

C.A. Thayer, 1905, San Pedro, CA

Environmental Assessment

Rehabilitate 1895 National Historic Landmark Schooner *C.A. Thayer*

July 5, 2002



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Purpose and Need

The National Park Service (NPS) proposes to rehabilitate the historic lumber schooner *C.A. Thayer*, a National Historic Landmark. The purpose of the project is to protect and preserve the *C.A. Thayer*, as called for in the Park's approved General Management Plan, to enhance the visitor experience, and enable more efficient use of park maintenance and operational funding. The *C.A. Thayer* has suffered massive deterioration through rot in its structural timbers and advanced decay of its fastenings. The project proposal would follow *The Secretary of the Interior's Standards for Historic Vessel Preservation Projects*, and would result in a vessel that can be maintained afloat, in sailworthy condition, by the Parks' historic preservation staff and volunteers, using Park base funding and limited cyclic funding for periodic preventive maintenance drydocking.

The project involves the rehabilitation of the 156-foot schooner *C.A. Thayer* presently moored at San Francisco Maritime National Historical Park's "Hyde Street Pier" facility. Built in 1895 and first sailed in the lumber trade, the *C.A. Thayer* is a nationally significant three-masted, wooden-hulled lumber schooner. The vessel has suffered massive deterioration through rot of its structural timbers and decay of its iron fastenings over the last 100 years of service.

The proposed action is needed to prevent the loss of the landmark schooner by returning it to a structurally sound condition, suitable for continued exhibition at Hyde Street Pier. The proposed work would adapt and rehabilitate areas in the exterior configuration of the vessel to its appearance as a lumber schooner during its primary period of significance from 1895 to 1912.

Background

Originally acquired in 1957 by the California State Parks and Recreation Department for use as a floating museum exhibit, the *C.A. Thayer* was transferred to the National Park Service in 1977 as part of the Golden Gate National Recreation Area. In 1989 the *C.A. Thayer* became part of a new independent NPS unit designated San Francisco Maritime National Historical Park. Due to its nationally significant historical associations, the *C.A. Thayer* was listed on the National Register of Historic Places in 1966 and declared a National Historic Landmark in

1986. Presently, its primary function is to serve as a floating exhibit providing a marine heritage educational platform, and to host an environmental living program, conveying traditional shipboard life to primary school children.

The *C.A. Thayer* is specifically mentioned in the Park's enabling legislation as one of the major vessels essential to the nature of the Park. Rehabilitation of the *C.A. Thayer* would meet the NPS mission and goals by preserving cultural resources, and by providing educational programming to increase the public's knowledge and awareness of Pacific Coast maritime culture.

Objectives

An inter-disciplinary team conducted an analysis and a public workshop to identify objectives, priorities and the costs associated with various alternatives. The team was composed of a mix of professional disciplines, members of the Park staff including shipwrights, historians, engineers, consultants, and marine preservation specialists. The team was grounded and experienced in historic ship rehabilitation and managing such projects. It was determined there were three (3) basic objectives of this project:

- Preservation of the Resource – Determination of best approach.
- Interpretation and Education – What would provide visitor satisfaction and a tailored educational opportunity to the visiting public and school groups?
- Sustainability – Determination of best approach for long-term maintenance.

Preservation of the Resource

The *C.A. Thayer* is one of two remaining examples of a West Coast sailing lumber schooner. As a National Historic Landmark, *C.A. Thayer* was determined to be of exceptional value in representing the theme of maritime history on the Pacific Coast. In 1993 it was placed on the National Trust for Historic Preservation's list of 11 Most Endangered Historic Places. In the absence of major repairs the *C.A. Thayer* is certain to ultimately suffer structural failure, requiring its removal from the water and, in all likelihood, disassembly. This would result in the total loss of *C.A. Thayer* as a nationally significant resource and as a floating classroom to various youth educational programs.

Interpretation and Education

Berthed among the NPS historic fleet at Hyde Street Pier, the *C.A. Thayer* is boarded by over 200,000 visitors each year and is the central focus of a variety of educational programs. National Park Service rangers use the *C.A. Thayer* to present interpretative programs to more than 35,000 visitors annually, including 12,000 school children. In addition, the *C.A. Thayer* serves as a floating overnight interactive classroom for 15,000 school children on an annual basis. The children participate in classroom studies, spend the night aboard the vessel, and learn about our nation's maritime heritage. The *C.A. Thayer* is the only historic vessel of its type providing an active interpretive experience.

Built to no formal classification standards, without the benefit of detailed plans or specifications, and using details of trade practice passed from generation to generation, the *C.A. Thayer* is itself a record of lost maritime building traditions. The resultant documentation work will amount to a detailed manual for the construction of an 1890s lumber schooner.

Sustainability

This project is primarily rehabilitation, "replacement in kind," of decayed and deteriorated structural members and fastenings. The vessel is on the NPS list of classified structures, LCS # 12951, with a management category of A: "Must Be Preserved and Maintained." Its condition is listed as "poor." During the scoping phase of this project, minor accommodations were considered that if made to the original structure would vastly improve its sustainability. For example, the "*Secretary Standards*" supports the use of high quality materials, "off-the-shelf" preservatives and coatings and improved ventilation. If rehabilitation using these improved materials and techniques is carried out, annual savings in the Park's base budget of \$50,000 can be anticipated. The park preferred alternative will result in an upgrade of the status of the structure from "poor" to "good."

Long-term Management

The rehabilitation of the *C.A. Thayer* will support the vessel's maintainability by changing its maintenance from short-term crisis management to a long-term maintenance management plan. Park management will be able to establish a 10-year maintenance approach using Park staff, volunteers and the services of routine shipyard drydocking for preventive maintenance and inspections. Managers will be able to predict and establish a level of manpower required for maintaining the vessel and eliminating the need for use of high cost emergency repairs and services. Future expenditures would be lessened through the full rehabilitation of the *C.A. Thayer*. With the vessel fully rehabilitated the Park would regain the Park shipwrights' time and reduce unplanned emergency expenses and emergency repairs. Further, we have concluded that the best way to achieve optimal ongoing conditions for both public interpretation and preservation is to provide for very limited sailing operation of the vessel. The act of maintaining the *C.A. Thayer* in sailing condition will improve both the interpretive look of the vessel and will insure a much superior standard of ongoing care. After rehabilitation, the park staff and volunteers can efficiently perform maintenance and keep the vessel in a sailworthy condition.

Maintenance

Required maintenance expenses over the last year have included the purchase of masts and spar replacements and topside repairs such as patching holes in rotted sections of stanchions, caprails, ceilings, bulwarks and the four-inch Douglas fir main deck. The required temporary patching expends valuable shipwright time, materials and redirects programmed resources.

The Park has only four trained and experienced shipwrights to maintain the entire fleet of ships and related facilities at Hyde Street Pier. The fleet includes the wooden scow schooner *Alma*, the 156-foot schooner *C.A. Thayer* and the 300-foot ferryboat *Eureka*. Additionally, the shipwrights maintain decks, roofs, masts, and cabins of all the vessels and make repairs to facilities such as restrooms, pier and pier railings. In the last two years the deteriorated condition of the vessel has required the full-time service of a shipwright to manage emergency services, make repairs, and manage the bilge pumps. This yearly expense is estimated at \$50,000 of unplanned operating base funds.

Issues

Issues identified during preliminary scoping, technical review and public review are discussed below. Those issues include potential adverse impacts to natural resources, cultural resources, and visitor experience.

The Park conducted a Public Workshop on April 27th regarding the proposed project. During that workshop the public voiced concerns regarding 1) the existing and future educational programs, 2) non-Bay area shipbuilding contractors, and 3) a statement in support of the immediacy of this project.

Impact Topics

Impact topics discussed in this Document.

Impacts of the alternatives on the following topics are presented in this EA: (1) Preservation of the cultural resource, (2) Visitor experience (3) Safety and (4) Park operations.

Impact topics Dismissed from Further Analysis.

The topics listed below would not be affected or would be affected negligibly by the alternatives evaluated in this EA. Therefore, these topics have been dismissed from further analysis. Negligible effects are effects that are localized and immeasurable or at the lowest levels possible.

Impacts to Air Quality.

The Clean Air Act of 1963, as amended, and associated with the NPS policies require the NPS to protect air quality within the parks. The no action alternative would not impact air quality, and although both the restoration and rehabilitation alternatives would require use of heavy equipment and materials such as paints and sealants, the project site in both cases would be an industrial area (a commercial shipyard) where such emissions occur regularly, and are tightly regulated. Similar ship repair work at the project site would occur whether the *C.A. Thayer* was present or not; as a result, the net effect on air quality as a result of the vessel's presence at the shipyard would be negligible.

Impacts to Socioeconomics and Environmental Justice.

The local and regional economy, and most businesses surrounding the park, are based on tourist sales, services and educational research. Actions evaluated in this EA would have negligible effect in the context of the overall local and regional economy. The alternatives calling for construction work (restoration and rehabilitation) would fund shipyard personnel salaries. However, ship repair would continue at the commercial facilities whether *C.A. Thayer* was present or not. The economic effects of actions evaluated in this EA would be negligible, and would not adversely affect the socially or economically disadvantaged populations.

Impacts to Traffic/Circulation

The construction site would be an active, commercial ship repair facility, with existing staff and on-going deliveries of supplies and materials. Ship repair work at the site would occur whether the *C.A. Thayer* was present or not. The net effect of the vessel's presence on traffic/circulation would be negligible.



Impacts of Noise

A construction project of *C.A. Thayer's* size would create additional noise. However, the construction site would be a working, commercial shipyard, and the noise created by work on the *C.A. Thayer* would be no greater than other noise already occurring within the facility. In fact, due to some of the traditional (i.e. pre-powertool) techniques used in the vessel's rehabilitation, the *C.A. Thayer* construction may create less noise than a modern vessel (which would occupy the drydock if *C.A. Thayer* were not present). There would be no increased noise associated with *C.A. Thayer's* presence in the shipyard.

Impacts to Archeological Resources

Work on the vessel would be conducted above ground, in facilities designed for that purpose. There would be no ground disturbance with potential to impact archeological resources.



Alternatives (including the Proposed Action)

During the planning process which has led to the current proposal for the preservation of the *C.A. Thayer*, a number of different approaches to a solution were considered by SAFR staff and consultants. This process stretched over a number of years. The conclusions reached by the staff and consultants are embodied in the preferred alternative; the various alternatives examined during the planning process are described below.

No Action

This alternative was examined largely in the sense of predicting the consequences for the vessel if no funding could be allocated or otherwise developed for the vessel's preservation. It was never believed that a No Action alternative could be considered responsible stewardship of the resource. It was rather a question of estimating how long the vessel might survive if nothing could be done to address its structural defects.


This question cannot be answered with any precision. The hull, with its massive timbers, is an amazingly tenacious structure. We would estimate that the hull has less than fifty percent of its designed girder strength, yet it is still floating. Certain low-cost measures, such as soaking all exposed surfaces with sodium borate and coating the decks with non-original type waterproofing would slow the deterioration to some extent.

As noted above, the factor that will probably eventually make the vessel unable to be maintained afloat is the hardening of the turn of the bilge amidships. The vessel will not dramatically break in half. Rather, it will develop leaks in this area that cannot be controlled. The vessel would then either be hauled ashore or sink.

This approach would result in the loss of the vessel, the educational programs, and continued visitor experience. Costs would continue to be unpredictable and extreme as deterioration continues. The vessel would eventually be placed on a barge and relocated to non-Park owned lands where it would be disassembled.

Restoration

The restoration alternative assumes overall restoration to the 1895–1912 configuration. To accomplish this work, the vessel would be moved from the Park's Hyde Street Pier to a



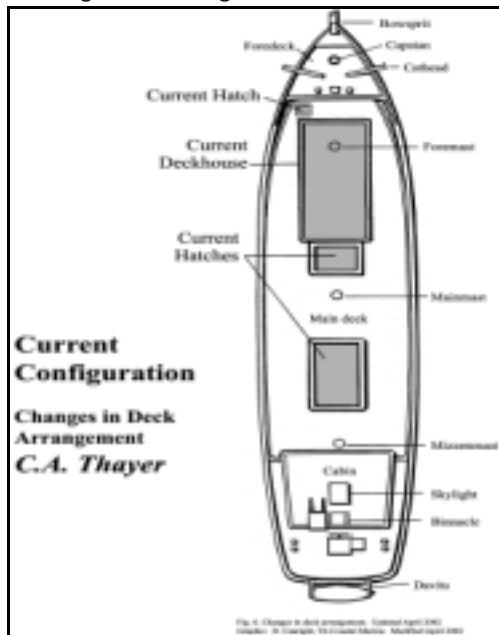
commercial ship repair facility. The advantage of this approach would be in the consistency of the finished presentation. When practical, it is considered desirable to present any historic structure in its configuration during one particular period of historic significance. For the *C.A. Thayer*, this would reasonably be the lumber trade, for which the vessel was designed and built. Such a presentation would offer the best opportunity for public understanding of the nature of the vessel as it was originally designed and outfitted. The vessel would be a unique representative of this very important West Coast trade.

The notable disadvantage of this approach would be the loss of the 1940s fishermen's forecastle (fo'c's'le) in the forward portion of the hold. This space is now used to house school children for overnight stays as part of a very successful environmental living program. This program, in operation for more than 25 years, has both provided an important educational opportunity for thousands of young people and has developed a significant constituency of *C.A. Thayer* friends and supporters. The retention of the fo'c's'le also allows for interpretation of the vessel's codfishing period. While we might not have chosen to build this compartment into the vessel had it ever been removed, it is a space of great utility, which offers continuity from an historical commercial use of the vessel. We feel that the retention proposed in the preferred alternative is entirely justified.

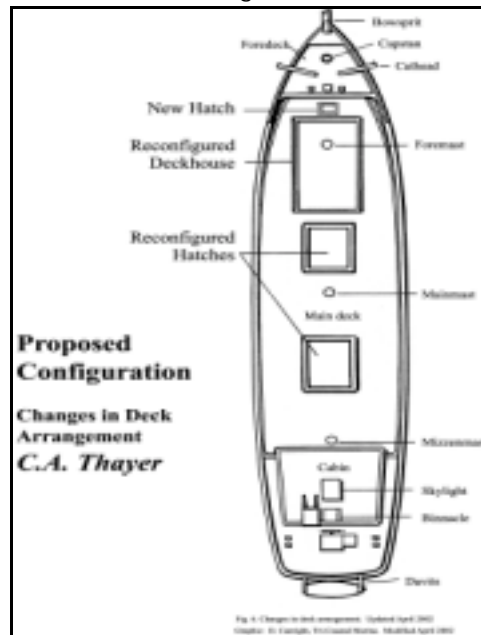
Another desirable deviation from the pure restoration alternative is interior alteration of the forward deckhouse to accommodate the environmental living program. The galley-cooking program requires more storage and preparation space than was provided by the historic configuration. While the preferred alternative restores the original exterior appearance of the house, the recommended interior changes are deemed essential for continued operation of this interpretive program.

Adaptive Rehabilitation -- Park Preferred Alternative

Existing Deck Configuration

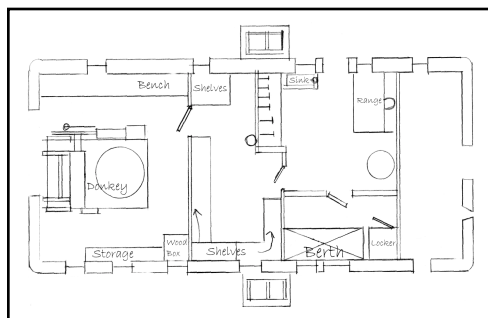


Preferred Deck Configuration

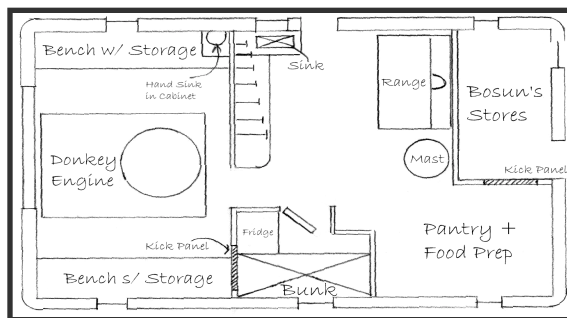


The adaptive rehabilitation alternative would return the schooner to a structurally sound condition, suitable for continued floating exhibition at the Park's Hyde Street Pier. The work would be done through replacements in-kind, using original type materials in virtually all areas. The aim would be to restore the exterior configuration of the vessel to the lumber schooner period, from 1895 to 1912. This alternative would not, however, be purely a restoration process, as certain alterations (re-configuring of the lengths the two cargo hatches, reducing the length of the forward house and returning the mizzen mast to a gaff-rigged configuration), made late in the vessel's career or during the museum period, would be retained.

Deckhouse: Existing Configuration



Deckhouse: Preferred Configuration



The fishermen's fo'c'sle in the hold will be retained. This is judged to be an historically significant alteration and is essential to the continued operation of the overnight environmental living program. Existing alterations to accommodate public access, including non-historic interior passages and staircases will be retained. Existing non-historic electrical and plumbing systems will be retained and upgraded to meet current

programmatic needs. To accomplish this work, the vessel would be moved from the Park's Hyde Street Pier to a commercial ship repair facility.

A further goal would be to return the *C.A. Thayer* to operational condition, able to make very limited sail training trips on San Francisco Bay. Maintaining the vessel in operational condition would improve its stationary public interpretation at Hyde Street Pier. It would also lead a higher level of ongoing maintenance, which would be required for operation under sail. This work could be accomplished in part by volunteer crews, rewarded by the chance to sail the vessel. Finally, this approach would help to insure that all work done during the rehabilitation project would meet operational standards.

A final project goal would be the production of a detailed documentation package. This body of new information would be the most detailed analysis ever developed of a large West Coast sailing vessel. As the vessel is dismantled, all of the hidden secrets of its construction would be revealed and recorded. Built to no rigid classification standards, without benefit of detailed plans or specifications, and using details of trade practice which were passed from generation to generation, the *C.A. Thayer* is itself a record of a lost tradition. The resultant documentation work would amount to a detailed manual for the construction of an 1890s lumber schooner.

Both the physical and cultural history of the *C.A. Thayer* have been extensively studied over a period of almost fifty years. There exists a great body of background material on the vessel, which will allow us to do a rehabilitation that can fully meet *The Secretary of the Interior's Standards for Historic Vessel Preservation Projects*.

While it is impossible to state with precision, we estimate that at least eighty percent of the *C.A. Thayer's* structural material would have to be replaced. Such a radical degree of replacement must certainly be seen as a threat to the historic integrity of the vessel. The nature of the project, however, replacing each element in original type material, using original assembly and fastening methods, would result in a vessel that is true to the original in both form and nature.

The overall intent of the project is to achieve replacement-in-kind of all deteriorated fabric. In general, this should be entirely feasible. However, the structural rehabilitation of the hull may involve limited use of laminates in place of solid originals, such as longitudinal timbers, clamps, keelsons, and keel, and would not be apparent to the visitor. The full functional strength of these elements is considered essential to the integrity of the structure, and the deviation from original-type materials would therefore be justified.

Alternatives Considered But Rejected

Partial Rehabilitation

Two forms of partial rehabilitation have been considered, solely in the interest of lower project cost. The first approach envisions replacement of only the upper portions of deteriorated frames and associated outer planking. The second approach proposes a phased rehabilitation of the hull, reducing the initial funding commitment required for work to begin.

The first approach is what is traditionally termed "retopping." The upper segments of the sawn frames, called "top timbers," along the length of the vessel would be replaced, along with the outer planking in the "topside" or above water area. This technique was used historically to get a few more years use out of a tired hull. The top timbers, subject to fresh water intrusion, are normally much more rotten than the lower members, which have been soaked in salt water. The technique is feasible if sufficient strength remains in the lower frame members and in the clamp timbers and thick ceiling planking. The work was sometimes done while the vessel was floating in lightened condition.

One problem with retopping is that it locks-in any deformation in the sheer line due to hogging. In the case of the *C.A. Thayer* this is clearly a consideration. Preserved primarily for its importance as an example of historical technology, it would be extremely unfortunate to commit to presenting the vessel indefinitely in a severely deformed state.

In any event, the deterioration of the *C.A. Thayer's* clamp timbers, heavy ceiling planking, waterway timbers, and deck framing is such that retopping would not be effective in holding the vessel even in its distorted state. A very modest gain in short-term strength, at considerable cost, would result in a great loss of historic fabric and would make any later major work more difficult.

The second approach envisions rebuilding the vessel through at least three successive shipyard projects. A likely scenario would be three phases, addressing the bow, the stern, and the midsection.

Beyond initial cost savings, there is nothing to recommend this approach. It would be almost impossible to produce a finished hull that duplicated the original designed form of the vessel. It would also be impossible to achieve the longitudinal strength of the original. Longitudinal timbers and planking, originally installed in very long unbroken runs, would be replaced in much shorter jointed segments.

Each phase would clearly be less costly than a single consolidated project, but final costs for the second "phased approach" would be higher than the preferred rehabilitation alternative. Costly transportation and mobilization costs would be repeated. Also, in order to achieve anything like an acceptable staggering of joints in longitudinal members, there would have to be waste in cutting back material installed in previous phases. The result would be an inferior finished project at a much higher cost than the preferred alternative.

Dry Berthing

If the vessel could be brought ashore, placed in a well-engineered support framework, and protected within an environmentally controlled structure, it would be theoretically possible to hold virtually all existing fabric indefinitely. The vessel could then be treated as a large museum object, subject to conservation measures as required.

The difficulties with this approach are both practical and programmatic. Placement ashore would involve the commitment of a suitable piece of land area. The continuity of this land use can only really be guaranteed within an area owned or controlled by the National Park Service. The San Francisco Maritime National Historical Park is extremely constrained in

land area and can offer no suitable site for the vessel within its own boundaries. The only Park area available is currently a popular grass/open space zone.

No other Bay Area NPS unit has, as a primary mission, the preservation of maritime resources. Outside SAFR boundaries, the vessel would be subject to the potential for continual re-evaluation of the land use and would therefore remain potentially threatened.

The *C.A. Thayer*, as it might be exhibited ashore, would have real value only to the extent that it was accessible for public visitation, and could be presented and interpreted in a meaningful context. Clearly, the most meaningful context for the vessel would be in the Park, within an area devoted to maritime history and preservation, visited by anyone interested in this subject. If the vessel were preserved and exhibited at some outstation, its interpretive potential, and therefore its practical value, would be diminished. The vessel's programmatic value would likewise suffer. As long as *C.A. Thayer* can be preserved afloat, accessible to the public and within an area devoted to maritime history, its interpretive potential will be maximized.

Exhibition within a structure ashore, even assuming a suitable location were available, would remain a difficult and experimental proposition. Most of the larger vessels now exhibited ashore have experienced some degree of long-term deterioration. While it is theoretically possible to stabilize the vessel, all aspects of the support engineering and environmental control work would have to be perfectly executed and maintained indefinitely. Initial costs would be somewhat higher than the proposed rehabilitation alternative.

Veneer and Bracing

It might be possible to hold the hull intact as a floating structure through reinforcement or encasement using some combination of non-original materials. Such a process might achieve basic structural stability and watertight integrity of hull and decks. This approach has been used with some effectiveness, usually in smaller vessels. Small craft are sometimes coated externally with a skin of fiberglass to achieve increased rigidity and watertight integrity ("veneering"). Larger vessels have been skinned over in layers of diagonal planking. It might be possible to install internal steel reinforcement or even an internal timber framework to neutralize hull stresses ("bracing").

The fundamental problem with this approach is that it involves a massive compromise of the original nature of the structure, including a more-or-less obvious visual impact. The interpretive value of the vessel would be undermined. For the general public, its value lies in offering a sense of the historical reality of a vessel of this type.

While such a structural system might hold the overall shape of the hull, it would not stop the continued deterioration of the original fabric. It would almost certainly involve intrusions into that fabric, resulting in loss of information inherent in the original material. The cultural value of the *C.A. Thayer* is based in part on the engineering inherent in the vessel. Altering the original functional nature of the structure would not truly preserve this value.



Affected Environment

Natural Resources

Environment, General

The proposed adaptive rehabilitation will move the vessel to a commercial shipbuilding facility. During removals of deteriorated wood, the contractor will be responsible for compliance with all regulatory guidelines regarding disposal of any debris waste products. During the rehabilitation, the contractor is also required to meet or exceed any regulations concerning application of paints and preservatives.

Project Setting

San Francisco Maritime National Historical Park

The ship currently rests along side the Hyde Street Pier on the San Francisco waterfront.



The vessel serves the visiting public and supports the Park "Age of Sail" educational program. While alongside a dedicated shipkeeper performs minor maintenance such as topside painting, watching for and dealing with leaking hull planks, and replacement of rotted wood. The ship has deteriorated beyond the capacity of the park to maintain and requires significant rehabilitation by a qualified shipbuilder. Effects of these maintenance activities are negligible.

A detailed map of the Aquatic Park area in San Francisco. The map shows the coastline with the park and beach. Key locations labeled include: Museum, Sea Scout Base, Moon Golf Port, Victorian Park, Hyde Street Pier, Fish Cannery, Larkin, Harbor Ship Yard, Branch, and various points of interest like 'Bathhouse', 'Swimming Area', and 'C.A. Thayer'. The text 'Aquatic Park' is prominently displayed in the center of the water area. The map uses various line styles (solid, dashed, dotted) to represent different types of boundaries or paths.

The Park proposes the use of a contracted shipbuilder to perform the extensive repairs and rehabilitation needed. The contractor will be required to relocate the ship to an industrial site. Since the ship is not strong enough to withstand an open water tow, it is likely that the industrial site will be within the confines of the San Francisco Bay. Approximately 500 vessels of *C.A. Thayer's* size (and approximately 1000 smaller vessels) are drydocked each year on San Francisco Bay. Environmental effects of the two-year rehabilitation proposed in the environmentally preferred alternative are of a short-term negligible impact.

A map of the San Francisco Maritime National Historical Park area. The map shows the city of San Francisco, the Golden Gate, and the surrounding water. Key locations labeled include Richmond, Tiburon, Sausalito, San Francisco, Oakland, and the Golden Gate. The park's name, "San Francisco Maritime National Historical Park," is prominently displayed in the center. The map also shows the Golden Gate Bridge, the Golden Gate Park, and the Golden Gate Ferry. The map is oriented with North at the top.

The natural resources affected by this project are related to construction materials used during the rehabilitation of the ship. The ships' hull, deck and masts are primarily constructed of Douglas Fir (*Pseudotsuga menziesii*) wood, with fastenings of steel and black locust (*Robinia pseudoacacia*) wood. All wood and steel products are readily available on the existing market in the quantity and type required. To assure watertight seams, the decks are caulked with hemp material called oakum. Oakum is typically made

from hemp strands impregnated with pine tar. The material is rolled into strands that are driven into seams and swell when wet. This entire project is being guided by *The Secretary of the Interior's Standards for Historic Vessel Preservation Projects*. These qualitative standards require materials to be replaced "in-kind" when materials are available and environmentally safe.

Cultural Resources

C.A. Thayer

The vessel itself is the cultural resource being affected. The *C.A. Thayer* is considered an historic structure having over 107 years of active service. The vessel is specifically mentioned in the Parks' enabling legislation, Public Law 100-348, and is central to the Park significance and mission of preservation. The vessel has had many careers and has served as a lumber schooner, a salmon station supply ship, a cod fisher, and most recently as a maritime heritage platform and classroom. Approximately 500 of this type were built beginning from about 1860. Only two of these have survived.

Visitor Experience, Safety, and Park Operations

The *C.A. Thayer* is berthed at San Francisco Maritime National Historical Park located at the Hyde Street Pier on the San Francisco waterfront at Hyde and Jefferson Street. Overall Park visitation is approximately 3.5 million/year. The ship is berthed with five other National Historic Landmark ships open to the public. In the last ten years, the *C.A. Thayer* averaged 200,000 walk-in visitors each year. Additionally, each year, the vessel receives another 7,000 visitors participating in ranger lead programs, 5,000 visitors in "teacher-led" self-guided programs and another 15,000 students from over 200 schools from 17 counties participate in an extremely popular overnight program.

While at the pier visitor safety is controlled by the Park with public access continually monitored by Interpretive Rangers and the Preservation staff. The vessel is in poor condition structurally however remains safe for the general public. As the *C.A. Thayer* continues to deteriorate beyond the Parks capacity of the Park to safely maintain afloat, the vessel will eventually be closed. Park operations will be affected, and additional funding required for off-site moorage and security.



Environmental Consequences

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. This section analyzes the environmental impacts of the three project alternatives on natural resources, cultural resources, and visitor experience. These analyses provide the basis for comparing the effects of the alternatives. The NEPA requires consideration of context, intensity and duration of impacts, indirect impacts, cumulative impacts, and measures to mitigate for impacts. NPS policy also requires that “impairment” of resources be evaluated in all environmental documents.

Methodology

General Definitions

The following terms were used to indicate the anticipated degree of impact, after considering the context, intensity, duration, and cumulative effects associated with each impact topic:

Context

The setting within which an impact is analyzed, such as the affected region, society as a whole, the affected interests, and/or a locality. In this environmental assessment, the intensity of impacts are evaluated within a local (i.e., project area) context, while the intensity of the contribution of effects to cumulative impacts are evaluated in a regional (i.e., park-wide) context.

Intensity

A measure of the severity of an impact. The intensity of an impact may be:

negligible, when the impact is localized and not measurable or at the lowest level of detection;

minor, when the impact is localized and slight but detectable;

moderate, when the impact is readily apparent and appreciable; or

major, when the impact is severely adverse and highly noticeable.

Duration

A measure of the time period over which the effects of an impact persist. The duration of impacts evaluated in this EA may be:

short term, when impacts occur only during construction or last less than one year; or

long term, when impacts last one year or longer.

Cumulative Impacts

Impacts on the environment that result from the incremental (i.e., additive) impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cultural Resources Analyses

The assessment of impacts on cultural resources and historic properties was made in accordance with regulations of the Advisory Council on Historic Preservation (36 CFR 800) implementing Section 106 of the National Historic Preservation Act. Please reference Appendix A for further details of that assessment.

An assessment was made of the nature and extent of effects on the cultural resource, the *C.A. Thayer*, anticipated from implementing the proposed undertakings. Cultural resources can be affected by actions that alter in any way the attributes that qualify the resources for inclusion in the National Register. Adverse effects can result when the integrity of a resource's significant characteristics are diminished. Consideration was given both to the effects anticipated at the same time and place of the undertaking, and to those potentially occurring indirectly at a later time and distance.

To provide consistency with requirements of the NEPA, the effects on cultural resources are also described in terminology intended to convey the duration, intensity, and beneficial or adverse nature of potential impacts. Impacts could be of short term, long term, or permanent duration. (Analysis of the duration of impacts is required under the NEPA; however, duration is not required and is not usually considered in assessing effects in terms of the National Historic Preservation Act). The intensity of impacts is defined as follows:

negligible, when the impact is barely perceptible and not measurable. Significant character-defining attributes of historic properties (including the informational potential of archeological resources) are not appreciably diminished by the undertaking;

minor, when the impact is perceptible and measurable. The effects remain localized and confined to a single element contributing to the significance of a larger national register property/district, or archeological site(s) with low to moderate data potential;

moderate, when the impact is sufficient to alter character-defining features of historic properties, generally involving a single or small group of contributing elements, or archeological site(s) with moderate to high data potential; or

major, when the impact results in a substantial and highly noticeable change in character-defining features of historic properties, generally involving a large group of contributing elements and/or individually significant property, or archeological site(s) with high to exceptional data potential.

Impairment Of Park Resources Or Values

In addition to determining the environmental consequences of the preferred and other alternatives, NPS *Management Policies* (NPS, 2000b) and Director's Order-12, *Conservation Planning, Environmental Impact Analysis, and Decision-making*, require analysis of potential effects to determine if actions would impair park resources.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable adverse impacts on park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely constitute impairment to the extent it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the Park's General Management Plan or other relevant NPS planning documents.

Impairment may not result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A

determination of impairment is made for each impact topic within each "Conclusion" section of this EA under "Environmental Consequences".

No Action Alternative

This alternative does not rehabilitate or repair the vessel to an extent that assures continued survival of the resource. It is felt by the Park, maritime preservationists and the marine community that, with no action, the vessel will eventually deteriorate beyond safe design limits and the NPS will be required to remove it from the collection and place it on a barge until eventually destroyed. The potential impacts from this no action approach are discussed below. This alternative is considered the least favorable resulting in loss of the resource and use by the public.

Impacts on Natural Resources

Water Quality

C.A. Thayer is exhibited in the water at Hyde Street Pier, on the shores of San Francisco Bay.

Cumulative Impacts

The vessel occupies a "footprint" on the surface, and affects tidal currents. If the vessel deteriorated to the point of breakup, a small amount of debris might spread across the surface of the water. The No Action Alternative would continue that maritime use.

Conclusion

The no action alternative would continue to have minor, localized effects on the Bay, but would not impair water quality.

Impacts on Cultural Resources

Historic Structures

The *C.A. Thayer* would continue to deteriorate under the no action alternative.

Cumulative Impacts

The *C.A. Thayer* will continue to deteriorate, and eventually sink, under the no action alternative. The vessel is currently experiencing "hogging" (deformation of the keel), and if unchecked this process may eventually break the vessel's keel (back). At the least, if unchecked, the "hogging" will pull apart the vessel's hull seams, causing it to sink.

Conclusion

The no action alternative would result in major, long-term impact and impairment to this National Historic Landmark vessel.

Park Visual Quality

The *C.A. Thayer* would continue to deteriorate at the vessel's Hyde Street Pier berth.

Cumulative Impacts

The vessel's appearance would suffer as portions of the schooner became unsafe for visitors (i.e. roped-off sections or obvious patching). At some point the vessel's hull/deck integrity would no longer be able to support its own masts and spars, and those would need to be removed.

Conclusion

The no action alternative would result in moderate, long-term impacts and impairment to the Park's visual quality.

Impacts on Visitor Experience and Park Operations

Visitor Experience

The no action alternative, in allowing the deterioration of a National Historic Landmark, would reduce public interest and enjoyment in the Park. Educational programs associated with the *C.A. Thayer*, including an overnight environmental living program for elementary school children, would end.

Cumulative Impacts

Over 200,000 visitors board *C.A. Thayer* each year, and Park staff use the vessel to present interpretive programs to over 35,000 visitors. In addition, an Environmental Living program uses the vessel as an interactive classroom for 15,000 children annually. The loss of a National Historic Landmark would deprive the public of a piece of American history, and break a vital link to the nation's cultural heritage.

Conclusion

The no action alternative would result in major, long-term impacts and impairment to visitor experience.

Park Operations

Increased staff time and materials funding would be required to maintain the vessel.

Cumulative Impacts

As the hull continues to lose structural integrity, the number (and seriousness) of leaks would increase, requiring more frequent maintenance drydockings, and increased time (and funding) required for repair. Similarly, as other areas of the vessel deteriorate, they would require increased maintenance and funding. Personnel and funding required for the increased maintenance costs of the *C.A. Thayer* would be drawn from other Park structures and programs.

Conclusion

The no action alternative would result in major, long-term impacts to Park operations. The no action alternative would impair the Park's ability to maintain other Park structures and areas.

Visitation

The *C.A. Thayer* would continue to deteriorate at the vessel's Hyde Street Pier berth.

Cumulative Impacts

Although *C.A. Thayer* is an important Park asset, it is only one of the Park's fleet of historic vessels. As the *C.A. Thayer's* appearance and interpretive value diminished due to continued deterioration, Park visitors would likely spend less time exploring the *C.A. Thayer*, and visitors with limited time might choose to bypass the *C.A. Thayer* entirely in favor of spending more time on one of the other Park vessels.

Conclusion

The no action alternative, while diminishing the vessel's interpretive value, would result in negligible impact and no impairment to visitation.

Impacts on Safety

Increased deterioration of the vessel would create unsafe conditions for visitors and staff.

Cumulative Impacts

As the structural integrity of the vessel deteriorates, the number of potential safety hazards increases. Although the possibility of sinking at the dock is an obvious danger, even more likely safety hazards due to general deterioration include: overhead dangers from unsafe masts, spars and rigging; tripping hazards in decking; unsafe railing, etc.

Conclusion

The no action alternative would result in major, long-term safety hazards to both visitors and staff. The no action alternative would impair safe visitor enjoyment of the vessel.

Restoration Alternative

Impacts on Natural Resources

Water Quality

C.A. Thayer would be restored at a commercial shipyard facility.

Cumulative Impacts

The vessel would be lifted out of the water into a drydock facility, and wastes generated by the restoration process would be captured on site (and disposed of by the shipyard according to all applicable regulations). The vessel would also be covered during appropriate work stages to prevent debris from dust, paint preparation and paint from entering San Francisco Bay waters.

Conclusion

The full restoration alternative would not impact or impair water quality.

Impacts on Cultural Resources

Historic Structures

The *C.A. Thayer* would be returned to its original, 1895 design under the full restoration alternative.

Cumulative Impacts

Although the basic structure and appearance of the *C.A. Thayer* remained consistent throughout the vessel's working life, some alternations were made to its deck and house configuration to accommodate the codfishing industry. Those alternations would be undone in the full restoration.

Conclusion

The restoration alternative would result in changes from the vessel's current configuration, but would not impact or impair the vessel as a National Historic Landmark.

Park Visual Quality

The *C.A. Thayer* would be moved from the vessel's Hyde Street Pier berth to a commercial ship repair facility.

Cumulative Impacts

The vessel would not be berthed in the Park for an extended period. Park visitors would notice the vessel's disappearance, but it is common for Park vessels to leave the Pier during maintenance/repair drydocks. Although this absence would be extended, the Park would create displays and other interpretive materials to explain the project (as it does when other vessels are absent from the Park). The remaining vessels in the fleet would maintain Hyde Street Pier's visual identity. After the project was complete, the vessel would return to its berth in the Park.

Conclusion

The restoration alternative would result in moderate, long-term impacts, but would not impair Park visual quality.

Impacts on Visitor Experience and Park Operations

Visitor Experience

The full restoration alternative would not change access by the general visitor, but would make presenting an environmental program aboard the vessel difficult.

Cumulative Impacts

Over 200,000 visitors board *C.A. Thayer* each year, and Park staff use the vessel to present interpretive programs to over 35,000 visitors. Although the configuration would require some alteration of existing programs, the impact would be minimal. The current Environmental Living program (15,000 students/year), however, would be significantly affected. The 1895 *C.A. Thayer* carried a small crew, and therefore offered minimal sleeping and support facilities (galley, food storage, etc.). The codfishing-era *C.A. Thayer*, on the other hand, carried a much larger crew of fisherman. The ELP program could be re-designed, but would be required to serve significantly fewer children and/or eliminate the overnight portion of the experience.

Conclusion

The restoration alternative would have a minor adverse effect on current interpretive programming, but no impact on self-guided visitation. The restoration alternative would have a long-term, moderate adverse effect on the Environmental Living Program, and would result in a moderate, long-term impairment of the Park's interpretive goals.

Park Operations

C.A. Thayer will be moved from its berth at the Park's Hyde Street Pier to a commercial shipyard where the restoration work will be performed.

Cumulative Impacts

The vessel's movement would require staff time to loose the mooring lines upon leaving, and to make fast the moorings upon return. These tasks would be intensive, but very short-term. A commercial tugboat, sub-contracting for the repair facility, would transport the vessel, with the shipyard assuming all responsibility for the vessel after the first line was thrown to the tug. The Park would be required to supply a representative in the shipyard to oversee the work, but project staff regularly perform that task at present.

Conclusion

The restoration alternative would result in minor, short-term impacts to Park operations, but would not impair Park operations.

Visitation

C.A. Thayer would be moved from its berth at the Park's Hyde Street Pier to a commercial shipyard where the restoration work would be performed.

Cumulative Impacts

Although *C.A. Thayer* is an important Park asset, it is only one of the Park's fleet of historic vessels. Park visitors would spend more time exploring the other Park vessels, and interpretive/educational programs would be revised to function aboard the other vessels. Overall Park visitation would remain the same.

Part of the restoration alternative would include guided interpretation at the construction site. This access would be limited to approximately 50 persons/week, on established tours, in consultation/cooperation with the commercial facility to insure public safety.

Conclusion

The restoration alternative would have a negligible impact on visitation at the Park, and no impairment to Park visitation. This alternative would have a moderate, long-term impact to visitation at the commercial facility, but would be accomplished in cooperation with the shipyard to make sure that the facility's operation was not impaired.

Impacts on Safety

The work would be performed off-site, at a commercial facility.

Cumulative Impacts

Although much of the work on the vessel would be unsafe for Park visitors/staff if performed in accessible Park areas, the commercial shipyard will regulate and mitigate safety hazards within their facility.

Conclusion

The restoration alternative would result in no impacts or impairment to safety.

Adaptive Rehabilitation: Park Preferred Alternative

Impacts on Natural Resources

Water Quality

C.A. Thayer would be restored at a commercial shipyard facility.

Cumulative Impacts

The vessel would be lifted out of the water into a drydock facility, and wastes generated by the rehabilitation process would be captured on site (and disposed of by the shipyard according to all applicable regulations). The vessel would also be covered during appropriate work stages to prevent debris from dust, paint preparation and paint from entering San Francisco Bay waters.

Conclusion

The adaptive rehabilitation alternative would not impact or impair water quality.

Impacts on Cultural Resources

Historic Structures

The *C.A. Thayer* would be rebuilt largely as it exists now, a state which reflects both its original, 1895 design and modifications made over the vessel's lifetime to facilitate its years in the codfishing industry.

Cumulative Impacts

Although the basic structure and appearance of the *C.A. Thayer* remained consistent throughout the vessel's working life, some alternations were made to its deck and house configuration to accommodate the codfishing industry. Some of these alternations would be retained in the adaptive rehabilitation, such as the larger forecastle (where the fishermen lived) and larger galley/food storage areas. Also retained would be some later additions which facilitate operation and safety, such as electrical systems, alarm systems and an electric bilge pumping system.

Conclusion

The adaptive rehabilitation alternative would retain the vessel's current configuration, which reflects its passage through different West Coast industries, but would not completely recreate the vessel's 1895 configuration. The adaptive rehabilitation would not impact or impair the vessel as a National Historic Landmark.

Park Visual Quality

The *C.A. Thayer* would be moved from the vessel's Hyde Street Pier berth to a commercial ship repair facility.

Cumulative Impacts

The vessel would not be berthed in the Park for an extended period. Park visitors would notice the vessel's disappearance, but it is common for Park vessels to leave the Pier during maintenance/repair drydocks. Although this absence would be extended, the Park would create displays and other interpretive materials to explain the project (as it does when other vessels are absent from the Park). The remaining vessels in the fleet would maintain Hyde Street Pier's visual quality. After the project was complete, the vessel would return to its berth in the Park.

Conclusion

The adaptive rehabilitation alternative would result in moderate, long-term impacts, but would not impair the Park's visual quality.

Impacts on Visitor Experience and Park Operations

Visitor Experience

The adaptive rehabilitation alternative would not change visitor access.

Cumulative Impacts

Over 200,000 visitors board *C.A. Thayer* each year, and Park staff use the vessel to present interpretive programs to over 35,000 visitors. *C.A. Thayer* also hosts an Environmental Living program. When the vessel returned from rehabilitation, all visitation would continue as it does presently. During the period the vessel was under construction in a shipyard visitors would be directed to experience other vessels in the Park's historic fleet, and the Environmental Living Program would be reprogrammed to utilize one of the Park's other vessels.

Conclusion

The adaptive rehabilitation alternative would have a minor, long-term impact on visitor experience during the time the vessel was in the shipyard, but no impact on visitor experience once the project was completed. The adaptive rehabilitation alternative would not impair visitor experience.

Park Operations

C.A. Thayer will be moved from its berth at the Park's Hyde Street pier to a commercial shipyard where the restoration work will be performed.

Cumulative Impacts

The vessel's movement would require staff time to loose the mooring lines upon leaving, and to make fast the moorings upon return. These tasks would be intensive, but very short-term. A commercial tugboat, sub-contracting for the repair facility, would transport the vessel, with the shipyard assuming all responsibility for the vessel after the first line was thrown to the tug. The Park would be required to supply a representative in the shipyard to oversee the work, but project staff regularly perform that task at present.

Conclusion

The adaptive rehabilitation alternative would result in minor, short-term impacts to Park operations but would not impair Park operations.

Visitation

C.A. Thayer would be moved from its berth at the Park's Hyde Street Pier to a commercial shipyard where the adaptive rehabilitation work would be performed.

Cumulative Impacts

Although *C.A. Thayer* is an important Park asset, it is only one of the Park's fleet of historic vessels. Park visitors would spend more time exploring the other Park vessels, and interpretive/educational programs would be revised to function aboard the other vessels. Overall Park visitation would remain the same.

Part of the adaptive rehabilitation alternative would include guided interpretation at the construction site. This access would be limited to approximately 50 persons/week, on established tours, in consultation/cooperation with the commercial facility to insure public safety.

Conclusion

The adaptive rehabilitation alternative would have a negligible impact on visitation at the Park, and no impairment to Park visitation. This alternative would have a moderate, long-term impact to visitation at the commercial facility, but would be accomplished in cooperation with the shipyard to make sure that the facility's operation was not impaired.

Impacts on Safety

The work would be performed off-site, at a commercial facility.

Cumulative Impacts

Although much of the work on the vessel would be unsafe for Park visitors/staff if performed in accessible Park areas, the commercial shipyard will regulate and mitigate safety hazards within their facility.

Conclusion

The adaptive rehabilitation alternative would result in no safety impacts and no impairment to safety.

Environmentally Preferred Alternative

Any project linked to the preservation of the schooner *C.A. Thayer* will be implemented within a context that includes natural resources. However, this National Historic Landmark's nature (i.e. because it is a floating vessel) allows its preservation to be carried out off-site, in a specialized, commercial facility equipped to mitigate impacts to natural resources. In a sense, preserving the *C.A. Thayer* is similar to taking an automobile to a repair shop -- the work can be accomplished in a confined, controlled space. Because of this quality, none of the alternatives present significant impacts or impairments to natural resources.

The no action alternative, however, presents significant impact and impairment to the *C.A. Thayer* as a cultural resource. The two action alternatives, although presenting some impacts, do not impair the *C.A. Thayer* as a cultural resource. Therefore, either of the two action alternatives (restoration or adaptive rehabilitation) are environmentally preferred.

Table 1. Alternatives Comparison

Impact	No Action	Restoration	Adaptive Rehabilitation (Preferred Alternative)
Natural Resource Water Quality	No impact	No impact	No impact
Cultural Resource Historic Structures Park Visual Quality	Major, long-term Moderate, long-term	No impact	No impact
Visitor Experience	Major, long-term	Minor, long-term (during project) Moderate, long-term (after completion)	Minor, long-term (during project) No impact (after completion)
Park Operations	Major, long-term	Minor, short-term	Minor, short-term
Visitation	Negligible impact	Negligible impact (Park) Moderate, long-term (commercial facility)	Negligible impact (Park) Moderate, long-term (commercial facility)
Safety	Major, long-term	No impact	No impact



Consultation and Coordination

Public Involvement

During the scoping process the Park invited peer professionals to consult on the development of alternatives and environmental consequences. The Park held a public workshop on April 27, 2002, to solicit comments from the public. A postcard notification of the workshop was mailed to approximately 200 local businesses, neighborhood groups and individuals, and a press release announcing the meeting was distributed to approximately 30 media outlets on April 5, 2002.

The Park has formed a partnership with the Council of American Maritime Museums (CAMM), members of which have been approached and have agreed to work with the Park in providing peer review during the rehabilitation of the *C.A. Thayer*. Their involvement through the process brings the combined independent experiences in work performed to the U.S.S. *Constitution*, the *Amistad*, *Lettie G. Howard*, *Earnistine*, *Olympia*, and the *Constellation*. The Park proposes to use CAMM to provide periodic on-site project review and public comment throughout the consultation process and the rehabilitation of the *C.A. Thayer*.

The Park has also been working in consultation with the California State Office of Historic Preservation and the Advisory Council on Historic Preservation.

The San Francisco Maritime National Park Association has been the manager of the Park environmental living programs. In addition, the Association's publicists have promoted the Park's public programs and events. The Park would expand its cooperative agreement with the Association to include publicity and public involvement in the consultation process and rehabilitation of the ship.

Stakeholders

In an effort to understand the context for this project, the study team developed a list of "stakeholders" with an active interest in making project decisions or in the outcome of such decisions. It should be noted that the local business community and neighborhood strongly support this project. San Francisco Maritime NHP, an urban park, is located in the Fisherman's Wharf district on the San Francisco waterfront, the third most visited tourist destination in the United States.

	<i>Stakeholders</i>	<i>Primary Interest</i>
1	<ul style="list-style-type: none"> • <i>Visitors</i> • <i>Educational Groups</i> • <i>Environmental Living Program</i> • <i>Overnights</i> • <i>Rangers/Docents</i> 	<ul style="list-style-type: none"> • <i>Visitor Experience and Quality</i> • <i>Protection of Resources</i> • <i>Local Economy</i> • <i>Educational Opportunities</i>
2	<ul style="list-style-type: none"> • <i>Congressional Delegations</i> • <i>Rep. Nancy Pelosi (CA)</i> • <i>Senator Barbara Boxer (CA)</i> • <i>Senator Diane Feinstein (CA)</i> 	<ul style="list-style-type: none"> • <i>Preservation of National Historic Landmark</i>
3	<ul style="list-style-type: none"> • <i>Media</i> 	<ul style="list-style-type: none"> • <i>Visitor Experience</i> • <i>Project Cost</i>
4	<ul style="list-style-type: none"> • <i>Local Governments</i> • <i>City of San Francisco</i> • <i>Port of San Francisco</i> 	<ul style="list-style-type: none"> • <i>Protection of Resource</i> • <i>Local Economy</i>
5	<ul style="list-style-type: none"> • <i>State Government</i> 	<ul style="list-style-type: none"> • <i>Protection of Resource</i> • <i>Regional Economy</i> • <i>Local Economy</i>
6	<ul style="list-style-type: none"> • <i>Local Business</i> • <i>Fisherman's Wharf Association</i> 	<ul style="list-style-type: none"> • <i>Protection of the Resource</i>
7	<ul style="list-style-type: none"> • <i>National Park Service</i> • <i>Servicewide</i> • <i>Park</i> • <i>Support Office</i> 	<ul style="list-style-type: none"> • <i>Protection of Resources</i> • <i>Visitor Experience</i> • <i>Park Operations</i> • <i>Local Economy</i> • <i>Educational Quality</i> • <i>Project Cost</i> • <i>Cultural Cyclic funding</i>

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Appendix A

Concurrently with the Park's implementation of the National Environmental Policy Act (NEPA), the following document was prepared as an outline of the process to initiate compliance with Section 106 of the National Historic Preservation Act.

Guidelines /Methodology For Adaptive Rehabilitation

The work proposed on the *C.A. Thayer* is best described as "Rehabilitation", as defined in *The Secretary of the Interior's Standards for Historic Vessel Preservation Projects*. The project is intended principally to return the vessel to structural stability and to a condition in which it can be well maintained. A secondary intent is to make relatively minor changes to its exterior configuration that would return the vessel to its lumber period appearance. These are clearly "Restoration" elements of the project.

We propose, however, to retain interior alterations in the forward part of the hold dating from the cod fishing period, to make interior alterations within the restored forward house, and to provide for both public and disabled access to the hold area. Each of these items is intended to allow continued use of the vessel as a museum exhibit and as the site of an environmental living program for school groups. These deviations from the pure "Restoration" concept are indeed aimed at "...returning the vessel to a state of utility..." which will "... make possible an efficient contemporary use...", as is described under the "Rehabilitation" definition.

The physical work of the project would be undertaken by a qualified private contractor, working under the close supervision of SAFR staff. The SAFR staff would be assisted by a contracted Project Manager with proven specific expertise in large wooden vessel construction. The SAFR team would also have the benefit of consultation and work product as required from the Park's Naval Architectural consultants, working under an Architectural and Engineering Services Contract. Finally the Park would consult, initially and intermittently as required, with a team of nationally recognized experts in ship preservation, to be drawn from the ranks of the Council of American Maritime Museums.

The specification package, developed by SAFR Contracting staff and the Designers and Planners Naval Architectural firm, outlines the Park's requirements for the project, without closely defining the work process to be employed. The package amounts to a Request for Proposals, defining the product to be delivered but not the sequence of operations, nor the details of methodology. The contractor's proposals would be evaluated on the basis of soundness in proposed methodology, past performance on related projects, and only lastly price. Evaluation would be done by a team to include the Project Manager, staff contracting personnel, the naval architectural consultants, the Historic Preservation Officer, and members of the expert review group.

The bulk of the materials required for the restoration project would be furnished to the contractor by SAFR/NPS. This insures the Park's control over the nature of materials going into the vessel, and eliminates any contractor mark-up on materials. The Park would work with the Defense Logistics Agency (DLA) to acquire these materials, with DLA serving essentially as a low cost broker.

The acquisition of timber will be among the most challenging aspects of the project, but should be quite feasible, working through the DLA and using both Canadian and American sources. All timber is to be treated with sodium borate, a relatively non-toxic material that penetrates well into Douglas fir. For certain of the largest timbers, appropriately engineered laminates might be employed in the place of solid originals. This would only be done in cases where the laminate would not be visible in the finished vessel, including perhaps lower keelsons and clamps. Laminates are not the preferred methodology and their use would be held to a minimum.

Other sorts of near-obsolescent materials, including forged clench rings, large ship spikes, Norwegian-type oakum, and pine tar-based marine glue, are still obtainable but require special ordering and long lead-time for delivery. These would largely be government-supplied materials.

Guidelines/Methodology For 106 Process Documentation

Documentation of the project would involve the joint efforts of SAFR staff, including the contracted Project Manager, a contracted documentation specialist (possibly through the Historic American Building Survey/Historic American Engineering Record, referred to as HABS/HAER), the Park Historic Preservation Officer, SAFR's naval architectural consulting firm, and the contractor selected for the project. Collection and quality assurance for the documentation aspects of the project will be under the general direction of the Park Historic Preservation Officer. The final documentation package would be guided by the Historic American Building Survey/Historic American Engineering Record *Guidelines for Recording Historic Ships*.

Documentation efforts would proceed along two distinct but interrelated lines. The contractor would be largely responsible for the working documentation that must be generated for the successful completion of the construction aspects of the project. This body of drawings, photographs, notes, and other products would be directed primarily at guidance of the contractor's work process. The contractor would be concerned with the problem of recording in detail the nature of the structure for the purpose of replicating precisely each element. All documentation generated during the process would finally become SAFR property and would be fully accessible to staff during the course of the work.

The work of the SAFR team would be directed primarily at producing an historical record of the vessel as it was, and only secondarily with the record of vessel as rebuilt. The focus would be to produce a lasting and thoroughly detailed image of the original vessel, such that the vessel could in fact be reproduced, in every particular, at any time in the future. The final work product would be a set of drawings, photographs, and notes conforming to HABS/HAER standards.

These efforts would obviously overlap and would have to be mutually informative. The thrust of the contractor's work would be practical technology, while that of the SAFR team would be historical technology. They would be recording the same structure, and would share information at all times. The work product would be distinct but mutually supportive.

The body of documentation assembled by SAFR in advance of the project, including historic drawings, specifications, photographs, oral histories, and related research, would support both efforts.

Interpretation Of Work

The *C.A. Thayer* restoration project would be a unique opportunity for the public to view what would be in effect a recreation of an historic shipbuilding process. No wooden shipbuilding project of this scale has been undertaken on the West Coast since about 1920. Every effort would be made to make the work accessible for public viewing and to encourage public involvement in the work.

The shipbuilding contractor would be required to make provisions for regular public access to the project. Details of this specification remain to be developed, but would include a specified area for safe public viewing, and some regular schedule of tours through the work site. Public access and interpretation would be a joint project of the San Francisco Maritime Park Association, the SAFR Ranger staff. Access and tours for school children would be particularly encouraged.

The involvement of SAFR's corps of volunteers in the project work would be encouraged. This involvement would foster the beginnings of an ongoing volunteer crew for the vessel, which will be vital for the long-term maintenance and operation of the vessel. It may be that volunteer work is only practical away from the contractor's work site. In this case, volunteer efforts might be confined to preparation of the rigging elements prior to their installation in the vessel.

A web site devoted to the project would be developed cooperatively between the Park and the Association, designed to provide access to the work to a remote audience.

Proposed Areas Of Configuration Restoration

As noted above, the project would involve restoration of a limited number of now-altered elements of the vessel, designed to return the exterior configuration to the 1895-1912 period.

The most immediately obvious area of proposed restoration is in the main deck area. Work performed for the U.S. Army in 1942 or 1943 lengthened both the main and the fore hatches from their original configuration. The main hatch was extended aft by 4 feet and the fore hatch extended forward by 8-1/2 feet. When the vessel returned to cod fishing in 1946, the enlarged main hatch was retained but the size of the fore hatch was reduced about 4 feet below the original configuration. At the same time, the forward house was lengthened by about 8 feet to accommodate a fisherman's mess room.

We propose to undo these late alterations, shortening the main hatch by 4 feet, extending the fore hatch forward by 4 feet and shortening the forward deckhouse by approximately 8 feet. Evidence supporting this conclusion is found both in physical evidence in the vessel and in a contemporary plan drawing of the *C.A. Thayer's* sister schooner *Metha Nelson*.

On the main deck forward of the house a small hatch which originally gave access to the chain locker would be reinstalled, and a smaller late-period hatch to port would be eliminated.

A minor alteration to the upper edge of the transom, apparently introduced during work done in Seattle in 1957, would be reversed to return the transom to its original, more finely molded, configuration. Also in the transom area, an issue involving the lumber ports currently leading through the transom into the hold, remains unresolved. It is uncertain at this time whether these ports are original to the vessel or if they were added during the Army's rebuilding work in 1942. This question is currently under review by SAFR staff. If no clear evidence is produced, the current configuration would be retained.

The final notable restoration item would be to return the mizzenmast to its original gaff-headed configuration. This change dates from the re-rigging of the vessel in 1946, which involved the use of masts and rigging taken from another vessel. The return to gaff-headed configuration requires only minor physical changes to the upper section of the mizzenmast, but would have a notable visual impact.

Proposed Alterations For Programmatic Purposes


To allow the vessel to continue or improve in its programmatic role as a museum vessel and a site for an overnight environmental living program for school groups, certain interior spaces would deviate from the overall philosophy of pure restoration.

The fishermen's fo'c's'le, occupying the forward fourth of the hold area and installed in its current configuration in 1946, would be retained. This area, with 22 bunks, accommodates class-sized groups of children for the popular and long-running overnight environmental living program. While retention of this later historic element of the vessel's configuration is incompatible with the overall presentation as a lumber schooner, we feel that the children's program is of such value that it should continue to be accommodated aboard the vessel.

Further to accommodate this program, certain interior alterations are proposed to the shortened deckhouse to be installed as a restored element. The program's cooking operations in the small galley area require that workspace and storage be provided in part of the area originally used as the lumber period fo'c's'le in the forward portion of the house. The addition of storage cabinets in the donkey-room at the after end of the deckhouse would be a less consequential alteration.

Certain existing additions and alterations, made during the museum ship period to allow efficient public access to interior spaces, would in general be retained in the vessel as restored. The items include staircases and landing platforms running through the fore hatch to the hold, two new openings leading from the hold into the fishermen's fo'c's'le, and an alleyway allowing circulation through the after cabins, from the main deck to the poop deck. We feel that these alterations, installed by the State Park System prior to 1963, are justified through their accommodation of general visitation.

Planning is now underway for provisions designed to allow for wheelchair access to the hold area. The plan will likely involve a chair lift installed in conjunction with the existing



stairways in the fore hatch. The pattern of visitor flow through the hold area, both for general and disabled visitors, would be affected by the final plan for the ballasting of the vessel, a plan now under development. The ballasting plan will determine the level and configuration of the accommodation deck in the hold area. Design for final hold access configuration, including A.D.A. access, will be submitted for review as it moves toward completion.

Program For Historic Compliance And Peer Review Of Planning And Work

This narrative summary of the proposed restoration project has been prepared for submission to all interested parties as an initial step in the National Historic Preservation Act consultation process (Section 106). This document, together with supporting historical documentation and Environmental Assessment Study, will be reviewed by SAFR staff and consultants, and by Cultural Resources staff at the NPS Regional level. This material will also be made available to the California State Historic Preservation Officer (SHPO) and to the Advisory Council on Historic Preservation (Council). The material was made available for comment by an informal panel of maritime preservation experts and was presented at a public meeting convened to gather input from the general public, held on April 27, 2002. Public comment on the plan was received for a period of thirty days following the public meeting. Comments were considered as a basis for alteration of the preferred alternative, and will be attached to the documentation. For the purposes of compliance with the NHPA Section 106, SAFR Preservation staff and NPS Regional level Cultural Resources staff will jointly arrive at an effect determination which will be formally submitted, with all supporting material, to the SHPO and the Council for concurrence.

The Section 106 Compliance process is seen as proceeding hand-in-hand with the National Environmental Policy Act (NEPA) approval process. The EA document, prepared for the NEPA process by SAFR staff and the Architectural Resources Group, will be presented for public review through the cooperation of the Maritime Park Association.



Appendix B

Regulations and Policies

Public Law 101-348 established San Francisco Maritime National Historical Park to "preserve and interpret the history and achievements of seafaring Americans and of the nation's maritime heritage, especially on the Pacific Coast." Both Section 106 of the National Historic Preservation Act and the National Environmental Protection Act apply to this project.

Following is a brief discussion of applicable Federal regulations, policies and plans related to the proposed project.

The Secretary of the Interior's Standards for Historic Vessel Preservation Projects

The methodology used to determine impacts included review of *The Secretary of the Interior's Standards for Historic Vessel Preservation Projects*, which identifies six types of treatments: acquisition, protection, stabilization, preservation, rehabilitation, and restoration. Rehabilitation (defined as: the act or process of returning a vessel to a state of utility through repair and alterations that make possible an efficient contemporary use while preserving those features of the vessel that are significant to its historical, naval architectural, technological, and cultural values) was identified as most applicable.

The Secretary of the Interior's Standards for Historic Vessel Preservation Projects are:

General Standards

- A historic vessel shall be put to a use, either continuing or new, that requires minimal change to its historic qualities and appearance.

- The defining characteristics of a vessel shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a vessel shall be avoided.
- Each vessel shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other vessels, shall not be undertaken.
- Most vessels change over time; those changes that have acquired historical significance in their own right shall be retained and preserved.
- Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a vessel shall be preserved.
- All vessels shall be subject to a program of preventive maintenance. Deteriorated historic features and their materials shall be repaired rather than replaced. Where the severity of deterioration requires removal of a distinctive feature, the replacement shall match in design, color, texture, and other visual qualities; and, where possible, material. Replacement of missing features shall be substantiated by historical, physical, or pictorial evidence.
- Every reasonable effort shall be made to protect and preserve physical evidence of features previously removed, replaced, altered, or otherwise affected in the course of a vessel's history.
- Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of vessels, if appropriate, shall be undertaken using the most gentle means possible.

Specific Standards for Rehabilitation

- Alterations or additions to a historic vessel shall be undertaken only when such alterations or additions will not have a serious impact on the historic fabric of the vessel, and only when the alterations or additions are compatible with the size, scale, color, material, and character of the vessel.
- Wherever possible, alterations to vessels shall be done in such a manner that if such alterations were to be removed in the future, the essential form and integrity of the vessel would be unimpaired.

National Environmental Policy Act of 1969 (NEPA) (Title 42 U.S. Code Sections 4321 to 4370 [42 USC 4321-4370]).

The purposes of the NEPA include encouraging "harmony between [humans] and their environment and promote efforts which will prevent or eliminate damage to the environment and stimulate the health and welfare of [humanity]". The purposes of NEPA are accomplished by evaluating the effects of federal actions. The results of these evaluations are presented to the public, federal agencies, and public officials in document format (e.g., environmental assessments and environmental impact statements) for consideration prior to taking official action or making official decisions. Implementing regulations for the NEPA are contained in Part 1500 to 1515 of Title 40 of the U.S. Code of Federal Regulations (40 CFR 1500-1515).

National Historic Preservation Act of 1966, as amended (NHPA) (16 USC 470 *et sequentia*).

Policy set forth in the NHPA includes preserving "the historical and cultural foundations of the Nation" and preserving irreplaceable examples important to our national heritage to maintain "cultural, educational, aesthetic, inspirational, economic and energy benefits." The NHPA also established the National Register of Historic Places composed of "districts, sites, buildings, structures and objects significant in American history, architecture, archeology, engineering and culture." Section 106 of the NHPA requires that federal agencies take into account the effects of their actions on properties eligible for or included in the National Register of Historic Places, and permit the Advisory Council on Historic Preservation an opportunity to review such actions. Federal agencies consult as appropriate with state historic preservation officers and other interested parties in fulfilling Section 106 requirements. Section 106 further requires federal agencies to propose and evaluate alternatives to undertakings that would adversely affect historic properties, or to adequately mitigate adverse effects if avoidance cannot be reasonable achieved. Section 110 of the NHPA requires federal agencies to manage and maintain historic properties under their jurisdiction in a manner that considers the preservation of historic, archeological, architectural and cultural values.

The Park's General Management Plan of 1997 discusses projected treatment of each of the Park's historic vessels. The stated treatment for the *C.A. Thayer* is "Restoration" for use as a stationary-floating exhibit. The preferred alternative represents a refinement, rather than a reassessment, of that definition and preferred direction.

The primary thrust of the project remains preservation of the resource through rehabilitation to the 1895-1912 configuration, primarily for use as a floating exhibit. A reading of the definitions employed in the *Secretary of the Interior's Standards for Historic Vessel Preservation Projects*, however, indicates that the stated standards for "Rehabilitation" should be employed for the project. The vessel's function as a floating exhibit requires some deviation from the pure restoration approach. It was always intended that the vessel continue to accommodate public visitation, and to accommodate the environmental living project, and therefore should not be returned in every particular to its 1895 configuration. Further, we have concluded that the best way to achieve optimal ongoing conditions for both public interpretation and preservation is to provide for very limited sailing operation of the vessel. The act of maintaining the *C.A. Thayer* in sailing condition will improve both the interpretive look of the vessel and will insure a much superior standard of ongoing care.

Clean Water Act of 1972, as amended (CWA) (33 USC 1251-1387).

The purposes of the CWA are to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters". To enact this goal, the U.S. Army Corps of Engineers (Corps) has been charged with evaluating federal actions that result in potential degradation of waters of the U.S. and issuing permits for actions consistent with the CWA. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions that affect waters of the U.S. Implementing regulations describing the Corps' CWA program are contained in 33 CFR 320-330. The San Francisco Bay is considered a "no-discharge zone" and as such the *C.A. Thayer* will not discharge water or any waste into the bay waters.

Relationship With Other Plans

This action being proposed is consistent with the mission of the Park and the National Park Service. Preservation of the schooner *C.A. Thayer* is specifically mentioned in the Park enabling legislation and is addressed in the following related documents.

Cultural Resources Management Plan, Golden Gate N.R.A., 1982. Notes deterioration of frames. Calls for inspection and replacement as needed. (pg. 76)

Report of Condition Inspection/Survey, C.A. Thayer, Hull and Cargo Surveyors, Inc. 1983. Details deterioration in framing, planking, and deck beams. Recommends replacement of deteriorated members, noting that it would be a "major project. (pg. 10)

Interpretive Prospectus, National Maritime Museum, Golden Gate N.R.A., 1987. Calls for presentation in lumber schooner configuration, but notes utility of fishermen's fo's'c'le for valuable environmental living program. (pp. 74 – 75)

Cultural Resources Management Plan for the Fleet of Historic Ships of the Golden Gate N.R.A. Tri-Coastal Marine Inc., 1988. Recommends continuation as floating museum ship but with limited sailing operation following rebuild. Recommends rebuild if some "minimum amount of fabric" can be retained in the finished product. (pp. 74 – 80)

Schooner C.A. Thayer Historic Structure Report, Draft, Tri-Coastal Marine Inc., 1991. Details condition of structure and recommends rebuild, with modifications to return to lumber configuration. Feels that much of heavy ceiling, deck beams, and knees may be saved and reused. Provides cost estimate and timber list. (pp. 27 – 106)

Preserving the C.A. Thayer, Morris Guralnick Associates Inc., 1992. Report of conclusions of a panel of ship preservation experts. Endorsed major in-kind rehabilitation approach. Recommended setting up temporary yard for the purpose and self-contracting. (pp. 21-26). Also discussed feasibility of preservation ashore in controlled environment and concluded that this was a possible approach. (pp.26 – 33)

Statement for Management, San Francisco Maritime N.H.P., 1994. Endorsed structural rebuild. (pg. 76)

San Francisco Maritime N.H.P. Resource Management Plan, 1996. Endorsed rehabilitation alternative, either in-house or through contract. (pp. 25 – 26) Submitted three-part project statement to accomplish the work.

General Management Plan, San Francisco Maritime N.H.P., 1997. The Park's General Management Plan (GMP), approved on October 9, 1997, after a public process which ended on September 27, 1997, called for "restoration" of the *C.A. Thayer*. The *C.A. Thayer* Environmental Assessment tiers down from the Park's GMP.

Appendix C

Publications

Anderson, Emil. "C.A. Thayer's Lumber to Australia, 1914." Transcript of June 1960 interview. up VM 6.5 C31

Beckwith, Herbert H., compiler. *Complete voyage record of the three masted schooner C.A. Thayer: covering the period from July 1895 through January 1903.* (Compiled from the New York Maritime Register supplemented by copies of the Marine Exchange arrival/departure cards, 1901 to Sept. 30 1957.) VM 6.5 C3 B43 1990

Canright, Stephen. "Born of the Lumber Trade: A Historical Context for the C.A. Thayer," *Sea Letter*, no. 50, Summer 1995, pp. 2-12. (Reprinted in *Ships in Scale*, July/August 1997, pp. 21-30 (reprint) p VM 6.5 C31 C36 1997.)

Cultural Resource Management Plan for the Fleet of Historic Ships of the Golden Gate National Recreation Area. DRAFT. 1988. V13 N35 T74

Damaged and Threatened National Historic Landmarks, 1988 Report. Compiled by Camille M. Martone Washington, D.C.: National Park Service, U.S. Department of Interior, 1988. Lists Sailing schooner C.A. Thayer with a short description of its significance, the threat/damage the vessel faces, and the recommended action it requires.

Damaged and Threatened National Historic Landmarks, 1989 Report. Washington, D.C.: National Park Service, U.S. Department of Interior, 1989. Lists Sailing schooner C.A. Thayer with a short description of its significance, the threat/damage it faces, and the recommended action the vessel requires.

Damaged and Threatened National Historic Landmarks, 1993 Section 8 Report. Washington, D.C.: National Park Service, U.S. Department of Interior, 1993. Lists Sailing schooner C.A. Thayer with a short description of its significance, the threat/damage it faces, and the recommended action the vessel requires.

Hull and Cargo Surveyors, Inc. *Report of Condition Inspection/Survey [of] C.A. Thayer, At Pacific Drydock on October 14, 1883 and subsequent dates.* 1984. VM 6.5 C3 H8 1983.

Kiser, Carol. "Comparison of Selected Construction Techniques on two Bendixsen-Built Wooden Schooners – *Neptune* and C.A. Thayer," MSS, July 1984. VN 144 K5.

Morris Guralnick Associates. *Preserving the schooner C.A. Thayer.* San Francisco: Morris Guralnick Associates, 1992. VM 6.5 C31 M67 1992.

"National Maritime Museum: Historic Ships of the Golden Gate National Recreation Area." [1989?]. V 13 N35 N35.

Olmsted, Roger R. *C.A. Thayer and the Pacific Lumber Schooners*. Los Angeles: Ward Ritchie Press, 1972. VM 6.5 C3 O41.

San Francisco Maritime Museum. *C.A. Thayer* (3m schooner). 2 volumes, Photographic album (copies of images in photo archives). [vol. 1] s VM 6.5 C3 P5 pam
[vol. 2] s VM 6.5 C31 P5 pam.

San Francisco Maritime Museum. *Schooner C.A. Thayer – cabin restoration*. Section of a report to the State of California, Division of Beaches and Parks, 1960.
VM 6.5 C34

San Francisco Maritime Museum. *The schooner C.A. Thayer: reports I-VI to the State of California, Division of Beaches and Parks*. 1959-1960.

Vol. I – The restoration of the *C.A. Thayer*

Vol. II – Salt salmon packet

Vol. III – Interviews

Vol. IV – Restoration of the *C.A. Thayer*, The *C.A. Thayer* and the North Pacific codfishery

Vol. V - Display plan, Nineteenth century seaman's life, Interviews

Vol. VI – A Pictorial History of the Schooner *C.A. Thayer* VM 6.5 C33.

Tri-Coastal Marine, Inc. *Schooner C.A. Thayer: Historic Structure Report 1991, Draft*. 1991. VM 6.5 C31 S3 1991.

Documents

Delgado, James P. 1981. "The Preservation of Historic Ships on Land: Analysis and Recommendations." San Francisco: Golden Gate National Recreation Area.

Dring, Harrison. 1978. Memorandum to William Mote, Assistant Chief of Maintenance, GGNRA.

Dring, Harrison. 1988. Interview with Don Birkholz, 16 November 1988, concerning changes in *C.A. Thayer's* deckhouse.

Golden Gate National Recreation Area. 1972. Invitation to Bid. Reliable as to intent to carry out work, but does not document actual work completed.

Golden Gate National Recreation Area. 1987. Repair Contract No. 8140-87-0021.
Generally accurate as to work performed.

Golden Gate National Recreation Area. 1989. Drydocking Contract No. 8140-9-0001.
Requisition No. 8140-9- 8018.
Generally accurate as to work performed; quantities in question.

Hastings, Steven. 1984. "Restoring the *C.A. Thayer*," draft of article in typescript.
A reliable account of the 1983 refit and the events and conditions leading up to it, by the then Marine Maintenance Foreman, GGNRA.

Humboldt Times. 18 June 1895. Article reporting the launching of the *C.A. Thayer*.
Vessel specification given in newspaper article at time of launching considered reliable as the information would probably have come through interviews with the owners or builder.

Klebengat, Captain Fred. 1975. Transcription of conversation with Karl Kortum.
Reliable as to West Coast lumber schooner practices.

Martinolich Ship Repair Company. 1959. Invoice for drydocking and repair work.
Reliable document.

Martinolich Ship Repair Company. 1975. Shipyard invoice for work performed at haulout.
Accurate listing of work performed.

Martinolich Ship Repair Company. 1978. Bid Proposal for drydocking and repair work.
Actual work completed is uncertain.

San Francisco Maritime State Historical Park. 1961. Bid Specification for drydocking.

San Francisco Maritime State Historical Park. 1964. Invitation to Bid for Drydocking.

San Francisco Maritime National Historical Park. Photo no. F16.35,380n. (Originally from *Seattle Times*) Reliable documentation of former existence of square yard and sail.

Winslow Marine Railway and Shipbuilding Co. 1943. Receipt for drydocking.
Considered a reliable accounting of work performed on vessel.