

(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section _____ Page ____

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SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 14000416

Date Listed: 7/18/2014

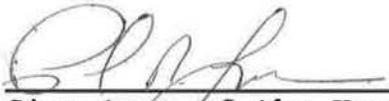
Lake Vernon Snow Survey Shelter
Property Name

Tuolumne
County

CA
State

Yosemite National Park MPS
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.



Signature of the Keeper

7/18/2014

Date of Action

Amended Items in Nomination:

Classification:

The name of the related multiple property listing should read: *Yosemite National Park MPS*.
The Number of Previously Listed Resources should read: 0

Significance:

The Significant Dates 1992, 2008 and 2011 are deleted.
[All selected significant dates must be contained within the selected period of significance.]

Bibliographical References:

The property was not previously determined eligible by the Keeper of the National Register.
[The determination was made by the NPS for compliance purposes only.]

These clarifications were confirmed with the NPS FPO office.

DISTRIBUTION:

National Register property file
Nominating Authority (without nomination attachment)

416

United States Department of the Interior
National Park Service



National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).

1. Name of Property

historic name Lake Vernon Snow Survey Shelter
other names/site number Lake Vernon Cabin, Lake Vernon Patrol Cabin, Yosemite National Park Building No. MA2450

2. Location

street & number Located at the terminus of the Lake Vernon Trail, Yosemite National Park not for publication
city or town Yosemite National Park (YOSE) vicinity
state California code CA county Tuolumne code 109 zip code 95389

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,
I hereby certify that this 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 60.
In my opinion, the property meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ___ statewide local

Admiral H. Mottin, Deputy ^{FPO} Date June 4 2014
Signature of certifying official Title
National Park Service
State or Federal agency/bureau or Tribal Government

In my opinion, the property meets ___ does not meet the National Register criteria.

Carol Roland-Nawi Carol Roland-Nawi, Ph.D. Date
Signature of commenting official

State Historic Preservation Officer Title California Office of Historic Preservation
State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

- entered in the National Register
- ___ determined eligible for the National Register
- ___ determined not eligible for the National Register
- ___ removed from the National Register
- ___ other (explain:)

[Signature] Signature of the Keeper Date of Action 7/10/2014

5. Classification

Ownership of Property
 (Check as many boxes as apply.)

- private
- public - Local
- public - State
- public - Federal

Category of Property
 (Check only one box.)

- building(s)
- district
- site
- structure
- object

Number of Resources within Property
 (Do not include previously listed resources in the count.)

Contributing	Noncontributing	
1		buildings
		district
		site
	1	structure
	2	object
1	3	Total

Name of related multiple property listing
 (Enter "N/A" if property is not part of a multiple property listing)

N/A

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
 (Enter categories from instructions.)

DOMESTIC – Institutional housing

OTHER – Station for field operations & research

Current Functions
 (Enter categories from instructions.)

DOMESTIC – Institutional housing

OTHER – Station for field operations & research

7. Description

Architectural Classification
 (Enter categories from instructions.)

OTHER: National Park Service Rustic style

Materials
 (Enter categories from instructions.)

foundation: **STONE – granite rubble**

walls: **WOOD – logs**

roof: **METAL – corrugated metal panels**

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Lake Vernon Snow Survey Shelter is located within a small U-shaped valley roughly four aerial miles north of the Hetch Hetchy Reservoir in the backcountry wilderness of Yosemite National Park in California. The valley is bordered by granitic ridges to the north, east and south and Lake Vernon to the west. The property boundary for the snow survey shelter lies approximately a half mile northeast of the lake and occupies an area of roughly ten acres. This area encompasses the building and associated infrastructure – such as a small corral, stock pasture, and a hitch rail. The snow survey shelter is perched on a granite shelf near the northeast corner of the property while all secondary structures lie to the south of the building within a moderately dense forest of Jeffery pine and an assortment of firs. The Lake Vernon Snow Survey Shelter is a subdued, single-story, log frame building constructed in the National Park Service Rustic style. The rustic style and use of local materials serves to visually harmonize the building with the surrounding environment. The building is rectangular in plan, approximately sixteen feet by eighteen feet, with a five and a half foot deep entry portico. Exterior walls are constructed of coped horizontal logs joined by saddle notches and supported by a modest foundation of granite rubble. The building is capped by a moderately pitched roof clad in corrugated metal. The interior space of the building is a single multi-purpose room consisting of a crude kitchen area and sleeping bunks. Interior walls are left unfinished exposing the log walls and roofing structure. The Lake Vernon Snow Survey Shelter is in good condition and retains all seven aspects of historic integrity as defined by the National Register of Historic Places.

Narrative Description

The collection of hydrologic data along the Falls Creek drainage has remained an essential component in the scientific determination of annual water supplies for the Hetch Hetchy Reservoir since the 1940s. As discussed further in Section 8, the Lake Vernon and Wilmer Lake Snow Survey Shelters were constructed in 1945 by the City and County of San Francisco, which own certain water rights within the boundaries of Yosemite National Park, and the California Department of Water Resources. The original Wilmer Lake Snow Survey Shelter has since been destroyed by an avalanche; however, the Lake Vernon Snow Survey Shelter has been used in association with winter snow surveys since its initial construction. In more recent history, the building has also functioned as an outlying field post associated with natural resource management activities and continues to be maintained as a historic resource by the National Park Service.

Setting

The Lake Vernon Snow Survey Shelter is located within the far northern region of Yosemite National Park, roughly four aerial miles north of the Hetch Hetchy Reservoir. A property boundary of approximately ten acres for the building has been determined by Yosemite's Branch of History, Architecture, and Landscape for purposes of this nomination. This area encompasses all contributing and non-contributing resources associated with the historic and current operation of the property: the snow survey shelter, a small corral, drift fencing, and a hitch rail.

The property is centrally located within a U-shaped valley formed by Moraine Ridge to the north, Andrews Peak to the northeast, and Mount Gibson to the east. The valley walls, predominately granitic, rise steeply above the fertile valley floor which is dominated by a moderately dense coniferous forest, dispersed boggy swamps, and Lake Vernon. Two main tributaries— Falls Creek and an unnamed creek stemming from Branigan Lake — converge within the valley and flow southwest towards Lake Vernon located at the valley's terminus. Falls Creek continues southwest from the lake and cascades in a steep descent to the Hetch Hetchy Reservoir.

The Lake Vernon Snow Survey Shelter is located at the base of Moraine Ridge, approximately a half mile northeast of Lake Vernon. The building is perched on a granite shelf roughly fifteen vertical feet above the valley floor. At an elevation of approximately 6,600 feet, the vegetation immediately surrounding the building is a sparse forest of Jeffery pine and an assortment of firs dispersed amongst granite outcroppings. Several non-contributing resources were erected within the property following the period of significance to service the needs of National Park Service personnel traveling with pack stock. A small corral and a log pole hitch rail are located along the valley floor approximately eighty feet to the east of the snow survey shelter. The corral is approximately twenty feet by forty feet and is crudely constructed of post and rail log fencing. Roughly 600 feet to the east of the corral lies Falls Creek, which serves as the building's primary water source during the warm summer months. The portion of the valley floor between the base of Moraine Ridge and Falls Creek is utilized as a grazing pasture for traveling stock animals. The surrounding steep terrain and Falls Creek serve as natural barriers for the pasture along its northwestern, northeastern, and southeastern perimeters. The southwestern perimeter of the pasture is delineated by a drift fence constructed of log posts and wire.

Access to the Lake Vernon Snow Survey Shelter is limited to foot or stock traffic from the Hetch Hetchy Trailhead, located ten miles by trail to the southwest, or from the Lake Eleanor Trailhead, located approximately twelve and a half miles by trail to the west. Historically, the shelter at Lake Vernon was the initial lay over stop along a sixty mile snow survey loop. The loop initiated at the Hetch Hetchy Trailhead, followed the Falls Creek drainage to the northeast, the circled back towards the point of origin roughly paralleling the park's northwestern boundary. (*See Continuation Sheet II for a reference map.*) Today, snow surveyors begin at the Hetch Hetchy trailhead and conduct "out-and-back" snow survey trips to five snow courses along the Falls Creek drainage — Beehive Meadow, Lake Vernon, Paradise Meadow, Wilmer Lake, and Grace Meadow. The total mileage, round-trip, for the present snow survey in the Falls Creek drainage is approximately twenty four miles.

Lake Vernon Snow Survey Shelter

The Lake Vernon Snow Survey Shelter was constructed in 1945 to building designs by the City and County of San Francisco. The building was designed in the National Park Service Rustic style, with special attention to architectural detailing reminiscent of past homestead cabins common to the Yosemite region — such as the use of local timber, saddle notched log walls, a gable roof, and its modest size. The snow survey shelter is a single-story log frame building, rectangular in plan with a sizable entry portico incorporated into the south elevation. Exterior walls are constructed of peeled logs supported by a granite rubble foundation. The building is capped by a moderately pitched gable roof clad in corrugated metal panels. The interior space of the building consists of a single multi-purpose room.

Exterior

The footprint of the Lake Vernon Snow Survey Shelter is rectangular in plan and measures approximately sixteen feet by twenty three and a half feet. This area encompasses the main portion of the building, roughly 225

square feet, and an entry portico formed by the projecting roofline of the southern gable. The gable roof is oriented on a longitudinal axis roughly north-south and has a moderate pitch of twelve over twelve. The portico is approximately five and a half feet deep and provides a shelter structure above the entrance. Two vertical log posts provide structural reinforcement to the southwest and southeast corners of the gable roof. The over-hanging eaves on the west, north and east facades are thirteen and a half inches wide and feature exposed log rafter tails and purlins. Each of the gable ends are finished with a log vergeboard. The roof is clad in corrugated metal panels and finished with a metal ridge cap. In August 2011, the Yosemite Historic Preservation crew installed two inch by six inch tongue and groove sheathing boards beneath the corrugated metal. Prior to this time the metal was fastened directly to the log purlins. The sheathing boards were installed to provide additional structural integrity for heavy snow loads and create a space that was more defensible against rodent intrusion. During the installation of the sheathing boards, the existing roofing material was removed and then reinstalled atop the new sheathing. The corrugated metal roofing material was incorporated into the original design plans for the building. The metal panels were last replaced with in-kind materials in 1992 by the Yosemite Historic Preservation crew.

The snow survey shelter's exterior walls are constructed of coped horizontal logs joined by saddle notches and chinked with jute fiber. The logs were harvested locally at the time of construction and left unfinished to expose the natural tones of the wood. The exterior walls were last treated within a clear preservative by the Yosemite Historic Preservation crew in August 2011. Over the last few decades, copper wool has been added inconspicuously between the logs and within potential points of entry to deter rodents and other pests. Sawn log crowns on the west, north, and east façade extend approximately fourteen inches beyond the exterior walls of the building. Sawn log crowns on the south façade extend in varying lengths ranging from approximately twelve to thirty inches. During the period of significance, each façade contained log crowns of varying lengths. The logs on the west, north, and east facades were docked to an even fourteen inches during a preservation maintenance project in 1992 by the Yosemite Historic Preservation crew. At this length, the log crowns were sheltered by the overhanging roof structure and would therefore be protected from excessive snow accumulation. This treatment, at the time, was thought to be the best alternative to ensure the structural integrity of the log walls.

The building's primary entryway is centrally located along the south façade. The fore mentioned portico was incorporated into the overall design of the building to shelter the entrance from heavy snow drifts. The entry is a plank and frame style Dutch door constructed of nine inch wide vertical dimensional lumber. An exterior door frame comprised of half-logs surrounds the door and is nailed directly to the exterior walls. The east and west facades are punctuated by a single, centrally located awning window that hinges inward. Each opening has an externally mounted steel plate shutter. The window located along the west elevation is a six-lite awning window, while the window of the east elevation is a four-lite window. The building originally had matching six-lite windows; however, the four-lite window replaced one of these sometime between 1986 and 2008. The existing steel shutters are also a later addition to the building. Each shutter is complete with a prefabricated steel frame and contains horizontal iron rebar guards. Initially, vertical board and frame style shutters were in place. The steel shutters were added in 1955 for heightened security measures to deter vandalism and intrusive black bears. An additional significant feature on the building is an alternate attic access door within the southern gable end. This door is located directly above the main entrance and accessed by a dimensional lumber ladder. The door is utilized during heavy snow years when the lower entrance can become completely covered by snow drifts. This feature was incorporated into original design plan for the building and is commonly seen on other snow survey shelters located throughout the Sierra Nevada. The door is a vertical plank and frame style door measuring two and a half feet wide

by three feet in height. Like the lower entry door, the attic door is constructed of nine inch wide dimensional lumber.

The building is supported by log stringers that span the entire width of the building and rest directly atop a dry-laid foundation wall of granite rubble. The foundation wall of the east and west elevation extends approximately five and a half feet to the south and serves as a base for the vertical log posts of the entry portico. The wall extensions are constructed of linear granite fieldstones laid in regular courses within a recessed mortar bed of Portland cement. Although the extensions differ slightly in construction from the foundation wall beneath the main portion of the building, they hold viable historic significance. The extensions are documented in historic photographs and have not been altered since their initial construction. The height of the of the building's foundation wall adjusts to the natural contour of the surrounding land as it gently slopes south. The foundation wall increases from just a few inches along the north elevation to approximately eighteen inches beneath the vertical log posts. Great care was taken to harvest all stones for the foundation wall from the surrounding environment at the time of construction.

The Lake Vernon Snow Survey Shelter is in overall good condition and is being maintained as a significant historic resource by the National Park Service. Minimal fabric deterioration has resulted from exposure to extreme weather conditions and rodent intrusion. The present state of the building can be largely attributed to the continued use of the building as an outlying field post and extensive preservation maintenance completed in 1992, 2008, and 2011 by the Yosemite Historic Preservation crew. Further description of the work completed during these projects can be found within the "Alterations & Preservation Maintenance" section below. Thoughtful construction of the Lake Vernon Snow Survey Shelter exemplifies the National Park Service Rustic style and stays true to the style's fundamental principles. Architectural elements found on the building that are characteristic of the style include the predominant use of local materials, overhanging eaves, moderately pitched roof, and exposed log framing. The use of local materials and natural elements are key components to the rustic style and serve to harmonize the building with the surrounding environment.

Interior

The interior space of the Lake Vernon Snow Survey Shelter is a single multi-purpose room that constitutes approximately 225 square feet. Although minor alterations have been made within the space, the overall feeling and layout have remained constant since 1945. Flooring throughout the space is seven inch wide, unfinished plank boards. The interior walls and ceiling have also been left unfinished, exposing the structural log framework. A slender built-in cabinet, constructed of beaded tongue and groove, is installed near the northeast corner of the building. This cabinet is documented in historic photographs dating to the early 1950s and is believed to have been installed during the construction of the building. Two-tier sleeping bunks constructed of vertical log posts and dimensional lumber are fastened to the interior wall at the southwest and southeast corners of the room. These bunks were installed by the Yosemite Historic Preservation crew in 2008. Prior to this time the building contained free-standing metal bunks that were specified in the design plans for the building. In August of 2011 the preservation crew also placed free-standing modular cabinets within the space. Other furniture present consists of modest movable pieces such as a wooden table and chairs. A wood burning stove is centrally located along the north wall of the building. The building has always contained a wood burning stove at this location; however, varying designs have replaced previously used stoves throughout the history of the building. The existing stove was

installed in 2008 during a preservation maintenance project. The backcountry shelter does not contain running water or electricity, adding to the rusticated charm and feeling of remoteness for the building.

Modifications

The Lake Vernon Snow Survey Shelter maintains a high degree of historic integrity and has had only minor alterations since its period of significance, 1945. The overall usage of space, layout, architectural design, and bulk of historic fabric has remained intact over time. In 1992, 2008, and 2011 the snow survey shelter underwent preservation maintenance and stabilization from the Yosemite Historic Preservation crew. All work adhered to the Secretary of the Interior's Standards for the Treatment of Historic Properties and therefore did not diminish from the building's historic integrity. All necessary fabric replacement was done using in-kind materials.

Exterior Changes

- The six-lite window located on the east elevation was replaced by a four-lite window sometime between 1986 and 2008.
- A large radio antenna was attached to the north gable end of the building by 1952 and then later removed sometime between 1964 and 1986.
- Iron rebar and steel shutters were installed within each window opening in 1955. These shutters replaced vertical wooden plank and frame shutters that were incorporated into the original design of the building and installed at the time of construction.
- Preservation maintenance completed in 1992:
 - Replacement of the southernmost roofing truss and vertical log posts using in-kind materials. The horizontal truss beam was hand-notched to replicate the existing rough hewn beam.
 - Replacement of numerous log crowns using in-kind materials and spliced onto the existing log walls.
 - Replacement of the east elevation log sill using in-kind material.
 - Log crowns on the west, north, and east elevations were docked to align with the overhanging roof.
 - Replacement of metal roofing material with "20 gauge galvanized materials" to match the existing material in-kind.
- Preservation maintenance completed in 2008:
 - Extensive rodent exclusion and installation of copper wool within gaps of the exterior log walls.
- Preservation maintenance completed in 2011:
 - Installation of two inch by six inch tongue and groove sheathing boards between existing log purlins and corrugated metal roofing material.
 - Replacement of one log crown using in-kind materials and spliced onto existing log wall.
 - Application of clear preservative to exterior log walls

Interior Changes

- Preservation maintenance completed in 2008:
 - Installation of log pole and dimensional lumber two-tier bunks. Replaced original metal bunks that had deteriorated.
 - Utilized the metal bunk material as an L-shaped baseboard around the perimeter of the interior space to deter rodent intrusion.
 - Installation of new wood burning stove to match existing in-kind.

- Preservation maintenance completed in 2011:
 - Installation of free-standing wooden cabinetry.

Non-contributing Resources

The small stock corral, hitch rail and drift fence were put in place following the period of significance to service the needs of National Park Service personnel traveling with pack stock. The property was originally intended to serve solely as a winter snow survey shelter. Given the property's high elevation, the shelter is not accessible to stock animals during the harsh winter months common to the Sierra Nevada; therefore, the stock facilities would not have been needed. Although it is unclear when the existing corral, hitch rail, and drift fence were installed, it is believed similar structures were built in the 1950s when the shelter cabin began being utilized during the summer months. At this time, the building became an outlying field post associated with natural resource management activities of the National Park Service in addition to its winter usage. The existing corral, hitch rail, and drift fence are considered non-contributing resources for purposes of this nomination due to: the lack of historic integrity, no connection with the original intent of the property, and their date of construction outside of the period of significance.

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

A Property is associated with events that have made a

significant contribution to the broad patterns of our history.

B Property is associated with the lives of persons significant in our past.

Lake Vernon Snow Survey Shelter

Name of Property

Tuolumne, CA

County and State

- C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D Property has yielded, or is likely to yield, information important in prehistory or history.

Areas of Significance

(Enter categories from instructions.)

CONSERVATION

SCIENCE

ARCHITECTURE

Period of Significance

1945

Significant Dates

1945 – Lake Vernon Snow Survey Shelter

designed and constructed

1992 – Preservation maintenance conducted

on the building

2008 – Preservation maintenance conducted

on the building

2011 – Rehabilitation of the roofing structure

Significant Person

(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation

N/A

Architect/Builder

Constructed by the City and County of San

Francisco in coordination with the California

State Department of Water Resources and the

National Park Service.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

Property is:

- A Owned by a religious institution or used for religious purposes.
- B removed from its original location.
- C a birthplace or grave.
- D a cemetery.
- E a reconstructed building, object, or structure.
- F a commemorative property.
- G less than 50 years old or achieving significance within the past 50 years.

Period of Significance (justification)

The period of significance for the Lake Vernon Snow Survey Shelter is 1945. This date corresponds to the construction of the building for functions associated with acquisition of hydrologic data within the Tuolumne River drainage. Designs for the building were produced by the City and County of San Francisco (CCSF) in April 1945. Construction of the building commenced during the summer of 1945 and completed by fall of the same year. All materials and labor were supplied by the CCSF and the California Division of Water Resources. Following the initial

construction, ownership of the building was transferred to the National Park Service. The building has been used continuously for over sixty years by the California Cooperative Snow Survey Program. It retains its original footprint and has not been significantly altered since the original construction date. The period of significance aligns with both the architectural development of the Lake Vernon Snow Survey Shelter, for Criterion C, and the initial date the building was utilized as an outlying field station for the collection of hydrologic data, for Criterion A.

Criteria Considerations (explanation, if necessary) None.

Statement of Significance Summary Paragraph

The Lake Vernon Snow Survey Shelter is locally and regionally significant in the area of natural resource conservation under *Criterion A*. The building is associated with the development and deployment of the California Cooperative Snow Surveys Program, as well as, the evolution of natural resource management within Yosemite National Park. The building was constructed in 1945 to serve specifically as winter accommodations for snow surveyors collecting hydrologic data along the Tuolumne River drainage. In addition to its primary function, the building was also utilized as a summer field post for Yosemite National Park and has played a substantial role in the management of Yosemite's backcountry wilderness. It is used at times as a staging area for backcountry projects such as trail work, forestry, resource management, and fire management. The architectural design of the building is classified as National Park Service Rustic style, making it locally significant under *Criterion C*.

The Lake Vernon Snow Survey Shelter is currently maintained by the National Park Service as a historic resource and continues to function in its original capacity. It is in good condition and retains all seven aspects of historic integrity, as defined by the National Register of Historic Places. The building was first recognized as a significant historic resource for Yosemite National Park in the late 1980s and deemed eligible for listing in the National Register of Historic Places in 2004.

Narrative Statement of Significance

Historical Context

The United States Geological Survey (USGS) estimates that as much as seventy-five percent of water supplies in the Western United States are derived from snowmelt. Rightfully so, many refer to the winter snowpack as the "lifeblood" of the West. How wet or dry a year is predicted to be has many economic and natural resource management impacts. Local, state, and regional municipalities, along with irrigation districts and other forms of industry, rely heavily on the implementation of widespread, systematic snow surveys to determine the annual water runoff from high elevation snowpack. The scientific data collected during these surveys provides scientists and resource managers with the tools they need to predict the availability of water supplies for human consumption, hydroelectric power, agriculture, industry, transportation, and recreation, as well as to predict the potential for spring flooding.

The resource tools available for snow surveying have gradually evolved through the years. Improved technology and advanced scientific calculations have led to more precise measurements of water runoff from snow melt. However, one essential element of snow survey programs has remained constant: the human part of the equation, the snow surveyor. And those hearty individuals rely on remote backcountry shelters to carry out their field work during the extreme winter weather conditions common in mountain environments.

Snow Survey in the Sierra Nevada

The scientific study and prediction of water supplies available from snowmelt began in the Sierra Nevada during the early 20th century. Lands bordering the Sierra to the east, south, and west are dominated by Mediterranean and desert climates, with little to no precipitation falling between May and October. The precipitation of the preceding winter is retained by natural and artificial reservoirs and then distributed by a vast network of irrigation systems to provide a reliable, uninterrupted water supply for all the downstream requirements. Heavily populated cities along the west coast of California and the central San Joaquin Valley, which has been transformed into an agricultural epicenter for the United States, are heavily reliant on these systems for necessary water supplies.

During the early development of irrigation systems in the western United States, government officials and business enterprises relied on anecdotal snow pack reports from animal trappers and mountaineers who ventured into the Sierra during the winter months. In 1895, a professor at the University of Nevada, Dr. James E. Church, began contemplating the effects of orographic precipitation near Lake Tahoe in Northern California. Over the next several decades, Church's research interest in weather provided unprecedented scientific determinations of water availability and altered the course of natural resource management in the West. Church and his colleagues developed specialized equipment and methodologies to measure the water content of snow that are, for the most part, still utilized today by scientists and snow surveyors.

During the early phase of his research, Church immediately recognized the need to have overnight accommodations located near his high elevation experimental sites. The ability to stay overnight provided the opportunity to collect more thorough weather data and study the effects of the environment on snow conservation. With the assistance of federal funds, Church and his coworkers erected the first snow survey shelter in the Sierra, the Summit Observatory, on Mount Rose in August 1906. Soon thereafter, Church developed the Mount Rose Snow Sampler and Scale, a patented device that measured the depth and water content of snow pack to determine snow density. Although scientific calculations have evolved during the last century of snow surveying, Church's sampling device has remained essentially unchanged and is still in use by snow surveyors today. In 1910, Church laid out the first official snow courses in the Sierra, within the Lake Tahoe and Truckee River basins. (The techniques of establishing and using snow courses will be described below.) The research findings derived from the courses allowed Church to predict seasonal water runoff within multiple watersheds and led to the management of Lake Tahoe's water level to avert seasonal flooding.

Building upon Church's pioneering work, states throughout the American West began developing snow survey programs of their own. California's Department of Engineering, in consultation with Church's staff, began establishing snow courses and constructing snow survey shelters in selected watersheds within the central Sierra Nevada in 1917. Although the state recognized the need for scientific determinations of spring runoff, funding for snow survey programs was far from stable. In 1923, state-allocated funds for snow surveys were temporarily discontinued. The expansion of the snow survey courses, however, did continue through the 1920s, but this depended upon various smaller enterprises such as irrigation districts and local agencies.

Between 1929 and 1934, severe droughts swept across the entire United States. In California, the drought was the worst citizens had witnessed since statehood in 1850. State administrators were forced to make drastic

changes to the way they managed natural resources. In response to the drought, the California legislature established the California Cooperative Snow Survey Program, to be coordinated by the newly formed Division of Water Resources (now the Department of Water Resources). The purpose of the program was to gather, analyze, and distribute data relating to the overall annual snowpack. The program was initially organized – and continues to operate today – as a collaborative effort among state and federal agencies, local municipalities, irrigation districts, and public utility companies. In the first year of the California Cooperative Snow Survey Program, the Division of Water Resources (DWR) established 150 snow courses and associated infrastructure throughout the Sierra Nevada. Funding for the equipment and construction of snow survey shelters was provided by DWR as well as water and power companies. The brunt of the snow survey fieldwork fell to federal agencies, such as the National Forest Service and the National Park Service, who oversaw the vast majority of lands within the Sierra. The data collected during field surveys was given to scientists within DWR, who then paired the findings with precipitation records and other scientific data relating to environmental factors to predict seasonal spring water runoff. These official predictions were then distributed to all interested parties to help guide natural resource management decisions across the region.

Snow Survey in Yosemite National Park

Yosemite National Park's participation in the California Cooperative Snow Survey Program over the last eighty years has been vital to the compilation of information and statistics for estimating the annual snow melt runoff and water supply of the Sierra Nevada. Centrally located within the Sierra, the park encompasses the headwaters of the Tuolumne and Merced Rivers, two of the largest watersheds in the region. These watersheds provide water resources for the San Francisco Bay Area and the San Joaquin Valley of California.

Yosemite rangers began conducting a limited number of high country snow surveys in 1912. The early surveys were far less scientific than the research being undertaken by Church and his coworkers on Mount Rose, but nonetheless marked the beginning of established snow courses within the Yosemite region. A system of fixed "snow poles," approximately ten to twelve feet in height, were set up at strategic sites (or "courses") throughout the park. The slender poles were constructed of wooden dimensional lumber posts, painted white with black incremental measurements and notched on top to shed snow. Park rangers were assigned to record the depth of winter snowpack using the snow poles while conducting routine patrols. Winter trips were conducted from Yosemite Valley to Tenaya Lake, Tuolumne Meadows, and Tioga Pass via the Tioga Road. The information collected during the snow surveys was then passed on to United States Geological Survey (USGS) and used by Yosemite administrators to predict seasonal openings of park infrastructure at the higher elevations.

In the mid-1920s, the Merced Irrigation District (MID) completed construction of the impressive Exchequer Dam, along with associated canal systems and power facilities, outside of Yosemite National Park's western boundary. The reservoir was intended for water conservation, flood control, and power generation for multiple municipalities within the San Joaquin Valley. The principal water source for the MID project was the Merced River drainage, which originated almost entirely within the boundaries of Yosemite National Park. To accurately predict the amount of yearly water supply available from the headwaters of the Merced River, the MID proposed a snow survey course and overnight snow survey shelter within the park modeled after Church's.

The proposed snow survey shelter was the first joint venture between the National Park Service and an outside enterprise, other than a park concessioner, to construct infrastructure within the Yosemite backcountry. The

shelter and snow course were to be located near Merced Lake at the confluence of Fletcher and Lewis Creeks, approximately fourteen miles from Yosemite Valley. Yosemite's superintendent readily acquiesced to the planned infrastructure because there was a recognized need to have a proper ranger's headquarters in the vicinity. The building would function as a National Park Service ranger station for most of the year and be occupied seasonally by snow surveyors employed by the MID. The district furnished \$1000 for the construction of the shelter, while the design, construction labor, maintenance, and ownership of the building fell to the National Park Service. There was brief discussion of a secondary snow survey shelter at Moraine Meadows in the far southwest region of the park; however, plans for this particular building never materialized. The Department of the Interior issued a special use permit for the MID to construct snow survey courses throughout the Merced River drainage and to utilize the Merced Lake Ranger Station during the winter months. The MID established several snow courses in the central region of the park and made use of an existing snow course in Dana Meadow, laid out in 1926.

During the 1930s, snow surveying within Yosemite National Park gained momentum with the creation of the California Cooperative Snow Survey Program. As mentioned previously, 1929 marked the beginning of a five-year drought for the western United States. Large state government appropriations and coordinated efforts were put forth for the determination of available water resources statewide. A multitude of snow courses were laid out and mapped throughout the Sierra Nevada under the direction of the Department of Water Resources (DWR). During this time, four separate snow survey routes were established along the headwaters of the Tuolumne and the Merced Rivers within Yosemite. The main route was a loop extending from Yosemite Valley to the eastern boundary of the park. The other routes consisted of "out-and-back" paths of travel to Moraine Meadows from Glacier Point Road, to Gin Flat from Yosemite Valley, and to Beehive Meadows from Hetch Hetchy Ranger Station. A Yosemite Nature Notes article issued in January 1953, described the manner in which snow courses were designed:

Each permanent [snow] survey site is established by selecting an area that is open, protected from drifting winds, and representative of a large section of surrounding country. This site is known as a snow course, and here the measurements are taken at spaced intervals, usually 50 feet apart, along straight lines crossing the snow. . . . The measurements are made with a hollow steel tube which is thrust downward into the snowpack until it strikes the ground beneath. When the tube is withdrawn it contains a sample or core of snow from the full depth of the pack. The loaded tube is then weighed on specially designed scales that convert the weight of the snow into water content, expressed in inches. . . .

— Assistant Chief Ranger Duane Jacobs, *Yosemite Nature Notes*, Jan. 1953.

The snow survey trips were conducted by National Park Service rangers in a coordinated effort with other agencies across the state. "Traveling through wind and storm, the snow patrol often [covered] twenty to twenty-five miles a day to secure data on snow conditions for irrigationists, power users, and the State."¹

In 1931, the DWR appropriated \$600 for the construction of a snow survey shelter at Buck Camp and additional funding for the rehabilitation of an existing cabin at Deer Camp to be used for snow surveys. The architectural plans for the Buck Camp Patrol Cabin were prepared by the National Park Service's Landscape Architect and Field Architect for Yosemite National Park, John Wosky. The plans incorporated principles of National Park Service Rustic style, with special attention to architectural detailing reminiscent of 19th-century homestead cabins common to the Yosemite region. The cabin was a single-story, two-room building situated along

¹ Jacobs, Duane D., "Snow Surveying." *Yosemite Nature Notes* 32, No. 1 (January 1953).

the edge of a large seasonal meadow. The building was clad in vertical log posts and capped by a moderately pitched gable roof. Like the Merced Lake Ranger Station, the Buck Camp Patrol Cabin was to be utilized by the National Park Service during the summer field season and the California Cooperative Snow Survey Program during the winter months.

The National Park Service also authorized the use of existing ranger stations in conjunction with ongoing snow survey activities. These included Tenaya Lake, Tuolumne Meadows, Tioga Pass, Chinquapin, Crane Flat, Mather, and Yosemite Creek. Only a few buildings utilized during the 1930s snow surveys remain intact today – the Buck Camp Patrol Cabin and the Merced Lake, Chinquapin; and Tuolumne Ranger Stations.

Due to pressures on the state budget during the Great Depression, funding for the state-coordinated snow surveys program was unavailable during 1934 and 1935. The cooperating agencies, however, independently continued to conduct surveys using state-owned equipment that remained in the field. Because of this continuation, the disruption to the scientific record was not as great as anticipated. By 1936, the California legislature was again able to appropriate funds for the snow survey program, which has remained in operation with no subsequent interruption in survey activities since that time.

The expansion of the snow survey program within Yosemite National Park resumed in the 1940s, with the construction of snow survey shelters and associated snow courses in the Tuolumne River drainage. The first phase of the expansion was initiated by the City and County of San Francisco's Public Utilities Commission (SFPUC), a member of the California Cooperative Snow Survey Program, to provide hydrologic data for the Hetch Hetchy Water & Power Project. In order to collect hydrologic data within the drainage, the SFPUC and DWR funded the construction of two snow survey shelters, at Lake Vernon and Wilmer Lake (also known as Wilma Lake), as well as numerous snow courses along a primary tributary of the drainage.

The Lake Vernon and Wilmer Lake Snow Survey Shelters were designed by the SFPUC and approved by the commission's Chief Engineer J. H. Turner in April 1945. The architectural plans for both shelters incorporated the design philosophies of the National Park Service Rustic style, including the use of local materials to harmonize with the surrounding environment, while also incorporating features that allowed the buildings to be functional during extreme winter weather. The shelters were sensible, one-room buildings of log construction capped by a moderately pitched gable roof. In anticipation of the deep snow pack, the architectural designs incorporated a sizable portico within a gable end to shelter the entrance from heavy snow drifts and an alternate attic access door. The Lake Vernon Snow Survey Shelter was constructed on an existing parcel owned by SFPUC located within a day's trek of the O'Shaughnessy Dam developed area. The Wilmer Lake Snow Survey Shelter was constructed approximately six miles from Lake Vernon in a secluded location along the Jack Main Canyon Trail.

The second phase of 1940s snow survey expansion in Yosemite National Park was initiated by the Division of Water Resources. In June 1946, the DWR issued a memorandum proposing additional snow survey infrastructure within the northern region of Yosemite National Park. This proposal was part of a larger plan to greatly expand the California Cooperative Snow Survey Program statewide. The expansion came about in response to a statewide population increase and heightened demand on water resources. The proposal for Yosemite National Park included the installation of six snow courses, four shelter cabins, and eight precipitation gauges in addition to the existing snow survey infrastructure. The proposal also incorporated architectural specifications and design

schematics for future shelter cabins: "The proposed shelter cabins would be twelve feet by fourteen feet in plan and depending upon accessibility and materials available at the site, would be constructed of sawed lumber, logs, or stone."ⁱⁱ Each shelter cabin would contain a set of double bunks, wood burning stove, and modest furniture pieces. The proposal stated that funding for the added infrastructure would be provided by the state and any other interested organizations or agencies, specifying that the development would be provided at no cost to the National Park Service. The estimated cost for each of the shelter cabins was between \$800 and \$1000. Yosemite administrators would provide guidance regarding the location of the new infrastructure to ensure it did not conflict with other natural resource management objectives.

Despite the vast importance of previous snow survey activity for natural resource management within the state, the only infrastructure in Yosemite National Park that resulted from the 1946 DWR proposal was a single snow survey shelter at Snow Flat. This would be the last snow survey shelter erected within the park, with the only exception being the rebuilding of Wilmer Cabin following an avalanche in 1986. It is unclear whether the proposed development was hindered by a lack of state funding or if the proposal met opposition from the National Park Service. However, additional proposed shelter cabins and associated snow courses located just beyond the boundaries of the park, within the Stanislaus National Forest, were constructed during the 1940s in accordance with the proposed specifications. These shelters include the Sachse Spring, Huckleberry, and Bond Pass Snow Survey Shelters. The Sachse Spring Snow Survey Shelter falls within feet of Yosemite's northwest boundary and has been subject to debate as to which agency, the National Park Service or the National Forest Service, owns the building. Although official title records have not been located, other archived records indicate that ownership falls to the National Park Service. By 1973, the SFPUC and Stanislaus National Forest "relinquished any interest [they had] in the snow cabins in the park". At that time, Yosemite National Park stepped in to take responsibility for the maintenance and operation of the Sachse Spring Snow Survey Shelter. A DWR document dated August 1981 states that ownership of the Sachse Spring Snow Survey Shelter had been transferred to the National Park Service.

In 1947, the Sachse Spring, Snow Flat, Bond Pass, and Huckleberry Snow Survey Shelters were all constructed to the design specifications outlined by the DWR proposal. (For purposes of this historic context, only the development history for snow survey infrastructure under the jurisdiction of Yosemite National Park will be discussed: the Sachse Spring and Snow Flat Snow Survey Shelters.) The Sachse Spring Snow Survey Shelter was constructed along the crest of Kibbie Ridge, which straddles the northwest boundary of Yosemite National Park. Given its remote location and available local materials, the shelter was built of log construction with a moderately pitched gable roof. The Snow Flat Snow Survey Shelter was constructed near an existing snow course centrally located within the park. The building was in close proximity to the May Lake Road and the developed infrastructure of the May Lake High Sierra Camp. Due to the surrounding development, this shelter cabin was built of frame construction with a moderately pitched gable roof. Similar to the Lake Vernon Snow Survey Shelter, the Sachse Spring building both buildings incorporated a sizable portico to shelter the entry from heavy snow drifts and an alternate attic access door.

Although snow survey shelters located throughout Yosemite were constructed at different times and by varying parties, the terms of agreement regarding each building were very similar. All snow survey shelters, snow

ⁱⁱ California Division of Water Resources, Department of Public Works, California, Memorandum Covering Proposed Additional Snow Survey Work in the National Parks in California, June 1946.

courses, and other snow survey infrastructure were erected under special use permits issued by the Department of the Interior. Funding for the installation of snow survey infrastructure was provided by the Merced Irrigation District, the California Division of Water Resources, or the San Francisco Public Utilities Commission. Snow surveyors working within Yosemite National Park consisted of hired employees from the National Park Service, National Forest Service, and the agencies listed above. The shelters, once constructed, were owned and maintained by the National Park Service. Authorization was given to the snow surveyors by Yosemite National Park to utilize the buildings during the winter months. During the summer season, the buildings were utilized by park personnel as outlying field stations for purposes associated with natural resource management.

Through the years, the methodology of snow surveying has incorporated improved technology and advanced scientific calculations; however, the foundation of the snow surveys program, the snow surveyor and backcountry snow survey shelters, has always endured. Following World War II, the ease and expediency of aerial observation of snowpack led to the placement of aerial snow depth markers in remote areas of the Sierra. Within Yosemite National Park, aerial markers were placed along snow courses at Beehive Meadow, Lake Vernon, Wilmer Lake, Sachse Spring, and Dana Meadow. While this method did reduce the manpower needed for survey work, field crews on the ground were still essential to the program in order to record the water content data of the snowpack. During the late 1950s and 1960s, snow survey programs across the United States turned to the use of automated snow sensors and the use of mechanized equipment to transport ground crews. Snow surveyors in Yosemite and elsewhere began conducting backcountry trips in snow cats and helicopters, which greatly reduced the need for snow survey shelters for a temporary time period. However, this steady progression towards a more mechanized method of snow survey in Yosemite would be nullified in the 1980s with the passage of the California Wilderness Act.

In 1984, nearly ninety percent of federal lands within Yosemite were designated wilderness. Under the Wilderness Act, the use of mechanized equipment was strongly discouraged – to be utilized only in cases of emergency or when the use of such equipment could be justified as a “minimum tool.” This meant that operations were to be carried out with as little impact to the environment as possible or feasible by the National Park Service. By 1990, it was agreed that snow surveys conducted on ski, without the assistance of helicopters or other mechanized transport methods, were the best alternative to meet all National Park Service and natural resource management objectives. The use of helicopters for snow surveys was only considered during conditions of high avalanche risk. The Wilderness Act inadvertently revived interest in maintaining the use of backcountry snow survey shelters for field crews. Throughout the 1990s and into the early 2000s, nearly all backcountry snow survey shelters received some degree of restoration or preservation maintenance by the Yosemite Historic Preservation Crew to ensure their longevity. The wilderness designation of park lands placed heavy restrictions on new development and ensured that remaining structures in the Yosemite backcountry were of special interest to the park. This designation also protected the historic context of backcountry properties to be interpreted as significant natural resource management facilities.

Since the drought of the early 1930s most of the American West has relied on federal and state snow survey programs to help guide the management of water supplies. Today in California, snow surveys are conducted within all of the main watersheds on the eastern and western sides of the Sierra Nevada – twenty-four in total. Small groups of snow surveyors conduct four separate trips each winter to thirteen snow courses within the Yosemite backcountry. The courses presently surveyed in Yosemite have remained essentially unchanged since 1947, and in

some cases longer. Information obtained from the snow surveys is transmitted to scientists at the state Department of Water Resources, which assembles data and publishes snow melt runoff forecasts. The existence of backcountry snow survey shelters has proven to be an absolute necessity to the fieldwork conducted during the harsh winter conditions common to the Sierra Nevada. As Dr. James E. Church discovered at the turn of the 20th century, these shelters facilitated surveyors' research on high elevation snowpack and by doing so, provided more accurate data collection on water supplies. The shelters also have become an indispensable tool for National Park Service personnel, aiding in backcountry ranger patrols, search and rescue missions, fire management operations, and other natural resource management activities. The snow survey shelters that remain functioning in their original capacity are tangible reminders of the evolution of natural resource management not only for Yosemite National Park, but also for the American West.

Additional historic context information

Architectural Significance

The Lake Vernon Snow Survey Shelter was constructed in the National Park Service Rustic style. Rustic architectural style dominated National Park Service architectural design from the beginnings of the agency until the 1940s. Early park administrators sought to create a unifying style for all park structures that readily identified them as park structures yet harmonized with the surrounding environment. The style was consciously rooted in the past and expressed the National Park Service mission to preserve the nation's natural and cultural heritage.

*"Rustic style, when successfully handled, through the use of native materials in proper scale and through the avoidance of rigid, straight lines, and over-sophistication, gives the feeling of having been executed by pioneer craftsmen with limited hand tools. It thus achieves sympathy with natural surroundings, and with the past."*ⁱⁱⁱ

The National Park Service Rustic style is characterized by use of local building materials and robust battered masonry foundations and chimneys that tied the building to its site. Other aspects contributed to the characteristic horizontal emphasis, such as the shallow pitched roof, exposed structural members, and wide over-hanging eaves. The elements often received varying treatment depending upon the actual setting of the building, but the major thrust of the design ethic was harmonization with the surrounding landscape.

The architectural plans for the Lake Vernon Snow Survey Shelter were prepared by the City and County of San Francisco in April 1945. The building was constructed and ready for occupation by autumn of the same year. The building was intended to be utilized as a shelter in the Yosemite backcountry and was constructed to withstand the harsh winter conditions of the Sierra Nevada. The architectural design of the building embodies the philosophies and distinct characteristics associated with the National Park Service Rustic style, while also intentionally being reminiscent of past homesteading cabins of the Yosemite region. The use of natural finishes and local materials serve to harmonize the building with the surrounding landscape.

Exterior character defining features include:

- Use of local materials (such as a logs and granite rubble)
- Coped log walls joined with saddle notches
- Sawn log ends

ⁱⁱⁱ Good, Park Structures and Facilities, 3-4

- Moderately pitched, gable roof
- Corrugated metal roofing
- Wide, over-hanging eaves with exposed log rafter tails
- Open-air entry portico with elevated access door
- Rough hewn truss beam within the south gable end

Interior character defining features:

- Exposed log walls and roofing structure
- Vertical plank door
- Seven inch wide plank flooring
- Wood burning stove
- Modest furniture pieces and a built-in wall cabinet

Historic Integrity

The Lake Vernon Snow Survey Shelter retains all seven aspects of historic integrity as defined by the National Register of Historic Places' standards: *location, setting, design, materials, workmanship, association, and feeling*.

The Lake Vernon Snow Survey Shelter remains in its original *location* near the inlet of Lake Vernon in Yosemite National Park. The lake is situated within one of the largest water drainages, Falls Creek, which feeds the Hetch Hetchy reservoir to the south. The acquisition of hydrologic data within the drainage has remained an essential component in the scientific determination of snow melt run-off. The building provided shelter for the snow surveyors during the harsh winter months common to the high elevation Sierra Nevada. Today, the building continues to serve in its original capacity and also as an outlying field post for other natural resource management activities. Because of the remote backcountry location, the *setting* has remained essentially untouched. Secondary resources – the corral, hitch rail, and drift fence – were added to the property following the period of significance, but are small in scale and do not detract from the overall interpretation or historic integrity of the property. In 1984, lands immediately surrounding the property boundary were designated wilderness. This protection ensures that no new development will occur outside of the property boundary or within the viewshed of the snow survey shelter.

The *design* for the Lake Vernon Snow Survey Shelter is in keeping with the philosophies and distinct characteristics associated with the National Park Service Rustic style, while also intentionally being reminiscent of past homestead cabins common to the Yosemite region. Building plans were produced by the San Francisco Public Utilities Commission and approved by the Commission's resident Chief Engineer, J.W. Turner. The building incorporates architectural details, such as substantial log pole framing, intended to withstand the harsh winter conditions of the Sierra Nevada. The use of natural finishes and local materials serve to harmonize the building with the surrounding landscape.

The building has had preservation maintenance repairs over the years; however, the majority of its original *material* remains intact, including: the original exterior architectural details, exterior log walls, roofing material, and interior finishes. The building has been preserved intact; in part due to its remote setting and also to its continued use by the National Park Service as backcountry lodging for wilderness travelers. The building is currently maintained by the National Park Service as a historic resource. The snow survey shelter was constructed by skilled log builders and demonstrates a high level of *workmanship*. Construction of a log frame building may be

impressive in any context; however, in this location the remote setting undoubtedly presented unique challenges for the builders. Great care was taken to harvest local materials from the surrounding environment. The snow survey shelter was intended to be a permanent building and was accordingly.

The architectural detailing of the Lake Vernon Survey Shelter, such as a moderately pitched gable roof and large entry portico within the gable end, *associates* the building with other National Park Service snow survey shelters throughout the park that maintain a similar design. The utilitarian style and setting of the building provides a *feeling* of a backcountry outpost for the management of park resources. The surrounding land designation as wilderness places heavy restrictions on new development outside of the property boundary and ensures that remaining structures within the Yosemite backcountry are of special interest to the park. This designation protects the context of the property to be interpreted as a significant natural resource management facility.

Previously Determined Eligible for the National Register of Historic Places

The Lake Vernon Snow Survey Shelter was first recognized for its historical significance during a historic resource case study conducted by Yosemite National Park in 1979. National Park Service Historian, Linda Green, recommended the property, among other significant cultural and historic resources throughout the park, to be nominated to the National Register of Historic Places in her 1987 multi-volume historic resource study, Yosemite: the Park and its Resources. A Draft Multiple Property Document (MPD) was composed in 2004 by the University of Nevada, Las Vegas History Department. The Draft MPD used historic contexts from Greene's resource study and recognized twenty buildings, which included "Lake Vernon Cabin Building #2450", for listing in the National Register of Historic Places. The Draft MPD has yet to be finalized by Yosemite National Park staff; however, it has received concurrence from the California State Historic Preservation Office. (*See Continuation Sheet III*) The Lake Vernon Snow Survey Shelter has been indentified for its historic significance and is said to be eligible for the National Register of Historic Places under Criteria A and C. The current nomination concurs that the property is significant under these criterions.

9. Major Bibliographical References

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Lake Vernon Snow Survey Shelter

Name of Property

Tuolumne, CA

County and State

Russell, Carl P., "Why Are Snow Surveys Made?" *Yosemite Nature Notes* 6, No. 3 (March 1927).

Thomas, Don, "Sierra Snowpack Slipping Below Normal, Snow Survey Shows." *The Fresno Bee*. February, 27, 2002.
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Yosemite National Park, Division of Facilities Management, Building Files, "Buck Camp Cabin."

Archive repositories consulted: Yosemite National Park Archives & Research Library; Hetch Hetchy Water & Power - Moccasin Archives; Merced Irrigation District; National Park Service's National Archives in San Bruno, California; and the National Park Service's Electronic Technical Information Center (ETIC).

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67 has been requested)
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____
- recorded by Historic American Landscape Survey # _____

Primary location of additional data:

- State Historic Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other
- Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property 10 acres
(Do not include previously listed resource acreage.)

UTM References

(Place additional UTM references on a continuation sheet.)

1	<u>11S</u>	<u>261554</u>	<u>4211793</u>	3	<u>11S</u>	<u>261747</u>	<u>4211666</u>
	Zone	Easting	Northing		Zone	Easting	Northing
2	<u>11S</u>	<u>261534</u>	<u>4211330</u>	4	<u>11S</u>	<u>261370</u>	<u>4211425</u>
	Zone	Easting	Northing		Zone	Easting	Northing

Verbal Boundary Description (Describe the boundaries of the property.)

The property encompasses ten acres near the inlet of Lake Vernon in the northwest region of Yosemite National Park. The boundary designation has been determined by Yosemite National Park's Branch of History, Architecture, and Landscapes for purposes of this nomination. All land adjacent to the Lake Vernon Snow Survey Shelter property has been designated wilderness.

Northeastern boundary – The northeastern boundary begins at a modern composting toilet that services the Lake Vernon Snow Survey Shelter, approximately 150 feet north of the building at coordinate 11S 261554 Easting 4211793 Northing. The boundary runs southeast for approximately 750 feet to Falls Creek at coordinate 11S 261534 Easting 4211330 Northing.

Southeastern boundary – The southeastern boundary begins at the said Falls Creek coordinate and follows the natural contour of the creek for approximately 1,440 feet southwest to stock fencing constructed perpendicular to the creek. (Coordinate 11S 261747 Easting 4211666 Northing.)

Southwestern boundary - The southwestern boundary begins at the said junction of the stock fencing and Falls Creek and follow the fencing northwest for approximately 620 feet to the junction of the fencing and trail leading to the Lake Vernon Snow Survey Shelter. (Coordinate 11S 261370 Easting 4211425 Northing.)

Northwestern boundary - The northwestern boundary begins at the said junction of the fencing and trail and runs northeast approximately 1,350 feet to the point of origin.

Boundary Justification (Explain why the boundaries were selected.)

The location for the Lake Vernon Snow Survey Shelter was strategically selected along the Falls Creek drainage snow survey route for the acquisition of hydrologic data within the Tuolumne River watershed. The boundary designation contains all that is significant and contributing to the historic character of the property, as well as, more modern infrastructure (i.e. the existing stock corral and pasture) associated with the current operation of the building.

11. Form Prepared By

name/title Jennifer Self, Architectural Historian

organization Yosemite National Park date August 30, 2011

Division of Resources Management and Science

Branch of History, Architecture, and Landscapes

street & number 5083 Foresta Road telephone 209.379.1222

city or town El Portal state CA zip code 95318

e-mail Jennifer_Self@partner.nps.gov

Additional Documentation

Submit the following items with the completed form:

I. Location Map:

Tiltill Mountain Quadrangle, California – Mariposa County, 7.5 Minute Series (topographic), United States Department of the Interior, Geological Survey, 1992.

II. Reference Map:

Reference map showing the locations of historic and present locations of snow survey shelters and snow courses in Yosemite National Park, as well as routes taken by snow surveyors.

III. Property Boundary Map:

Reference map showing the Lake Vernon Snow Survey Shelter's property boundary and associated features.

IV. Concurrence Letter:

Concurrence letter from the California State Historic Preservation Office dated August 23, 2004. States properties identified within a draft Multiple Property Document for Yosemite National Park, including the "Lake Vernon Cabin Building #2450", are eligible for listing in the National Register of Historic Places.

V. Historic Photographs

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Lake Vernon Snow Survey Shelter

City or Vicinity: Yosemite National Park

County: Tuolumne State: CA

Photographer: Jennifer Self

Date Photographed: August 2008

Location of original digital files:

Yosemite National Park

Division of Resources Management and Science

Branch of History, Architecture and Landscapes

El Portal, CA

Photo #1 (CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0001)

South-west corner, west (left) and south (right) elevations, camera facing north-east.

Photo #2 (CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0002)

Rear of shelter, east façade. Camera facing west.

Photo #3 (CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0003)

South (left) and east (right) elevations. Camera facing north-west.

Photo #4 (CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0004)

Interior view, camera facing southeast

Photo #5 (CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0005)

Interior roof structure. Camera facing east.

Property Owner:

(Complete this item at the request of the SHPO or FPO.)

name Department of the Interior, National Park Service, Yosemite National Park

street & number 5083 Foresta Road telephone _____

city or town El Portal state CA zip code 95318

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management, U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Lake Vernon Snow Shelter
Name of Property
Tuolumne County, CA
County and State
Historic Resources of Yosemite National Park
Name of multiple listing (if applicable)

Section number 8 Page 25

Association with *Historic Resources of Yosemite National Park Multiple Property Submission*

The Lake Vernon Snow Shelter is associated with the *Historic Resources of Yosemite National Park Multiple Property Submission*. It is representative of the following historic contexts, as defined in Section E of the MPS cover document: Settlement and Industry in Yosemite, 1851-1951; and Architecture, Landscape Design, and the Construction of the Visitor Experience in Yosemite, 1856-1964. It is an example of the following property types, as defined in Section F: Resources Associated with Settlement and Industry (1851-1951), with a subtype of Exploration, Settlement, and Resource Exploitation; and Resources Associated with Architecture and Design (1856-1964), with a sub-type of Heavy Log, Stone, Wood Frame.

United States Department of the Interior
National Park Service

Lake Vernon Snow Survey Shelter

Name of Property

Tuolumne County, CA

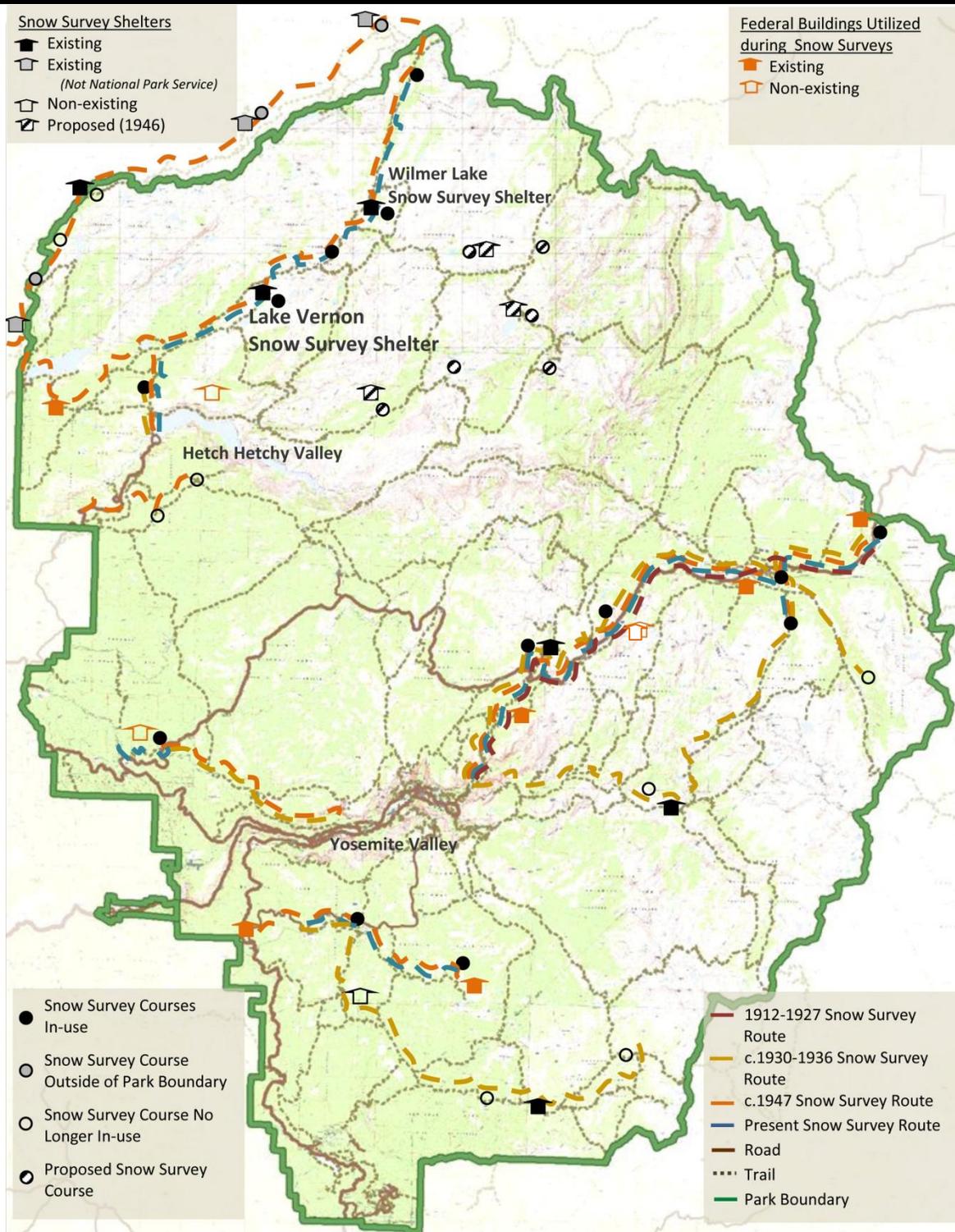
County and State

n/a

Name of multiple listing (if applicable)

Section number Additional Documentation Page II

YOSEMITE NATIONAL PARK
Snow Survey Infrastructure & Routes
Lake Vernon Snow Survey Shelter and Associated Features



United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number Additional Documentation Page III

This map has been formatted to fit this page and is NOT TO SCALE.

Lake Vernon Snow Survey Shelter
Name of Property
Tuolumne County, CA
County and State
n/a
Name of multiple listing (if applicable)



- Legend**
- Yosemite Park Boundary
 - Trails
 - Tuolumne County**
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3

- Building/Structure**
(Intended to be representative and is not to scale)
- Creek**
- Property Boundary**

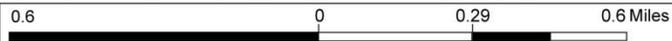
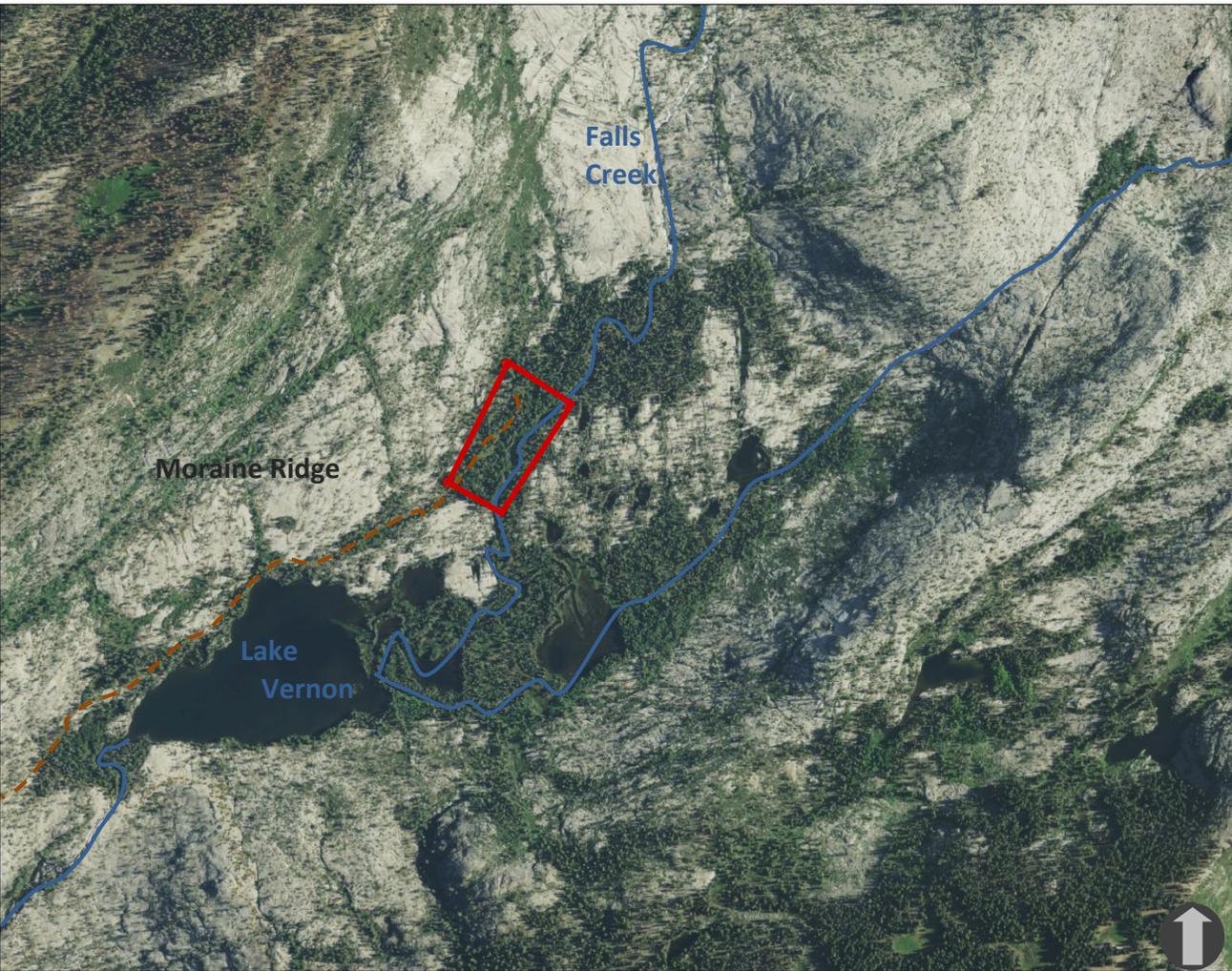
Inset below shows location of shelter and approximate orientation of photos.



Notes

10 Acres

Lake Vernon Snow Survey Cabin - Property Bounday



© Yosemite National Park

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Lake Vernon Snow Survey Shelter

Name of Property

Tuolumne County, CA

County and State

n/a

Name of multiple listing (if applicable)

Section number Additional Documentation Page IV

STATE OF CALIFORNIA - THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION

P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 853-6624 Fax: (916) 853-6624
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov



August 23, 2004

Dr. Stephanie Toothman
National Park Service
Pacific West Region
909 First Street
Seattle, Washington 98104-4159

Dear Dr. Toothman:

Thank you for the opportunity to comment on the National Register Multiple Property nomination for Yosemite National Park. I concur that the properties identified and evaluated in the nomination do constitute a coherent group of geographically dispersed resources that are eligible for listing in the National Register. The nomination does an excellent job of defining separate, but related contexts that make clear the significance of the individual resources, as well as the reasons that they collectively constitute a multiple property. The inclusion of a number of the park's less elaborate, high altitude resources is particularly noteworthy. The context statements synthesize a large amount of historic documentation in a clear and concise manner and the descriptive material that is provided for the individual resources or resource groupings is excellent.

We concur in all of your findings regarding the resources enumerated in the multiple property nomination. We agree that the following properties are eligible for the National Register as a part of a multiple property.

Lake Vernon Cabin Building #2450

May Lake High Sierra Camp Historic District
Hetch Hetchy Comfort Station Building #2104
Henness Ridge Fire Lookout Building #5300
The Golden Crown Mine
Glen Aulin Sierra Camp Historic District
Chinquapin Historic District
Buck Creek Cabin Building #4800
Snow Flat Cabin #Building #3501
Snow Creek Cabin Building #3450
Sachse Springs Cabin Building #2452
Ostrander Ski Hut Building #5110
Old Big Oak Flat Road
New Big Oak Flat Road
Merced Lake Ranger Station Building #3400
Merced Lake High Sierra Camp Historic District

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Lake Vernon Snow Survey Shelter

Name of Property

Tuolumne County, CA

County and State

n/a

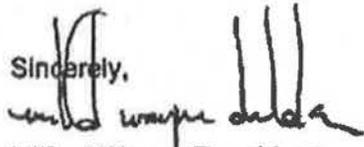
Name of multiple listing (if applicable)

Section number Additional Documentation Page IV (Cont'd)

Wawona Tunnel
Vogelsang High Sierra Camp Historic District
Tuolumne Meadows High Sierra Camp Historic District

I have signed the application as commenting authority. If you have any questions, please call Gene Itogawa of my staff (916) 653-8936.

Sincerely,



Milford Wayne Donaldson
State Historic Preservation Officer

Cc: Kimball Koch

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Lake Vernon Snow Survey Shelter

Name of Property

Tuolumne County, CA

County and State

N/A

Name of multiple listing (if applicable)

Section number Additional Documentation

Page V



Historic Photo #1. Lake Vernon Shelter, 1952. Photographer: unknown
Yosemite National Park, Division of Facilities Management
Building Files, Folder "Lake Vernon Cabin". El Portal, CA.

Location of original photo:

**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Lake Vernon Snow Survey Shelter
Name of Property
Tuolumne County, CA
County and State
N/A
Name of multiple listing (if applicable)

Section number Additional Documentation Page V



Historic Photo #2. Snow surveyors cooking in Lake Vernon shelter, camera facing south-east, c. 1950. Photographer: unknown. Photo: Don Paulsen Collection, California Department of Water Resources, 1416 9th Street, Sacramento, CA .



Historic Photo #3. Snow survey crew at shelter, c. 1950. Photographer: unknown. Photo: Don Paulsen Collection, California Dept. of Water Resources, 1416 9th Street, Sacramento, CA.



Lake Vernon Snow
SUNNET SAFETY

Produced by the United States Geological Survey 1990
Revision by USDA Forest Service 2001

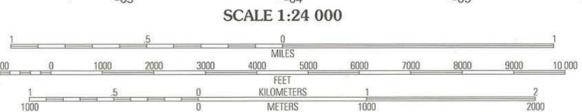
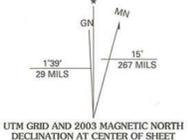
Topography compiled 1984. Planimetry derived from imagery taken 1998 and other sources. Public Land Survey System and survey control current as of 2003. Boundaries current as of 2003.

North American Datum of 1927 (NAD 27). Projection and 10 000-foot ticks: California coordinate system, zone 3 (Lambert conformal conic). Blue 1000-meter Universal Transverse Mercator ticks, zone 11.

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software.

Non-National Forest System lands within the National Forest. Inholdings may exist in other National or State reservations.

This map is not a legal document. Public lands are subject to change and leasing, and may have access restrictions; check with appropriate offices. Obtain permission before entering private lands. Unsurveyed land net is not official.



CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048



QUADRANGLE LOCATION

1	2	3	1 Cooper Peak
			2 Emigrant Lake
			3 Tower Peak
			4 Kibbie Lake
			5 Plute Mountain
			6 Lake Eleanor
			7 Hetch Hetchy Reservoir
			8 Ten Lakes

ADJOINING 7.5' QUADRANGLES

HIGHWAYS AND ROADS

Interstate	1	Primary highway	1
U. S.	2	Secondary highway	2
State	3	Light-duty road	3
County	4	Composition: Unspecified	4
National Forest, suitable for passenger cars	5	Paved	5
National Forest, suitable for high clearance vehicles	6	Gravel	6
National Forest Trail	7	Dirt	7
		Unimproved; 4 wheel drive	8
		Trail	9
		Gate; Barrier	10

TILTILL MOUNTAIN, CA
2001
38119-A6-TF-024
NGA 2060 II SW-SERIES V895





CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0001



CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0002



CA_Tuolumne County_Jake Vernon Snow Survey Shelter_0003



CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0004



CA_Tuolumne County_Lake Vernon Snow Survey Shelter_0005

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Lake Vernon Snow Survey Shelter

MULTIPLE NAME: Yosemite National Park MPS

STATE & COUNTY: CALIFORNIA, Tuolumne

DATE RECEIVED: 6/02/14 DATE OF PENDING LIST: 6/25/14
DATE OF 16TH DAY: 7/10/14 DATE OF 45TH DAY: 7/19/14
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 14000416

REASONS FOR REVIEW:

APPEAL: N DATA PROBLEM: N LANDSCAPE: N LESS THAN 50 YEARS: N
OTHER: N PDIL: N PERIOD: N PROGRAM UNAPPROVED: N
REQUEST: Y SAMPLE: N SLR DRAFT: N NATIONAL: N

COMMENT WAIVER: N

___ ACCEPT ___ RETURN ___ REJECT _____ DATE

ABSTRACT/SUMMARY COMMENTS:

The Lake Vernon Snow Survey Shelter is locally significant under National Register Criteria A and C, in the areas of Architecture, Conservation and Science. Built by the City and County of San Francisco from standardized plans during the first phase of 1940s snow survey cabin construction, the 1945 Lake Vernon cabin was established as an important component of the dispersed system of snow survey cabins built to aid in the scientific study of regional hydrology. Severe droughts in the late 1920s and early 1930s had highlighted the importance of water conservation in the areas served by the Sierra Nevada Mountains. Remote cabin sites such as this provided important shelter to winter survey crews and provided the Park with seasonal backcountry shelters and field stations. The property is a fine local example of rustic-style log design and meets the registrations requirements set out in the Yosemite MPS.

RECOM./CRITERIA Accept Criteria A+C

REVIEWER PAUL R. LOSIGNAN DISCIPLINE HISTORIAN

TELEPHONE _____ DATE 7/10/14

DOCUMENTATION see attached comments Y/N see attached SLR (Y)N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.