

An Agroforestry Model for the Napa Valley



WHERE RIVER RESTORATION MEETS AGRICULTURE

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9-26-13



Agroforestry

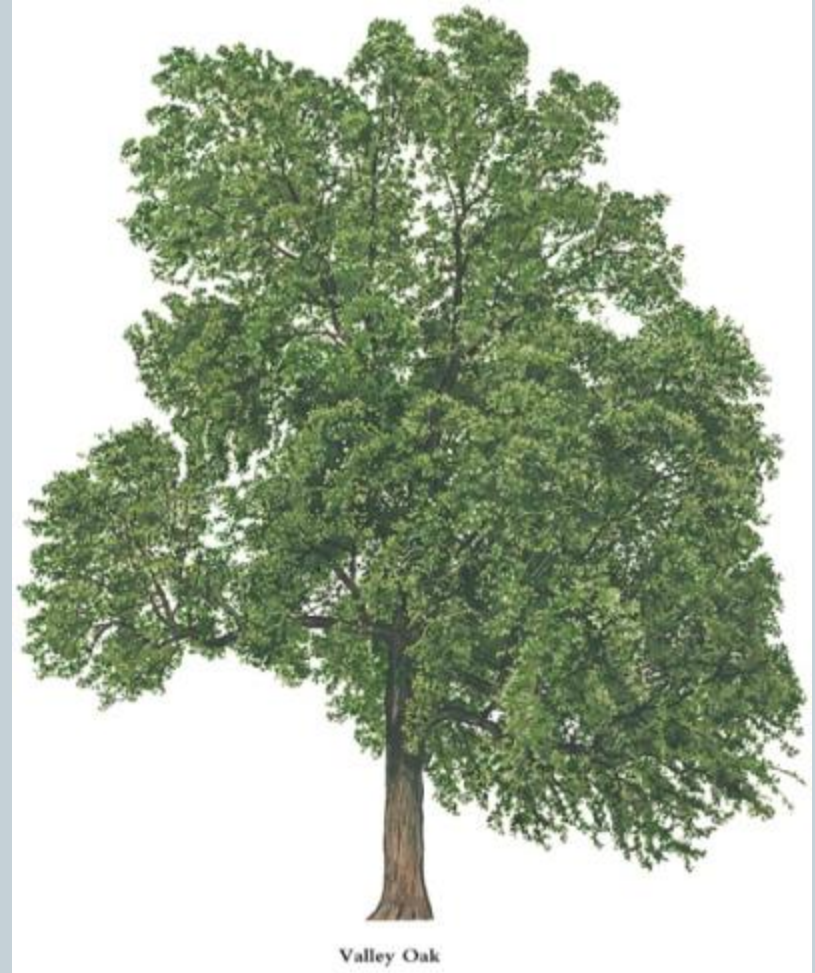


“a dynamic, ecologically based natural resources management system that, through the integration of trees in farmland and rangeland, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels”

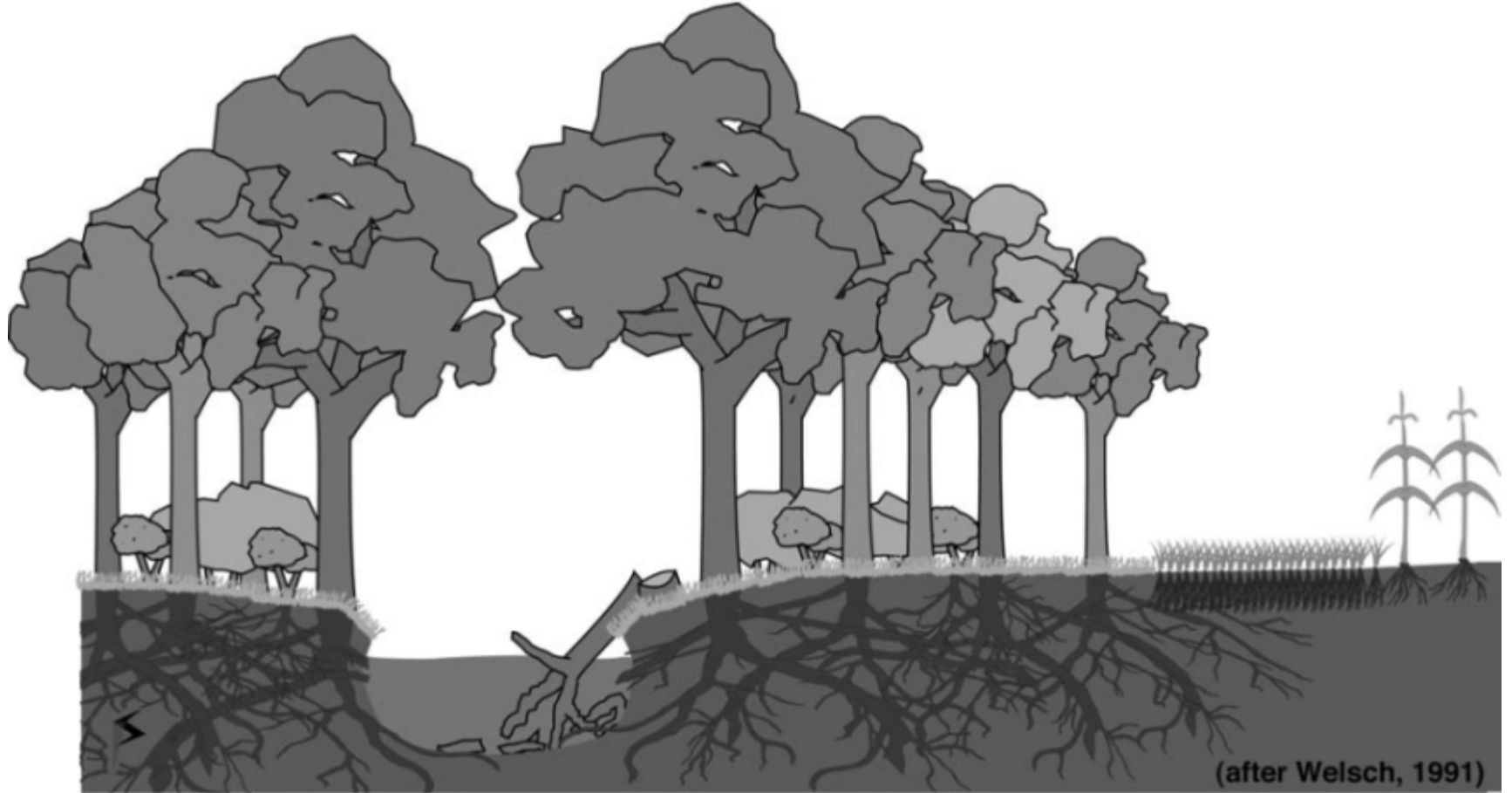
*International Center For Research in Agroforestry (ICRAF)
and World Agroforestry Center (WAC)*

Agroforestry Practices

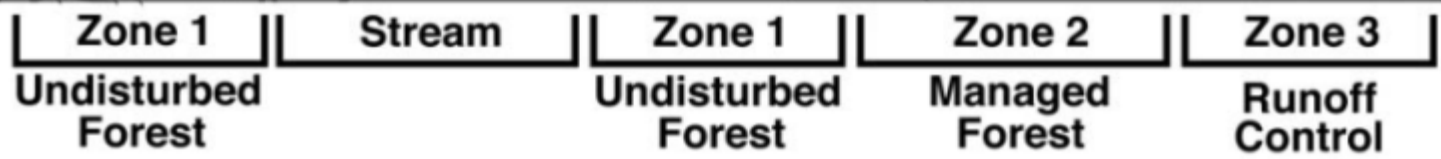
- Alley Cropping
- Forest Farming
- Silvopasture
- Shelterbelts
- Windbreaks
- **Riparian Buffer**



Riparian Forest Buffer



(after Welsch, 1991)



Ecosystem Services



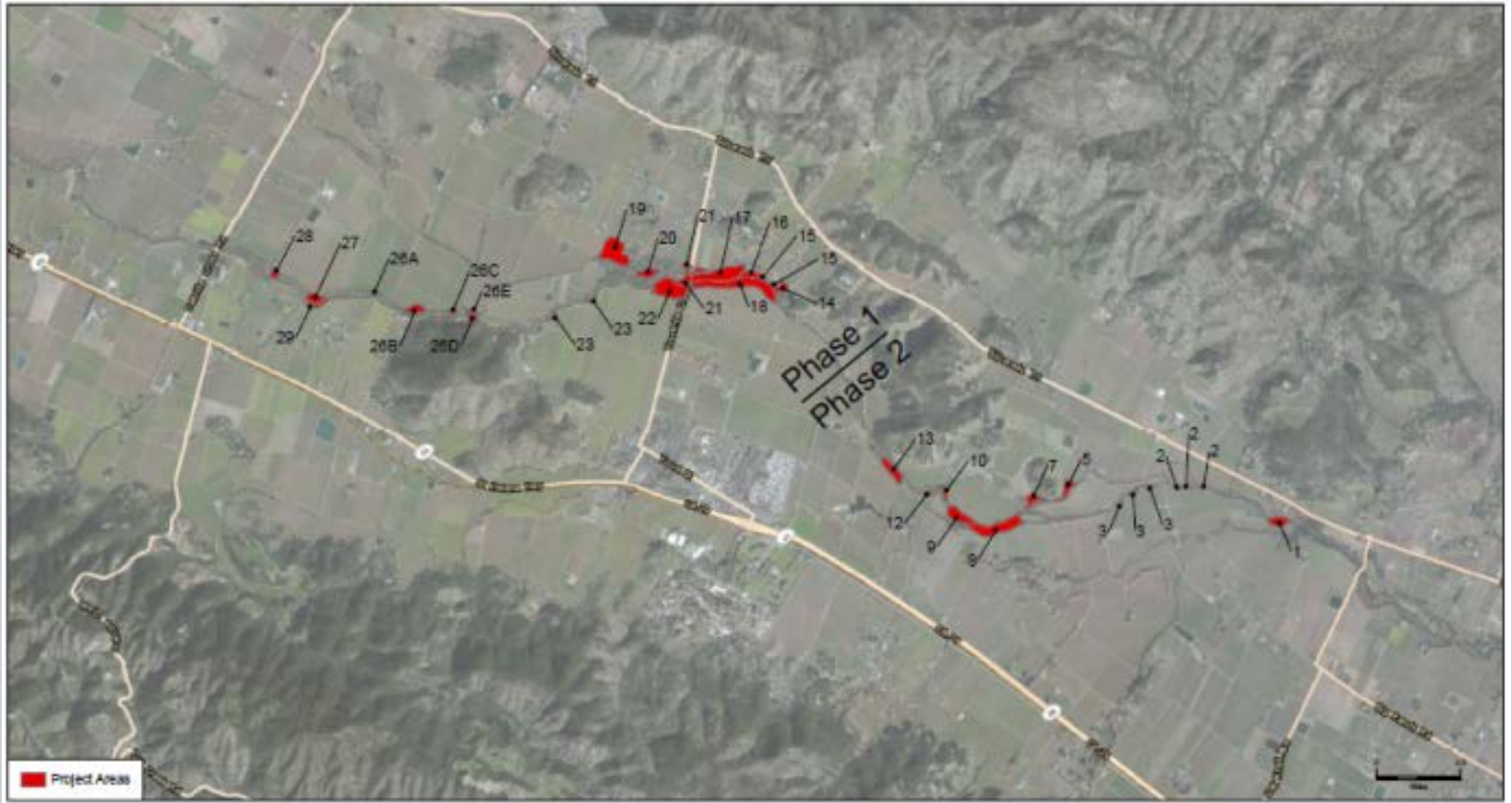
1. Carbon Sequestration
2. Air Quality Improvements
3. Water Quality Improvements
4. Erosion Control/Bank Stabilization
5. Wildlife Corridors/Biodiversity Conservation
6. Rain Water Interception/Reduce Peak Flows



Napa River Existing Conditions



Oakville to Oak Knoll Restoration



Managed Retreat Concept

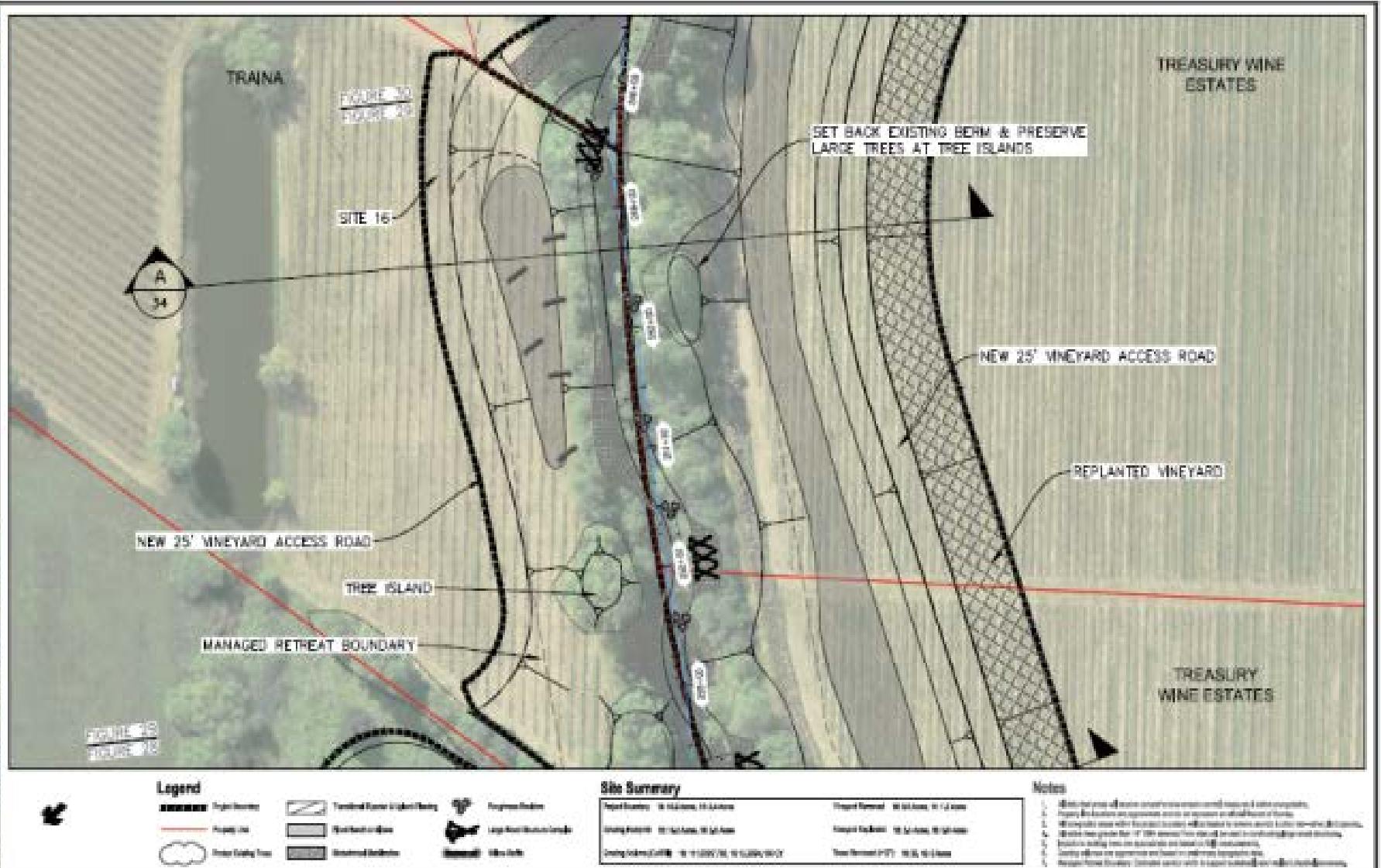
Passive Restoration



MANAGED RETREAT BASED ON RESTORATION AREA 23



Active Restoration





The Ecosystem Services of Truffle Cultivation



700 Valley Oak (*Quercus lobata*)

Size	Total Rainfall Interception GAL	Carbon lb Sequestered/ Stored	Air Quality Benefits				
			NO2 lb Deposition/ Avoided	PM10 lb Deposition/ Avoided	SO2 lb Deposition/ Avoided	O3 lb Deposition	VOC lb Avoided
1-3 in DBH	34,208	8,045 / 9,730	0.0 / 2.0	0.3 / 0.5	0.0 / 1.0	0.0	.2
3-6 in DBH	222,925	43,647 / 146,926	0.4 / 13.4	2.1 / 3.3	0.1 / 6.8	0.9	1.7
6-12 in DBH	645,994	111,395 / 736,273	4.3 / 36.3	10.7 / 8.9	0.8 / 18.4	9.8	4.6
12-18 in DBH	1,342,172	200,756 / 2,326,317	25.1 / 61.6	45.5 / 15.3	4.9 / 31.8	57.2	7.9

100 Acres-20,000 Oaks Trees

12-18 in DBH	38,345,841	5,735,599 / 66,462,889	718 / 1,760	1,300 / 435	140 / 908	1,633	225
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Closing Thoughts

- **Napa Climate Action Plan-requires 30% reduction of green house gas emissions by 2020 (377,120 metric tons)**
 - 100 Acres/20,000 Oak Trees=66,462,889 lb/30,147 metric tons of Carbon or 8% reduction/mitigation
- **Napa River TMDL Implementation Measures & Objectives-Effectively attenuate significant increases in storm runoff, so that the runoff from vineyards shall not cause or contribute to downstream increases in rates of bank or bed erosion**
 - Mean Annual runoff at Oakville gauge is 150,900 ac-ft
 - 100 Acres/20,000 Oak Trees would intercept-38,345,841 gal/110 ac-ft or .07% of total runoff

