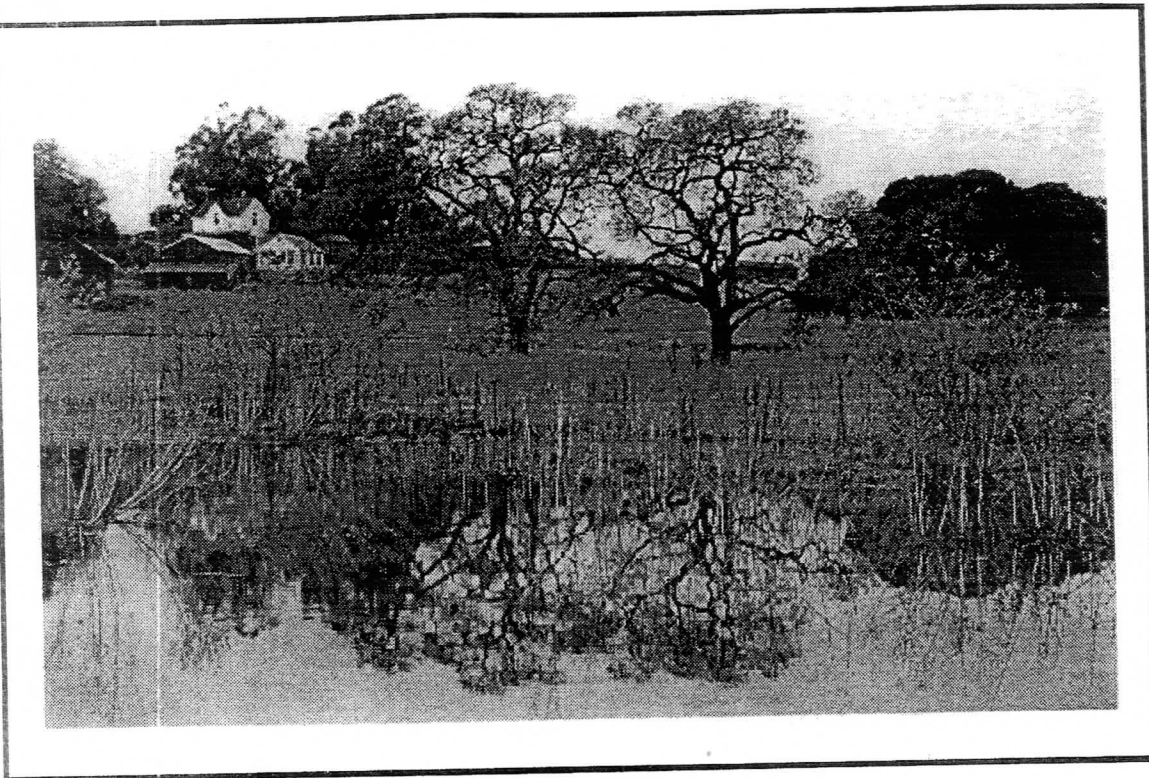


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Pg. 1



PREPARATION OF IMPLEMENTATION PLAN  
FOR  
LAGUNA DE SANTA ROSA

for

City of Sebastopol  
Laguna Foundation

By

Prunuske Chatham, Inc.  
Questa Engineering Corporation  
Ralph J. Alexander and Associates

April 1998

**QUESTA STUDY TEAM PRESENTATION AGENDA  
LAGUNA DE SANTA ROSA**

- Team Introductions

- Questa Engineering - Prime Contractor

- Civil Engineering/Hydrology
    - Site investigations (Soils/Hydrology)
    - Plans and Specifications

- Ralph J. Alexander and Associates

- Park Planning/Urban Design
    - Public Involvement

- Prunuske Chatham Incorporated

- Biological Site Investigations
    - Restoration/Enhancement Guidelines
    - Design Ideas Sounding Board

- Team Management Roles

- Jeff Peters - Questa

- Project Manager- Administration and Plan Guidance and Direction

- Study Team Contact Point
      - Site Investigations for Biology Enhancement

- Margaret Henderson, ASLA Questa

- Day-to-Day Issues and Research
    - Permits/CEQA Assistance
    - Preparation of Plans and Specifications

- Ralph Alexander - Urban Design/Park Planning Team Leader

- Public Involvement Coordinator

- Harold Appleton - Project Biologist/Forester

- Qualification, Issues and Approach

- Questa Engineering Corporation

- Qualifications
    - Approach Overview
    - Civil Engineering and Plans and Specs

- Ralph Alexander

- Qualifications
    - Public Involvement Approach
    - Urban Design Approach

- Prunuske Chatham

- Qualifications
    - Approach to Biological Restoration Design

- Summary

### **Community Involvement Approach**

- Field tours with agencies and interest groups
- Informal workshops and public presentations
- Post maps on wall at community center
- Utilize newsletters, newspaper articles
- Community involvement includes implementation and fund raising
- Utilize the "no surprises" approach to planning

### **Urban Design/Park Planning Approach**

- Identify/avoid sensitive areas
- Provide trail linkages that do not encircle habitats
- Use native plants, natural appearances for hard scapes
- Utilize fencing and planting buffer strips for sensitive areas
- Include flood proofing and flood maintenance in design
- Enhance view corridors and entry points
- Include educational experience in trail design
- Utilize a common design theme

### **Biological Enhancement Approach**

- Site investigations to characterize soils, hydrology, micro-climate, plant communities
- Reference area investigations to develop design criteria
- Research to develop criteria on:
  - Site requirements, growth forms and habitat values
  - Species and structural diversity
  - Stand density and canopy cover
  - Snags and downed woody debris
  - Genetic issues
  - Short-term establishment and long-term maintenance needs
  - Hydrologic based planting and maintenance

### QUESTA STUDY TEAM QUALIFICATIONS

- Non-traditional engineers, environmental hydrologists and scientists.
- Integration of engineering, science and landscape architecture.
- Small, hands-on firms with extensive senior staff involvement in projects.
- Locally involved firms with direct experience with Laguna hydrology/biology.
- Experience with resource-based planning, community involvement, and direction of volunteer groups and non-profit organizations.
- Completion of very similar projects including planning, permitting, construction documents, and construction inspection.
- Flexibility and adaptability to best meet your needs for professional services, including licensed professional staff.
- Proven commitment by senior staff and key investigators to see you project through to completion.
- Personal commitment by study team management to the ideal of a protected and enhanced laguna.

**TABLE III-1**  
**RECOMMENDED SPECIES COMPOSITION WITHIN**  
**RIPARIAN FOREST CANOPY STRATA,**  
**OAK WOODLAND, AND BRACKISH EMERGENT MARSH**

Strata or Habitat Type	Species	Species Composition Within Each Stratum
<u>Mixed Riparian Forest</u>		
Overstory (10%)	Red Tree Willow	35%
	Valley Oak	30%
	Coast Live Oak	10%
	Oregon Ash	10%
	California Bay	10%
	Buckeye	5%
		100%
Understory (60%)	Arroyo Willow	20%
	Red Tree Willow	20%
	Box Elder	10%
	Coyote Bush	10%
	Wild Rose	10%
	Toyon	5%
	California Blackberry	10%
	Grasses & Forbes	15%
	100%	
<u>Oak Woodland</u>		
	Valley Oak	75%
	Coast Live Oak	25%
	100%	
<u>Brackish Emergent Marsh</u>		
	Common Tule	80%
	Alkali Brush	20%
	100%	

**TABLE 2-1  
GUIDE FOR DETERMINING "N" VALUES  
FOR VEGETATION MANAGEMENT CLASSES**

CLASS	DESCRIPTION (WHR CLASS)	TYPICAL DENSITY TREES/ACRE	TYPICAL BASAL AREA/ CANOPY COVER	"n" VALUE*
1	Dense Thicket (Dense)	300-600+	BA > 100 Cover 80-100%	.091-.150
2	Closed Canopy (Dense)	200- 400+	BA 50-100+ Cover 80-100%	.076-.090-managed .080-.150-unmanaged
3	Park-Like (Dense)	120- 300	BA 30-50 Cover 60-79%	.060-.075-managed .071-.090-unmanaged
4	Moderately Dense (Moderate)	50- 150	BA 20-30 Cover 40-59%	.046-.059-managed .050-.070-unmanaged
5	Savanna-Like (Open)	10- 60	BA < 20 Cover 25-39%	.038-.045
6	Oak-Grassland (Sparse)	<10	BA < 10 Cover < 25%	.030-.037

\* Note: Typically use the lower "n" value for the lower BA or canopy cover range and the higher "n" value for the upper end of the class. Separate "n" values are given for managed stands, where selective thinning and limbing and removal of hazardous trees and downed woody debris has occurred. Consider also the extent of ground cover and shrubby vegetation. In extreme cases with dense ground cover and downed woody debris, increase "n" value by .02 to .05.

TABLE 3-2

**RECOMMENDED SPACING FIGURES FOR TREES OF  
VARIOUS DIAMETERS TO MEET ROUGHNESS CLASSES  
FOR SPECIFIED BASAL AREA**

DBH (Inches)	Class 4/ Moderately Dense Basal Area 30	Class 3/Park-Like Basal Area 50	Class 2/Closed Canopy Basal Area 80
4	11.2	8.7	6.9
6	16.9	13.0	10.3
8	22.5	17.5	13.8
10	28.1	21.8	17.2
12	33.7	26.2	20.6
14	39.3	30.5	24.0
16	45.0	34.8	27.5
18	50.5	39.2	31.0

\* Assumes trees are limbed up with no lower branches contributing to roughness and few shrubs on ground. Spacing figures not normally applicable for trees less than 2 inches or greater than 24-inches.

TABLE 3-3

**RECOMMENDED SPACING FIGURES AND NUMBER OF TREES PER ACRE FOR TREES OF VARIOUS SPREADS TO MEET WHR CANOPY CLASS GOALS**

**A. Heights, Spreads and Dbh of Native Trees**

	Height Range (feet)	Height Average (feet)	Spread Range (feet)	Spread Average (feet)	DBH Range (feet)	DBH Average (feet)
Oregon Ash	40-80	60	30-45	37	1.2-2.4	1.8
White Alder	40-90	65	35-50	42	1.2-2.4	1.8
Box Elder	25-60	42	35-50	42	0.5-1.8	1.2
Cottonwood	40-80	60	30-50	40	1.5-2.5	2.0
Big Leaf Maple	35-95	60	30-50	40	1.5-2.5	2.0
California Bay	40-80	60	45-75	60	1.5-2.5	2.0
Buckeye	15-40	37	30-55	42	0.5-1.5	1.0
Black Walnut	30-70	50	25-55	40	1.5-3.0	2.2
Red Willow	35-65	50	30-45	37	1.2-2.4	1.8
Arroyo Willow	13-25	19	15-35	25	0.3-0.9	0.5
Live Oak	30-75	53	60-80	70	2.5-6.0	3.5
Valley Oak	50-90	70	50-70	60	3.0-7.0	4.5

**B. Minimum Number of Trees per Acre/average Spacing Per Tree for Minimum Number of Trees**

Average Spread (feet)	Canopy Class 2 (20% Cover)	Canopy Class 3 (35% Cover)	Canopy Class 4 (50% Cover)	Canopy Class 5A (70% Cover)	Canopy Class 5B (90% Cover)
5	49.2/29.8	86.1/22.5	123.1/18.8	172.3/15.9	221.5/14.0
25	17.7/49.8	31/37.5	44.3/31.7	62.1/26.5	79.9/23.4
37	8.1/72.0	14.2/55.4	20.3/46.3	28.4/39.3	36.5/34.6
45	5.5/89.3	9.6/67.4	13.7/56.5	19.2/47.7	24.7/42.1
60	3.1/118.8	5.4/90.1	7.7/75.5	10.8/63.5	13.9/56.0
70	2.3/137.5	4.0/104.5	5.7/87.8	7.9/74.4	10.2/65.5

1. Heights, spreads and DBH compiled from a number of sources for trees at or nearing maturity at a good riparian site.
2. Assuming spread is equal to the diameter of the circle of shade formed by the crown of the tree, the number of trees per acre shown is the minimum number to achieve the canopy. Depending on the growth of the trees, objectives of achieving canopy cover rapidly, and expected mortality, it may be desirable to initially overplant the trees in clusters to allow for selective thinning and die-off as the trees mature. Densities can also be increased to reflect that canopies are seldom perfect circles and that in dense stands trees co-mingle and share canopy space at their margins.





# ORGANIZATION CHART

(KEY STAFF)

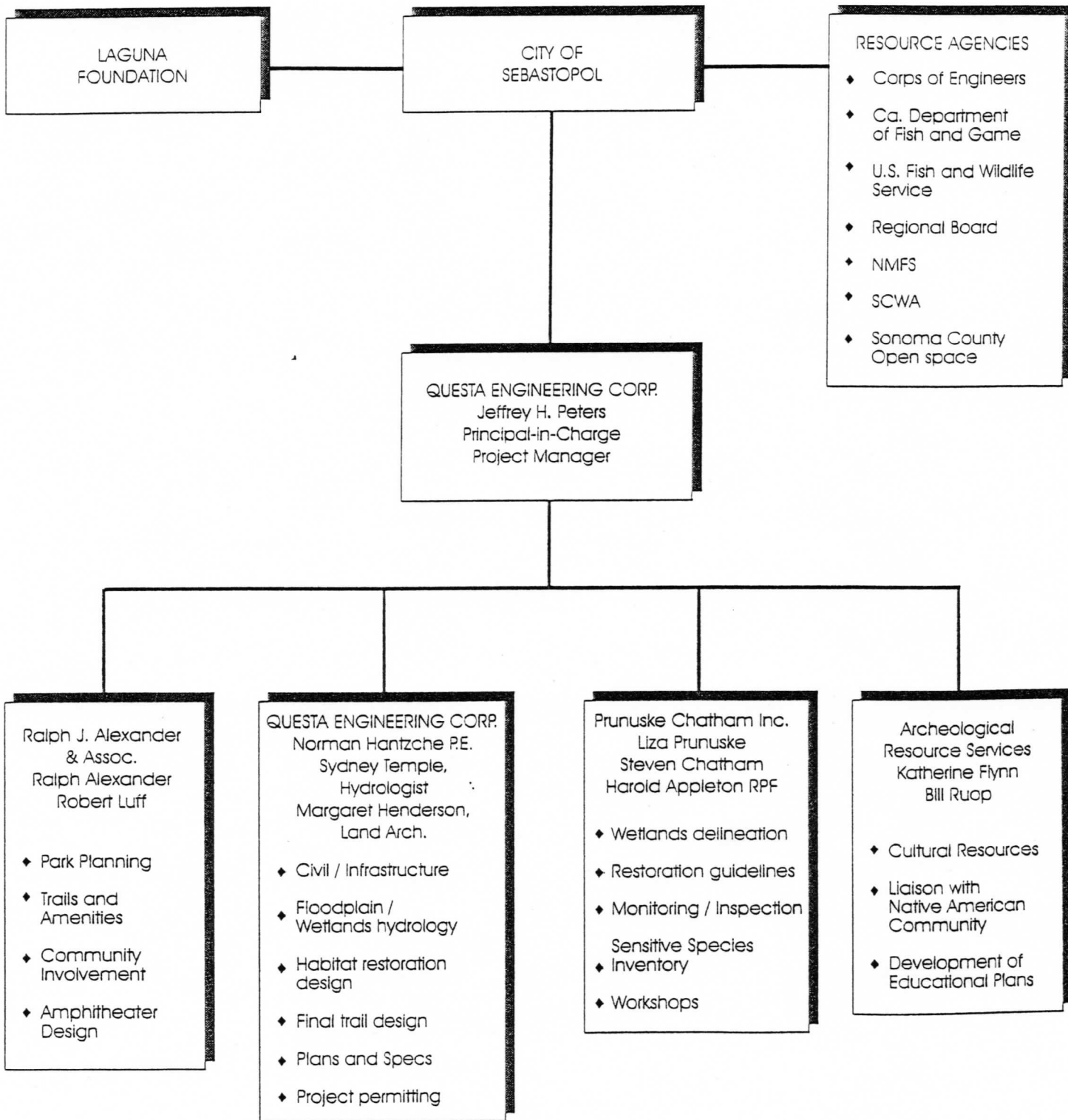


FIG 1