LEVEE AS ARMATURE
TOWARD ART, ECOLOGY, AND COMMUNITY

A PUBLIC ART MASTER PLAN FOR THE SAN LORENZO RIVERWAY
COMMISSIONED BY THE SANTA CRUZ ART COMMISSION
CITY OF SANTA CRUZ, CALIFORNIA

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Art as Habitats

Map showing locations:
- Riverway Scroll
- Watershed & Floodplain Awareness
- Freeboard Saltates
- The Sycamore & The Redwood
- Gateway Plaza Landing
- Willow Harvest Festival
- Art as Habitats
After eons of erosion through the purisima formation sandstone, the meandering San Lorenzo River established a floodplain (Fig.1). Now the river finds a new course contained within a man-made context (Fig.2). This engineered solution calls for a new layer – a conversation with the containment – where art, community, and ecology find balance.
Introduction

“In 1999 the Santa Cruz City Council appointed the San Lorenzo Urban River Plan Task Force to update the San Lorenzo River Design Concept Plan and the San Lorenzo River Enhancement Plan. These plans needed updating due to the federal listing of the steelhead trout and Coho salmon as threatened species, the designation of the San Lorenzo River as critical habitat for Coho and steelhead, and because the U.S. Army Corps of Engineers flood control improvement project had begun construction (Fig. 3,4). The citizen-member Task Force was charged to undertake a planning process to develop programs and projects that would further enhance the habitat, safety, and aesthetics of the San Lorenzo River within City limits (Fig.5).”

—Excerpt from the San Lorenzo Urban River Plan

The intent of the Public Art Master Plan for the San Lorenzo Riverway, as stated by the Public Art Committee, is as follows: “The desired outcome of this project is to incorporate public art into the overall site and selected structures to enhance public awareness of the River, encourage appropriate use of the Riverway, interpret the social and ecological history of the River, and illuminate its present-day role as a multifaceted community resource. The public art elements are intended to create a unique sense of place, but not to compete with the River’s natural beauty or impede the functionality of the levee.”

Perhaps the penultimate solution to the flooding of Santa Cruz by the San Lorenzo River is to move the urban core back to the bluffs above the natural floodplain and allow the River’s natural meander to return. As it stands, the paradox between the San Lorenzo’s need to meander and the City of Santa Cruz’s desire to contain the River provides the impetus for this Public Art Master Plan for the San Lorenzo Riverway (Art Plan). The levee is the single most dominant man-made element in Santa Cruz, although it has yet to realize its potential as a key urban amenity. The San Lorenzo River is the reason for the city’s location; however, the river has yet to become re-established within its channelized predicament caused by the growth of the city. Artists, as creative thinkers, can provide important contributions that would be as poetic as they are pragmatic. This Art Plan is the vision and the armature providing the framework, approach, and dynamics between artist, community, and city. The foundation of the Art Plan is based in part on the purpose and goals stated in the San Lorenzo Urban River Plan (River Plan) and they should be considered companion documents.

This Art Plan is comprised of the following sections: The Public Art Making Process offers an approach for developing ideas and relationships between artist, community, and the city. The section Recommended Projects – First Phase introduces the first projects to be developed. Riverway Scroll is a distilled collaborative visualization set on the surface of the levee Riverway Path. Watershed and Floodplain Awareness and Global Gauge contextualize the levee regionally and globally. The next section, Recommended Projects – Second Phase, proposes an additional series of collaborative, approaches intended to establish a philosophical framework for future public art projects. Design Considerations is a series of observations that could provide design guidelines for amenities and utilitarian needs on future design collaboration among artists, designers, and the utility client. Finally, the Resources section provides important background references for prospective collaborators.
1. The Public Art Making Process

As stated in the San Lorenzo River Urban Task Force Plan, “education is paramount toward providing a foundation for understanding and supporting the San Lorenzo ecosystem.” Public art is a combination of public process and public education. Artists have increasingly become players in the designing of the public realm. This collaboration requires artists to conceptually “come out of their studios” and for the other design professionals to welcome the artist as an equal team thinker in the art of making public places (Fig.7).

Personal aspirations and public accountability create an exciting common ground for artists, agencies, and the community. As a provocateur, trickster, and healer, the artist can stimulate thinking as well as present a visually legible image with a disarming, poignant viewpoint (Fig.6). The life jacket becomes a metaphor as well as a prop, illustrating the needs for habitat protection at all levels of the food chain. Artists working in the public must be cognizant of the responsibilities and obligations inherent in shared space. The approach can vary from temporary to permanent projects, collective or individual efforts, site-specific or self-contained, and on rare occasions stand-alone pieces. Signature artworks are to be avoided. The implementation strategies range from artist initiated proposals, commissioned projects, and/or design-team collaborations. Collaborations among artists and historians, scientists, writers, and other design professionals are highly encouraged. This approach can open up the creative process and broaden the project’s scope. Design-team projects incorporating an artist from the outset provide both a seamless and cost-effective outcome. A larger pool of funding sources is available when an interdisciplinary team approach is taken for public art projects. From an administrative standpoint, it is imperative that the goals of this Art Plan are reviewed and integrated into future development projects in a timely manner. Lead time in selecting an artist is important. Make no assumptions about what the artists would want to do; allow them to assess the situation. The watershed is not contained by legal boundaries and, in turn, the artists engaged in comprehensive watershed issues should be allowed to assess the whole system.

Projects should develop incrementally so that artists, communities, and agencies can learn and grow concurrently. In this way, thoughtful, site-specific, and creative expressions can evolve into unique solutions. Public art requires a time commitment for all involved, especially to administer a successful program. Public art is on the frontline of community education, providing lessons in civics, art, and social actions.

6. Kathleen Abood presenting the Camp Paradise Life Jacket to City Council, Nov 27, 2001 and (right) Camp Paradise in the San Lorenzo floodplain

7. Embrace the River Design Charette 2002
2.1 Overview of First Phase

The levee is the single most dominant man-made feature within the City of Santa Cruz. Its pathway provides a ready-made armature for portraying a visual collection of concepts toward a healthy river ecosystem and rejoining the River with the community. The following three projects introduce the Art Plan and can be implemented within a short timeframe. These first projects, Riverway Scroll (2.2), Watershed and Floodplain Awareness (2.3), and Global Gauge (2.4), exemplify a process that is public, inclusive, and accessible, drawing on the talents of many collaborators toward developing an aesthetic and educational baseline. All three of these projects cross-reference each other and interconnect to create a bigger picture, drawing together floodplain, watershed, and global awareness. A possible tool to be developed concurrently could be a web site to educate and facilitate the intent of the Art Plan and present proposals and projects as they develop.

2.2 Riverway Scroll

The hardscape surface of the Riverway Path will serve as the canvas for this project through the collective layering of ideas by many artists and their collaborators (Fig.12). Over time, the contributions will create a dynamic accretion upon the surface of the Riverway Path, driven by scientific data, historical and human-interest stories, and a variety of points of view about what is seen and not seen as one journeys along the Riverway. This project has the potential of becoming a significant exchange involving scientists, historians, and artists — collaborating, commingling, and creating the serendipity of chance encounters and intentional connections. The chance encounter of a pedestrian meeting artists installing their work is to be encouraged. As one strolls (or scrolls) along the Riverway Path on repeated visits, new layers added since the last visit will be found and old layers of meanings rediscovered.

The two parallel Riverway promenades frame two independent yet interdependent journeys, set at one’s feet as the Riverway Scroll. On one side, there is the neighborhood, the native, and the passive. On the other side, there is the urban, the imported, and the active. Artists would be selected for their abilities to compose and portray an aspect of the ecosystem, habitat, poetic notion, natural or human-determined history, and the current and future state of the Riverway, floodplain, its habitat, and wildlife. These issues could be rendered illustratively or technically, or reinterpreted through a myriad of aesthetic viewpoints, and should be created by artists
Adapted at critical thinking, through the mediums of painting, drawing, stenciling, and paper cutting applied. A variety of anamorphic points of view, playing with perspective and illusion, could provide moments of clarity and abstraction to the text and images as pedestrians walk along the scroll (Fig.8-10).

Artists would have an opportunity to attend workshops to learn about ecological issues, available resources and opportunities for developing concepts, as well as learning about techniques for applying the medium. The suggested medium is an environmentally friendly and durable traffic marking paint, which is water based and already in use by the City of Santa Cruz. The images would last as long as the asphalt lasts, or until patching or replacement of the walkway surface occurs. The manufacturer would supply the paint unpigmented so that the artist can select and blend the appropriate color. Consideration will be given to natural oxides and pigments if appropriate. Glass bead impregnated paint provides a durable reflective surface similar to traffic paint. Traffic paint is formulated to resist wear for five to ten years.

At some point in the future, when it becomes necessary to patch or replace the asphalt walkway, the Riverway Scroll project could be partially or wholly covered, restated, reinterpreted, or transformed. This approach could provide a patch-work-quilt pattern language, which ultimately may become the dominant feature as the concepts presented in the Riverway Scroll transform in new ways. In the event of a major resurfacing of the walkway, other approaches could be considered and integrated into the surface during installation. These approaches will vary, depending on the walkway surface medium selected, and can range from embedding inlays (Fig.13,14). It would be important to bring an artist into the discussion early if any major resurfacing is planned for the walkway.

A distinctive and consistent visual reference denoting all levee access ramps throughout the system could be an effective identity approach (Fig.11). The surface of all levee ramps would be painted using the same techniques as the Riverway Scroll project, to create a “RampArt” with alternating black and white striping. Half of the width of the surface will be measured in metric increments, the other side in feet. This will serve as both an entrance marker to the levee and an indicator that this earthen form, the levee, is not a natural one but rather an engineered ramp against nature’s will. The alternating black and white has classical architectonic references as well.

**ACTIONS**

- In order to test concepts, mythologies, and facilitation approaches, for the full implementation of Riverway Scroll, a prototype or model consisting of a series of anamorphic paintings executed by a select group of artists would be applied to the walkway.
- Select and hire a coordinator and introduce this individual to the goals and process of the first phase project. Initiate the Riverway Scroll project with a select group of artists skilled in a range of techniques in order to develop approaches and prototypes.
- Send out a “call for artists, educators, and ecologists” to participate in a day-long workshop. The workshop would provide an opportunity for habitat specialists to present issues of ecological restoration along the Riverway corridor, and how best these findings could be reflected through the Art Plan. In addition, the workshop would introduce a variety of approaches and techniques applicable to the traffic-paint medium.
- Artists, and possibly their co-collaborators, would develop a proposal to be presented in a public forum/museum/gallery context with the intention to commission proposals.
- The public forum/museum/gallery and installation would provide an opportunity for artists and scientists to explain their concept and promote environmental concerns poignantly. Coordinate with the media and learning institutions as a form of educational outreach. This phase provides material which could be used on a web site.

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11. Two studies of “The Etruscan Steps” for the levee access ramps

12. Riverway Scroll studies (not shown anamorphically)
13. Embedded materials into asphalt

14. Terrazzo inlays
2.3 Watershed & Floodplain Awareness

At various auto and pedestrian entrances into the San Lorenzo Watershed, thresholds would be marked in a distinctive manner, for example, with striping across the roadway or adjacent signage (Fig. 15). This approach would create a highly visible reinforcement for watershed issues. This is similar to the fish stencil seen throughout Santa Cruz at storm drains, which states: “No Dumping, Flows to the Bay”. Another marker would proclaim entry into the next watershed as one leaves the San Lorenzo River Watershed (Fig. 17). Within the floodplain, a series of subtle yet consistent markings would reinforce the connection of the Riverway Scroll to the floodplain (now part of downtown Santa Cruz). Subtle markings showing the height of the last major flood (Fig. 18), the extent of a 200+ year flood within the City of Santa Cruz, projected water levels due to global warming would be part of a layered “discovery.” This would assist pedestrians in making a connection between downtown, the Riverway Scroll, and the River Plan. Other projects could include the casting of special “personal hatch covers” and other utility covers typically found in the street, which by their design would draw connections among the infrastructure, watershed, and floodplain (Fig. 16). The constant rediscovery of these system-wide elements by pedestrians, bicyclists, and motorists would reinforce the interconnected approach and intent of all three first-phase projects. Watershed projects would require collaboration with City and County agencies including their Art Commissions.

**Actions**
- Conduct workshops (coinciding with the Riverway Scroll workshop) with watershed and floodplain specialists, artists, and school teachers. Develop, select, and commission highly visible ways to communicate issues.
- Conduct media events during the process and installation of watershed and floodplain projects.
Previous studies suggest that the expected global warming from the greenhouse effect could raise sea level 50 to 200 centimeters (2 to 7 feet) in the next century or two. This is the first nationwide assessment of the primary impacts of such a rise on the United States: (1) the cost of protecting ocean resort communities by pumping sand onto beaches and gradually raising barrier islands in place; (2) the cost of protecting developed areas along sheltered waters through the use of levees (dikes) and bulkheads; and (3) the loss of coastal wetlands and undeveloped lowlands. The total cost for a one meter rise would be $270-475 billion, ignoring future development.

We estimate that if no measures are taken to hold back the sea, a one meter rise in sea level would inundate 14,000 square miles, with wet and dry land each accounting for about half the loss. The 1500 square kilometers (600-700 square miles) of densely developed coastal lowlands could be protected for approximately one to two thousand dollars per year for a typical coastal lot. Given high coastal property values, holding back the sea would probably be cost-effective.

The environmental consequences of doing so, however, may not be acceptable. Although the most common engineering solution for protecting the ocean coast—pumping sand—would allow us to keep our beaches, levees and bulkheads along sheltered waters would gradually eliminate most of the nation’s wetland shorelines. To ensure the long-term survival of coastal wetlands, federal and state environmental agencies should begin to lay the groundwork for a gradual abandonment of coastal lowlands as sea level rises. (Greenhouse Network)

2.4 Global Gauge

Two factors will eventually cause the San Lorenzo River Urban Levee to breach – the probability of the 200+ year flood and/or the possibility of rising oceans and higher tides due to global warming (Fig.19). Santa Cruz shares a common geography with other coastal cities and each needs to take a proactive stance on global issues.

For this project, a Global Gauge would be painted directly on the railroad trestle support column and adjacent to the two existing tidal gauges (Fig.20). This provides an ideal location for telling a story concerning the ramifications of global warming on coastal communities around the world. Many visitors pass by this and other columns as they discover the riverbed at ocean’s edge during low tide (Fig. 21). This project is one that lends itself to the writers and the storytellers. The point size of the text would be of a legible size, perhaps painted with the assistance of a sign painter. A website could have readouts of the tide levels already monitored by the City through an electronic device existing under the Laurel Street Bridge set to inform the adjacent pump station.

Actions

- Conduct a writers’ workshop to develop text and stories to correspond to the Global Gauge.
- Text and gauge should be painted directly on the west side of the railroad support column and be visible from the Riverway Path.
3.1 Overview of Second Phase

The following four proposals expand upon the First Phase projects and should be considered a catalyst toward continuing the goals of the Art Plan. All three proposals discussed here were conceived during the Embrace the River Design Charrette conducted by the City of Santa Cruz, SLURP, and the National Park Service in January 2002, and have since been refined in this Art Plan.

**Freeboard Saltates** (3.2) provides a sculptural stand-alone element and has the potential to be adopted as an amenity, catalyst, and pedestal. **Art as Habitat** (3.3) demonstrates the use of art within nature as nurturer and healer of habitat. The **Willow Harvest Festival** (3.4) combines art, culture, and ecology through a celebratory event.

3.2 Freeboard Saltates

Freeboard is "the distance between maximum [flood] and the top of [the levee]." (Fig.26)

Saltation is "a mode of transport of hard particles over an uneven surface in a turbulent flow of air, water, etc., in which they are lifted sharply up and accelerated forward by the flow, then fall back." [Oxford English Dictionary] (Fig.22)

Geological resistance and river persistence collate boulders, stone, and sand with the descending sizes dispersed by flow velocities. The choreography of this descending order of saltates from boulders to rocks to gravel and finally to sand would provide one of the first sculptural elements along the Riverway Path. Boulders, rocks, and stones would be sliced, polished, and set opposite each other as matched pairs on the two levees. They would be secured on a concrete pad adjacent to the Riverway Path at freeboard (Fig.25). Locating at or above the freeboard avoids the complicated jurisdiction of the Army Corps of Engineers (Fig.27). Saltates would be sited at specific intervals along the levee in descending size and geologic order. The first installation would be comprised of a split and polished boulder placed at the head of the project area near Highway One and integrated into the Pedestrian Bridge project. As the installations advance downstream, smaller boulders and rocks would be combined into a cast-concrete conglomerate with the top surface composed of sliced and polished stone to gravel. The polished surface elevation would be approximately 18 inches above freeboard with a footprint of 3’ x 3’, creating a reflective surface suitable as a pedestal, table, seat, and/or engraved surface. Seating would be encouraged...
because it would keep the stone surface polished (Fig. 23). The final element in this episodic journey would be the Purisima Formation Sandstone (saltates ground to sand and compressed) located at the mouth of the San Lorenzo River (Fig. 28).

The sandstone block would be engraved with geological and historical text including a reference to the amount of sand passing the alluvial floodplain to sea, and the eons taken to compress and uplift a new sandstone formation (Fig. 29). Rather than being gleaned from the River, boulder specimens would be acquired from bridge-excavation projects and sand/gravel operations within the watershed (Fig. 24).

The installation may need to be incremental as boulders are found and funding becomes available. Specimens would be stored (perhaps along the Riverway) until funding is in place for installation. The Freeboard Saltates project will have an appeal on a number of levels. A saltate may function as a pedestal for another’s art, or possibly a bench, a geologic record, a haiku palette.

**Actions**

- Locate source of sandstone block, large saltates, and potential future supply by notifying appropriate agencies. Locate and transport stone to stone-cutting facility. Establish a location along the levee for the temporary display (storage) of material.

  - Apply text to sandstone cube.

  - Provide footings for all saltates and install securely as saltates become available.

  - Provide future opportunities for embellishment of the saltates’ sawn surface.
3.3 Art as Habitat

The levee corridor can play host to a number of approaches for enhancing biological values of fish and wildlife river habitat. Habitat specialists need to collaborate with the artist in order to create a multifaceted solution. River habitat reports prepared for SLURP would serve as an important reference source and inspiration. Including advocacy groups such as the Santa Cruz Bird Club, Coastal Watershed Council, and the Santa Cruz Natural History Museum (to name just a few) can provide another level of expertise and support to the restoration of the ecosystem. Habitat artworks need to be made of biodegradable materials such as willow which exists in abundant supply. Willow structures would be designed and constructed in workshops to provide woven shade structure and habitat refuge (Fig. 33, 34). One example could be a flotilla of hand-woven willow islands in the shape of lifesavers, to be sited in the estuarine reach, that would provide a protected nesting habitat until they are washed out to sea during winter storms as a yearly offering (Fig. 30). These willow islands suggest an earlier time when the estuarine reach comprised a much larger aquatic habitat, including an island called Opera Island. There are a number of aquatic-habitat enhancement needs such as stream channeling and shade, log structures, and water’s edge vegetation (Fig. 31). Within the estuarine reach of the river, a complex balance of saltwater and freshwater stratum, with their varying levels of oxygen, may require a unique technological stop-gap sculptural solution to maintain a viable habitat until the estuarine (presently a portion of a parking lot) is returned to its natural ecological mission (see River Plan). What visual metaphors could artists bring to this solution? The log and boulder structures could become both metaphor and habitat enhancer. Logs offered up by the flooding watershed could be selected and anchored both for riverbed habitat and to reduce erosion along active embankments. The shock value of a sculpture such as a row of trees transformed into wetlands “planters” and parked on what is presently paved over wetlands can incite community thinking. Art is not always polite but can disarm using humor and satire. In order to be successful, these works of Art as Habitat need to work foremost as an asset to the ecological conditions and, like all habitat structures, be well constructed to withstand the forces of the River during flooding, be legible in its intent, and have a cohesive aesthetic.

The undersides of bridges are a good, untapped source for habitat development. Retrofitting old bridges and designing new bridges can provide habitat for birds, bats, and aquatic life that need a particular sense of security, light levels, and heat gain. Precautions need to be taken so that the enhancement of one habitat does not adversely affect another. One example would be to guard against bird guano introduced into the river when designing bird and bat habitats beneath bridges.

An exchange between artists sponsored by the Sister Cities program would provide another perspective for both cultures. What do our sister cities do about their flooding waters and river habitats? What festivals...
and cultural interface of theirs might relate to the river? What hydraulic approaches and technologies might we learn from? Why not unite cities faced with rising rivers and oceans into a global collective concern and create a new sister city relationship based on shared environmental concerns?

**Actions**

- Invite a series of lectures or an exhibition of work that is consistent with the goals of the Art Plan and that exemplifies Art as Habitat.

- Develop and advertise an ongoing series of workshops with habitat specialists knowledgeable with all three reaches of the San Lorenzo River ecosystem, with the intent to commission artists to create an artwork as habitat.

3.4 Willow Harvest Festival

The San Lorenzo Riverway provides a platform for community celebrations, fairs, and festivals that take place as ongoing events or special occasions. As the Riverway use increases and the Art Plan is implemented, substantive homegrown events will evolve. There have been successful festivals and fairs in Santa Cruz and there are lessons to be learned from them. The following recommendations serve as a starter, to tie in the utilitarian needs of River maintenance with that of the City’s cultural aspirations. A harvest festival of willow would be a good start.

Maintenance and stewardship of the San Lorenzo River, Riverway, and levee should be considered an opportunity for ritual or festival. The draft horse employed in the pulling of root balls in order to maintain flood capacity is a ready-made spectator event. The organized removal of willow should be seen as a harvesting of a resource. Ways and means need to be developed to find uses and markets for the willow products. Artisans could be encouraged to create willow amenities such as “living” seating and fences, as a way to honor Axel Erlandson, creator of the Tree Circus of Scotts Valley (Fig.32). Willow paper and pulp products, willow furniture, and habitat constructions could all provide items for a unique craft fair.

**Actions**

- Coordinate the removal of unwanted willow with the Willow Harvest. Consider the “harvest” a performance, which results in producing “product.”

- Harvested willow should be cut in such a manner as to be useful for the various needs of the willow craft. Provide a demonstration project that exemplifies the diversity of willow.

- Organize a workshop exploring techniques and aesthetics of willow fabrication. Invite artists working in the medium to show their work. (This workshop could be combined with the “Art as Habitat” workshop.)

- Provide an incentive, subsidy, and market for willow products. Including a popular vote for best of the show, include cash prizes. This event might take place at the county fair or farmer’s market.

- Site willow easels with willow paper along the scenic San Lorenzo River for watercolorists to paint waterscapes (using San Lorenzo River water to paint with). Coordinate a workshop for skilled watercolorists and ecologists to create a body of work for exhibit at a local venue.
GENERAL DESIGN
CONSIDERATIONS

The following is a set of design guidelines to assist the collaboration among artists, the City Public Works department, and other departments in creating utilitarian elements and amenities that reinforce the goals of the River Plan and the Art Plan.

4.1 Poetic Utility

The utility of the levee is the dominant aesthetic of the San Lorenzo corridor. Even the attempt to naturalize it with plantings cannot conceal its scale and purpose. This utility should be elevated to the notion of “Poetic Utility” to enable us to accept its presence and accompanying infrastructure as part of the aesthetic equation (Fig.16). The exemplary image of the Kwakutl stone pile driver, Shark Head, illustrates the poetic potential of art merged with utility (Fig.37). In recent history, during the Weimar and Bauhaus periods and the Depression era WPA projects, artists have been involved in public works projects. Some of the ideas to come from these were that “less is more,” that the sound of industrial machinery can be considered “music,” and that there needs to be a sense of uniqueness to give power to place.

Existing utilities include pump stations, head houses, valves, and pipes. To reinforce the concept of “Poetic Utility,” landscaping should not be used to hide utility structures. Rather, it should be used to enhance and complement their presence (Fig.35). The design of future amenities could also take its cue from this pragmatic approach (Fig.38-40). A "bucket brigade" actually performing the function of bailing water out over the levee gunnel could be one dramatic sculptural element which metaphorically reveals the purpose of the pump station infrastructure (Fig.36).

All utility compounds along the Riverway corridor should be equipped with solar power arrays to provide the pathway lighting. Sculptural pumping projects directly associated with the Riverway utilitarian needs should be budgeted by the respective utility to include an artist on their design team.

Existing sewer line

35. Wetlands moat
36. Existing primary pump station at the Laurel Street Bridge showing "bucket brigade" and Riverway Scroll studies
37. Pile Driver: Shark Head.
Salmon weirs were built across streams by the people of the northern and central coast, by pounding pointed stakes into the stream-bed with two-handed, heavy strikers. The crowning image of the pile driver is this shark head, a crest of the Eagle clan. The thumbs fit into the “eyes,” the rest of the fingers, on the other side, into “gill slits”.

A drinking fountain cooled by gray water. The gray water also waters native willow tree. Anaheim, CA. Buster Simpson.


40. Public restroom located over existing sewer line
4.2 Bridges

As density increases in the Santa Cruz urban core, the need for bridges, preferably pedestrian and bicycle bridges, will increase. Bridges present a visible civic gateway (as seen from Highway One for example) and a link, joining community and nature. Future bridges spanning from levee to levee, require structures that exemplify efficient and legible engineering principles (Fig. 44). Revealing these principles as part of the aesthetic should be the objective of the engineer and, in turn, embellished, not decorated, by the artist. During the 2002 Design Charrette “Embrace the River,” a concept was developed to strategically place saltates boulders as the needed counterweights for a new bridge designs (Fig. 41). This approach exemplifies the importance of early involvement of artist on design teams. The approved bridge proposal (April 2002) relies on a mass of concrete cantilevered beyond the fulcrum of the piling. The saltates could provide some of the needed counter-levered mass. Existing bridge structures over the San Lorenzo River have a commanding presence from various vantage points within the City, day or night. The addition of sentinel redwoods would mark the landings by day, efficient and distinctive lighting would entice the passage by night.

New bridges and the retrofit of existing bridges must reinforce a healthy river ecosystem that passes beneath. Bridges could provide habitats within their structural design (Fig. 42). The journey over a bridge should include amenities to encourage the observation of the ecosystem below. Shade canopies, sound focusing/listening stations, seating if space permits, interpretive signage, habitat and pedestrian-friendly lighting, plus socially conducing nodes (see River Plan) all play a part in the bridge-passage experience (Fig. 43). Like some of the famous bridges of Europe that support commerce, the bridges of the San Lorenzo could become “Bridges of Habitat.” Bridge landings provide another opportunity for habitat treatment, where above-freeboard space permits. The proposed addition of redwood groves to be planted on each side of every bridge, north of the estuarine reach, provide both habitat and aesthetic advantages. Lighting levels on all existing bridges should be lowered for both design and habitat concerns. Distinctive solar-powered light emitting diodes (LEDs) would provide a habitat-friendly, resourceful, and engaging illumination scheme for the bridges of Santa Cruz lightscape.
4.3 Lighting

Darkness is important for habitat, and the magic of the night should be part of the pedestrian experience. Viewing the Milky Way and the constellations of the heavens in an urban context is a rare treat. If lighting is to be installed, it should be directed at the Riverway Path, where it will do the most good. This foot-lighting approach would enhance the glass-bead impregnated paint used for the Riverway Scroll project to refract, creating a nighttime reflective scroll walkway. The City’s sustainable goals would be reinforced by the use of photovoltaic power to illuminate LED lighting (Fig 45, 46). A motion detector would be installed on each fixture along the Riverway to conserve power and create a cadence, as lights go on and off due to the rhythm of passing pedestrian movement. This kinetic light show would signal the existence of other pedestrian or bicyclist movement approaching. Off-the-shelf solar light products are cost effective and can be affixed to structures that could be designed to accept signage and other amenities the City feels necessary for public safety. Light pollution originating from adjacent street lighting and developments should be shielded or designed to eliminate light spill into the Riverway corridor. Ultimately, the whole lighting scheme for the Riverway corridor needs to be re-examined.

The head house fencing surrounding the valve access stations calls for an intervention such as an illuminating vector (Fig 47). If we continue to insist that they be concealed (revealing the plumbing would be the most straightforward approach) the structures should be more than just a screen.

4.4 Signage

One of the goals of the Riverway Scroll (2.2) is to function as a map, sometimes abridged and sometimes unabridged. In that way, a meaningful adventure could be gleaned as pedestrians and bicyclists experience and explore the Riverway corridor, floodplain, and watershed.

The open space of the Riverway should be left uncluttered, although some signage will be necessary for public safety, in which case, if possible, it could be clustered on existing or proposed structures, eliminating the need for more stanchions. It is possible that at some point in the future, some of the concepts first seen on the Riverway Scroll would be transformed into signage installation and meaningful way-finding devices through a new medium.

4.5 Amenities

Poetic utility, the sustainable use of materials, and the design-and-then-build approach provide a homegrown aesthetic for designing amenities to be placed along the Riverway. The homegrown public works (CCC or WPA of the 1930s) approach is preferred over the catalogued package. There are examples throughout Santa Cruz of vernacular solutions to creating public amenities (Fig 48, 49). The proposed Freeboard Saltates (3.2) will provide seating along the Riverway Path. The City has installed trash receptacles, plastic dog bag

45. Solar illuminary for the San Lorenzo Riverway. Solar power drives the LED or compact fluorescent fixtures which illuminate a reflector and bounce light onto the riverway. Construction would be stout, utilitarian, and sustainable.

46. Solar light tree / light fixtures could be direct or bounced off under reflective surface of solar panel.

47. Illuminated valve head house.

48. Early public works benches located in the Sycamore Grove in Santa Cruz.
dispensers and other elements on an as-needed basis. A representative from the City Public Works department design staff should attend workshops conducted by the Art Plan in order to coordinate future activities, sharing relevant issues and needs. Public works budgets could be augmented with art monies to enhance the level of design.

4.6 Public Access Nodes

As the city develops, the RampArt (Fig. 11) would be replaced by stairways and plaza entrances designed as part of the redeveloped waterfront. The distinctive black and white “measured” step motif could carry through into permanent materials, such as black and white granite, continuing to reinforce the visual icon of the RampArt and bring community to the river, perhaps creating a place called “The Etruscan Steps” (an aesthetic equivalent to the Spanish Steps of Rome) (Fig. 51).

4.7 Focus Sites

A number of special locations along the Riverway are identified in the San Lorenzo Urban River Plan (River Plan) as focus sites. These sites possess intrinsic qualities, for which suggested approaches are presented. The Art Plan embraces a process that does not specifically detail what these focus sites may look like. A combination of these two approaches, and ultimately the dynamics of time, will provide guidance in determining the appropriate spirit for these focus sites. As stated in the River Plan, the Riverway is a work in progress. The Art Plan considers it a work in process. Both are interdependent.
5.1 Gateway Plaza Landing

The original purpose of the Plaza Landing, located at the Gateway Center, became obsolete when the proposed bicycle/pedestrian bridge alignment was resited just to the north. Plaza Landing is located on top of the levee and overlooks both the adjacent shopping center and the riverine reach, where there is a significant willow habitat nurtured by the River. The parking area adjacent the levee could provide space for a variety of startup enterprises bringing needed diversity to the retail mix of the Gateway Plaza (Fig.53). This concept was developed during the Embrace the River Charrette. To begin with, inexpensive rentable space such as surplus shipping containers could provide space without the burden of a high financial outlay (Fig.54). Contextually, the shipping containers have provided the major retail anchors in this plaza their commodities. The regenerative cycle begins again.

The parking lot’s pedestrian pathway is on an east/west axis with the Gateway Plaza Landing. This pathway is at a low drainage point for the parking lot and provides an opportunity for a bio-mitigating allee of willow and fescue (which bio-degrade hydrocarbons from the parking lot) (Fig.52). Start up businesses should provide a focus on some aspect of the Riverway and its habitat such as bicycle rental facilities, willow craft/workshop space, and environmental outreach “club houses.” Seating amenities under the sycamore tree colonnade canopy (Fig.71) become animated with business and community activity, creating a populated Gateway Plaza Landing.
5.2 Laurel Street Stabilization

The face of the Beach Hill purisima formation sandstone cliff has stood in the way of the San Lorenzo River’s meander for eons. The recent levee alignment has intensified and channeled the River’s energy directly at this sandstone face and the roadway fill at its base. As a result, the landfill making up the Laurel Street roadbed along the edge of the bluff is eroding at a rapid rate and will eventually expose the utility infrastructure buried beneath the roadbed. As long as a roadbed is necessary, the battle with the River will continue, no matter what is placed there. Any plans developed for a stabilization wall should clearly reveal the materials used and the structural intent (Fig.58,60). If there is to be a veneer, it should be habitat based rather than simply cosmetic. This habitat veneer could be a precast product, designed with recesses sized appropriately to accommodate habitat, or provide mounting rings for a constructed “log jam” habitat (Fig.59). These and other intentionally designed “habitat footholds” along the proposed constructed wall will enable a thriving habitat to be re-established. At locations adjacent to the proposed bank stabilization project, there exist public works relics from an earlier era: an old riveted pipeline burrowing into the sandstone formation (Fig.65), a remnant of an earlier walkway with hand railing (Fig.56), architectural remnants and sections of hand-laid wall employed as rip rap (Fig.61), and a section of roadbed eroding away and revealing a multitude of layers beneath (Fig.57). These various relics are now part of the site’s archeology and as the pedestrian discovers these incidences and anomalies they provide a link to the recent past.

This erosion should be seen as a potential sculptural feature, one that can tell a story of time and the forces of nature at play. Somewhere along this edge, perhaps at the pedestrian plaza proposed at Liebrandt Avenue (Fig.55), conditions would allow this dynamic process to continue with its story of disintegrating and regenerating habitat. Allowing a small section of the plaza to naturally erode over time without compromising the structural requirements of the proposed wall would create a testimony to the River’s power when confronted with man’s interventions (Fig.57). In the future, significant architectural rubble could be added as needed as a sort of offering and habitat enhancement.
5.3 Purisima Formation
Sandstone Bluffs

The purisima formation sandstone bluffs stand out as a major unifying land feature that defines the limits of the floodplain of Santa Cruz (Fig.63). Future public and private developments adjacent to, and on, the bluffs, should not impose upon the bluffs. Many of these sandstone escarpments are hidden under a mass of invasive ivy such as the Beach Hill outcropping (Fig.62). The invasive vegetation should be removed from all the bluffs.

5.4 Stairways to the Bluff

Beach Hill Stairway provides one of the most spectacular views up the San Lorenzo River and of downtown Santa Cruz. The two existing stairways on Beach Hill at the terminus of S. Pacific Ave. at Front Street are lovely examples of early straightforward public works projects. The integration of the walkway into the sandstone formation, the interface of native sandstone walls with masonry walls where needed, and the use of pipe rail, set up a wonderful vernacular and ad hoc approach that should be protected and used as a model (Fig.66). The Beach Hill Stairway, which connects Cliff Street with the Laurel Street Extension, calls for rebuilding the formal stairway and making a strong formal connection with the proposed section of the Riverway Path. This stairway axis connection could continue down to the River’s edge as a seating wall and bulkhead (Fig.60), reinforcing the proposed concrete structural wall along the Laurel Street Extension.
5.5 The Sycamore Colonnade & The Redwood Sentinel

The choreographing of two native trees, the sycamore as a colonnade along the levee and the redwood as a sentinel grove located at bridge crossings would provide an inviting rhythm along the Riverway promenade and evolve into a legacy within 100 years (Fig. 67). The stately sycamore, often planted as a colonnade along riverside promenades, provides an inviting canopy of shade for pedestrians and habitat (Fig. 71). The colonnade of sycamores signals a formal, urban domestication of the native sycamore.

Starting at the Highway One Bridge, the colonnade would be planted on the outboard side of both levees, and extend south to the area of the transitional reach. There are locations where planting cannot occur, such as the spillway adjacent the residential trailer park. The sentinel grove of redwoods would signal a river crossing and create a node at a scale required to complement the bridge (Fig. 68).

The unique existence of the Santa Cruz native sycamore grove upriver from the Riverway provides a seed bank for the proposed colonnade of sycamores. A native sycamore nursery could be established on City property during the early years of propagating (Fig. 69). This nursery could be an educational feature adjacent to the Riverway. In the formative development of these young trees, a simple twist or grafting of the trunk would ultimately create a unique living sculptural element on the sycamore trunk colonnade. This approach honors the famous Scotts Valley artist Axel Erlandson who employed innovative grafting and forming techniques to create unique living sculptures from sycamores, which he called the “Tree Circus” (Fig. 70). The recently planted naturalistic landscape would be considered transitional, and by the time these trees approach the end of their life cycle, the sycamores will be of appropriate scale to transform the Riverway experience into a stately urban promenade.
ACKNOWLEDGMENTS
We are indebted to local organizations, including the members of the San Lorenzo Urban River Task Force and the Santa Cruz Art Commission, as well as city, state, and federal agencies who labored and lobbied, in order to stretch the regulatory envelope for the sake of thoughtful solutions toward a healthy San Lorenzo River ecology. This Public Art Master Plan is the beneficiary of their conviction and vision. It is now the hope that these visionaries can join and contribute with other artists to make a physical reality of what was talked about so long at meetings and on paper. The appendix of references is the result of their hard work and will serve as a technical reference.
THE RIVER IN ITS REGIONAL SETTING
Excerpt from the San Lorenzo River Design Concept Plan, 1987

Early Role and Functions
The San Lorenzo River flows approximately 25 miles from a steep forested watershed in the Santa Cruz Mountains to the broad floodplain in Santa Cruz, near its mouth at the Pacific Ocean. The drainage basin is relatively short and steep, and flows vary dramatically from summertime lows of less than 30 cubic feet per second (cfs) to over 30,000 cfs during peak winter floods. The estimated 100-year flood is 50,000 cfs in Santa Cruz.

Prior to the early 1900s, the San Lorenzo River coursed through a richly forested basin dominated by conifers, with alders, willows, sycamores and other riparian species clustered along its banks. The River wandered freely throughout the flat floodplain at its downstream end, upon which rests the City of Santa Cruz. Streams and abandoned channels functioned as marshy areas well suited to migratory birds and fish. The estuarine lagoon at the River mouth probably played an important role as a nursery or breeding ground for fish. Commercial use of the River was limited by the sandbar formed across the River mouth by ocean waves, and the only traffic along the River was driftwood. Though the San Lorenzo did not develop a strong tradition of use for commerce, navigation, and transportation, it has served recreational purposes. In its early history, recreation occurred in an informal and unplanned fashion along the banks and secluded backwater sloughs. In some areas, where builkheads were built, a more formal use of the River for fishing and promenading was possible. At the end of the last century, the River mouth became the site for the Venetian Water Carnivals, designed to promote the city and spur development. These carnivals were held twice, in 1895 and 1896, over a four-day period where the glamour and pageantry of early Venice was reenacted along the shores of the sea and River. During these events, the mouth of the River was damned to create a temporary lake and float a stage, and 10,000 people came to view performances from bleachers built along the banks of the River. At night, fireworks and lanterns created a festive setting, of interest to many and recorded at great length in the San Francisco newspapers.

History of Flooding and Flood Control Improvements
Flooding played a key role in the early history of the San Lorenzo River basin. Because of the hazards to life and property, early inhabitants, the Ohione Indians, settled in reed structures outside of the floodplain. The Spanish, who discovered the River in 1769 and named it for the day's saint, built their first mission along the banks of the River. When it was flooded, they prudently relocated to their present site on the bluff now called Mission Hill, which overlooks the River. Structures within the floodplain were kept to a minimum, and the lower reaches of the River during these early years were primarily used for cattle grazing, fishing, and recreation.

As the basin became more urbanized, structures located within the floodplain of the River were repeatedly washed away. For example, as early as 1862, historical record shows that high waters deposited the machinery of a paper mill some distance from its original location, at what is now Paradise Park. Since that time, floods have been recorded in 1869, 1890, 1895, 1909, 1911, 1931, 1940, 1941, and 1945. The most severe flood in recent history occurred in December 1955, when several weeks of heavy rainfall, combined with logjams and other channel obstructions, caused the River to overflow its banks from the headwaters to the mouth. Consequently, several people lost their lives, thousands were displaced from their homes, and $49 million of damage, in current (1987) value, was incurred to property.

To avoid repetition of the flooding experienced in the previous decade, the U.S. Army Corps of Engineers (COE) in the early 1950s began designing a flood control project for the city's River reaches. As this design was being completed, the 1955 flood occurred, causing the COE to modify its design to account for the higher flows. Additionally, local concerns about adequate space for growth downtown yielded a design goal of restricting the River to the narrowest possible path through urban Santa Cruz. The resulting $2.2 million project involved lowering the channel bottom, removal of vegetation, and construction of riprap banks and levees, extending from the River mouth two miles to the city's water intake at Tate Street. When the project was completed in 1959, it was turned over to the City for annual maintenance, which primarily involved dredging the channel bottom to its new depth, five to eight feet below sea level. After construction of the flood control project, City officials found that aggravation of silt in the channel was occurring at a more rapid pace than predicted by the COE, and at a much higher cost for dredging. For nearly two decades, the City and the COE were unable to reach agreement on the most cost-effective means to ensure flood protection. In this period, dredging was conducted only intermittently, mostly in the reach below the Highway One Bridge. Noting the large buildup of sediment that had occurred by the early 1970s, the State issued warnings to the City that flood protection was severely threatened. Flood capacity of the channel was estimated to contain flows of a 35-year magnitude, instead of the 100-year protection required. Additional study by the COE, at the City's request, indicated massive annual dredging as the only cost-effective solution. The City disagreed, arguing that dredging costs were prohibitive, and that even if dredged, the channel might silt in with an early season storm and then be inadequate for the rest of the rainy season.

Heavy storms in the winter of 1981-82 renewed incentives to add flood protection, and fortuitously provided significant data on high flows in the River. While the City was spared the disastrous loss of life and property suffered by the rest of the County in the early days of 1982, the lower River nearly flooded, and a portion of the Soquel Avenue Bridge collapsed due to undermining. In the aftermath, FEMA imposed floodplain regulations on an area that includes the downtown commercial core and 10 percent of the city's housing stock. Measurements of the bed levels before and after the storm revealed unexpected behavior of the River during the peak flows. Surveys showed that, after the waters receded, the level of the channel bottom was considerably lower than before the storm, contrary to expectations. Furthermore, stream flow measurements taken during high flows indicated that far more water was contained in the channel than predicted by the existing COE model, given the pre-storm level of silt in the channel.

Based on the substantial deviation of these findings from expected River behavior, the COE Waterways Experimental Station (COE-WES) was funded by Congress for a new investigation, “San Lorenzo River Sedimentation Study,” published in 1986. Simultaneously with the COE-WES study, the City contracted the services of its own hydrologist, Phillip Williams and Associates. The new empirical data, along with advanced techniques of computer modeling of River flows, revealed that high waters scour large quantities of silt out...
of the channel, re-excavating a considerable portion of the channel’s designed capacity. The extent of scour had not been recognized before because its effects are disguised when ebbing storm waters slow down and resume dropping their silt load in the channel, replacing much of what had been mobilized during high flow.

Taking scour into account, the flood control channel has significantly greater capacity than previously believed, even with the bed silted in. Additional modeling showed that improved passage of flood waters through the system could be achieved by removing constrictions caused by two of the bridges crossing the River. The low-arched Riverside Avenue Bridge raised the water surface elevation by as much as six feet during high flows. Correction of this, along with similar effects caused by the older portions of the Water Street Bridge, will just allow containment of the 100-year flood. Complete protection would be assured with the construction of a low flood wall adding 1-3 feet of height to the levees. Avoiding assignment of blame for earlier errors, agreement was reached between COE-WES and the City’s hydrologist that by modifying the two bridges and adding the flood wall, the flood control system would work without annual dredging. Cost/benefit analysis by the COE showed that, amortized over a project life of 50 years, the capital outlays for bridge and levee changes would be far less costly than maintaining the existing system. An alternative flood control system, based on these findings, opens up new opportunities for examining possibilities to improve the River.

RESOURCES

Related Reading

Natural Capitalism: Creating the Next Industrial Revolution
Paul Hawken, Amory Lovins, L. Hunter Lovins
Back Bay Books, 1999

Gaviotas: A Village to Re-invent the World
Alan Weisman

Speech Transcription – An Artist’s Perspective on Public Art Making
“Key Speaker Address” by Tad Savinar
Fresh Perspectives: Public Art 2002 Conference
Americans for the Arts Website, http://www.americansforthearts.org/global/print.asp?id=841

Technical & Related Reports on the San Lorenzo River & Levee

City of Santa Cruz Bicycle Transportation Plan 2000
City of Santa Cruz City, May 9, 2000

Pre-Design Report – San Lorenzo River Bicycle & Pedestrian Bridge
SGA Architecture, December 17, 2001

San Lorenzo River, CA - Communication from the Assistant Secretary of the Army
Chief of Engineers, Department of the Army, June 30, 1994

San Lorenzo River Design Concept Plan
City of Santa Cruz, June 1987

Lower San Lorenzo River & Lagoon Management Plan
City of Santa Cruz Redevelopment Agency, January 14, 2002
THE FOLLOWING IS A PORTFOLIO OF CONSIDERATIONS
The mass of the engineered concrete tetrapod would lay its weight to anchor the drifting tree trunks offered up from the San Lorenzo River Watershed. This is the dance between gravity and buoyancy, between tetrapod and the log, and between the Sumo Bear hugging the Steelhead. With each rise and fall of floods and tidal action, the tetrapod and log readjust to the hydraulic forces and the gain or loss of sediment. The "wrestling" of mass versus buoyancy and the shifting subtleties are intended to be observed over a protracted length of time. This displacement of the tetrapod's mass and the decomposing of the log is a dynamic performance to create habitat for the endangered Steelhead in the estuarine reach of the San Lorenzo River.

The tetrapods are typically used as breakwater structures and are found at the entry to Santa Cruz Harbor. The tetrapod will be modified to create the anatomical figure, "Sumo Bear". These sculptural elements will be placed in the San Lorenzo River in order to provide and enhance habitat as per the recommendations of the habitat specialists. In the context of a river bound by man made levees, the figurative tetrapod becomes both metaphorical bear and interventionist habitat anchor. In the mind's eye, the piece is about a time when there was a dynamic balance between natural systems. Perhaps the point will be made when viewing the precariousness of a tetrapod upon a log that we face a desperate point in our dance and that the steelhead is yet another canary.

Tetrapod Armor Units, 2003
Existing condition, breakwater, Santa Cruz Harbor. Army Corp of Engineers, circa 1980's
Tetrapod Armor Units, 2003
Detail, breakwater, Santa Cruz Harbor, Army Corp of Engineers, circa 1980's.
Severed street with exposed plumbing above Seabright Beach due to erosion. Road right of way is now a public pathway.
Regeneration, 2003
Laurel Street Extension, bank erosion condition should be considered a living feature illustrating the
dynamics of erosion and reclamation. The site possesses various attempts at stabilizing the bank from
erosion.
Historically, Opera Island was in the center of a large estuarine marsh, presently a parking lot behind the levee. The floating island of reeds and willow is a seasonal sacrificial habitat/sculpture providing sanctuary until future reclamation of the marsh.
Hill Climb, 2003
Archeological artifacts of past and present civic projects by Santa Cruz Public Works. Early vernacular projects incorporated modest materials such as standard plumbing fixtures as handrails, incorporating existing sandstone formations into the design, the use of native or modest materials. The approach had a feeling it was design on site. The contemporary approaches are more about economy and designed off site.
Studies for Gabions, 2003

clockwise from left
Gabionne di Marble Venus, 1993
Galvanized metal, marble, 28” high x 16” wide x 12” deep. Prototype as riparian riprap sculpture. Limestone/marble mitigates acidic pH waters. Private Collection.

Existing gabions as part of the levee project installed along the San Lorenzo River.

Automobile carcasses as river bank gabion riprap. Eastern United States.
Gabion to Consumption, 2003
Tapered shopping cart basket used as gabion framework. Tapered sides allow for configuration of serpentine and buttress bulkhead formations. The shopping cart is a cost-effective readymade gabion frame, and a recurring image along urban segment of the San Lorenzo River.
Sumo Bear Wrestling Steelhead, 2003
Modified concrete tetrapods (mimicking a Bear) anchoring logs (as if Steelhead) and providing marine habitat enhancement along the estuarine and transitional reach.
Sumo Bears Awaiting Steelhead, 2003

Concrete tetrapod anchors along the estuarine reach of the San Lorenzo River Levee, awaiting placement as floating logs appear in the estuarine reach. The sculptures take on the presence of figurative stewards awaiting purpose.
Sumo Bear Securing Habitat, 2003
Stabilizing floating logs in the riverine reach. In sight of the Highway One Bridge and the proposed Pedestrian Bridge.
Floodwater manipulated willow. A natural phenomena providing habitat along the channelized riverine reach.
Encampment, 2003
Riverside camp and midden along the San Lorenzo River.
Encampment, 2003
View of San Lorenzo River from El View Lodge.