Lake Tahoe Angora Fire Workshop

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Objectives

1. Discuss the effects of urbanization on Forest Structure, Species Composition, and Undeveloped Forest Fragments

2. Identify the factors contributing to the changes in the Lake Tahoe urban forest

3. Predict future characteristics of the Lake Tahoe Urban Forest with particular reference to the Angora Fire Area

Previous Research

Tahoe City

Sunnyside

Tahoe Pines

Lake Tahoe

Tahoma

South Lake Tahoe
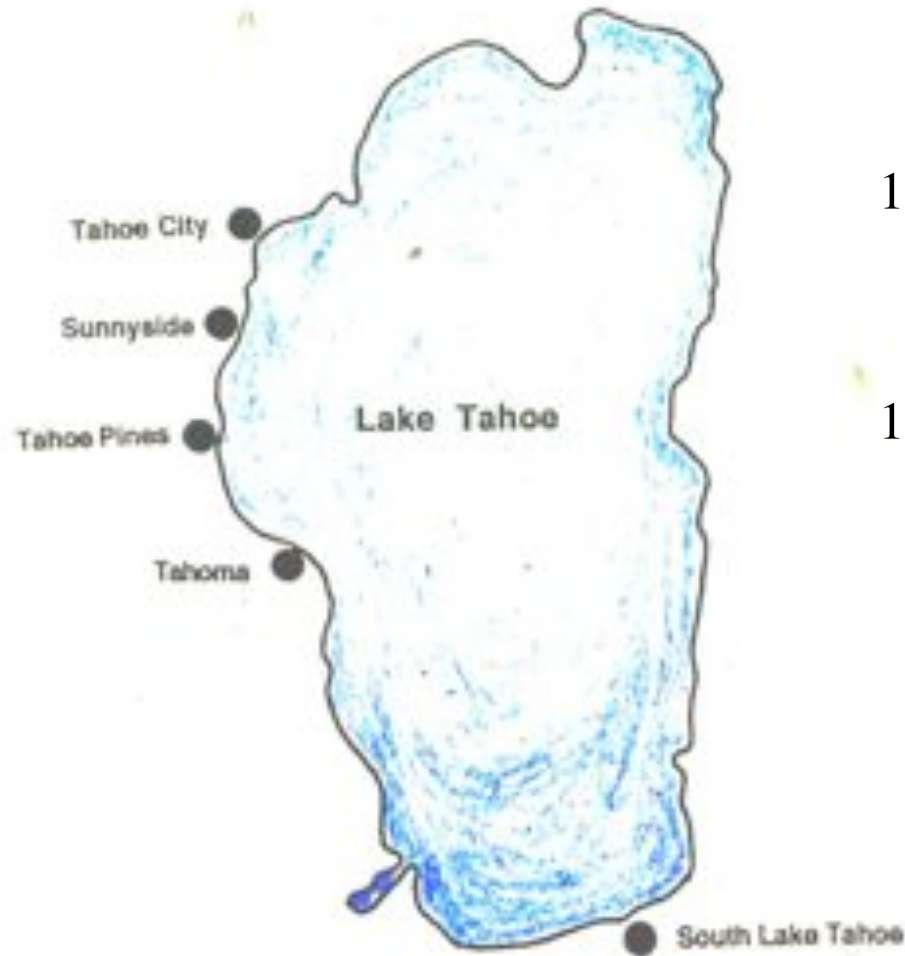
1979-85
  • Urban Forest Compositioon
    ans Structure
1995-2001
      • Impacts of Urbanization

Human History of the Tahoe Basin

- Native American Period
- Euro-American Period

  Pre-1950

  Post 1950

Population Growth

Year	Year Round Population	Summer Population
1950	2,500	5,000
1960	10,000	20,000
1980	50,000	90,000
2000	67,000	>100,000

Characteristics of the Lake Tahoe Urban Forest

1. "Pre-settlement" natural forest context for urbanization
2. Structure of the Urban Forest
3. Tree Species Composition of the Urban Forest
4. Fragmentation of the Urban Forest

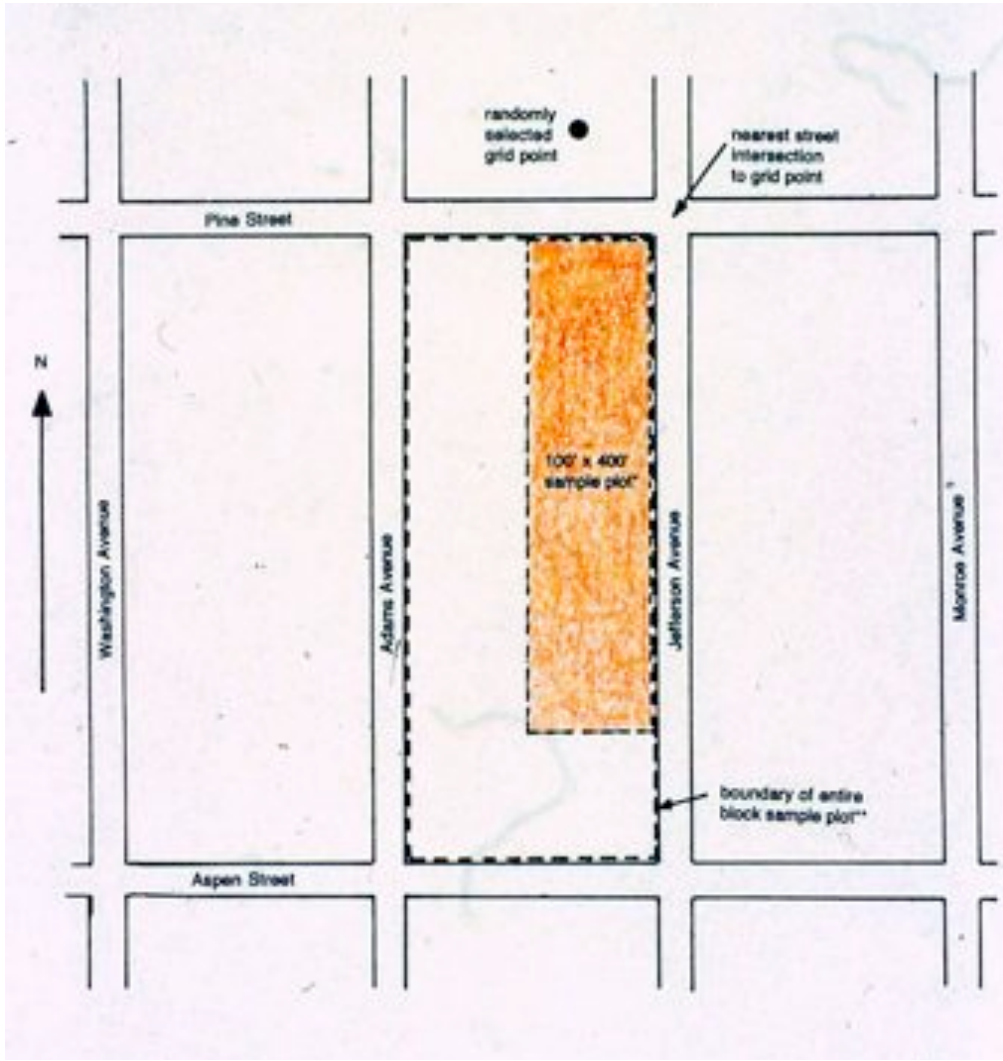| Mixed Conifer	Jeffrey Pine	Lodgepole Pine

Pointer 39°03'44.49" N 120°07'54.68" W   Streaming |||||||100%   Eye alt   2.20 km

Lake Tahoe

Mt.Kinney Cr.

Tahoma

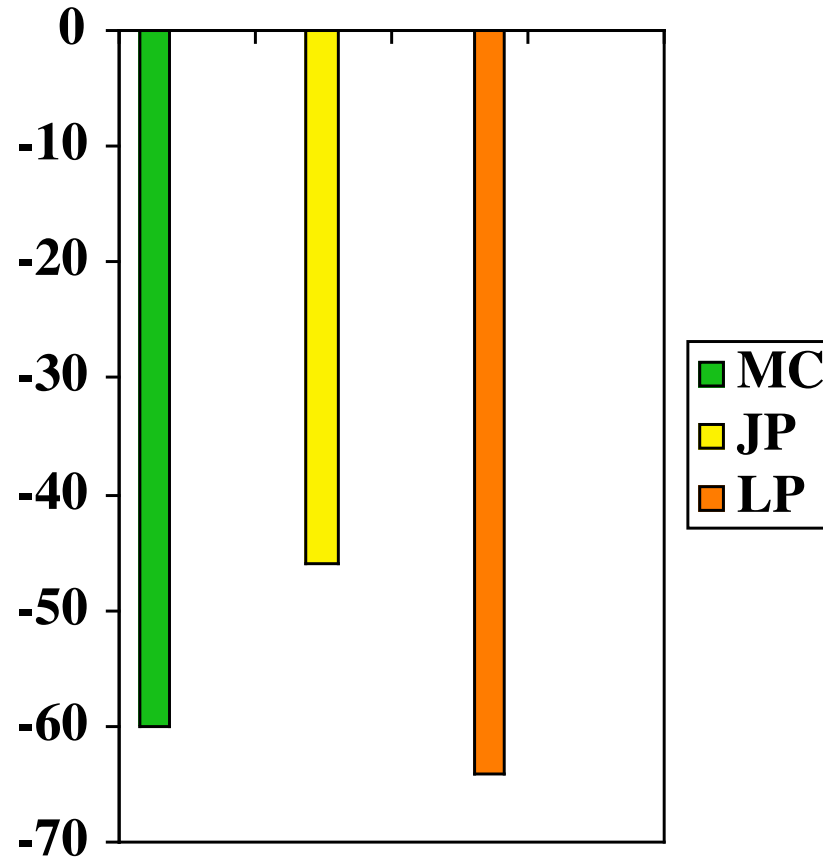0   2000'

Forest Fragment

Sugar Pine Point State Park

Forest Structure

1. Canopy cover
2. Tree Density
3. Species Richness
4. Size Class

Tree Canopy Cover

Forest Type	Undeveloped	Developed
Mixed Conifer	77	31
Jeffrey Pine	67	33
Lodgepole Pine	76	27

Change in Canopy Cover (%)

Density (#/ac) of Native Conifer Trees

Forest Type	Undeveloped	Developed	% Difference
Mixed Conifer	277	153	- 50.3
Jeffrey Pine	142	83	- 41.6
Lodgepole Pine	361	88	- 75.7

Tree Density (#/ac)

Forest Type	Undeveloped	Developed
Mixed Conifer	277	153
Jeffrey Pine	142	83
Lodgepole Pine	361	88

Change in Tree Density (#/ac)
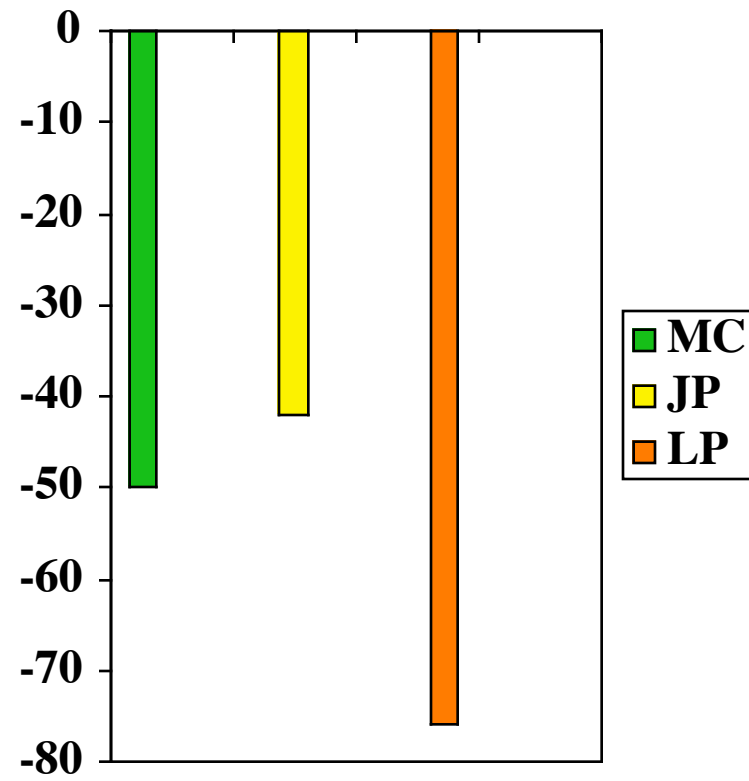
Tree Species Richness
(# species in sample)

Forest Type	Undeveloped	Developed
Mixed Conifer	6	29
Jeffrey Pine	5	23
Lodgepole Pine	3	17

Change in Tree Species Richness (%)
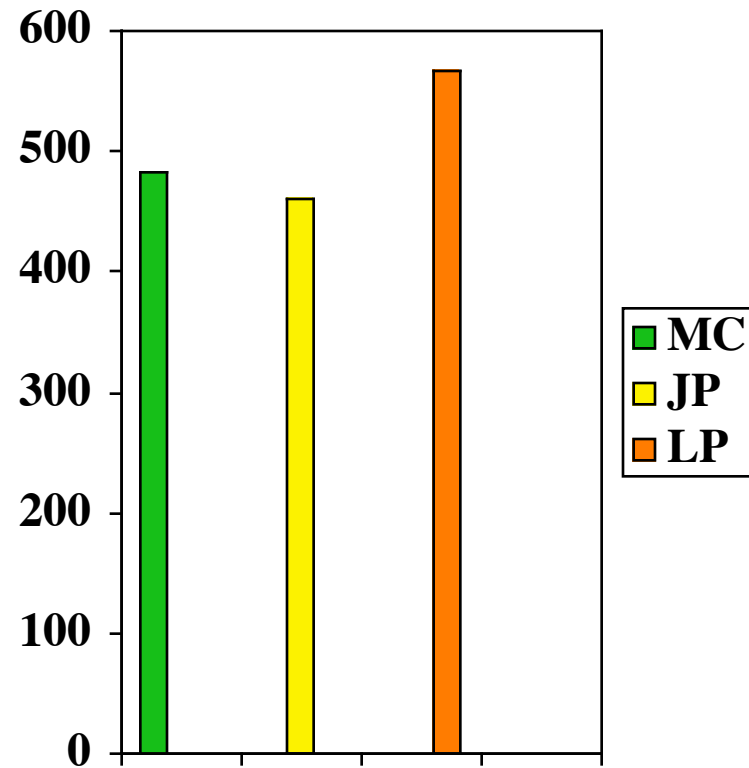
Size Class Distribution of Native Conifers

Forest Type	Lot Type	Number per Acre			
		Seedlings	Saplings	Poles	Trees
Mixed Conifer	Undeveloped	76	153	161	116
	Developed	7	23	46	67
Jeffrey Pine	Undeveloped	2	3	4	138
	Developed	0	2	3	80
Lodgepole Pine	Undeveloped	2	15	53	308
	Developed	0	2	5	83

Size Class Distribution of Native Conifers in the Mixed Conifer Forest Type (#/ac)
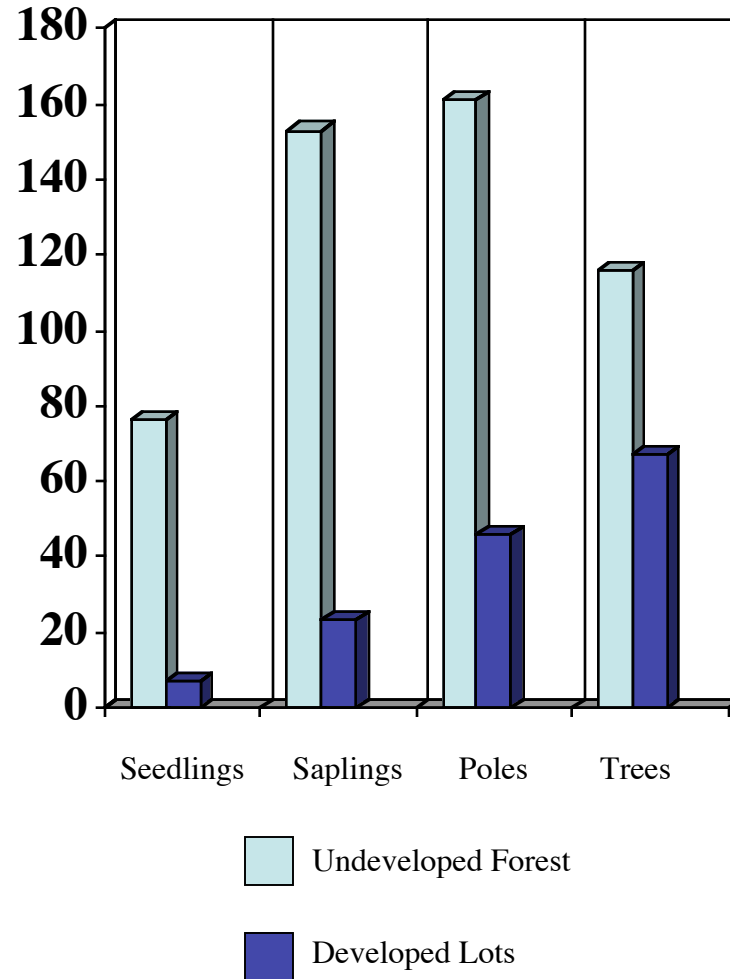
Species Composition

- Tree Species
- Native vs. Exotic Species
- Conifer vs. Hardwood Species

Forest Type	Number of Tree Species
Mixed conifer	29
Jeffrey pine	23
Lodgepole pine	17
Total	35

Tree Species observed on developed lots at South Lake Tahoe and Tahoe City

Species	Tahoe City Mixed Conifer	South Lake Tahoe Jeffrey Pine	South Lake Tahoe Lodgepole
Abies concolor (white fir)	•	•	
Abies magnifica (red fir)	•	•	•
Acer dasycarpum (silver maple)	•	•	•
Acer ginnala (Amur maple)	•		
Acer glabrum (mountain maple)	•	•	
Acer palmatum (Japanese maple)	•	•	
Acer platanoides (Norway maple)	•	•	
Acer saccharum (sugar maple)	•		•
Alnus rhombifolia (white alder)	•	•	
Betula pendula (European white birch)	•	•	•
Calocedrus decurrens (incense cedar)	•	•	•
Cercis canadensis (American redbud)	•		
Crategus spp. (Crabapple)		•	
Juniperus californica (California juniper)		•	
Koelreuteria paniculata (goldenrain tree)	•	•	
Malus pumila (apple)	•	•	•
Pinus thunbergii (Japanese black pine)	•		
Picea pungens (Colorado blue spruce)	•	•	•
Pinus contorta (lodgepole pine)	•	•	•
Pinus jeffreyi (Jeffrey pine)	•	•	•
Pinus lambertiana (Sugar pine)	•		
Pinus mugo (mugho pine)	•		
Populus nigra "Italica" (Lombardy poplar)		•	•
Populus tremuloides (Aspen)	•	•	•
Populus trichocarpa (western black cottonwood)	•		•
Prunus cerasifera (purpleleaf plum)	•	•	•
Prunus serrula (Japanese flowering cherry)	•		
Quercus alba (white oak)		•	
Quercus palustris (pin oak)		•	•
Robinia pseudoacacia (black locust)		•	
Salix babylonica (weeping willow)	•		
Salix matsudana (Hankow willow)	•		•
Salix scouleriana (Scouler's willow)	•	•	•
Sequoiadendron gigantea (giant sequoia)	•	•	•
Sorbus aucuparia (mountain ash)	•		

Native vs. Exotic Species Composition

Species Origin	Mixed Conifer Undeveloped	Mixed Conifer Developed	Jeffrey Pine Undeveloped	Jeffrey Pine Developed	Lodgepole Pine Undeveloped	Lodgepole Pine Developed
Native to Forest Type:						
Conifer	4	4	3	3	2	2
Hardwood	2	2	2	2	1	1
Total	6	6	5	5	3	3
Percent	100	20.7	100	21.7	100	17.7
Native to Tahoe Basin, but not native to Forest Type:						
Conifer	0	2	0	4	0	2
Hardwood	0	2	0	2	0	2
Total	0	4	0	6	0	4
Percent	0	13.7	0	26.1	0	23.5
Exotic:						
Conifer	0	4	0	2	0	2
Hardwood	0	15	0	10	0	8
Total	0	19	0	12	0	10
Percent	0	65.6	0	52.2	0	58.8

Native vs. Exotic Tree Species on Developed Lots (%)
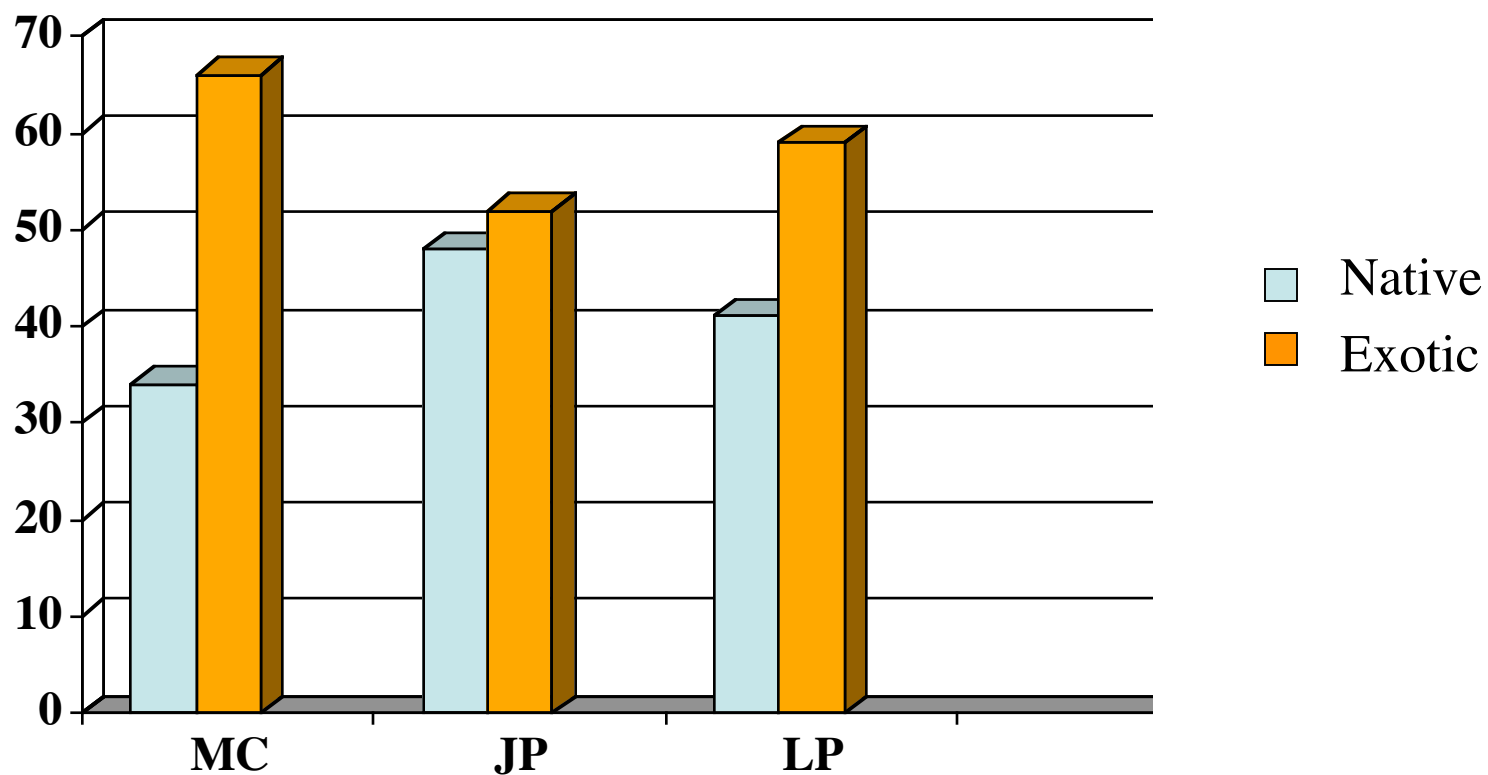
Conifer vs. Hardwood Species

Tree Type	Mixed Conifer		Jeffrey Pine		Lodgepole Pine		Average	
	Und.	Dev.	Und.	Dev.	Und.	Dev.	Und.	Dev.
Conifer	66.7	34.5	60.0	39.1	66.7	35.3	64.5	36.3
Hardwood	33.3	65.5	40.0	60.9	33.3	64.7	35.5	63.7

Characteristics of Forest Fragments

| Characteristic	Range
Size	2000 to 871,200 ft.^{2}
Perimeter	190 to 4493 ft.
Canopy Cover	5 to 100 %
Litter Depth	0.25 to 4.2 in.
Distance from Forest Edge	0 to 4909 ft.

Species Richness of Forest Fragments
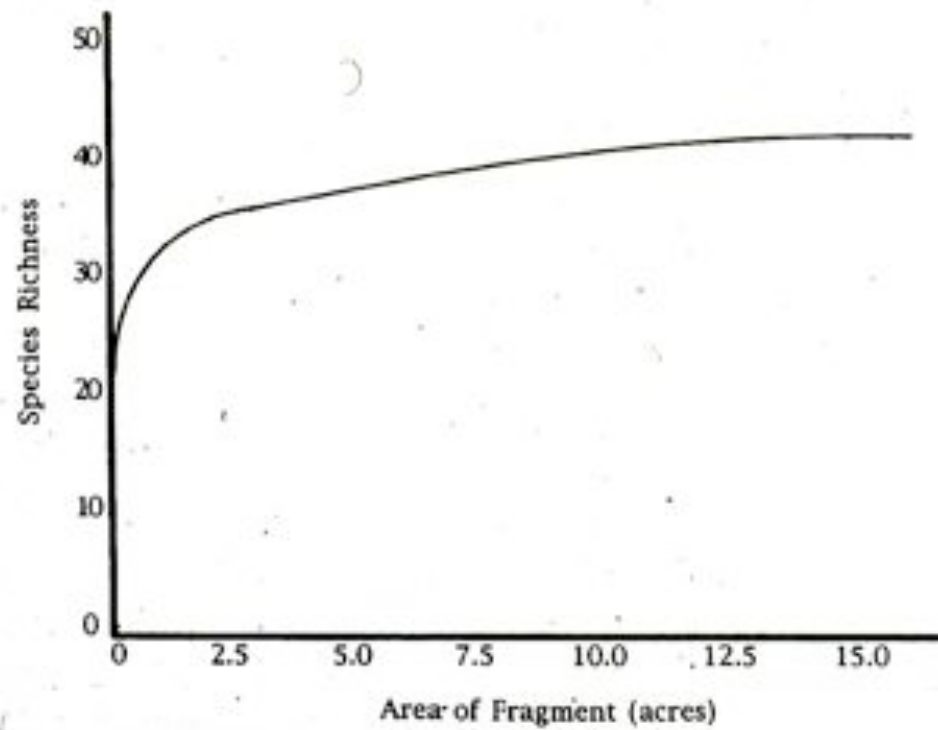
Correlation between Species Richness
and
Characteristics of Forest Fragments

Species Richness	Area	Perimeter	Canopy Cover	Litter Depth	Distance to Forest Edge
Total Species	+	0	-	0	0
Native Species	+	0	-	0	0
Exotic Species	+	+	-	-	+

Fuel Loading in relation to Fragment Size
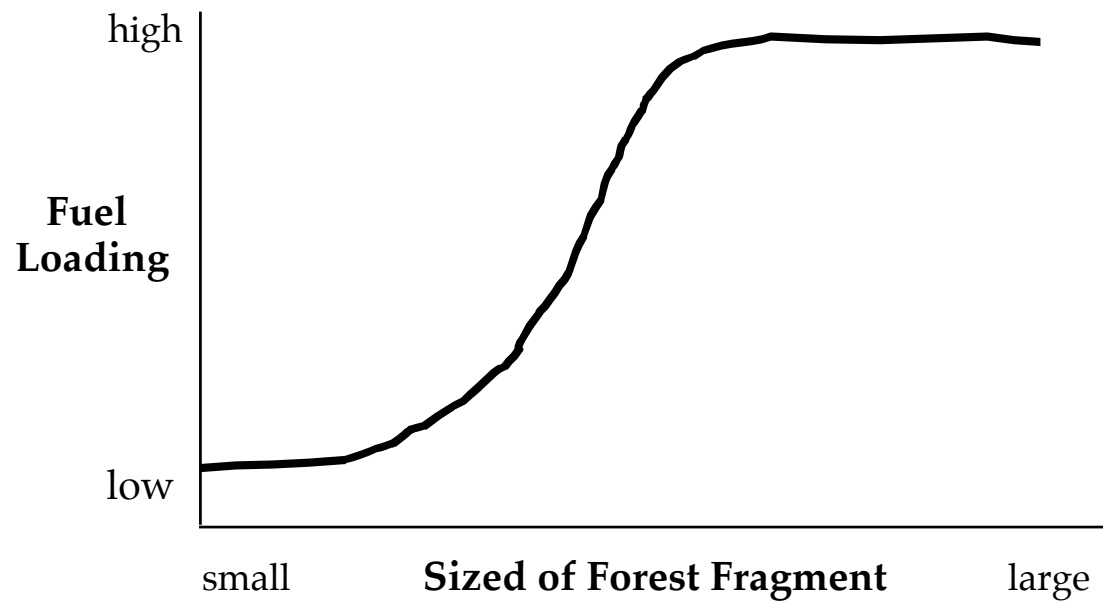
Small Forest Fragment

Large Forest Fragment

Factors contributing to changes in the forest

Staples arrives, trees and shortcut go

By Catherine Abel

Locals who live or work near the Y have long used a very short street for access between Highway 50 and James Street. That option is gone. The unnamed street is gone, subsumed into what will be the parking lot of the new Staples office supply store.

David Gay, operator for many years of the James Street propane facility, said he leased the property from CalTrans and built the street long ago for the convenience of his truck drivers. "Dave Gay Lane" was quickly adopted by other locals. "I've used it myself for 27 years," said David Kurtzman, owner of Aspen Realty.

Real estate law recognizes what is called "right of adverse possession," in which a road or footpath can become public property if it has been used "openly and notoriously," for at least five years.

The catch, says Dale Sare, a local attorney, is that such use must be "adverse" to the self-interest of the property owner.

But road-builder Gay made no attempt to prevent the public from using the road he built. And anyway, Kurtzman said, such "adverse possession" rules don't apply to land owned by the state—CalTrans, in this case.

Photo by Cory Hannaford

A tractor hauls away a 42-inch diameter Jeffry pine cut down to make way for a new Staples discount office supply store near the "Y".

"If this was a permissive use, the owner could withdraw that permission," said Dale Sare, a local attorney.

Since Staples' site plan provides for access to James Street as well as to Highway 50, Sare predicts that locals will incorporate its parking lot into their short-cut strategy, "like they do across the Mikasa property."

Another concern voiced by Y-area locals has been the loss of several large trees on the property. About six trees with diameters up to 42 inches have been felled. "TRPA approved it," said Kathy Wilson of the city's planning department. The rule against cutting live trees of more than 30 inches in diameter doesn't apply, she said, "if they're within the footprint of the building."

Eight trees of 14 to 24 inches have been taken down, with TRPA permission, from what will be the parking lot. Two remain. Other much smaller trees have been left around the perimeter of the lot as landscaping.

The store building, on the south end of the two-acre lot, will be approximately 140 by 160 feet. The parking lot is to have 74 spaces, four of them for the handicapped.

"They have their demolition and grading permits," Wilson said. "We expect the building permit (soon)."

Kurtzman said he agrees with locals who say there is not enough business to support two Y-area office supply stores. "It's a good thing, though," he said. "Both locations will be improved from what they were, and whichever one fails will probably be converted to another outlet store."

"I'm amazed that both are going forward," Sare said.

A rumor circulating around town that Office Depot will sell its under-construction building next to McDonald's on Hwy. 89 to Meeks Lumber is untrue, said Teri Jamin, city Public Services Director. "That lot is not big enough for a lumber yard," she said.

Trees offered for sale in Tahoe City and South Lake Tahoe

Species (and cultivars)	Number	Percent of Total
Total Number	110	100
Total Hardwoods	80	72.7
Native Hardwoods	3	2.7
Total Conifers	30	27.3
Native Conifers	5	4.5

Tree Species Composition

Natural Forest

Developed Lots
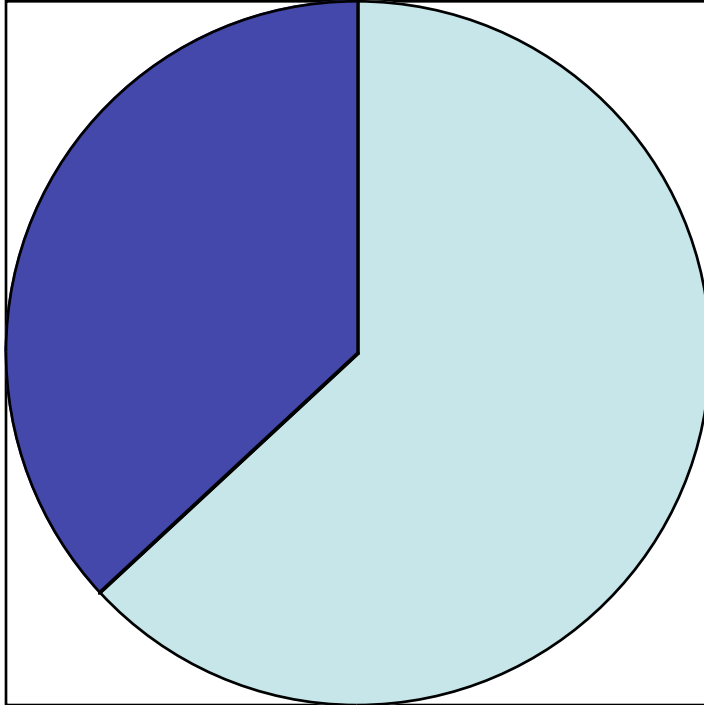
- Conifers
- Hardwoods
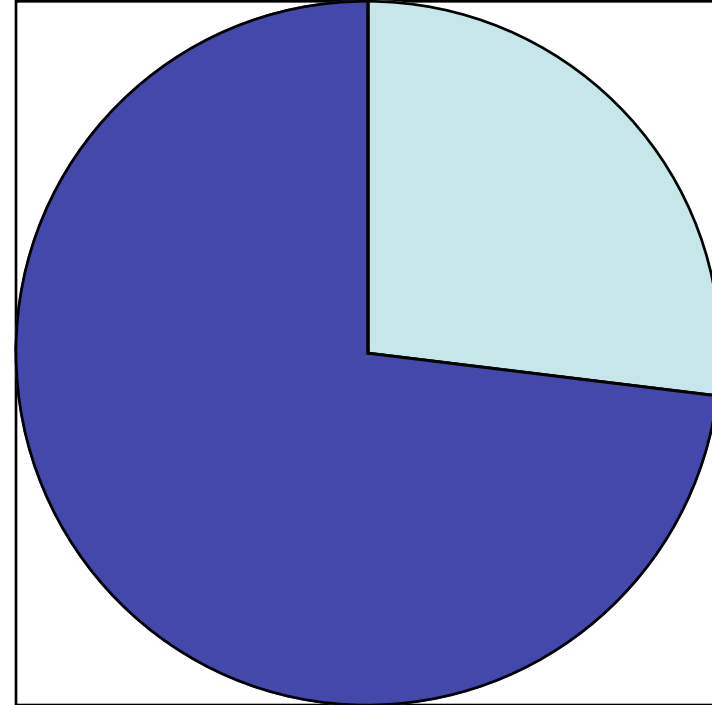
Landscape Design Characteristics of Nursery Trees

Characteristic	Number	Percent of Total
Fall Color	40	36.4
Evergreen	31	28.2
Showy Flowers	28	25.4
Edible Fruit	10	9.1
Fire Hazard	70	63.6

Future Characteristics of the Lake Tahoe Urban Forest

Unburned Areas

Alternative Scenarios for Burned Area

Future Characteristics of the
Unburned Lake Tahoe Urban Forest

a. Species Composition

      Confer ------> hardwood

b. Canopy Cover

      High---------->Low

Tree Density

      High---------->Low

d. Fire hazard

      High---------->Low

Alternative Scenarios for Burned Area

1. Unassisted Recovery of Vegetation
2. Restoration of Pre-fire Urban Forest
3. Vegetation Management to reduce Fire Hazard

Jacksonville, FL

The Red Shirt, Winslow Homer

Great Jacksonville Fire, 1901

Jacksonville, Fl - 2005

Future Considerations for the Tahoe Urban Forest

What do people want?

How can these desires relate to the

ecology of the Tahoe Basin?

What does Tahoe need?

"Malls"

-Jessica Barackman, 10
South Lake Tahoe

"More stores. Maybe a Walmart or Mervyn's. Those types of stores."

-Judy Romero
South Lake Tahoe

"A lot more happiness, harmony and mutual respect among drivers."

-Annamarie E. Wyatt
South Lake Tahoe

"More places for minors to hang out. A place to go where we don't get yelled at."

-Katie Salberg
South Lake Tahoe

"More free recreational opportunities for kids — soccer fields, racquetball, roller skating, that kind of thing. There's no place for kids."

-Terri Senteio
South Lake Tahoe

How can these desires relate to the ecology of the Tahoe Basin?

Fire hazard and plants

Water requirements of plants

Nutritional requirements of plants

Fire behavior

End

Species Composition of Natural Forest and Nursery Trees

Tree Type	Natural Forest (%)	Nursery (%)
Conifers	63.2	27.3
Hardwoods	36.4	72.7