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## Hydrology

### Title

C(re)ek-storation Community Collaboration Site: North Fork of Strawberry Creek by La Loma and Le Conte Avenues

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## C(re)ek-storation Community Collaboration

Site: North Fork of Strawberry Creek by La Loma and Le Conte Avenues

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Final Draft

Abstract: The aim of this paper was to design an urban creek restoration plan for the North Fork of Strawberry Creek in Berkeley, given both the ecological and social constraints and opportunities of the site for community collaboration. Community collaboration on even the most minor of urban creek restoration projects is significant for the socio-ecological resilience of the urban community. A case study of the Codornices Creek restoration project at the Ohlone Greenway facilitated by the Friends of the Five Creeks community group in 1999 was conducted for its potential relevance and application to the future of North Fork of Strawberry Creek. The lessons learned from this urban creek restoration project then informed the design of a restoration plan for a reach of the North Fork of Strawberry Creek on the property of Kingman Hall Student Cooperative to be begun in the Fall of 2011. This paper presents the preliminary design plan of the North Fork Strawberry Creek restoration project and recommends modes of facilitating and ensuring restoration resilience on the proposed restoration site. These recommendations include creating and connecting a greater network of stewardship along the North Fork of Strawberry Creek, and ensuring communication between on- and off-campus organizers throughout the Strawberry Creek watershed.

## I. Problem Statement

Urban creeks face challenges ranging from urban runoff, land use pollution, hydromodification and invasive species proliferation (Meyer, 2001). Recognition of the benefits of urban creeks to human and environmental health has yielded an increasing commitment to urban creek restoration. Community initiative provides great momentum for such projects. Community groups and individuals within the City of Berkeley (such as Friends of the Five Creeks), as well as the University of California Berkeley campus, are examples of organizations that can engage and facilitate such initiative. However the vision for Strawberry Creek is challenged by similar issues as watershed management and restoration everywhere (Charbonneau, 1992). Creeks and water know no boundaries. They cross jurisdictional lines and in doing so become vulnerable to the ebb and flow of community relations, including the

variable potential for collaboration.

Though well-meaning and well-implemented, urban creek “restoration” projects may find long-term sustainability allusive due to trial and error plant selection, lack of public knowledge and participation, disrespect of restored areas and an absence of means for continued stewardship and monitoring. Allowing creeks to connect communities (and vice versa) both ecologically and socially may be one such way to ensure persistent resilience of restoration



Figure 1. Strawberry Creek on UC Berkeley Campus  
source: strawberrycreek.com

efforts. In the context of urban watershed management and restoration, resilience is not only the ability of the ecosystem to withstand the challenges presented by urban forces, but also the strength and interconnectedness of a community network to engage in long-lasting stewardship.

This research paper uses an understanding of this social and environmental context to create a design for collaborative community “c(re)ek-storation” on a site along the North Fork of Strawberry Creek in the North Berkeley Hills (*Figure 2*). The site of restoration potential is located on a property owned by the Berkeley Student Cooperative (BSC), called Kingman Hall Co-op. Home to fifty students, the location presents opportunities and constraints for

collaboration. On the one hand, the existence of an intentional community with already-established modes for communication and education is a great asset and source for momentum. On the other hand, the setting presents challenges including the transiency of the community, as well as the after effects of recent retrofit reconstruction.

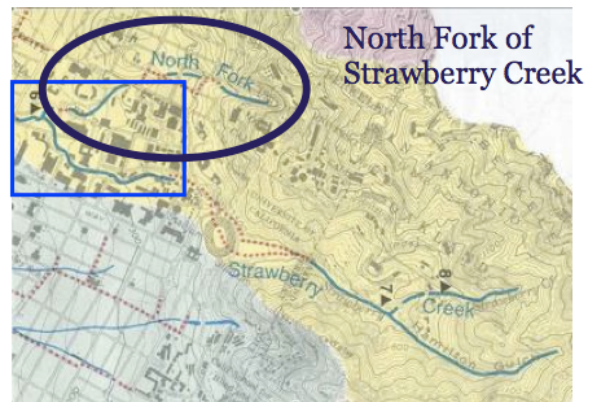


Figure 2. North Fork of Strawberry Creek  
source: [www.strawberrycreek.com](http://www.strawberrycreek.com)

A comparison of the restoration of Codornices Creek at the Ohlone Greenway in 1999 is used as a case study to better understand community-initiated urban creek restoration projects. The site was selected from other restoration projects in the area for its relevance to the site in question for restoration. The two sites, the North Fork of Strawberry Creek at Kingman Hall and Codornices Creek at the Ohlone Greenway, share a comparable size of approximately 100 feet of creek reach, a similar setting of urban conditions, adjacent homes, and user-friendly access, as

well as a history of and opportunity for community collaboration and volunteerism. The main difference in the properties is that one is on private land, while the other is more park-like and accessible to the passerby.

The ultimate motivation of this paper was to do the necessary background research to design a comprehensive restoration plan and timeline for the North Fork of Strawberry Creek given: steep site conditions, proximal location of Kingman Hall Student Co-op, and associations with a UC Berkeley Chancellors Community Partnership Fund grant to involve campus-community collaboration in the restoration activities.

## **II. Research Questions:**

- What are the opportunities and constraints for urban creek restoration on the North Fork of Strawberry Creek?
- What can be learned from the restoration project case study of Codornices Creek at the Ohlone Greenway and applied to the site on the North Fork of Strawberry Creek at Kingman Hall?

## **III. Methods/Study Approach**

The study approach for this project adopted two methodologies for two sites: site visits and historical site research. The North Fork of Strawberry Creek was assessed for a restoration project and Codornices Creek at the Ohlone Greenway was used as a case study. The case study site was visited on April 21, 2011, twelve years after the completion of the restoration project.

Site visitation methods were both observational and qualitative including: sketches of the reaches, photography, vegetation identification, bank assessments, and canopy cover estimates. Historical site research encompassed in-person interviews and discussion, written correspondence, and pursuit of publications. Research of the relevant history of the North Fork of Strawberry Creek consisted of reviewing a previous neighborhood collaboration project

completed, investigating the status of onsite land use, and examining planning logistics for restoration beginning in the Fall of 2011. Then the data collected informed a preliminary restoration plan design for the North Fork of Strawberry Creek (*Appendix A*). The methodology for the restoration plan included consultation with local experts, native nurseries and community members. The design includes a rough restoration timeline, native plants species and participatory process components. The proposed plan will then be reviewed by the parties involved in the restoration project, and evolve throughout the project.

#### **IV. Results**

##### *Strawberry Creek Background*

Since the 1980s, UC Berkeley Campus has hosted many restoration efforts on Strawberry Creek (Charbonneau, 1992). Continuous re-vegetation of riparian areas plus community collaboration makes this urban creek a heralded restoration success story on campus. The portion of the North Fork of Strawberry Creek that flows through campus is less robust in its restoration success than the South Fork (Charbonneau, 1992). This can partially be attributed to the more residential urban landscape and multiple stakeholder properties through which the North Fork travels, as compared to the more urban-wild interface of Strawberry Canyon along the South Fork. The North Fork begins in Blackberry Canyon<sup>1</sup> (Charbonneau, 1987). It travels on Lawrence Berkeley National Labs property<sup>2</sup> and then down through the residential urban areas of the North Berkeley Hills in a combination of culverted and above ground flows. In the process the creek accumulates runoff and contamination, effectively acting as a storm drain system. As a result, “flashy” episodes threaten the integrity of creek ecosystems.

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<sup>1</sup> The creek has also been referred to as “Blackberry Creek”. However, this name also belongs to another nearby creek in Alameda County and is, as a result, often dismissed to avoid confusion.

<sup>2</sup> This reach of the creek has been referred to as “Cafeteria Creek” and was the source of contestation by the community after a proposed construction of a parking lot (Kilduff, 2003).

*The North Fork of Strawberry Creek at Kingman Hall Co-op Restoration Site*

History: The North Fork of Strawberry Creek emerges from a culvert on the west side of La Loma Avenue on the property of Kingman Hall Co-op, a Berkeley Student Co-op since 1977, and home to fifty students. Past collaborative community planning restoration projects between the neighbors along the North Fork, the co-ops and other campus and community groups were facilitated by monetary support by the Chancellor's Community Partnership Fund, a community development grant (Pelot-Whitcomb, personal communication, 2011). In the summer and fall of 2007 a series of terraced seats in the Kingman Hall amphitheater area, which at the time were rotting wood, were replaced with secure stone. After a series of ivy removal workdays, the funding was used to buy sword ferns, trees, native plants and several grapevines in 2008. A drip irrigation system was installed to lessen the watering maintenance needs. Unfortunately, due to lack of continuation in participation of management, the drip system went underutilized and many of the plants died. Today an outcrop of ferns remains, however they did go under some stress during some landscaping associated with the retrofit that began the end of May 2010. Most of the retrofit project is complete, except for the deck bordering the creek due to a pending Fish and Wildlife Service permit (Stathers, personal communication, 2011).

Site description and assessment: The Kingman amphitheater is located about ten feet above the open culvert and stream bed (*Figure 3*). Water falls approximately one foot from the culvert into the creek where a pool has formed. The creek itself is in relatively good condition, exhibiting a diversity in depth, riffles and pools, as well as sediment size. Both banks along the creek bed have severely steep slopes. The south bank shows signs of undercutting and is 5 feet from the base of the redwood tree. The north bank is at approximately 65 percent grade

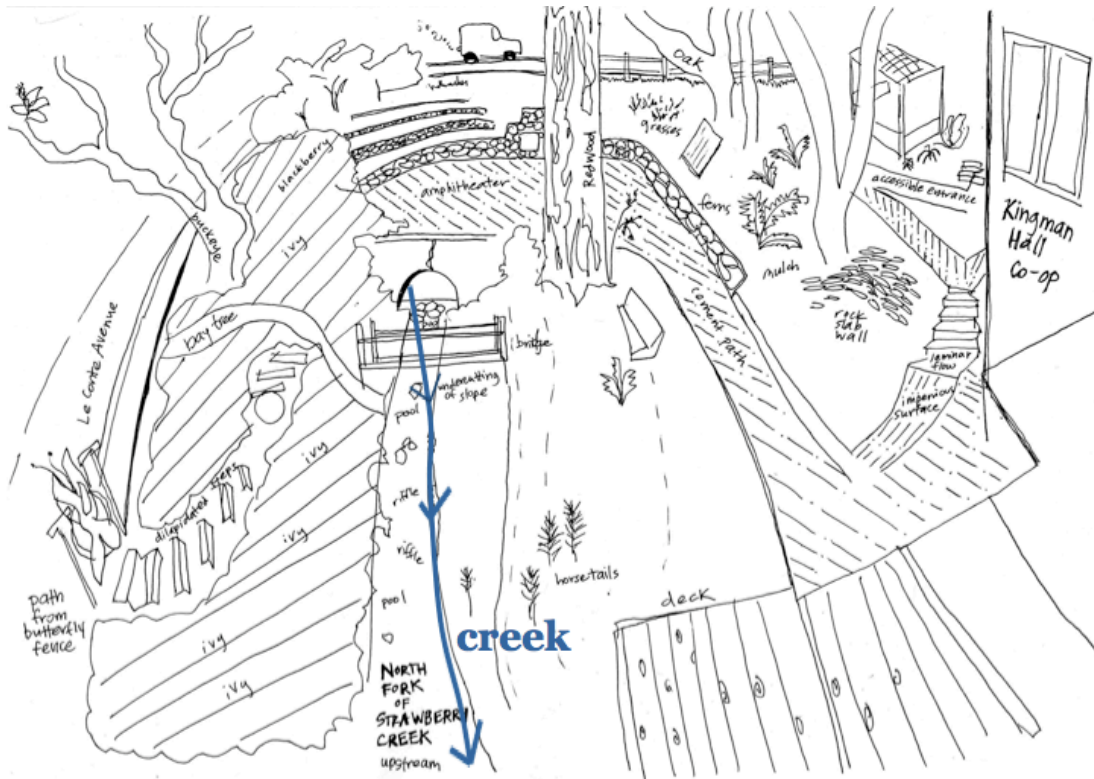


Figure 3. Sketch of Kingman Hall amphitheatre facing upstream

extending over about 25 feet and is completely overrun with ivy and blackberry, which may serve as a prime habitat for urban rat populations.

The amphitheatre recreation space is a semicircular area with a cement stage, an old outdoor oven and terraced seats that are built into the hillside beneath the street of La Loma Avenue. The terraces are covered in bright green grass including clover as well as weeds such as pellitory plant (*Parietaria sp.*). North-to-south-traveling La Loma Avenue turns into Le Conte Avenue as it bends around the amphitheatre westward. The amphitheatre is separated from the street by a wooden fence, and bordered by trees where not overgrown with blackberry. Wooden steps leading to a butterfly gate that opens on to Le Conte Avenue are dilapidated and disintegrating, as is an old wooden bridge over the creek. Currently access to the bridge and creek is restricted due to continuing retrofit construction on the building's deck. The necessary



construction infrastructure was installed to combat any negative impacts from construction per city ordinance (Creeks Ordinance, Berkeley City Code 17.08).

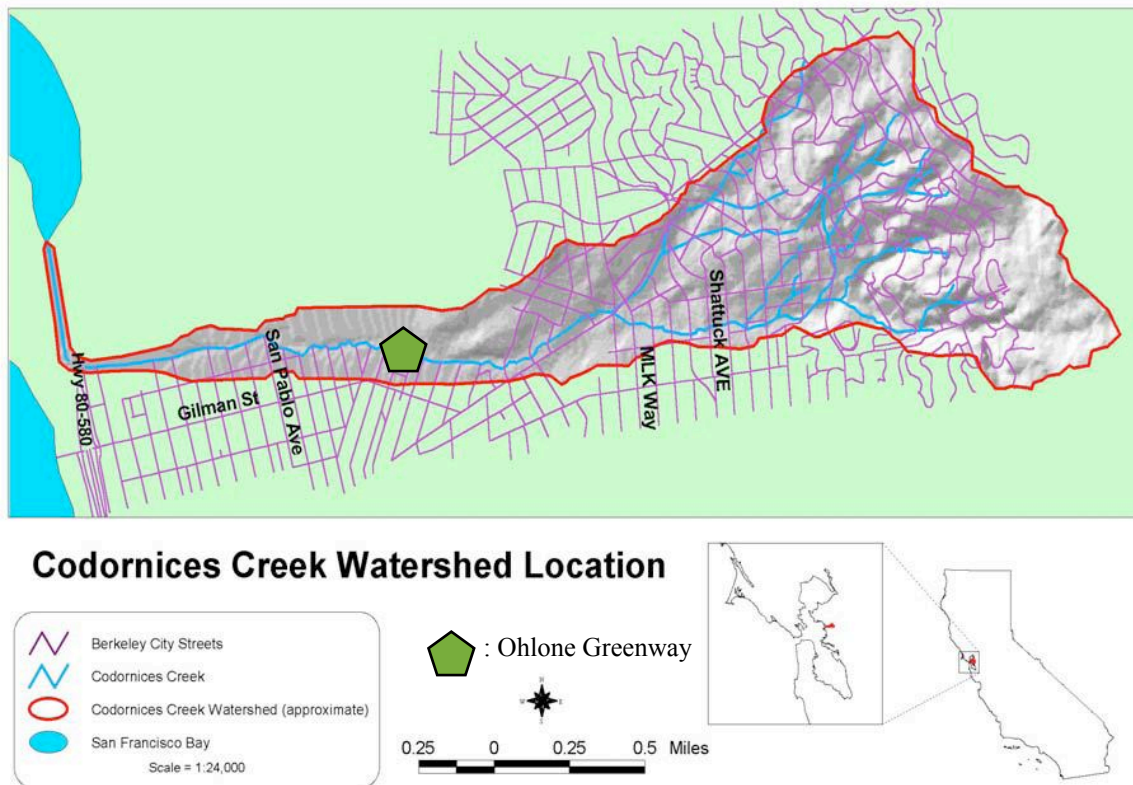


Figure 4. Codornices Creek at the Ohlone Greenway

The amphitheater area acts a sort of catchment basin. It is impacted by stormwater flows that run in sheets over the impervious surface of the cement wheelchair accessible path. Rain is also intercepted by the beautiful and dense canopy of native trees, including bay, oak, redwood, and buckeye. Canopy cover is approximately 70 percent. The area receives very little sunlight except in the midmorning and late afternoon.

#### *Case study of Codornices Creek at the Ohlone Greenway*

History: The restoration of Codornices Creek at the Ohlone Greenway was one of Friends of the Five Creeks first big projects. Fueled by a sighting of trout in the creek and a desire to improve what was once an overgrown patch of creek fenced in by chain link, the project was spearheaded by architect Todd Jersey in 1999 (Schwartz, 2005). Once electro-fishing

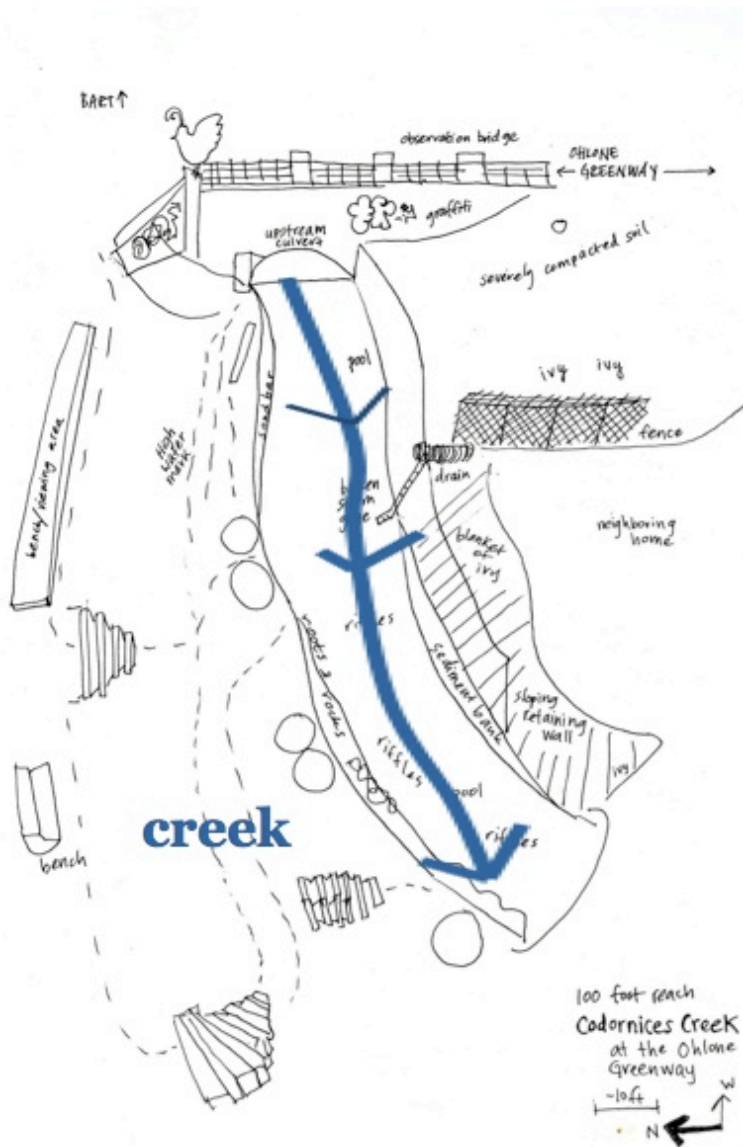


Figure 5: sketch of Codornices Creek at the Ohlone Greenway

confirmed the presence of steelhead trout in the creek, there was even greater momentum behind the project. The fence was replaced with a lookout, complete with quail sculptures and educational signs including a map (Schwartz, personal communication, 2011). Banks were structurally supported, invasive plant species were removed and replaced with natives. Spaces for lingering, including benches as well as terraces and steps, were

constructed to provide access. All was implemented with the support of volunteer labor from the community. Difficulties that amassed in the project were: a high loss of plants due to poor soil, lack of irrigation, planting methods, trampling and supposed theft of ferns, difficulty establishing vegetation under BART tracks and in highly compacted, flood-scoured channel close to creek, a slowly collapsing retaining wall (NRPI).

Site description and assessment: Codornices Creek emerges from a culvert tunnel underneath the Ohlone Greenway, a bike-pedestrian path that travels north to south (Figure 2).

The site is located two blocks north of Gilman Street, and opposite 1200 Masonic Avenue, close to the Berkeley-Albany border. The site is bordered by the Ohlone Greenway path to the East and a stair- and path- covered slope leading to an open park area with grass and benches to the North. The western half of the south bank borders a home. Along this stretch there is a caving cement wall overgrown with ivy. A chain link fence extends perpendicular to the stream, dividing the private property from the eastern half of the southern bank. At this point a black gutter is directed to the stream, and just below lies a broken stream depth measuring instrument. To the east of the fence is a barren space due to a heavily compacted soil flood zone, with litter and graffiti. The canopy is nicely dappled, with no cover in some areas, and up to about 60% in others. Pebbles and sand bars were observed, as well as a riffle pool riffle pattern before disappearing again into another ground-level culvert tunnel. High water marks were observed on the north bank: a collection of settled twigs and debris neatly fitting into one another, approximately four feet up from the creek center.

## **V. Discussion**

Visiting the project of the Codornices Creek site twelve years after its culmination was helpful for visioning possibilities for the North Fork of Strawberry Creek. The two reaches had some commonalities: steep slopes; tiered use infrastructure such as steps, benches and amphitheaters; urban location and neighboring homes; and invasive species neglect. Lessons learned from the Codornices case study are similar to those learned from attempts of past restoration projects at Kingman Hall. There is a need for phased, experimental vegetation plantings to account for ecological unpredictability as well as for testing compatibility with social use. Most importantly is the need for sustained stewardship and caretakers. Both sites

require the upkeep and care to maintain such commitment to restoration. They would benefit greatly from continual assessment of land use and scientific monitoring. Further, an element that the Codornices Creek site offers and Kingman does not, is educational signs. A sign on the pedestrian walkway along La Loma/Le Conte Avenues as well as in the amphitheater itself is an opportunity for illuminating the presence of urban watersheds.

A significant concern is how to make creek stewardship at Kingman Hall resilient over time. The student co-op is a somewhat transient community, with people coming and going and an almost constant turnover of house members. The longest house members stay is two to three years and the shortest, a single semester. Transiency can compromise a sense of stewardship and lead to cycles of neglect and revival. To encourage successful ecological success of the restoration and avoid bank collapse, the project is intended to extend over the course of a couple years. This will only succeed with a sustainable community dedicated to completing the project. To make the restoration project on the North Fork of Strawberry Creek resilient in the long term, a communication network of passing on the responsibility to new house members will be established. Such methods can include: a written and performed retelling of the restoration story each year, a signed contract reminding members to respect the creek, and the creation of a leadership role called something to the effect of “Strawberry Creek Keeper at Kingman Hall”. This person’s responsibility each semester could include educating the house about the creek and its history including maintaining educational signs, preventing onsite pollution and misuse of the creek, and facilitating cleanup days.

## **VI. Conclusion**

The North Fork of Strawberry Creek presents an opportunity to connect the campus community to the North Berkeley Hills neighborhood. Students themselves may be instrumental

in this endeavor, as the proposed restoration site at the North Fork of Strawberry Creek is perpetually ensured to be bordering student properties for years to come. The creek emerges from a culvert below La Loma Avenue right next to a Berkeley Student Co-op House, Kingman Hall, and slightly downstream is Tellefsen Hall (more commonly called “the band house”).<sup>3</sup> It is the moral responsibility of homeowners to be stewards of proximal creeks.

To ensure stewardship of this piece of Strawberry Creek—which is inherently connected to the UC Berkeley campus by both students and ecology—a sustainable network of caretakers is needed. Another “Creek Keeper” community representative may be appointed annually from Tellefsen Hall. Both Tellefsen Hall and Kingman Hall Creek Keepers, as well as long-term neighbors, and community organization representatives can commit to annual meetings, consistent correspondence and tours of the urban creek watershed. Further, student Creek Keepers can maintain liaisons with Strawberry Creek restoration student groups on campus. Research and volunteer opportunities may then extend beyond the portions of Strawberry Creek that flow through campus to include the entire watershed. As collaboration in planning, restoration and monitoring proliferate, both ecological and social resilience for the North Fork of Strawberry Creek will be embraced—thereby connecting creek and community.

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<sup>3</sup> Tellefsen Hall is currently going through landscape redesign plans, which provides an opportune moment for consideration of the creek within the space (Stathers, personal communication, 2011).

## Appendix A: Restoration of the North Fork of Strawberry Creek

### Restoration plan timeline and next steps

#### *Summer 2011:*

- Reach out to neighbors and community members to seek feedback on restoration planning and execution.
- Coordinate with community groups associated with the Chancellor's Community Partnership Fund including Friends of the Five Creeks and the Berkeley Student Co-ops, among others, for participation in the fall activities.
- Research the landscape proposals for Tellefsen Hall and begin building creek-caring camaraderie between the neighboring student housing.
- Begin preparing the site by removing young ivy and blackberry plants.
- Establish relationships with on-campus community groups, including potentially the TGIF-funded Strawberry Creek native nursery.
- Research native nurseries including: the UC Berkeley Botanical Garden, Watershed Nursery in Richmond, Native Here Nursery by Tilden Park.

#### *Fall 2011*

- Establish approximately three, 3-4 hour weekend workdays with 15-20 people participating (or fewer because of bank slope concerns)—a total of roughly 180 hours of community participation; tools will be provided by Friends of the Five Creek and potentially from the tool-lending library; least vulnerable segments of the creek will be worked on first in alternating patches.
- Cement the “Strawberry Creek Keeper at Kingman Hall” role in Co-op by-laws.
- Hold an assessment meeting to reflect on how the project went and plan for future phases of the project.

#### Restoration project elements:

- Remove invasive blackberry, ivy, pellitory plant
- Rebuild wooden steps
- Consider replacing or re-structuring the bridge
- Replace the culvert wall (more long-term, permit-requiring project)
- Protect horsetails with minimal trampling
- Fence of redwood sapling to ensure survival
- Address water flow from the impervious pavement surfaces with strategic plantings at higher elevation

## Appendix B: Plant Species Selection

Species planted during restoration project for Codornices Creek at the Ohlone Greenway

Plant species removed	Species planted
English ivy <i>Hedera helix</i>	California wild rose ( <i>Rosa californica</i> ) Douglas' iris ( <i>Iris douglasiana</i> ) Pacific ninebark ( <i>Physocarpus capitatus</i> ) red-flowering currant ( <i>Ribes sanguineum</i> ) ferns

Recommended species for planting on the North Fork of Strawberry Creek by Kingman Hall

Species to be removed	Recommendations for planting (common names)
English ivy <i>Hedera helix</i> Himalayn blackberry <i>Rubus discolor</i>	spreading rush ( <i>Juncus patens</i> ) irisleaf rush ( <i>Juncus xiphioides</i> ) California wild rose ( <i>Rosa californica</i> ) snowberry ( <i>Symphoricarpos sp.</i> ) blue elderberry ( <i>Sambucus mexicana</i> ) Solomon's seal ( <i>Smilacina sp.</i> ) hummingbird sage ( <i>Salvia spathacea</i> ) fringe cups ( <i>Tellima grandiflora</i> ) coral bells ( <i>Heuchera</i> )  Plants selected for: shade and drought tolerance, continuous cover, and "idiot-proof" qualities

## Appendix C: Site photos



Figure: Terraced steps and stove at Kingman Hall amphitheater.



photo: facing downstream,  
cracked wall and bridge

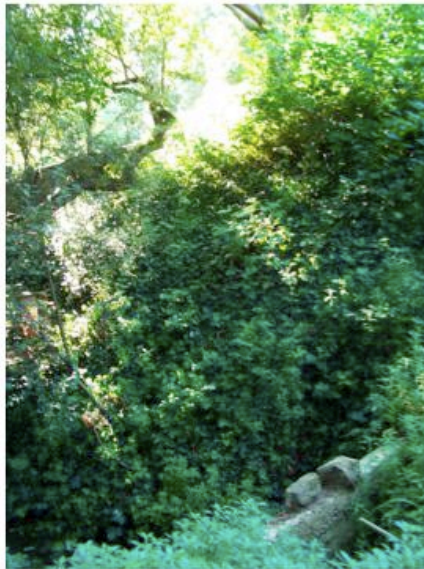


photo: steep,  
overgrown banks

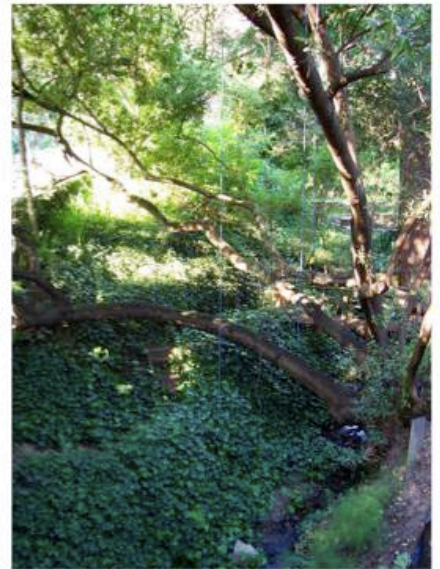


photo: facing up  
stream, shady site



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