
National Park Service
Cultural Landscapes Inventory
2011



Prairie Creek Fish Hatchery
Redwood National Park

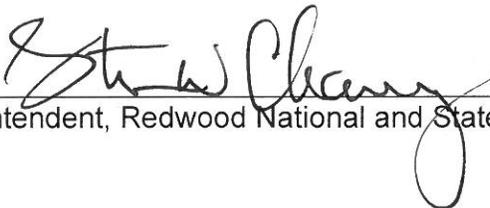


Prairie Creek Fish Hatchery Redwood National and State Parks

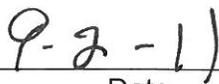
Redwood National and State Parks concurs with the findings of the CLI, including the management category and condition assessment as identified below:

MANAGEMENT CATEGORY: **B: Should be preserved and maintained**

CONDITION ASSESSMENT: **Fair**



Superintendent, Redwood National and State Parks

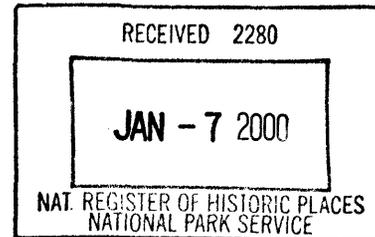


Date

Please return to:

Vida Germano
Cultural Landscapes Inventory Coordinator
National Park Service
Pacific West Regional Office
1111 Jackson St., Suite 700
Oakland, CA 94607-4807

United States Department of the Interior
National Park Service



NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

=====

1. Name of Property

=====

historic name: Prairie Creek Fish Hatchery

other name/site number:

=====

2. Location

=====

street & number: Located at milepost 124.83 on U.S. Highway 101
north of Orick, California.

not for publication: _____

city/town: Orick vicinity: X

state: CA county: Humboldt code: 023 zip code:

=====

3. Classification

=====

Ownership of Property: Redwood National Park

Category of Property: District

Number of Resources within Property:

Contributing

5

7

12

Noncontributing

 buildings

 sites

6 structures

 objects

6 Total

Number of contributing resources previously listed in the National Register: 0

Name of related multiple property listing: none

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this X nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 66. In my opinion, the property X meets does not meet the National Register Criteria. See continuation sheet.

Walter H. Brown

12/22/99

Signature of certifying official

Date

National Park Service

State or Federal agency and bureau

In my opinion, the property X meets does not meet the National Register criteria. See continuation sheet.

Walter H. Brown

Jan. 14, 1999

Signature of commenting or other official

Date

Acting, State Historic Preservation Officer

State or Federal agency and bureau

5. National Park Service Certification

I, hereby certify that this property is:

Elsa H. Beal

entered in the National Register

 See continuation sheet.

determined eligible for the

National Register

 See continuation sheet.

determined not eligible for the

National Register

removed from the National Register

other (explain):

for

Signature of Keeper

2/4/00

Date of Action

6. Function or Use

Historic: Agriculture

Sub: Fishing Facility

Current: Not in use.

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Inventory Unit Summary & Site Plan

The Cultural Landscapes Inventory Overview:

Purpose and Goals of the CLI

The Cultural Landscapes Inventory (CLI), a comprehensive inventory of all cultural landscapes in the national park system, is one of the most ambitious initiatives of the National Park Service (NPS) Park Cultural Landscapes Program. The CLI is an evaluated inventory of all landscapes having historical significance that are listed on or eligible for listing on the National Register of Historic Places, or are otherwise managed as cultural resources through a public planning process and in which the NPS has or plans to acquire any legal interest. The CLI identifies and documents each landscape's location, size, physical development, condition, landscape characteristics, character-defining features, as well as other valuable information useful to park management. Cultural landscapes become approved CLIs when concurrence with the findings is obtained from the park superintendent and all required data fields are entered into a national database. In addition, for landscapes that are not currently listed on the National Register and/or do not have adequate documentation; concurrence is required from the State Historic Preservation Officer or the Keeper of the National Register.

The CLI, like the List of Classified Structures, assists the NPS in its efforts to fulfill the identification and management requirements associated with Section 110(a) of the National Historic Preservation Act, National Park Service Management Policies (2006), and Director's Order #28: Cultural Resource Management. Since launching the CLI nationwide, the NPS, in response to the Government Performance and Results Act (GPRA), is required to report information that respond to NPS strategic plan accomplishments. Two GPRA goals are associated with the CLI: bringing certified cultural landscapes into good condition (Goal 1a7) and increasing the number of CLI records that have complete, accurate, and reliable information (Goal 1b2B).

Scope of the CLI

The information contained within the CLI is gathered from existing secondary sources found in park libraries and archives and at NPS regional offices and centers, as well as through on-site reconnaissance of the existing landscape. The baseline information collected provides a comprehensive look at the historical development and significance of the landscape, placing it in context of the site's overall significance. Documentation and analysis of the existing landscape identifies character-defining characteristics and features, and allows for an evaluation of the landscape's overall integrity and an assessment of the landscape's overall condition. The CLI also provides an illustrative site plan that indicates major features within the inventory unit. Unlike cultural landscape reports, the CLI does not provide management recommendations or treatment guidelines for the cultural landscape.

Inventory Unit Description:

Prairie Creek Fish Hatchery (PCFH) is located about four miles north of Orick, California in Humboldt County within Redwood National Park. The hatchery is located just above the confluence of Lost Man Creek with Prairie Creek, in a mountainous and heavily forested area on the east side of U.S. Highway 101. Except for a house opposite the hatchery on the other side of Highway 101, most of the immediate land surrounding the hatchery is undeveloped.

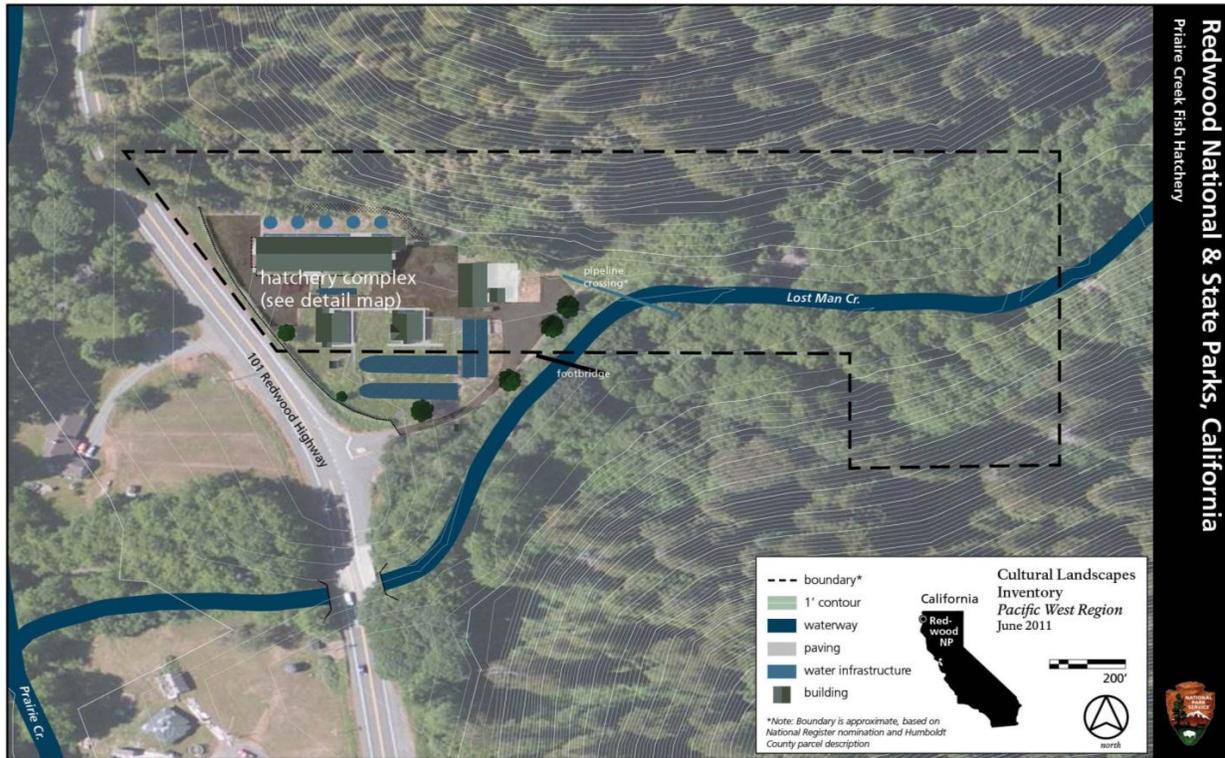
PCFH was listed on the National Register of Historic Places (NRHP) in 2000 as a district. It is eligible for the NRHP under Criterion A (association with historic events) at the state level for its significance as one of only three fish hatcheries known to both survive and possess integrity among 150 hatcheries built, both by private and government entities, in California from 1871 to 1946. PCFH was built by the California Department of Fish and Game. It is representative of pre-World War II hatcheries in California, and illustrative of significant changes in hatchery goals and infrastructure in post-war years. This hatchery evidences basic trends in the uses and designs of hatcheries, in perceptions of environmental issues (especially the impacts of dams), and in government actions and programs considered appropriate to address those issues. The period of significance is 1936 to 1946, which begins with the construction of a permanent hatchery that replaced an earlier temporary facility on the same site. According to the National Register Nomination, the period ends in 1946, as the PCFH is representative of facilities constructed prior to World War II. Beginning in 1947, new hatcheries tended to be larger, more mechanized, less labor intensive, and used more electrical power. These qualities made those facilities different in design and function from previous hatcheries like the one at Prairie Creek.

The boundaries of the PCFH historic district are the same as those of the original 6.2-acre parcel that was purchased by the California Department of Fish and Game. Currently within the historic district boundaries are the main Hatchery, two houses, the garage-shop, the shed, round concrete water tanks, and the pipeline stream crossing, which is all that remains of the pipeline. The buildings that survive are well-built, but modest, plain, wood-frame structures, designed by the California Division of Architecture. The reinforced concrete outdoor water tanks and pipeline crossing still convey the function of the facility. The PCFH originally consisted of a 6.2-acre parcel with a main Hatchery building, four houses, a garage-shop, a shed, and outdoor water tanks; a 3,000-foot-linear-right-of-way for a 12-inch pipeline; and an 800-foot-long reservoir created by a rock dam. However, most of the pipeline has washed away in floods and the original dam and reservoir were removed in 1989.

Despite diminished integrity of design, workmanship, materials, and feeling that is associated primarily with the loss of the pipeline and dam, there remains a high degree of integrity amongst the buildings and other features of the PCFH. Whereas the pipeline and reservoir were upstream, away from the highway and hidden in the forest, the features which survive are highly visible and strongly convey the significance of the property.

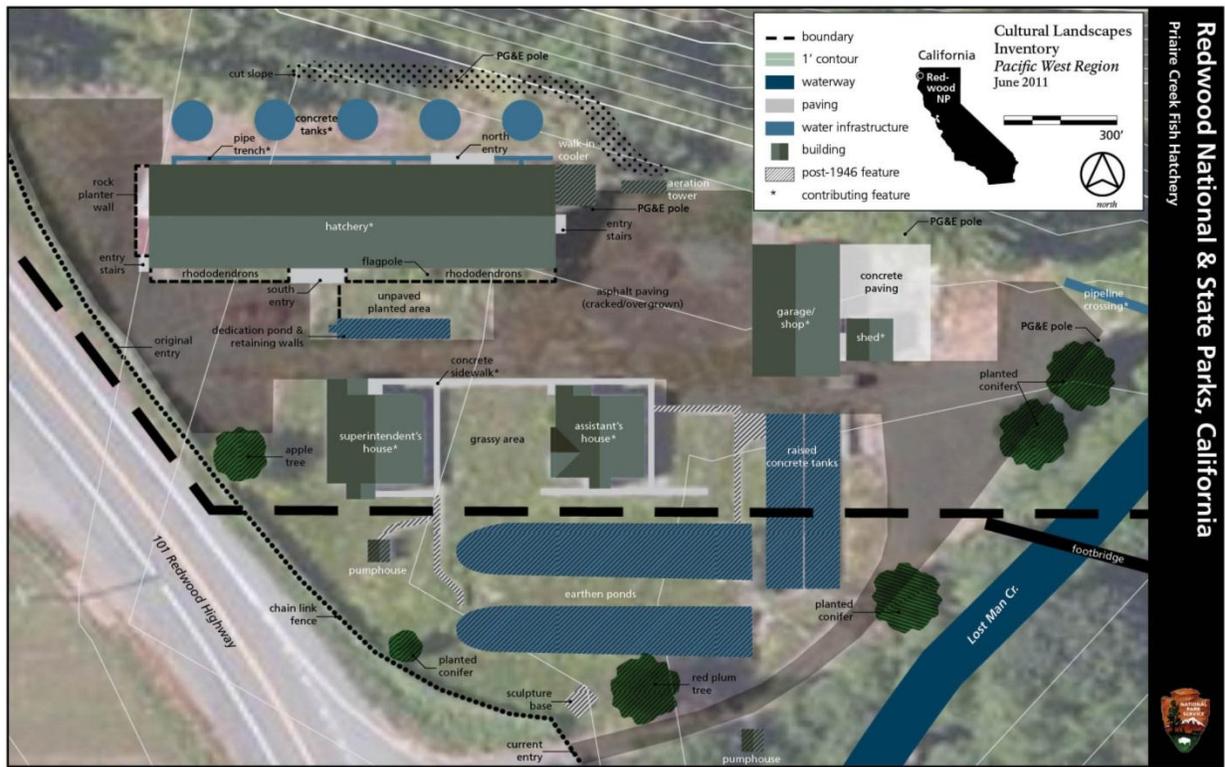
The historic character of PCFH is still evident in the following landscape characteristics: natural systems and features, spatial organization, land use, vegetation, circulation, buildings and structures, and small scale features. Based on the evaluation of these characteristics, the cultural landscape at the PCFH exhibits key patterns, relationships, and features that convey the historical significance of the district. Overall, the landscape is in fair condition.

Site Plan



Overview of Prairie Creek Fish Hatchery site and cultural landscape boundary (Braa, PWR, 2011). See the Supplemental Information section for a full 11"x17" version of site plan.

Prairie Creek Fish Hatchery
Redwood National Park



Detail of Prairie Creek Fish Hatchery building complex (Braa, PWR, 2011). See the Supplemental Information section for a full 11"x17" version of site plan.

Property Level and CLI Numbers

Inventory Unit Name:	Prairie Creek Fish Hatchery
Property Level:	Landscape
CLI Identification Number:	700003
Parent Number:	700003

Park Information

Park Name and Alpha Code:	Redwood National Park REDW
Park Organization Code:	8480
Park Administrative Unit:	8480

CLI Hierarchy Description

The Prairie Creek Fish Hatchery (PCFH) is a landscape with no component landscapes.

Concurrence Status

Inventory Status: Complete

Completion Status Explanatory Narrative:

The Prairie Creek Fish Hatchery (PCFH) Cultural Landscape Inventory (CLI) is based on the previous National Register of Historic Places nomination form completed by Michael R. Corbett in January 2000. This document resulted in PCFH being listed as a district on the National Register of Historic Places. Further background information was provided by the Historic Resources Study Report for PCFH, prepared by Michael Corbett and Denise Bradley for Mountain Anthropological Research in May 1997. Fieldwork for the CLI was conducted in June, 2011 by Brian Braa and Vida Germano from the Pacific West Region's Oakland office. Elizabeth Pidgeon, a Historic Architect also from the Oakland office, accompanied Vida and Brian on the fieldwork visit to inspect the buildings, update building descriptions, and provide guidance on needed stabilization measures.

Concurrence Status:

Park Superintendent Concurrence:	Yes
Park Superintendent Date of Concurrence:	09/02/2011
National Register Concurrence:	Eligible-Keeper
Date of Concurrence Determination:	2/4/2000

Geographic Information & Location Map

Inventory Unit Boundary Description:

Boundary Description

The Humboldt County Recorder provided the following boundary description for Prairie Creek Fish Hatchery's (PCFH) original 6.2 acre parcel. This boundary was used as the district's boundary in the January, 2000 National Register nomination form.

“Beginning at the intersection of U.S. Highway 101’s eastern right-of-way line and the south line of Section 14 in Township 11 North of Range 1 East, proceed northwesterly along said right-of-way approximately 305.5’ to a point 270’ from said section line, measured at a right angle to same. Then proceed east 947.6’, parallel with said section line to a point which is 200’ east and 270’ north from the quarter section corner on said section line. Then proceed 420’ south, at a right angle to said section line into the northeast corner of Section 23. Then proceed approximately 200’ west, parallel with said section line to the quarter section line at the west boundary of the northeast quarter of section 23. Then proceed north approximately 150’ along said quarter section line to the south line of Section 14. Then proceed west along said section line approximately 608.1’ to the point of origin.”

Boundary Justification

The boundary of the PCFH historic district was based on work that was established in the 2000 National Register of Historic Places (NRHP) registration form. That form was in turn based upon the *Final Historic Resources Study for Prairie Creek Fish Hatchery*, prepared in 1997 by Michael Corbett and Denise Bradley of Mountain Anthropological Research.

This boundary follows the original 6.2-acre parcel purchased for the PCFH, on the east side of U.S. Highway 101. This parcel is L-shaped consisting of a generally rectangular area (170 feet by about 900 feet) with an east-west orientation, and a small panhandle (150 by 200 feet) south of the east end.

The historic district contains all surviving components of the PCFH facility from the period of significance (1936 to 1946). Both contributing and noncontributing features are located within the district. Additionally, two ponds, two wells, concrete tanks, and a weir/fish ladder related to operations were built outside of the historic district after the period of significance. Several features of the original PCFH were located east of the 6.2 acre parcel, occupying a curvilinear right-of-way outside of its boundaries. These included the pipeline, the upper dam, and the pond behind the dam. However, these are no longer in existence and therefore this area has been excluded from the boundaries of the district.

The UTM listed for the district corresponds to the center of the property and is listed in the NRHP Places geographic database. It identifies the exact location of the inventory unit. UTMs for the corners of the property have not been provided because they are not required by the Cultural Landscape Inventory for properties less than 10 acres.

State and County:

State: California

County: Humboldt

Size (Acres): 6.2

Boundary UTMS:

Source	Type of Point	Datum	Zone	Easting	Northing	ID
<i>GPS-Differentially Corrected</i>		<i>NAD 83</i>	<i>10N</i>	<i>413820</i>	<i>4576215</i>	<i>A</i>

Prairie Creek Fish Hatchery Redwood National Park

Location Map:



Prairie Creek Fish Hatchery is located seven miles northeast of Orick, California, in the southern half of Redwood National Park (NPS 2011).

Management Information

General Management Information

Management Category: B: Should be Preserved and Maintained

Management Category Date: 09/16/2011

Management Category Explanatory Narrative:

The Prairie Creek Fish Hatchery (PCFH) historic district meets all criteria for Category B – Should Be Preserved and Maintained. PCFH has been listed on the National Register under Criterion A. Furthermore, its significance is compatible with Redwood National Park’s legislated significance, which was created, in part, to preserve sites that can provide scientific study as well as have historical values related to the coastal redwood forests and the streams with which they are associated (Public Law 90-545). Lastly, it has a potential purpose appropriate to its traditional use or function, because its facilities are relatively intact for its period of significance.

NPS Legal Interest

Type of Interest: Fee Simple

Public Access

Type of Access: No Access Currently

Public Access Explanatory Narrative:

The area surrounding Prairie Creek Fish Hatchery has been fenced to prevent public access. This is mainly to protect the public from hazards presented by its unmaintained buildings and landscape, as well as prevent vandalism of the PCFH. Furthermore, all of the buildings have been secured with bolted and locked doors, and windows covered with plywood in an effort to prevent public access to their interiors.

Adjacent Lands Information

Do Adjacent Lands Contribute? No

National Register Information

Existing National Register Status

National Register Landscape Documentation:

Entered – Documented

National Register Explanatory Narrative:

The Prairie Creek Fish Hatchery (PCFH) is listed on the National Register of Historic Places (NRHP) as a district. This district encompassed the entire area of the site's original 6.2 acre parcel, which contains all surviving contributing features of PCFH. The listing date of February 4, 2000, was the first date the district was placed on the NRHP, and the listing has not been modified since that time.

Existing NRIS Information:

Name in National Register:	Prairie Creek Fish Hatchery
NRIS Number:	00000034
Primary Certification Date:	02/04/2000

National Register Eligibility

National Register Concurrence:	Eligible--Keeper
Contributing/Individual:	Individual
National Register Classification:	District
Significance Level:	State
Significance Criteria:	A – Associated with events significant to broad patterns of our history
Period of Significance:	1936 – 1946
Historic Context Theme:	Developing the American Economy
Subtheme:	Agriculture
Facet:	Fish Farming
Historic Context Theme:	Creating Social Institutions and Movements
Subtheme:	Recreation
Facet:	Sports
Historic Context Theme:	Transforming the Environment
Subtheme:	Conservation
Facet:	Fish, Wildlife and Vegetation Preservation

Historic Context Theme: Expressing Cultural Values
Subtheme: Architecture
Facet: Vernacular Architecture

Area of Significance:

Area of Significance Category Agriculture
Conservation
Entertainment/Recreation

Statement of Significance:

The following narrative has been constructed from information contained in the 2000 National Register of Historic Places nomination. The original nomination did not provide a separate section for the statement of significance, but instead included information relating to significance throughout the document. Therefore, information relating to significance has been consolidated in the text below.

Prairie Creek Fish Hatchery (PCFH) is significant under the National Register of Historic Places (NRHP) Criterion A at a state level. The PCFH is representative of the nature of pre-World War II functions of hatcheries in California, and illustrative of significant changes in hatchery goals and infrastructure in post-war years. The hatchery's period of significance begins in 1936 and ends in 1946 because the property evidences basic trends in the uses and designs of pre-World War II hatcheries. The property also reflects perceptions of environmental issues (especially the impacts of dams), and government actions and programs considered appropriate to address those environmental issues. As such, it is a good representation of the efforts of the California Department of Fish and Game (DFG) during the period of significance.

Among the 150 hatcheries built in California from 1871 to 1946, PCFH is one of only three fish hatcheries known to both survive and still possess integrity. In addition, the PCFH was among the last built before a major state program of modernization and mechanization began in 1947. Although built in the 1930s, it has more in common with 19th-century hatchery facilities than it does with those built after 1946. It was among the last built before that date, and, while a detailed survey has not been done, it is the only one of its period known to survive largely intact. While in operation, attributes it shared with earlier hatcheries were its small size, localized region of release, design to hatch and release fingerlings, purpose of stocking fish in local streams, provision of housing for workers, dependence on simple technology with minimal need for power, and funding through fishing licenses and related fees.

PCFH is part of a tradition of using fish hatcheries to support both conservation of native fish species and provision of native fish stocks for sports fishing in California. The state's Fish Commission, a DFG predecessor, was first established in 1870. It was intended primarily to conserve and restore fish in California waters for sport fishing. This was in reaction to depletion of fish stocks by overfishing, as well as by habitat changes resulting from logging and mining. In addition, by the mid-1920s, the federal Bureau of Fisheries began to support hatcheries first because of the potential benefits to commercial ocean fishing and later to mitigate the effects of dams on fish stocks.

In relation to the fish hatchery program of the DFG and its predecessors, PCFH is a rare surviving representative of an important early phase of hatchery history. California hatcheries were primarily developed during three periods. Facilities developed during Period I (1871 to 1915) and Period II (1916 to 1946) were similar in many ways. They were low technology enterprises with minimal requirements for

power. Most were small and placed in isolated locations, thus requiring worker housing. They were designed to release small fish. Because they were paid for by fishing licenses and related fees, and most were built for the purpose of stocking streams for sport fishing. Period I was dependent on railroads to receive feed, eggs, and other supplies, and to ship fish. During Period II, trucks were used for these purposes and new hatcheries could be located away from railroads, as was the case with PCFH. Period III (1947 to present) was very different from Periods I and II. This is the primary reason PCFH's period of significance ends in 1946. Most facilities after that date were built as mitigation for dam construction and were paid for by federal and state agencies outside DFG. The facilities were large, highly mechanized, and dependent on substantial amounts of electrical power. They provided less housing for workers, who now commuted in automobiles. These facilities were designed to raise fish to a larger size before release.

Architecturally, PCFH reflects traditions in California fish hatchery design before World War II. California fish hatcheries have typically contained: a Hatchery building providing shelter for the hatching process; support buildings for storage, maintenance, and fuel; indoor and outdoor ponds for growing fish; a reliable source of good water, which has usually meant a stream, but may also include wells; systems to deliver water to the PCFH, such as a pipeline; fish ladders and other features to facilitate the return of fish to a hatchery; and housing for a superintendent and workers. Electric power generally had to be generated using gasoline generators, and therefore was used sparingly. Hatchery buildings from this period were generally ordinary and unadorned examples of their times, whether garages, sheds, or houses.

PCFH exhibited all of these elements within its complex. It had a Hatchery building with outdoor ponds for growing fish; a support shed/garage; a dam, reservoir and pipeline to convey water from nearby Lost Man Creek to the facility; three houses for the superintendent, assistant superintendent and workers; a residential cistern for domestic water; and gasoline-powered pumps to move water when gravity was not sufficient. Its buildings were utilitarian and little-decorated, constructed of locally harvested redwood.

End of the Period of Significance

DFG did not modify PCFH after 1946 to reflect the new paradigm of hatchery mechanization. Therefore, it did not provide a typical example of hatchery design after that date. Although the PCFH continued to operate for a time, DFG closed the facility in 1956 because it was considered outmoded. In 1958 the property was purchased by Humboldt County, which modified the facility to include mechanized features. From the mid-1970s to 1992 it was the only county-operated anadromous fish hatchery in the United States. In addition, as logging declined it held a more conspicuous position in the local economy and local life. However, its entire history as a county facility has taken place since 1958 and most of the county's changes were implemented post-1960. Under the criteria of the NRHP, if a property is less than 50 years old, it must possess exceptional significance under criteria consideration G in order to be eligible. PCFH facilities from this period do not appear to possess exceptional significance. Furthermore, the PCFH also does not appear eligible under criterion A for its local role in the economic development and social life of Humboldt County.

National Historic Landmark Information

National Historic Landmark Status: No

World Heritage Site Information

World Heritage Site Status: No

Chronology & Physical History

Cultural Landscape Type and Use

Cultural Landscape Type:

Historic Vernacular Landscape

Current and Historic Use/Function:

Primary Historic Function:

Fishing Facility (Hatchery)

Primary Current Use:

Vacant/Maintained (Mothballed)

Other Use/Function

Domestic (Residential)-Other

Other Type of Use or Function

Historic

Current and Historic Names:

Name

Prairie Creek Fish Hatchery
Prairie Creek Station (Experimental)

Type of Name

Both Current and Historic
Historic

Ethnographic Study Conducted:

No Survey Conducted

Chronology

Note: Unless otherwise referenced, information came from the 2000 National Register nomination.

Year Begin	Year End	Event	Annotation
1928	1928	Established	Temporary fish hatchery established by the California Department of Fish and Game (DFG) on Lost Man Creek, to determine the feasibility of hatching cutthroat trout eggs at this location. This was named “Prairie Creek Station (Experimental)” to reflect its status. It was located on the west side of U.S. 101, near the site of the present-day PCFH, just below the junction of Prairie Creek and Lost Man Creek. Facilities consisted of racks and traps for catching fish, a tent hatchery, a 2,500-foot 12-inch flume, two cabins for employees, and a garage (PCFH National Register Nomination 2000:15-17). The cabins and garage may have been reused in the later permanent facility.
1935	1935	Platted	DFG had 6.2 acres of land surveyed, in order to purchase the land and establish a permanent fishery. The survey map showed the proposed hatchery property, the route of a pipeline from an upstream point of diversion to the hatchery property, and the point of diversion on Lost Man Creek. Proposed hatchery buildings were shown in dashed lines on the map.
1935	1935	Established	Water permit number 4619 was granted by the California Department of Water Resources on 29 August 1935. This allowed the construction of a permanent facility, and required construction to commence before 1 April 1936, be completed by 1 December 1938, and be in complete operation by 1 December 1939.
1936	1936	Land Transfer	Property sold by Hammond & Little River Redwood Company and the Hill-Davis Company to the Division of Fish and Game. This included the 6.2 acres surveyed in 1935 along with a right-of-way for a pipeline from Lost Man Creek and the point of diversion on Lost Man Creek (Humboldt County Recorder 1936).
1936	1936	Built	Initial construction of permanent facility begins, with the 8’ high concrete diversion dam and whitewashed Hatchery building completed by 31 December 1936. The complex included a circular driveway between the Hatchery and the future three houses. In the center of this driveway was a stand of second growth redwoods, dahlias, and a flagpole.

1937	1937	Built	Additional structures within the complex were completed: superintendent's house, assistant's house, garage-shop, shed used to store firewood, 3,000 foot 12" steel pipeline, pipeline stream crossing (a suspension bridge across creek with a walkway above the pipe), elevated water filter (wooden cage full of rocks) at the east end of the Hatchery building, and pump which moved water to covered 1,980 gallon redwood domestic water tank elevated 60 feet on hillside. The buildings were whitewashed, and built with virgin redwood milled locally. South of the houses (current location of raised tanks, pump houses and earthen ponds) was the location of clotheslines and a garden.
1937	1937	Established	PCFH placed into full operation (California Department of Natural Resources 1939:35), with 80 troughs and four tanks (Leitritz 1970:67).
1936	1943	Built	Five round concrete tanks constructed on north side of hatchery.
1936	1943	Built	Sidewalks added to area surrounding the houses.
1940	1940	Established	An inspection confirmed that the maximum use of water had been reached. Accordingly, "License for Diversion and Use of Water Number 2355" was issued (California Department of Public Works 1942) for 1.86 cubic feet of water per second, enabling PCFH to operate on a permanent basis. The facility's objective was to raise annually 1.75 million fish, of which 150,000 would be over three inches.
1943	1943	Alteration	Attic bedroom finished out, with access stair, in Superintendent's house.
1945	1955	Stabilized	The water quality deteriorated and water flows increased following World War II because of logging operations in the watershed above the hatchery. As a result, annual stabilization of the creek banks adjoining the hatchery property was required during the years between the end of the war and 1955 (Leitritz 1970:67).
1955	1955	Abandoned	Department of Fish and Game ceases operations at PCFH because it was considered outmoded (PCFH National Register Nomination 2000:32).
1958	1958	Purchased/Sold	Humboldt County leased the property from the Department of Fish and Game for five years. In 1961, an act of the State Assembly conveyed the PCFH to the county without cost, stipulating that it be used only as a fish hatchery.

1962	1962	Built	Three wells were dug, and a pumphouse constructed in an effort to mitigate water quality issues because water arriving from Lost Man Creek was too warm and dirty for the fish. This pumphouse was located just north of the intersection of U.S. 101 and Lost Man Creek, just outside the PCFH boundary.
Circa 1962	Circa 1962	Moved	Entrance to PCFH from U.S. 101 was moved from its original location between the houses and Hatchery building to its present location just north of Lost Man Creek.
1962	1962	Built	Ornamental “dedication pond” and associated retaining walls were built where the driveway had been (Corbett 2000). Along with this, rock planters were constructed around the south and west sides of the Hatchery building. The area between the pond and the hatchery was regraded with a short retaining wall on the west, and left unpaved, presumably to allow planting (onsite observation during 2011 CLI site visit).
Circa 1965	Circa 1965	Removed	In association with the use of well water, the old filtration tank behind the Hatchery was demolished.
Circa 1965	Circa 1965	Built	A new aeration tower was constructed. Silted creek water and well water could be improved by passing it through this tower.
Circa 1965	Circa 1965	Built	Two rock-lined rectangular ponds were dug in the earth south of the houses, in an effort to modernize hatchery operations. Eggs now were hatched in incubators in the Hatchery building, with the fry transferred to the round tanks and then to the ponds.
Circa 1966	Circa 1966	Demolished	The cabin across Lost Man Creek was demolished (Sanders 1996).
1969	1971	Built	Many new facilities were constructed under Superintendent Steuer, to accommodate growing salmon when normal capacity at the hatchery was exceeded. These included the Lower Dam, a pond on the north side of Lost Man Creek about 100 yards above the Lower Dam, a levee, and a culvert (Sanders 1997, Anderson 1997).
1968	1968	Built	Redwood National Park was established, which added visitor facilities just south of the PCFH boundary, including: a footbridge across Lost Man Creek, a fence, and a picnic table. PCFH became a regular part of school field trips, and received thousands of visitors (Sanders 1996).

1971	1971	Built	To improve water quality, a new well and pumphouse were created. They were located behind the superintendent's house (Joanne Sanders 1996).
1971	1971	Built	Several types of fencing were added to PCFH after 1971. These include a 6-foot high chain link fence along the west boundary of the hatchery, a split-rail fence to the north of the five round watertanks, and a split-rail fence to the east of the driveway. Vertical plank fencing was added north of the garage-shop and shed, and south of the superintendent's and assistant's houses.
1973	1973	Demolished	Easternmost house was demolished to build the rectangular concrete tanks (Humboldt County 1992).
1973	1973	Built	Two rectangular concrete tanks were constructed in the location of the demolished house, along with a fish ladder just below. An electrical weir was placed in the stream at the base of the ladder. The weir replaced previous mechanical weirs. With these new facilities, the hatchery process was modified. Salmon returned up the fish ladder to the concrete tanks where they were spawned; eggs were moved to incubators inside the Hatchery building; growing fish were moved to inside tanks, then outside tanks, then the rock-lined earthen ponds, then the rectangular concrete tanks again before release (Sanders 1996).
1973	1973	Built	A walk-in cooler was built outside the east end of the Hatchery for frozen meat. This provided an alternative food source for the fish, which were previously fed with pellets.
1973	1973	Maintained	Concrete sidewalks and steps throughout site were replaced with new concrete, at the same time as concrete tanks were added to the site. (Observations of concrete materials while on-site in 2011).
1973	1973	Built	A mobile home was placed east of the garage-shop and shed (Humboldt County 1992).
1973	1973	Moved	Old 8-foot diameter domestic water tank was brought down the hill and moved inside the hatchery next to the three existing 10-foot diameter tanks.
1974	1974	Built	A 5-ton carved redwood sculpture of a salmon carved by Floyd Davis of Crescent City was installed at entrance to PCFH. This was done in honor of a highly publicized fish that was nick-named Indomitable, which had improbably returned to the hatchery through its outfall system.

Prairie Creek Fish Hatchery
Redwood National Park

1978	1978	Conserved	Following expansion of Redwood National Park, logging activity was stopped in the watershed above the hatchery (Redwood National Park, 2008). Over time this would result in increased water quality in Lost Man Creek.
1981	1981	Maintained	The houses, originally whitewashed, were repainted red and re-roofed.
1981	1981	Removed	The original salmon sculpture was removed due to deterioration. It was sold to Buck's Restaurant in Woodside, California.
1981	1981	Built	A new salmon sculpture was placed at the entrance to PCFH, similar to the first sculpture.
1984	1984	Built	A new power pole was installed by PG&E east of the Hatchery building.
1988	1989	Removed	The original, upper dam, no longer in use was removed (Sanders 1996).
1992	1992	Abandoned	Despite much favorable publicity and efforts of private groups and public officials, PCFH was closed October 31, 1992, due to funding problems. In less than a month, the fish, most of the furnishings and equipment, and the personnel (except for a caretaker) were gone.
1992	1992	Removed	The mobile home was sold and moved away, and the salmon sculpture removed and eventually sold to the Washington Elementary School for one dollar.
1996	1996	Altered	At time of 1996 HRS survey, doors and windows were nailed shut with plywood.
1997	1997	Maintained	Prior to taking ownership, the NPS agreed to undertake basic repairs, and efforts to 'mothball' (preserve for future use) the structures (King Smith, 2001). At this time, the houses, garage-shop and shed were reroofed, all windows were covered with plywood with openings for ventilation, exterior doors were removed for protection (stored within buildings) and replaced with plywood framed doors with secure bolt system, and gutters were installed on the Hatchery north and south elevations (King Smith 2001). Painted sheet metal gutters were possibly removed from the houses at this time; some downspouts remained (onsite observation by CLI team, 2011).

Prairie Creek Fish Hatchery
Redwood National Park

1997	1997	Maintained	NPS locked the site to prevent public access, and assumed responsibility for landscape maintenance, cutting grass regularly (King Smith 2001).
1997	2011	Removed	Metal thieves removed extraneous utilities conduit and boxes.
1998	1998	Land Transfer	Ownership of PCFH was transferred from California State Department of Fish and Game to the NPS (King Smith 2001 and Deed on file at REDW South Operations Center).
2005	2005	Maintained	Plants were pruned throughout the site in preparation for photography for the 2005 Historic American Buildings Survey. This included removing blackberries from building foundations and the Dedication Pond, pruning the rhododendrons on the south side of the hatchery building, and pruning shrubs on the northwest corners of the houses (conversation with Karin Anderson Grantham, 2011).
2011	2011	Stabilization	Two support posts with concrete footings and steel post bases were added beneath beams flanking the north doorway to relieve loads on Hatchery posts adjacent to the doors. The bases of existing posts in these locations failed due to wet condition/rot.
2011	2011	Maintained	The Superintendent's House was partially primed in preparation for repainting all of the buildings. However, lead paint was found to have been used in the past so the repainting project was stopped.

Physical History:

The following physical history is taken primarily from the 2000 National Register of Historic Places nomination. However, the historical information contained in that document included several historic context descriptions not typically contained in a CLI. Therefore, the physical history has been consolidated in this section and the context descriptions are included in the supplemental information section of the CLI.

Pre 1936: Prairie Creek Station (Experimental)

For nearly ten years before PCFH was permanently established, it operated as a “temporary” or “experimental” hatchery. According to the 30th Biennial Report of the California Department of Fish and Game (DFG): “During the summer and fall of 1927, a survey was made to find a stream on the northwest coast from which cut-throat trout eggs could be obtained. After a close study and from data gathered in former years, we decided to establish a temporary hatchery and traps on Prairie Creek, Humboldt County” (California Department of Natural Resources 1929:57). The following year, in mid-November 1928, the hatchery was ready for operation. Facilities at that time included racks and traps in Prairie Creek for catching fish; a tent hatchery with eight eyeing troughs, later increased to 30 (Nash 1996); a 2,500-foot long, 12-inch flume; and two cabins for employees. This first station was not at the site of the present PCFH but apparently was on the west side of the highway. The station was located on “Prairie Creek below its junction with Lost Man Creek” (California Department of Natural Resources 1929:57). It was not far away from the post-1936 site, however, as its 2500-foot flume brought water from Lost Man Creek.

While the purpose of the 1927 survey was to find a source for cutthroat trout eggs, in the first season, 1928-1929, high water enabled the cutthroat trout “to pass over the tops of the racks” so that none were trapped and no eggs were taken. During the 1928-1929 season, the station operated both as an egg collecting station and a hatchery for both trout and salmon; 208,000 silver salmon eggs were taken and hatched at Prairie Creek, except for 60,000 eggs taken to Fort Seward Hatchery; and 1,400,000 steelhead trout eggs were taken, with nearly half hatched at Prairie Creek Station and the remainder taken to Fort Seward Hatchery. “Several logjams and other obstructions in Prairie creek” were partially removed, and plans were made to remove the rest before the next fall salmon run. Four types of fish were observed: chinook salmon, silver salmon, cutthroat trout, and steelhead trout. “The chinook and steelhead are desirable for general distribution and the silver salmon and cut-throat trout were of value for distribution in Humboldt County.” The overall assessment of the first year was favorable: “Judging from the first season's showing, we think the establishing of the station was justifiable and the station is a decided asset. There is ample water for hatchery purposes, even if the capacity is increased and the water seems to be good” (California Department of Natural Resources 1929:57).

The 31st Biennial Report stated that due to bad weather: “we still consider the station in an experimental stage and unproven as to either its continuance or as to its abandonment.” The only substantial improvement made to the facility during 1929-1930 was to build a garage. Because “a good run of steelhead trout in Prairie Creek” was believed to occur only every five years, “we have planted the creek heavily during the past two years in the hope of ultimately building up a regular steelhead run in the creek. If we are able to succeed in this endeavor, it will be very good proof of the plan of planting large numbers of small fish instead of a few large fish.” An alternate plan under consideration was the establishment of a hatchery on Redwood Creek (California Department of Natural Resources 1931:52-53). Nevertheless, the hatchery continued hatching steelhead, cutthroat trout, silver salmon and King

salmon eggs and distributing the fry in waters of Humboldt and Del Norte Counties through 1936” (Leitritz 1970:67).

For the period of its temporary status, from 1928 to 1936, the predecessor to PCFH was named “Prairie Creek Station (Experimental)” (California Department of Natural Resources 1931:52). More loosely, it was referred to by its two functions, as Prairie Creek Egg Collecting Station and Prairie Creek Hatchery (Leitritz 1970:67). At least in its first year, it appears to have been located on the west side of the highway (rather than on the east side as it is today). Sometime before 1935, it was moved to another temporary location on the south side of Lost Man Creek (which is east of its present location). A 1935 survey map showed a rectangular Hatchery building on the south side of Lost Man Creek on the section line, just east of the midpoint of the section line with a house shown west of the midpoint (Elam 1935). Thus, during the period 1928 to 1936, the temporary hatchery appears to have been originally located west of Highway 101 and west of the present location of PCFH. Later, it was relocated south of Lost Man Creek and east of the present location of PCFH.

The exact location of the temporary hatchery building is unknown, however an undated photograph of the “Prairie Creek Hatchery” at the State Archives may show the tent hatchery of the first season (1928-1929). This is a rectangular stud-frame structure with gabled roof framing. The lower walls are clad on the outside by horizontal wood planks. The roof, upper walls, and gable ends appear to be draped in white canvas. The building is situated among tall trees. The photograph is taken along a path leading diagonally to a corner of the structure.

Another undated photograph published in 1970 of the old hatchery building, Prairie Creek (Leitritz 1970:67) shows a structure with a similar shape, in a similar setting, from the same diagonal point of view. This structure appears to have the same horizontal siding on its lower walls, but its upper walls have been enclosed with windows and it has a solid roof with overhanging eaves. It appears to be a wider building, but the use of a different camera lens for the two photographs makes them hard to compare. This may be the same building as shown in the apparently earlier photograph, with improvements to the structure; it may be another building on the same site; or it may be another building on a different site.

Another undated photograph from the State Archives labeled “Main Racks Prairie Creek” is an upstream view of what appears to be a spillway with wooden box-like structures below the spillway.

One of the two cabins described in the 30th Biennial Report, for 1926 to 1928, may be the same structure shown on a survey of the property in 1935 situated on the section line on the south side of Lost Man Creek (Elam 1935). A hand-drawn addition to a map made by the Department of Fish and Game later in 1935 showed the cabin just north of the section line (California Department of Natural Resources 1935). In 1962, the cabin was shown on another map at this same location (Larson & Macmillan 1962). In fact, both cabins may have survived into the 1970s (Sanders 29 July 1996); if the second cabin was south of the first, it would not necessarily have been shown on any of these maps.

Although there is no physical evidence, it seems possible that the garage built in 1929-1930 may survive either moved or on its original site as the shop or shed. Because the garage was described as a major improvement, it seems unlikely that it would have been simply abandoned. Rather, like the employee cabins but unlike the temporary tent hatchery, it may have been reused in some form.

1936-1946: Development of Permanent Facility

In 1935, the Department of Natural Resources, Division of Fish and Game initiated steps to replace the temporary Prairie Creek station with a permanent hatchery. Until this time, the hatchery had operated on land leased from the Hammond & Little River Redwood Company and its partner, the Hill-Davis Company, and had relied primarily on temporary facilities including a tent hatchery and a flume (presumably an open, wood structure). To build a permanent hatchery, the land had to be surveyed and purchased; it was necessary to get a license from the Department of Public Works, Division of Water Resources to take water from Lost Man Creek; and the buildings and other features of the hatchery facility had to be designed and built.

In May of 1935, the Division of Fish and Game had a survey made to accompany its application to the Division of Water Resources (California Department of Natural Resources 1935). On the map prepared by the surveyor, the following features were shown: the proposed Hatchery property, the route of a pipeline from an upstream point of diversion to the Hatchery property, and the point of diversion on Lost Man Creek. The Hatchery property was an L-shaped piece of land (later described as 5.8 acres) consisting of a main east-west section, generally rectangular in shape, and a small panhandle projecting southward from the east end. The main part of the property was crossed by Lost Man Creek flowing northeast to southwest, from the east end to the center of the southern boundary; and the west end faced the Redwood Highway. The southern boundary of this section of the property was the line between Sections 14 and 23 of Township 11 North, Range 1 East, south of which was the property of Robert McIntosh. A comparison with another survey made just prior to this map suggests that the southward panhandle at the east end of the property was included in order for the old temporary facility to fall within the boundaries of the new fish Hatchery property (Elam 1935).

For the purposes of the application, several features of the proposed Hatchery were shown by the surveyor with dashed lines to indicate their proposed location and the general functioning of the facility. On the west half of the property between Lost Man Creek and the Redwood Highway, several buildings were shown including a rectangular Hatchery, a garage, two houses (for a superintendent and an assistant), and a "B.Q." (possibly meaning Bachelors' Quarters). A discharge flume was shown leading from the southeast corner of the property in a southeastward direction to Lost Man Creek. In addition, a tank was shown near the east end of the property which was the terminus of a 3,000-foot, 12-inch pipeline from the point of diversion. The route of the pipeline was shown as a dashed curve which crossed Lost Man Creek, passed across the eastern boundary of the L-shaped property, traveled east across adjacent portions of Township 11 North, Range 1 East, and curved south along the left bank of Lost Man Creek to the point of diversion on the south side of the meandering creek.

The map was prepared with the size and shape of the property shown as they were later established, and the facilities shown partly as they were established (California Department of Natural Resources, Division of Fish and Game 1935b). However, marked by hand on the map were corrections which showed the property as it was actually built. These hand corrections, which are not dated, were as follows: a domestic water tank is shown north of the group of buildings; the garage is turned from an east-west orientation to a north-south orientation, occupying the space of the building later called the shop; a small shed was shown east of the south end of the garage-shop; a third house, for an assistant, was shown between the houses of the superintendent and another assistant; the discharge flume was moved so that it ran from the center of the Hatchery directly south toward Lost Man Creek; a house was shown on the east side of the creek south of the pipeline. Each of these features was built as shown on the altered surveyor's map, although some features have since been removed. Only one feature is unknown – the "B.Q." which was hand corrected to a point east of the garage-shop and the shed. This structure may have been built,

because a structure in the general location shown on the map appears in a 1950 aerial. In summary, PCFH was built largely according to this map prepared in mid-1935, and all the features shown, whether as part of the original base map or drawn in by hand, were built by 1940.

The map accompanied an “Application to Appropriate Unappropriated Water,” submitted as application number 8391 to the Division of Water Resources as the first step towards permanent licensing to take water from a stream (California Department of Public Works 1935a). The application requested three cubic feet per second to be used for recreational and incidental domestic use where recreational use was defined to include fish culture. Water would be taken from a diversion works, which was not categorized as a dam, in a 12-inch riveted steel pipeline for 3,000 feet, falling 7.44 feet. The cost of the diversion works, intake, and pipeline was \$1,800. In response to this application, Permit Number 4619 was granted on 29 August 1935, with the stipulations that construction begin before 1 April 1936, be completed by 1 December 1938, and be in complete operation by 1 December 1939.

With a permit to take water, work on the entire PCFH complex could proceed, beginning with design of facilities by the Department of Public Works, Division of Architecture (Nash 1996). PCFH was one of three new hatcheries about which it was said that “Extensive construction and improvement have been accomplished through government relief agencies (California Department of Natural Resources 1937). This is all that is known about the source of money for the project. In the first of three progress reports required as steps toward licensing, received 20 October 1936, \$10,000 worth of work had been done, but the project was not finished. By that time, 1,800 feet of 12-inch steel pipe had been laid and construction had begun on “new hatchery buildings.” A diversion dam and the Hatchery were projected to be finished by 31 December 1936 and other Hatchery structures in the following year (California Department of Public Works 1936).

In addition, on 29 July 1936, the property was sold by Hammond & Little River Redwood Company and the Hill-Davis Company to the Division of Fish and Game. The sale included the property surveyed in 1935 together with right-of-way for a pipeline from Lost Man Creek and the point of diversion on Lost Man Creek (Humboldt County Recorder 1936).

According to the “Progress Report by Permittee” for 1937, prepared 8 October 1937, all work on the PCFH was complete “at a total expenditure of approximately \$20,000 for materials, labor and service.” At the time of the report, the PCFH was not using as much water as it expected it would need, and was not in full operation (California Department of Public Works 1937). By the end of the year, this was achieved: “During 1937, the rebuilt Prairie Creek and Basin Creek hatcheries were put into full operation” (California Department of Natural Resources 1939:35), with 80 troughs and four tanks (Leitritz 1970:67) and the description as an egg collecting station was dropped (Leitritz 1970:13). The buildings were built under the supervision of a state employee who hired local carpenters to do the work. Glen Nash, now retired in Eureka, recalls building two of the houses with one other man. They worked from a set of plans provided by the state and used virgin redwood milled locally. He considered the houses well designed and well built, but “nothing fancy.” At the time they were built, there were more trees on the site. During the period of construction, the workers stayed in a motel in Orick (Nash 1996).

The progress report for 1938, filed 14 October 1938, stated that maximum use of water had been reached, a prerequisite to inspection for permanent licensing. This was clarified in a letter on 25 October 1938 stating that the entire capacity of the water line was not being used, but that it would be used when additional tanks were installed “at some indefinite time in the future” (California Department of Natural Resources 1938).

Following the assertion in the progress report for 1939 (California Department of Public Works 1936-1939) that maximum use of water had been reached, the facility was inspected on 18 September 1940. This inspection was conducted by A.S. Wheeler, assistant hydraulic engineer for the Division of Water Resources, accompanied by Allan F. Pollitt, PCFH foreman. Facilities noted in the inspection were a concrete dam (8 feet high, 175 feet long) “with a plank apron and a 4' x 54' spillway at the center”; a conduit consisting of “4' of 16” and 3000' of 12” pipe” discharging into a filtration tank (22.6' x 16.6' x 7.8') with three 8-inch distribution lines; three houses occupied by fourteen people; one house with a sink only for two people; a Hatchery building with 40 double rearing tanks and a meat room; five outside ageing tanks; 800 square feet of flowers and ornamentals; 2,825 square feet of lawns; an aquarium; and a 1,980 gallon domestic water tank. The objective of the facility was to raise annually 1,750,000 fish, 150,000 of which would be over three inches long (California Department of Public Works 1941). Following this report, License for Diversion and Use of water Number 2355 was issued (California Department of Public Works 1942) for 1.86 cubic feet per second, enabling PCFH to operate on a permanent basis.

PCFH Facilities and Operations Prior to 1955

Once the license had been issued, new reports were filed with the Division of Water Resources every three years. Reports continued to be made every two years by the Division of Fish and Game in the Biennial Reports. Looking back, Leitritz wrote, “During the 1940s, silver and king salmon and cutthroat, rainbow, and steelhead trout were produced. The installation also served as headquarters for rescue work on north coastal streams” (Leitritz 1970:67). The superintendent of PCFH from 1943 to 1949 was Steven Paul Smedley. Smedley's son, Glen, now a retired Del Norte County Supervisor in Crescent City, was a teenager living at the PCFH during those years and recalls the place and its operation well. When the Smedley family moved in, the only electricity at the PCFH was provided, unreliably, by a hand cranked, blue Kohler gasoline powered generator in the north end of the shop. Gasoline was pumped by hand in front of the shop. Water was delivered in a pipeline carried across Lost Man Creek on a suspension bridge with a walkway above the pipe. The dam where the pipeline began was a wood frame structure of rocks, with a trap and holding boxes at the north end. The pipeline ended at an elevated water filter located behind the east end of the Hatchery building, where the easternmost round tank now stands. The filter was a wood cage full of rocks. When the water had passed down through the filter, it was distributed to the Hatchery building, to five round concrete tanks on the north side of the Hatchery building, and to the domestic water tank. At the Hatchery building, it was carried in a flume across the north side of the building and distributed to the troughs. From the bottoms of the troughs, it was carried as waste in an outfall line southward into Lost Man Creek. From the filter, another pipe carried water to a pump north of the Hatchery building, which raised it 60 feet to a tank on the hillside for domestic purposes. This was a round, redwood tank on a stand, covered by a roof. The shed east of the shop was used for storage of “presto logs” to heat the houses (Smedley 1996).

The entrance to PCFH from Redwood Highway was a circular driveway between the Hatchery building and the three houses. In the center of the driveway were dahlias, a stand of second growth redwoods, and a flagpole with a cross bar for two flags. South of the houses (where the raised tanks, pump houses, and earthen ponds are now) were clotheslines and a garden. Two big redwood trees were cut down and removed. A very large stump outside the north end of the shop was overgrown with Cecil Bruner roses planted by Mrs. Smedley. Rhododendrons around the property flourished and were fertilized with salmon carcasses. Mr. Smedley built a small smokehouse on the west side of the creek, south of the pipeline. Smoke was brought to the smokehouse in an underground pipe from the houses (Smedley 1996).

The buildings were all whitewashed. The northernmost of the three houses was occupied by the Smedleys with two boys and two girls. The attic was finished as a bedroom for the girls. In the middle house were the Laidlaws with five children. There was a young couple in the third house. Across the creek, a single man lived in the cabin (Smedley 1996).

Two types of fish were hatched, salmon and trout. Salmon swam up the creek and were trapped behind the dam. They were dipped out, examined, and, if ripe, eggs were removed from females and spawned from males in buckets. Carcasses were left for bears, and fresh carcasses were eaten by the staff or given away. Fertilized eggs were carried to the Hatchery building and set in special baskets with holes inside the troughs. The baskets were turned, eggs hatched, and fry grew to fingerlings. (During Steve Sanders tenure as superintendent, fry were referred to as button-ups or swim-ups). Fingerlings were moved to outside tanks to grow. When they were big enough, they were placed in milk cans with aerators, loaded in trucks and carried to streams in Humboldt and Del Norte Counties. By 1949, the deliveries were made in a special tank truck. Trout were raised in the same way, except that trout eggs were collected at the Mt. Shasta Hatchery and delivered to PCFH.

While the fish were growing, they were fed a diet of ground liver, delivered regularly from a slaughterhouse in Eureka. The liver, from cattle, was dyed green so it wouldn't be eaten by humans. It was ground in the northeast room of the Hatchery building (Smedley 1996).

“Following World War II, the water supply deteriorated because of logging operations in the watershed above. Flows decreased in summer and winter floods required expensive annual stabilization of the creek banks adjoining the PCFH property” (Leitritz 1970:67). Between 1946 and 1948, \$1,482 was spent on improvements to the water system (California Department of Natural Resources 1949). These improvements may have included the five redwood tanks mentioned for the first time in documents during 1949. These were outside the Hatchery building and measured four feet by 16 feet by 30 inches high.

“The old, outmoded installation required extensive repairs by 1955, so work there was largely discontinued and production was replaced by the Cedar Creek Experimental Station” (Leitritz 1970:68). A description of the facility is available about the time it closed from another former employee, Bob Will, former manager of the private Rowdy Creek Fish Hatchery. Will worked at PCFH from May to December 1955 under superintendent Carleton Rogers. Will described the facility almost exactly as Smedley did for 1943 to 1949, including whitewashed buildings; an elevated rock filter at the end of the pipeline; the dam built of wood with rocks; access to the property between the Hatchery building and the three houses; and a single cabin across the creek. The only difference in 1955 was that the area south of the houses was a large blackberry patch instead of a garden and clothesline area. Throughout the state period, there were five to eight persons employed at the facility, and a total population that included up to 15 employee dependents (Will 1996).

PCFH Facilities and Operations after 1955

The history of PCFH for the period immediately after 1955 is not completely known. Bob Will visited the facility in the spring of 1956 and was involved in shipping eggs from Mt. Shasta later in that year, indicating that it was still in operation, after which it was idle for some time (Sanders 1989). The Report of Licensee filings for the years 1956 to 1964 state that the full amount of water allowed under the license was used in each of those years, that it was still operated by Fish and Game, and that three families remained in residence (California State Water Rights Board 1958-1964). However, the Department of Fish and Game stated that it had been abandoned in the 44th Biennial Report for the period ending 30

June 1956 (California Department of Natural Resources 1957). According to Leitritz, “Humboldt County assumed operation of the facility in 1957” (Leitritz 1970:68). “On December 16, 1957 the Board of Supervisors, upon the request of the Department of Fish and Game, executed a lease for a term of five years. The lease commenced February 1, 1958 and terminated June 31 [sic], 1963” (Sanders 1989). On 15 September 1961, an act of the State Assembly took effect “to provide for the conveyance to Humboldt County of the Prairie Creek Fish Hatchery.” The property was transferred without cost to be used only as a fish hatchery for the following reasons: “The Legislature finds that there is an urgent need that all available facilities be used to produce fish for the citizens of this State and that use of this property by the County of Humboldt is a state public purpose since it will permit the continued operation of a fish hatchery which would otherwise be discontinued for economic reasons (California Assembly 1961).

The description of this property was exactly the same as that purchased by the state in 1936. A resurvey of the property in 1962 confirmed the original description of the boundaries (Larson and Macmillan 1962). This survey showed some but not all features of the facility. The features shown were the Hatchery buildings, three dwellings along the southern edge of the property between U.S. 101 and Lost Man Creek, one dwelling on the southern edge of the property east of Lost Man Creek, and a portion of the pipeline crossing Lost Man Creek.

By 1962, under the ownership of Humboldt County, the superintendent of the facility was Ken Johnson. Johnson is remembered for having discovered on December 2, 1964, the salmon which returned to the PCFH through the outfall system by swimming up narrow pipes, jumping two and one-half feet, and getting around a screen. The fish was named Indomitable and was widely publicized (Hufford n.d.:310). Later, in 1974, a five-ton, carved redwood sculpture of Indomitable, made by Floyd Davis of Crescent City, was installed at the entrance to PCFH (Hufford n.d.:310; Bentzley 1984). This sculpture deteriorated and was replaced about 1981 by a similar sculpture. The first was sold and now resides at Buck’s Restaurant in Woodside, San Mateo County (MacNiven 1996). The last record of the second sculpture was that it had been moved to the Arcata-Eureka Airport when the PCFH closed (31 October 1992) and was then sold by the Humboldt County supervisors to Washington Elementary School for one dollar (Bernay 1992; Humboldt County Administrative Officer 1992).

During the 1960s, under Johnson and his successor, Bill Steuer (ca. 1967 to 1970), numerous changes were made. Operational changes were made both to improve water quality and to modernize an outmoded process. Due to increased runoff caused by logging, silt in Lost Man Creek resulted in water which was often too warm and too dirty for the fish. At least three efforts were made to dig a well, one of which resulted in the construction of a small pump house in 1962 (Sanders 1996; Humboldt County 1992). This was located just north of the intersection of U.S. 101 and Lost Man Creek on land which was outside the PCFH property. Sometime during the 1960s, and perhaps at this time, the entrance to PCFH from the highway was moved from its original location between the Hatchery building and the houses to its present location just north of Lost Man Creek. In association with the use of well water, the old filtration tank behind the Hatchery building was demolished and a new aeration tower was built by Humboldt County. Silted creek water and, especially, well water could be improved by passing through the aeration system.

Around 1965, the ornamental “dedication pond” was built where the driveway had been, between the Hatchery building and the houses, and, to modernize the hatchery process, two, rock-lined, rectangular ponds were dug in the earth south of the houses. Inside the building, metal racks were placed for incubator trays, replacing the baskets with fertilized eggs which were previously put in the troughs for hatching. Now, fertilized eggs were placed in incubators until they grew into fry; fry were placed in troughs until they were big enough to move to the round tanks; and later to the rock-lined earthen ponds. The growing fish were fed dry pellets in place of ground liver (Humboldt County 1966; Sanders 1996;

Sanders, Joanne 1996; Will 1996). Under superintendent Steuer, the cabin across Lost Man Creek was demolished (Sanders 1996); the lower dam was completed in August 1969 (California State Water Resources Control Board 1970); facilities, consisting of a pond on the north side of Lost Man Creek about 100 yards above the Lower Dam, a levee, and a culvert, were built to accommodate growing salmon when normal capacity at the facility was exceeded (Sanders 1997; Anderson 1997); and there was “quite a bit of construction work in and along Lost Man Creek.” Because of problems with the water and construction work, no water was taken from the creek in 1965-1969 (California Department of Fish and Game 1970).

In early 1971, Steve Sanders took over as Superintendent. Under Sanders, additional changes were made to improve the operation, which, because of poor water quality, was on its “last legs” (Sanders 1996). At that time a new water intake was under construction and nearly complete. This never produced satisfactory water. Instead, in 1971, a new well was dug and a new pump house built for it which were located behind the superintendent's house (Joanne Sanders 1996; California State Water Resources Control Board 1974). A new pump for this well was purchased in 1973 (Humboldt County 1992), and a new pole for increased power was installed east of the PCFH by PG&E in 1984. An electrical weir, superseded by mechanical weirs, was placed in the stream at the base of a new concrete fish ladder. Fish were diverted up the ladder into a pair of new, rectangular, aboveground, concrete tanks. The old domestic water tank (8-foot diameter) was brought down the hill and placed inside the Hatchery building next to the three existing tanks (10-foot diameter). More incubators were also purchased for the Hatchery building. To provide better feed than pellets, a walk-in cooler was built outside the east end of the Hatchery building for frozen meat (Sanders 1996).

With these new facilities, the hatchery process was modified. Salmon returned up the fish ladder to the big rectangular concrete tanks where they were spawned; eggs were moved to incubators; “fry were moved to troughs, which were 'ponded' into sections; growing fish were moved to inside tanks, then outside tanks, then the rock-lined earthen ponds, then the rectangular concrete tanks again before release” (Sanders 1996).

This operation was run with three workers. Family accommodations changed when the easternmost house was demolished to build the rectangular concrete tanks, and a mobile home was placed east of the garage-shop and shed (Humboldt County 1992). The houses, originally whitewashed, were painted red and reroofed in 1981. In 1988, the original, upper dam, no longer in use, was removed (Sanders 1996).

While the principal purpose of the facility continued to be a hatchery, with establishment of Redwood National Park around it in 1968, there was an increase in tourism, fishing, swimming and sightseeing in the 1970s. Redwood National Park built a footbridge across the creek on PCFH property to accommodate visitors. PCFH received thousands of visitors and was a regular part of school field trips in Humboldt County. In addition to its function as a hatchery, PCFH and its personnel took on the added role of serving as an interpretational and educational facility (Sanders 1996).

According to Report of Licensee filings, water quality was “marginal” in the mid-1970s but afterward improved (California State Water Resources Control Board 1977 and 1979). Although water quality issues improved, funding problems soon emerged. The county provided funding until restricted by Proposition 13 in 1978; the Department of Fish and Game provided grants until 1990, when the funding criteria changed to require stream rehabilitation; and the county provided funding again in 1991 and 1992 (Rathjen 1992). Despite much favorable publicity and the efforts of private groups and public officials, PCFH closed October 31, 1992 (Frishberg 1991; Rathjen 1992; Times-Standard 1992; Humboldt County Board of Supervisors 1988; Bernay 1992). In less than a month, the fish, most of the furnishings and equipment, and the personnel, except for a caretaker, were gone. The mobile home was sold and moved

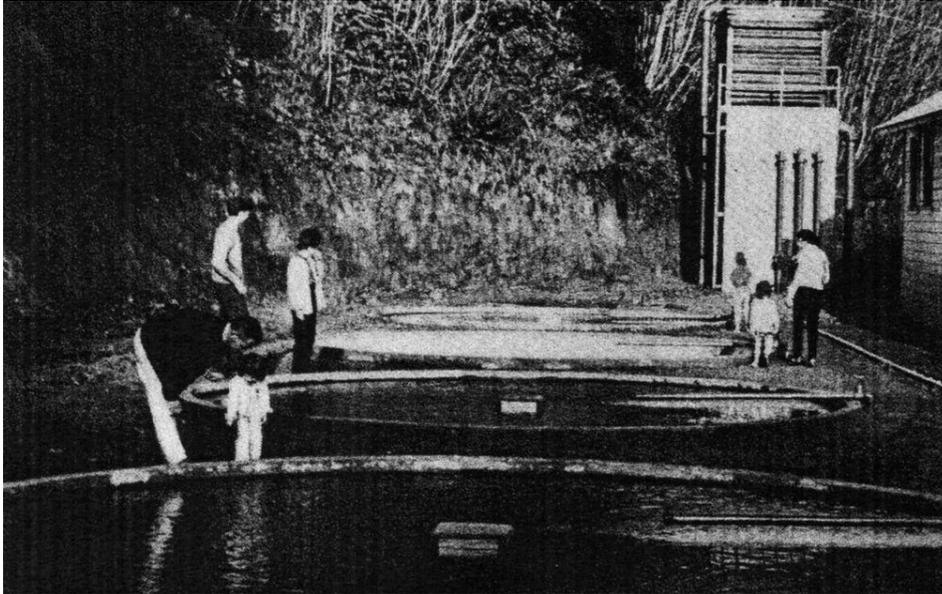
away, and the sculpture of Indomitable was taken to the Arcata-Eureka Airport in McKinleyville (Bernay 1992).



1950 oblique aerial photo showing historic Prairie Creek Fish Hatchery and surrounding forest. Note the cistern located on the hillside above the Hatchery building, and the pipeline corridor leading east (to the right) across Lost Man Creek (Copy of photo, courtesy of REDW).



1950 oblique aerial photo showing detail of the landscape within the core building area of historic Prairie Creek Fish Hatchery. Note the hedge along the south side of the Hatchery building, the original entry drive from Highway 101, and the extent of area for automobile circulation within the site (Copy of photo, courtesy of REDW).



North side of Hatchery building, showing concrete tank area. Note lack of vegetation and topographic cuts in hillside (From Orick Chamber of Commerce promotional brochure. n.d.).

Analysis & Evaluation of Integrity

Analysis and Evaluation of Integrity Narrative Summary:

Where possible, analysis and evaluation has been taken from the 2000 National Register of Historic Places nomination. However, although that document incorporated landscape elements, they were not organized according to the requirements of a CLI. Furthermore, some of the landscape elements were not described in detail. Therefore, this section builds upon the National Register nomination, but also includes additional information to provide a complete understanding of the cultural landscape.

Summary

Prairie Creek Fish Hatchery (PCFH) has experienced a number of changes since the end of its period of significance. These changes consist of improving and enlarging facilities after 1947 to provide an increasingly mechanized operation. However, many of the original buildings and structures still survive, which provide insights into early California fish hatchery operations. The property retains the physical features essential to convey its historic significance, which is of utmost importance in assessing integrity (U.S. Department of the Interior 1991:44-46).

The PCFH boundary encompasses the main Hatchery building, two houses, a garage-shop, a shed, five round concrete water tanks, sidewalks, and the pipeline stream crossing. These buildings and structures are located adjacent to Highway 101 and are highly visible to motorists along this route. This building complex represents the remaining historic development associated with PCFH and its operation. It still possesses a high degree of integrity, and strongly conveys the significance of the property.

The upper dam and its associated reservoir were removed in 1989. However, the dam and reservoir were located in the forest upstream from the facility's main buildings and hidden from view from U.S. Highway 101. As such they did not play a large part in conveying the historic character of the landscape nor the significance of PCFH.

In terms of the seven aspects of integrity, PCFH possesses a high degree of integrity of location and association. The wider setting of forested hillsides and stream course remains intact. The group of buildings and other features that survive from the period of significance contribute strongly to integrity of feeling, in part because they maintain the original plan of buildings and spaces between them. In addition, the architecture of the buildings conveys PCFH's association to California's Department of Fish and Game (DFG), because it exhibits the elements and architecture style typically used in hatcheries built by DFG. The remaining houses convey the idea that housing was an integral part of PCFH complex during this period, because the people who worked at the facility also lived there. The buildings also have integrity of design, workmanship and materials, because for the most part they retain their original materials and have not been materially modified since the period of significance.

Some facility modifications have resulted in effects to the cultural landscape. Integrity of setting is diminished somewhat by the expansion of the facility in the 1960s and 1970s. Integrity of feeling is diminished by the repurposing of the main driveway, construction of the Dedication Pond and associated planter walls, the addition of asphalt paving, loss of most of the pipeline and the upper dam, and painting the originally whitewashed buildings a dark red. Integrity of design, workmanship, and materials is diminished by the alterations of the water supply system, demolition of the third house, and construction of raised concrete water tanks in its place. The integrity of design, workmanship, and materials is also diminished due to adding asphalt paving to the originally unpaved entry drive.

Fortunately, these changes have not irretrievably damaged the landscape's integrity. Changes to the original circulation system involved little loss of design and material, and could be easily restored. The losses of the third house and the cabin are ameliorated by the survival of two houses. The greatest loss is in the water supply system, because the original dam that supplied water to the PCFH was removed in 1989 and much of the pipeline washed away in a circa 1971 flood. However, the dam was found to be ineligible for National Register listing prior to its removal, because it was not remarkable in design or construction (Shoup 1988). Furthermore, the 2000 National Register nomination discussed the removed dam, saying that its absence did not affect the overall integrity of the site because of its invisibility to the visitor.

In short, the central cluster of buildings and associated features have always been the primary public aspect of the facility, and remain largely intact. Therefore, the cultural landscape retains overall integrity and conveys the significance of the property under criterion A.

Subsequent sections discuss in further detail the major cultural landscape characteristics of PCFH. These consist of natural systems and features, spatial organization, circulation, topography, buildings and structures, constructed water features, small-scale features, and vegetation.

Natural Systems and Features

Natural Systems and Features are the natural aspects that have influenced the development and physical form of a landscape.

Natural systems were key to establishing a successful hatchery operation at the PCFH site. The confluence of Prairie Creek and Lost Man Creek provided an ideal location for a fish hatchery, as Lost Man Creek is a natural cutthroat trout spawning ground. At the time the PCFH was built, the creek provided good water quality at an appropriate temperature for hatching and raising fish. Furthermore, the flat alluvial plain at the confluence allowed the building of facilities without a need for major topographic modifications. This was in stark contrast to the area's narrow valleys surrounded with steep, forested hillsides, which provided little buildable space. Local vegetation played a role in the PCFH's construction, as redwood trees from the adjacent forest provided materials for buildings. Vegetation grows rapidly in the region, which probably was a main reason DFG kept the PCFH site relatively free of plants. This prevented surrounding vegetation from encroaching on its facilities.

Hydrology

The PCFH facilities are located within a level alluvial plain at the confluence of Lost Man Creek and Prairie Creek. Drainage within this area appears to be adequate, because even with the region's heavy rainfall (70 inches on average) the PCFH's buildings have received no recorded flood damage. However, to accommodate drainage from tanks within the Hatchery building, soil was removed beneath the building and replaced with rock cobble to allow water from operations to drain away quickly.

PCFH's location along Lost Man Creek was chosen because it provided ideal conditions for the hatchery facility. The temperature and quality of water from adjacent Lost Man Creek was appropriate for the fish that DFG wanted to raise, and the creek was already a natural spawning ground. After the end of PCFH's period of significance, however, heavy logging activities occurred in the watershed above the PCFH. This resulted in higher water temperatures and increased silt in Lost Man Creek, which reduced the site's value for spawning fish. In response PCFH operators drilled wells and installed an aerator in an effort to obtain water with a lower temperature and less silt/turbidity. In 1978, logging activity was stopped in the watershed after Redwood National Park was expanded to include the Lost Man Creek watershed (Redwood National Park, 2008).

Water quality in Lost Man Creek has since improved, and although Redwood Creek is listed under the Clean Water Act as sediment and temperature-impaired, anadromous fish (meaning those that spend most of their life cycle in the ocean and return to freshwater to spawn) are currently found in Redwood Creek and Lost Man Creek. In fact, Lost Man Creek contains designated critical habitat for three species listed as threatened under the Federal Endangered Species Act: Northern California steelhead (*Oncorhynchus mykiss*), Coastal California Chinook salmon (*O. tshawytscha*), and Southern Oregon/Northern California Coast coho salmon (*O. kisutch*) (Redwood National Park, 2009). Coastal cutthroat trout (*O. clarki*) are also found in the creek. These four species were mentioned as being historically raised at the PCFH.

Topography

PCFH is located on a level alluvial plain between Lost Man Creek and Prairie Creek, and is bordered to the north by a steep hillside covered by old growth redwood forest. Because of the relatively flat landscape, only a few topographic modifications were necessary to build the PCFH's facilities. Although these alterations were not recorded in detail in historic documents, they are apparent through on-site

observation. The toe of the hillside north of the Hatchery building was cut back approximately 10 feet to provide a larger area for the five concrete tanks, rock water filter, and aeration tower. Also, approximately 12" of earth was excavated to accommodate the round concrete tanks, which were set into the ground. The steepness of the hill north of the Hatchery building was also used to advantage, by placing a cistern on the hillside to develop head for water pressure.

Vegetation

In the vicinity of PCFH, old-growth forest covers steeply sloped hillsides, with coastal redwoods being the dominant species. These trees provided a source for building materials, as locally harvested redwood was used to construct the original buildings at PCFH. Vegetation grows rapidly in the region, as indicated by the currently overgrown conditions around the PCFH buildings. Likely because of this, during the period of significance DFG kept the area around PCFH buildings relatively free of vegetation. This resulted in a tidy and efficient-appearing facility, as indicated by a 1950 aerial photograph.

Today, blackberry, ferns, and other herbaceous plants have quickly taken over the abandoned site. These grow at the base of all buildings and constructed features, as well as throughout the asphalt-paved areas. Although vegetation in these areas was cut back in 2005 in preparation for HABS documentation, it has grown back robustly. Also, the forest to the north of the Hatchery building appears to have expanded to the south which has caused the area with the five round concrete tanks to be less open than during the period of significance.

The forest in the watershed above PCFH was heavily logged between 1950 and 1978, resulting in only 15% of old-growth forest remaining in this area (Redwood National Park 2008:10; 2009). However, much of the vegetation within the cultural landscape boundary appears to represent that present during the period of significance. Dominant trees are coast redwood (*Sequoia sempervirens*) and Douglas-fir (*Pseudotsuga menziesii*). Other trees include hardwoods such as tanoak (*Lithocarpus densiflorus*), madrone (*Arbutus menziesii*), big-leaf maple (*Acer macrophyllum*), and California bay or laurel (*Umbellularia californica*). Common understory plants are sword fern (*Polystichum munitum*) and redwood sorrel (*Oxalis oregana*), which are accompanied by rhododendron (*Rhododendron macrophyllum*), huckleberry (*Vaccinium spp.*), salal (*Gaultheria shallon*), salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), azalea (*Rhododendron occidentale*), and other shrubs. Red alder (*Alnus rubra*) dominates the riparian vegetation surrounding Lost Man Creek.

Summary

Natural systems retain integrity to the period of significance, particularly with the improvement in water quality due to discontinued logging operations. However, the presently overgrown state of the abandoned PCFH is much more vegetated than during the period of significance.

Landscape Characteristic Graphics:



Old growth redwood forest forms a backdrop for the PCFH (Braa, PWR, 2011).

Spatial Organization

The spatial organization within a historic property refers to the three-dimensional organization of physical forms and visual associations in the landscape.

The PCFH facility was located and organized on the only buildable land within the original parcel between U.S. Highway 101, a steep hillside to the north, and Lost Man Creek to the south and east. Being adjacent to the highway was crucial, because it provided necessary transportation access for the remote hatchery. Its facilities were placed along a roughly east-west axis from the highway to the creek. As built in 1936, the PCFH had three main areas: 1) a complex of buildings clustered around the main entry from Highway 101; 2) right-of-way of unspecified width for a 12-inch pipeline stretching approximately 3,000 feet in a curvilinear alignment eastward from the PCFH complex to the water source; and 3) the water source on Lost Man Creek, which was outside of the 6.2-acre parcel. This water source consisted of a concrete dam 175 feet long and four feet wide at its extreme points, and a reservoir that backed up as much as 800 feet. A substantial amount of the original building complex, as well as the pipe where it crosses the creek, remain in place today.

The building complex consisted of a driveway flanked by buildings and structures for PCFH operations on its north and east sides, and houses for workers on its south side. Additional structures adjacent to buildings supported their functions. The Hatchery building had five concrete tanks for fish-rearing on its north side, fed by water from a rock filter. Water was also pumped from the filter up adjacent hill to a cistern used for residential water supply. A shed stood behind the garage-shop. Clotheslines and gardens were located south of the houses, outside of the PCFH boundary. In addition, a cabin on the east side of Lost Man Creek provided employee housing. Today, the buildings and structures are in their original configuration, with the spaces for gardens clearly evident although in disuse.

Several modifications to these facilities occurred subsequent to the period of significance. Changes included moving the site's main entrance and driveway to the south along Highway 101 (outside of the PCFH boundary), blocking the original entrance with a chain-link fence, removing a median from the driveway and replacing it with an ornamental pond, demolishing the workers house on the east end of the row of houses, demolishing the cabin on the east side of Lost Man Creek, constructing two rectangular concrete above-ground tanks on the site of the demolished workers house (partially outside of the PCFH boundary), constructing two earthen ponds south of the houses (outside the boundary), adding pump houses and wells south of the houses (outside the boundary), and replacing the original rock filter with a two-story tall concrete aerator building. In addition, the original dam and much of the original pipeline have either been removed or washed away by flooding.

Even with these alterations, however, the overall essential spatial relationships between structures that were present during the period of significance have not been disrupted. Still extant is the feeling and association of structures clustered together, to provide efficient operations for a working PCFH with on-site residences. In addition, the pipeline crossing over Lost Man Creek makes visible a portion of the original water conveyance system from the creek. The loss of the dam and portions of the pipeline does not significantly affect the overall integrity of main building complex as they were not essential to conveying the site's significance (Corbett 2000). Therefore, spatial organization of the cultural landscape retains integrity.

The key spatial organization of the site is retained. The buildings are organized around the driveway, with the PCFH operations on the north and east sides of the driveway, and housing on the south.

Landscape Characteristic Graphics:



Buildings organized around original entrance drive, clockwise from left: Hatchery building, Garage-Shop, Assistant's House, and Superintendent's House (Braa, PWR, 2011).

Circulation

Circulation comprises the spaces, features, and applied material finishes which constitute systems of movement in a landscape.

Circulation within PCFH historically consisted of a main drive from Highway 101 used by both vehicles and pedestrians, and pedestrian-only walkways. These pedestrian-only walkways consisted of both concrete sidewalks adjacent to the houses as well as a dirt footpath from the Shed to the upper dam. This footpath also included a wooden walkway atop the pipeline's stream crossing.

Portions of the circulation system retain integrity today. The main entry was moved to the south and a new entry road constructed after Humboldt County took over the facility in 1962. The original entrance was fenced off at this time, and the original drive served primarily as a maintenance yard. Today, the concrete sidewalks are mostly still in place, although one section between the back of the Superintendent's House and the Assistant's House has been removed. Although the footpath has become overgrown, the walkway suspended over the pipeline stream crossing still exists.

Contributing Features

Sidewalks (IDLCS 58076, PCFH04, 1936-1943).

Concrete sidewalks were located both north and south of the houses, as well as on the east side of each house. Although 18 inch-wide straight sidewalks remain in place today in these locations, they were likely reconstructed when the raised rectangular tanks were built. This conclusion is based on observation during the 2011 CLI fieldwork, because concrete used in the sidewalks more closely matches that used in the tanks than in older features, such as the five round concrete tanks.

In addition, about 30 feet of sidewalk between the superintendent's house and the assistant's house is missing. This may have happened at reconstruction or a later time. However, this is only a small portion of the total sidewalk area. Furthermore, it does not affect the feeling of the historic houses being part of a small district with separate yards connected by walks. In addition, a comparison between 1950 aerial photographs and 2011 on-site observations indicates that the sidewalks likely occupy the same footprint of the originals. As a result, they retain their integrity of location, design, setting, feeling and association. Overall the sidewalks retain integrity to the period of significance.

Pipeline stream crossing (IDLCS 58087, PCFH07, 1936).

The structure which originally served to carry the pipeline across Lost Man Creek, along with a wooden walkway atop the pipeline, is still in place. This structure was part of the original footpath from the Shed to the upper dam. It consists of a small suspension bridge with a steel tower on either side of the creek and steel cables. The towers are rectangular frames braced with crossing diagonal members in an X shape. Suspended from the cables are the pipeline and the wooden walk above it.

Non-Contributing Features

Main Drive (1936, modified circa 1962).

As built in 1936, the site was historically accessed from U.S. Highway 101 via a linear driveway, around which the original buildings were arranged in a U-shaped plan. The driveway was roughly 40 feet-wide and 225 feet-long. Between the Hatchery building, and the Superintendent's- and Assistant's-houses, the center of the drive was occupied by an approximately 10 foot-wide by 90 foot-long median which divided the drive into two 15 foot-wide driving lanes. Although records are not available as to the paving surface, as seen in a 1950 aerial photograph, it appears to have been gravel. Areas on either end of the Hatchery building, west of the Superintendent's House and south of the Shed also contained gravel. Although they were not differentiated from the main drive by materials or design, they had the feeling of being away from the main traffic flow. This is because the linear arrangement of the buildings and the median visually organized the space into a central main drive with utility areas on its sides.

Following the sale of PCFH by the state to Humboldt County, around 1962 the main drive was significantly altered. The main entrance to the site was moved to the south and the original entrance was blocked by a fence. A new driveway was built from the moved entrance, with visitor's approaching the cultural landscape from its backside at the Garage-Shop. In addition, the median was replaced with a much smaller ornamental pond. Additionally, the area between the ornamental pond and the Hatchery building was raised with dirt fill. Therefore, the visual hierarchy that began with entering the site on an east-west axis surrounded by the main buildings has been lost. The area between the buildings took on the role of a maintenance yard, utilitarian in character. In addition, the gravel areas were paved with asphalt or concrete, which changed from the dirt or gravel paving that existed during the period of significance. The asphalt has not been maintained since the site was abandoned in 1992. It is presently disintegrating in many areas, with vegetation growing through cracks and gaps in the pavement.

Summary

The sidewalks and the pipeline stream crossing still possess integrity, and they still convey the importance of pedestrian connections between features of the early PCFH. The main drive does not have integrity, because the entry was moved after the period of significance and the drive itself was modified with the removal of the median and addition of dirt fill and asphalt pavement.

Character Defining Features:

Feature: Pipeline Stream Crossing
Feature Identification Number: 154307
Type of Feature Contribution: Contributing
IDLCS Number: 58087
LCS Structure Name: Pipeline Stream Crossing
LCS Structure Number: PCFH07

Feature: Sidewalks
Feature Identification Number: 154313
Type of Feature Contribution: Contributing
IDLCS Number: 58076
LCS Structure Name: Sidewalk

Feature: Main Drive
Feature Identification Number: 154309
Type of Feature Contribution: Non Contributing

Landscape Characteristic Graphics:



Walkway above pipe at stream-crossing (Braa, PWR, 2011).



Tower supporting pipeline on west end of stream crossing (Braa, PWR, 2011).



Concrete sidewalk north of Assistant's House (Braa, PWR, 2011).



Concrete sidewalk north of Assistant's House (Braa, PWR, 2011).



Concrete sidewalk south of Superintendent's House (Braa, PWR, 2011).



Original main entry drive (Braa, PWR, 2011).

Buildings and Structures

Buildings are features constructed for sheltering any form of human activity. Structures are features constructed for purposes other than sheltering human activity, and may include mechanical and structural engineering systems. In addition to buildings and structures, there are many engineered structures that form a water system to support PCFH operations. Because of their interrelated nature, these are described in the Constructed Water Features section.

The buildings at PCFH were typically utilitarian in appearance and little decorated, being clad in ordinary rustic siding with a minimum of decorative trim. This reflects the paradigm for California fish hatchery design before 1947. Contributing buildings include the Hatchery building, Superintendent's House, Assistant's House, Garage-Shop, and Shed.

The July 1996 Historic Resources Study survey indicated that the windows and doors of the buildings had been nailed shut with plywood. In 1997 the NPS undertook basic repairs, and efforts to 'mothball' (preserve for future use) the structures. At this time, the houses, Garage-Shop and Shed were reroofed, all windows and doors covered with plywood with openings for ventilation, brick chimneys banded for stabilization, and gutters added at the Hatchery building's north and south elevation entryways to divert water from the stairs and landings. During a 2011 visit the mothball measures appeared to be working well. In general, window sills and sash remain intact and without rot. Water leakage was only observed in one area: the southeast workroom/tool area in the Hatchery building, which had a minor leak via an abandoned vent flue. The houses showed no evidence of pests. Pest presence in the Hatchery building was primarily in the east end work areas, near floor drains lacking covers.

Building configurations and features are relatively unchanged. According to records, the buildings were originally whitewashed, but since 1981, have been dark red with cream colored trim. At some time in-between, the houses were painted a golden-tan color, and trim was painted red. Historic photos indicate that the residences may have been a different color than the Hatchery buildings. Additional features were installed in the 1960s, primarily stone veneer walls at hatchery building stairways, and may be contributing to wood rot problems at both the north and south entries by trapping moisture and inhibiting air circulation.

In addition to the existing buildings described below, several changes have occurred to PCFH buildings. A bachelor's cabin, built in 1928 for the Prairie Creek Station (experimental) on the south side of Lost Man Creek, was demolished circa 1967. The eastern-most workers house, built in 1936, was demolished about 1972. A non-historic mobile home moved to a concrete pad on the east side of the shed was sold and moved away around 1992. Two structures indicated in 1950 aerial photographs remain undocumented because they are no longer present on site and it is unclear whether these existed during the period of significance. One was positioned between the shed and pipeline crossing, and appears to have been a windowless utility building. Also, an unknown structure was positioned at the northeast corner of the Hatchery building. This could have been the rock filter that was replaced by the present-day aerator.

Contributing Buildings and Structures

Below is a detailed description of the contributing buildings and structures located at PCFH. The List of Classified Structure (LCS) numbers and dates of construction are also referenced.

Hatchery building (IDLCS 58008, PCFH01, 1936).

The Hatchery building at PCFH was typical for its time, with its large column-free room with bands of windows on outside walls to provide light for operations. The building is a one-story rectangular side-gabled roof building measuring 41 by 130 feet oriented on an east-west axis. It has a heavy timber frame trussed structure with wood stud frame infill. Structurally the building is divided into bays based on a 16 foot interval, with 5½ inch by 6 inch posts set on concrete piers supporting a system of braced English timber trusses (Urquhart 1950:401). Truss vertical members are steel rods and diagonal members are wood, with steel bolted fasteners. Bolted steel angle gussets tie the truss bottom plates to the supporting posts, and bolted steel toe plates tie the truss top chords to the supporting posts. At mid-span a diagonal timber truss running perpendicular to the trusses provides lateral bracing, running full length of the building. A system of blocked purlins supports the corrugated metal roof; the overhanging eaves are enclosed with narrow tongue and groove V-joint wood siding at the underside and wood fascia. Exterior walls are sheathed in 7 inch tongue & groove V-joint siding with 1x4 inch corner lap-joint trim. Two-over-two double-hung windows are spaced three per bay, each two stud spaces in width. The corrugated metal roof has a rolled-type ridge cap. The Hatchery building is entered through several doors: one centered at the east elevation, one at the southwest corner of the west elevation, one roughly centered on the south elevation, and one offset to the east on the north elevation. The side doors are replacements of hollow core construction; the east end door is paneled. Outside the east end of the building is a shed-roofed lean-to, covering a “Harmon Cooler” refrigerator installed in the 1970s.

Inside, the two easternmost bays are partitioned and the seven remaining bays are open. Above the partitioned spaces is a loft. The partitioned area is divided by a central corridor, with a food preparation area on the north side; and a shop, office, and bathroom on the south side. The food preparation area, where liver was ground, includes a storage cooler and a concrete floor tank with a faucet and drain. The shop has built-in shelves and a metal chimney or vent pipe. The office opens not into the corridor, but into the main space. Knob and tube fixtures indicate that electricity was provided early in the life of this building.

The remainder of the Hatchery building interior is a column-free space, open through the trusses to the underside of the roof. During the period of state operation, from 1936 to 1955, there were 80 troughs in the building. Troughs are narrow open flumes which step down from north to south, in which the eggs are hatched and the fish start to grow. Today there are six pairs of redwood troughs at the west end, fed water by a flume along the north wall. Each trough steps down at the center. Between the troughs and the partitioned area are two sunken rectangular tanks of reinforced concrete; four round redwood tanks; and metal racks with plastic incubator trays (installed after 1971). The floor in this area is a raised wood deck added because of water damage to the original floor below (Will 1996).

Superintendent's House (IDLCS 58043, PCFH02, 1936).

The westernmost of the three original houses was originally designated the superintendent's house and was slightly larger than the others. The house is a simply built Arts and Crafts bungalow style with simple geometry, well detailed porch ceilings, attic vent detailing, and picturesque brick chimneys. The open eaves with enclosed rafters are unusual for the style.

It is a rectangular one and one-half story front-gabled roof building (26 feet 3 inches by 38 feet 6 inches) oriented on a north-south axis set facing the Hatchery building. A projecting gable covers the entry porch (12 feet by 7 feet – 6 inches), which fronts on the main driveway area. A small gabled back porch abutting the southern boundary of the parcel is set off center on the south elevation. Porch detailing includes double chamfered posts, chamfered top rails, simple balusters with eased edges, and chamfered newel posts. Original boxed stairs are missing, replaced by utilitarian open risers. Porch ceilings are enclosed with narrow profile V-joint siding with quarter molding trim.

The simple asphalt shingled gable roofed structure is built of wood stud (light) frame construction on a concrete perimeter foundation with wood framed floors over a ventilated crawlspace. Clad in 7 inch tongue & groove V-joint siding with 1x4 inch corner lap-joint trim, exterior openings are trimmed out with plain boards. Windows have sloped sills with a plain apron. The overhanging open eaves have enclosed rafters with 7 inch tongue and groove V-joint siding, with a continuous plain fascia all around. Both gables (north and south) have distinctive gable infill vents with vertical slotted openings for attic ventilation. Although no gutters are extant, remnants of some downspouts exist. The interiors are lit by double-hung wood sash single glazed windows (one-over-one), except the upstairs gable end window which has been replaced with an aluminum window. Entrances at the front and rear are paneled wood doors with glass upper panels. A small flue vent chimney constructed of red common brick with an arched top is set at the east side of the ridge.

The rectangular plan of the house is structurally divided into two bays, with a supporting wall dividing the public and bedroom areas. The house is entered from the front porch directly into the living room. The living room and rear kitchen occupy the west side of the house; the east side has a bedroom in each corner with a short corridor and a bathroom in between. The northeast corner bedroom has a wood stair leading up to an attic bedroom. Interior finishes originally included wood baseboards and cornice moldings, and wood battens between wallboard panels. Original finishes are intact in the corridor and the southeast bedroom, as is most of the standard manufactured hardware. Heat is provided by a wood stove (which replaced an early stove about 1971) in the living room, vented through a metal flue to the brick chimney on the roof. Electricity and plumbing were originally provided. The bathroom is partially remodeled, but retains some original tile and fixtures. The northeast bedroom, living room, and kitchen have been refinished. The attic bedroom was finished about 1943.

Assistant's House (IDLCS 58070, PCFH03, 1936).

This is the easternmost of the two remaining houses; originally it was the middle of three houses. The house is a simply built Arts and Crafts bungalow style with simple geometry, well detailed porch ceilings, attic vent detailing, and picturesque brick chimneys. The open eaves with enclosed rafters are unusual for the style.

It is a rectangular one and one-half story cross-gabled roof building (26 feet 3 inches by 34 feet 6 inches) oriented on a north-south axis set facing the Hatchery building. A projecting gable covers the entry porch (8 feet 3 ½ inches by 6 feet), which fronts on the circular drive area. A small gabled back porch (4 feet by 6 feet 10 inches) abutting the southern boundary of the parcel is set off center on the south elevation. Porch detailing includes double chamfered posts, chamfered top rails, simple balusters with eased edges, and chamfered newel posts. Original boxed stairs are missing, replaced by utilitarian closed risers. Porch ceilings are enclosed with narrow profile V-joint siding with quarter molding trim. The two foot extension of the kitchen at the west side of the building is achieved with a transverse (cross) gable.

The simple asphalt shingled cross-gable roofed structure is built of wood stud (light) frame construction on a concrete perimeter foundation with wood framed floors over a ventilated crawlspace. Clad in 7 inch

tongue & groove V-joint siding with 1x4 inch corner lap-joint trim, exterior openings are trimmed out with plain boards. Windows have sloped sills with a plain apron. The overhanging open eaves have enclosed rafters with 7 inch tongue and groove V-joint siding, with a continuous plain fascia all around. Both gables (north and south) have distinctive gable infill vents with vertical slotted openings for attic ventilation. Although no gutters are extant, remnants of some downspouts exist. The interior is lit by wood sash, double-hung windows (one over one). Similar to the Superintendent's house, all gables (north, south and east) have distinctive gable infill vents with vertical slotted openings for attic ventilation. Entrances at the front and rear are paneled wood doors with glass upper panels. A small flue vent chimney constructed of red common brick with an arched top is set at the east side of the ridge; the arch top is broken, with several rows of brick missing.

The rectangular plan of the house is structurally divided into two bays, with a supporting wall dividing the public and bedroom areas. The house is entered from the front porch directly into the living room. The living room and rear kitchen occupy the west side of the house; the east side has a bedroom in each corner with a short corridor and a bathroom in between. A stair in the southeast corner bedroom leads upstairs to an attic bedroom. Interior finishes originally included wood baseboards and cornice moldings, wood battens between paperboard wall panels, and standard manufactured hardware. Original finishes are generally intact in the kitchen, corridor, bathroom, and southeast bedroom. Living room and northeast bedroom finishes have been remodeled. Heat is provided by a wood stove (which replaced an earlier stove about 1971) in the living room which is vented through a steel pipe to a brick chimney on the roof. Electricity and plumbing were originally provided. The attic bedroom is finished in sheet rock, and was not originally a finished part of the house.

Garage-Shop (IDLCS 58083, PCFH05, 1936).

This building plays an important visual role in the complex due to its location closing the end of the U-plan, and the strong geometry of its form and detailing. It is a one-story side-gabled roof building, rectangular in plan (48 feet 4 inches by 24 feet 4 inches), and oriented on a north-south axis. This is a simple corrugated metal gable roof structure built of wood (medium) frame construction placed on a concrete slab foundation. Walls are clad in 7 inch tongue & groove V-joint siding with 1x4 inch corner lap-joint trim. The medium pitch gable roof is supported by purlins notched and set at four feet on center over wood frame Howe trusses that are approximately six feet on center. The corrugated metal roof has a rolled-type ridge cap; overhanging open eaves have enclosed rafters with 7 inch tongue and groove V-joint siding and plain fascias, with a deeper fascia at the gable end rake. Exterior openings are trimmed out with plain boards. No gutters or downspouts evident.

The building's vehicular entrance consists of three large rolling track doors centered on the west elevation. The doors are mounted on two tracks, the center panel being on a single track mounted at the exterior, the remaining flanking doors mounted on a single track mounted at the interior of the opening. Each door is constructed of planks set vertically, with X-bracing, and plywood at the interior side. At the south elevation a man door is flanked symmetrically by two windows; the north elevation has two windows with a man door; the east elevation has three windows symmetrically arranged. All windows are two-over-two double hung wood sash single glazed windows. Inside, the floors are concrete, with raised sections at either end. The south end is partitioned for storage with horizontally planked unpainted wood walls. At the north end is an oil tank and a gas generator (AC generator, DC exciter) manufactured by International Harvester, with a plate stamped "Signal Corps U.S. Army; Power Unit PE 215." The interior is unfinished. No gutters or downspouts are evident.

Shed (IDLCS 58086, PCFH06, 1936).

A small rectangular one-story building (14 feet 6 inches by 12 feet), oriented on a north-south axis, positioned just east of the garage-shop. The shed is a simple asphalt shingled front-gabled roof structure built of wood stud (light) frame construction on a concrete foundation, it is clad in 7 inch tongue & groove V-joint siding with 1x4 inch corner lap-joint trim. Exterior openings are trimmed out with plain boards. The medium pitch roof has overhanging open eaves with exposed plain cut rafter ends with no fascia; the gable end rake has a medium two-part bargeboard detail. The south gable has an opening for an infill vent, similar in size to those still extant at the residences – although no vent remains. The single interior space is lit by awning type windows, one each centered in the east and west side walls. A diagonally braced site-built wood plank door mounted on surface mounted strap hinges provides entry to the one room space. No gutters or downspouts are evident. A simple post and beam timber frame stands at the east elevation; early photographs indicate some sort of lean-to shelter at the east side, whether canvas or a built roof is unknown. The interior was not visually accessible for inspection.

Description of Features Outside Historic District Boundaries

Pump House (1962).

This is a small square one-story building (8 feet by 8 feet) located outside the PCFH property near the new south gate that was established in the 1960s on the north edge of Lost Man Creek. This is a stud-frame structure on a concrete perimeter foundation. It is clad in 7 ¼ inch tongue & groove V-joint siding with 1x4 corner trim; exterior openings are trimmed out with plain boards. It has a front-gabled roof with overhanging eaves and exposed rafters. The roof is clad in asphalt shingles. The building is ventilated by louvered openings on each side and a roof monitor. It has a wood door and no windows. There is a pipe running between the southeast side of the building and the ground above the creek. No gutters or downspouts are evident.

Pump House (1971).

This is a small rectangular one-story building (6 feet 3 inches by 8 feet 2 inches) oriented on a north-south axis, and located south of the superintendent's residence outside the boundaries of the parcel. The simple asphalt shingled front-gabled roof structure is built of wood stud (light) frame construction on a concrete slab foundation; clad in 7-inch tongue & groove V-joint siding with 1x4 corner lap-joint trim, it has a large wood louvered vents positioned high on the east and the west sidewalls for ventilation. Exterior openings are trimmed out with plain boards; the interior is unfinished with exposed framing. The gable roof overhanging eaves are open with exposed plain cut rafter tails (no fascia); gable end raked eaves have a large scale plain fascia. The door is missing. Inside is a 40-horsepower Holloshaft® Pump Motor. No gutters or downspouts are evident.

Features that have been Removed or Demolished

There are several features that were part of the PCFH facilities that have been demolished or removed. Within the historic district, these included the easternmost residence, a cabin on the south side of Lost Man Creek, a gable roofed outbuilding positioned between the shed and pipeline crossing, and a shed roof structure positioned at the northeast corner of the PCFH. These last two structures are not well-described in the site's history, but are visible in a 1950 aerial. The shed roof structure may have been the original rock filter that was replaced by the Aerator circa 1962.

Indomitable (1974).

Associated with the PCFH, but outside of its historic district boundary, there have been two carved, redwood sculptures (approximately 21 feet in length) at PCFH in recognition of a well-publicized salmon

which returned to its place of origin in the PCFH by an improbable route through pipes and screens in 1964 (see additional information in section 8). The first sculpture stood from 1974 until about 1981, by which time it had deteriorated. The second stood from 1981 to 1992 when PCFH closed. Each carved redwood sculpture of Indomitable was mounted on a metal pole in a concrete pad just inside the new gate. The pole, concrete pad, and a dedication plaque remain. The dedication plaque reads: "As a lasting tribute to the never ending struggle within nature for the survival of the species . . . This replica of the indomitable salmon was presented to Humboldt County and its Prairie Creek Fish Hatchery on March 5, 1974, by the following as a symbol of the interdependence and common spirit that binds man to nature and all living things." Also remaining are stone-faced steps from the driveway down to the concrete pad.

Character Defining Features:

Feature: Hatchery Building
Feature Identification Number: 152127
Type of Feature Contribution: Contributing
IDLCS Number: 58008

Feature: Superintendent`s House
Feature Identification Number: 152129
Type of Feature Contribution: Contributing
IDLCS Number: 58043

Feature: Assistant`s House
Feature Identification Number: 152131
Type of Feature Contribution: Contributing
IDLCS Number: 58070

Feature: Garage-Shop
Feature Identification Number: 152133
Type of Feature Contribution: Contributing
IDLCS Number: 58083

Feature: Shed
Feature Identification Number: 152135
Type of Feature Contribution: Contributing
IDLCS Number: 58086

Landscape Characteristic Graphics:



Hatchery building, contributing (Braa, PWR, 2011).



Superintendent's House, contributing (Braa, PWR, 2011).



Assistant's House, contributing (Braa, PWR, 2011).



Garage-Shop, contributing (Braa, PWR, 2011).



Shed, contributing (Braa, PWR, 2011).



Pump House (1962) near the south gate, outside of boundary (Braa, PWR, 2011).



Pump House (1971) south of Superintendent's House, outside of boundary (Braa, PWR, 2011).

Constructed Water Features

Constructed water features are the built features and elements that utilize water for aesthetic and utilitarian functions in the landscape.

Water features within PCFH belonged to two categories: those used to provide and manipulate water for facility operations, and those for domestic uses. With regard to hatchery operations, water was delivered in a pipeline carried across Lost Man Creek on a suspension bridge with a walkway above the pipe. The dam where the pipeline began was a concrete gravity dam with a plank apron and a 4-foot by 54-foot spillway in the center. Its reservoir backed up roughly 800 feet behind the dam (Shoup 1988). About 3,000 feet of riveted steel pipe led from this dam to an elevated water filter located behind the east end of the Hatchery building, where the easternmost round tank now stands. The filter was a wood cage full of rocks. When the water had passed down through the filter, it was distributed to the Hatchery building and to five round concrete tanks on the north side of the Hatchery building. At the Hatchery building, it was carried in a flume across the north side of the building and distributed to the troughs. From the bottoms of the troughs, it was carried as waste in an outfall line southward into Lost Man Creek.

For domestic uses, water was diverted from the filter through a pipe leading to a pump, most likely gasoline-operated, north of the Hatchery building. This raised it 60 feet up the hillside to a round redwood tank with a roof, placed on a stand.

In the early days, PCFH operations required fairly intensive human interaction with the constructed water features. Salmon swam up the creek and were trapped behind the dam. They were dipped out, examined, and, if ripe, eggs were removed from females and spawned from males in buckets. Fertilized eggs were then carried to the Hatchery building and set inside the troughs in baskets with holes. The baskets were turned, eggs hatched, and fry grew to fingerlings. Fingerlings were then moved to outside tanks to grow. When they were large enough, they were placed in milk cans with aerators, loaded in trucks and carried to streams in Humboldt and Del Norte Counties.

Changes After Period of Significance

After 1946 water quality deteriorated because of logging operations in the watershed above. These operations resulted in flooding, increased sediment, and higher water temperatures. This adversely affected PCFH operations and required improvements to the water delivery system. As a result, many changes were made over the next 40 years which significantly altered the site's water features and PCFH operations. Some improvements were temporary, such as the late 1940's installation of five redwood tanks outside the Hatchery building. Improvements made in the 1960s and 1970s were more permanent, but with the exception of the aeration tower all were outside of the historic district's boundary.

As a result of post-1946 changes, much of the original water supply system has been destroyed or removed. The upper dam and its reservoir was removed in 1989 (Sanders 1996). Most of the pipeline, except the stream crossing (described below) is gone as it lay falling apart and unused on the ground during most of the 1960s, and washed away in a flood circa 1971-1972. The original filtration tank was removed around 1962-1965. The domestic water supply system was taken apart and the original domestic water tank was reused inside the Hatchery building. Other structures which were added after 1955, including an electric weir, two mechanical weirs, and two silt fences have since been removed. A pond, levee, and culvert from 1967 to 1970 are silted up and overgrown with plants.

These facilities, combined with changes inside the Hatchery building, modified the hatchery process. Salmon returned up the fish ladder to the big rectangular concrete tanks where they were spawned; eggs were moved to incubators; fry were then moved to the troughs, which were “ponded” into sections; growing fish were moved to inside tanks, then outside tanks, then the rock-lined earthen ponds, then the rectangular concrete tanks again before release.

Effect on Integrity

Constructed water features retain minimal integrity to the PCFH’s period of significance. However, although some features have been removed and others have been added, the remaining features associated with the original development support enough meaning to convey its feeling and association with historic fish hatchery operations. The removal of the original dam does not affect integrity, because as the 2000 National Register nomination stated, it was located upstream of the facility, hidden from view and not part of the visitor experience of PCFH.

Below is a detailed description of the contributing and non-contributing constructed water features located at PCFH. The List of Classified Structure (LCS) numbers, if assigned, and dates of construction are also referenced.

Contributing Constructed Water Features

Five Round Concrete Tanks (IDLCS 58126, PCFH08, ca. 1936 to 1943).

All five round water tanks located outside the north wall of the Hatchery building were built within the period 1936 to 1943. The tanks are of reinforced concrete construction and measure 20 feet in diameter. They are sunk into the ground so they project only a few inches above the ground on the outside, but are about a foot deep. The walls are about four inches thick and the bottoms slope slightly to a drain at the center. Today, a pipe is cantilevered from the side toward the center of each tank. This replaces an earlier system for aerating the water. The aggregate in the concrete is exposed below the waterline in the tanks and presents a distinctive appearance.

Non-Contributing Constructed Water Features

Aeration tower (ca. 1962-1965).

This is a concrete frame supporting an elevated wooden aeration tank.

Rectangular Above Ground Concrete Tanks (ca. 1973).

This pair of reinforced concrete tanks was built in the early 1970s as elements in a redesigned water supply and hatchery process. The rectangular tanks are side by side and share a common wall. Vertical grooves in the concrete walls are designed for the placement of moveable gates. Valves at either end allow water and fish to be moved in and out of the tanks. Each tank is approximately 79 feet long by 10 and 1/2 feet wide.

Dedication Pond (ca. 1962).

A pond was built between the Hatchery building and the houses about 1962 when the original driveway was removed from the area. This pond is referred to locally as the “dedication pond” and contains a metal plaque inscribed with: “In Memory of Joe D. Walker, Fish and Game Conservationist, Bella Vista Rod and Gun Club.” The rectangular pond is approximately 38 feet long and 11 feet wide. It is faced with irregular-cut stone in concrete mortar. At either end of the pond are ornamental plantings of juniper and ferns.

Lower Dam (1969-1971).

The lower dam, consisting of a concrete dam between wing walls, was built to try to maintain a source of water in Lost Man Creek after the original (upper) dam was silted up. The lower dam has been described as being located upstream about 100 feet from the pipeline crossing. However, because of overgrown vegetation and high stream conditions its exact location, dimensions, and condition could not be verified.

Description of Features outside of the Historic District Boundaries

Rock-Lined Earthen Ponds (ca. 1965).

This pair of ponds was excavated in the area south of the PCFH property. The ponds were lined with rocks and linked at either end by concrete channels with valves and gates. Each pond is approximately 96 feet long and 15 feet wide. Currently, the ponds do not contain water and grass has grown through the rock lining.

Fish Ladder (ca. 1973).

This reinforced concrete fish ladder was built to enable returning salmon to climb to the new rectangular concrete tanks.

Pond, Levee, Culvert (ca. 1967-1970).

These are overflow facilities to accommodate growing salmon when the normal capacity of the PCFH was exceeded. These facilities consist of a pond on the north side of Lost Man Creek about 100 yards above the Lower Dam, a levee, and a culvert. The pond and culvert are silted up and overgrown.

Features Removed or Demolished

There are several constructed water features that were part of PCFH facilities that have been demolished or removed. Within the historic district, these included a portion of the pipeline, as well as the original filter (a wooden cage filled with rocks) that was replaced by the concrete aerator. Outside of the historic district was the remainder of the pipeline, the upper dam, and the reservoir above the dam.

Character Defining Features:

Feature: Five Round Concrete Tanks

Feature Identification Number: 152147

Type of Feature Contribution: Contributing

IDLCS Number: 58126

Feature: Aeration Tower

Feature Identification Number: 152149

Type of Feature Contribution: Non Contributing

Feature: Rectangular Above Ground Concrete Tanks

Feature Identification Number: 152151

Type of Feature Contribution: Non Contributing

Feature: Dedication Pond and associated retaining walls

Feature Identification Number: 152153

Type of Feature Contribution: Non Contributing

Feature: Lower Dam

Feature Identification Number: 152155

Type of Feature Contribution: Non Contributing

Landscape Characteristic Graphics:



Round concrete water tank number three (of five), contributing (Braa, PWR, 2011).



Aeration Tower, non-contributing (Braa, PWR, 2011).



Rectangular, Above Ground Concrete Tanks, non-contributing (Braa, PWR, 2011).



Dedication Pond, non-contributing (Braa, PWR, 2011).



Rock-Lined Earthen Ponds, non-historic and outside historic district boundary (Braa, PWR, 2011).

Small-Scale Features

Small-scale features are the elements which provide detail and diversity for both functional needs and aesthetic concerns in the landscape.

Remaining historic small-scale features provide insight into hatchery operations and document boundaries and land use areas during and after the period of significance.

Undetermined Features

Pipe Play Structure West of Superintendent's House (unknown).

A freestanding pipe structure stands west of the Superintendent's house. It is not mentioned in historical documents, and therefore its date of construction is unknown. The structure likely related to domestic activities of the house, and could have accommodated swings for children. It is constructed of segments of one inch water pipe, connected with standard elbows to form a free standing double u-shape.

Concrete Steps into Hatchery building (ca. 1962).

Concrete steps have been placed at two entrances to the Hatchery building. The current steps were likely constructed when the raised rectangular tanks were built. This conclusion is based on observation during the 2011 CLI fieldwork, because the materials used in the steps more closely match that used in the tanks than in older features, such as the five round concrete tanks. It is unknown whether they replaced deteriorating concrete steps or wooden steps.

Pipe Trench North of Hatchery Building (ca. 1962).

Pipes that delivered water to the Hatchery building and the five round concrete tanks were placed below grade in a concrete lined trench with a wooden plank covering. The trench appears to have been constructed at the same time that the raised rectangular tanks were constructed. This conclusion is based on observation during the 2011 CLI fieldwork, because the concrete used in the trench more closely matches that used in the tanks than in older features, such as the five round concrete tanks. Furthermore, the pipes within the trench are made of PVC, which indicates they were likely installed after the trench was constructed. It is unknown whether this trench is largely a reconstruction of a previous concrete trench, or a improvement made outside of the period of significance. Planks atop the trench have deteriorated, with many rotted and missing.

Non-contributing Features

Features Associated With Dedication Pond (ca. 1962).

Several features were added to the PCFH at the same time as the dedication pond and are built of the same materials. Wooden platforms with stone-faced steps were added to the south (front) and north entries of the Hatchery building. A raised stone-faced slab with steps was added to the west entry of the Hatchery building. In addition, low, stone-faced, retaining walls that contain planting beds were added to the front (south) side of the Hatchery building on either side of the entry porch. These walls connect to the dedication pond. The planting beds in front of the Hatchery building contain rhododendron. There is also a stone-faced, planting bed wall along the west side of the Hatchery building.

PG&E Poles (1984).

Several poles were installed in 1984 to supply additional electric power needs of the increasingly mechanized facility. The pumps in particular required an additional reliable power supply.

Footbridge and Fence (after 1968).

To accommodate an increase in tourism after the park was established in 1968, Redwood National Park built visitor facilities at PCFH. These included a wooden foot bridge across Lost Man Creek, a split rail fence along the east side of the driveway, and a picnic table on the south side of the creek. Of these, the footbridge and portions of the split rail fence remain. However, the bridge is deteriorating and most portions of the fence are missing.

Chain Link Fence (after 1971).

A six-foot high chain link fence along the west boundary of the PCFH was added well after the period of significance, and is considered non-contributing. It blocks the original entrance to the site, and extends south below the parcel boundary.

Concrete Slab Surrounding Shed (ca. 1981).

The area north of the shed, as well as the area between the shed and the garage, was hardened with concrete. This likely took place when a mobile home was placed on the site for additional employee housing in 1981. This slab is on existing grade and is in contact with the bottom of the buildings' cladding, which has impeded drainage and caused the cladding to rot in places. This concrete slab is non-contributing.

Split Rail Fence North of building (after 1971).

A split rail fence is located to the north of the five, round, water tanks outside of the Hatchery building. This type of fence is also located to the east of the driveway. The fence consisted of three split rails with posts approximately 9 feet on center. However, one section of this fence still remains.

Features that have been Removed or Demolished

Vertical plank fence (after 1971).

A vertical plank fence was installed in the 1970s or 1980s on the north side of the garage-shop and shed, south of the superintendent's house, and south of the assistant's house. This fencing was not part of the original structure and was built outside of the site's period of significance. All of the plank fencing was removed sometime between 2000 and 2003.

Flagpole (ca. 1936).

Originally, the site included a flagpole with a cross bar for two flags. This was located in the center of the driveway. This was likely removed when the dedication pond was constructed. However, this original flagpole was possibly moved to the south side of the Hatchery building, where a flagpole is currently located.

Character Defining Features:

Feature: Pipe Play Structure
Feature Identification Number: 152157
Type of Feature Contribution: Undetermined

Feature: Concrete Steps into Hatchery building
Feature Identification Number: 152159
Type of Feature Contribution: Undetermined

Feature: Pipe Trench North of Hatchery building
Feature Identification Number: 152161
Type of Feature Contribution: Undetermined

Feature: Features Associated With Dedication Pond
Feature Identification Number: 152163
Type of Feature Contribution: Non Contributing

Feature: PG& E Poles
Feature Identification Number: 152165
Type of Feature Contribution: Non Contributing

Feature: Chain Link Fence
Feature Identification Number: 152167
Type of Feature Contribution: Non Contributing

Feature: Asphalt Paving
Feature Identification Number: 152169
Type of Feature Contribution: Non Contributing

Feature: Concrete Paving Surrounding Shed
Feature Identification Number: 152171
Type of Feature Contribution: Non Contributing

Feature: Split Rail Fence North of PCFH
Feature Identification Number: 152173
Type of Feature Contribution: Non Contributing

Landscape Characteristic Graphics:



Pipe play structure west of Superintendent's House, undetermined (Braa, PWR, 2011).



Concrete steps on east side of Hatchery building, undetermined (Braa, PWR, 2011).



Concrete, plank covered pipe trench on north side of Hatchery building, undetermined (Braa, PWR, 2011).



Features associated with the Dedication Pond include planter walls installed on the west end of the Hatchery building, non-contributing (Braa, PWR, 2011).



Features associated with the Dedication Pond include rock facing on the western concrete steps into the Hatchery building, non-contributing (Braa, PWR, 2011).



Features associated with the Dedication Pond include a rock retaining wall between the pond and the Hatchery building. Steps on the south side of the building have a similar treatment, non-contributing (Braa, PWR, 2011).



Features associated with the Dedication Pond construction include rock facing around wooden steps into the north side of the Hatchery building. Steps on the south side of the building have a similar treatment, non-contributing (Braa, PWR, 2011).



Several PG&E poles were installed north of the buildings in the 1980s, such as this pole north of the Shed, non-contributing (Braa, PWR, 2011).



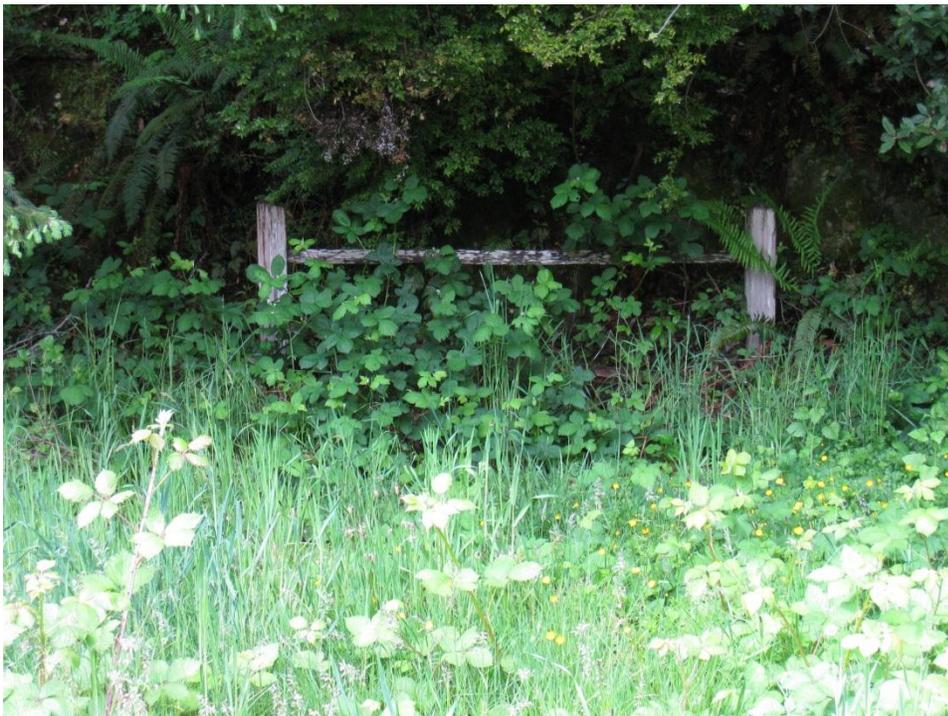
Chain link fence west of the Hatchery building, non-contributing (Braa, PWR, 2011).



Asphalt paving west of Garage-shop, non-contributing (Braa, PWR, 2011).



Concrete paving north of Shed, non-contributing (Braa, PWR, 2011).



Split rail fence remnant north of Hatchery building, non-contributing (Braa, PWR, 2011).

Vegetation

Vegetation refers to deciduous and evergreen trees, shrubs, vines, ground covers and herbaceous plants, and plant communities, planted or modified by humans. (Native vegetation and plant communities are discussed in Natural Systems and Features.)

With regard to ornamental vegetation and planted areas, no detailed visual or written record of the landscape of PCFH during its period of significance was found. Descriptions of the landscape provided by people who lived there during this period provided the record of plantings. The median in the center of the main driveway was said to contain dahlias and a stand of second growth redwoods. South of the houses were clotheslines and a garden, but this area was outside of the historic district boundary. The tri-annual water licensee reports mention lawns and rhododendrons. During the period of significance, rhododendrons around the property were said to flourish because they were fertilized with salmon carcasses. At the north end of the Garage-Shop, Cecil Bruner roses were said to grow over the remains of a large tree stump.

Oblique aerial photographs taken in 1950 clearly show a hedge on the south side of the Hatchery building, cut lawn surrounding the houses, an ornamental shrub at the northwest corner of the center house (currently the eastern-most house), and a large shrub at the northwest corner of the garage. The median in the center of the drive contained lawn.

Today, a few echoes of these plantings remain. The area surrounding the houses still consists mainly of grass now un-mown, and there is an ornamental shrub at the northwest corner of each house. Also, the Hatchery building has a few rhododendrons along its south wall.

However, many ornamental plants were likely put in place or grew naturally after the period of significance. Most of them likely date from the early 1960s or 1970s, and were planted separately with no overall plan. They include rhododendrons on the south side of the Hatchery building, vinca and other groundcover plants on the west side, and ferns transplanted from the surrounding forest on the north side. Trees were planted by Humboldt County, including two fruit trees, three evergreen trees along the current entrance driveway and a red plum inside the entrance gate. Other plant materials include holly at the northwest corner of the Superintendent's House, a species that looks similar to escallonia is located at the northwest corner of the Assistant's House, juniper and ferns at either end of the Dedication Pond, blackberries along all of the chain link fences and at the base of many building walls, escallonia on the west side of the raised concrete tanks, grasses and blackberries growing through cracks in the asphalt, and grasses growing through cracks in the five round concrete tanks. Much of this vegetation was planted by Steve Sanders, former superintendent, specifically ornamental shrubs, lilies, ferns, the red plum, and trees along the entry driveway.

Summary

The vegetation that was present during the period of significance includes the lawn areas, the Rhododendrons on the south side of the Hatchery building, and the ferns on the north side of the Hatchery building.

Landscape Characteristic Graphics:



The planting bed on the Hatchery building's south side contains rhododendrons, which may have formed a hedge in this area during the period of significance, historic (Braa, PWR, 2011).



Other Hatchery building plantings include ferns on north side of the building, historic (Braa, PWR, 2011).



Assistant's House plantings include a shrub similar to escallonia, located at the northwest corner, non-historic (Braa, PWR, 2011).



Assistant's House plantings include a bed with ferns along the north side, non-historic (Braa, PWR, 2011).



Two apple trees west of Superintendent's House, non-historic (Braa, PWR, 2011).



Evergreen trees along entry drive, non-historic (Braa, PWR, 2011).



Red plum tree inside entry gate, non-historic (Braa, PWR, 2011).



Juniper and ferns at west end of Dedication Pond, non-historic (Braa, PWR, 2011).



Blackberries grow naturally in the area, and now are located along the perimeter chain link fence and at base of many buildings, non-historic (Braa, PWR, 2011).

Archaeological Sites

Archeological sites are the location of ruins, traces, or deposited artifacts in the landscape, and are evidenced by the presence of either surface or subsurface features. Evaluation of these sites and features under Criterion D is outside of the scope of this study.

Archaeological investigations have not been carried out at the Prairie Creek Fish Hatchery, nor have possible archaeological resources been identified. However, these might aid in understanding the significance and extent of historic activities within the historic district. Therefore, Redwood National Park staff should consider performing a limited archaeological survey to determine whether further investigations are warranted.

Condition

Condition Assessment and Impacts

Condition Assessment: Fair

Assessment Date: 06/02/2011

Condition Assessment Explanatory Narrative:

Through the analysis and evaluation of landscape characteristics and features, it has been determined that the Prairie Creek Fish Hatchery is in “Fair” condition. The landscape shows clear evidence of minor disturbances and deterioration by natural and/or human forces, and some degree of corrective action is needed within 3-5 years to prevent further harm to its cultural and/or natural values. If left to continue without the appropriate corrective actions, the cumulative effect of the deterioration of many of the landscape characteristics will cause the inventory unit to degrade to poor condition.

The most pervasive impact comes from vegetation growing against the sides of buildings, through paved surfaces, on roofs, and against the pipeline crossing. This is causing the sides of buildings and small scale features to deteriorate, partly because vegetation holds water against these features for prolonged periods. Other impacts include:

- Concrete and planters surrounding the garage-shop and the Hatchery building are preventing proper drainage away from the base of these buildings.
- Planks covering the open pipe trench north of the Hatchery building have rotted and collapsed in many areas, which is channels rainwater underneath the building.
- Accumulation of water under the Hatchery building at the north doorway and dock have caused rot and subsequent crushing failure of two wooden structural posts, which is causing significant subsidence; emergency supports were installed in 2006, which temporarily stabilized the condition.
- Accumulation of water at the building’s south entry has caused some subsidence of the wall section as well.
- Vandals are also causing damage to the building structures, due to people forcibly removing copper and other metals, as well as painting graffiti on building sides.

Corrective action will prevent the deterioration from causing loss of contributing features.

Stabilization Measures:

The following stabilization measures have been identified for Prairie Creek Fish Hatchery:

Hatchery Building

- Replace planks covering the concrete pipe trench on the north side of the Hatchery building. This should be done in a manner that connects several of the planks together, to increase stability and facilitate handling.
- Remove masonry planter walls, preferably in total, but minimally at strategic points to create a path for storm water to drain from the building.

- Remove non-historic walk-in freezer (east side) to eliminate moisture build-up in adjacent wall materials, presence of rotting timber and bio-growth (pest control), interrupted site drainage, and eliminate potential safety hazards.
- After vegetation removal, inspect building perimeter drainage patterns and concrete trench system; make repairs and/or regrade as needed to re-establish drainage away from structure.
- Excavate and remove soil from base of building on south and east sides, where the soil is in contact with wooden building elements, to maintain six inches of clearance between wood and soil where possible.
- Secure gutters and downspout joints properly, clean out debris, and check drain slope. If not possible to inspect and maintain, consider replacing with diverter system to redirect water from loading docks without additional burden of maintenance.
- Leakage at ceiling of southeast tool room: water is entering via a disconnected roof vent and pooling on top of storage closet just west of doorway; investigate cause and remediate.

Garage/Shop

- Remove concrete pad on the east side of the garage and the north side of the shed to a minimum distance of five feet from building base, to eliminate contact between the concrete and wooden building elements and allow storm water drainage away from the structures.
- Where soil is in contact with wooden building elements, excavate and remove soil to maintain clearance for material drainage and pest management.
- Remove concrete pad between garage and shed to eliminate contact between the concrete and wooden building elements and allow storm water drainage away from the structures. If needed to prevent vegetation growth between the two buildings, place landscape fabric on soil surface.

Shed

- If needed for pest control, install hardware cloth at gable end openings.

Superintendent's House

- After vegetation removal inspect building perimeter drainage patterns; make repairs and/or regrade as needed to re-establish drainage away from structure and maintain six inches of clearance between wood and soil where possible.
- Remove vegetative growth and soil build-up from chimney brick arch top.
- Paint porch wood decking and millwork that has weathered bare.

Assistants' House

- After vegetation removal inspect building perimeter drainage patterns; make repairs and/or regrade as needed to re-establish drainage away from structure and maintain six inches of clearance between wood and soil where possible.
- Remove non-historic wood trunk from entry porch or raise with blocking to eliminate wet condition and allow deck material to dry out properly.
- At east edge of entry porch, where missing trim has allowed water entry into sidewall and propagated moss growth – wedging materials apart: remove moss and dirt; replace trim or insert a temporary flashing to divert water from entering wall.
- Install temporary flashing cap at chimney to divert water, leaving ventilation space to maintain air circulation and prevent moisture build-up.
- Paint porch wood decking and millwork that has weathered bare.

Vegetation

Hatchery Building

- On the south side of the Hatchery building, remove all vegetation within five feet of the base of the building except the rhododendrons. This will keep larger non-historic vegetation, such as blackberries, from resting on the building's sides, minimizing damage from moisture. The five-foot buffer will decrease the needed maintenance frequency, because it will minimize seed distribution adjacent to building sides.
- On the north side of the hatchery building, remove all ferns within 18 inches of the base of the building. This will keep vegetation from resting on the building's sides minimizing damage from moisture.
- Remove grasses, algae, lichen and moss from interior of five round concrete tanks, and from stone stairways. See Appendix D for specific removal methods and product MSDS sheets.

Houses

- Where sidewalks are present, remove blackberries and other vegetation between sidewalk and the base of buildings.
- Where sidewalks are not present, remove blackberries and other vegetation within five feet from the base of buildings.
- At porches, remove and prevent vegetation growth from underneath; remove and prevent moss from porch deck millwork.
- On shingled roofs, remove and prevent mosses, algae and lichen growth.

General Landscape Areas

- Dedication pond: remove blackberries and other vegetation that are growing over the walls and within the pond.
- Pipeline at stream crossing: remove blackberries and other vegetation covering the structure to an area within five feet of the pipeline corridor, and prune tree branches that are resting on or otherwise in danger of damaging pipeline.
- Asphalt paving: remove blackberries and other vegetation growing in cracks in the pavement, to prevent further deterioration of the surface.

Impacts

Type of Impact: Vegetation/Invasive Plants
External or Internal: Both Internal and External
Impact Description: Blackberries, wild roses, vinca, ferns and ornamental shrubs have grown against the base of most of the site's buildings. These are causing damage by holding moisture against the wood structures, which are rotting in places.

Type of Impact: Vegetation/Invasive Plants
External or Internal: External
Impact Description: Blackberries, wild roses, and vinca have grown over the walls of the dedication pond, and are growing into the structure's masonry. This is beginning to cause damage to the walls, by creating gaps between stones, and dislodging mortar from the joints.

Type of Impact: Vegetation/Invasive Plants
External or Internal: External
Impact Description: Grasses are growing through cracks in the five round concrete tanks, and mosses are covering the surface of the tanks. This is causing the cracks to enlarge over time, and the moss is causing the concrete surface to deteriorate.

Type of Impact: Vegetation/Invasive Plants
External or Internal: External
Impact Description: Blackberries are covering the west end of the pipeline structure, and tree branches have come to rest on the pipeline in the stream corridor. These are causing the pipeline to rust, and increased weight to be placed upon its structure.

Type of Impact: Vegetation/Invasive Plants
External or Internal: External
Impact Description: Grasses, blackberries, and herbaceous groundcovers are growing through cracks in the asphalt paving that covers the site. This is causing the cracks to enlarge and holds water below the surface. Both of these impacts are causing the pavement to buckle. As a result, the paving is beginning to disintegrate and wash away.

Type of Impact: Improper Drainage
External or Internal: External
Impact Description: Concrete paving in the area east of the garage and surrounding the shed was built on top of existing soil without re-grading. As a result it abuts the building's wood cladding. This is causing water to accumulate against the cladding and has resulted in rot.

Type of Impact: Improper Drainage
External or Internal: Both Internal and External
Impact Description: Non-historic planters built on the south and west sides of the Hatchery building prevent proper drainage of water away from the building. They

were placed on top of existing soil, and as such are higher than the foundation of the building. Therefore, the only way for storm water to drain away presently is by channeling below the building.

Type of Impact: Deferred Maintenance
External or Internal: Both Internal and External
Impact Description: Gutters on both the north and south side of the Hatchery building are causing water to be concentrated in areas underneath the building.

Type of Impact: Improper Drainage
External or Internal: Internal
Impact Description: Accumulation of water under the Hatchery building at the north doorway and stairs has caused rot and subsequent crushing failure at two structural posts, resulting in significant subsidence. Temporary gutters installed to protect wood deck and stone stairs have no mechanical attachment of downspouts, allowing separation and failure. In addition missing planking at the east end of the stoop has allowed water entry, resulting in separation of the steps' stone veneer.

Type of Impact: Improper Drainage
External or Internal: Internal
Impact Description: Accumulation of water under the Hatchery building at the south doorway deck and stairs has resulted in failure of wood materials supporting the floor structure in the direct area. Lack of flashing and/or improper spacing between the exterior deck wood and the building are causing material degradation.

Type of Impact: Deferred Maintenance
External or Internal: External
Impact Description: Many of the planks atop the concrete pipe trench to the north of the Hatchery building have rotted and fallen into the trench. This has resulted in rainwater draining into the trench. The trench then funnels the rainwater under the building. Furthermore, the lack of covering allows vegetation to become established in the trench, which then damages the concrete structure. Moreover, the open trench has become a health and safety hazard because it is intermittently open and closed. This could result in people tripping and falling into the open trench.

Type of Impact: Vandalism/Theft/Arson
External or Internal: Both Internal and External
Impact Description: Vandals are breaking into buildings to remove and steal copper and other metal items. The buildings are suffering damage as a result, as items are pulled from walls and structural elements. Graffiti has also sometimes been a problem, requiring the park to periodically clean paint from the buildings.

Treatment

Approved Treatment: Rehabilitation

Approved Treatment Document: General Management Plan

Document Date: 01/01/2000

Approved Treatment Document Explanatory Narrative:

The Redwood National and State Parks General Management Plan approved by NPS in April 2000, identifies an approved treatment for PCFH. That document states that the park will “actively pursue opportunities for the adaptive rehabilitation of the historic Prairie Creek Fish Hatchery” because it is considered a complex of historic structures suitable for the historic property leasing program.

Approved Treatment Completed: No

Bibliography and Supplemental Information

Bibliography

For a full bibliography, see the Supplemental Information Section, Appendix B.

Additional Resources:

Bucher, Ward, ed. 1996. *Dictionary of Historic Preservation*. New York: John Wiley & Sons.

Feilden, Bernard. 1994. *Conservation of Historic Buildings*. Burlington, MA: Elsevier Architectural Press.

Harris, Samuel Y. 2001. *Building Pathology: Deterioration, Diagnostics, and Intervention*. New York: John Wiley & Sons.

King Smith, Ann. 2001. *Adaptive Use Strategy, Prairie Creek Fish Hatchery*. Internal park report produced by Ms. King Smith, as the Cultural Resources Branch Chief, to provide re-use guidance for the hatchery site.

McAlester, Virginia and McAlester, Lee. 2003. *A Field Guide to American Houses*. New York: Alfred Knopf.

National Park Service. 2000. *Redwood National and State Parks General Management Plan*. Produced in association with the California Department of Parks and Recreation.

Redwood National Park. 2008. *South Fork Lost Man Creek, Second Growth Forest Restoration Environmental Assessment*.

Redwood National Park. 2009. *North Fork Lost Man Creek Bridge Environmental Assessment*.

Shoup, Laurence H. 1988. *An Historic Overview and National Register of Historic Places Significance Evaluation of the Upper Lost Man Creek Dam, Humboldt County, California*. Report produced for Redwood National Park by Archaeological/Historical Consultants.

U.S. Department of the Interior, National Park Service. *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Washington, D. C.

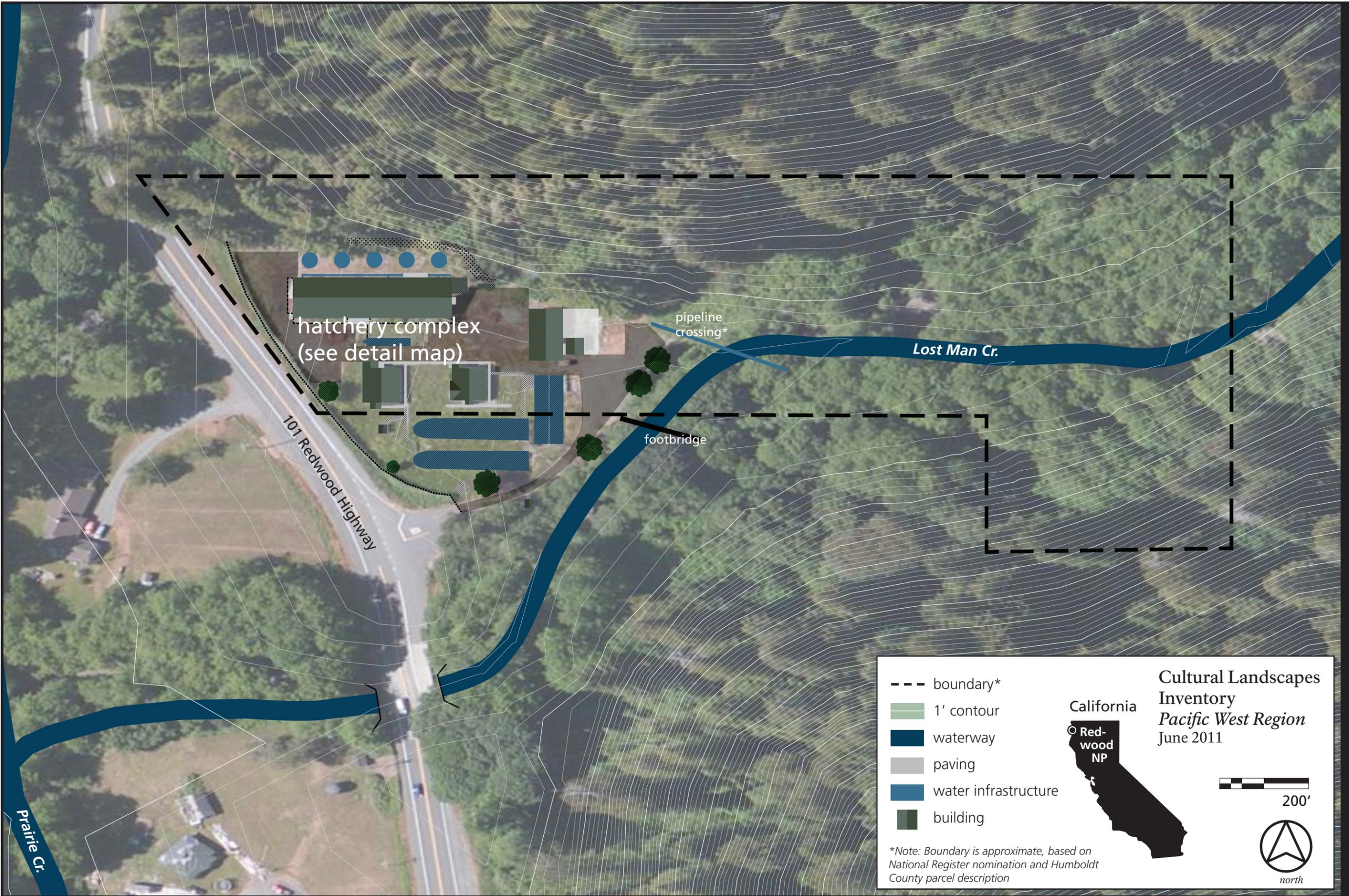
Supplemental Information

Title: Appendix A

Description: Large Format Site Plans

Two 11"x17" site plans follow this page:
Overall Site / Cultural Landscape Boundary
Detail Plan For Hatchery Complex

Redwood National & State Parks, California
Prairie Creek Fish Hatchery



Cultural Landscapes Inventory
Pacific West Region
June 2011

California
Redwood NP

200'
north

--- boundary*
1' contour
waterway
paving
water infrastructure
building

**Note: Boundary is approximate, based on National Register nomination and Humboldt County parcel description*



Redwood National & State Parks, California
 Prairie Creek Fish Hatchery

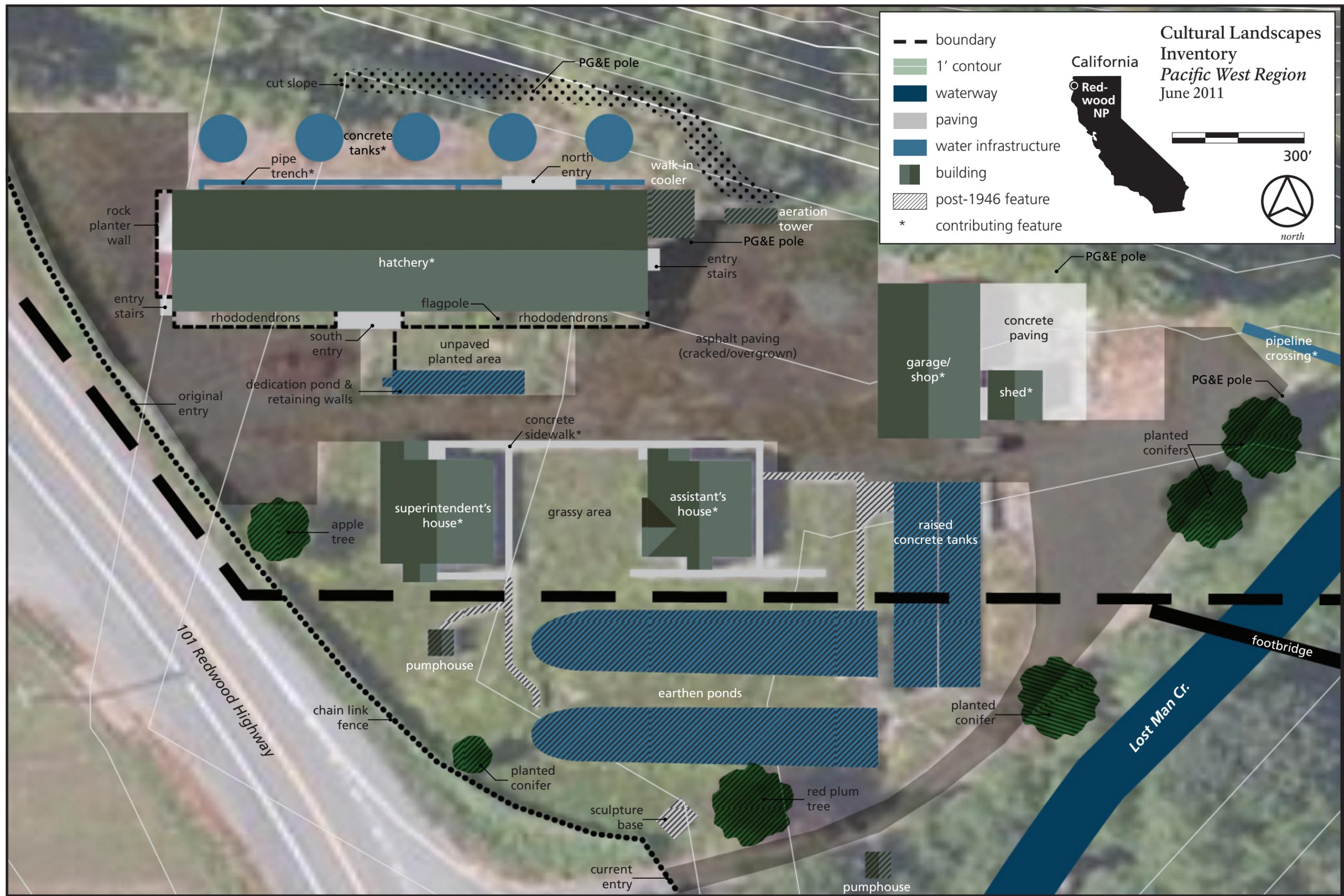
Cultural Landscapes Inventory
 Pacific West Region
 June 2011



300'



- boundary
- 1' contour
- waterway
- paving
- water infrastructure
- building
- post-1946 feature
- * contributing feature



Title: Appendix B

Description: Bibliography from 2000 National Register Nomination

A reproduction of the 14 page bibliography from the 2000 National Register Nomination follows this page. Many of the references contained within the history section refer to sources in this bibliography, and therefore it has been included in its entirety.

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Prairie Creek Fish Hatchery Page 39

Bibliography

WRITTEN SOURCES

Angney, Heather

1996 "Whither a Wooden Woodside Fish Not Fit for a Smallish Dish?" *Oakland Tribune*. 1 December, p. C-9.

1996 "Carving Still Makes for One Heck of Fish Story." *San Mateo County Times*. 24 December.

Bamburg, Bonnie L.

1986 "Fish Hatchery, Brookdale, Santa Cruz County." California Historic Resources Inventory Form (DPR 523, Rev. 11/85). April.

Bentzley, Gina

1984 "Steelhead Trout Spawn Record Number of Eggs at Hatchery" in *The [Eureka] Times Standard*. 12 March. Reprinted in Zuber et al n.d.:314.

Bernay, Xan

1992 "Prairie Creek Fish Hatchery Fades into History." *The [Eureka] Times Standard*. 23 November: A1.

California. Assembly.

1961 Final history. Chapter 1564: An act to provide for the conveyance to Humboldt County of the Prairie Creek Fish Hatchery. Approved by the Governor 12 July 1961, in effect 15 September 1961: 3384.

California. Department of Fish and Game.

1970 Letter from Elton D. Bailey, Fisheries Management Supervisor to Salvatore Billeci regarding oligochaete worms at PCFH - 1951 and 1952. 22 April. From the file of Stu Russell, Humboldt County, Board of Supervisors, Administrative Office.

California. Department of General Services. Office of Architecture and Construction

1968 *History of Office of Architecture and Construction*. Sacramento: State Printing Office.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 9

Prairie Creek Fish Hatchery Page 40

=====

California. Department of Natural Resources. Division of Fish and Game.

- 1929 30th Biennial Report for the Years 1926-1928.
Sacramento: California State Printing Office.
- 1931 31st Biennial Report for the Years 1928-1930.
Sacramento: California State Printing Office.
- 1933 32nd Biennial Report for the Years 1930-1932.
Sacramento: California State Printing Office.
- 1935a 33rd Biennial Report for the Years 1932-1934.
Sacramento: California State Printing Office.
- 1937 34th Biennial Report for the Years 1934-1936.
Sacramento: California State Printing Office.
- 1938 Letter from J.H. Vogt to Division of Water Resources.
25 October.
- 1939 35th Biennial Report for the Years 1936-1938.
Sacramento: California State Printing Office.
- 1941 36th Biennial Report for the Years 1938-1940.
Sacramento: California State Printing Office.
- 1943 37th Biennial Report for the Years 1940-1942.
Sacramento: California State Printing Office.
- 1945 38th Biennial Report for the Years 1942-1944.
Sacramento: California State Printing Office.
- 1947 39th Biennial Report for the Years 1944-1946.
Sacramento: California State Printing Office.
- 1949 40th Biennial Report for the Years 1946-1948.
Sacramento: California State Printing Office.
- 1951 41st Biennial Report for the Years 1948-1950.
Sacramento: California State Printing Office.
- 1953 42nd Biennial Report for the Years 1950-1952.
Sacramento: California State Printing Office.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 9

Prairie Creek Fish Hatchery Page 41

=====

- 1955 43rd Biennial Report for the Years 1952-1954.
Sacramento: California State Printing Office.
- 1957 44th Biennial Report for the Years 1954-1956.
Sacramento: California State Printing Office.
- 1959 45th Biennial Report for July 1, 1956 through June 30,
1958. Sacramento: California State Printing Office.
- 1961 46th Biennial Report for the Years 1958-1960.
Sacramento: California State Printing Office.
- 1963 47th Biennial Report for the Years 1960-1962.
Sacramento: California State Printing Office.
- 1965 48th Biennial Report for the Years 1962-1964.
Sacramento: California State Printing Office.

California. Department of Public Works. Division of Water Resources.

- 1935a Application to Appropriate Unappropriated Water (Form
1). Prepared by Division of Fish and Game.
Application No. 8391, filed 13 July 1935. From the
files of Redwood National Park.
- 1935b Letter from Harold Conkling, Deputy in Charge of Water
Rights to Department of Natural Resources, Division of
Fish and Game issuing permit no. 4619 for application
no. 8391. 11 September. From the files of Redwood
National Park.
- 1936-39 Progress Report by Permittee (Form 67). Annual reports
prepared by Division of Fish and Game. 20 October
1936, 8 October 1937, 14 October 1938, and 16 October
1939. From the files of Redwood National Park.
- 1941 Inspection Report. Report to the State Engineer of the
inspection [of PCFH] on 18 September 1940 by A.S.
Wheeler, Assistant Hydraulic Engineer. 8 February.
From the files of Redwood National Park.
- 1942 License for Diversion and Use of Water. License No.
2355. 12 January. From the files of Redwood National
Park.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 9

Prairie Creek Fish Hatchery Page 42

=====

1943-55 Report of Licensee (Form 91). Tri-Annual Reports prepared by Division/Department of Fish and Game. 21 October 1943, 16 October 1946, 18 October 1949, 20 October 1952, 24 January 1956. From the files of Redwood National Park.

California Fish and Game

1931 "Division Activities, Bureau of Fish Culture." Vol. 17:4 (October 1931): 482-483.

1934 "The Lake Almanor Hatchery" by J.H. Vogt. Vol. 20:2 (April 1934): 130-133.

California. Fish and Game Commission

1927 29th Biennial Report for the Years 1924-1926. Sacramento: California State Printing Office.

California. State Water Resources Control Board. Division of Water Rights

1976-86 Report of Licensee. Tri-Annual reports prepared by County of Humboldt [on PCFH]. 25 November 1940, 3 January 1974, 30 January 1977, 15 January 1980, 12 April 1981, 16 January 1984, 4 December 1986. From the files of Redwood National Park.

California. State Water Rights Board

1958-64 Report of Licensee (Form 91). Tri-Annual reports prepared by Department of Fish and Game [on PCFH]. 10 November 1958, 25 October 1961, 10 November 1964. From the files of Redwood National Park.

1967 Report of Licensee [Form SWRB 17 (8-67)]. Tri-Annual reports prepared by the County of Humboldt [on PCFH]. From the files of Redwood National Park.

Chapman, Mike

1982 "Fish vs. Farmers: Fish Create Problems for Oat-growing Farmers" in the *Eureka Times Standard*. 7 July. Reprinted in Zuber et al n.d.:296.

Feinberg, Lenore and Terri Morgan

n.d. *California's Salmon Resource, Its Biology, Use and Management*. Sea Grant Report Series No. 3. California Sea Grant College Program. CSGCP No. 72. La Jolla: California Sea Grant College Program.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 9

Prairie Creek Fish Hatchery Page 43

- Frishberg, Manny
1991 "Prairie Creek Fish Hatchery Endangered." *Southern Humboldt/Northern Mendocino Life & Times*. 1 October: 18.
- Hagood, Jean
n.d. "Orick News" in *The Union*. Reprinted in Zuber et al n.d.:311.
- Hay, Duncan and Michael R. Corbett
1992 *Historic Resources Assessment Report for the Pit 1 Hydroelectric Project, Shasta County, California*. Prepared for Pacific Gas and Electric Company by Dames & Moore, San Francisco.
- Hufford, Thelma. *Orick Log* columnist
n.d. (a) "Orick News" in *The Union*. Reprinted in Zuber et al, n.d.:310.
n.d. (b) "Roads Have Rich History" in *The Union*. Photocopy of article in files of Don Tuttle, Humboldt County Natural Resources.
1977 "Orick News" in *The Union*. 17 March. Reprinted in Zuber et al, n.d.:95.
1985 "Geneva" in *The Union*. 17 October:15.
1993 "Redwood Creekers Wade into New Year" in *The Union*. 14 January.
- Humboldt County
1966 Inventory of County Property (Cowdery's form No. 620). 30 June. From the files of Stu Russell, Humboldt County, Board of Supervisors, Administrative Office.
1992 Department 275, Prairie Creek Fish Hatchery. Departmental Statement of Fixed Assets for the Fiscal Year 1991-1992. 23 June: 197. From the files of Stu Russell, Humboldt County, Board of Supervisors, Administrative Office.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

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Prairie Creek Fish Hatchery Page 44

Humboldt County. Board of Supervisors

1961 In the matter of accepting Quitclaim Deed from State of California for Prairie Creek Fish Hatchery. 10 October.

1988 Resolution No. 88-144. Supporting the designation of the county fish hatchery at Prairie Creek, Orick, Ca. as a Humboldt County historical structure and supporting its inclusion with the California Point of Historical Interest Program. 29 November.

Humboldt County. County Administrative Officer

1992 Memo from Chris Arnold to Board of Supervisors regarding Disposition of Surplus Equipment -- Fish Hatchery. 6 November. From the files of Stu Russell, Humboldt County, Board of Supervisors, Administrative Office.

Humboldt County Recorder

1936 Deed, Recording sale of property by Hammond & Little River Redwood Co., Ltd. and Hill-Davis Company, Limited to State of California, Department of Natural Resources, Division of Fish and Game. 29 July 1936. Attached to letter from Sondra S. Humphries, Pacific Land Resources Program Center, National Park Service, Pacific West Field Area, San Francisco to California Department of Fish and Game. 14 February 1996.

The Humboldt Times

1966 "A Fish Story" (editorial). 27 August:4.

Jordon, Frank C.

1928 *California Blue Book or State Roster*. Sacramento: California State Printing Office.

Kyle, Douglas E.

1990 *Historic Spots in California*, fourth edition, revised. Stanford: Stanford University Press.

Lantis, David W., Rodney Steiner, and Arthur E. Karinen

1963 *California: Land of Contrast*. Belmont: Wadsworth Publishing Company.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 9

Prairie Creek Fish Hatchery Page 45

=====

Leitritz, Earl

1970 *Fish Bulletin 150: A History of California's Fish Hatcheries, 1870-1960.* Sacramento: State of California, The Resources Agency, Department of Fish and Game.

Leitritz, Earl and Robert C. Lewis

1976 *Fish Bulletin 164: Trout and Salmon Culture (Hatchery Methods).* Sacramento: State of California, Department of Fish and Game.

Outdoor California

1959 "Dry Feeds for Trout and Salmon." 20:11 (November).

1964a "Wildlife Conservation Board Plans Program for Parks and Recreation Bond Act Money." September: 12.

1964b "Trinity Hatchery - 'To Save A Resource'." October: 10-12.

1966 "Fish, Wildlife and Water Development." February: 3.

Rathjen, Mark

1992 "Bid to Save Fish Hatchery; Public May be Asked to Help Prairie Creek. *The [Eureka] Times-Standard.* 29 February.

Redwood National Park. Arcata Office

1994 Hazardous Material Survey (Level I) of Prairie Creek Fish Hatchery, Tract 12-141.

1996a Information on Prairie Creek Fish Hatchery from "NPS Lands Files" in office of Aida Parkinson.

1996b Information on Prairie Creek Fish Hatchery from files in office of Ann King Smith.

Sacklin, John, Vicki Ozaki, Terry Hofstra and Ann King Smith

1988 *Environmental Assessment, Upper Dam Removal, Lost Man Creek, Redwood National Park.* August. From the files of Redwood National Park.

Sacramento Bee

1974 "Orick Townspeople Honor Their Heroic Salmon; Monument for Indomitable." 2 June: C1-C4.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 9

Prairie Creek Fish Hatchery Page 46

=====

Sanders, Steven D.

- 1985 Memo to Robert E. Hendricks, County Administrative Officer Regarding a Otter proof Hatchery Perimeter Fence. March 27. From the files of Stu Russell, Humboldt County, Board of Supervisors, Administrative Office.
- 1989 Services Review Presentation to [Humboldt County] Board of Supervisors, Prairie Creek Fish Hatchery. 9 January. From the files of Stu Russell, Humboldt County, Board of Supervisors, Administrative Office.

Schwarzloopf, Chet

- 1948 "Orick Busy Logging and Shop Center; Town Grows Swiftly." Newspaper article in "Orick " clipping file at the Humboldt Historical Society.

Shebley, W.H.

- 1927a "History of Fish Planting in California" in *California Fish and Game*, Vol. 13, No. 3 (July 1927): 163-174.
- 1927b "Four New Hatcheries for California" in *California Fish and Game*, Vol. 13, No. 3 (July 1927): 174-180.

Shoup, Lawrence H.

- 1988 *An Historic Overview and National Register of Historic Places Significance Evaluation of the Upper Lost Man Creek Dam, Humboldt County, California.* Prepared for Redwood Nation Park, Crescent City. 30 June.

Stickney, Robert

- 1996 *Aquaculture in the United States: A Historical Survey.* John Wiley & Sons.

The (Eureka) Times-Standard

- 1992 "Salmon Kebob." 17 September.

Tuttle, Don, Humboldt County Natural Resources.

- 1996 Information from the files of Don Tuttle related to Prairie Creek Fish Hatchery.

Urquhart, Leonard Church

- 1950 *Civil Engineering Handbook*, third edition. New York: McGraw Hill.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

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Prairie Creek Fish Hatchery Page 47

United States Department of the Interior. National Park Service.
Interagency Resources Division

1991 National Register Bulletin 15: How to Apply the
National Register Criteria for Evaluation.

n.d. (a) National Register Bulletin 16A: How to Complete the
National Register Registration Form.

n.d. (b) National Register Bulletin 30: Guidelines for
Evaluating and Documenting Rural Historic Landscapes.

Zuber, Gloria, Thelma Hufford, Blanche Blankenship, and Savina Barlow
n.d. Oreg-W; Orick Then and Now... Orick: Historical
Committee of Orick Chamber of Commerce.

MAPS, PLANS, AND PHOTOGRAPHS

California. Department of Natural Resources. Division of Fish and
Game.

1935 Prairie Creek Hatchery, Map showing Hatchery site
leased from H. & L. R. R, Lbr. Co. Ltd. Survey 27-30
May. Drawn 11 June. From files at Redwood National
Park.

1992 Aerial photograph of Prairie Creek Fish Hatchery. Flown
9 July 1992. Received from Redwood National Park,
Arcata Office.

California. Resources Agency. Department of Conservation. Division of
Forestry

1949 North Half of Humboldt County. On file at the Bancroft
Library of the University of California at Berkeley.

California. State Archives

n.d. "Prairie Creek Hatchery" and "Main Racks Prairie Creek."
Two photographs showing temporary hatchery and dam, ca.
1928-1935.

Elam, Arthur W., Licensed Land Surveyor

1935 Survey No. 365 for Hammond & Little River Redwood Co.,
Ltd. Section Line Between Sections 14 & 23 T. 11 N. R.
1. E. HB&M. Scale 400'=1 inch. Survey completed 26
April. Filed in Humboldt County Recorder's Office 26
July.

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=====

Humboldt County Assessor

1996a Assessor's Parcel Map 519-20 in Sec 22 & W1/2 Sec 23
11N 1 E. Scale 1"=800'.

1996b Assessor's Parcel Map 519-17 in Secs 13 & 14 & ptn sec
23 11N 1E. Scale: 1"=800'

Humboldt County Engineer

1922 Map 10 of Maps of Humboldt County. Base map copyright
1922.

1955 Map 1-HUM-1-K. Book 3 of Highway Maps, page 75. Filed
15 September.

Larson & MacMillan, Eureka, California

1962 Record of Survey for Arcata Redwood Co. in Sections 14
& 23 T.11N., R. 1E. Scale 1"=50'. May 1962. Recorded
in book 20 of Surveys, page 21, Humboldt County
Recorder's Office. 6 August.

Lentell, J.N.

1898 *Official Map of Humboldt County, California.* On file at
the Bancroft Library of the University of California at
Berkeley.

1909 *Map of Humboldt County, California.* On file at the
Bancroft Library of the University of California at
Berkeley.

1914 *Map of Humboldt County, California.* On file at the
Bancroft Library of the University of California at
Berkeley.

Redwood National Park. Arcata Office

n.d. (a) Plan View; Upper Dam, Lost Man Creek, Redwood National
park, NEY4, Sec. 23, T.11N., R.1E.. Scale: 1"=60'. From
files of Ann King Smith, Redwood National Park, Arcata
Office.

n.d. (b) Lost Man Creek Dam Site; Blasting and Excavation
Schedule. Scale: 3/4"=100'. From files of Ann King
Smith, Redwood National Park, Arcata Office.

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National Park Service

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1992 Aerial photograph of PCFH. Scale 1:6,000. Flown 9 July 1992.

Smedley, Glen

1996 Hand corrected map of PCFH showing conditions ca. 1943-1949. Faxed to Michael Corbett.

Sunderland, Clyde

1954 Humboldt County, California. Aerial photographs (1:20,000) for United States Department of Agriculture, Commodity Stabilization Service. Photo CVL-14N-084-1954. On file at the Map Room of the University of California at Berkeley.

U.S. Army. War Department. Corps of Engineers

1945 Orick Quadrangle, California, Grid Zone "G." 15 minute series (1:62,500). On file at the Map Room of the University of California at Berkeley.

U.S. Army Map Service

1947 Orick, California (1:50,000). A.M.S. series v795, sheet 1166 1. On file at the Map Room of the University of California at Berkeley.

U.S. Department of the Interior, Geological Survey, U.S. Department of the Army

1952 Orick Quadrangle, California. 15 minute series (Topographic). On file at the Map Room of the University of California at Berkeley.

U.S. Geological Service

1966 Orick California. 1:24,000. Photoinspected 1975.

INTERVIEWS

Anderson, Dave. Redwood National and State Parks

1996 Telephone interview with Denise Bradley. 17 July.

1997 Telephone conversation with Michael Corbett. 4 March.

Barngrover, Bruce. California Department of Fish and Game, Region 2

1996 Telephone interview with Michael Corbett. 30 October.

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- 1997 Telephone interview with Michael Corbett. 6 March.
- Barracco, Allan. California Department of Fish and Game
1997 Telephone interview with Michael Corbett. 6 March.
- Buchert, Florine. Orick, CA
1996 Telephone interview with Michael Corbett. 27 September.
Mrs. Buchert is the daughter of Jim Laidlaw who worked
at PCFH in the 1940s.
- Corn, Bob. California Department of Fish and Game, Region 1
1996 Telephone interview with Michael Corbett. 31 October.
- Crowe, Michael. National Park Service
1996 Telephone interview with Michael Corbett. 29 October.
- Ellis, Roger. California Department of Fish and Game, Region 4
1996 Telephone interview with Michael Corbett. 31 October.
- Gordon, Don. Humboldt County, Real Property Office
1996 Interview with Michael Corbett. 12 July.
- Gunter, Royce. California Department of Fish and Game, Region 3
1996 Telephone interview with Michael Corbett. 31 October.
- Haynie, Mike. California Department of Fish and Game, Region 5
1996 Telephone interview with Michael Corbett. 29 October.
- Hendrickson, Gary. Associate Professor of Fisheries, Humboldt State
University
1996 Telephone interview with Michael Corbett. 1 November.
- Hufford, Thelma. Columnist for *The Union*, Arcata, CA
1996 Telephone interview with Michael Corbett. 18 September.
- Laidlaw, William. Eureka, CA
1996 Telephone interview with Michael Corbett. 1 October.
Mr. Laidlaw is the son of Jim Laidlaw who worked at PCFH in
the 1940s.
- Lortie, Marilyn. California Office of Historic Preservation.
1997 Telephone conversation with Michael Corbett.
28 February.
- MacNiven, Janis. Buck's Restaurant, Woodside.

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1996 Telephone conversation with Michael Corbett.
6 December.

Nash, Glen. Eureka, CA

1996a Telephone interview with Denise Bradley. 23 July.

1996b Interview with Michael Corbett. 29 August. Mr. Nash worked on the construction of the PCFH buildings in 1928 and 1935.

Russell, Stu. Humboldt County, Board of Supervisors, Administrative Office

1996 Interview with Michael Corbett. 12 July.

Sanders, Joanne. Linda, CA

1996a Telephone interview with Michael Corbett. 30 October.

1996b Telephone interview with Michael Corbett. 5 December.

Sanders, Steve D, former Superintendent at PCFH from 1971 to 1994.
Linda, CA

1996a Telephone interview with Denise Bradley. 29 July.

1996b Telephone interview with Michael Corbett. 28 October.

1996c Telephone interview with Michael Corbett. 4 November.

1996d Telephone interview with Michael Corbett. 11 November.

1997 Telephone interview with Michael Corbett. 4 and 7 February.

Smedley, Glen. Crescent City, CA

1996 Telephone interview with Michael Corbett. 29-31 October. Mr. Smedley is the son of Stephen Paul Smedley superintendent of PCFH between 1943-1949.

1997 Telephone interview with Michael Corbett. 26 February.

Thomas, John. California Office of Historic Preservation

1996 Telephone interview with Michael Corbett. 29 October.

Tuttle, Don. Humboldt County, Department of Natural Resources

1996a Interview with Michael Corbett. 12 July.

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1996b Telephone interview with Michael Corbett. 28 December.

Will, Bob. Rowdy Creek Fish Hatchery

1996 Telephone interview with Michael Corbett. 31 October.
Mr. Will worked at PCFH in 1955.

Yamashita, Mas. Department of Fish and Game, Inland Fisheries
Division

1996 Telephone interview with Michael Corbett. 29 October.

Title: Appendix C

Description: Architecture, Facilities, and Landscapes of Fish Hatcheries

Throughout their history in California, fish hatcheries have typically consisted of a number of built components: a hatchery building providing shelter for, the hatching process; support buildings for storage, maintenance, and fuel; indoor and outdoor ponds for growing fish; pipelines and other facilities for delivery of suitable water to the hatchery; fish ladders and other features to facilitate the return of fish to a hatchery. Remote hatcheries and almost all hatcheries built before World War II had housing for a superintendent and workers. Hatcheries required access to transportation, to receive feed, eggs, and other supplies, and to ship fish. Until after 1900, this always meant access to a railroad. After 1900, this increasingly could mean automobile roads. Apart from lighting, heating, plumbing and other systems for the comfort of workers, electricity was used at hatcheries for pumps and other machines when it became available - from generators or by hookups to outside sources. Finally, all hatcheries have needed a reliable source of good water, which has usually meant a stream, but may also include wells.

A hatchery is a complex which includes all of these features. However, the way in which these features exist within individual hatcheries can take various forms: compact or spread out; small or large; plain in appearance or decorated; consist of the minimum of features or of many buildings, hydraulic features, and other equipment; lack any utilities or be dependent on electric power to run a variety of devices to move and treat water, feed fish, medicate fish, spawn fish, open and close gates, count eggs, weigh and grade fish (Leitritz 1976).

The key building in any hatchery facility is the hatchery building, a type of structure whose requirements for good light and unobstructed space for troughs, tanks, and water conduits have remained constant for a long time. Hatchery building interiors from 1915 (Mt. Shasta), 1936 (PCFH), 1953 (Lake Almenor[sic]), 1958 (unidentified), and 1973 (unidentified) were all large rectangular, column-free rooms with bands of windows on outside walls (Leitritz 1965:78,114; California Fish and Game 1934:132). The Lake Almenor [sic] Hatchery appears identical to PCFH in construction and interior space. The exteriors of hatcheries built as early as 1881 suggest that the same type of space was already provided by that time (Leitritz 1970:17, 25). While old hatchery buildings can still serve modern needs, many have been replaced due to wear and tear, especially induced by constant overflows of water onto walls and floors. Floors have often rotted out of hatcheries (Will 1996).

Other buildings at hatchery facilities appear to have been ordinary examples of their times, whether garages, sheds, or houses. For example, the superintendent's residence at the first Tahoe Hatchery of 1896 was a saltbox in form, a typical inexpensive house of its day (Leitritz 1970:21); the residence at the Price Creek Hatchery of 1906 was a typical rectangular house with a hip roof and front porch (Leitritz 1970:25); the three houses at PCFH of 1936 were ordinary bungalows; and the four houses at Fish Springs Hatchery of 1952 were simple concrete block houses with gable roofs, and steel sash windows (Leitritz 1970:83). An exception was the Burney Creek Hatchery (closed 1949) of 1927, which incorporated housing for workers on the second floor of the hatchery building itself (Leitritz 1970:41; Shebley 1927:168).

Just as most of the buildings have been typical examples of their type in plan and construction, they have also been generally utilitarian in appearance and little decorated. The first Tahoe Hatchery (1896) and the Tallac Hatchery (1897) had vertical board and batten siding and no embellishments; the Brookdale Hatchery (1905) had a hip roof, horizontal siding, and a symmetrical arrangement of windows on the entrance facade - but no other decoration; the Fort Seward Hatchery, Fall Creek Hatchery, Kaweah

Hatchery, Central Valley Hatchery, and PCFH buildings of the 1930s were all clad in ordinary rustic siding with a minimum of decorative trim; and buildings of the 1950s and later such as at Moccasin Creek, Darrah Springs, and Fish Springs hatcheries are industrial structures clad in corrugated metal siding (Leitritz 1970:passim).

While most early hatchery buildings were plain in appearance, a few, especially in the period 1910s to 1930s, received architectural embellishment from the Office of the State Architect who designed them. For most of these, embellishment was little more than shingled siding and composed facades or volumes which created a rustic appearance, such as at Burney Creek (1927), Fern Creek (1927), Big Creek (1927), and Feather River (1935). The Yosemite Hatchery (1927) represented an extreme case of this type with river rock walls and a log trellis (Shebley 1927:passim; Leitritz 1970:passim).

As designed, the Mt. Whitney Hatchery of 1917 and the second Tahoe Hatchery of 1920 were distinguished works of architecture (Leitritz 1970:21, 63). Both were rustic in materials and suggested northern European or Alpine models in image. Mt. Whitney was a long stone structure with a tower at one end whose top had half-timbered walls and a jerkinhead roof. The Tahoe Hatchery was dominated by a jerkinhead roof with eaves overhanging ground floor walls. It had a stone base and log porch columns.

Today, Mt. Shasta (1881) survives as an example of an early plain looking hatchery and Mt. Whitney survives as a romantic image of a hatchery operation, among state hatcheries. The second Tahoe Hatchery building may survive, but it was closed as a hatchery in 1956. The remaining state operated hatcheries were either built or largely rebuilt since the 1950s (Gunter 1996; Ellis 1996; Barngrover 1996; Haynie 1996; Corn 1996; Yamashita 1996). Among closed hatcheries, while no survey has been done, PCFH is the only one known to survive largely intact.

Title: Appendix D

Description: Fish Culture in California

With the tremendous boom in the population of California beginning with the Gold Rush in 1849, there was a rapid decrease in fish and other aquatic creatures from overfishing in some areas. In 1851, the state passed a law “concerning oysters and oyster beds”; in 1852 and 1854, laws were passed outlawing obstructions which inhibited salmon in streams; and in 1861, the first laws were passed protecting trout. The issue was first addressed, in a comprehensive manner with the establishment of the California Fish Commission in 1870, and the authorization, in 1871, of a federal Commission of Fish and Fisheries for each state (Leitritz 1970:8).

The purpose of the California Fish Commission, consisting of three commissioners, was “to provide for the restoration and preservation of fish in the waters of the state.” This was to be accomplished by the establishment of 'fish breederies' to stock and supply streams, lakes and bays with both foreign and domestic fish, to purchase and import spawn and ova, to employ fish culturists and other needed help, to construct fish ladders, and to distribute spawn and ova to fish breeders,” and to provide for the conservation of fish (Leitritz 1970:8). The first work of the California Fish Commission was to import exotic trout and plant them in California waters. From 1871 to 1908, 15 species of trout were introduced to California. In 1882, striped bass were brought from Red Bank, New Jersey to Suisun Bay (Shebley 1927:166-169).

During the 19th century, “hundreds of lakes and streams were stocked” (Shebley 1927:169). Typically, small fish were carried in cans from the hatchery by rail. Various means were devised to keep the water in the cans cool and aerated. From the railroad, cans of live fish were carried by army ambulance wagon to the water where they were “planted.” Or, if roads were not adequate for wagons, they were packed in on mules. After 1893, the California Fish commission arranged for free delivery of its fish by the Southern Pacific Railroad. “As the demand for fish increased with the ever-increasing population of the state and the capacity of the baggage cars on the different railroads was often overcrowded with fish cans”, the commission obtained its own specially outfitted rail car in 1907. Beginning about that time, trucks became available for deliveries, and with the gradual construction and improvement of roads, transformed not only the delivery process, but the possibilities for locating hatcheries (Shebley 1927:171-172).

Over the years, the name and structure of the California Fish Commission changed. In 1909, the Board of Fish Commissioners became the Board of Fish and Game Commissioners, reflecting expanded responsibilities since 1878. In 1927, the Fish and Game Commission and several other state entities were joined together under the newly created Department of Natural Resources. Within the Department of Natural Resources there were four new divisions including a Division of Fish and Game under a new Fish and Game commission. Within the Division of Fish and Game were nine new bureaus including the Bureau of Fish Culture which operated hatcheries; the Bureau of Patrol which planted trout; and the Bureau of Hydraulics which installed fish ladders. At that time there were 18 hatcheries and 20 egg collecting stations (Jordan 1928:177-181). Later, in 1952, the Division of Fish and Game became a separate department (Department of Fish and Game) outside the Department of Natural Resources (Leitritz 1970:9).

An essential aspect of the work of the California Fish Commission and its successors was the establishment of fish hatcheries. In the last quarter of the 19th and the first half of the 20th centuries, many stations were set up first with temporary facilities as “experimental” stations before being established on a permanent basis. Even so, many of these were closed within a few years of opening. Out

of 169 experimental and permanent hatcheries and egg collecting stations established between 1871 and 1960, only 23 were still in operation in 1960. Among the problems encountered in establishing hatcheries, those associated with an adequate, year-round supply of clean, cool, aerated, low-nitrogen water were most important. Problems related to water quality included dams and other obstructions downstream and runoff upstream causing silt and affecting water quality and temperature. Although hatcheries went through a lengthy licensing process to take water from streams, the possession of a license was no guarantee that additional licenses would not be granted to others on the same stream for activities that would ruin conditions for the hatchery. Floods, fires, politics, and economics all posed dangers to established hatcheries as well (Leitritz 1970:10-14).

The first two hatcheries in California were established in 1870, and from 1870 to 1915, there was a steady pattern of construction of new hatcheries and egg collecting stations, with one or two opened in most years. The size and character of these facilities varied according to location, purpose, and period of construction. Beginning in 1913, fishing licenses were required in California, with the fees going to support the building of hatcheries and other work of the California Fish commission. From 1916 to 1927, the pace of hatchery construction increased, with three to six new facilities opening in most years. One reason for this was the expanding use of trucks. In 1927, the year before PCFH was opened as an experimental facility, there were nine hatcheries operating “where the fish are planted by the hatchery foremen and crews by the use of trucks. These fish are always delivered in good condition as the trips are short and the fish are carried in trucks and can be given better care. These are mostly small hatcheries that are used to furnish a supply of fish for nearby streams and lakes” (Shebley 1927:172).

By 1927, the year that the Fish and Game Commission was given a new organizational framework within the Department of Natural Resources, funding sources had also expanded to include “hunting and angling licenses, commercial fishermen's licenses, trappers' licenses, commercial gun club licenses, tonnage tax on fish paid by fish canners and reduction plants, tags permitting the sale of domestically reared fish and game, domestic game and fish breeders' licenses, and fines imposed on fish and game law violators” (Jordan 1928:180).

In 1928, the year after this reorganization took effect, ten new hatcheries were established, the largest in any single year before or since. Then, from 1929 to 1934, a relatively high rate of new hatcheries opened each year, followed by the period from 1935 to 1942 when one or two hatcheries opened each year (Leitritz 1970:10-14). In 1934, Public Law Number 732 was passed by the U.S. Congress, requiring mitigation of the loss to fish caused by dams, resulting in a number of new hatcheries (Leitritz 1970:17).

During the war years, work “centered around an effort to maintain a normal program so far as war time limitations would permit” (California Department of Natural Resources 1945:9-14). “Hatchery and residential buildings suffered continued depreciation . . . when materials and labor were unavailable for normal upkeep,” and plans were made “for extensive repair and remodeling” (California Department of Natural Resources 1947:41).

While the war limited work at the hatcheries, afterwards there was a boom and a reorientation of the program. In the immediate aftermath in 1945, “the lifting of gasoline restrictions contributed to a tremendous increase in the purchase of fishing licenses” (California Department of Natural Resources 1947:39). Soon, “it became apparent that a large amount of repair and new construction must be done in order to keep existing facilities in operation and to add to new hatchery facilities . . . It was hoped that with the enactment of the Wildlife Conservation Act of 1947 and the subsequent allocation by that board of \$2,187,200 for fishery projects that a sound planned hatchery expansion and rehabilitation program could be undertaken” (California Department of Natural Resources 1951:73). Prior to 1947 and the

funding that became available in that year, 150 hatcheries had been built. Under the new modernization program, the first small phases of three hatcheries were opened from 1947 to 1949 (Leitritz 1970:10-14; 74-76), but because the Division of Fish and Game relied upon the Division of Architecture, for its facilities, and was overwhelmed with war-deferred work, “It was not until 1950 that the Division of Architecture could undertake our first fish hatchery projects” (California Department of Natural Resources 1951:73). Even then, work “did not get underway as rapidly as expected” (California Department of Natural Resources 1953:21). From 1952 to 1959, eleven new hatcheries were opened (Leitritz 1970:10-14).

Post-war hatchery construction was different in character from and larger in size than hatcheries before the war. Until World War II, hatcheries were generally built to enhance sport fishing. Afterwards they were more often built as mitigation for darn construction. Whereas the state hatchery program had long included small hatcheries at remote sites, after the war small hatcheries were considered inefficient and were closed, and big new hatcheries were built. The old hatcheries were relatively labor intensive. The new hatcheries were increasingly mechanized. The old hatchery program focused its efforts on raising and releasing fingerlings. The new program grew larger fish before they were released. Until the 1950s, fish were fed ground meat. By 1960, meat was almost completely replaced by processed pellets.

At the time of the first phase of this transformation, “three of the older, outmoded hatcheries were abandoned.” The abandoned installations were Prairie Creek Hatchery, Humboldt County; Kings River Hatchery, Fresno County; and Madera Hatchery, Madera County. “This brought to ten the total of outmoded hatcheries that have been closed during the modernization period” (California Department of Natural Resources 1957:35). The efforts to modernize were ongoing with a program of automation and modernization at the state hatcheries (Outdoor California September 1964). This was succeeded in the 1970s by a major effort to improve efficiency (Gunter 1996).

Today there are 27 state hatcheries in five regions. Many of today's hatcheries were established before 1946. However, even at the hatcheries established prior to World War II, buildings and structures' date mostly from the 1950s and afterwards. In addition, there is one federal fish hatchery, Coleman National Fish Hatchery; it is located below Shasta Dam. PCFH was for many years the only county operated fish hatchery in California and the only one in the United States to raise anadromous fish (Sanders 1997). There are numerous small private hatcheries in California.

Title: Appendix E

Description: Fish Hatchery policy in California

From the earliest days of fish hatcheries in California, hatcheries have had two purposes. The act of the state legislature which established the Fish Commission in 1870 stated that the purpose was “to provide for the restoration and preservation of fish in the waters of the state” (Shebley 1927a: 164). While the language of the act implied a fish conservation motive, the unstated, underlying purpose was to stock streams for sport fishing. Many streams and lakes had become depleted from overfishing and habitat changes, such as those caused by logging and hydraulic mining. California waters were stocked both with native fish and with exotics, imported from other parts of the united states, whose only purpose was sports fishing. The rise of sport fishing was associated with larger cultural developments, notably the rise of tourism and an interest in the outdoors, another manifestation of which was the establishment of the Sierra Club in 1892. In 1890, state officials persuaded the southern Pacific Railroad to transport fish from hatcheries to streams for free because of its association with tourist travel on the railroad (Shebley 1927a:170). Sport fishing increased in the early. 20th century with the introduction of the automobile, which provided larger numbers of sports fishermen with access to more streams and lakes in increasingly remote areas (Stickney 1996:132,136).

Sport fishing was the first important reason for fish hatcheries, and it has continued to be one important reason throughout the history of hatcheries, up to the present day. Sport fishing has had a growing economic value to the state, from the generation of sales of fishing and camping equipment and traveling expenses; and, since 1913, the sale of fishing licenses. Today, the state takes in over \$2,000,000 a year in fishing licenses, and it is estimated that billions of dollars in sales are added to the economy (Barracco 1997).

In the 20th century, other reasons arose for hatcheries which came to have equal or greater importance than sport fishing. The effect of hatcheries on commercial ocean fishing was long hard to quantify and the subject of debate during the late 19th and early 20th centuries. Then, in 1924, the U.S. Bureau of Fisheries began supporting hatcheries for that reason (Stickney 1996:134-135). In the late 1940s, mechanization of commercial fishing boats resulted in a substantially increased commercial catch. Today, private organizations of commercial fishermen pay the state to supply 4,000,000 salmon a year to augment ocean fishing (Barngrover 1997).

From the beginning, a secondary reason for hatcheries was for the conservation of fish species. The increased damming of streams for hydroelectric power, irrigation, and water supply in the early 20th century contributed to an enhanced recognition of the relationship between habitat changes and to a growing interest in conservation. For example, the Pit 1 hydroelectric facility in Shasta County was nicknamed “The Fish Killer” even before it was completed in 1921 (Hay and Corbett 1992: 19-5). In 1934, new hatcheries were required by federal law to mitigate the losses caused by dams, an action regarded at the time as a conservation measure.

From 1947, when large amounts of money became available for the state hatchery program following passage of the Wildlife Conservation Act of 1947, to 1988, nearly all new hatcheries were built for mitigation purposes. This coincided with increased mechanism and a premium on economy and efficiency. Generally speaking, old, small hatcheries were closed, and larger, modern ones were built. The emphasis of the hatchery program shifted in this period away from the support of sport and commercial fishing and toward mitigation (Barngrover 1997).

In 1988, the California Salmon and Steelhead Restoration Act and related federal legislation shifted the emphasis of the hatchery program and state policy toward fish preservation. New objectives, unrelated to those of the past, included the improvement of genetic strains through natural reproduction, and preservation or restoration of habitat, rather than focusing only on the supply of fish. Under this new policy, hatcheries have a diminished role (Barngrover 1997; Barracco 1997).

In summary, hatcheries were first built in California, beginning in the 1870s, primarily for sport fishing, and were associated with the development of tourism and economic development. From the mid-1920s, hatcheries were also developed to support commercial fishing. A major new reason for hatcheries was established in 1934, to mitigate for the losses created by dams. Support of sport fishing, commercial fishing, and mitigation continued as the primary objectives of the state hatchery program, influenced by trends toward mechanization, economy, and efficiency in the period 1934 to 1988. In 1988, state and federal policy shifted the emphasis of the hatchery program toward improving genetic diversity through natural reproduction and to conservation through habitat preservation, improvement, or restoration.

Title: Appendix F

Description: PCFH in Relation to Local History

The history of PCFH is closely associated with the development of U.S. Highway 101 and the nearby town of Orick, California. This history can be divided into three general periods: 1) the early history, 1848 to 1927, associated with the exploitation of natural resources and homesteading; 2) the second phase, 1928 to 1967, associated with development of transportation and the local economy based on natural resources and agriculture; and 3) the third phase, 1968 to present, associated with declining reliance on natural resources and increasing tourism.

Early History, 1848 to 1927

The early history of the area is associated with the exploitation of natural resources. The first Euro-Americans in the region came looking for gold along the Trinity and Klamath Rivers in the late 1840s and 1850s. Very quickly, a lumber industry was also established; several mills were established in Eureka by 1854. Logging increased in the 1880s as the redwood forests closer to San Francisco were depleted (Lantis et al. 1963:422-423).

The first settler in the vicinity of PCFH arrived in 1864, with many others in the 1870s and 1880s. These settlers homesteaded and established the community of Orick on Redwood Creek, about three and one-half miles south of where the hatchery would later be built. The early homesteaders were primarily engaged in raising animals including cattle, dairy cows, chickens, and goats (Hufford 1985; Hufford 1993).

In the 1870s, Indian trails in the county were first developed as wagon roads (Hufford n.d.). An official county map in 1898 showed a north-south road generally along the alignment of U.S. Highway 101 through Orick and past the site of PCFH (Lentell 1898). The first bridge was built on this road over Redwood Creek in Orick in 1905 (Hufford n.d.). Official county maps in 1898, 1909, and 1914 showed the land north of Orick, including the site of PCFH owned by the American Lumber company (Lentell 1898; Lentell 1909; and Lentell 1914). After World War I, an influx of settlers from Italy and Switzerland came to Orick and established about 25 small dairy farms (Hufford 1993). By 1922, the site of PCFH was part of a large undivided property owned by the Hammond Lumber company and the Hill-Davis Company, with the property immediately to the south owned by Robert McIntosh, a pioneer settler in Orick (Lentell 1922).

Second Phase, 1928 to 1967

Big changes came to the area beginning in 1927, initiating the second phase of local history. In that year a new highway bridge was built over Redwood Creek at Orick (Hufford 1928). In 1928, the state bought the right-of-way for construction of a highway north of Orick (Humboldt County Engineer 1955). By 1935, this highway would be completed and functioning as a portion of the Redwood Highway, which later was designated U.S. 101. Also in 1928, the predecessor of the PCFH, a temporary hatchery and egg collecting station was established on Prairie Creek. In 1933, a Civilian Conservation Corps (CCC) camp was established about one and one-half miles north of PCFH, now the site of Prairie Creek Redwoods State Park, Elk Prairie Campground (Hufford 1977; Nash 1996). The CCC camp included barracks, headquarters building, cookhouse, shop, post exchange, and post office. CCC workers cleared stumps left by highway construction workers, and built rail fences, a bridge across Prairie Creek, fire trails, campgrounds, and “the all-redwood Visitor Center with the hand hewn beams and huge double rock

fireplace” (Hufford 1977). In 1936, PCFH was rebuilt as a permanent facility.

After World War II, “Orick became a boom town-with a fire department and a community services district and a community hall-and more churches and more bars were built and the school was enlarged and more service stations were built and logging trucks were allover” (Hufford 1993). There were tepee burners and little mills “all over” (Hufford 1993), including the Geneva Company mill, built in 1945 on land bought from the heirs of Robert McIntosh. The Geneva mill was sold to Hammond Lumber Company in 1952 and subsequently to Louisiana Pacific who closed it in 1957 (Barlow et. al. 1985). Development of small houses and enterprises extended north of Orick intermittently along the highway, including construction of a house for a Geneva Lumber company manager across the highway from PCFH in 1949-1952 (California Resources Agency 1949; U.S. Department of the Interior 1952).

Third Phase, 1968 to Present

The third phase of local history is associated with the establishment of Redwood National Park in 1968. The roots of the local tourist industry were much earlier, with designation of the “Redwood Highway” by 1935; recognition of sport fishing as a significant element of the economy by establishment of the temporary fish hatchery in 1928; and development of State Park facilities by the CCC and others in the 1930s. But tourism was a relatively minor element of the economy until 1968 when the establishment of the National Park both created a major focus for tourists in northern California and also permanently removed a substantial amount of land which was formerly logged by timber companies. In this same period, increased mechanization reduced the need for workers in the woods and in the mills. For related reasons, the 25 dairy farms around Orick were consolidated into “four big dairy ranches and a couple of cattle and sheep ranches” (Hufford 1993). A major result of these changes was a need for fewer workers, and a consequent sharp decline in the local population.

Title: Appendix G

Description: Management of Biological Growth on Concrete

Management of Biological Growth on Concrete

Biological growth on concrete attracts and holds water. If left in place it can provide humus for plant growth or result in damaging moisture conditions resulting in surface pitting or more serious consequences. Water exposure can result in leaching out of calcium oxide - resulting in chipping, spalling or exfoliation of the concrete. More severe prolonged exposure can result in failure at pour joints, cracks, and deterioration that allow further water entry. The resulting change of alkalinity in the concrete can cause carbonation and rust jacking of iron reinforcement, which expands and causes further mechanical damage. Relative humidity of 65% and exposure to light produce ideal conditions for growth. Removal of moisture is the ideal solution, but impractical in outdoor exposures such as the exterior concrete tanks. Solutions involve removal of existing growth, followed by a combination of pre-treating to prevent growth and removal in the incipient stages of growth.

All chemical treatments have the potential for leaving behind residual material. Upon breaking down, the organic deposits can provide food for future bio-growth or alter the ph balance in a way that provides a more hospitable environment for re-growth. Recent research by NCPTT prefers the use of biocidal cleaners over non-ionic detergents for surfaces susceptible to deposits and organic growths. See Recommended References. Treatment should be accomplished with the gentlest methods possible. Prior to treatment test methods on small areas.

Methods of Removal:

1. Early treatment: wipe with diluted ammonia.
2. Mechanical removal of large growth: dry brush and/or use wooden scrapers to eliminate as much of the growth as possible. Water wash surface with low (100 psi or less) or medium pressure water (300-400 psi). Scrub with natural or synthetic bristles. Do not use metal bristles, which can worsen pitting and leave behind metal particles that oxidize and stain surfaces. Finish with a final rinse.
3. Steam/hot pressurized water cleaning can be very effective for removing bio-growth and dried up soil deposits. Does not result in a large amount of water runoff, no secondary cleaning or neutralizing required for completing treatment.
4. Use biocidal cleaner such as *EnviroKlean BioWash* by Prosoco or *D/2 Biological Solution* by Cathedral Stone. These have additives to help deter bio-growth from returning for a more extended period of time. Procedures similar to method #2.

EnviroKlean BioWash

<http://www.prosoco.com>

D/2 Biological Solution

<http://www.cathedralstone.com/products/solution.aspx>

Management of Recurring Growth:

1. Removal of incipient growth: wipe with diluted ammonia.

Caveats:

1. Do not undertake any cleaning method involving water in severe cold weather; elevated moisture levels in material can result in increased spalling or cracking.
2. Do not use bleach or oxidizing cleaners, which may deposit soluble salts.
3. Chemical cleaners all have the potential for negatively impacting the concrete if not completely and properly rinsed or neutralized. Leftover residues can cause etching of surfaces, making them even more water permeable.
4. Cleaners can be dangerous to operators, and have potential impacts to the environment which should be fully evaluated before use.

Recommended References:

NCPTT *Best Practice Recommendations for Cleaning Government Issued Headstones*

<http://ncptt.nps.gov/wp-content/plugins/download-monitor/download.php?id=Best-Practices-Final.pdf>

Section 1: PRODUCT & COMPANY IDENTIFICATION

Product Name: D/2 Biological Solution

Exclusively Distributed By:

Cathedral Stone® Products, Inc.
 7266 Park Circle Drive
 Hanover, MD 21076
 Telephone: 410-782-9150
 Fax: 410-782-9155

Manufactured By:

Sunshine Makers, Inc.
 15922 Pacific Coast Highway
 Huntington Harbour, CA 92649
 Telephone: 800-228-0709
 Fax: 562-592-3830

Emergency Phone: Chem-Tel 24-Hour Emergency Service: 800-225-3924

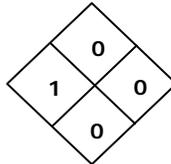
Use of Product D/2 Biological Solution is an easy-to-use liquid that aids in the removal of a broad spectrum of soils. It is designed for use on outdoor sculpture, monuments, decorative fountains, stone, brick, terra cotta, concrete, stucco, and other architectural surfaces.

Section 2: HAZARDS IDENTIFICATION

D/2 Biological Solution is a colorless liquid with a very faint detergent-like odor. It is non-flammable, non-combustible, non-explosive, and non-reactive.

Hazard Rating (NFPA/HMIS)

Health = 1* Reactivity = 0
 Fire = 0 Special = 0
 * Mild eye irritant, non-mutagenic and non-carcinogenic



Rating Scale

0 = Minimal 1 = Slight 2 = Moderate
 3 = Serious 4 = Severe

Eye Contact: Eye Irritant.

Skin Contact: Prolonged skin contact with D/2 Biological Solution may irritate the skin. Repeated daily application to the skin without rinsing, or continuous contact of D/2 Biological Solution on the skin may lead to irritation.

Ingestion: Essentially non-toxic. May cause stomach or intestinal upset if swallowed.

Inhalation: No adverse effects expected under typical use conditions. Adequate ventilation should be present when using D/2 Biological Solution over a prolonged period of time. Open windows or ventilate via fan or other air-moving equipment if necessary. Mucous membranes may become irritated by concentrate mist.

Carcinogens: No ingredients are listed by OSHA, IARC, or NTP as known or suspected carcinogens.

Medical Conditions: No medical conditions are known to be aggravated by exposure to D/2 Biological Solution.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	<u>CAS Number</u>	<u>OSHA PEL ACGIH TLV</u>
Surfactants	Proprietary	None established
Wetting Agents	Proprietary	None established
Buffers	Proprietary	None established

Section 4: FIRST AID MEASURES

If in Eyes: Immediately rinse the eye with large quantities of cool water; if present, contact lenses should be removed after 5 minutes of rinsing; continue rinsing 10-15 minutes more. Both upper and lower lids should be lifted to facilitate thorough rinsing.

If on Skin: Minimal effects, if any, from diluted product; rinse skin with water, rinse shoes and launder clothing before reuse. - Reversible reddening may occur in some dermal-sensitive users; thoroughly rinse area.

If Inhaled: Use in well-ventilated area, or use adequate protection from inhaling mist during spray applications. Prolonged exposure of workers to concentrate-mist during spray application may cause mild irritation of nasal passages or throat. If this happens, relocate workers to fresh air.

If Ingested: Give several glasses of milk or water to dilute; do not induce vomiting. If stomach upset occurs, consult physician.

Section 5: FIRE FIGHTING MEASURES

Extinguishing Media: Not flammable/non-explosive. No special procedures required.

Special Fire Fighting Procedures: None required.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid contact with eyes. Do not rub eyes with hands during cleanup. No special precautions for dermal contact are needed. Wash hands thoroughly after cleaning up spill or leak.

Procedure to follow in case of spill or leak: Evacuate area. Identify source of leak or spill and contain with sand, earth, or containment bin. Then proceed to clean up spill or leak.

Method for cleaning up: Recover all usable material. Residual may be removed by wipe or wet mope. Rinse area with plenty of water and mop to sanitary sewer.

Section 7: HANDLING AND STORAGE

No special handling is required. Keep in a closed plastic container. Store at ambient temperature. Avoid contact with eyes. Wash hands thoroughly after handling. **This product is non-hazardous for storage and transport according to the U.S. Department of Transportation Regulations.**

This material does not meet the definition of a hazardous material according to 49 CFR, ICAO, IMDG and the UN Orange Book.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Precautionary measures: No special requirements under normal use conditions.

Exposure Limits: The D/2 Biological Solution formulation presents no health hazards to the user, other than mild eye irritancy.

Eye protection: Caution, including reasonable eye protection, should always be used to avoid eye contact where splashing may occur, such as during spray applications.

Respiratory Protection: No special precautions required.

Ventilation: No special ventilation is required during normal use.

Skin protection: No special precautions required; rinse completely from skin after contact.

General hygiene conditions: There are no known hazards associated with this material when used as recommended. The following general hygiene considerations are recognized as common good industrial hygiene practices:

- Avoid breathing vapor or mist.
- Avoid contact with eyes.
- Wash thoroughly after handling and before eating, drinking, or smoking.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear Liquid	Freezing Point:	-9 °C (16 °F)
Odor:	Very faint detergent-like odor	Boiling Point:	98°C (209°F)
pH:	9.5	Specific Gravity:	1.011
Evaporation Rate:	0.4 (butyl acetate = 1)	Vapor Pressure:	20.7 mm Hg
Water Solubility:	100%	Vapor Density:	1.3 (air = 1)

Section 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials to Avoid: **Contains ammoniated compounds – do not mix with bleach, tub & tile cleaner, mold/mildew removers, or chlorinated compounds.**

Hazardous Decomposition Products: None expected

Section 11: TOXICOLOGICAL INFORMATION

Toxicity Data: Available from relevant laboratory testing of ingredients or similar mixtures.

Acute Toxicity:	Oral LD ₅₀ : >2.0 g/kg body weight	Dermal LD ₅₀ : Not estimated
Eye Irritation:	With or without rinsing with water, the irritation scores in rabbits at 24 hours did not exceed 17 (mild irritant) on a scale of 110 (extremely irritating); all scores were normal at seven days.	
Dermal Irritation:	In a standard test on rabbits, mild irritation was found at 72 hours; well-defined reddening was observed at 7 and 14 days after exposure.	
Dermal Sensitization:	No allergic reactions occurred in guinea pigs treated with D/2 Biological Solution.	
Carcinogenicity:	D/2 Biological Solution contains no carcinogenic compounds as defined by the National Toxicology Program (NTP), the international Agency for Research on Carcinogens (IARC), or the Occupational Health and Safety Administration (OSHA).	

Section 12: ECOLOGICAL INFORMATION

Biodegradability:	All components are inherently biodegradable.
Ecotoxicity:	Not Tested.

Section 13: DISPOSAL CONSIDERATIONS

Unused Product:	* Dilute with water 1:10 (1 part D/2 Biological Solution to 10 parts water) and dispose by sanitary sewer.
Used Product:	*Used product may be hazardous depending on the cleaning application and resulting contaminants.
Empty Containers:	*Triple-rinse with water and offer for recycling if available. Otherwise, dispose as non-hazardous waste.

*Dispose of used or unused product, and empty containers in accordance with the local, State, Provincial, and Federal regulations for your location. Never dispose of used degreasing rinsates into lakes, streams, and open bodies of water or storm drains.

Section 14: TRANSPORT INFORMATION

IATA Proper Shipping Name: Detergent solution

Hazard Class: Non hazardous

Section 15: REGULATORY INFORMATION

***Reportable components:** None. The U.S. Environmental Protection Agency (EPA) has determined that propylene glycol ethers are not included within the listed category "glycol ethers" under either EPCRA §313 Toxic Release Inventory or Clean Air Act §112 Hazardous Air Pollutants (both lists include only ethylene glycol ethers). Nor are propylene glycol ethers included in the various EPA Resource Conservation and Recovery Act, and Clean Water Act lists, nor the California Proposition 65 lists.

All components are listed on: EINECS and TSCA Inventory

No components listed under: Clean Air Act Section 112

RCRA Status: Not a hazardous waste.

CERCLA Status: No components listed

TSCA TRI Reporting: Not required / Not listed

CA PROP. 65 Status: No components listed

Section 16: OTHER INFORMATION**For Safety Information, Sales Applications and Availability contact:**

CATHEDRAL STONE® PRODUCTS, INC.
7266 Park Circle Drive, Hanover, MD 21076

Telephone: 410-782-9150 Fax: 410-782-9155

DISCLAIMER: All information appearing herein is based upon data obtained by the manufacturer and recognized technical sources. Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of this information, Sunshine Makers, Inc. or its distributors extends no warranties, makes no representations and assumes no responsibility as to the suitability of such information for application to purchaser's intended purposes or for consequences of its use.

MATERIAL SAFETY DATA SHEET



I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME AND ADDRESS: PROSOCO, Inc.
3741 Greenway Circle
Lawrence, KS 66046

EMERGENCY TELEPHONE NUMBERS:
8:00 AM – 5:00 PM CST Monday-Friday: 785/865-4200
NON-BUSINESS HOURS (INFOTRAC): 800/535-5053

PRODUCT TRADE NAME: Enviro Klean[®] BioWash

II INGREDIENT INFORMATION

INGREDIENT NAME: ACTIVE:	(COMMON NAME)	CAS NO.	ACGIH TLV/TWA	OSHA PEL/TWA
Di-(C8-10)-alkyl dimethyl ammonium chlorides	(Quaternary compounds)	68424-95-3	None established	None established
Alkyl dimethyl benzyl ammonium chloride (C12-16)	(Quaternary compounds)	68424-85-1	None established	None established
Nonyl Phenol Ethoxylate	(Nonionic surfactant)	9016-45-9	None established	None established

III PHYSICAL DATA

	BOILING POINT (°F)	VAPOR PRESSURE (mm Hg)	VAPOR DENSITY (Air = 1)	EVAPORATION RATE
Di-(C8-10)-alkyl dimethyl ammonium chlorides	Not Determined	Not Determined	Heavier than air	Slower than ethyl ether
Alkyl dimethyl benzyl ammonium chloride (C12-16)	Not Determined	Not Determined	Heavier than air	Slower than ethyl ether
Nonyl Phenol Ethoxylate	>201°F	Not Determined	Heavier than air	Slower than ethyl ether

	SPECIFIC GRAVITY	pH	SOLUBILITY IN WATER	APPEARANCE AND ODOR
Enviro Klean [®] BioWash	1.00	5.5-6.5	100%	Clear liquid, low odor

IV FIRE AND EXPLOSION HAZARD DATA

EMERGENCY OVERVIEW

Enviro Klean[®] BioWash is a clear, low odor liquid. This product may cause moderate eye irritation. May cause mild skin irritation after prolonged contact. Material is stable and will not burn. Nontoxic by inhalation. Inhalation of concentrate mists may cause upper respiratory irritation.

FLASH POINT (METHOD): Material is stable and will not burn.

FLAMMABLE LIMITS: Material is stable and will not burn.

EXTINGUISHING MEDIA: Not flammable/nonexplosive.

SPECIAL FIRE FIGHTING PROCEDURES: No special procedures required.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None required.

V HEALTH HAZARD DATA

HUMAN HEALTH EFFECTS: BioWash is a moderate eye irritant; mucous membranes may become irritated by concentrate mist.

Prolonged skin contact with BioWash may irritate the skin. Repeated application to the skin without rinsing or continuous contact of BioWash on the skin may lead to irritation. Allergic reactions are not anticipated.

PRIMARY ROUTES OF EXPOSURE: Skin, eyes, inhalation, ingestion.

CARCINOGEN INFORMATION: Not listed (OSHA, IARC, NTP).

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Allergic reactions are not anticipated.

EFFECTS OF OVEREXPOSURE: None expected based upon the available toxicity data.

EYE CONTACT: This product may be irritating to the eyes. Caution, including reasonable eye protection, should always be used to avoid eye contact where splashing may occur, such as during spray applications.

SKIN CONTACT: May cause skin irritation. Gloves recommended for prolonged exposure. Rinse completely from skin after contact. Repeated or prolonged contact may cause moderate to severe irritation.

INHALATION: Mists may be irritating to the respiratory tract and mucous membranes.

INGESTION: Ingestion may cause irritation of the mouth, throat and gastrointestinal tract. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision.

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: Immediately rinse the eye with large quantities of cool water; continue 15 minutes or until the material has been removed. Both upper and lower lids should be lifted to facilitate thorough rinsing. Seek medical attention at once.

SKIN CONTACT: Concentrate may cause irritation. Minimal effects, if any, from diluted product. Rinse skin with water, rinse shoes and launder clothing before reuse. Wear protective gloves if long-term exposure is likely. If irritation persists, get medical attention.

INHALATION: Prolonged exposure of workers to concentrate-mist during spray application may cause reversible irritation of nasal passages or throat. Relocate workers to fresh air. If symptoms persist, get medical attention.

INGESTION: Give several glasses of milk or water to dilute; do not induce vomiting. Depending on volume ingested relative to size of individual can cause nausea and diarrhea. Get immediate medical attention.

VI REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: None.

INCOMPATIBILITY (MATERIALS TO AVOID): Chlorine. Product should not come into contact with chlorinated products, or other strong oxidizers.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: At thermal decomposition temperatures, carbon monoxide, carbon dioxide, and oxides of nitrogen.

VII SPILL OR LEAK PROCEDURES

SPILL, LEAK, WASTE DISPOSAL PROCEDURES: Recover usable material by convenient method. Residual may be removed by wipe or wet mop.

WASTE DISPOSAL METHODS: Fully soluble in water and with dilution is biodegradable. If disposed by sanitary sewer or drain, diluted solutions should not harm sewage-treatment microorganisms. Dispose of in accordance with all applicable local, state, and federal laws. Do not reuse container. Drain container before disposal in household trash.

VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: No special requirements under normal use conditions. Wear a NIOSH approved dust/mist respirator, when mists are present.

VENTILATION: No special ventilation is required during use.

PROTECTIVE CLOTHING: If you experience dermal sensitivity, wear protective clothing such as long-sleeved work shirt and pants, work boots and neoprene gloves to avoid prolonged skin contact. Do not allow clothing to become saturated with product. If work practices cannot be adjusted to avoid excess clothing saturation, splash resistant or Tyvek® clothing and boots may be required.

PROTECTIVE GLOVES: Use Neoprene or PVC gloves as necessary to avoid prolonged contact.

EYE PROTECTION: Safetyglasses with side shields are recommended during use. If work practices or application technique cause a risk of splashing or excessive wind drift, then splash-resistant goggles may be required.

OTHER PROTECTIVE EQUIPMENT: Access to eyewash is recommended. Provide fresh water for rinsing skin.

IX SPECIAL PRECAUTIONS

WORK PRACTICES: Proper work practices and planning should be utilized to avoid contact with workers, passersby, and non-masonry surfaces. Do not atomize during application. Beware of wind drift. See the Product Data sheet and label for specific precautions to be taken during use. Smoking, eating and drinking should be discouraged during the use of this, or any chemical product. Wash hands thoroughly after handling.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: No special precautions required. This product is non-hazardous for storage and transport by all modes of transport. Store in a cool and dry place.

OTHER PRECAUTIONS: None.

X REGULATORY INFORMATION

SHIPPING: Non-hazardous for transport by all modes.

SARA 313 REPORTABLE:**CHEMICAL NAME****CAS****UPPERBOUND CONCENTRATION % BY WEIGHT**

N/A

CALIFORNIA PROPOSITION 65:

Contains no chemicals listed under Proposition 65.

XI OTHER

MSDS Status:**Date of Revision:** April 18, 2002**For Product Manufactured After:** N/A – new product**Changes:** Section III – pH corrected..**Item #:** 41055**Approved By:** Regulatory Department

DISCLAIMER:

The information contained on the Material Safety Data Sheet has been compiled from data considered accurate. This data is believed to be reliable, but it must be pointed out that values for certain properties are known to vary from source to source. **PROSOCO, Inc. expressly disclaims any warranty express or implied as well as any liability for any injury or loss arising from the use of this information or the materials described.** This data is not to be construed as absolutely complete since additional data may be desirable when particular conditions or circumstances exist. It is the responsibility of the user to determine the best precautions necessary for the safe handling and use of this product for his unique application. This data relates only to the specific material designated and is not to be used in combination with any other material. Many federal and state regulations pertain directly or indirectly to the product's end use and disposal of containers and unused material. It is the purchaser's responsibility to familiarize himself with all applicable regulations.

DATE OF PREPARATION: _____ **April 18, 2002** _____



BioKlean™

biological and atmospheric stain remover

OVERVIEW

Enviro Klean® BioKlean™ safely removes biological and atmospheric staining from vertical or horizontal masonry surfaces. Cleans difficult mold and mildew staining that blackens limestone, marble, concrete and other masonry surfaces in humid environments.

The BioKlean™ system includes a liquid cleaner and a liquid activator (sold separately). Treated surfaces are neutralized with a solution of Sure Klean® Limestone & Masonry Afterwash diluted 1:1 with clean water. Effectively removes light-to-severe staining without damage to the surface or the environment caused by more conventional cleaning methods.

SPECIFICATIONS

For all PROSOCO product specifications visit www.prosoco.com and click on "SpecBuilder" or "Solution Finder."

ADVANTAGES

- Removes mold and mildew staining, and light to heavy atmospheric soiling from masonry and wood.
- Will not damage masonry when properly used.
- Easy to apply with brush, roller or spray.
- Liquid formulation allows for fast and easy mixing.

Limitations

- Do not apply at temperatures below 40°F (4°C).
- On concrete and architectural concrete block, repeated applications may result in surface etching.
- Metal surfaces must be protected from exposure to cleaning solution.
- Not for use on polished marble, travertine or limestone.
- Suitable for use on wood and some painted surfaces. ALWAYS TEST.

REGULATORY COMPLIANCE

VOC Compliance

Enviro Klean® BioKlean™ is compliant with all national, state and district regulations.

TYPICAL TECHNICAL DATA

FORM	Cleaner: light yellow liquid Activator: clear liquid
SPECIFIC GRAVITY	Cleaner: 1.09 Activator: 1.10
pH	Cleaner: 13.7 Activator: 2.40
WT/GAL	Cleaner: 9.10 lbs Activator: 9.57 lbs
ACTIVE CONTENT	Not applicable
TOTAL SOLIDS	Not applicable
VOC CONTENT	Not applicable
FLASH POINT	Cleaner: >200°F (>93°C) Activator: not applicable
FREEZE POINT	Cleaner: 14°F (-10°C) Activator: no data
SHELF LIFE	1 year in tightly sealed, unopened container

PREPARATION

Protect people, vehicles, property, plants, metal and all non masonry and acid-sensitive surfaces from cleaner, rinse, residue, fumes and wind drift. Protect and/or divert auto and pedestrian traffic.

Surface and Air Temperatures

Cleaning effectiveness is reduced when surface and air temperatures fall below 50°F (10°C). Do not apply at temperatures below 40°F (4°C). If freezing conditions exist prior to application, let masonry thaw.

Equipment

Apply using a synthetic roller, soft-bristled brush or spray applicator. Rinse with enough water and pressure to flush spent cleaner and dissolved soiling from the masonry surface and surface pores without damage. Inadequate rinsing leaves residues which may stain the cleaned surface.

Masonry-washing equipment generating 400–1000 psi with a water flow rate of 6–8 gallons per minute is the best water/pressure combination for rinsing porous masonry. Use a 15–45° fan spray tip. Heated water (150–180°F; 65–82°C) may improve cleaning efficiency.

Use adjustable equipment for reducing water flow rates and rinsing pressure as needed for sensitive surfaces. Rinsing pressures greater than 1000 psi and fan spray tips smaller than 15° may permanently damage sensitive masonry. Water flow rates less than 6 gpm may reduce cleaning productivity and contribute to uneven cleaning results.

Storage and Handling

Store in a cool, dry place with adequate ventilation. Always seal container after dispensing. Do not alter or mix with other chemicals. Published shelf life assumes upright storage of factory-sealed containers in a dry place. Maintain

temperature of 45–100°F (7–38°C). Do not double stack pallets. Dispose of unused product and container in accordance with local, state and federal regulations.

APPLICATION

Before use, read “Preparation” and “Safety Information.”

ALWAYS TEST each type of surface and each type of stain for suitability and desired results before overall application. Test using the following application instructions. Let test dry thoroughly before inspection and approval.

Mixing Instructions

BioKlean™

For 5-gallons of prepared solution, add 3 gallons clean water to a plastic container. Carefully add one gallon BioKlean™ cleaner, followed by one gallon BioKlean™ activator. Stir thoroughly with a nonmetallic tool. *NOTE:* Prepared solutions must be used immediately.

Limestone & Masonry Afterwash

Add 1 part clean water in a plastic container. Carefully add 1 part Limestone & Masonry Afterwash to the clean water. Never pour water into cleaner.

Coverage Rates

- *Porous Surfaces:*
85–125 sq.ft. / 8–12 sq.m.
- *Semi-Porous Surfaces:*
85–150 sq.ft. / 8–14 sq.m.
- *Non-Porous Surfaces:*
85–200 sq.ft. / 8–19 sq.m.

ALWAYS TEST

ALWAYS TEST a small area of each surface to confirm suitability and desired results before starting overall application. Test with the same equipment, recommended surface preparation and application procedures planned for general application.

Application Instructions

1. Working from the bottom to the top, apply prepared BioKlean™ solution to a dry surface.
2. Leave solution on the surface for 5–20 minutes. If solution begins to dry, reapply.
3. Gently scrub heavily soiled areas.
4. Rinse thoroughly with clean water. If using a sponge or string mop to rinse, change rinse water often. Pressure-rinse porous surfaces to remove heavy soiling.
5. Immediately after rinsing BioKlean™ from masonry surface, apply the prepared Limestone & Masonry Afterwash to the wet surface.
6. Let the Afterwash dwell for three to five minutes.
7. Pressure rinse from the bottom of the treated area to the top. Make sure to cover each portion of the masonry surface with a concentrated stream of water. To avoid streaking, keep wall surfaces immediately below area being cleaned running wet and free of cleaner rundown and residues.

Cleanup

Clean tools and equipment using fresh water.

SAFETY INFORMATION

Enviro Klean® BioKlean™ Cleaner

Enviro Klean® BioKlean™ Cleaner is an alkaline product and has safety issues common to corrosive materials. Use appropriate safety equipment and job site controls during handling and application. Read the full label and MSDS for precautionary instructions before use.

First Aid

Ingestion: If conscious, give large amounts of milk or water and call a physician, emergency room or poison control center immediately. Do not induce vomiting.

Eye Contact: Rinse eyes thoroughly for 15 minutes while lifting eyelids to assure thorough cleaning. Get immediate medical assistance.

Skin Contact: Remove contaminated clothing and rinse thoroughly for 15 minutes. Get medical attention as needed. Launder contaminated clothing before reuse.

Inhalation: Remove to fresh air. Give artificial respiration if not breathing. Get immediate medical attention.

24-Hour Emergency Information:
INFOTRAC at 800-535-5053

SAFETY INFORMATION

Enviro Klean® BioKlean™ Activator

Enviro Klean® BioKlean™ Activator is an oxidizer with corrosive characteristics. Use only as directed. Use appropriate safety equipment and job site controls during handling and application. Read the full label and MSDS for precautionary instructions before use.

First Aid

Ingestion: If conscious, give large amounts of water and call a physician, emergency room or poison control center immediately. Do not induce vomiting.

Eye Contact: Rinse eyes thoroughly for 15 minutes. Get immediate medical assistance.

Skin Contact: Remove contaminated clothing and rinse thoroughly for 15 minutes. Get medical attention. Launder contaminated clothing before reuse.

Inhalation: Remove to fresh air. Give artificial respiration if not breathing. Get immediate medical attention.

24-Hour Emergency Information:
INFOTRAC at 800-535-5053

BEST PRACTICES

To avoid streaking, keep wall surfaces immediately below area being cleaned running wet and free of cleaner rundown and residues.

Masonry-washing equipment generating 400–1000 psi with a water flow rate of 6–8 gallons per minute is the best water/pressure combination for rinsing porous masonry. Use a 15–45° fan spray tip. Heated water (150–180°F; 65–82°C) may improve cleaning efficiency.

Repeated applications to concrete or architectural concrete block may result in surface etching.

Prepared BioKlean™ solutions must be used immediately.

Never go it alone. For problems or questions, contact your local PROSOCO distributor or field representative. Or call PROSOCO technical Customer Care toll-free at 800-255-4255.

WARRANTY

The information and recommendations made are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible application of our products, nor anticipate every variation encountered in masonry surfaces, job conditions and methods used. The purchasers shall make their own tests to determine the suitability of such products for a particular purpose.

PROSOCO Inc. warrants this product to be free from defects. **Where permitted by law, PROSOCO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of merchantability or fitness for**

particular purpose. The purchaser shall be responsible to make his own tests to determine the suitability of this product for his particular purpose. PROSOCO's liability shall be limited in all events to supplying sufficient product to re-treat the specific areas to which defective product has been applied. Acceptance and use of this product absolves PROSOCO from any other liability, from whatever source, including liability for incidental, consequential or resultant damages whether due to breach of warranty, negligence or strict liability. This warranty may not be modified or extended by representatives of PROSOCO, its distributors or dealers.

CUSTOMER CARE

Factory personnel are available for product, environment and job-safety assistance with no obligation. Call 800-255-4255 and ask for Customer Care - technical support.

Factory-trained representatives are established in principal cities throughout the continental United States. Call Customer Care at 800-255-4255, or visit our web site at www.prosoco.com, for the name of the Enviro Klean® representative in your area.



D/2 Biological Solution

D/2 Biological Solution is a safe, easy to use liquid that removes a broad spectrum of biological deposits from hard environmental surfaces. A contact time of only 1 to 2 minutes will loosen most fungal and algal deposits with manual scrubbing and is typically sufficient for excellent results.

Growth of bacteria, fungi, algae, lichens, and mosses contributes significantly to the degradation of many types of construction materials, and can be disfiguring. D/2 can be utilized to control this problem on outdoor sculpture, monuments, decorative fountains, gravestones, and tombs. Biological growth found on some individual building features (such as parapets and zones of ground contact) or materials (such as stucco) can also be treated with D/2, although it is not a general purpose architectural cleaner.

Features and Benefits

- **Fast Acting:** 1 to 2 minute contact time for great results.
- **Keeps Surfaces Clean for a Minimum of 1 year**
- **Safe for Landscape Plantings and Grass**
- **No Detrimental Effects on Masonry**
- **Non-Toxic and Biodegradable:** No special precautions required for handling and storage.

Application Procedures

No Scrub/No Rinse Method

1. Apply D/2 Biological Solution with a brush or pump sprayer to a dry surface. Do not pre-wet the surface. 2. Allow to dry. Repeat if there are heavy biological deposits. D/2 works with the elements and results occur within one week to one month depending on severity of growth and weather conditions. The surface will become cleaner over time as the subsurface biological growth dies and releases.

Immediate Result Method

1. Apply D/2 Biological Solution with a brush, roller or pump sprayer to a dry surface. Do not pre-wet the surface. 2. After waiting 2-5 minutes, scrub surface with a non-metallic, short bristle scrub brush. 3. Allow the undiluted D/2 to remain on the surface 5-10 minutes longer. 4. Apply additional D/2 to maintain a wet surface and continue scrubbing. 5. Rinse with clean water.

Heavy biological deposits should first be loosened using a low pressure washer (300 to 600 psi), or by mechanical scraping using wood or plastic tools. Follow removal with one or more applications of D/2 as stated above. The surface will become cleaner over time as the subsurface biological growth dies and releases.

Light biological deposits may be removed with a D/2 dilution of water from 1:1 to 1:4 parts water by volume. Perform tests to determine effectiveness of various dilutions. Follow testing with application of D/2 as stated above.

Safety Information

D/2 Biological Solution is non-mutagenic, and contains no carcinogenic compounds as defined by NTP, IARC, or OSHA. It is considered essentially non-toxic by swallowing, as it has an oral LD50 of greater than 5.0 g/kg of body weight. No special ventilation is required during use.

Packaging and Coverage

D/2 Biological Solution is available in 32 ounce spray bottle, 1 gallon and 5 gallon containers, and 55 gallon drums.

The area that can be treated with one gallon of D/2 will vary considerably as a function of the nature and extent of biological deposits, as well as the physical characteristics of the surface.

Typical coverage to remove medium deposits will vary from 250 to 350 square feet per gallon.

Technical Data

Physical Form Transparent,
low viscosity liquid
Color Almost colorless
pH 9.5
Specific Gravity 1.01g/cc
Solubility in Water Complete
Vapor Pressure 25 mm Hg @ 20°C

Notice: The information contained herein is based on our own research and the research of others, and it is provided solely as a service to help users. It is believed to be accurate to the best of our knowledge. However, no guarantee of its accuracy can be made, and it is not intended to serve as the basis for determining this product's suitability in any particular situation. For this reason, purchasers are responsible to make their own tests and assume all risks associated with using this product.

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PROSOCO
SINCE 1939



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BioWash®

biological soiling remover for masonry

DESCRIPTION AND USE

Growth of bacteria, fungi, algae, lichens, and mosses disfigures and degrades many types of construction materials. BioWash® is a highly efficient alternative to aggressive cleaners traditionally used on interior and exterior masonry, stone and tile surfaces.

BioWash® helps remove a broad spectrum of biological deposits from vertical or horizontal masonry, stone and tile surfaces. BioWash® can also be applied safely to nonmasonry substrates such as wood, painted surfaces, metal, plastic and glass. Simply dilute with clean water as directed, and apply BioWash® to the surface. A short contact time, gentle scrubbing and a water rinse are normally enough to remove light-to-moderate deposits of fungi, algae, lichen and bacteria typically encountered on building surfaces and monuments.

ADVANTAGES

- Safe for landscape plantings and grass.
- Safe for interior use in occupied buildings.
- Effective on all types of stone, concrete and brick masonry.
- Non-fuming, low-odor formulation.
- Needs no substrate neutralization.
- Minimal precautions required for handling and storage.

- Easy to apply with brush, roller or coarse spray.
- Biodegradable.
- Concentrated for economy.
- Safe and effective on wood, painted surfaces, metal, glass and plastic.

Limitations

- Selectively removes light-to-moderate biological deposits only. For removal of heavy biological or atmospheric soiling, consult your PROSOCO representative, or call Customer Care - technical support, toll-free at (800) 255-4255.

TYPICAL TECHNICAL DATA

FORM: Clear, low-odor liquid, slight amber color
SPECIFIC GRAVITY: 1.00
pH: 5.5–6.5
WT/GAL: 8.34 lbs.
ACTIVE CONTENT: NA
TOTAL SOLIDS: NA
FLASH POINT: NA
FREEZE POINT: 32°F (0°C)
SHELF LIFE: 3 years in unopened container
SOLUBILITY IN WATER: Complete

PREPARATION

Protect people, vehicles, property and all surfaces not set for cleaning from product, splash, rinse, residue, fumes and wind drift. Protect and/or divert traffic if needed.

Drain water from architectural structures (such as fountains) before application. Carefully brush or scrape loose surface debris, and heavy growths of moss, ivy, or other contaminants from the dry surface.

Fragile or Deteriorated Surfaces

Fragile or deteriorated stone may require reduced rinsing pressure, or even stone consolidation to avoid further damage.

Severely deteriorated limestone and marble may be strengthened enough for thorough cleaning by treatment with Conservare® HCT. HCT also prolongs the service life of acid-soluble stone by dramatically increasing its resistance to acid rain. Consult your PROSOCO representative, or call Customer Care - technical support, toll-free at (800) 255-4255 for more information on use of HCT in conjunction with BioWash®.

Surface and Air Temperatures

Cleaning effectiveness is reduced when surface and air temperatures fall below 50°F (10°C). Do not apply at temperatures below 40°F (4°C). If freezing conditions exist before application, let masonry thaw.

BioWash® is recommended for these substrates.

Substrate	Type	Use?
Architectural Concrete Block	Burnished	yes
	Smooth	yes
	Split-faced	yes
	Ribbed	yes
Concrete	Brick	yes
	Tile	yes
	Precast Panels	yes
	Pavers	yes
	Cast-in-place	yes
Fired Clay	Brick	yes
	Tile	yes
	Terra Cotta	yes
	Pavers	yes
Marble, Travertine, Limestone	Polished	yes
	Unpolished	yes
Granite	Polished	yes
	Unpolished	yes
Sandstone	Unpolished	yes
Slate	Unpolished	yes

Always test to ensure desired results.

BioWash®

Equipment

Apply using a soft-bristled brush, roller or coarse spray. Rinse with enough water and pressure to flush spent cleaner and dissolved soiling from the masonry surface and surface pores without damage. Inadequate rinsing leaves residues which may stain the cleaned surface.

Masonry-washing equipment generating 400-1000 psi with a water flow rate of 6-8 gallons per minute is the best water/pressure combination for rinsing porous masonry. Use a 15-45° fan spray tip. Heater water (150-180°F; 65-82°C) may improve cleaning efficiency.

Use adjustable equipment for reducing water flow rates and rinsing pressure as needed for sensitive surfaces. Rinsing pressures greater than 1000 psi and fan spray tips smaller than 15° may permanently damage sensitive masonry. Water flow rates less than 6 gpm may reduce cleaning productivity and contribute to uneven cleaning results.

Storage and Handling

Store in a cool, dry place. Always seal container after dispensing. Do not alter or mix with other chemicals. Published shelf life assumes upright storage of factory-sealed containers in a dry place. Maintain temperature of 45-100°F (7-38°C). Keep from freezing. Do not double stack pallets. Dispose of in accordance with local, state and federal regulations.

APPLICATION

Before use, read “Preparation” and “Safety Information.”

ALWAYS TEST for suitability and results before overall cleaning. Test using the following application procedures. Let test area dry thoroughly before inspection.

NOTE: Many types of biological soiling change color when exposed to BioWash®. Most surface discoloration will disappear soon after thorough water rinsing and weathering.

Dilution Rates

Adjust dilution rate based on testing. Always pour cold water into empty bucket first, then carefully add product.

Type of Soiling

Concentrate : Water

Light biological deposits	1:10
Moderate biological deposits	1:5
Heavy biological deposits	use in concentrate

Coverage Rates

One gallon of diluted BioWash® treats 80 to 240 square feet, based on surface texture, weather conditions at time of application, and the severity of soiling.

Application Instructions

1. Working from the bottom to the top, apply generously to dry surface until surface is thoroughly wet.

2. Leave on the surface for 2-3 minutes. If needed, apply more to keep the surface wet.
3. Mist treated surfaces with water and gently scrub with a non-metallic, short-fibered scrub brush to loosen biological soiling.
4. Working from the bottom to the top, rinse thoroughly with clean water. Reduce rinsing pressure as needed for fragile or deteriorated stone. See “Fragile or deteriorated surfaces” in “Preparation” section.
5. If used on food-contact surfaces (such as, but not limited to picnic benches or bench-table combos, food-stand counters, eating- or food-preparation surfaces, etc.) a potable water rinse must follow cleaning.

It may take several days for the full cleaning effect to be realized. When practical, allow two or more weeks for biological soiling to disappear. Repeat as necessary to remove remaining biological soiling.

Cleanup

Clean tools and equipment with fresh water.

SAFETY INFORMATION

Enviro Klean® BioWash® is a water-reduced cleaning product. Use appropriate safety equipment and job site controls during handling and application. Read the full label and MSDS for precautionary instructions before use.

First Aid

Ingestion: Seek medical attention.

Eye Contact: Rinse thoroughly for 15 minutes. Get medical assistance if irritation persists.

Skin Contact: Remove contaminated clothing and rinse thoroughly. Get medical attention if irritation persists. Launder contaminated clothing before reuse.

Inhalation: Remove to fresh air. Get medical attention as necessary.

24-Hour Emergency Information: INFOTRAC at 800-535-5053

WARRANTY

The information and recommendations made are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible application of our products, nor anticipate every variation encountered in masonry surfaces, job conditions and methods used. The purchasers shall make their own tests to determine the suitability of such products for a particular purpose.

PROSOCO, Inc. warrants this product to be free from defects.

Where permitted by law, PROSOCO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of merchantability or fitness for particular purpose. The purchaser shall be responsible to make his own tests to determine the

suitability of this product for his particular purpose. PROSOCO's liability shall be limited in all events to supplying sufficient product to re-treat the specific areas to which defective product has been applied. Acceptance and use of this product absolves PROSOCO from any other liability, from whatever source, including liability for incidental, consequential or resultant damages whether due to breach of warranty, negligence or strict liability. This warranty may not be modified or extended by representatives of PROSOCO, its distributors or dealers.

CUSTOMER CARE

Factory personnel are available for product, environment and job-safety assistance with no obligation. Call 800-255-4255 and ask for Customer Care.

Factory-trained representatives are established in principal cities throughout the continental United States. Call Customer Care at 800-255-4255, or visit our web site at www.prosoco.com, for the name of the Enviro Klean® representative in your area.

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REMOVING BIOLOGICAL SOILING: Advantages & Disadvantages

	PRODUCT	EFFICACY	POTENTIAL HARM TO MASONRY	HEALTH/SAFETY ISSUES
BioWash®	BioWash®	Highly effective and aids in the loosening and detachment of biological deposits.	Rinses cleanly, with no reported adverse effects.	Minimal precautions required for handling or storage. NFPA ratings are 0=fire, 0=reactivity, 0=special handling, 1=health (moderate eye irritant). Biodegradable with dilution
Traditional remedies	Sodium hypochlorite (household bleach, 5%)	Can be highly effective, but requires the addition of a surfactant.	Forms soluble salts, which reappear as whitish efflorescence. Can also cause some yellowing.	Mild respiratory irritant. Causes severe but temporary eye injury. Contact with ammonia produces hazardous gases.
	Calcium hypochlorite (swimming pool bleach)	Requires prolonged and/or repeated application.	Similar to household bleach, but residual salts are acidic.	Severe skin and eye irritant. In solid form is strong oxidizer with considerable explosion hazard. Decomposes upon contact with acids to give chlorine gas. Harmful to aquatic life.
	Hydrogen peroxide (aqueous, 15%)	Highly effective, but requires the addition of a surfactant.	Often causes distinct reddish discoloration (oxidation of ferrous compounds). Etches polished limestone and marble.	Severe skin and eye irritant. Higher concentrations (as purchased) may be explosive; do not store near combustible materials.
	Ammonium hydroxide (household ammonia)	Relatively limited as a biocide. Typically takes many applications.	Repeated use may lead to discoloration (precipitation of hydroxides).	Well-known respiratory, skin and eye irritant.

BioWash®



Hatchery Building – Walk-in Freezer



Hatchery Building – Walk-In Freezer Rotting Material



Hatchery Building – Disconnected Downspouts



Hatchery Building – Tool Room Roof Vent Leakage



Superintendent's House – Chimney Bio-Growth



Assistant's House –Porch



Assistant's House – Porch Edge Condition



Assistant's House – Porch Edge Condition (detail)



Assistant's House – Damaged Chimney



Vegetation Management – Hatchery Stone Stairs



Vegetation Management – Porches