including the name board along with many other items salvaged from other vessels that wrecked along the coast (Richardson 2016:15-18). The scatter of *Klamath*’s remains along the shore and tidal zone, with larger fragments offshore, is consistent with the site formation process of a salvaged steam schooner slowly breaking up over the years

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in a dynamic coastal environment.

In contrast to archaeological signatures left by shipwrecks like *Klamath*, the maritime cultural landscape of the Sonoma and Mendocino coast also encompasses maritime incidents that resulted in temporarily grounded vessels that got away without necessarily leaving a trace. These temporary groundings were and remain a part of the maritime cultural landscape, reflected in community memory, in the accident reports and insurance records, and in photographs. Collectively they speak to the conduct and hazards of maritime navigation and as factors that led to changes in moorings, and the ultimate abandonment of some doghole ports. Individually, they were community events remembered and documented as extraordinary situations. One such example, the April 1951 grounding and 25-day successful salvage effort to free the Japanese freighter *Kenkoku Maru* from the beach near Black Point in April-May 1951 brought considerable human enterprise to a portion of Sonoma's coast. The oral history of historic events and locations where these moments took place are all part of the maritime landscape and are components of the story even though physical traces are minimal or no longer present. The physical place where those events happened are still there and can speak to the heritage and connection the present-day community has to recognizing a sense of place.

Decline and End of Doghole Ports Use (1920-1950)

In 1923, the Chief of the U.S. Forest Service reflected on the status of the lumber industry. He believed that the industry was rapidly changing as the last virgin forest areas had been entered and that lumbermen needed to rethink how and what trees are harvested. He felt that the industry must adjust to new conditions of timber supply and transportation along with the relationship between the sawmill and product users (Brown 1923:xi). Sonoma and Mendocino lumber operations experienced the forces he described and adapted to new advancements to remain viable. The main changes in the area came in how the products were moved out of the mills to the market. The doghole ports' demise resulted from increased access to the area by trucks and railroads coupled with overharvesting of very slow growing forests. These more effective and less weather dependent modes of transportation put a close to the conveyance of lumber by water. Land transportation methods remained ineffective until the 1920s when railroad and roads for trucks pierced the hard-to-reach communities along the Redwood Coast. Before rail lines opened the interior in 1912, the sea was the only link for the lumber to the world's markets. It was lumber that made up the majority of wood products in terms of value and importance. Lumber companies financed the construction of new or extensions to the existing railway system to provide a cheaper and quicker way of moving products. In 1922, forty percent of redwood products were still moved out by water, a testament to the efficiency of the steamship combined with port facilities well suited to the trade (Bryant 1922:375).

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Lumber production notes indicate that there was a surplus of lumber in California in the 1920s. This, along with a lumber surplus in other states, and the decline in domestic consumption, led to a decrease in demand. At the same time lumber consumption and production focused more on the Midwest states east of the Mississippi River, and New York (Bryant 1922:392-394). Redwood sales domestically shifted to local consumers and eastern states for use as siding and wide panel stock. Foreign exports of all lumber, including redwood, peaked in 1913, and slowly declined in the 1920s. Overall reduction in demand during World War I and increased Canadian supply market caused the U.S. lumber market to collapse. Only small quantities of lumber were exported to Spain, Chile, Peru, China, and Australia (Bryant 1922). In 1899, redwood lumber production accounted for sixty-nine percent of the entire lumber totals for California. By 1904 it was down to forty-eight percent and by 1920 it had dropped to thirty-one percent (Bryant 1922:506-509). Many lumber companies shut down with the uncertainty of the market, union disputes, new lumber regulations, and diminishing forests. The operations that did survive moved transport to land based methods making the doghole ports and their chutes obsolete. The last chute in Northern California stopped operations in 1938, although many chutes physically remained in place until after World War II when they were finally dismantled (Tooker 1968:7).

Chutes, whether apron or wire, and schooners, whether sail or steam, became a unique solution to a unique problem. For more than half a century, this combination provided a ready means to exploit the wealth of the north coast redwood forest of California. It was a tribute to the ingenuity, and perhaps greed, of the lumber merchants; whatever the motive, it played an important part in California history (Sullenberger 1980:56).

Northern California's forests continue to be logged commercially while the wild, isolated coastline draws visitors seeking connection with the environment and escape into nature. The doghole port communities have nearly vanished with only traces of them present in Sonoma County that coincide with the historic locations of the past. They include Duncans Mills, Timber Cove, Stewarts Point and The Sea Ranch. In Mendocino County the populated communities tied to lumbering heritage include Fort Bragg, Point Arena, Albion, Anchor Bay, Caspar, Little River, Mendocino, Gualala, Navarro, Noyo, Westport, Rockport, and Manchester. The Northern California's coast remains relatively isolated, sparsely developed, and known as a wild place where the natural world draws visitors with its scenic beauty. Strong cultural bonds to earlier settlers and the doghole ports exist in Sonoma and Mendocino Counties. In many places, property ownership has passed down through several generations of families and property owners recognize the way the lumber and other industries shaped the landscape.

Doghole Ports Inventory

Historical and archaeological research indicates the presence of fifty-seven doghole ports within

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Sonoma and Mendocino Counties. To better understand the larger transportation network and extent of the maritime cultural landscape a brief description of each doghole port, from north to south, is provided in this inventory. Details on each doghole port include its historic timeline, estimated years when the chutes or landing were active, associated mills or railroads, materials shipped, vessel traffic, and associated shipwrecks.

Mendocino County

Needle Rock Landing (active circa 1873-1930)

Needle Rock Landing is located in Sinkyone Wilderness State Park near Needle Rock. This is the most northern doghole port in Mendocino County. The first settlement at Needle Rock was by Captain Morgan and his son in 1868. They partnered with D.W. McCallum to build a doghole port. In 1890, J. B. Stetson Jr. acquired the land and constructed 3.0 miles of rail lines and landing for a mill (Carpenter and Millberry 1914:119-120). The chute included a small pier with a wire chute said to be the highest and longest of any port in Mendocino (*San Francisco Chronicle* January 16, 1898). In 1896, W.P. Thomas, Wiley English, and Ed Warren purchased the operation. Railroad ties and tan bark was the most common product to be shipped from Needle Rock Landing (*Ukiah Daily Journal* April 3, 1896). Needle Rock Company acquired the doghole port in 1898 and chute operated up until circa 1930.

Bear Harbor Landing (active circa 1884-1909)

Bear Harbor Landing is within Sinkyone Wilderness State Park and near Bear Harbor Camp. In 1884, W. A. McCornack purchased the land from the Kaiser Brothers and eventually built a pier with a trough chute at its end (Carpenter and Millberry 1914:119). Tan bark was the most common material shipped out of the landing (Peterson 1886). A railroad from the landing connected all the way back inland over to the eastern side of the mountains into Indian/Anderson Creek at Andersonia (*Ukiah Daily Journal* January 3, 1896). In 1893, McCornack sold the chute and land to Pollard, Dodge, Stewart, and Hunter who formed the Bear Harbor Lumber Company. A wire chute replaced the trough chute in the 1890s (*San Francisco Chronicle* January 16, 1898). In 1903, Southern Humboldt Lumber Company purchased Bear Harbor Lumber Company (*Healdsburg Tribune* July 24, 1939). The closure date of this doghole port is unknown and there is no mention of lumber activity in newspapers after 1909.

Northport Landing, also known as Anderson's Landing (active circa 1872-1883)

Northport Landing is within Sinkyone Wilderness State Park, less than 2 miles southwest of Wheeler. The doghole port was located on Mistake Point at the mouth of Little Jackass Creek and 1.25 miles northwest of Big White Rock. In 1872, Robert Anderson built a wire chute, abandoned in 1883. Vessels were loaded by wire that stretched across the cove to a mooring located on the east side. At one time Northport was a busy place with most business associated

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with tan bark. It was loaded using a cage lowered from the landing stage on the cliff to the waiting vessels below (Davidson 1889:289; California State Parks 2019).

Monroe Landing, also known as Hale's Grove Landing or Usal Landing (active circa 1905-1911)

The exact location of Monroe Landing is not known other than it was south of Usal. The doghole port may be within Sinkyone Wilderness State Park. Jackson (1977) included it in his list of doghole ports with a wire chute. In 1904, the Monroe Lumber Company was reportedly building a new pier at Devilbliss Ranch to be called Monroe Landing (*Ukiah Republican Press* July 29, 1904). Newspapers report cargoes associated with Monroe Landing between 1905 and 1911 of shingles, lumber, and laths (Carpenter and Millberry 1914:548-549). There's no mention of the landing until 1939 (Tavares 2011:41; *Ukiah Dispatch* November 10, 1939).

Devilbliss Landing (active circa 1895-1896)

The exact location of Devilbliss Landing is not known. Jackson (1977) included it in his list of doghole ports and states it had a wire chute (Jackson 1977:18). San Francisco Bay Area newspapers do have it as a location under shipping intelligence between 1895 and 1896. A 1914 history of Mendocino County included a biography of George Devilbliss who lived at Cottoneva Creek. He was engaged in the lumber business and ran a store in Westport until 1895 (Carpenter and Millberry 1914:548-549).

Rockport Landing, also known as Cottoneva Cove, Miller's Chute, or Summer Anchorage (active circa 1877-1940)

Rockport Landing is on private property owned by the Mendocino Redwood Company located at the mouth of Cottaneva Creek in Rockport Bay. In 1877, William R. Miller built the first sawmill at Cottaneva Creek and developed the doghole port. His chute system sat on the north point of a large cove with a sandy beach connected to the mill by a railway. A steel wire suspension bridge spanned from the cliff edge over the water to a large rocky island where the trough chute resided (Carranco 1982:114). The landing was a private business with nothing shipped out except the lumber made and owned by the proprietor in 1886 (Davidson 1889:296; Peterson 1886). A wire chute replaced the trough chute. In 1886, Miller sold his operation to the Cottoneva Lumber Company, then the New York and Pennsylvania Lumber Company. The Finkbine-Guild Lumber Company purchased the company in 1924 followed by the Great Southern Lumber Company in 1927, and eventually the Rockport Redwood Company in 1938. After a fire in 1942, the lumber was shipped to Fort Bragg shutting down the doghole port. (Redwood Lumber Company 2019).

Hardy Creek Landing (active circa 1895-1920)

Hardy Creek Landing is located on private property south of Hardy Creek. In 1895, T.L. Johnson

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and Assessor McFaul secured the rights to build a pier and chute at Hardy Creek (*Ukiah Daily Journal* October 11, 1895). The Hardy Creek Lumber Company began mill operations in 1896 and manufactured railroad ties, tan bark, and posts (*Ukiah Daily Journal* January 10, 1896 and August 14, 1896). The 1909 *United States Coast Pilot* described the landing as having a wire chute frequented by steam schooners (Department of Commerce and Labor 1909:100). The landing was abandoned by 1920.

Union Landing, also known as McFaul's Landing (active circa 1899-1920)

Union Landing is located on private property south of the mouth of Juan Creek, less than 0.25 miles from the northern boundary of the Westport Union Landing State Beach. The doghole port supported many small mills in the area. Steam schooners accessed the landing by pier and wire chute. (Department of Commerce and Labor 1909:100). In 1899, McFaul and his sons bought property near Juan Creek and formed the Union Commercial Company. They built the doghole port's pier and chute along with a railroad running from a mill at Howard Creek, also owned by McFaul, to the landing. Union Landing operated until 1920 (Sullenberger 1980:102-104).

Westport Landing, also known as Switzer's Chute, Bells, Beall's, or Helmke's Landing (active circa 1865-1930)

Westport Landing is located within Westport Headlands Park. The first use of the Westport Landing was in the 1860s by Lloyd Beall who constructed a chute there. The land was then purchased by Boyd and Switzer in 1877, followed by Fred Helmke, then James Rodgers in 1878 who ultimately named it Westport (Sullenberger 1980:102). The landing had two chutes, a southern one, which had a pier and truss bridge with a trough chute, and a northern chute with a pier and trough chute. Lumber was brought from sawmills on Wages Creek, De Haven, and Howard Creek. Cargoes included railroad ties, posts, tan bark, and shakes (Davidson 1889:293; Peterson 1886). A wire chute replaced the trough chutes that operated into the 1920s. Eight historic vessel losses were reported at or near Westport Landing.

Kibesilah Landing, also known as Ackermann's Landing (active circa 1880-1890)

Kibesilah Landing is located on private property west of Kibesilah near the mouth of Kibesilah Creek. The doghole port had a substantial pier and trough chute projecting in a southern direction from the north side of the rocky headland, Smiths Point. Vessel loaded posts, cordwood, and tan bark from a mill south of Newport. In 1882, the mill moved to Fort Bragg and the town slowly shrank and vessel traffic decreased. In 1885, there were no moorings or fasteners and little to no vessel traffic due to a lack of demand for railroad ties and lack of shelter. The landing was considered abandoned around the late 1880s (Davidson 1889:292; Peterson 1886).

Newport Landing (active circa 1880-1900)

Newport Landing is not on land owned by The Inn at Newport Ranch, located just west of

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Newport. The doghole port sat on the north side of the cove and contained a trough chute (**Figure 2**). In 1877, Stewart and Hunter built the first sawmill on Mill Creek, a tributary of Ten Mile River. Vessels loaded lumber hauled by horse teams from up to 4.5 miles away. On average, 50 vessels took shipment from Newport Landing a year. A new trough chute was built further along the headland (northwest) following a destructive storm in 1886. After 1887, lumber was sent to Fort Bragg while posts and railroad ties were shipped out of Newport Landing (Davidson 1889:291). The landing was no longer used by 1900.

Laguna Landing, also known as Cleone Landing (active circa 1883-1920)

Laguna Landing is within MacKerricher State Park with its adjacent waters also within the park. The doghole port was located at the southern end of Ten Mile River Beach. In 1883, the Dewelly brothers built the first mill in the area along with a pier. Little Valley Lumber Company bought the Dwelly's mill and added a second mill and a tramway to the pier (Borden 1961a:7). At the pier's terminus was a single trough chute. In 1886, the structure washed away and replaced with a wire chute. Materials shipped out include railroad ties, tan bark, posts, and wood (Davidson 1889:289-290; Peterson 1886). Due to the difficulties in mooring lumber was eventually shipped by rail to Fort Bragg. Laguna Landing still operated up to 1923 (Borden 1961a:7; Sullenberger 1980:98).

Fort Bragg Landing, also known as Soldiers Harbor (active circa 1885-1930)

Fort Bragg Landing is within Noyo Headlands Park and owned by the City of Fort Bragg. In 1885, Charles Russel Johnson built a mill in Fort Bragg and a pier. Considerable lumber products shipped from Fort Bragg on steam schooners although some farm and dairy produce were also shipped out from the port (*San Francisco Chronicle* January 16, 1898). By 1900, Fort Bragg was the largest coastal town between San Francisco and Eureka, all due to the nearby timber lands and mill facilities (Department of Commerce and Labor 1909:99). The pier was no longer used by the 1930s with the advent of railroads and trucks. While the earliest history of Fort Bragg is from 1857 through 1864 when a military post on Mendocino Indian Reservation was there, it is the lumber industry that shaped the landscape and the community.

Noyo Landing, also known as Noyo Anchorage/Harbor (active circa 1860-1930)

Noyo Landing is within Noyo Headlands Park and owned by the City of Fort Bragg. A large mill complex sat on the river's northern side. The first sawmill in Noyo was 1852 with a steam powered mill opening in 1858 under Alexander Macpherson and Henry Wetherbee. The Noyo Lumber Company, established in 1886, owned many acres along the river as well as a mill that focused mainly on producing railroad ties (Stebbins 1986). Both the 1886 Peterson survey and 1889 *Pacific Coast Pilot* describe the landing not having any chutes. Most of the loading was done with lighters from the mill's pier transporting ties out to waiting vessels. Some smaller vessels tied directly to the pier. Larger vessels loaded only by lighters (Davidson 1889: 288;

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Peterson 1886). A wire chute was added to the doghole port's north point around 1900 and continued to be active until the 1920s (*The Press Democrat* March 22, 1953). When railroads reached Fort Bragg, just north of Noyo, the port closed around 1930, eventually removing the wire chute in 1953 (*The Press Democrat* March 22, 1953). Eight historic vessel losses are associated with Noyo Landing.

Pallas Bay Landing, also known as Palace Bay Harbor (active circa 1880-1887)

Pallas Bay Landing is located on private property at the mouth of Hare Creek. The doghole port had one trough chute that projected out from the north shore. The chute was built around 1880 and was linked to a railroad tie cutting operation owned by John A. Blumberg and Robert A. Hardy at Hare Creek (*Mendocino Beacon* July 20, 2006). In 1882, only five cargoes were shipped out consisting of posts, railroad ties, wood, and tan bark. In 1885, the mooring anchor buoys had been removed making it difficult for any vessel to utilize the chute (Davidson 1889:287). San Francisco newspapers chronicle the busiest years for Palace Bay was 1880-1881, followed by a period of no activity from 1883-1885, with business resuming in 1886. In 1884, the railroad reached Hare Creek connecting it to Caspar Lumber Company's mill and probably diverting most of the material to Caspar Landing (Carranco and Labbe 1975). The last year of shipments from Pallas Bay Landing was in 1887.

Bromley Gulch Landing (never active)

Bromley Gulch Landing is located within Jug Handle State Natural Reserve. The doghole port was located at the mouth of Bromley's Gulch, 1.5 miles northwest of Caspar. In 1884, a trough chute was built on the cove's south side with no protection for visiting vessels. There were also no mooring anchors within the landing to assist with loading so it was never used (Davidson 1889:286; Jackson 1977).

Caspar Landing, also known as Caspar Anchorage or Caspar Creek Harbor (active circa 1864-1930s)

Caspar Landing is located within Caspar Headlands State Beach. The doghole port is located at the mouth of Caspar Creek. The first European settler in the area was Siegfried Caspar, a German trapper. In 1861, William H. Kelley and William T. Rundle built the first sawmill at Caspar and formed the Caspar Lumber Company. Jacob Green Jackson purchased the facility three years later and used lighters to lead schooners in the harbor. In 1865 the first trough chute was built with a tramway connecting the mill to the doghole port. Two trough chutes, an inner and outer one, sat on the cove's northern side and serviced the mill. The local timber had been exhausted by 1875 so saw logs for the mill came from Jug Handle Creek and Hare Creek (Davidson 1889:286; Peterson 1886; Sullenberger 1981). The doghole port configuration changed in 1889 with a single trough chute and a wire chute to accommodate larger vessels (Department of Commerce and Labor 1909:98). The Caspar Lumber Company maintained the

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doghole port until the 1930s when trucks took over shipments. The mill finally closed in 1955.

Russian Gulch Landing (active circa 1875-1920)

Russian Gulch Landing is within Russian Gulch State Park with its adjacent waters also within the park. The doghole port is at the mouth of Russian Gulch and was the site of the first redwood shingle mills in Northern California, being built in 1867 by L.E. Ballister & Co. A second shingle mill was run by Prince Grey from 1878 to 1888, then purchased in 1888 by Eugene Brown (Mendocino Coast Model Railroad & Historical Society 2019). In 1875, A.W. McPherson and Harry Wetherbee, mill owners from Noyo, received permission to build a pier and trough chute at Russian Gulch. Locally available timber had been cut down and the two chutes were abandoned by 1885 (Davidson 1889:285; Sullenberger 1981). In 1888, Eugene Brown resurrected the doghole port and placed a wire chute on the cove's north side, used in the summer, for railroad ties, posts, and split timber. This chute was probably used by Gray Johnson Lumber and Shingle Mill who operated at Russian Gulch from 1918 into the 1920s. They also built a new pier at the doghole port to facilitate shipments (Mendocino Coast Model Railroad & Historical Society 2019; Sullenberger 1981). One historic vessel loss is associated with Russian Gulch Landing.

Mendocino Landing, also known as Big River Cove/Landing (active circa 1850s-1940)

Mendocino Landing is within Mendocino Headlands State Park and at the mouth of Big River in Mendocino Bay (**Figure 5**). In 1852, Jerome Ford and Henry Meiggs settled Mendocino and built the first sawmill there, an industry that would prosper until the start of World War II. Eventually, a large sawmill, replacing earlier smaller scale efforts, was constructed on the right bank of Big River. The doghole port's earliest configuration included three trough chutes and three mooring buoys to the north with a pier further south near the river mouth (Peterson 1886). In 1889, there were two operational chutes on the northern head with a third, the inner one having been abandoned and taken down. The lumber was moved from the mill to the chutes by tramway (Davidson 1889:284). By 1909, a wire chute was utilized with products including lumber, farm, and dairy produce and general merchandise brought in. The bulk of the trade was now by steam schooner with an occasional schooner still visiting and larger steamship calling directly to foreign ports (Department of Commerce and Labor 1909:98).

Little River Landing, also known as Bell's Landing or Kents Cove (active circa 1860s-1917)

Little River Landing is located within Van Damme State Park with the adjacent water also within Van Damme State Park. The doghole port was located in a cove at the mouth of Little River near Van Damme Beach. In 1864, Little River grew up as a mill town and shipyard of Thomas Peterson with roots back to William H. Kent who settled there in 1862. Lighters were initially used to load schooners until a more substantial doghole port was built (Sullenberger 1981). In 1873, the landing had a single trough chute and pier while in 1889 the landing consisted of two

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chutes and a pier. The pier was built extending out into the cove from a sandy beach near the river, with a chute on either side (Peterson 1886). Lumber came from two mills, one at the south side of Little River and a second at Stillwell Gulch. Cargoes consisted of railroad ties, tan bark, farm, and dairy products with general merchandise brought in (Davidson 1889:282; Department of Commerce and Labor 1909:98). By 1917, the doghole port received no traffic and the pier was out of repair. The mill had closed earlier in 1893 (Department of Commerce and Labor 1917:113). Seven historic vessel losses occurred near Little River Landing.

Big Gulch Landing, also known as Pullen's Landing (active circa 1874-1885)

Big Gulch Landing is located on private land less than a mile north of Albion Landing, at the mouth of Dark Gulch, and just west of Van Damme State Park. A single trough chute constituted the doghole port with only two schooners loading in 1882 and none in 1883. The chute was marked out of repair in 1883 and not active by 1885, possibly due to lack of readily accessible timber (Davidson 1889:281). Newspapers show that cargoes from Big Gulch Landing only consisted of railroad ties.

Albion Landing, also known as Albion Harbor (active circa 1860-1930)

Albion Landing is on private land within Albion Cove, at the mouth of Albion River (**Figure 6**). The doghole port sat on the cove's north side and consisted of a pier with use of a tug and lighters to load vessels. The town developed around the first lumber mill built in 1853 with roots back to a land grant in 1844 to William A. Richardson (Carranco 1992:111). The 1886 survey of the doghole port does not depict the pier (Peterson 1886). Later descriptions after 1900 include the pier and a wire chute at its end (U.S. Department of Commerce 1917:112). The Albion mill and railroad traced their beginnings to 1853 and operated until 1928 when the last log went through the sawmill. This was at a time when Northwestern Pacific Railroad To support the transportation network, the Albion River Steamship Company and Albion Lumber Company owned at least three steam schooners and a tug (Borden 1961b). Ten historic vessel losses occurred near Albion Landing.

Henley's Landing, also known as Handley's Chute) (active circa 1868-1900)

Henley's Landing is located on private land on the south side of Albion Cove. In 1865, William Handley settled in the area and built a chute several years later (Munro-Fraser 1880a). It is shown on an 1872 and 1886 map and described in the 1889 *Pacific Coast Pilot*. Vessels were secured under the chute with a single mooring anchor and four fasteners secured on land when loading railroad ties and posts (Davidson 1889:280; Peterson 1886). Based on its location near Albion, it is likely that products came from the mills in the surrounding area.

Whitesboro Landing, also known as Salmon Creek (active circa 1870-1902)

Whitesboro Landing is located on private land at the mouth of Big Salmon Creek, within

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Whitesboro Cove. Early settlement at Whitesboro dates to the 1870s with mill owner L.E. White and James Pullen and Associates of the Salmon Creek Mill Company. In 1886, the town included two hotels, a saloon, and general store (*Pacific Rural Press* June 19, 1886). A pier extended northwest, out towards the cove, with three derricks at the end supporting three chutes. Lumber came on rail from two mills, one 0.25 miles from the pier and a second 8.0 miles up the creek (Davidson 1889:279). Seven historic vessel losses occurred near Whitesboro Landing.

Navarro Landing, also known as Navarro Harbor (active circa 1860-1917)

Navarro Landing is located on private land at the mouth of the Navarro River. The doghole port was located just north of the Navarro River Redwoods State Park. Charles Fletcher settled Navarro in 1860 with partners, James Kennedy and Thomas Kennedy of San Francisco. San Francisco-based company, Tichenor and Co. purchased land from Fletcher and constructed the Navarro Mill; a key economic driver for the town's development. Lighters loaded schooners until the doghole port was built up in 1874 (Navarro By The Sea 2019). The 1889 *Pacific Coast Pilot* described the landing as having a pier with a derrick at its end. The derrick supported two chutes with a tramway moving the lumber from the mill and out to the pier end (Davidson 1889:278; Peterson 1886; Borden 1961b). By 1909, the doghole port had been mostly abandoned with lumber, tan bark, and railroad ties only occasionally shipped out (Department of Commerce and Labor 1909:97). It had been finally abandoned by 1917 (U.S. Department of Commerce 1917:112). Eight historic vessel losses occurred near Navarro Landing.

Cuffey's Cove Landing, also known as Cuffee Cove or Cuffy Cove (active circa 1868-1909)

Cuffey's Cove Landing is located on private land on the north side of Cuffeys Cove, just south of Cuffeys Inlet. The area, known for its potatoes, was settled in 1855 by James Kennedy with the first landing constructed in 1868 by John Kimball (Cuffeys Cove 2019). In 1870 there was one trough chute present. By 1886, there were three trough chutes, extending down to the south, with a fourth western facing chute also referred to as a half pier, extending to the north (Davidson 1889:277). Approximately 100 vessels loaded at Cuffey's Cove Landing per year with cargoes of railroad ties, lumber, posts, and wood. A steam powered railway moved the lumber from the mill to the doghole port (Davidson 1889:277). By 1909, the landing and village had been mostly abandoned because the chute at Greenwood Landing was superior and the mill directed their lumber there instead (Department of Commerce and Labor 1909:97). Eight historic vessel losses occurred near Cuffey's Cove Landing.

Chisholm Landing (active circa 1870)

Chisholm Landing is located on private land between Greenwood Landing and Cuffey's Cove Landing. The 1870 U.S. Coast and Geodetic Survey map shows a single trough chute labeled Chisholm chute. The chute extends out from the cliff edge across the water to a rocky island with the end pointing to the northwest. Several small buildings sat to the south, and no road extends

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down to the chute. The 1889 *Pacific Coast Pilot* references the presence of this chute and stated it was no longer active (Davidson 1889:277).

Greenwood Creek Landing (active circa 1886-1917)

Greenwood Creek Landing is in Greenwood Creek State Beach, west of Elk, on the north side of a cove at the mouth of Bonee Gulch. The area was settled in 1862 by Briton Greenwood, a member of the Donner relief party. The chute included a pier that spanned the north side of a series of rock outcroppings, the largest named Wharf Rook, ending with a trough chute at the end (Carranco 1982:110). White Lumber Company, owned by E. L. White of San Francisco, built the chute between 1886 and 1889 that supported vessels loading lumber, tan bark, and railroad ties. The railroad followed the north bank of Greenwood Creek, carrying lumber to both this chute and the one at Cuffey's Cove Landing to the north (Davidson 1889:276; Peterson 1886). By 1909, a wire chute replaced the trough chute and permitted a considerable amount of lumber to be shipped out, along with tan bark, farm and dairy products (Department of Commerce and Labor 1909:97). One historic vessel loss occurred near Greenport Landing.

Unnamed Landing (active circa unknown-1889)

The 1889 *Pacific Coast Pilot* described an abandoned trough chute one-third of a mile northwest of Uncle Abe's Landing that had been torn down (Davidson 1889:275). No other information is known about this doghole port, including its exact location.

Uncle Abe's Landing (active circa 1876-1889)

Uncle Abe's Landing is located on privately owned land less than a mile northwest of Elk Creek. The doghole port had a single trough chute moving lumber, shingles, posts, railroad ties, firewood, and tan bark. The vessel was secured with two fasteners in the rocks and two mooring anchors. Seven vessels loaded there in 1882 and only one in 1883 due to the small demand for railroad ties (Davidson 1889: 275). The doghole port is not indicated on historic charts, therefore its exact location is unknown.

Bridgeport Landing, also known as Hoag's Landing, Field's Landing, or Kimball's Chute (active circa 1871-1892)

Bridgeport Landing is located on privately owned land north of Manchester. The doghole port first had a trough chute and later a wire chute (Jackson 1979:20). The trough chute passed over the water using trestle work with the apron end extending to the south. "Double tracks are laid on the chute and the cars are moved by wire rope. The freight was mostly potatoes; but there is a sawmill one-quarter of a mile up the gulch" (Davidson 1889:275). A road led down to the chute with several small buildings at the bluff edge. Fifteen vessels visited the landing per year shipping out lumber, posts, wood, and tan bark (Davidson 1889:275). In 1892, L. White owned the landing and is the last reference to its use as a doghole port (*Ukiah Republican* March 4,

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1892). Three historic vessel losses occurred near Bridgeport Landing.

New Haven Landing (active circa 1886-1892)

New Haven Landing is located in Manchester State Park with adjacent waters lying in Manchester State Park. The doghole port was located near the mouth of Mal Passo Gulch. Mal Passo's location is indicated, and later material does record its existence in the 1880s. The single trough chute extended out from the cliff with assistance from a pier at its end to allow the vessel to be outside the rocks in the water (Davidson 1889:274; Peterson 1886). A wire chute replaced the trough chute in later years (Jackson 1979:20). In 1892, C.A. McFaul owned the chute for the shipment of tan bark, railroad ties, posts, and stave bolts from his sawmill (*Ukiah Republican* March 4, 1892). One historic vessels loss occurred near New Haven Landing.

Arena Cove Landing (active circa 1866-1930)

Arena Cove Landing is located on Point Arena city owned land and BLM public land (Point Arena Stornetta Unit of the California Coast National Monument) with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The doghole port was located at the mouth of Point Arena Creek, northwest of the town of Point Arena and south of Point Arena and its lighthouse. Shipping activities started with lighters and the first pier and trough chute date to the 1866 (Whatley 2013:16). By the 1880s, materials shipped out included lumber, posts, tan bark, and produce. The 1889 *Pacific Coast Pilot* described a pier and a large, long trough chute on the cove's north side (Peterson 1886). T.K. & W., operator of the chute, built a second pier further north in the cove. It was not connected to land, and only used as a loading platform. By 1909, the landing had added a wire chute in addition to the trough chute and pier with considerable amount of dairy, produce, railroad ties, and tan bark produced locally. Lumber activity at Point Area Cove lasted until the Great Depression and by 1940 the mills had closed. Seven historic vessels losses occurred near Arena Cove Landing.

Buster's Landing, also known as France's Landing (active circa 1871-1874)

The exact location of Buster's Landing has not been determined. The only geographic reference to the doghole port is in *The Doghole Schooners* by Jackson who described a landing 1.0 mile north of Scott's Landing named Buster's (Jackson 1977:18). The 1889 U.S. Coast and Geodetic nautical chart (#661) depicted an unnamed trough chute approximately 3.0 miles north of Saunders' Landing and 2.0 miles south of Arena Cove at the end of Warren Drive off U.S. 1. The landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. San Francisco newspapers indicated that schooners visited Buster's Landing and loaded railroad ties, posts, and cordwood from 1871-1874.

Scott's Landing, also known as Slide Rock or Scoutt's Landing (active circa 1870-1890)

The exact location of Scott's Landing is undetermined. The only geographic reference to the

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doghole port is in *The Doghole Schooners* by Jackson which shows a landing north of Saunders' Landing named Scott's (Jackson 1977:18). A franchise for Scott's Landing was granted to Lew Gerlock in 1870 to use 100 ft of land for his business for a 20-year period (Munro-Fraser 1880a). The 1889 U.S. Coast and Geodetic nautical chart (#661) shows an unnamed trough chute approximately 3.0 miles north of Saunders' Landing and 2.0 miles south of Arena Cove at the end of Warren Drive off U.S. 1. The landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. No other features such as buildings or names locations are in close proximity to the chute.

Saunders' Landing, also known as Hearn's Landing (active circa 1877-1895)

Saunders Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The doghole port was located within a small cove at the mouth of Rocky Gulch. The chute sat on an island on the cove's southern side (Davidson 1889:268). Lumber from a mill at Schooner Gulch was moved to Saunders Landing for loading. A. Saunders built the lumber mill in 1875 and was later owned by Nealon & Young (Carpenter and Millberry 1914). Products included wood, railroad ties, and posts. The 1886 Peterson survey shows a single trough chute with a railroad line running out across the gap between the cliff and island. Three historic vessel losses are associated with Saunders' Reef, just offshore of Saunders' Landing.

Iverson's Landing, also known as Ferguson's Cove or Rough and Ready Landing (active circa 1880-1911)

Iverson's Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary (**Figure 3**). It was named by Captain Nels Iverson, the doghole ports developer and owner of several coastal schooners, many servicing the lumber trade (Jackson 1977:12). The 1880 Coast Survey map depicts one trough chute. By 1889 two wire chutes projected from Iverson Point. The doghole port serviced 30 shiploads per year of tan bark, posts, railroad ties, and cordwood (Davidson 1889). The Peterson 1886 survey shows both wire chutes up platforms above the cliff top to get the optimal angle for stretching the wire. The inner chute, closer to Ferguson's Cove, placed the vessel between shore and a large offshore rock with five fastener points in the surrounding rocks (Peterson 1886). Ten historic vessel losses are associated with Iverson's Landing.

Steen's Landing, also known as Hardscratch Landing or Signal Port Landing (active circa 1882-1890)

Steen's Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The doghole port had one trough chute that supported shipping out lumber tan bark, posts, and cordwood from a mill, constructed in 1883 by L.B. Doe & Co. (Carpenter and Millberry 1914). The chute was perched up on a high cliff with its base

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built on a pier slightly out from land and the A-frame further out with its legs sitting in the offshore rock islands. In the 1880s several roads led down from the timber lands, to the doghole port at the mouth of Signal Creek, with only a few small buildings in the neighboring area (Davidson 1889:267; Peterson 1886). The mill only ran for a few years and the post office was open from 1888 to 1890. Two historic vessels losses occurred near Steen's Landing.

Nip and Tuck Landing, also known as Phelp's Landing, Bryne's Landing, Peter's Landing, or Beadle's Landing (active circa 1879-1903)

Nip and Tuck Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The doghole port had a single trough chute then a wire chute perched on a cliff along a stretch of open coastline near Reesman/Roesman Gulch. The treacherous position of the chute resulted in a short lifespan of the landing with a trough chute as it was practically abandoned by 1889 (Davidson 1889:266). Cargoes included railroad ties, posts, tan bark, and cordwood. While referenced as Phelp's Landing, the *San Francisco Chronicle* published there was a wire chute at the doghole port, an operational date later than reflected in the *Pacific Coast Pilot* (*San Francisco Chronicle* May 6, 1894). The last mention of a cargo shipping from there was in 1903.

Fish Rock Landing, also known as Haven's Anchorage (active circa 1870-1914)

Fish Rock Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The doghole port was located on the northern end of Anchor Bay. A single trough chute supported loading vessels carrying lumber, tan bark, posts, railroad ties (Davidson 1889:165-266). William Ferguson built the first chute in 1870 (State of California 1870:101). The first franchise to get permission for a chute was given to E.J. Stevens in 1866 (Munro-Fraser 1880a). The last account of using the doghole ports was in 1914 when the steam schooner *Scotia* loaded there (Anchor Bay Campground 2019). Sixteen historic vessel losses occurred near Fish Rock, a group of offshore rocks just outside the doghole port.

Collin's Landing, also known as St. Ores (active circa 1869-1900)

Collin's Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. It is located near St. Orres Creek, less than a mile north from Bourn's Landing. The earliest information on the doghole port originates from a newspaper article in 1869 that recorded lumber being shipped from there. It is likely that a trough chute was utilized for that business (Jackson 1977:20). An 1875 photo and the 1886 Peterson survey showed a wire chute on the end of a pier with horses pulling cart loads of material out to be loaded while large stacks of railroad ties lie along the bluff edge within a fenced storage yard. Twenty-five vessels frequent the landing annually, mainly carrying out tan bark, posts, and cordwood. A mill at one time operated at the doghole port, abandoned by 1889 and in 1909 no evidence of the chute was indicated (Davidson 1889; Department of Commerce

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and Labor 1909:96).

Bourn's Landing, also known as Bourne's Landing, Bowen's Landing or Bone's Landing (active circa 1862-1920)

Bourn's Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. Bourn's Landing is located north of the Gualala River and was the doghole port used for shipping out Gualala Mill products. In the 1880s two trough chutes operated there (Gualala Country Inn 2019). Peterson's survey of Bourne's Landing in 1886 shows three distinct areas where a vessel loaded. To the south of the cove there was a wire chute located on a pier, a freight chute and shed for lighters sat in the cove to the north of the wire chute, and lastly, a trough chute comes off one of the rock islands at the northern end of the doghole port. Railroad tracks span from the bluff over a bridge to the chute (Peterson 1886). The doghole ports saw vessels loading lumber tan bark, railroad ties, cordwood, stave bolts, and shingles (Davidson 1889:264-265). By 1909 only the wire chute is mentioned in the *Pacific Coast Pilot* (Department of Commerce and Labor 1909:95). Sixteen historic vessel losses are associated with Bourn's Landing.

Gualala Landing, also known as Walalla Landing, Robinson's Landing, or Rutherford's Landing (active circa 1865-1884)

Gualala Landing is located on privately owned land with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The doghole port is located north of the mouth of the Gualala River. The town of Gualala was founded in 1861 by Cyrus D. Robinson although an earlier land grant was given to General Rafael Gracie. Robinson sold part of his land to a group of men who built a mill along the river in the 1860s. The mill was rebuilt several times under many owners over the years until being scrapped before World War II. The mill's first owners were Rutherford and Webb followed by William Heywood and S.H. Harmon in 1872 (Durstun and Oliff 2010). In 1865, Robinson built the first chute near Gualala, a trough chute. He chose a bad location and it was not a successful venture (Gualala Country Inn 2019). The *Pacific Coast Pilot* of 1889 noted there were once two wire chutes used to load tan bark, railroad ties, and cordwood on schooners, abandoned in 1884 (Davidson 1889: 264). An extensive rail line, a subsidiary of the mill, supported the mill with a line running up the coast to Bourn's Landing. Two historical vessel losses are associated with Gualala Landing.

Sonoma County

Joe Tongue's Landing, also known as Joe Tonga's Landing (active circa 1880-1900)

The exact location of Joe Tongue's Landing has not been confirmed. The Sea Ranch website states that a modified wire chute with a steam powered swinging boom was constructed in the 1880s by farmer Joe Tongue of Gualala. Tongue had leased Robert Rutherford's ranch during the

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1890s for growing grain and fruit, which he shipped from an exposed north-facing landing he constructed on a rocky ocean bluff behind Rutherford's barn. A historic photo depicts a small boat ferrying sacks, most likely grain, to a waiting vessel lying offshore (Clark 2016; Clark 2009:17). Contemporary historians Susan Clark and Harry Lindstrom believe the landing is located at the end of Fish Rock Road behind where Rutherford's barn sat at the northwest corner of Equinox and Halcyon, one mile south of Gualala River. Rutherford's barn was built on the west side of the country road, less than $\frac{3}{4}$ of a mile from the mouth of the Gualala River. It was demolished in the early 1970s (Clark 1990:75).

Del Mar Landing (active circa 1898-1926)

Del Mar Landing is located on land privately owned by The Sea Ranch with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The landing had a single wire chute which was seaward of the California Coastal Trail (Sea Ranch sign 35E-5). During 1849, Charles Meyer and William Benitz contracted with Henry Hegeler to build a landing near Del Mar Point. The landing was most likely abandoned when Meyer and Benitz sold the Rancho in 1855 and it was not until 1898 that activity resumed in the area. Lumber dealers William and George Bender installed a wire chute at Del Mar Landing around 1898, and, in 1903, acquired the Knipp-Stengel Ranch and the Rutherford Ranch and built a large mill, Del Mar Mill, to the south. Materials shipped out on vessels by the wire chute included tanbark, railroad ties, fence posts, shingles, and cordwood. The mill burned in 1910 and was not rebuilt. By 1926, the wire chute was abandoned (Rudy 2009).

Bihler Landing, also known as Black Point (active circa 1875-1926)

Bihler Landing is located on land privately owned by The Sea Ranch with the adjacent waters lying within Greater Farallones National Marine Sanctuary. Bihler Landing occupies a cove north of Stewart's Point Landing. In 1875, William Bihler and David L. Brown Ross bought a section of land along the coast and built two trough chutes (Rudy 2009:59-60). The 1879 U.S. Coast Survey map depicts three main roads on the point, two leading to the chutes. The roads connect to the timber land to the east where material originated from and into the town of Annapolis. Material shipped out included wood, posts, tanbark, and stave bolts. In addition to these products, the landing shipped considerable quantities of produce (Clark 2009:27; Lindstrom 2013). Starting in the 1880s, ranchers Adam Knipp and Chris Stengel managed Bihler Landing under their Fisherman's Bay Commercial Company since Bihler's land holdings had become too large for him to manage on his own. They eventually purchased the land in 1896 and remained active through 1901 (Clark 2009:29, 71). Timber broker Walter Frick ran the chute, then a wire one, through the late 1910s. By 1926, the chute and landing had been abandoned (Clark 2009:60). One historic vessel loss is associated with Bihler's Landing.

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Stewart's Point Landing, also known as Fisherman or Fisherman's Bay (active circa 1875-1925)

Stewart's Point Landing is located on land privately owned by the Richardson family with the adjacent waters lying within Greater Farallones National Marine Sanctuary. The site is the most unaltered doghole port of this MPS study. The landing had both trough chutes and a wire chute during its lifespan which were all positioned on the northern side of Fisherman Bay. When John and Andrew Fisk departed Fisk Mill they settled at Stewart's Point. With two mills operating in the area, Platt and Clipper, the Fisk's constructed three trough chutes at the landing by 1875. An extensive network of roads and a horse drawn railway connecting the doghole port to the interior mills (Thompson 1877). Stewart's Point Landing shipped out lumber, tan bark, cordwood, railroad ties, posts, shingles and fencing. In 1881, Herbert Archer Richardson bought out the Fisks and the operation would become an entire family business four generations living and working there, up until Harold Fontaine Richardson's passing in September 2016. The Richardsons built a wire chute at the landing in 1909 that operated until around 1925 (Rudy 2009:58-59). The Richardson family continues to use the property for ranching (Clark 2009:43-58). Due to the consistent traffic in the cove the area has the greatest number of historically reported losses totaling eighteen vessels.

Fisk's Mill Landing (active circa 1860-1910)

Fisk's Mill Landing is located within Salt Point State Park with adjacent waters within Greater Farallones National Marine Sanctuary. Fisk's Mill Landing's single trough chute extended off the southern end of the cliff on the northwest side of Fisk Mill Cove. John Colt Fisk was most likely the first person to use the land around Fisk Mill Cove for lumbering. His activities started around 1860 when he leased 300 acres of land from Samuel Duncan. Fisk built a steam sawmill and trough chute at Fisk Mill Cove for cutting railroad material (Porter 1982:3; Rudy 2009:57). Fisk's time at the landing was short lived and he moved north to Stewart's Point and sold the mill and businesses to Frederick Helmke, who purchased the land from Duncan in 1865. A. J. Helmke continued in the lumber trade. Between 1868 and 1874, 437 schooners loaded lumber, cordwood, posts, and tan bark cargos at Fisk's Mill Landing (Porter 1982:3, 11-12; Rudy 2009:57). In the mid-1880s, Edward Kruse and his son Edward P. E. Kruse took over the property. By 1910 the shipping intelligence section in San Francisco newspapers does not report any vessels arriving from Fisk's Mill Landing. The maritime traffic in the area resulted in three historically reported vessel losses off Fisk's Mill Landing.

Salt Point Landing (active circa 1870-1917)

Salt Point Landing is located within Salt Point State Park with adjacent waters within Salt Point State Park and Greater Farallones National Marine Sanctuary. Activities at Salt Point began in 1851 when Samuel Duncan bought part of the German Rancho from Henry Hageler to use for timber cutting (Rudy 2009:57; Douglass 2002:27). Salt Point had an excellent supply of easily accessible sandstone, and Duncan capitalized on this by leasing part of his land to Charles Grant,

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Philip Hinckle, and Joseph Corliss who began to export the material in 1855. Quarrying was done for the next 13 years at several locations around Salt Point (Porter 1982:7-9; *Daily Alta* June 5, 1856). Around the same time, a partnership of Joshua Hendy and Duncan ran a mill nearby until 1860 (Munro-Fraser 1880b:379). It was not until 1870 that a larger operation with chutes was set up at Salt Point. Frederick Funcke and Lewis Gerstle purchased Salt Point Ranch and used the land to produce tanbark, posts, and cordwood (Rudy 2009:57). In 1872, William R. Miller leased additional land built a sawmill at Miller Gulch (Douglass 2002:52, 54). Surveys maps of Salt Point, from 1876 and 1878, show two trough chutes extending off the western side of Gerstle Cove. By 1889, there was only one chute still open, which closed in 1917. The maritime traffic in the area resulted in eight historically reported vessel losses off Salt Point Landing including the freighter *Norlina* lost in 1926.

Walsh Landing (active circa 1889-1912)

Walsh Landing is owned by the Ocean Cove Store and Campground as well as private individuals. The adjacent waters are within Greater Farallones National Marine Sanctuary (**Figure 4**). In 1857, Fred and Anna Liebig built a home there and in 1860 established a small general merchandise store and saloon (Rudy 2015:55). William Joseph Walsh purchased Lieberg's property in 1889 and named it Walsh Landing. In 1900, lumberman Fred Linderman leased Walsh Landing and installed a single wire chute on the northern side of Ocean Cove. Walsh also owned Salt Point at the time and made a good business decision to focus his attention there and allow Linderman to try his hand at running a lumber chute. The Linderman's shipped out pilings and other split wood from the chute. Additionally, Frank Kehoe ran a logging camp making railroad ties around Walsh Landing during the 1910 time period, which made the wire chute an easy avenue for moving his ties out market until 1912 when the landing closed (Rudy 2009:56).

Stockhoff Cove Landing (Sonoma County) (active circa 1870-1906)

Stockhoff Cove Landing is part of Sonoma County's Stillwater Cove Regional Park with the adjacent waters lying within Greater Farallones National Marine Sanctuary. Historical records indicated that there may have been a wire chute located there, or it was simply an anchorage or landing place for vessels to load or discharge cargo. Stockhoff Cove was named for John Stockhoff, who came to the area in the late 1860s and laid down roots through the purchase of land to create a homestead. The Stockhoffs made a living through lumbering, ranching, and farming and owned many acres of farmland (Rudy 2015:40). The family grew potatoes and other produce that were then loaded onto schooners at Stockhoff Cove or neighboring chutes (Rudy 2009:55).

Stillwater Cove Landing (active circa 1868-1889)

Stillwater Cove Landing is on privately owned land with the adjacent waters lying within Greater

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Farallones National Marine Sanctuary. The doghole port's chute sat on the northwestern portion of Stillwater Cove. One of the earliest settlers at Stillwater Cove was Christian Friedrich Ruoff who arrived there in the fall of 1851 with his wife, Francesca, and their three children. In 1854, Christian died leaving Francesca to take over the operations there. After three years Francesca married a lumber dealer named Jesse Martin Blanchard. The marriage ended in divorce by 1870. She took back her Ruoff name and her family property. It was during her marriage to Jesse that she learned the ropes of the lumber business and built a trough chute at the cove by at least 1868. In 1875 a considerable quantity of wood, bark, posts, and hogs are shipped out (Rudy 2009:55, 169; Rudy 2015:17-1; *Sonoma Democrat* July 24, 1875). The 1876 U.S. Coast Survey map shows a single trough chute with one or two buildings at its base.

Timber Cove Landing (active circa 1860-1925)

Timber Cove Landing is located on the private land of Timber Cove Resort within adjacent waters within Greater Farallones National Marine Sanctuary. The doghole port's chutes sat on the northern portion of Timber Cove. In the 1860s a trough chute was built by William Benitz to support his nearby lumber mills and those of Mr. Webber and D.B.L. Ross. Benitz left the area by the mid-1860s, and his brother-in-law, John Kolmer, took over operations of the chute. The land around Timber Cove was eventually purchased by W.R. Miller in 1866 who then built a new sawmill in 1872 and eventually a new chute. The mill was located five miles away near Salt Point and a railroad connected it with the landing (*Russian River Flag* August 22, 1872). He departed in the late 1870s, leaving others to run the chute. Products important to the landing included posts, pilings, timber, tanbark, and produce (Rudy 2009:54). The last enterprise to use a chute at Timber Cove was Ernest Saltzig. In 1921, he purchased a wire chute from Carlos Call of Fort Ross and moved it to Timber Cove. He shut down the chute in 1925 (Rudy 2009:54). The maritime traffic in the area resulted in three historically reported vessel losses off Timber Cove.

Fort Ross Landing (active circa 1867-1920)

Fort Ross Landing is located within Fort Ross State Historic Park with adjacent waters within Fort Ross State Historic Park and Greater Farallones National Marine Sanctuary. The doghole port sat on the northern portion of Fort Ross. James Dixon was the first to construct a trough chute at Fort Ross in 1867 to support the timber industry (Foster 1981:2). He already had a mill at Kolmer Gulch, just north of Fort Ross, and eventually moved it closer to Fort Ross Gulch. In 1873, George W. Call bought the property for ranching (Tooker 1975:8-10). The 1876 U.S. Coast Survey chart of Fort Ross shows the single trough chute that Call inherited. The products loaded for San Francisco were firewood, tanbark, cordwood, railroad ties, fence posts, dairy products, and farm produce. (Davidson 1889:256-257; Munro-Fraser 1880b:378). The trough chute at Fort Ross blew down in 1898 and was replaced with a wire chute in the same location. Eventually the wire chute was moved across the cove to the front of the Call ranch house (Tooker 1975:14). In 1910, the Calls built a new wire chute. By the 1920s the Calls sold their

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chute to Ernest Saltsiz of Timber Cove who moved it there and Fort Ross Landing closed (Tooker 1975:15). The maritime traffic in the area resulted in seven historically reported vessel losses off Fort Ross including the National Register listed steamship *Pomona* lost in 1908 (NRIS # 07000306).

Russian Gulch Landing (active circa 1875-1910)

Russian Gulch Landing is located within Sonoma Coast State Park with adjacent waters within Greater Farallones National Marine Sanctuary. The landing is located two miles north of the mouth of the Russian River. The doghole port sat on the southeast side of the cove with the steep chute pointing towards the northwest point. Historical records vary in what the name of the doghole port was, calling it Rule's Landing during an earlier period and referencing it as Russian Gulch Landing at a later time. The Russian Gulch land was part of the 4,000 acres purchased by John and Elizabeth Rule in the 1860s. They established a sawmill nearby to process timber and service the neighboring communities through a dairy, cattle ranching, and timber operations. (Edwards 2012:2-1). Between 1877 and 1884, there was a wire chute used when the port was known as Rule's Landing. In 1904, Western Redwood Company built a sawmill in Jenner and the next year work began on a standard gauge railroad connecting Jenner to Russian Gulch Landing (Douglass 1995:4). The maritime traffic in the area resulted in three historically reported vessel losses off Russian Gulch Landing.

Rule's Landing (active circa 1877-1884)

Rule's Landing is located within Sonoma Coast State Park and Greater Farallones National Marine Sanctuary. Rule's Landing lies northwest of the mouth of the Russian River. Its narrow neck connects the northwest side with the main bluff (Davidson 1889:255). The doghole port sat on the southeast side of Rule Head, a small oblong island protruding out from the main cliff edge. The exposed nature of the landing resulted in only a short operating period before the chute structure was moved south to a more suitable location at Russian Gulch Landing. Rule's Landing is named after John and Elizabeth Rule who purchased several thousand acres of land in 1870 for ranching and timber operations. Rule's Landing had only a wire chute due to the cove's high and steep cliffs. Reportedly brought in from Duncan's Landing, installation of the wire inaugurated transshipment operations in 1877. The wire cable infrastructure was taken down in 1884 and moved north to Russian Gulch Landing.

Duncan's Landing (active circa 1876-1889)

Duncan's Landing is located within Sonoma Coast State Park and Greater Farallones National Marine Sanctuary. Duncan's Landing rose up as an active doghole port after brothers Samuel M. and Alexander Duncan built a lumber mill near there on the south side of the Russian River in 1860. Lumber was moved to the chute by a network of horse drawn trams a mile south within the Wright Ranch. The narrow-gauge railroad route paralleled the coastline and connected with the

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infrastructure out on Duncans Point. An 1876 U.S. Coast Survey chart indicated two trough chutes projecting south into the cove. In 1877, the area contained six large sawmills (Munro-Fraser 1880:148). The company town, known as Duncans Mills, was a direct result of the success of the Duncans Mills Land and Lumber Company. Its heyday lasted from 1862 to 1877 (Painter 2001:5-6, 11-13). By 1889, the railroad had replaced the shipment of products out of the immediate area, and the doghole port's chutes were abandoned (Davidson 1889:255). Maritime traffic in the area resulted in two historically reported vessel losses off Duncan's Landing.

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F. Associated Property Types

This MPS does not address the maritime cultural landscape features present inland of the doghole ports. Based on other surveys, there is evidence of stumps, logging camps, roads, railroad trestles, and mills waiting to be integrated into a larger study that goes beyond the doghole ports and enlarges the footprint of the maritime cultural landscape to connect the forests to the sea.

Significance

Properties nominated under cover of this MPS are historically and archaeologically significant at the state level due to their association with the lumber industry and maritime commerce along the Northern California coast with an 1860 to 1940 period of significance. Properties are eligible for listing on the National Register of Historic Places under Criteria A and D. Properties may be eligible for listing under one or more of the following areas of significance: Maritime History, Commerce, Transportation, Engineering, and/or Archaeology: Historic—Non-Aboriginal. The doghole ports primarily served as transshipment points for local industries and community centers. Doghole ports represent engineered solutions to solve the problem of not having ideal maritime ports for the import and export of materials from isolated coastal counties.

Doghole Ports Maritime Connection (Criterion A: Maritime History)

To be eligible under Criterion A in the area of Maritime History, a property must be associated with a doghole port that utilized vessels to move materials. Without the maritime component, the doghole ports would not have been established. The engineering feat of using lumber chutes were essential as there was no land-based way to transport large quantities of material on a commercial scale out from the area. The businesses relied on vessels to make the last link in the chain to deposit the lumber or other commodities at larger ports including San Francisco for sale or transshipment. As the industry became more mechanized and efficient, the types of vessels also adapted and evolved. Sailing schooners gave way to steam schooners which was eventually replaced by steamships. The evolution of vessel design matched the advancements in the industry. Doghole ports supported the maritime trades and are included in the maritime history of areas of exploration, navigation, and use of coastal and deep sea waters.

Lumber and Associated Doghole Port Commerce (Criterion A: Commerce)

To be eligible under Criterion A in the area of Commerce, a property must possess enough integrity to be identified as a doghole port and be connected to the larger network of commercial enterprises who utilized the doghole port as a means to move their products from source to market, mainly the lumber industry. The types of business in the network may include, and are not limited to, lumbering, ranching, farming, and quarrying. The doghole ports are an integral part of the commercial enterprises that operated within Sonoma and Mendocino Counties with a main focus on the lumber business as well as other goods, services, and commodities. Without the chutes on the coast there would not have been an

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outlet for commercial success and longevity.

Doghole Ports Transportation Network (Criterion A: Transportation)

To be eligible under Criterion A in the area of Transportation, a property must be part of the larger doghole port transportation system that used the chute system to transfer goods, materials, and people from shore to waiting vessels for waterborne movement. There were fourteen landing sites in Sonoma County and forty-three landing sites in Mendocino County that made up the Northern California doghole port operations. The doghole port was the end of a larger network which began in the timber lands up slope. The lumber industry utilized the natural terrain to work with the landscape and built the sawmills and roads/railways along the river/creek beds. This made it easier to move logs to sawmills and products to the doghole ports. While each doghole port chute may have operated in competition with the other chutes, they relied on the larger network for continued business and facilities to better support each other. The doghole ports demonstrate the process and innovative technology of conveying material and passengers along a rugged coastline that was not conducive to using traditional transportation methods.

Lumber Chutes and Infrastructure (Criterion A: Engineering)

The doghole port lumber chutes were unique structures that solved the problem of how to load vessels in locations that could not accommodate traditional port structures such as piers and wharfs. "These conditions are peculiar to the California coast, there being no other part of the world where the chute system is in vogue" (*Pacific Rural Press* September 20, 1884). By working with the natural landscape, engineers designed and built a system of chutes along the Northern California coast. To be eligible under Criterion A in the area of Engineering, a property must have physical remains of a lumber chute with enough integrity to be identified as significant and demonstrate its connection to the doghole port network. Additional remains may include associated infrastructure such as railways, roads, or landscape alternations. While each doghole port chute setup was slightly different, as it needed to work with the geographic layout of the land, coast, and underwater terrain, they all used a similar principle of loading vessels along an isolated treacherous coastline where traditional methods could not be employed. The doghole port designers used unique engineering techniques to design, construct, and operate equipment, machinery, and structures to serve the needs of the community, business, and general public.

While Engineering is most often an Area of Significance under Criterion C, Criterion A is appropriate for a new engineering technology first put into place that had impacts on an industry. Engineering under Criterion C requires the physical resource be sufficiently intact to reflect the engineering technology.

Doghole Ports as Archeological Sites (Criterion D: Archaeology: Historic–Non-Aboriginal)

Doghole ports are eligible under Criterion D and significant in the area of Archaeology: Historic–Non-Aboriginal based upon the archaeological site's likelihood to yield information important to history. The doghole ports are significant because they contain a variety of documented resources both terrestrial and submerged. The archaeological remains consist mainly of the lumber chutes and infrastructure, a

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distinctive form of mechanisms engineered to use the natural landscape of the Northern California coast to profit from the region's resources and develop the communities still present. As no intact lumber chutes are extant and little historical material exists on their history, the archeological remains are the only way to study how the chutes were designed, built and operated and how they fit into the larger doghole port system. Additional terrestrial archaeological remains at the doghole ports include building foundations, stone walls, and landscape alternation to support the chute operations. The lumber chute remains are located on land, the offshore rocks, and underwater as a complex system of mooring points kept a vessel in place under the chute end that required eyebolts and anchors. Other archaeological remains consist of historic shipwrecks that sank at the doghole ports during their career servicing the chutes. Those shipwrecks may yield information about vessel design, use, and adaptation, cargo transport, shipboard life, and wrecking events not captured in the historical record. The doghole ports are significant based on the study of historic cultures through survey, excavation, and analysis of physical remains. The archaeological information from individual doghole ports and as a group demonstrates how the landscape affected the design and longevity of a landing site. Through the maritime cultural landscape approach, archaeological remains may reveal the interconnectedness of man and the natural world and the utilization and impact on the environment during the heyday of the lumber industry in Sonoma and Mendocino Counties.

Registration Requirements

In order for a doghole port to be eligible for listing under Criteria A and D at the state level of significance in association with this MPS, there must be physical evidence that a doghole port was located at a specific locale within Sonoma or Mendocino Counties. The property must potentially yield information on the history of the lumber trade or use of doghole ports and their chutes, piers, or wharves to support local industries, for example farming or ranching. The property must have sufficient structural integrity to visually convey the historic function, design, and use of the doghole port. Evidence can include mooring hardware, chute features, landscape modification, building remains, and shipwrecks. Material can be located on land, at the shoreline, or underwater as well as a combination of any or all of the previous. Site integrity must be sufficient for archaeological investigation to also yield information about doghole port design, construction, and use. In the case of a shipwreck, it must yield information to answer research design questions related to vessel design, use, shipboard life, and its wrecking event.

Evidence of location should be confirmed by an archaeologist and compared with historical sources to determine what features are consistent with the doghole port's use during the lumber trade. To be considered eligible for individual or a district nomination, the archaeological site must have sufficient integrity for archaeologists to determine that the area was a doghole port, shipped lumber or other materials via ships through the use of a chute, pier, or davit, and has diagnostic features that indicate this function and identity. Sites may be eligible even if disturbed by natural forces or human interactions as long as the resource has integrity and has the potential to yield useful information.

Cultural materials will not be considered individually eligible or significant for association with the multiple property submission unless they can be associated with doghole port activities. Cultural

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materials may include, and are not limited to, mooring anchors and hardware, shipwrecks, or material fallen or pushed off the cliff linked to the port facilities. If such cultural materials have the potential to yield information because of their own characteristics apart from any associated with a doghole port, they may be considered as significant objects, rather than part of a site.

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G. Geographical Data

Northern California's doghole ports were centered in Sonoma and Mendocino Counties, north of the main shipping port of San Francisco, California. A number of individuals and businesses within the two counties operated successful doghole ports due to the accessible nearby timberlands comprised of large and plentiful redwood, tan oak, and Douglas fir forests. The trees were commercially harvested, and products shipped around the world out of doghole ports starting after the Civil War and continued into the beginning of the twentieth century. The doghole port locations were strategically chosen along the coast due to their favorable geographic landscape for moving lumber and goods from shore to a waiting vessel with chutes and piers combined with access to inland sawmills and processing facilities. The suitability of the terrestrial, coastal, and submerged terrain was all necessary for the doghole ports to operate and be economically profitable.

The fourteen landing sites in Sonoma County and the forty-three landing sites in Mendocino County encompass the scope of the doghole ports in Northern California (**Location Map**). The land, waters, and bottom land covered under this nomination include those only within state jurisdiction and those co-managed by NOAA's Greater Farallones National Marine Sanctuary, where applicable. The overall boundary covering the doghole ports extents starts 0.25 miles back from shore and extends out 0.5 nautical miles from shore for each individual doghole port within Sonoma and Mendocino Counties. This area constitutes the boundary of this multiple property nomination.

The state and federal mandate to protect and manage historical resources within the geographic constraints of this MPS arises from various state and U.S. federal regulations, laws, and orders. The geographic range of this MPS covers properties potentially located on private or California terrestrial and submerged state lands, primarily managed by the Californian State Lands Commission. Additionally, some properties are also co-managed by the California State Parks, and federal management overlaps in places under the Department of Commerce National Oceanic and Atmospheric Administration's Greater Farallones National Marine Sanctuary.

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H. Summary of Identification and Evaluation Methods

The Multiple Property Documentation Form was developed based upon historical and archaeological research on doghole ports started in the late 1980s by California State Parks Department of Parks and Recreation (CA DPR) archaeologists working with the National Park Service, notably at Fort Ross and the wreck of *Pomona*. CA DPR then partnered with Indiana University and the PAST Foundation for work at Fort Ross due to the combination of being state park, a repository for several historic shipwrecks, and the remains of the lumber chute and ranch operations. For over twenty years archaeologist and divers conducted several field projects there to document land and submerged remains. In 2016 and 2017, CA DPR and the National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) conducted the Sonoma Coast Doghole Ports Project to document the submerged and terrestrial archaeological remains of the doghole port landing sites in Sonoma County to better understand the overall maritime network and infrastructure required to move materials to and from the Redwood Coast. The work also assisted NOAA with its National Historic Preservation Act Section 110 responsibilities that require a federal government to inventory, assess, and characterize the historic properties under their jurisdiction as well as to nominate potentially eligible properties to the National Register of Historic Places.

Sonoma Coast Doghole Ports Project archaeologists investigated fourteen sites on land and four underwater. Remnants of doghole port infrastructure include the lumber chutes, mooring hardware and anchors, buildings, and railroad/road grades were found at twelve sites on land and two underwater. Additionally, ten shipwreck locations associated with the lumber trade or the area's larger maritime cultural landscape were investigated for site assessment and outreach purposes with remains located at eight of those shipwreck sites. In 2019, CA DPR archaeologists extended doghole port related field work to Mendocino County to better understand the differences or similarities present compared to those sites located in Sonoma County. This work built upon a historical resource study done in 1980 on six state park system units along the Mendocino Coast by Martha Sullenberger (Sullenberger 1980). This report was the first step in developing a plan to identify historical resources within the parks and provided a regional approach to a thematic study, the lumber industry and doghole ports.

Since a large number of doghole ports reside in a California State Park as well as some included in Greater Farallones National Marine Sanctuary, CA DPR and ONMS has been researching and documenting these sites to have a greater understanding about the larger context of the lumber industry and its connection to the sea through doghole ports. These projects seek to develop a better understanding of the areas' context to allow historians, archaeologists, and the general public with a better appreciation of the resources' background and significance, both on land and underwater. It places these unique features, along with associated shipwrecks, in a larger maritime cultural landscape and provides data for education and outreach initiatives.

Research from primary and secondary sources provided the background for the historical context. A multitude of books, newspapers, and websites have written about the Redwood Coast lumber industry and vessels related to it and this MPDF aimed to compile that information in a concise manner with a

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focus on Sonoma and Mendocino Counties. The historical context serves as a way to link together doghole ports located along the coast. The individual stories of each doghole port are varied and unique and their success relied on being part of the larger network, a system of chutes and vessels to move wood and other products from the isolated coastal forests and mills to market. The extant archaeological remains are tangible connections to a time of development and growth in California.

Three historical sources provided significant information for this MPDF. The *Coast Pilot*; Coast Survey topographic charts, known as T-sheets, published by the U.S. Coast and Geodetic Survey (later Office of Coast Survey); and Thomas H. Peterson maps provided vital clues about the layout of the doghole ports and provided historical context for the archaeological resources discovered. The T-sheets in particular were a detailed source of information, as they documented features that were not incorporated into the final, published charts of the various areas. The rich potential of U.S. Coast and Geodetic Survey T-sheets and associated notes and photographs was recognized by various scholars (Byram 2013), include special reference to doghole ports and lumber chutes (Byram 2013:27 and Haugan 2005). These archival materials provided archaeologists a reference for where and what features might be located both underwater and on land.

The U. S. Coast and Geodetic Survey published editions of the *Coast Pilot* in 1889, 1903, 1909, 1917, 1934 covering the coasts of California, Oregon, and Washington. The *Coast Pilot* functioned as a navigational guidebook for mariners that detailed the physical geography of the coastline, drawings of important landmarks, tide tables, reports on aids to navigation, locations of safe anchorages, and hazard locations (shipwrecks, submerged rocks, pinnacles, kelp, etc.). Important to this project, the books also noted if there was a chute present and if so what type, its condition and dimensions, mooring locations, water depths, and types of cargos exported. Comparison of the editions revealed the evolution of, use, and decline of the doghole ports.

The 1889 edition of the *Coast Pilot* remarked that, “The timber comes close to the shores, and the hills to the crest-line are covered with forests. A large traffic in lumber is carried on at numerous very small coves and landings along the short stretch of coast. . .” (Davidson 1889:259). In comparison, the 1909 edition of the *Coast Pilot* relates that, “Lumber, farm, and dairy produce are shipped from several small landings, at most of which the loading and unloading of vessels is accomplished by the use of a wire cable” (Department of Commerce and Labor 1909:94). This brief mention of doghole ports activities suggested diminished use. By the 1934 edition, the *Coast Pilot* described the landings as having been practically abandoned besides an occasional shipment of timber products from Stewart’s Point (U.S. Department of Commerce 1934:133). The only lumber activity at the time recorded in the *Coast Pilot* near Sonoma is being done by wire cable in Mendocino County.

The *Coast Pilot* supplemented the T-sheets, which provided detailed geographic information on the entire coastline, including the doghole ports. Each chart included data from hydrographic surveys, which mapped the depths of coastal waters and offshore hazards, and topographic surveys, which mapped the land, including the shoreline, natural and cultural features, and elevations above the sea. The T-sheets contained details such as place names (including names used by the Kashia), locations of the chutes and

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moorings, and associated roads or buildings. During the time frame of when the doghole ports operated in Sonoma and Mendocino, there were two separate sets of T-sheets available, those dating from 1878-1880 and 1929-1930.

The third important source utilized was a series of maps—each individually depicting a doghole port—housed in the collections of the Huntington Library in San Marino, California. The New Zealand Insurance Company of San Francisco evidently contracted with local shipbuilder Thomas H. Peterson (or possibly Petersen) in 1885 to produce incredibly detailed hand-colored drawings and descriptions of the doghole ports. These maps noted the location of the chutes, the location and description of the hardware on shore, and the vessel position/orientation while moored under the chute end. The descriptions also covered the location of the underwater mooring anchors, their tonnage, and chain length and size. The maps were duplicated by E.A. Dakin of Electric Pen Printer at 320 Sansome Street in San Francisco, California. A notation on the maps reveals that the copies were presented to the U.S. Coast Survey with compliments of the New Zealand Insurance Company on 23 January 1886.

Archaeological data analysis is based off a wide range of survey methodologies. Terrestrial surveys consisted of walking the cliffs, shoreline and intertidal zone to locate archeological features. Features on land encountered included, chute support leg holes, iron pins, eyebolts, ring bolts, chain and other fastening hardware embedded in the cliffs along with foundations, railroad beds and rails, wire rope and machinery pieces. Archaeological resource locations were recorded with GPS receivers and documented through photos/video, sketches, and traditional drawings accompanied by individual measurements. Land surveys also utilized a hand-held metal detector to locate any buried remains and features associated with two shipwrecks that went aground and were pushed ashore before breaking up and subsequently salvaged, *Maggie Ross* and *Acme* (**Figure 8**).

To locate resources underwater, archaeologist conducted marine magnetometer surveys and snorkel/self-contained underwater breathing apparatus (SCUBA) diving visual surveys. Following the magnetic survey, anomalies were in turn investigated by divers to maximize the probability of locating archaeological resources. Magnetometer data was combined with probable target locations based on nineteenth century maps of the doghole ports noting the location of chutes, hardware, and mooring anchors. Once cultural material was found, divers documented it with photos/video, measurements, and sketches. If feasible, a surface buoy was placed at the location, and its geographic position determined with a GPS.

Snorkeling efforts also supplemented the survey by accessing the intertidal zone and offshore rocks where pins, eyebolts, and other chute components were positioned to assist with securing the chute itself and mooring vessels under the chute and in the coves. Snorkelers were also able to search in shallow water for submerged shipwreck remains as well. The dive team conducted nearshore snorkeling surveys to confirm the location of the lumber steam schooner *Klamath* south of Del Mar Landing and a steam engine from the Del Mar Mill reportedly pushed off the cliffs and visible at low tide. Snorkeling at these locations was done from shore from a nearby beach or climbing along the rocks.

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Archaeological resources were compared to historical maps and photos and placed into the larger historical context of doghole ports and the California lumber industry. Data was recorded in GIS compatible file formats and then imported and analyzed by ArcGIS. Maps generated by ArcGIS provided varying views of the resources found in a survey area. Properties nominated under cover of this MPS must have had enough archaeological data available to provide an exact location, determine its identity, and convey its tie to the historic context of the California lumber industry and use of doghole ports within Sonoma and Mendocino Counties.

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Location Map



Northern California Doghole Ports Maritime Cultural Landscape MPS

Mendocino County • Doghole Port
 Sonoma County

Created with ESRI ArcGIS 10.7.
 Basemap ArcGIS World Street Map 4/7/2021.
 Version 4/7/2021

0 20 40 60 Km

0 10 20 30 Miles



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Figure 1 Unidentified two-masted schooner loading lumber under a trough chute between Gualala and Point Arena. undated (San Francisco Maritime National Historical Park, Carl Christensen Collection, K06.30,548pl (SAFR 21374)).



Figure 2 Two-masted schooner *Golden Gate* under the trough chute at Newport. The remains of an old out of service trough chute in the foreground with the active trough chute in the background, undated (San Francisco Maritime National Historical Park, P93-065, Series 5, File Unit 11, Item E11.18751 (SAFR 21374)).



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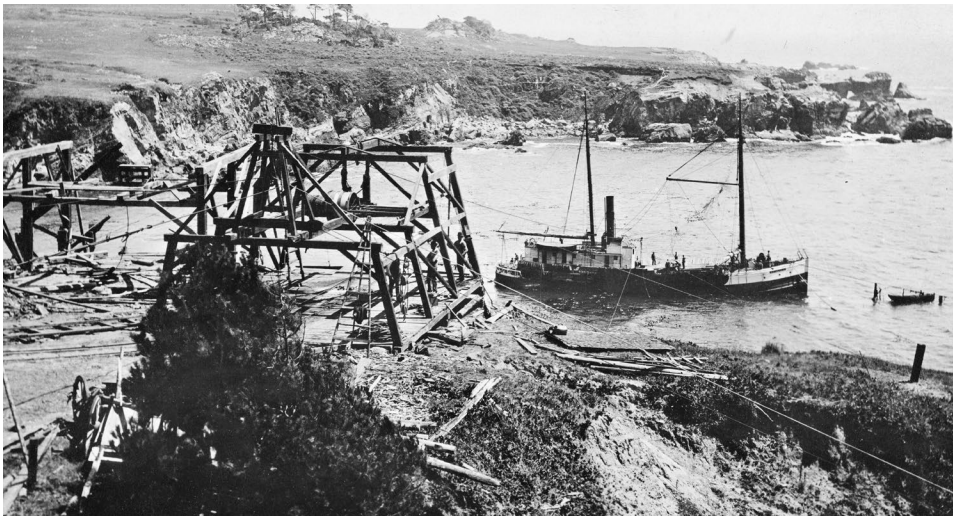
Name of multiple listing (if applicable)

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Figure 3 Unknown two-masted schooner under the wire chute off Iverson's Landing, August 1886 (San Francisco Maritime National Historical Park, J. Porter Shaw Collection, E11.559pl (SAFR 21374)).



Figure 4 Steam schooner *Gualala* loading under the wire chute at Walsh Landing, undated (San Francisco Maritime National Historical Park, E06.2n (SAFR 21374)).



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Figure 5 Unknown two-masted schooner loading under the trough chute at Mendocino Landing, circa 1870. This doghole port represents those of a smaller scale where material was brought in from sawmills located in the surrounding areas (San Francisco Maritime National Historical Park, P93-065, Series 5, File Unit 16, Item E20.38308 (SAFR 21374)).



Figure 6 The sawmill and harbor at Albion with a steam schooner tied up to its pier, undated. This doghole port represents the larger operations with a sawmill at the same location as the landing (San Francisco Maritime National Historical Park, P93-065, Series 5, File Unit 11, Item E11.22033 (SAFR 21374)).



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Figure 7 The steam schooner *Klamath* wrecked near Del Mar Landing in 1921, it was a total loss. It was salvaged by the local community and its remains are extant just offshore (San Francisco Maritime National Historical Park, E03.30,218n (SAFR 21374)).



Figure 8 The steam schooner *Acme* wrecked north of Fort Ross Landing at Kohlmer Gulch in 1889. It eventually broke up and was heavily salvaged leaving no remains that have been located to date ((San Francisco Maritime National Historical Park, Mercedes Pearce Stafford, E03.6,339pl (SAFR 21374)).

