

Napa River - Living River Objectives

A Living Napa River

by Karen Rippey

The Goals and Objectives for a “Living” Napa River System, based on geomorphic, water quality and habitat considerations was completed for the Community Coalition for a Napa River Flood Management Plan on July 2, 1996. The document was developed by the “Water Quality/Fish Habitat” design review workgroup, co-chaired by Leslie Ferguson, San Francisco Bay Regional Water Quality Control Board and Jim Swanson, California Department of Fish and Game.

The document played a critical role in the final design of the Napa River Flood Management Plan because it provided the local community with a scientifically based reference document that could be used to guide project design.

A “living” Napa River system functions properly when it conveys variable flows and stores water in the floodplain, balances sediment input with sediment transport, provides good quality fish and wildlife habitat, maintains good water quality and quantity and provides recreation and aesthetic values. A “living” Napa River conveys equilibrium and harmony with all that it touches and resonates this through the human and natural environment.

One of the goals is for activities along the Napa River to use geomorphic principles involving river channel geometry and sediment transport dynamics, taking into account the differences between estuarine and riverine reaches. The overall objective is to maintain a long-term, sustaining river ecosystem that is a “living” Napa River system.

The following pages list the objectives for achieving a “living” Napa River system as defined in the Goals and Objectives for a “Living Napa River System” in the Napa River Flood Management Plan of July 2, 1996. If you would like to see the full document visit the Friends of the Napa River office or the Napa County Flood Control District office at 1001 Second Street, Napa.

From the June, 2000, River Focus, the Friends of the Napa River Newsletter.
Reformatted as a separate document in November 2002 (BK).

Napa River - Living River Objectives

NO.	OBJECTIVES	APPLICABLE
1.	Maintain or restore the river to a state of geomorphic equilibrium.	Geomorphic stability
2.	Maintain the natural slope of the River. The slope of the River should not be altered significantly by dredging or straightening.	Geomorphic stability
3.	Maintain the natural width of the River.	Geomorphic stability
4.	Maintain the natural width/depth ratio of the River.	Geomorphic stability
5.	To the maximum degree possible, maintain or restore the connection of the River to its floodplain. This should be of sufficient width to accommodate river meandering caused by naturally occurring flows	Geomorphic stability
6.	Provide sufficient setbacks to allow natural meandering processes.	Geomorphic stability
7.	Maintain channel features such as mudflats, shallows, a naturally uneven bottom configuration, and sandbars.	Geomorphic stability
8.	<p>Restore the river to a state of sediment transport equilibrium as follows:</p> <p>a. Upstream of Trancas (riverine):</p> <ul style="list-style-type: none"> • The amount of sediment entering and leaving the system should be equal. • Restore the natural relationship between the floodplain, riparian edge and River. <p>b. Downstream of Trancas (estuarine)</p> <ul style="list-style-type: none"> • Re-establish natural deposition rates. <p>This will require adequate flow and channel geometry, providing appropriate velocity, slope, width, and depth to transport the sediment load. The project should not increase the sediment load or alter the settling capacities of the sediment such that there is an increase sediment deposition South of Third Street.</p>	Sediment transport
9.	Quantify the overall sediment load to the system. Long-term watershed management measures should be determined to reduce the sediment load to the system to re-establish equilibrium.	Sediment transport
10.	Design a project that re-establishes a system in equilibrium and decreases upstream erosion rates, rather than relying on maintenance dredging to maintain the channel capacity.	Sediment transport
11.	Design a project that minimizes the need for erosion control measures such as rock rip-rap or other hard structure/materials.	Sediment transport
12.	Maintain seasonal flows of sufficient magnitude and duration to sustain channel morphology within a floodplain and sustain estuarine system components.	Flow and velocity
13.	Maintain adequate flows and velocities for sediment transport.	Flow and velocity
14.	Maintain velocities in the ranges that might be expected in a natural system.	Flow and velocity
15.	Identify measures throughout the watershed to increase infiltration and decrease stormwater runoff.	Flow and velocity
16.	Preserve the size and seasonally varying location of the null/entrapment zone and its ecological characteristics.	Dynamics of the null/entrapment zone

Napa River - Living River Objectives

NO.	OBJECTIVES	APPLICABLE
17.	Tidally influenced waters (South of Trancas) Minimum, at all times: 5.0 mg/L	Dissolved oxygen
18.	Cold water Fishery (North of Trancas) Minimum, at all times: 7.0mg/L	Dissolved oxygen
19.	All waters Minimum (three month median): 6.8-7.2 mg/l ⁵ (summer, 80% of saturation)	Dissolved oxygen
20.	Maintain or restore the river to a state of geomorphic equilibrium. This should eliminate the need for extensive ongoing maintenance dredging.	Dissolved oxygen
21.	Maintain or restore a riparian zone to provide shade for the River in order to reduce temperatures.	Dissolved oxygen
22.	Maintain or restore adequate low flows.	Dissolved oxygen
23.	Maintain adequate water velocity during low flow months.	Dissolved oxygen
24.	Maintain adequate circulation patterns.	Dissolved oxygen
25.	Maintain and decrease nutrient loading. Nutrients should not increase through discharge of dredge material or sediment resuspension; such that increased primary production occurs.	Dissolved oxygen
26.	Maintain water temperatures appropriate to the needs of the local biota.	Dissolved oxygen
27.	Water quality factors should not increase the total dissolve solids or salinity so as to adversely affect the location the entrapment zone, or beneficial uses of the River, particularly fish migration and estuarine habitat.	Salinity
28.	The project should not have any the following effects on salinity (seasonally or in worst case conditions such as summer low-flow or droughts): 1. Compress or alter the location of the null/entrapment zone; 2. Steepen the salinity gradient; 3. Alter the average salinity concentrations (seasonal); or 3. Alter the location of the seasonally varying upstream extent of salinity. 4.	Salinity
29.	The natural river/creek water temperature should be maintained.	Temperature
30.	Velocity, circulation patterns, and mass flow should not be altered in a manner that causes an increase in temperature.	Temperature
31.	Avoid increases in turbidity from dredging or other project activities that can cause an increase in water temperature.	Temperature
32.	Avoid creating thermal barriers to migration or movement by project activities (e.g., dredging).	Temperature
33.	Increases from normal background light penetration or turbidity should not be greater than 10% in areas where normal turbidity is greater than 50 NTU.	Turbidity

Napa River - Living River Objectives

NO.	OBJECTIVES	APPLICABLE
34.	The flood control project should not: <ul style="list-style-type: none"> • Increases sedimentation rates in the lower River (below Trancas), • Increase bank and bed erosion upstream or in the tributaries, • Cause resuspension of sediments from dredging, • Increase algae growth. 	Turbidity
35.	All waters should be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental responses in aquatic organisms. Detrimental responses include decreased growth rate and decreased reproductive success of resident or indicator species (See San Francisco Bay Regional Water Quality Control Board, Basin Plan for specific numeric limits).	Toxicity
36.	The project should not result in the release or discharge nitrates and phosphates in concentrations that promote aquatic growths to the extent that such growths cause a nuisance or adversely affect beneficial uses.	Nutrients/Algae Blooms
37.	A recommended maximum level for nitrate is 0.3 mg/l.	Nutrients/Algae Blooms
38.	The project should not result in a wide, shallow low-flow channel (this would result in increased water temperatures, causing increased plant growth).	Nutrients/Algae Blooms
39.	The vegetable transition zones should exist from the low water level to the upper floodplain. Each zone should be of sufficient width to sustain habitat complexity and ecosystem function. There are no set widths. Specific widths will vary with topography and bank slope. To create a self-sustaining river system, widths should be set by studying and mimicking natural conditions to the greatest extent feasible.	Vegetation
40.	Design a project that minimizes the need for erosion control measures such as rock rip-rap or other hard structures/materials.	Vegetation
41.	From saltwater to freshwater, the vegetation should exist in a linear uninterrupted continuum. This continuum should have the successional variation, diversity and structure to provide cover and habitat for a natural variety of aquatic and terrestrial life.	Vegetation
42.	No physical or water quality barriers to migration.	Vegetation
43.	Post-project conditions should include: <ul style="list-style-type: none"> • geomorphic features (e.g., meanders) that will foster development of varying water depths over mudflats, sand bars, pools; • graduation of depth from bank to bank; • presence of pools, low flow channels, mudflats, and sand bars, • banks at a slope and with appropriate substrate to support vegetation; • minimal maintenance dredging or other disturbances that eliminate structural complexity. • 	Vegetation
44.	Maintain seasonal flows in the Napa River and its tributaries that permit upstream migration, summer residence, and out migration of steelhead.	Vegetation
45.	Restore or maintain riparian and wetland habitat. Re-establish a linear continuum of vegetation and a buffer of sufficient width to protect plants and animals from human disturbance.	Wildlife
46.	Maintain mudflats and shallow areas.	Wildlife

Napa River - Living River Objectives

NO.	OBJECTIVES	APPLICABLE
47.	Restore or maintain a riparian corridor that is predominantly undisturbed by human activity. Minimal disturbance can be achieved by creating a trail system that is not located directly along the River banks in most places. Rather, the trail should be located a distance away from the River, with discrete access points viewing, fishing, etc. (Exceptions to this would be within the City Downtown area where parks, trails could be located as enhancements to that area).	Wildlife
48.	No physical or water quality barriers to migration	Aquatic species habitat
49.	The project should provide for a graduation of depth from the bank to bank.	Aquatic species habitat
50.	Maintain existing riffle:run:pool ratios in the upstream areas, and try to replicate this in the downstream areas. Maintain a low flow channel and gravel bars.	Aquatic species habitat
51.	Maintain geomorphic features (e.g., meanders) that foster continued development of varying water depths, pools, etc.	Aquatic species habitat
52.	Provide for sufficient cover for various fish life stages, particularly nursery habitat for steelhead and contiguous bank escape cover for out migrating steelhead smolts (wooden snags, rootwads, large rocks and submerged vegetation).	Aquatic species habitat
53.	Ensure conditions that create clean, well rounded gravel for spawning.	Aquatic species habitat
54.	Embeddedness less than 25%.	Aquatic species habitat