California Department of Parks and Recreation
National Park Service

Historic Orchard Workshop

California Department of Parks and Recreation
and the National Park Service
March 23-25, 2010
Jack London State Historic Park

Day 1: Identifying and Assessing Historic Orchards

Session 1: Walking tour of SDC historic orchard

Learning goals:

Understand that orchards may be identified as historic properties.

Understand some basic vocabulary, such as species, variety, rootstock, scion, tree form and spacing.

Any questions from the tour?

Session 2: Historic Significance and Integrity of Orchards and Fruit Trees

Learning goals:

Understand that fruit trees and orchards have evolved over time.

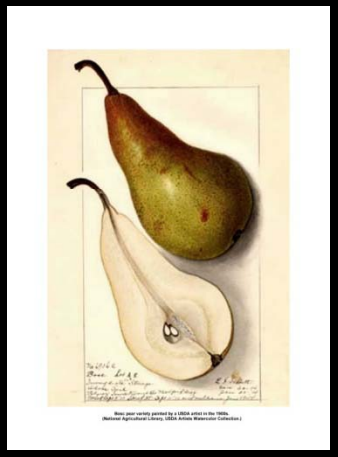
Understand the process for evaluating the significance and integrity of orchards and individual fruit trees.

Recap some basic orchard vocabulary:

species
variety
scion and rootstock
seedling tree vs grafted tree
tree form
spacing

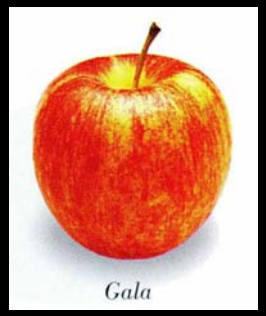
Species

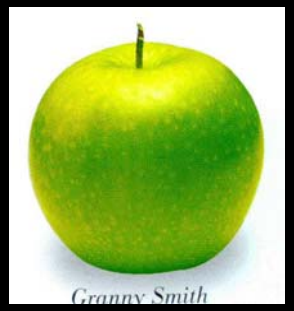




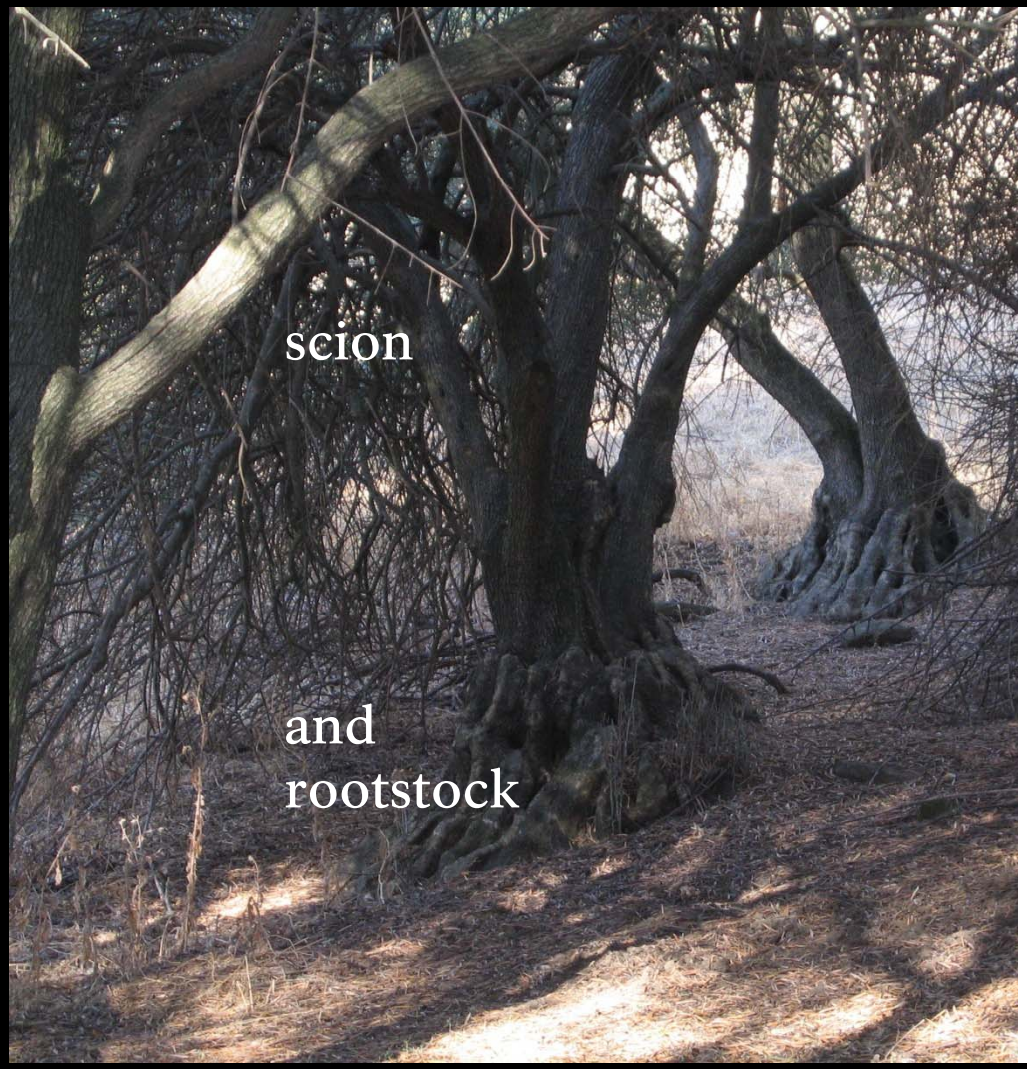

almond, apple, apricot, cherry, hazelnut, lemon, olive, orange, peach, pear, pecan, plum, walnut, etc. . .

Variety





Fuji, Gala, Golden Delicious, Granny Smith, Jonagold, etc..



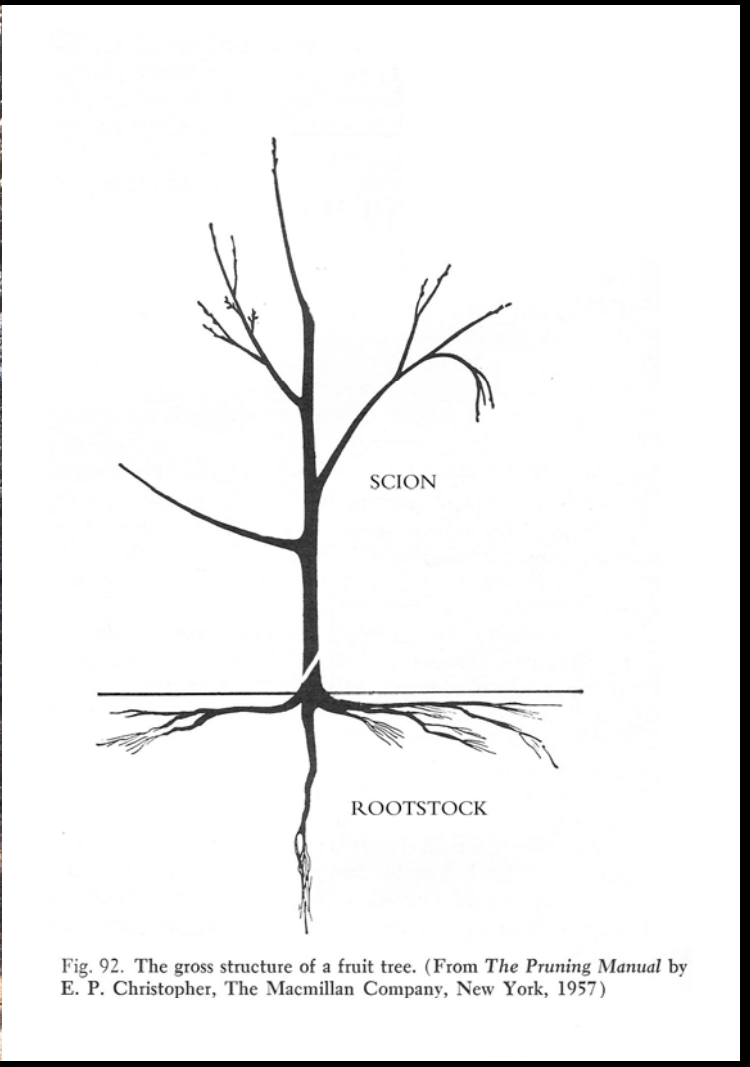
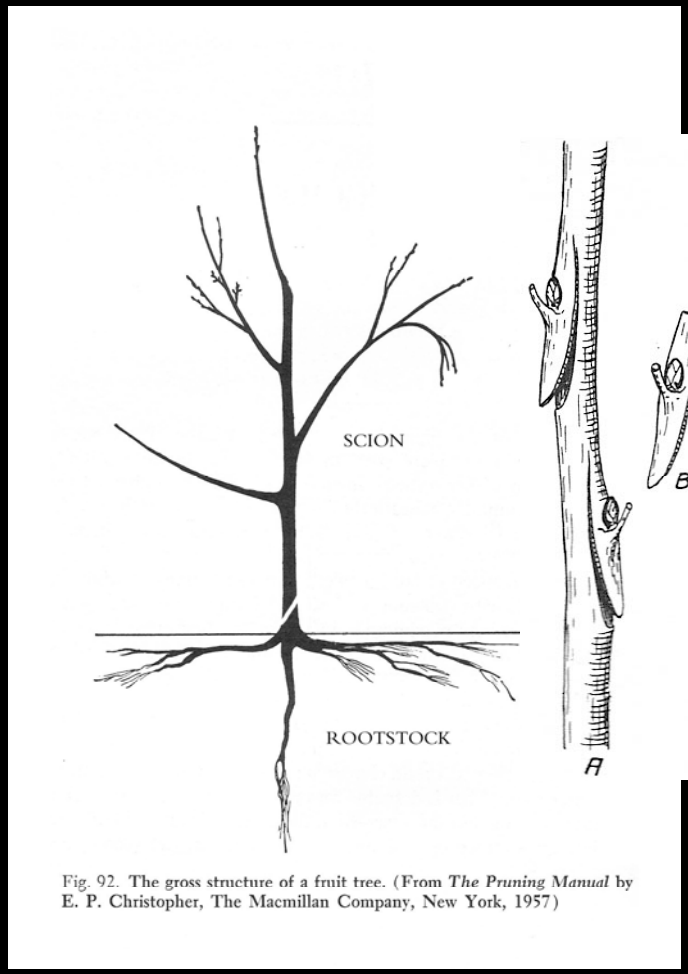


Fig. 92. The gross structure of a fruit tree. (From *The Pruning Manual* by E. P. Christopher, The Macmillan Company, New York, 1957)

Grafting



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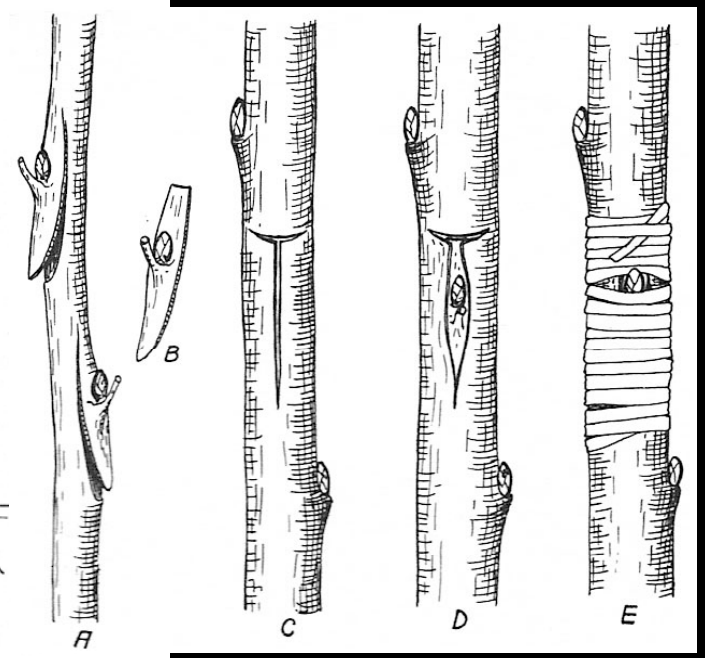
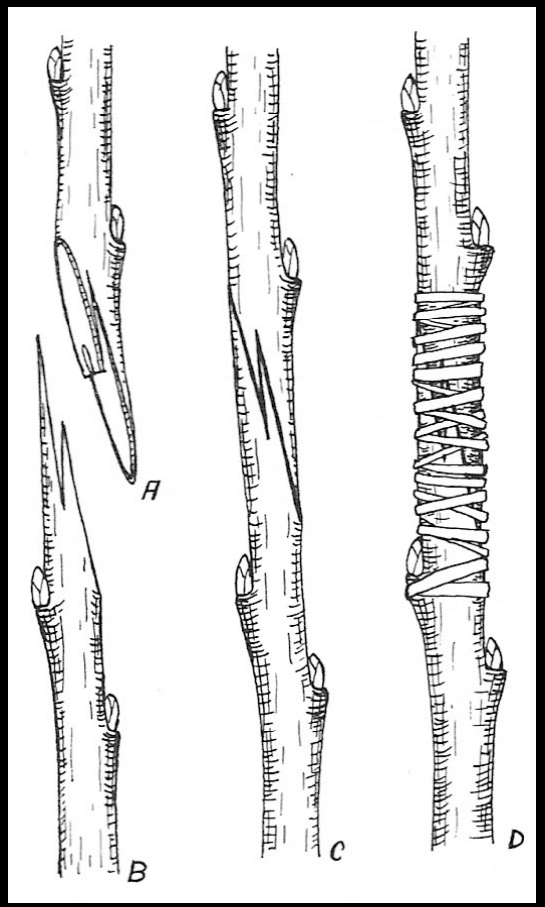
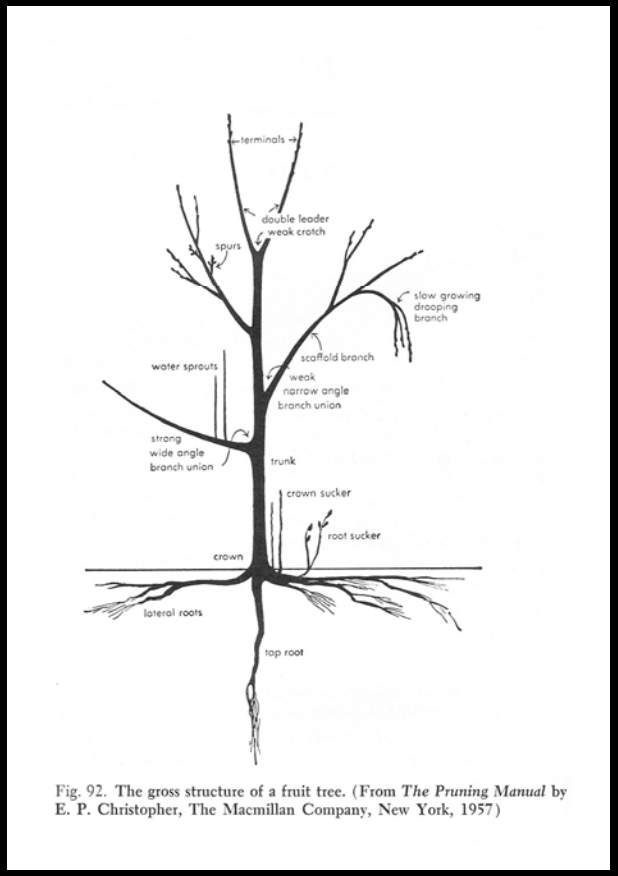


Bud grafting



Whip grafting

seedling versus grafted tree



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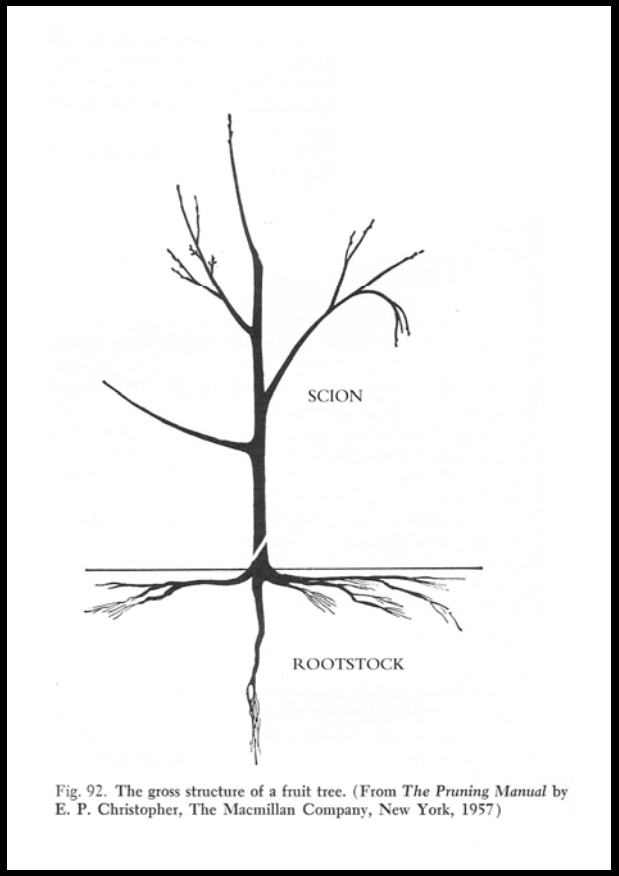
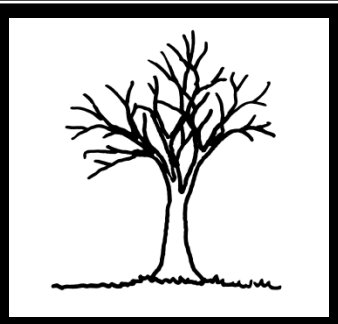
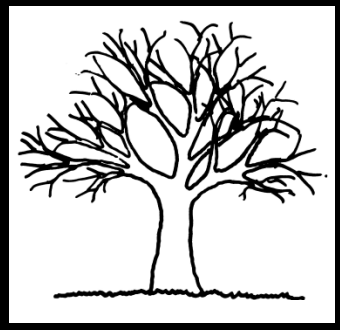


Fig. 92. The gross structure of a fruit tree. (From *The Pruning Manual* by E. P. Christopher, The Macmillan Company, New York, 1957)

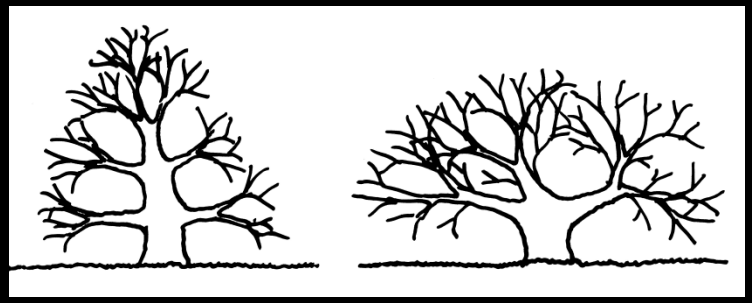
Tree form



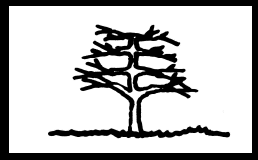
Full size, seedling



Full size, variety

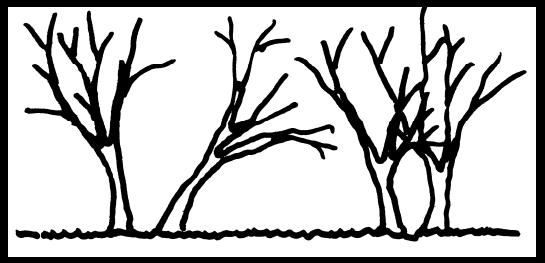


Full size, variety, short trunk

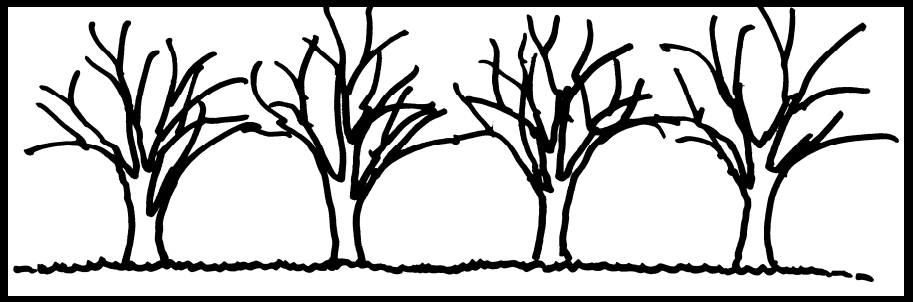


Dwarf size, variety

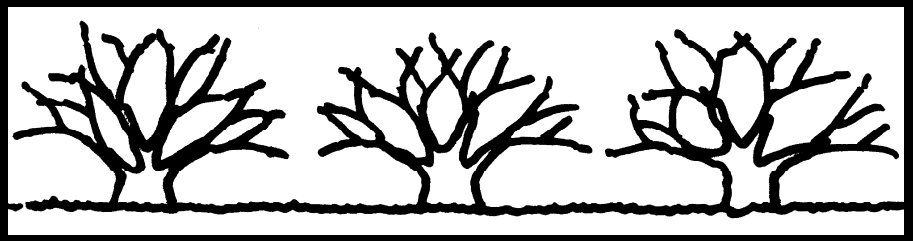
Tree spacing



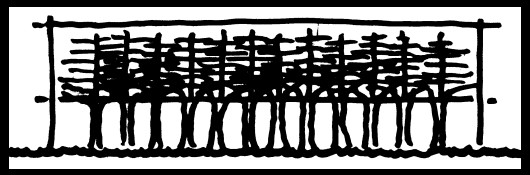
Irregular spacing



Geometric spacing

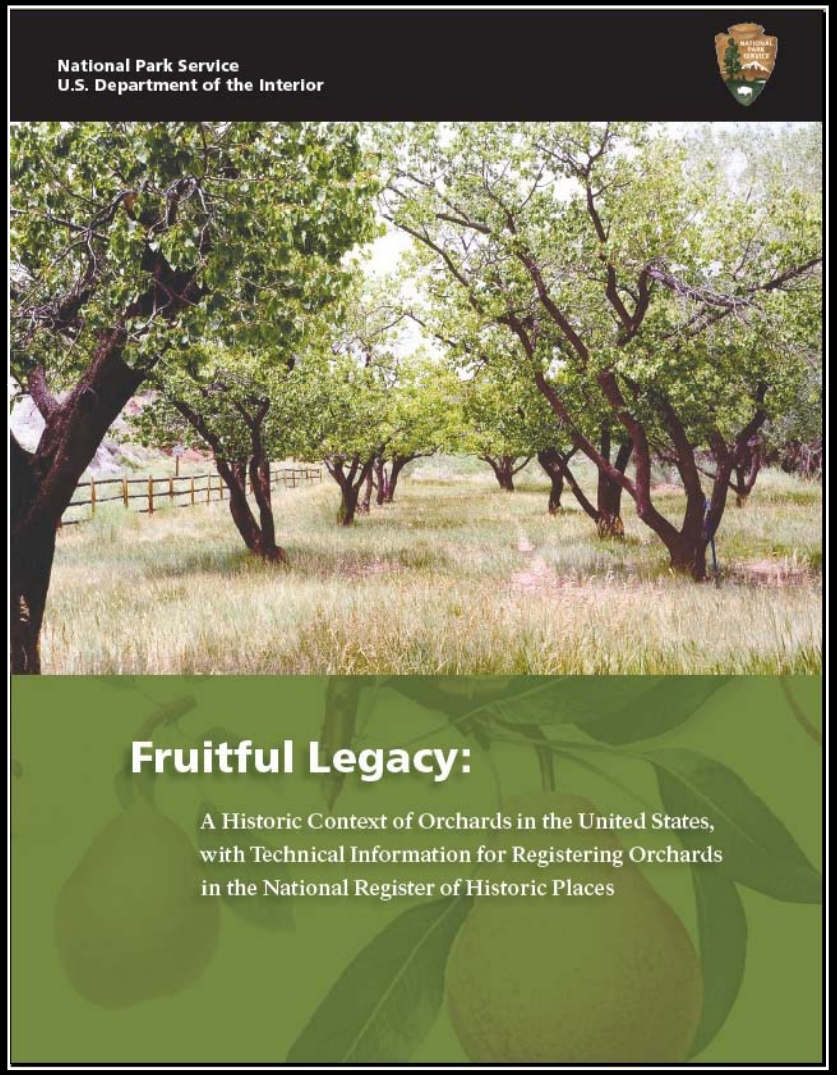


Geometric wide spacing

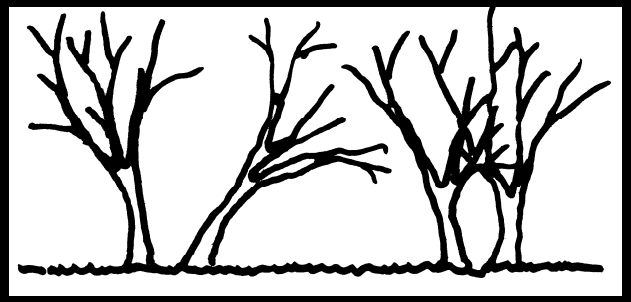


Geometric small spacing

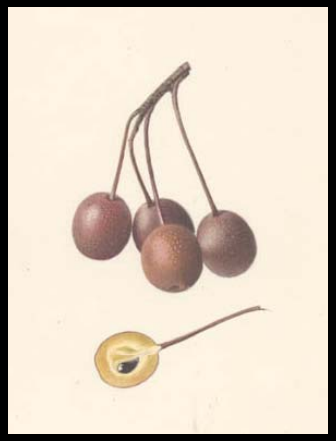
Brief History



1600-1800 (mid 1800s in West)



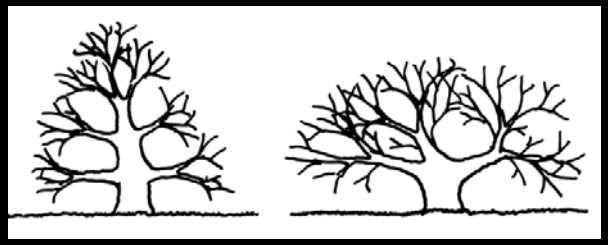
Full size, seedling trees,
not varieties,
irregular spacing

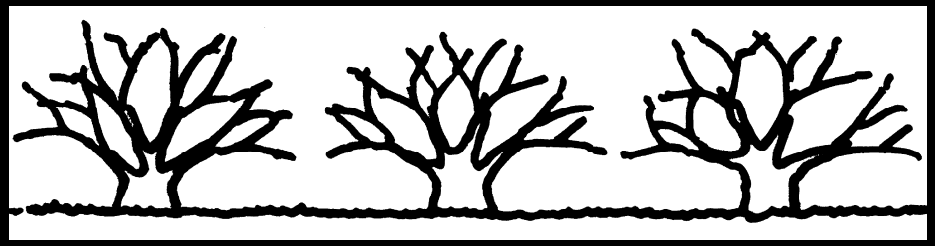


1801 – 1880 (mid 1800s – 1880s in West)

Full size, variety trees, geometric spacing, many varieties

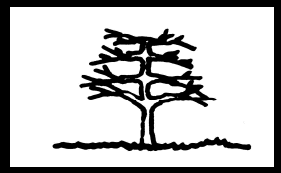
1881 – 1945 (1881 – 1960s in West)

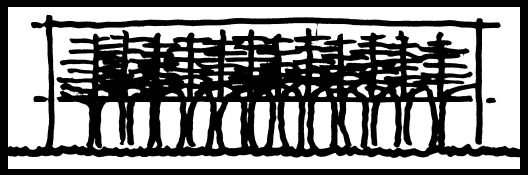




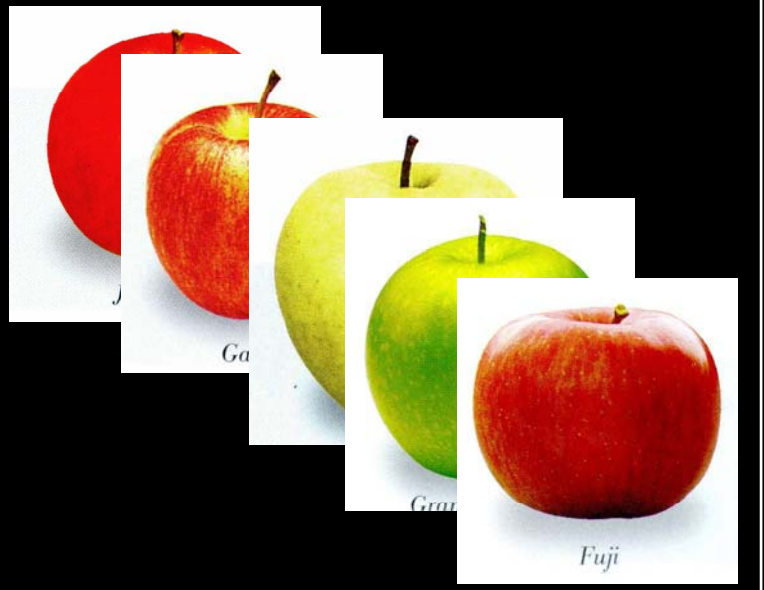
Full size,
variety trees,
short trunks,
wide spacing
fewer varieties

1946 - present (1960s - present in West)





Dwarf variety trees,
small spacing,
more varieties,
short-lived trees



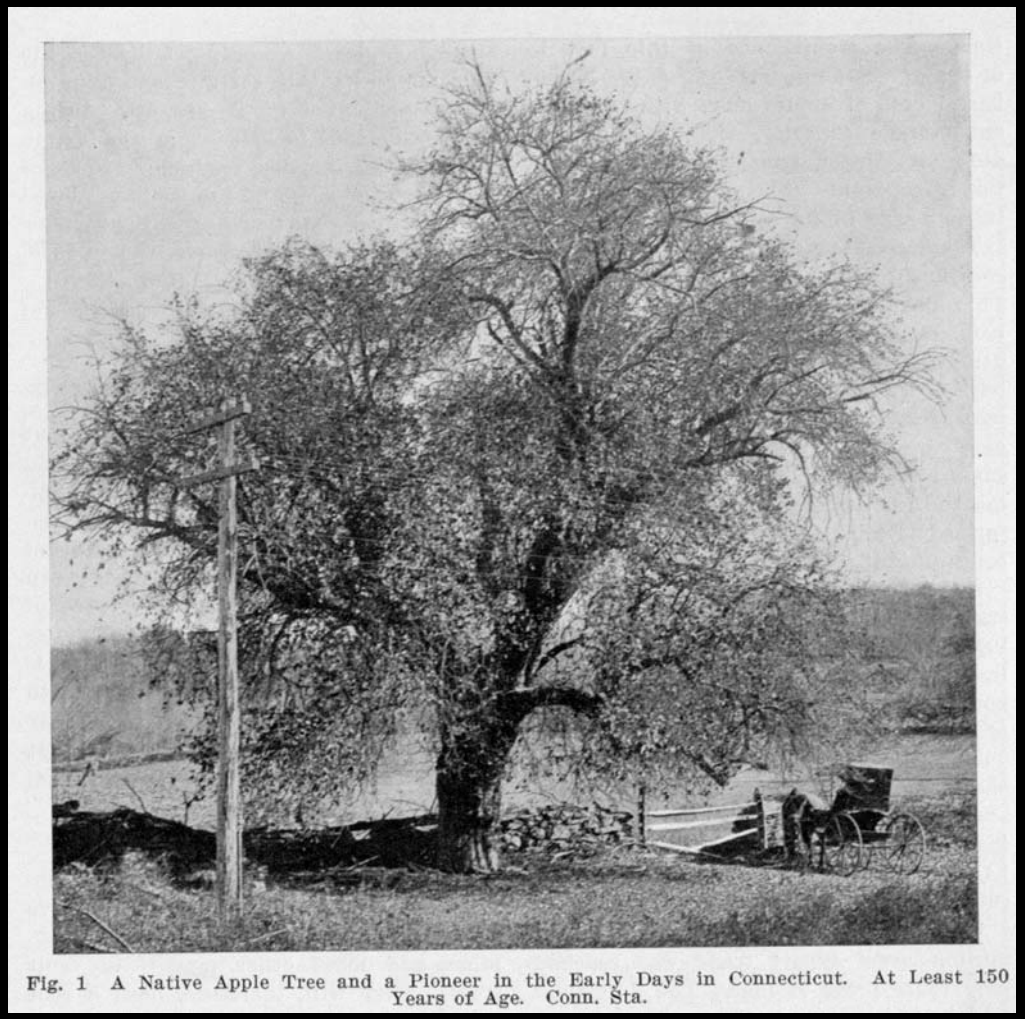


Fig. 1 A Native Apple Tree and a Pioneer in the Early Days in Connecticut. At Least 150 Years of Age. Conn. Sta.

1600 to mid 1800s in West

mid 1800s to 1880

1880 to 1960s in West

1960s to present in West

National Register of Historic Places

The National Register of Historic Places is the comprehensive list of districts, sites, buildings, structures, and objects of national, regional, state, and local significance in American history, architecture, archeology, engineering, and culture kept by the National Park Service under authority of the National Historic Preservation Act of 1966.

Eligibility

Buckner Homestead Historic District
North Cascades National Park

Dorris Ranch Historic District
Springfield, OR

Fruita Rural Historic District
Capital Reef National Park

To be eligible for listing on the National Register of Historic Places, an orchard, group of fruit trees, or a single fruit tree must possess ***significance and integrity***.

The National Register Criteria for Evaluation can be applied to these types of resources and may be applied in more than one way. Three of the four criteria, especially A, B, and C, have two or more applications to orchards and fruit trees.

Level of Significance

• The significance of the overall property must be identified at one of three levels: national, state or local.

• **Local level**: A property is significant at the local level when its historic context represents an aspect of the history of a town, city, country, cultural area, or region.

• **State level**: A property is significant when its historic context represents an aspect of the history of the state as a whole.

• **National level**: A property is significant when its historic context represents an aspect of the history of the United States as a whole. The orchard must be exceptional in representing the theme of the history of orchards in the nation.

Period of Significance

• The period of significance is the period in which the orchard, group of fruit trees, or single fruit tree attained significance qualifying it for the National Register.

• The period of significance begins with the date when significant activities or events began giving the property its historic significance. This is the period from which the resource dates, or the period that the resource accurately represents. (This distinction is made because fruit trees are living organisms with finite life spans.)

• A period of significance for a single fruit tree, group of fruit trees or an orchard can be as short as one year or it can span multiple years.

• An orchard can have more than one period of significance if it represents more than one period or has more than one association.

Historic Context

• Historic context is an organizing structure for interpreting history that groups information about historic properties that share a common theme, common geographical area, and a common time period. The development of historic contexts is a foundation for decisions about the planning, identification, evaluation, registration, and treatment of historic properties, based upon comparative historic significance.

• Defining the significance of an orchard or fruit tree requires a thorough understanding of the history and existing conditions of the resource in relation to its associated historic context.

• In 2009, the NPS published a historic context of orchards in the United States, from 1600 to the present time.

Significance

•A cultural landscape is eligible for the National Register if it possesses the quality of significance in American history, architecture (including landscape architecture and planning), archeology, engineering and culture.

•Orchards and fruit trees may possess the quality of significance in any of these areas: American history, landscape architecture, archeology, and culture (horticulture is covered by each of these areas.)

•An orchard or group of fruit trees must be shown to be significant for one or more of the following National Register Criteria for Evaluation: A, B, C or D.

National Register Criteria Evaluation

Criteria	*Type of Significance*
A.	Associated with events that have made a significant contribution to the broad patterns of our history
B.	Associated with the lives of persons significant in our past
C.	Embodying the distinctive characteristics of a type, period, method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
D.	Having yielded or may be likely to yield, information important in prehistory or history

Listing Orchards and Fruit Trees in the National Register of Historic Places

Resource	*National Register Property Type*	
	Listed Individually	*Listed as Contributing*
Orchard	Historic District or Historic Site	Feature
Group of Fruit Trees	Historic Site	Feature
Single Fruit Tree	Historic Site	Feature

Historic Integrity

- The historic integrity of an orchard, group of fruit trees, or single tree is a measure of the physical authenticity, conveyed by extant characteristics or features that were present during the period of significance.

- The seven aspects of integrity are conveyed in cultural landscapes through their extant landscape characteristics and associated features.

- Not all seven aspects of integrity are always relevant in every historic property. The property type and type of significance of the historic context influence the relevance of the various aspects of integrity.

Seven Aspects of Integrity Applied to Orchards and Fruit Trees

- **Location**: place where the orchard or fruit trees were planted, and their distribution upon the land

- **Design**: a combination of elements that create the form, plan, space, structure and style of an orchard or fruit trees in a horticultural system

- **Setting**: the physical environment of the orchard or fruit trees, including the land forms, rivers or streams, naturally-occurring vegetation, climate, elevation

- **Materials**: physical elements that were combined or deposited in a configuration to form the orchard or fruit trees, e.g., seedling or grafted trees, ground covers, stakes, fences, windbreak and ditch materials

Aspects of Integrity contd.

• **Workmanship**: the physical evidence of the crafts of a particular culture of people during the period of significance, such as cultivation and care of an orchard (propagation, planting, pruning, fertilizing, irrigating and harvesting) and protection of an orchard (pest control, animal husbandry, staking, fencing and windbreaks

• **Feeling**: the orchard or fruit trees' expression of the aesthetic or historic sense of the period of significance, evoked by sounds, smells, and the seasonal rhythm of horticultural activities, productivity and change

• **Association**: the direct link between the important historic event, person, or distinctive characteristics of a period, and an orchard or fruit trees

Analysis and Evaluation

- Analysis and evaluation is the study of a cultural landscape in terms of its individual landscape characteristics and associated features, and the determination of the landscape's integrity and significance based on its site history and existing conditions.

- Landscape characteristics are the broad tangible patterns or intangible processes that influenced the development of a cultural landscape, or were formed through its development.

- Some orchards may possess a system of landscape characteristics, while others may not.

- A cultural landscape that retains integrity will possess an extant system of landscape characteristics.

Orchards as Cultural Landscapes

•Orchards that have landscape characteristics can be identified as cultural landscapes and may be listed in the National Register as a historic district or historic site. The distinction separating cultural landscapes that are historic sites from historic districts is dependent on size, complexity and number of buildings.

•A simpler orchard, group of fruit trees, or a single fruit tree are composed of individual features, rather than landscape characteristics. These features cannot be a cultural landscape, although they can still be listed in the National Register as historic sites or as the contributing features a broader cultural landscape that are listed as districts or sites.

Landscape Characteristics Applied to Orchards

A cultural landscape may be composed of the following landscape characteristics:

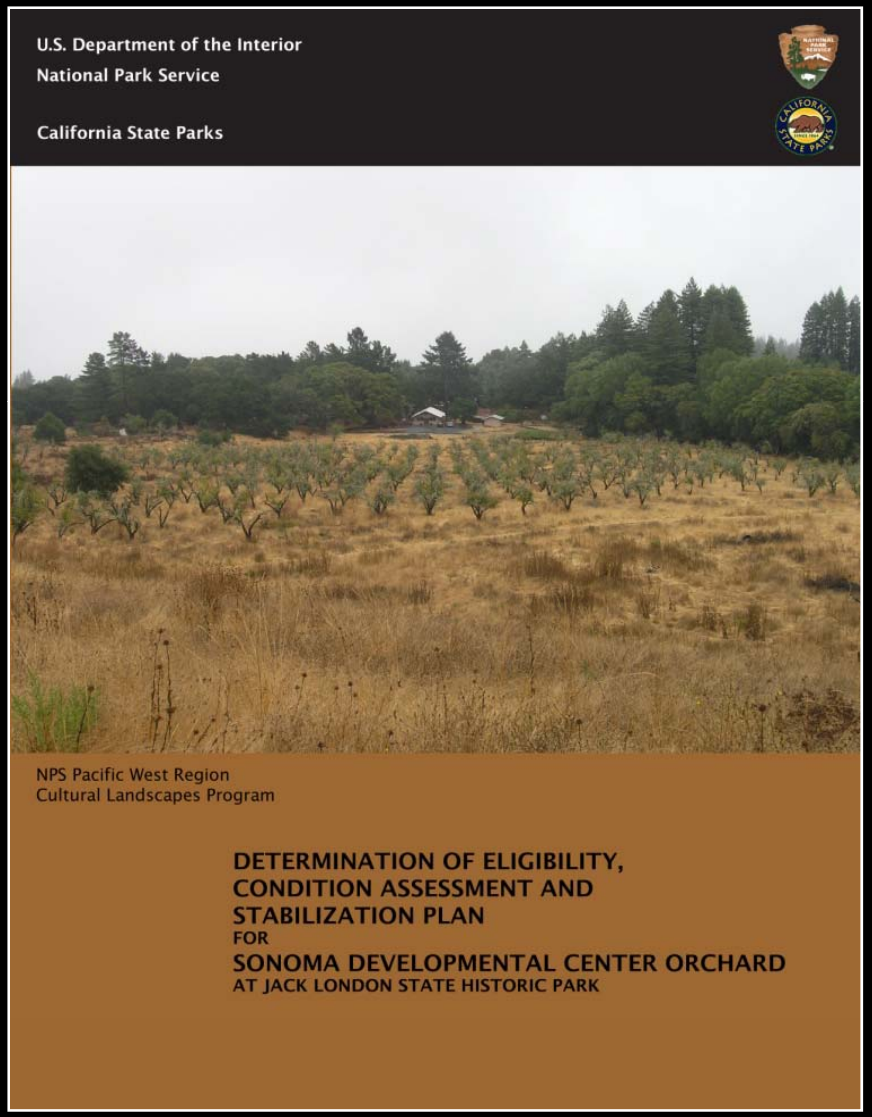
Natural Systems and Features
Land Use
Circulation
Vegetation
Cluster Arrangement
Constructed Water Features
Archeological Sites
Spatial Organization
Cultural Traditions
Topography
Buildings and Structures
Small Scale Features
Views and Vistas

•Not all 13 landscape characteristics are found in every cultural landscape.

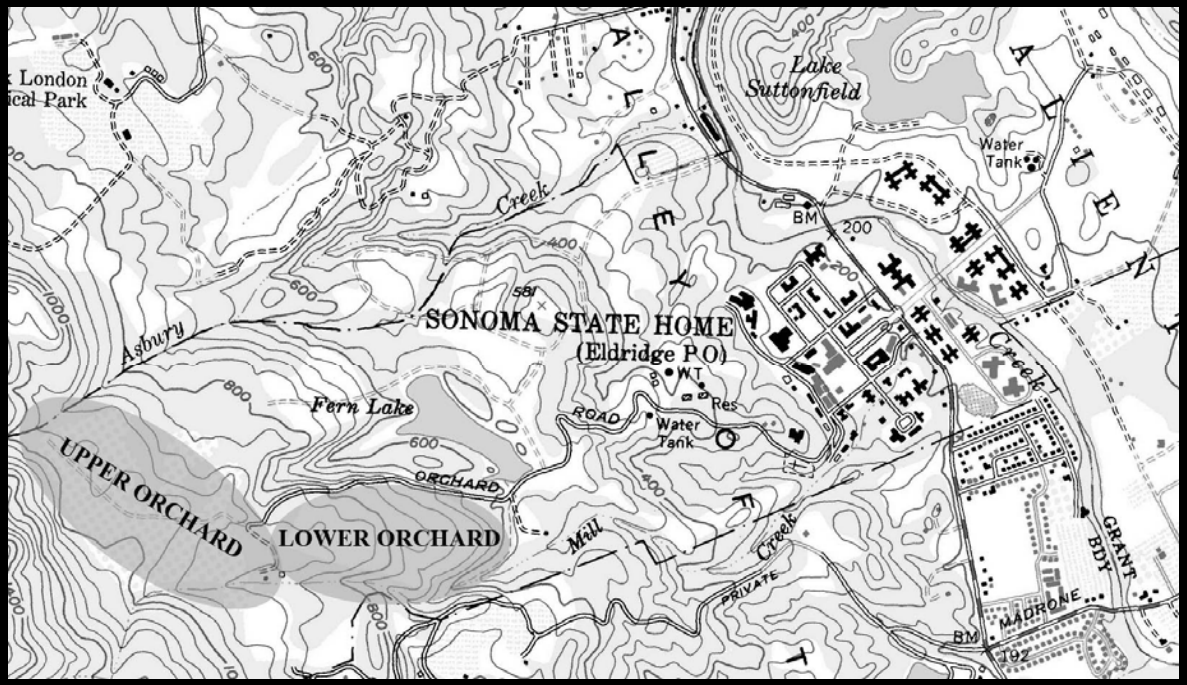
Case Study:
Sonoma Developmental Center Orchard

Historic photograph looking east from the Sonoma State Home, circa 1910s.

Determination of Eligibility, Condition Assessment and Stabilization Plan for Sonoma Developmental Center (SDC) Orchard at Jack London State Historic Park, 2007



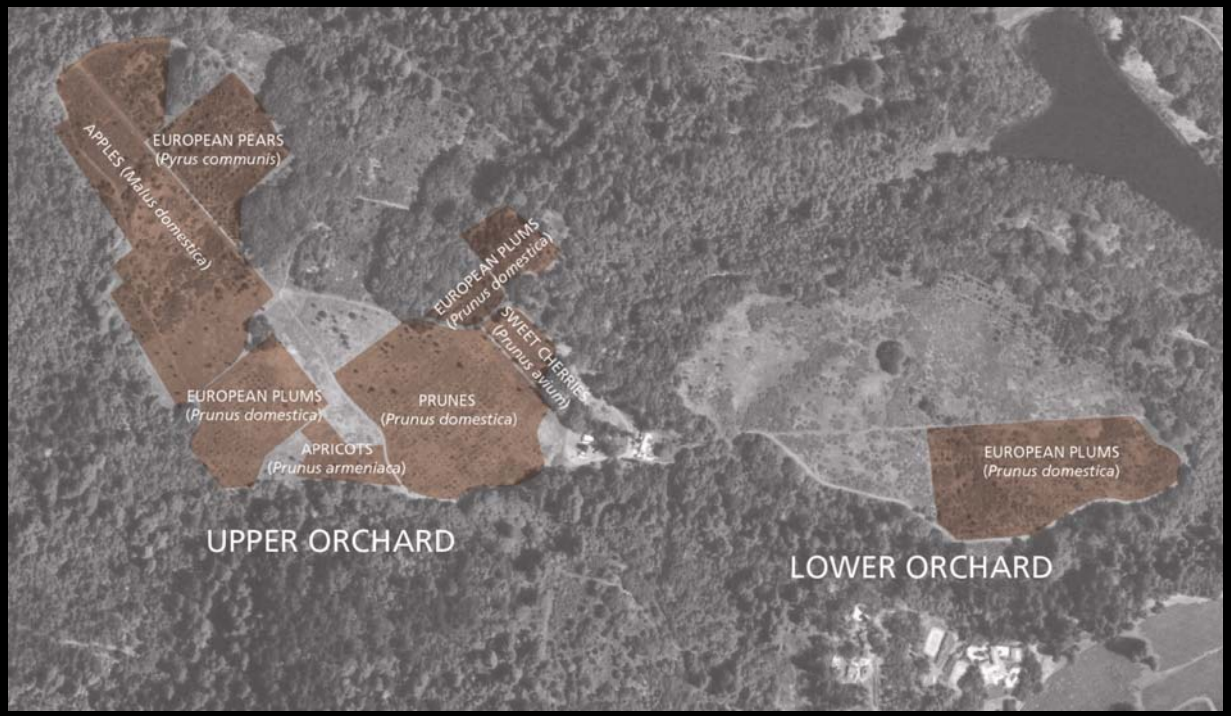
Orchard Location



USGS topographic map, photo revised, 1980

- Located behind the Sonoma Developmental Center (SDC), near Sonoma Mountain, Eldridge, California
- Area contains two historic orchards: the upper "Coon Trap" orchard and the lower orchard
- California State Parks acquired the orchards as well as 600 acres of surplus land from the SDC in 2002

Orchard Layout & Acreage



Fruit species in the SDC Orchard: apple, apricot, cherry, peach, pear, plum, prune & quince

Upper "Coon Trap" orchard contains:

- 21 acres of fruit trees
- 52 acres of cleared land

Lower orchard contains:

- 5.5 acres of fruit trees
- 32 acres of cleared land

Total orchard acreage:

- 26.5 acres of fruit trees
- 84 acres of cleared land

National Register of Historic Places Criteria

The Sonoma Developmental Center Orchard may be found eligible at the state level of significance under two criteria:

Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history.

Criterion C: Embodying the distinctive characteristics of a type, period, method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.

SDC Orchard Significance

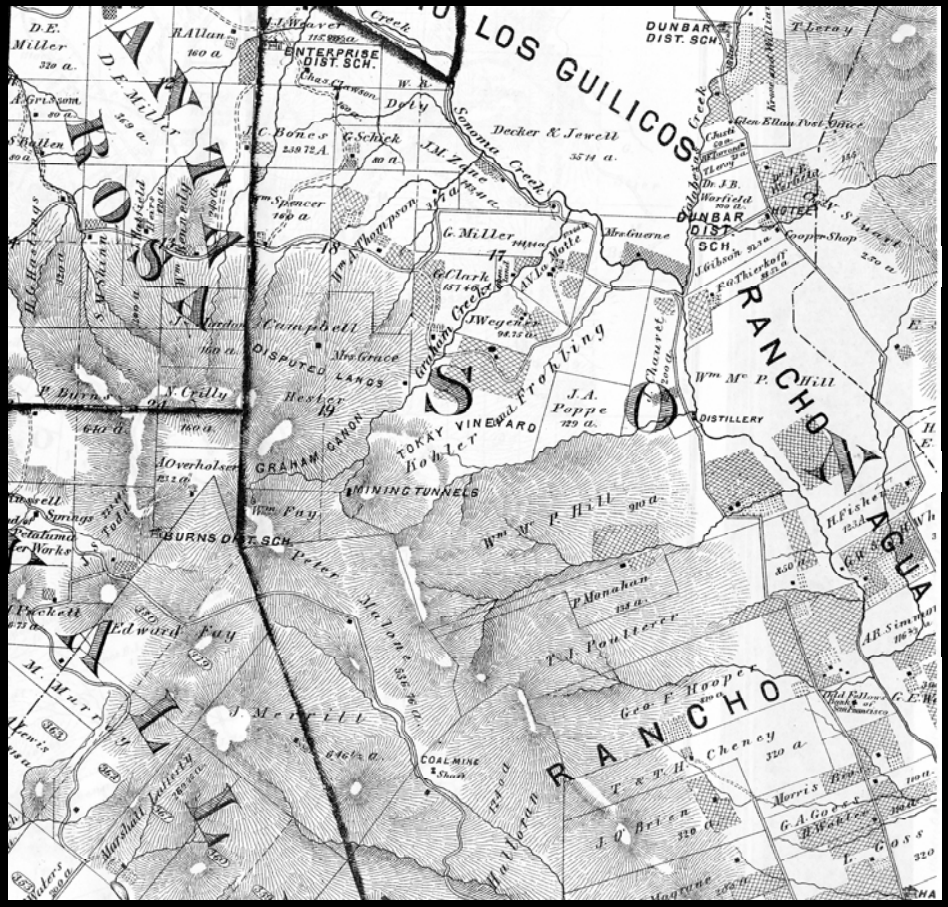
Under **Criterion A**, the orchard is significant due to it's association with the development of state hospital farms in California.

The orchard is also significant under **Criterion C**, serving as a fine example of an intact, pre-World War II orchard landscape.

Period of Significance: 1908-1957

The period of significance reflects the episode of greatest orchard development, beginning in 1908 when the first fruit trees were planted on the hills behind the hospital and ending in 1957 as the orchard began to decline.

Criterion A



Historic map illustrating the boundaries of the William McPherson Hill property in 1877

- California was one of the first states west of the Mississippi River to create facilities to care for individuals with disabilities
- The site of the California Home for the Care and Training of Feeble-Minded Children was selected in 1889
- Site included 1,700 acres of land and an extensive acreage of fruit trees in a rural, isolated environment

- Rural, isolated environments were considered ideal in the latter part of the 19th century for institutional development

- These environments allowed the development of agricultural activities, which promoted isolation and self-sufficiency

- This type of environment was also considered essential in the continued recovery of patients

- Often, institutional environments like the Home were literally viewed as a "Garden of Eden"

Historic photograph of the William McPherson Hill vineyard, circa 1880s.

Historic bird's eye view of the Sonoma State Home, n.d.

- Following nationwide trends, the California Home for the Care and Training of Feeble-Minded Children developed as a "farm colony"
- Farm colonies were also developed at Napa State Hospital and the Metropolitan State Hospital in California as well as across the nation
- The SDC Orchard is one of the few remaining pre-World War II state hospital orchards in California

Criterion C

The SDC Orchard possesses the distinct characteristics of a pre-World War II orchard. Characteristics of the orchard include:

a) numerous heirloom fruit varieties and species

b) the presence of standard fruit trees grafted onto seedling rootstocks

c) trees that are “low headed” with a short trunk (less than three feet tall)

d) trees pruned in an open-bowl style

e) fruit trees laid out in a standard grid system

-30 x 30 feet square spacing for apples and pears

(40 trees per acre)

-22 x 22 feet for apricots, plums and prunes

(60 trees per acre)

Painting of the apple harvest in an 18th-century seedling farm orchard. Note the tall tree trunks and irregular form and spacing of trees.

Contemporary photo illustrating an apricot tree in the SDC Orchard. Note the short trunk and open bowl form.

Landscape Characteristics

Landscape characteristics are the patterns or processes that historically influenced the development of the cultural landscape, or were created as a result of its development.

The Sonoma Developmental Center Orchard possesses five landscape characteristics that retain significance and integrity. These include:

a) land use

b) spatial organization

c) circulation

d) vegetation

e) natural systems and features

Landscape Characteristics

Session 3: Performing Orchard Condition Assessments

Learning goals:

Understand the process for performing orchard condition assessments.

Understand how to use a condition assessment field form.

Orchard Condition Assessment Form

National Park Service *Olmsted Center for Landscape Preservation*

TREE ASSESSMENT REPORT

Date:

Inspected By:

Park:

Tree Species:
Tree I.D. #:

TREE CHARACTERISTICS

DBH: _____ **# of Trunks:** _____ **Height:** _____ **ft.** **Spread:** _____ **ft.**

LIVE CROWN RATIO: _____ **%**

	FORM:		CROWN CLASS:		AGE CLASS:
	Generally Symmetric		Dominant		Young
	Minor Asymmetry		Co-dominant		Mature
	Major Asymmetry		Intermediate		Over Mature
	Stump Sprout		Suppressed		

PRUNING HISTORY:

	Cyclic Maintenance		None
	Hazard Stabilization (Only)		Unknown

SPECIAL VALUE:

	Historic Specimen		
	Witness Tree		
	Period Tree		
	Non-historic		
	Other:		

Comments:

TREE HEALTH

FOLIAGE COLOR:		FOLIAGE DENSITY:		LEAF SIZE:	
	Normal		Normal		Normal
	Chlorotic		Sparse		Small
	Necrotic				

CALLUS DEVELOPMENT:		VIGOR CLASS:	
	Excellent		Excellent
	Average		Average
	Poor		Fair
	None		Poor

EPICORMICS ? _____

TWIG DIEBACK ? _____

MAJOR PEST/DISEASES ? _____

Comments:

SITE CONDITIONS

SITE CHARACTER:

	Historic Cultural Landscape		Trail/Informal Activity Area
	Cultural Landscape		Recreational Area
	Natural Resource		Transportation Corridor

IRRIGATION:

	None		Excessive
	Adequate		Trunk Wetted
	Inadequate		

SOIL CONDITIONS:

	Drainage Problem		Droughty Soil
	Compacted Soil		Soil Cracking
	Soil Heaving		Other:

Comments:

Orchard Condition Assessment Form contd.

TARGET

STATIONARY TARGETS:		MOBILE TARGETS:	
	Buildings		Pedestrian
	Structures		Vehicular Traffic
	Hardscapes (stone wall, patio, etc)		Trails Systems
	Landscapes (plant material, etc)		Roadways, Walkways
	Small Features		

CAN TARGET BE MOVED ?

OCCUPANCY:

	Occasional Use		Intermittent Use		Frequent Use

TREE DEFECTS

DEFECTS

DEFECT	ROOTS / R. CROWN	TRUNK	SCAFFOLDS	BRANCHES
Poor Taper				
Co-dominant / Fork				
Multiple Attachments				
Included Bark				
Excess End Wt.				
Cracks / Splits				
Hangers				
Girdling				
Wounds				
Decay				
Cavity				
Conk/Mushroom				
Bleeding				
Loose/Crack Bark				
Deadwood / Stubs				
Canker / Galls				
Insect / Disease				
Nest Hole / Bee Hive				
Previous Failure				

UNNATURAL LEAN ?

ROOT ROT SUSPECTED ?

HAZARD IDENTIFICATION

PART MOST LIKELY TO FAIL:

HAZARD CLASSIFICATION

___ PRIORITY HAZARD

___ HAZARD

___ POTENTIAL HAZARD

___ NON-HAZARD

HAZARD ABATEMENT

RECOMMENDATIONS:

	Remove tree.
	Replace tree.
	Propagate tree – remove at later date.
	Move target – eliminate hazard condition.
	Install support system: cable / brace.
	Inspect existing cable(s) / brace(s).
	Inspect tree on annual / bi-annual basis.
	Monitor tree conditions for change.
	Monitor tree conditions for change. Possible Removal
	Prune: Remove defective part.
	Prune: Reduce end weight.
	Prune: Remove deadwood.
	Prune: Crown clean.
	Prune: Reduce crown.
	Prune: Crown thinning.
	Other:

COMMENTS:

Day 2: Stabilizing and Maintaining Historic Orchards

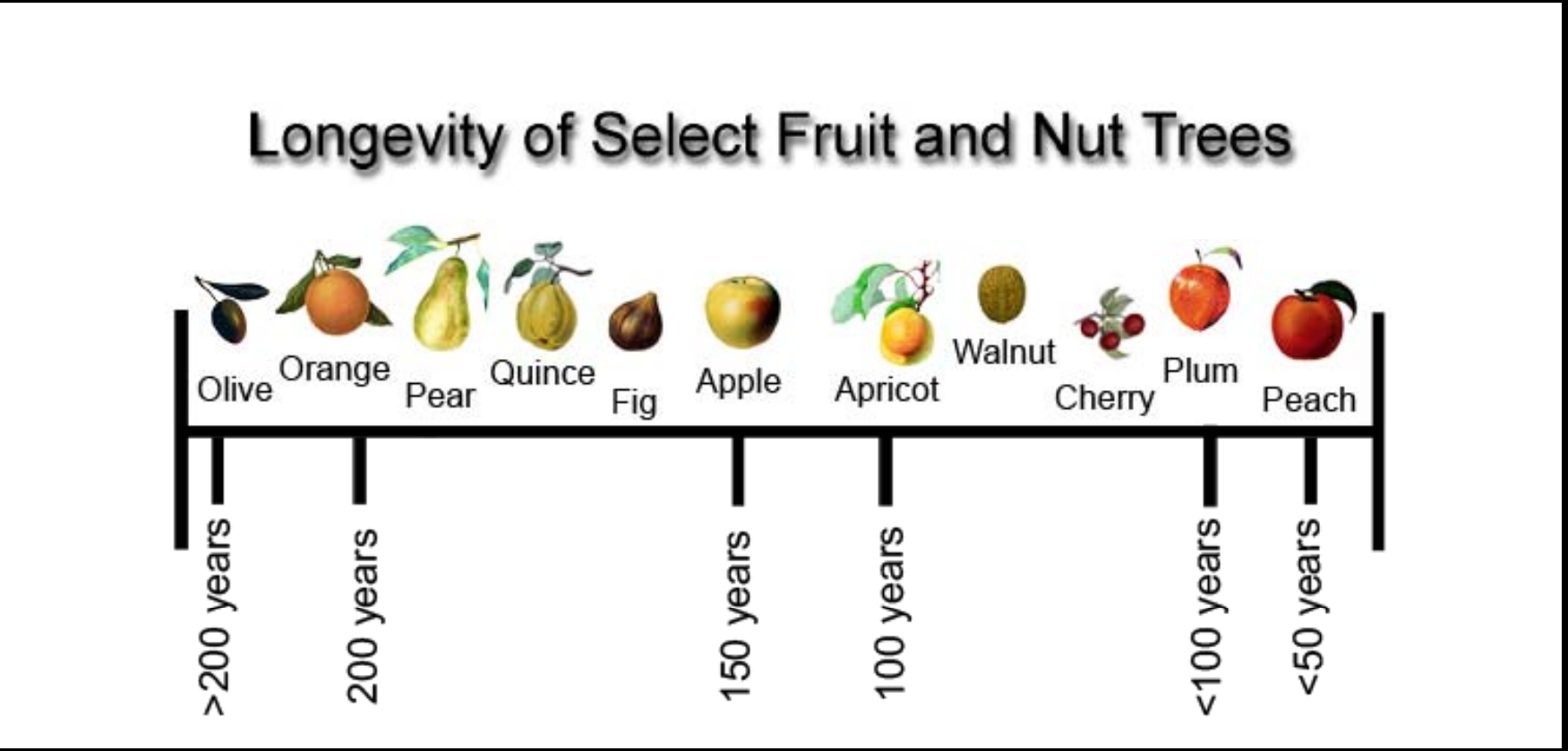
Session 4: Fruit Tree and Orchard Stabilization

Learning goals:

Understand orchard stabilization philosophy.

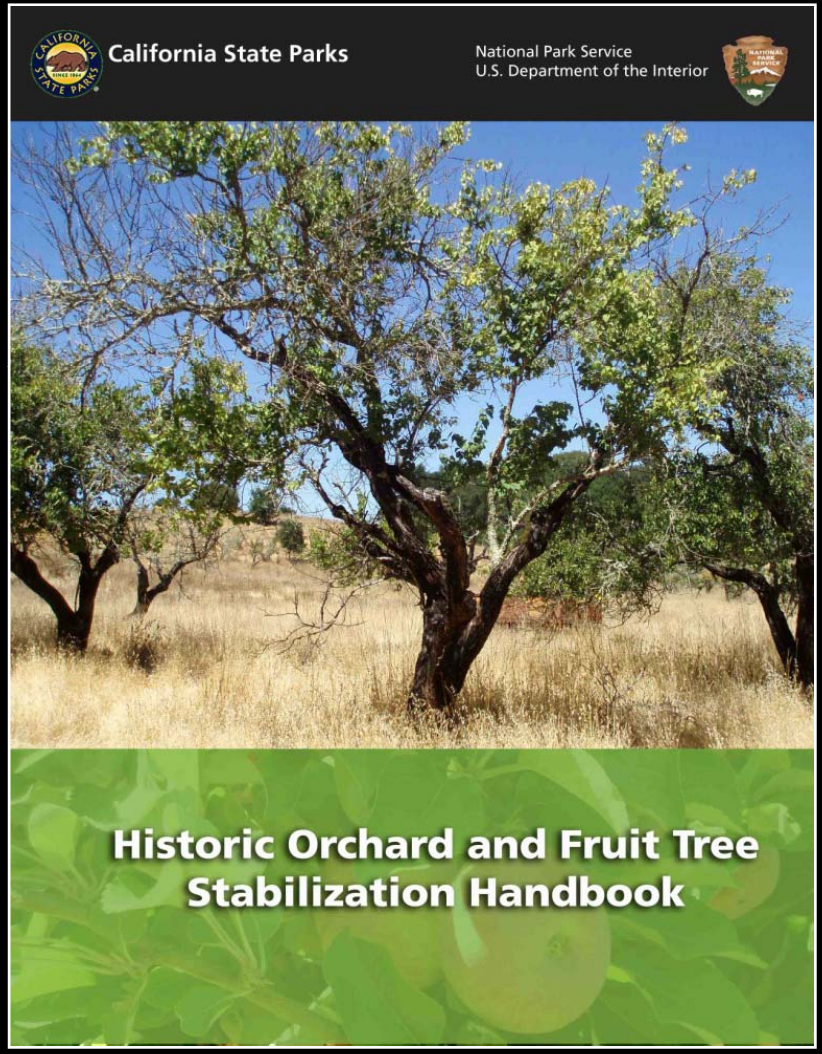
Understand basic stabilization process and techniques.

Any questions from yesterday?


Longevity of Select Fruit and Nut Trees
Olive
Orange
Pear
Quince
Fig
Apple
Apricot
Walnut
Cherry
Plum
Peach
>200 years
200 years
150 years
100 years
<100 years
<50 years

Orchard Stabilization Guidance

Historic Orchard and Fruit Tree Stabilization Handbook (2010)



Orchard Stabilization Philosophy

Take action to retain status quo and prevent further deterioration of condition

Begin monitoring of condition

Begin record keeping of stabilization actions

Conserve germplasm

Stabilization Process

Identify and remove stressors

- Stressors cause unfavorable growing conditions

Stabilization Process

Encroaching vegetation

Remove competition from over-story through pruning or vegetation removal

Stabilization Process

Encroaching vegetation

Remove competition from under-story through pruning or vegetation removal

Stabilization Process

Brush hogging to remove competition from under-story

Stabilization Process

Encroaching vegetation

Remove competition from rootstock suckers through pruning

Stabilization Process

Encroaching vegetation

After removal of rootstock suckers

Stabilization Process

Encroaching vegetation is one of the most common stressors

Summary Table of Orchard Health Problems & Stressors

Fruit Trees	Health Problems	Health Stressors
Apple	Apple Aphid, Leaf Roller, Flea Beetle, Codling Moth, Sawfly	Vegetation encroachment, lack of water, trunk cavities, pack rat nests, rootstock sprouts, animal and human damage
Apricot	Leaf Hopper, Flea Beetle, Rust & Bracket Fungus, Gummosis	Vegetation encroachment, lack of water, trunk cavities
Cherry	Aphids	Vegetation encroachment, lack of water, trunk cavities
Pear	Psyllid, Leaf Roller, Flea Beetle, Aphid	Vegetation encroachment, lack of water, trunk cavities, pack rat nests, rootstock suckers
Plum	Leaf Hopper, Flea Beetle, Aphid, Rust & Bracket Fungus, Gummosis	Vegetation encroachment, lack of water, trunk cavities, rootstock suckers
Prune	Leaf Hopper, Flea Beetle, Aphid, Rust & Bracket Fungus, Gummosis	Vegetation encroachment, lack of water, trunk cavities, rootstock suckers

Stabilization Process

Identify and remove stressors

Stressors cause unfavorable growing conditions

Encroaching Vegetation
Dead wood

Stabilization Process

Dead wood

Remove dead wood – both attached and hanging

Stabilization Process

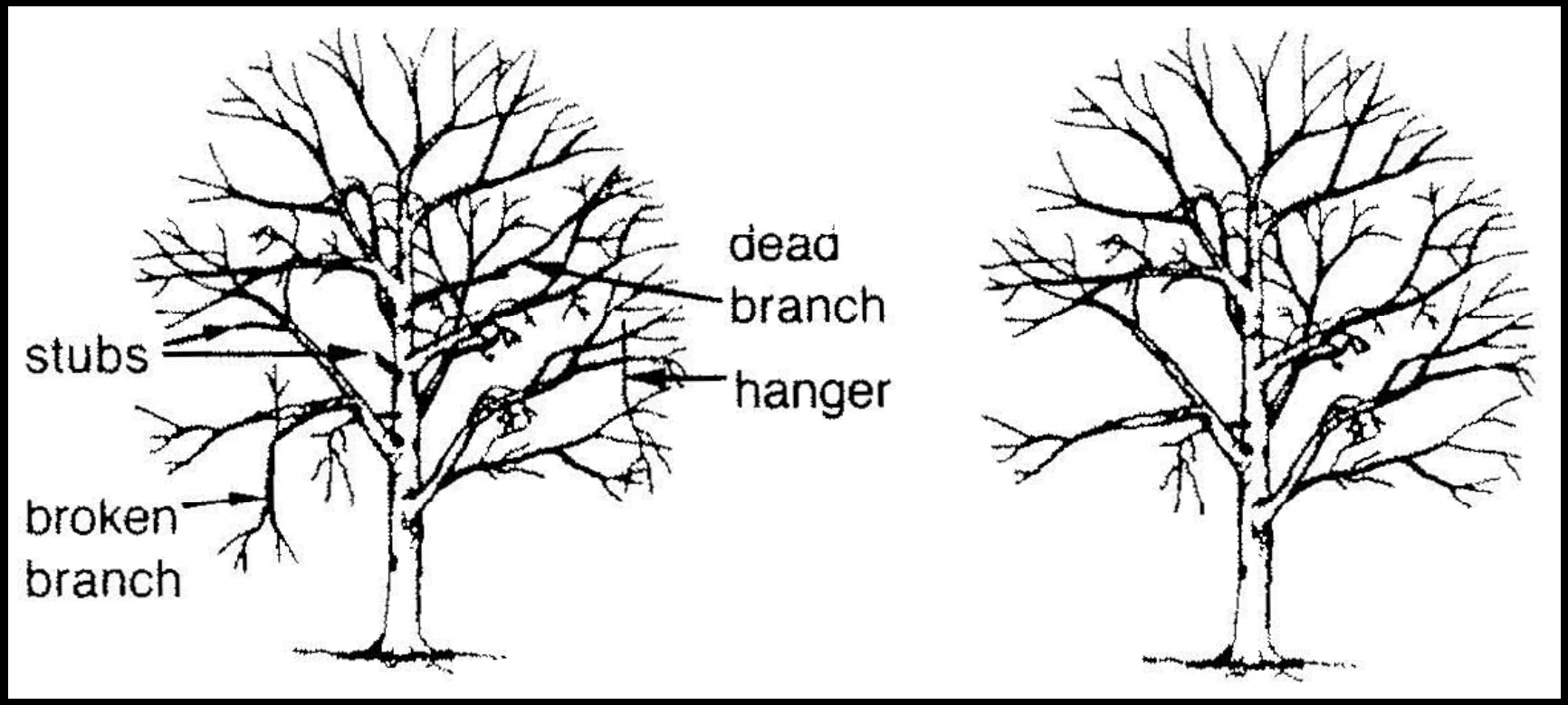
Dead wood

Remove dead wood – both attached and hanging, through pruning

Stabilization Process

Dead wood

Dead-wooding is also called “Cleaning”



BEFORE

AFTER

Stabilization Process

Identify and remove stressors

Stressors cause unfavorable growing conditions

Encroaching vegetation
Dead wood
Leaning/unbalanced trees

Stabilization Process

Leaning/unbalanced trees

Prop or brace leaning live trees

ANSI A300 (Part 3) - 2001) – Tree Shrub, and Other Woody Plant Maintenance – Standard Practices (Support Systems : Cabling, Bracing, and Guying)

Stabilization Process

Leaning/unbalanced trees contd.

Prop or brace leaning live trees

Stabilization Process

Identify and remove stressors

Stressors cause unfavorable growing conditions

Encroaching vegetation
Dead wood
Leaning/unbalanced trees
Soil compaction

Stabilization Process

Soil compaction

Relieve soil compaction
by aerating and then mulching

Stabilization Process

Identify and remove stressors

Stressors cause unfavorable growing conditions

Encroaching vegetation
Dead wood
Leaning/unbalanced trees
Soil compaction
Drought

Stabilization Process

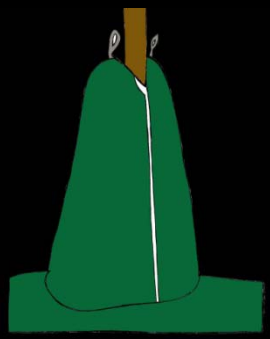
Drought

Relieve drought through supplemental watering

Stabilization Process

Drought

Relieve drought through supplemental watering



Stabilization Process

Identify and remove stressors

Stressors cause unfavorable growing conditions

Encroaching vegetation
Dead wood
Leaning/unbalanced trees
Soil compaction
Drought
Cavities

Stabilization Process

Cavities

Repair cavities with bridge grafting

Stabilization Process

Identify and remove stressors

Stressors cause unfavorable growing conditions

Encroaching vegetation
Dead wood
Leaning/unbalanced trees
Soil compaction
Drought
Cavities
Sun scald protection

Stabilization Process

Sun Scald Protection

Paint tree trunks with white wash to protect un-shaded bark from splitting, peeling and girdling

Stabilization Process

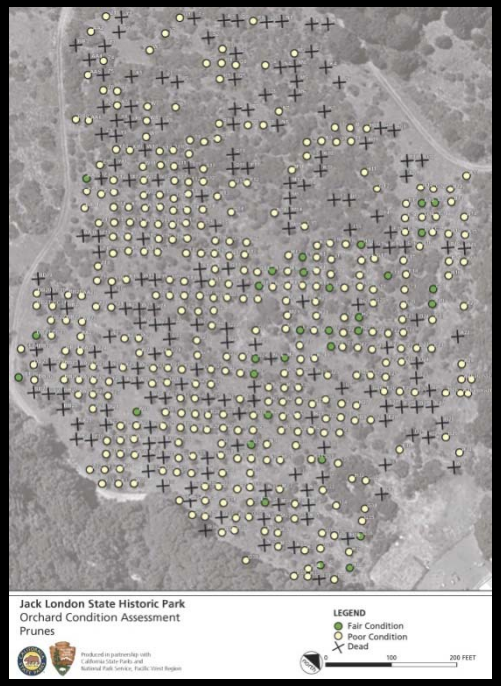
Record keeping

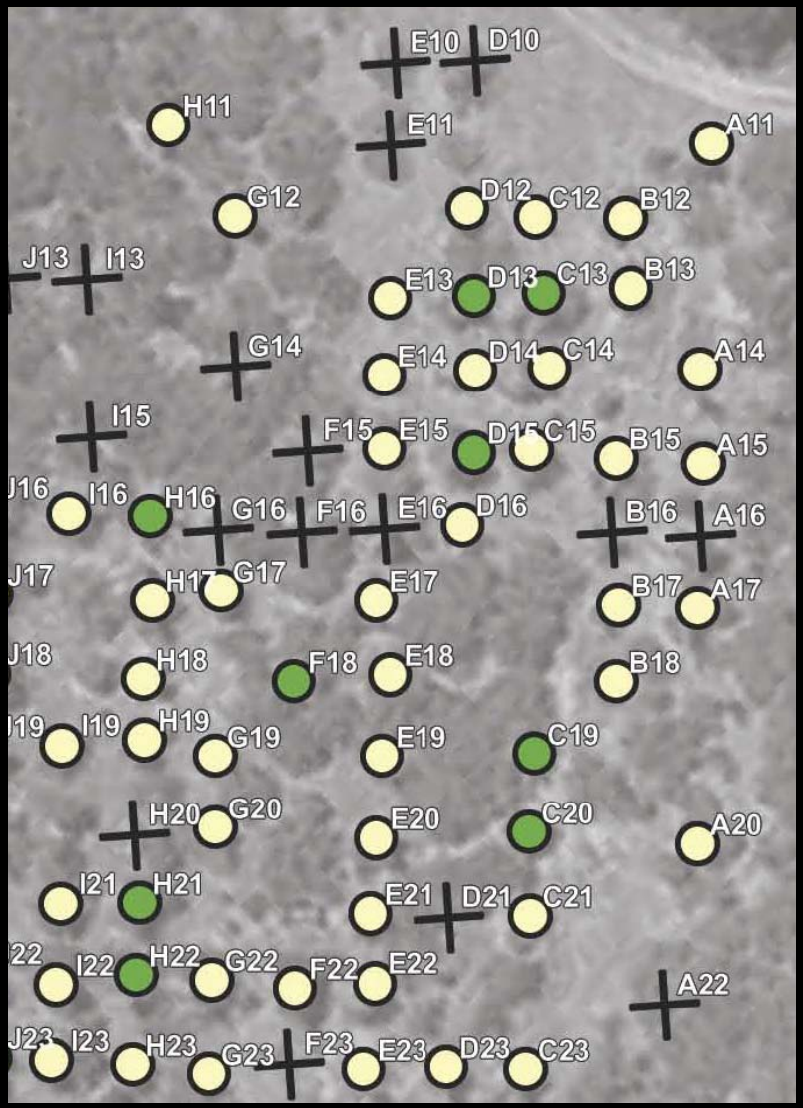
Document stabilization actions

Stabilization Process

Record keeping

Document stabilization actions





Stabilization Process

Record keeping

Document stabilization actions

California Department of Parks and Recreation

Site Name

Fruit Tree Stabilization Record

Tree ID	Cond.	Deficiency	Dead-wood Prune	Sucker removal	Brush-Hog	Aerate	Mulch	Prop/ Brace	Cavity repair	Other Action
A1	Fair	Cracks/splits	01/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010			
A2	Poor	Decay	01/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010			
A3	Fair	Loose/cracked bark	01/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010			
A4	Poor	Previous failure	01/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010			

Session 5: Fruit Tree and Orchard Preservation Maintenance

Learning goals:

Understand orchard preservation maintenance philosophy.

Understand basic preservation maintenance techniques.

Preservation Maintenance Philosophy

Preservation Maintenance Philosophy

Preserve and protect historic features.

Repair and replace historic features in-kind.

Perform cyclic maintenance actions that retain or improve condition while retaining historic character.

Preservation Maintenance Techniques

Winter pruning
Summer pruning
Mowing
Mulching
Fertilizing
IPM basics
Irrigating
Propagating
Replanting
Sun scald protection

Preservation Maintenance Techniques

Winter pruning

Objectives:

- Promote tree vigor
- Remove dead, diseased or crossing limbs
- Balance form of tree

Preservation Maintenance Techniques

Winter pruning
to promote vigor

Preservation Maintenance Techniques

Winter pruning
to remove dead, diseased or crossing limbs

Preservation Maintenance Techniques

Winter pruning
to balance form
of the tree

Preservation Maintenance Techniques

Summer pruning

Objectives:

- Reduce tree vigor
- Remove dead, diseased or crossing limbs
- Remove water sprouts

Preservation Maintenance Techniques

Summer pruning
to reduce
tree vigor

Preservation Maintenance Techniques

Summer pruning
to remove diseased or crossing limbs

Preservation Maintenance Techniques

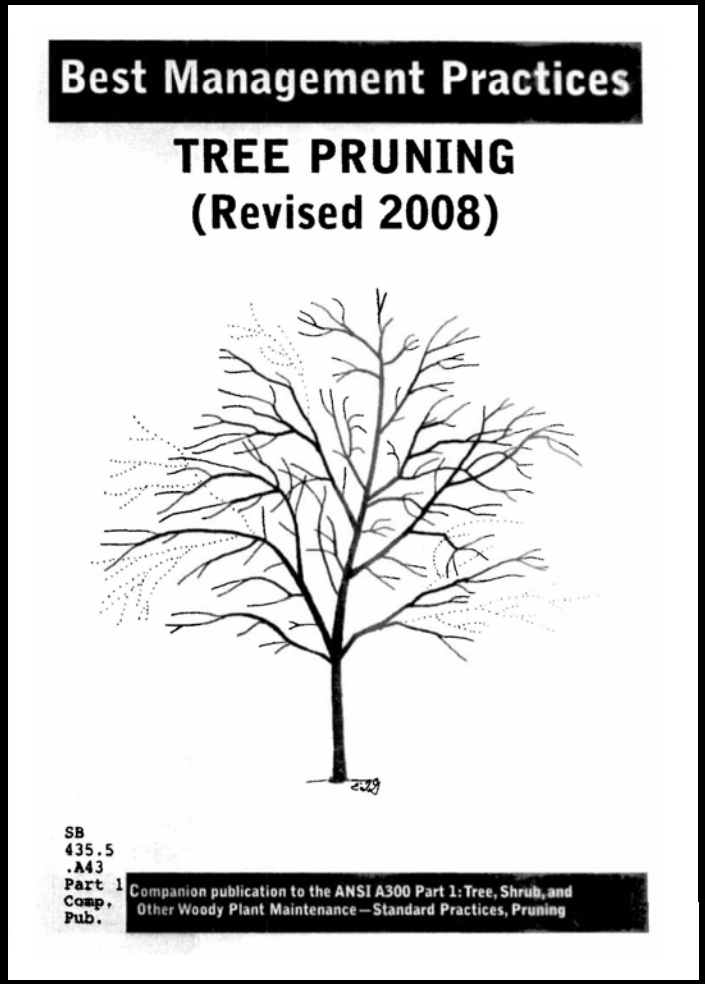
Summer pruning

to remove water sprouts
(aerial suckers)

Preservation Maintenance Techniques

Pruning standards

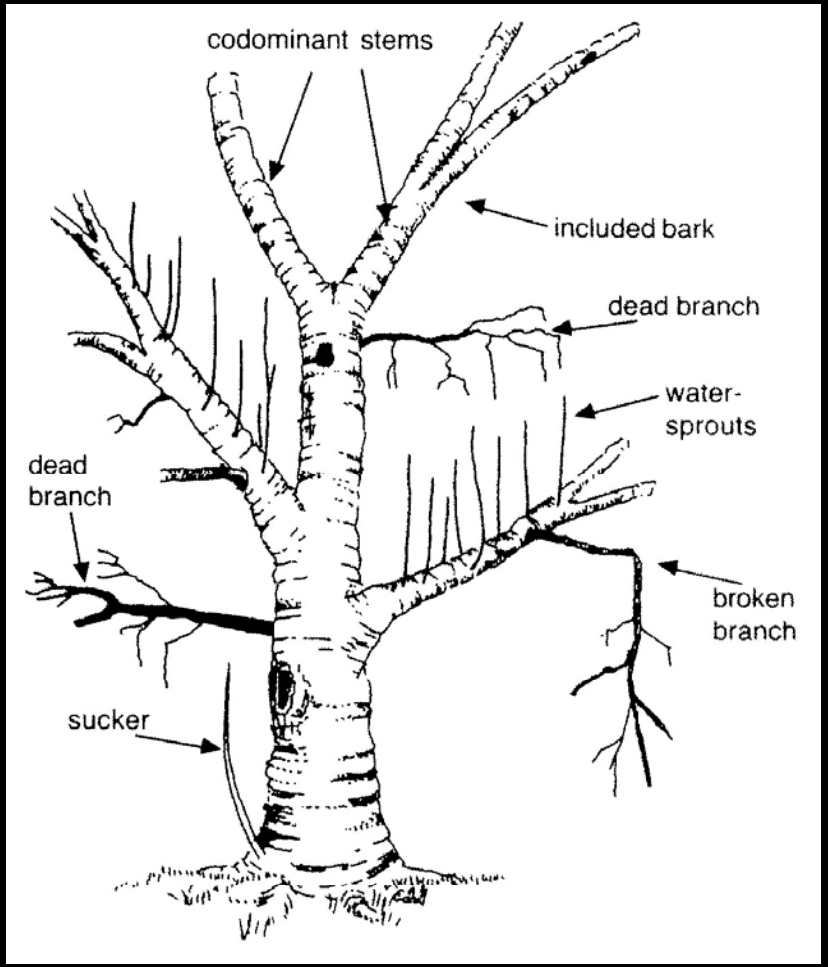
ANSI A300(Part 1) - 2001 –
Tree, Shrub, and Other Woody Plant Maintenance –Standard Practices (Pruning)



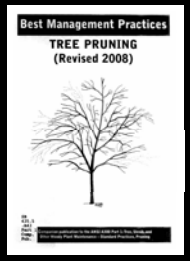
Preservation Maintenance Techniques

Pruning standards

Vocabulary

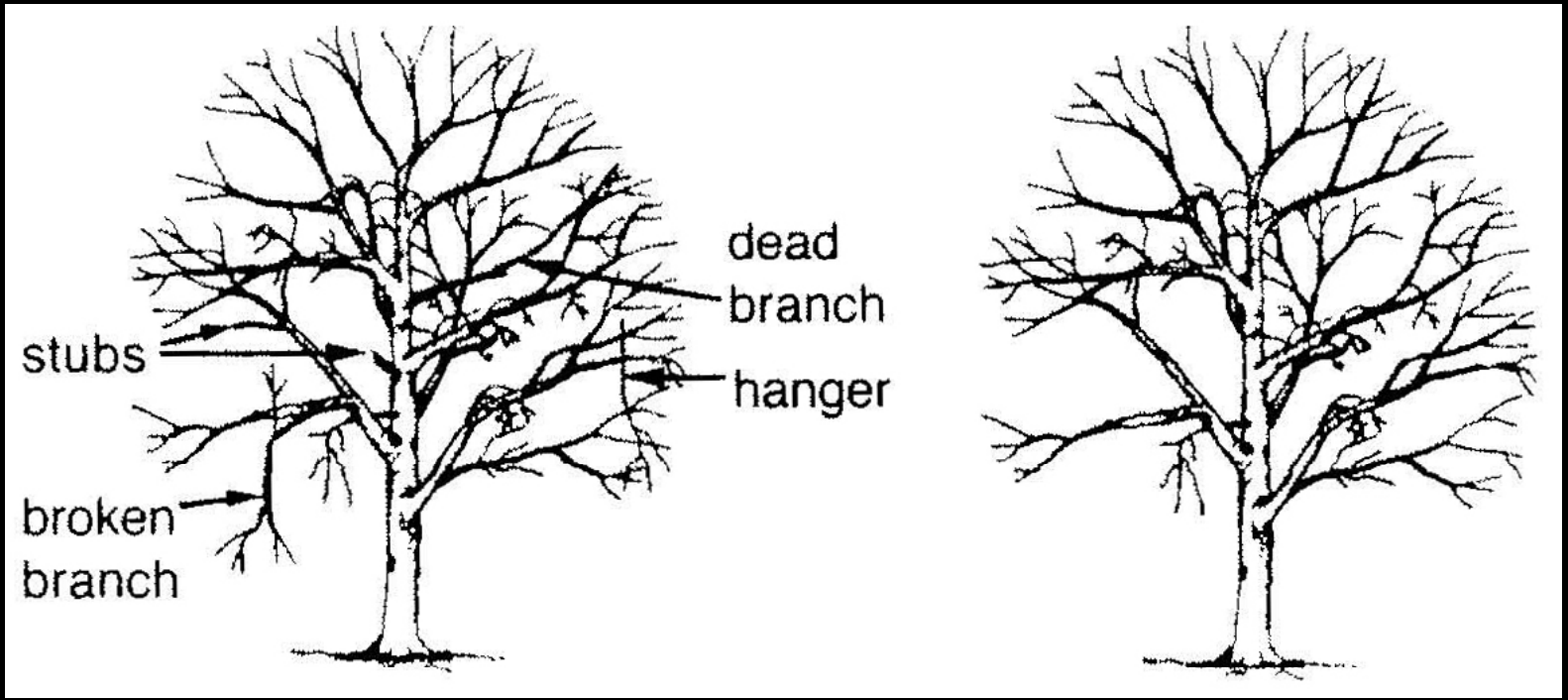


Preservation Maintenance Techniques



Winter and summer pruning techniques:

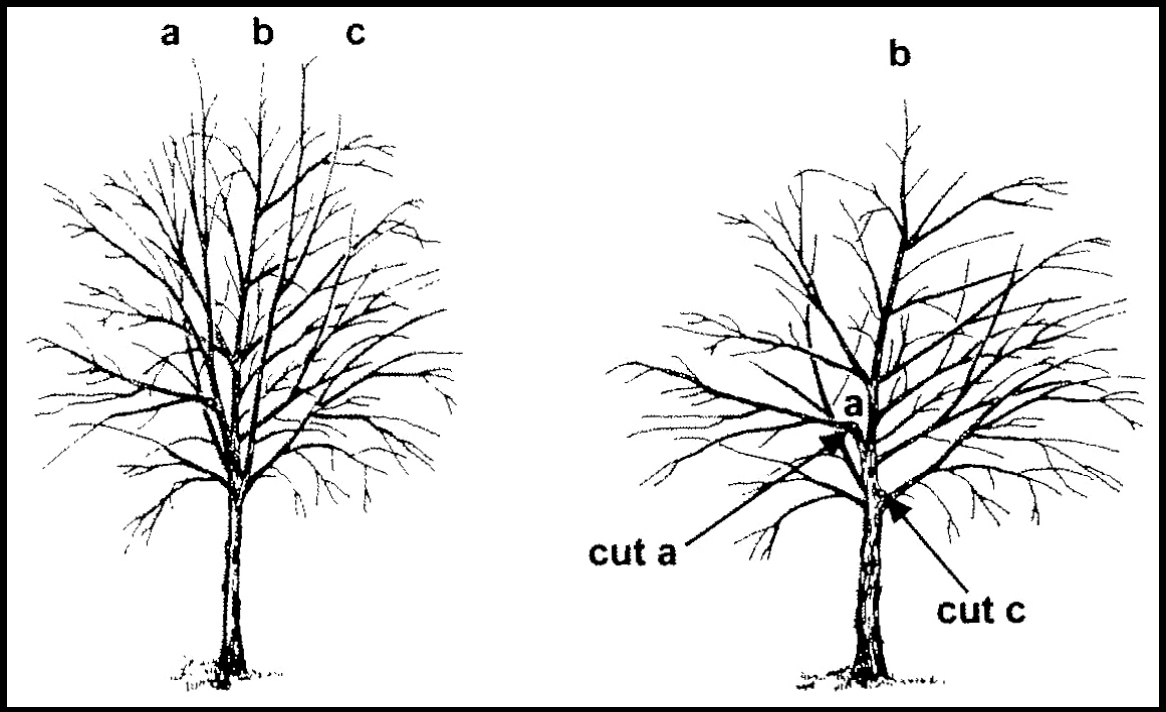
Dead-wooding or cleaning



BEFORE AFTER

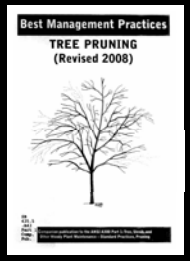
Preservation Maintenance Techniques

Winter pruning techniques:
Thinning or structural pruning



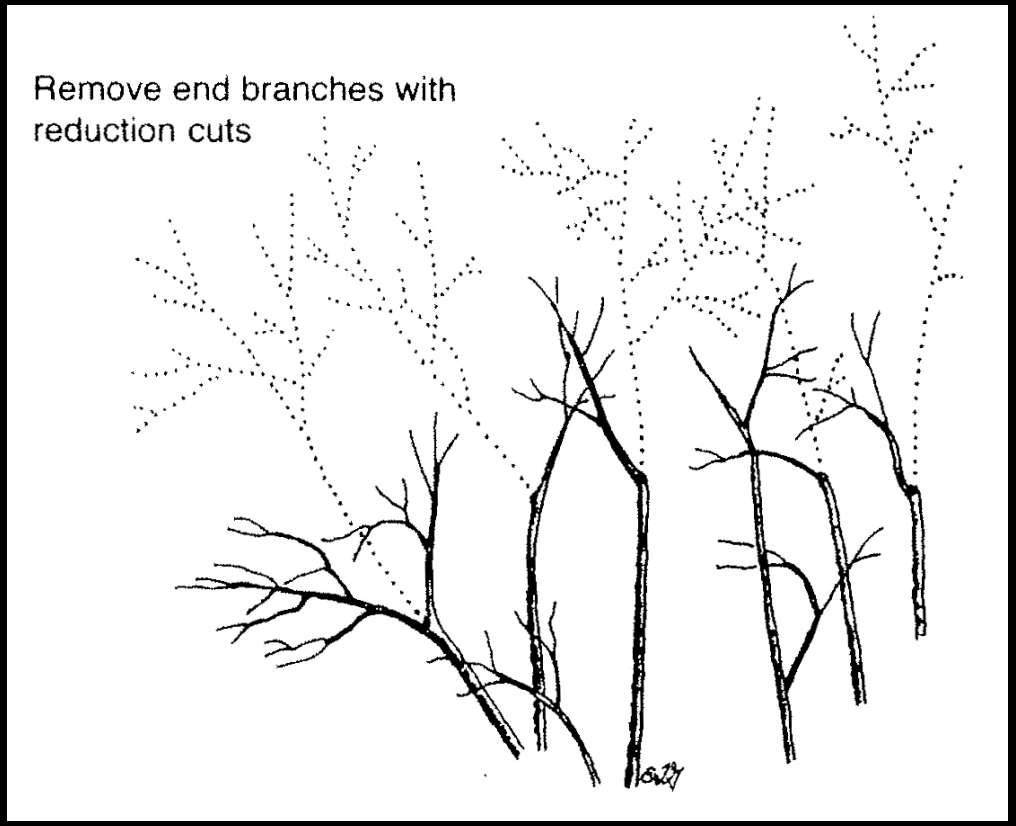
BEFORE AFTER

Preservation Maintenance Techniques



Winter and summer pruning techniques:

Heading back or canopy reduction



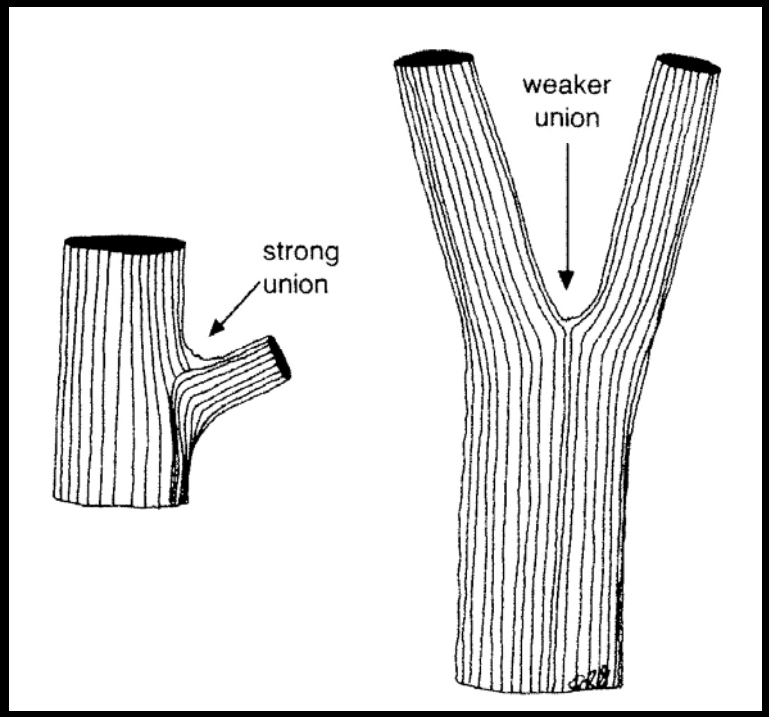
Winter pruning: stimulate vigor

Summer pruning: reduce vigor

Preservation Maintenance Techniques

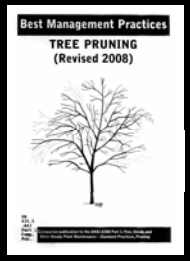
Pruning techniques:

Types of
branch unions

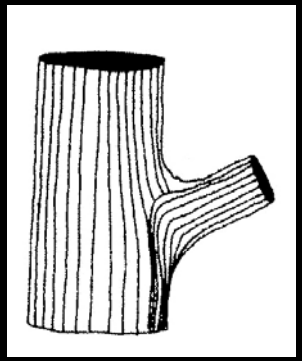


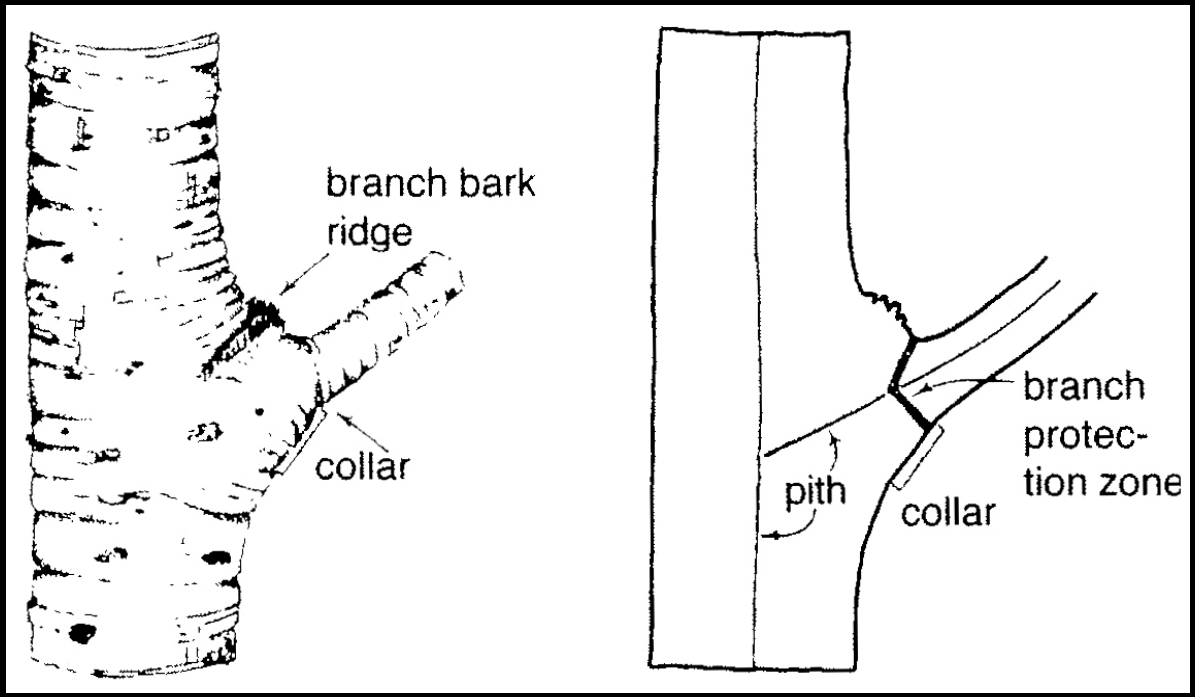
Lateral branch Scaffold branch

Preservation Maintenance Techniques



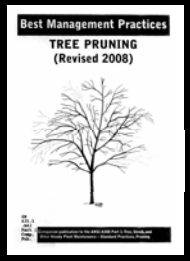
Winter and summer pruning techniques:
Lateral branch union





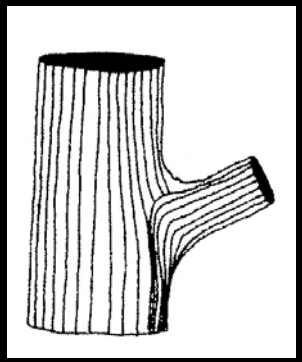
OUTSIDE INSIDE

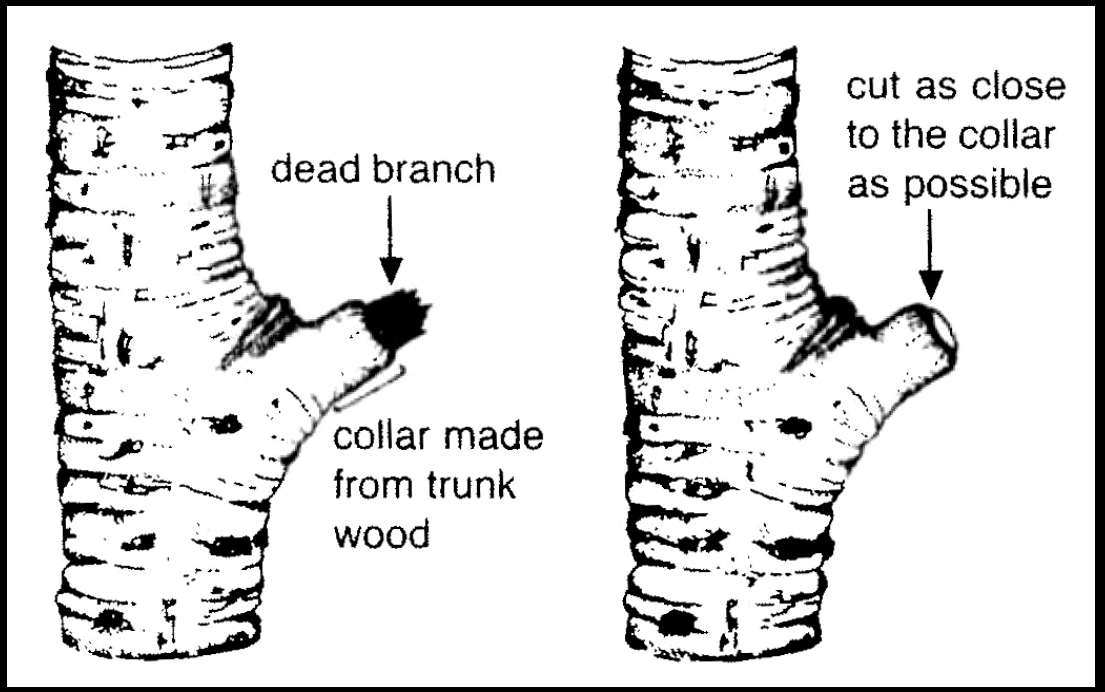
Preservation Maintenance Techniques



Winter and summer pruning techniques:

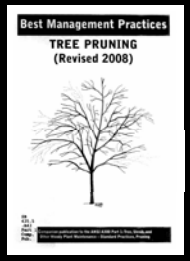
Lateral branch union – where to make cut



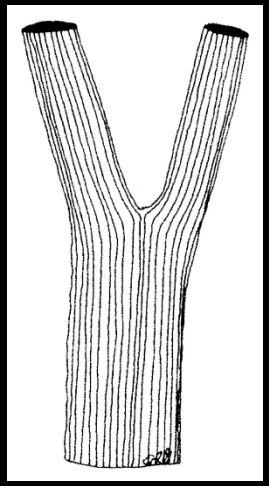


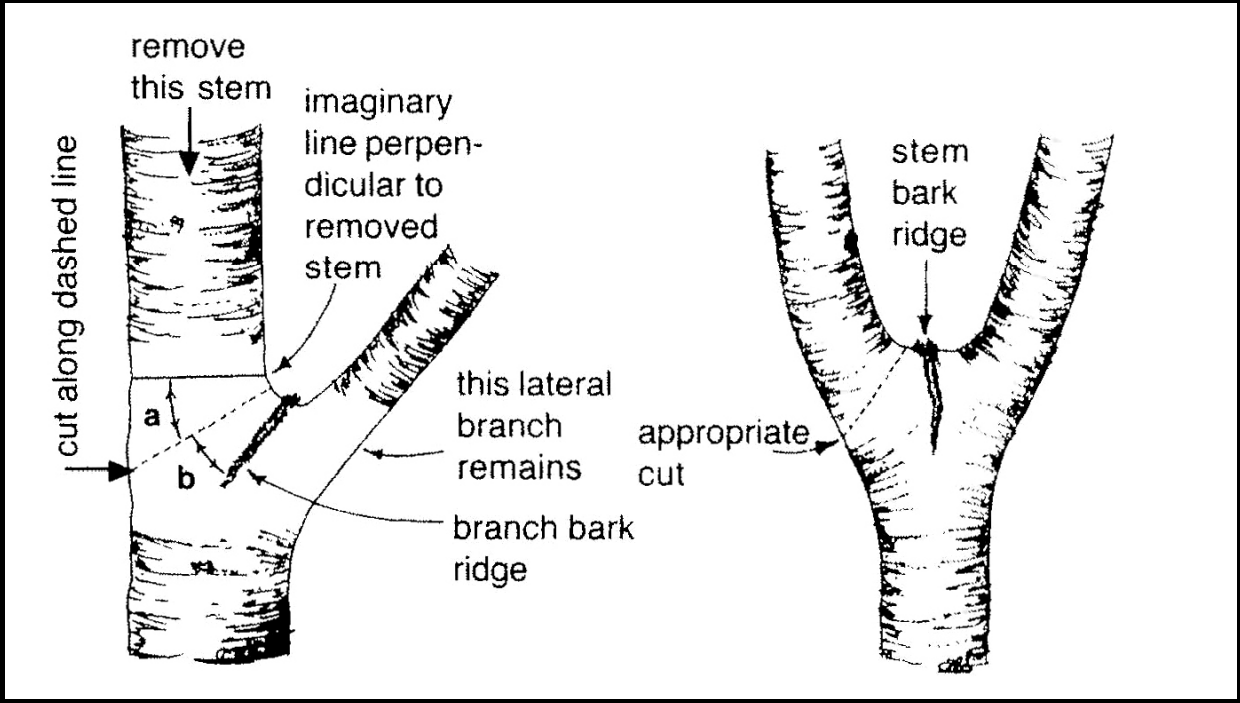
BEFORE AFTER

Preservation Maintenance Techniques



Winter pruning techniques:
Scaffold branch union – where to cut



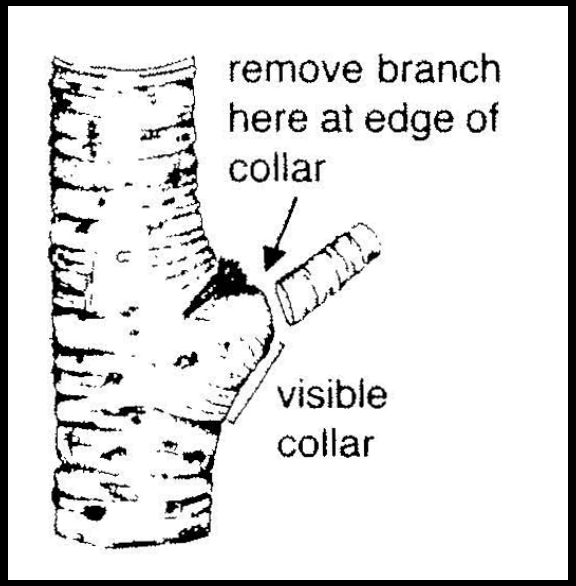


Larger scaffold branch

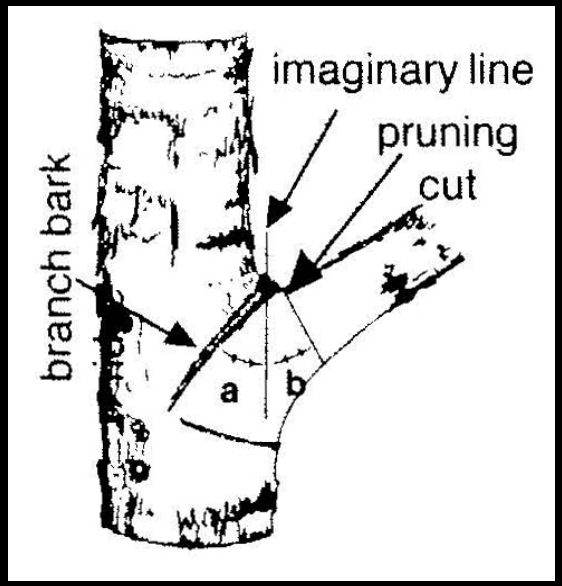
Equal scaffold branch

Preservation Maintenance Techniques

Pruning techniques:
Summary – where to cut



Lateral branch removal
(winter and summer, if dead)



Scaffold branch removal
(winter)

Preservation Maintenance Techniques

Pruning techniques: Bad examples

Preservation Maintenance Techniques

Pruning techniques: Good examples

Preservation Maintenance Techniques

Winter pruning
Summer pruning
Mowing

Preservation Maintenance Techniques

Mowing

Objectives:

- Manage ground cover to suitable height
- Control invasive species in ground cover
- Reduce competition from ground cover
- Protect soil from erosion and compaction
- Reduce evaporation

Preservation Maintenance Techniques

Mowing orchard ground cover

Preservation Maintenance Techniques

Mowing orchard ground cover – using the right equipment

Preservation Maintenance Techniques

Winter pruning
Summer pruning
Mowing
Mulching

Preservation Maintenance Techniques

Mulching

Objectives:

- Reduce competition from ground cover within drip-line
- Reduce evaporation
- Fertilize soil with nutritional mulch
- Promote pest and disease resilience
- Protect soil from erosion and compaction

Preservation Maintenance Techniques

Mulching
with nutritional mulch

Apply mulch within drip-line 2-3” deep, hold away from trunk

Preservation Maintenance Techniques

- Winter pruning
- Summer pruning
- Mowing
- Mulching
- Fertilizing

Preservation Maintenance Techniques

Fertilizing

Objectives:

- Stimulate soil fertility through the use of organic nutrients
- Avoid the use of supplemental fertilizer unless the soil is nutrient deficient

Preservation Maintenance Techniques

Fertilizing with nutritional mulch

Use finely shredded bark mulch with added compost to stimulate soil ecology.

Preservation Maintenance Techniques

- Winter pruning
- Summer pruning
- Mowing
- Mulching
- Fertilizing
- IPM Basics

Preservation Maintenance Techniques

Integrated Pest Management Basics

Objectives:

Remove stressors and maintain healthy growing conditions to promote pest and disease resilience.
Monitor for serious pests and diseases.
Use organic methods for protective treatments.
Treat infestations.

Preservation Maintenance Techniques

IPM Basics
Monitor for pests and diseases

Get to know the pest and disease problems in your park:
e.g., Codling Moth, Fireblight, Wildlife, Powdery Mildew, Anthracnose, Scab, Aphids, Maggot, Leaf Miner, Scale, Sun Scald.

Preservation Maintenance Techniques

IPM Basics
Monitor for pests and diseases

Differentiate those that affect fruit quality:
Codling Moth, Scab, Maggot


Codling Moth



Scab



Maggot

Preservation Maintenance Techniques

IPM Basics
Monitor for pests and diseases

From those that affect tree vigor:
Powdery Mildew, Aphids, Leaf Miner, Scale



Preservation Maintenance Techniques

IPM Basics
Monitor for pests and diseases

From those that can be life-threatening:
Anthracnose, Fireblight, Wildlife, Sun Scald




Preservation Maintenance Techniques

Integrated Pest Management Basics

Remove stressors and maintain healthy growing conditions to promote pest and disease resilience.
Monitor for serious pests and diseases.
Use organic methods for protective treatments.
Treat infestations.

Preservation Maintenance Techniques

IPM Basics

Organic methods for protective treatments.
Treat when acceptable threshold is exceeded

Insect pests	Dormant oil and insecticidal soap Prune out infested wood
Bacteria and fungi	Lime sulfur and Bordeaux Mixture Prune out infested wood
Wildlife	Traps, fencing, repellents, mow
Sun scald	White wash tree trunk

Preservation Maintenance Techniques

- Winter pruning
- Summer pruning
- Mowing
- Mulching
- Fertilizing
- IPM basics
- Irrigating

Preservation Maintenance Techniques

Irrigating

Objectives:

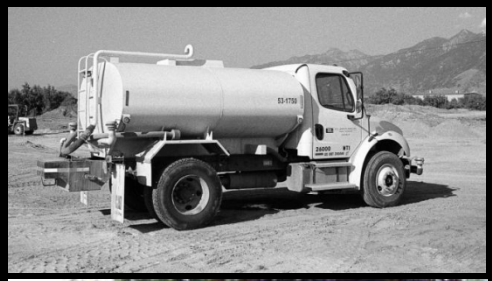
Provide supplemental water in balance with growing conditions.
Avoid irrigating stable, mature fruit trees that have not been irrigated since establishment.

Preservation Maintenance Techniques

Irrigating

Techniques include:
- Hand watering
- Tree bladders
- Ditch irrigation
- Drip irrigation
- Sprinkler irrigation

Water supply:
- Natural water body
- Tank
- Water Main



Preservation Maintenance Techniques

Winter pruning
Summer pruning
Mowing
Mulching
Fertilizing
IPM basics
Irrigating
Propagating

Preservation Maintenance Techniques

Propagating

Objectives:

Replace diseased, dead or missing trees in the orchard. Replace-in-kind with the same variety and rootstock or with a seedling tree, as appropriate to significant historic period.

Preservation Maintenance Techniques

Nursery propagation requirements:

Desired number of propagated trees –
30% extra for losses after planting.

Scion variety –
provided by the park or from USDA.

Type of rootstock –
generally the type will be seedling rootstock.

Height of graft union.

Delivery date in 1 or 2 years -
delivery date should be close to time of planting.

Preservation Maintenance Techniques

Winter pruning
Summer pruning
Mowing
Mulching
Fertilizing
IPM basics
Irrigating
Propagating
Replanting

Preservation Maintenance Techniques

Replanting

Objectives:

To re-plant trees that have been removed or are missing from the site.
To re-plant in the same location, using the same spacing as the former tree, to preserve historic character.

Preservation Maintenance Techniques

Replanting Preparation Considerations

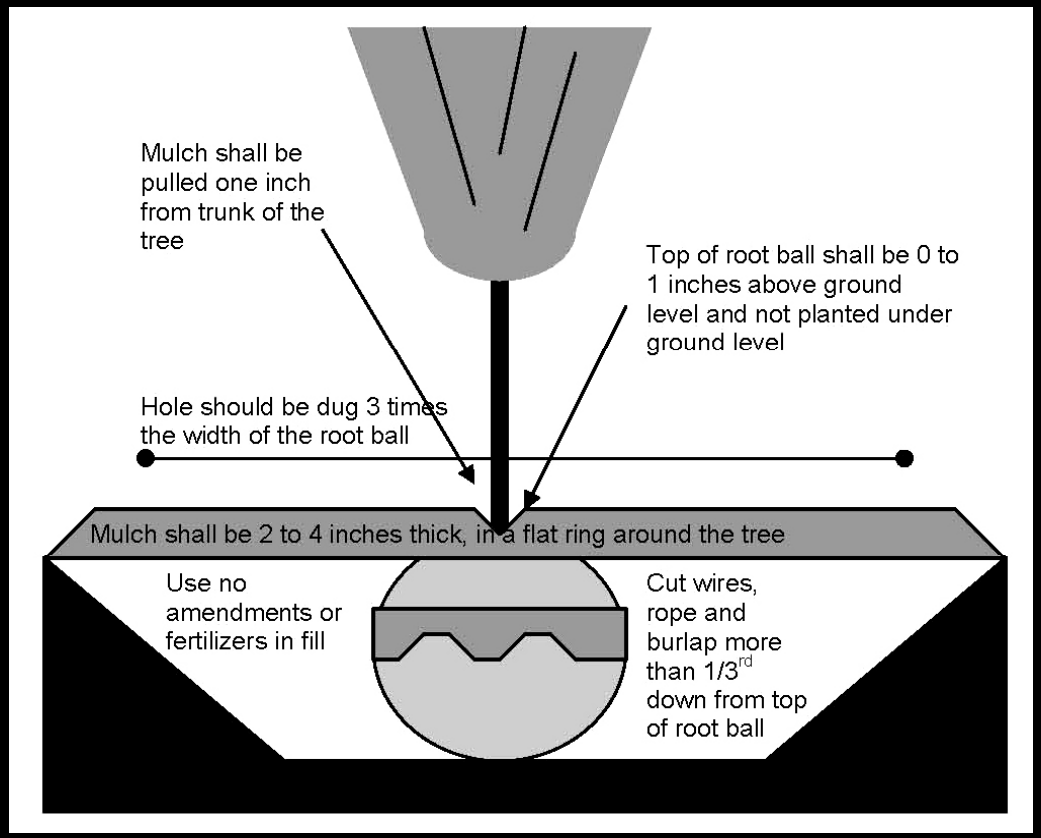
Identification of tree planting location(s)
Archeological testing
Stump grinding
Topsoil replacement

Preservation Maintenance Techniques

Replanting Considerations

Best time is in Fall, or early Spring for bareroot trees

Archeological monitoring



Preservation Maintenance Techniques

Replanting Considerations

Stake trees for 2 years

Provide browse protection for 5 years

Preservation Maintenance

Record keeping

Document preservation maintenance actions

California Department of Parks and Recreation

Site Name

Fruit Tree Preservation Maintenance Record

Tree ID	Cond.	Winter Prune	Summer Prune	Spray	Mow	Thin Fruit	Harvest	Irrigate
A1	Good	01/01/2010	06/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010	06-09/2010
A2	Fair	01/01/2010	06/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010	06-09/2010
A3	Good	01/01/2010	06/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010	06-09/2010
A4	Fair	01/01/2010	06/01/2010	01/01/2010	02/01/2010	02/05/2010	02/06/2010	06-09/2010

Session 6: Performing stabilization pruning techniques

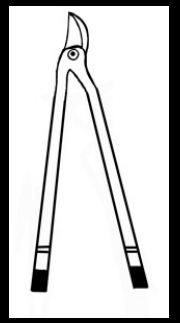
Learning goals:

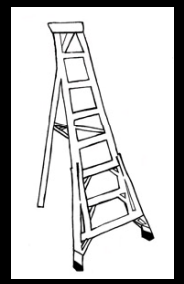
Understand stabilization pruning techniques, including dead-wood removal, sucker removal and water sprout removal.

Session 6: Performing stabilization pruning techniques

Workshop CD :

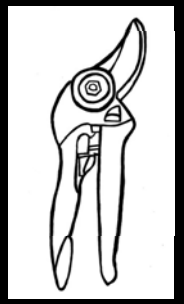
Sample Contract “Kestner Homestead Fruit Tree Pruning, Aeration and Mulching”





Standards:

ANSI Z133.1 - 2000 – Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements



ANSI A300(Part 1) - 2001 – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Pruning)

Session 6: Performing stabilization pruning techniques

Learning goals:

Understand stabilization pruning techniques, including dead-wood removal, sucker removal and water sprout removal.

Any questions from yesterday?

Day 3: Planning to Preserve Historic Orchards

Session 7: Orchard Stabilization Plans and Orchard Management Plans

Learning goals:

Understand the purpose and contents of an Orchard Stabilization Plan.

Understand the purpose and contents of an Orchard Management Plan.

Orchard Stabilization Plans

Orchard Stabilization Plan

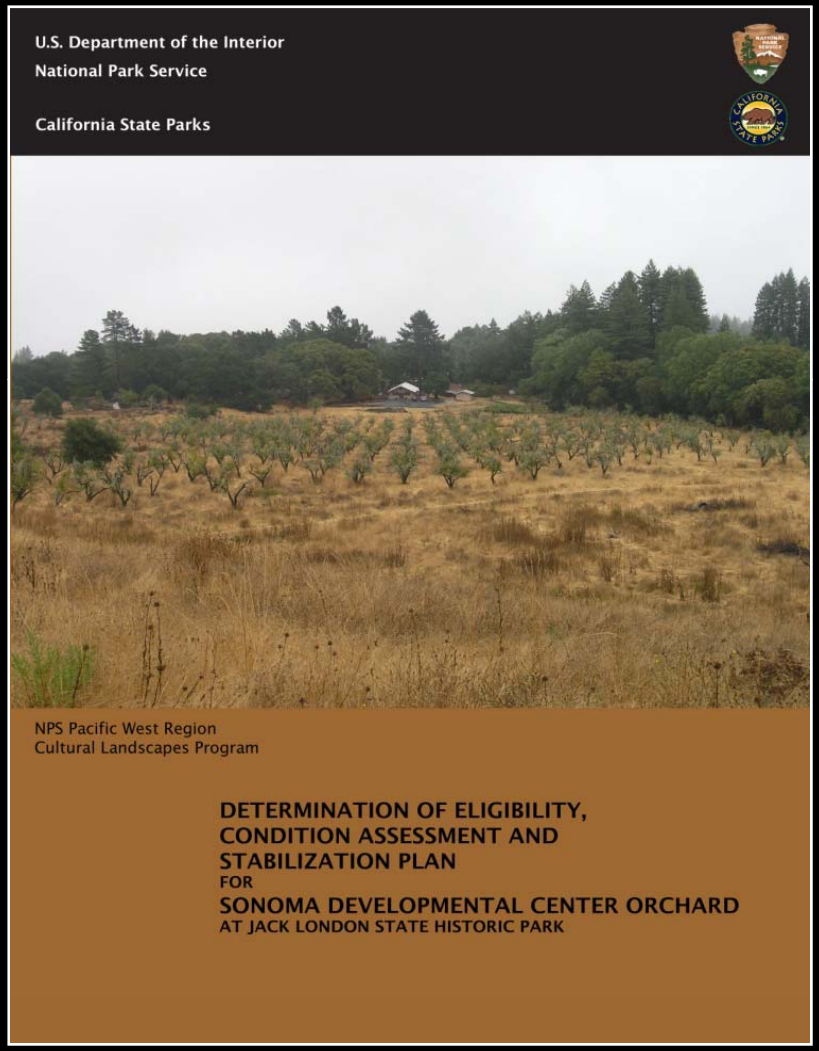
Identifies the stabilization actions to be taken to prevent further deterioration in condition of the orchard, in lieu of a Preservation Maintenance Plan or Treatment Plan.

Orchard Stabilization Plan

Example:

SDC Orchard at
Jack London State Historic Park
Orchard Stabilization Plan, 2007

(also contains:
Determination of Eligibility
Condition Assessment)



Orchard Preservation Maintenance Plans

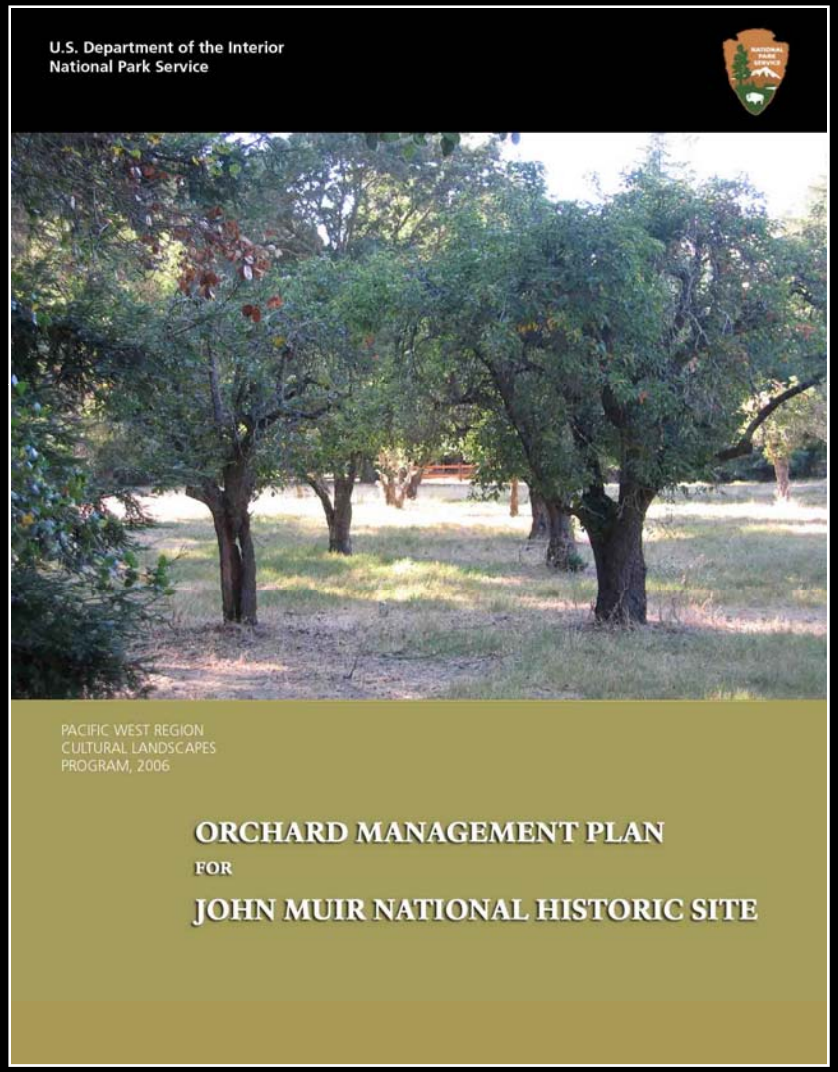
Preservation Maintenance Plan

Identifies the cyclic preservation maintenance actions and techniques to be used to retain or improve the condition of the orchard, while preserving historic character. The Plan specifies the type, location and frequency of actions needed over time.

Orchard Management Plan

Example:

John Muir National Historic Site
Orchard Management Plan (2006)



Session 8: Orchard Treatment Plans

Learning goals:

Understand the purpose and contents of an Orchard Treatment Plan.

Orchard Treatment Plans

Identifies the recommended historic preservation treatment for the orchard. Prescribes phasing and methods for implementation.

Orchard Treatment Plans

Historic Preservation Treatments*

Preservation
Restoration
Rehabilitation
Reconstruction

*Secretary of the Interior's Standards for the Treatment of Historic Properties

Orchard Treatment Plans

Must combine SIS for Treatment with park management objectives

Orchard Treatment Plans

Management objectives:

Are derived from a planning process.

Are consistent with the General Plan.

Are informed by a Determination of Eligibility (DOE document) or Cultural Resource Inventory.

Orchard Treatment Plans

Proceeded by a Cultural Resource Inventory

(such as a Cultural Landscape Inventory, CLI) or DOE

contents:

- Physical History
- Statement of Significance
- Existing Conditions Site Plan
- Characteristics & Features
- Stabilization Measures

Orchard Treatment Plans

Management objectives include:

- Significance, integrity and condition of orchard
- Fruit production or orchard character?
- Natural resource protection and preservation
- Visitor access and safety
- Interpretive goals and opportunities
- Maintenance operations and sustainability
- Availability of technical expertise/support

Orchard Treatment Plans

Management objectives include:

Significance, integrity
and condition of orchard

Orchard Treatment Plans

Management objectives:

Fruit production or orchard character?

A choice between more or less intensive management

Fruit provides additional educational and social value

Orchard Treatment Plans

Management objectives include:

- Natural resource protection
  - Wildlife/fruit/visitor interactions
  - Exotic plant control
  - T & E species habitat
  - Water quality

Orchard Treatment Plans

Management objectives include:

Visitor access and safety

Orchard Treatment Plans

Management objectives include:

Interpretive goals and opportunities

JOMU Interpretive Prospectus:

"Muir's fruit ranch gave him financial independence so he could pursue his interests; his happy home life provided emotional support to counterbalance a life of wandering and struggling in conservation causes."

Opportunities:

self-guided tour brochure
interpretive wayside panels
guided walking tours
cider press/harvest celebrations
orchard open days/workshops

Orchard Treatment Plans

Management objectives include:

Maintenance operations and sustainability

Issues may include:
Organizational expertise
Staff/volunteers/friends
Equipment, tools
Irrigation needs
Browse protection needs

Orchard Treatment Plans

Park management objectives are combined with the SIS for Treatment to develop a Treatment Plan

Orchard Treatment Plans

Secretary of the Interior's Standards for Treatment

Preservation:
Retain historic appearance through cyclic preservation maintenance and replacement-in-kind

Restoration:
Return appearance to historic condition by removing later additions and replacing missing features

Rehabilitation:
Preserve historic characteristics and features, but make some compatible alterations and additions

Reconstruction:
Re-plant a vanished orchard using excellent evidence

Orchard Treatment Plans

Secretary of the Interior's Standards for Treatment

Preserve and protect, repair and replace in-kind

Restore missing features, remove later additions

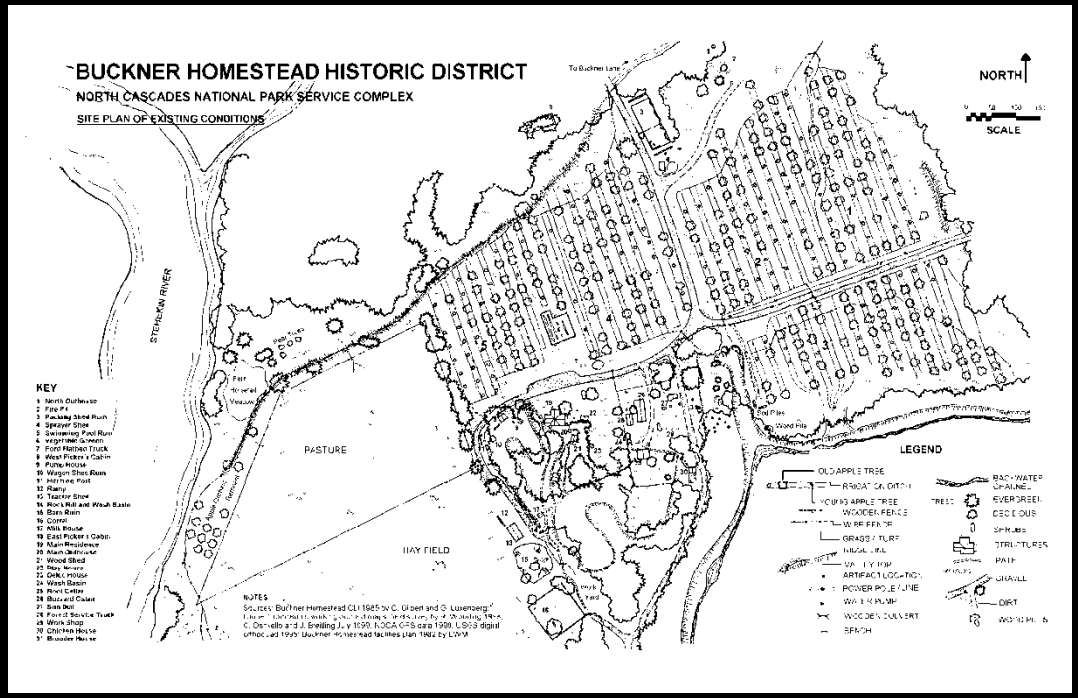
Rehab – make compatible alterations & additions

Reconstruct – must be minimum conjecture

Orchard Treatment Plans

Preservation Treatment

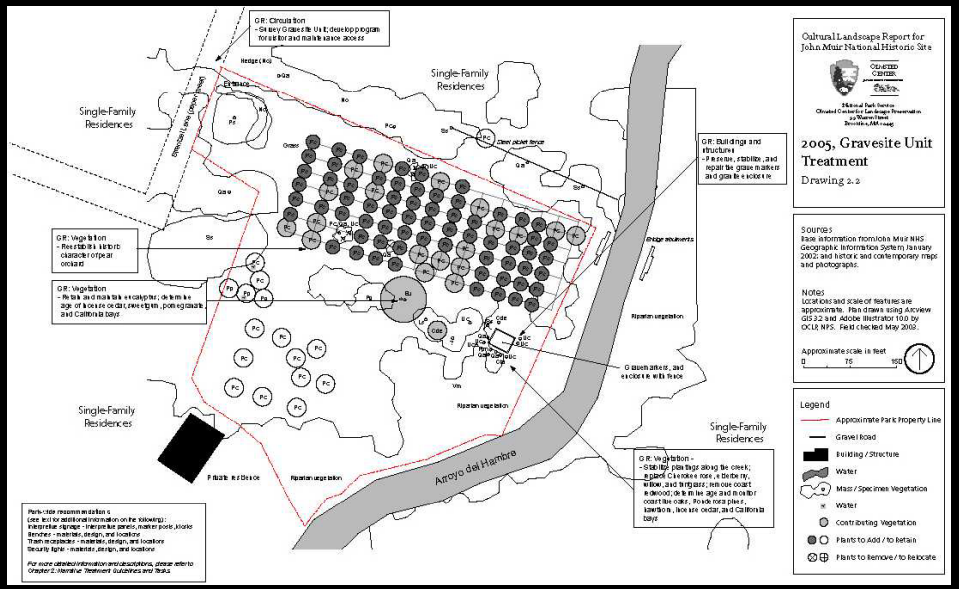
- Winter pruning
- Summer pruning
- Mowing
- Mulching
- Fertilizing
- IPM basics
- Irrigating
- Propagating
- Replanting
- Sun scald protection



Orchard Treatment Plans

Restoration Treatment

Propagate to replace missing trees
Re-plant in former tree locations
Prune in appropriate style
Remove incompatible features



Orchard Treatment Plans

Rehabilitation Treatment

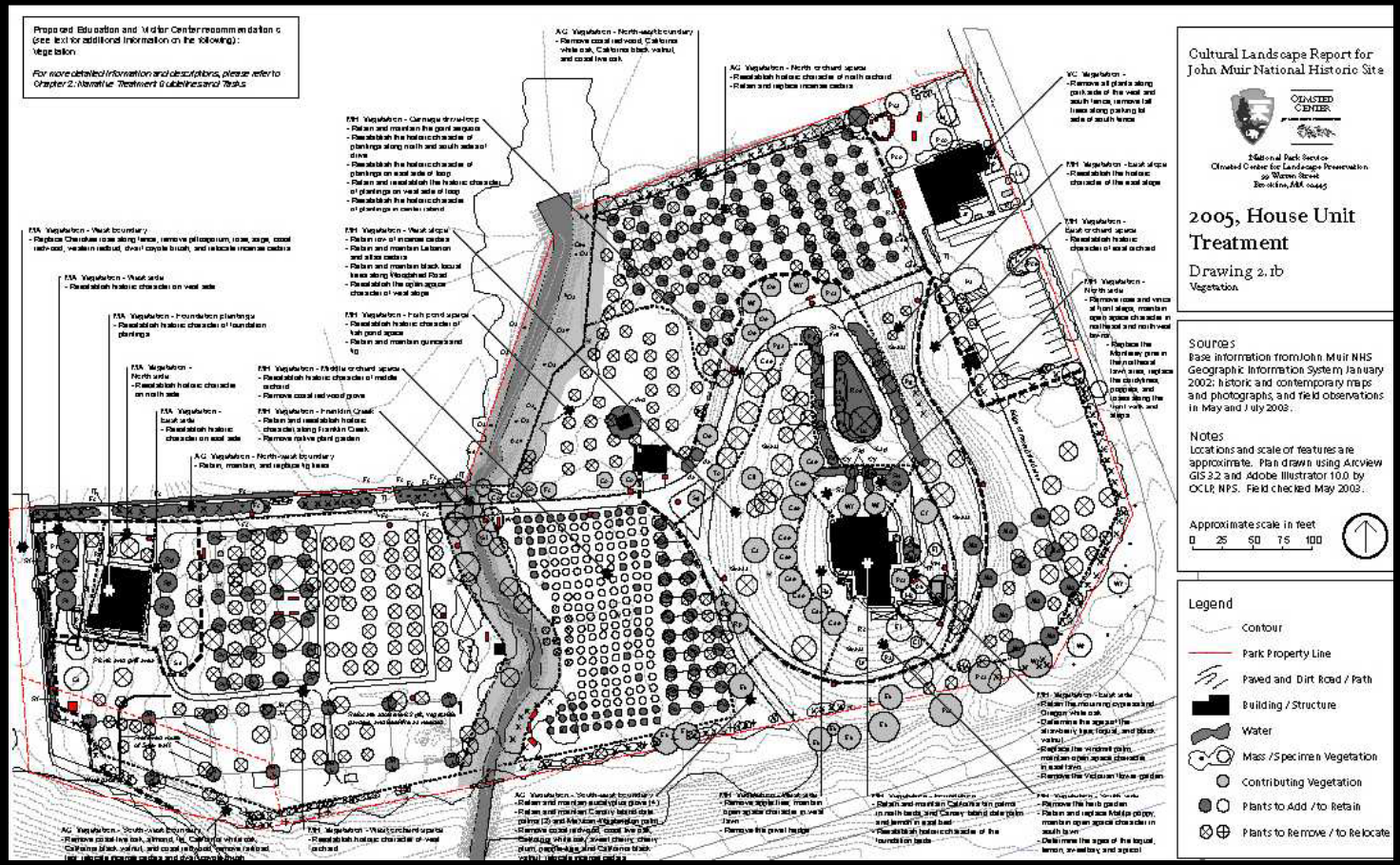
Retain historic characteristics and features

Also make some compatible alterations or additions:

- Modify extent of original orchard layout
- Modify mix of species or varieties grown
- Install subterranean irrigation system
- Modify orchard floor ground cover

Orchard Treatment Plans

Rehabilitation plan example:



Orchard Treatment Plans

Reconstruction Treatment

Replicate vanished historic orchard using accurate:

- Orchard location
- Species and cultivars and rootstock
- Tree spacing
- Tree scaffold and pruning style

Session 9: Q & A Time

Learning goals:

Obtain some basic guidance on orchards or fruit trees in your park.