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MARITIME CULTURAL LANDSCAPE OF SONOMA'S DOGHOLE PORTS

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NOAA Office of National Marine Sanctuaries
California State Parks

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Maritime Cultural Landscape of Sonoma's Doghole Ports

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Preface

Volume 37, in our series of Publications in Cultural Heritage entitled *Maritime Cultural Landscape of Sonoma's Doghole Ports,* represents the conclusion of a collaborative project with National Oceanic and Atmospheric Administration's (NOAA), Office of National Marine Sanctuaries (ONMS) and the Cultural Resources Division (CRD), of California State Parks. What started back in the spring of 2015 as just an idea at a CRD training at Asilomar has blossomed into this holistic study of the maritime cultural landscape of the "Redwood Coast." Credit for this idea belongs to Dr. James P. Delgado, formerly of NOAA, who as a guest speaker of our training, sowed the seed of a partnership between ONMS and CRD. This seed grew into a formal Memorandum of Agreement between the two agencies, which laid the foundation and allowed for the launching of what was to become the Sonoma Doghole Ports Project. It was "Jim" Delgado's vision that the project would document both maritime and terrestrial resources as equal parts of a cultural landscape in that the two are intricately intertwined, for where the sea meets the land, has always invited human endeavor.

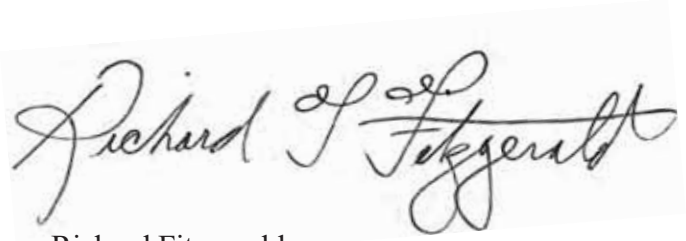
Along the Sonoma County coast, this interaction began thousands of years ago when the ancestral Kashia Pomo decided to call this area their home. They utilized these coastal terraces for seasonal camps focused on hunting, fishing, and gathering the abundant natural resources present along the seashore and the remains are still evident on the landscape today. This report however, focuses on the very thin section of history that essentially begins with the arrival of the Russians and the establishment of Fort Ross in the early 19th century up to 1920's when the maritime commerce that had flourished gave way to the arrival of the automobile and its inherent infrastructure. A more comprehensive treatment of the Kashia Pomo cultural landscape can be found in Dowdall et al. 2015.

Presented below are the results of two seasons of fieldwork along the rugged and wild continent's edge that is the Sonoma coast. Two teams of archaeologists, one terrestrial and the other underwater, investigated a string of sites from Duncan's Landing in the south to Joe Tongue's Landing in the north. In doing so, they revealed the remnant infrastructure of a maritime network of ports, moorings, wharves, anchors, landings, narrow gauge railroads, quarries, building footprints and communities all the byproduct of the economic boom brought about by the Gold Rush of 1849.

Surprisingly, the terrestrial team found a considerable number of features of this network along the dangerous rocky headlands. It was these headlands and accompanying coves, which afforded just enough protection under the right conditions for millions of board feet of Redwood lumber to be loaded to precariously secured schooners via intricate composite chutes. Beneath the surface, the underwater team located the anchors and mooring points of these delivery systems that all too often were not sufficient to avoid calamities that claimed many lives and ships. Indeed, even some of those shipwrecks were located. These physical remnants will not likely last into the next century, but through the efforts of this

project the echo of this uniquely Californian maritime heritage will be preserved, remembered, and appreciated for its role in the development of California.

Lastly, it has been an honor and privilege to serve as the editor of this series for the past eleven years. This will be my last hurrah in that role however, as I move over to hand it off to the next generation of Parks' archaeologists, historians, and curators. To be a member of the cultural staff of California State Parks is to be given a great responsibility for we are the gatekeepers of many of the State's most significant historic sites and their associated narratives both good and bad. In this sense, I believe this publication series serves a small but important role in relating those stories for all interested Californians.



Richard Fitzgerald
February 2021

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Introduction

The expansion of Gulf of the Farallones National Marine Sanctuary into Greater Farallones National Marine Sanctuary (GFNMS) in 2015 resulted in a greatly increased area coming under the National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS) management purview. The expanded sanctuary boundary, extending along the coast from Bodega Bay to Manchester Beach just north of Point Arena, encompassed an area with thousands of years of human maritime activity. As part of the National Historic Preservation Act (NHPA) compliance process associated with the sanctuary's expansion, the ONMS West Coast Region consulted with the California's State Historic Preservation Officer (SHPO), as required under Section 106 of the National Historic Preservation Act (NHPA). This consultation process included an inventory of known and potential archaeological resources in the expansion area. In keeping with ONMS' commitment to utilizing the concept of the maritime cultural landscape as a means to characterize and evaluate these resources, an overview of the northern expansion area—the "Redwood Coast," was undertaken.

The sanctuary expansion process made clear that a more comprehensive survey, especially of the interaction of historic activities and by extension the known and suspected resources, was essential. This report is the result of a two-year collaborative project between the ONMS and California State Parks, with other key partners, to complete that survey. The results are important on more than one level. Rather than focus on sites either "on land" or "underwater," this survey 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 coast. The interrelationship of underwater and terrestrial resources requires the maritime cultural landscape's more 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. This report focuses on the latter aspects of that interaction beginning in the mid-nineteenth century and continuing into the present.

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 worldviews 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 causality 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*, Americans, and Europeans began to subdivide the area for their purposes. 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 rugged shoreline

had few roads and no long-distance railroads, so the most cost-effective way to move the lumber was by sea. Enterprising ranchers and lumbermen rigged a network of chutes and cables extending from the bluffs down into small coves, allowing material to be transferred from shore to a waiting ship.

A fleet of small, maneuverable schooners, steam schooners and eventually steamers carried the area's produce and forest products to markets as close as San Francisco and as distant as Australia and Asia. These landings, known regionally and colloquially as "doghole ports," began to define the maritime landscape. Dubbed "dogholes" because they were so narrow and exposed that mariners joked they were barely large enough for a dog to turn around. 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. 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—wharves, wire "chutes," rail lines, and steam winches—remained in use into the 1920s. The doghole port operations were not isolated or independent ventures; rather they were units in a larger network landscape that linked the interior mills with the coastal shipment points. The resulting communities founded at these transshipment points filled with both businesses and families, many of whom lived there for generations and still have connections there today.

The Sonoma Coast Doghole Ports Project conducted fieldwork in 2016 and 2017 to document the submerged and terrestrial archaeological remains of the landing sites to better understand the overall maritime network and infrastructure required to move materials to and from the Redwood Coast. Archaeologists investigated 14 sites on land and four underwater. Remnants of the doghole port's infrastructure including the lumber chutes, mooring hardware and anchors, buildings, and railroad/road grades were found at 12 sites on land and two underwater. Additionally, 10 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.

As noted, this report provides information on the context of the Redwood Coasts' maritime cultural landscape. It contains brief historical synopses of each doghole port and shipwreck combined with findings from the archaeological surveys. This is not a comprehensive record of Sonoma Coast's doghole ports as the heritage and contributions of the Native Americans and other cultural components have not been included. This report serves mainly as a tool to increase awareness and appreciation about this unique heritage of the Redwood Coast, to provide a record of the physical remains present, and to aid cultural resources managers in preserving our shared heritage for future generations.

The Project

PROJECT GOALS

The Sonoma Coast Doghole Ports Project conducted a non-disturbance characterization Phase I survey of the submerged and terrestrial archaeological resources associated with 14 northern California's Redwood Coast doghole ports, or transshipment locations, in Sonoma County (Figure 1; Table 1). While a cultural resources management (CRM)-based project, this effort was conducted using the theoretical concept of the maritime cultural landscape. This is important, as NOAA in particular has utilized maritime cultural landscapes as a defining context for not only characterizing but also managing resources. Within that context, there are no boundaries between "natural" and "cultural" resources, nor are there necessarily boundaries between terrestrial and underwater sites. To that end, this project was intended to define the extent and nature of doghole sites both above and below the tide line, which coincidently also defines the management interface between the major partners, California State Parks and the Office of National Marine Sanctuaries. In proposing and organizing the project, the ONMS Maritime Heritage Program's goal was to use the theoretical construct of the maritime cultural landscape to assist in present and future co-management of the resource, and to also potentially use the results of this survey to inform and outline a National Register of Historic Places (National Register) nomination that would test and define how a maritime cultural landscape approach could follow the National Register criteria of significance.

The project focused on those properties located within or adjacent to a California State Park and within Greater Farallones National Marine Sanctuary (GFNMS). The fieldwork, undertaken in August 2016 and August 2017, systematically searched for remains associated with the doghole ports including buildings, lumber chutes, underwater moorings, and associated shipwrecks. The project took a larger, holistic view of the doghole ports as a group, not individual sites, to better characterize the extent of their impact on the region and its communities.

Project findings will facilitate resource protection and interpretation of the historical and archaeological properties under each organization's stewardship. Archaeologists also focused on 10 shipwreck sites with ties to the lumber trade or the area's larger maritime cultural landscape (Table 2). Both submerged and shore side resources were documented using photos/video, measured sketches and Global Positioning System (GPS) equipment. Data was compiled and imported into Geographic Information System (GIS) software to create a map of each of the doghole port's archaeological features. Prior to conducting fieldwork, historical research found maps, photographs, and archival research materials to better understand the doghole port's layout and chute structures.

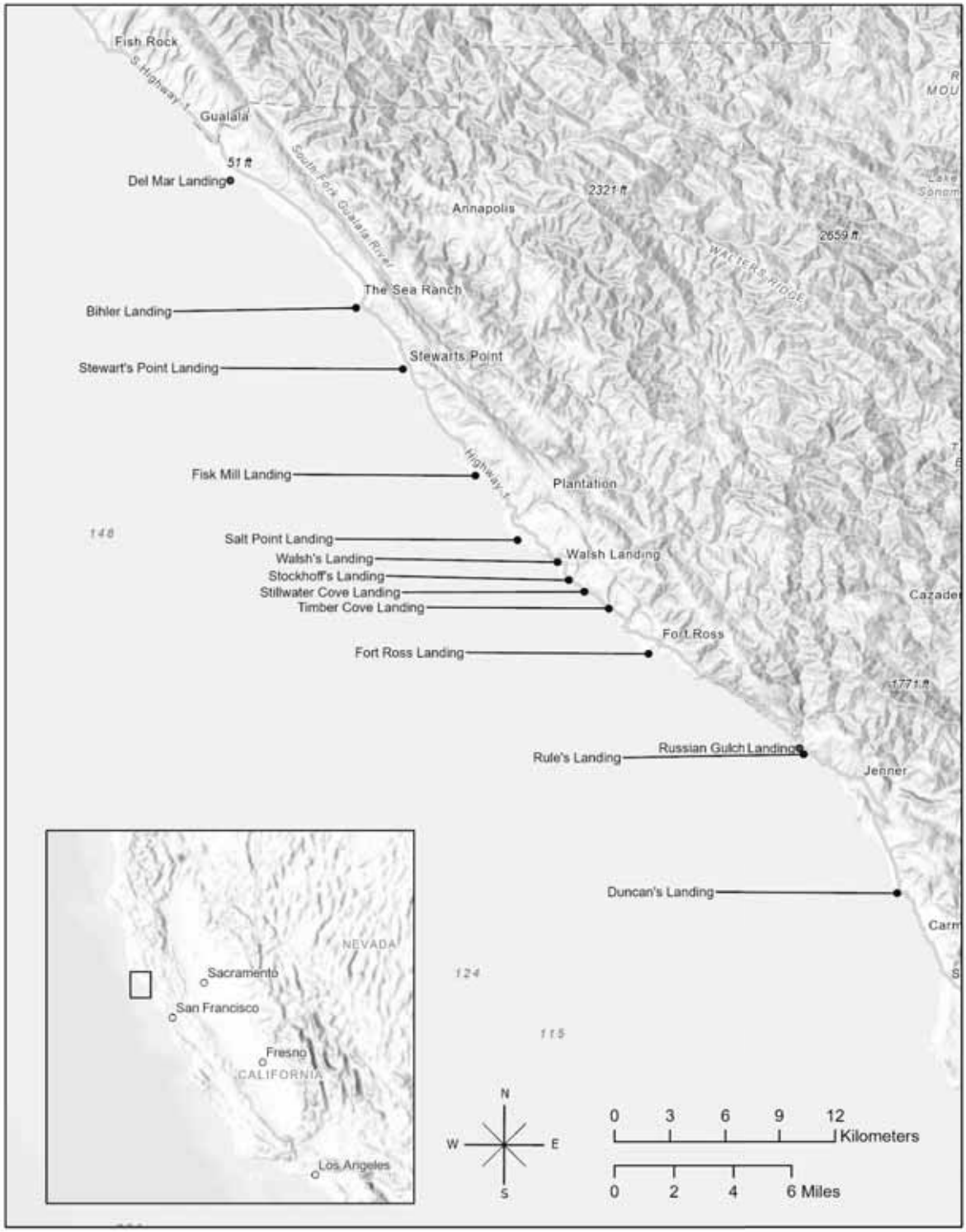


Figure 1. Overall project map with various port images.

Table 1. Fieldwork at doghole ports conducted during 2016 and 2017.

Doghole Port	2016 Terrestrial Survey	2016 Underwater Survey	2017 Terrestrial Survey	2017 Underwater Survey
Joe Tongue's Landing	-	-	Site searched for but not located	-
Del Mar Landing/ Del Mar Mill	Yes	-	Yes	-
Bihler Landing/ Black Point	Yes	-	-	-
Stewarts Point/ Fisherman Bay	Yes	-	Yes	Yes (magnetometer and diving)
Fisk Mill Cove	Yes	Yes (diving)	-	-
Salt Point Landing	Yes	Yes (diving)	-	-
Walsh Landing	-	-	Yes	-
Stockhoff Cove	-	-	Site searched for but not located	-
Stillwater Cove	Yes	-	-	-
Timber Cove	Yes	-	-	-
Fort Ross Landing	Yes	Yes (diving)	Yes	Yes (magnetometer and diving)
Russian Gulch Landing	Yes	-	Yes	-
Rule's Landing	Yes, but terrain difficult for adequate survey	-	-	-
Duncan's Landing	Yes	Yes (diving)	-	-

Table 2. Fieldwork at shipwreck sites conducted during 2016 and 2017.

Shipwreck	2016 Terrestrial Survey	2016 Underwater Survey	2017 Terrestrial Survey	2017 Underwater Survey
Klamath	-	-	Yes	Yes (snorkeling)
Unknown site at Stewarts Point	-	-	-	Yes (diving)
Windemere	-	Yes - no remains located	-	-
Acme	Yes - metal fragments located	-	Yes (included hand held metal detector) no remains located	-
Pomona	-	Yes (diving)	-	-
Riga	-	Yes (diving)	-	-
J. Eppinger	-	Yes (diving)	-	-
Joseph S. Spinney	-	Yes (diving)	-	-
Whitelaw	-	Yes - no remains located yet	-	-
Maggie Ross	-	-	Yes (included hand held metal detector)	-

Historical and archaeological research revealed a landscape dotted with evidence of people's adaptation to the rugged marine environment allowing their families, businesses, and communities to flourish from the mid-nineteenth century into the twentieth century. The story of human interaction with the environment during the heyday of the lumber industry in northern California is vital to understanding the present terrestrial and underwater archaeological resources. These resources serve as touchstones, connecting current residents and visitors to once vital maritime enterprises along the Sonoma Coast.

This collaborative project between federal, state, and private partners helped National Oceanic and Atmospheric Administration (NOAA) meet its National Historic Preservation Act mandates and promote stewardship to better connect present-day communities to their shared maritime heritage. This project also recorded resources within California State Parks that have not been previously documented to better understand the full extent of their properties. Archaeologists, historians, and researchers from NOAA's Office of National Marine Sanctuaries (ONMS), California State Parks (Parks), Sonoma State University, University of California Davis' Bodega Marine Lab, San Francisco Maritime National Historical Park, and Fort Ross Conservancy, amongst many other contributing institutions and private citizens, all contributed to the success of the project.

PROJECT LOCATION

The project focused on the doghole ports within Sonoma County, California spanning an area of the coast roughly 40 miles long between Bodega Head to the south and the Gualala River to the north. This strip running from the coastal ridge to the shoreline and its neighboring waters is known as the Redwood Coast due to its signature and iconic forest. Within the project area, 14 doghole ports were studied with varying degrees of complexity and integrity. The doghole ports' location overlaps with a number of California State Parks as well as Greater Farallones National Marine Sanctuary. The increased protections and interpretation potential afforded to sites within a managed area was beneficial to the project in many ways. It provided backing through regulations and laws to prevent damage to fragile archaeological sites, the availability of funding for fieldwork efforts, increased potential for partnerships, along with ongoing opportunities to expand the landscape approach to other California State Parks and national marine sanctuaries.

The California State Parks included in this survey, from south to north, are Sonoma Coast State Park, Fort Ross State Historic Park (SHP), and Salt Point State Park. While there are other California State Parks located on the Sonoma coast, doghole ports were only located within these three parks. Salt Point State Park covers 5,970 acres with 6 miles of rough, rocky coastline. Its campgrounds and trails connect visitors to the beautiful land-sea interface. Fort Ross SHP, established in 1909, encompasses about 3,200 acres including a Russian fort compound, a visitor center with interpretive exhibits, a museum bookstore, staff offices and a research library. Sonoma Coast State Park, designated in 1934, spans more than 10,000+ acres including 17 miles of coastline from Bodega Head to Vista Trail. It is comprised of several beaches separated by rock bluffs and headlands. Visitors to this park would likely not believe that significant industrial operations once existed on this park's shores.

The project's underwater survey components took place within the waters of Greater Farallones National Marine Sanctuary. GFNMS is part of a system of 14 National Marine

Sanctuaries and two Marine National Monuments managed by NOAA's ONMS. Designated in 1981 as the Gulf of the Farallones National Marine Sanctuary, GFNMS originally encompassed 1,279 square miles just north and west of San Francisco Bay. In 2015, the ONMS expanded GFNMS north and west of its original boundaries to encompass 3,295 square miles, changing its name from Gulf of the Farallones National Marine Sanctuary to Greater Farallones National Marine Sanctuary. The sanctuary protects open-ocean, nearshore tidal flats, rocky intertidal areas, estuarine wetlands, subtidal reefs and coastal beaches within its boundaries.

The California Coastal National Monument, managed by the Bureau of Land Management, overlaps with the project's research area. Designated by President Clinton in 2000, the monument encompasses thousands of islands, rocks, exposed reefs, and pinnacles beginning 12 miles offshore up to the mean high tide zone. This includes 1,000 acres of offshore rocks and 7,924 acres onshore. The focus of the monument is the protection and management of geologic and biological resources.

Several of the project's doghole ports have submerged components that lie within a California state designated marine protected area (MPA). California MPAs fall into three categories: State Marine Reserves (SMR), State Marine Conservation Areas (SMCA) and State Marine Parks (SMP). The California Department of Fish and Wildlife manages the marine natural heritage in these MPAs. Project goals do not conflict with MPA regulations and fieldwork did not impact the geological or biological resources protected within the MPAs.

Historic shipwrecks and other submerged archaeological sites are managed by the California State Historic Preservation Office and the California States Lands Commission. Archaeological resources are protected under California Public Resources Code sections 6309, 6313, and 6314 and California Code of Regulation 14 CCR § 929. The Sonoma Coast Doghole Ports Project was a non-disturbance archaeological survey and did not violate any state laws pertaining to the protection of cultural, historical, or archaeological resources.

Several properties associated with the Redwood Coast lumber industry are listed on the National Register or designated a National Historic Landmark. These properties include a historic district in Point Arena, the O.W. Getchell House at Anchor Bay, Fort Ross National Historic Landmark, and the Iverson House in Point Arena. Additionally, Duncan's Mills, consisting of 31 properties in the town of Duncan Mills, is a Sonoma County Historic District. Long term goals for this project include a National Register Multiple Property Submission for the Sonoma Coast doghole ports, an updated National Register/Landmark listing for Fort Ross SHP, or more targeted individual National Register property nominations.

RESEARCH QUESTIONS

The project focused on answering several research questions to better understand the connection California State Parks and Greater Farallones National Marine Sanctuary have to the maritime cultural landscape of the Sonoma Coast's doghole ports and associated lumber industry as well as additional aspects of the region's relationship to the sea. Physical evidence of a variety of activities and people is present in the form of historic resources located at several doghole ports. The surveys sought to answer the following questions:

- What are the physical resources still present at each doghole port?
- What are the locations, conditions, and ages of those resources?
- What are the threats to those resources?
- How are the remains at one site different or the same as another site?
- How do the historical maps and photos compare with the actual remains?

The project explored several avenues associated with the doghole ports including shipwrecks associated with them, some well-known, while others were only indicated through historical reports. The historic steamship *Pomona*, located in Fort Ross SHP and listed on the National Register, as well as the freighter *Norlina*, located in Salt Point State Park, were in the project plan to visit to provide updated documentation on their condition. Additionally, it was a priority for divers to gather data/imagery suitable for resource management and outreach efforts. Both sites are publicly known and are visited by divers. The project aimed to answer the following questions:

- What is the condition of the site in comparison to previous years?
- Is there any evidence of anthropogenic impacts to the site?
- What additional efforts can be taken to better protect and interpret the site?

Lastly, the archaeologists conducted surveys to locate new shipwrecks to add to the area's archaeological resource inventory. While some underwater archaeological research took place within the boundaries of California State Parks, all shipwrecks investigated fell within GFNMS. NOAA, as a federal agency, is required by Section 110 of the National Historic Preservation Act to inventory, assess, and nominate eligible resources to the National Register, and protect historical resources under their jurisdiction. Thus, this project helped the agency meet its historic preservation responsibilities. The project specifically sought to find the following shipwrecks: schooner *J. Eppinger*, steam schooner *Klamath*, bark *Windermere*, steam schooner *Acme*, steam schooner *Maggie Ross*, steam schooner *Whitelaw*, and ship *Joseph S. Spinney*. At each location, the survey gathered data to answer the following questions:

- Is there evidence of a shipwreck at the location?
- If so, what are the extent and characteristics of the remains?
- Is there evidence of salvage or other anthropogenic impacts?
- Do the remains match historical maps and accounts of its sinking?
- What is the possible identity of each shipwreck?

FIELD METHODOLOGY AND FINAL PRODUCTS

The project utilized a number of techniques to document the doghole ports and shipwrecks. Terrestrial reconnaissance consisted of surveying the cliffs, shoreline and intertidal zone to locate archeological features. Features on land encountered by the team members included, chute support features, iron pins, eyebolts, ring bolts, chain and other fastening hardware embedded in the cliffs along with foundations, braided wire rope, machinery parts, and railroad beds, ties and rails. 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 buried remains and features associated with two shipwrecks, *Maggie Ross* and *Acme,* that went aground and were pushed ashore before breaking up. Targets identified by the metal detector survey were flagged and explored by limited shovel probing. If the target encountered was identified as historic, limited shovel probing ceased to prevent artifact damage. The historic resource was documented, its location recorded, and then reburied.

Regarding the built environment, historians from California State Parks conducted a Historic American Landscape Survey (HALS) documenting existing buildings and landscape features typical to doghole ports. With focused work at Fort Ross and Stewarts Point, the HALS team made 35 black and white large-format photographs. The collection of photos range in composition from wide-angle landscapes to close-up details of housing, vernacular outbuildings, agricultural machinery, maritime equipment and linear transportation networks in order to create a historic portrait of the working relationship between humans and the environment at a doghole port. The photos were developed using traditional darkroom methods in order to meet the standards for submittal to the National Park Service's Heritage Documentation Program and submitted for inclusion to the Library of Congress's HABS/HAER/HALS collection.

To locate resources underwater, archaeologists conducted magnetometer surveys and visual surveys using snorkel and SCUBA. In 2016, ONMS West Coast Region's research vessel *Fulmar* supported SCUBA diving operations (Figure 2). In 2017, a Parks' Sonoma District 12-foot inflatable (IRB) served as the support for the magnetometer surveys as well as for SCUBA diving activities. The magnetometer survey employed a Marine Magnetics SeaSPY marine magnetometer, Trimble DSM232 Differential GPS receiver, and HYPACK software to navigate planned survey lines and gather the magnetic and positioning data. Data was processed using Hypack's magnetometer editing extension and the Marine Magnetics Survey Modeling Tool Kit for ArcGIS, developed by BOEM and NPS. The software produced color-shaded magnetic gradient maps to identify anomalies.

Following the magnetic survey, anomalies were 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. Underwater, researchers anticipated finding artifacts and sites associated with the doghole ports including shipwrecks, anchors, log buoys, wire rope, and chain. Additionally, researchers expected to find concentrations of material culture at the doghole port anchorages resulting from items being thrown or lost overboard. Once an artifact or site 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 land team by being able to access 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 now visible at low tide. Snorkeling at these locations was done from shore at a nearby beach or climbing along the rocks.

Source: NOAA ONMS and DPR

Figure 2. Diving operations in Gerstle Cove off the R/V *Fulmar*.

Project data was compiled for this technical report to detail the fieldwork's findings from 2016 and 2017. 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 the survey area.

All archaeological resources identified on land were documented on Department of Parks and Recreation (DPR) 523 forms. All new or updated DPR 523 forms, along with the technical document reporting findings, have been submitted to the California Historical Resources Information System, Northwest Information Center for permanent trinomial assignment. Additional products that may result from the project includes:

- Updating the existing National Register nomination for Fort Ross to include updated information on its role as a doghole port,
- National Register Multiple Property Submission for Sonoma Coast doghole ports including terrestrial and underwater features,
- National Register nomination for Salt Point Landing to update terrestrial site information and include underwater features,
- Revision and expansion of the GFNMS Maritime Cultural Landscape study,
- A more focused study on GFNMS doghole ports and/or shipwrecks,
- Incorporation of project data into several Sonoma State University graduate theses.

This technical report serves as an overview of the historic significance of the Sonoma coast doghole ports and an inventory of the archaeological features to assist with monitoring for possible impacts or new discoveries. However, this document is only an overview of the topic and further research should be done on individual doghole ports to better understand the scope, construction, and use of the sites beyond the reach of this project. The report's findings should also be useful for interpretation efforts within California State Parks and ONMS, as well as local historical societies and museums. Many visitors walk the cliffs and coastline of Sonoma County unaware of the doghole ports and their importance. The information provided here will provide background material to better appreciate and steward our shared maritime heritage.

Sonoma Coast Maritime Cultural Landscape

SUMMARY

The overlapping activities at and around the Sonoma Coast's doghole ports left physical and cultural traces through place names, archaeological artifacts, community settlements, shipwrecks, and once busy ocean highways to form a unique and significant maritime cultural landscape that is still evident today. The interconnected peoples of native Kashia, Russian, Chinese, Mexican, and European ancestry created a diverse community. The human interaction with the marine environment, especially at the land-sea interface, can be seen through the historical records and tangible artifacts present at the doghole ports. The report, "The 'Redwood Coast:' The Maritime Cultural Landscape of the Northern California Coast from Bodega Bay to Mendocino" by James P. Delgado (2016) identifies 10 main elements to the Redwood Coast maritime cultural landscape:

- Its location is a prominent and longstanding landmark for international and national maritime traffic.
- It is a drowned coastal environment of 18,000 years ago on which ancient humans likely migrated to settle the Americas.
- It is an area strongly shaped and influenced by the offshore marine environment and the edge of the continental shelf.
- It is an area whose rich pelagic and shore-side marine resources provided sustenance for the Coast Miwok and Kashaya Pomo peoples.

- It is an area whose climate and marine mammal habitat brought the first non-native settlers to the coast.
- It is an area whose fishery inspired the growth of a commercial and recreational industry.
- It is an area whose thick redwood forests inspired a lumber trade that lasted from the mid-nineteenth into the twentieth century.
- It is an environment whose nature resulted in as many as 200 shipwrecks.
- It is an area whose history, culture and rugged beauty, as well as the need to provide regular links, inspired push for access by land as well as by sea.
- It is a significant section of the California coast.

The above statements recognize the region's heritage and uniqueness resulting in the designation of numerous state parks, expansion of GFNMS, movements in the early 1960s to prevent the construction of a nuclear power plant near Bodega Bay, designation of 14 marine protected areas, and public coastal access secured by the California Coastal Commission. The balance between resource protection and human use is an ongoing conversation, one that Sonoma's residents and larger community are constantly exploring to determine the best way to ensure stewardship along with economic sustainability.

THE LARGER MARITIME WORLD

The Sonoma coast's nineteenth-century development was part of a longer and larger process by which the Pacific coast of North America, including California, was integrated into the emerging global economy. While the industrial revolution played a role, the key element in the creation of that economy was the role of ships and shipping. Explored and opened to trade by competing European powers in the sixteenth and seventeenth centuries, the Pacific's economic role first focused on access to Asian goods. Assimilating other goods and resources such as whale oil into the growing global economy "opened" more of the Pacific. The voyages of Britain's Captain James Cook and the publication of his journals and charts ushered in a dramatic era of increased shipping, European settlement, and further integration of the Pacific into an increasingly interconnected world (Igler 2013). It was during this period that the Russians came to California and settled on the Sonoma coast.

The discovery of gold in California, and the resultant gold rush spurred the dramatic rise of San Francisco as America's dominant port on the Pacific. San Francisco and its port served as the nexus for shipping that served the rapid expansion of the city and surrounding territory which shipped out hundreds of millions of contemporary dollars in gold (Delgado 2009). The abundance of gold provided the means by which San Francisco's entrepreneurial mercantile class overcame natural obstacles to the port's development. This included creating a working waterfront on what had been a shallow, muddy cove unsuitable as a port, 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). This intensive over-capitalization, and the continued pace of shipping into San Francisco made the city and its port a major player in the global economy. It also led to the rise of its merchant class that dominated the region

which made San Francisco the "imperial heart of a vast trading network" that dominated coastal and interior development and trade (Robbins 1994:173).

In this context, the rise of the doghole ports and the evolution of the Sonoma coast maritime cultural landscape is intricately tied to San Francisco. The natural resources of the coast, timber, and stone were harvested as construction materials as San Francisco rapidly expanded into the twelfth largest urban center in the United States by 1860 (Delgado 2009:89). In time, these commodities were harvested and shipped from the doghole ports to expanding markets up and down the coast, across the Pacific, and internationally. The coast and its environment favored the development of ranches, especially dairy and sheep farms. These farms and ranches served the San Francisco market, beginning with the Gold Rush and continuing over the next century. Linking them, and their goods to that market were the ships that called at the doghole ports.

These small ports connected "isolated" coastal settlements and their goods to the city. The ports, initially developed by local ranchers seeking to connect to the San Francisco market, quickly evolved into corporate extensions of infrastructure developed by outside interests. Profits were such that the capital was available to build, repair, and rebuild expensive ports on an exposed coast. The same held true for the other requirement, the ships. A fleet of hundreds of schooners, mostly two-masters, regularly worked the coast, calling at the doghole ports to offload goods from San Francisco needed or desired by the coastal communities, and in turn to load local commodities for the return trip.

These craft operated in the same manner as the trucks working the highways of America do now. The "shipping intelligence" columns of the San Francisco *Daily Alta California* collectively show changing patterns as individual schooners called at Sonoma and Mendocino coast ports after leaving San Francisco, sometimes loading at a single doghole, other times loading at more than one, collecting timber, tanbark and dairy products until fully laden. They also sailed south, to ranches on the Marin and Santa Cruz coasts. The goods were not always intended for San Francisco. The shipping vessels called at Benicia, Stockton, and Sacramento, heading up San Francisco Bay and thence the San Joaquin and Sacramento Rivers. The "doghole" 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 craft. The evolution of these craft is more than a change in size, rig, and mode of power; it is part of an evolving, 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 Ranch, and Point Arena that served larger, steam-powered vessels.

The Sonoma Maritime Cultural Landscape

Sonoma's maritime cultural landscape is intrinsically tied to its majestic old growth Redwood forests. These massive trees only grow within a narrow ecological and climatological band. Redwood trees grew to massive proportions in the drainages and slopes of Sonoma's coastal mountains. Their tall, thick, straight-grained trunks made them ideal for easy sawing, splitting, and milling. Redwoods are low in flammable resins and have high tannins helping to repel insects. For those seeking to profit from their harvest, the only problem with the feasibility of commercial operations in northern California was that the land was isolated and rugged, making it difficult to get products to San Francisco and the international markets. The only economically viable way to move lumber and other materials

on a large scale was to transport them using the ocean and California coast as a transportation corridor, using relatively small, low draft vessels and taking advantage of the few, partially sheltered coves to access and load products.

Transporting Sonoma's forest products to market via land routes was virtually impossible. Land conveyance remained ineffective until the railroad and roads large enough for trucks pierced the hard-to-reach communities along the Redwood Coast in the 1920s. Up until the turn of the century, vessels stopping at the doghole ports and their chutes were the primary way for quarries, lumber operations, ranchers, and farmers to export products and goods and, in turn, bring in supplies and freight from the city needed for everyday life. "Early historic-period settlement on the northern Sonoma coast was based on natural resource extraction" (Douglass 2002:35). Doghole ports were a necessity to support coastal industries. This vital connection was essential for the coastal communities to be able to exist and provide the lumber products needed around the world. After the Russian enterprise at Fort Ross was abandoned in 1841, the coastal tract of land, claimed by John Sutter and Mexico, was granted to mainly 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. Landowners subsequently leased out portions of their land for timber rights, leading to the beginning of the industry in the late 1850s (Clark 1990).

Like so much of northern California history, the global reaction to the gold strike on the American River provided the spark that initiated large scale commercial timbering and lumbering operations. Timbering activities by the Russian colonists began in the area in the early 1800s, but it was on a small scale. Construction of the first steam sawmill near Bodega Bay in 1844 spurred lumber production to a new level and led to the influx of interest in Sonoma county and beyond (Canright 1977:4). Following news of the gold discovery and resulting influx of '49ers, 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. Increasing levels of lumber production coincided with increasing two-way trade between the West Coast and Hawai'i, Australia, China, and South America in the 1870s and 1880s (Douglass 2002:20–21). These overseas markets provided for the demand that allowed doghole port infrastructure to become increasingly industrial, and convinced San Francisco interests to fund that infrastructure.

An 1875 article in the *Sonoma Democrat* newspaper summarized Sonoma County's wealth and provided an annual value of 18 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 feet). The county's total production of forest, ranch, and mine production was $5,522,800, therefore, butter and lumber made up 7% each of the annual value. Other high value items like wine, wheat, hay, barley, and quicksilver were not likely transported by water, but the list also mentioned tanbark, firewood, and cheese production as significant contributors to the economy and were also common doghole port exports (*Sonoma Democrat* 2 January 1875).

In comparison to lumbering activities in more northerly California counties or the Pacific Northwest, Sonoma County's operations were small. However, timber harvesting and processing methods remained the same as at other locations. Lumbermen began by

cutting down individual trees with hand or steam powered reciprocating saws. Once on the ground, trees were broken down into more readily moveable logs (Figure 3). Depending upon the operation, these logs were further refined into lumber closer to the harvest point or moved to shore-side sawmills. The final products could be square timbers for construction, boards, staves, shingles, railroad ties, fence posts, or tanbark. Moving the massive redwood logs was logistically challenging. In addition to sheer human muscle, horses, mules, and oxen were used and eventually steam powered locomotives and donkey engines. 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. 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).

Source: Sonoma Heritage Collection, Sonoma County Library

Figure 3. Logging redwoods in Sonoma County.

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 shipping the products and then selling them. Independent vessels were frequently used at first, but doghole port and mill operators recognized they could cut costs and retain more profits if they owned their own vessels. For

example, small fleets were built by the Call's at Fort Ross and the Richardson's at Stewart's Point to service their doghole ports.

Doghole ports also functioned as a place where passengers traveling to the wider world boarded vessels to connect with the larger market and associated business interests. In addition to business and personal related outbound travel, the Sonoma coast also offered recreational pursuits with doghole ports functioning as tourist entry and exit points. "Fort Ross is considered the paradise of fishermen and hunters," boasted an undated article. The passenger business was so busy that the owner of the land near Fort Ross, George W. Call, operated a line of gasoline steam schooners with cabins for 12 to 15 individuals that plied between San Francisco and Fort Ross (Pearce n.d.). Vessels servicing the doghole ports played an important role, providing economic and social connectivity and communication for Sonoma's otherwise isolated communities.

Doghole port style infrastructure was not unique to the Sonoma coast; similar landscapes elsewhere on the California coast, in the Pacific Northwest and even in the Hawaiian Islands were equipped with mechanical apparatuses to move people and goods to and from vessels on a hostile shore (Figure 4). While used in other places, it was in Sonoma and Mendocino counties that they are most well-known. The heyday of the doghole ports lasted for roughly 80 years beginning in the 1860s and ending with World War II. The use of lumber chutes coincided with the development and use of lumber schooners, steam schooners, and steamships on the West Coast and led to an increase in maritime traffic on the Northern California coast. Martha Sullenberger (1980) sums it up nicely in her Parks' report, *Dogholes and Donkey Engines: A Historical Resource Study of the Six State Park System Units on the Mendocino Coast*:

> 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; but whatever the motive, it played an important part in California history (56).

Source: Fort Ross Conservancy

Figure 4. Lumber chutes provided the isolated coastal communities with a way for people to catch a ride to the "city" or bring in supplies for everyday life.

Doghole Ports

INTRODUCTION

Sonoma County's cliff lined coastline was generally inhospitable to traditional maritime infrastructure. The unsheltered coves with cliffs 50 feet high and western facing mouths were the only option for vessels to stop at with some protection. No 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 14 locations between Bodega Head to the south and Gualala River to the north where lumber and other products were exported. Because these indentations along the shoreline did not have docks and wharfs like traditional ports, they were set up with "glorified playground slides" at first and later with cable systems similar to a modern zip line to move items from shore to vessels (Tooker 1968:2).

No one knows who first labeled the small coves dogholes, but it was mostly likely a sailor who entered one of these tiny retreats along Sonoma or Mendocino County. Historians have recalled 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 doghole comes from staff at the Guest House Museum in Fort Bragg, California who state they were named after a dog because the sailors could tell where they were by the barks of the dogs on the ranches along the coast, each bark being distinctive based on the dog that lived on the property (Mark Hancock 2017, elec. comm.). Many ports were used seasonally since winter storms made coming close to shore a risky proposition. Most of the shipping from doghole ports was done from May through October when the weather was the best. Even in summer months the doghole ports were subject to the prevailing winds and swells.

The doghole port's end resulted from increased access to the area by trucks and eventually the railroad. These more effective and less weather dependent modes of transportation greatly reduced shipping of most products by sea. The last chute in Northern California stopped operations in 1938. Many chutes remained in place until after World War II when they were finally dismantled (Tooker 1968:7).

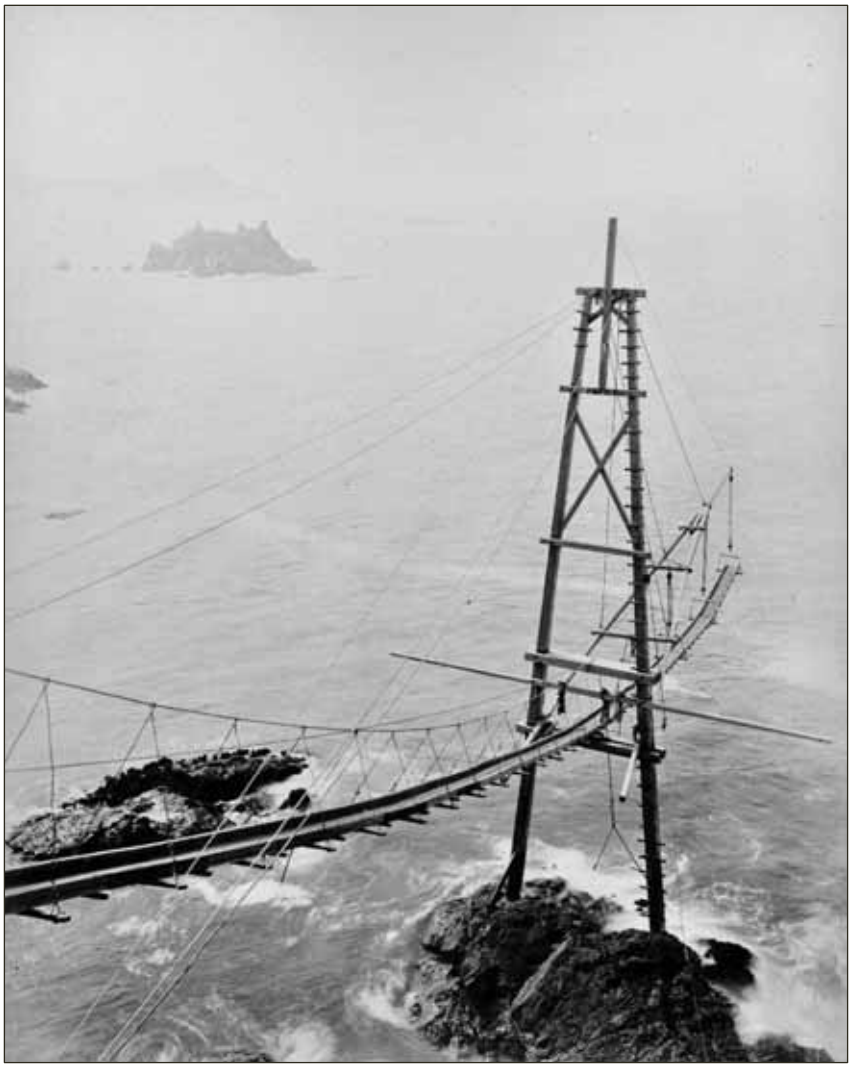
LOADING METHODS

Two main varieties of loading apparatus were utilized at the doghole ports within the project's study area: trough chutes and wire chutes. The main reason for the chute's construction was to facilitate the shipment of lumber products. They were used to move a variety of goods. Lumber was the predominate reason for the chutes and it will be the primary but not the only focus of this report. Both chute types and methods facilitated the movement of goods from shore to vessels and thence to market. The chutes required a system of ropes/cables and anchors to secure a waiting schooner or steamer near enough to shore to be accessed by the chute, but prevent it from going ashore or striking submerged hazards. Proper placement at the bluff's edge was crucial for its effectiveness. There needed to be a relatively flat piece of land to allow access for the products to be moved from mill or other origin to the doghole port for staging. This was typically done by mules or horses on tramways, roads, and log skids. The most important aspect of the chute was its location within the cove to provide protection to loading and waiting vessels. Typically, the chute was in the lee or northern side of the cove to provide as much shelter as possible from incoming swells. Vessels moored under the chute end, facing towards the incoming seas to minimize movement. Lumber and cargo were loaded into a vessel's hold first and once full, was placed on deck. Vessels carried approximately half of their load on deck with stacks rising several feet high secured with chains to keep everything secure. It was common to have one chute per doghole port, but if trade demands necessitated it and there was enough viable room, multiple chutes were built at a single location. Trough chutes were more susceptible to damage from southeast or southwest gales during storm events and often had to be rebuilt or repaired. Very few chutes operated year-round because of the lack of shelter.

Trough Chute

Starting in the 1850s, trough chutes, also known as slide or apron chutes, were developed to solve the problem of access to the doghole ports. This apparatus became the most common method of loading lumber onto a waiting vessel along the Sonoma 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 Hittell attributes the invention of the slide chute to the California coast (Hittell 1882:430).

A trough chute was comprised of a wooden A-frame or towers built into the shore's rocky outcroppings that supported a wooden trough held in place with rope, chains, wire cable, and iron rods (Figure 5). 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 feet with a long arm, called a swing apron, projecting out over the water another 40 to 90 feet (Potter 1890:11997–11998). If the chute needed to pass over semi-submerged rock at the shoreline, a series of towers were built to provide stability. The chute was held in place against wind and wave by



Source: California State Library

Figure 5. Trough chute at Signal Port, north of the project area (1886).

wire cables secured to the cliffs with iron pins and eyebolts. A system of wooden pulleys and wire cables raised and lowered the apron as lumber and other products were slid down the chute from shore to ship using gravity. The chute was basically a wooden slide that looked like half a suspension bridge (Canright 1977:17). Chute builders sought 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* 20 September 1884). At the chute's terminus, a movable plank or clapper could be raised or lowered from shore or by the moored vessel. This device regulated the flow of materials as they moved down the chute. Timbers were not slid down individually. Rather, the chute was constantly fed material so 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 5 to 10 feet above a vessel's rail and could be adjusted based on the lumber's weight, tides, or sea conditions.

From seven to 10 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 the smaller sized vessels servicing the Sonoma coast. A good day's work might involve moving 50,000 board feet. Lumber was not the only item the chute's moved. If other materials such as general freight needed to be slid down, they were bundled and put on a sled. Horses then pulled the sled back up and helped discharge any merchandise or goods needed for the local communities (*Pacific Rural Press* 8 September 1888). Trough chutes varied in size and complexity as each was adapted to the specific topographic configuration of each doghole port. 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 a staple and did not disappear 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 (Sullenberger 1980:54). Historian Richard Tooker commented 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 first practical use of a wire chute was at Gualala in Mendocino County, the first doghole port north of the project study area.

Wire chutes required a flat spot near the bluff's edge. A wide, shallow, trench was then cut in the ground, and a wooden platform was erected over the trench. The heavily built platform held a shaft with two differently sized drums of wire rope. They sat high enough off the platform floor to avoid interfering with the men operating the chute. A series of sheaves were also mounted on the platform frame for the wire rope to pass over, running 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 1½ and 2 inches, 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, the 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 or on shore across the cove. The wire's total length extended as much as 800 feet.

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 (Figure 6) and 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. Eventually, donkey engines were geared to control both wire drums and help move the traveler to and from the vessels along with raising and lowering the platform (Tooker 1968:4).

Source: University of California, Berkeley

Figure 6. Steam schooner being loaded using wire chute at Mendocino Bay.

The wire chute operations were much simpler and faster than a trough chute, the advantage being that the cargo could be moved 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. Another advantage of the wire chute was related to 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, materials could be tied into bales to better contain the shipment (*San Francisco Chronicle* 6 May 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.

Operations shifted from trough to wire chutes beginning in the 1880s and 1890s but the lumber industry's downturn in the 1890s caused many owners to delay switching to wire chutes until business picked up again. 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).

Pier/Wharf

Traditional transshipment facilities were few and far between on the Northern California coast. The only location in Sonoma County known to have a wharf was Fort Ross Cove. Wharves required protection from the open ocean to construct, something in very short supply in the area. They were also costly to maintain and easily destroyed by heavy weather if it was built in an area subject to heavy weather and sea conditions.

Two additional transshipment methods commonly employed in many other locations were not in Sonoma County. If a lumber mill was accessible by river, vessels traditionally transited directly to a wharf at the mill. This was not possible on the Russian River, the single large river in the study area. The bar across the river's mouth was too shallow to permit ocean going vessels to ascend it. Water flow down the river was also highly variable. In the summer, when weather conditions were likely more suitable for crossing a bar, the Russian River's levels were at their lowest.

Lightering was also not a practical solution to lumber transshipment. Lightering was extremely labor intensive and slow since the materials had to be loaded and unloaded onto the lighter before being eventually transferred to the larger vessel. Shallow draft barges loaded on the Russian River could have been employed to move lumber out to a waiting vessel. This method might have been used in the 1850s prior to the schooner and chute combination coming on scene (Jackson 1977:14).

Mooring Structures

Moorings were established at doghole ports in the coves near the lumber chute's end to stabilize the active vessel. Buoys and anchors were positioned at several locations within and just outside the coves to accommodate several waiting vessels. A large anchor was placed on the seafloor with a log measuring as much as 50 feet long at the surface to hold the chain/wire rope. These underwater components 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 were used to secure mooring lines. Vessels at the chute might even be secured by several underwater anchors as well as with lines on shore to keep them in one place. It could take several days to load cargo. A four-point anchoring system was common with lines running from the port and starboard bow along with the port and starboard quarters (Davidson 1889).

VESSEL TYPES

Doghole ports came on scene after the 1850s when the demand for lumber caused timbermen to seek new forests to harvest. Very few harbors in Northern California could accommodate large vessels and those ports were farther north in Mendocino, Humboldt, and Del Norte Counties. Two vessel types dominated the lumber and merchant trade along the Sonoma coast, the schooner and steam schooner. While some smaller steamships serviced Sonoma's doghole ports, most of them were too large and focused their trade at bigger ports farther up the coast into the Pacific Northwest. The need for vessels designed for the lumber trade and the difficulties associated with loading and discharging cargo, along with maneuvering in tight harbors or coves, went hand in hand with the overall demand for more vessels along the Pacific Coast for all aspects of trade.

The small, wooden-hulled two-masted single-decked schooner was the ideal vessel for accessing the doghole ports. 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 sails allowed them to utilize the generally onshore winds in the area. The schooner's flat but heavy bottom and light rig permitted them to sail without ballast, a time saving advantage. Crews numbered between four and seven, considerably less than deep water sail vessels with a square rig. 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).

The two-masted schooner dominated the lumber trade between the 1850s and 1890s with 300 of them, weighing between 50 and 300 tons, servicing the industry (Ryan 2010:142–144). These were all local and regionally built craft. In all, West Coast shipbuilders launched "some 540 sailing vessels of 100 tons gross and upward" 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 dominated the doghole port traffic and moved products from the Sonoma coast to San Francisco where it was sold and loaded onto larger vessels (Figure 7). The 219-foot-long, three-masted schooner *C.A Thayer*, launched in 1895, is the only West Coast lumber schooner still afloat today and is homeported at the San Francisco Maritime National Historical Park.

Source: University of California, Berkeley, Bancroft Library

Figure 7. Typical two-masted lumber schooner arriving in San Francisco.

HAZARDS/SHIPWRECKS

Many vessels were lost while engaged in the doghole port trades. It was equally dangerous sailing the coast, riding out a storm at a doghole port mooring waiting to load, or positioned under a chute loading within the confines of the small coves (Figure 8). 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. Lucky captains found their vessel ashore on one of the few sandy beaches where it could be refloated. More often than not, the vessels were a total loss and too damaged to be saved. Due to each doghole port's unique geography, specific captains and vessels specialized in visiting these locations. Their familiarity allowed them to moor safely and navigate a particular port's hazards thereby lessening the chances of an incident. There was also incentive for the mills or chute owners to own and operate vessels to ensure the crew was familiar with the doghole ports and to eliminate the charter costs (Historic American Engineering Record n.d.:7; Ryan 2010:146).

One important aspect of this study is assessing the shipwrecks of the Sonoma coast not only in traditional cultural resource management terms, i.e., accidents that resulted in a partial or complete loss that in turn would leave an archaeological signature, but also as "phantom" wrecks, i.e., those "that got away" without necessarily leaving a trace. These phantom wrecks 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 the business, of at times fatal

consequences for crew, and as factors that led to changes in moorings, and the ultimate abandonment of some dogholes. Individually, they were community events that remain stamped in the collective memory.

Source: LOT 3544-58, no. 1188, Library of Congress Prints and Photographs Division Washington, D.C.

Figure 8. Lumber schooners riding out a storm off the Mendocino Coast.

Doghole Ports Project Findings

INTRODUCTION

Three historical sources provided significant information for this study. The *Coast Pilot,* Coast Survey "T" sheets, and the Thomas H. Peterson maps provided vital clues about the layout of Sonoma's doghole ports and provided historical context for the archaeological resources discovered. The team used these references to begin the search 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 area's topographic charts, known as T-sheets published by the U.S. Coast and Geodetic Survey, the predecessor to today's Office of Coast Survey. The T-sheets provided detailed geographic information on the entire coastline, including the doghole ports (Table 3). 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 moorings, and associated roads or buildings. During the time frame of when the doghole ports operated in Sonoma there were two separate sets of T-sheets available, those dating from 1878 to 1880 and 1929 to 1930.

Table 3. Summary table of doghole port and chute information included in the 1889, 1909, and 1917 editions of the *Coast Pilot*.

DOGHOLE PORT	1889/1909/1917 CHUTE(S)	1889 MOORING BUOYS OR LINES	1889/1909/1917 PRODUCTS SHIPPED
Del Mar Landing	no mention/no mention/wire cable	N/A	N/A
Bihler Landing	2 chutes, only outer used/wire cable/wire cable	3 mooring buoys, 6 mooring lines	wood, posts, tanbark, stave bolts
Stewart's Point/Fisherman Bay	in 1887 three chutes, outer carried away and inner not used, only middle used now/wire cable/wire cable	3 mooring buoys, 7 mooring lines	wood, posts, tanbark, shingles
Fisk Mill Cove	1 chute/no mention/no mention	4 mooring buoys and 6 mooring lines	lumber, wood, tanbark, posts
Salt Point Landing	inner chute rebuilt, outer abandoned/all but abandoned/practically abandoned	4 mooring buoys and 6 mooring lines	wood, posts, tanbark, produce
Walsh Landing	N/A	N/A	N/A
Stockhoff Cove	N/A	N/A	N/A
Stillwater Cove	1 chute/no mention/no mention	2 mooring buoys and 6 mooring lines	wood, posts, railroad ties, tanbark
Timber Cove	1 chute/no mention/no mention	2 mooring buoys and 5 mooring lines	wood, posts, tanbark, produce
Fort Ross Landing	2 chutes/a landing chute/a landing chute	3 mooring buoys, 3 mooring lines	posts, cord wood, tanbark, produce/lumber and dairy shipped and merchandise received/same as previous
Russian Gulch Landing	a steep chute/no mention/no mention	3 mooring buoys	N/A
Rule's Landing	landing located in 1877 abandoned, wire cable there but taken down 1884 and moved to Russian Gulch Landing/no mention/no mention	N/A	N/A
Duncan's Landing	former considerable lumber activity, now use railroads	2 mooring buoys	N/A
Joe Tongue Landing	N/A	N/A	N/A

The last important source utilized by the team 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, location and description of the onshore hardware, and 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.

Detailed descriptions of the Sonoma coast doghole ports are reported below with sections that begin with a brief historical sketch of the landing followed by explanation of survey methods and summary of findings, beginning with Duncan's Landing to the south and ending with Joe Tongue's Landing to the north.

DUNCAN'S LANDING (CA-SON-348/H)

In August 2016, archaeologists conducted a terrestrial and underwater survey of Duncan's Landing, the project's southernmost doghole port. Its land features lie within Sonoma Coast State Park and adjacent waters are within GFNMS. The landing was located 2¾ miles from Salmon Creek on a small jutting 60-foot-high cliff next to a dangerous rocky cove. The doghole port sat on the southeast side of Duncan's Point along the bluff edge with historical charts from 1876 showing two trough chutes extending to the south. Previous archaeological surveys at Duncan's Point focused on a Kashia/Coast Miwok village site, and the area was listed on the National Register in 1971 (NPS reference #71000206). Past surveys did not document Duncan's Landing as a doghole port therefore the Sonoma Coast Doghole Ports Project added new information not previously known about the property and updated the existing DPR 523 site record to reflect the new data.

The 2016 survey documented two features which are believed to correspond to the trough chutes. The westernmost feature is located farther out toward sea while the eastern feature sits closer inside the cove. Underwater surveys to locate materials related to the lumber chutes or shipwrecks did not find any man-made structures.

Historical Background

Duncan's Landing developed into an active doghole port after Samuel M. and Alexander Duncan built a lumber mill on the south side of the Russian River in 1860, where Bridgehaven is situated today. 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 infrastructure out on Duncan's Point. The 1876 U.S. Coast Survey chart indicates two trough chutes projecting into the cove with four moorings, two near the chute ends and two farther out at the cove's mouth (indicated by exclamation marks; Figure 9). One main road leads onto Duncan's Point with a cul-de-sac at the end to access the outer chute while a smaller road splits off for the inner chute. Half a dozen buildings sat

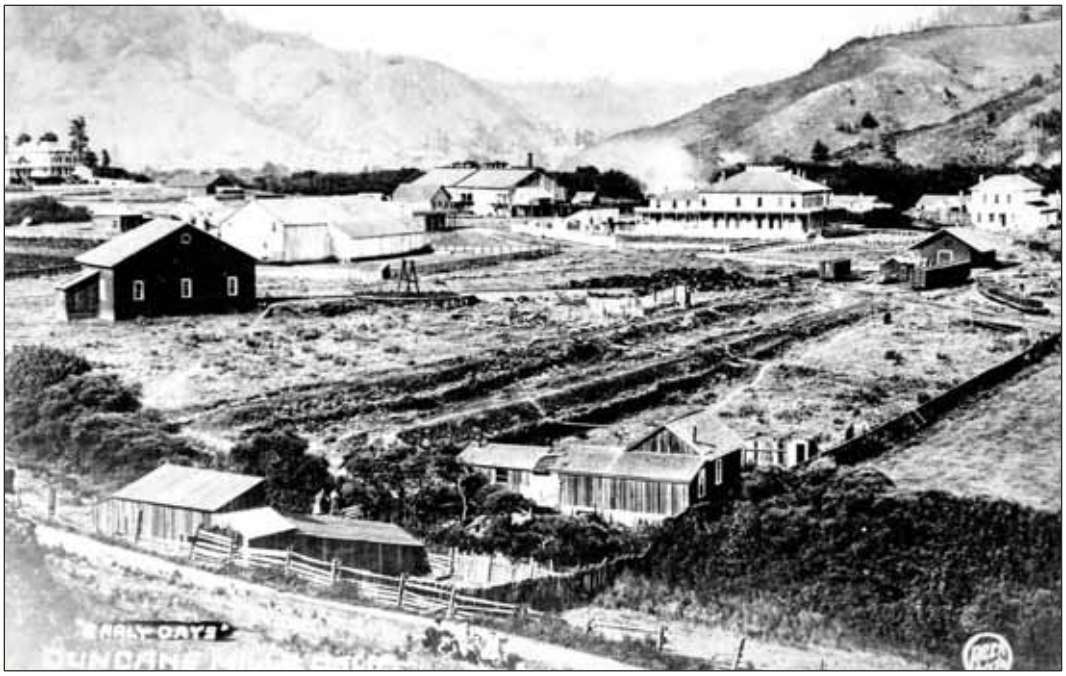
Source: NOAA's Historic Map & Chart Collection

Figure 9. U.S. Coast Survey "T" sheet map 1876.

on the point to support chute operations. In 1877, the area contained six large sawmills with the capacity to produce 175,000 board feet of lumber for market daily, as well as shingles, laths, pickets, tanbark, charcoal, and cord wood (Munro-Fraser 1880:148).

The importance of having a landing at Duncan's Point is apparent in 1875 when the steamer *Alexander Duncan* was constructed in San Francisco to provide regular service to the doghole port at Duncan's Landing. It was built to carry 200,000 board-feet of lumber and shortly after its launch, the vessel started running trips to/from San Francisco (*Daily Alta California* 8 May 1875; *Daily Alta California* 15 May 1875). By 8 December 1875, the mills were closing down after an 11-month season and reporting their success in local newspapers. They had cut 7,000,000 feet of lumber and shipped 6,000,000. At the doghole port sat 1,000,000 feet for which *Alexander Duncan* was loading 140,000 feet, and two schooners, *Two Brothers* and *Sarah Louisa*, would take an additional 300,000 feet. The remaining 560,000 feet was being held until January for shipment. For the few months *Alexander Duncan* ran in 1875, it averaged four trips per month making it a valuable resource to support the doghole port (*Sonoma Democrat* 11 December 1875). In 1876, the steamer continued its service carrying lumber along with other commodities such as butter, cheese, eggs, chickens, turkeys, wool, hides, and assorted goods. On average, it made the run from Duncan's Landing to San Francisco in 10 hours. A schooner typically took four days and carried less cargo. It is of note that steamers, like *Alexander Duncan*, were the preferable vessel type for carrying perishable products over sailing vessels because their reliable speed allowed the freshest items to get to market. One trip for *Alexander Duncan* included carrying 133,000 feet of lumber, 37 boxes of butter, two boxes of cheese, and five bundles of hides. A similar trip from Duncan's Landing to San Francisco in January 1877 was made by the schooner *Euphemia* and carried only 45,000 feet of lumber. (*Daily Alta California* 3 June 1876).

In 1877, the mill moved upriver after the North Pacific Coast Railroad set up operations in the region and built a bridge across the Russian River. The company town, now known as Duncan's Mills, was a direct result of the success of the Duncan's Mills Land and Lumber Company (Figure 10). Their livelihood depended on the ability to ship materials out



Source: Sonoma Heritage Collection, Sonoma County Library

Figure 10. View of Duncan's Mills in 1877.

at the landing and on to San Francisco. The town's heyday lasted from 1862 to 1877 with a population around 250. The Sonoma Land and Lumber Company and the Russian River Land and Lumber Company both owned large tracks of timberland. They also used Duncan's Mills to process their raw trees. Additional products important to the town included dairy, sheep, potatoes, grain, and fruit which might also have been moved out by the doghole port (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. The 1889 edition of the *Coast Pilot* commented on Duncan's Landing and wrote that in the past there was a considerable amount of traffic done there in the lumber trade but was now done by the railroad (Davidson 1889:255). By the turn of the twentieth century there were several large hotels, a post office, store, livery, and railroad depot to support the lumber industry and a growing number of vacationers seeking solace and adventures in hunting and fishing (Painter 2001:5–6, 11–13). The maritime traffic in the area resulted in two historically reported vessel losses off Duncan's Landing. No evidence of either vessel was located during the project survey (Table 4).

Timbering around Duncan's Mills had slowed by 1900, and the Coast Survey map from 1930 has no indication of any doghole port features still remaining at Duncan's Landing. The infiltration of roads and the automobile led to the decline of the railroad and changing focus of the community and its industries. Today, only small remnants of Duncan's Mills' past remain intact. The focus is on tourist-oriented attractions, mostly centered on railroad heritage. Sonoma County designated the town a historic district in 1982, but it was re-evaluated in 2012 to more accurately document its role in California maritime and lumbering history.

Table 4. Historically reported vessel losses at Duncan's Landing.

Name	Vessel Type	Date Lost	Length (ft)	Width (ft)	Build Date	Located
Emma Adelia	Schooner	Apr 10, 1872	-	-	-	-
Sovereign	Schooner	1873	-	-	1864	-

Survey Results

Chute Findings

The project updated the existing DPR 523 site record for Duncan's Landing to incorporate the historic era doghole port's hardware, structural features, and maritime landscape attributes. The two cluster areas, totaling 22 individual features, are situated on the bluff and match up with the inner and outer chute locations, confirming the accuracy of the 1876 "T" sheet. They sit on the southern side of Duncan's Point facing into Duncan's Cove, separated by approximately 120 feet.

The southwesternmost concentration is comprised of 17 separate components extending 100 feet along the cliff. They are all hardware associated with the outer trough chute in the form of *in situ* iron eyebolts or metal fragments with varying degrees of preservation. The tight concentration of eyebolts within this area indicate the location of the outer chute. The eyebolts are part of the system of cables, chain, and hardware to secure the chute to the cliffside. Some eyebolts are intact while others are only partially intact (Figure 11) and heavily degraded. The eyebolt's heights range from 5 inches to fewer than 2 inches. One eyebolt has a single link of iron chain attached to it while another had been hammered to a 90-degree angle for unknown reasons.

The northeastern feature area is comprised of five separate components covering an area along the cliff measuring 30 feet long. They are all hardware associated with the inner trough chute in the form of *in situ* iron eyebolts with varying degrees of preservation. All five eyebolts are grouped together. The eyebolts are also part of the system of cables, chain, and hardware to secure the chute to the cliffside. Three eyebolts are intact while two are partially intact or broken off. The eyebolts' heights range from 5 inches to not more than a nub.

No other historic features were located at Duncan's Landing on land due to the dismantling and removal of the chute and associated buildings after it was no longer used as a doghole port. The site has also suffered from development of an access road and parking lot to serve Sonoma Coast State Park visitors. While people can walk around the top of Duncan's Point, feature areas sit off the main walking trail and are located towards the cliff edge. It is unlikely that they are regularly seen, which hopefully protects them from human induced impacts. The main threat is from coastal erosion.

Project archaeologists conducted two dives within Duncan's Cove but did not locate any artifacts linked to the doghole port. A dive was made on each of the two inner mooring locations, indicated as exclamations marks on the 1876 Coast Survey map, but nothing was found. The rough conditions prevented additional underwater work at the site. While there is access to Duncan's Cove from the beach for the public to dive at this location, it is rarely explored due to the dangerous environment and remote location.

Source: NOAA ONMS and DPR

Figure 11. Project archaeologist inspecting *in situ* hardware at Duncan's Landing

RULE'S LANDING

In August 2016, archaeologists conducted a terrestrial survey of Rule's Landing. Its land features lie within the Sonoma Coast State Park and the adjacent waters are within GFNMS. Rule's Landing lies 1½ miles northwest of the mouth of the Russian River, under a high head, 220 yards long by 120 yards wide sitting north/northwest and south/southeast. Its narrow neck connects the northwest side with the main bluff which reaches 140 feet high (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 ¼-mile to a more suitable location at Russian Gulch Landing.

Historical Background

Rule's Landing is named after the Rule family (John and his wife Elizabeth) who purchased several thousand acres of land in 1870 for ranching and timber operations. Unlike other landings that transitioned from a slide chute to a wire chute, 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. Out of date information in the 1889 edition of the *Coast Pilot* described the wire chute as stretching 150 yards from a point on the main bluff to a rock close under the extremity of

Rule Head. Vessels moored under it, in the center of the cove. Other mooring buoys were placed outside the cove to help sailing vessels warp out once loaded (Davidson 1889:225).

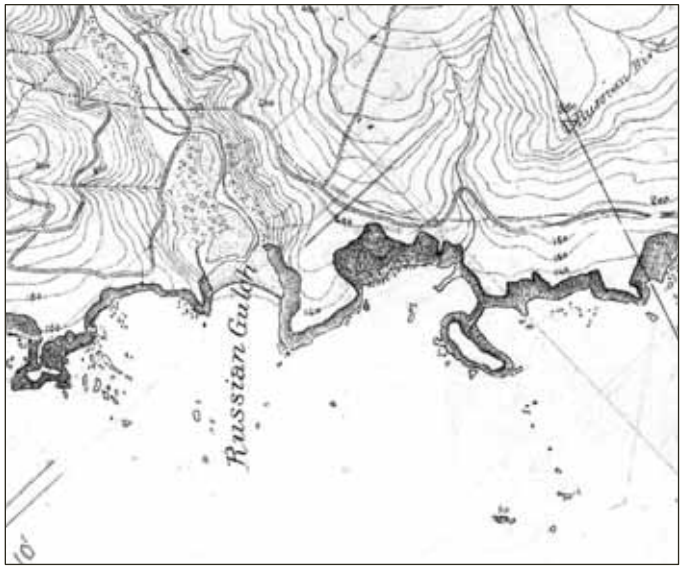
With the chute's short operational time frame, newspapers do not reflect the business conducted at Rule's Landing. There are also no reports of vessel loss in the area during the limited years of operation.

Survey Results

Due to the steep and hazardous conditions near the cliff edges, the survey team could not safely spend much time at Rule's Landing. A brief survey of the area did not locate any features associated with the doghole port and a DPR 523 site record was not submitted until a more comprehensive look at the area could be done.

RUSSIAN GULCH LANDING (CA-SON-2261H)

In August 2016 and August 2017, archaeologists conducted a terrestrial survey of Russian Gulch Landing. Its land features lie within Sonoma Coast State Park and the adjacent waters are within GFNMS. The landing is located two miles north of the mouth of the Russian River, next to a large sandy beach known as Russian Gulch (Figure 12). The doghole port sat on the southeast side of the cove with the steep chute pointing towards the northwest point.



Source: NOAA's Historic Map & Chart Collection

Figure 12. U.S. Coast Survey "T" sheet map 1876.

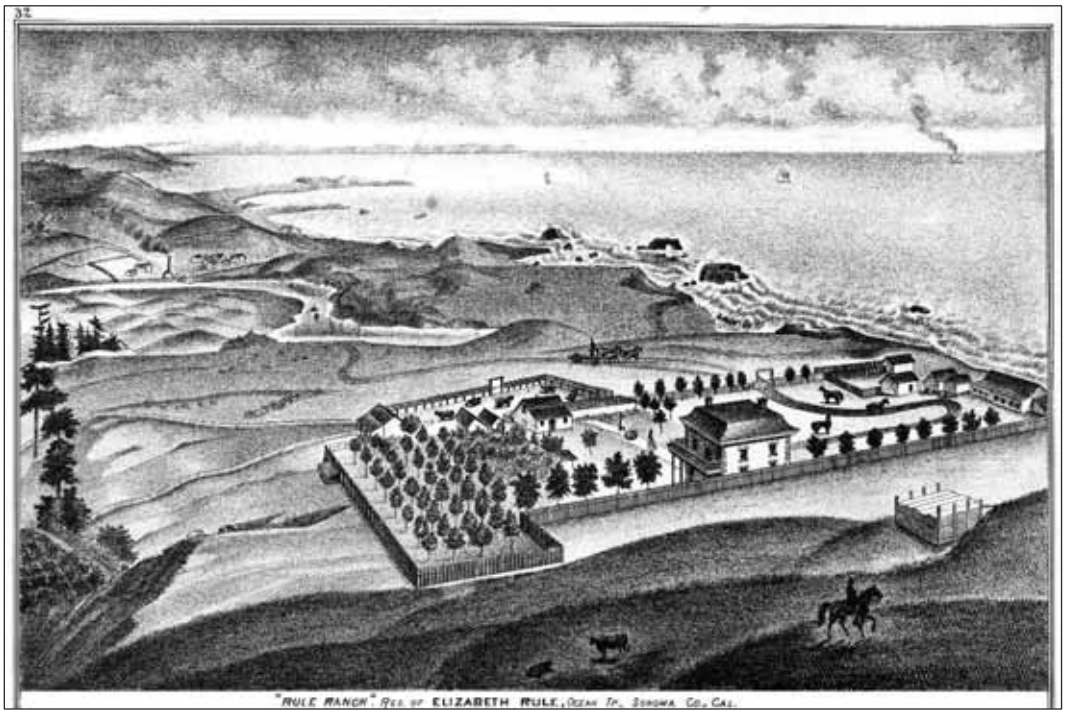
Previous archaeological survey at Russian Gulch Landing was done in 1948 by Bauer and again in 1995 by Robert Douglass who both identified the site as Rule's Landing. Historical records vary in what the name of the doghole port was, calling it Rule's Landing during an earlier period and referencing it as Russian Gulch Landing at a later time. The Sonoma Coast Doghole Ports Project relocated many of the features from previous surveys and updated the DPR 523 site record, adding new information not previously known about the property.

Survey results are broken into two parts, the five features located up on the bluff and 27 features located along the cliff edge, closer to the shoreline. Up on the top of the bluff, extant features are in the form of a roadbed/railroad grade while farther down below in the rocks there are hardware and square cut outs indicating the location of the trough or wire chute(s).

Historical Background

Russian Gulch Landing was an active doghole port supplied by the Russian River mills through a steam railroad system. The doghole port had a trough chute at first and later a wire chute extending from the bluff just south of Russian Gulch Beach. The trough chute's use dated to the late 1880s, while the wire chute represented a more modern technology and is connected with the Western Redwood Lumber Company that was active after the turn of the twentieth century.

The Russian Gulch landing was once part of the 4,000 acres purchased by John and Elizabeth Rule in the 1860s (Figure 13). They established a sawmill nearby to process timber as well as the doghole port servicing the neighboring communities. John passed away shortly thereafter, leaving Elizabeth in charge of the ranch and never completing the sawmill. She ran the dairy, cattle ranch, and timber operations and supplied San Francisco with beef, dairy products, and wood. The property remained with the Rule family until 1941 (Edwards 2012:2-1).

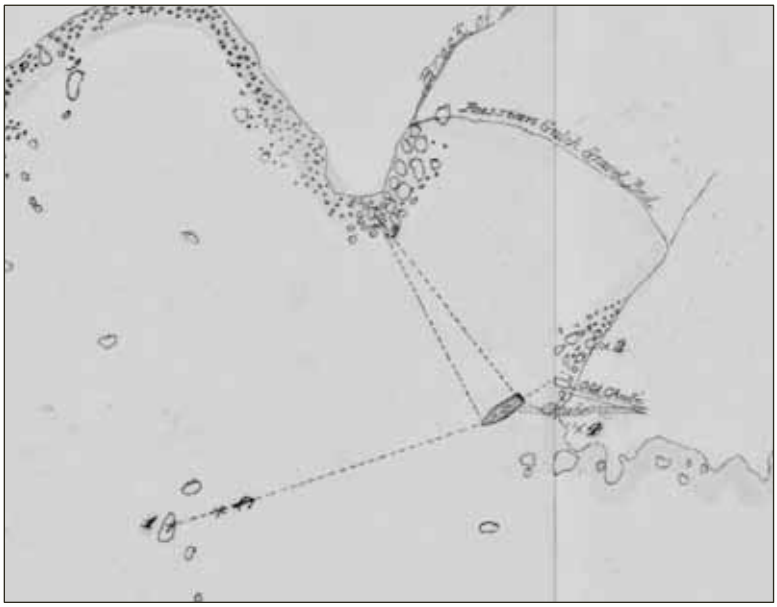


Source: David Rumsey Historical Map Collection

Figure 13. Drawing of Rule Ranch from the *Thompson and West's Historical Atlas of Sonoma County*, 1877.

Between 1877 and 1884, a wire chute was used when the doghole port was known as Rule's Landing. The chute may have been disassembled and moved there from the Rule's Landing site. There is also reference to a wire cable being moved from Duncan's Landing in 1877 to this location. It is likely that, "The recycled cables from Duncan's Landing… may have been more in the nature of an improvement to the existing operation" (Douglass 1995:4). The wire chute was not the only loading apparatus; in fact, the doghole port also had trough chute(s) at the same time.

A survey of the area in 1886 by Thomas E. Peterson shows a map with two trough chutes, the inner one marked as the old chute and the outer one labeled just as chute (Figure 14). The vessel would moor under the chute with 15 feet of water under it at low tide with its bow facing out toward sea. Three moorings on shore and one in the rocks held it in place. The first mooring, which held the bow, was a combination of a 2¼-inch ring bolt secured in an offshore rock with 20 fathoms of chain, along with a buoy attached to an anchor. The second mooring, which held the stern, consisted of a 1¾-inch ring bolt in the rocks with 16 fathoms of 1¼-inch chain. The third mooring, or a 1¼-inch ring bolt, was located across to the rocks on the north side of the cove. Two lines stretched to it from the vessel's starboard bow and starboard stern. The last, or fourth, mooring was a 1¼-inch ring bolt with 4-inch wire rope in the rocks under the chute to hold the port quarter. The mooring anchors were normally taken to San Francisco every fall, overhauled, and replaced in the spring (Peterson 1886).



Source: Huntington Library, San Marino

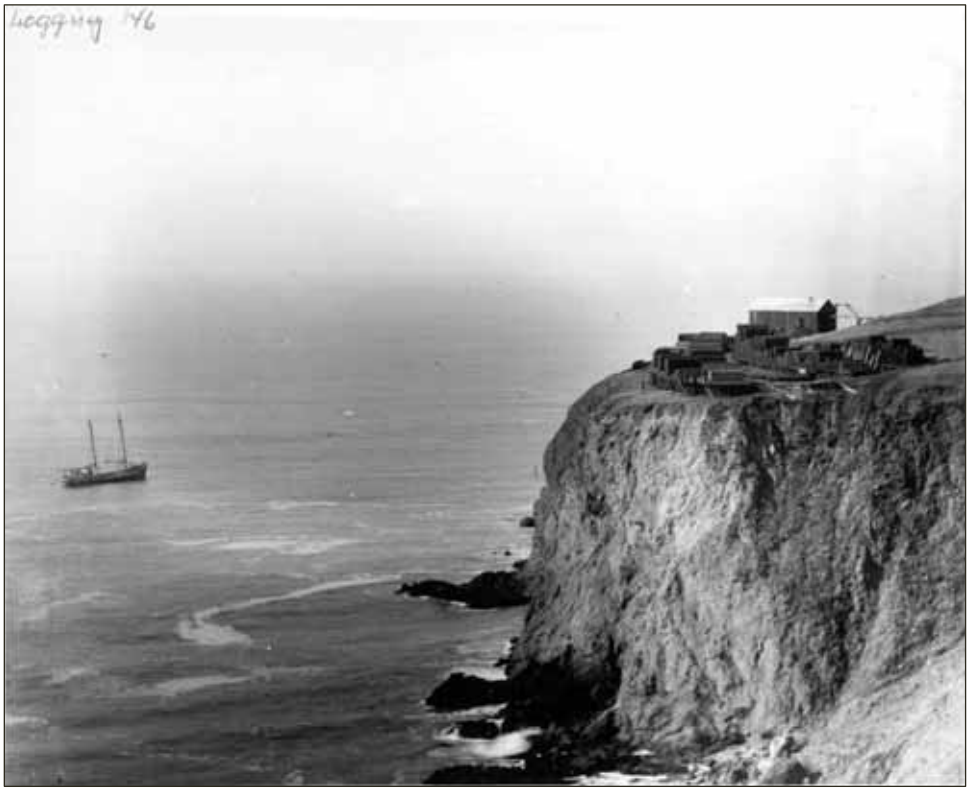
Figure 14. Map of Rule's Landing/Russian Gulch Landing as surveyed by Peterson in 1886.

The *Coast Pilot* in 1889 described that the schooner would be anchored about 1,800 feet from shore, in 11 feet of water, and held in place by mooring lines strung to three piles. Two mooring buoys were at the port, one in four fathoms under the western rocks in the passage, and another between the outer rocks on the east side of the passage. While most of

the historical records talk about the wire chute(s) at Russian Gulch, an 1892 photo showing the wreck of *Maggie Ross* shows two trough chutes in the background in addition to the wire chute on the top of the bluff (Davidson 1889:256).

In 1904, a sawmill was built in Jenner at the mouth of Jenner Gulch, and the next year work began on a standard gauge railroad connecting Jenner to Russian Gulch Landing. This facilitated the moving of lumber from the mill to the doghole port for shipment by using flat rail cars and locomotives. The Western Redwood Company's railroad was for its own use, first running to a landing in Jenner then to Rule's Landing and into Russian Gulch. At Russian Gulch, the edge of the sea cliff was leveled and used as a turning basin with a turntable for the locomotives (Douglass 1995:4). A narrow-gauge railroad was also built on Rule Ranch that ran into Jenner Gulch and Russian Gulch to help remove timber.

While a majority of the lumber from the Jenner area was shipped to market via the railroad, the Western Redwood Company experimented with shipping out material using vessels (Figure 15). They would access the Russian River by using a wharf, but the mouth frequently silted up thus closing the entrance. The company then switched to using wire chutes to bypass the problems with the Russian River (Cyvil 1909:579).



Source: Sonoma Heritage Collection, Sonoma County Library

Figure 15. Western Railroad Lumber Company storage yard and hoist house at Russian Gulch c. 1904.

An article in *Technical World Magazine* from 1909 described the wire chute at Russian Gulch Landing. The wire chute had a 1-inch cable running down from the cliff to a waiting vessel that was moored with two lines strung on the port side, one forward and one aft, and one amidships on the starboard. The mooring lines bisected and formed a triangle for stability. The process was simple to ferry the load from shore to ship. A loaded rail car is run onto the turntable in the chute's shed directly under the trolley. Two horizontal bars are placed under the bundle of lumber and secured on each side. The load is then lifted, and the brake released sending it down the bluff. It took only two minutes for the car to make a round trip, and a typical schooner loaded in two and a half days (Cyvil 1909:579–580).

The overharvesting of lumber caused the end of the doghole port at Russian Gulch Landing. The timber resources diminished to a point that sawmills and railroad lines were forced to close by the 1910s. Evidence of the Rule Ranch and the neighboring timber, ranching, and transportation route are still present including those at the doghole port.

Rule's Landing/Russian Gulch Landing operated roughly between 1875 and 1910. Over this 35-year period both schooners and steamers frequented the doghole port carrying loads of lumber back to San Francisco. A typical trip in 1893 was with the steamer *Albion* that carried 190 cords of bark and 60 cords (92,160 board feet) of wood to San Francisco in eight hours (*San Francisco Call* 10 February 1893). By comparison, in 1879 the schooner *Abraham Lincoln* carried 70 cords (107,520 board feet) of lumber to San Francisco in 72 hours (*San Francisco Call* 24 September 1879). A large number of vessels operated back and forth from Russian Gulch Landing carrying mainly posts, bark, railroad ties, and lumber. While other doghole ports shipped out non-lumber products the shipping intelligence from San Francisco papers does not indicate that this occurred at Rule's Landing/Russian Gulch Landing. It is likely that other materials were transported, but it could have been at a smaller scale and not in large enough quantities to be reported in newspapers.

The maritime traffic in the area resulted in three historically reported vessel losses off Russian Gulch (Table 5). A shipwreck up on the beach in the creek bed was located in 2017 which has been potentially identified during this project as *Maggie Ross*. A description of the site will be included in the survey results section that follows.

Table 5. Historically reported vessel losses at Russian Gulch Landing.

NAME	VESSEL TYPE	DATE LOST	LENGTH (FT)	WIDTH (FT)	BUILD DATE	LOCATED
Unknown	Sailing Vessel (Chinese?)	1850	-	-	-	-
D.C. Haskins	Schooner	24 August 1885	-	-	-	-
Maggie Ross	Steam Schooner	23 August 1892	115	32	1878	Possibly

Survey Results

Chute Findings

The 2016 and 2017 project used the work by Robert Douglass as a starting point for its survey. His report, *Rule's Landing: A Lumber Shipping Focus on the Sonoma Coast*, states that remains of the lumbering infrastructure, including railroad ties and timbers embedded in the ground next to the ties that run out to the east, can be found at the bluff immediately south

of Russian Gulch Beach. These timbers might be part of a railroad turntable. Farther east there are additional features including a row of posts with notches at the top that could be associated with a platform alongside the tracks. Above this area, 50 feet up the hillside, there is a frayed end of a large wire cable protruding from the ground pointing to the bluff's southwest corner. At the bluff's edge, there is a redwood timber and crosspiece within a bush. These are probably associated with the wire chute.

The project updated the existing DPR site record for Russian Gulch Landing to incorporate additional historic era doghole port features. There were five features recorded on top of the bluff and is consistent with the transportation network that once brought lumber onto the bluff and to the chute(s). The top of the landing covers an area 500 feet wide by 500 feet long. While the exact position of the chute(s) cannot be determined from the five features identified, the grade/roadbed for the railroad can be identified. It can be seen at the outer edge of the bluff following the curve of the land. Three features are linked to the foundation of a railroad bed or corduroy road. They consist of a flattened area with consistently spaced railroad ties or timbers, indicating the route of the track around the top of the landing. There is a series of railroad ties in a row covering a length of 17 feet, a 135-foot-long section of roadbed with four exposed timbers, and one fragment together in a ditch adjacent to the roadbed. While the timbers are not *in situ,* they lie next to or close to their original location. There is also a 40-foot-long stretch of roadbed with three *in situ* railroad ties.

The final two features are individual timbers of unknown origin and use and include a partially buried fragment measuring approximately 22 feet, 3 inches long by 12 feet wide. It has a cross piece and 6-inch pin. Next is a 2-foot, 1½-inch-long piece along with a post measuring 7 feet, ½ inches by 5 feet, ¾ inches. Additional features include a fragment of milled lumber and glass scatter, wood fragments, braided metal wire (consistent with the gauge used in wire chutes) protruding from the ground, iron ring embedded in the sandstone cliff, and an iron pin.

Additionally, in 2017, the project was joined by volunteer John Harreld who conducted a supplementary survey along the cliffs, adding to the information known about the site and subsequently added to the DPR 523 site record. He conducted a visual survey of the cliff and the beach on the opposite side of the cove where he located a substantial number of features in the form of iron hardware and cutouts in the rocks for the trough chute's legs. In total, 27 individual features were recorded which can be divided into four categories; (1) hardware features and holes where hardware once sat; (2) shallow flat cutouts; (3) larger deeper square cutouts with an orientation of 299–305 degrees; and (4) larger deeper square cutouts with an orientation of 281–287 degrees. The layout of the features seems to indicate the presence of two trough chutes due to the differing orientation of the square cutouts which served as the base of support for the chute's wooden legs and supporting structures.

The 1892 image of *Maggie Ross* wreck shows two trough chutes, the northern or inner one closest to the beach has three, possibly four sets of wooden legs supporting the trough as it came down the cliff side and connected with the swing apron. The features located by Harreld roughly line up with the location and orientation as depicted in the historic photograph. Six features are square cutouts or flat areas (orientation of 299–305 degrees) concentrated together showing where the inner chute might have been. The other five square cutouts (orientation of 281–287 degrees) together represent the location of the outer chute. The cutouts are not consistent in size and depth and vary from 6 to 42 inches wide with

depths of 4 to 40 inches. The most common size is around 17 inches wide. The chutes' supporting hardware or mooring components represent iron eyebolts, deteriorated iron fittings, or small holes indicating where additional hardware might have been located.

Maritime Heritage Resource Survey

Maggie Ross

In June 2017, John Harreld conducted a pre-project scouting mission to several of the doghole ports to gather information to help with planning logistics. During his trip to Russian Gulch Landing, he observed a 22-foot section of what is believed to be the shipwreck of the steam schooner *Maggie Ross* sitting upright in the freshwater creek that flows into the ocean. The changes in water level and its route exposed the hull fragment, which has been reportedly covered and uncovered over the years with the earliest known mention being that from Carlos Call during the 1970s (Call 1972:3–36). The vessel originally grounded on the beach on the opposite side of the large rock behind where it sits today, a distance of over 250 feet. The vessel must have broken up and a portion pushed over a large sand bank on the beach during a large storm or during a period of high water in the creek.

The steam schooner *Maggie Ross* measured 115 feet long by 32 feet wide by 10½ feet deep with a tonnage of 282. It was constructed by John Ross in 1878 in Pleasant Point, Oregon and was reportedly financed by "Santa Cruz interests." Prior to its fatal trip, it was engaged in the coastal trade transporting lumber to San Francisco from Coos Bay, Oregon and other California ports outside Sonoma including Eureka and Fort Bragg. One trip in 1890, it carried 280,000 feet of lumber from Coos Bay for the California Lumber Company. The vessel was plagued by bad luck. In September 1889, it was noted that the steamer had been laid up for "some weeks" on Mission Flats in San Francisco, due to claims filed against the steamer for repairs. She was a staunch seaworthy craft, but unfortunately her builder ran his condensing pipes beneath the bottom of the vessel up against the keel. They were consequently continually getting broken, causing delay and expense" (San Francisco *Daily Alta California* 20 September 1889:2). After getting the overdue repair bills settled by the owners, Heyman and Meyers, "the steamer will now ply between Bixby's Landing and this port" (San Francisco *Daily Alta California* 20 September 1889:2).

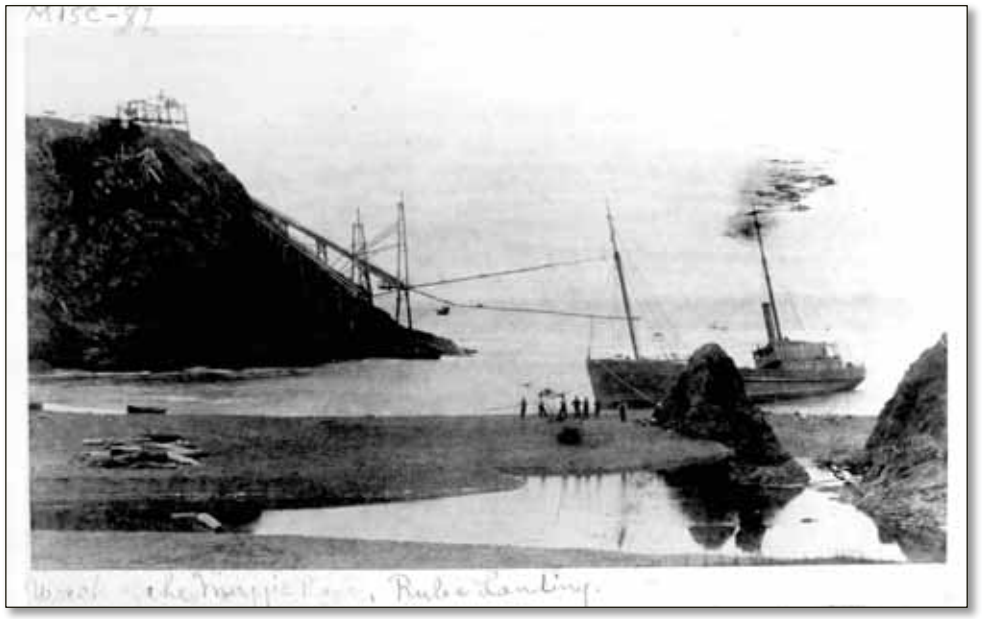
Two notable events toward the end of its career gave the steamer a bad name as a "hoodoo ship." The San Francisco *Call*'s account of the wreck of *Maggie Ross* at Russian Gulch in 1892 summarized a year of accidents and tragedy:

> On January 9, 1891, she arrived in this port in tow of the steamer Emily. She had struck on Coos bar in coming out, causing her to leak badly. The Emily picked her up 10 miles south of Lake Arago with fires out, the water in the hold being above them. The deck load had been thrown overboard to lighten her. The captain of the Emily put five men on board to assist and towed her to Port Orford with five feet of water in the hold. After 17 hours spent in repairs the Emily towed the disabled steamer down to San Francisco. There was a stiff salvage bill, of course, but this was the last of the *Maggie*'s misfortunes. On December 11 of the same year, 1891, while rounding Cape Arago on the way to this port the steamer was caught in a tremendous southwest gale which carried away all her sails and smokestack so that she

rolled helplessly for days in the trough of the sea. Both the boats were stove in and rendered unseaworthy. In trying to clear the deck lumber one of the houses fell, instantly killing the steward Arensen.

Another sea broke the legs of two of the seaman, and yet another washed the second mate overboard. The captain and crew patched up the boats as well as they could and put off, but, after consultation, the captain and engineer, with one of the crew, were put back on the wreck at their own request, preferring to take their chances there rather than in leaky and crowded boats in the heavy sea on an ironbound coast. The boats were picked up by the schooner *Annie Gee*, which landed the men at Marshfield, Or. The captain and engineer were taken off the steamer by the steamer *Willamette Valley*, which then towed her into Yaquina Bay. It was not till February 8 of the present year that the *Maggie Ross* left Yaquina Bay and came down to this port to resume her trips, the last of which is now recorded [*San Francisco Call* 24 August 1892:7].

On 22 August 1892, *Maggie Ross* departed San Francisco for Coos Bay, Oregon with a cargo of stores valued at $1,000. At the time it was owned by the Golden Gate Lumber Company and was insured for $23,000 by the Canton and Firemen's Fund of San Francisco. Under the command of Captain George Marshall, it struck a submerged rock offshore and started to fill with water. Marshall was forced to beach his steamer at Russian Gulch in hopes of saving it (Figure 16). An investigation found that the loss was caused by negligence of its officer in charge, W. F. Whitney, who was running the vessel in a different course than what the captain had instructed. He was suspended for 30 days for neglect of duty.



Source: Sonoma Heritage Collection, Sonoma County Library

Figure 16. The *Maggie Ross* wrecked on Russian Gulch Beach in 1892.

On 27 August 1892, a wrecking party left San Francisco onboard the steamer *Whitelaw* in hopes of salvaging *Maggie Ross*. They carried 200 empty casks in hopes of floating the vessel. If that was an impossible task, they hoped to recover the machinery and "everything of value" (*San Francisco Chronicle* 28 August 1892).

In early September, it was reported that the "wreck of the steamer *Maggie Ross* proves to not be worth raising and will be sold at auction just as it stands on the rocks at Russian Gulch (San Francisco Call, 6 September 1892:6). The damage was too great, and the steamer was declared a total loss. The *Whitelaw* returned to San Francisco with some of the wreckage. A few days later the newspapers announced the auction of the vessel together with its furniture, tackle, and apparel (*San Francisco Call* 2 September 1892; *San Francisco Chronicle* 8 September 1892).

A few days later, the Humboldt *Times* reported that the wreck had been bought at auction for $195 by Captain T. P. H. Whitelaw, and the wrecking steamer *Whitelaw*, which had previously tried to pull the wreck free, had been dispatched, towing the schooner *Catalina* to "wreck the steamer." *Catalina* was to be "placed alongside the wreck to take the machinery out of *Maggie Ross*, after which empty casks will be placed in the hull at low tide and decked over. When the tide rises the shell can be floated off" (Humboldt *Times* 13 September 1892). The salvagers succeeded in stripping the hulk, but left the hull wedged into the rocks and sand.

In June 2016, a team from Parks visited *Maggie Ross* site to assess the condition of the recently uncovered hull section. They conducted a visual survey and documented the site with photographs. Photos were processed using photogrammetry software and a scaled 3D model was produced. Additionally, a hand-held magnetometer survey around the structure was completed but no additional targets were identified.

A larger team returned to *Maggie Ross* site in August 2017 to better document the wooden hull section in hopes of determining whether it was from the bow or stern (Figure 17). Preliminary evidence supports the section originating from the bow, but a more thorough investigation is warranted.

It appears that the hull section is comprised of the stempost along with an apron on the inside and a cutwater on the outside. Inner and outer hull planking is present on both sides along with paired frames. The starboard side has five sets of frames while the port side has seven sets. The space between the frames is filled in with sand and rocks holding the entire structure in place. Iron fastenings are present including nails and drift bolts throughout the section. No sheathing or sacrificial planking was observed. The starboard side is 19 feet long and the port side measures 22 feet long. The distance between the two broken ends is 20 feet. The whole section tilts over on its port side with its starboard hull side pushed in. The starboard lies closest to the beach and is exposed to possible storm surge/waves. The starboard side is more exposed (3 feet in height) with several outer and inner hull planks visible while the port side is only exposed at the tops of the frames. The distance between the outer and inner hull planks measures 1 foot with the frames measuring 1 foot wide and 14 inches between frames.

After the hull documentation, the team conducted a hand-held magnetometer survey in the creek as well as up on the beach surrounding the large rock to locate a possible debris field (Figure 18). Several small indeterminate iron fragments were located but nothing diagnostic in nature were identified. If there are larger artifacts buried in the sand, they were

below the depth the metal detector could penetrate. A more systematic and comprehensive survey of the beach and intertidal zone in the future might find additional remains from *Maggie Ross*. While the steamer was salvaged, it is likely that wave action and storms broke up the vessel scattering materials throughout the area.

Source: NOAA ONMS and DPR

Figure 17. Documentation of the *Maggie Ross* potential bow fragment.

Source: NOAA ONMS and DPR

Figure 18. Handheld metal detector survey near the *Maggie Ross* hull section.

FORT ROSS LANDING (CA-SON-1454/H)

In August 2016 and 2017, archaeologists conducted a terrestrial and underwater survey of Fort Ross Cove and the adjacent land. Its land features and a portion of the underwater components lie within Fort Ross SHP and all the adjacent waters are within GFNMS. The doghole port sat on the northern portion of Fort Ross Cove on an elevated marine terrace east of the Northwest Cape. A historical chart from 1876 shows one trough chute extending to the south with several outbuildings and a network of roads. Previous archaeological surveys at Fort Ross concentrated mainly on the prehistoric elements but did note the presence of some historic features associated with the lumber trade. Fort Ross and the Commanders House were listed on the National Register as National Historic Landmarks in 1966 and 1970 respectively (NPS reference #660000239 and 70000150). The Sonoma Coast Doghole Ports Project added new information focused on the lumber chute era not previously known, both on land and underwater. The site record from 1984 was also updated and boundary was expanded to include newly identified features.

The survey divided the 2016 and 2017 findings into three parts, the first being the terrestrial and underwater components related to the doghole port's chutes, the second is 10 buildings associated with the Call Ranch period, and third the maritime heritage resources or shipwrecks and artifacts located in Fort Ross Cove. The first part, centered on Fort Ross' chute(s) and wharf, is comprised of two separate loci, one encompassing the lumber chute operations while the other includes the Call Ranch wharf. The area defining the lumber chute is comprised of 29 features including the following: hardware associated with the chute(s), cutouts in the rocks for the chute supports, remnants of structures, road features, and wooden fragments. The wharf area has the same types of elements. Underwater surveys located material possibly related to the lumber chutes along with other features directly associated with the shipwrecks resident in Fort Ross Cove. A magnetometer survey in 2017 provided targets for divers to subsequently investigate and help guide operations. The project also conducted monitoring dives on the previously documented shipwreck of the steamship *Pomona*.

Historical Background

Fort Ross Cove's northern shoreline was the epicenter of the doghole port and where the eventual lumber chute(s) and the short-lived stone wharf was located. A community developed around Fort Ross to support the lumber, ranching, and agricultural endeavors and contributed to the doghole port's success and longevity. With the sale of Fort Ross and the surrounding land to John Sutter by the Russian-American Company in 1841, the identity slowly changed. This was also affected by the fact that Mexican authorities did not recognize Sutter's claim of ownership and instead divided the property into two ranchos, the Bodega Rancho (between Bodega Bay and the Russian River) and Muniz Rancho (between the Russian River and Timber Cove, including Fort Ross). Manuel Torres was awarded the Muniz Rancho but sold it shortly after to William Otto Benitz, the land manager under Sutter. As maritime traffic and the exploitation of the redwood forests expanded, Fort Ross became the shipment center because of its large natural harbor and relatively developed infrastructure.

At first products, mainly agricultural in nature, were loaded on small boats and lightered out to waiting vessels. Benitz constructed a stone and wooden pier, down by the water's edge on the north side of the cove, to more easily ship out goods including lumber,

pilings, stone, potatoes, grain, eggs, butter, apples, ducks, pigeons, hogs, and deer or cow hides. They were sold throughout Sonoma County as well as to San Francisco and Sacramento merchants (California State Parks 2012:30).

Eventually Benitz acquired considerable wealth since his local products were in great demand during the Gold Rush. He sold his land in two parcels, the northern part to James W. Dixon, including Fort Ross, and the southern went to Charles Fairfax.

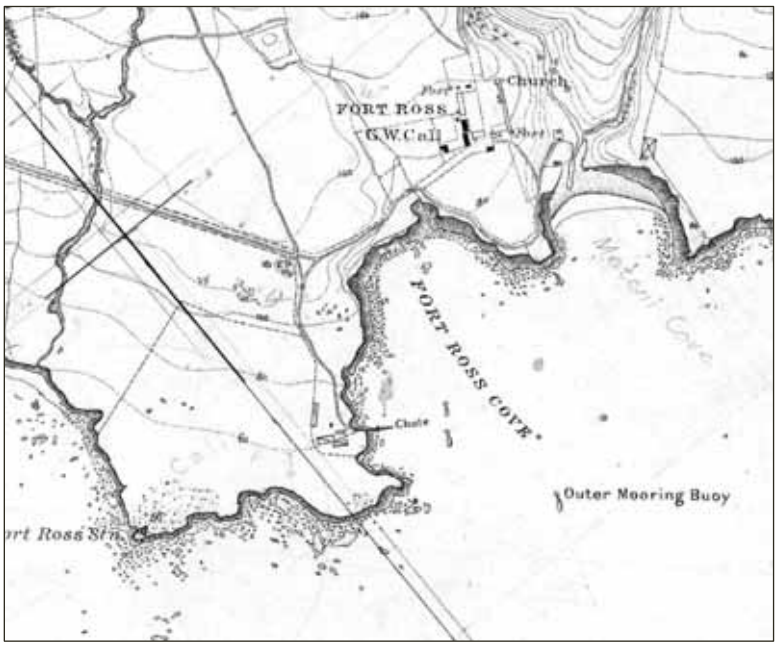
James Dixon, a mill operator from Marin, saw there was a need for a more efficient way to service the growing timber industry and constructed a trough chute at Fort Ross in 1867 (Foster 1981:2). He had already built a mill at Kolmer Gulch, just north of Fort Ross, and eventually moved it closer to Fort Ross Gulch and prospered with the new chute system. The chute's main A-frame or tower was made from two 18-x-18-inch timbers eight feet apart standing 75 feet tall with its feet set in cutouts made in the rocks just offshore (Figure 19). The towers were braced with wire rope connected back to hardware set in the cliffs. The chute's floor, where the timbers slid down, measured the typical three feet wide and 180 feet long with another 100 feet for the swing apron. The outer end of the chute leading down to sea was made of three sections, each 18 feet long supported by an upper boom. The inner section of the chute floor, which connected it to land, was 175 feet long and permitted wagons direct access to transfer their load. This was also heavily braced with wooden supports and wire rope (Tooker 1975:8–10).

Source: Fort Ross Conservancy

Figure 19. Fort Ross' trough chute, unknown date.

While lumber was lined up end by end and slid down the chute, the process of using the chute for other materials required a wheeled car fitted inside the chute bed. It measured six feet long with 6-inch wheels. The cart could be pulled up the chute by horses if materials needed to be offloaded or it used gravity, controlled by a rope wrapped around a post on land, to ride down. Dixon remained active at Fort Ross until selling his land less than 10 years later. In 1873, a 2,500-acre plot, including Fort Ross, went to George W. Call who intended to use it for ranching (Tooker 1975:8–10). Dixon's departure marks the end of lumber milling around Fort Ross as Call was more interested in other ventures.

The 1876 U.S. Coast Survey chart of Fort Ross shows the single trough chute that Call inherited (Figure 20). A lone main road dead ended at the chute out on the bluff along with four buildings used for storage and possible housing for the donkey engine. To help with securing the vessel under the chute and in the cove, three underwater moorings are depicted, two at the end of the chute with a single mooring in the outer waters.



Source: NOAA's Historic Map & Chart Collection

Figure 20. U.S. Coast Survey "T" sheet map 1876.

While the Coast Survey chart indicated the location of Call's trough chute, a more detailed and descriptive survey by Thomas Peterson in 1886 provides specifics not captured elsewhere. It shows a single trough chute with a vessel positioned underneath its end moored with six lines, some running to shore and others to offshore rocks. It mentions that the cove is well sheltered from the northwest and somewhat from westerly swells at the chute but there is no shelter from the southwest swells, the ones that result in disasters. In the summer, the anchorage could accommodate two vessels up to 75 tons while during the winter only a single smaller vessel would be safe. All buoys are marked with a black cross and numbered in red and the ringbolts on shore as mooring points are also marked and numbered in red. Buoy number 1 is a 1,700-pound anchor underwater with 15 fathoms of 1½-inch chain. It is

used to tie in the bow's port side. Buoy number 3 is held with an 880-pound anchor with 12 fathoms of 1¼-inch chain. It secures the stern's port quarter. The remaining four mooring points are on land along the cove's northern cliffs. Mooring point 4 is a 1¼-inch ringbolt in the rocky bluff with two parts of old ¾-inch chain used to hold the vessel's headline. Mooring point 5 is also a 1¼-inch ring bolt set in the rocks used for the bow's starboard quarter. Mooring point 6 is a 1¼-inch ringbolt also in the rocks for the stern's starboard breastline. Mooring 7 is a 1¼-inch ringbolt in a large boulder used for the starboard quarterline. Mooring 8 is a section of 1¼-inch chain around a rock pinnacle used for the stern line. The survey also included Buoy number 2, used for a vessel not under the chute but at anchor in the cove. It is held in place with a 1,200-pound anchor and 13 fathoms of 1¾-inch chain which has its end tied to a rock with a 3-inch ringbolt. There are 15 fathoms of 1½-inch chain leading between the anchor and the rock's ringbolt (Peterson 1886).

The 1889 edition of the *Coast Pilot* describes the anchorage at Fort Ross as a small broad cove open to the southwest swell and only partially protected from the northwest swell. There are three mooring buoys, two in the cove in 5½ and 8 fathoms and one farther out marking a submerged rock only visible at low tide. A chute projects out from the cliffs and vessels are moored with six lines to buoys and shore-based fastenings. The typical products loaded for San Francisco there were firewood, tanbark, cordwood, railroad ties, fence posts, dairy products, and farm produce. Approximately 60 cargoes are loaded annually. There was room for two vessels in the anchorage and in the winter vessels could secure to the southeast buoy and have lines running to shore to ride out a storm (Davidson 1889:256-257; Alley, Bowen & Co. 1880:378).

The purchase of Fort Ross by George W. Call provided a new feel for the property as he settled there with his Chilean wife, Mercedes Levia Call, and three young children. He enlarged and invigorated the surrounding community, turning it into one of the main shipping and mercantile centers of the northern California coast. Eventually there was a post office, hotel, blacksmith shop, saloon, storehouse, telegraph office, and meat market. As the stage route passed right by Fort Ross, the place became a destination and refuge for travelers and vacationers. While Call intended to focus on ranching, with his maritime background and previous knowledge of timber operations, he operated a highly successful doghole port and expanded on Benitz and Dixon's efforts. A major advantage was that Fort Ross had a wharf, a rarity and the only one in the county. He revamped the wharf and added a warehouse and derrick to support his shipping operations (Figure 21). The pier was later severely damaged during a windstorm in 1898. Call fixed the pier, but constant erosion made it hard to maintain. By 1930, it was abandoned.

George Call utilized the trough chute extensively for his business ventures. The main material shipped from Fort Ross when he purchased the property was "split" products such as tanbark, cordwood, and posts. He also used the chute to support the ranch (sheep, cattle, horses, and hogs). Dairy operations and butter were his cash crop as well as butchered and dressed veal, and live hogs (Tooker 1975:11). In the fall apples replaced butter as the valuable commodity shipped south.

Source: Fort Ross Conservancy

Figure 21. Stone and piling pier, originally constructed by Benitz.

The timber industry was not Call's primary interest other than cutting and shipping tanbark and firewood. Other neighboring timber operations and mills along with ranches as well as the larger community used his chute to import and export their materials. Horse and oxen pulled wagons to the chute and Call's facilities supported the shipment of goods as well as keeping lines of communication open to surrounding cities.

While most of the project's doghole ports have little historical documentation to assist the survey, Fort Ross is different and has several first-hand descriptions and records chronicling its history. This allows a unique look into the family, their operation of the chute(s), and development of their own fleet of vessels. Surviving records indicate that Sonoma County operated Fort Ross' chute as a franchise, and the Board of Supervisors had delegated authority, through legislation, to set rates for handling freight. While the exact rates for Fort Ross have not been uncovered, they are likely similar to other chutes and listed as follows: tanbark $1 per cord, cordwood $0.75 per cord, posts $1.00 per hundred, butter $0.25 a box (135 lbs.) and $0.55 a barrel (50 gal.), eggs $0.10 a box (30 or 36 dozen), wool $0.50 a bale, apples $0.10 a box, and merchandise $1.50 a ton.

The chute had enough vessels for contract hire to service the landing and chute, but Call saw an opportunity to use Fort Ross for weekly passenger service to Bodega Bay and San Francisco. In 1896, the gasoline-powered schooner *Etta B.* started the new venture which proved to be profitable. Call then ordered the gasoline schooner *La Chilena* (Figure 22) built and eventually a third and larger gasoline schooner, the *Mary C.* owned by a captain from

Source: Fort Ross Conservancy

Figure 22. The *La Chilena* in front of Fort Ross wire chute.

the Bodega Bay area. This service operated until the early 1920s. Although steamers primarily carried passengers, they managed to turn a profit because of the perishable items that could be brought to market in just a few hours (Tooker 1975:12).

The trough chute at Fort Ross blew down in 1898, during the same storm that damaged the pier, and George decided to replace it with a wire chute the next year (built by the St. Ores brothers of Gualala). It was put in the same location as the original trough chute on the bluff at the north end of Fort Ross Cove. The wooden frame measured 30 feet wide and approximately 20 feet high with two drums of wire rope inside (18 and 36 inches in diameter). One thousand feet of wire, made up of two sections, connected land to a waiting vessel. One end ran from the chute to a vessel, a run of 300 feet. A second section of wire was tied into a rock offshore and laid underwater connecting it to a mooring buoy. The vessel fished up to the outer wire and was ferried out to the inner wire and connected and tightened onboard with the ship's tackle. The loads were sent down the line on a traveler hung on the wire. Loose material was sent down in carts while larger items could be bundled together (Tooker 1975:13).

After loading all the stockpiled wood that had accumulated near the old trough chute location, it is reported that the entire wire chute assembly was moved across the cove to the front of the Call ranch house. The wire was run out to the rocks where the stone wharf had been located and the moorings were repositioned where the vessel would sit about 550 feet from shore. An indentation in the cliff was cut out to accommodate the wire, which is still visible today. This set up allowed the wire to be stored completely out of the water with both ends terminating on land (Tooker 1975:14).

The Call-era at Fort Ross was long-lived and well documented. In 1903, George sold the 2½ acres comprising the fort and its buildings to the California Historical Landmarks

League who eventually deeded it to the state in 1906. Call died in 1907, but his widow Mercedes continued to live at the ranch for another quarter century with sons, Carlos and George H., who managed the ranching interests and chute operations for many years.

In 1910, the Calls built a new wire chute in the original trough chute position to allow deeper drafted steam schooners and steamers to load at Fort Ross. The new wire chute had a donkey engine to pull the traveler back to land and could accommodate ships that were moored 300 feet out. By the 1920s, the maritime timber shipment business was being replaced by a system of roads between the coast and San Francisco leading the Calls to sell the chute to Ernest Saltsiz of Timber Cove who moved it there. At the same time, the weekly passenger service with the *Mary C.* ended (Tooker 1975:15).

The long period of maritime activity at Fort Ross and diversity of commerce is a microcosm of the entire Redwood Coast. The impact of the chutes and landing in Fort Ross Cove are evident by the success of Benitz, Dixon, and the Calls, whose enterprising ventures allowed them to amass considerable land and wealth derived from natural resources abundant in the area. For roughly 50 years, Fort Ross Cove served as one of the main, and safest, ports for shipment to the larger cities in the Bay Area. Ships used the doghole port to conduct business while supporting the community by providing transportation and connecting the isolated coast to the rest of California.

During the 1850s, when Fort Ross was under Benitz's control, vessel traffic mainly utilized the cove as an anchorage, fishing spot, as well as for loading agricultural products. An advertisement in the *Daily Alta* newspaper from San Francisco on 23 March 1853 included an advertisement for 600 bags of "Fort Ross potatoes" and 500 bags of "Fort Ross seed potatoes." It is not until the late 1860s to 1870s that accounts of wood, lumber (roughly 40,000 to 60,000 board feet per trip), shingles, bark, posts, and charcoal show up as materials originating from Fort Ross on schooners. This coincides with Dixon's purchase of the land, construction of a sawmill, and overall focus on timbering. A typical trip took around 20 hours from Fort Ross to San Francisco but many times it was much longer due to heavy weather or unfavorable wind. Dixon's dairy and farm supplemented the lumber operations as potatoes and butter is also listed as cargo on departing schooners.

Records from the Call family give us a feel for the traffic that used Fort Ross, during the 1870s through 1890s, a period of high activity at this lumber center and doghole port. George W. Call kept track of the vessels stopping at his landing and he noted that since January 1875, 94 individual schooners, steam schooners and steamers (the timeframe of his count is unknown) had visited the port. During that year, the annual shipment from Fort Ross was valued at $88,000 with cord wood bringing in the most at $32,000, then butter at $18,000, followed by lumber at $15,000, and posts at $8,600. The only other doghole port that shipped out a higher value during the same time was Stewart's Point/Fisherman's Bay with goods valued at $107,000. The only way to transport the material was by ship so the entire economic livelihood of the region was relying on the coastal fleet. In 1877, 86 vessels loaded at Fort Ross 619 cords of tanbark, 1,048 cords of firewood, 32,783 posts, and 4,300 cords of other split wood. In 1893, only 15 ships called at Fort Ross with 1,050 cords of material loaded (Tooker 1975:12–13; *Sonoma Democrat* 2 January 1875). Commerce at Fort Ross continued as the vessel types changed from sail to steam schooners and steamers which afforded more reliable and quicker trips.

Despite the doghole port and its wire chute shutting down in the 1920s Fort Ross Cove has continued to this day as a place for vessels to come to fish or anchor while traveling up and down the coast. When ships ran into trouble offshore, they often headed for Fort Ross seeking a safe place to land survivors because of its large sandy beach and access to roads. As a result, there are eight historically reported vessel losses off Fort Ross Cove ranging from schooners, to a steel hulled steamship, to more modern fishing vessels (Table 6). Evidence of three of these vessels have been located or potentially located, *Pomona*, *J. Eppinger*, and F/V *Riga* that were part of the 2016 and 2017 project. It is likely that material from additional shipwrecks may be located farther out in deeper water as the doghole ports project did not complete a magnetometer survey of the entire area. The maritime cultural landscape of Fort Ross Cove exhibits evidence of several successful Sonoma County businesses that utilized all the available resources to build and adapt to the changing economic climate, beginning in the mid-nineteenth century up into the early twentieth century. Today, the area is still treasured, not for the extraction of its natural resources, but for the preservation and recreational pursuits centered on its maritime heritage and the natural beauty it still possesses.

Table 6. Historically reported vessel losses at Fort Ross Landing.

Name	Vessel Type	Date Lost	Length (ft)	Width (ft)	Build Date	Located
J. Eppinger	Schooner	2 January 1901	89	26.2	1887	Possibly
John Stitson	-	October 1878	-	-	-	-
Mary Deleo	Schooner	1892? 1916?	68	22.5	1869	-
Pomona	Screw Steamship	17 March 1908	225	33.5	1888	Yes
Regia	Fishing Vessel	1974	45	-	-	-
Riga	Fishing Vessel	11 May 1932	38.8	13.5	1931	Possibly
Sacramento	Schooner	1844	-	-	-	-

Survey Results

The Sonoma Doghole Ports Project conducted a survey of the land and underwater components linked to the use of Fort Ross as a doghole port in the nineteenth and early twentieth century. Over the 50-year lifespan of the landing located at Fort Ross Cove, it supported at least one trough chute and several wire chutes that ferried materials from shore to vessels headed for larger markets. The project updated the existing DPR site record for Fort Ross to incorporate the historic era doghole port's hardware, structural features, and maritime landscape attributes. Fort Ross Landing is a complex site. Therefore the survey divided the results into three parts for this report based on their location and context, the first being the terrestrial and underwater components related to the doghole port's chutes/wharf out on the cove's northern edge, the second is 10 buildings associated with the Call ranch period (nine next to Fort Ross proper and one across US Highway 1 [US 1]), and third are maritime heritage resources or shipwrecks and artifacts located in Fort Ross Cove including the steamship *Pomona*.

Chute Findings

The first group of remnants was centered on Fort Ross' chute(s) and is comprised of two separate loci on the northern shoreline encompassing the lumber chute operations and the other centered on the Call wharf. The chute area includes 29 features: hardware associated with the chute(s), cutouts in the rocks for the chute supports, traces of structures, road features, and wooden fragments. The wharf area has essentially the same types of features.

The main area of doghole port activity occurred on the bluff. The features' characteristics coincide with historical evidence of trough and wire chutes, a wharf, and associated roadbeds and structures. Project archaeologists conducted a non-disturbance comprehensive survey to document the features to better understand the layout and status of historical resources. The manipulation of the landscape by Dixon, Benitz, and Call to utilize the land to support the chutes' and the pier's operations is clear by the remnants present today and they also support what was surveyed by the Coast Survey and Peterson in the nineteenth century. Access to the bluff from Call Ranch and earlier homesites was through a single main road with additional smaller roads connecting with the chute and wharf site. There is a 600-foot section of roadbed and a 1,000-foot section of roadbed that terminated at the chute on the cove's northern edge. This permitted horse and oxen driven carts to move materials down to the water for storage prior to shipping. An additional roadbed, measuring 900 feet long, travels from the Call wharf up to Call Ranch. These three roadbeds can be seen on aerial imagery and are used as walking paths for visitors today.

At the chute's land side there were several buildings (three larger and one smaller) as depicted on the 1876 survey. Features are located on ground that has been flattened and likely indicates the footprint of a structure or storage area, most likely a warehouse to store supplies or a place to store material waiting to be loaded. A scatter of milled wood, timbers, and broken fragments measuring 310 feet long by 280 feet wide are located northwest of the structure flat and may represent a storage or staging area. Two rock retaining walls were identified and recorded which likely provides stability to the cliff face, one measuring 4 feet long while the second measuring 95 feet long.

A cluster of 13 features were found together on a rocky outcropping and on offshore rocks indicating the location of the doghole port's chute(s) and mooring system (Figure 23). Features include a variety of iron artifacts such as eyebolts, ring bolts, and pins as well as wire rope. The chute itself needed hardware to tie it back to shore and the vessels under the chute also needed similar hardware to hold them in place. With the presence of at least one trough chute and two wire chutes known to occupy the same area over time, it is not clear which individual features are connected to which chute or mooring setup. The iron hardware combined with what appeared to be a clearing for a platform at the cliff edge above the fastenings does confirm where the trough chute led down off the edge to the water. Additionally, there are square cutouts or rebates in the rocks just offshore. These were used for the trough chute's support legs and provides more information on the structure's orientation. The wire chutes had less infrastructure to support them and it is likely that vessels utilized some of the same underwater and shore based mooring points as with the earlier trough chute setup.

Source: NOAA ONMS and DPR

Figure 23. Project archaeologists documenting chute remains.

The Call pier area, located at the water's edge and directly below the bluff, was northeast of the Fort Ross chute location. The pier's construction predates the Call period at Fort Ross, but Call fortified and enlarged the pier and added a warehouse and derrick to support his line of steam schooners. They used it for loading and offloading passengers and materials. Storms and erosion have moved away the rocks that were stacked up to form the pier's base, so today there is a gap between land and the rock outcroppings. The 500-foot long swath includes additional hardware or miscellaneous metal. Evidence of the wooden platform that sat on top of the piled boulders was noted and includes a wooden beam protruding from the cliff face, in line with the orientation of the wharf complex. This area also includes a square cutout in the rock for one of the wharf's legs. The entire operation was serviced by a road leading down from the top of the bluff, which is the same path used today, ending at stairs that lead to the water's edge.

The Call pier area also contains several hardware components of note such as a long rod with a cable tightening component on the end and a pin with a bent piece of metal around it forming an opening at the other end along with two additional pins embedded in rock. The Peterson 1886 survey shows a mooring attachment in the rocks near this location, but additional fixtures were not identified in this location. Lastly, there are several bent rods near the intertidal zone northeast of the main wharf location, but it is unclear whether they are modern or associated with the historic pier.

In 2016, project archaeologists conducted five dives within Fort Ross Cove to locate remains linked to the doghole port's moorings or chute operations (Figure 24). Dive locations were based on the georectified 1876 T-sheet. The targets were the trough chute end, both inner mooring anchors, and the pier. Divers also kept an eye out for material related to the many shipwrecks that occurred in the cove.

Source: NOAA ONMS and DPR

Figure 24. Dives in Fort Ross Cove conducted from the R/V *Fulmar*.

A dive under the chute end, in 35 feet of water, located no artifacts. Divers investigating the inner or northern mooring location as depicted on the Fort Ross Cove "T" sheet, in 40 feet of water, did not find a mooring anchor. Instead they found a diesel engine and shipwreck material suspected to be from the F/V *Riga*. Divers investigating the outer or southern mooring location, as depicted on the Fort Ross Cove "T" sheet, in 50 feet of water, discovered a small, iron Admiralty-style anchor measuring approximately 4 feet long. It was lying flat on the seafloor and lacked a stock. Initially thought to be a mooring anchor, insurance maps found in the Huntington Library revealed that the anchors used at Fort Ross Cove were much larger, averaging 900 to 1,200 pounds. Based on its location and size it is more likely that the anchor is from the shipwreck of the schooner *J. Eppinger* that wrecked near the wharf in 1901. The final two dives at the wharf did not locate any artifacts.

Fort Ross Cove Magnetometer Survey – 2017

In anticipation of 2017 fieldwork, project archaeologists evaluated their 2016 project underwater search methodology to determine ways to improve its efficacy. Previous research in Fort Ross Cove and anecdotal information from local residents suggested that there were

more anchors to be found, but the precise locations for these submerged doghole port artifacts was not available. Additionally, a diver named Carl Drye, who spent time exploring Fort Ross Cove in the 1980s, contacted the research team with information about an iron cannon he encountered there underwater. Mr. Drye described the cannon's location as being off the southern facing bluff at the end of the road projecting from Fort Ross' southern entrance gate (pers. comm.). As the project sought to search a larger area to find these artifacts, the previous year's diver search methodology was felt to be ineffective.

To locate the more widely spread doghole port moorings reported by others, project archaeologist Matthew Lawrence planned a magnetometer survey to investigate the anchorage area under the bluff at the west side of Fort Ross Cove where the pier and chutes were located. In hopes of finding the cannon reported by Mr. Drye, another survey area was plotted to encompass the area adjacent to the fort. Survey lines in both areas were spaced at 30-foot intervals. The project team planned to utilize a Marine Magnetics SeaSPY magnetometer towed at the surface by an 18-foot rigid hull inflatable boat (RHIB) operated by Parks' Sierra District. Magnetometer data acquisition and survey navigation were to be accomplished with Hypack Max survey software running on a rugged Dell PC laptop. A Trimble DSM232 DGPS receiver would provide positioning information. All equipment was powered with a deep-cycle 12VDC battery.

Survey operations were planned to start in Fort Ross Cove on 13 August and continue through 14 August 2017; however, the project team experienced difficulties launching its RHIB. Boat launches on Sonoma County's rugged coast are few and far between and utilize the doghole ports for shelter. Even the most protected launching locations at Ocean Cove and Timber Cove were highly dependent upon tidal fluctuation to provide enough water to float a small, trailered boat over shore-side rocks. Ultimately, the team found it impractical to launch the 18-foot RHIB without risking serious damage to the vessel. As an alternative, Parks' Sonoma District loaned the project a 12-foot inflatable rescue boat (IRB) and tiller controlled outboard that drew less water and weighed considerably less.

Rather than being dependent upon the established boat launches some distance away from the study area, the smaller inflatable made it possible to launch from the sandy beach in Fort Ross Cove. With help from many of the project team members, the small boat was hauled to the water's edge. Packing the suite of survey equipment into the smaller vessel proved challenging, but with some equipment re-organization, Matthew Lawrence and Ross Carey, California State Parks lifeguard on loan from the Monterey District, began surveying the anchorage and cannon survey areas in Fort Ross Cove. Barely submerged wash rocks around the cove's perimeter made for challenging navigation of the planned survey lines. By the end of the day, the magnetometer had revealed over a dozen magnetic anomalies in the cove.

Survey operations were planned to investigate an area off Windermere Point, the suspected location of the *Windermere*, on 15 August, 2016. That morning, the team again launched the small IRB at the sandy beach and motored beyond the entrance of Fort Ross Cove but aborted the trip due to unsafe sea and weather conditions. With the equipment and personnel mobilized, the survey team expanded the Fort Ross Cove investigations with the addition of two new survey areas that extended into the cove's mouth and covered the entrance to the sandy beach. Like the previous day, these areas were then investigated with 30-foot line spacing and the magnetometer floating at the surface to prevent its contact with submerged rocks and entanglement in kelp. Total magnetic field readings were recorded at a

sample rate of four times per second. Survey speeds averaged 4 knots (2.06 m/sec) resulting in readings taken every two feet.

Magnetic detections in the center of the cove were significant with variations from the background and tens of meters in duration. Based on the known position of *Pomona*, it is likely that the magnetometer recorded anomalies from the vessel's widely scattered remains. An intriguing series of anomalies detected with similar duration and intensity on several lines ran from the west end of the sandy beach out into the cove. In total, the survey investigated an area measuring 0.08 square miles in size, navigating 15 linear miles.

Following survey operations Matthew Lawrence reviewed the magnetometer data with Hypack Max's magnetometer editing extension. He identified anomalies on each survey line and created a table of anomaly locations. This process identified 50 raw line anomalies with geographic locations that were then imported into the Sonoma Doghole Ports GIS for further analysis and grouping. Fifteen (15) anomalies were selected for diver investigation based on the anomaly's significant deviation from background magnetic field intensity and a duration of no more than 65 feet. These characteristics were expected to reflect doghole port features and not *Pomona* remains.

After the completion of the fieldwork activities, Matthew Lawrence analyzed the magnetometer data utilizing the Marine Magnetic Survey Modeling and Visualization ArcGIS Toolkit developed by the National Park Service (NPS) and the Bureau of Ocean Energy Management (BOEM). Identifying anomalies during data acquisition and through analysis of the raw magnetic profiles as conducted prior to diver ground-truthing during this project resulted in quick follow up, but it did not provide the best geographic positions of the anomalies' source material. Standard magnetic survey data analysis calls for contouring the magnetic survey data to provide better positioning information and a more accurate characterization of the anomaly. The NPS/BOEM toolkit goes one step better. The magnetic survey data analysis utilizes algorithms to create color-shaded representations of the data that highlight rapid changes in magnetic field data from one reading to the next. The developers hypothesize that these rapid changes are the easiest way to identify magnetic anomalies resulting from cultural material amidst changes in the background magnetic field intensity from diurnal variation and large-scale geologic influences.

Diver investigations during the 2016 and 2017 projects revealed the source of several magnetic anomalies depicted by the gradient data. Other anomalies were not revealed by ground-truthing or were not investigated by divers. Gradient anomalies that were not investigated or were not found to have a readily located source represent locations deserving of follow-up diver surveys to determine their source.

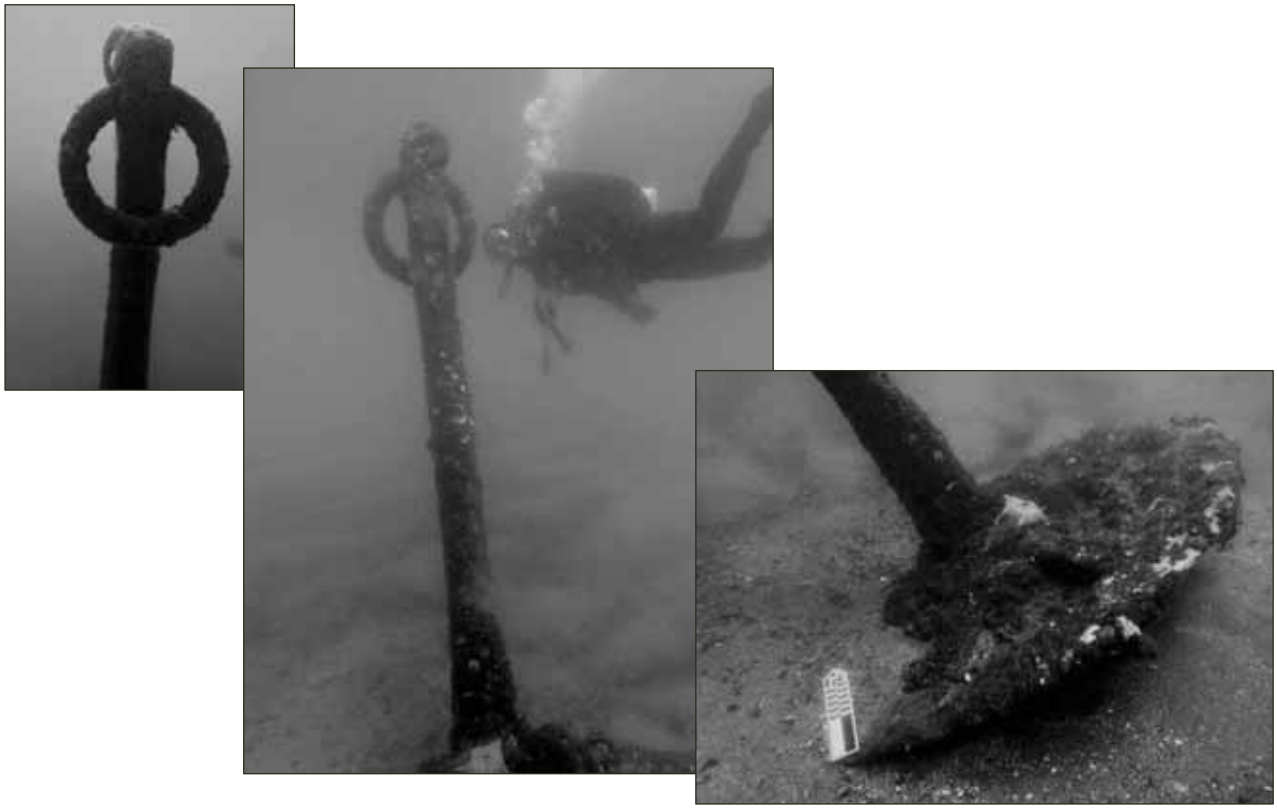
Following the magnetic survey, the team conducted dives in Fort Ross Cove at eight magnetic anomaly locations (Figure 25). Two artifacts were discovered, a small segment of stud link chain and a large iron mushroom-style anchor. Both are possibly associated with the lumber chute operations at the doghole port.

Source: NOAA ONMS and DPR

Figure 25. Dive operations launched off Fort Ross Cove.

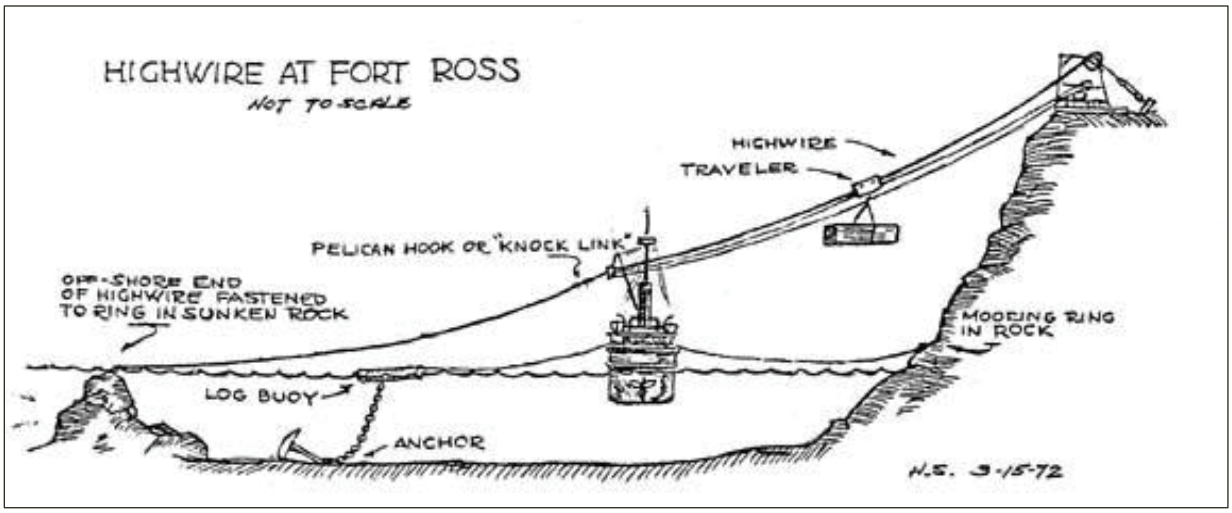
The stud link chain was located in the middle of Fort Ross Cove, 400 feet from shore, south of the sandy beach. It is suspected to be part of the port's underwater mooring system. Each mooring included an anchor, an appropriate length of chain given water depth and scope needed, and a wooden log as a surface buoy. The Peterson survey in 1886 depicts three moorings in the vicinity of the chain segment. The divers did not observe anything attached to the chain, just an isolated fragment.

The mushroom anchor (Figure 26) was located 600 feet from shore, in the northern portion of Fort Ross Cove. It stood nearly upright on the seafloor. Its shank measured 5 inches in diameter and was 6.7 feet long. Its circular base measured 4 feet wide. The anchor discovered in 2017 is unusual as it appeared to have started its life as an older folding stock anchor. This is evidenced by an empty hole in its stock and large 1.3-foot-wide ring. It appeared to the divers that the mushroom base was added at a later time. Carlos Call, the son of George W. Call, recalled during a 1972 interview that there was a 4,500-pound mushroom anchor in Fort Ross Cove used as a mooring anchor. The *Sea Letter* from August 1972 included a diagram of a wire chute in Fort Ross Cove showing a similar style mushroom anchor used as a mooring anchor (Figure 27).



Source: NOAA ONMS and DPR

Figure 26. Mushroom style anchor located in 2017.



Source: San Francisco Maritime Museum, August 1972:3

Figure 27. Diagram of a wire chute in Fort Ross Cove with a mushroom anchor mooring similar to what the project documented.

Call Ranch Survey

The 2017 fieldwork included documentation of the Call ranch buildings present in Fort Ross SHP. In total there are seven buildings, two buildings ruins, and several ranch elements that contribute to the landscape of the doghole port. The team was joined by Call descendant Steven Pearce who provided valuable knowledge about the resources and background history of their use. The buildings, structures, and features are in varying states of de-stabilization and preservation. In 1903, George W. Call sold 4.45 acres of his land, including Fort Ross and associated buildings, to the Historical Landmarks League. They, in turn, deeded the property to the predecessor of California State Parks in 1906. Call passed away in 1907 and sons, Carlos and George H. continued to operate the ranch until the 1920s. Carlos lived on the property until his death in 1972. In 1978, the Call family sold an additional 1,261.5 acres to State Parks. In 1979, the Louisiana Pacific Company bought the last part of the Call ranch. In the 1990s, California State Parks acquired 2,157 acres from the Louisiana Pacific Company, uniting the original Call property. The Call Family House is open occasionally for tours while the majority of ranch buildings have been repurposed and currently used by state park staff for maintenance and storage. The list of resources is included below, along with notes on their dimensions and use. Information obtained from the Call era buildings and structures speaks to the evolution of land use through lumbering, ranching, and agricultural pursuits at Fort Ross.

As a final note, one resource of particular importance to the doghole port activities of Fort Ross in San Francisco, may offer another means by which to interpret the story. The Fort Ross yawl boat, rigged and used with the chute after 1900, is now in the small craft collection of San Francisco Maritime National Historical Park. Yawls were small craft carried on ships and schooners. Built by San Francisco boatbuilder George Kneass around 1900 for the Call family, the yawl was their doghole's general purpose boat. Slung by lines hooked into ringbolts at the bow and stern, the yawl allowed the Calls and their workers to ride down to the water. There, the yawl was used to help secure vessels mooring at the chute,

as well as to run out to boats anchored offshore. San Francisco Maritime National Historical Park Historian, Stephen Canright, describes the Fort Ross yawl as:

> … carvel-built, with a near-plumb stempost and wide wineglass transom stern with minimal rake. She is of medium scantlings; heavy enough to take a beating, yet light enough to row well. She has two thwarts, two rowing stations, and a generous sternsheets of redwood plank. The boat is framed in white oak and planked in Port Orford cedar, and is iron nail fastened. She is 13' in length overall and 5' 2" in beam; a length to beam ration of about 2.5 to 1. She is, in other words, a chunky little thing, but so nicely shaped that she would not be a chore to pull. She would certainly carry a load. There is nothing fancy about her. Her iron fastenings speak to her lack of pretension, but her lines and the neatness of her build insist on her pedigree [Canright 2018].

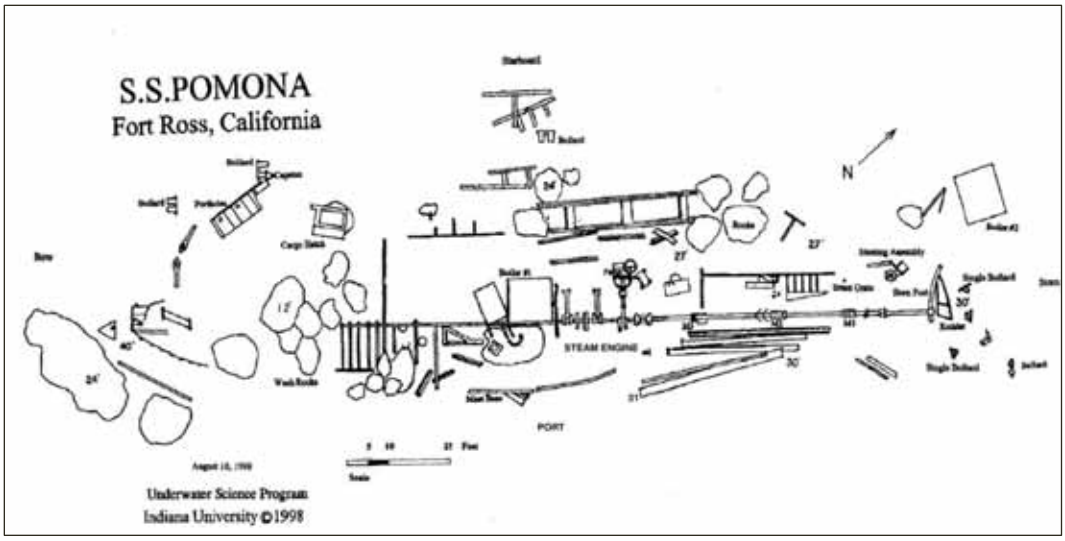
Maritime Heritage Resource Surveys

Pomona

In 2016 and 2017, archaeologists conducted monitoring dives on the steamship *Pomona* located in Fort Ross Cove. On the evening of 17 March 1908, the 225-foot-long *Pomona* was steaming northward from San Francisco to Eureka on a routine voyage with 147 passengers, U.S. Mail, and 300 tons of general cargo. Due to the heavy seas and strong northwest wind, Captain Charles Swansen hugged the coast closer than normal to get protection from the land. The ship struck Monterey Rock just south of Fort Ross, so named for the steamer *Monterey* that had collided and sank on the rock previously, and began taking on water. The previous wreck of *Monterey* and the naming of the rock for the accident is another important part of the maritime cultural landscape, reflecting in its name a reminder of an event, a ship and in that, an instructive reminder to other mariners. That reminder notwithstanding, the nature of the coast and the conditions of working in it did not prevent the loss of *Pomona*.

Swansen, tried to run her aground in Fort Ross Cove, but impacted the fringing wash rocks where the ship foundered. There was no loss of life, and all onboard were ferried ashore and hiked up the road to the ranch of George Call, where the women and children were taken in and made comfortable by the Call family with milk and coffee. The baggage, cargo, and mail, insured at $15,000, were lost in the wreck, which the San Francisco newspapers termed "unnecessary and totally avoidable." Over the subsequent months, salvage efforts by Thomas Whitelaw of San Francisco's Coast Wrecking Company removed much of its steel hull and machinery to sell for scrap along with smaller items like glassware, and china. Storms and the dynamiting of the wreck to clear it as a navigational hazard accelerated the site formation process and flattened the vessel's remains.

In 1981, a team of California State Parks and National Park Service divers, including one of the authors of this report (Delgado), surveyed *Pomona* for the first time. Their efforts continued throughout the 1980s and 1990s and the site was designated as CA-SON-1704H. Beginning in 1998, Indiana University conducted several projects to map and document the steamship, which also included marking the site with a surface buoy in 1999. The team recorded the steamship's remains and created a site map to help interpret the site for divers (Figure 28). In 1999, *Pomona* was the subject of a master's thesis at San Jose State University (Simoulin 1999) and in 2008 the property was listed on the National Register.



Source: Adapted from Indiana University 1998

Figure 28. *Pomona* site plan highlighting select wreck features.

Pomona lies with its bow broken over the wash rock where she ran aground. The disarticulated bow section includes her stempost, hull structure, hawse holes and a hatch cover. Beyond the wash rock, the hull retains an outline of its original shape, as the decking slopes downward from the shallow rock to the mid-ship area. The starboard Scotch marine boiler remains in its approximate original location, while the port boiler has moved past the stern. Large I-beams and sections of the masts lie strewn about the site as well as disarticulated debris and smaller artifacts.

In 2016, archaeologists conducted three dives on *Pomona* and in 2017 there was an additional dive conducted. The goals were to assess the condition and gather imagery to help with outreach efforts by California State Parks and GFNMS. Overall, the site appears in good shape and has not changed dramatically since the last efforts to document the site in the 1990s. The only area that has degraded is the boilers and divers observed active areas of rust indicating the site is being impacted through natural and/or anthropogenic forces. The amount of boiler plating has decreased allowing a clearer view of its interior components including the firebox and fire tubes. The drive shaft, associated piping/valves, disarticulated hull plating and frames show no signs of change.

The single dive made on *Pomona* in 2017 tested the feasibility of a future project to create a 3D model of the entire shipwreck using photogrammetry. The divers gathered imagery and successfully compiled a 3D scaled model of the steamship's drive shaft. This effort demonstrated that the site conditions were favorable enough for additional photogrammetry projects to update the site map, establish a baseline for site monitoring, and capture additional details not found on the site map created with traditional recording methods.

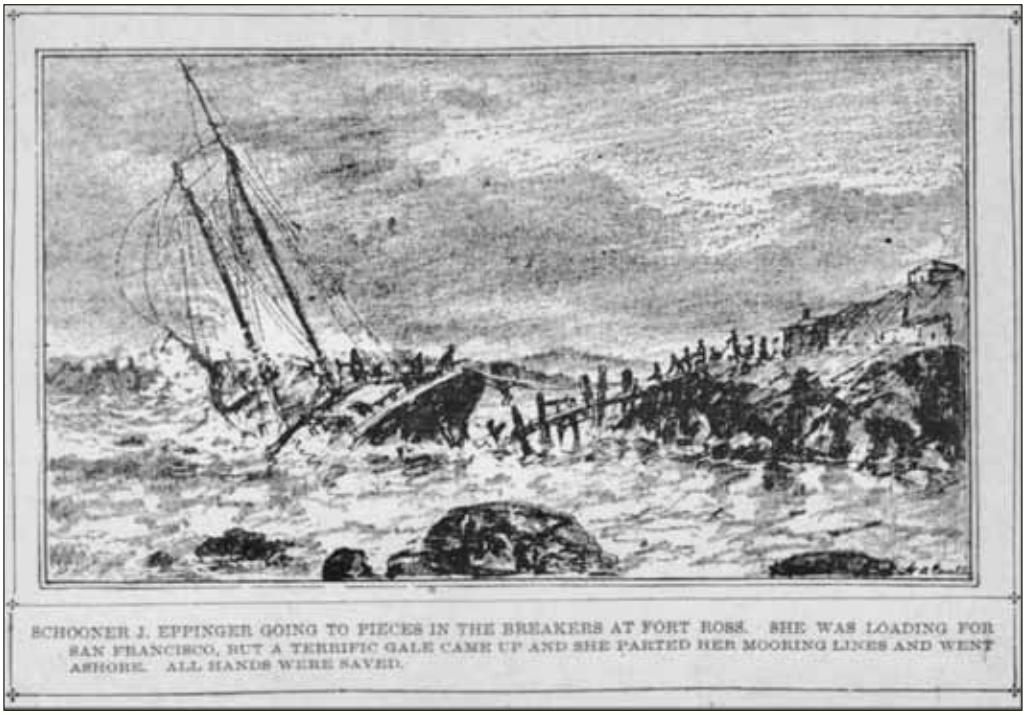
J. Eppinger

In 2016, a single small admiralty style anchor was located in Fort Ross Cove 450 feet from shore, near the chute locations and 520 feet from the Call wharf. The anchor measured approximately 4 feet long and lay flat on the seafloor missing its stock. Initially thought to

be a mooring anchor, research revealed it to be much smaller than the typical ones mentioned in historical documents. These anchors were much larger averaging 900 to 1,200 pounds. The research team developed another theory. The anchor may have come from the schooner *J. Eppinger* that wrecked near the wharf in 1901.

The 89-foot long, 26-foot wide, two-masted wooden-hulled schooner *J. Eppinger* was built in 1887 by Charles G. White, of San Francisco, and launched on 28 January 1888. Its official number was 76710 and it was engaged in the lumber trade in the late 1880s and the pelagic sealing trade in the North Pacific Ocean, Bearing Sea, and Japanese waters during the 1890s. During the last few years of its career, it was owned by coastal ranchers and shippers H.A. Richardson & Co. of Stewart's Point and engaged in the Redwood Coast lumber trade visiting several doghole ports.

The *J. Eppinger* left San Francisco on 30 December 1901 and arrived at Fort Ross to load lumber just in time to be caught in the first winter gale of the year. It was carrying neither cargo nor passengers. Since there was no good place to anchor in Fort Ross Cove, the schooner picked up one of the lumber chute's moorings. A gale developed offshore, and the schooner was unable to head out to sea to ride out the storm. Seas began to break over *J. Eppinger* and it was doomed. Carlos A. Call, son of proprietor George Call of the Fort Ross ranch, stripped and swam through the surf, a line tied around his waist. He grabbed a loose line from the schooner, and was then pulled back to shore while holding it. Young Call's heroism saved the lives of the otherwise doomed crew. The line was fastened to the mainmast and run up the bluff, and one by one, Capt. Jensen and his five-man crew were pulled off the disintegrating schooner. The schooner parted its mooring lines on 2 January 1901 and wrecked, taking out the Call Wharf (Figure 29; *San Francisco Call* 4 January 1901).



Source: *San Francisco Call* 4 January 1901

Figure 29. Illustration of the *J. Eppinger* wrecking.

The wrecking event caused the schooner to be broken up on the rocks as it was pushed ashore. Dives around the Call wharf in 2016 did not find any wreckage, but the rocky bottom might have obscured its now fragmentary remains. Divers recovered an anchor in the 1960s from near the landing/wharf of similar size and design to the one located by this project. It is attributed to *J. Eppinger*. The anchor sat on display at Fort Ross until at least 1984, but the whereabouts of that anchor today are unknown (Rudy pers. comm. 2016).

The events surrounding *J. Eppinger*'s dramatic sinking and the dynamic environment in Fort Ross Cove might never conclusively prove if the anchor located in 2016 is from *J. Eppinger* or not. Since the anchor recovered in the 1960s and the recently documented anchor seem to match in dimensions it is likely they are associated with each other and with *J. Eppinger*. While the rest of the schooner is lost to history, the anchor on the seafloor serves to remind us of a vessel and an event that is part of the Redwood Coast's maritime cultural landscape.

F/V Riga

Dives at the inner or northern mooring location, in 40 feet of water, located a four-cylinder marine Diesel engine possibly from F/V *Riga*. The engine measured 10 feet, 2 inches long with its flywheel 2 feet, 3 inches in diameter. The propeller shaft, which extends out several feet, measured 4 inches wide. Surrounding the engine is unidentified metal debris, most likely associated with the origin of the engine.

The 45-foot-long wooden-hulled fishing vessel (F/V) *Riga* was constructed in 1931 by Menotti & Pasquinucci of Sausalito for J. Leepen of San Francisco. The Pasquinucci family operated the Sausalito Boat Building Works and is reported to have launched more than 700 vessels during their 60-year career, ranging from fishing vessels to pleasure sailing craft. *Riga* was built as a trolling boat for the coastal waters off northern California with a 75 horsepower Cummins diesel engine (*Pacific Fisherman's* volume 31:34). The *Riga*'s name is often spelled differently throughout the historical documents with name variations including *Requa* and *Regia.* The fishing vessel's official number was 230590 and is listed with its correct name spelling in the 1931 edition of the *Merchant Vessels of the United States*.

On 11 May 1932, F/V *Riga* caught fire and sank in Fort Ross Cove. It was fishing for halibut when it needed to put into the cove to work on its engine. The account of its sinking stated that a spark from its engine back firing might have started the fire. The vessel burned for an hour before finally sinking and was declared a total loss. Its owner and captain at the time, Neil Burton, escaped into a small boat with its crew and landed onshore safely (*Petaluma Argus-Courier* 14 May 1932).

Sport divers back in the 1950s or 1960s report finding *Riga*'s anchor and chain but it is unclear if they actually found the vessel or material from the doghole port's moorings. Additional documentation of the engine and associated debris will provide more information and more conclusively prove if the shipwreck of the fishing vessel *Riga* has been located.

TIMBER COVE LANDING (CA-SON-2682H)

In August 2016, archaeologists conducted a survey of the land surrounding Timber Cove to document the features associated with its role as a doghole port. The land is privately owned by the Timber Cove [Resort] with the adjacent waters lying within GFNMS. The

doghole port's chutes sat on the northern portion of Timber Cove on an elevated marine terrace west of a small rocky beach used today by Timber Cove Boat Landing and Campground. A historical chart from 1876 shows one trough chute extending to the southeast with several outbuildings to the west. A network of roads connected it to the Timber Cove Settlement and neighboring mills and communities such as Fort Ross to the south. This is the first known archaeological survey of the area. The Sonoma Coast Doghole Ports Project adds new information on the historic use of the area associated with the lumber industry to better understand its role in the larger doghole ports network.

The survey located two concentrations of features on the 150-foot-high bluffs of Timber Cove at the area where the chute was historically positioned. They are only separated by 50 feet and are associated with each other based on the nature of the feature types, both being hardware. The first concentration, located on northeast end, consists of nine components while the second, at the southwest end, has six components. All of the 15 elements are hardware or related to hardware such as empty holes in the rocks. Additionally, there is a roadbed to the chute area, and a flat clearing indication where a structure of storage yard was located. The team did not conduct an underwater survey of Timber Cove.

Historical Background

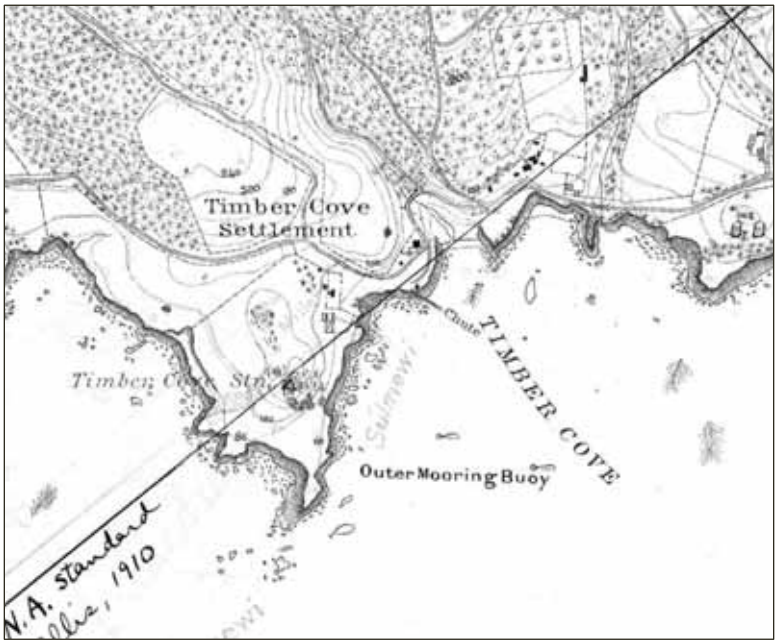
Timber Cove was the site of one of the earliest lumber mills and chutes on the Sonoma Coast. William Benitz, who is also associated with Fort Ross, constructed a mill in 1862 which burned down two years later. During the same time period, another mill was built on a nearby ridgeline, 1½ miles back from the cove, in 1861 by Mr. Webber and D. B. L. Ross. It was short lived and only lasted three years before being disassembled. Both mills were steam powered with the Benitz mill having a capacity to cut 25,000 feet per day and the Webber/Ross mill processing 16,000 feet per day (Alley, Bowen & Co.1880:378). In the 1850s a trough chute was eventually set up at Timber Cove by Benitz, or the lumbermen he leased some of the land to, to ship out materials and it was still in use when the 1876 and 1885 surveys were conducted along the coast (Figure 30). Products important to the landing included posts, pilings, timber, tanbark, and produce with the first shipment of lumber sent out by Kalkman and Schneppe on the schooner *Palestine* in 1859 (Rudy 2009:54).

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. He also built a new chute for his own use. The mill was located five miles away, near Salt Point with a railroad connecting it with the landing (*Russian River Flag* 22 August 1872). He departed in the late 1870s, leaving others to run the chute, although his name is still listed with the property after that time (Rudy 2009:54).

The 1876 map of Timber Cove shows a single trough chute extending out to the southeast from the northwest side of Timber Cove (Figure 31). A single building sits at the base of the chute with a road leading to it and additional buildings of varying sizes dotting the area. Miller's name is in pencil identifying him as the landowner. The *Coast Pilot* of 1889 explained the conditions in Timber Cove as being able to serve as an anchorage for vessels during northwest winds, but the water is exposed to the southwest and south winds. It noted that the landing was one of the principal ports for the shipment of lumber and produce north

Source: Fort Ross Conservancy

Figure 30. Schooner loading at the trough chute in Timber Cove.



Source: NOAA's Historic Map & Chart Collection

Figure 31. U.S. Coast Survey “T” sheet map 1876.

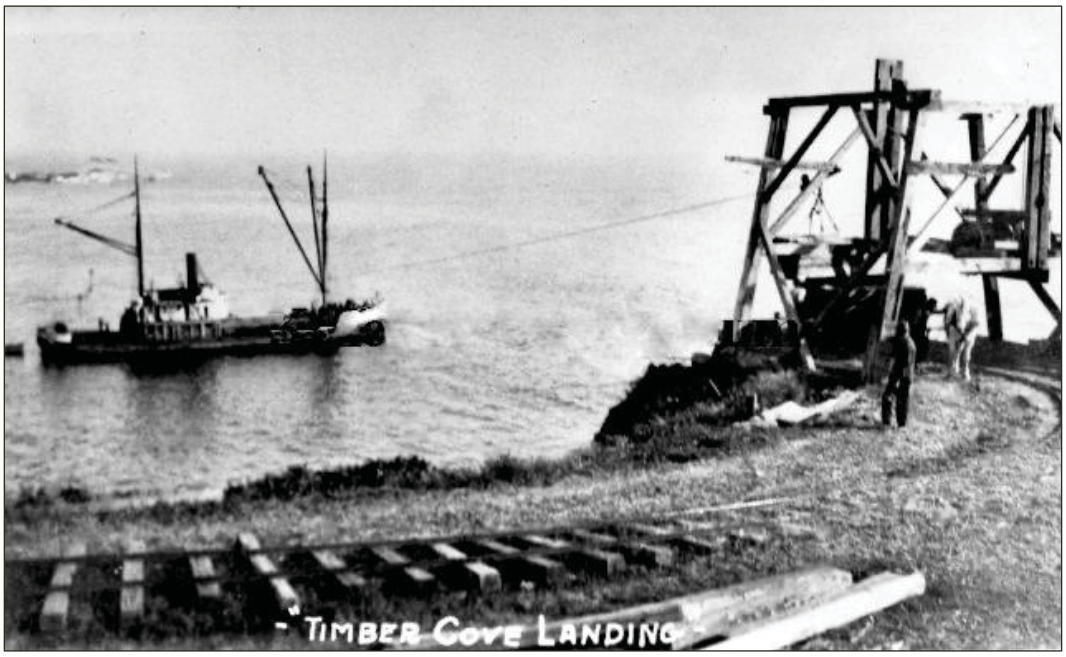
of Fort Ross. The chute end provided 16 feet of water for visiting vessels to sit in with five mooring lines. Two mooring buoys are in the cove in four and seven and a half fathoms, 200 yards from each other. It advised that vessels could anchor safely between the two buoys. The cove contained a number of dangerous submerged rocks making navigating inside it very treacherous. The chute permitted vessels to load in the winter and summer with most cargoes being wood, posts, and tanbark (Davidson 1889:259–260).

The most detailed information on the Timber Cove trough chute arrangement was from a survey of the area in 1885. It identified one chute with five securing points set in the rocks and two mooring anchors. The doghole port could accommodate two vessels (fewer than 75 tons) in the summer and only one smaller vessel in the winter. The survey map depicted buoys and onshore mooring points with black crosses and numbered in red. Buoy 1 was located in the outer cove and used for vessels waiting to load or to sail from during a southeast wind. It was connected to a 1,500-pound anchor with 15 fathoms of 1½-inch chain. Buoy 2 secured the vessel's port side at the bow while under the chute. The 1,260-pound anchor had 10 fathoms of 1½-inch chain and was just inshore of buoy 2. It could also be used as the departure for a vessel during a northwest wind. The remaining five mooring points were all on land. Mooring 3 was a 1½-inch ring bolt used for the vessel's starboard bowline. Mooring 4 was a 1¼-inch ring bolt used for the starboard bow breastline. Mooring 5 was a 1½-inch ring bolt with two fathoms of 1-inch chain located on a rock in the cove only visible at low tide and used to secure the vessel's stern or port quarter line. Mooring 6 was 1¼-inch ring bolt in a submerged rock periodically used for the stern line. Mooring 7 was a 1½-inch ring bolt used for the starboard stern quarter. The arrangement of submerged and onshore anchor points assured a secure hold for vessels using the port.

Maps spanning the 1870s through 1900 show Timber Cove as a well-developed community with several buildings positioned along the coastline, including a post office. 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 there (Figure 32). By 1925, the chute shut down ending a long 50+ year run as a doghole port (Rudy 2009:54). A few years later another survey of the coast was conducted in 1930 and no landing was identified at that time.

Timber Cove's role in the doghole port system was noteworthy as described in many newspapers of the time, beginning in the late 1850s. The importance of the maritime trade to the doghole port is apparent as vessels were the only way to ship out products to market. The earliest reports from Timber Cove mention schooners carrying potatoes, wood, lumber, posts, railroad ties, and rails as the most common commodity landed in San Francisco. The shipping intelligence reports in San Francisco newspapers chronicle the movements of vessels to and from Timber Cove and their cargoes. Schooner loads ranged from 60 to more than 100 cords per trip as well as sometimes carrying up to 8,000 posts.

In 1875, a reporter for the *Sonoma Democrat* traveled from Santa Rosa to Gualala and described his trip in detail. He stopped overnight at Timber Cove and was shown around by W. R. Miller. He wrote that Miller was engaged in the mercantile business and was the principal businessman of the place. The operation shipped out 700 cords of wood per month as well as tanbark, posts, and dairy products. The article went on to say the schooners *Osceola* and *Susan Owens,* along with the scow schooner *Jennet,* made regular trips to San Francisco from Timber Cove (*Sonoma Democrat* 24 July 1875). Overall, the products shipped out from



Source: Kelley House Museum

Figure 32. The wire chute at Timber Cove only operated for a few short years in the 1920s.

the doghole port in 1875 totaled $22,000 and included cords of wood (3,000 per year valued at $12,000), posts (50,000 annually totaling $4,000), tanbark (150 cords a year valued at $1,800), and butter (8 tons annually at $4,800).

Vessels at Timber Cove faced many dangers due to the hidden rocks present throughout the doghole port along with little protection provided from the weather (Table 7). The loss of the schooner *Golden Rule* is one example of a vessel that met its end there. After an extensive career in the coast trade, the schooner was lost on 18 December 1882 while moored at Timber Cove with 15 tons of ballast waiting to load. Stormy weather and heavy seas parted the mooring lines, and as the schooner dragged, the anchors were lost. The five-man crew was saved, but *Golden Rule*, valued at $4,000, was a total loss.

Table 7. Historically reported vessel losses at Timber Cove Landing.

NAME	VESSEL TYPE	DATE LOST	LENGTH (FT)	WIDTH (FT)	BUILD DATE	LOCATED
Ester Cobos	Schooner	April 1891	72	22	1878	-
Golden Rule	Schooner	1882	-	-	1867	-
Liberty	Schooner	27 February 1872	-	-	-	-

Survey Results

Chute Findings

The project completed a new DPR 523 site record for Timber Cove as this was the first survey of the area. The record included the findings of the 2016 land survey which focused on the historic era doghole port's hardware, structural features, and maritime landscape attributes. There are four main clusters of features on the bluff that match up with the location of the trough and wire chutes depicted in historic maps and photographs. In total, the survey recorded 17 smaller features within the larger clusters of hardware positioned in the rocks, a roadbed, and a flat square area indicating a building or storage yard. All features are located on private property, on the northwest edge of Timber Cove, just northwest of the beach used by the Timber Cove Boat Landing and Campground. The property is on the southeastern edge of Timber Cove [Resort], and the doghole port's land features are on land owned by them.

The two clusters of features, situated along the rocky cliff face and shoreline, measure about 100 feet long, with a distance of 100 feet between them. The Coast Survey chart from 1876 indicated the trough chute, at that time, was on the western edge of a rocky protrusion The steep cliffs and difficult access to the waterline made a complete investigation of the area difficult (Figure 33). A future survey along the bluff with a small boat or drone might discover additional hardware.

Source: NOAA ONMS and DPR

Figure 33. Archaeologists standing near the location of the wire chute at Timber Cove.

The first concentration of features consists of hardware from metal bolts, wire cable, and several flat plates bolted to the rocks. There is a type of hardware identified at Timber Cove not found at any other doghole port in the project area. Metal plates, measuring about a foot long by 6 inches wide, are bolted directly to rock. They originally had an eye on all of them to permit a shackle or other mechanism to be attached to it. Their specific use is unknown, but they appear to date from the same time period based on the level of deterioration. Documentation of the trough chutes in the 1870s and 1880s only mentions eyebolts. Therefore, it is possible that these items date to a later time when a wire chute was in use here. The second cluster has six individual features, all of which are metal eyebolts secured in rocks along the cliff.

An access road was documented running over 350 feet from the modern highway down to near the cliff edge and back around following the natural shape of the bluff. The roadbed leads almost to a flat cut into the south facing slope. The 1876 survey map does show a building that lines up with the flat area recorded in 2016.

The beach east of the main survey area is used today by visitors to the Timber Cove Boat Landing and Campground. A walking survey of that area located a low concrete seawall dating to the 1970s, a bundle of wire rope, and a concrete pad with a pipe (used currently as a fish cleaning station).

Embedded in the concrete pad are miscellaneous metal pieces with a large modern anchor sitting on top and stainless-steel cable in a pile to one side. The origin of the modern anchor is unknown.

Maritime Heritage Resource Survey

In addition to a terrestrial survey of Timber Cove's chute area, the team documented three anchors and associated chain on the property of the Timber Cove Boat Landing and Campground. The anchors were reported to have come from Cemetery Point near the Ruoff Cemetery. Barbara Verno, the current owner, recalled that her father, Ray Traba, might have brought them up in the 1950s (Rudy 2017). The Ruoff-Thomas Cemetery lies a mile north up the coast just south of Stillwater Cove. Proximity of Cemetery Point to Stillwater Cove, another active doghole port, suggests that the anchors were most likely salvaged from Stillwater Cove and were part of the mooring system there. The anchors and chain are positioned around the campground property and are used as decoration and as a reminder of Timber Cove's role as a doghole port.

The first anchor and length of chain sits on the Timber Cove Boat Landing and Campground's main sign out front along US 1. The anchor measures 4 feet, 7 inches wide from fluke tip to fluke tip and 5 feet, 4 inches high. The top of its shank is broken where the eye begins. It is 4 inches at the thickest part where the fluke intersects with the shank. Stud link anchor chain laid out on the ground around the anchor stretched 65 feet. Each link measured 8 inches long by 5 inches wide.

A second anchor on US 1 flanked the entrance to the Timber Cove Boat Landing and Campground. The folding stock anchor measured 4 feet, 11 inches wide from fluke tip to fluke tip and its shank was 5 feet, 10 inches long. Its stock measured 7 feet, 4 inches long and it had a ring with a shackle on top with stud link chain attached to it.

A 30-foot-long length of stud link chain wrapped around a smaller Timber Cove Boat Landing sign on the property. It appeared that the chain was connected to the previously described anchor but had broken and now lay separated. Each link was 7 inches long by 4 inches wide. Some of the studs in the middle of the links had corroded and fallen away.

A third anchor was located at the back of the Timber Cove Boat Landing and Campground property. It had a folding stock and was smaller than the other two. It had 3 feet of exposed shank measuring 3 inches wide. The flukes were buried in the ground and could not be documented. The stock measured 5 feet, 4 inches long and the ring at its top is about 1 inch wide.

The final anchor associated with the Timber Cove Landing was located at the Stillwater Cove Ranch, owned by Lynn Hay Rudy and her husband. It has been on display in their barn since the 1940s and was attributed to Timber Cove by its owners. Its shank measured 53 inches long and 50 inches from fluke to fluke. The folding stock was 60 inches long and its ring had several links of chain attached to it (Rudy pers. comms. 2016).

STILLWATER COVE LANDING (CA-SON-2683H)

In August 2016, archaeologists conducted a terrestrial survey of Stillwater Cove to document the features associated with its role as a doghole port. The land is privately owned with the adjacent waters lying within GFNMS. The survey team had the permission of the landowners, who were active participants during the documentation and provided information about the history of the site and where features were located. The doghole port's chute sat on the northwestern portion of Stillwater Cove. Note that the historical location of Stillwater Cove, where the lumber chute sat and was the focus of this survey, is different from today's Stillwater Cove Regional Park which is located 0.5 miles north at Stockhoff Creek. A historical chart from 1876 shows one trough chute extending to the southeast with a single large building just northeast of the chute. Two roads come down from the main road along the coast and end together at the base of the chute. This is the first known archaeological survey of the area. The Sonoma Coast Doghole Ports Project adds new information on the historic use of the area associated with the lumber industry and a better understanding of its role in the larger doghole ports network.

The 2016 survey documented two clusters of features along the 75-foot-high cliffs that likely correspond to the location of the trough chute. The first cluster is mainly comprised of hardware and cutouts (rebates) in the rocks for the chute legs. The second group is located slightly northwest and includes hardware. A rock wall and hole drilled in a large rock are located on the bluff, near the residence.

Historical Background

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. He preemptively claimed a tract of land between the two large ranchos and was also given land by William Benitz. In 1854, Christian died leaving Francesca to take over the operations there. He is buried nearby at the Ruoff Cemetery at Cemetery Point, south of Stillwater Cove. Francesca then married a lumber dealer named Jesse Martin Blanchard, but that ended in divorce by 1870. She took back her Ruoff name and her family property. It was during her

marriage to Jesse that she probably learned the ropes of the lumber business and she built a trough chute at the cove by at least 1868. The chute is depicted on the 1876 and 1885 survey maps of the area. In 1875, it is written that the chute was owned by Captain John Ruoff, Francesca's son, and a considerable quantity of wood, bark, posts, and hogs are shipped out. Unfortunately, no historical photos have been discovered that capture the logging chute. The town of Stillwater Cove never developed but Francesca built and ran a private elementary school that operated until 1878. With help from her children, she ran a successful store and landing (Rudy 2009:55, 169; Rudy 2015:17-1; *Sonoma Democrat* 24 July 1875).

The 1876 U.S. Coast Survey map shows a single trough chute at Stillwater Cove with one or possibly two buildings at its base (Figure 34). Two roads come down from the main road where they converge at the chute. The rest of the surrounding land is fairly undeveloped aside from a homestead site and orchard. An accounting was conducted a year prior to this map being produced that includes a breakdown of what was shipped from the chute. It chronicled that $9,600 of product was moved out through the chute consisting of $6,000 of cordwood, $2,400 of posts, and $1,200 of tanbark. This number is smaller in comparison to its southern neighbor, Timber Cove, who moved $22,600 of material and its northern neighbor, Salt Point, which shipped out $59,900 worth of products (*Sonoma Democrat* 2 January 1875).

Source: NOAA's Historic Map & Chart Collection

Figure 34. U.S. Coast Survey "T" sheet map 1876.

The most detailed description of the Stillwater Cove chute was included in a survey of the coast in 1885 by Thomas Peterson. The landing supported six moorings in the surrounding rocks and one underwater anchor to stabilize the vessel under the chute end. The map depicted the moorings with black crosses and numbered in red. Peterson wrote on his map that there was only one mooring anchor at the time of his visit, with the second having lost its surface buoy during the last storm. Mooring buoy 1 was a 1,400-pound anchor with

15 fathoms of 1½-inch chain used for the vessel's headline (bow). It also served as the departure point for a vessel leaving with a northwest wind. The second or outer anchor, which was missing its buoy at the time of the survey, was used to sail from during a southeast wind. Mooring point 2 was a chain around a rock spur used for the starboard bow line.

Mooring 3 was a 1¼-inch ringbolt embedded in the rocks and used for the starboard bow breast line. Mooring 4 was a 1¼-inch ringbolt in the rocks used for the port bow breast line. Mooring 5 was a 1¼-inch ringbolt in the rocks used for the port quarter line. Mooring 6 was a 1¼-inch ringbolt in the rock with a short piece of $^{7}/_{8}$-inch chain used for the stern line. Lastly, mooring 7 was a $^{7}/_{8}$-inch chain around a rock used for the starboard quarter line. Peterson indicated that the moorings were overhauled every year in the fall. If both underwater anchors were in working order, the landing could accommodate two small 50-ton vessels in the summer and one vessel in the winter (Peterson 1885).

The 1889 edition of the *Pacific Coast Pilot* described Stillwater Cove's anchorage as very contracted and unsheltered with a strong undertow. The cove is open to the south and southwest swells and was considered inferior to Timber Cove, but vessels could load year-round in good weather. The *Pilot* reported that the single chute primarily loaded vessels for San Francisco carrying wood, posts, railroad ties, and tanbark. The water depth under the chute end was 11 feet, and there are six mooring lines and two mooring buoys, one in five and one in 10 fathoms (Davidson 1889:260).

Very limited information was found to reveal Stillwater Cove's historical timeline with no mention of the lumber chute operations after the 1880s. The next U.S. Coast Survey map of the area from 1930 provided no indication of the chute or any buildings along, nor roads leading down to the water.

The vessel traffic at Stillwater Cove was first reported in the San Francisco newspapers in 1866. Schooners carried wood, bark, railroad ties, and posts for destinations like San Francisco and Vallejo. The newspaper details included arrival information and who received the cargo. The most common name in the 1860s and 1870s was Higgins & Collins of San Francisco who were wholesale and retail dealers of wood, lumber, shingles, redwood posts, tanbark, and whale oil. Their advertisements stated that they sold wood by the cargo, tier, or cord and were well known buyers along the Sonoma and Mendocino coasts (Douglass 2002:54). The other well-known buyer of lumber products in San Francisco was Funcke & Wassermann who ran a tannery and needed a constant supply of firewood and tanbark for curing their hides. Their ownership of land and the chute at Gerstle Cove near Salt Point made them an influential player at both ends of the lumber business (Douglass 2002:58).

Stillwater Cove's busiest period was during the 1870s when schooners visited several times a month to load cargo at the chute. By the turn of the twentieth century the doghole port no longer serviced the lumber industry, and its chute was shut down. No known shipwrecks occurred at Stillwater Cove despite the rocky and hazardous nature of the cove and frequent vessel traffic.

Survey Results

Chute Findings

The project completed a new DPR 523 site record for Stillwater Cove as this was the first archaeological survey of the area. The record included the findings of the 2016 land survey which focused on the historic era doghole port's hardware, structural features, and maritime landscape attributes. There are two main clusters of features on the bluff which likely correspond to the location of the trough chute. The survey recorded 24 individual smaller features within the larger clusters including the hardware positioned in the rocks (Figure 35), several cutouts/rebates in the rocks for the chute legs, and two rock retaining walls. All features are located on private property, on the northwest edge of Stillwater Cove.

Source: NOAA ONMS and DPR

Figure 35. Project archaeologists documenting chute remains at Stillwater Cove.

The trough chute's position can be determined by the layout of the features documented during the survey. The two groupings indicate that the chute's supports and main swing arm protruded out from the cliff side where a mix of both hardware, chain, cutouts were mapped. The cutouts, or rebates, were areas where square footings were cut into rock to hold the chute's vertical legs. Additionally, there are places in the rock that had an indentation made to permit the wooden braces to pass through them (Figure 36). The

Source: NOAA ONMS and DPR

Figure 36. Notch cut out of rock that held part of the chute frame.

current house on the property has a walkway extending from it that roughly follows the same orientation of the trough chute. Hardware, consisting of eyebolts, brackets, and a metal rod, are associated with the chute, either with the mooring system or support wires tying the whole structure together.

Two rock retaining walls were found at Stillwater Cove sited approximately 150 feet from the cliff face. A 50-foot section of two-course, dry stacked wall and a 28-foot-long section of four/five-course, dry stacked wall were recorded. The two walls run perpendicular to each other and may have been part of the infrastructure needed to access the chute and bring materials down to the cove for shipment. Two roads lead down to the bluff as indicated on a survey map from 1876. The rock walls could have been utilized to shore up the land or roadbed.

The remains at Stillwater Cove represent a smaller, more locally utilized doghole port as compared to the more industrialized configurations such as Duncan's Landing and Russian Gulch Landing. Historical documents indicated that it only had a single trough chute, and the time period of operation was shorter than neighboring operations. The 1875 accounting of only $9,600 worth of product being loaded and shipped out added to the conclusion that the port was not as successful as its neighbors to the north and south.

In addition to the information recorded and referenced above, another maritime heritage artifact present on the property relates to the larger cultural landscape of the Sonoma coast. A harpoon from a harpoon gun, a twentieth-century invention, lies at the base of steps leading down from the property owner's house to the water. The property owners recalled

that a whale washed ashore in the 1980s with the harpoon embedded in it after being killed by a Russian whaler. They retained the harpoon following the whale's removal (Lawrence 2016). This event occurred before the 1982 United Nations Convention on the Law of the Sea which established the 200-mile exclusive economic zone of the United States.

STOCKHOFF COVE LANDING

In August 2017, archaeologists conducted a terrestrial survey of Stockhoff Cove to document the features associated with its role as a doghole port. The land is part of Sonoma County's Stillwater Cove Regional Park with the adjacent waters lying within GFNMS. 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. The Sonoma Coast Doghole Ports Project revealed new information on the historic use of the area associated with the lumber industry to better understand its role in the larger doghole ports network.

The 2017 survey did not locate any features linked to the cove's use as a doghole port. Project archaeologists conducted a thorough pedestrian survey of the cove's northwest side but did not find any features to indicate its use as a doghole port or temporary anchorage. Local historian Lynn Hay Rudy wrote that she had found a ring bolt in the rocks of Stockhoff Cove, but the project team was unable to locate the feature.

Historical Background

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 1870 Census recorded that he was a lumberman and lived there with his wife, Charite, and their four children. The Stockhoffs made a living through lumbering, ranching, and farming, owning many acres of farmland. The 1876 U.S. Coast Survey map labeled the area as a Lighthouse Reservation. This land was considerable and was eligible to be taken by the federal government to build a lighthouse, an idea that never materialized (Rudy 2015:40). The family grew potatoes and other produce that were then loaded onto schooners at Stockhoff Cove or neighboring chutes. Stockhoff family members recall that the cove was used for shipping out lumber, and a grandson noted that he used to watch schooners loading via the highline there around 1906 (Rudy 2009:55).

The 1876 U.S. Coast Survey map marked several buildings of the Stockhoff family home sitting adjacent to the main road along the coast as well as the Lighthouse Reservation (Figure 37). Those same buildings are still present on later surveys, and today the local historian and author Lynn Hay Rudy owns and resides at the old Stockhoff homestead. A search for information on the Stockhoff's operations at Stockhoff Cove did not result in much information other than noting that he was an early coastal pioneer engaged in farming and ranching. There was no mention of any vessels or maritime activity linked to the Stockhoff name or cove. A Sonoma County map from 1900 and the 1930 U.S. Coast Survey map of the area do not provide any information on the use of the area as a doghole port other than the buildings associated with the original Stockhoff family settlement still present.

Source: NOAA's Historic Map & Chart Collection

Figure 37. U.S. Coast Survey "T" sheet map 1876.

WALSH LANDING (CA-SON-2718H)

In August 2017, archaeologists conducted a terrestrial survey of Walsh Landing, now called Ocean Cove, to document the extant remains of this doghole port. The land is owned by the Ocean Cove Store and Campground along with several other private property owners. The adjacent waters are within GFNMS. Historical records show that the doghole port had at least one wire chute located on the northern side of the cove (Davidson 1889).

The 2017 survey documented two main features associated with the location of the wire chute, both situated along the northern side of Ocean Cove at Walsh Landing. A large flat terrace overlooks the ocean where the main wire chute structure was most likely positioned. The second feature is a flattened area that might have hosted a structure housing additional machinery (e.g., winch). Additional features include four iron eyebolts used for the mooring system embedded in the cliff face and tidal rocks, all of which are likely associated with the chute or mooring system. Archaeologists also visited Ocean Cove's beach and observed modern material consisting of metal scaffolding, a concrete landing, a hoist and winch, metal pipes, and cables.

Historical Background

The area around Ocean Cove was first surveyed by J. C. Conway under instructions from the United States Surveyor General on 18 October 1860. At that time, the property was owned by Fred and Anna Liebig. Previous owners of the land included the Jacksons and Johns. The Liebigs had built the first home there in 1857, and they established a small general merchandise and liquor store in 1860 as well as a saloon. The business was focused on the store and the cove was not used much during the Lieberg's time. The earlier maps of Ocean

Cove, from 1876 and 1877, show it owned by F. Liebig with its store and forested land all the way down to the water's edge (Rudy 2015:55).

William Joseph Walsh purchased Lieberg's property on 14 October 1889 and named it Walsh Landing. Little information is known about Walsh's operations there, but based on newspaper reports of vessels carrying wood from Walsh Landing to San Francisco, it can be assumed that there was either a chute or lightering process going on earlier than previously thought. In 1900, lumberman Fred Linderman leased Walsh Landing and installed a single wire chute on the northern side of Ocean Cove, managed by his father John. 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 shipped out pilings and other split wood from the chute until at least 1912. Additionally, Frank Kehoe ran a logging camp making railroad ties around Walsh Landing during the 1910 time period (Figure 38), which made the wire chute an easy avenue for moving his ties out to market (Rudy 2009:56).

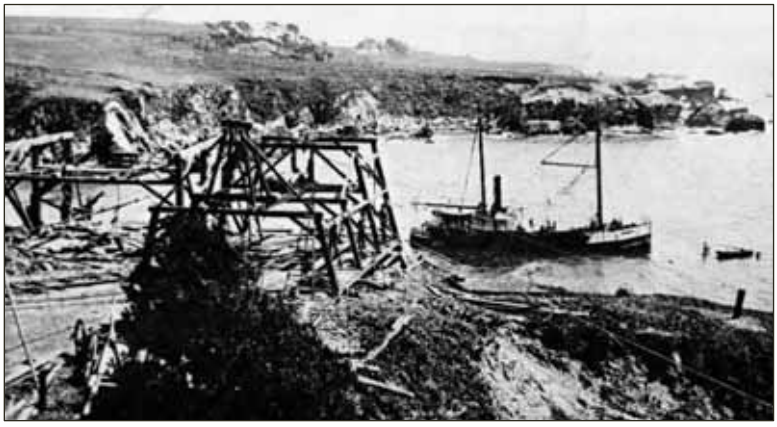
Source: San Francisco Maritime National Historical Park E12.2 991 1p (SAFR 21374)

Figure 38. Rail system to move ties to the chute site.

Walsh Landing only had a wire chute (Figure 39) and was not a popular doghole due to the shallow rocky nature of the cove. Smaller schooners and steam schooners were the main vessel types that frequented the chute since they were more maneuverable and safer to operate in closer quarters. San Francisco newspapers first mention loads of wood and posts coming from Walsh Landing starting in 1891 and continuing throughout the 1890s. The list of schooners included *Reliance*, *Portia*, *Mary Etta*, *Corinthian*, *Ocean Spray, Bender Brothers*, and *Christina Steffens*. Schooners continued to stop at the landing into the 1900s, with cargoes averaging 75 cords of wood, but soon steamers began calling at the chute. The first notation in the *San Francisco Call* of a steamer servicing the landing is *Albion* in 1906 (*San Francisco Call* 11 August 1906). The only other steamer that loaded at the chute, as reflected in the *San Francisco Call*, was *Gualala* (Figure 40). The last account of a vessel at Walsh Landing was in September 1912 when *Gualala* brought 6,700 ties to San Francisco (*San Francisco Call* 29 September 1912). There are no historically reported shipwrecks off Walsh Landing.

Source: San Francisco Maritime National Historical Park E12.508 7ps (SAFR 21374)

Figure 39. The wire chute at Walsh Landing with a load of ties.



Source: San Francisco Maritime National Historical Park E06.2n (SAFR 21374)

Figure 40. *Gualala* at Walsh Landing.

Survey Results

Chute Findings

The terrestrial survey of Walsh Landing located several notable features linked to the use of the area as a doghole port at the turn of the twentieth century. The only known chute located at the cove was a wire chute positioned on the northern side of Ocean Cove, as indicated in historic photographs dating between 1900 and 1910. The presence of the wire chute was not indicated on Coast Survey maps as its use falls after the 1876 survey, and it was dismantled before the 1930 survey.

Two flat terraces are present on the cliff edge, indicating the location of the wire chute's main wooden structure as well as a possible winch house used to pull the wire and loads of lumber in and out to waiting vessels. The first feature is an artificially flattened area of earth measuring 100 x 500 feet, sitting between two large pine trees (Figure 41). There is a depression in the ground between the pines measuring 6 x 3 feet, 15 feet back from the bluff's edge. Just inland from this depression, there is a possible buried wooden timber, but its presence was not confirmed during the preliminary survey. The timber might be a remnant from the wire chute's platform and could indicate the location of the wire chute's main platform where the wire drum was located. This was the point where loads of materials were placed on the wire and moved down to the waiting vessel. The second feature is an earthen pad located about 80 feet up the hill. It measures 36 feet by 49 feet and was supported by a natural retaining wall, augmented with boulders. This location may have been where the winch house once sat, holding a donkey engine and winch to mechanically control the wire and loads. The current residents of the property use this clearing as a fire pit.

Source: NOAA and DPR

Figure 41. Location of wire chute structure.

The survey documented four iron fasteners that were used for the chute's mooring system in the rocks/cliffs around Walsh Landing. Due to hazardous conditions, the team was unable to reach the individual artifacts; therefore, no geographic coordinates were determined for these artifacts or measurements taken of their sizes and arrangement. The embedded features include an iron staple/U-bolt and iron ring bolt near the main chute feature, a ring bolt on top of a rock in the middle of Ocean Cove, and an iron staple/U-bolt set in the rocks at the water's edge across Walsh Landing on the southern side of Ocean Cove. The only other

material found near the chute location was a section of wire rope. It was moved to be on display near the property owner's house. The original use location of the wire rope could not be determined, but it is consistent with the type of rope used on wire chutes.

Just below Walsh Landing and closer to the northern end of the Ocean Cove beach, there was a modern landing and metal scaffolding on private property constructed from various material including possible historic, salvaged, and modern material. The concrete holding the landing together was fine grained with abalone shells mixed in. Set into the concrete was a metal plate, 2 x 3 feet, that supported remnants of a hoist and pulley system, near the scaffolding. It was oriented northeast by southwest and measured 6 inches in diameter and 20 feet long. A modern cable was attached to it.

Also on the beach, but to the southeast of the hoist, team members found a modern winch and cable. Lastly, three metal pipes were found sitting below the historic landing at the intertidal zone. One pipe measures approximately 30 feet in length. The second pipe is partially obscured by rocks and measures 6 feet long. The third pipe was submerged and could not be measured. Today, Ocean Cove is used as a boat launch. The southern side of the cove is a campground. The general store, operated by the campground along US 1, dates to 1860 and is a part of the doghole port's cultural landscape.

SALT POINT LANDING (CA-SON-248/H)

In August 2016, archaeologists conducted a terrestrial and underwater survey of Salt Point Landing, located in Gerstle Cove, to record features associated with its role as a doghole port. The land is within Salt Point State Park with the adjacent waters also inside park boundaries as well as within the GFNMS. Historical records indicate that there were two trough chutes within the cove. The Sonoma Coast Doghole Ports Project adds new information to the archaeological record on the historic use of the area associated with the lumber industry to better understand its role in the larger doghole ports network. The site is part of the Salt Point Archaeological District, which was listed on the National Register in 1971 (#71000207).

The 2016 survey located many features linked to the cove's use as a doghole port, both on land and underwater. The archaeological resources are directly tied to the lumber chute and quarrying operations and provide evidence of the active use of the cove to support the region's timbering and ranching activities. In total 16 features comprise the landing site consisting of one underwater artifact and 15 terrestrial artifacts. The types of features are mainly comprised of hardware and quarried sandstone blocks on the western side of Gerstle Cove at the historic location of the two trough chutes. In addition to the resources out on the bluff and in the water, there is also a single anchor near the entrance that most likely originated from the cove and is similar in style to the mooring anchors found at other doghole ports.

Historical Background

Activities at Salt Point began in 1851 when Samuel Duncan bought part of the German Rancho from Henry Hageler to use for timber cutting. It is thought that Duncan used a primitive system of slings hung on wires to load vessels with his products, not like the wire chutes later used along the coast (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, Philip Hinckle, and Joseph Corliss who began to export the material in 1855. They built a "floating wharf" to ship out the rock from Gerstle Cove, but little details have been found about its location or dimension. Quarrying was done for the next 13 years at several locations around Salt Point, and stone was used to build the Naval Yard at Mare Island and pave the streets of San Francisco (Porter 1982:7–9; *Daily Alta* 5 June 1856).

Around the same time, a partnership of Joshua Hendy and Duncan moved machinery from a mill once in Benicia at the Blumedale Sawmill Company to the area in 1854. It is reported that this was the first steam powered sawmill in the [Salt Point] township with a capacity to produce 5,000 feet per day. The engine was soon enlarged to a 16 horsepower one, and the mill's capacity also increased to 12,000 feet. Hendy sold off his interest in the business to Alexander Duncan, Samuel's brother, who ran the mill until 1860 and cut 30 million feet of lumber (Alley, Bowen & Co.:379). "The Duncan brothers left Salt Point in 1859, and the place was relatively quiet, although in 1863 Davidson reported some lumber schooner calling" (Rudy 2009:57).

It was not until 1870 that a larger operation was set up at Salt Point when Frederick Funcke and Lewis Gerstle, representing the firm Funcke and Wasserman, later known as Funcke & Company, purchased the 3,300-acre Salt Point Ranch and used the land to produce tanbark, posts, and cord wood through 1881. Salt Point Landing was revitalized with the new owners and their chute, and they immediately filled the holds of schooners with materials for San Francisco. One of the company's main focuses was harvesting tanbark to use in its hide tanneries and they used Salt Point Landing as a shipment center.

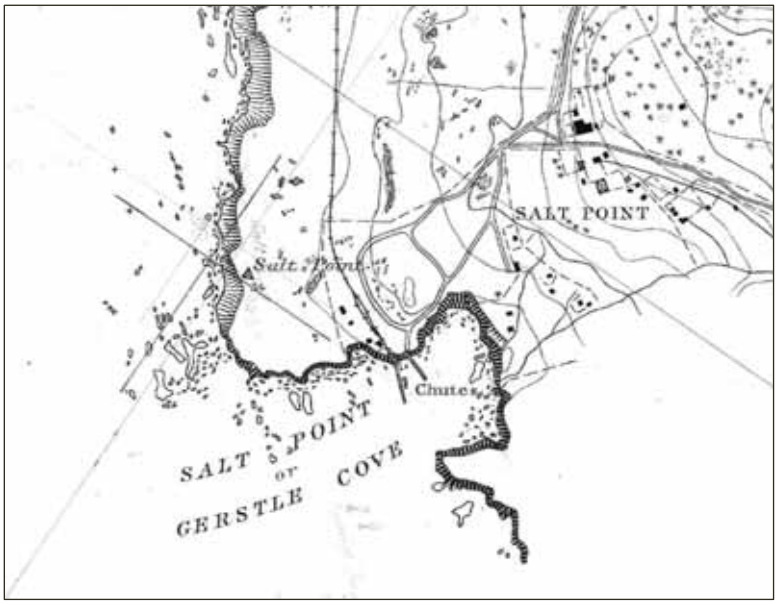
They had been receiving tanbark from the Salt Point area since 1868, but it was not until a few years later that they made the next step and controlled the market from forest to tanning factory. Their demand for tanbark was so high that Salt Point could not supply enough, and they bought materials from neighboring operations as well (Rudy 2009:57). In 1871 there were 26 shipments from the doghole port, 15 with wood, bark, and posts associated with Funcke & Wasserman's tannery and the other 11 (10 with wood and 1 of posts) may have been related to surplus ranch materials or from neighboring ventures capitalizing on the chute's availability for use by the public for a fee. There were also plans by the company to establish a town called Louisville which never materialized (Douglass 1999:126; Douglass 2002:48).

In 1872, William R. Miller leased 1,200 acres of the Funke and Wasserman land for its timber rights and built a sawmill at Miller Gulch, located a mile to the north. He also obtained permission to build a new chute at Gerstle Cove and use 5.5 acres near the chutes for his lumber storage yard. Access to his chute from the sawmill was through a horse drawn railroad/tramway which Miller also constructed. His main customer was the San Francisco firm of Higgins and Collins for whom he had a long-standing relationship with Timber Cove. Miller remained active there until he moved north in 1876 to more profitable logging grounds around Mendocino (Douglass 2002:52, 54).

With two chutes operational at Salt Point Landing, the doghole port quickly made an impact on the overall shipment totals in the Sonoma region. In 1874, $59,900 worth of products originated from the shipping point consisting of 3,500,000 feet of lumber, 3,000

cords of wood, 400 cords of tanbark, 7,500 posts, and 700 hides. It ranked third behind Fisherman's Bay and Fisk Mill (*Sonoma Democrat* 2 January 1875). With four miles of railway connecting it to neighboring mills, Miller's chute was said to be one of the best chutes in the area with schooners making regular trips to the cove (*Sonoma Democrat* 24 July 1875). The setup was unique at Salt Point with two separate businesses having their own chute. In comparison, other doghole ports with two or more chutes were under the same management and did not have to compete for business.

Surveys maps of Salt Point, from 1876 and 1878 (Figure 42), show two chutes extending off the western side of the cove with railroad tracks leading to the outer one and a road connecting to the inner one. The rail tracks lead to the north along the coast and connected with the buildings near Miller Gulch, most likely associated with the sawmill there. The road joined with Salt Point Settlement, just inland from Gerstle Cove. Out on the cliff near the outer chute were four to five buildings of varying sizes, possibly used as storehouses to support the doghole port operations.



Source: NOAA's Historic Map & Chart Collection

Figure 42. U.S. Coast Survey "T" sheet map 1878.

Detailed information about Salt Point Landing was available through Thomas Peterson's 1885 survey. He indicated that there was only one active [trough] chute at the port. It was suitable for summer operations, but too dangerous for winter use due to heavy swells and a hazardous reef. There were two mooring anchors and 12 ring bolts in the surrounding rocks, apparently more than is necessary as some were never used. The anchors were overhauled every fall and were in good order. The survey map depicted the mooring points with crosses numbered in red. Mooring buoy 1 was a single 1,900-pound anchor located in the outer portion of the cove with 15 fathoms of 1¾-inch chain. It was primarily used to sail from during a southeast and northwest wind. Mooring buoy 2 was attached to a 1,300- pound anchor with 15 fathoms of 1-inch chain and used for a vessel's bow. Mooring

3, drilled into an offshore rock, had a 2-inch ringbolt used to secure the starboard bowline while under the chute. Mooring 4 was a 2-inch ringbolt in the cliff used for the port bow. Mooring 5 was a 2-inch ringbolt with a short length of chain and was revealed only at low tide. Sailors connected their port stern breastline to it. Mooring 6 was a 2-inch ringbolt driven into a large boulder on the beach and used for the starboard bow breastline. Mooring 7 was a 2-inch ringbolt embedded in a large boulder on the beach to serve as the starboard stern breastline. Mooring 8 was a 2-inch ringbolt in a flat rock for the port quarterline. Mooring 9 was a 2-inch ringbolt in a large boulder on the beach used for the starboard quarterline. Mooring 10 was a 2-inch ringbolt sometimes used for the sternline. Mooring points 11 and 12 were seldom used (Peterson 1885).

The 1889 description of Salt Point Landing in the *Pacific Coast Pilot* indicated that the outer chute had been abandoned by that date. However, the inner chute had been substantially rebuilt, changing its orientation, and extended 13 feet farther into the water. Where Peterson described as many as 12 mooring points, the *Pilot* reported that six mooring lines were available to loading vessels. The infrastructure supported two vessels of 80 tons in the cove in calm weather. Three mooring buoys were positioned in the water, two inner ones in 5 and 6 fathoms and another one in 10 fathoms farther offshore. The moorings were in good shape but not maintained. Schooners called at the port and loaded wood, posts, tanbark, and produce (Davidson 1889:261).

In its heyday there was a busy village near Salt Point named Louisville, but by the late 1880s most of the buildings had been abandoned. A few houses, a hotel, blacksmith shop, and a store remained active. Funcke and Gerstle sold their property to W. J. Walsh, of Walsh Landing, in 1881, and the slow downturn of activity began after that. This decline by the turn of the century was mainly due to the deforestation of the surrounding land leading to the overall decline of the lumbering business in the region. Ranching of sheep and cattle took over as the main business, and by 1889, there was only one chute still open, and that closed in 1917. By the next mapping survey of the coastline conducted in 1929, there is no evidence of the doghole port's infrastructure besides a few small buildings away from the coast.

Maritime traffic at Salt Point Landing was comprised mostly of small schooners, mostly during the 1870s and 1880s, at the height of port activities. It was not until slightly later that steam schooners came on scene and by then the doghole port's productivity was in decline. Funcke and Wasserman used the chute for their tannery products while Miller focused his sales to dealers Higgins and Collins. With a small customer base, the doghole port in Gerstle Cove saw repeat visits from the same vessels that profited immensely from the regular customers. San Francisco newspapers report schooners visiting Salt Point beginning in the mid-1850s returning with cargoes of produce, lumber, and stone. Commerce continued with shipments of posts, cordwood, pickets, and railroad ties (to order), but it was not until the two trough chutes were built that the activity increased. Schooners which frequented the chutes included *Napa City*, *Pet*, *Mary Deleo*, *Lottie Collins*, *Steiner Nicholson*, *J.P. Haven*, *D.W. Tietgen*, and *Three Sisters* (*Sonoma Democrat* 24 July 1875; Douglass 2002:298). Salt Point produce and lumber arriving in San Francisco was used locally or combined with other loads, moved to a larger vessel, and shipped on to other U.S. ports or abroad.

Historical records show that there were at least seven vessels lost near Salt Point during its time as an active doghole port (Table 8). The freighter *Norlina* wrecked in 1926. Aside from *Norlina*, none of the other vessels have been located. The loss of the schooner *D.W. Tietjen* is emblematic of how many vessels were destroyed along the Sonoma coast. The 20-year old, 49-ton schooner was lost on 27 March 1878 after parting its mooring lines while in Gerstle Cove during a gale with heavy seas. It was driven ashore and broke up on the rocks. *D.W. Tietjen* was an active player in the coastal scene and frequented many doghole ports such as Fort Ross and Bowen's Landing before its loss.

Table 8. Historically reported vessel losses at Salt Point Landing.

NAME	VESSEL TYPE	DATE LOST	LENGTH (FT)	WIDTH (FT)	BUILD DATE	LOCATED
Hanna (Hannah) Louise	Schooner	12 April 1872	-	-	-	-
Erial	-	1889	-	-	-	-
Bianca	Schooner	6 December 1861	-	-	-	-
Nautilus	Schooner	October 1877	-	-	1868	-
Phantom	Schooner (2 masts)	November 1881	-	-	1878	-
Mary D Pomeroy	Schooner (2 masts)	18 December 1879	-	-	1879	-
Ellen H Wood	Brig	27 March 1859	105	29.5	1856	-
D. W. Tietjen	Schooner	27 March 1878	-	-	1867	-
Norlina (ex *S.S. Harfleur, Georgiana, U.S.S. Norlina*)	Freighter	4 September 1926	385	51.1	1909	yes

Survey Results

Chute Findings

The terrestrial and submerged survey of Salt Point Landing located features linked to the use of the area as a doghole port at the turn of the twentieth century to support the quarrying, lumber, and ranch operations. Two trough chutes were located on the northwest side of Gerstle Cove, within the southwest portion of Salt Point State Park, 115 feet southwest of today's public parking lot. The 2016 findings expand on surveys conducted by Bauer in 1949 and by Bramlette, Dowdall, and Thompson in 1988 which expands the archaeological site boundary to include the doghole port's historic elements. Previous surveys focused on the prehistoric remains and only noted the presence of quarrying and shipping features. The development of the bluff for public recreation as a park has distributed and impacted original site context. A road, restrooms, and fish cleaning station are located on the bluff where the chute's out buildings and shore side infrastructure were once located.

The 16 features recorded at Salt Point Landing are located on a flat marine terrace, or just offshore, and line up with the historically documented location of the two trough chutes used by Miller/Funcke and Wasserman. The team documented items directly related to the chutes as well as a roadbed, which appears to be part of the road to the inner chute operated by Funcke and Wasserman. The main concentration of features covers an area 300 feet long

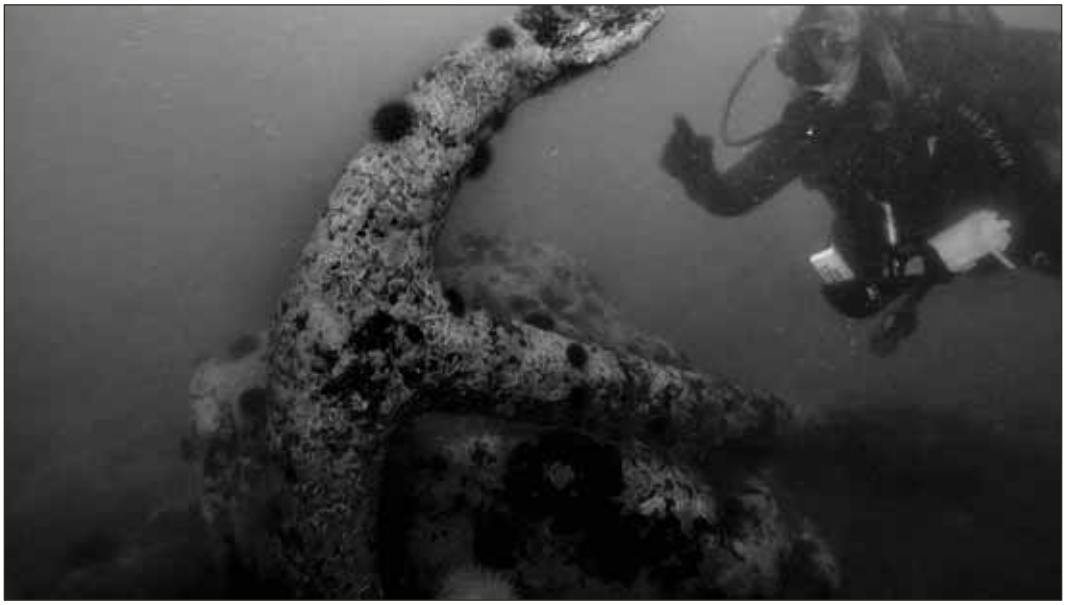
by 50 feet wide and sits on the cliff edge and continues down to the intertidal zone edge. Additional artifacts are present throughout the site but not within the main concentrations.

Most of the features consist of hardware such as eyebolts or remnants of eyebolts (Figure 43). There are 14 pieces of hardware with several features containing sets of two. It is unclear if the pairs are intentional or whether it indicates a new pin placed in the same area because the existing one became too deteriorated to use. There are 13 eyebolt fragments at nine locations at the chute location and one across the cove. The 1885 survey of the cove indicated the presence of 12 eyebolts. Some of the features documented in 2016 line up with the mooring's eyebolt locations indicated on the map. In addition to the eyebolts, there is one cutout in the rocks where one of the chute legs or supports sat.

The final feature is an Admiralty-style collapsible stock anchor and segment of chain located in 55 feet of water within Gerstle Cove (Figure 44). It measured roughly 8 feet tall and 8 feet wide overall. Its position matched with the location of the two adjacent mooring anchors depicted on the 1876 and 1878 Coast Survey maps. It was also near the location of mooring [anchor] 2 represented on the 1885 Peterson chart. The dimensions closely matched those of the anchor out front of the Timber Cove Boat Landing and Campground. The dive team made a dive on the historic location of the other mooring anchor in 45 feet of water, closer to shore, but only observed a small piece of circular aluminum tubing and a section of railroad iron. A final dive was conducted at the historic location of the outer mooring buoy in 60 feet of water, but the divers did not find any artifacts.

Source: NOAA ONMS and DPR

Figure 43.Project archaeologist documenting the remains at Salt Point Landing.



Source: NOAA ONMS and DPR

Figure 44. Anchor discovered in Gerstle Cove.

Across Gerstle Cove, to the southeast from the lumber chute positions, the team found a single isolated winch with wire cable wrapped around its drum. It is next to the state park visitor center behind a wooden fence. It appeared to have been placed there as a decorative element.

Lastly, three concentrations of sandstone rocks linked to the quarrying efforts, which predate the heyday of the timbering business, were identified and documented. These slabs provide information on the variety of commercial ventures at this location which contribute to the maritime cultural landscape. The stones have drill holes and chisel quarrying marks, all evidence of the methods used to free the blocks from the adjacent sandstone outcropping. At least 16 individual blocks exist at Salt Point Landing, located above the former chutes at the headland.

Maritime Heritage Resource Survey

The project recorded two additional anchors in the vicinity of this port, which were no longer *in situ*. One anchor resided behind the Salt Point (Gerstle Cove Campground) entrance kiosk, just off US 1 and the second was located at the park maintenance yard. Local historian Lynn Hay Rudy recalled that the first anchor may have been illegally recovered from Walsh Landing. Park rangers discovered it on display at a dive shop in Santa Rosa and brought it back to Salt Point where it is currently on display (Rudy pers. comm. 2016). The folding stock anchor measured 5 feet, 8 inches between flukes and 7 feet from crown to top of the shank.

The second anchor was at the Woodside Campground/Salt Point State Park maintenance yard just outside a chain link fence and next to a large tree. It is believed to have been recovered from Gerstle Cove, but no additional details about its history have been

uncovered. The anchor had a folding stock with a shackle and segment of chain. It measured 4 feet, 6 inches from fluke tip to fluke tip and its shank was 7 feet, 4 inches long.

In addition to the three mooring anchors historically reported to be in Gerstle Cove, the schooner *Fanny* lost an anchor at Salt Point in 1857 (*Daily Alta California* 27 September 1857). This is the only other anchor to be known to be lost in the area so far. An anchor from a schooner of that size and time period would most likely be smaller than the one located underwater, the one behind the entrance booth, or the one at the maintenance yard.

Norlina

If time permitted, the team planned to dive on the shipwreck of the freighter *Norlina* located in South Gerstle Cove. The schedule did not allow this to happen although volunteer John Harreld made several dives on the site in the fall of 2017 and has provided an overview of what remains. This shipwreck is within the park/sanctuary boundary and visited by sport divers on occasion, despite conditions making access from shore a difficult endeavor.

The 385-foot long 4,596-ton steel-hulled steam freighter *Norlina* began its career in 1909 as the British vessel S.S. *Harfleur*. It was transferred to American registry and renamed *Georgiana* in 1915. In the following year she changed owners and became *Norlina*. It was commissioned in the U.S. Navy in early May 1918 as USS *Norlina* (ID # 1597). For the next year, the freighter moved supplies to Europe to support the Allied war effort in World War I. In May 1919, it was delivered to the U.S. Shipping Board and returned to her owners, the Garland Steamship Company.

Norlina was en route from San Francisco to Puget Sound, Washington with general cargo when it ran aground in the fog on 4 August 1926 near Horseshoe Point (Figure 45). There were efforts to refloat the freighter and pull it off the rocks, but the rescue efforts were unsuccessful. The ship broke in half and came to rest on a nearby reef where it sits today. *Norlina* was eventually salvaged and dynamited.

There have been no formal archaeological surveys to ascertain the full extent of the *Norlina* wreck site. Online dive reports and those from John Harreld state that the hull is broken up, but there are identifiable pieces of frames and hull plating in approximately 30 feet of water. The 150-foot-long drive shaft is still in place as well as two of its boilers, located in 8–12 feet of water. Hull fragments are scattered over a large area along with possible winch or windlass parts and other engine/machinery components. Mr. Harreld has been documenting the *Norlina*'s remains and has drawn a preliminary site map to better understand the wreck layout and record its features for future study. Follow up work is needed on *Norlina* wreck site to further document its remains since it is a historical resource within GFNMS and Salt Point State Park and is one of the most easily accessed dive sites for the public.

Source: San Francisco, Maritime National Historical Park, International Newsreel Collection, P82-19a. 1,077pl (SAFR 19106)

Figure 45. *Norlina* aground in August 1926.

FISK'S MILL LANDING (CA-SON-1630/H)

In August 2016, archaeologists conducted a terrestrial and underwater survey of Fisk's Mill Landing, located in Fisk Mill Cove (Figure 46), to record historic features associated with its role as a doghole port. The land is within Salt Point State Park with adjacent waters within GFNMS. Historical records indicate that there was one trough chute within the cove. C. Porter (1985) and J. Keswick (1987) had previously recorded the site, noting prehistoric material and elements of the lumber chute. Porter drew a rough sketch map covering the land from US 1 to the cliff edge and noted the possible roadbed along with lumbering artifact concentrations. The Sonoma Coast Doghole Ports Project adds new information to the archaeological record related to the historic use of the area and its relationship with the broader commerce and maritime transportation network.

The 2016 survey located features linked to the cove's use as a doghole port on land only as dive conditions did not allow more than a preliminary search of one of the mooring anchor locations. The archaeological resources recorded by the team are connected to the area's history as one of the active doghole ports along the Sonoma coast. A total of 22 features represent the landing site, the lumber chute, and associated components. The types of features located are mainly comprised of hardware, cutouts for the chute legs, and structural components such as milled timbers. They confirm the location of the trough chute and use of the bluff as a successful doghole port supporting the mills and local community.

Source: Jaffke 2020

Figure 46. View towards Fisk's Mill Landing.

Historical Background

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. His arrival on the land was contested at first by several families of squatters from Stewart's Point who had been living on the land two miles north of Salt Point. The dispute ended in one squatter murdering another while Fisk left Duncan, the legal landowner, to sort out the eventual eviction of the family. Fisk built a steam sawmill and trough chute at Fisk Mill Cove for cutting railroad material. Fisk's mill was able to turn out 20,000 board feet a day. By 1868, 56 schooners stopped there to load and transport wood products. Fisk Mill Landing developed with a small community of several houses, a store, a hotel, and post and express office just to the south of the chute. The cove was relatively open and had deeper water than most doghole ports making it a good place to conduct business (Porter 1982:3; Rudy 2009:57).

Fisk's time at the landing was short lived. He moved north to Stewart's Point and sold the mill and businesses to Frederick Helmke, who purchased the land from Duncan in 1865. He went on to manage the store, hotel, saloon, and three lumber chutes at Stewart's Point with his brother, A. J. Helmke, who continued in the lumber trade. Between 1868 and 1874, 437 schooners loaded at Fisk's Mill chute. While Fisk's name stayed with the landing, the village was often referred to as Helmke's in newspaper articles. At the height of Helmke's success, around 1870, his estate was worth $30,000, and he employed 30 lumbermen, a Chinese servant, and several teamsters. In addition to the logging and milling, he cultivated fields of grain as the winter months' weather was too rainy to have year-round work in the forests (Porter 1982:3, 11–12; Rudy 2009:57).

Coastal shipment records from the year 1874 show that Fisk's Mill Landing was a highly productive doghole port (Figure 47) and was second only to Stewart's Point (Fisherman's Bay). The annual shipment was valued at $61,800 worth of products with (3,500,000 board feet) lumber being the most profitable, followed by cordwood, (75,000) posts, then (400 cords) tanbark (*Sonoma Democrat* 2 January 1875).

Source: Fort Ross Conservancy

Figure 47. Schooner loading at Fisk's Mill Landing.

Mr. Helmke ran a successful operation at Fisk's Mill Landing. An article from July 1875 commented that he was a, "… gentleman full of energy and enterprise; as a businessman second to none in our country." He was proprietor of the mill, store, and a large body of land who had first started business in the area at Timber Cove many years ago and moved to Fisk Mill and carried on his extensive and prosperous work (*Sonoma Democrat* 24 July 1875). Eventually, as with the rest of the region, the decline in the market led to Helmke moving his mill to Mendocino in 1875. Historical accounts conclude that Helmke defaulted on his loan and lost the property. He stayed at Fisk's Mill Landing for a short time to oversee the shipment of the remaining posts, wood, and tanbark until finally vacating by 1880. The 1878 Coast Survey map shows the single trough chute extending out from the bluff with an extensive network of roads and rails leading back from the chute to the mill and village to the east (Figure 48). A large building sat at the land end of the chute with two other smaller ones near the rail tracks.

With the mill no longer there, the village became deserted, although the hotel stayed busy as people using the stage route stopped there for rest. A winter storm in 1884 damaged the chute's apron, but repairs were made that kept the landing open. Edward Kruse and his son Edward P. E. Kruse took over the property and chute operations after Helmke's financial problems, and the doghole port remained open and active into the twentieth century. Known

Source: NOAA's Historic Map & Chart Collection

Figure 48. U.S. Coast Survey "T" sheet map 1878.

now as the Kruse Ranch, the family concentrated on sheep ranching and a wholesale grocery business. Local ranchers and smaller lumber mills still used the chute mostly for cordwood, posts, and tanbark until the wood supply was exhausted (Porter 1982:12; Rudy 2015:30, 58).

In 1885, a comprehensive record of the mooring system was captured by Thomas Peterson showing the location of both underwater anchors and mooring hardware on land. Peterson's map depicted both the mooring buoys and fasteners in the rocks, which were numbered in red and marked with a cross. There were four mooring anchors in the cove with buoys attached to them. Number 1, the outer most one accompanying a 1,600-pound anchor, lacked a surface buoy. The anchors were suitable for vessels fewer than 100 tons and in the summer, three could be accommodated if the outer buoy were replaced.

Buoy 2 was secured to a 1,000-pound anchor with 14 fathoms of 1¼-inch chain used for a vessel's port bow breast line. Buoy 3 was tied with 11 fathoms of 1¼-inch chain to a 1,200-pound anchor and used for a vessel's head line while under the chute. Buoy 4 was fastened to a 1,200-pound anchor with 9 fathoms of 1-1/8-inch chain for the port quarter line. Mooring point number 5 was a length of chain around a rock spur used for the headline. Peterson noted that this mooring point was hard to pick up in a small boat in rough conditions. Mooring 6 was ¾-inch old rusty chain around a rock on top of the bluff with a ring at each end to secure the starboard bow breast line. Mooring 7 was another segment of chain around a rock up on the bluff used for the starboard quarter line. Mooring 8 had not been installed at the time of the survey, but it was planned to be a 1¾-inch ring bolt for the stern line. All of the moorings had not been overhauled in over a year and were not safe for any larger vessel (Peterson 1885). The lack of maintenance at the chute was most likely a result of the Kruse's lack of management since they were not active players in the lumber business.

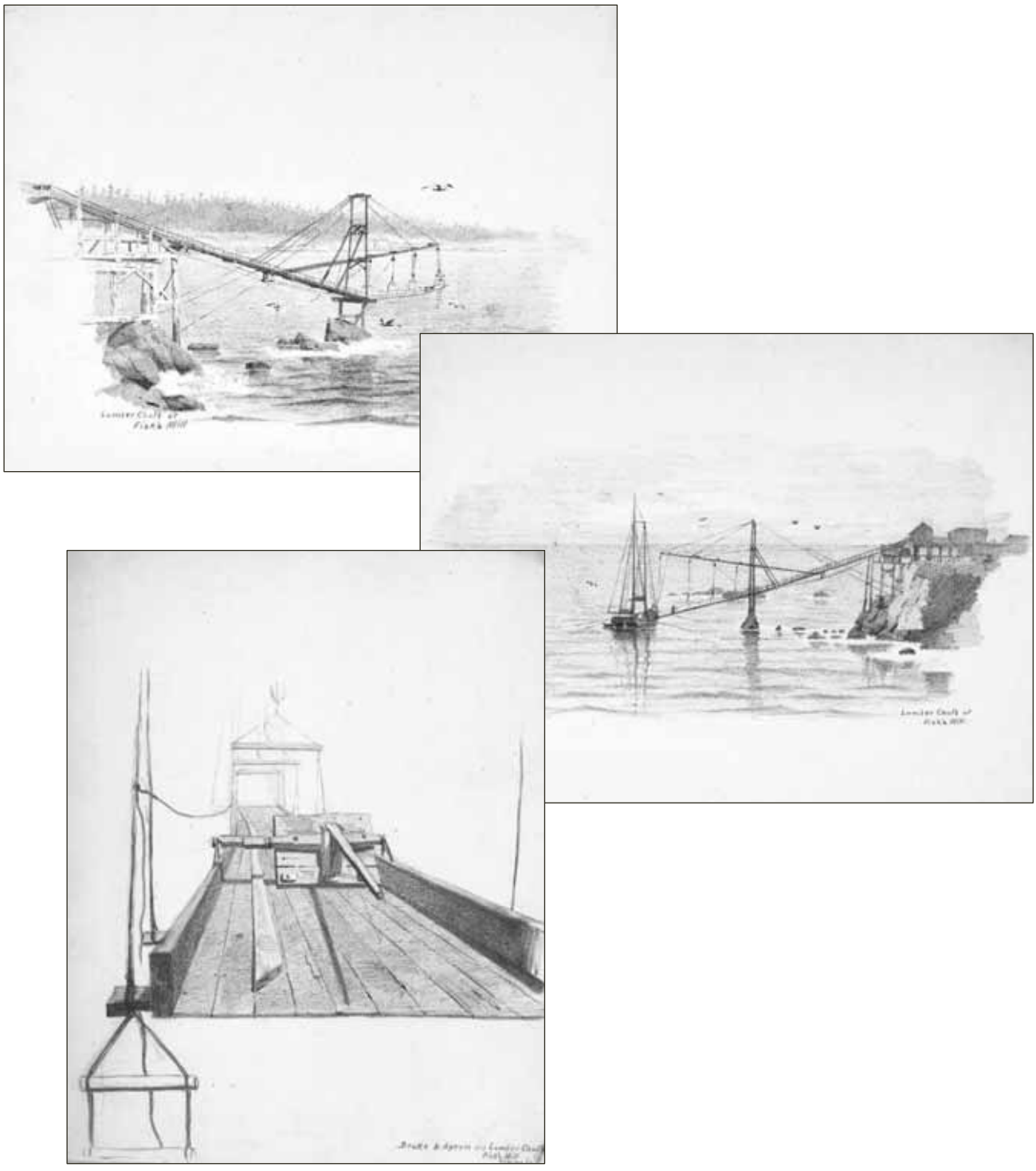
The 1889 Coast Pilot described Fisk Mill Cove and the single chute located on the end of the southern point on the cove's western side. "There is good water here, no hidden dangers, and the three-fathom line lies within one hundred yards of the bluff" (Davidson 1889:261). Vessels of 100 tons could moor there with the best time being in the summer. Four mooring buoys sat around the chute, two located 100 yards from the chute in seven to eight fathoms, the outer one in 12 fathoms about 300 yards to the south/southeast of the chute, and the final one on the south side near the outer rocks, to the west of the anchorage. There was 14 feet of water under the chute, and six mooring lines were available for loading vessels. Shipments included lumber, wood, bark, and posts and lumber originated from Platt's mill, located about ¾ of a mile up the coast (Davidson 1889:261).

Maritime traffic at Fisk's Mill Landing began early with Fisk establishing his mill and chute, which was then followed by Halmke's expansion of the business (Figure 49). By the mid-1860s, newspapers show that schooners including *Two Brothers*, *Eden*, and *Flora* loaded produce, lumber, slats, pickets, wood, posts, shingles, railroad ties, and bark, much of it destined for San Francisco, Vallejo, Rio Vista, Cache Creek, Oakland, and Petaluma. The main customers of products included Higgins & Collins, Ackerson & Co., Bender Brothers, and Funke & Wasserman. Throughout the 1870s schooners continued to frequent the doghole port, and it was not until the early 1890s that there was a decline in shipments with the material mainly carried being wood and bark. By 1910 the shipping intelligence section in San Francisco newspapers does not show any more vessels arriving from Fisk Mill. While the doghole port is referenced as Fisk Mill, it is important to note that additional information about the activities there were uncovered by searching Helmke's name, either in reference to his store or the chute.

Three vessels reportedly sank near Fisk Mill Cove, all of whom were engaged in the lumber trade (Table 9). The career and fate of *Gracie B. Richardson* is an excellent example of a West Coast schooner that was locally built and owned with a loss typical of the coastal fleet servicing the doghole ports. The 70-foot long schooner was built by Matthew Turner in Benicia in 1885 for the Richardson family of Stewart's Point, the next doghole port north of Fisk Mill Cove. It carried loads of lumber products from Stewart's Point to San Francisco over its three years of service. While heading north with general merchandise in 1888, it ran aground on the rocks in foggy weather just north of Fisk Mill Cove. The schooner began to break up, and the three passengers and crew took to its small boat and were safe while the vessel went ashore. It was a total loss at Fisk Mill Cove (San Francisco *Daily Alta California* 1 January 1889).

Table 9. Historically reported vessel losses near Fisk Mill Cove.

NAME	VESSEL TYPE	DATE LOST	LENGTH (FT)	WIDTH (FT)	BUILD DATE	LOCATED
Archie and Fontie	Schooner (2m)	31 March 1902	76.5	25.5	1890	-
Gracie B (Belle) Richardson	Schooner	7 September 1888	-	-	1885	-
Caroline	Schooner	24 January 1876	-	-	1862	-



Source: UC Berkeley, Bancroft Library

Figure 49. Drawings from 1883 of the Fisk Mill trough chute by Charles J. Hittell.

Survey Results

Chute Findings

The survey of Fisk's Mill Landing located several notable features on land linked to the use of the area as a doghole port at the turn of the twentieth century. The only known chute was a trough chute positioned on the western bluff above Fisk Mill Cove, as indicated in historic photographs and maps. The survey confirmed the location of the chute and presence of other structural components to support the chute. The project updated the site record to incorporate additional historic era doghole port features. Of the 24 features identified, 22 were related to the doghole port. The top of the landing covers an area 300 feet wide by 400 feet long in the northwest portion of Salt Point State Park, about ½-mile west of US 1. The main bluff and cliffs/shoreline contain the main locus of remains which range from various hardware pieces to milled timbers and rebates for the chute legs.

The 2016 survey drew upon features recorded by C. Porter (1985) and J. Keswick (1987) but with a more thorough survey of the bluff and intertidal zone for features associated with the landing and chute. Individual features were cataloged, and geographic coordinates recorded to better understand the layout of the doghole port's chute and supporting infrastructure.

Fisk's Mill Landing's single trough chute extended off the southern end of the projecting cliff, on the northwest side of Fisk Mill Cove. Features recorded during the 2016 survey match up with the historical maps and photos that show the chute's support legs extending out to a rock just offshore. A set of cutouts or rebates in the rocks for one of the smaller shore side supports were recorded along with rebates from one of the larger main legs that supported the apron. The chute's orientation can be determined by these two sets of rebates.

The remaining features are comprised of the remains of a log windlass, hardware, and structural material. Aside from the extensive infrastructure remains found at Stewart's Point, the windlass was the only piece of mechanical equipment documented during this survey. The 78-inch-tall vertical log windlass had an iron spindle with some of the surviving wood and associated hardware set into the ground (Figure 50). It is sited 50 feet back from the cliff edge and northeast of the chute. It is unclear how the windlass was used, but its position suggests that it served as a mechanical assist for moving heavy items around the head of the chute. It is possible that the windlass, as a reused piece of ship's equipment, was salvaged from one of the wrecks that took place at Fisk Mill Cove.

The most numerous items recorded are hardware (n=18), all consistent with the types of mooring and chute fasteners found at all the doghole ports. They are either eyebolts, ring bolts, staples, or deteriorated bolts of some fashion. Additionally, a section of braided wire rope, concreated metal fragments, and a cut nail make up the remaining hardware components at the site.

The last group of material is structural in nature and comprised of milled timbers. The deteriorated wooden pieces are varying lengths and widths of unknown origin. Possible uses could have been for the outbuilding or warehouses near the chute or from the chute itself.

Source: NOAA and DPR

Figure 50. Historian inspecting the log windlass at Fisk's Mill Cove Landing.

Project archaeologists conducted one dive within Fisk Mill Cove but did not locate any artifacts linked to the doghole port. A dive was made on the eastern mooring buoy location in 65 feet of water, indicated as an exclamation mark on the 1876 Coast Survey map. Depth at the western buoy location was 90 feet, and the outer buoy was in the surf zone and unreachable. The rough conditions prevented additional underwater work at the site.

STEWART'S POINT LANDING (CA-SON-2717H)

In August 2016 and August 2017, archaeologists conducted a terrestrial and underwater survey of Stewart's Point Landing and Fisherman's Bay to record features associated with the lumbering and ranching era. The spelling of the two locations varies in historical sources and is often referred to as Stewart's Point or Fisherman's Bay. The land is privately owned by the Richardson family with the adjacent waters lying within GFNMS. The site is the most unaltered doghole port identified in the study area and contains numerous well-preserved features, including historic buildings and their contents. Stewart's Point Landing is half a mile southeast of Stewart's Point. The shore is formed of 50-foot-high broken cliffs and closely bordered by many small rocks. The cove opens to the west and measures over ½-mile, north/south, by ¼-mile, east/west, with bluff shores oriented southeast/northwest. The bluff and associated property slopes to the southwest consist mostly of pasture with a few eucalyptus trees adjacent to the Richardson residence and bordered to the southeast by a thin strip of riparian vegetation along Stewart's Creek. The creek discharges directly into Fisherman's Bay. The doghole port had both trough chutes and a

wire chute, all positioned on the northern side of Fisherman's Bay. This is the first known archaeological survey of the area.

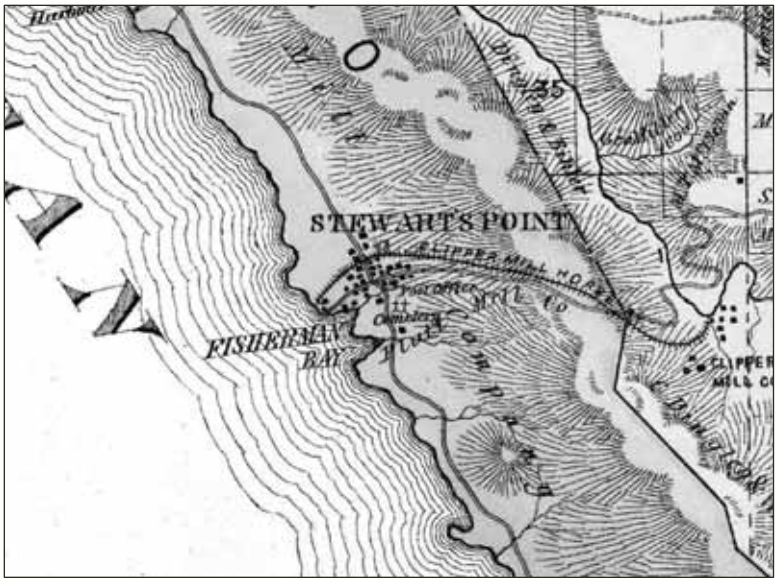
While Stewart's Point Landing is situated on private property, Stewart's Point Store, on US 1, provides a scenic view of the doghole port. The maritime cultural landscape contains a combination of lumber and ranch features, all emblematic of the redwood coasts' diverse heritage. In 2016, the survey team was also fortunate enough to talk with Harold Richardson (1919–2016), grandson of H. A. Richardson, lifelong timberman, and resident of Stewart's Point. He relayed stories of growing up, working, and living at the doghole port. Stewart's Point hotel, school, and store are listed as a Sonoma County Historic Landmark (#109).

In 2016, the team documented the presence of 16 features on the terrace. With the large amount of structures to document, the 2016 goal was to focus on features directly tied to the lumber industry and the shipment of materials out from the landing. In 2017, a more comprehensive documentation of the area's buildings was completed along with a remote sensing and diver survey of Fisherman's Bay. High resolution photography and notes of size and orientation were taken of 16 buildings. Richardson family members were interviewed regarding historic use. The underwater and shoreline survey located 18 features as well as a large windlass and associated shipwreck debris near the mouth of Fisherman's Bay.

Historical Background

When John and Andrew Fisk departed Fisk Mill, they settled at Stewart's Point and built a landing on the western side of Fisherman's Bay out on the headland. This move brought them into conflict with the Stewart and Helms families that had been squatting on land, actually owned by William Bihler. The Stewart and Helms families purchased some of the land they had been occupying from Bihler in the early 1860s, but this transaction did not resolve the situation. Fighting between the settlers over property lines led Tom Stewart to shoot and kill Davenport Helms in 1866. Both of these families moved on, leaving it open for the Fisk brothers. The Fisk's took over managing the store, saloon, and blacksmith shop while also profiting from the expanding lumber business (Rudy 2015:67; Kalani and Sweedler 2004:82). With two mills operating in the area, Platt's and Clipper, just inland of Stewart's, the Fisk's were smart businessmen and constructed three trough chutes at the landing. An extensive network of roads and rail lines connecting the doghole port to the interior mills made moving the material to the shore cost effective (Figure 51; Thompson 1877a).

By 1875, the Fisk brothers' operation was in full swing with a booming mercantile business combined with the three trough chutes and hotel, stated as "one of the best houses on the coast." Stewart's Point was successful due to a number of factors including Bihler owning the surrounding land for cattle grazing and agriculture (mainly hay and potatoes), the nearby Platt mill running a Winter's celebrated self-acting mill with a capacity of 30,000 feet per day, a horse drawn railroad connecting the mill to the landing, and chutes that supported eight schooner visits per week. The vessels frequenting the doghole port included *Ida Florence*, *Emily Schroeder*, *Susie*, *Sky Lark*, *Champion*, *Mary Deleo*, *Napa City*, *Emma and Louisa*, *Geo. Lewis*, *Phoeba Fay*, and *Tartar*. There is also a report of a scow schooner *Mose* stopping there to load lumber for Santa Ana and Newport in southern California (*Sonoma Democrat* 24 July 1875). Stewart's Point Landing at Fisherman's Bay was the most active doghole port of the county at the time (Figure 52) with an annual value of goods shipped out



Source: Thompson 1877

Figure 51. Historical atlas map from 1877 shows the network of roads and rails between interior mills and the landing at Fisherman Bay.

Source: California State Library

Figure 52. Trough chute with schooner loading tanbark at Stewart's Point Landing.

at $107,000, comprised mainly of lumber at 9,000,000 feet (valued at $90,000) followed by 1,000 cords of tanbark and 1,000 cordwood (*Sonoma Democrat* 2 January 1875). Other types of material included posts, fencing, and railroad ties. J. C. Fisk also built a shingle mill with a capacity to turn out 30,000 shingles a day (Thompson 1877b:100; Alley, Bowen & Co.1880:379).

The Coast Survey T-sheet dated 1878 shows the level of development at Stewart's Point and the extensive chute system (Figure 53). The three trough chutes extended into the bay with a rail line leading out to the two outer ones and a road to the inner one. Over a dozen buildings of varying sizes were situated on the bluff. Four mooring buoys were used for securing the vessels at the chutes or while waiting to load. Back to the east, near present-day US 1, sat the rest of the community infrastructure. More than 30 buildings comprised the main center of business at the intersection near Skaggs Spring and included Stewart's Point Store, still a popular stop today.

Source: NOAA's Historic Map & Chart Collection

Figure 53. U.S. Coast Survey "T" sheet map 1878, showing Stewarts Point/Fisherman Bay.

In 1881, Herbert Archer Richardson, known as H. A., bought out the Fisks and slowly developed his empire that would rival the Call's at Fort Ross. Richardson had worked for the Fisks as a bartender and saved enough over a couple of years to purchase the enterprise. Stewart's Point would become an entire family operation with four generations living and working there, up until Harold Fontaine Richardson's passing in September 2016. H. A. controlled both the production and shipment ends of the lumber industry with his doghole port connected to thousands of acres of prime forest. Fisherman's Bay made an excellent place for the chutes and was more protected than other locations along the coast. Richardson also ran a large railroad tie operation which became one of the main sources of income. Eventually, he bought the horse drawn railroad to further control the market. To round out his industry, Richardson owned several vessels, both sail and steam, to carry cargoes to San

Francisco. They included *Vanguard*, *Gracie Belle Richardson*, and *Arche and Fontie*. Historian Lynn Hay Rudy wrote the following about H. A.'s no-nonsense personality.

> H. A. Richardson was successful, but not generally popular with the locals. Many preferred to ship their ties and farm produce from Fort Ross. He is said to have brusquely told the novelist Jack London to wait for a hotel room until he unloaded the schooner. London rode on (Rudy 2015:72).

The 1885 survey by Thomas Peterson and the *Pacific Coast Pilot* from 1889 describe Stewart's Point as having only the middle chute in working order. The outer one had been condemned after being damaged while the inner one was inoperable due to a broken apron. Three vessels up to 125 tons could stop there at one time in the summer months, while only a single 100-ton vessel would be safe in the winter. Overall, the Richardson family kept their facility in good order, and the moorings were regularly overhauled. Vessels sat broadside to the chute with seven mooring lines (numbers 5–11) securing them in place. Four mooring buoys with anchors (buoys 1–4), sat in the bay with two inside the entrance, and two outside in deeper water.

Buoys and mooring points are described by Peterson as follows. Buoy 1 was secured to a 2,500-pound anchor with 15 fathoms of 1½-inch (the half closer to buoy) and 2-inch chain (the half closer to anchor). This anchor was used for vessels to sail from or as an anchorage if the chute was already occupied. Buoy 2 was connected to an 1,800-pound anchor. It had 15 fathoms of chain, half were 1½-inch links and the other half were 2-inch links. The buoy was also for vessels awaiting the chute. Buoy 3 was secured with an 1,800-pound anchor and 12 fathoms of both 1½-inch and 2-inch chain. It is used to secure a vessel's headline and to sail from in a northwest wind. Buoy 4 had a 1,500-pound anchor with 10 fathoms of 1¾-inch chain used for the port bowline. Mooring 5 was a 1½-inch ring bolt with a short segment of 1¼-inch chain set in an offshore rock for vessels not at the chute, but needing another attachment point. Mooring 6 was a 2-inch ringbolt in the rocks with 2 fathoms of 1-inch chain for the headline. Mooring 7 was a 1½-inch ringbolt in the rocks, on the southern side of the cove, across from the chute, with 2 fathoms of 1-inch chain. Lines from a loading schooner's bow were secured here when there was a swell. Mooring 8 was a 1½-inch ringbolt in the rocks used for the starboard bow breast line. Mooring 9 was a 1½-inch ringbolt in the rocks with 2 fathoms of chain and used for the port quarterline. Mooring 10 was a 1½-inch ringbolt hammered into the rocks with 2 fathoms of 1-inch chain for the port stern breastline. Mooring 11 was a 1½-inch ringbolt in the rocks for the starboard quarterline. The extensive mooring system at the Stewart's Point Landing provided vessels with more than enough holding making it a popular and secure destination. Approximately 25 schooners visited the chute per year to load wood, posts, tanbark, and shingles (Davidson 1889:262–263; Peterson 1885).

Around the turn of the century, railroad ties became one of the main products shipped out of Fisherman's Bay. The Richardsons adapted to this product and technological advancements by building a wire chute there by 1909. They also embraced the use of steam schooners to continue the doghole port's business (Rudy 2009:58–59). The horse drawn railroad was replaced with a steam locomotive to bring lumber from the Gualala River, making the doghole port's lifespan last longer than most. H. A. Richardson expanded the influence of Stewart's Point by having a local Wells Fargo stop at the store as well as having one of the few places where you could make a telephone call at the turn of the century.

Richardson opened a campground along the ocean on the southern end of Fisherman's Bay. He also installed gas pumps at the store around the same time the coast road was being paved, allowing visitors a place to affordably stop during tough economic times. While the lumber schooners and steam schooners visited the doghole port to load lumber, they were not empty when arriving. Their holds were filled with all the necessities for life in the community as well as for running a successful and well-known hotel and saloon, including ice and foodstuffs. Richardson's ownership of so many vessels kept the costs down when importing supplies and must have contributed to his overall profits. As with the other doghole ports, the chutes at Stewart's Point Landing ended their life around 1925 when ranching took over as the main source of income for the region. The accessible forest had all been cut and so the Richardson's again adapted. The Richardson family continues to use the property for ranching today (Clark 2009:43–58).

Stewart's Point Landing had a high volume of maritime traffic during its long doghole port career, probably only second to the number of vessels that called at Fort Ross Landing. Due to consistent traffic in the cove, the area has the greatest number of historically reported losses (n=18). The newspapers are filled with vessel arrival and departure information for Stewart's Point, signifying a busy port. The hazards of working along the Sonoma coast are evidenced by the stories of wrecked vessels. One of the losses included the 68-foot long schooner *Gracie Belle Richardson* owned by H. A. Richardson and Higgins and Collins of San Francisco (Table 10). While moored under the lumber chute waiting to load, the wind began to blow turning into a gale with heavy seas. One of the lines parted and the vessel swung under the chute and broke free, ending up on the rocks on 16 November 1889. All the crew was saved but the schooner was a total loss. It was only six months old, having been built by George G. White of San Francisco with a carrying capacity of 100,000 feet of lumber (*San Francisco Chronicle* 19 November 1889).

A little over a decade later and emblematic of the port's shift to steam schooners and railroad tie cargos, the steam schooner *Ruth* met a similar end on 12 November 1903 while loading ties for San Pedro. It was owned by George D. Gray and Company of Oakland. Heavy surf tossed the vessel and parted its mooring lines. The 15-man crew was all saved, but *Ruth* ended up on the reef and was not salvageable (*Oakland Tribune* 12 November 1903). Both the *Gracie Belle Richardson* and *Ruth* were illustrative of the dozens of vessels that called at this port supplying building materials and other wood-based products to a growing nation.

Survey Results

Due to the long-term ownership of Stewart's Point by the Richardson family, and their continued use of the property for lumbering, ranching, and agricultural pursuits since the 1880s, preservation of the structures and their contents is remarkable. Equally important is the family's knowledge of their history. This is the only largely intact doghole port left on the Sonoma coast. There is no other site in Sonoma County that even comes close to the large-scale preservation of a doghole port's cultural landscape and infrastructure. The 2016 and 2017 project documented as much as it could during the limited field visit, but a more thorough investigation and documentation is warranted. Shortly after the project team's visit in 2016, the property's owner, family patriarch, historian and preservationist, Harold Richardson passed away. The future of Stewart's Point is unclear. Fortunately, Mr.

Table 10. Historically reported vessel losses off Stewarts Point Landing.

Name	Vessel Type	Date Lost	Length (ft)	Width (ft)	Build Date	Located
Abraham Lincoln	Schooner (2 masts)	15 March 1881	73	22	1864	-
Albion	Steam Schooner	21 March 1913	120	31	1892	-
Annie	Schooner	February 1871	-	-	-	-
Charles T Winslow	Schooner (2 masts)	14 February 1885	-	-	1864	-
George Henrich	Schooner	28 March 1871	-	-	-	-
Gina (Jennie) Reed	Schooner	17 November 1861	-	-	-	-
Gracie Belle Richardson II	Schooner	16 November 1889	68	24.5	1889	-
Huichica	Schooner	28 March 1871	-	-	-	-
Kate Piper	Schooner	1871	-	-	1868	-
automobile fell off during transit of *Mae Hyman*	Gas Schooner	23 February 1921	59.5	16.4	1920	Yes
Mary Etta	Schooner	26 February 1905	71	23	1891	-
Minerva	Schooner	28 March 1871	-	-	-	-
Pet	Schooner	April 1866	-	-	1865	-
Pinole	Schooner (2 masts)	14 November 1873	-	-	-	-
Portia	Schooner	15 October 1894	75	23.2	1888	-
Ruth	Steam Schooner	11 November 1903	151	33.5	1898	-
Susie	Schooner	15 February 1876	-	-	1872	-
Wild Pigeon	Steamer (built as a schooner)	17 November 1870	116	-	1853	-
William	Schooner	20 February 1871	-	-	-	-

Richardson's oral history has been documented and his stories passed down to relatives still living in the area. The entire team was honored to be able to meet Mr. Richardson in 2016 and hear some of his recollections of life at the landing. We also thank Lois Faulk, Harold's niece, and Dan Faulk, Lois' son, who permitted the team to access the property in 2017 and continue the terrestrial work along with conducting remote sensing and diving operations off the beach in Fisherman's Bay, a truly memorable experience.

Chute and Building Findings

In 2016 and 2017 the project had access to Stewart's Point Landing to conduct both land and underwater survey work and to record the doghole port features including buildings, some of the building's contents, chute remains including mooring points, and associated submerged archaeological resources. In total, the team recorded 16 buildings, 16 additional features, nine chute moorings, remains from a car, a segment of chain in the intertidal, and cement fragments. The only item located underwater believed to be linked to the chute was a pile of iron rails and other indeterminate iron pieces located under the location where the

wire chute discharged or received from a waiting vessel. The team hypothesizes that the rails were being sent ashore and were accidentally dropped into the water.

Overall, the property still retains much evidence of its use as a doghole port. Archaeologists found railroad and road grades, evidence of the wire chute's supporting timbers and associated materials like wire rope, rail tracks, travelers, the mooring hardware located around the shoreline, a small building adjacent to where the chute sat, and stacks of railroad ties near the bluff. As the property owners adapted their use of the land after the chute's closure in the 1920s to ranching, the lumber related buildings and infrastructure were reused for different purposes. Many of the buildings still standing today were first built and utilized during the doghole port era for business and domestic life, such as the residence, saloon, and hotel. Newer buildings were constructed to support the ranch and were also included in this survey to capture the full extent of the property's heritage. All of the recorded features and buildings are positioned between US 1 near the Stewart's Point Store and the bluff's edge to the southwest and a fence running northeast/southwest on the far northwest side of Fisherman's Bay.

The main buildings directly associated with the chutes include two warehouses positioned on the bluff overlooking the bay, as depicted on the 1878 Coast Survey map. The eastern warehouse, measuring 24'2" by 56'9," sits next to a pile of timbers from the collapsed wire chute (Figure 54) and contains items directly associated with the chute. Contents include block and tackle, turnbuckles, spools of wire rope, a two-wheeled traveler for running on the wire chute line, assorted hardware, and tools for moving logs. The warehouse also holds items from the steam schooner *Klamath*, wrecked in 1921, which the Richardson's were involved in salvaging near Del Mar Landing. The items include the vessel's name board, lifejackets, life ring, and ship's ladder along with other lifejackets from the steamer *Unimak*, a steam schooner owned by the Richardsons in the 1920s.

The western warehouse, measuring 36½ inches long by 20½ inches wide, sits on the bluff edge and also contains material linked to the lumber chute and doghole port activities. It is the southernmost structure at Stewart's Point Landing. The building can clearly be seen on the 1878 Coast Survey map as a rectangular structure with an "X" through the middle. Items inside are two woven baskets used to put on the wire to transport people or materials, shake shingles, ship's blocks, a large circular sawblade, oxen yokes, and wire rope. As with the other building there are miscellaneous ship parts such as a sail, skylight, ladder, ventilator pipe, and a barrel stand from the steamer *Unimak*. A stack of railroad ties located next to the building appear ready to send down the wire to a waiting vessel (Figure 55).

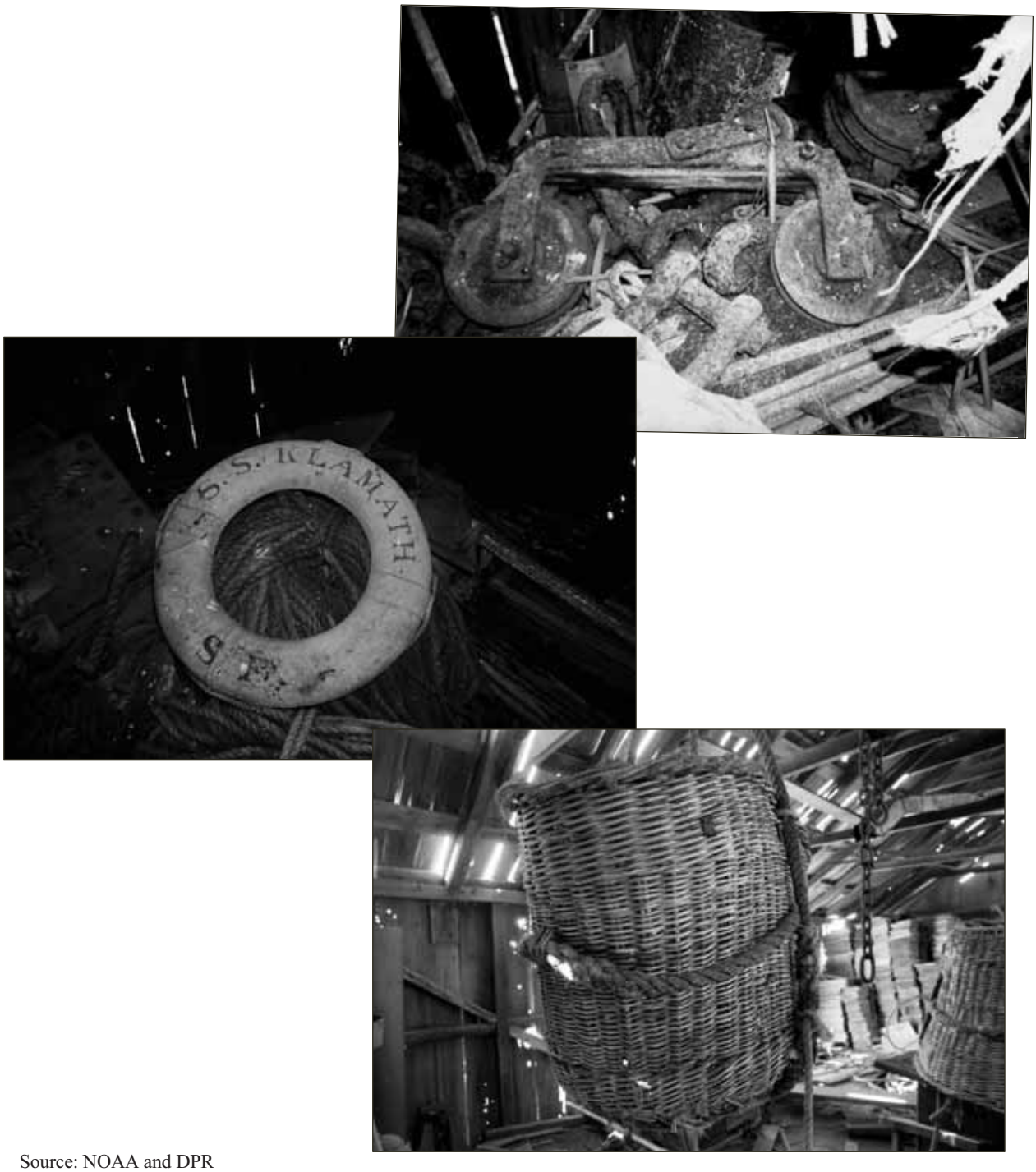
Sixteen features on the bluff were identified in the survey and include elements associated with the wire chute itself, piles of material such as railroad ties, milled wood, fence posts, bricks, and other singular features (water tank, feed bin, etc.). Railroad grades/roadbeds that run through the property provide continuity and information on transportation routes as material was moved from the mill to the chute. Other features are directly related to ranching activities such as a feed trough and livestock chute. Items related to local infrastructure like fence posts, milled timber, telephone poles, and bricks represent features associated with community infrastructure. Isolated landing sites needed to manufacture or ship all the items needed to build and maintain their facilities so it is not unusual that stockpiles of these types of items would be present on the Richardson property.

Source: NOAA and DPR

Figure 54. Project archaeologist documenting chute remains at Stewarts Point Landing.

Source: Jasinski

Figure 55. Stacked railroad ties near landing site.



Source: NOAA and DPR

Figure 56. Select items noted inside Stewarts Point warehouses including two-wheeled traveler (top), life ring stamped with "S.S. KLAMATH/S.F." (center), and cargo basket (bottom).

The features most important to the chute are the railroad terminus leading to the wire chute loading platform, the collapsed chute timbers and rails, and an indentation in the land for the outer trough chute. The wire chute loading platform is located at the southern tip of Stewart's Point Landing, next to the warehouse, indicating the location of the wire chute on the bluff edge where the middle trough chute would have previously been located. The fact that this site was used initially for the trough chute and later by the wire chute indicates that it was a good location and suitable for loading awaiting schooners. The wire chute replaced the trough chutes because it could move more cargo at a faster rate, as well as being easier and cheaper to operate. This coincided with the increased use of steam schooners and steamers which were more maneuverable, could hold more cargo, remain on a steadier timeframe, and required less men to operate. The last feature directly related to the chutes is a manmade cutout that slopes down the cliff face and likely represents the location of the outer trough chute. That chute proved to be in a less than ideal position and by the mid-1880s, it was out of use and condemned.

The survey extended into Fisherman's Bay, east of Stewart's Point Landing, accessed by way of a dirt road terminating at a cobble beach at the water's edge. Team members visually surveyed the shoreline, offshore rocks, and both sides of the beach, searching for evidence of port-related artifacts and features. The historic maps depicted a number of mooring related eyebolts and chain. Archaeologists documented nine mooring hardware pieces in the rocks on both sides of the beach as well as the remains of a car and other disarticulated material. The hardware consists of stud link iron chain, staples, and eroded eyebolts, all of which would have been used to secure vessels under the chute.

In addition to the mooring hardware, iron portions of an automobile were found at several locations, scattered among the rocks on the north side of the cove. It may have been pushed off the cliff or washed ashore. There were two axles and wheel hubs, an engine block, and unidentified metal debris. Lastly, there were cement blocks and broken up metal rebar pieces on the rocks. A brief hand-held metal detector survey in the intertidal zone at Fisherman's Beach located a small segment of iron chain. There is no indication as to whether this chain was related to the mooring hardware, other maritime uses, or a shipwreck.

Fisherman's Bay Survey Magnetometer Survey – 2017

Upon arriving on the Sonoma Coast, the project team had the great fortune to learn that they would be able to access the road leading down to Fisherman's Bay through the Richardson property. Having perfected beach launching the IRB at Fort Ross, the team determined that a magnetometer survey would be the most effective way to locate doghole port infrastructure and shipwrecks in the bay. On 17 August 2017, Lawrence and Carey navigated survey lines set at 10-foot intervals, plotted to run northwest/southeast along the longest axis of the bay. Additional survey lines were plotted to investigate the northern arm of the bay; however, the remote sensing team quickly found that submerged rocks in the area prevented successful line spacing. The equipment and methodology were the same as used in Fort Ross Cove.

The survey covered an area of 0.04 square miles, 6 miles, and detected 14 anomalies that were likely anthropogenic in nature. Several of the anomalies appeared clustered and likely caused by recording the magnetic field variation from a single source on more than one survey line. Unlike Fort Ross Cove and the massive magnetic signature of *Pomona*, all

anomalies detected in Fisherman's Bay were of interest. The analysis was conducted in the field to provide locations for divers to ground-truth the following day.

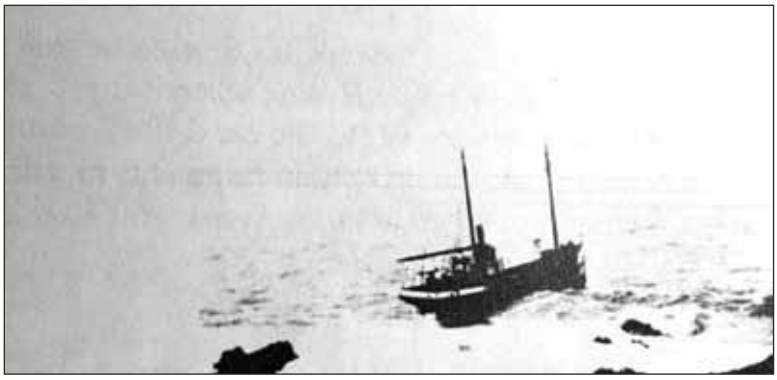
Upon completion of survey activities, the research team returned to its field base near Fort Ross. In the process of preparing equipment for the following day, lifeguard Ross Carey found that the IRB outboard would no longer start. On the morning of 18 August, the team took the IRB to the DPR district mechanic who revealed that only one of the engine's two cylinders had been working all week and that the remaining cylinder had failed. Lacking an outboard, the team determined that several closer anomalies could be safely investigated by diving from shore and/or paddling the IRB.

After returning from the field, Matthew Lawrence analyzed the magnetic survey data with the NPS/BOEM Marine Magnetic Survey Toolkit for ArcGIS. This analysis created a color-shaded magnetic anomaly map for the survey area in which the gradient between magnetic readings was displayed through a classified color ramp. The map depicts the greatest change in positive magnetic readings as bright red and the greatest negative changes in the gradient as dark green. Changes of plus or minus one gamma were set as a null color to highlight the more significant changes. The gradient change processing revealed distinct loci along the north side of the cove, pinpointing an area for underwater investigation.

During swim surveys near the inner chute's apron end, off the landing's eastern side, two dive teams located material 150 feet from shore. It likely represents cargo that fell from the chute during loading/unloading of vessels or from material falling down from above as the chute deteriorated. Railroad iron, a pulley, and other unidentified iron objects lie on the seafloor. The car parts identified as part of the shoreline survey could represent an automobile that reportedly fell off the 59-foot-long gas schooner *Mae Hyman* when it capsized after hitting a submerged rock on 23 February 1921. The characteristics of the engine block and drive train fragments match that of a 1920s era car. The schooner was en route from San Francisco to Point Arena with 40 tons of cargo when the car became loose and fell off (*Healdsburg Tribune* 24 February 1921; Dillon 1965).

Maritime Heritage Resource Survey

The swim surveys help to identify a shipwreck site located 250 feet from shore, directly south of the southern warehouse. Divers report a large windlass with chain and a hawse pipe along with iron debris. Only one reconnaissance dive was conducted at this area, so more information will be needed to assess the extent of the site and possible vessel identity. The large size of the windlass, chain, and hawse pipe suggests that the vessel was most likely a steam schooner as smaller schooners would not have been equipped with such substantial machinery. Based on historical accounts of vessel losses, there are three steam schooners that sank in Fisherman's Bay, the 116-foot long *Wild Pigeon* built in 1853 and sank in 1870, the 151-foot long *Ruth*, built in 1898 and sank in 1903 (Figure 57), or the 120-foot long *Albion*, built in 1892 and sank in 1913.



Source: San Francisco Maritime National Historical Park E03 18,744n (SAFR 21374)

Figure 57. Steam schooner *Ruth* fighting the waves before sinking in Fishermans Bay.

BIHLER LANDING/BLACK POINT (CA-SON-2680/H)

In August 2016, archaeologists conducted a terrestrial survey of Bihler Landing at Black Point to record the historic features associated with its use as a doghole port. The land is privately owned by The Sea Ranch with the adjacent waters lying within GFNMS. Historical records show that there were two trough chutes followed by a single wire chute located on the bluff as indicated in survey maps and illustrations. The landing site is located approximately ½-mile west of US 1 and 23 feet southwest of the public coastal access trail. The Sonoma Coast Doghole Ports Project recorded evidence of the historic use of the landing to better understand its role in the larger doghole ports landscape along the Redwood Coast.

The 2016 survey recorded 24 historic features at Bihler Landing with elements associated directly related to the lumber chute and includes hardware and wire, cutouts or rebates for the chute supports, wire winch and associated components, a bitumen slick, structural timbers and a drilled socket. These remains provide information to place the chutes within the landing context and show the past use as an industrial site. They coincide with maps from the late nineteenth century and show landing layout and orientation.

Historical Background

Bihler Landing occupies a narrow cove four miles north of Stewart's Point Landing with limited shelter for moored vessels. In 1875, William ("Dutch Bill") Bihler and David L. Brown Ross bought a section of land along the coast with the intent of profiting from the booming lumber business. They built two trough chutes; at the time the area was referred to as Black Point. The name was later changed to Bihler Landing in reference to the property owner at the time. Ross was the foreman of the Gualala mill and was key to running the operations at Bihler Landing. Bihler, known mainly as a cattleman, chose not to use the chute for his ranching pursuits with only timber products moving by way of the ocean highway. His cows went overland to market (Rudy 2009:59–60).

The construction of the chutes by Bihler and Ross caused a tremendous amount of growth in the surrounding area. The 1879 U.S. Coast Survey T-sheet depicts two trough chutes and at least a dozen buildings at the doghole port and three main roads out on the

point, two leading to the chutes (Figure 58). The roads connect into the timber land to the east where material originated from and into the town of Annapolis. The buildings at the landing included a hotel, livery, blacksmith shop, sheds, and additional warehouses to support the chute operations. Over the next 10 years the community expanded and added a post office and wagon maker. Two mooring buoys, one near the outer chute and one farther out, are also drawn in pencil on the map. In addition to wood products, the landing shipped out considerable quantities of produce (Clark 2009:27; Lindstrom 2014).

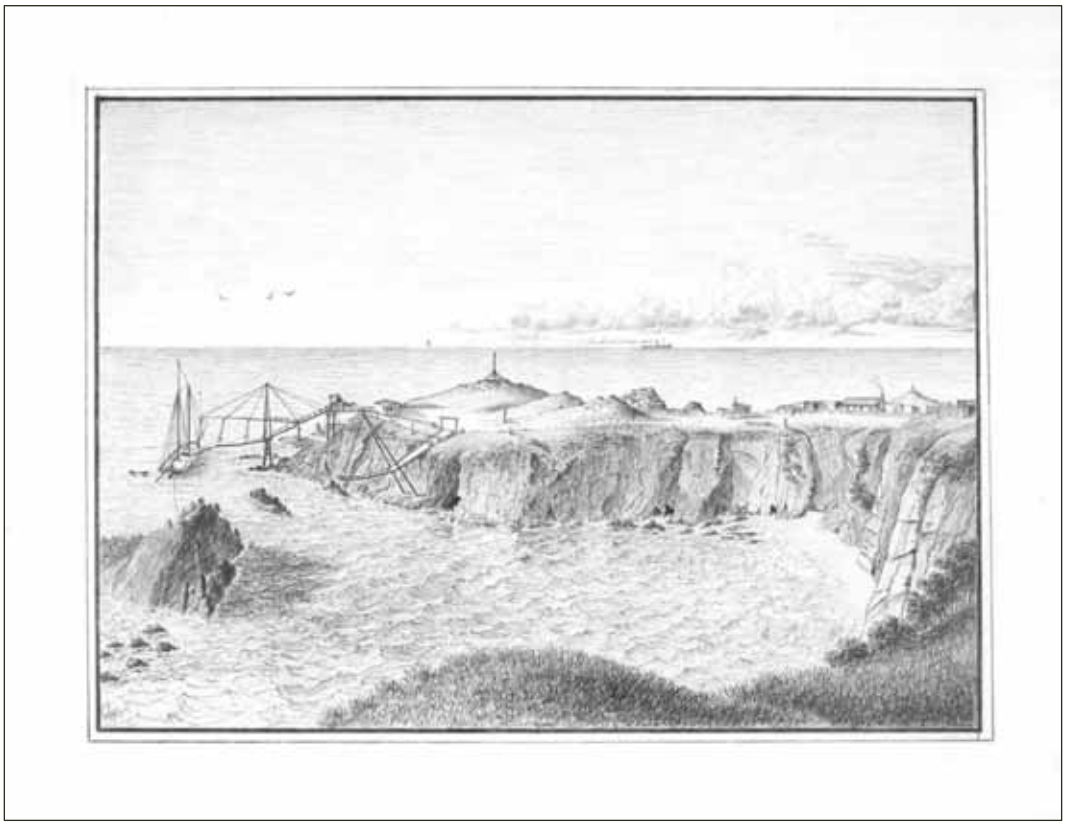
Source: NOAA's Historic Map & Chart Collection

Figure 58. U.S. Coast Survey "T" sheet map 1879.

In November 1885, Thomas Peterson surveyed Bihler Landing and described the moorings system in detail. The port had no shelter from northwest to southeast winds and the breakers close to the chute made loading vessels difficult. Peterson commented that the moorings were not well looked after compared to other places. The chute was apparently leased to Ross and he felt that the owner, Bihler, was not going to put any money into mooring maintenance. The map depicted two trough chutes, with only the outer one in use, three underwater anchors with surface buoys, and four mooring points in the surrounding rocks. Mooring 1 was a 2,000-pound anchor with 15 fathoms of 1¼-inch chain, referred to as the southeast mooring, used for a vessel to sail from. It is located the farthest out from shore. Mooring 2 was a 1,600-pound anchor with 2 fathoms of 1¼-inch chain used to secure the headline while under the chute. Mooring 3 was a 1,200-pound anchor with 10 fathoms of 1¼-inch chain for the port bowline. Mooring 4 was a 2-inch ringbolt with 4 fathoms of 1¼-inch chain for the starboard bowline. Mooring 5 was a 1½-inch bolt with 2 fathoms of wire rope and 2 fathoms of $^{7}/_{8}$-inch chain used for the starboard quarterline. Both moorings were located on the same side as the chute, while the final two moorings, numbers 6 and 7, were in the rocks across the cove on the opposite side. Mooring 6 was a 1½-inch ringbolt with 2 fathoms of "old" 1-inch chain for the sternline. Lastly, mooring 7 was two turns of 3½-inch wire rope around a spur of rocks used for the port quarterline (Peterson 1885).

In 1889, five schooners a month loaded at Bihler Landing from the outer trough chute, which was the only one still operational. Material shipped out included wood, posts,

tanbark, and stave bolts. The *Coast Pilot*, published in the same year, states that the chute extends from the bluff into 23 feet of water, with six mooring lines to hold a loading vessel in place under the apron. The stability of a vessel to remain in place was essential as breakers were close to the starboard side as well as 50 yards to the east with a constant swell. Three mooring buoys were present, the inner one 100 yards from the chute and the other two farther outside. The unsheltered cove (Figure 59) only permitted use during the summer season as large swells in the winter made it unsafe between October and June (Davidson 1889:263).



Source: UC Berkeley, Bancroft Library

Figure 59. Drawing of the chutes at Bilher Landing by Charles Nystrom ca. 1880.

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 became too large for him to manage on his own. The County Directory in the mid-1880s recorded only 61 permanent residents at Black Point, while many laborers were probably seasonal depending on the lumber and ranching seasons. Knipp and Stengel eventually purchased the land in 1896 and remained active through 1901. The post office at Stewart's Point was moved to Bihler Landing in 1889 with the expansion of Knipp and Stengel's business. They managed to acquire 6,000 acres of Bihler's land and sold large amounts of beef to the local mills for more than 40 years (Clark 2009:29, 71).

The next owners of Bihler Landing were the Bender Brothers who used the landing north at Del Mar for their products, but it is likely that smaller ventures might have used the

chute at Bihler during that time. Timber broker Walter Frick was the final owner of the landing during the doghole era. He ran the chute, now a wire one, through the late 1910s. By 1926, the chute and landing had been abandoned, and the remaining Black Point population soon followed suit and moved on (Clark 2009:60). A 1929 survey of the California coastline near Bihler Landing shows that by this time the Black Point community was gone, along with the landing's structures located out on the bluff. Maritime traffic at Bihler Landing ramps up in the mid-1870s with the construction of the trough chutes. One of the first mentions of a vessel bringing lumber to San Francisco from there is in August 1876 when the schooner Skylark carried 73 cords of wood to Funcke and Company (*Daily Alta California* 26 August 1876). From then on, schooners made trips to the doghole port to load cordwood, stave bolts, bark, and posts for clients including Higgins and Collins, the Bender Brothers, and Johnson and Jensen. Other cargoes reported to be shipped from Bihler's, not seen at other places, were cat wood and grape vine sticks. The overall frequency was far less than landings at Fort Ross or Stewart's Point, but its chute did contribute to the overall economic success of the Redwood Coast. By 1900, steam schooners had emerged on scene at Bihler Landing, which probably coincided with the transition to a wire chute (Figure 60). The steamers *Gualala*, *Redwood City*, and *Navarro* are just a few of the vessels that visited the doghole port. After 1905, San Francisco newspapers did not report shipping information from Bihler Landing, indicating the slow decline in its use. Of special note, California newspapers often referred to the landing as Bihler Point.

Source: Fort Ross Conservancy

Figure 60. Wire chute replaced the trough chutes at Bihler Landing around the turn of the twentieth century.

Survey Results

Bihler Landing is a double-headed point with 50 feet high cliffs with a rocky coastline and submerged reefs. The cliff bases near the tidal zone are covered in mussels and kelp, obscuring some of the potential shoreline features. The California Coastal Trail runs in front of Black Point Grill at Sea Ranch Lodge, where a trail connects with it, leading down to the landing site at the coastline. A large open meadow leads down to the location of where the buildings and chutes were positioned on the eastern and southern sides of the headland. The bluff has been modified by grading to accommodate the roads that once serviced the doghole port.

Chute and Building Findings

Twenty-four features were identified at the Bihler Landing site that relate directly to the doghole port. The two trough chutes were both located on the eastern side of the landing with the outer one, the only one really used, pointing to the southeast. The wire chute was located at a different place, on the southern end of the headland past the bottleneck. Overall, the features encompass an area that spans 500 feet long by 250 feet wide.

The most numerous type of feature documented were the hardware associated with both the trough chutes and the wire chute. Features include eyebolts, a hook, iron fasteners such as unidentified pins or other metal fragments, and wire cable. These are scattered around the entire survey area and are part of the mooring system or part of the cabling to secure the chutes to shore.

There are wooden timbers protruding from the cliff face that are also likely linked to the chute's decking, its platform, or structural components. These line up with three cutouts or rebates in the rocks that supported the chute legs and help determine the orientation of the trough chutes. On the other side of the narrowing or bottleneck in the headland sat the wire chute as indicated by a large depression of graded surface where the wire and winch house sat. There is evidence of the platform and base where the wire winch would have controlled the descent of cargos, sent down the wire chute. Another feature is a circular drilled out socket and may represent a place where one of the wire chute platform's legs once sat. This was the only one of its kind located at the site. Lastly, there is a spill of bitumen, or asphalt embedded with pieces of milled timbers, bottle glass, and wire rope (Figure 61). This could have been in a barrel shipped in or already at the landing site. In order for the bitumen to end up flowing down the cliff it must have been exposed to extreme heat.

Bihler Landing had a similar number and variety of features as compared to other doghole ports documented during the project. Evidence of both its trough and wire chutes were found. The preservation at the landing is moderate as it was likely sanitized to remove rusty machinery and fragmented wood detracting from The Sea Ranch views. It is heavily visited by the public who walk out to the cliff edge. Fortunately, The Sea Ranch has protected several structures from the Black Point settlement including the hotel's livery stable just inshore of the landing as well as the Knipp-Stengel barn near US 1, which is listed on the National Register.

Source: NOAA and DPR

Figure 61. Archaeologists recording one of many chute features at Bihler Landing.

DEL MAR LANDING AND DEL MAR MILL (CA-SON-2681H AND CA-SON-2716H)

The Del Mar doghole port has two components, the landing site as well as the location of a lumber mill located on the bluff just south of the chute. Due to the proximity of the two sites and relationship between them, they will be discussed within the same section for the purposes of this report. In August 2016 and August 2017, archaeologists conducted a terrestrial survey of Del Mar Landing and Del Mar Mill to record the doghole port's historic features. The land is privately owned by The Sea Ranch community with the adjacent waters lying within GFNMS. The landing historically only had a single wire chute located 10 feet seaward of the California Coastal Trail, just north of post 58 (Sea Ranch sign 35E-5) and ½-mile west of US 1. The mill is also accessible from the Coastal Trail, between post 57 (Sea Ranch sign 35E-6) and post 56.

Survey of Del Mar Landing identified six features, consisting of a single timber beam extending out from the eroded cliff at a 90-degree angle, a segment of a vertical timber with concrete used as a footing, a cutout or rebate for a vertical timber along with three *in situ* hardware. The exposed setting of the doghole port is subjected to strong winds and rough seas with no protection, resulting in a higher level of deterioration compared with other project locations. The Del Mar Mill site is situated 400 feet to the south and is comprised of four main extant features, the foundation of the mill's engine house, a log skid landing area,

an elevated narrow-gauge railroad, and a scatter of several metal artifacts located in the intertidal zone, below the main mill complex.

Historical Background

During the summer of 1849, Charles Meyer and William Benitz contracted with Henry Hegeler to build a landing near Del Mar Point. Frederick Hugal had already established a barn or warehouse there, so the men teamed up (they were already partners in the German Rancho) to ship produce. The landing was most likely temporarily abandoned when Meyer and Benitz sold the Rancho in 1855. It was not until 1898 that activity resumed in the area and a more modern landing was constructed. The Coast Survey maps from the late 1870s do not show any landing or development near Del Mar.

Lumbers dealers William and George Bender installed a wire chute at Del Mar Landing around 1898, and in 1903, acquired the 3,200-acre Knipp-Stengel Ranch and the 985-acre Rutherford Ranch. They built a large mill, Del Mar Mill, to the south along the bluff. The mill had several buildings associated with it including a powerhouse with a steam engine to operate the saws and machinery. Materials shipped out on vessels by the wire chute included tanbark, railroad ties, fence posts, shingles, and cordwood. They also added a saloon, store, and warehouse adjacent to the country road to dry and store the milled lumber prior to shipment.

The Bender Brothers (operating as the Bender Mill and Lumber Company) had financial problems soon after the mill was built, so logging and mill operations were given by the court to Frank Glynn and Hans Peterson. The small community at Del Mar lasted only a few years but was mildly successful. Workers from the closed Gualala mill and nearby Annapolis came to Del Mar and settled there to work, residing in bunkhouses or cabins. A rail line reached from Del Mar Landing to the creek, north of the Knipp-Stengel barn and eventually Del Mar Mill. After logs were cut inland, they were pulled with oxen onto log skid roads to the rail line where they were loaded on rail cars and shipped to the mill for processing. The log skids were still in place until the 1980s when sewer work crushed them (Rudy 2009:61).

Del Mar mill burned on 28 June 1910. The spark that ignited the blaze came from a locomotive moving railroad ties to the landing. The mill's closure caused the slow demise of the landing's business. With the destruction of the mill and its powerhouse, the steam engine was pushed off the cliff and is reportedly seen at low tide. The machine shop did not catch fire and remained standing until the development of The Sea Ranch properties.

In 1912, the property was sold to Walter Frick, but by that time, the lumber business in Sonoma County was in decline as all the large trees had already been harvested. Frick was not a lumberman; instead, he was an investor who bought large tracts of land for resale. He sold the Del Mar property to a group of Russian Baptist emigrants, but that endeavor failed with them leaving a few years later. Frick repurchased the land at auction and is best known for planting rows of cypress trees to serve as wind blocks and repairing the fencing, many of which are still around today (Rudy 2015:74). By 1926, the wire chute was abandoned, and the land was used for dairy cows and sheep ranching. Due to the short lifespan of the Del Mar Landing doghole port, it is not mentioned widely in historical documents or maps. Its

poor location limited the ability of vessels to fully utilize it and caused it not to be as profitable compared with other landings with more protected coves.

The first mention of Del Mar Landing in San Francisco newspapers is from 1904 with the departure of the steamer *Gualala* heading for the doghole port to pick up cargo (*San Francisco Call* 1 October 1904). The last mention is in 1911 when *Gualala* departed San Francisco again for Del Mar Landing (*San Francisco Call* 11 September 1911). In between those years there was infrequent traffic to the chute. It was a hazardous location for steam schooners or steamers to sit under the wire. A schooner, only relying on sails, could not maneuver fast enough to be able to avoid the rocks and coastal shoreline at Del Mar. An article from January 1909 reported that the steamer *Alcatraz* had arrived in San Francisco from Del Mar Landing, but it only brought 30,000 feet of lumber since the weather was too rough to load more (*San Francisco Call* 30 January 1909). Vessels that visited the landing included the steamers *Albion*, *Brooklyn*, *Phoenix* and steam schooners *Newark* and *Grace Dollar*. There are reports of vessels landing its cargo in San Francisco and Los Angeles. The relatively minimal vessel traffic resulted in no reported losses near the wire chute and only one close to it, the steam schooner *Klamath* in 1921, which sank to the south. The only incident reported in newspapers was the grounding of the steam schooner *Santa Barbara* on 1 October 1905. It was traveling north from San Francisco to Seattle with 16 passengers when it ran ashore, coincidentally at the wire chute. All the passengers and crew were safe, and the steamer was pulled free and towed to San Francisco for repairs (*Los Angeles Herald*, 1 October 1905:1).

Del Mar Landing Survey Results

Chute Remains

Del Mar Landing is the most northern doghole port studied during this project. The landing is at the southern portion of Del Mar Point and contained a single wire chute on the bluff with a small building encasing the wire and steam powered winch. The location is extremely exposed to the winds and seas, causing erosion of the soft sandstone bedrock cliffs where the chute once sat. Project archaeologists recorded four features, a single structural timber and three hardware items. The overall dimensions of the site measure roughly 85 feet in diameter. These items match up with the only known historic image of the landing, showing a steam schooner loading offshore.

The first component is a single 15-foot long by ½-foot wide milled timber beam running southwest, out towards the water and perpendicular to the cliff. This is from the small building encasing the wire winch drum and steam engine. The protruding beam represents the center point for this small site, with hardware distributed around it. Additional components associated with the chute include a rebate with a timber fragment still encased in concrete along with a square rebate where a structural leg once sat. The remaining three features consist of hardware used to either hold the loading vessel under the wire chute or to secure the wire chute apparatus in place on land. One eyebolt has a 5¾-inch diameter ring attached to it. Eyebolts range in size from 6¼ to 3¾ inches tall.

The relatively few features found at Del Mar Landing are the result of several factors. The presence of a single wire chute meant that there was less hardware required on land to moor a vessel in place when compared with trough chutes. It is likely that there were submerged mooring anchors offshore, but there are no historical documents to confirm it.

The doghole port was not in a protected cove, so it was exposed to wind and waves, which resulted in a shorter lifespan. A shorter operational period meant that infrastructure maintenance would be less intense and the need for replacing hardware would be greatly reduced, thereby resulting in less features overall. Del Mar Landing represents a short lived, later period doghole port that was not highly successful but managed to serve the nearby Del Mar Mill's needs for a brief period at the beginning of the twentieth century.

Del Mar Mill Remains

Del Mar Mill site resides on The Sea Ranch property, 400 feet to the southeast of Del Mar Landing, along the California Coastal Trail. It is the former location of the lumber/shake sawmill, bunkhouse, and cookhouse built in 1903 by the Bender Brothers. The mill utilized the nearby Del Mar Landing to ship out products. The site consists of four extant features, the foundation of the mill's powerhouse, the log skid landing area, an elevated narrow-gauge railroad grade, and an artifact scatter located below the bluff, at the intertidal zone.

The main feature located during the survey was the foundation of the mill's powerhouse (Figure 62), made from dry-set quarried stone blocks. It measures 30 feet long by 26 feet wide by 4.5 feet high. It is positioned south/southwest of the California Coastal Trail and cliff edge. The foundation's greywacke sandstone slabs are roughly 36 inches wide by 14 inches long with the northern end 50 inches higher in elevation than the southern end. Inside, there is a small depression that measures between 12 and 20 inches wide. Articles inside the foundation include a metal pin, metal fragments, and fire bricks. The depression and firebricks likely indicate the original location of the firebox for the donkey engine's boiler.

An abandoned road is located north of the foundation along with eight partially buried railroad ties to the east. An unburied portion of one of the ties measures 60 inches long by 8 inches wide. Fragments from other ties are scattered on the eastern end of the road. Additionally, a scatter of metal artifacts was noted directly below the powerhouse foundation feature and confirms the story that the steam engine was pushed off the cliff following the 1910 fire.

John Harreld conducted a more detailed survey of the intertidal zone and recorded 19 metal artifacts including a flywheel, measuring 25 inches in diameter and metal spikes.

Source: NOAA and DPR

Figure 62. Del Mar Mill powerhouse foundation (top) and associated fire brick (bottom).

JOE TONGUE'S LANDING

Joe Tongue's Landing is the northernmost doghole port located in Sonoma County. Little historical information exists on the landing, and only one historic photo of the landing was identified during archival research. 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 1890s for growing grain and fruit, which he shipped out from an exposed north-facing landing he constructed on a rocky ocean bluff behind Rutherford's barn. The photo depicts a small boat ferrying sacks, most likely grain, to a waiting vessel lying offshore (Clark 2009:17; Clark 2016).

Contemporary historians Susan Clark and Harry Lindstrom believe that 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 ¾-mile from the mouth of the Gualala River. It was reportedly demolished in the early 1970s (Clark 1990:75).

Despite intensive coverage surveys along the coast, west of the Rutherford barn site, the team was unable to identify physical remains of the site. More historical research is needed before additional fieldwork is conducted.

Additional Shipwrecks

In addition to the doghole ports, the project focused on several historic shipwrecks in the area to expand the maritime cultural landscape survey and include a significant element to the doghole port legacy. Efforts were made to locate five vessels wrecked along the Sonoma County coastline including the ship *Joseph S. Spinney*, steamer *Whitelaw*, bark *Windermere*, steam schooner *Acme*, and steam schooner *Klamath*. Due to unfavorable sea conditions and remote locations, the team was unable to complete remote sensing operations and only had limited time to conduct visual surveys. Divers did locate remains possibly from the *Klamath* and *Joseph S. Spinney*, although more time is needed to ascertain the extent of the sites and gather additional information to conclusively say whether the vessels have been found.

SHIP *JOSEPH S. SPINNEY* AND STEAMER *WHITELAW*

The wreck site of the ship *Joseph S. Spinney* and steamer *Whitelaw* is located in GFNMS, one mile north of Russian Gulch Landing and almost five miles south of Fort Ross. The project team used information previously acquired from local sport divers who located and dove on the site in the 1980s. By examining their lineups with objects on shore and nearby rock formations, several artifacts were found to tentatively identify *Joseph S. Spinney*. Due to limited underwater visibility and surge, survey and documentation was challenging which resulted in an abbreviated investigation.

Historical Background

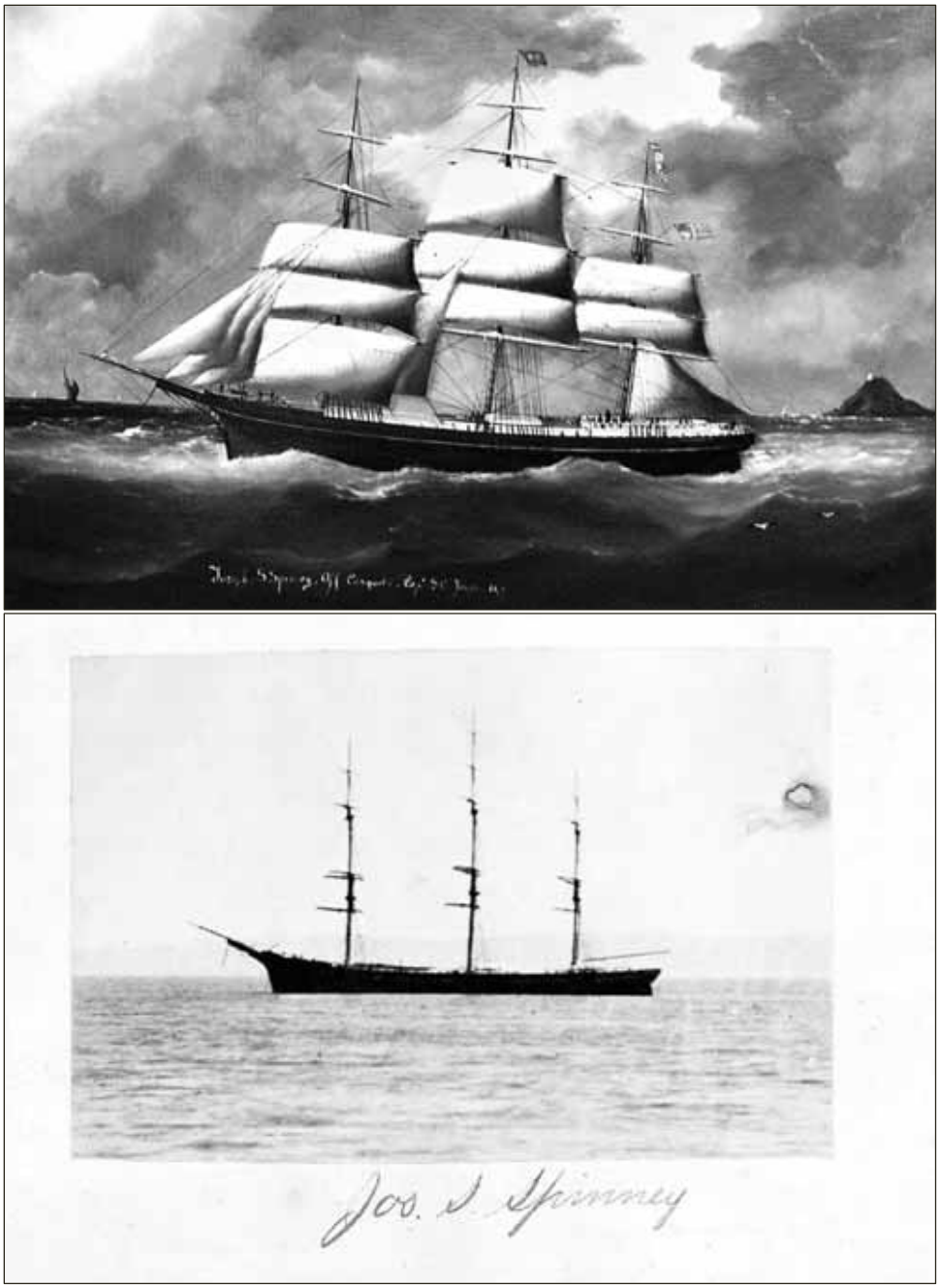
The wooden-hulled ship *Joseph S. Spinney* was built in Thomaston, Maine by Harvey Mills and Associates and launched in October 1874. It measured 230.9 feet long, 42.6 feet wide, 19.5 feet depth of hold and weighed 1,988 gross tons. It had three decks and three masts

(Figure 63). Between 1874 and its loss in 1892, the ship sailed to ports around the world. It loaded guano in South America, carried case oil from San Francisco to Japan, sailed from San Francisco to Liverpool with wheat, and brought railroad iron to Seattle from Liverpool.

After making good time from New York (departed on 8 May 1892), *Joseph S. Spinney* arrived off California in the fog and its captain, F. F. Curling, lost his bearings. On 25 October 1892, it struck a submerged rock five miles north of Russian Gulch. An hour later, the ship got off the rock but was leaking badly. As water filled its hold, the ship's pumps clogged, signaling to the crew that it was time to abandon ship. In their haste, they left the sails set. While the captain headed for Drake's Bay, the ship drifted south with people reportedly seeing it sailing along the next day. Finally, the ship smashed into nearshore rocks and broke up. The ship was carrying general cargo, consigned to Sutton and Beebe, consisting of 21 barrels of whiskey, clothes ringers, hardware, barrels of lard oil and resin, coils of barbed wire, merchant bar iron, sheets of steel, galvanized water pipe, horseshoes, and steel railroad rails (*San Francisco Chronicle* 27 October 1892 and 13 October 1893; *San Francisco Call* 29 November 1892).

Shortly after the wrecking, Lorentz Ford bought the rigging and two small boats used by the crew to row to safety on 31 October 1892 for $410. Later in November 1892, T. P. H. Whitelaw, working for the underwriters, began sending his wrecking steamers *Whitelaw* and schooners *Sampson* and *Catalina* to salvage the cargo which was valued at over $200,000. *Whitelaw* subsequently sank while salvaging *Joseph S. Spinney* three months later. Newspaper accounts of the salvage reported that the divers cut away rigging and sawed through the deck and deck beams to gain access to the hold. They also recovered sails, two anchors and cables, along with spars and masts. A grappling iron and dynamite were used during the salvage operations (*San Francisco Chronicle* 1 November 1892, 6 November 1892, 13 February 1893 and 13 October 1893).

The wooden-hulled steamer *Whitelaw* was built in San Francisco at T. H. White's shipyard and launched on 13 October 1882 specifically for the salvage industry. It measured 98.6 feet long, 25 feet wide, 9.2 feet deep, and was 80 net tons and 127 gross tons. It was substantially built, with two masts and a 50-horsepower steam engine. Salvage equipment included steam derricks, diving apparatus, and wrecking appliances. Newspapers reported that at the time of its loss in 1893 it had made a quarter of a million dollars for its owner, Thomas P. H. Whitelaw. The steamer was very active along the coast, profiting from the shipwrecks that resulted from California's rough weather and jagged coastline. *Whitelaw* not only worked on the California coast, but ventured farther north and participated in salvage activities in Oregon and Victoria, British Columbia as well (*San Francisco Chronicle* 13 February 1893; *San Francisco Call* 13 April 1893 and 15 May 1892).



Source: Vallejo Gallery, San Francisco Maritime National Historical Park Fireman's Fund Collection, P79-037a-A0630, 423n (SAFR 15238) and *San Francisco Chronicle* 17 October 1892 and 13 October 1893

Figure 63. Painting of the *Joseph S. Spinney* by Edouard Adam Sr. from 1879 (top) and depiction of the vessel in 1892 (bottom).

While salvaging *Joseph S. Spinney* the wrecking steamer *Whitelaw*'s mooring lines parted during a gale around 3 o'clock A.M. on 12 February 1893, and it was pushed onto the rocks and sank. During the incident, *Whitelaw*'s propeller got fouled on some of the ropes attached to *Joseph S. Spinney*. The wind was blowing from the south and west, causing the steamer to turn broadside to the waves with its deck toward the sea. Its captain, L. T. John, and his 11-man crew managed to get into their two small boats and reached shore safely. It was insured for $17,000. Onboard at the time of its loss was $30,000 worth of wrecking apparatus (*San Francisco Chronicle* 13 February 1893 and 14 February 1893; *San Francisco Call* 14 February 1893).

Survey Results

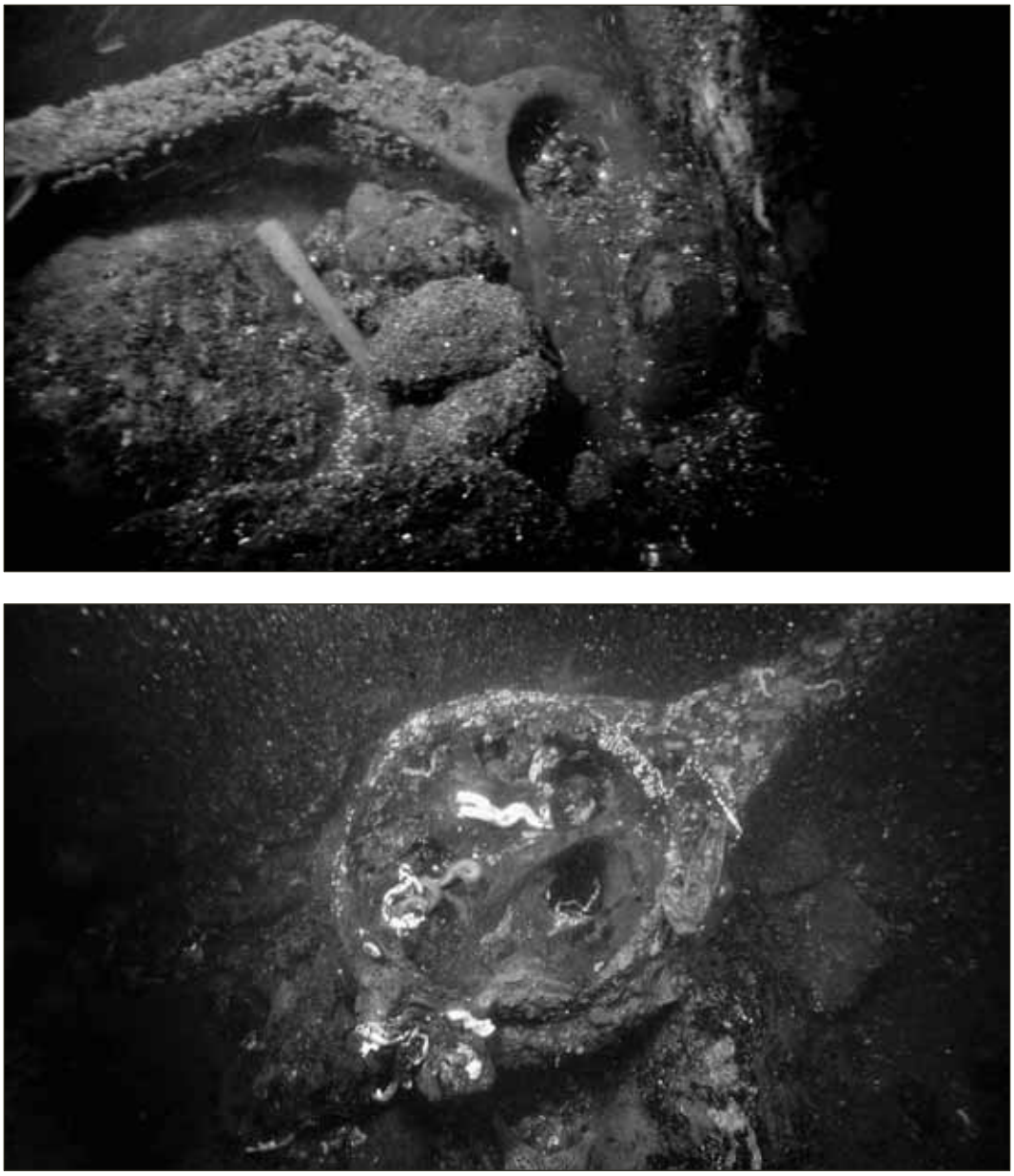
Local diver Bruce Lanham recalls that in 1981 or 1982, Dave Buller, another North Coast local diver and shipwreck historian, located *Joseph S. Spinney* and/or *Whitelaw* with a magnetometer (Schwemmer 2013). Bruce Lanham and his brother Robert dove on a shipwreck near the historically reported sinking location of *Joseph S. Spinney* and *Whitelaw* and remember seeing material from both vessels including railroad iron, an engine, propeller shaft, and propeller. They noted that the *Whitelaw* was laying parallel to shore in 15 feet of water with its stern to the south with the *Joseph S. Spinney* positioned in deeper water (about 35 feet), sitting perpendicular to shore with its stern to the west.

Over a two-day period in August 2016, seven exploratory dives were made to locate remains from the shipwrecks of *Joseph S. Spinney* and *Whitelaw*. Operations were conducted off R/V *Fulmar* (Figure 64) directly and from its inflatable as conditions permitted. Visual searches were conducted in the area identified by Bruce Lanham. The team identified several artifacts possibly associated with *Joseph S. Spinney* based on the depth at 35 feet and the characteristics of the features discovered. The items recorded include a long segment of chain, a gudgeon (Figure 65), hawse pipe, ceramic sherd, drift bolts, mast or bowsprit ring, and a dead-eye (0.6 feet across) with part of the metal strapping running around and below it still attached (Figure 65). The hawse pipe is only 15 feet away from the gudgeon, indicating that the site has potentially been affected by the historic salvage activity, possible sport dive damage, and/or natural forces from the wind and waves as the location is exposed to incoming weather.

Due to limited time at the site, more work is needed to determine the extent of the ship's remains, to record all the known features geographically, measure and more clearly photograph those features, and to also locate the nearby *Whitelaw*. The limited visibility and rough conditions did not allow divers to search in shallower areas closer to shore and offshore rocks where the steamer is supposedly sitting. Overall, the project managed to relocate the *Joseph S. Spinney* and determined that the site warrants a more dedicated project to fully understand the site and search for *Whitelaw* as their history and wreckage is intertwined.

Source: NOAA and DPR

Figure 64. Dive operations at the *Joseph S. Spinney* and *Whitelaw* site from R/V *Fulmar.*



Source: NOAA and DPR

Figure 65. Select features associated with the *Joseph S. Spinney* including a gudgeon (top) and deadeye (bottom).

BARK *WINDERMERE*

The shipwreck of the bark *Windermere* is located in GFNMS one and a half miles north of Fort Ross Landing and a half mile south of Timber Cove Landing. Historical maps and records along with reports from local sport divers indicate that the remains of the vessel are present just offshore of Windermere Point, in Fort Ross SHP. Only a general position of the shipwreck was known by the project team. Therefore, only one exploratory dive in 2016 was made to locate remains. The rough sea conditions and limited underwater visibility

prevented additional dives to investigate further. Initial plans called for a magnetometer survey to be done in 2017 to pinpoint the shipwreck, but the DPR inflatable was not large enough to survey offshore.

Historical Background

Bark *Windermere* was launched 21 February 1878 by W.H. Potter and Sons of Liverpool, England. It had two decks, four masts, weighed 1,193 tons (net) and 1,240 tons (gross), was 224.7-foot-long, 36.4 feet wide and had a 21.9-foot depth of hold. Its official number was 78765. The vessel history is unknown prior to its loss other than frequent trips between Liverpool and Australia. Its rig has been referenced as a clipper ship, ship or bark/barque.

Windermere departed Newcastle, New South Wales (Australia) on 7 July 1883 sailing to San Francisco with a cargo of Wallsend coal. It went ashore just south of Timber Cove on 7 September 1883 (Sydney *Evening News* 7 July 1883). All hands were saved, but the vessel was a total loss (*Los Angeles Herald* 8 September 1883). On 10 September, the vessel and its 1,500 tons of coal cargo were listed for sale by auction in the newspapers. It was sold the next day for $600 with the cargo going for an additional $25 (*San Francisco Chronicle* 1 January 1884). On 15 June 1889, the *Daily Alta* reported that A. J. Moisant purchased *Windermere* from Lorentz Foard and W. J. Ray, and the steamer *Acme* would be going to the wreck in a week with a diver named Baker to conduct salvage activities. Later in September 1889, the schooner *Albion* made at least two trips from San Francisco to recover additional iron, almost 900 tons, from the wrecked *Windermere* (*Daily Alta* 28 September 1889).

Survey Results

The historical account of its sinking and salvage activities state that the wreck lies in 36 feet (6 fathoms) of water. When the steamer *Acme* salvaged *Windermere*, those accounts state that it put down four moorings in 48 feet (8 fathoms) under a cliff and surrounded by sunken rocks.

The single dive conducted off the northwest side of Windermere Point did not find any man-made debris. A more systematic search is needed with a magnetometer to provide divers with a more defined area to search and possible anomalies to investigate. As this area is dotted with submerged and low-lying rocks, navigation of a small boat is challenging making the need for a magnetometer survey essential before operating in a hazardous environment.

STEAM SCHOONER *ACME*

The steam schooner *Acme* wrecked at Kolmer Gulch Beach 1889 and was the target for a hand-held metal detector survey in 2016 and 2017. The vessel potentially lies in Kolmer Gulch on the south side of Windermere Point, 1.1 miles north of Fort Ross Landing. Its remains would be within the boundary of Fort Ross SHP. The 2016 pedestrian survey found a few unidentified metal fragments along the rocks near the shoreline that may possibly be associated with the wreck site. These artifacts were not relocated in 2017, and the metal detector survey along the beach did not have any significant hits.

Historical Background

The wooden hulled steam schooner *Acme* was built in Siuslaw, Oregon in 1888 for the lumber trade by Captain C. J. Jorgensen. It was 77.51 gross tons and measured 72 feet long by 22 feet wide by 7.4 feet deep. It was an unpowered schooner at its launch but later received an engine, making it a steam schooner. Fulton Iron Works of San Francisco installed its 25 nominal horsepower steam engine. *Acme*'s official number was 106607 (*San Francisco Chronicle* 2 December 1888 and 3 July 1889).

On 25 June 1889, *Acme* left San Francisco, its homeport, for Fisk Mill Cove. While headed north it stopped at the site of *Windermere* to salvage some iron. Reportedly, *Acme* was going to Fisk Mill to move a number of anchors and moorings that needed to be re-laid and recover several lost anchors (*San Francisco Chronicle* 13 June 1889). Other newspaper reports suggest that it was bound for Timber Cove for a load of cordwood when it struck an uncharted rock (*San Francisco Chronicle* 3 July 1889). These conflicting accounts of the steamer's intentions may suggest that it was not headed directly to Fisk Mill or Timber Cove, but, in fact, was chartered to go to *Windermere*. On 15 June 1889, the *San Francisco Chronicle* carried a story that A. J. Moissant (*Acme*'s principal owner) purchased *Windermere* from Lorentz Foard and W. J. Rey, and he engaged diver George Baker and the *Acme* to go to the wreck site to recover iron. While at anchor on 28 June, the steamer struck something, probably the *Windermere*, and began taking on water. Captain Ole Jensen cut its lines and beached the vessel ½-mile south of where it struck. At that time, there was 4 feet of water in the hold. *Acme* broke up in the heavy weather and was soon salvaged by the wrecking steamer *Whitelaw*. It was valued at $16,000 (*Daily Alta California* 6 July 1889; *San Francisco Chronicle* 15 June 1889 and 7 August 1889).

Survey Results

Visual and hand-held metal detector searches at the shoreline found no clearly identifiable remains of *Acme.* It is likely that few remains, if any at all, could be found with a more intensive search. Contemporary salvage and natural deterioration caused by its exposed location on the beach have dramatically reduced the wreckage. If there are any remnants left, they are probably buried.

STEAM SCHOONER *KLAMATH*

The *Klamath* shipwreck site is comprised of both a scatter of metal artifacts on land as well as larger structure offshore and in the tidal zone. The submerged components are located in GFNMS, just offshore of The Sea Ranch, ½-mile south of Del Mar Landing. The 50+ items on the shoreline are located on The Sea Ranch property which is privately owned. While the bow separated from the rest of the vessel and pushed ashore, the stern came to rest 165 feet from the shoreline, just outside two large rocks. The remains are situated west of the California Coastal Trail and interpretive sign post #34A-12. The high steep cliffs make it difficult to access the area and is the reason why in-water activities have been limited to snorkeling and freediving. The large number of artifacts on shore are a result of the wrecking process in 1921, subsequent salvage activities, and the effects of tides, waves and wind over a hundred years has continued to break apart the wooden hulled steam schooner leaving only large machinery parts and twisted metal.

Historical Background

The 201.5-foot-long by 41.6-foot-wide wooden-hulled steam schooner *Klamath* was built by J. H. Price of the Bendixsen yard for Charles R. McCormick and Company in 1909 near Eureka, California. It displaced 1,038 tons and had two boilers with a single triple expansion steam engine and a single screw propeller built by the United Engineering Works of San Francisco. It was constructed to carry 1,500,000 feet of lumber, freight, and 60 passengers for the West Coast coastal trade. At the time of its launch, it was one of the largest wooden steamers, if not the largest, engaged in the lumber trade (*Los Angeles* Herald 19 January 1910; *San Francisco Call* 2 January 1910). *Klamath* ran regular trips along the coast with frequent visits up the Columbia River and to San Francisco and San Pedro. It was outfitted with more than the normal amount of passenger accommodations to supplement the lumber profits which helped offset operating expenses when it was traveling north with little to no cargo (Canright 1993:5).

The *Klamath* wrecked during a storm on the night of 4 February 1921 when it hit the rocks en route from San Francisco to Portland, Oregon in ballast with 34 officers and men and 19 passengers (Figure 66). Captain Thomas Jamieson ordered the steamer astern, but the vessel again hit the rocks fatally wounding it. The vessel broke its back in two and was considered 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 was abandoned. The wreck was offered for sale with Stewart's Point, H.A. Richardson and Sons, winning the bid. They placed a small donkey engine on the bluff and used a winch to pull off material from *Klamath*. The salvage operation was conducted for several months with help from *Cadet*. Some of the items from *Klamath* are still on the Richardson property today, including the nameplate. After several months, the hull was broken up by the waves with the bow pushed onshore and the stern sinking in deeper water. Several truckloads of items were removed but the boilers, engine, propeller, and shaft were too heavy to drag onshore. The fuel tanks were pulled to shore but too large to truck off and they remained on the shore for many years until they eroded into pieces (Richardson 2016:15–18). Today, the scatter of artifacts along the shore and tidal zone (Figure 67), with larger remains offshore, is consistent with the site formation process of a steam schooner slowly breaking up over the years in a dynamic coastal environment.

Survey Results

In 2010, John Harreld began his investigation of *Klamath* after locating historic photos of the vessel aground north of Del Mar Landing. Walking the shoreline, he identified the rock formations that held the wreck. A closer examination of the intertidal area revealed artifacts and freediving offshore revealed more pieces of a shipwreck. He confirmed the presence of debris consistent with a steam schooner located just offshore. His extensive and well-documented work on the site over the past eight years, including a comprehensive survey of ¼-miles of shoreline to record 53 artifacts, provided the Doghole Ports Project team with a considerable head-start in 2017. Mr. Harreld's comparison of historic photos of *Klamath* to rock formations to determine the position of the vessel significantly helped with the investigations.

Source: San Francisco Maritime National Historical Park

Figure 66. Historic image of the steam schooner *Klamath* near Del Mar Landing.

Source: NOAA and DPR

Figure 67. Archaeologists documenting the *Klamath's* remains along the shoreline.

Mr. Harreld documented the 53 artifacts with photographs and measurements along with recording their geographic position to help understand the extent of the wreck site along the coastline. The artifacts on shore are mostly unidentifiable metal fragments with a few small pieces of wood timber. There are very few items that can be identified with the exception of thin plating that may be associated with water/fuel tanks or boilers. John identified a copper alloy valve and a long piece of iron on his free dives.

The survey in 2017 mapped 12 artifacts onshore and conducted a hand-held metal detector survey of the shallow intertidal zone. Divers also swam to the southwest or ocean side of the offshore rocks to investigate the area where the stern section came to rest. The site record includes artifacts identified by Harreld along with those the team documented in 2017. A brief hand-held metal detector survey was completed in the shallow water during low tide to determine if there was additional material between the shoreline and offshore rocks (Figure 68). A large amount of ferrous metal was found, but time constraints did not permit an investigation of the individual "hits." Further work is needed to provide more information on artifacts present in that area.

Source: NOAA and DPR

Figure 68. A hand-held metal detector was used to survey the portion of the *Klamath* wreck site.

While it was still low tide, the team swam out to the ocean side of the rocks where *Klamath* met its demise and assess whether shipwreck debris still exists in that location. The swells and kelp coverage made the visual snorkel survey challenging, but archaeologists confirmed the presence of large metal structures including a large diameter shaft, possibly associated with the steam engine propeller shaft. The cursory swim over the site confirmed that there are substantial remains that warrant a more dedicated project with dive gear to fully investigate the area.

The connection between *Klamath* and Stewart's Point is evident by the amount of material from the steam schooner still resident in the buildings owned by the Richardson family. During the land survey of the Richardson property, the team photographed several items that are from *Klamath* such as its wheel, several lifejackets and life rings along with a name board (Firgure 69). There are many more "maritime" or "shipwreck" items at Stewart's Point, but it is unknown from which vessel(s) they originated.

Source: NOAA and DPR

Figure 69. *Klamath* nameboard stored in warehouse on Richardson property in 2017.

Conclusion

Doghole ports were once centers of maritime and commercial activity along the northern California coast. The exposed and rocky coastline of Sonoma County made its small ports very valuable to its inhabitant's economic and social lives. Since their heyday, much of the physical evidence of human activity at Sonoma's doghole ports has disappeared through environmental deterioration and directed efforts to return the area to its "natural state." Today, evidence of the confluence of land and sea networks represented by the ports has been revealed through this archaeological study of port infrastructure and sunken vessels. These archaeological sites now lie within several California State Parks and in Greater Farallones National Marine Sanctuary. Archaeologists, historians, and resource managers continue to work together to document and interpret the doghole port remains and shipwrecks to better understand the area's past and connect present-day communities to their heritage.

The Sonoma Coast Doghole Ports Project recorded the terrestrial and underwater archaeological remains of doghole ports along the Sonoma County coast to develop baseline data for cultural resource managers. During approximately three weeks of fieldwork, conducted in August 2016 and 2017, archaeologists conducted Phase I surveys at 14 doghole ports and documented the archaeological features and artifacts present there. Pedestrian surveys at the 14 land sites found archaeological material or evidence of the doghole port's infrastructure at 12 of them (all but Stockhoff Cove and Joe Tongue's Landing). Underwater and marine remote sensing surveys at five doghole ports (Fisk Mill, Fort Ross, Salt Point, Stewart's Point, and Duncans Landing) resulted in divers finding artifacts at three of them (Fort Ross, Salt Point, and Stewart's Point).

Ten shipwreck sites in the project area were investigated, with the team finding vessel remains at eight locations. Substantial archaeological evidence of the chutes and associated maritime commerce at the doghole ports were recorded during this project. These artifacts document the level of historic activity that utilized the landings during the mid-nineteenth to early twentieth centuries. Features consistently located at the sites include evidence of road/rail beds, flattened earth for structures, rock walls, and wood beams/timbers. Material specific to the chutes such as rebates/cutouts for vertical supports, a variety of metal fastenings (eyebolts, pins, staples), and wire rope were also widely present. Numerous anchors and heavy chain documented in the project area, but no longer *in situ*, were found. While these items have lost some context, they are still a contributing part of the cultural landscape. Their visibility provides opportunities for public engagement and education.

Field surveys were combined with archival research to document the larger lumber industry landscape that linked the redwood forests to the world. The economic and social effects of the lumber industry were vast and served as an important source of employment, building materials, and stimulated settlement in areas overlooked by other industries. The evolution of the lumber industry can be followed through the history of doghole ports along

the Sonoma coast with their success intimately tied to the financial backing from operations in San Francisco who supplied the necessary capital and market for their products. The evolution of the industry, exemplified by physical infrastructure changes such as the chute types and servicing vessels, combined with the scale of the associated businesses that operated and supported the landings, shows the growth of technology and mechanization. Ultimately, these economic efficiencies lead to overharvesting of the trees and the demise of the Redwood Coast lumber trade. The specific topography and micro-environment where the landing or chute(s) resided also greatly contributed to the type and success of the individual doghole port. Those operations with the more sheltered coves, deeper water access, greater accessibility to mills, timber resources, and suitable land for ranching had greater overall success and longevity.

The Sonoma Coast doghole ports within this study can be grouped into three categories based on the number and type of lumber chute(s) present over time, timeframe of chute operations, and type of business owner linked to the landing (Table 11). The grouping is not based on overall geographic scope of the doghole port, but its location did in many cases contribute or impede the success of an area. The first category is a small doghole port, which only had a single chute present over time along with a shorter operational lifespan of 10 to 30 years. These ports included Rule's Landing, Stillwater Cove Landing, Walsh Landing, and Del Mar Landing. The second category is medium doghole ports with at least one, but more likely two chutes, that also transitioned from a trough to wire chute over time. The lifespan was longer than the smaller ports ranging from 40 to 70 years. These ports included Timber Cove Landing, Salt Point Landing, Fisk Mill Cove, and Fort Ross Landing. Another factor defining medium ports was a more advanced transshipment system including horse tramways or steam railways to move materials to the chutes. The last category is large doghole ports with at least two trough chutes present at the same time with many of them followed by a wire chute. The lifespan varied from 20 to 50 years. The ports had a more industrialized system backed in many cases by a company rather than an individual landowner. This business association may have been a larger lumber company or a specific buyer of the products who used the chute(s) almost solely for their business. The large ports included Duncan's Landing, Russian Gulch Landing, Stewart's Point Landing, and Bihler Landing. The small, medium, and large doghole ports did not operate at different times or in a linear fashion (from small to large), rather they all roughly were up and running at the same time. Each occupied a niche, dependent upon how far the nearest timber area or sawmill was and contributed to the larger network of landings dotting the coastline.

Today, the doghole ports no longer see the coming and going of lumber ships or reverberate with the sound of sawmills, but the area's heritage continues to be present in the archaeological remains that are present above and below water. Connecting local residents and visitors alike to these stories adds another dimension to the coastal beauty and sense of history the doghole ports still have to offer. California State Parks and the Office of National Marine Sanctuaries promote stewardship of this nation's heritage through ongoing research and interpretive initiatives. The Redwood Coast's heritage lives on in the tribes and coastal communities whose origins, place names, and identities are tied closely with the maritime traditions embodied by the doghole ports.

Table 11. Summary of the doghole ports operational timeframe and number and types of chutes based on project research and fieldwork.

Doghole Port	Operational Time	Number and Type of Chute(s)	Notes	Type of Doghole Port (small, medium, or large)
Duncan's Landing	1860–1880s	2 trough	horse tramway/ steam railway	L
Rule's Landing	1870s–1880s	1 wire	-	S
Russian Gulch Landing	1870s–1910	2 trough, 1 wire	steam railway	L
Fort Ross Landing	1860s–1920s	1 trough, 1 wire	-	M
Timber Cove Landing	1850s–1920s	1 trough, 1 wire	-	M
Stillwater Cove Landing	1870–1880	1 trough	-	S
Stockhoff Cove	Unknown	Unknown	-	-
Walsh Landing	1880s–1910s	1 wire	-	S
Salt Point Landing	1870s–1917	2 trough	railway	M
Fisk Mill Cove	1860s–1900	1 trough	railway	M
Stewart's Point	1870–1920s	3 trough, 1 wire	steam railway	L
Bihler Landing	1870s–1920s	2 trough, 1 wire	-	L
Del Mar Landing	1898–1910s	1 wire	-	S
Joe Tongue's Landing	Unknown	Unknown	-	-

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