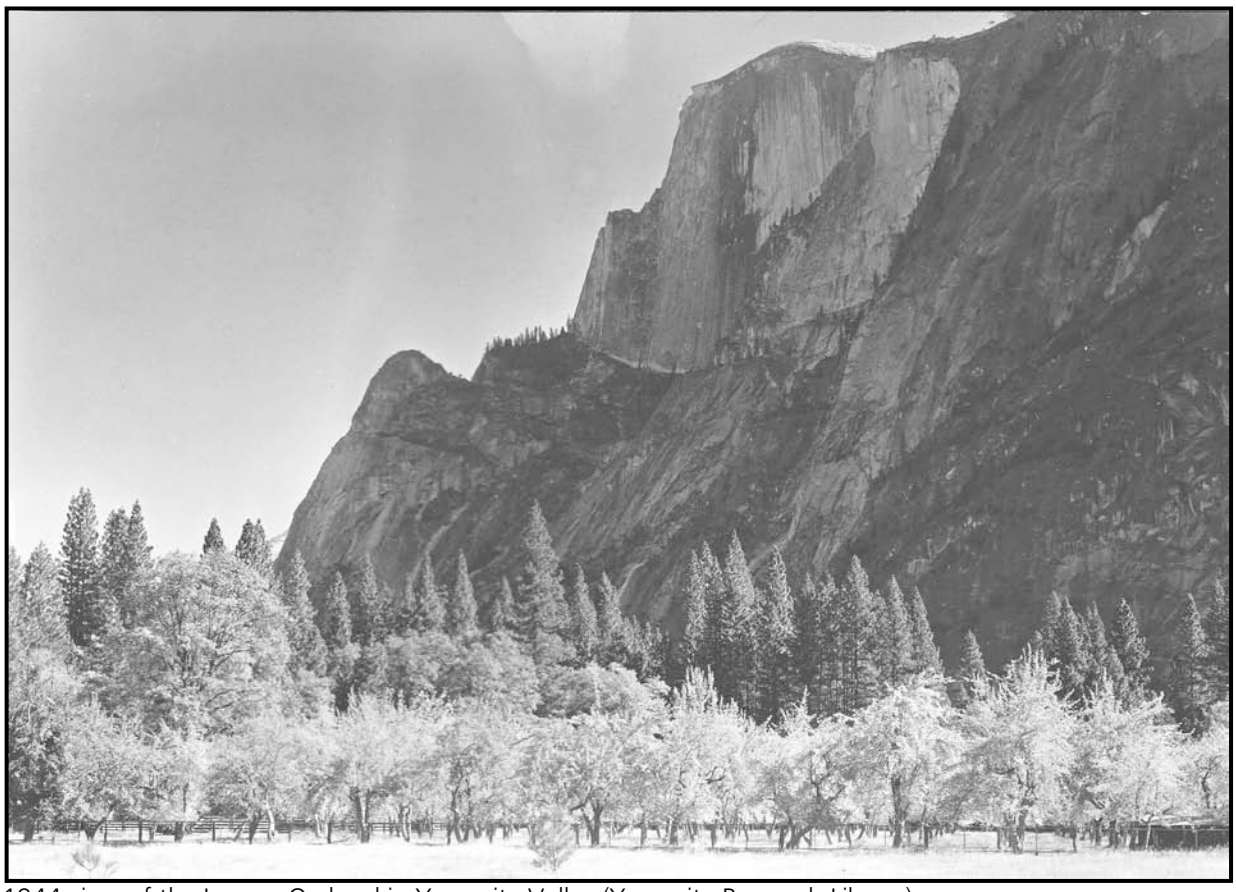
Orchard Management Guidelines



1944 view of the Lamon Orchard in Yosemite Valley (Yosemite Research Library).

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Yosemite National Park

Division of Resources Management and Science

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Executive Summary

Yosemite National Park contains a robust collection of historic orchards that date from as early as the 1850s, some of which still show remarkable physical health and historic integrity. These orchard resources represent the oldest surviving remnants of Yosemite's pioneer past and a potential reservoir of valuable heirloom genetic resources in the form of rare and historic fruit varieties. These orchards have been problematic from a management perspective due to the propensity for bears to gather around and climb fruit trees in search of fruit. Because many of these orchards and individual fruit trees occur near visitor use services, the orchards effectively serve as bear attractants to high-use areas, which can result in subsequent conflicts.

The purpose of these Orchard Management Guidelines is to document the history, physical condition, historic integrity, and management recommendations for each of the orchards and all of the individual fruit trees at Yosemite. A summary of these recommendations is presented in the table below. The document begins with a history of orchards in the United States and follows with a history of Yosemite's orchards. It documents orchards from four primary areas at Yosemite: Foresta, El Portal, Yosemite Valley, and Wawona. It details the steps for responsible stabilization maintenance and provides long-term treatment recommendations that take into account each orchard's relative value as a cultural resource. It also details creative strategies that could help reduce or eliminate the management conflicts with regard to bear and deer, which graze on apples.

Orchard	# of Trees	Physical Condition	Historic Integrity	Recommendation
Meyer Ranch	37	Good-Fair	High	Rehabilitation
McCauley Ranch	18	Poor	Low	Stabilization
Hennessey Orchard	66	Good-Fair	Low	Rehabilitation
Johnny Wilson's Place	40	Fair-Poor	Low	No Action
Lamon	172	Fair-Poor	High	Rehabilitation
Curry Village	105	Poor	High	Removal
Hutchings	42	Poor	Low	Removal
G. Clark Homestead	16	Fair-Poor	High	Preservation
Wawona Fire Dorm	8	Good	High	No Action
Washburn	13	Fair-Poor	Low	Removal

TABLE 1. SUMMARY OF MAJOR YOSEMITE ORCHARDS WITH RECOMMENDATIONS.

These guidelines maintain an objective perspective on the relative benefits of these historic resources versus the natural resources with which they are not always compatible. Overall, these guidelines recommend a net reduction in orchard sites with the elimination of three problematic and severely degraded sites, while select orchards that have high interpretive value and a lesser degree of management conflicts will receive some degree of stabilization measures.

Introduction

The management and preservation of historic orchards and their heirloom genetic resources is an emerging priority in the National Park Service. In 1992, the National Park Service produced a document titled *Inventory and Conservation of Genetic Resources in the Form of Historically Significant Fruit and Nut Trees in the National Park System*. Historical Landscape Architect Susan Dolan, working with the Olmstead Center for Landscape Preservation, the Pacific West Region Cultural Resources, and Park Historic Structures and Cultural Landscapes Program, has produced a document titled *Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present, which* details the history and the significance of these resources. The United States Department of Agriculture is engaged in a partnership *National Plant Germplasm System*, which aims to acquire, preserve, evaluate, document, and distribute our nation's agricultural genetic resources. The working relationship between the USDA initiative and the NPS initiative is still growing and shows the potential to become a strong collaboration. In a broader sense, the preservation of heirloom fruit genetic resources is emerging as a grass-roots movement world-wide. This movement, for example, is typified by the non-profit Slow Food USA and its Ark of Taste and Renewing America's Food Traditions programs. The latter program produced a *Forgotten Fruits Manual and Manifesto* draft in 2009, which aims to disseminate the knowledge necessary for individuals to become involved in the preservation and propagation of rare heirloom apple varieties. This contextual cross-section reveals the relevance – and indeed, the urgency – of these Yosemite Orchard Management Guidelines.

Rare and historic heirloom fruit varieties do not necessarily look as though they deserve protection. These trees may go unnoticed on inconspicuous sites, perhaps beneath the full canopy of wild forests or on the edges of over-grown fields. A rare old tree may be reduced to a single thin limb growing from the top of a gnarled old trunk. Unlike spectacular historic buildings or famous battlefields, their inherent value as cultural resources worthy of protection is not always intuitive. In Yosemite, these historic resources have not been interpreted and their management has not been a priority; however, if this trend were reversed, they could provide a compelling display of Yosemite's pioneer history. The legacy of Yosemite's Euro-American settlers and homesteaders is vividly revealed in these agricultural relics. Unfortunately, the conflict between these orchards and the wildlife that feeds on their fruit continues to frustrate management. It is our faith, however, that these guidelines will provide the framework to ensure that Yosemite's resources, natural and cultural, can co-exist without irreconcilable conflicts in perpetuity.

Orchard Development in the United States

1600 – 1800, Fruit Introduction and Colonization

Fruit cultivation began with the apple and predates the Roman Empire. The earliest known ancestor of the domesticated apple is a wild apple that grows in the mountains of Kazakhstan. Here the wild apples are often the climax species in the forest, growing up to sixty feet tall and producing fruit that varies in size and color. The Silk Route traversed these forested mountains and the first apples probably were spread by travelers who gathered the largest and sweetest of these fruits for trade.[1]

Domestication began in China with the discovery of grafting in the second millennium. This discovery allowed the Greeks and Romans to choose and propagate the choicest varieties. As the Romans conquered much of Europe, apples spread across the continent. According to journalist and author Michael Pollan, Roman apples still can be found throughout Europe. He states that, "According to Pliny, the Romans cultivated twenty-three different varieties of apples, some of which they took with them to England. The tiny, oblate Lady apple, which still shows up in markets at Christmastime, is thought to be one of these."[2] Apples subsequently were brought to America and were established in the early colonies.[3]

The first fruit trees in America were shipped across the Atlantic as seeds by European settlers and missionaries and these were among the first exotic species to transform the new landscape. Seeds were planted in areas cleared of brush. The seeds brought by settlers had already been improved through thousands of years of domestication and throughout the following centuries, through human agency, fruit trees rapidly evolved and transformed from their semi-wild forbearers into the domesticated varieties common today.

As Europeans began to leave for the New World, fruit cultivation was reaching new popularity in England, where highly ornamental fruit gardens were described as pleasure grounds. This aesthetic transferred easily to America and similar fruit gardens could be found at the homes of prominent settlers and wealthy landowners. More common, however, was the farm orchard. The farm orchard consisted of a few cleared acres sown indiscriminately with seeds that were allowed to sprout however and wherever they could. This resulted in wild orchards without the even spacing or form common today. Densities in these uniquely American early farm orchards reached 50 trees per acre. The most common farm orchards consisted of apples or peaches.

Cultivation of these early orchards was left to nature; pruning and irrigation were not performed and fertilization was accomplished passively through livestock. Furthermore, livestock were often let out into orchards to eat fallen fruit and leaves; their tendency to consume lower leaves on trees resulted in tall trunks and a wild appearance.

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[1] Michael Pollan, The Botany of Desire: A Plant's Eye View of the World (2001). 12.
[2] Ibid. 12.
[3] The history of early fruit cultivation found in this orchard management report was largely adapted from Susan Dolan's Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present. Dolan breaks down fruit cultivation into four distinct time periods: 1600-1800, 1800-1880, 1880-1945 and 1945 to the present.

Seedling fruit trees, unlike grafted varieties, are unique individuals with variability in form as well as shape, size, color and taste of fruit. The seedling farm orchard was therefore an irregular collection of trees, each with a unique character, flowering and fruiting at different times. Despite great genetic diversity in such orchards, fruit was rarely palatable raw, and for the first 200 years of settlement in America, the fruits of farm orchards were used almost exclusively for production of alcoholic beverages and for livestock feed. Apples also were used for baking or drying, and could overwinter in a cellar. Peaches, however, lacked storage properties and were fed to livestock or used for brandy. While apple and peach orchards were becoming widely established in the colonies, pears were predominantly planted in southeastern Canada as a result of French influence.

By the mid 17th-century, Americans began to improve the quality of fruit brought from Europe. Among the wealthy, fruit gardens were common and these educated fruit growers selected seedling fruit trees that produced better fruit and propagating them through grafting.[4] This process created two apple varieties that would remain commercially important well into the 20th-century: Rhode Island Greening and Roxbury Russet.[5]

Grafting, however, was not a new technology; it had occurred in China and Rome thousands of years earlier. Grafting involves the attachment of vegetative cuttings to seedling rootstock. This technique allows growers to combine a fruiting clone of known qualities with a vigorous root stock, however, it remained confined to a few gardens of fruit collectors; seedling orchards would remain prominent until the late 18th-century.[6]

The widespread dismissal of grafted varieties, despite their superior taste and better quality, was due to the importance of cider in early American society. Cider was the most common beverage in colonial America and often served as wages, for barter and for sustenance. A five-acre seedling orchard could yield up to 1,000 gallons of cider, the yearly supply for a farm household.[7] Everyone in the farm household would drink the alcoholic beverage; and some considered it more sanitary than water. Seedling orchards produced apples with varying characteristics and an extended harvest. Any apples that weren't used in cider production could be fed to livestock or stored over winter in cellars.

During the 18th-century, more types of fruit were introduced into the United States including the Damson plum, quince, sweet cherries and sour cherries. Most of these types of fruits remained largely overlooked in favor of apples, peaches and pears.

The first American commercial nursery emerged in the 18th century. The creation of the Prince Nursery in 1730 was the single most important event in the history of fruit cultivation in the early half of the 18th-century. The nursery was founded by Robert Prince in Flushing, New York. Prince imported European fruit varieties, propagated them by grafting and sold them to middle class and wealthy landowners including George Washington and Thomas Jefferson. The nursery imported and popularized many European varieties

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[4] Susan Dolan, Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft) (Department of the Interior, National Park Service, Jan., 2007). 61.
[5] Ibid. 62.
[6] Ibid. 63.
[7] Ibid. 59.

and, for the first time, made many fruit varieties widely available. This contributed to the widespread cultivation of grafted varieties, which then replaced seedling trees.[8]

Prince Nursery was a great success and remained the country's preeminent nursery until the 1860s, when the business closed and was incorporated into the Linnaean Botanic Gardens. In addition to popularizing European varieties, the Princes were responsible for the creation of many new American fruit varieties, primarily commercially important apple cultivars. These included the Newton Pippen apple, which was the first American fruit variety exported to Europe.[9] By 1771, three years before the start of the Revolutionary War, five varieties of American fruit were offered for sale in Europe. All of these were apples.

During the Revolutionary War, Spanish monks introduced an entirely different set of fruits to North America. For the next 50 years they utilized extensive irrigation systems built by American Indians to grow oranges, olives, figs and grapes.[10]

The late 1700s saw an increase in commercial orchards and fruit varieties including the first American peach variety, the Heath Cling. The numbers and types of fruit propagated and grown in farm orchards also increased during this time. By 1800, the United States of America had been seeded with a robust gene pool of European and Asian fruits, which would give rise to the golden age of fruit growing in the 19th-century.[11]

1800 – 1880, Fruit Diversification and Migration

The second distinct period of fruit cultivation in the United States, referred to by Dolan (2007) as the Golden Age of Pomology, represents the boom of orchard plantations. Cultivated orchards, rather than seedling orchards, were planted nationwide and diversity reached its pinnacle. Many new commercial orchards were created and "orcharding" became an acceptable way to earn a living. This era represents the pre-industrial stage of orchard management, when farmers could be found washing trees with soapy water to prevent pest outbreaks.

During the early 1800s, horticultural societies were formed and facilitated the spread of cultivated fruit varieties. They also published the first American horticultural literature, which disseminated essential information to amateur fruit growers. The new literature recommended changes in care of fruit trees; pruning and staking as well as fertilization by hogs and poultry was recommended.

With the new interest in orcharding came a significant increase in American fruit varieties. At that time most varieties were apples, the most commercially important of which was called Ben Davis. Its characteristics included later bloom time, which helped prevent loss from frost, a younger fruiting age, tolerance of warmer climates and most importantly, resistance to bruising, therefore transporting well.[12] The Ben Davis was the first apple that emphasized commercial qualities over taste and became so popular it was grown in southern latitudes from coast to coast.

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[8] Ibid. 69-70.
[9] Ibid. 71.
[10] Ibid, 71.
[11] Ibid, 73.
[12] Ibid. 88.

Other important varieties from the time include Northern Spy, Winesap, McIntosh, Rome Beauty, Northern Beauty and King. One reason for the explosion in grafted varieties was the wide genetic base provided by the many seedling orchards planted in the previous century.

Seedling orchards, however, were still planted. During this period the fabled Johnny Appleseed, whose true name was John Chapman, traveled the edges of civilization planting seedling orchards. Each year Chapman would collect seeds from the remains of cider press operations in Pennsylvania and he would travel to the fringes of developed land to plant orchards. He would raise the saplings until settlers came, at which point he would sell trees. He would then turn over care of his orchard to a local boy and repeat the process in a new location. Despite the competition from grafted, more edible varieties, Chapman's trees sold well, in large part because of their use for making hard cider.

Chapman was regarded as an eccentric character, commonly barefoot, wearing a burlap sack and tin pot hat, often sleeping outside in a hollowed log or under the stars. Chapman was a man of faith, held in particular with the Swedenborgian doctrine, which theorized that there is no rift between the natural and divine. As author Michael Pollan states, "I imagine Chapman's was a world much like that inhabited by the ancient Greeks, in which all nature and experience were suffused with divine significance: the storms, the dawns, the strangers at your door. One looked outward, to the land for meaning, rather than inward or upward."[13] By the time of his death in 1845 Chapman had cultivated 1,200 acres of seedling orchards throughout four states and he had widely contributed to the spread and diversity of apples.

At the same time, wealthy landowners and farmers alike began to recognize the benefits of planting the adaptable grafted trees. Grafted varieties became more widely acceptable and farmers began to learn to graft their own trees. Knowledge of graft techniques was passed down generations, and farmers shared promising scion wood with each other. Consequently, thousands of new and locally-adapted varieties emerged.

During the first half of the 19th-century, Belgian fruit growers began experimenting and creating new varieties of pears. Through many Belgian pear breeders, the quality of pears improved from crisp, breaking flesh to the soft, buttery flesh common now. At this time pears in North America were only common in the northeastern portion of the United States and the adjoining part of Canada. As American fruit growers began to import the Belgian pear varieties, pear orchards and trees began to spread across the United States. William Coxe, fruit grower and author, was one of the first Americans to import Belgian pears. In 1817 his book, *View of the Cultivation of Fruit Trees,* he described the varieties grown in his personal orchard and extolled the virtues of one of the first American pear varieties, the Seckel. He described it as "… the finest pear in this country or any other…" and this praise greatly influenced the popularity of the variety.[14]

This interest in fruit breeding resulted in the first variety from an American native species. The Kentucky native Chickasaw Plum was hybridized in 1814 to create the variety Miner. The Miner plum was able to tolerate warmer summers and as a result, rapidly spread into the south. Additionally, the fruit was sweeter and softer than its unhybridized cousin, the Chickisaw Plum.

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[13] Pollan, The Botany of Desire: A Plant's Eye View of the World. 34.

[14] Dolan, Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft). 96.

As grassroots popularity of fruit growing increased, many commercial orchards were developed. Early commercial orchards were centered in New York's Hudson Valley. Easy access to water transport after the advent of the steam engine allowed for rapid distribution of fruit and the rise of agricultural commerce along the Eastern Seaboard. These orchards were planted with grafted trees rather than seeds and were, for the first time, laid out on a grid generally spaced 20 to 30 feet apart. As the first commercial orchards garnered great success more soon spread into upstate New York and the Niagara River Valley. Eventually, through canals and railroads, farmers in interior areas could access smaller more localized markets to sell their fruit for profitable returns. Orcharding became so profitable that many farmers switched from vegetable crops to fruit trees. After the War of 1812 the first opportunities arose for the export of American fruit and fruit trees. Fruit exports increased further after Queen Victoria repealed a tax on imported apples in 1838.

The widespread adoption of fruit cultivation by common farmers opened a new market for agricultural journalism. Some of the most popular catalogs were *American Farmer* and *The Cultivator*. Nursery catalogs not only became some of the most important sources for horticultural information of the time, but fueled the demand for cultivated varieties of fruit trees as well. As the United States grew after the Louisiana Purchase, nurseries and orchards emerged in the Midwest. One of the most important was the Stark Brothers Nursery founded in Louisiana, Missouri, in 1816. The Stark Brothers specialized in the import and development of varieties that would thrive in the Midwest, which had a much wider climatic range than the North or South.

By this time, orchards were planted across the entire continent. In the 1820s, Britain's Hudson Bay Company built an agricultural outpost in the Oregon Territory near the mouth of the Columbia River. In 1825 the first apple tree on the West Coast was planted at Fort Vancouver; by 1836 vast areas were taken up by the outpost farms, which fed the settlers in the area. Settlers began bringing fruit trees across the Oregon Trail. Two men in particular, Henderson Luelling and William Meek, transported hundreds of fruit trees and began the first nursery in the Pacific Northwest, in Oregon City.

By 1830, the Prince Nursery offered as many American apple varieties as European. In 1841, the Prince Nursery catalog offered 272 varieties of apple, 420 varieties of pear, 109 varieties of cherry and 156 varieties of plum. By 1847, the balance between the availability of European and American peach varieties had also shifted, with more American than European peach varieties for sale. The 1847 Prince Nursery catalog offered 76 varieties of peach; 48 were American varieties and only 28 were European.[15]

[15] Ibid. 106.

During the mid-19th-century apples became a symbol for American democracy and American fruit varieties became a source of national pride. As a result, horticultural writers such as Andrew Jackson Downing Jr. took advantage of this popularity and wrote many horticultural works. Downing, an early landscape architect, wrote the definitive 19th-century horticultural text, *The Fruits and Fruit Trees of America.* The text discussed different American varieties, educated readers on fruit tree care, and influenced the types of varieties grown. Downing died shortly after the publication of his book, which remained popular for more than 50 years. Some key recommendations from *Fruits* include a wider spacing of 30 feet for apples, 16-20 feet for peaches, cherries and plums, and grafts only three or four inches from the ground. Additionally, Downing recommended "high heading" where branches began at the top of a relatively high trunk. He encouraged farmers to look at their orchards as investments that could be passed down to their sons.

FIGURE 1. FRUIT TREES OF THE 1800-1880 PERIOD WERE FULL-SIZED WITH TALL TRUNKS. THIS SPECIMEN IS IN THE CURRY VILLAGE ORCHARD.

In 1849, Downing and his brother Charles founded the American Pomological Congress. The Congress was comprised of notable fruit growers and nurserymen. Their mission was to identify and describe fruit varieties and test them for commercial use. Three years later they changed their name to the American Pomological Society and published their first report, *Fruits Worthy of Cultivation*. The report contained a list of the 32 most highly recommended apple varieties. The Society also held influence over pear breeding. They raised the popularity of the pear, which led to the first American variety, the LeConte, a cross between Asian and European pears. This variety was named after American naturalist John Eatton LeConte Jr., who introduced the fruit in 1856.[16]

By the end of the Mexican-American War in 1848 and the subsequent addition of large tracts of land to the United States, many failed miners discovered the rich agricultural potential of California and turned to fruit cultivation. Some would reinvigorate abandoned mission orchards, and within 20 years California had a thriving orchard industry. The completion of the Transcontinental Railroad facilitated the easy export of West

[16] John Eatton LeConte was the uncle of influential preservationist and Sierra Club cofounder, Joseph LeConte, who wrote the Journal of Ramblings through the High Sierra of California, and for whom the LeConte Memorial Lodge in Yosemite Valley is named.

Coast fruit to the east. Further expansion of the rail system encouraged settlement and orchard development up the West Coast into Washington.

Commercial orchards appeared around the country but small subsistence orchards were still commonly planted. A major influence on orchard form and function of these smaller orchards was the Homestead Act of 1862. The Homestead Act gave land to claimants who could show improvements to the land over a five-year period. Planting an orchard was an easy way to fulfill this requirement and was more economical and less laborious than raising annual farm crops. Many settlers would leave the land and orchard for five years until their claim was granted. Often these were started with seedling trees and improved when the property became occupied, although many were abandoned completely.

The latter 1870s saw the novelty of fruit growing wear off. As one author described it, "A period of excess in fashion, discourse, breeding, fascination and mysticism was ended with orchard pest and disease infestations and their ensuing economic losses. Preoccupation and pride in the beauty and taste of fruits would be superseded in the 1880s with more pragmatic concerns for yield and economic viability." [17]

Figure 2. Fruit trees from the 1880-1945 period featured bowl form and short trunks. This specimen is at the Wawona Fire Dorm.

1880 – 1945, Orchard Specialization and Industrialization

The beginning of the 20th-century brought great industrial changes to the United States. More people began moving to the cities and working in industrial jobs rather than in rural farming communities. Naturally, this had an impact on the way orchards were managed. Changes in orchard management were fueled by science and technology, leading to commercial orchards that looked and performed differently than their predecessors. Reductions in the types of varieties grown occurred and the form, shape and layout of orchard trees also changed. These alterations were affected by the formation of the United States Department of Agriculture and the work of agricultural experimental stations.

[17] Dolan, Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft). 131.

Changes in orchard layout and fruit tree form were brought about as a result of new equipment and the need to facilitate access and increase yield. Tree shape changed from an unpruned form with a tall trunk to a three-foot trunk and either a bowl or pyramidal form. Apple and pear tree spacing varied from 30 by 30 to 40-50 by 40-50 feet apart, while tighter spaced fruits switched to a rectangular pattern.

It became paramount that trees produce fruit of a consistent quality; therefore varieties were selected with marketability in mind. Important factors included taste, beauty and storage characteristics. As a result most orchards went from hundreds of varieties to 10 widely grown commercial varieties. Citrus and nut fruits, however, continued to diversify due to new technology.

During this period some new varieties were created, most notably the apple varieties McIntosh and Red Delicious. The discovery of Red Delicious was one of the most important events in the history of commercial apple growing, as it became the predominant apple variety sold in the United States. The most important pear variety was the Bartlett pear, primarily grown in New York and California. Peach cultivation remained more decentralized, while sour cherry production centered in the Upper Midwest and sweet cherries were commonly grown in the Pacific Northwest. Japanese and European plums were grown in the Pacific states and American plums were grown in the Midwest. Citrus fruits were limited to California and Florida. Pecans were grown in Texas, walnuts and almonds in California and filberts in the Pacific Northwest.

In addition to regionalization, increased urbanization led to a net decrease of orchards and fruit trees across the country. Only the Pacific Northwest continued to increase fruit production. By 1930, more than 50 percent of the orchards existing in 1880 were gone and orchards had been transformed from small-scale farm orchards to large commercial plantations managed by growers. This change was facilitated by the national increase in infrastructure; railroads followed by the national system of roads allowed for easy transport of fruit and cold storage, while canning and irrigation technologies increased the storability and productivity of orchards. The first pesticides also were developed during this time and these chemicals led to higher survival rates of fruit trees and better quality fruit.

These innovations brought about changes in orchard management, and orchards evolved into self-sufficient growing and packing facilities. The Great Depression and the Progressive Era caused further shifts, forcing growers to organize regionally, form growers' cooperatives and marketing commissions, and build regional processing facilities. Despite these measures the Great Depression compelled even more growers to abandon their orchards.

By the end of this period, dwarf fruit trees were becoming popular with homeowners as a good choice for a small urban or suburban backyard. Research was under way by the United Stated Department of Agriculture and grower organizations to reduce tree sizes in commercial orchards and increase efficiency through labor savings.

This period represents the greatest loss of fruit varieties as well as net cultivation of fruit trees in general. It also represents the industrialization of orchard management, which would be further refined in the future.[18]

1945 – Present, Fruit Monoculture and Orchard Intensification

Due to the interests of a new generation, the end of World War II saw an increase in the number of orchards for the first time in 60 years. This period also is characterized by a notable change in orchard appearance. Fruit trees became much smaller with the advent of dwarfing rootstocks, which in turn allowed tighter spacing of trees; 10 to 20 times as many trees could be planted on an acre. This change was facilitated by an educated generation of fruit growers and their teachers on a national and international scale.

This time period brought about the end of farm orchards as small-scale commercial operations. Instead orchards became large-scale commercial enterprises or remained small backyard orchards for private use. The change in orchard composition and management was concurrent with a national change from a rural, agricultural economy to a technological and industrialized economy. This change led toward monocultural orchards with large blocks of single varieties ranging over hundreds or even thousands of acres. This trend lasted until the 1980s, when interest in diversity was rekindled.

The highly competitive economy of the late 20th-century brought down profit margins and required great economic investments and large risks in order to turn a profit. Post-World War II demand for fresh produce rose sharply but rising production costs forced growers to follow business plans and keep abreast with technological advances in order to compete within the market. Despite the high demand, heavy competition and increasing costs associated with rising wages, fertilizer and pesticide costs, and energy prices often had orchardists at the point of bankruptcy.

To combat these issues, researchers focused on increasing fruit production at the tree level. The solution was dwarfed varieties that fruited earlier in their life, were easier to harvest, and could be grown closer together. After 1945 almost all full-size varieties were modified into dwarfed varieties. The transformation into dwarfed rootstocks has taken the last 50 years to encompass all fruit varieties including apples, pears, peaches, plums, cherries, apricots, nuts and citrus. Apples and pears were the first fruits to be dwarfed. The most common dwarfing method is clonal, or cloned rootstocks; peach is the only remaining fruit that is not propagated by clonal rootstock.

Research and development of clonal dwarfed rootstocks occurred first in Europe, primarily England, due in large part to the lack of space for full-sized orchards on the densely populated island. Dwarfed rootstocks soon were adapted in the United States. They were introduced in the East and migrated across the nation, first to the Midwest and then the West.

The dwarfed rootstock not only changed the layout of the orchard but the form of the trees also changed from bowl-shaped to a central leader or modified central leader. Pruning styles were modified as a result of early fruit bearing, which would weigh down the young branches and cause them to break. The new style moved bearing branches proportionally higher up the tree. Dwarfed trees also produced a crop yearly

[18] Ibid. 204.

whereas standard trees often only produced biennially. The dwarfed varieties produced better fruit in general, with fewer bruises and blemishes and had a lower percentage of culls, so by the 1970s the transition from seedling apple rootstocks to clonal dwarfing rootstocks was complete.

By the 1980s, Golden Delicious and Red Delicious had been over-planted and consequently, a severe price drop occurred. By this time 50 percent of all apples produced were Red Delicious and most of the rest were Golden Delicious. This near monoculture resulted in a flooded market and facilitated the aforementioned renewed interest in diversity.

Fruit growing has always played an important role in American culture and will continue to do so. Currently a resurgence of interest in heirloom fruit varieties is occurring and many early fruit varieties are sought by collectors.

Orchards in the National Parks

Of the 392 areas managed by the National Park Service, 60 percent of the properties have been set aside as evidence or as symbols of history or prehistory.[19] Many of the remaining parks, primarily set aside for their extraordinary natural features, contain prehistoric and historic remnants. Many national parks around the country inherited remnants of the past including orchards and early settlements throughout the country. As fruit trees were a major part of the American landscape in the 17th and 18th-centuries, it is no surprise that so many orchards later became parts of the National Park system. As a result of this designation, many orchards were preserved that otherwise may have been destroyed or replaced during subsequent development.

When the National Park Service was created in 1916, the fledgling organization already had 14 parks to manage and some units contained orchards. As acquisition continued, the park service continued to incidentally obtain orchards, which were often ignored or neglected. According to NPS Historical Landscape Architect Susan Dolan, many of the orchards within national parks predate formation of the parks.

The majority of old fruit trees and orchards within the national park system belong to this period in the history of orchards and fruit development. For many parks, the period (1880-1945) corresponds to the time when the land was in agricultural use before the designation of the park, and the period is sufficiently recent that it captures extant fruit trees with the greatest longevity, such as apple, pear, orange and cherry.[20]

Most orchards in national parks have been treated on an individual basis by each park but during the Civilian Conservation Corps (CCC) era, much work was completed in historic preservation nationwide. At a number of historic sites managed by the National Park Service, orchards were planted by the CCC to restore the appearance of a site to a historic period. For example, at Morristown National Historical Park in New Jersey, the CCC replanted a vanished orchard to recreate the appearance of an 18th-century farm. At San Antonio Mission National Historic Site in Texas, the CCC planted fruit trees to recreate the appearance of 19th-century mission orchards. These were among the first reconstructed orchards in the national park system[21]

Other major orchard restoration has been completed by the park service as well. In Vancouver, Washington, clonal dwarfing rootstocks were used for the apple trees planted by the National Park Service (NPS) at Fort Vancouver National Historic Site in the mid 1960s. The orchard, a planned reconstruction of the early 19th-century Hudson's Bay Company's Fort orchard, was funded by Mission 66.[22] In addition to extensive reconstructions, many orchards throughout the park system are maintained or preserved in their current configurations. Despite these notable restoration efforts, however, many orchards within park service lands are neglected or under-utilized as historic resources.

A service wide survey completed in 1992 states that of the 341 NPS units authorized at the time of the survey, 337 responses were initially confirmed. Four survey responses, 3 from Scenic Trails Parks and 1 from

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[19] *National Park Service History: NPS History* (Department of the Interior, National Park Service, March 22, 2006 [cited July 21 2008]); available from http://www.nps.gov/history/history/hisnps/.

[20] Dolan, *Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft)*. 209.

[21] Ibid. 197.

[22] Ibid. 224.

the Roosevelt-Campobello International Park, were later verified as negative responses. Of the 337 NPS units from which survey information has been compiled, 127 sites responded that fruit and/or nut trees were present, while 210 sites responded that there were not.[23] [24]

Dolan (2007) sums up the importance of orchards throughout the National Park System, "Historic orchards in national parks are now the repositories of rare varieties or strains of varieties, and are becoming rare examples of extant old fruit tree forms and layouts."[25]

[23] William M. Coli, Nora J. Mitchell, Final Report: Inventory and Conservation of Genetic Resources in the Form of Historically Significant Fruit and Nut Trees in the National Park System. (North Atlantic Regional Office, Boston, MA: Department of the Interior, National Park Service, 1992)., 15.

[24] No mention is made of Yosemite's orchards in this document and a positive response is not noted for the park.

[25] Dolan, Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft)., 262

Yosemite Orchard History

Most orchards in Yosemite National Park predate the formation of the park and are associated with early homesteading in the Sierra. The Homestead Act of 1862 was a response by the U.S. government to public pressure to release unoccupied public land for settlement. Previously, the government had sold the land for revenue purposes, but as the West gained political power, politicians began to push for free land. The Homestead Act followed. It provided 160 acres free to any settler after five years of residence or sale of the land for $1.25 per acre after six months of residence.

Various stipulations were added to the Homestead Act before a person could qualify for a land patent. These included an age requirement of 21 years or veteran status, having or having intent to gain U.S. citizenship and that, "such application is made for his or her exclusive use and benefit, and that said entry is made for the purpose of actual settlement and cultivation, and not either directly or indirectly for the use or benefit of any other person." After five years whomever wished to receive the title to the land had to provide witnesses that affirmed "that he, she, or they have resided upon or cultivated the same for the term of five years immediately succeeding the time of filing the affidavit aforesaid."[26]

Orchards, particularly in the Sierra, were a good way to fulfill the cultivation requirement. An orchard, once planted, required little attention or maintenance, especially in comparison to other crops that required yearly tilling and replanting. Some settlers would plant and abandon an orchard, returning only after five years to claim the land patent. Early homestead orchards often were planted solely to fulfill the Homestead Act requirements. Fruit from these orchards was used by the families living on the land. Apples predominated and were used for cooking and baking but primarily for making hard cider.

Many orchards within the park were planted in reaction to homestead requirements rather than in optimal orchard locations. Many of the park's original orchards, planted for expedience rather than horticultural suitability, have since disappeared or are in poor condition. The majority of Yosemite's remaining fruit trees are of two varieties: Newton Pippin and Northern Spy. These two varieties have good storage qualities and can be used as dessert apples, for cooking and for hard cider production.

In 1991, pomologist C. T. Kennedy completed a survey of Yosemite's historic fruit trees. The tree varieties were identified where possible and brief histories were assembled. Kennedy noted the small number of varieties located throughout the park and he attributed the lack of diversity to multiple variables:

Yosemite's orchards preceded specialized monotypic practices and it is therefore unusual that these old orchards are not more diverse. It is possible that the homesteaders merely wanted to install an orchard and simply planted whatever was available in the area. If the plantings were hastily installed to satisfy homestead requirements, it is possible that cultivar choice was left to the Sacramento nurserymen who supplied the trees. It is also possible that package offers of trees were accepted or even that unscrupulous nurserymen dispatched mislabeled lots of trees. No trees at Yosemite were top-worked in order to add new grafted

[26] Only naturalized citizens of the United States were eligible to homestead land, which allowed only persons of white descent to become US citizens. However, women were allowed to file homestead claims.

varieties onto mature trees. This suggests both the lack of sophistication of Yosemite orchardists compared to their peers elsewhere in rural California.[27]

With the exception of the more recent Fire Dormitory orchard in Wawona, the orchards in Yosemite National Park date to a 30-year period between 1856 and 1885. This era is pivotal due to the Homestead Act (1862) closely followed by the Yosemite Grant (1864).These orchards represent this early era of homesteading and settlement in the Sierra Nevada, prior to the establishment of Yosemite National Park. These include the most prominent orchards in the park, such as Galen Clark's orchard in Wawona, the Curry Village and Lamon Orchards, Hutchings Orchard, remains of small "back porch" orchards around the Valley, the Meyer and McCauley Orchards in Foresta, and the Hennessey Ranch and Johnny Wilson's Place in El Portal

Many Yosemite pioneers were entrepreneurs catering to early tourists who visited Yosemite Valley. This not only included lodging but food as well. Not all orchards were originally intended for retail purposes but most ended up filling demand for fresh food, baked goods and alcoholic beverages. James C. Lamon planted two orchards in the Valley for this purpose. These two orchards were among the most prominent in the park and they are the largest extant orchards. Many visitors to the park benefited from Lamon's cultivation of the Valley and recorded their impressions of Lamon's farm:

He has truly made the wilderness to 'blossom like the rose' and has succeeded in raising excellent vegetables, and some exceedingly fine berries and other fruit; his garden is one of the sights of the Valley, and the visitor is sure of a warm reception; if the proprietor be not at home to sell you his fruit, you are allowed to pick and eat, but not to carry away, in his garden, depositing on his window a quarter or half a dollar in silver.[28]

Both inside and outside the Valley, other orchards were planted to sustain Yosemite's growing tourism industry. In Wawona, the Washburns planted the largest orchard in the park to provide fruit for the growing Wawona Hotel and Yosemite Stage & Turnpike Company stage route. A few trees of this short-lived orchard remain along the edge of the golf course, which replaced the orchard in 1918. The Foresta farms and orchards were used to grow produce for the various hotels and park management in the Valley. Presumably these farms were profitable for their proprietors, who would deliver loads of beef and produce to the Valley multiple times per week. In El Portal, fruit trees and vegetables were grown by James Hennessey and Johnny Wilson to sell and trade with visitors and local workers.

Prior to the 1864 Yosemite Grant, several farms and orchards were established by early settlers in Yosemite Valley, notably the two orchards planted by James C. Lamon. Remnants of smaller, backyard orchards in the Valley date to this time; however, few trees remain. James Mason Hutchings planted his orchard in 1865. Both Lamon and Hutchings had settlements within the Valley by the time the Yosemite Grant was created in 1864. According to U.S. law at the time, their homesteads were not technically legal; only surveyed lands could be homesteaded and the Sierra remained un-surveyed. As squatters, they simply hoped that their claims would be approved after the Valley was legally surveyed. However, when the Valley was set aside for preservation by the U.S. government in 1864, litigation ensued for years between Hutchings, Lamon and the government. In 1868, the pair was awarded the right to keep their claims within Yosemite Valley and they

[27] C.T. Kennedy, *Survey of the Orchards of Yosemite National Park* (1991).
[28] James Lamon: Yosemite's First Settler, (ca. 1874). 6.

were allowed to designate the boundaries of their property.[29] Hutchings laid out his claim in the form of a cross stretching from wall to Valley wall. Lamon's claim split his property into two sections that covered both of his orchards. Eventually, after extensive litigation, both men lost the right to private property and settled with the government. However, they both were offered the opportunity to lease their land, which only Lamon accepted.[30] Presumably, the decline of Lamon's orchards began sometime after his death in 1875.

With the transition of the Yosemite Grant to a National Park and the subsequent boundary expansion in 1890, management of the park's previously private lands began to shift. Early superintendents focused largely on making the rough country in Yosemite accessible by horse trail and mapping the resources within the park boundary. Management, particularly under Director Steven T. Mather, eventually transitioned to the maintenance and preservation of the natural environment. New transportation routes provided easier and more rapid delivery of produce to concessioners; therefore, the park's farms and orchards were phased out. Residents of Foresta, which was partially incorporated into the park in 1905, continued to occupy their land and operate their farms into the 20th-century. One of the last surviving ranches in Foresta was Meyer Ranch, which was run by the Meyer family until the 1970s.

The extant park orchards represent the only living and often the only physical evidence of Yosemite's extensive homesteads and farms. These farms were once the sole providers of fresh produce to residents and tourists alike. They played an important role in Yosemite's early culture and tourism infrastructure. The extant fruit trees, primarily apples, still produce fruit that has been enjoyed by residents and visitors for almost 150 years.

Current Conditions of Yosemite's Orchards

The physical conditions of Yosemite orchards vary by location but the trees are quite old (between 60 and 150 years) and consequently, they often are in poor physical condition. The physical condition is dependent on several site-specific factors including degree of exposure to direct sunlight, available moisture in the soil, disease, and other factors including soil compaction and damage by bears or high snow loads. Individual trees range between excellent condition and poor condition; however, most are between fair and poor condition. None of Yosemite's orchard trees have received cyclic maintenance in recent history and this also has allowed them to become less vigorous than similarly aged trees that receive treatment such as irrigation, pruning, and mulching. Perhaps the single most debilitating external factor for these trees is the natural encroachment of the surrounding forests. As the orchards have aged, surrounding forests have grown higher and have encroached upon previously open areas; consequently, many trees exist in part or full shade.

The historic integrity of Yosemite's orchards is based on the orchard's ability to convey its historic significance. In many cases, this is based on the extent to which the formal layout of the trees and the form of the trees themselves resembles the original orchard. The ability of an orchard to effectively reflect its past and contribute to a cultural landscape is a primary factor when determining an orchards historic integrity. Written or photographic data that informs our understanding of the orchard's past also can enhance our

[29] Alfred Runte, Yosemite: The Embattled Wilderness (Lincoln & London: University of Nebraska Press, 1990). 15-23.
[30] Ibid. 10.

estimation of its integrity. Some of Yosemite's orchards have moderately high historic integrity for their age and this is primarily because they have been preserved by the National Park Service. These might include the Lamon and Curry Village orchards and the Meyer Ranch orchard. The Curry Village orchard, although in poor physical health, possesses high historic integrity due to the orchard-like setting preserved by the ordered rows of the parking facility. Others, such as the Washburn orchard, have very little historical integrity. Because the golf course and the Wawona Road eliminated such a high proportion of that orchard, the extant relic in no way resembles its original form.

The absence of active maintenance certainly has had a profoundly negative effect both on the physical condition and historical integrity of Yosemite's orchards. Maintenance likely ceased when original or subsequent proprietors died or abandoned them and since that time, the National Park Service has adhered to passive, benign neglect. This approach has allowed many historic orchard trees to become shaded by native vegetation and it has allowed many more to die undocumented. Lack of any pruning has lead to the trees having dense, overgrown canopies that do not easily shed snow. Consequently, Yosemite's orchard trees collapse nearly every year due to excessive snow-loading. Many trees are very nearly dead and are in urgent need of a stabilizing maintenance regime. In the absence of maintenance, only the hardiest individuals have survived and these prove to be almost exclusively apple trees. Apples, however, also have a longer expected lifespan than other fruits; therefore it is expected that most of the peach, pear, cherry, plum, nectarine, and almond trees have died.

Many orchard relics have been recognized as important historical resources around the park. A number of Yosemite's orchards are a part of various historic districts and other nominations to the National Register of Historic Places. Hutchings' orchard is a part of the 1977 Yosemite Village Historic District as well as the Yosemite Valley Historic District Nomination. In addition to Hutchings' orchard, the Lamon and Curry Village Orchards are contributing features of the Yosemite Valley Historic District. The nomination describes the three apple orchards as,

"…the last significant landscape features associated with the extensive 19th-century history of homesteading and early tourism in the Valley. The Lamon Orchard and meadow are the best-preserved examples of this theme. Hutchings' Orchard is also a contributing site for the same reason, although it is in poor condition,"[31] and, "One of the most remarkable features of Camp Curry is the parking lot/apple orchard, first suggested by Frederick Law Olmsted, Jr. in 1927.[32] This proved to be a happy reuse of an 1861 apple orchard, which, by 1927 had little use since produce could be brought in economically on improved roads. The rows of mature fruit trees give a certain dignity to the space, although the frequent overcrowding of the lot, and the additional parking area immediately to the south, undermine the quality of the orchard space".[33]

Other park orchards, including Meyer Ranch and Galen Clark's Homestead have been included in National Register nominations for which the nomination process has not been completed. Many of the park orchards also are mentioned by Linda Greene in her 1987 park-wide Historic Resource Study.

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[31] *Yosemite Valley Historic District National Register Nomination*, (Yosemite National Park: Department of the Interior, National Park Service). 28.

[32] Olmsted actually opposed the parking lot, however, the Board of Expert Advisors, of which Olmsted was a part, eventually decided to place the parking lot amidst the orchard.

[33] *Yosemite Valley Historic District National Register Nomination*. 49-50.

Despite their acknowledged historical significance, most of Yosemite's orchards have insufficient recorded data to understand original layouts. Commonly lacking information includes comprehensive lists of species and varieties, historic irrigation methods and historic use of fruit. It is particularly difficult to discern historic layout for previously extensive orchards that have few trees left. This includes the McCauley Ranch orchard, most of which burned in the 1990 A-Rock fire, the Sentinel Beach orchard, and the majority of the remaining orchards in Wawona.

Despite the lack of direct management recommendations for these historic resources, many park documents give over-arching guidance for their management. The 1980 General Management Plan for Yosemite National Park succinctly states the mission of resource management within the park:

- Restore and maintain natural terrestrial, aquatic, and atmospheric ecosystems so they may operate essentially unimpaired,
- Preserve, protect, and restore scenic resources and,
- Preserve, restore, or protect significant cultural resources (historic and prehistoric).[34]

These mandates, unfortunately, are often incompatible. This is the case with Yosemite's orchards. Historic orchards certainly are significant cultural resources; however, their fruit is an unnatural food source for many species of wildlife. When wildlife feed on orchard fruit it disrupts natural ecological relationships. This conflict is most apparent with black bears. Fruit affects the natural feeding habits of the American black bear, *Ursus americanus*, which is estimated to number between 300 and 500 in Yosemite.[35] Black bears are an important part of the Yosemite ecosystem but can adapt their diets if given access to human food. Throughout the park it is common to find bears feeding on apples in the orchards.

Orchards in the park typically are near human habitation or recreation areas. This proximity presents the increased potential for human-bear interactions; it compounds the problem in such a way that bears are lured close by the orchards and then become attracted to other sources of human food. Not only does this reinforce the un-natural food habits of the bears, but it increases the incidence of bear / human conflicts and property destruction. Even in years of poor apple yield, bears still frequent the orchards and enter adjacent visitor use areas. Most forms of orchard tree stabilizing maintenance improves fruit yield, which would further exacerbate the management dilemma. If, however, management strategies can be implemented that would prevent bears from seeking or obtaining fruit, these cultural resources can coexist with the natural ecosystem within which they are situated. Annual fruit harvest days take place in the autumn; however, these events are limited to the Lamon and Curry Village orchards. This helps to reduce available fruit and provides a source of fruit for Yosemite area residents and volunteers. Fruit derived from other orchards is often harvested by individuals, although no concerted fruit-picking effort takes place in orchards other than Lamon and Curry Village. This effort represents the only current fruit management for Yosemite's orchards. In the past, any leftover picked fruit has been donated to a local hog farmer.

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[34] *Yosemite National Park, General Management Plan*, (Yosemite National Park: Department of the Interior, National Park Service, 1980). 5-10.
[35] Yosemite National Park, Wildlife (Dec. 22, 2004 [cited July 24 2008]); available from http://www.nps.gov/archive/yose/nature/wlf_bears.htm.

Though the diverse orchards in the park each require unique treatments based upon their existing conditions and historical integrity, some recommendations can be implemented on a park-wide basis.

PARK-WIDE RECOMMENDATIONS

Every orchard in Yosemite should undergo either (1) removal or (2) stabilization. In most cases, orchards that receive stabilization will also receive one of four treatment standards as defined in the *Secretary of the Interiors Standards for the Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes*: preservation, restoration, rehabilitation, and reconstruction.

Preservation standards require retention of the greatest amount of historic fabric, including the landscapes historic form, features and details as they evolved over time.

Restoration standards allow for the depiction of a landscape at a particular time in its history by preserving materials from the period of significance and removing materials from other periods.

Rehabilitation standards acknowledge the need to alter or add to a cultural landscape to accommodate continuing or new uses while retaining the landscape historic character.

Reconstruction standards establish a framework for recreating a vanished or non-surviving landscape with new materials, primarily for interpretive uses.

Some orchard trees within Yosemite are not historic. Many, for example, have grown from root-suckers into mature trees and these should be removed because they do not possess historic or valuable genetic resources because root-suckers are derived from the seedling rootstock. Other trees may have sprouted from seeds and these also should be removed. When non-historic trees are removed, no additional process is necessary. When historic trees are slated for removal, these must first undergo documentation and germplasm conservation, if necessary.

As a first step in beginning to properly manage Yosemite's historic orchards, all fruit trees should be identified. Although Kennedy identified a number of the trees in his 1991 report (see Appendix III) a large number of trees remain unidentified. Trees that remain unidentified include those trees that were either not fruiting in 1991 or are components of entire orchards that were not inventoried at that time (namely, the orchards in Foresta and El Portal). Once all of the trees are identified, the park should consult with staff at the USDA federal germplasm repositories and make sure that all of our cultivated varieties are represented in their collections. Germplasm conservation is the process by which the genetic material is cryogenically preserved in an indoor facility. The USDA Agricultural Research Service at Geneva, New York, should be the only federal germplasm repository for Yosemite apple material; its sister facility in Corvallis, Oregon should be the repository for pears. To conduct the genetic testing of fruit trees, several green leaves of each tree should be harvested from each tree of interest and placed in labeled zip-lock bags. Then, these leaves should be shipped overnight to the National Council of Genetic Resources Preservation (NCGRP) in Fort Collins,

Colorado.[36] It should be noted that many of the fruit tree varieties that were identified in the 1991 Kennedy report are not currently represented in the national germplasm repository.[37] Once germplasm conservation is completed, the genetic resources contained within the park's historic trees should be safely preserved in perpetuity.

Prior to removal, historic trees also can be propagated *in situ* at Yosemite. For example, this document recommends the rehabilitation of the Lamon orchard and the Meyer Ranch orchard. If this were executed, orchard rows that have missing trees could be in-filled with propagated cuttings from representative varieties from throughout Yosemite's orchards. These cuttings would have to be cultured at a nursery facility until they reached sufficient size to install in the field. By this means, these orchards could serve as interpretive arboretums of Yosemite's historic fruit trees.

Those trees that are not slated for removal should undergo stabilization measures. If, for example, an orchard will be neither preserved nor removed, its specimens will be allowed to age and die; however, these trees must be maintained. Stabilization measures include the removal of all encroaching natural vegetation, the removal of root-suckers, yearly pruning, removal of dead wood, yearly fruit removal, and optional mulching. For rehabilitated orchards, it may even be possible to restore historic irrigation techniques, if the methodology can be determined. These activities represent a responsible management regime for all trees that will not be removed. This management will be expensive and labor-intensive; therefore, these guidelines will recommend the reduction and consolidation of orchard resources. For many orchard trees, stabilization will be the full extent of management activities; however, for some others, stabilization will be a step toward preservation or rehabilitation.

The removal of vegetation is a particularly difficult and even controversial activity. In some instances, a mature forest has completely overcome areas of historic orchards. This has occurred along the northern edge of the Curry Village orchard, between the parking facility and Southside Drive. It also has occurred along the northern edge of the Lamon orchard. In some instances, management may want to consider removing those portions of orchard that are overgrown with large groups of mature trees. In some other instances, it may be desirable to remove large pine and incense cedar trees, especially when such removal serves multiple purposes. The installed pines, for example, between Curry Village Drive and the Curry Village orchard parking facility were the result of a misguided planting of ponderosa pine saplings in1929 and therefore are not natural in that area.[38] Their removal would benefit the orchard but it would also benefit the historic Curry Village viewshed and the ecology of the adjacent wetland.

Stabilization techniques probably will stimulate fruit production in some instances; however, some measures can be taken to help reduce fruit production or ease its management. To promote tree vigor, trees should be pruned during the winter months. However, a second light pruning during the summer comprised of removing the flower clusters at the cluster ends, would retard fruit production. Herbaceous vegetation also

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[36] Gayle Volk, USDA plant geneticist, telephone and email correspondence with Historical Landscape Architect Daniel Schaible, October 8, 2010. Also, see Appendix IV.

[37] Gayle Volk, USDA plant geneticist, telephone and email correspondence with Historical Landscape Architect Daniel Schaible, October 6, 2010. Also, see Appendix IV.

[38] Yosemite National Park, Camp Curry Cultural Landscape Report (2010). 103-104.

competes with orchard trees and it is therefore advisable to periodically mow the vegetation beneath the drip line of the rows. Mowing beneath the rows will improve tree health, but it also will make fallen fruit more visible and therefore easier to pick up on volunteer work days.

Stabilization measures should be undertaken as described above unless otherwise stated in individual orchard recommendations. Additional preservation and rehabilitation recommendations are provided for the majority of orchards; however, all preservation or rehabilitation actions should be preceded and accompanied by these standard stabilization techniques. Because the orchards have had no maintenance for many years, new maintenance regimes may result in a new burst of growth and a possible increase in fruit production (although this can be mitigated by a light pruning during the summer). Several additional options are available to reduce fruit production.

One important effort is the removal of less important or individual trees from around the park. This would concentrate management energy on selected and intensively managed areas. These guidelines recommend the stabilization and rehabilitation of select orchards, the removal of many more, and the ultimate effect of this strategy is a consolidation of these cultural resources onto fewer well-managed sites. This compromise would reduce the impact on native ecosystems and wildlife and allow for better preservation and maintenance of the remaining trees. Of the current 562 historic fruit trees, this management plan recommends removal of 252 fruit trees, and stabilization or no action on approximately 66 trees throughout the park. The plan recommends the installation of approximately 100 new trees to in-fill rehabilitated orchards; however, the result will be a net loss of trees throughout the park and a reduction in the number of sites where fruit can be accessed by wildlife, particularly in areas that have a documented history of negative bear/human interactions. Over one-half of the extant trees will be either removed or lost through attrition.

Wildlife access to orchard fruit can be reduced in several ways. Bears will eat immature apples during the spring and early summer before they are ripe so some effort should be made to prevent or reduce fruit production. The first method, as discussed earlier, would be carried out through a light summer pruning. Any fruit that is formed should be removed early in the season while the fruit is still green. This can be accomplished with organized volunteer work days, wherein trees are shaken and the branches are beaten with rods to dislodge unripe fruit. What remains will be a fraction of the typical fruit yield and in years when this fraction is still substantial, the latter volunteer event can be repeated.

In Yosemite Valley, seasonal harvest days are organized by the park and accomplished by locals, volunteers and visitors. These activities take place once or twice per year in the Curry Village and Lamon Orchards but do not remove all of the fruit. Harvest typically occurs when apples already are ripe but probably should be conducted earlier in the season. A Yosemite-wide harvest plan could be implemented and the apples utilized in interpretive activities, such as cider production. Apples also could be given to local food banks and local residents for personal use. If used for baking, apples can be harvested before they are completely ripened.

An innovative solution to orchard management in Yosemite might be issuing a Special Use Permit to an outside organization or individual to manage the orchards. If pursued, this Special Use Permit should be issued in accordance with Director's Order #53: Special Park Uses, Section 11. Agricultural Uses. This document states that, a Special Use Permit can be "…issued for agricultural activities which meet defined objectives of restoring or perpetuating human-influenced landscapes identified in NPS planning

documents…In Permitting agricultural use of NPS lands, the NPS will foster practices which conserve soil, protect natural waterways and groundwater, control proliferation of exotic species, and avoid toxic contamination of the environment." Prior to pursuing this option, a financial analysis and feasibility study should be conducted to ensure that outside maintenance of the park's historic orchards is a viable option.

As an absolute last resort and pending compliance, hormonal sprays could be applied to fruit trees before fruiting to prevent or lessen the fruit yield for that year. If used at the recommended strength, the sprays will reduce a crop of commercial apples. According to UC Davis Pomologist Scott Johnson[39], the sprays can be applied at several times the recommended strength for a stronger affect. The effect of the hormonal sprays on native plant species, however, has not yet been assessed; therefore, this option is probably inappropriate within a national park. At the least, these products should be further researched and tested before mass application. Products include Amid Thin and Ethrel.[40]

In order to best accomplish the variety of yearly maintenance tasks, a series of funding options should be pursued. Implementation of these recommendations should be executed by Yosemite National Park staff or by a qualified contractor. Mutual agreement between divisions, primarily Resources Management & Science and Facilities Maintenance and potentially Business and Revenue Management and park partners will be necessary to define monetary and maintenance responsibilities.

Orchards in Yosemite are concentrated in four different geographic areas: Foresta, El Portal, Yosemite Valley and Wawona. Each area has a unique place in Yosemite's history. Detailed recommendations are therefore divided across these three geographic areas and each area's respective orchards.

Currently, no interpretive plaques or signs are present at any of the park orchards. This should be remedied for several of the park's prominent orchards, at least one in each major geographic area. Interpretation should include at minimum a standard 24 inch by 36 inch interpretive plaque, prominently placed near the orchard or along an orchard pathway. If appropriate the sign can interpret other nearby features as well. It would be excessive to place signage at all remaining orchards so interpretation should be implemented as discussed in the following individual orchard recommendations and only in concert with a park-wide Long-Range Interpretive Plan.[41] In addition, all of the fruit trees should be permanently labeled, with the labels including the trees species and cultivated variety. This would aid in the interpretation and resource management of the park's historic orchards.

Concurrent with the stabilization of orchards, all orchards that will be maintained into the future should be entered into the NPS Facilities Management Software System (FMSS) as maintained landscape locations. This will allow the park to be able to receive project funding to maintain its orchards, from sources such as the Cultural Cyclic Maintenance fund.

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[39] Scott Johnson Ph.D., University of California at Davis Pomology Department. Kearney Agricultural Center Extension Specialist for apples, kiwifruit, fresh shipping peaches, nectarines and plums, with Historical Landscape Architect Sky Skach, February, 2008.

[40] See Appendix for Material Safety and Data Sheets.

[41] A Wayside Signage Plan does not currently exist although work is expected to begin in 2008.

Yosemite Orchard Locations

Figure 3 illustrates the locations of Yosemite Valley, Wawona, El Portal and Foresta, where most major orchards are located. Individual and small groupings of fruit trees, both historic and non-historic, also occur in other areas including several individual trees in the El Portal Administrative area, one non-historic tree at the Arch Rock entrance station and a historic specimen at the Cuneo House at Hodgdon Meadow. It is likely that other individual trees exist elsewhere in the park.

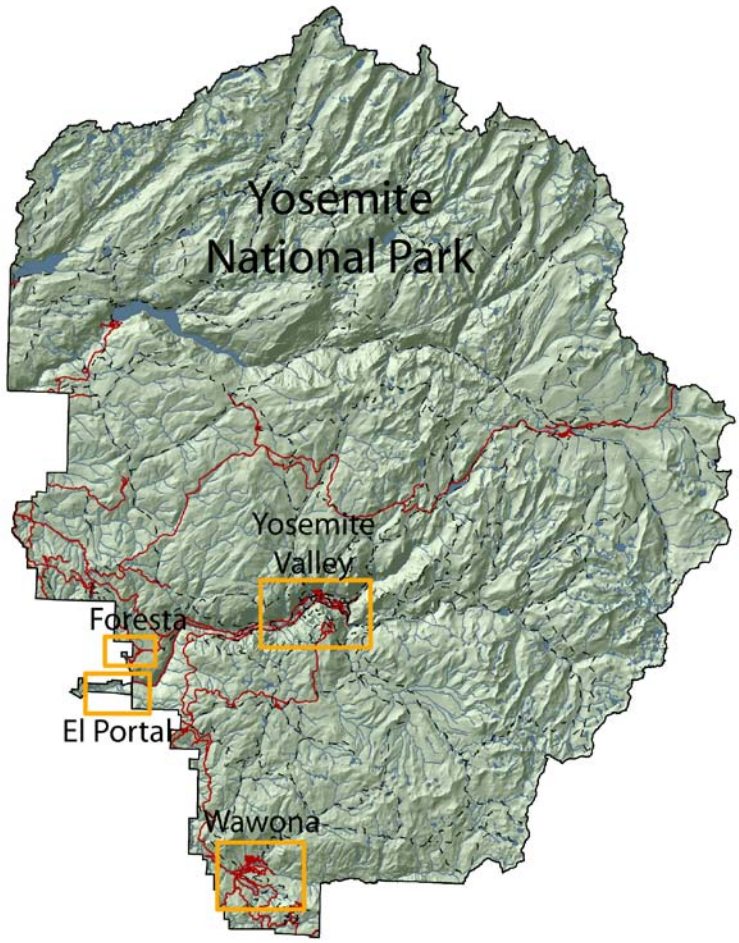

Figure 3. Site plan showing the three discrete Yosemite areas that have major historic orchards.

Foresta Area Orchards

Introduction

Two orchards occur in the Foresta area. These are associated with the Meyer and McCauley ranches, respectively. Foresta was founded by pioneers and its rural agricultural economy was associated with the development of tourism in Yosemite and these two orchards were important components of this early cultural landscape. The orchards at Foresta remained under private ownership until the 1970s; consequently, they have been without maintenance for a much shorter period of time than other Yosemite orchard and are therefore in better condition. The large A-Rock fire swept through the area in 1990 and destroyed many trees in these orchards. Common problems with the remaining trees include drought stress, competition from both overstory and understory vegetation, and fire damage. Foresta was not part of the comprehensive 1991 fruit tree inventory and the specific varieties are unknown.

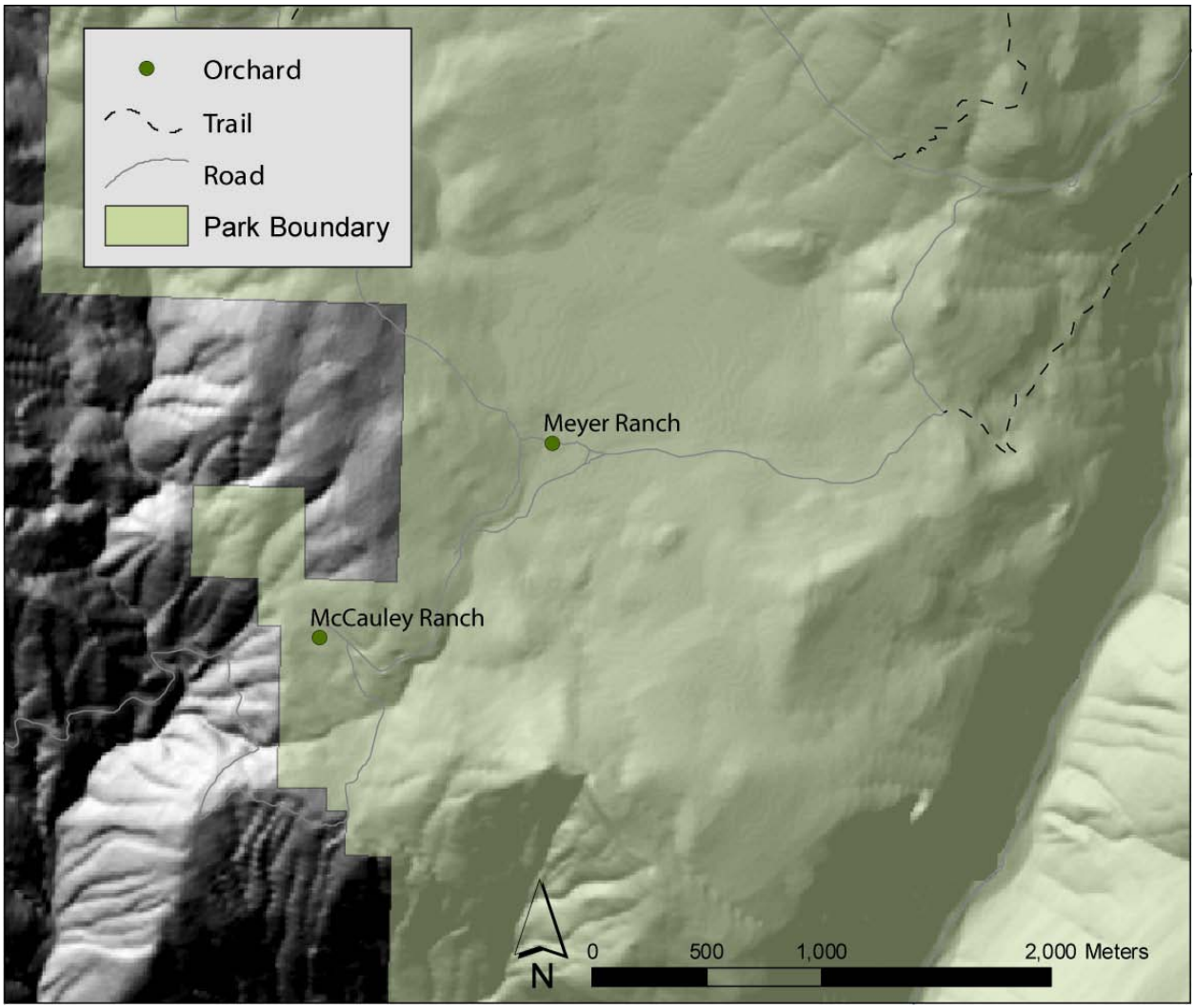

Figure 4. Orchard locations in Foresta.

HISTORY

Foresta was one early settlement in the Yosemite area. It was home to many influential pioneers and it remains a unique privately-owned inholding. Foresta contains the remains of two homestead orchards, one at Meyer Ranch and one at the remains of McCauley Ranch. The histories of these two homesteads have been intertwined since their inception.

After the completion of the Coulterville Road on June 18, 1874, followed a month later by the completion of the Big Oak Flat Road, Foresta could be accessed by wagons and stages. One year later, two Germans, John Diedrich Meyer, one of 11 children, and his business partner Peter Van dar Miesson became the first Euro-American settlers in the Big Meadow area when they paid an American Indian less than $15 for his squatter's rights. Miesson, whose Americanized name was Peter Mieson, began working the land while Meyer remained in Groveland, where he was joined by four siblings.

One of John's brothers, Gerhardt (George) Meyer, was injured while working on the Big Oak Flat Road and went to Big Meadow to recover. Within a few years George had acquired his brother's interests there and became Mieson's partner. In 1881, Mieson became a naturalized citizen, followed by George Meyer a year later. Upon receiving citizenship, each filed for 160-acre homesteads and, due to boundary irregularities, ended up with a total of 324 acres.[42] The partners collected tolls and ran a stable for the Washburn & McCready stage company along the Coulterville Road, which ran adjacent to their homesteads. They enlarged the meadow, planted crops such as barley, alfalfa, potatoes and berries, started a produce garden and orchard, and acquired cattle and hogs.

It is uncertain exactly when the orchard at Meyer Ranch was planted, but it was probably between 1873, when Mieson began "improving" the land, and the early 1880s when the partners became American citizens and received land grants. The orchards may have been planted earlier to fulfill the Homestead Act's requirements; however, the form of the trees, which have shorter trunks, averaging 2.5 feet tall and pruned forms, indicate that they were planted after the homestead was granted, when changes in national orchard management practices gave rise to open bowl pruning styles. Spacing between trees averages approximately 20 feet, which further indicates that the

FIGURE 5. VIEW DOWN THE COULTERVILLE ROAD TOWARD MEYER RANCH HOUSE AND ORCHARD, CA. 1950.

[42] Shirley Sargent, Yosemite's Rustic Outpost: Foresta Big Meadow (1983). 9.

orchard was planted in the late 19th-century, as 20-30 foot spacing was common at that time.[43]

Mieson and Meyer were helped around the ranch by George Anderson, a Scotsman. The Scotsman was an ex-miner and sailor who helped the partners build the ranch house and barns. In return they allowed him to build a small cabin on the southern end of their property. Anderson is most famous for being the first man to climb Half Dome; he is also known for his attempt to build a wagon road to the top of Vernal Fall. He intended to build a trail up Half Dome, with a hotel halfway up, for which Mieson and Meyer were to provide produce and meat. Anderson's 1884 death from pneumonia, however, aborted those plans.

The fourth man to settle in Foresta was an American Indian by the name of Thomas A. Rutherford from New York. Around 1878, he homesteaded 160 acres adjoining the southern boundary of Meyer and Mieson's property. In 1883, James McCauley purchased the holdings of John Hamilton, a Yosemite guide, who settled about a mile south of Meyer's property and built his house and barn on 40 acres. A year later, when Rutherford died of pneumonia, both Meyer and McCauley wished to obtain the deceased's land, which included a water-powered sawmill and blacksmith shop. To Meyer's dismay, McCauley was appointed administrator of Rutherford's estate and when the property was auctioned off one of McCauley's hired men purchased the property with money supplied by his employer. The property was eventually transferred into McCauley's name and he then homesteaded an additional 160 adjoining acres.

FIGURE 6. THIS CIRCA 1950 IMAGE SHOWS THE MEYER RANCH WITH BOTH ORCHARDS INTACT, AT LEFT AND RIGHT OF THE HOUSE.

James McCauley was a key character in the early development of Yosemite Valley. He was responsible for financing and building the Four-Mile Trail to Glacier Point. In the winter he and his family lived at their ranch in Foresta, but the rest of the year they lived in the Mountain House at Glacier Point, where he ran the inn and started the infamous Firefall. The McCauley Orchard is planted on the 160 acres that McCauley homesteaded after he purchased the Rutherford property. The orchard was probably planted in the 1890s, either as part of the homestead requirements or shortly after the land grant was awarded in 1894.

[43] Dolan, Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft). 183.

In 1900, after years of courting, George Meyer married McCauley's niece, Elizabeth McCauley, and shortly thereafter, in 1905, the boundaries of Yosemite National Park changed to incorporate Meyer Ranch and the Rutherford property but not the lower part of McCauley's ranch, which contains the orchard. The park came under the jurisdiction of U.S. Army rangers and residents had to abide by their rules, including proper fencing of cattle. The locals benefited from Army tenure, however, because they were able to sell cattle and produce to feed the military men.[44]

After McCauley's death in 1911, some of McCauley's land, the original 40 acres, was sold by his sons and became the site of Foresta. The Rutherford homestead also was sold and parceled into lots. The McCauleys did not, however, sell the portion of land that contained the ranch house, barns and orchard. George Meyer died in 1917 and both men left their property to Elizabeth McCauley Meyer.[45]

Figure 7. The 1941 fire camp in the Meyer Ranch orchard.

In 1935 the McCauley Ranch house burned, followed by the Meyer Ranch house in 1937. The McCauley house was never rebuilt but the Meyer Ranch house was rebuilt in its original location by Meyer's sons. A few years later, in 1941, another fire endangered Foresta and the Meyer orchard was utilized for a different purpose. "Mrs. Meyer related that 'a big crowd of men came here quick.' For several days, the firefighters had a camp in the orchard across from her new house."[46]

The 1990 A-Rock fire burned a large area of the western portion of the park, including many homes in Foresta and a large portion of the McCauley Orchard. Today, only a few trees from the McCauley Orchard remain.

Many historic farm orchards remain undocumented throughout their history. Such ordinary, utilitarian landscape features often were overlooked and typically were deemed worthy of preservation. The Foresta orchards are no different, but remain as a testament to the tenacity of fruit trees and a record of early pioneer life in the Foresta area.

[44] Sargent, Yosemite's Rustic Outpost: Foresta Big Meadow. 12.
[45] Ibid.
[46] Ibid. 59.

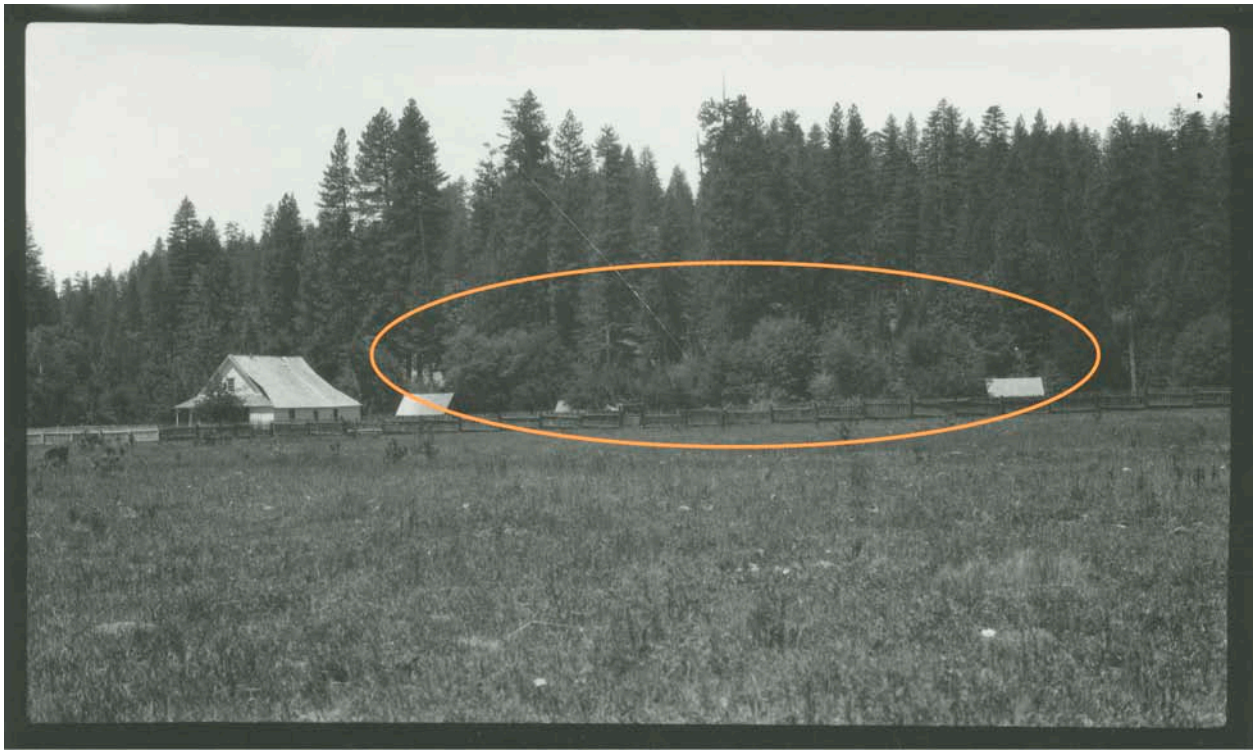

FIGURE 8. SOUTH VIEW TOWARD MEYER RANCH ORCHARD ACROSS COULTERVILLE ROAD. MUCH OF THIS ORCHARD STILL EXISTS. (YOSE, CIRCA 1930S)

FIGURE 9. NORTHWEST VIEW TOWARD ORCHARD ALONG THE EDGE OF BIG MEADOW. ONLY ONE LIVE TREE REMAINS. (YOSE, CIRCA 1930S)

Meyer Ranch

Existing Conditions

Unlike the rest of the park's orchards, the Foresta orchards, including that of Meyer Ranch, were not part of the 1991 Kennedy inventory. These individuals therefore have not been identified and may contain rare or locally significant varieties. With two exceptions – an unknown tree and a plum tree – the fruit trees are apples. Spacing between trees averages 21 feet apart. No developed fruit was observed in August 2007, although the unknown specimen and a few apple trees carried the remains of aborted fruit. The lack of fruit indicates severe stress, which results from multiple factors.

The orchard is encroached upon by the surrounding ponderosa pine forest, which shades the sun-loving apples. Several rather large pines within the orchard also are shading the apple trees. Some are growing near enough to severely impact the health of the fruit trees. These pines also compete for a limited supply of water, further compromising the health and longevity of the orchard. Small pines are common throughout both the orchard and the nearby meadow. The orchard understory is comprised of tall grass that further competes for limited water resources. The trees themselves show no evidence of recent pruning and probably have not been maintained during the 30 plus years since the Meyers left the property. Many of them have dead limbs in the canopy. Fallen and dead branches can be found around the bases of many trees, some of which have fallen over and either are dead or have few remaining live branches. Root suckers, which sap resources from the scion, can be found at the base of a few trees.

Condition	Number	Percentage
Dead	9	24%
Poor	11	30%
Fair-Poor	4	11%
Fair	4	11%
Good-Fair	2	5%
Good	7	19%
Total	37	100%

Table 2. Meyer Ranch orchard condition assessment.

The remains of a ditch occur along the southern side of the orchard. The ditch may be the remains of an old irrigation system or of a channel dug to power the early sawmill built by Thomas Rutherford. Other remnants of farm life, including fences and a well house, also remain on site.

While the orchard remains in relatively good condition in comparison to other park orchards, it has not been maintained or restored with the rest of Meyer Ranch. The two barns, which are the last remaining original structures associated with the site's pioneer heritage, have been recently restored. The South Barn was restored in 1994 and the North Barn was reroofed in 2004 by the park's Historic Preservation Crew. More recently, a park partner

Figure 10. Current view from within Meyer Ranch orchard. (Photo: S. Skach, 2007)

association, the Yosemite Institute, restored the porch on the 1938 version of the farmhouse and completed rehabilitation of both the interior and exterior. Big meadow, adjacent to the ranch, is currently considered a candidate for ecological restoration. The orchard, however, has suffered from consistent neglect, likely dating to the passing of Elizabeth Meyer in 1952 or to the acquisition by the Park Service in the 1970s.

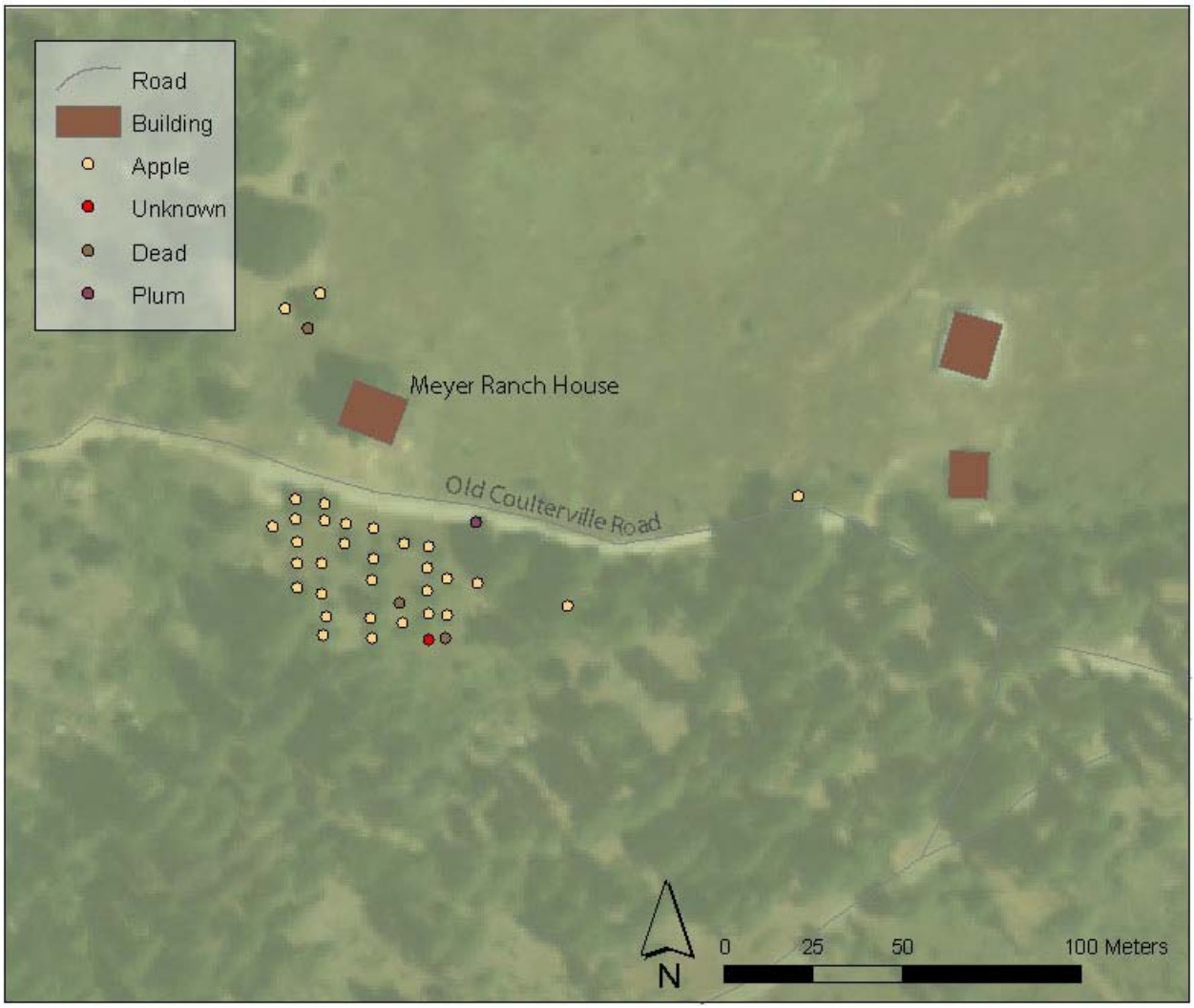

FIGURE 11. MEYER RANCH ORCHARD MAP.

FIGURE 12. MEYER RANCH TREE CONDITIONS: DEAD APPLE (#27), APPLE IN POOR CONDITION (#1), APPLE IN GOOD CONDITION (#8), AND APPLE IN FAIR CONDITION (#9), CLOCKWISE FROM UPPER LEFT (PHOTOS: S. SKACH, 2007).

RECOMMENDATIONS: REHABILITATION

The Meyer Ranch Orchard retains historic integrity and contributes to the Big Meadow homestead cultural landscape. The orchard itself could be evaluated for individual listing under National Register Criterion A or as a part of a historic district (including the two barns and the residence), which states that the orchard should be *associated with events that have made a significant contribution to the broad patterns of our history.* The orchard reflects the early homesteading history of Yosemite and represents the most complete remains of an extensive farm, which once provided fresh produce for the park's military administration and various hotels and concessioners in Yosemite Valley.

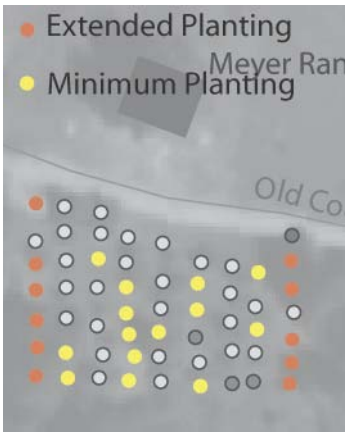

FIGURE 13. MEYER RANCH ORCHARD REHABILITATION LAYOUT.

Rehabilitation at the Meyer Ranch orchard would entail the infill of the broken rows with propagated trees from Meyer Ranch and McCauley Ranch orchard cuttings. This layout is illustrated in Figure 13.

Rehabilitation would require stabilization and annual maintenance. Upon stabilization, these historic trees should be inventoried by a qualified pomologist. Any varieties that are not currently represented in the federal germplasm repository should be sent there for conservation. To aid in interpretation and resource management, all of the fruit trees should be permanently labeled, with the labels including the trees species and cultivated variety. Young trees would be propagated directly from existing trees in the orchard by a qualified nursery. The trees will be ready for field installation in several years, but depending on the number of trees, a graduated planting plan could be distributed over a longer period of time, which would minimize the number of young trees at one time. The gaps within rows should be in-filled with propagated trees, with a minimum planting consisting of 13 trees and an extended planting of 25 trees. All young trees should be pruned and trained using techniques that date to the period of planting, the late 1800s. Trunks should remain short and the crown should be pruned into an open bowl style.

FIGURE 14. MATURE PINES ENCROACH UPON MEADOWS AND ORCHARDS, SHADING AND WEAKENING HISTORIC TREES. (PHOTO: S. SKACH, 2007)

Both young and old trees will also require irrigation to achieve optimal health. Young trees are not able to withstand summer drought, and in order to prevent rapid decline of the remaining historic trees they should be irrigated during the dry season. Commercial orchards use upward of 3 ½ acre feet of water per year and old apple trees can drink up to 60 gallons per day. However, these trees have not been irrigated for decades and the reintroduction of water should be staged in order to prevent mold in the root zone. Because the

orchard should not be managed to maximize fruit production, less than 3 ½ acre feet can be applied; preference for watering newly established trees should be given.

Near the back of the orchard, along the southern edge, the remains of an old irrigation ditch still occur. The most historically accurate method of irrigation would be accomplished through the restoration of this system. Significant historical research and archaeology work would be required to determine the full extent and exact layout of the irrigation system. Any irrigation options should be researched for potential impacts to the adjacent meadow hydrology.

The three trees that are north of the Mayer Ranch House and the two trees that are east of the orchard should be removed as they are non-historic. For additional information, including a year by year breakdown of treatment recommendations for the Meyer Ranch Orchard, refer to Appendix I.

McCauley Ranch

Existing Conditions

The 18 trees in the McCauley orchard are the remnants of a much larger orchard that was heavily damaged in the 1990 A-Rock fire. As a result, the extant trees are widely spaced with little evidence of row spacing or the previous extent of the orchard. This orchard therefore has very little historical integrity.

Condition	Number	Percentage
Dead	0	0%
Poor	3	17%
Fair-Poor	2	12%
Fair	3	17%
Good-Fair	6	34%
Good	4	22%
Total	18	100%

Table 3. McCauley Ranch orchard condition assessment.

The remaining trees' physical conditions range from poor to good. This orchard is unique in its relatively high number of extant pear trees. The orchard site is located across an open south-facing slope with no overstory competition and minimal groundcover competition. The overall condition of the orchard would be higher if not for the presence of a few unusual stressors. First, several of the trees are located within or directly adjacent to stock pens, and provide the only shade in the area. Root zones are compacted and bark and lower branches show some livestock damage. Furthermore, some trees are located underneath power lines, and have been chopped off, rather than carefully pruned, at approximately six feet. The downed wood was left on the ground nearby. Additional orchard-wide stressors include lack of water, root-suckers, and general lack of maintenance.

These trees, like those at Meyer Ranch, were not part of the 1991 inventory and therefore, varieties have not been identified. Several of the remaining trees produced healthy fruit and some were even prolific. Despite the relatively abundant fruit, much of which lay on the ground, little evidence of bear grazing could be found. Interestingly, a bee's nest at the base of a telephone pole adjacent to the heaviest fruit-bearing trees showed ample evidence of bear interest so it is clear that bears visit the area.

Part of the space occupied by a few trees also is used to contain stock animals. Livestock has been pastured in the McCauley fields during the summer season since at least 1985. The area holds horses or mules and

during the summer season the number of animals ranges from zero to ten. Staff at NPS Corrals maintains the fencing in the area and takes care of livestock stationed at McCauley Ranch.[47] Some of the historic fruit trees occur within the fenced areas.

FIGURE 15. SOME HISTORIC TREES IN THIS ORCHARD OCCUR BENEATH POWER LINES AND AS THE TREE AT CENTER-LEFT ILLUSTRATES, SOME OF HAVE UNDERGONE INAPPROPRIATE PRUNING.

[47] Johanna Wheeler, NPS Corrals Supervisor, E-mail Correspondence with Historical Landscape Architect Sky Skach, March 25, 2008.

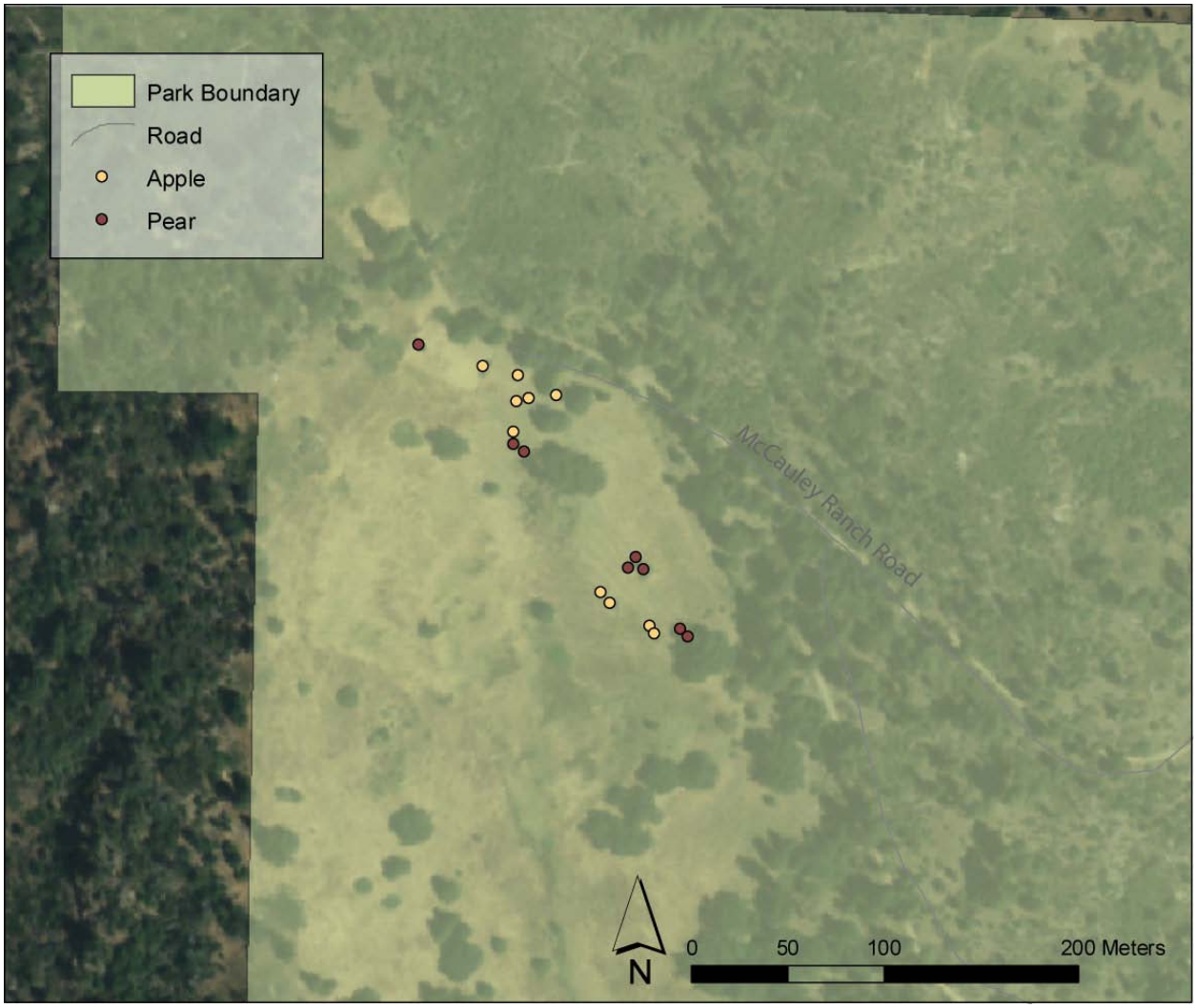

FIGURE 16. MCCAULEY RANCH ORCHARD MAP.

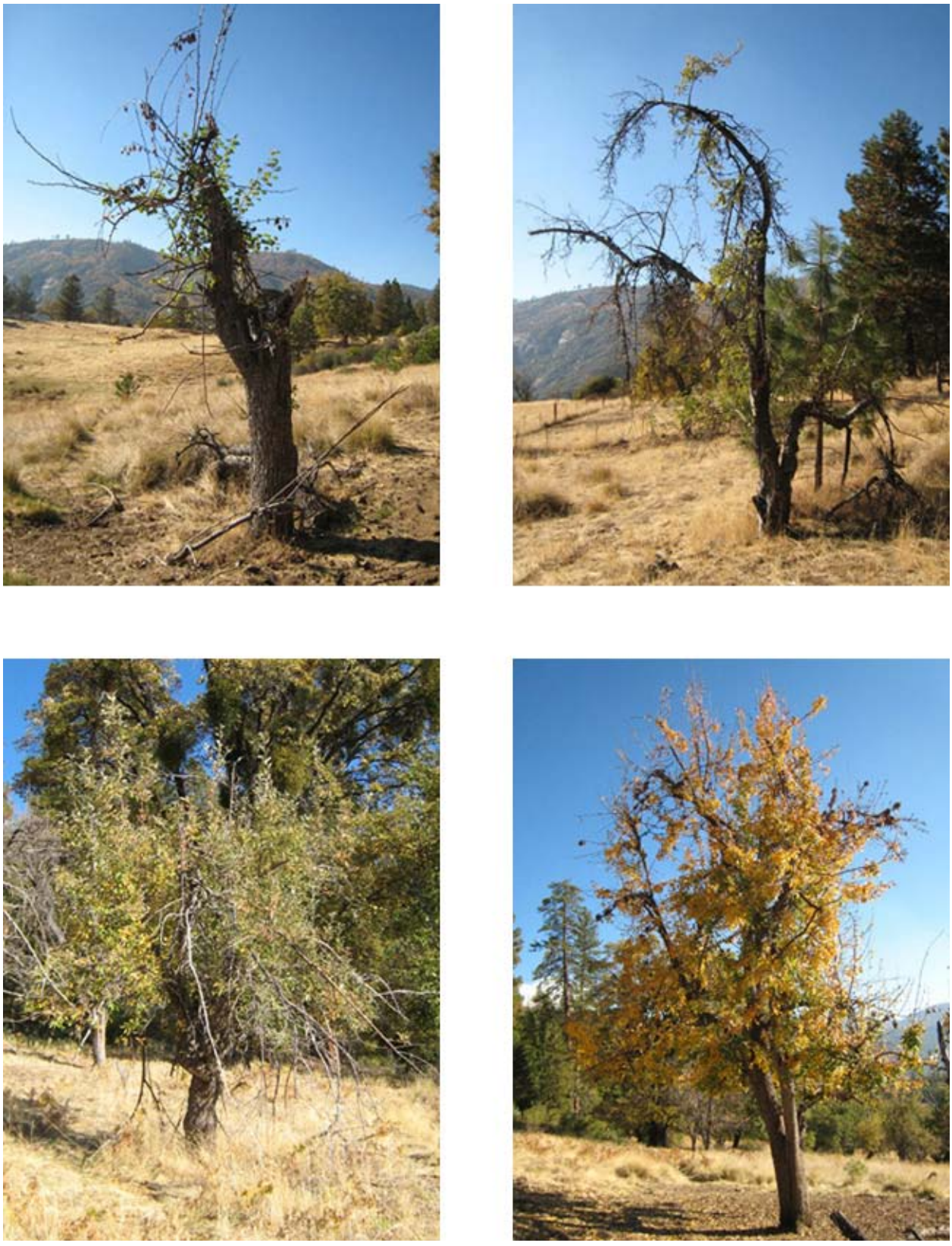

Figure 17. McCauleY Ranch tree conditions: Inappropriately cut Pear (#13), apple tree in poor condition (#3), Pear in good condition (#11), Apple in fair condition (#16), clockwise from upper left (Photos: S. Skach, 2007).

Recommendations: Stabilization

The McCauley Ranch Orchard retains little historic integrity due in large part to the 1990 A-Rock fire. Remains of other homestead activities and structures are minimal and the area is not easily accessed by park visitors. The majority of the remaining trees in the McCauley Ranch Orchard are in good condition, and with initial stabilization and cyclic maintenance the life of this orchard can be extended. Lack of visitation, historic integrity, and access nevertheless renders further treatment activities unjustified. The preferred option, therefore, is to stabilize and retain the remaining trees as they complete their natural life cycles. As the majority of the extant trees at McCauley Ranch are in fair condition or better, stabilizing the trees will be relatively easy. This will involve removal of root-suckers, competing vegetation, and dead wood. These trees also could be mulched in lieu of grass removal. Upon stabilization, these historic trees should be inventoried and if any rare varieties are identified they should be propagated in the rehabilitated Meyer Ranch orchard. Any found varieties that are not currently represented in the federal germplasm repository should be sent there for conservation.

Figure 18. A historic irrigation flume in McCauley orchard, hewn from a log.

Historically, irrigation was likely accomplished through a series of ditches and hand-carved flumes that redirected water from the nearby Crane Creek. These ditches, however, have long since ceased to function and the flumes have disappeared. Stabilization of this orchard does not, however, include any restoration work and it is therefore unnecessary to restore the historic watering system.

For additional information, including a year by year breakdown of treatment recommendations for the McCauley Ranch Orchard, refer to Appendix I.

El Portal Area Orchards

Introduction

Two orchards occur in the El Portal area. These two orchards are associated with James Hennessey and Johnny Wilson. Prior to becoming Yosemite's administrative area, El Portal served as an important location for natural resource extraction, and commercial and agricultural development. Earliest among the areas Euro-American settlers was homesteader James Hennessey, who in the 1870s took up roughly 40 acres on the south side of the Merced River and created a farm.[48] Commercial farming operations within El Portal expanded in 1917 when John Wilson, A Yosemite area American Indian, homesteaded 30 acres of land about one mile north of the Hennessey Ranch.[49] Although these orchards have been unmaintained for several decades, many of their fruit trees have survived. Common problems with these trees include drought stress, competition from both overstory and understory vegetation, and a general lack of maintenance. El Portal was not a part of the comprehensive 1991 fruit tree inventory and the specific cultivated varieties of trees there are unknown.

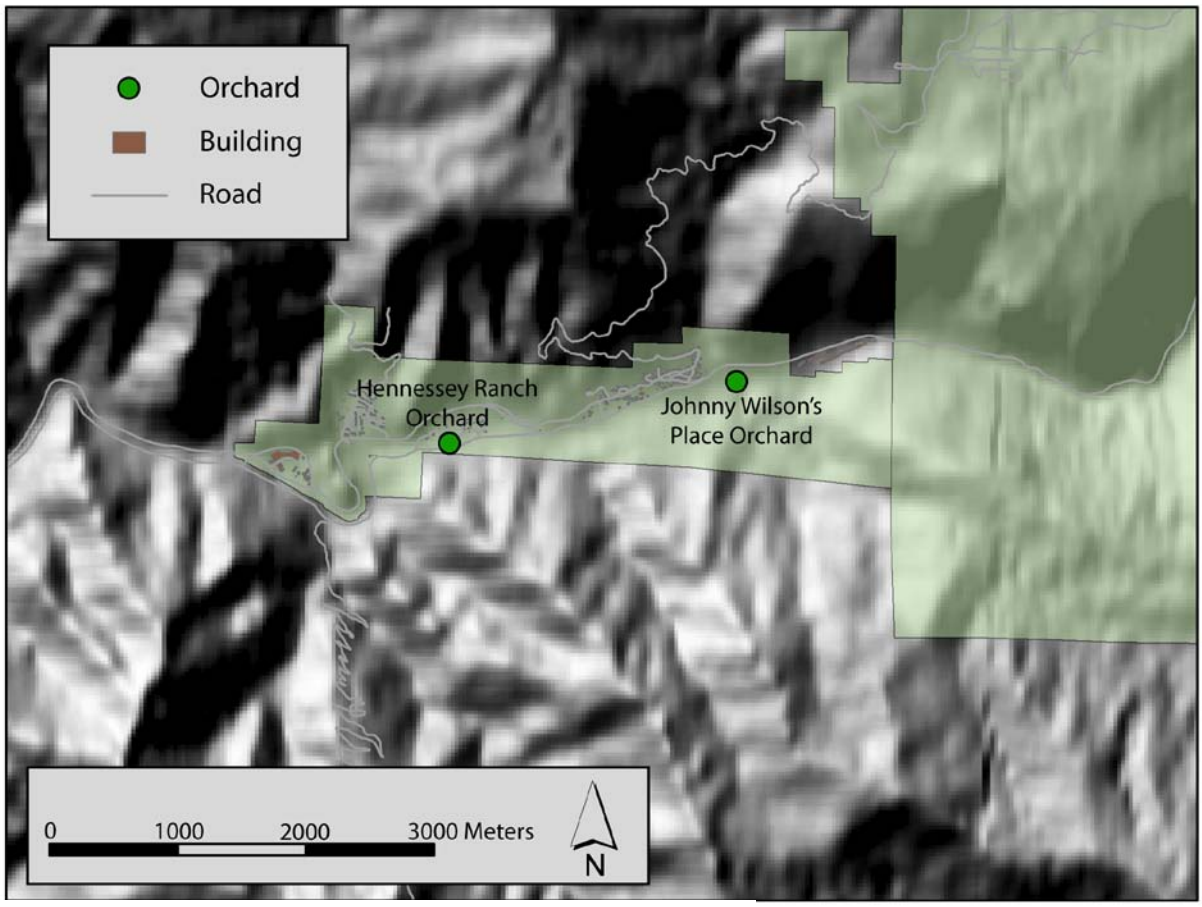

Figure 19. Orchard Locations in El Portal.

[48] Law, *Memories of El Portal*. 3

[49] Davis-King, *Johnny Wilson's Place: Investigations at CA-MRP-362/H and CA-MRP-363H within the El Portal Archeological District.* 1.

HENNESSEY RANCH HISTORY

James A. Hennessey, a native of Ireland, likely arrived to the Yosemite area first in the late 1860s and briefly worked at Hite's Cove for John R. Hite, before starting his own extensive garden and orchard in present day El Portal.[50] By 1873 he had formally obtained a patent on 160 acres in El Portal and was producing fruit and vegetables on what is currently used as a government trailer park.[51] Hennessey proved to be an industrious homesteader; he constructed an expansive orchard and vegetable farm and a trail to transport his produce. The Hennessey Trail zigzagged through the mountains due east of the ranch until arriving at "Henness Ridge" (a derivative of Hennessey) near the present day Yosemite West development.[52] Using pack mules, Hennessey was known to transport his produce to Wawona, Hite's Cove, the Yosemite Valley hotels, and even as far away as the logging camps at the Fresno Grove of Big Trees (currently referred to as the Nelder Grove) and the mining town of Bodie.[53] A pack mule trip from the Hennessey Ranch to Bodie was estimated at taking over 4 days each way. In addition to his farming enterprise, Hennessey also constructed a two-story frame building on his property to accommodate Yosemite bound travelers.[54]

Although it is unknown exactly what was grown at Hennessey Ranch, there is historic record of peach trees and blackberry. The Mariposa Gazette issue from September 27, 1890 states that "…from one tree he picked nine peaches which filled a basket of the half bushel size. One which he measured was 14 ½ inches in circumference, (4 7/8 inches in diameter) and the others were of equal size." In July 29, 1882, the Mariposa Gazette also extolled the fine quality of the blackberries produced at Hennessey Ranch: "Hennessey's Ranch on the Merced River is this season producing blackberries in large quantities and of superior quality. Anyone in Mariposa or vicinity desiring any of this delicious fruit can…order at one dollar per gallon". In addition to blackberry and peach, multiple varieties of apple, pear and walnut trees are still present at the ranch.

FIGURE 20. HENNESSEY RANCH VEGETABLE GARDEN WITH THE ORCHARD IN THE BACKGROUND, CIRCA 1890S.

Evidently under financial duress, in 1887 the Hennessey Ranch was foreclosed. Hennessey's former employer, John Hite, acquired the house, corral, barn, orchard, and outbuildings on the site.[55] By March

[50] Greene, *Yosemite National Park: Historic Resource Study*. 242.
[51] Greene, *Yosemite National Park: Historic Resource Study*. El Portal Appendix page Ii. Law, *Memories of El Portal*. 9.
[52] Law, *Memories of El Portal*. 10.
[53] Greene, *Yosemite National Park: Historic Resource Study*. 79, 242.
[54] Greene, *Yosemite National Park: Historic Resource Study*. 242.
[55] Greene, *Yosemite National Park: Historic Resource Study*. 242.

18, 1889, the ranch belonged to Augustus H. Ward, who had extensive mining and real estate interests in the area.[56] Ward continued operating the Hennessey Ranch for several decades, until at least 1909.[57] Upon leaving the farm, Hennessey moved to San Francisco where he engaged in mining stock speculation. In the midst of financial problems and marital strife, Hennessey committed suicide on November 4, 1908.[58]

In 1958, the NPS acquired 2000+ acres in El Portal to be used as the park's administrative site.[59] At this time, the former Hennessey Ranch was converted into a government trailer park. Although the trailer park still exists, the majority of the trailer locations are currently vacant. However, evidence of Hennessey's Ranch is still marked by the site's fruit trees and remnant stone walls.

Existing Conditions

The Hennessey orchard is located in the present day government trailer park on the south side of the Merced River. This location may have once been a former location of the Merced River, as there is a noticeable depression that runs parallel to the river along the southern portion of the trailer park. All of the fruit trees are located within this depression. This likely has had a beneficial effect on the health of these aged fruit trees as the depression provides them with more surface flow water and places them close to the water table. Indeed, these trees are in substantially better condition than the nearby fruit trees at Johnny Wilson's Place, which were likely more dependent on artificial irrigation. Despite the absence of maintenance and competition from other plants, the overall condition of the trees at Hennessey Ranch is surprisingly good.

Condition	Number	Percentage
Dead	?	?%
Poor	6	9%
Fair-Poor	7	11%
Fair	14	21%
Good-Fair	25	38%
Good	14	21%
Total	66	100%

Table 4. Hennessey Ranch Orchard Condition Assessment.

In addition to the favorable location in relation to water, another reason that the Hennessey Ranch orchard is in such good condition is that it is made up of a high percentage of Walnut trees (*Juglans regia*). Walnut trees make up roughly half of the extant fruit trees at Hennessey Ranch and are substantially longer lived than apple or pear trees. The overall condition of the trees is reflected in their production of fruit; the majority of the trees at the Hennessey Ranch were heavy with fruit during the early fall of 2010.

Unlike other orchards at Yosemite, there is no discernable pattern to the spacing or configuration of fruit trees at the Hennessey Ranch. The trees here do not conform to rows and are very irregularly located. It is possible that Hennessey integrated his vegetable, berry, and livestock operations into his orchard, which might account for some of the orchard's wide spacing and irregular form. The fact that a number of trees

[56] Unrau, *Evaluation of Historical Significance and Integrity of the Cultural Resources in El Portal Administrative Site: Determination of Eligibility for Listing in the National Register of Historic Places.* 10.
[57] Ibid. 10.
[58] Ibid. 10.
[59] Greene, *Yosemite National Park: Historic Resource Study*. Appendix page Iii.

have likely died since they were planted in the 1870s has undoubtedly exacerbated the orchards unperceivable sense of order.

The orchard itself is heavily overgrown with several vine and cane growing species, including, Virginia creeper, grape, blackberry and poison oak. In many instances, this understory has grown well within the canopy of fruit trees, in some cases nearly smothering the tree. In October of 2010, however, the NPS used the herbicide glyphosate (Roundup) to remove the blackberry and other invasive species in the area, which could potentially reinvigorate the fruit trees in future years. To a lesser degree, the fruit trees at Hennessey Ranch are being compromised by native trees encroaching upon the orchard, including ash, willow, pine, and oak.

Figure 21. Towering walnut trees left and center with a mature pear tree on the right. (Photo D. Schaible, 2010)

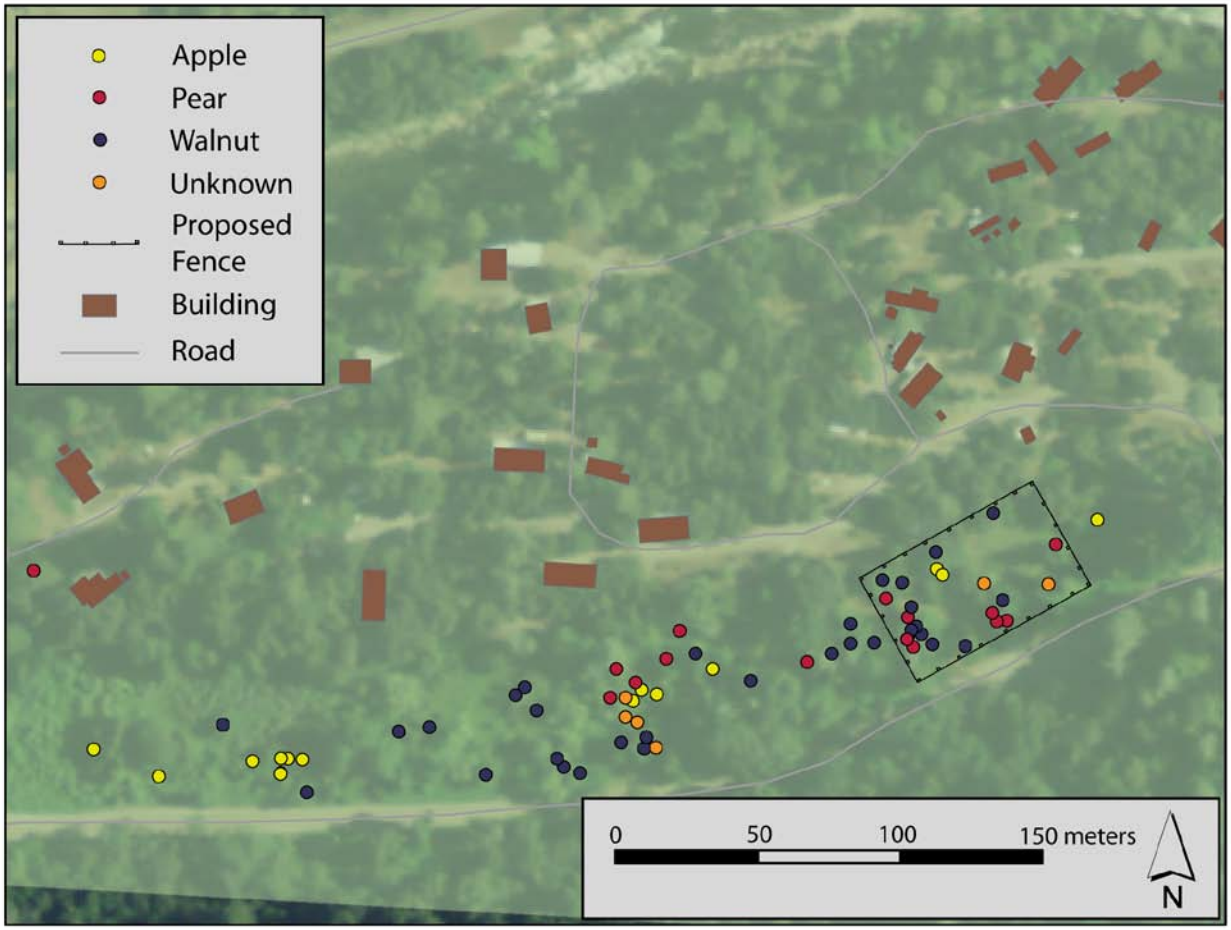

Figure 22. Hennessey Ranch Orchard Map

FIGURE 23. HENNESSEY RANCH TREE CONDITIONS: APPLE IN FAIR-POOR CONDITION (#35), PEAR IN GOOD-FAIR CONDITION (#23), PEAR IN GOOD CONDITION (#2), WALNUT IN GOOD CONDITION (#13), CLOCKWISE FROM UPPER LEFT (PHOTOS: D SCHAIBLE, 2010)

Recommendations: Rehabilitation

Due to its relative good condition and its association with James Hennessey, El Portal's first Euro-American settler, the Hennessey Ranch Orchard is a good candidate for stabilization and rehabilitation. Rehabilitation is the preferred treatment recommendation because it acknowledges the need to alter a cultural landscape to accommodate continuing or new uses while retaining the landscape's historic character. In this instance, the recommendation would be to first document and perform stabilization maintenance on the historic fruit trees that compromise the orchard. Following documentation, a feasibility study should be conducted to determine the cost, viability, and community interest in rehabilitating the old Hennessey Ranch into a community garden for the El Portal area. As proposed, this rehabilitation would preserve the agricultural heritage of the area while providing the residents of El Portal a sought after location for a community garden.

As conceived, the community garden at Hennessey Ranch would not encompass the entire area where the historic fruit trees remain. Rather, the community garden would encompass the portion of the historic orchard's footprint that maintains the greatest variety and concentration of fruit trees that are in the best condition while providing adequate space for community garden plots. As envisioned, the community garden vegetable plots would be interspersed between the preserved fruit trees. A fence should be constructed around the gardens perimeter to prevent bears and deer from accessing the fruit within the community garden. The fence should be given a berth wide enough to encompass the drip-line of fruit trees, thereby preventing magafauna from grazing on fallen fruit. In order to discourage bears and deer from feeding in this location, all fruit trees that are outside of the fence line should be documented and removed, as should other exotic sources of food that are currently in this location, including grapes and blackberries.

Figure 24. Despite years of neglect, many of the fruit trees at Hennessey Ranch continue to produce an abundance of fruit (Photo: D. Schaible, 2010).

Since this orchard has low interpretive value and, due to a lack of documentation, its historic integrity is largely unknown, it would be impracticable and inadvisable to attempt to restore this orchard to its historical dimensions or composition. Rather, the recommended approach in dealing with this orchard would be to rehabilitate the eastern portion of the orchard into a community garden, which would be a compatible land use in keeping with the site's historic character. This rehabilitation would focus on preserving the character, spatial organization, and fruit tree varieties at Hennessey Ranch while allowing for the removal of those fruit trees that are not encompassed within the fence line. As proposed, a fence of roughly125x225 feet would be constructed, which would contain roughly 23 fruit trees and exclude roughly 43 fruit trees.

Rehabilitation of this orchard would entail regular maintenance including standard stabilization techniques. Encroaching trees should be removed wherever they compromise the health of orchard trees. Once

inventoried, all unrepresented varieties should undergo germplasm conservation, if necessary. Any varieties of fruit trees at Johnny Wilson's Place or in the section of Hennessey Ranch that is outside of the fence line that are not represented within the rehabilitated portion of the orchard should be propagated within the rehabilitated portion of the Hennessey Ranch orchard. To aid in interpretation and resource management, all of the fruit trees should be permanently labeled, with the labels including the trees species and cultivated variety.

Hennessey Ranch is the only El Portal orchard that would undergo rehabilitation. This orchard will require cyclic maintenance including general tree care, and occasional to yearly pruning activities undertaken by a qualified arborist. Any or all of these management activities could be contracted to outside professionals.

For additional information, including a year by year breakdown of treatment recommendations for the Hennessey Ranch orchard, refer to Appendix I.

Johnny Wilson's Place History

Johnny Wilson's Place was a historic-era farm that was owned, built, and maintained by the Wilson family, a locally important American Indian family.[60] It is located east of the present day El Portal Market on the southern side of the Merced River. It is unclear when the first historic-period Indians used the site, but it is known that Johnny Wilson was allotted 30 acres of land there on February 17, 1917 (recorded March 21, 1938, in the Mariposa County *Official Records*, Vol b:37; Appendix D). However, based on the artifacts present at the site, it is believed that historic-era occupation of the site began in the late 1890s and continued on into the mid 1930s. Johnny Wilson's Place was referred to by many names over the years, including El Portal Rancheria, Mount Diablo Ranch and the Miwok name of name of *Sit 'ke-noo-al-lah*.[61]

Figure 25. Johnny Wilson Place in 1928. Multiple structures can be seen in the left of the photograph.

Johnny Wilson grew a wide variety of crops on his farm. During its prime, he grew lettuce, cucumbers, celery, onions, carrots, tomatoes, chilies, blackberries, raspberries, grapes, apples, peaches, peaches, pears, plums, and strawberries. Mother Curry was reportedly particularly

[60] Davis-King, *Johnny Wilson's Place: Investigations at CA-MRP-362H and CA-MRP-363H within the El Portal Archeological District.* 73.
[61] Ibid. 1.

fond of the strawberries grown by Wilson, and she would buy them by the "bucket" to include in meals back at Camp Curry.[62] Based on an oral interview with Minnie Karamos and Marion Lucero (Johnny Wilson's granddaughters) in 1996, Mr. Wilson grew "Bartlett [pear], Winter Grains, crabapples, Yellow Delicious, Red Delicious, Pippins, what they call now the Santa Rosa plums, black plums that would turn into prunes on the trees, freestone and cling peaches, green plums, one cherry tree, but they didn't grow too good here, [and] Roman apples". A diversion ditch off of Indian Creek supplied water for the crops, and is still subtlety apparent within the landscape. Wilson would meter out water from the diversion as needed by removing the earth and rocks at the ditches intake.[63]

The farm contained several buildings and structures, including several residences, sheds, stone terraces and wall to delineate garden plots, wire fences, irrigation ditches and a tram. The tram was used to ferry people across the Merced River periods of high water flow, and was bound to oak trees on either side of the river. A cart was attached to the tram that passengers would sit in. Remnants of the tram, including the trees that once supported it, are still present in the landscape.

The Wilsons were a prominent Indian family in the early days of El Portal. Johnny Wilson had a wife, Nancy "Mary" Wilson, and a son, Billy Wilson, who also lived on the farm with his wife, Lena Wilson. Billy and Lena Wilson had a child, Billy Jr., and both Billy (Minnie, Mildred, and Marion) and Lena (Hazel Brown Oliver) had children from previous marriages as well. Hazel had two children of her own, Mary Jane and Margaret.[64] In addition, the Wilson's were known for hosting many Indian guests at their property. Unfortunately, the Wilson family was beset by several unexpected deaths in the late 1920s and early 1930s. In 1928, five people, including three children (Billy Jr., Mary Jane, and Margaret) and two adults (Lena Wilson and Hazel Brown Oliver) took the tram cart across the river. For reasons that remain unclear, the tram cart overturned and all three children perished.[65] A short two years later, in 1930, Billy and Lena Wilson were found dead in their parked car near Johnny Wilson's Place. Although events surrounding the murders are full of suspicion, and an individual named Joe Rube was arrested and then released, a criminologist ultimately concluded that Lena had been shot by Billy, who then committed suicide.[66]

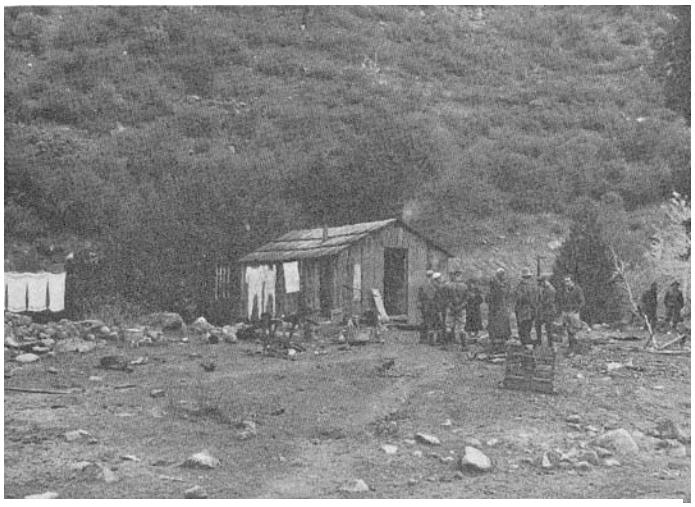

FIGURE 26. JOHNNY WILSON'S PLACE IN 1928, TAKEN DURING AN INVESTIGATION INTO THE ACCIDENTAL DROWNING OF THREE CHILDREN.

[62] Ibid. 49.
[63] Ibid. 24
[64] Ibid. 43.
[65] Ibid. 43.
[66] Ibid. 46.

On May 23, 1937, Johnny Wilson was found dead in his house. Reportedly, he was found by his neighbor who went to check on him when he saw that there was no smoke coming from his chimney.[67] The coroner reported in the Mariposa County *Register of Deaths* that he was 85 years old and that he died of "infirmities of old age, probably chronic heart disease, arteriosclerosis". When Johnny Wilson died, he passed his land on to his three granddaughters, Minnie, Mildred, and Marion, divided into thirds. According to the title search conducted in 1981, 20 of the 30 acres were sold in 1959 and the remaining ten acres, which included the orchard, were repossessed in 1979 following a contested default on property taxes. [68]

Condition	Number	Percentage
Dead	?	?
Poor	9	22%
Fair-Poor	11	28%
Fair	12	30%
Good-Fair	5	13%
Good	3	7%
Total	40	100%

TABLE 5. JOHNNY WILSON'S PLACE TREE CONDITION ASSESSMENT.

EXISTING CONDITIONS

Johnny Wilson's Place is located in an otherwise undeveloped tract of land on the south side of the Merced River. There is no formal road or trail access to the ranch, although California Highway 140 runs within several hundred feet of the ranch, albeit on the opposite side of the Merced River. Accordingly, Johnny Wilson's Place is only currently accessible during periods of low flows in the Merced when it is possible to skip across boulders and cross the river. Historically, a tram would provide access across the river, but this feature has been inoperable for many years.

Despite being relatively younger than many of the orchards at Yosemite, the overall condition of the orchard at Johnny Wilson's Place is Fair-Poor. Located on a fully exposed bench relatively high above the Merced River, the trees appear to be in an advanced state of decline due to lack of sufficient water. During the site visit in September of 2010, few of the trees were producing any fruit and most of them had substantial die back in their canopies. Only a single tree was producing fruit that was not aborted while immature. Other stressors that are likely fueling the decline in health among the orchard are encroachment of trees (particularly along the toe slope to the south) and neglect.

FIGURE 27. JOHNNY WILSON'S PLACE ORCHARD, DEPICTING GENERALLY WIDELY SPACED FRUIT TREES SURROUNDED BY GAS (PHOTO: D. SCHAIBLE, 2010).

Although highly irregular, the extant orchard at Johnny Wilson's Place appears to form a wide circle. The primary irrigation ditch is still evident and runs roughly through the center of the orchard and likely included

[67] Ibid. 47.
[68] Ibid. Appendix D.

lateral ditches out to the trees along the circles perimeter. Archeological records indicate that several residences were located in close proximity to the orchards, roughly along the western and southwestern edge of the orchard.

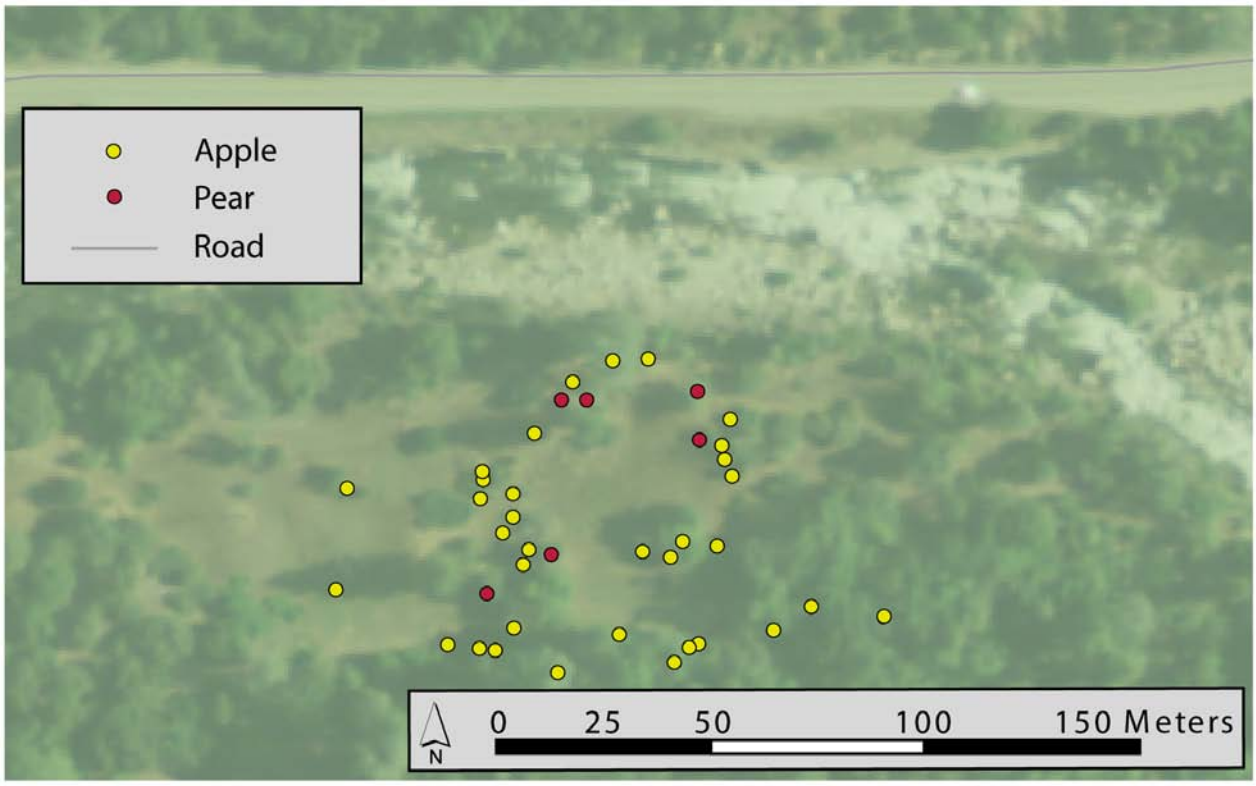

FIGURE 28. JOHNNY WILSON'S PLACE ORCHARD MAP

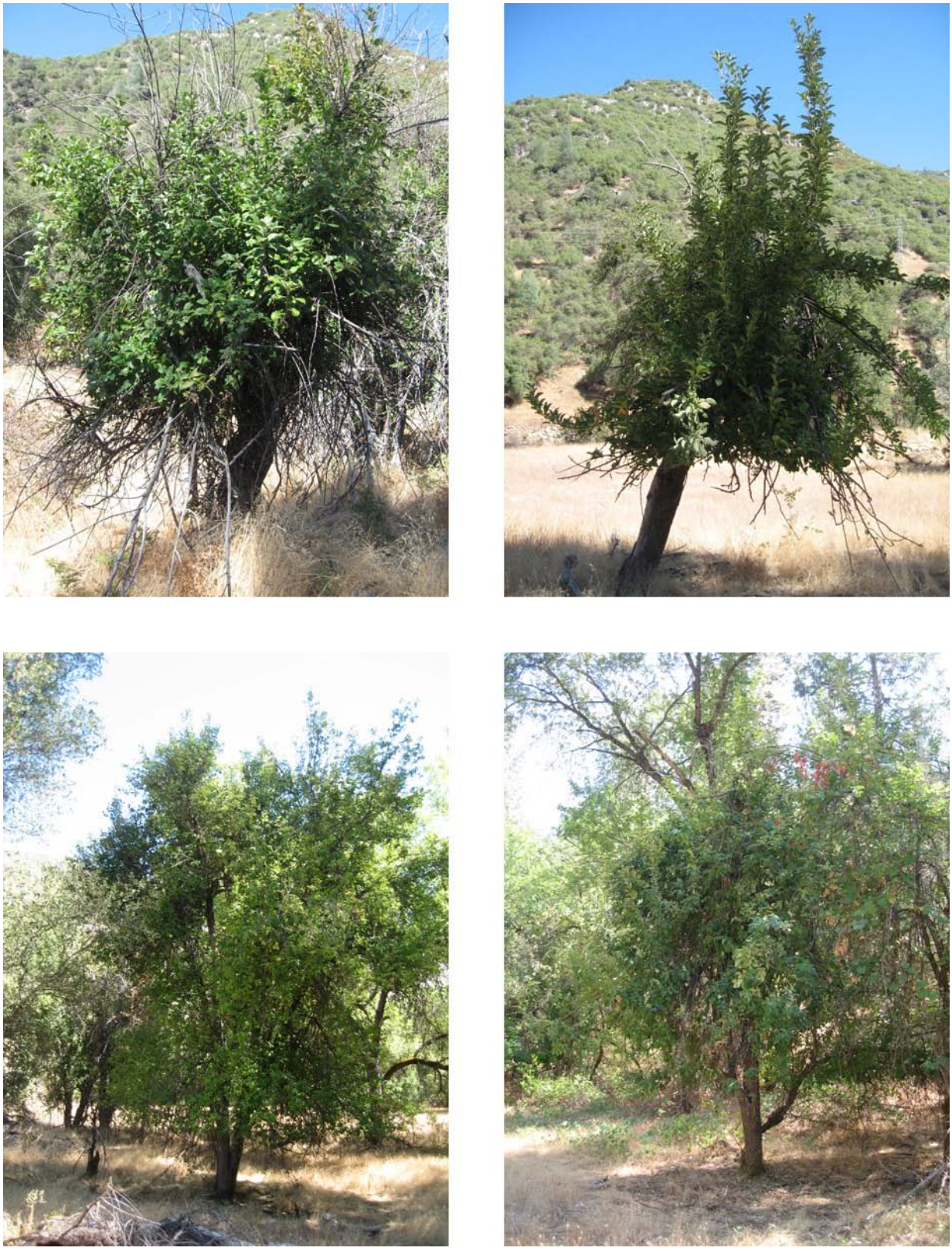

Figure 29. Johnny Wilson Place tree conditions: apple in fair-poor condition (#12), apple in fair condition (#1), apple in fair condition (#37), pear in good condition (#7), clockwise from upper left (photos: D Schaible, 2010)

Recommendations: No Action

For a multitude of reasons, the recommended treatment for the Johnny Wilson Place orchard is to take no action. Conducting any level of preservation maintenance on the orchard would be difficult because it is inaccessible for many months out of the year as it is located on the opposite side of the Merced River from Highway 140. During the late summer and early fall periods of low water flow, access to the orchard can be achieved by jumping across boulders in the river bed. During the majority of the year however, access to the orchard would involve constructing a trail from further west in El Portal, constructing a bridge, or taking unacceptable risks trying to ford across the Merced River. In addition, the orchard has minimal interpretive value due to its inaccessible location. Furthermore, the low historic integrity and relatively poor condition of the orchard makes it a poor candidate for any level of preservation maintenance.

Figure 30. Typical image from the Johnny Wilson Place orchard, showing several stunted, drought stressed trees. (Photo: D. Schaible,

However, unlike other orchards, there is little imperative to remove these trees. Due to the substantial stress that the trees are under due to lack of water and pruning, the fruit trees at Johnny Wilson's Place seldom produce any fruit. During field work in 2010, only one tree produced mature fruit. While there is evidence of bear visitation to the orchard, its inaccessible location is not conducive to bear/human interaction and the habituation of park wildlife. Secondly, this orchard is included as a feature within the El Portal Archeological District and archeological site CA-MRP-362. Removing this orchard, which is having minimal effects on park wildlife, would likely constitute an adverse effect to the El Portal Archeological District and would trigger tribal and SHPO consultation. Rather than actively remove this orchard, it is recommended that the park allow the trees to live out their natural life span.

Before the orchard is lost through attrition, however, a plant geneticist should be contracted to identify all cultivated varieties of fruit trees within this orchard. Once inventoried, all unrepresented varieties should undergo germplasm conservation, if necessary. Any species or varieties of fruit trees at Johnny Wilson's Place that are not included within the rehabilitated portion of the Hennessey Ranch orchard should be propagated and then planted there.

Yosemite Valley Area Orchards

INTRODUCTION

Yosemite Valley has the largest concentration of extant historic fruit trees in the park. The three largest remaining orchards – Lamon, Curry Village and Hutchings' orchards – are found in the Valley and contain the oldest fruit trees. Many other individual trees can be found throughout the Valley, remnants of both small and large orchards. Yosemite Valley contains a total of 331 live fruit trees, which comprises roughly two thirds of the park's total fruit trees. Yosemite Valley also contains remnants of at least seven distinct orchards, which is the largest number of orchards concentrated anywhere in the park. The larger orchards are the most thoroughly documented within the park and were well known and often utilized by early settlers in the Valley. The individual trees, however, have very little documentation and low historic integrity.

These guidelines recommend a net reduction of fruit trees in Yosemite Valley; the present –day ten orchard sites would be reduced to two. Reduction of fruit trees would allow key areas to undergo ecological restoration and would reduce the availability of unnatural food sources to park wildlife. This approach would consolidate the scattered and poorly-maintained orchards into fewer well-managed and interpreted sites.

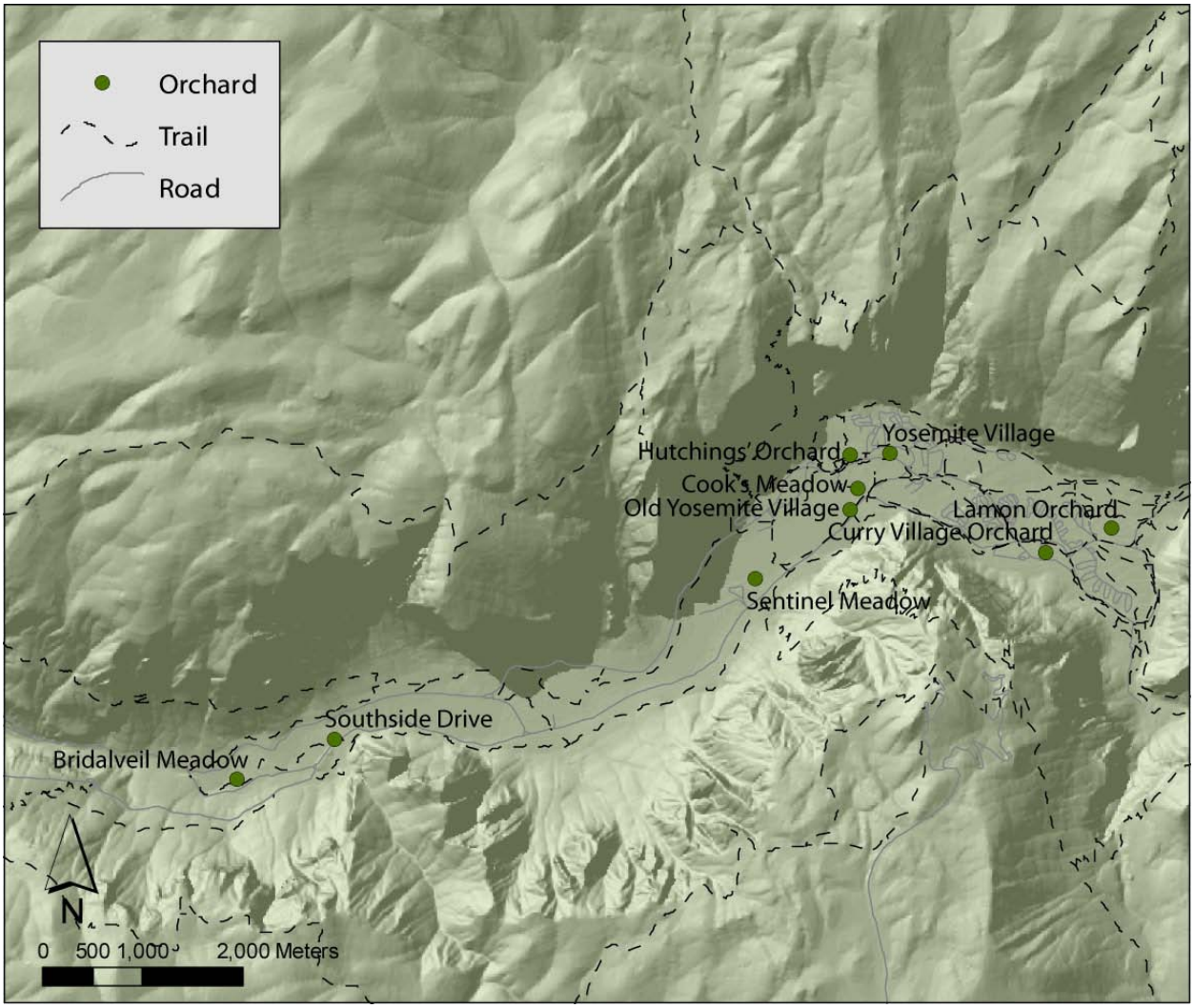

FIGURE 31. YOSEMITE VALLEY ORCHARD AND TREE LOCATIONS.

CURRY VILLAGE AND LAMON ORCHARDS HISTORY

The Curry Village Orchard and Lamon Orchard both were planted in the mid-1800s by James C. Lamon, the first permanent settler in Yosemite Valley. As the largest, most prominent orchards in the park, the two orchards planted by Lamon are well-documented throughout the park's historical record. These two orchards are mentioned in early visitor accounts of the Valley, several early historical works, and interviews with early residents of the Valley.

In 1859, Lamon planted a garden and orchard under Half Dome, near the present location of the stables, with the intention of selling fruit and vegetables to visitors. The first orchard was followed in 1860 by the second orchard, which has been retrofitted into the Curry Village overflow parking area.[69] In the fall of 1859

[69] James Lamon: Yosemite's First Settler.

he built a cabin near his orchard where he spent several summers tending his orchards and garden and helping to build a hotel, which later became the Hutchings Cedar Cottage.

Lamon purchased trees from two local nurseries, Marshall's Nursery in Mariposa and Harris' Nursery in Nipawassas, and included apple varieties such as Winesap, Watercore, Wood Apples, Gravenstein, Maiden Blush, Baldwin and New York Greening.[70] [71] Lamon chose commercially well-established varieties that were late harvest and cold-hardy. Winesap and Baldwin varieties were among the most commonly sold varieties at the time and could be harvested in the fall; the Baldwin variety can be harvested as late as October.[72] Each orchard covered approximately four acres and incorporated approximately 500 trees each spaced 20 feet apart.[73] The orchards were irrigated by surface water through ditches.[74] Lamon's gardens and orchards were well-loved and often praised by early park visitors.

In 1861, not long after Lamon planted the orchards and gardens and built two cabins, he filed a claim for a 160-acre homestead. The homestead claim included the areas of Camp 7, Camp 15 and Housekeeping Camp, the grounds for the present Ahwahnee Hotel as well as meadows between there and Indian Creek.[75] In 1863 Lamon became the first Euro-American to spend the winter in Yosemite Valley. He stockpiled food and became the first year-round resident of the Valley.

Lamon did not have a legal right to file a homestead claim on un-surveyed land and when Yosemite Valley was preserved, through the Yosemite Grant, Lamon's and fellow settlers' claims were denied. Several years of appeals and litigation ensued whereby the men argued their right to have land within Yosemite Valley.[76] As part of the argument to keep his land, Lamon cited the improvements he had made including buildings and cultivated land. In his testimony presented to the California Senate in 1869, Lamon describes the orchards as,

…two large and very fine orchards of fruit trees, now beginning to bear abundantly, being of the very choicest selection of grafted fruit, consisting of apples, pears, peaches, plums, nectarines, almonds, etc., over one thousand trees altogether, all of which have been transplanted and cultivated with the greatest care and labor in thoroughly and deeply preparing the ground and constant cultivation.[77]

At one point, during the contentious process, Lamon and fellow settler James Mason Hutchings were allowed to have their claims surveyed for approval. They were allowed to dictate the boundaries of their claims in uncustomary fashions. Lamon laid out his claim in three distinct parcels, two of which enclosed the orchards he had planted. Eventually, Lamon and other litigants were defeated in the courts in 1868, when Congress refused to ratify Californian legislation allowing private claims in Yosemite Valley. In 1874, as compensation for refusal of his claim, Lamon was granted $12,000, more than most Americans at that time would earn in a

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[70] Yosemite Field School, "Exotic Trees of the Yosemite Valley," (1932). 2.

[71] The 1991 Kennedy Survey identifies the majority of the remaining apples as Newton Spy and Rhode Island Greening, so this statement is not corroborated by the remaining apples varieties.

[72] Dolan, *Fruitful Legacy: A Historic Context of Fruit Trees and Orchards in the United States, from 1600 to the Present (Draft)*. 133.

[73] *James Lamon: Yosemite's First Settler*.

[74] School, "Exotic Trees of the Yosemite Valley." 2.

[75] *James Lamon: Yosemite's First Settler*.

[76] Runte, *Yosemite: The Embattled Wilderness*. 17.

[77] School, "Exotic Trees of the Yosemite Valley." 2.

lifetime.[78] Lamon eventually acquiesced to lease his cultivated land for $1 per year and continued to live in Yosemite Valley, where he presumably maintained his orchards until his death in 1875.[79]

After Lamon's death his property, then known as the Royal Arches Farm, was subsequently leased to Aaron Harris in 1876, who expanded the facilities to cater to more visitors. According to historian Linda Greene, "He established a more formal campground and began growing animal fodder (clover, timothy, wheat, hay) and selling groceries such as vegetables, butter, eggs and milk to campers."[80] At one time Lamon's orchards were known as the Harris orchards.[81] Simultaneous with the expiration of Harris's lease in 1887, the buildings on the property burned. The commissioners refused to replace them and, as his lease had expired, Harris did not wish to undertake the project.

The following year, the property was leased to William F. Coffman and George W. Kenney and in 1889 the state constructed a number of new buildings using salvaged lumber from the demolition of the Leidig and Black hotels. The buildings included a barn, carriage shed, an office, a residence, a corral, and living quarters located on the site of the grounds of the Ahwahnee.[82] The stable complex that housed the Coffman and Kenney saddle horse business eventually became known as Kennyville.

By 1894, local resident John Degnan was cultivating Lamon's upper orchard and the family lived in a small frame house near the site of Lamon's original cabin for many months.[83] Several years later Degnan and his wife built a new house and bakery from which they sold baked goods to park visitors.

Camp Curry was founded near the second orchard in 1899. As park visitation continued to grow, particularly after automobiles were allowed into the park, Camp Curry became more and more popular for overnight visitors. Consequently, the park sought to expand automobile parking facilities. The Yosemite National Park Board of Expert Advisors was asked to supply their opinions on the parking issues as well as other design, planning, and general issues affecting the park's future. The Board was comprised of Duncan McDuffe, a prominent California Brokerage firm president, Dr. John P. Buwalda, a geologist with the California Institute of Technology, and Fredrick Law Olmsted Jr., a notable landscape architect at the time.[84] The Currys were lobbying for a lot near their facility, however Olmsted strongly disagreed and reported "The more we studied it the more keenly we felt that it would be a calamitous loss to obliterate the arm of the meadow in front of Camp Curry by gravelling it and converting it into an automobile parking space."[85] Despite Olmsted's conviction that a lot in this location would be "a necessarily ugly, bare, parking yard, partly or wholly filled with serried ranks of automobiles," in 1927 the parking facility was located adjacent to Camp Curry and throughout the orchard. To accommodate automobiles within the orchard, every third row of the formerly extensive orchard was removed to provide traffic lanes. Since that time, both of Lamon's orchards have suffered heavily from neglect. A 1932 paper from the Yosemite Field School notes that,

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[78] Runte, Yosemite: The Embattled Wilderness. 35.
[79] Linda Greene, Yosemite National Park: Historic Resource Study, 3 vols., vol. 1 (Yosemite National Park: Department of the Interior, National Park Service, 1987). 145.
[80] Ibid. vol 1. 146.
[81] School, "Exotic Trees of the Yosemite Valley." 2.
[82] Greene, Yosemite National Park: Historic Resource Study. vol 1. 146.
[83] Ibid. 352.
[84] Runte, Yosemite: The Embattled Wilderness. 154.
[85] Ibid. 155.

The orchards fell into neglect and have had no pruning until last year, so are not doing very well. The Curry orchard is in poorer condition than the one at the Stables, due to the fact that it is being used as a parking lot. Nevertheless both have born abundantly, and continue to bear fruit. The Curry orchard is a favorite spot for nature walks, due to the number of birds which find it favorable for nesting.[86]

Unfortunately, this typifies current orchard management at Lamon and Curry Village orchards. Maintenance has been limited to fruit collection.

LAMON ORCHARD

EXISTING CONDITIONS

Currently, both of Lamon's orchards have good historic integrity. They both are rare examples of orchards dating to the 1800-1880 era of pomology. They both portray characteristics typical from the time period. The trees are spaced at approximately 20-foot intervals, with tall trunks and tall, wild forms. This orchard is sufficiently intact that its original layout can be discerned and, although trees have disappeared and the trees are largely overgrown, the historic integrity of the Lamon Orchard remains good.

Few intact examples remain of orchards of this time frame; in fact, the Lamon Orchard is among the better-preserved extant specimens.[87] This orchard represents the typical orchard of that era with a wide range of varieties, tall trunks, and relatively wild full-grown forms. Its preservation and rarity is due in large part to the formation and preservation of Yosemite as a state park and later as a national park. An unusual example of early agriculture, this orchard deserves special consideration for future management actions.

Condition	Number	Percentage
Dead	4	2%
Poor	78	45%
Fair-Poor	36	20%
Fair	45	26%
Good-Fair	4	3%
Good	5	3%
Total	172	100%

TABLE 6. LAMON ORCHARD TREE CONDITION ASSESSMENT.

The Lamon Orchard is located east of the Yosemite Valley stables and, with 168 live trees, it represents the largest collection of extant historic fruit trees within the park. Fruit trees can be found throughout the adjacent meadow, with several near the stable buildings and several in the forested areas along the meadow. These outliers suggest the former expanse of the orchard, which must have extended farther to the north, south and west, with an original total of over 500 fruit trees. All the extant trees of this formerly extensive orchard are apples, except a single pear tree found in the meadow along the western edge.

As a result of multiple stressors, this orchard is in poor physical condition. Nearly half of the remaining trees are in poor condition. Only 6 percent are above fair condition. Despite the current poor condition the Kennedy survey identified 215 live trees, indicating a respectable 78 percent survival rate of the trees over the

[86] School, "Exotic Trees of the Yosemite Valley." 2.
[87] Susan Dolan, Historical Landscape Architect, Pacific West Region, Telephone Interview with Historical Landscape Architect Sky Skach, March 31, 2008.

nineteen-year period from 1991 to 2010. Despite the many stressors and generally poor overall condition of the orchard, the trees still produce fruit. In September 2007, several trees contained fruit and several more contained the aborted remains of apples.

The 1991 Kennedy survey identified many varieties present in the Lamon orchard containing both common and several rare varieties. The most common varieties are the Northern Spy and Newton Pippen varieties.[88] These two apple varieties are particularly versatile with long-keeping qualities and can be used as dessert apples, for hard cider or culinary uses. Several of the rarer varieties, including 'Maidenblush' and 'Smith's Cider', were used specifically for cider production. A notable variety, found only in the Lamon orchard, is a lone apple tree of the 'Martha' variety which produces tiny apples used exclusively for cider production.[89] According to Kennedy, Martha apples "provided an astringent 'bite' which rendered a mix with common apples more interesting."[90]

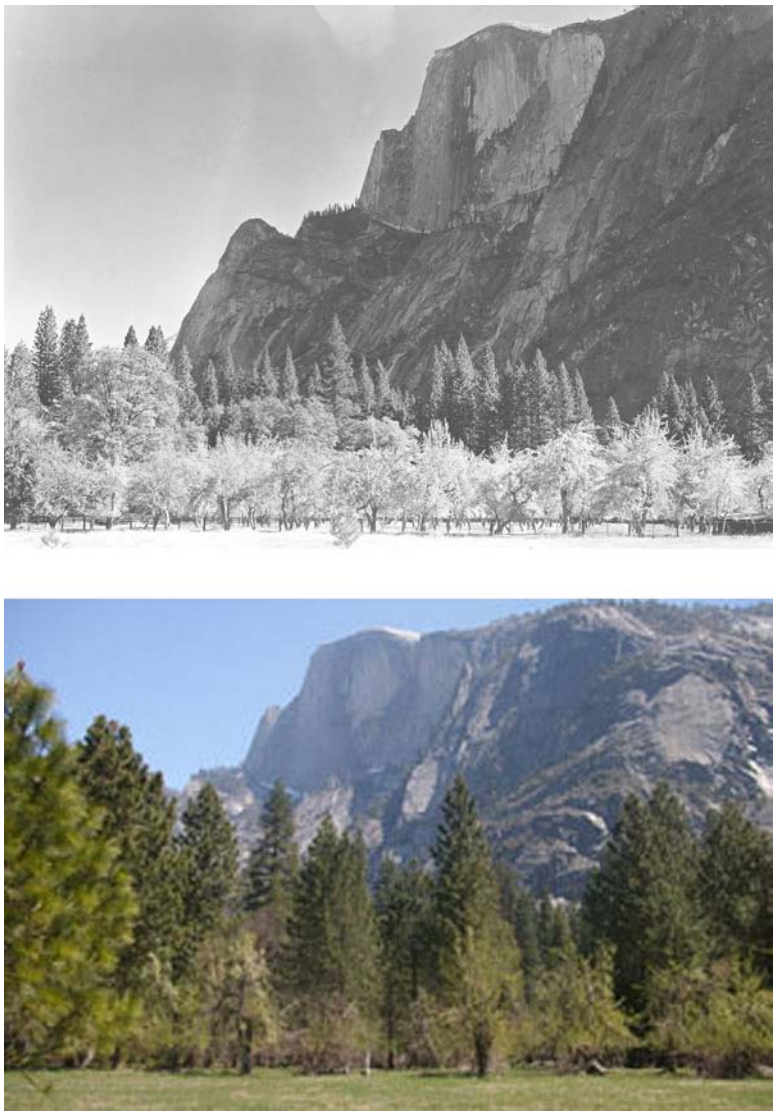

Figure 32. Lamon orchard in 1944 (above) (Photo: YOSE Research Library) and in 2008 with more mature pines and yet high historic integrity (below) (photo S. Skach).

The surrounding coniferous forest is encroaching upon this orchard from all sides. Presumably, Lamon kept his orchards and gardens free of encroaching trees and most encroachment began after his death in 1875. Several fruit trees on both the north and south edges of the forest can be found among large 50 to 100-year-old ponderosa pines and incense cedars. Many of the exterior fruit trees are therefore in the poorest condition. Some pines are growing so close that they have seriously damaged or killed nearby fruit trees.

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[88] Kennedy, Survey of the Orchards of Yosemite National Park.

[89] Kennedy's numbering system is no longer complete and specific varieties cannot be ascertained. We have a general idea what varieties are present in each orchard but individual trees cannot necessarily be identified using our remaining records.

[90] Kennedy, Survey of the Orchards of Yosemite National Park.

The dense herbaceous meadow around the bases of the fruit trees presents additional competition for water. Other common stressors to the trees include damage from bears climbing trees to consume fruit and dead wood in the canopy. The low-lying meadow is otherwise an excellent site for an orchard and the trees do not appear to be drought stressed.

A stable operation is located immediately adjacent to the Lamon Orchard. Indeed, several trees remain near the stable buildings, including one apple tree that occurs between two buildings. Despite their proximity to the stables, most apple trees are unaffected because the stable operations do not extend into the orchard. A kennel also is located on the south edge of the orchard and it may be compacting the soil around nearby trees. The kennel detracts from the historic integrity of the orchard.

Figure 33. North view of Lamon orchard. The conifers at the northern edge of the orchard have enveloped additional orchard trees (Photo: S. Skach, 2007).

The Lamon Orchard is in poor condition and without management, will continue to decline. This would represent the loss of the largest remaining example of a historic homestead orchard in Yosemite.

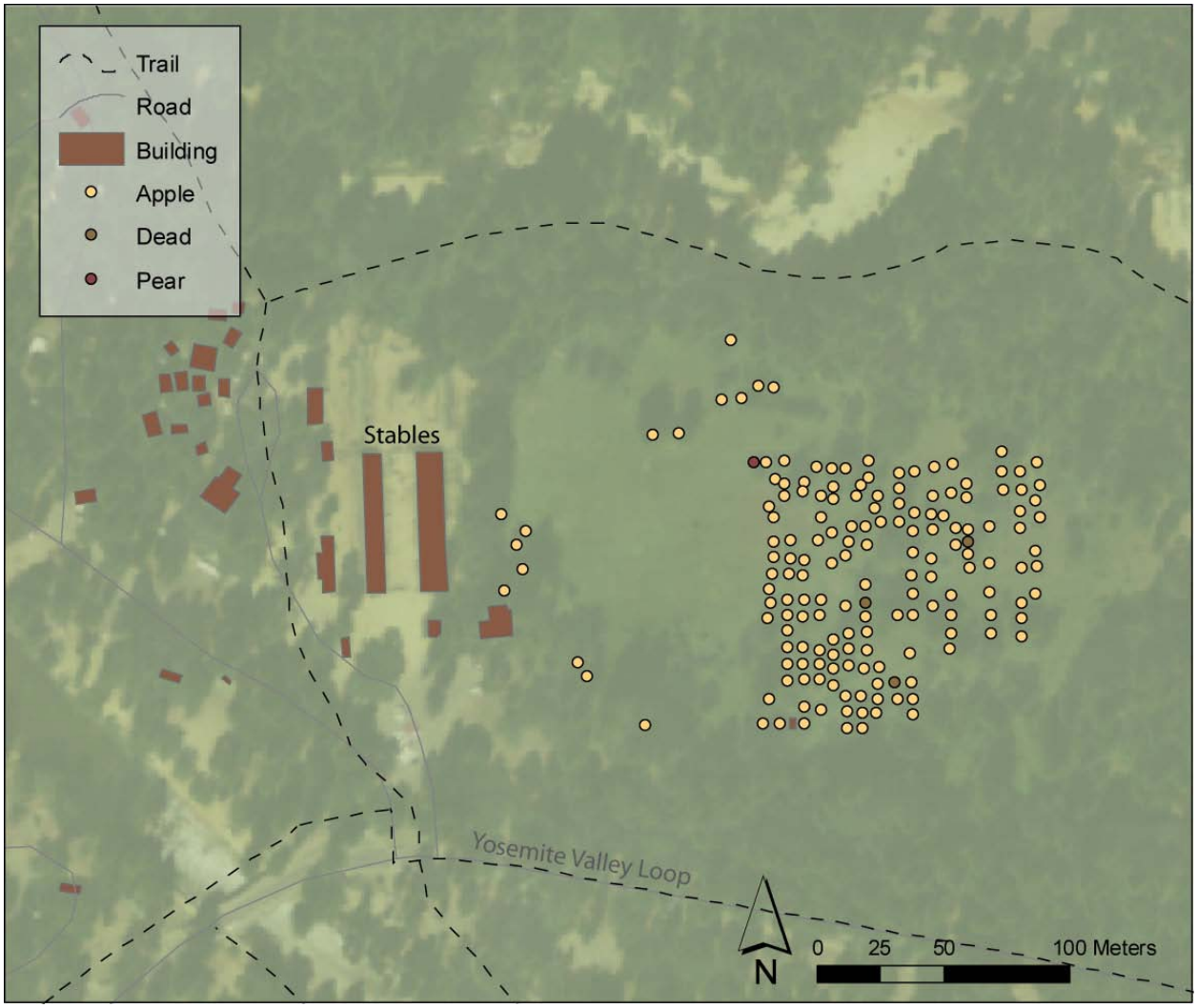

FIGURE 34. LAMON ORCHARD MAP.

Figure 35. Lamon orchard tree conditions: Dead apple (#28), apple in poor condition (#16), apple in good condition (#1), and apple in fair condition (#66), clockwise from upper left (Photos: S. Skach, 2007).

RECOMMENDATIONS: REHABILITATION

As the largest remaining orchard in the park with good historic integrity and preservation value, the Lamon Orchard is the leading candidate for historic preservation. With initial stabilization and cyclic maintenance, this orchard can be returned to a stable condition suitable for further rehabilitation. The removed location of the orchard is ideal for additional interpretation and increased visitation with minimal negative effects.

This recommendation is in keeping with public comments pertaining to the Yosemite Valley Plan.[91] It is coupled with a recommendation for the eventual removal and naturalization of the Curry Village Orchard, thereby effectively balancing the conflicts regarding cultural and natural resource considerations. The Curry Village Orchard removal and ecological restoration (discussed below) necessitates the preservation of the Lamon Orchard. The Lamon Orchard, rather than the more senescent and problematic Curry Village Orchard, is selected for rehabilitation due to its good integrity, its less-sensitive location, and its removal from concentrated visitor-use areas. Through its rehabilitation, the Lamon Orchard will act as an arboretum in which the historic varieties of exotic fruit trees found within the park are preserved and interpreted as a reminder of early Yosemite pioneer culture. To aid in interpretation and resource management, all of the fruit trees should be permanently labeled, with the labels including the trees species and cultivated variety.

Rehabilitation would require initial stabilization and preservation techniques as previously described. Importantly, it would also require the infill of existing broken rows. This would be accomplished with newly-propagated grafted saplings, especially rare varieties, from around the Valley. This would accomplish two goals simultaneously: first, it would allow for the continuation of imperiled fruit tree specimens from throughout the Valley; second, it would rehabilitate the Lamon Orchard using the same historic varieties that James Lamon originally planted in his orchards. This strategy would improve the historic integrity of the orchard. This consolidation would reduce conflicts with natural resources, it would satisfy historic preservation goals, and it would create a valuable new interpretive opportunity for Yosemite visitors. The degree of infill plantings may depend on the total number of trees across Yosemite that need to be preserved. The minimum number of trees required to fill in current gaps is approximately 90 trees and an additional 61 trees can be added to further complete the non-extant southeast corner and the westernmost

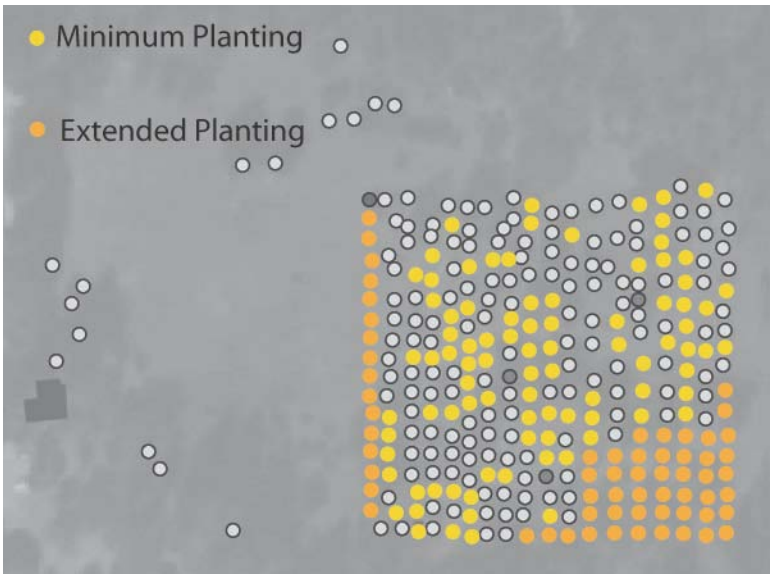

FIGURE 36. LAMON ORCHARD REHABILITATION PLANTINGS WITH IN-FILL IN YELLOW AND RECONSTRUCTED ROWS IN ORANGE.

[91] Ibid. Volume 1A, 1-19.

row. In either scenario, the outlying trees along the far western and northern periphery of the orchard would be stabilized and allowed to complete their natural life cycles. Upon death, these trees would not be replaced in their current locations.

The Lamon Orchard is the only Valley orchard that would undergo rehabilitation. This orchard will require cyclic maintenance to reduce fruit yield, general tree care, and occasional to yearly pruning activities undertaken by a qualified arborist. Any or all of these management activities could be contracted to outside professionals.

A rehabilitated orchard would, as mentioned, present excellent opportunities for new interpretive programs. These can include ranger-led walks, harvest-day cider-making demonstrations and/or new and formalized self-guiding interpretive trails. Programs should be focused during spring and winter months to reduce human-bear interactions; however, the organized gathering of fruit during the summer should remain. As part of comprehensive bear management within the orchard, the orchard should be officially closed between the months of June and November, when fruit presents the greatest enticement to bears. This action can be written into the Superintendent's Compendium.

In 1998, Valley Gardener Jack Knieriemen suggested restoring and interpreting the garden as a specimen of early agriculture in the Valley. He stated that restoring the Lamon Orchard would fulfill two important needs: "that of preserving rare and/or old fruit cultivars while serving as a reminder of early pioneer use of the Valley."[92] Park staff have also received numerous informal comments from visitors and regional professionals willing to invest their own time and resources in this act of preservation. For example, a grounds manager from California State University at Fresno has recently proposed funding his own research to study and help preserve these trees and their rare varieties. These stories reinforce the public interest and concern regarding the disposition of Yosemite's historic orchards.

Figure 25. Bears frequent the Lamon orchard, where they graze on fruit. Diligent fruit management would reduce their attraction to this site. (YOSE)

In conclusion, the rehabilitation of the Lamon Orchard allows the consolidation of Yosemite's rare fruit tree varieties, the preservation of these valuable historic resources, a responsible resolution to the inherent conflict

[92] Yosemite Valley Gardener Jack Knieriemen, *Proposal: Lamon Meadow Orchard Restoration and Use as Interpretive Display* (Yosemite National Park: Jan 19, 1998).

between orchards and wildlife, and an exciting new interpretive experience for visitors. Without the historic orchards, the history of Yosemite Valley's pioneers is not otherwise apparent and their landscape legacy is not otherwise visible. This act of rehabilitation will become a showcase of Yosemite's commitment to historic preservation and a source of pride for the park and its keepers.

For additional information, including a year by year breakdown of treatment recommendations for the Lemon Orchard, refer to Appendix I.

Curry Village Orchard

Existing Conditions

Like the Lamon Orchard, the Curry Village Orchard is a rare example of an orchard from the 1800-1880 golden age of pomology. This orchard is a strong reminder of the Valley's past agricultural land uses. The geometry of this orchard is clearly visible, in large part by the way the parking area was superimposed on top of the orchard. Curry Village orchard is the second largest orchard in the park and it retains good historic integrity, although the forms of individual trees are more dense and overgrown than managed trees would be. This orchard is currently in poor physical condition.

As mentioned, the Curry Village Orchard is currently used as a parking facility for Curry Village visitors and overnight guests. Many more orchard trees occur within the surrounding forest area, primarily between the parking area and the adjacent Southside Drive. One tree occurs north of Southside Drive and several others occur west of the Curry Village entrance drive. These outlying trees indicate the previous extent of the orchard before the development of Camp Curry.

The extant trees are primarily long-lived apples interspersed with occasional plum trees. The plum trees appear to be root sprouts in the original location of historic trees and therefore are not themselves historic. The trees in the poorest condition are those found beneath the canopy of the surrounding conifers rather than those in the parking area. This underscores their low tolerance for shady conditions. Many of the trees within the parking area produced abundant fruit in the 2007 and 2008 seasons.

Condition	Number	Percentage
Dead	2	2%
Poor	21	20%
Fair-Poor	26	24%
Fair	28	27%
Good-Fair	13	13%
Good	15	14%
Total	105	100%

Table 7. Curry Village orchard tree condition assessment.

Many conifers, particularly ponderosa pines, have encroached upon and overtaken the area surrounding the orchard. The traffic associated with automobile parking within the Curry Orchard has largely kept conifers from encroaching, although a few young conifers can be found growing adjacent to fruit trees. Other competition includes exotic invasive blackberry (*Rubus discolor*) growing around and upon some of the trees along the eastern edge of the parking lot. One tree is entirely enveloped by blackberry canes and it has become difficult even to see the tree beneath the blackberry.

Because of its close proximity to humans and their food, the Curry Village Orchard presents a particular problem with the Valley's bear population. As discussed previously, bears are attracted to human food, which they find in automobiles, in trash, in tents, cabins, and other structures. They also are attracted to the apples as the fruit begins to ripen in the orchard trees. The confluence of the orchard and parked vehicles (which often contain food) compounds the bear attraction and leads to a recurrent conflict. In addition, the trees in this orchard are taller than what their natural form would impart. This is because bears climb the trees in search of fruit and consequently break the tree's lateral branches. This "pruning" encourages the central leader to grow upwards.

Figure 38. Curry Village orchard parking area (Photo: S. Skach, 2008).

As mentioned, soil compaction is a consequence of this orchard's use as a parking lot. Due to compaction, the soil's ability to absorb water is compromised and therefore, the trees also are impacted by limited water resources. The talus slope above Curry Village drains into the parking lot and into the orchard and during the springtime, the soils often are saturated; however, during the summer months, the site is very dry. The irrigation ditches that historically watered the orchard were destroyed long ago and the orchard has not been irrigated for many decades. Other stressors include root suckers and trunk damage from automobiles.

Despite all of these stressors, 105 trees remain, over half of which are in fair condition or better. In the 1991 survey, Kennedy identified a total of 143 live trees, or a total survival rate of 72 percent.

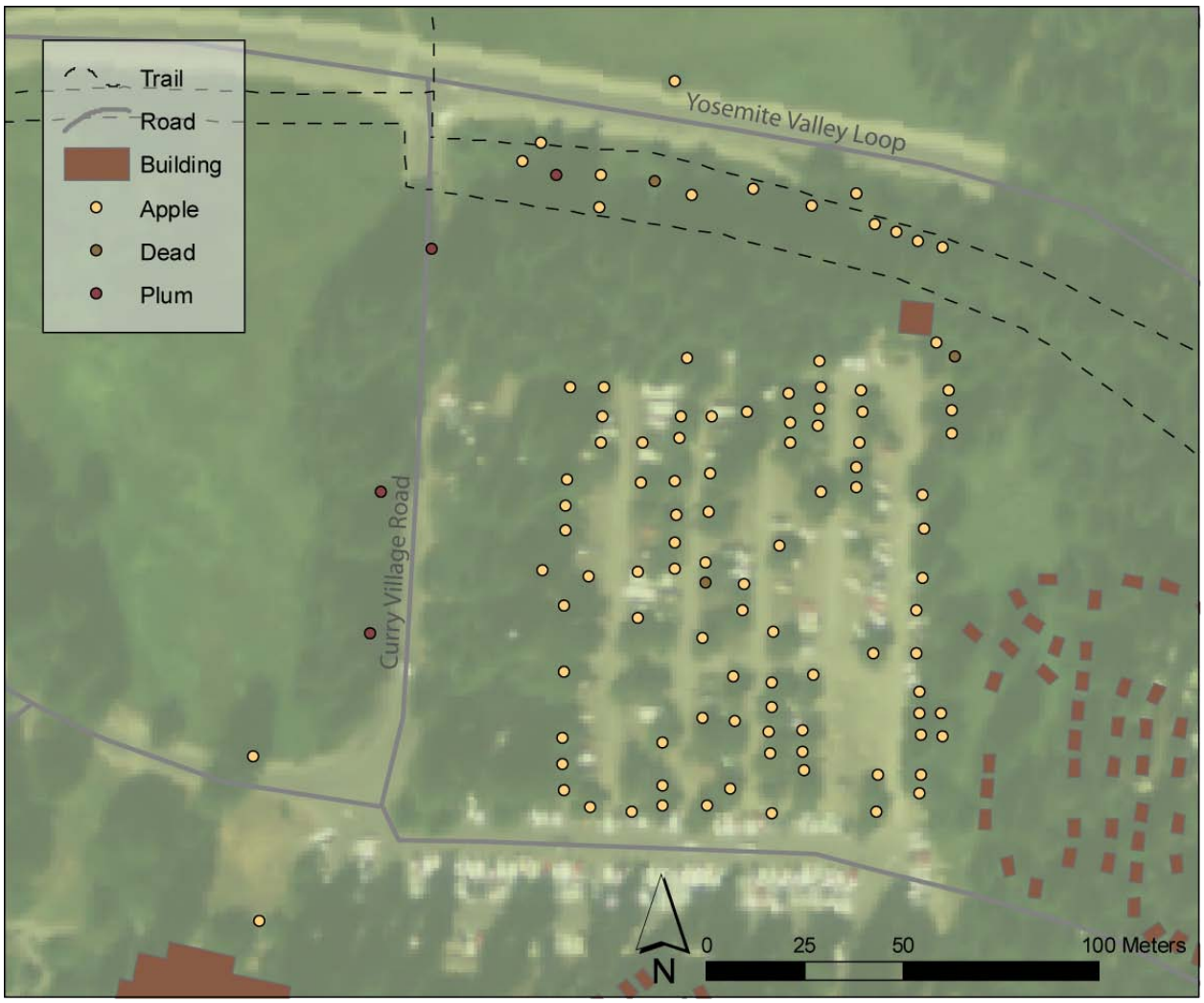

FIGURE 39. CURRY VILLAGE ORCHARD MAP.

Figure 40. Curry Village orchard tree conditions: Dead apple (#6), apple in poor condition (# 21), apple in good condition (#35), apple in fair condition (#13), clockwise from upper left (Photos: S. Skach, 2007).

RECOMMENDATIONS: REMOVAL / MEADOW RESTORATION

With initial stabilization and cyclic maintenance this orchard could be returned to a stable condition suitable for further restoration. Unlike the Lamon Orchard, however, the Curry Village Orchard is in a high-use area adjacent to Curry Village, where human / wildlife conflicts are common. Any preservation actions must effectively resolve this conflict. These guidelines recommend a compromise that will reclaim a valuable natural area, resolve the inherent human / bear conflict, and mitigate the loss to cultural resources via documentation, possible germplasm conservation, and cultural resource consolidation in the Lamon Orchard. This option is contingent on replanting rare varieties from the Curry Village Orchard to the Lamon Orchard to ensure in-park preservation. Therefore, these guidelines recommend removing the Curry Village Orchard only in conjunction with the rehabilitation of Lamon Orchard. It is worth noting, however, that removing the Curry Orchard would still constitute an adverse affect to the Yosemite Valley Historic District.

This document recommends the long-term removal of both the orchard parking facility and Curry Village Orchard. [93] This option has the greatest comprehensive benefits to wildlife and ecological processes. The loss of this orchard will be mitigated by documentation, possible germplasm conservation, and propagation of rare varieties in a rehabilitated and interpreted Lamon Orchard. The implementation of this would require ecological restoration as it would seek to reconnect the historic orchard area with the greater portion of Stoneman Meadow.

Removal of both the Curry Village Orchard and its parking facility would help resolve the perennial bear management conflict in this area. It is important to note that both the apple trees and the motor vehicles are bear attractants and the removal of either one without the removal of the other would not effectively solve this problem. Unfortunately, many generations of bears have learned to seek both orchard fruit and other human foods and the removal of these facilities may only shift the management burden to a new area without truly solving the problem. When this area is restored to natural conditions, for example, bears may begin to frequent other parking areas at Curry Village and they may break into vehicles or dwellings with greater frequency in other areas of the Valley.

The Curry Village Orchard is a low-lying area at the base of a talus slope and adjacent to an existing wetland. This area once would have accepted the water that flows down the talus, ultimately recharging the water table and supporting the wetland-wet meadow ecology associated with Stoneman Meadow. Currently, water from the talus slope pools on paved ground, submerges pedestrian sidewalks in several inches of water, and negatively impacts the visitor experience and the overall condition of the cultural landscape. Ecological restoration of this site would improve groundwater recharge, improve the health of adjacent wetland-wet meadow areas, and provide added habitat for many specialized wetland organisms. Although the removal of the orchard is an adverse affect to the Yosemite Valley Historic District, the removal will have some benefits to the District. It will improve the drainage and usability of pedestrian circulation routes, improve the area's air quality and the soundscape, and it will improve historic views from Curry Village and Glacier Point.

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[93] Yosemite National Park, *Yosemite Valley Plan.*, Volume 1A, 2-52.

Until the time that the trees and parking lot can be restored to natural conditions the trees should be stabilized and effectively maintained in order to improve their health and appearance and to reduce the amount of fruit available to bears.

For additional information, including a year by year breakdown of treatment recommendations for the Curry Village Orchard, refer to Appendix I.

HUTCHINGS ORCHARD

HISTORY

James Mason Hutchings was an early and influential Yosemite Valley personality. He arranged the first tourist trip to the Valley in 1855 and subsequently published the adventures in his periodical, *California Magazine*.[94] Hutchings spent the next several years extolling the virtues of Yosemite's wonders in his publication, and by 1864 he had taken proprietorship of the Upper Hotel and began a lifetime as a Yosemite concessioner. As hotel proprietor he improved the hotel by building a sawmill nearby and constructed wooden partitions for the rooms as well as other improvements, including a rear addition that completely enclosed the trunk of a large cedar tree.

After a winter on the cold south side of the Valley, Hutchings and his family moved to the north side of the Valley where they constructed a cabin in the oak savanna near the base of Yosemite Falls. In 1865, Hutchings planted his garden and orchard behind the cabin.[95] Little information exists about the Hutchings orchard, although his first saplings were apparently transported to the Valley via mule and were said to be from "Harris," the nursery used by Lamon a few years earlier. The orchard originally comprised over 200 trees and was part of an extensive farm where Hutchings grew vegetables, grapes, numerous berries, and grains, all of which were watered by an extensive system of irrigation ditches.[96] Hutchings used the produce in his establishment and sold it to visitors.

Hutchings is better known for the decade of litigation, largely instigated by himself, with the state of California and federal government in order to gain ownership of the land that he occupied. Following the Yosemite Grant, Hutchings and other settlers, including Lamon, were offered a ten-year lease on their current properties; they refused, insisting that the terms of the lease infringed on their property rights. As a result the state had little alternative but to take legal action against the trespassers.[97]

Early settlements ruled in their favor and allowed the men to determine the shape of their claims. Hutchings laid out his claim in the shape of a cross, effectively blocking the Valley in all directions, thereby ensuring personal control over Valley happenings. Subsequent trials, however, determined his actions inappropriate and illegal, and the state then revoked Hutchings' right to own private land within Yosemite Valley. Hutchings in particular continued to fight the ruling, taking his arguments to the Supreme Court in the

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[94] Carl P. Russell, *100 Years in Yosemite: The Story of a Great National Park* (London: Cambridge University Press, 1931). 49.
[95] Kennedy, *Survey of the Orchards of Yosemite National Park*. states that the orchard was planted between 1864-65, and School, "Exotic Trees of the Yosemite Valley." states that the orchard was planted in either 1865 or 1866.
[96] Greene, Yosemite National Park: Historic Resource Study. 70.
[97] Runte, Yosemite: The Embattled Wilderness. 22.

landmark case of *Hutchings v. Low* of 1872. This case ruled against his land claim and established the constitutionality of the national park.[98]

Ten years after the 1864 Yosemite Park Act, Hutchings and Lamon were awarded large settlements; Hutchings received the largest settlement for $24,000, and both men were re-offered leases on their land. Lamon chose to accept the lease while Hutchings refused and was subsequently evicted from his property in 1875.[99] Accordingly, Hutchings would have left his orchard when it was approximately 10 years old. In 1876 Coulter and Murphy took over Hutchings' holdings followed a year later by John K. Barnard, who ran Hutchings' hotels along with Coulter and Murphy's additions.[100] Barnard and his family moved into the Hutchings cabin and probably maintained the orchards and gardens.

When Hutchings was later selected as commissioner of the Yosemite Grant, Barnard vacated the residence but continued managing the various hotels. Hutchings and his family moved back into their cabin, where Hutchings lived until his death in 1902. It is likely that Hutchings resumed care of the orchard and maintained it until his death. Acting Superintendant Gabriel Sovulewski and his family lived in the cabin from 1906-1909, until the cabin was removed. In the following years the orchard was likely neglected and was impacted by development of paths and roads that serviced the nearby housing development.[101]

Existing Conditions

The Hutchings orchard is a relic of the 1800 – 1880 era of pomology and it is a contributing feature of the Yosemite Valley Historic District. It is located south of the Lost Arrow housing development and south of the current Yosemite Valley School. It is situated in a hot, dry California black oak woodland east of Yosemite Creek, near Yosemite Falls. Due to its advanced age, its rather inhospitable site, and the absence of maintenance, this orchard is in poor physical condition. Two pedestrian paths divide the orchard into three sections. As a consequence of forest encroachment and trail developments, this orchard is barely discernible as a unit and therefore has poor historic integrity.

Condition	Number	Percentage
Dead	4	10%
Poor	22	52%
Fair-Poor	7	15%
Fair	3	6%
Good-Fair	6	14%
Good	0	0%
Total	42	100%

Table 8. Hutchings orchard tree condition assessment.

The western portion of the Hutchings orchard contains no live trees, but several dead apple snags still occur among the large conifers that have colonized the site. The central section contains the greatest number of extant fruit trees, all of which face heavy competition from conifers, blackberries and herbaceous vegetation. Many of the trees in this area are in extremely poor condition, with large amounts of dead and downed wood. The eastern section of this orchard was planted along the edge of an oak savanna, the trees from which shade a portion of the orchard. Other competition comes from young evergreens, grass and blackberry vines. Trees in this eastern group receive more light and they are in better physical condition. A split rail fence

[98] Ibid. 33-36.
[99] Greene, *Yosemite National Park: Historic Resource Study*. 120.
[100] Ibid. 120.
[101] Ibid. 446.

has been built on either side of the pathway that separates the central and eastern groups of the extant trees.

It is difficult to perceive, from first glance, that the extant trees once comprised a large and fruitful orchard. The majority of the trees (52 percent) are in poor condition, and they have been encroached upon by mixed forests on a fragmented site. The majority of the trees contain large amounts of dead wood in their canopies and many also are weakened by root suckers. These conditions probably account for the absence of fruit in Hutchings orchard in 2007.

FIGURE 41. HUTCHINGS ORCHARD. NOTE PEDESTRIAN WALK AND TRAMPLED CHARACTER IN THIS HIGH-USE AREA.

Kennedy notes stress on Hutchings orchard from drought in 1991, "Prognosis for survival good, if normal rainfall; Risk of loss from sun burning trees if attempt to rehabilitate. Most losses are apparently due to drought."[102] Since this time, the park has endured several seasons of drought and an additional 15 trees have died since Kennedy's analysis.

It should be noted that many of the vines growing in this orchard are hops (*Humulus lupulus)*, which also were cultivated by Valley residents. Much like apples, many agricultural hops varieties have been lost over the past centuries. The hops varieties within the park should be identified by a specialist to determine their value. Hops is, however, an invasive vine, which naturalizes on a localized basis. After varieties have been identified and any valuable genetic resources have been preserved, this species should be eradicated from Yosemite National Park.

[102] Kennedy, Survey of the Orchards of Yosemite National Park.

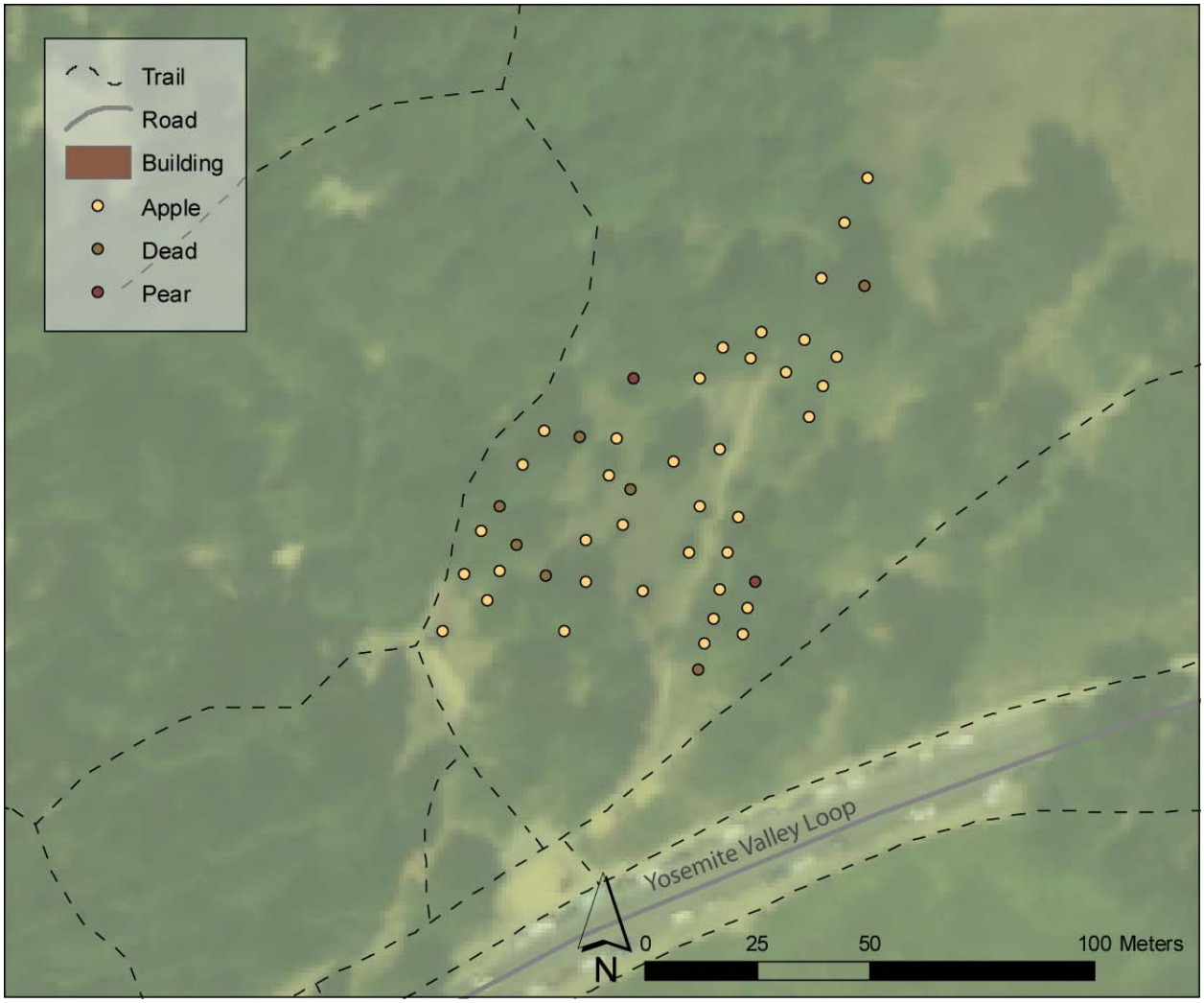

FIGURE 42. HUTCHINGS ORCHARD MAP.

Figure 43. Hutchings orchard tree conditions: dead apple (#35), apple in poor condition (#23), apple in good-fair condiiton (#12), apple in fair condition (#7), clockwise from upper left (photos: s. skach, 2007).

Recommendations: Removal / Ecological Restoration

The Hutchings orchard should be removed in conjunction with ecological restoration of the site to California black oak woodland. Although stabilization may be feasible, the poor physical condition and rapid decline of this orchard indicates that stabilization may fail; therefore, the expense associated with stabilization should be avoided. Rather, the loss of this historic orchard should be mitigated by appropriate documentation, germplasm conservation, and propagation of rare varieties in a rehabilitated Lamon orchard.

As previously mentioned, all orchard trees that do not receive stabilization and cyclic maintenance should be removed proceeding documentation and conservation. In this case, the poor physical condition and poor historic integrity of the cultural resource does not warrant stabilization and ultimately, the benefits of ecological restoration on its high-traffic and high-profile site justify the orchard's removal. Orchard removal should occur in conjunction with ecological restoration.

For additional information, including a year by year breakdown of treatment recommendations for the Hutchings Orchard, refer to Appendix I.

Yosemite Valley Miscellaneous Trees

History & Existing Conditions

The remains of several other Yosemite Valley orchards still exist; however, many of these relics are often reduced to a single specimen or a very small group of specimens. Due to the poor physical condition, unknown histories, and unclear historic extents of these relics, historic integrity is very poor. For example, it is often unclear if single trees were once parts of more extensive orchards or if they were single specimens when planted. This lack of historic context and integrity, coupled with a lack of written history, leaves very little material for preservation or interpretation. The majority of these miscellaneous trees, including those on the site of the old Yosemite Village and around the chapel, probably were backyard fruit trees, although some may have been part of small orchards. Other trees probably were sprouts from discarded apple cores.

Along Sentinel Beach a long linear planting of apple trees are the only remains of a once larger orchard dating from around 1865-1870. Kennedy states that his investigation revealed,

…that the trees are the only survivors of an immense orchard planted long ago in the historical flood path of the Merced; this must have been the largest of the orchards in the Valley, of at least 500-1000 trees. Occasional apple trees found upon the forest terrace above the river level (at Four Mile Trail head) suggest that the orchard may have extended even farther yet, but has since been reclaimed by forest.[103]

It seems unlikely, however, that these remnants were once a single extensive orchard. No historical evidence reinforces this hypothesis and an orchard of such expanse probably would have been mentioned in records or correspondence. It is nevertheless possible, based on the layout of existing trees.

[103] Kennedy, *Survey of the Orchards of Yosemite National Park*.

These dispersed trees also were mentioned in historical observations that state, "There are four or five trees near the site of Galen Clark's house, located just south of the foot-bridge at Leidig Meadow. John Muir is said to have had a cottage in what is now Camp 12, near the foot-bridge, and there is one apple tree growing at that spot."[104] None of these particular trees still exist.

Condition	Number	Percentage
Dead	1	4%
Poor	6	23%
Fair-Poor	2	8%
Fair	10	38%
Good-Fair	1	4%
Good	6	23%
Total	26	100%

TABLE 9. YOSEMITE VALLEY MISCELLANEOUS TREES CONDITION ASSESSMENT.

Excluding the three major orchards, fruit trees can be found at many other sites. The majority of these trees are in poor condition and probably have received no maintenance. One site is along the western side of Bridalveil Meadow and this site hosts one tree, of unknown origin and in poor condition. A second site is along Southside drive, where another single apple tree occurs approximately 20 feet away from the road. This tree also has no historic data associated with it may be a volunteer. Although it grows within the forest, it was in good condition and produced fruit in 2007. Several more apple trees occur at a third site on the north side of Southside Drive, near Sentinel Beach. Spread throughout the area, ten fruit trees remain interspersed within the forest and meadow edge. These trees are overgrown with grass, underbrush and large overstory conifers. Those few still in the open meadow are in better condition than their forested counterparts. These are the aforementioned trees, which Kennedy believed to be the remnants of a very large orchard in the Merced floodplain. Several additional fruit trees occur at a site near the chapel and across Southside Drive in the adjacent meadow. Four fruit trees surround the chapel, including three apple trees and one pear. The two fruit trees in front of the chapel are near several incense cedar trees and consequently, they are in poor condition. The apple and pear in front show some evidence of maintenance, however, and they are in fair and poor condition, respectively. Two apple trees occur in the lightly forested area directly west of the chapel. A prescribed burn in the fall of 2007 caused significant damage to both trees and rendered them difficult to assess. The single apple tree in Sentinel Meadow, across Southside Drive from the chapel, also appears to have been impacted by a prescribed fire. This tree was part of the old Yosemite Village plantings and it is one of three extant trees at the historic village location. A plum tree is located along Southside Drive, several hundred feet west of the aforementioned apple tree. Two other trees, an apple and a historic cherry are located across a path and they were unaffected by the prescribed fire. Both occur in an area that has since become overgrown with native trees and both are in poor condition. A large multi-stemmed apple tree occurs at a site in Leidig Meadow and this specimen is in poor to fair condition. It is located on the north edge of the meadow and receives full sun; it may be drought stressed due to its warm, dry location. Three

[104] Ibid.

addition apple trees occur in Cook's Meadow. These are in fair to good condition. According to Kennedy these trees are likely, "relics of a much larger, general planting."

Other individual fruit trees occur in the current Yosemite Village area. Two non-historic trees occur at the Indian Village. These are apple and pear, respectively, and both are located along the small stream that runs through the village. They are young trees that are both in good condition despite competition from larger conifers.

One historic apple tree occurs behind the Rangers' Club. This tree is in very poor condition with broken scaffolds and only one live, new branch from the trunk. The tree was identified by Kennedy as the rare 'Sheepnose' variety. Sheepnose apple, also known as 'Black Gilliflower', is a particularly old variety, which dates to the 1700's and originated in the Northeast United States, most likely Connecticut. It ripens in the late fall from October to November; however no evidence of fruit was seen during fall 2007 field visits.[105] This is the only miscellaneous Yosemite Valley fruit tree that is addressed individually in this plan.

Figure 44. Bridalveil Meadow apple specimen, at center left (photo: S. Skach, 2008).

Additionally, one young apple tree in good condition occurs along the southern edge of the Ahwahnee Meadow and two historic apple trees occurs on the Ahwahnee grounds, south of the hotel. Both are in fair condition though neither show evidence of recent maintenance. A single apple occurs near Housekeeping camp between a bend in the Merced River and the road. It appears to be historic; however, its condition is poor. The back side of North Pines Campground, near the river and bike path, contains a number of cherry trees. Fourteen were recorded; however, more probably occur in the area. The origin of these trees is unclear; they may be volunteer trees from seeds, they may be grafted orchard varieties, and they may or may not be historic. They are small, bushy, multi-stemmed trees in fair condition. Finally, one apple tree is located behind the Happy Isles Nature Center. It appears to be a young sprout with no historic form and no evidence of pruning.

[105] *Big Horse Creek Farm: Specializing in Appalachian Mountain Apple Trees* (Big Horse Creek Farm, Mar. 19, 2008 [cited July 24 2008]); available from http://www.bighorsecreekfarm.com/descriptions1.htm.

Throughout the various residential areas, modern fruit trees also occur around dwellings. These trees were not inventoried.

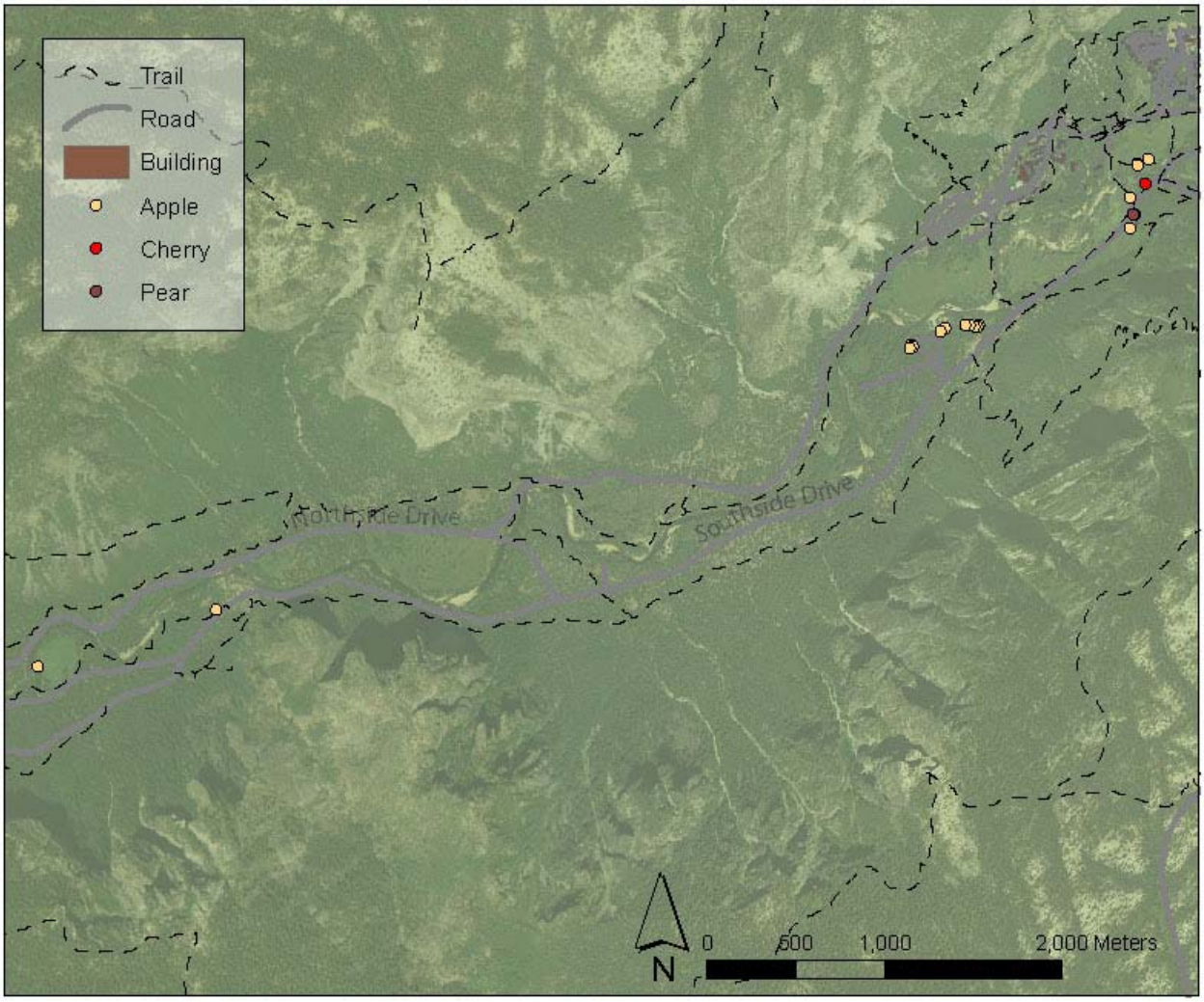

FIGURE 45. YOSEMITE VALLEY MISCELLANEOUS TREES MAP.

Figure 46. Yosemite Valley miscellaneous tree conditions: mostly dead apple at four mile trailhead, apple in poor condition at four mile trailhead, apple in good condition at Cook's meadow, apple in fair condition at four mile trailhead, clockwise from upper left (photos: s. skach, 2007).

RECOMMENDATIONS: REMOVAL

Due to their lack of historic integrity, these trees do not significantly contribute to the Yosemite Valley Historic District. They provide dispersed sources of non-native food for wildlife and they therefore are a nuisance from both management and ecological perspectives. Removal of these scattered trees is the preferred and most responsible management decision. Orchard trees that lack historic integrity do not contribute to the cultural landscapes of Yosemite and yet they continue to pose a visitor safety and wildlife management threat. Few of these trees produce any fruit and stabilization would probably encourage these trees to flower and produce fruit. Many of these trees are near roads, for example, and if they were stabilized and consequently produced fruit, bears and deer would graze on that fruit near roadways. This would pose a threat both to the animals and to visitors who tend to drive less responsibly when wildlife is within view.

One tree is an exception to this recommendation. The rare 'Black Gilliflower' variety apple tree that occurs along the south face of the Rangers' Club should be stabilized and preserved. This tree is in a benign location and it is of very high conservation value. This tree should be preserved and it should be a top priority for management. First, it should undergo germplasm conservation, if necessary, and then it should be propagated in the Lamon Orchard. Several grafted saplings should be developed from its few live shoots in order to assure that the genetic material is preserved. After these measures have been completed, it should be documented, the parent tree should be removed because it is nearly dead, and it should be replaced with one of the new grafted saplings.

The remainder of these scattered trees should be documented, any uncollected varieties should undergo germplasm conservation, and new graft saplings should be propagated in the Lamon Orchard. Only after these measures have taken place should the trees be removed. Any root suckers that sprout from the stumps should be treated with an approved herbicide.

Wawona Area Orchards

Introduction

Wawona was an early stop along the stage road to Yosemite Valley and it thereby became a thriving, largely self-sufficient community. Land-use at Wawona, as with other Yosemite communities, included a combination of agriculture and tourism infrastructure. Wawona farms included the use of meadow land for pasture, the cultivation of vegetable produce, and the establishment of orchards. These products were often used locally and they also allowed the Wawona area establishments to better outfit tourist parties and attract more tourists to their profitable stagecoach and hotelier businesses.

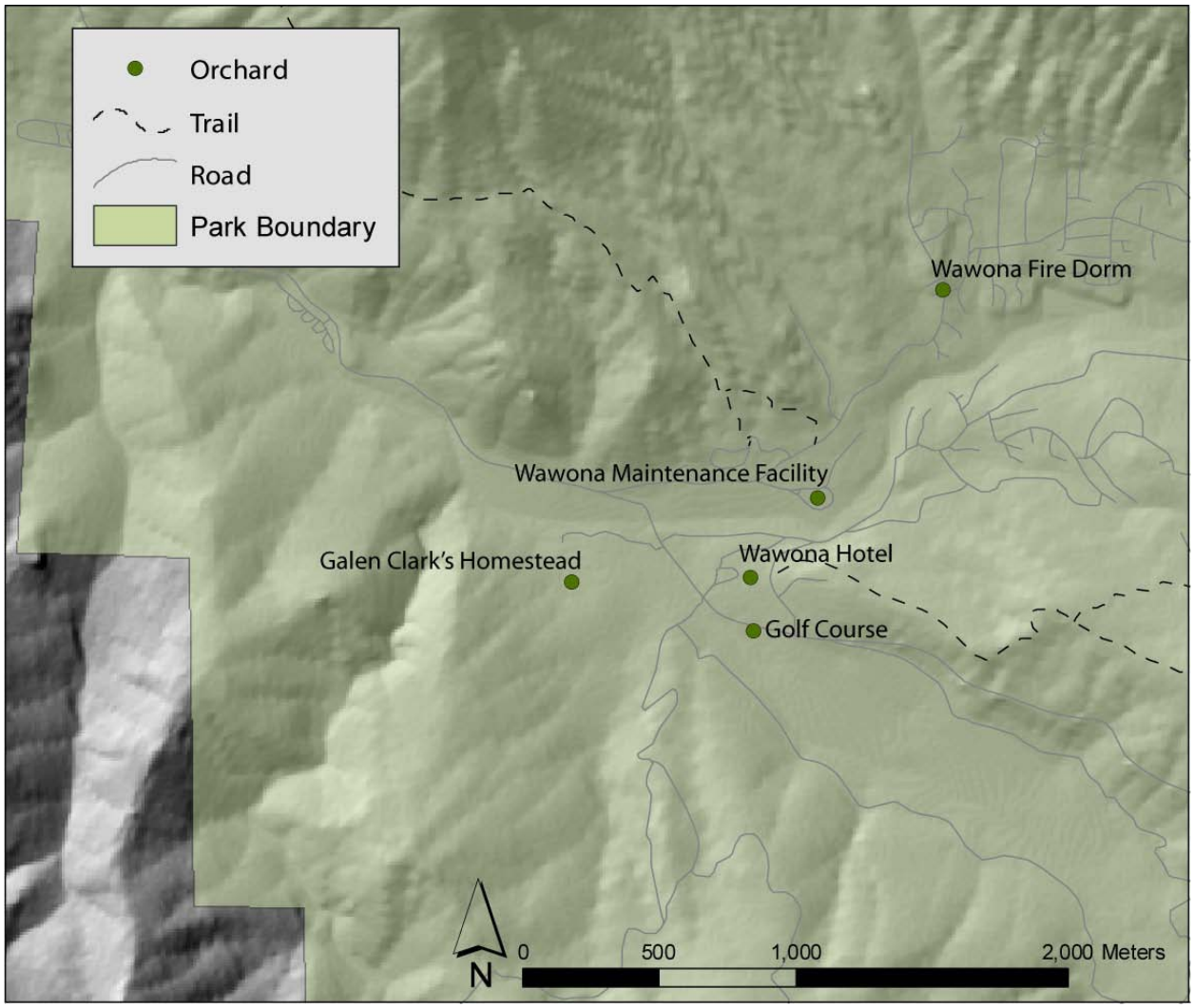

Figure 47. Wawona orchard locations.

Wawona contains significant remains of two historic orchards, Galen Clark's Homestead orchard and Henry Washburn's orchard, which supplied fruit to the hotel. Other miscellaneous trees are individual specimens located throughout the area and little is known of them. Another more recent orchard surrounds the Wawona Fire Dormitory. This orchard was planted between the 1940s and 1950s. This is the sole orchard

that is actively maintained in the Wawona area. Throughout Wawona, 49 trees have been found in five different locations.

Galen Clark's Homestead Orchard

History

Galen Clark is among Yosemite's most iconic inhabitants. He arrived in Wawona in 1856 as a convalescent and struggling businessman. Clark filed a land claim near the South Fork of the Merced River "for agricultural and growing purposes."[106] The meadow he chose was conveniently located along the South Fork of the Merced River, approximately 25 miles both from Mariposa and from Yosemite Valley. Clark was an ill man when he arrived and developed his small farmstead while struggling to enter the budding stagecoach and tourism business.

Clark developed his land into a humble retreat with an open door to visitors. He reinforced a spring near his camp for a well, which still remains. He then built a log cabin and planted four giant sequoia trees beside it. These trees are still extant and they mark the historic site of the cabin, of which nothing else remains. His home was frequently visited by local Indians. Other frequent visitors included the Mann brothers, who finished their toll trail from Mariposa to Yosemite Valley in 1856. Clark helped build the first bridge across the South Fork in 1857 and as use of the trail increased, he sold more provisions to visitors. He was often called upon to provide meals and so referred to his home as 'Clark's Station'.[107] In the following years, Clark was thereby encouraged to expand his agricultural products for sale to visitors. He developed vegetable gardens, hay, and an orchard. His livestock operation eventually expanded and included a small dairy herd. Clark hired local Native Americans to help tend his crops.

Clark eventually became well known for his hospitality and culinary skills. As reported by Fritz Ludlow in the 1864 Atlantic Monthly, "Here he gives travelers a surprise by the nicest poached eggs and rashers of bacon, home-made bread and wild strawberry sweetmeats which they will find in the State."[108] Clark became well-known as a rancher, host, hunter, cook, entertainer and guide; however, his skills as businessman were less notable.

Throughout most of his life, Clark was in debt and his time in Wawona was no different. With his partner Edwin Moore, the Mariposa County Supervisor, he constructed a hotel capable of accommodating many guests. The structure was completed and opened in 1870 on the alternate side of the meadow from his homestead[109]. He invested in this hotel and also became an early booster for the first stage route from Wawona to Yosemite Valley. Even after the stage route was partly completed, he ran out of financing and the road was never completed. This early roadbed still exists and runs roughly parallel to the southwestern length of the existing Wawona Road. After this failure, Galen Clark gave up his Wawona holdings and left for Yosemite Valley, where he remained.

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[106] Shirley Sargent, *Galen Clark: Yosemite Guardian*, Third ed. (Yosemite, CA: Flying Spur Press, 1981). 12.
[107] Ibid. 15.
[108] Ibid. 17.
[109] Shirley Sargent, *Yosemite's Historic Wawona* (Yosemite, California: Flying Spur Press, 1984). 14.

Little is known about the historic configuration or extent of the orchard. It probably was one large, contiguous orchard. It was planted between 1858 and 1864 near the aforementioned spring, which probably served as a water source for irrigation. The orchard site, however, is in a low-lying wet meadow and therefore must have required little irrigation.

Upon Clark's departure, the Washburn family took over hotel operations in the Wawona area. They operated Galen Clark's Homestead site as a picnic area and spa; the mineral spring was promoted as having curative properties. The spring was at one point covered and a pavilion was installed on the site. As part of the spa area, the Washburns may have maintained Clark's fruit trees.

Existing Conditions

This orchard contains 16 extant trees that occur in a low, wet meadow west of the golf course. The homestead clearing is just south of a drainage channel and the spring reinforced by Clark. The spring feeds a small stream which may have been used for irrigation; however, the stream appears to be seasonal and in dry years, may not be available when the trees would most need supplemental water. The spring is reinforced by natural stone and shows evidence of heavy siltation.

These trees are in poor physical condition due to their age and the absence of maintenance. The site is very protected and has sufficient natural moisture that the trees do not seem to suffer from drought stress. Also, probably due to the wet conditions, the forest has not significantly encroached upon the trees and they therefore still receive adequate sunlight. As with many of Yosemite's old trees, these trees have dead wood in their canopies and many also have suckers at their bases. All of the trees at this site that Kennedy surveyed in 1991 are still present and represent the highest survival rate across all of Yosemite's orchards. Although the trees are in poor condition, many produced fruit in the 2007 season. Many of the trees are small and may be root sprouts from the original trees. The large trees possess irregular forms and show little evidence of formal pruning.

Condition	Number	Percentage
Dead	0	0%
Poor	5	31%
Fair-Poor	4	25%
Fair	4	25%
Good-Fair	0	0%
Good	3	19%
Total	16	100%

Table 10. Galen Clark Homestead orchard trees condition assessment.

The 16 extant trees in Clark's orchard once were part of a larger homestead orchard. The extant trees do not occur in any coherent pattern and they may have been loosely clustered around Clark's cabin rather than placed in straight rows. The site still retains the aesthetic of a small farm clearing and because it has not become re-forested, the site's history is rather easy to envision. Clark's well and his row of sequoias also add to the historic integrity of this site. The site is not impacted by any contemporary developments and its quiet, removed character would lend itself well to visitation and interpretation.

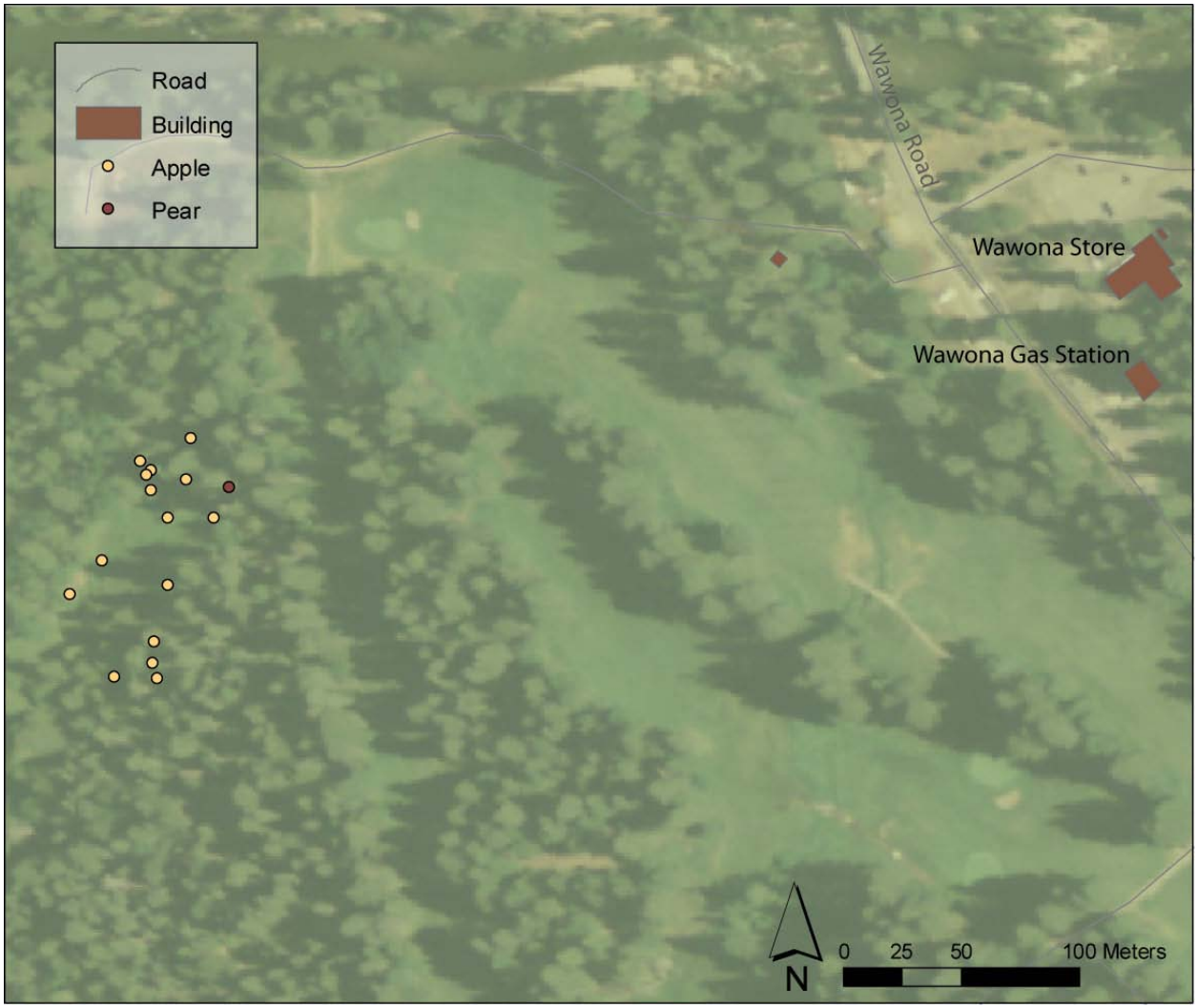

Figure 48. Galen Clark's Homestead orchard map.

Figure 49. Galen Clark's Homestead orchard tree conditions: mostly dead apple (#15), apple in poor condition (#8), pear in good condition (#1), apple in fair condition (#14), clockwise from upper left (photos S. Skach, 2007).

Recommendations: Preservation

Due to its age and its value as a component of Galen Clark's homestead, this orchard should be stabilized and preserved. Restoration of the orchard is not feasible due to a lack of data regarding historic configuration. Any trees that are suspected root sprouts could be removed and replaced with historic varieties from adjacent trees. Preservation of this orchard would entail regular maintenance including standard stabilization techniques. Coniferous trees must be removed wherever they compromise the health of orchard trees. Any unrepresented varieties should undergo germplasm conservation and should be propagated in the Lamon Orchard. If thereafter any trees in the orchard die, they can be replaced by this same stock.

Given the strong public interest in Galen Clark, this orchard easily could become part of a larger interpretive effort at the homestead. The spring and the row of giant sequoias would comprise the rest of the historic features and these could be interpreted along an established trail with appropriate signage. To aid in interpretation and resource management, all of the fruit trees should be permanently labeled, with the labels including the trees species and cultivated variety.

For additional information, including a year by year breakdown of treatment recommendations for Galen Clark's Homestead Orchard, refer to Appendix I.

Wawona Fire Dorm Orchard

History

The Wawona Fire Dorm Orchard was planted in the early 1950s by Lou and Myrtle Stockton who owned the property before it was obtained by the National Park Service. In the late 1940s Lou Stockton purchased the lot directly adjacent to the Fire Dorm property and he then planted an orchard and built the existing cabin. When purchased, the property consisted only of a bare lot.

The couple maintained their orchard during the early years of their marriage in the 1950s. The Stocktons were long-time residents of Wawona and Lou Stockton was a local postal carrier. When the park service acquired several properties in the 1970s, residents were offered lease backs, which allowed them to remain on their properties for a fixed number of years in return for a yearly drop in purchase price for the park service. The Stocktons were elderly enough that they were able to acquire a lifetime tenancy, after which the property passed to National Park Service ownership.[110] After this time little is known about this orchard; however, Kennedy notes in his 1991 survey that "residents and neighbors make use of fruits."

This orchard is located in Section 35, which is a largely private in-holding within Yosemite. Due to the large number of inholdings, Section 35 was excluded from the pending Wawona Basin Historic District and the orchard therefore would not be a contributing feature of that district.

Existing Conditions

[110] Norman May, Telephone Interview with Historical Landscape Architect Sky Skach, September 4, 2008.

The orchard located at the Wawona Fire Dorm is in excellent condition. This is due to the relatively young age of the trees and also due to an active maintenance regime. The eight trees found around the fire dormitory are in fair condition or above. Several of the apple trees produced fruit during the 2007 season but the single pear tree showed no evidence of fruit. The trees show evidence of regular pruning and maintenance and the fruit is presumably utilized by surrounding residents. No evidence of bear damage or disease is present.

Several other trees were observed, though not evaluated, in a nearby private yard. These seem to be part of the original Stockton planting; however, they could be older. The nearby trees match those at the fire dorm in form and size. Kennedy indicated that in 1991 the planting consisted of eleven trees, which indicates that he too suspected those private trees to be part of the historic Fire Dorm Orchard. He also noted that deer were frequent and that the fruit was utilized by residents and neighbors.

These trees are unique in the park as they were planted nearly 80 years after the majority of Yosemite's other fruit trees. They therefore represent a different period of orchard development in the United State and reflect characteristics from this time period. The trees are consistent in shape and more widely spaced with approximately 30 foot spacing. They also contain shorter trunks, approximately three feet tall, and bowl shaped canopies.

Condition	Number	Percentage
Dead	0	0%
Poor	0	0%
Fair-Poor	0	0%
Fair	2	25%
Good-Fair	0	0%
Good	6	75%
Total	8	100%

TABLE 10. WAWONA FIRE DORM ORCHARD TREES CONDITION ASSESSMENT.

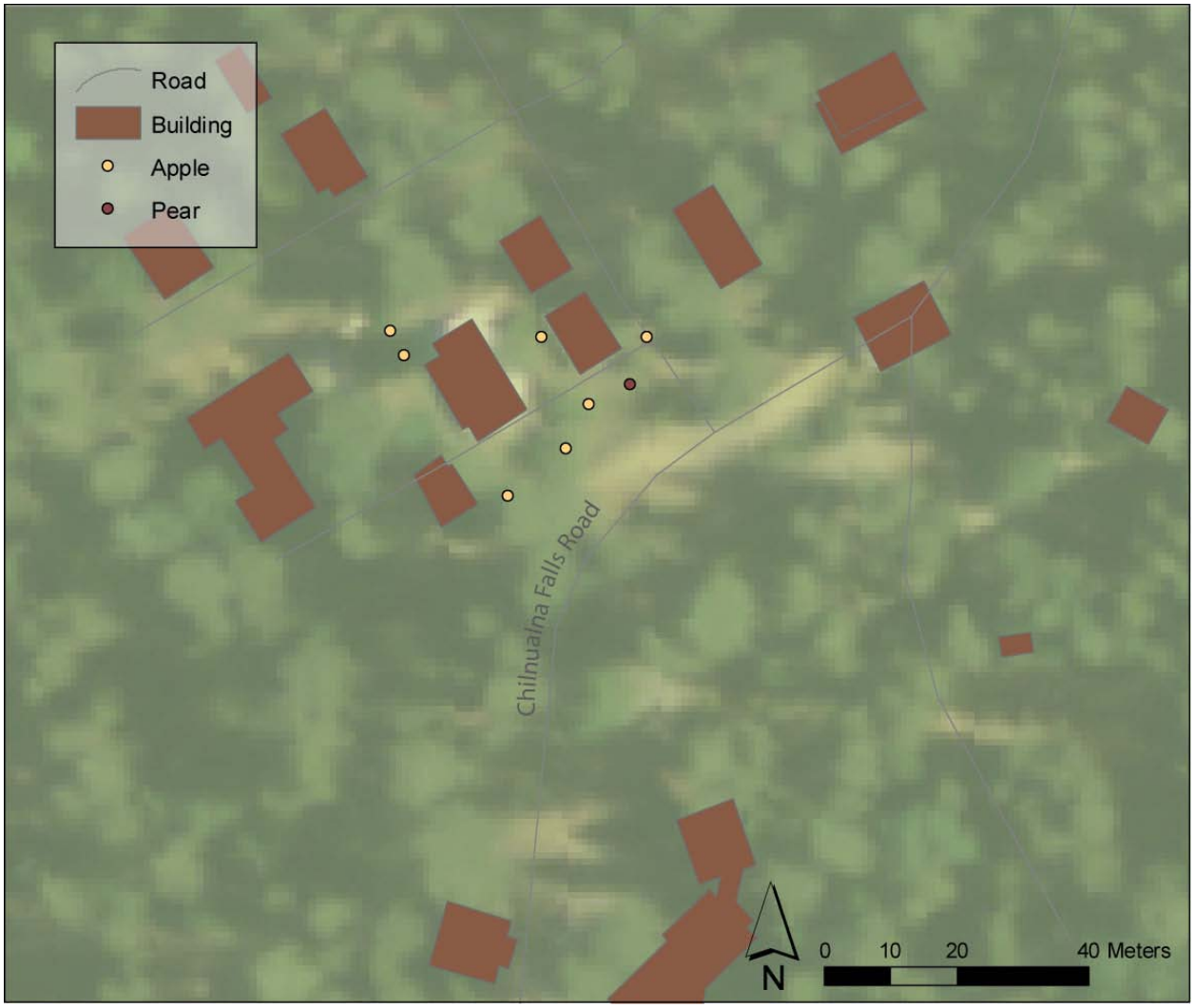

FIGURE 50. WAWONA FIRE DORM ORCHARD MAP.

FIGURE 51. WAWONA FIRE DORM ORCHARD TREE CONDITIONS: PEAR IN FAIR CONDITION (LEFT), APPLE IN GOOD CONDITION (RIGHT) (PHOTOS: S. SKACH, 2007).

RECOMMENDATIONS: NO ACTION

Because the trees are now over 50 years old they are eligible to be considered a historic resource and should be treated as such if any alterations to the site are considered. The Wawona Fire Dorm orchard is unique among Yosemite orchards because it has been actively maintained and harvested since it was installed. The residents who cultivate these trees are clearly engaged in a successful maintenance regime; therefore, the National Park Service should not interfere with their management. If, however, these trees should fall into neglect, they should be stabilized and preserved. This should involve replacement of dead trees with propagated grafted saplings from neighboring trees of similar variety.

WASHBURN ORCHARD

HISTORY

Wawona has been associated with overnight visitor accommodation since its inception in the 1850's. Clark & Moore's Station, established and run by Galen Clark and his partner Edwin Moore, was an ideal stopping point for tourists. These visitors also could purchase provisions for the road and from the beginning the establishment cultivated many agricultural products for this purpose. Its founders, however, eventually sold out to the business-savvy men of the Washburn family.

Henry Washburn and his partners in the Washburn, Coffman and Chapman Company filed an application with the Mariposa County Supervisors to complete the toll road from Clark and Moore's Station to Yosemite Valley in November of 1874. The very next month, they purchased Clark and Moore's property. These actions effectively began an era of Washburn family management at Wawona.

Washburn and his partners greatly expanded Wawona facilities and services. They developed an extensive stage coach service, which conveniently picked up passengers at the nearest train station, transported them to the inn where they stayed the night and then transported them into Yosemite Valley. Importantly, the partners built the Wawona Hotel, which required the expansion of onsite agricultural activities.

Two of Washburn's fourteen brothers joined him in 1878 and they changed the name of the establishment to *Big Tree Station*. Chapman and Coffman sold their half interest in the company back to Henry Washburn and the family enterprise continued to expand. Agricultural expansions included a dairy herd, beef cattle, hogs, chickens, produce gardens and an extensive orchard. By 1882, Jean Bruce Washburn suggested the name Wawona for the hotel, which became official by September of that year.

According to Kennedy, the orchard was planted from1879-1885 and probably was the largest in Yosemite; however, this information remains uncorroborated. As early as 1883, the Mariposa Gazette extolled the virtues of the Wawona Hotel and described how "vegetables, eggs, apples, oranges, strawberries, everything in the front line that can be found in the markets of the state can be found there."[111] All of the produce excepting oranges probably were produced on site. This extensive operation was worked by hired laborers, many of whom were immigrants from China and elsewhere.

After Henry Washburn died in 1902 his brother John took over management of the company and in the early 1900s, John's son Clarence became a manager of the Washburn enterprise.[112] In 1917 the Washburns added several amenities including a swimming pool, the Annex and a nine-hole golf course. The construction of the golf course almost certainly required the removal of a large part of the orchard. Clarence Washburn was a meticulous record keeper, however, and his records indicate that the orchard remnant was maintained at least as recently as the 1920s.

Construction of the new Wawona Road in the 1930s necessitated the demolition of yet another portion of the remnant apple orchard. In 1932, the U.S. government purchased the property, the Yosemite Park and Curry Company purchased the buildings, and Yosemite Park and Curry Company assumed management as the chief park concessionaire. They retained Clarence Washburn as manager and stated that things would continue as normal. In a letter to Washburn, Don Tresidder, the head of the Yosemite Park & Curry Company stated, "The raising of fresh vegetables, grazing of cattle, horses, etc., will continue as in the past."[113] This statement suggests that the orchard remnant was probably still utilized for hotel produce. It remains unclear when this orchard remnant fell into neglect.

[111] Ibid. 37.
[112] Ibid. 59.
[113] Ibid. 69.

Existing Conditions

This orchard remnant is located between the Wawona Road and the Wawona golf course, just south of the Wawona Hotel. The trees are separated from the road by a split-rail fence. Only thirteen trees remain of this once-extensive orchard. The trees are standard size with tall trunks and full-grown form. They are spaced approximately 20 feet apart. All thirteen trees surveyed by Kennedy in 1991 remained alive in 2007 and several of these produced fruit in the 2007 season. The trees suffer little from competition, as they are along the edge of an open golf course. Approximately half of these trees are in fair condition, and with minimal maintenance, these trees could thrive.

Condition	Number	Percentage
Dead	0	0%
Poor	5	38%
Fair-Poor	3	25%
Fair	4	31%
Good-Fair	0	0%
Good	1	8%
Total	13	100%

Table 12. Washburn Orchard tree condition assessment.

The orchard remnant, however, has low historic integrity because its historic form and extent is unknown. The presence of the Wawona Road and the Wawona golf course further obscure the history of the site and its previous land use. The remnant is aligned in discernable rows so the orchard clearly was formally aligned but in the absence of more historic data, any reconstruction would be based on conjecture.

Kennedy stated that fruit was at one time removed through the use of fire hoses and noted bark disease and broken branches as a result. No evidence of this practice remains visible.

Figure 52. Washburn orchard from golf course. Note fence, which separates the golf course and orchard remnant from the highway. The highway runs between the apple trees and the conifers.

A persistent wildlife conflict has long been associated with this orchard remnant. Along the fence several posted signs warn visitors not to feed deer. The fence was installed during the mid-1980s to prevent people from walking onto the golf course while viewing these animals. The frequency that deer graze on fallen apples has created a nuisance due to the nearness of the Wawona Road. Deer herds reportedly have thinned since the 1980's and this wildlife conflict is somewhat reduced; nevertheless, evidence of deer was readily apparent during field visits.[114] This orchard is not actively maintained, despite its proximity to the Wawona Hotel.

[114] Wawona Buildings & Grounds Kermit Comstock, Telephone Interview with Historical Landscape Architect Sky Skach, June 12, 2008.

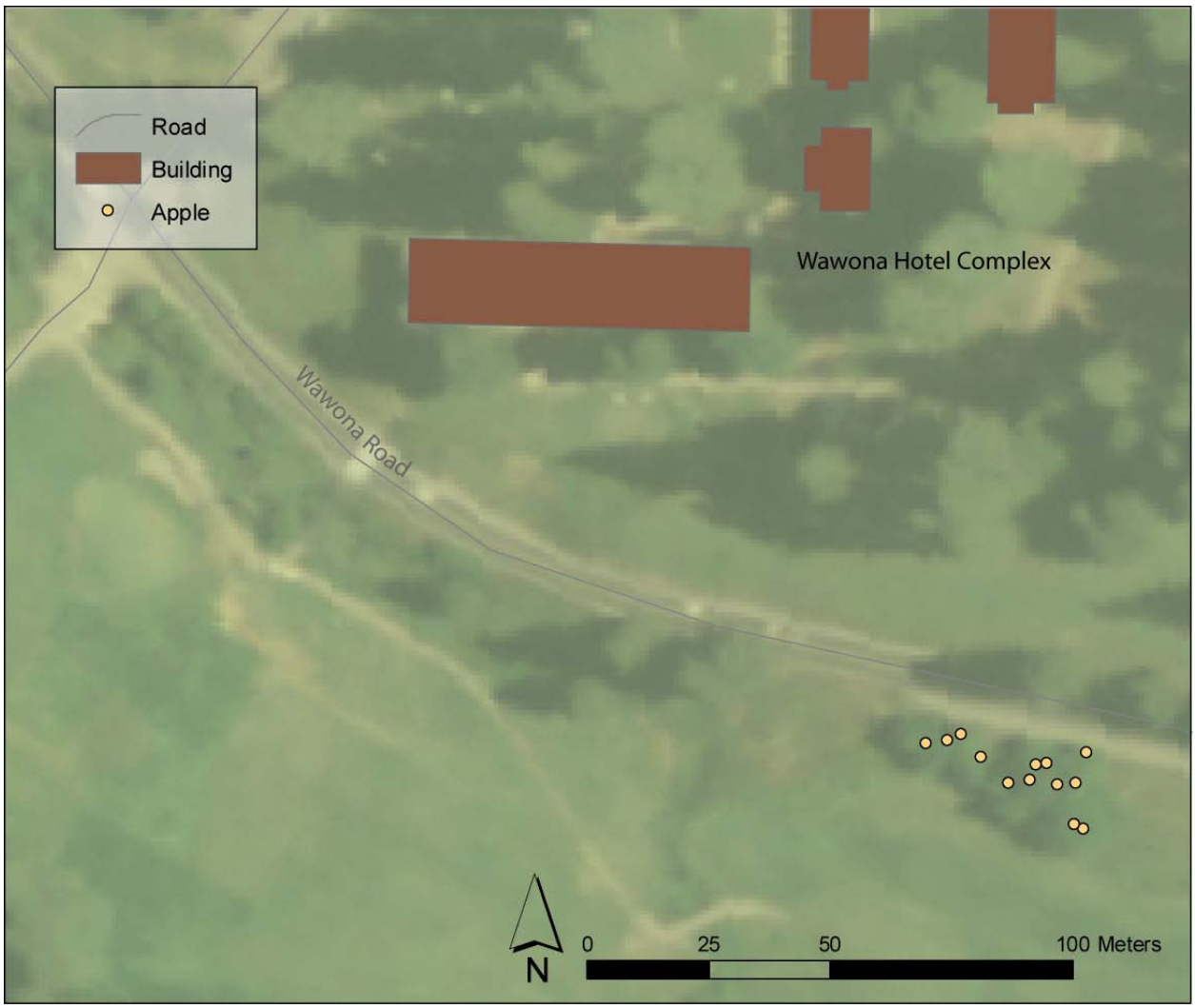

FIGURE 53. WASHBURN ORCHARD MAP.

FIGURE 54. WASHBURN ORCHARD TREE CONDITIONS: APPLE IN POOR CONDITION (UPPER LEFT), APPLE IN FAIR CONDITION (UPPER RIGHT), APPLE IN GOOD CONDITION (BELOW) (PHOTOS: S. SKACH, 2007).

Recommendations: Removal

These trees should be removed following documentation and germplasm conservation, if necessary. Any rare varieties should be propagated in the rehabilitated Lamon Orchard. Because this orchard remnant is prominently located next to a busy roadway, removal should be undertaken during the off-season.

Removal of these trees will eliminate a wildlife hazard along the Wawona Road. Its removal will not adversely affect the cultural landscape because of its low historic integrity.

Miscellaneous Wawona Orchard Trees

History& Existing Conditions

Little is known about many of the individual trees found throughout Wawona. Many of them are historic and were related to the Wawona Hotel Complex and were probably planted by the Washburn family. Several others may not be historic or may have been volunteer seedlings.

Figure 55. Two relatively mature apple trees appear behind young Wawona Washburn. It is evident here that she could not have planted either of these trees (photo: courtesy of Tom Bopp).

The two apple trees behind the Wawona Hotel, however, are mentioned in Washburn family lore. These two trees supposedly were planted in honor of Arbor Day by young Wawona Washburn and her brother. Photographic evidence confuses the story, however, because young Wawona is shown in front of full grown trees. Yet another photograph shows her as an older child in front of a younger apple in the northern hotel location. This tree probably died and was replaced by Wawona and her family.[115]

Other trees, such as relic trees on the hotel grounds near the historic garden area and one found at the end of the Washburn Ditch may have been a part of larger plantings and could have been planted either during Clark's tenure or later by the Washburn family. It is unclear whether they were individual plantings or parts of

Figure 56. Wawona before a much younger (extant) specimen (Photo: Courtesy of Tom Bopp).

[115] Tom Bopp, E-mail Correspondence with Historical Landscape Architect Sky Skach, June 16, 2008.

FIGURE 57. AERIAL VIEW OF THE WAWONA HOTEL COMPLEX SHOWING THE ORCHARD CA. 1925 (PHOTO: COURTESY OF TOM BOPP).

small or large orchards. The trees at Stella Lake probably are relics of an orchard that predated the lake. Kennedy suggests that the area was probably covered by an orchard before the lake was dredged because the Washburn irrigation ditch ran immediately along that site. Other trees, like those found near the maintenance facility have unknown origins. They may have been parts of larger orchards but no supporting data has been found.

Most of these trees are in good physical condition; however, some are

FIGURE 58. APPLE TREE AT WAWONA MAINTENANCE FACILITY (PHOTO: S. SKACH, 2007).

Condition	Number	Percentage
Dead	1	8%
Poor	2	17%
Fair-Poor	1	8%
Fair	4	33%
Good-Fair	0	0%
Good	4	33%
Total	12	100%

TABLE 13. WAWONA MISCELLANEOUS TREES CONDITION ASSESSMENT.

suffering from overstory and understory competition as well as lack of water. None of these trees are currently maintained though many produced fruit during the 2007 season. Most of them have no historic integrity due to their lack of historical data and their scattered places in the contemporary landscape.

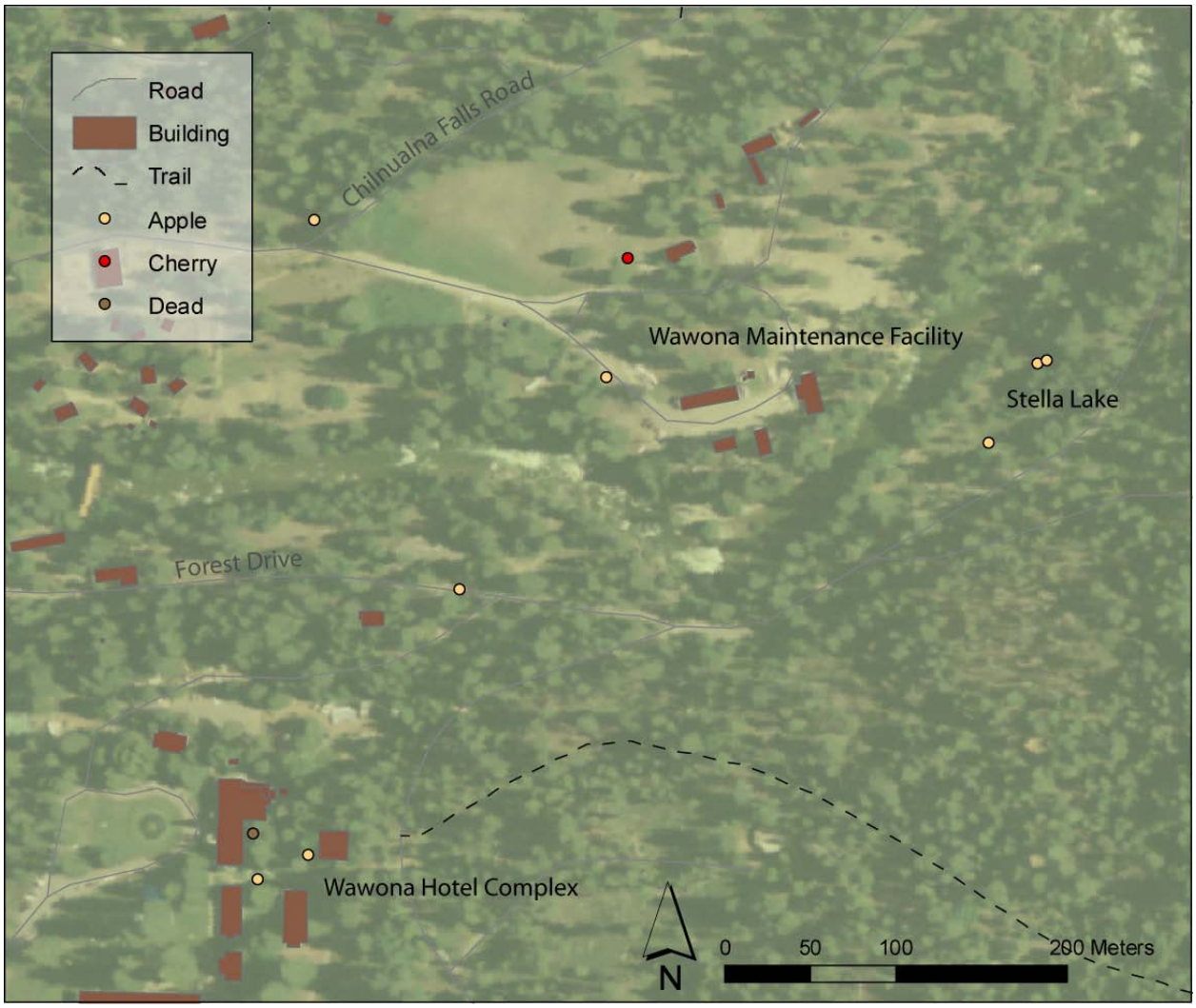

FIGURE 59. MAP OF WAWONA'S MISCELLANEOUS TREE LOCATIONS.

RECOMMENDATIONS: REMOVAL

It is recommended that all of these trees be removed, excepting the two specimens behind the Wawona Hotel. One of these trees has already died, but the neighboring tree is alive. These two trees should be stabilized and preserved. All Wawona orchard trees should be documented, undergo germplasm conservation if necessary, and any rare varieties should be propagated in the Lamon Orchard prior to removal. The one dead tree behind the Wawona Hotel should be propagated using cuttings from the neighboring specimen. These two trees are associated with the early history of the Wawona Hotel and therefore contribute to the pending Wawona Basin Historic District.

All trees can be removed with the exception of the tree behind the Wawona Hotel. Furthermore, the second dead tree behind the Wawona Hotel should be replaced. The replacement tree should be propagated utilizing samples from the surviving tree behind the Wawona Hotel.

With these two notable exceptions, all the miscellaneous Wawona trees can be removed after proper documentation and germplasm conservation occurs. Removal of these trees will reduce the total number of locations in Wawona where wildlife has access to exotic fruit. Due to their fragmented nature, removal of the trees will not detract from the historic setting of the Wawona area.

Conclusion

Yosemite is renowned for its scenic grandeur, its natural wonders, and its biological diversity. Its history, in the shadow of such grandeur, is sometimes overlooked. Yosemite nevertheless is a place of a long, rich and significant history. The cultural landscapes tell the stories of the people who settled the region, fought to protect it, and built one of the first great democratic parks in the world. The orchards of Yosemite are essential elements of this legacy. They were planted and tended by some of the most prominent public figures from Yosemite's past.

This context must be remembered when management is confronted with difficult decisions regarding the disposition of historic orchards. While the conflict between orchards and bears is inherent, they are not without solutions. Often the care, maintenance, and preservation of Yosemite's cultural landscapes - including its orchards - will depend not only on funding but also on the presence of a well-informed and open-minded management team.

This document has consolidated the histories that lend such value to Yosemite's orchards. It also has attempted to present an objective analysis of existing conditions, issues, conflicts, and potential solutions for these orchards. While its foundation is aligned with the value of cultural resource preservation, its solutions sometimes must sacrifice or consolidate these resources in its acknowledgement of the hazards they can pose to Yosemite's megafauna, its millions of visitors, and its staff. This compromise has the potential to bring together the different management divisions and special interests into a cooperative maintenance regime. The result of such cooperation would foster an enlightened era for historic preservation and interpretation in the setting of a more ecologically balanced Yosemite National Park.

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Appendix I: Major Orchard Maintenance Schedules

MEYER RANCH ORCHARD, *REHABILITATION*

Date	Maintenance Action
1st Summer	Remove all conifer trees from the orchard.
1st Summer	Remove non-historic apple tree near barns and outlying trees to the east of the orchard.
1st Summer	Remove and burn coarse woody debris from the orchard floor.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard.
Summer, cyclic	Conduct a light pruning, primarily removing flower clusters, to retard fruit production.
Summer, cyclic	Undertake organized fruit harvest.
Late Summer, cyclic	Mow orchard prior to fruit ripening.
Late Summer, cyclic	Collect and remove any and all remaining fruit that has fallen from the trees.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings for propagation.
2nd Summer	Install irrigation system.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
1st Winter	Remove dead branches from the canopies of orchard trees.
1st Winter	Install permanent tree identification labels on fruit trees, including genus, species and cultivated variety as needed.
Winter, cyclic	Remove root suckers from the bases of all trees.
Winter, cyclic	Prune trees to promote vigor.
1st Winter	Block informal parking beneath orchard trees near Old Coulterville Road.
Spring, cyclic	Aerate soil within drip line.
Spring, cyclic	Mulch 8’ in diameter around the base of each tree.
3rd / 4th Spring	Install nursery-grown grafted saplings in row gaps according to an approved re-planting plan. Begin training these trees in open bowl form.

McCauley Ranch, *Stabilization*

Date	Maintenance Action
1st Summer	Remove and burn coarse woody debris from the orchard floor.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard.
Summer, cyclic	Conduct a light pruning, primarily removing flower clusters, to retard fruit production.
Summer, cyclic	Undertake organized fruit harvest.
Late Summer, cyclic	Mow orchard prior to fruit ripening.
Late Summer, cyclic	Collect and remove any and all remaining fruit that has fallen from the trees.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings for propagation. Nursery-grown grafted saplings from McCauley Ranch may be used in the Meyer Ranch rehabilitation.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
1st Winter	Remove and burn dead branches from the canopies of orchard trees.
Winter, cyclic	Remove root suckers from the bases of all trees.
Winter, cyclic	Prune trees to promote vigor.
Spring, cyclic	Aerate soil within drip line.
Spring, cyclic	Mulch 8’ in diameter around the base of each tree.

HENNESSEY RANCH ORCHARD, *REHABILITATION*

Date	Maintenance Action
1st Summer	Remove encroaching trees wherever they compromise the health of orchard trees
1st Summer	Remove and burn coarse woody debris from the orchard floor.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard.
1st Summer	Remove invasive species from the orchard, including blackberry, grape, and Virginia creeper.
1st Summer	Construct fence around the perimeter of the future community garden.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings from unrepresented varieties outside of the fence line for propagation.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
1st Winter	Remove dead branches from the canopies of orchard trees.
1st Winter	Install permanent tree identification labels on fruit trees, including genus, species and cultivated variety as needed.
Winter, cyclic	Remove root suckers from the bases of all trees.
Winter, cyclic	Prune trees to promote vigor.
1st Spring	Following identification and the taking of cuttings for propagation, remove all fruit trees that are outside of the fence line.
Spring, cyclic	Aerate soil within drip line.
Spring, cyclic	Mulch 8' in diameter around the base of each tree.
3rd / 4th Spring	Install nursery-grown grafted saplings in appropriate locations within the fence line. Begin training these trees in open bowl form.

LAMON ORCHARD, *REHABILITATION*

Date	Maintenance Action
1st Summer	Remove all conifer trees from the orchard.
1st Summer	Remove the kennel from the orchard.
1st Summer	Remove and burn coarse woody debris from the orchard floor.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard that have not been previously identified.
Summer, cyclic	Conduct a light pruning, primarily removing flower clusters, to retard fruit production.
Summer, cyclic	Undertake organized fruit harvest.
Late Summer, cyclic	Mow orchard prior to fruit ripening.
Late Summer, cyclic	Collect and remove any and all remaining fruit that has fallen from the trees.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings for propagation. Rare or historic varieties from throughout the park may be used to in-fill rows at Lamon Orchard, as long as installed varieties date from the same era as Lamon Orchard.
2nd Summer	Install irrigation system.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
1st Winter	Remove and burn dead branches from the canopies of orchard trees.
1st Winter	Install permanent tree identification labels on fruit trees, including genus, species and cultivated variety as needed.
Winter, cyclic	Remove root suckers from the bases of all trees.
Winter, cyclic	Prune trees to promote vigor.
Spring, cyclic	Aerate soil within drip line.
Spring, cyclic	Mulch 8’ in diameter around the base of each tree.
3rd / 4th Spring	Install nursery-grown grafted saplings in row gaps according to an approved re-planting plan. Begin training these trees in open bowl form.

* Note: Lamon Orchard interpretive elements will require planning and compliance. The preliminary design process should begin immediately in order that funding might be secured as soon as possible.

Curry Village Orchard, *Removal / Meadow Restoration*

Date	Maintenance Action
1st Summer	Remove and burn coarse woody debris from the orchard floor.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard that have not been previously identified.
Summer, cyclic	Prune trees after flowering has commenced.
Summer, cyclic	Undertake organized fruit harvest.
Late Summer, cyclic	Collect and remove any and all remaining fruit that has fallen from the trees.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings for propagation. All rare or unique varieties in the Curry Village orchard should be installed in the Lamon orchard.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
1st Winter	Remove and burn dead branches from the canopies of orchard trees.
Winter, cyclic	Remove root suckers from the bases of all trees.
Spring, cyclic	Aerate soil within drip line.
Spring, cyclic	Mulch 8' in diameter around the base of each tree.
2nd Summer	Following germplasm conservation (if necessary) cuttings and propagation cuttings, document and remove all orchard trees that occur outside of the parking area.

*Note: The Curry Village orchard must undergo stabilization until such time as removal and meadow restoration is funded and firmly planned. This table reflects those stabilization measures.

HUTCHINGS ORCHARD, *REMOVAL / ECOLOGICAL RESTORATION*

Date	Maintenance Action
Summer, cyclic	Undertake organized fruit harvest
Late Summer	Collect and remove any and all remaining fruit that has fallen from the trees.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard that have not been previously identified.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings for propagation. All rare or unique varieties in the Hutchings orchard should be installed in the Lamon orchard.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
2nd Summer	Following propagation cuttings and germplasm conservation (if necessary), all orchard trees should be removed.

GALEN CLARK'S HOMESTEAD ORCHARD, *PRESERVATION*

Date	Maintenance Action
1st Summer	Remove and burn coarse woody debris from the orchard floor.
1st Summer	Contract with a plant geneticist to identify all cultivated varieties of fruit trees within this orchard that have not been previously identified.
Summer, cyclic	Conduct a light pruning, primarily removing flower clusters, to retard fruit production.
Summer, cyclic	Undertake organized fruit harvest.
Late Summer, cyclic	Collect and remove any and all remaining fruit that has fallen from the trees.
1st Summer / Autumn	Finalize contract with a qualified nursery to take cuttings for propagation. All rare or unique varieties in the Galen Clark's Homestead orchard eventually should be installed in the Lamon orchard.
1st Winter	Send 1st year green dormant shoots to USDA facilities for germplasm conservation, if necessary. USDA staff should provide detailed instructions.
1st Winter	Remove and burn dead branches from the canopies of orchard trees.
1st Winter	Install permanent tree identification labels on fruit trees, including genus, species and

	cultivated variety as needed.
Winter, cyclic	Remove root suckers from the bases of all trees.
Winter, cyclic	Prune trees to promote vigor.
Spring, cyclic	Mulch 8’ in diameter around the base of each tree.

Appendix II: Field Notes

Meyer Ranch Field Notes

Data Collected 10.3.2007 by Sky Skach & Adam Peltier

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	MR 1-Apple	Poor	No	15-20%	No	
Apple	MR 2-Apple	Poor	Trunk	0%	No	Fallen over, sprouts alive
Apple	MR 3-Apple	Fair-Poor	Limbs	10-15%	No	
Apple	MR 4-Apple	Poor	No	8%	No	
Dead	MR 5-Dead	Dead	-	-	-	
Plum	MR 6 & 7	Good	No	90-100%	No	Two trunks 3' apart
Apple	MR 8-Apple	Good	No	90%	No	
Apple	MR 9-Apple	Fair	Trunk	70-80%	No	
Apple	MR 10-Apple	Good-Fair	No	70-80%	No	
Apple	MR 11-Apple	Poor	Trunk	30%	No	
Unknown	MR 12-Unknown	Fair	-	-	Aborted	Fallen over, with sprouts
Apple	MR 13-Apple	Good	Branch	80-90%	No	
Dead	MR 14-Dead	Dead	-	-	-	
Apple	MR 15-Apple	Poor	No	30-40%	No	
Apple	MR 16-Apple	Fair-Poor	Scaffolds	60%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	MR 17-Apple	Good	Scaffold	80-90%	No	
Apple	MR 18-Apple	Poor	Trunk	40%	No	
Apple	MR 19-Apple	Poor	Scaffolds	60-70%	No	
Apple	MR 20-Apple	Poor	Scaffold	-	No	
Apple	MR 21-Apple	Fair-Poor	Both	40-50%	No	
Apple	MR 22-Apple	Fair-Poor	No	30-40%	No	
Apple	MR 23-Apple	Fair	No	30-40%	No	
Apple	MR 24-Apple	Dead	-	-	No	1 Root sucker
Apple	MR 25-Apple	Dead	-	-	-	Few branches, few live branches
Apple	MR 26-Apple	Poor	Scaffold	10-15%	No	
Dead	MR 27-Dead	Dead	-	-	-	
Apple	MR 28-Apple	Dead	-	-	-	Root suckers
Apple	MR 29-Apple	Good	No	90%	No	
Apple	MR 30-Apple	Poor	Trunk	40-50%	No	
Apple	MR 31-Apple	Poor-Dying	Trunk	5%	No	
Apple	MR 32-Apple	Poor	No	5-10%	No	
Apple	MR 33-Apple	Poor	No	5-10%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	MR 34-Apple	Good-Fair	No	70-80%	No	
Dead	MR 35-Dead	Dead	-	-	-	
Apple	MR 36-Apple	Good	Scaffold	90%	No	
Dead	MR 37-Dead	Dead	-	-	-	

McCauley Ranch Field Notes

Data Collected 10.19.2007 by Sky Skach & Marti Gerdes

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Pear	MC 1-Pear	Good-Fair	No	30%	No	In middle of stock pen
Apple	MC 2-Apple	Fair	Trunk	20-30%	No	Used as fence post for stock pen
Apple	MC 3-Apple	Poor	Both	5-7%	No	
Apple	MC 4-Apple	Good	No	70%	No	
Apple	MC 5-Apple	Poor	Trunk	1-3%	No	
Apple	MC 6-Apple	Fair	Both	25-30%	No	
Apple	MC 7-Apple	Fair-Poor	Trunk	15-20%	No	
Pear	MC 8-Pear	Good-Fair	No	80%	No	
Pear	MC 9-Pear	Good-Fair	No	60-70%	No	
Pear	MC 10-Pear	Fair-Poor	No	15%	No	
Pear	MC 11-Pear	Good	No	70-80%	No	
Apple	MC 12-Apple	Good-Fair	Trunk	30%	No	Recently trimmed, under powerlines
Pear	MC 13-Pear	Poor	No	3-4%	No	Top recently cut off, under powerlinces
Apple	MC 14-Apple	Good-Fair	No	60%	Yes	Root suckers
Apple	MC 15-Apple	Good-Fair	Trunk	30%	Yes	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	MC 16-Apple	Fair	Trunk	25-30%	No	
Pear	MC 17-Pear	Good	No	80-90%	No	
Pear	MC 18-Pear	Good	No	70%	No	

HENNESSEY RANCH FIELD NOTES

Data Collected 9.23.2010 by Daniel Schaible

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	HR_1	Fair	No	70%	Yes	
Pear	HR_2	Good	No	95%	Yes	
Unknown	HR_3	Fair	No	70%	No	
Walnut	HR_4	Good-Fair	No	70%	No	shaded
Unknown	HR_5	Fair	No	70%	No	
Pear	HR_6	Good-Fair	No	70%	Yes	
Pear	HR_7	Fair	No	50%	Yes	Covered in grape and Virginia creeper
Walnut	HR_8	Good-Fair	No	75%	Yes	Covered in grape and Virginia creeper
Pear	HR_9	Good-Fair	No	60%	Yes	Covered in grape and Virginia creeper
Apple	HR_10	Fair	No	50%	Yes	
Apple	HR_11	Good-Fair	No	60%	Yes	
Walnut	HR_12	Good	No	90%	Yes	
Walnut	HR_13	Good	No	90%	Yes	
Walnut	HR_14	Good-Fair	No	75%	Yes	
Walnut	HR_15	Good-Fair	No	70%	Yes	
Pear	HR_16	Poor	Branch	05%	No	Alm,ost dead
Pear	HR_17	Fair	No	45%	Yes	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Walnut	HR_18	Good-Fair	No	85%	Yes	
Walnut	HR_19	Good-Fair	No	85%	Yes	
Pear	HR_20	Good-Fair	No	85%	No	
Walnut	HR_21	Good-Fair	No	85%	Yes	
Walnut	HR_22	Good	No	95%	Yes	
Pear	HR_23	Good-Fair	No	80%	No	
Walnut	HR_24	Good	Trunk	100%	Yes	
Walnut	HR_25	Good	No	95%	Yes	
Walnut	HR_26	Good	No	90%	Yes	
Walnut	HR_27	Good	No	100%	Yes	
Walnut	HR_28	Good-Fair	No	80%	Yes	
Pear	HR_ 29	Good	No	90%	No	
Walnut	HR_30	Good-Fair	No	60%	Yes	
Apple	HR_31	Poor	Trunk	05%	No	Almost dead
Walnut	HR_ 32	Good	No	90%	Yes	
Pear	HR_33	Good-Fair	No	90%	No	
Pear	HR_34	Poor	Trunk	15%	No	Covered in grape and blackberry
Apple	HR_35	Fair-Poor	No	40%	Yes	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	HR_36	Poor	Branch	20%	No	
Walnut	HR_37	Good-Fair	No	70%	Yes	
unknown	HR_38	Fair	No	45%	No	Covered in grape
Walnut	HR_39	Good	No	85%	Yes	
Apple	HR_40	Poor	Trunk	15%	No	
Unknown	HR_41	Fair-Poor	No	40%	No	
Walnut	HR_42	Fair	No	55%	Yes	Covered in grape
Unknown	HR_43	Fair	No	55%	No	
Unknown	HR_44	Good-Fair	No	85%	No	
Pear	HR_45	Good	No	100%	No	
Pear	HR_46	Good-Fair	No	90%	No	Some grape in crown
Pear	HR_47	Good	No	100%	No	
Walnut	HR_48	Fair	No	55%	Yes	Leaning
Walnut	HR_49	Good-Fair	No	90%	Yes	
Walnut	HR_50	Good-Fair	No	75%	Yes	Partially covered in grape
Walnut	HR_51	Fair-Poor	No	45%	No	
Walnut	HR_52	Fair	No	60%	No	
Walnut	HR_53	Fair	No	65%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Walnut	HR_54	Good-Fair	No	85%	Yes	Partially covered in blackberry
Walnut	HR_55	Good-Fair	No	75%	No	
Walnut	HR_56	Fair-Poor	No	35%	No	
Walnut	HR_57	Good-Fair	No	90%	Yes	Partially covered in blackberry
Apple	HR_58	Fair-Poor	No	50%	No	Partially fallen over
Apple	HR_59	Fair	No	60%	No	Partially covered in grape
Apple	HR_60	Fair	Trunk	55%	No	Partially covered in grape
Apple	HR_61	Fair-Poor	Branch	35%	No	Leaning over
Apple	HR_62	Good-Fair	No	85%	No	
Walnut	HR_63	Good	No	90%	Yes	
Apple	HR_64	Poor	No	25%	No	Covered in grape
Apple	HR_65	Fair-Poor	No	30%	No	Covered in grape
Pear	HR_66	Good-Fair	Branch	85%	Yes	In front yard of Abbieville house.

JOHNNY WILSON'S PLACE FIELD NOTES

Data Collected 9.20.2010 by Daniel Schaible

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	JWP_1	Fair	Trunk	80%	No	
Apple	JWP_2	Fair-Poor	Trunk	50%	No	
Apple	JWP_3	Poor	Trunk	40%	No	collapsed
Apple	JWP_4	Poor	Trunk	30%	No	Fallen over
Apple	JWP_5	Fair	Trunk	60%	No	Partially fallen
Apple	JWP_6	Poor	Trunk	10%	No	Shaded w grape in crown
Pear	JWP_7	Good	No	100%	Yes	
Apple	JWP_8	Fair-Poor	No	80%	No	Partially fallen
Apple	JWP_9	Good-Fair	No	90%	No	
Apple	JWP_10	Poor	No	30%	No	
Apple	JWP_11	Fair-Poor	No	30%	No	
Apple	JWP_12	Fair-Poor	Trunk	50%	No	
Apple	JWP_13	Poor	No	30%	No	
Apple	JWP_14	Fair-Poor	Trunk	30%	No	
Apple	JWP_15	Fair	Branch	50%	No	
Apple	JWP_16	Fair	Branch	60%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	JWP_17	Fair-Poor	Branch	40%	Aborted	
Pear	JWP_18	Good-Fair	No	80%	Aborted	
Apple	JWP_19	Fair	No	55%	Aborted	
Apple	JWP_20	Fair-Poor	Trunk	40%	No	
Pear	JWP_21	Good-Fair	No	80%	No	
Pear	JWP_22	Good-Fair	No	70%	No	
Pear	JWP_23	Poor	No	15%	No	
Pear	JWP_24	Good	No	90%	No	
Apple	JWP_25	Fair	Trunk	60%	No	
Apple	JWP_26	Fair	No	65%	No	
Apple	JWP_27	Fair-Poor	Trunk	50%	No	
Apple	JWP_28	Good-Fair	No	80%	No	
Apple	JWP_29	Fair	No	50%	No	Partially fallen over
Apple	JWP_30	Fair	Trunk	40%	No	shaded
Apple	JWP_31	Poor	Trunk	05%	No	Almost dead
Apple	JWP_32	Good	Branch	75%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	JWP_33	Poor	No	40%	No	Heavily shaded
Apple	JWP_34	Fair-Poor	Trunk	50%	No	Heavily shaded
Apple	JWP_35	Fair-Poor	Trunk	50%	No	Heavily shaded
Apple	JWP_36	Fair	No	50%	No	
Apple	JWP_37	Fair	No	80%	No	
Apple	JWP_38	Fair	No	80%	No	Grapes in crown
Apple	JWP_39	Fair-Poor	No	45%	No	Shaded
Apple	JWP_40	Poor	Branch	10%	No	Shaded

LAMON ORCHARD FIELD NOTES

Data Collected 10.18.2007-10.22.2007 by Sky Skach, Adam Peltier & Marti Gerdes

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 1-Apple	Good	Trunk	90%	No	
Apple	LO 2-Apple	Fair	No	60%	No	Root suckers
Apple	LO 3-Apple	Fair	No	90%	No	
Apple	LO 4-Apple	Good	No	90%	No	Central leader
Apple	LO 5-Apple	Fair	Trunk	90%	No	Leaning on house
Apple	LO 6-Apple	Good	No	70%	No	
Apple	LO 7-Apple	Poor	No	40%	No	
Apple	LO 8-Apple	Poor	No	40%	No	Root suckers
Apple	LO 9-Apple	Poor	Trunk	10%	No	
Apple	LO 10-Apple	Fair	No	50%	No	Multi-trunked
Apple	LO 11-Apple	Fair-Poor	No	40%	No	
Apple	LO 12-Apple	Fair	No	40%	No	Missing lots of bark
Apple	LO 13-Apple	Fair	Unknown	70%	No	
Apple	LO 14-Apple	Poor	Trunk	30-40%	No	
Apple	LO 15-Apple	Fair	Unknown	60%	No	
Apple	LO 16-Apple	Poor	Scaffold	30-40%	No	Used as fence post
Pear	LO 17-Pear	Fair	No	50-60%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 18-Apple	Poor	Scaffold	30-40%	No	
Apple	LO 19-Apple	Poor	Trunk	30%	No	
Apple	LO 20-Apple	Poor	Trunk	30%	No	
Apple	LO 21-Apple	Poor	Trunk	30%	No	
Apple	LO 22-Apple	Poor	Trunk	15%	No	Lost most bark
Apple	LO 23-Apple	Poor	Trunk	40-50%	No	
Apple	LO 24-Apple	Poor	Unknown	20%	No	Fallen
Apple	LO 25-Apple	Poor	Trunk	40-50%	No	
Apple	LO 26-Apple	Poor	Unknown	10%	No	Fallen
Apple	LO 27-Apple	Poor	Trunk	20-25%	No	Nearby tree fell on it
Dead	LO 28-Dead	Dead	-	-	-	
Apple	LO 29-Apple	Poor	Trunk	25%	No	
Apple	LO 30-Apple	Poor	Unknown	15%	No	Fallen
Apple	LO 31-Apple	Poor	Trunk	40%	No	
Apple	LO 32-Apple	Fair	Scaffold	45%	No	
Apple	LO 33-Apple	Poor	All	25-30%	No	
Apple	LO 34-Apple	Fair	Trunk	50%	No	
Apple	LO 35-Apple	Poor	Scaffold	35%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 36-Apple	Poor	Trunk	12%	No	
Apple	LO 37-Apple	Fair	Unknown	60-70%	No	
Apple	LO 38-Apple	Poor	Scaffold	30%	No	
Apple	LO 39-Apple	Poor	Unknown	10-15%	No	Fallen, some root suckers
Apple	LO 40-Apple	Fair	Unknown	40-50%	No	Dead leader
Apple	LO 41-Apple	Fair	No	80-90%	No	
Apple	LO 42-Apple	Poor	Trunk	20%	No	
Apple	LO 43-Apple	Fair-Poor	Scaffold	40%	No	
Apple	LO 44-Apple	Fair-Poor	Scaffold	30-40%	No	
Apple	LO 45-Apple	Poor	Both	20%	No	
Apple	LO 46-Apple	Fair-Poor	Trunk	50-60%	No	
Apple	LO 47-Apple	Fair	No	30-40%	No	
Apple	LO 48-Apple	Poor	Trunk	15%	No	
Apple	LO 49-Apple	Poor	Trunk	60%	No	
Apple	LO 50-Apple	Good	No	90%	No	
Apple	LO 51-Apple	Fair	Scaffold	60%	No	
Apple	LO 52-Apple	Fair	Unknown	60%	No	
Apple	LO 53-Apple	Fair	No	50%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 54-Apple	Fair-Poor	Scaffold	40%	No	
Apple	LO 55-Apple	Fair	No	75%	No	
Apple	LO 56-Apple	Fair-Poor	Scaffolds	60%	No	
Apple	LO 57-Apple	Poor	Scaffold	40%	No	
Apple	LO 58-Apple	Poor	Both	15%	No	
Apple	LO 59-Apple	Poor	Trunk	20%	No	
Apple	LO 60-Apple	Poor	Both	10-15%	No	
Apple	LO 61-Apple	Poor	Trunk	30%	No	
Apple	LO 62-Apple	Poor	Trunk	5-10%	No	
Apple	LO 63-Apple	Good	Unknown	80-90%	No	
Apple	LO 64-Apple	Fair	No	40%	No	
Apple	LO 65-Apple	Poor	Both	40%	No	
Apple	LO 66-Apple	Fair	Unknown	40%	No	Leaning
Apple	LO 67-Apple	Fair	No	40%	No	
Apple	LO 68-Apple	Poor	Unknown	10%	No	
Apple	LO 69-Apple	Poor	Trunk	10%	No	
Apple	LO 70-Apple	Poor	Unknown	10%	No	
Apple	LO 71-Apple	Fair-Poor	No	40%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 72-Apple	Poor	Unknown	20%	No	
Apple	LO 73-Apple	Fair	No	70%	No	
Apple	LO 74-Apple	Poor	Trunk	40%	No	Missing lots of bark
Apple	LO 75-Apple	Poor	Scaffold	40%	No	
Apple	LO 76-Apple	Poor	Unknown	30-40%	No	
Apple	LO 77-Apple	Poor	No	30%	No	
Apple	LO 78-Apple	Poor	Unknown	30%	No	Fallen
Apple	LO 79-Apple	Poor	Scaffold	30%	No	
Apple	LO 80-Apple	Poor	Trunk	10%	No	
Apple	LO 81-Apple	Fair	Scaffold	60%	No	
Apple	LO 82-Apple	Poor	Trunk	40%	No	
Apple	LO 83-Apple	Fair-Poor	Trunk	60-70%	No	
Apple	LO 84-Apple	Poor	Trunk	25-30%	No	
Apple	LO 85-Apple	Fair-Poor	Trunk	40%	No	
Apple	LO 86-Apple	Poor	Trunk	5%	No	Mostly dead
Apple	LO 87-Apple	Fair-Poor	No	20-30%	No	
Apple	LO 88-Apple	Poor	No	30%	No	
Apple	LO 89-Apple	Poor	Scaffold	50%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 90-Apple	Fair-Poor	Trunk	50-60%	No	
Apple	LO 91-Apple	Fair-Poor	Unknown	40-50%	No	
Apple	LO 92-Apple	Poor	Scaffold	30%	No	
Apple	LO 93-Apple	Poor	Trunk	25%	Aborted	
Apple	LO 94-Apple	Poor	Scaffold	15%	No	
Apple	LO 95-Apple	Fair-Poor	Scaffold	40-50%	No	
Apple	LO 96-Apple	Fair-Poor	Trunk	15-25%	No	
Dead	LO 97-Dead	Dead	-	-	-	Probably apple
Apple	LO 98-Apple	Fair-Poor	Unknown	40-50%	No	
Apple	LO 99-Apple	Fair	No	40-50%	No	
Apple	LO 100-Apple	Fair	No	50%	No	
Apple	LO 101-Apple	Fair	Scaffolds	60-70%	Yes	
Apple	LO 102-Apple	Fair	Trunk	50-60%	No	
Apple	LO 103-Apple	Fair	No	40%	No	
Apple	LO 104-Apple	Fair	No	40-50%	No	
Apple	LO 105-	Fair-Poor	No	15-20%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
	Apple					
Apple	LO 106-Apple	Poor	Trunk	10-15%	No	
Apple	LO 107-Apple	Fair-Poor	No	20%	No	
Apple	LO 108-Apple	Fair	Trunk	20%	No	
Apple	LO 109-Apple	Fair	No	50-60%	Aborted	
Apple	LO 110-Apple	Fair-Poor	No	15-20%	No	
Apple	LO 111-Apple	Fair	No	20-30%	No	
Apple	LO 112-Apple	Fair	Trunk	30-40%	No	
Apple	LO 113-Apple	Fair-Poor	No	15%	No	
Apple	LO 114-Apple	Fair-Poor	Scaffold	20%	No	
Dead	LO 115-Dead	Dead	-	-	-	Probably apple
Apple	LO 116-Apple	Fair	Trunk	40%	No	
Apple	LO 117-Apple	Fair	Trunk	20-30%	Aborted	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 118-Apple	Poor	Scaffolds	15-20%	Aborted	
Apple	LO 119-Apple	Fair	No	15-20%	No	
Apple	LO 120-Apple	Fair-Poor	Scaffold	20%	No	
Apple	LO 121-Apple	Fair	Trunk	20-25%	Aborted	
Apple	LO 122-Apple	Fair	Scaffold	20-30%	No	
Apple	LO 123-Apple	Poor	Both	3-5%	No	One live sucker from trunk
Apple	LO 124-APple	Poor	Trunk	5-8%	No	Mostly dead
Apple	LO 125-Apple	Good-Fair	No	60-80%	No	
Apple	LO 126-Apple	Poor	No	3-5%	No	Mostly dead
Apple	LO 127-Apple	Good-Fair	No	80-90%	Yes	
Apple	LO 128-Apple	Good-Fair	Trunk	60%	No	
Apple	LO 129-Apple	Fair	No	30-40%	No	
Apple	LO 130-	Fair	No	30-40%	No	Multi-trunked

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
	Apple					
Apple	LO 131-Apple	Poor	Trunk	30-40%	No	
Apple	LO 132-Apple	Poor	No	20-30%	No	
Apple	LO 133-Apple	Fair-Poor	Both	40-45%	No	
Apple	LO 134-Apple	Fair-Poor	Unknown	50%	No	
Apple	LO 135-Apple	Poor	Trunk	30-40%	No	
Apple	LO 136-Apple	Good-Fair	Scaffolds	70%	No	
Apple	LO 137-Apple	Poor	Trunk	30%	No	
Apple	LO 138-Apple	Poor	-	-	No	Fallen, one live branch from base
Apple	LO 139-Apple	Fair-Poor	Scaffold	40%	No	
Apple	LO 140-Apple	Fair-Poor	Trunk	50-60%	No	
Apple	LO 141-Apple	Poor	Both	60-70%	No	
Apple	LO 142-	Poor	Trunk	5%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
	Apple					
Apple	LO 143-Apple	Fair-Poor	Trunk	60%	No	
Apple	LO 144-Apple	Fair	Trunk	70%	No	
Apple	LO 145-Apple	Fair	Trunk	60%	No	
Apple	LO 146-Apple	Poor	Trunk	40%	No	
Dead	LO 147-Dead	Dead	-	-	-	
Apple	LO 148-Apple	Fair	No	40-50%	No	
Apple	LO 149-Apple	Fair-Poor	No	20-30%	No	Missing lots of bark
Apple	LO 150-Apple	Poor	Scaffold	20%	No	
Apple	LO 151-Apple	Poor	Trunk	20-30%	No	
Apple	LO 152-Apple	Fair-Poor	Trunk	20%	No	
Apple	LO 153-Apple	Poor	Trunk	5-10%	No	Mostly dead
Apple	LO 154-Apple	Fair-Poor	No	50%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 155-Apple	Fair-Poor	Scaffolds	40-50%	No	
Apple	LO 156-Apple	Fair	No	70%	No	
Apple	LO 157-Apple	Poor	Trunk	15-20%	No	
Apple	LO 158-Apple	Poor	All	15-20%	No	
Apple	LO 159-Apple	Fair-Poor	Scaffold	30-40%	No	
Apple	LO 160-Apple	Poor	Trunk	30%	No	Mostly dead
Apple	LO 161-Apple	Fair	Scaffold	60-70%	Aborted	
Apple	LO 162-Apple	Poor	Both	15-20%	No	
Apple	LO 163-Apple	Fair-Poor	Both	50-60%	No	
Apple	LO 164-Apple	Fair-Poor	Scaffolds	30-40%	No	
Apple	LO 165-Apple	Fair-Poor	All	20-30%	No	
Apple	LO 166-Apple	Poor	Both	15-20%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	LO 167-Apple	Poor	Trunk	5%	No	Mostly dead
Apple	LO 168-Apple	Poor	Scaffold	20%	No	
Apple	LO 169-Apple	Poor	Scaffold	20%	No	
Apple	LO 170-Apple	Poor	Trunk	5%	No	
Apple	LO 171-Apple	Fair-Poor	Both	20-30%	Aborted	
Apple	LO 172-Apple	Fair-Poor	Scaffolds	30-40%	No	

Curry Village Orchard Field Notes

Data Collected 10.25.2007 by Sky Skach & Adam Peltier

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 1-Apple	Good	No	60-70%	No	
Apple	CV 2-Apple	Good	No	80%	No	Root Suckers
Plum	CV 3-Plum	Good	No	80%	No	
Apple	CV 4-Apple	Good-Fair	Trunk	70%	No	Cedars encroaching
Apple	CV 5-Apple	Fair-Poor	Trunk	30%	Yes	
Dead	CV 6-Dead	-	-	-	-	
Apple	CV 7-Apple	Fair	No	40%	Yes	
Apple	CV 8-Apple	Fair	No	45-50%	No	
Apple	CV 9-Apple	Fair-Poor	Trunk	30%	No	Leaning
Apple	CV 10-Apple	Poor	Scaffold	15-20%	No	
Apple	CV 11-Apple	Good-Fair	No	80-90%	Yes	
Apple	CV 12-Apple	Good-Fair	Scaffold	50-60%	Yes	
Apple	CV 13-Apple	Fair	No	40%	No	
Apple	CV 14-Apple	Poor	Trunk	30%	Yes	
Apple	CV 15-Apple	Fair-Poor	Scaffold	30%	Yes	
Apple	CV 16-Apple	Poor	Trunk	40%	No	
Apple	CV 17-Apple	Fair-Poor	Trunk	30-40%	Yes	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 18-Apple	Poor	Trunk	5%	No	
Dead	CV 19-Dead	Dead	-	-	-	
Apple	CV 20-Apple	Fair	No	60-70%	Yes	
Apple	CV 21-Apple	Poor	Trunk	30%	Aborted	Leaning
Apple	CV 22-Apple	Fair	No	40-50%	Aborted	
Apple	CV 23-Apple	Fair-Poor	Trunk	50-60%	Aborted	
Apple	CV 24-Apple	Good-Fair	Scaffold	70-80%	No	
Apple	CV 25-Apple	Fair-Poor	Trunk	40%	No	Multi-trunked
Apple	CV 26-Apple	Good-Fair	Scaffold	80%	Yes	
Apple	CV 27-Apple	Poor	Unknown	40%	Yes	Overgrown with blackberries
Apple	CV 28-Apple	Fair	Trunk	50-60%	Yes	Root suckers
Apple	CV 29-Apple	Poor	Trunk	30%	Aborted	Root suckers
Apple	CV 30-Apple	Poor	Scaffolds	30-40%	No	
Apple	CV 31-Apple	Fair-Poor	No	30-40%	No	Overgrown with blackberries
Apple	CV 32-Apple	Good-Fair	Scaffold	60-70%	Aborted	
Apple	CV 33-Apple	Fair-Poor	No	30-40%	Yes	
Apple	CV 34-Apple	Good-Fair	Trunk	80%	Yes	
Apple	CV 35-Apple	Good	Scaffold	70-80%	Yes	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 36-Apple	Poor	Trunk	15-20%	Aborted	Root suckers
Apple	CV 37-Apple	Good-Fair	Trunk	80-90%	No	Under powerline
Apple	CV 38-Apple	Fair-Poor	Both	20%	No	
Apple	CV 39-Apple	Fair-Poor	Scaffold	80%	Aborted	
Apple	CV 40-Apple	Fair	Trunk	60%	No	Root suckers
Apple	CV 41-Apple	Good	No	90%	No	Multi-trunked
Apple	CV 42-Apple	Poor	Trunk	Unknown	Aborted	Very overgrown with blackberries
Apple	CV 43-Apple	Good	No	80%	No	
Apple	CV 44-Apple	Fair	Trunk	60%	No	
Apple	CV 45-Apple	Poor	Scaffold	20%	No	
Apple	CV 46-Apple	Good	No	80%	Aborted	Few root suckers
Apple	CV 49-Apple	Fair-Poor	Trunk	70%	Aborted	
Apple	CV 50-Apple	Fair	Unknown	60-70%	Yes	
Apple	CV 51-Apple	Poor	Trunk	30%	Yes	Root suckers
Apple	CV 52-Apple	Fair	Trunk	50-60%	No	Root suckers
Apple	CV 53-Apple	Fair-Poor	No	30%	Yes	Few root suckers
Apple	CV 54-Apple	Poor	Trunk	20-30%	Yes	Few root suckers
Apple	CV 55-Apple	Fair-Poor	Trunk	40%	Yes	Root suckers

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 56-Apple	Fair-Poor	Both	40%	Yes	Root suckers
Apple	CV 57-Apple	Good	Scaffold	80%	Yes	
Apple	CV 58-Apple	Fair	Trunk	70%	Aborted	
Apple	CV 59-Apple	Fair-Poor	Unknown	40-50%	Yes	Root suckers
Apple	CV 60-Apple	Fair-Poor	Both	60%	Yes	
Apple	CV 61-Apple	Fair	Scaffold	60%	Aborted	
Apple	CV 62-Apple	Fair-Poor	No	40%	Aborted	Multi-trunked
Apple	CV 63-Apple	Poor	Trunk	15%	Yes	
Apple	CV 64-Apple	Fair-Poor	Trunk	30%	Yes	Central leader form
Apple	CV 65-Apple	Poor	Trunk	30-40%	Yes	Many root suckers
Apple	CV 66-Apple	Fair	No	40%	Yes	
Apple	CV 67-Apple	Fair	Scaffold	40-50%	Aborted	
Apple	CV 68-Apple	Fair	Scaffold	30-40%	No	
Apple	CV 69-Apple	Fair	Scaffold	40%	Yes	
Apple	CV 70-Apple	Good	No	60-70%	Yes	
Apple	CV 71-Apple	Good	Scaffold	40-60%	Yes	
Apple	CV 72-Apple	Fair	Trunk	50-60%	Yes	Root suckers
Apple	CV 73-Apple	Fair	Scaffolds	80-90%	Yes	Rootsuckers

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 74-Apple	Fair	No	50-60%	Yes	
Apple	CV 75-Apple	Poor	Trunk	15-20%	No	Missing lots of bark
Apple	CV 76-Apple	Fair	Scaffold	40%	No	Root suckers
Apple	CV 77-Apple	Fair	No	40-50%	Aborted	Few root suckers
Apple	CV 78-Apple	Good-Fair	No	40-50%	No	
Apple	CV 79-Apple	Fair	No	30-40%	No	
Apple	CV 80-Apple	Fair-Poor	Both	30-40%	No	
Apple	CV 81-Apple	Fair-Poor	Trunk	40%	No	
Apple	CV 82-Apple	Good-Fair	No	40%	No	
Apple	CV 83-Apple	Good-Fair	Scaffold	60-70%	No	
Apple	CV 84-Apple	Fair-Poor	All	40-50%	Aborted	Root suckers
Apple	CV 85-Apple	Fair-Poor	Trunk	50-60%	No	
Apple	CV 86-Apple	Fair	Scaffold	80%	No	
Apple	CV 87-Apple	Fair	Trunk	30%	Yes	Root suckers
Apple	CV 88-Apple	Fair-Poor	Trunk	30-40%	Yes	
Apple	CV 89-Apple	Fair-Poor	Scaffold	50-60%	Aborted	
Apple	CV 90-Apple	Poor	Scaffold	20%	No	Missing bark
Apple	CV 91-Apple	Fair	Trunk	30%	Yes	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 92-Apple	Good-Fair	Scaffold	50-60%	Yes	
Apple	CV 93-Apple	Poor	Trunk	15%	No	
Apple	CV 94-Apple	Good-Fair	No	50-60%	Yes	
Apple	CV 95-Apple	Fair	Unknown	40-50%	Yes	Root suckers
Apple	CV 96-Apple	Poor	Both	20%	Yes	
Apple	CV 97-Apple	Fair-Poor	Trunk	50%	Yes	
Apple	CV 98-Apple	Poor	Trunk	30%	No	
Apple	CV 99-Apple	Fair	Trunk	40-50%	Aborted	
Apple	CV 100-Apple	Poor	All	20%	No	
Apple	CV 101-Apple	Poor	Trunk	30-40%	No	
Apple	CV 102-Apple	Fair-Poor	Trunk	30%	No	Root suckers
Apple	CV 103-Apple	Fair	No	30-40%	No	
Apple	CV 104-Apple	Fair	No	40-50%	Aborted	
Plum	CV 105-Plum	Good	No	90%	No	Loosk like sprout
Plum	CV 106-Plum	Good	No	90%	No	Small root suckers
Plum	CV 107-Plum	Good	No	90%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	CV 108-Apple	Good	No	80-90%	No	
Apple	CV 109-Apple	Good	No	80-90%	Yes	Multi-trunked, rootsuckers

HUTCHINGS ORCHARD FIELD NOTES

Data Collected 10.22.2007 by Sky Skach & Marti Gerdes

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	HO 1-Apple	Poor	No	5-10%	No	
Apple	HO 2-Apple	Poor	Trunk	5-10%	No	
Dead	HO 3-Dead	Dead	-	-	-	
Apple	HO 4-Apple	Fair	No	40-50%	No	
Apple	HO 5-Apple	Fair-Poor	Scaffold	40-50%	No	
Apple	HO 6-Apple	Fair-Poor	Trunk	15%	No	
Apple	HO 7-Apple	Fair	No	40%	No	
Apple	HO 8-Apple	Good-Fair	No	40%	No	
Apple	HO 9-Apple	Poor	Both	30%	No	
Apple	HO 10-Apple	Poor	Trunk	30-40%	No	
Apple	HO 11-Apple	Good-Fair	Scaffolds	50-60%	No	
Apple	HO 12-Apple	Good-Fair	Scaffold	60-70%	No	
Apple	HO 13-Apple	Poor	Scaffolds	20%	No	
Dead	HO 14-Dead	Dead	-	-	-	
Apple	HO 15-Apple	Fair	Scaffold	20%	One	
Apple	HO 16-Apple	Fair-Poor	Unknown	15%	No	
Pear	HO 17-Pear	Good-Fair	No	70-80%	No	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	HO 18-Apple	Poor	Scaffolds	30%	No	
Apple	HO 19-Apple	Fair-Poor	Trunk	30-40%	No	
Apple	HO 20-Apple	Poor	Scaffolds	20-30%	No	
Apple	HO 21-Apple	Good-Fair	No	40-50%	No	
Apple	HO 22-Apple	Poor	Trunk	4%	No	
Apple	HO 23-Apple	Poor	Both	10-20%	No	
Apple	HO 24-Apple	Good-Fair	Trunk	40-50%	No	
Apple	HO 25-Apple	Fair-Poor	Both	20-30%	No	
Apple	HO 26-Apple	Poor	Trunk	0-5%	No	
Apple	HO 27-Apple	Poor	Trunk	15%	No	
Pear	HO 28-Pear	Fair-Poor	No	40%	No	
Apple	HO 29-Apple	Fair-Poor	Scaffold	40%	No	
Apple	HO 30-Apple	Poor	Both	20%	No	
Dead	HO 31-Dead	Dead	-	-	-	
Apple	HO 32-Apple	Poor	Trunk	30%	No	
Apple	HO 33-Apple	Poor	Trunk	15%	No	
Apple	HO 34-Apple	Poor	Trunk	15%	No	
Dead	HO 35-Dead	Dead	-	-	-	

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	HO 36-Apple	Poor	Both	30%	No	
Apple	HO 37-Apple	Poor	All	15-20%	No	
Apple	HO 38-Apple	Dead	-	-	-	
Apple	HO 39-Apple	Poor	No	15%	No	
Apple	HO 40-Apple	Poor	Trunk	20%	No	
Apple	HO 40-Apple	Poor	Trunk	20%	No	
Apple	HO 41-Apple	Fair-Poor	No	30%	No	
Apple	HO 43-Apple	Poor	Trunk	5-10%	No	
Apple	HO 44-Apple	Poor	Trunk	15%	No	

YOSEMITE VALLEY MISCELLANEOUS TREES FIELD NOTES

Data Collected 10.17.2007 by Sky Skach, Danny Schailble & Adam Peltier

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	YV 1-Apple	Fair-Poor	No	Unknown	No	Chapel, burned in prescribed fire
Apple	YV 2-Apple	Fair	No	50-60%	No	Chapel, crowded by cedars
Pear	YV 3-Pear	Poor	Unknown	40%	No	Chapel, very crowded
Apple	YV 4-Apple	Poor	No	50%	Aborted	Chapel, burned in prescribed fire
Apple	YV 5-Apple	Good	No	50%	No	Cook's Meadow
Apple	YV 6-Apple	Fair	Both	60%	No	Cook's Meadow
Apple	YV 7-Apple	Good	No	90%	No	Cook's Meadow
Apple	YV 8-Apple	Fair	No	50-60%	No	Four Mile
Apple	YV 9-Apple	Poor	No	40-50%	No	Four Mile
Apple	YV 10-Apple	Poor	No	40%	No	Four Mile
Apple	YV 11-Apple	Fair	No	30%	No	Four Mile
Apple	YV 12-Apple	Good-Fair	No	60%	No	Four Mile
Apple	YV 13-Apple	Dying	-	-	No	Four Mile, fallen & dying
Apple	YV 14-Apple	Fair-Poor	No	50%	No	Four Mile

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	YV 15-Apple	Fair	No	95%	No	Four Mile
Apple	YV 16-Apple	Fair	No	80-90%	No	Four Mile
Apple	YV 17-Apple	Fair	Unknown	60-70%	Yes	Four Mile
Apple	YV 18-Apple	Poor	Trunk	20%	No	Rangers' Club
Cherry	YV 19-Cherry	Good	No	90%	No	Museum, young under canopy
Pear	YV 20-Pear	Good	No	100%	No	Indian Village, young, by stream
Apple	YV 21-Apple	Good	No	100%	No	Indian Village, young, by stream
Apple	YV 22-Apple	Poor	No	20%	No	Old Yosemite Village, in forest
Cherry	YV 23-Cherry	Good	No	90%	Aborted	Old Yosemite Village next to road
Apple	YV 24-Apple	Good	No	50-60%	Yes	Southside Drive, may not be that old
Apple	YV 25-Apple	Fair	Unknown	70%	No	Bridalveil Meadow
Peach	YV 26-Peach	Poor	No	15-20%	No	Old Wellness Center
Apple	YV 27-	Good	No	100%	No	Happy Isles Nature Center, young sprout

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
	Apple					
Cherry	YV 28-Cherry	Poor	No	80%	No	North Pines, multi-trunked
Cherry	YV 29-Cherry	Good-Fair	No	95%	No	North Pines, two trunks
Cherry	YV 30-Cherry	Fair	No	80%	No	North Pines
Cherry	YV 31-Cherry	Fair	No	80%	No	North Pines, multi-trunked
Cherry	YV 32-Cherry	Fair	No	80%	No	North Pines, multi-trunked
Cherry	YV 33-Cherry	Poor	No	15-20%	No	North Pines, falling over
Cherry	YV 34-Cherry	Fair	No	70%	No	North Pines, leaning
Cherry	YV 35-Cherry	Good-Fair	No	80-90%	No	North Pines, multi-trunked, rootsuckers
Cherry	YV 36-Cherry	Fair	No	70%	No	North Pines
Cherry	YV 37-Cherry	Good	No	90%	No	North Pines, leaning, rootsuckers
Cherry	YV 38-Cherry	Fair-Poor	No	70%	No	North Pines, rootuscker
Cherry	YV 39-	Fair	No	100%	No	North Pines, many sprouts 4’ radius

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
	Cherry					
Cherry	YV 40-Cherry	Fair-Poor	No	60-70%	No	North Pines
Cherry	YV 41-Cherry	Poor	No	60%	No	North Pines, rootsuckers
Apple	YV 42-Apple	Fair-Poor	No	30%	No	Housekeeping Camp, no pruned form, odd bark
Apple	YV 43-Apple	Good-Fair	No	70-80%	Yes	Ahwahnee gournds, multi-trunked, rootsuckers
Apple	YV 44-Apple	Good	No	80-90%	No	Ahwahnee, not recently maintained
Plum	YV 45-Plum	Fair	Unknown	70-80%	No	Sentinel Meadow, unsure of species
Apple	YV 46-Apple	Fair-Poor	Trunks	80%	No	Liedig Meadow, 5 trunks 8’ radius, drought stressed
Apple	YV 47-Apple	Good	No	100%	No	Ahwahnee Meadow, small, not historic

GALEN CLARK'S HOMESTEAD ORCHARD FIELD NOTES

Data Collected 10.16.2007 by Sky Skach, Danny Schailble

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Pear	GC 1-Pear	Good	Trunk	90-100%	No	
Apple	GC 2-Apple	Fair	Trunks	50%	No	Multi-trunked
Apple	GC 3-Apple	Poor	Both	30%	No	
Apple	GC 4-Apple	Poor	Trunk	20%	Yes	
Apple	GC 5-Apple	Good	No	80%	Yes	May be seedling
Apple	GC 6-Apple	Fair-Poor	Both	50%	No	
Apple	GC 7-Apple	Fair-Poor	Trunk	50%	No	
Apple	GC 8-Apple	Poor	No	20%	No	Leaves spotted
Apple	GC 9-Apple	Fair-Poor	Unknown	40%	No	Being overgrown
Apple	GC 10-Apple	Poor	Trunk	50%	No	Being overgrown
Apple	GC 11-Apple	Good	No	90%	No	May be seedling
Apple	GC 12-Apple	Fair-Poor	No	50-60%	No	
Apple	GC 13-Apple	Fair	No	50%	No	
Apple	GC 14-Apple	Fair	No	80%	Yes	Leaves spotted
Apple	GC 15-Apple	Poor	Trunk	10-15%	No	Leaves spotted
Apple	GC 16-Apple	Fair	No	80%	Yes	Multi-trunked

WAWONA FIRE DORM ORCHARD FIELD NOTES

Data Collected 10.16.2007 by Sky Skach, Danny Schailble

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	FD 1-Apple	Good	No	100%	Aborted	Maintained
Pear	FD 2 Pear	Fair	No	80%	No	Maintained
Apple	FD 3-Apple	Good	No	90%	Yes	Maintained
Apple	FD 4-Apple	Good	No	90%	Yes	Maintained
Apple	FD 5-Apple	Good	No	100%	No	Maintained
Apple	FD 6-Apple	Good	No	100%	No	Maintained
Apple	FD 7-Apple	Good	No	90%	Yes	Maintained
Apple	FD 8-Apple	Good	No	100%	No	Maintained

WASHBURN ORCHARD FIELD NOTES

Data Collected 10.16.2007 by Sky Skach, Danny Schailble

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	WO 1-Apple	Fair	Scaffolds	80%	No	
Apple	WO 2-Apple	Fair-Poor	Trunk	75%	No	
Apple	WO 3-Apple	Fair	Trunk	80-90%	No	
Apple	WO 4-Apple	Poor	Trunk	50-60%	No	
Apple	WO 5-Apple	Fair	Trunk	75%	No	
Apple	WO 6-Apple	Poor	Trunk	70%	No	
Apple	WO 7-Apple	Fair-Poor	Trunk	50%	No	
Apple	WO 8-Apple	Fair	Trunk	60-70%	No	
Apple	WO 9-Apple	Fair-Poor	Trunk	60%	No	
Apple	WO 10-Apple	Poor	No	30%	No	
Apple	WO 11-Apple	Poor	No	40-50%	No	
Apple	WO 12-Apple	Good	No	80-90%	No	
Apple	WO 13-Apple	Good	No	95%	Yes	

WASHBURN MISCELLANEOUS TREES FIELD NOTES

Data Collected 10.16.2007 by Sky Skach, Danny Schailble

Species	ID Number	Condition	Cavity	% Live Canopy	Fruit	Comments
Apple	WM 1-Apple	Fair	No	30%	No	By Carrige Shop, next to road, may not be historic
Apple	WM 2-Apple	Poor	No	20-25%	No	Stella Lake, falling over, rootsuckers
Apple	WM 3-Apple	Fair	No	60%	No	Stella Lake, multi-trunked
Apple	WM 4-Apple	Poor	No	50%	No	Stella Lake, may be sprout or root sucker
Apple	WM 5-Apple	Good	No	100%	No	Behind Wawona Hotel, being maintained
Dead	WM 6-Dead	Dead	-	-	-	
Apple	WM 7-Apple	Good	No	90%	No	In front of Moore Cottage, young tree
Apple	WM 8-Apple	Good	No	95%	Yes	By fork in Chilunalna Rd.
Apple	WM 9-Apple	Good	No	80%	No	Maintenance parking lot
Cherry	WM 10-Cherry	Fair	No	75-80%	Yes	Maintenance parking lot

Apple	WM 11-Apple	Fair	Unknown	50%	No	Hotel grounds
Apple	WM 12-Apple	Fair	Unknown	50%	No	End of Washburn Ditch

APPENDIX III: SURVEY OF ORCHARDS IN YOSEMITE NATIONAL PARK (1991)

C. T. Kennedy COPY

ACTION	✓		Init.	Date
		Chief of Resources		
		Natural Resource Spec.		
		Cultural Resource Spec.		
		Impact Mitig Spec.		
		Wildlife Biologist		
		Park Forester		
		Envir. Compliance		
		Restoration		
		GIS		
		Editorial Assistant		
		Clerk Typist		
		File		

2 December 1991

Mr Leslie L. Pointer
Chief, Resources Management
P.O. Box 577
Yosemite National Park, CA 95389

Dear Mr. Pointer:

During the past two months I have visited the orchards of Yosemite Valley and Wawona for the purpose of collecting sample fruits to enable the provisional identifications of the fruit cultivars. Collections were made in those areas of greatest risk of loss of historical plant material, and where human and animal contact has recently been observed. I enclose the results of the survey. I believe your staff have preserved various maps to which tree numbers have been keyed.

It should be noted that fruit identifications can only be provisional, as remarked in my letter of 25 July, since identities can only be as perfect as the specimens provided. Because certain trees are no longer in a condition to produce typical specimens of fruits or foliage, and cannot display characteristic form of growth, some of the trees remain unidentified. It was however possible to establish that certain of these unidentifieds are identical to others; thus various trees are indicated as "Unknown A," "Unknown B," etc. Some of the trees produced no fruit at all, and I declined to conjecture as to their identity.

I believe the provisional identifications are sufficiently reliable to provide a basis upon which removal or repropagation may proceed. In the lists, those trees most clearly showing the characteristics of their type are indicated by an asterisk; these are the specimens of choice for providing material for repropagation, if that course is adopted. Different strategies are available to curatorial discretion in preserving trees of unknown identity, or which cannot produce fruits for identification. These strategies are described in the enclosed survey. The usual course is a conservative one, where all unknown types are saved for later identification.

If the choice is made to maintain the current plantings without further relocation, a reduction in the number of trees may be advisable for reason of animal and human safety and again, this survey suggests retaining those trees indicated by an asterisk, and perhaps any unable to produce fruit.

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that cultivar choice was left to the supplying nurseryman, package offers of trees were accepted, or that unscrupulous

The enclosed identifications indicate that the cultivars Northern Spy and [illegible] were chosen. Newtown Pippin comprise nearly half of the orchards in the park. This is corroborated by the importance in Californian plantings of these two cultivars at the time the Yosemite and Wawona orchards were created, and the reputation of the fruits and dual utility (cider and culinary) to which the crops were apparently put. The number of Spy and Newtown may be exaggerated, due to the high number of imperfect specimens relied upon for identification, and that immature and imperfect apples tend to approximate the form, flesh characters and coloring of these two cultivars. However I believe the identifications may be relied upon for purposes of maintaining the full range of cultivars present; any cultivars omitted were more likely missed by reason of not fruiting than by misattribution.

Repropagation and relocation may be the strategy of choice, in dealing with the issues of maintaining all the old apple cultivars and preventing human and animal injuries where trees are now growing. Some curatorial considerations were discussed in a synopsis I enclosed with my July letter, "A Curatorial Outline of Treatment for Historical Plantings." This synopsis should be reviewed at the time that Yosemite staff consider the options for maintaining or removing the orchard trees. Repropagation may be carried out in form of grafting of dormant scions (collected in winter), or by budding of active growth (collected in summer). Whatever strategy is adopted, I encourage repropagation as soon as possible of the various cherry trees found at the schoolyard and at Sentinel Meadow, all of which are at immediate risk of loss.

Competent propagators are not readily found. The generality of commercial nurseries in the state will custom propagate any variety of fruit, but only in multiples of one hundred each, according to trade practice. Few or none are set up to work with mixed rows of trees. This is not practicable for your purposes, but there is one smaller nursery in Sonoma county, a specialist in apples, which is able to produce trees in ones and twos and at reasonable cost. If you have not already resolved the problem of removal and repropagation, I can assist with tagging and collection of wood, and provide you contact with that nursery.

I hope that the enclosed survey provides all of the information necessary to carry out whichever course of action is determined by your office. If further assistance is required for arranging for collection and repropagation, feel free to contact me during the coming winter and spring.

Sincerely,

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Survey of the Orchards of Yosemite National Park

There are seven surviving orchards established in Yosemite National Park, localized within three areas of longtime human occupation: Yosemite Valley, El Portal / Foresta, and Wawona. Documentation attests to the great age of the surviving orchards, and with one exception, all date to the first years of European-American settlement in the Yosemite region.

Permanent residents gained title to Yosemite lands after March 1862 by homesteading, and the homestead process encouraged orchard planting. In particular, squatters residing since the 1850s took advantage of the homestead process to legitimize their possession of Yosemite lands. In order to perfect the homestead patent, five years of residence or cultivation upon the land had to be shown. As a one-time effort, tree planting was the form of cultivation most economic in use of money, labor and material. After tree planting, actual presence on the land to protect proprietary rights became unnecessary. There is some evidence that the valley had in fact been overplanted in fruit trees during this period, and that homesteading resulted in irrational land use and excessive conversion of meadow and forest to orchard cultivation.

Trees were planted in various locations, as dictated by the arbitrary requirements of land claims, rather than in the most suitable orchard locations. The now-vanished orchards on dry uplands at Sentinel Meadow and at the original village of Yosemite are examples of plantings for expedience, not for practical horticulture. Orchards are now found in Yosemite only where both human policy and growing conditions have coincided at a location to allow tree survival. Thus, today's orchards probably represent only a small fraction of the former fruit plantings of Yosemite.

The surviving orchards are substantially of apples, though sufficient plum, pear and cherry trees remain to indicate that some mixed plantings did exist. Identification and analysis of the surviving cultivars allows for conclusions as to the date and purpose of the several orchards. The preponderance of apples would not normally be expected in such a place as Yosemite Valley, where the climate allowed the growing and fruiting of more exotic fruits. Flowers of plums, peaches and the like bloom earlier and are susceptible to late frosts, and while these might have proven barren in the Valley, would have performed impressively at locations in Wawona or El Portal. That peach trees are not found outside the valley can be explained by their relatively short life, but cherries and pears - if any were planted - would still be found. Since no cherry trees are found outside the Valley, and but few pears, this suggests that planters were concerned less with what was planted, than in the act of planting itself. The ultimate utility of the crop might have been an only secondary consideration. The analysis of apple cultivars confirms this impression. Two apples - Northern Spy and Newtown Pippin - comprise some 50% of surviving apple trees both inside and outside the Valley. While these two are noted for multiple utility (dessert, culinary, cider) and long-keeping qualities, one would expect a more considered planting, which would include a balance of several cultivars for variety and a successional crop. The dating of the orchards places these in a period before specialized monotypic fruit growing, so one is led to the conclusion that the planters did not exercise care in cultivar selection and perhaps (as inexperienced orchardists) expressed no opinions on the matter. If the plantings were made hurriedly for purpose of satisfying homestead requirements, it is likely either

that cultivar choice was left to the supplying nurserymen (then in Sacramento), or package offers of trees were accepted, or that unscrupulous nurserymen dispatched mislabelled lots of trees. No trees at Yosemite were observed to be topworked - to change by grafting mature trees to another variety. This suggests both the lack of sophistication of Yosemite orchardists compared to their peers elsewhere in rural California, and the unrealistic economy of fruit growing there.

The tourist-oriented economy (remarkable in its era) and isolation of 19th-century Yosemite made a peculiar market for food commodities. Transient visitors demanded both staple materials (costly to haul in) and sensation of the luxuries of civilized life. The rather few permanent residents were more adaptable to the economic vagaries of rural isolation. Fruit orchards provided excellent, locally produced goods, both luxury and staple. Peaches, plums and cherries at Yosemite were described by correspondents during the period. Apples would have been the fruit of choice as a staple, due to their adaptability to long-keeping and processing. Apple drying on the farm was common throughout the US during the 19th century. Both physical and archival evidence indicate however that the greatest use made of Yosemite apples was for fermentation and occasional distilling. Cider was the most common alcoholic beverage in rural America until the central European immigration following the Civil War. The past importance of cider is lost upon modern-day Americans, accustomed to the culture of brewed products - beer and whiskey. Alcohol was then as now an important part of recreation, and at Yosemite was unduly expensive because of costs of haulage. Cider as a beverage of hospitality probably survived longer at Yosemite than anywhere else, outside of Appalachia.

Whether cider was conceived as the primary use of the orchard crop before the orchards were planted, or whether the use of apples for cider followed as a matter of necessity for disposal, is unclear. But it is obvious that fresh apple production greatly surpassed demand at Yosemite. Again, the cultivars planted suggest an answer. Northern Spy and Newtown Pippin were considered usable, but hardly choice, for cider purposes. Newtown is excessively acid at all times and renders little juice. Spy, while productive, tends towards excessive acid unless stored long, by which time much or most juice has been lost from the flesh. It seems probable that the development of a small cider industry at Yosemite was fortuitous and necessitated by overproduction of barely suitable apple varieties. One favorite cultivar for cidermaking, Maidenblush, is fairly common in two later (ca. 1880) Valley orchards, and the use of another there, Smiths Cider, is suggested by its own name. The peculiar discovery of a single tree of Martha in Curry Stable orchard is provocative. This tiny apple was used exclusively for cider, as it provided an astringent "bite" which rendered a mix with common apples more interesting. The presence of these cider varieties (but only in orchards planted well after the initial period of homesteading) raises the question whether careful blended cidermaking was carried on at Yosemite, or that the trees represented the chance whimsy of dubious nurserymen.

Dating the various orchards might seem difficult in the absence of documentation. The planting of Galen Clark orchard at Wawona in 1856-8 is well attested. Others are shown in various archival photographs. As no topworked trees were detected, any orchard trees in their present form may be taken as representative of age for their entire orchard. But since trees of the same cultivar vary in size according to the vitality of the rootstock upon which they were propagated, dating from inspection is unreliable. The range of cultivars themselves provides the best dating of any orchard. The dates of origin of apple cultivars found in the orchards range from 1800 to 1865. None were introduced later than 1870, and allowing some time for introduction to the Pacific coast, the

conclusion follows that the orchards were planted during the period 1860-75. The sole exception is the orchard at Wawona fire dormitory, which was planted within the memory of residents in the area. Again, the selection of pears is indicative. Only one cultivar, Vicar, is found in the park, indicating that certain orchards antedate the large introduction of French pears to California by various growers in 1869-71.

The irregular planting plan of orchards of Schoolyard and Sentinel Beach in the Valley, and Galen Clark at Wawona are suggestive of the relatively unsophisticated techniques of their planters. The orchards at Curry Stable and Curry Village by contrast were obviously planted by use of square, line and planting boards. These were also the two largest and latest orchards found, and have the greatest proportion of survivors, compared to orchards elsewhere. These were probably planted and maintained by experienced orchardists.

1. Curry Village

143 trees arranged in 21 apparent rows. This area is now used for visitor parking for Curry Village; most visitors seem not to realize the apple trees except during fruit season. The original planting seems to have been denser; every third row had apparently been removed to provide passage for automobiles. Spontaneous cedar and other trees have overgrown the apples to create a canopy and locally dense shade, causing irreversable decline of much of the planting. Soil is a light sand with forest duff but severely compacted by constant foot and vehicle traffic, causing much damage to root systems of trees. Relatively few hollow trunks but shade and bear breakage have produced excessively tall growth. Near south rim of valley; receives little or no sunlight November - February. This probably retards bloom season of trees to past frost danger; crop is heavier than at warmer Valley locations (Schoolyard, e.g.) despite poor physical condition of trees. Only plum tree (particularly susceptible to late frost) in Valley is found here, where is able to produce a crop. Various young cherry, etc., trees at west margin of orchard are fortuitous and origin is probably related to presence of bus platforms nearby. Three rows of trees at east are surrounded by forest. Trees dated to probably 1870s+, none recent.

Human and vehicular use is about the highest of any location in the park. Historicity of the planting and its relation to adjacent Camp Curry area is high. Bears are noted to be attracted to the area during autumn months, are attracted exclusively by apple fruits on trees. Bears are particularly driven to climb into the trees, often using adjacent parked vehicles for assistance. Damage to vehicles is frequent and breakage of tree limbs is universal. As a result, the condition of the trees is very poor and the orchard is hardly capable of restoration without complete replanting. Rehabilitation would involve removal of upper twenty feet of most trees, to regenerate new scaffold. Potential for harm to animals and humans from encounters, especially at night, is extreme. Spontaneous growth of conifers is rapidly foreclosing chances of survival of the orchard.

2. Curry Stable

215 trees, mostly arranged at rear of meadow in 18 rows; others near stable buildings. Chiefly apples, some pears. A kennel encloses some trees at southwest corner and other trees are found in forest top north. Soil is a poor granitic sand, loose, well drained. Located near south rim but receives more light than

Curry Village. Its distance at far end of an occasional horse pasture and poor visibility from road makes for little human traffic in or around the orchard. Some visitors were noted collecting fruits -- one interviewed had been coming to Yosemite and collecting apples here in each of past 50 years. Considerable mix of cultivars, some adapted particularly for dessert, culinary, cider. Presence of cv. 'Martha' is noted above. Trees fairly productive, generally appear not affected by several years of low rainfall. Rodent activity noted under most trees and between rows. Presence of bears obvious from scat and marks on trunks; of deer from high "skirts" of branches, indicating regular browsing from ground. Bear damage (breakage) not great during early season, suggesting a preference for Curry Village fruits, and only later patronage of the stable orchard. Some breakage of branches. Many or most trees with hollow boles. Trees generally in fair condition and capable of restorative work. Pines have colonized the eastern third of the orchard and will probably cover all the area within 15 years, decline of orchard will then be rapid. Some dead trees noted at center of orchard, cause unknown. Planting ca. 1870+, no recent plantings.

Human traffic in this area is slight and danger from encounters with animals is moderate. More deer are found here than at other Valley orchards. Much space available for expansion of planting if necessary. Historical background of orchard is unclear, but no apparent connection with current stable operation. Well laid out for possible interpretive facility. Trees require efforts to discourage rodents, general pruning to lighten branches hanging from hollow trunks: light work compared to other orchards.

3. Schoolyard

53 Trees, including two cherries which suggest a mixed orchard originally. Below north rim of valley, a warm location and soil meagre and dry. Yosemite Creek passes immediately to north. Appears that orchard formerly extended further into playing fields to northeast. Crop moderate, trees show stress from repeated drought late in life. 60 - 80% hollow boles, forms difficult to rehabilitate without irrigation to encourage recovery. One pear tree, vigorous. Cherries declining rapidly, should be repropagated immediately if desired to preserve them. Planting in such a dry location and arrangement of orchard without defined rows suggests that trees did not receive proper attention from an experienced fruit grower. This may account for some of the conditions observed: much dead wood in trees and "missing" trees. 20% of area is colonized by cedar, affected trees will not survive beyond ten years. Breakage from animals low, is apparently not a favored browse or fruit area, probably from human habitation nearby. Orchard is traversed by main foot/bike path between Yosemite Village and Yosemite Lodge. Northside Drive passes along south edge of orchard, popular car parking. Both visitor and resident traffic is fairly constant. No historic buildings or artifacts remain. Apparent origin, 1864-5.

Prognosis for survival good, if normal rainfall; Risk of loss from sunburning trees if attempt to rehabilitate. Most losses are apparently due to drought. Cedar growth threatens some trees; cherries will not survive much longer. Little space for expanding planting if current meadow management regime is preserved; difficult to reestablish orchard here without constant artificial irrigation.

4. Ahwanee Meadow

A single apple tree beneath conifers, west of hotel dining room is almost certainly a recent seedling and should be removed. Various elderberry and wild cherry clumps are observed in the meadows in locations suggestive of strategic, landscape planting. These may have been collected elsewhere in the park and brought here, or may be fortuitous seedlings.

5. Visitor Center

The warm location is poorly adapted for fruit culture. Soil is scant, rocks general. If it was ever planted in fruits, the orchard(s) did not last long. One apple tree at rear of old Ranger Club appears to be of the rare cv. 'Sheepnose'. A fairly young pear tree is at rear of the museum, also an apple 150 feet north of visitor center, both obviously recent seedlings, suitable for removal.

6. Cooks Meadow

Three trees isolated at the center of the meadow are probably relicts of a much larger, general planting. A path runs near the three trees. Soil typical sandy meadowland. Trees very dense, probably from deer browsing. No sign of bear interest here. Planted approx. 1870-80.

The exposure and obviousness of this location, where considerable efforts have been made to reestablish the meadow, argues against allowing fruit trees to remain here. Probably the most frequent place of visitor - animal encounters in the park, a place for short interpretive hikes offered to the public.

7. Sentinel Meadow

13 trees. This in part was site of old village of Yosemite, before that of a pine-oak forest; growth typical of rocky, talus bench lands. The forest was cleared and land levelled, and small dooryard orchards appeared around cabins. As the trees failed due to drought on the dry soils, more cottages were built, and eventually commercial enterprises. A few fruit trees remain in scattered groups on both sides of the road, apparent relics of individual cottage gardens rather than great orchards. Most eclectic fruit collection in the Valley, of apple, pear, cherry. Much soil disturbance since demolition of structures and more recent restoration of meadow. Building walls, drains, flower gardens, septic tanks made life of trees possible here. Continued tree losses are likely, with drought and destruction of support from human ecology. One tree (#7) is dying in favor of a dooryard Sequoia. A swarm of cherry specimens reveals two original trees and three seedlings of them. Area apparently not attractive to animals; constant vehicle and daytime foot traffic. Probably includes oldest fruit trees in park - ca. 1856-8.

Most trees not amenable to rehabilitation, a few close to death. Historicity of this area of Valley very high to highest, however soil poorly adapted for tree culture. Any plantings here must receive irrigation to survive long.

8. Four Mile Trailhead

Four trees. Apparently a transition or continuation of the series of orchards of Sentinel Meadow and of Sentinel Beach. As elsewhere, soils very poor

for fruit culture. Few trees appear to have survived, but are in fair condition and productive. Are unnoticed, little disturbance from either animals or humans. Dense shade will eliminate these trees soon. Planted approximately 1860-65.

9. Sentinel Beach

Ten trees remaining, originally many more. At first view, this appears as a single row of apple trees extending for a half-mile of the south bank of the Merced River - a rare example of a linear orchard. Further investigation reveals that the trees are the only survivors of an immense orchard planted long ago in the historical flood path of the Merced; this must have been the largest of the orchards in the Valley, of at least 500 - 1000 trees. Occasional apple trees found upon the forest terrace above the river level (as at Four Mile Trailhead) suggest that the orchard may have extended even further yet, but has since been reclaimed by forest. Soil (if any) is river gravel. Currently, trees comprise hummocks and islets in occasionally-flooded river bed. River course apparently now changes more readily than 100 years ago; then banks were sufficiently stable to allow the orchard trees to be planted and at least some to become established. Trees assume shrubby form, are subject to flood water damage, loss of branches. Best-preserved trees are those upon forest terrace. An obvious bear path follows the line of trees up and down the river. Some bear damage visible. Planted ca. 1865-70.

Precarious conditions make survival of trees doubtful, area is unsuited for continued tree maintenance. No cultural artifacts or human ecology remains in this area. Campground and picnic area adjacent, to west. Occasional hikers and river bathers present. Apple trees in dense forest areas will perish within a few more years. Prognosis dubious.

10. Wawona

64 trees at 6 locations. The history of Wawona and its orchards is quite distinct from that of Yosemite Valley, as are the climate and soil. Climate is better adapted for fruit culture than the locations in Valley. Soils vary, but are generally older, deeper, richer than the river sands of Valley, but equally well drained. Some remaining orchards are remarked for their strong historical associations with Galen Clark and the Washburns who created Wawona resort. Long tradition of limited agriculture here; affirmed by activities of local history center. Auto traffic is constant on highway, pedestrians are few and hikers only occasional away from road. Deer are always present; bear damage to some trees is apparent. Human - animal encounters near fruit trees are frequent and serious injuries to visitors have resulted.

a. Galen Clark Orchard. An artificial clearing in forest, west of golf course. Reached by a short walk from access road. Clear ground has been maintained by NPS to preserve historical site of Clark Cabin (demolished). 16 scattered trees remain of one larger orchard. Exposure towards north, forest enclosure permit little sunlight to apple trees during most of year. Trees generally in good condition, all fruiting, site could respond to restoration. Much space available for replanting. Location not visible and unsigned, discreet distance from road discourages most visitors. Bear damage observed. Surface water rising here is probable reason for survival and fair condition of trees. A stream passes among surviving trees. Fruit samples were lost, but were able to field identify all trees as either 'Newtown Pippin' or 'Rhode Island Greening'.

Planted ca. 1858-64. 101 Smith Cider 123 Smith Cider
124 Baldwin

b. Fire Dormitory Orchard. Eleven trees planted on grounds ca. 1940-50. All are modern cultivars of no particular historicity or significance to the area. Deer are frequent here; residents and neighbors make use of fruits.

c. Ranger Station. 15 trees, most are wild cherry, apparently introduced for landscaping. A single apple tree remains across road, of a probable orchard that may have extended to history center.

d. Stella Lake. Two apple trees which antedate former lake; before 1900 area was probably covered with orchard. Another tree at turnout, shaded. All trees at risk of loss from neglect, had apparently been first established by irrigation via ditch system.

e. Hotel and Golf Course. 13 trees, all apples, beside road turnout and four trees on slope to east of hotel. Frequented by deer. Cultivars unknown; fruit is stripped by use of blast from firehose to prevent human/deer encounters beside highway. These and others on slope east of highway are relicts from a formerly immense orchard apparently planted by the Washburns ca. 1879-85. Nearly all trees were removed and replaced by resort golf course many years ago. Surviving trees are an attractant to deer and to visitors. While there is some historicity to these trees - the only survivors of the largest orchard in the park - their historical significance is inferior to those of Clark Orchard not far away. Mechanical damage to trees, bark disease are apparent from cumulative effect of blasts of water to strip fruit. Decline of trees is inevitable.

CURRY VILLAGE ORCHARD

1 Smiths Cider
2 unknown A
3 no fruit
4 unknown B
5 unknown A
6 Rhode Island Greening
7 Smiths Cider
8 Rhode Island Greening
9 unknown B
10 Northern Spy *
11 Newtown Pippin
12 Newtown Pippin
13 unknown B
14 unknown A
15 Smiths Cider
16 no fruit
16bis unknown B
17 Baldwin
18 Northern Spy
19 unknown A
20 unknown B
21 unknown A
22 Roxbury Russet
23 no fruit
24 Rhode Island Greening
25 Smiths Cider *
26 Northern Spy
27 Newtown Pippin
28 Roxbury Russet
29 no fruit
30 Smiths Cider
31 Newtown Pippin
32 unknown D
33 Northern Spy
34 Smiths Cider
35 no fruit
36 unknown B
37 Newtown Pippin
38 Newtown Pippin
39 Smiths Cider
40 Smiths Cider
41 unknown A
42 Newtown Pippin
43 no fruit
44 unknown C
45 Newtown Pippin
46 unknown A
47 Roxbury Russet
48 unknown A
49 unknown B
50 Rhode Island Greening
51 unknown A *
52 unknown A
53 unknown A
54 unknown A
55 unknown E *
56 unknown B
57 unknown A
58 unknown A
59 Baldwin
60 Newtown Pippin
61 Smiths Cider
62 Fall Pippin *
63 unknown A
64 unknown E
65 Rhode Island Greening *
66 unknown A
67 unknown B
68 no fruit
69 Rhode Island Greening
70 Maidenblush *
71 Rhode Island Greening
72 Northern Spy
73 unknown B
74 unknown A
75 unknown B
76 no fruit
77 unknown B *
78 Northern Spy
79 no fruit
80 unknown F *
81 Smiths Cider
82 Roxbury Russet
83 unknown A
84 unknown D *
85 Roxbury Russet
86 unknown E
87 unknown D
88 unknown A
89 unknown A
90 Baldwin *
91 no fruit
92 unknown A
93 unknown E
94 Fall Pippin
95 no fruit
96 Newtown Pippin
97 unknown C *
98 Rhode Island Greening
99 Newtown Pippin *
100 Roxbury Russet *

101 Smith Cider
102 Rhode Island Greening
103 no fruit
104 Rhode Island Greening
105 Rhode Island Greening
106 unknown D
107 unknown D
108 Newtown Pippin
109 unknown A
110 unknown B
111 unknown D
112 Newtown Pippin
113 no fruit
114 Newtown Pippin
115 Newtown Pippin
116 Rhode Island Greening
117 Roxbury Russet
118 unknown B
119 no fruit
120 unknown E
121 unknown A
122 Northern Spy
123 Smith Cider
124 Baldwin
125 unknown D
126 unknown C
127 no fruit
128 no fruit
129 White Winter Pearmain *
130 no fruit
131 Pear, Vicar of Winkfield
132 Northern Spy
133 no fruit
134 Plum, no fruit (seedling)
135 Cherry, no fruit (seedling)
136 no fruit
136bis no fruit
137 Myrobolan, no fruit (seedling)
138 Myrobolan, no fruit (seedling)
139 unknown A
140 Plum, no fruit (seedling)
141 Plum, German Prune
142 Prunus virginiana demissa
143 Prunus virginiana demissa

CURRY STABLE ORCHARD

1	Ben Davis	51	Newtown Pippin
2	Newtown Pippin	52	Newtown Pippin
3	Maidenblush	53	Northern Spy
4	Northern Spy	54	Northern Spy
5	Northern Spy	55	Northern Spy
6	Newtown Pippin	56	no fruit
7	Northern Spy	57	no fruit
8	Newtown Pippin	58	Northern Spy
9	Northern Spy	59	Northern Spy
10	no fruit	60	Northern Spy
11	Northern Spy	61	Northern Spy
12	Northern Spy	62	Newtown Pippin
13	Pear, Vicar of Winkfield	63	Northern Spy
14	Roxbury Russet *	64	Northern Spy
15	Northern Spy	65	Northern Spy
16	Northern Spy	66	no fruit
17	Northern Spy	67	Northern Spy
18	Maidenblush	68	Newtown Pippin
19	Newtown Pippin	69	Northern Spy
20	Newtown Pippin	70	Newtown Pippin
21	Northern Spy	71	Newtown Pippin
22	Northern Spy	72	Northern Spy
23	Newtown Pippin	73	Northern Spy
24	Northern Spy	74	Northern Spy
25	Northern Spy	75	Northern Spy
26	Northern Spy	76	Newtown Pippin
27	Baldwin	77	Smiths Cider *
28	King of Tompkins County *	78	Northern Spy
29	no fruit	79	Northern Spy
30	Newtown Pippin	80	Northern Spy
31	Northern Spy	81	Maidenblush *
32	Northern Spy	82	no fruit
33	Northern Spy	83	Northern Spy
34	Northern Spy *	84	Northern Spy
35	no fruit	85	Newtown Pippin
36	no fruit	86	Northern Spy
37	Northern Spy	87	Northern Spy
38	unknown H *	88	unknown G *
39	Newtown Pippin	89	Northern Spy
40	no fruit	90	Northern Spy
41	Northern Spy	91	Northern Spy
42	Newtown Pippin	92	Newtown Pippin
43	Northern Spy	93	no fruit
44	Northern Spy	94	Newtown Pippin *
45	no fruit	95	Northern Spy
46	no fruit	96	Newtown Pippin
47	Northern Spy	97	Newtown Pippin
48	Newtown Pippin	98	Newtown Pippin
49	Newtown Pippin	99	Northern Spy
50	Northern Spy	100	Newtown Pippin

101	Northern Spy
102	Smiths Cider
103	Northern Spy
104	Northern Spy
105	Ben Davis *
106	Newtown Pippin
107	no fruit
108	Ben Davis
109	Northern Spy
110	no fruit
111	no fruit
112	no fruit
113	Yellow Bellflower *
114	Newtown Pippin
115	Newtown Pippin
116	Newtown Pippin
117	Northern Spy
118	Northern Spy
119	no fruit
120	Newtown Pippin
121	Northern Spy
122	Northern Spy
123	Maidenblush
124	unknown H
125	Northern Spy
126	Newtown Pippin
127	Newtown Pippin
128	Fall Pippin *
129	Smiths Cider
130	Newtown Pippin
131	Northern Spy
132	Newtown Pippin
133	Northern Spy
134	Northern Spy
135	Northern Spy
136	Newtown Pippin
137	Northern Spy
138	Maidenblush
139	Newtown Pippin
140	Northern Spy
141	Northern Spy
142	Northern Spy
143	Newtown Pippin
144	Newtown Pippin
145	Northern Spy
146	Newtown Pippin
147	Newtown Pippin
148	Newtown Pippin
149	Newtown Pippin
150	Northern Spy
151	Baldwin *
152	no fruit
153	Newtown Pippin
154	Newtown Pippin
155	Newtown Pippin
156	no fruit
157	Northern Spy
158	Northern Spy
159	no fruit
160	Winesap *
161	Northern Spy
162	Northern Spy
163	Newtown Pippin
164	Newtown Pippin
165	no fruit
166	Northern Spy
167	Northern Spy
168	Northern Spy
169	no fruit
170	no fruit
171	Newtown Pippin
172	Northern Spy
173	no fruit
174	Northern Spy
175	Northern Spy
176	Northern Spy
176bis	Martha *
177	no fruit
178	no fruit
179	Newtown Pippin
180	Newtown Pippin
181	Newtown Pippin
182	Northern Spy
183	Northern Spy
184	Newtown Pippin
185	no fruit
186	Newtown Pippin
187	Northern Spy
188	Newtown Pippin
189	no fruit
190	Newtown Pippin
191	no fruit
192	Newtown Pippin
193	no fruit
194	Northern Spy
195	Northern Spy
196	Newtown Pippin
197	Northern Spy
198	Newtown Pippin
199	Newtown Pippin
200	Newtown Pippin

201	Newtown Pippin	
202	no fruit	
203	Northern Spy	
204	Rhode Island Greening	
205	Rhode Island Greening	*
206	Rhode Island Greening	
207	Grindstone	*
208	no fruit	
209	Northern Spy	
210	no fruit	
211	Ben Davis	
212	Northern Spy	

SCHOOLYARD

KAWONA

1	no fruit
2	Northern Spy
3	no fruit
4	unknown I
5	pear, Vicar of Winkfield
6	Ortley *
7	no fruit
8	Baldwin
9	Newtown Pippin *
10	Northern Spy
11	unknown I
12	Rhode Island Greening
13	unknown I
14	no fruit
15	unknown I
16	Rhode Island Greening
17	no fruit
18	unknown I
19	unknown I
20	no fruit
21	Northern Spy *
22	Baldwin *
23	no fruit
24	Northern Spy
25	Newtown Pippin
26	cherry, unknown A
27	Baldwin
28	Golden Russet *
29	Northern Spy
30	Rhode Island Greening
31	Rhode Island Greening
32	Baldwin
33	Northern Spy
34	pear, Vicar of Winkfield *
35	Newtown Pippin
36	Northern Spy
37	Newtown Pippin
38	no fruit
39	Northern Spy
40	Northern Spy
41	Northern Spy
42	Newtown Pippin
43	no fruit
44	Newtown Pippin
45	no fruit
46	no fruit
47	Northern Spy
48	Baldwin
49	Rhode Island Greening *
50	Rhode Island Greening
51	Swaar *
52	no fruit
53	Northern Spy
54	cherry, unknown B
55	Northern Spy

COOKS MEADOW

1 no fruit
2 Northern Spy
3 Northern Spy

SENTINEL MEADOW

1 Jonathan *
2 Maidenblush *
3 no fruit
4 pear, Vicar of Winkfield
5 no fruit
6 Northern Spy
7 no fruit
8 no fruit

also five cherry trees, probably 2 originals and 3 seedlings

SENTINEL BEACH

1 (south half) rootstock
1bis (north half) Rhode Island Greening
2 no fruit
3 Newtown Pippin
4 Jonathan *
5 Newtown Pippin
6 Newtown Pippin
7 no fruit
8 Northern Spy
9 no fruit
10 Newtown Pippin
11 Newtown Pippin

FOUR MILE TRAILHEAD

1 no fruit
2 Winter Banana *
3 White Winter Pearmain *
4 Winesap *

VISITOR CENTER

At rear of Ranger Club: Sheepnose *
At rear of Indian Gardens/Museum: pear, probable seedling

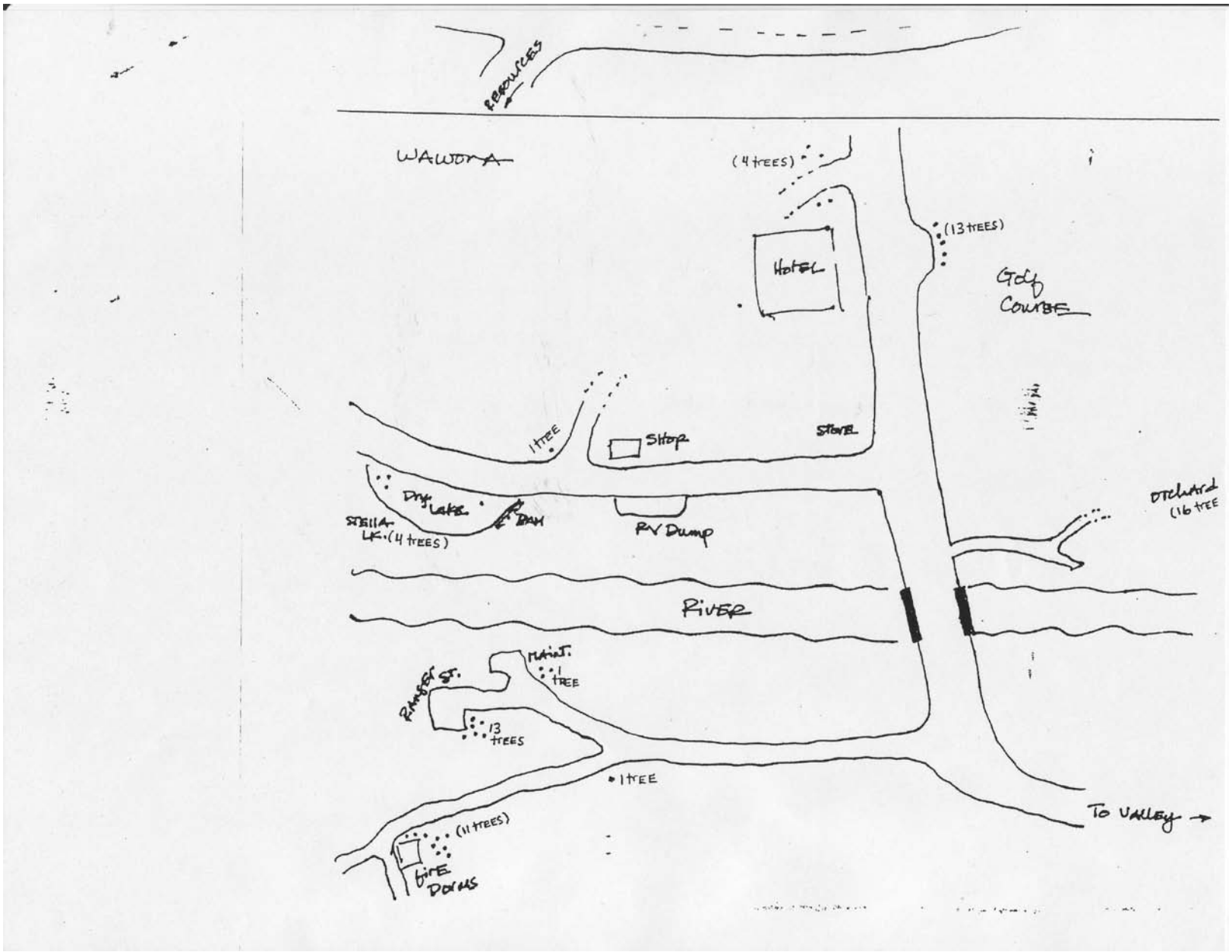
AHWAHNEE MEADOW

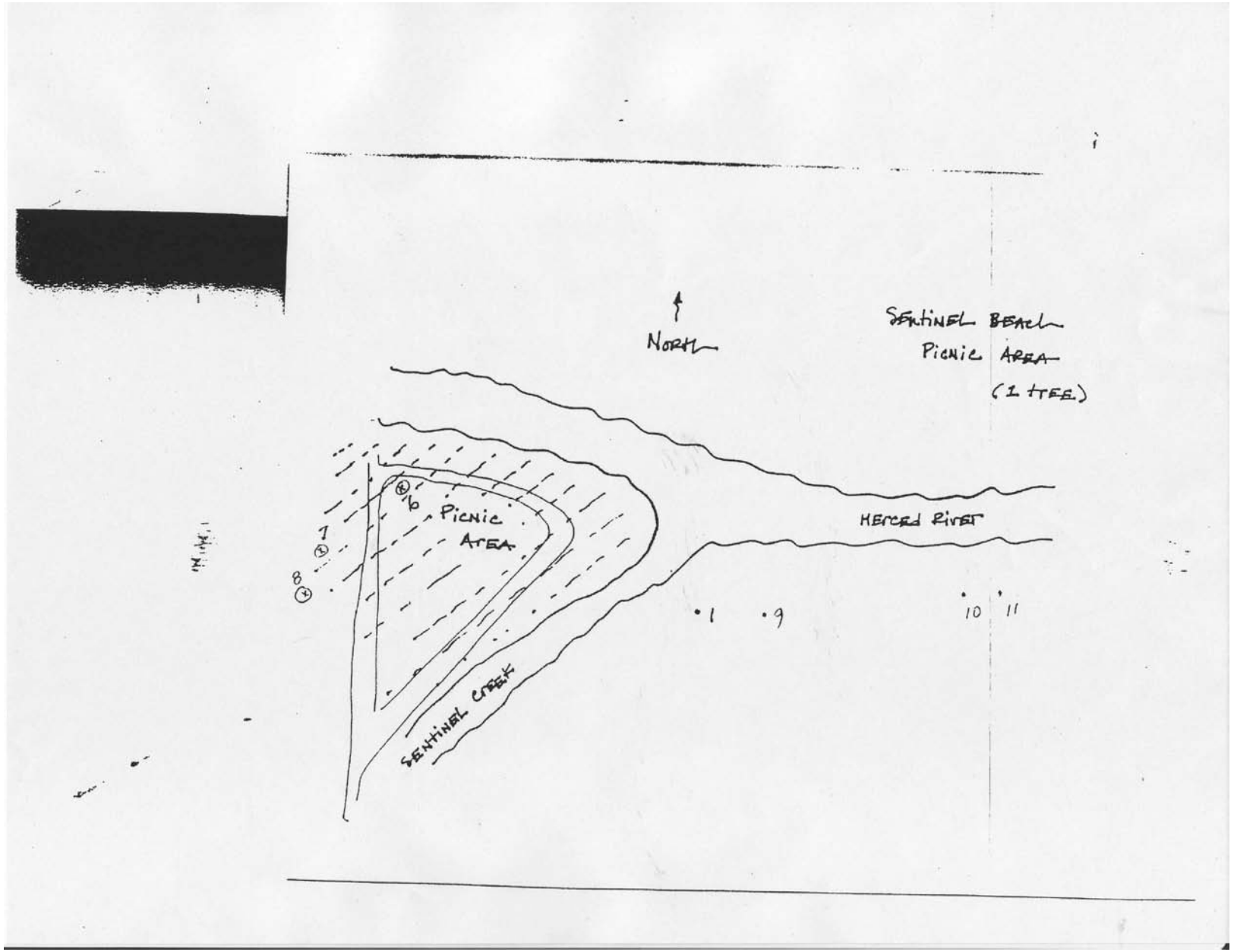
At east of center meadow: 2 Elderberry, probable introduced
Approx. 500 ft west of Dining Room: apple, probable seedling
In west meadow: several clumps wild cherry, probable introduced

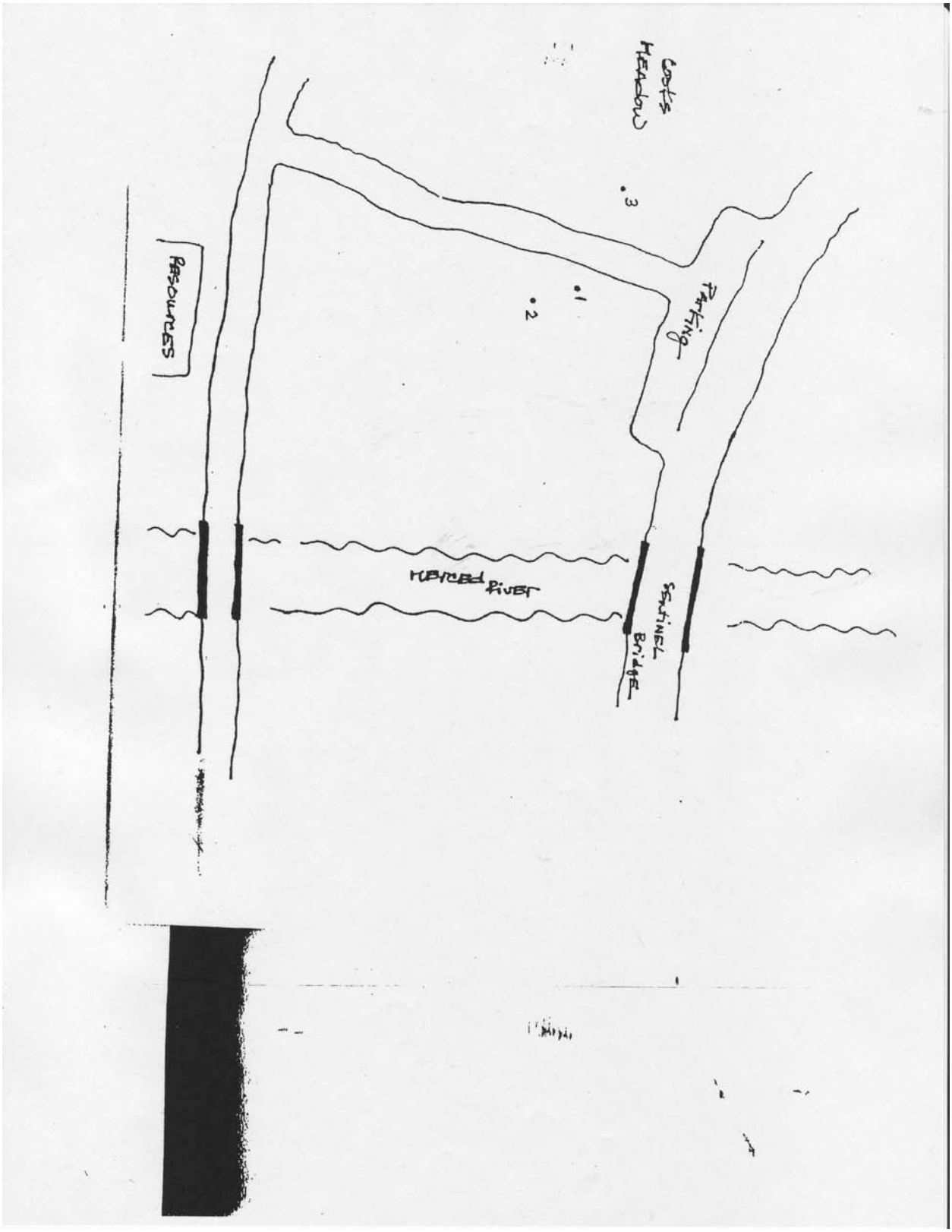
WAWONA

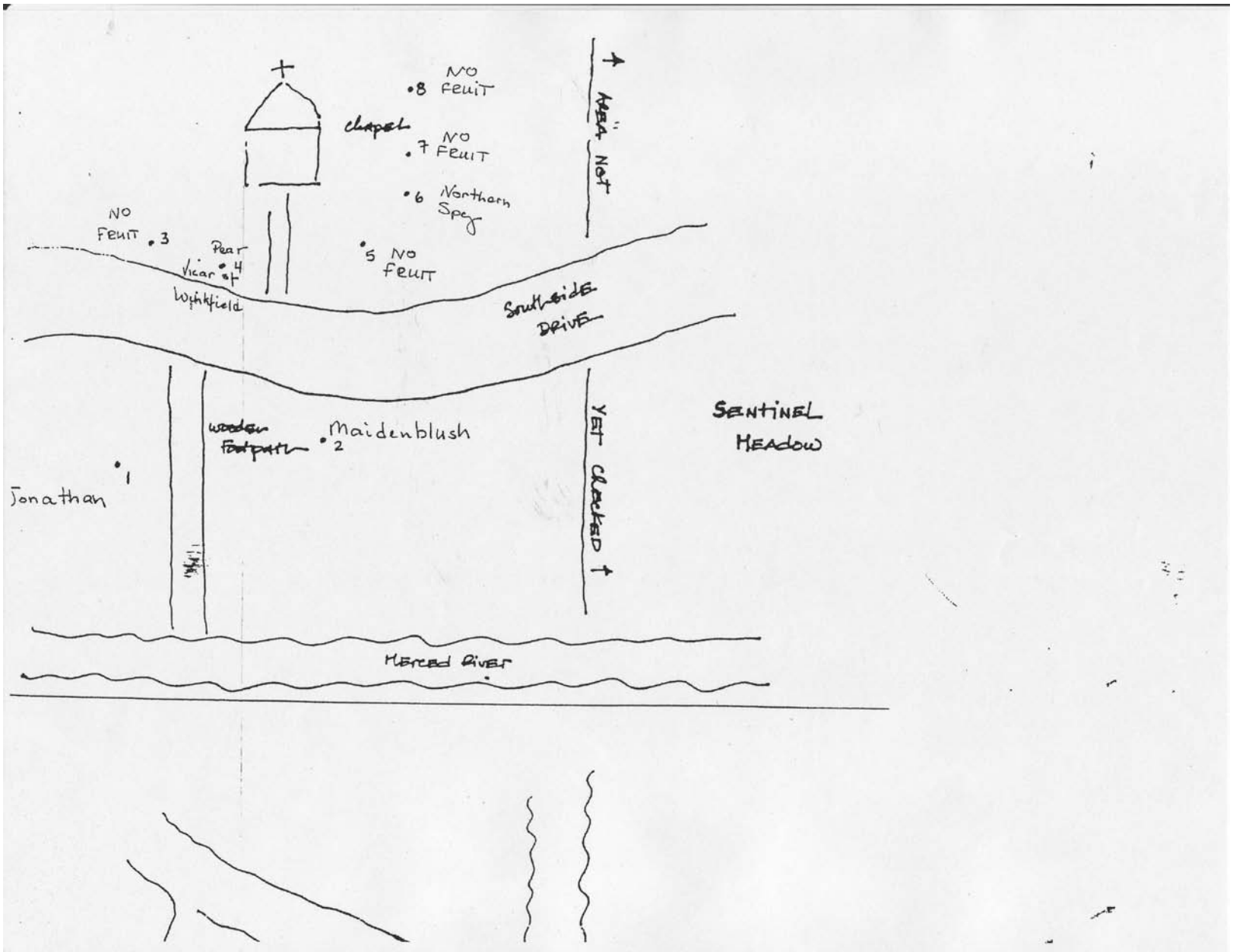
all trees 1 through 13 are Newtown Pippin or Rhode Island Greening (samples lost)

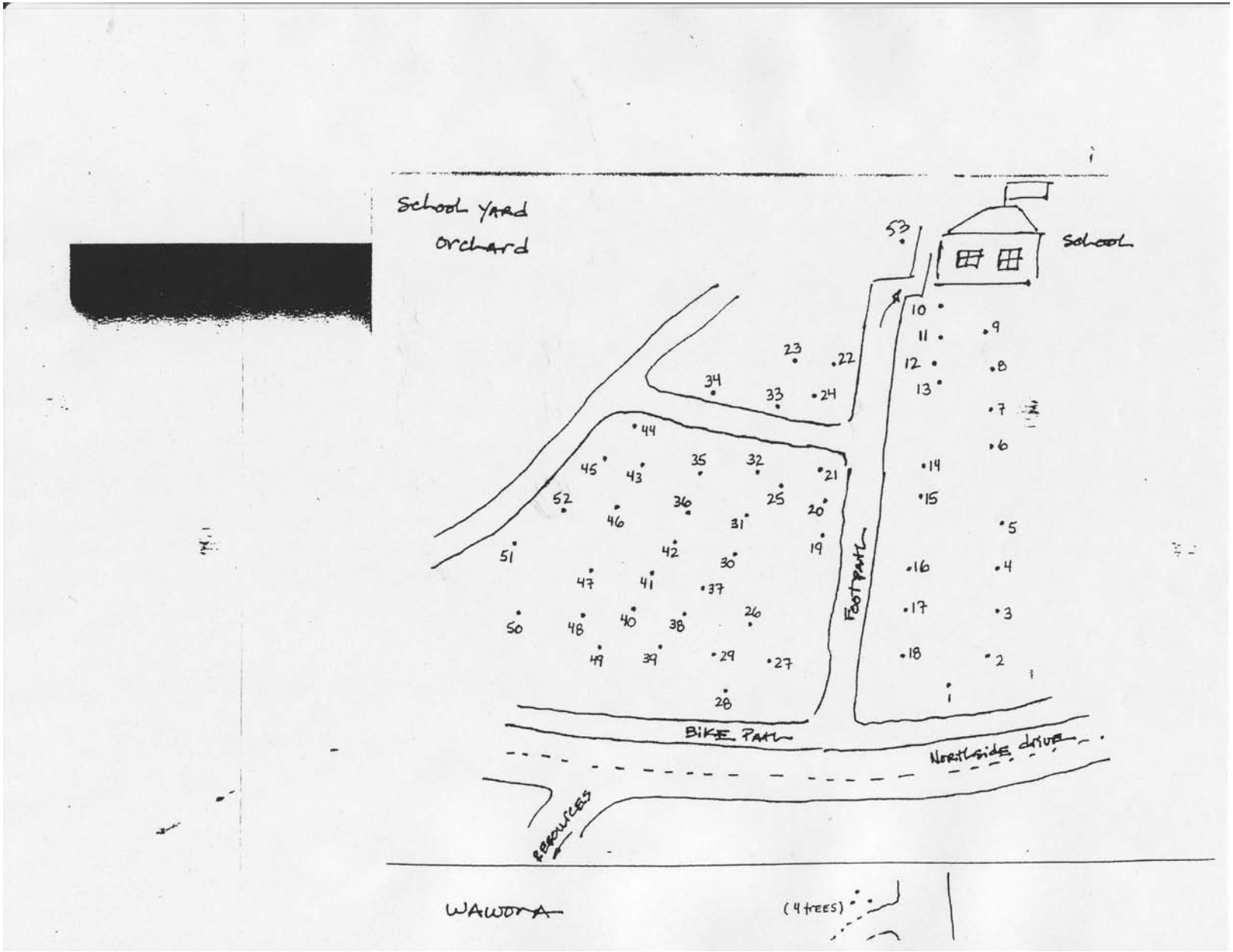
14 Maidenblush
15 Rhode Island Greening *
16 Maidenblush
17 no fruit
18 Maidenblush
19 no fruit
20 pear, Vicar of Winkfield
21 Jonathan *
22 Maidenblush
23 Maidenblush *
24 Baldwin
25 King of Tompkins County *
26 Maidenblush
27 Maidenblush
28 no fruit
29 Maidenblush
30 wild plum
31 unknown J *
32 pear, Winter Bartlett *
33 King of Tompkins County
34 no fruit
35 no fruit
36 walnut, unknown
37 no fruit
38 no fruit
39 no fruit
40 no fruit
41 Golden Delicious
42 Baldwin
43 Holland Pippin *
44 no fruit
45 wild cherry
46 Newtown Pippin
47 Newtown Pippin *
48 no fruit
49 Newtown Pippin
50 plum, unknown B *
51 hawthorn
52 King of Tompkins County

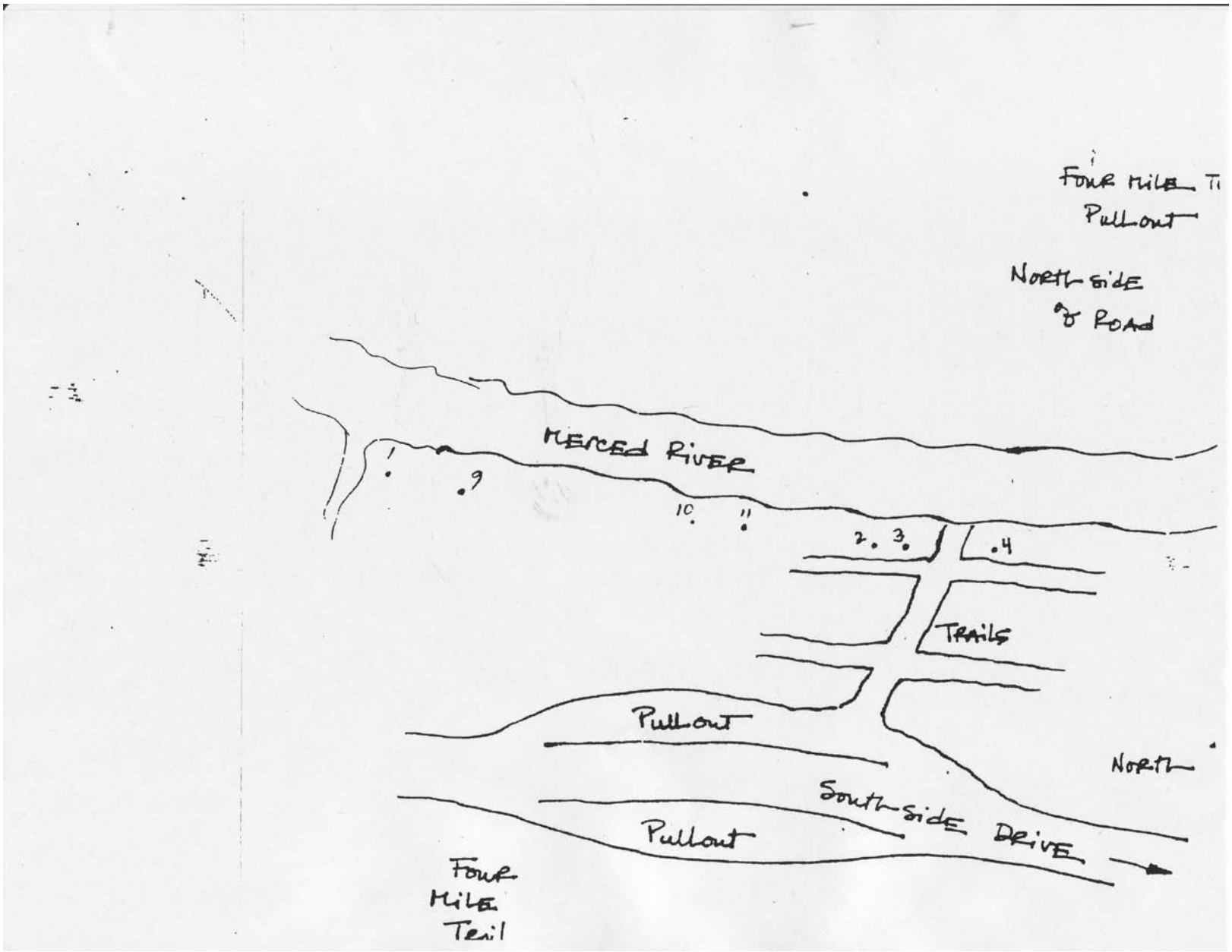

RESOURCES
WAWONA
(4 trees)
(13 trees)
HOTEL
GOLF COURSE
1 TREE
SHOP
STORE
DRY LAKE
DAM
STELLA LK. (4 trees)
RV Dump
ORCHARD (16 TREE
RIVER
RANGER ST.
MAINT.
1 TREE
13 trees
1 TREE
(11 trees)
FIRE DORMS
TO VALLEY

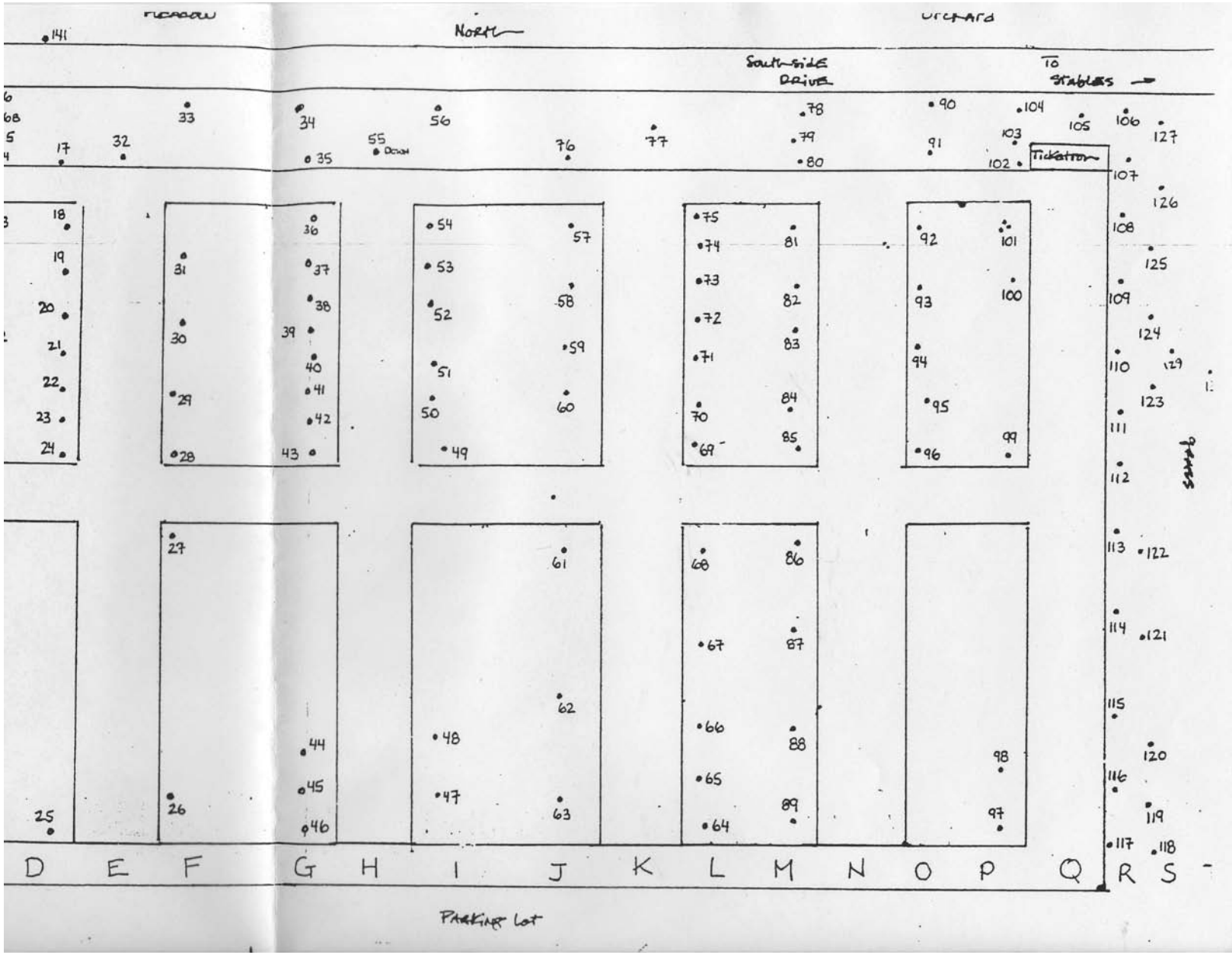

NORTH
SENTINEL BEACH
PICNIC AREA
(1 TREE)
PICNIC
AREA
HERCED RIVER
SENTINEL CREEK
1
6
7
8
9
10
11


Cooks Meadow
3
1
2
Parking
Resources
Merced River
Sentinel Bridge


NO FRUIT
8
chapel
NO FRUIT
7
6 Northern Spy
AREA NOT
NO FRUIT 3
Pear
Vicar st 4
Wyhkfield
5 NO FRUIT
South side DRIVE
SENTINEL MEADOW
YET CHECKED
wooden footpath
Maidenblush
2
1
Jonathan
MERCED RIVER


School Yard
Orchard
School
53
10
11
12
13
9
8
7
6
14
15
5
16
4
17
3
18
2
1
23
22
34
33
24
44
45
43
35
32
21
52
36
25
20
46
31
51
42
30
19
47
41
37
50
48
40
38
26
49
39
29
27
28
FOOT PATH
BIKE PATH
Northside drive
RESOURCES
WAWONA
(4 trees)


FOUR MILE TI
PULLOUT
NORTH SIDE
OF ROAD
MERCED RIVER
9
10
11
2. 3.
.4
TRAILS
PULLOUT
NORTH
SOUTH SIDE DRIVE
PULLOUT
FOUR
MILE
TRAIL


Orchard
North
South side Drive
To Stables
Ticketron
Graves
Parking Lot
D E F G H I J K L M N O P Q R S

APPENDIX IV: EMAIL CORRESPONDENCE WITH GAYLE VOLK, USDA PLANT GENETICIST

"Volk, Gayle" <Gayle.Volk@ARS.USDA.GOV>	To	<Daniel_Schaible@nps.gov>
	cc	
10/08/2010 02:00 PM	Subject	RE: List of known fruit tree varieties at Yosemite

Here are a couple paragraphs on our genotyping work. I can certainly provide more info to you if needed. I will send two additional e-mails, each with chapter drafts (to be published in an Apple Genomics book) that might be of interest to you.

Scientists at the USDA-ARS National Center for Genetic Resources Preservation (NCGRP) and our collaborators at the USDA-ARS Plant Genetic Resources Unit in Geneva, NY have genotyped thousands of apple accessions in the National Plant Germplasm System. A set of seven microsatellite markers differentiates the individual trees that represent diploid wild species individuals. Diploid domesticated apple cultivars have been fingerprinted with between six and 19 microsatellite markers. We have found that a set of six microsatellites differentiate most of the unique cultivars, but sports are not differentiated using these genetic tests. Data from these experiments serve as a reference set to identify unknown apple varieties. The USDA collection includes many modern and historical dessert apple types from many countries, breeding lines, European cider apple types, and rootstocks. Ploidy information and some marker data are available for accessions that are not diploid.

Several green leaves should be harvested from each tree of interest, placed in labeled zip-lock bags, and shipped overnight to the NCGRP in Fort Collins, Colorado. NCGRP staff will extract DNA, amplify desired regions using PCR, and then precisely determine the size of the amplified regions. The size of the region amplified by each of the marker-specific primers is determined through either slab-based or capillary-based sequencing methods. Data obtained for the unknown samples is then compared to our database of known apple collections. We use this data to determine the identity of unknown apple varieties. We will also identify which accessions do not have very similar representatives already in the USDA apple collection.

-----Original Message-----
From: Volk, Gayle
Sent: Wednesday, October 06, 2010 1:32 PM
To: 'Daniel_Schaible@nps.gov'
Subject: RE: List of known fruit tree varieties at Yosemite

Here's a first list of what I think are in the system. Looks like you might already have some novel material. Some of these have similar names in GRIN (but not the same). I would suggest including the "no" samples in the genetic testing to see if they have another name match.
--Gayle

Smiths Cider	no
Rhode Island Greening	yes
Northern Spy	yes

Newtown Pippin	no?--but I thought we did....
Baldwin	yes
Roxbury Russet	yes
Fall Pippin	yes
Maidenblush	yes
White Winter Pearmain	yes
Pear, Vicar of Winkfield	yes
Ben Davis	yes
King of Tompkins County	no
Yellow Bellflower	yes
Martha	yes
Winesap	yes
Grindstone	no longer in the collection
Ortley	yes
Swaar	no longer in the collection
Golden Russet	yes
Jonathan	yes
Winter Banana	yes
Sheepnose	no?
Golden Delicious	yes
Holland Pippin	no?

-----Original Message-----
From: Daniel_Schaible@nps.gov [mailto:Daniel_Schaible@nps.gov]
Sent: Wednesday, October 06, 2010 12:40 PM
To: Volk, Gayle
Subject: List of known fruit tree varieties at Yosemite

Hi Gayle. Thank you for retuning my call this morning. I look forward to working with you in the future in helping to implement Yosemite's Orchard Management Plan.

As requested, here is the list of known fruit tree varieties in Yosemite. I think that most of them are apples, with maybe a few pears included. Please let me know if all of these varieties are already represented in the national germplasm repository.

Smiths Cider
Rhode Island Greening
Northern Spy
Newtown Pippin
Baldwin
Roxbury Russet
Fall Pippin
Maidenblush
White Winter Pearmain
Pear, Vicar of Winkfield
Ben Davis
King of Tompkins County
Yellow Bellflower
Martha
Winesap
Grindstone
Ortley
Swaar
Golden Russet

Jonathan
Winter Banana
Sheepnose
Golden Delicious
Holland Pippin

Thank you so much for your help. Also, when you have a chance, please send a couple short paragraphs explaining what you guys do and how you might be able to assist our efforts.

Thanks!

Daniel Schaible
Historical Landscape Architect, Yosemite National Park
P.O. Box 700-W
El Portal, California 95318

(209)379-1295
(209) 379-1452 (FAX)