



# LANDSCAPE PERFORMANCE SERIES

## **Napa River Flood Protection Project – Napa, CA Methodology for Landscape Performance Benefits**

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### **Environmental**

#### **Expanded capacity of the river channel through the City of Napa by 13,000 cfs to 43,000 cfs to accommodate the 100-year flood.**

Napa County Flood Control and Water Conservation District provided the current flood capacity (43,000 cfs).

Previous flood capacity was sourced from: "Preliminary Analysis of a Geomorphically-Based Channel Design for the Napa River Flood Management Plan." by PWA & Associates, Ltd in September 1996.

#### **Restored 75% of the historic wetlands north of Butler Bridge, including 289 acres of brackish marsh, 324 acres of mudflats, and 112 acres of seasonal emergent wetlands, which has resulted in the presence of 71 species of migratory and resident birds observed onsite, including two species of interest, the Peregrine Falcon and the Burrowing Owl.**

Existing habitat acreages were identified by Stillwater Sciences on behalf of NCFCD in 2012. See above maps for details.

In 2004, the San Francisco Estuary Institute, in partnership with Friends of the Napa River and the Napa County Resource Conservation District began developing an atlas of the historical Napa Valley ecology. Included in their mapping were layers of the historical wetlands and tidal marsh areas, published in 2007 in poster format and available as a GIS dataset. In order to determine the ratio of existing wetlands to historical wetlands, the research assistant overlaid the existing wetlands on the historical wetlands in GIS and found the intersection of the areas.

In 2003, the Napa County Resource Conservation District, funded by the US EPA, initiated a volunteer-based wetland monitoring program to monitor birds, fish, vegetation and water quality at five sites in the Napa Valley – including the South Wetlands Opportunity Area (*Napa Wetland Monitoring Program, Draft Report, 2007*). According to this document, 69 bird species were identified during point surveys in the SWOA from 2003 to 2006. The following is a list of species identified:

1	American Avocet	44	Northern Pintail
2	American Coot	45	Northern Shoveler
3	American Crow	46	Pine Siskin
4	American Goldfinch	47	Red-shouldered Hawk
5	American Green-winged Teal	48	Red-tailed Hawk
6	American Kestrel	49	Red-winged Blackbird
7	American Pipit	50	Ring-billed Gull
8	American White Pelican	51	Rock Dove (Feral Pigeon)
9	American Wigeon	52	Ruddy Duck
10	Barn Swallow	53	Savannah Sparrow
11	Black Phoebe	54	Scaup Species
12	Black-bellied Plover	55	Scrub Jay
13	Black-necked Stilt	56	Snow Goose
14	Black-shouldered Kite	57	Snowy Egret
15	Blue-winged Teal	58	Snowy Plover
16	Brewer's Blackbird	59	Song Sparrow
17	California Gull	60	Tree Swallow
18	Canada Goose	61	Turkey Vulture
19	Caspian Tern	62	Western Bluebird
20	Cinnamon Teal	63	Western Gull
21	Cliff Swallow	64	Western Meadowlark
22	Common Raven	65	Western Sandpiper
23	Double-crested Cormorant	66	White-crowned Sparrow
24	European Starling	67	White-faced Ibis
25	Forster's Tern	68	White-tailed Kite
26	Gadwall	69	Willet
27	Great Blue Heron		
28	Great Egret		
29	Greater White-fronted Goose		
30	Greater Yellowlegs		
31	Horned Lark		
32	House Finch		
33	Killdeer		
34	Least Sandpiper		
35	Lesser Yellowlegs		
36	Long-billed Curlew		
37	Long-billed Dowitcher		
38	Mallard		
39	Marbled Godwit		
40	Marsh Wren		
41	Mourning Dove		
42	Northern Harrier		
43	Northern Mockingbird		

**Table 3.1-1.** SWOA bird list

Two additional “species of significance” were identified during non-survey periods, the Peregrine falcon and the Burrowing Owl.

The draft report describes the methodology for identifying birds as follows: “Bird surveys were conducted quarterly at all sites using a point count method adopted from the Point Reyes Bird Observatory (PRBO). RCD staff members were trained in the method by PRBO in 2003 and 2004. Volunteers with local bird identification expertise were recruited to collect data at each site. Survey points were marked with PVC pipe and steel rebar, and each survey location was recorded with a handheld GPS unit” (pg. 18).

Surveys lasted five minutes at each point and were conducted 15 minutes to 4 hours after sunrise, during the period when birds are most active. Survey data was collected at each point

four times a year (once a season) from 2003 to 2006 (Appendix A, Draft Report). For additional details on the methodology used, refer to Appendix A of the *Napa Wetland Monitoring Program*.

#### Sources

- Interactive Vegetation Map:  
<http://geo.stillwatersci.com/maps/napa/vegetationmonitoring2012.html>
- SFEI Historical Ecology Atlas: <http://www.sfei.org/NapaRiverHE>
- SFEI Napa Ecology Poster, 2007:  
[http://www.sfei.org/sites/default/files/SOE07HEposterBeller\\_finalHiRes%201.pdf](http://www.sfei.org/sites/default/files/SOE07HEposterBeller_finalHiRes%201.pdf)
- Napa Wetlands Monitoring Program Report, 2007:  
<http://www.naparcd.org/documents/NapaWetlandsMonitoringProgramFinalReport.pdf>

#### **Social**

**Engages an estimated 575 volunteers in a given year in restoration and education projects at the South Wetlands Restoration Area through bi-annual community engagement events, semi-monthly school events, monthly group events, and occasional corporate events.**

According to the Napa County Flood Control District, multiple stakeholders are engaged in volunteer activities throughout the year. While the Flood Control District does not keep tallies of volunteers, regular event participation is estimated as follows:

- Combined semi-annual events = 200 (The Earth Day Downtown Napa River Cleanup, one of two events included in this estimate, has been run by the Napa RCD annually since 2006. A look at the 2013 Earth Day Clean Up figures provided on the RCD website indicates that 95 volunteers participated in the event on the Napa River and Napa Creek in the downtown area this year, 45 participated at the South Wetland Opportunity Area, 46 at Kennedy Park, and 15 at Riverside Drive. A total of 201 volunteers participated in this single event, suggesting either that a larger number of volunteers than estimated are engaged annually in events on the Napa River, or that this number has increased annually.)
- bi-monthly school events:  $27.4 * 6 = 165$
- Monthly group events =  $12 * 12 = 144$
- Occasional corporate events = 60

Class size was determined by finding the average class size of all Napa Valley School District schools, excluding alternative education schools.

#### Sources:

- Napa County Flood Control and Water Conservation District, interview (May 31, 2013)
- Napa education statistics: <http://www.ed-data.k12.ca.us/>
- Napa County RCD: <http://www.naparcd.org/EarthDayRiverCleanup.htm>

**Galvanized more than 30 governmental and community organizations (ranging from the Chamber of Commerce, Napa Valley Economic Development Corp., Farm Bureau, and the Conference and Visitors Bureau to the Sierra Club, Friends of the River, and Land Trust, among others) and 400 individuals to articulate their environmental values, creating the “Liver Living Principles” that guided the development of the flood protection plan.**

The Living River Strategy provides a list of the key players in the Community Coalition. For the purposes of this document, those were the only agencies and organizations counted here, though other agencies and organizations may also have participated throughout the process.

**Restoration efforts have resulted in the integration of 2.5 miles of new, paved trail along the east bank of the Napa River into the currently developing San Francisco Bay Trail network. The Bay Trail will eventually allow for a continuous, 500-mile long 'recreational corridor' around the Bay. This corridor is currently 66% complete, and the Napa River Trail provides a small but significant link along the trail's northern edge.**

Trail length for the Napa River Trail was identified using GIS, working off the SF Bay Trail network map. Information on the SF Bay Trail is available publicly on the SF Bay Trail website. Additional trails, both completed and planned, associated with the NRFPP are listed in the sustainable features and were also measured using GIS.

Source:

- SF Bay Trail:
  - <http://www.baytrail.org/baytrailmap.html>
  - <http://www.baytrail.org/aboutus.html>

## **Economic**

**Resulted in the creation of 1,373 temporary building construction jobs and 1,248 permanent retail and administrative jobs related to properties developed in expectation of 100 year flood protection along the Napa River.**

According to the 2004 Keyser Marston Associates *Napa Jobs-Housing Nexus Analysis*, "New construction is uniquely important, first, as one of a number of parallel factors contributing to growth, and second, as a unique and essential condition precedent to growth" (pg. 6). Simplified, construction of new buildings and renovation of old ones creates jobs, thereby directly stimulating economic activities, and it provides space for new employment opportunities, without which, a city's economy cannot grow. The *Napa Jobs-Housing Nexus Analysis, 2009* lists the most recent employment density factors that allow one to determine the total number of permanent employees that will work in a building based on that building's square footage. These factors are based on the Napa Airport Industrial Area Market and Jobs/Housing Projections Update and county permit submittals, among others (see *Napa Jobs-Housing Nexus Analysis, 2009* for more information). Employment density for Downtown Napa was divided into three categories, acknowledging that buildings may be multi-use. Building square footage was classified by its primary function as: offices, retail structures, or lodging.

- Offices: 250 square feet per employee
- Retail: 350 square feet per employee
- Lodging: 1 room (average of 500 square feet) per employee

Temporary construction jobs, on the other hand, are determined using the number of construction jobs created per \$1 million in capital spending (as per *Estimated San Francisco Jobs Created by Capital Spending, 2009*). In the case of downtown Napa, the EDD estimated 5 jobs per \$1 million capital spent. These jobs are only associated with the nine developments listed below. Jobs created to implement the Flood Protection Project itself have not been calculated.

To quantify the number of jobs created as a result of the Napa River Flood Protection Project, in 2011 the City of Napa Economic Development Division compiled a list of developments that had been built from 1999-2011 which would not have moved forward if it were not for the Project.

According to Jennifer LaLiberte of the EDD, these developments would have been economically

unviable or would not have been permitted by FEMA without the NRFPP due to their location in the 100 year floodplain.

Those developments are:

- Copia
- Napa River Inn/Napa Mill
- Oxbow Public Market
- Westin Verasa Hotel
- River Terrace Inn/Cuvee Restaurant
- Kyser Lui Williams block
- First & Main (Wiseman Building)
- River Front
- Winship Building

Below is the breakdown of building square feet and employees working there:

<b>Downtown Napa -- 1999 to present</b>				
<b>New Development = "X" new jobs</b>				
<b>Development Projects Built along Napa River / Creek</b>	<b>Office SF</b>	<b>Retail SF</b>	<b>Lodging # Rooms</b>	
<b>After Measure A</b>				
Copia	77,000	3,000	-	
Napa Mill / Napa River Inn	2,500	28,000	66	
Oxbow Public Market	-	23,000	-	
Westin Verasa Hotel	-	4,265	160	
River Terrace Inn / Cuvee Restaurant	-		106	
Kyser Lui Williams block	-	17,400	-	
First & Main (Wiseman Building)	20,000	10,000	-	
Winship Building Remodel	7,000	1,975	-	
River Front	30,000	44,000	-	
<b>Total square feet or rooms</b>	<b>136,500</b>	<b>131,640</b>	<b>326</b>	
<b>Divided by</b>	<b>250sf/employee</b>	<b>350 sf/employee</b>	<b>1 hotel room/employee</b>	<b>Total Employees</b>
<b># employees working at development</b>	<b>546</b>	<b>376</b>	<b>326</b>	<b>1,248</b>

Below is the amount of capital spending for each building identified above, and the resulting number of construction jobs estimated from that figure.

<b>After Measure A</b>	<b>Construction Value (total)</b>	<b>Temporary Construction Jobs</b>
	<b>Shell + Tenant Improvements</b>	<b>Assuming 5 jobs per \$1 million spent</b>
Copia	\$55,000,000	275
Napa Mill / Napa River Inn	\$16,700,000	83
Oxbow Public Market	\$12,219,500	61
Westin Verasa Hotel	\$100,000,000	500
River Terrace Inn / Cuvee Restaurant	\$6,000,000	30
Kyser Lui Williams block	\$3,000,000	15
First & Main (Wiseman Building)	\$5,393,975	27
River Front	\$75,353,800	377
Winship Building	\$1,000,000	5
<b>Total</b>	<b>\$274,667,275</b>	<b>1373</b>
<b>Temporary construction jobs created per \$1 million in spending = 5</b>	<b>1,373</b>	

Sources:

- Keyser Marston Associates, Napa Jobs-Housing Nexus Analysis, January 2009
- Estimated San Francisco Jobs Created by Capital Spending, 2009
- City of Napa Economic Development Division spreadsheets

**Cost Comparison Methods**

**Removal of contaminated soil from the Oil Company Area cost approximately \$20 million while sheet piling to cover the contaminated area would have cost approximately \$10 million. While the cost of soil removal from this area was higher in terms of dollars, the decision to remove the contaminants rather than isolate them was based on a desire to remain true to the living river principles and the ecological benefits that would stem from such a removal.**

Cost of removing contaminated soil was provided by the Napa River Flood Control and Water Conservation District. An estimate the cost of sheet piling was not provided, as the decision to remove the soil was related to the ecological benefits of doing so, as well as an adherence to the Living River principles guiding the project.

- Sheet piling (PZ-27) = \$1,475 per ton (including equipment and operator budget)
- $\$1,475/2,000 = 0.73$  cents per pound
- $0.73 * 32 = \$23.6/\text{sq.ft.}$
- Estimated 10 acres to be covered (based on area analysis of Oil Company Road Area)
- $10 \text{ acres} * 43650 = 435,600$  square feet

- $435,600 * 23.6 = \$10.3$  million

**The Napa County Flood Protection and Watershed Improvement Authority estimates that, after completion of all project phases within the city of Napa, the project cost will reach \$550 million. Floods have resulted in \$26 million in property damage annually throughout Napa County. This project will reduce, if not eliminate, flood damage within the city of Napa and downstream communities significantly in upcoming years. Furthermore, it has spurred over \$204 million dollars a year in economic activity through the development of currently under-utilized lots and will spur an additional \$390 million once the project is complete.**

Estimated project costs were determined by expenses up until now and work left to be done. Economic activity figures were determined using data provided by the City of Napa Economic Development Division. In 2005, the EDD performed an analysis of annual losses from properties under-utilized due to their location in the Napa River 100 year flood zone. This analysis determined that \$470.40 per square foot were lost a year, based on lost sales, tax revenues, rents, loans, bank deposits, property management fees, employee payroll, utility payments, and advertising revenue to local media. Using this figure, as well as the square footage of sites developed from 1999-2011, I came up with an estimate of economic activity that has been positively affected by the NRFPP until through 2011. I then subtracted the three sites that were developed between 2005 and 2011 (which appeared on both EDD property lists) to determine what sites cannot be developed until the NRFPP, or components thereof, is completed. Development of these lands will result in additional economic activity upon completion of the project.