

City of Santa Cruz
**MOORE CREEK CORRIDOR
ACCESS & MANAGEMENT PLAN**

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MOORE CREEK CORRIDOR ACCESS AND MANAGEMENT PLAN

NOVEMBER 1987

MOORE CREEK CORRIDOR ACCESS AND MANAGEMENT PLAN: EXECUTIVE SUMMARY

Introduction

Moore Creek is an intermittent stream that lies at the west boundary of the City limits. It has its beginnings on the UCSC campus and flows finally into a coastal lagoon at Natural Bridges State Park. The fact that this watershed is largely undeveloped and physically isolated from the surrounding urbanized area by steep slopes gives the Moore Creek Corridor a unique wilderness feeling, unmatched in the City limits. Flora and fauna are abundant and complex in the canyon which provides an important wildlife corridor and ecological link between the open lands of the University and Natural Bridges State Park.

The Moore Creek Canyon Corridor Access and Management Plan was developed in order to provide the policy and action plan necessary to ensure the protection of this unique natural area while making it more accessible to passive recreational uses. The goal of the plan is to balance City policies aimed at limiting access because of natural constraints and the fragility of the area with policies suggesting that public access to Moore Creek Canyon be provided and trail systems encouraged. If successful, the continuous pedestrian link from Natural Bridges to UCSC through a relatively undisturbed natural area can be realized.

This report is divided into the following sections: 1) reasons for developing the plan; 2) proposed policies and programs; 3) implementation.

I. Reasons for Developing the Plan

A. Relevant Existing Policies

The Moore Creek Canyon Access and Management Plan has its roots in the Western Drive Master Plan, adopted in December 1978. Recommendations in this Plan call for improvements to Western Drive itself, retention of the rural character of the area and protection of Moore Creek and the Arroyo Seco canyons and the provision of access to them. Recommendations addressed lands to be placed in the public domain, as well as public access points and connections to Natural Bridges Coastal Trail.

Local Coastal policy also addresses the protection of Moore Creek Canyon, its wildlife and riparian habitat, downstream ponds and waters and its potential as an attractive in-land link to the coastal recreational resources of Natural Bridges State Park. In addition to established policy, recent public interest has been shown in the future of Moore Creek Canyon and a desire expressed to see the City act on its policies.

Other City policies supporting the protection of as well as access to Moore Creek Canyon are found in the General Plan and the Open Space and Conservation Element of the General Plan. In summary, this element states that "... it appears that the areas (in the City) with the most unique characteristics and balance of life are those areas where land is least suited for urban uses. These include the canyon and arroyo areas, where redwoods and mixed forests occur; the marsh and stream areas of Moore Creek. . . Due to the difficulty of developing such areas and its adverse affect on the environment, it is recommended that zoning measures and

other controls be considered for such areas. Careful study should also be given to the Moore Creek Watershed area, which is the most unspoiled riparian corridor in the City."

Zoning Ordinance Conservation Regulations address development on slopes and related matters of drainage control, erosion, hazard areas, seismic hazard areas, underground water recharge areas and thus have relevance to this as well as other canyon areas.

Finally, portions of the westside of Moore Creek and adjacent lands have been designated as greenbelt lands since 1979 when the City's voters approved Measure "O". Measure "O" resulted in the adoption of specific Zoning Ordinance provisions and overlay land use districts designated to "maintain essentially undeveloped lands surrounding existing urban development in uses that retain the land's physical characteristics and its potential for future development . . ."

County regulations for County lands adjacent to and west of Moore Creek Canyon reflect the spirit and intent of the City's policies insofar as being sensitive to the resources and constraints of Moore Creek Canyon. The same can be said of State Coastal Act Policies.

In summary, the Moore Creek Access and Management Plan represents the first focused effort to bring together existing City policies into a comprehensive document to implement goals of the General Plan, Local Coastal Plan, Western Drive Master Plan and the Open Space and Conservation Element.

B. Existing Conditions

The natural history of the area points to the need to minimize environmental disturbance of the canyon as well as controls on adjacent development. The City's Open Space and Conservation Element indicate that the soils on the steep slopes that border Moore Creek are highly susceptible to erosion. Intensive use of or vegetation removal on these steeply sloped areas can adversely impact Moore Creek and Antonelli Pond through increased sedimentation loading. Sedimentation impacts on Antonelli Pond have been extensively studied and conclusions drawn indicate that the pond may be expected to fill in over a 100-year period based upon sedimentation rates occurring between 1962 and 1974.

Further, weak soil conditions are a potential problem giving rise to landslides. Studies of the area have located areas of potential soil creep in the east and west facing slopes in the Moore Creek Canyon north of Meder Street.

Drainage in Moore Creek Canyon presents other potential difficulties due to existing channel capacity of Moore Creek. Of the five existing culverts in Moore Creek, three were found to be entirely too small to accommodate present or future flows. Such inadequacy could result in flooding problems in the area.

In addition to providing a wildlife corridor, Moore Creek Canyon contains interesting plant communities which play an important role in relation to the local climate to moisture absorption which decreases slope erosion and to the local wildlife in providing habitat and supporting the complex food web of herbivore, carnivore, and decomposer.

II. Proposed Policies and Programs

Review of existing policies for Moore Creek Canyon and examination of its resources and constraints formed the basis for the proposed trail system. Access to the corridor is based on the goal of keeping the corridor as wild and undeveloped as it is today. Toward this end, paved pathways, inviting and accessible entryways, and prominent signage are not suggested. Instead, utilization of existing trailways and game trails is the order of the day.

The goal of this portion of the plan is to provide public access in a manner compatible with the needs of private property, existing development, and within the constraints of the watershed's natural setting. Due to existing development patterns and physical accessibility, the majority of this study focuses on the east branch of Moore Creek. It is along this branch of Moore Creek that site specific recommendations are provided. Even though the majority of the west bank of Moore Creek lies on lands which are presently undeveloped and under private ownership, many of the land management policies and programs will be applicable as the land develops. However, recommendations for access points, viewing stations, etc. within these lands must necessarily be schematic.

A. Access

The proposed Moore Creek pathway originates at the UCSC Arboretum and terminates at Natural Bridges State Park to the south. The Arboretum was chosen as the trail head for two reasons: parking is available for hikers utilizing the proposed pathway and Moore Creek has its origins just north of the parking area. From the Arboretum, the pathway would ultimately head south across High Street and along Moore Creek. Until easements along Moore Creek between Moore Creek Road and High Street are acquired, existing pedestrian access points along Moore Creek Road could function as trail heads. The pathway would then follow Moore Creek south from these access points to a point where it intersects Meder Street. At this point, the pathway would run along Meder Street to Western Drive, since Moore Creek drops some 40 feet in elevation just south of Meder Street. The pathway continues along the existing Western Drive sidewalk to a point opposite Monarch Way where access to the creek could be gained. This access point, first suggested by the Western Drive Master Plan, is suggested due to its favorable topography, undeveloped state and proximity to existing pedestrian access ways leading to the adjacent Arroyo Seco Canyon. It is suggested that public access from Western Drive across this parcel be acquired through dedication or purchase. From there, existing informal pathways along the creek lead to the point where Moore Creek crosses under Highway 1. At this point, the trail system would be developed to route pedestrians to the westerly terminus of Grandview Street. As a short term solution, pedestrians could utilize Grandview Street to Western Drive

and cross at Highway 1. Sidewalks on the south side of Highway 1 would be followed along Western Drive, then Mission Street, then Natural Bridges Drive and then Delaware Avenue terminating at the western shores of Antonelli Pond. Currently, the existing pedestrian signal at Western Drive/Highway 1 intersection provides the only controlled crossing point in the vicinity of Moore Creek. While this crossing may be suitable as an interim solution, it is suggested other long-term solutions such as a pedestrian crossing between Shaffer Road and Western Drive, be explored. The intermittent, low-frequency use of this crossing point would continue to ensure smooth flow of traffic along the State Highway 1 corridor.

Upon crossing Highway 1, the proposed pathway would travel along a sidewalk as yet undeveloped along the east side of the Burkett Street and cross Mission Street Extension. At this point, two alternate routes to the Natural Bridges State Park are suggested. As an interim solution, pedestrians would travel along the sidewalk along Mission Street Extension and down the sidewalk along the west side of Natural Bridges Drive. However, as a more long-term solution, pedestrians would turn west along Mission Street Extension, pick up a future pathway along Moore Creek and traverse the Southern Pacific Railway right-of-way. This ultimate solution is extremely meritorious in that it could connect directly with existing pathways along the east side of Antonelli Pond.

Consistent with goals to limit and direct public access to Moore Creek, the majority of City residents will be linked to Moore Creek visually rather than physically. Visual access will permit persons physically unable to utilize the proposed trail system to enjoy the grandeur of Moore Creek Canyon. Therefore, the provision of strategically located viewing areas is critical. Viewing areas are suggested in those areas of panoramic views of the steep cliffs which border Moore Creek. Viewing areas may also function as transition points between trails. Development of 3 viewing areas are recommended along Moore Creek Canyon:

- 1) At the entryway to the corridor opposite Monarch Way (discussed earlier);
- 2) The promontory west of Mountain Way and Western Drive;
- 3) At the entryway to the corridor west of Grandview Street cul-de-sac.

Other viewing areas are suggested on promontories on the greenbelt lands on the west side of Moore Creek. Specific locations would be determined through preparation of area specific plans prior to or concurrent with parcel development.

Access to Moore Creek Corridor from the Grandview Street neighborhood already occurs at this location. However, this location should be formalized into a distinct entryway to the corridor. It could also serve other functions as well. It is suggested that a "mini-park" of distinct urban flavor be developed that could serve as an entryway to Moore Creek Corridor and as a park to the City as a whole. In addition, assuming the future development of a pedestrian crossing at State Highway 1, employees of the industrially-zoned land south could utilize the mini-park area as an open space for lunch or other activities.

Policy

Develop a low profile trail system in Moore Creek Canyon corridor linking the corridor with UCSC, Natural Bridges State Park Coastal Trail and Wilder Ranch and Beaches State Park..

Programs

- Require dedication or purchase or solicit donation of lands on both sides of Moore Creek to include canyon slopes below the 30% slope line, for lands between State Highway 1 and High Street to be included in the trail system. Exceptions may be made to protect the privacy of existing development.
- Develop safe, controlled pedestrian crossing point at Highway 1 either at, below or above grade..
- Develop pathway along east side of Moore Creek south of Mission Street Extension. Obtain rights for pathway to traverse Southern Pacific right-of-way to link up with existing trail system on the eastern shore of Antonelli Pond.
- Encourage the University of California to provide public access along Moore Creek from north of High Street to the headwaters as part of its Long Range Development Plan (LRDP).
- New development on the bluff tops above Moore Creek or its tributaries shall be set back sufficiently so that it will not be visible from the creek bed.
- Use of existing and proposed trail system shall be limited to pedestrians only.

Policy

Provide connections from existing City rights-of-way to Moore Creek Canyon trail system.

Programs

- Purchase or require dedication or solicit donation of necessary lands for access to Moore Creek Canyon; the access points recommended are 1) opposite the intersection of Monarch Way and Western Drive; and 2) west of Grandview Street turnaround area.
- Require construction and provision of public viewing areas as part of private developments in locations designated in the Moore Creek Access and Management Plan. To minimize impact on private developer, open space provided for pedestrian trails and/or viewing areas, mini-parks, etc. should be "counted" toward the developer's normal open space contribution.

- Develop specific Grandview Street turnaround area and Monarch Way viewing area to enhance their use as public access and viewing stations.

B. Management

Although largely undeveloped and physically isolated from surrounding urbanized areas, Moore Creek Corridor has nevertheless been adversely impacted by activities within the watershed. An extensive study of Antonelli Pond and, by inference, Moore Creek itself, was undertaken by the firm of Harvey and Stanley Associates in August 1980. It documents the impacts of watershed activities on sedimentation rates and pond water quality and suggests measures to mitigate identified impacts. The 1980 study documents a severe problem: the sedimentation of Antonelli Pond itself. The rate of sediment increase in Antonelli Pond has accelerated from 36 tons of sediment deposited yearly in 1942 to some 190 tons per year deposited between 1968 and 1974. This sedimentation is directly attributable to management practices in the watershed as well as the inherent soil erosion rates on steep slopes bordering the creek. Without specific attention to soil erosion mitigation measures, the pond may be expected to fill over at the present rate of sedimentation in about 100 years. However, accelerated development in the watershed area could be expected to shorten the 100 years to 10 years or less.

Sedimentation also directly affects the substantial nutrient and heavy metals which were found in Antonelli Pond during the studies performed by Harvey and Stanley. Therefore for two reasons, the careful management of land use activities, grading, cut and fill, etc. is of extreme importance. The recommendations for management of Moore Creek Canyon are aimed at water quality, soil erosion, sedimentation and grading, vegetation and public services.

Water Quality

Policy

Maintain the water quality of Moore Creek at the highest level feasible by regulating the discharge of storm waters into Moore Creek and its tributaries.

Programs

- Maintain all post-project runoff at pre-project levels through the use of retention or detention ponds, with a controlled release, to trap sediment and sediment bound heavy metals, nitrates and phosphates.
- Equip new storm drain systems both on-site and off-site with sediment/oil and grease traps. Regular maintenance program should be developed as part of local Homeowner Association policies and City Public Works Department Maintenance Programs.
- Institute regular street sweeping program in the Moore Creek Canyon watershed area, as financial resources are available.
- Direct all storm water, once cleansed, to Moore Creek, a groundwater recharge area, proper quality and at a proper rate. This will enhance groundwater recharge in the lower Moore Creek Corridor.
- Equip all outflow culverts and storm drain facilities with energy dissipators to minimize downstream sedimentation of Moore Creek.

- Provide control and improve quality of storm runoff from Granite Rock Corporation Yard.

Soil Erosion, Sedimentation and Grading

Policy

Significantly reduce the quantity of sediments transported to Moore Creek and Antonelli Pond.

Programs

- Require the submission and installation of erosion control and grading plans for all projects located in Moore Creek Watershed Area.
- Require that all exposed slopes shall be revegetated immediately upon cessation of grading activities through installation of permanent vegetation in conjunction with hydroseeding and other temporary erosion control measures. Temporary berms shall be in place at the edge of the setback line to prevent siltation of Moore Creek. These temporary berms shall be replaced by permanent measures prior to project clearance and/or subdivision acceptance.
- Limit vegetation removal to that amount necessary to complete approved construction projects. Any vegetation removed shall be replaced or replanted so as to ensure slope stability, limit soil erosion potential and significantly reduce off-site sedimentation.
- Require that land be developed in increments of workable size which can be completed in a single construction season. Erosion and sediment control measures shall be coordinated with a sequence of grading, development, and construction operations. Erosion control measures shall be put into effect prior to the commencement of the next increment period.
- Prohibit all earth-moving activities between December 1st and March 1st. In addition, grading activities shall not begin after September 1st unless grading can be expected to be completed and plantings completed by December 1st.
- Prohibit grading, vegetation removal, construction of structures or alteration of the existing contours within twenty feet of any 30% slope. Precise topographic survey shall be conducted as part of project review to ensure that erodible soil conditions beyond the 20-foot setback are not disturbed.
- Specific building envelopes shall be designated on all plans submitted for permit processing within the Moore Creek Corridor study area. No construction shall occur outside of the designated building envelope.

Vegetation

Policy

Existing vegetation shall be retained and protected to the maximum feasible.

Programs

- Require that replanting and/or plant removal be designed to increase quantity, diversity and productivity of native vegetation and to ensure slope protection, habitat enhancement and buffering.
- Removal of non-native vegetation should be considered only in those areas where this action will serve to protect concentrations of native vegetation. Efforts should be made to contain eucalyptus, particularly where it threatens existing native species. Selective removal of non-native trees and other vegetation may be permitted or required by the City if authorized or approved by a qualified professional with relevant academic training and experience. This removal shall only be permitted when accompanied by an approved replanting program. However, no removal shall be permitted in designated special or unique habitat areas.
- Require that existing landscaping be incorporated into final project landscape plans.
- Require that landscaping plans emphasize native species and include those varieties with both habitat and food-bearing value.

Public Service Systems

Policy: Drainage

Improve existing culverts to accommodate projected flows in Moore Creek.

Policy: Sanitary Sewers

Provide sanitary sewage facilities and necessary appurtenances thereto in such a way as to minimize impact on Moore Creek Canyon.

Programs

- Prohibit construction of new sanitary sewer lines down Moore Creek Canyon.
- Allow use of septic tanks in areas west of Meder Street "dip" in those areas not currently served by sanitary sewer facilities only when endorsed by registered sanitarian and approved by the County Department of Environmental Health and the City's Public Works Department.

Policy: Access and Circulation

Future improvements to circulation facilities should be designed to improve access to Moore Creek, both physically and visually to the extent consistent with environmental constraints.

Program

- Require that future road improvements or improvements to existing roadways include provisions for pedestrians, bicyclists as well as other vehicles.
- Install sidewalks along streets leading to and from proposed trail including Meder Street, Burkett Street, Mission Street Extension, Grandview Street and Delaware Avenue.
- Require that access to public viewing areas established by this Plan be accessible to the handicapped to the maximum extent feasible.

The foregoing policies and programs are applicable to general development activities within the Moore Creek Corridor and watershed. However, a need to provide policies and programs on a site specific basis to provide specific guidance to individual property owners during project planning and development. These are enumerated below:

Management of Antonelli Pond

Policy

Implement management action plans of Harvey and Stanley Associates Report of August 1980.

Programs

- Consider a requirement for the dedication of additional lands on the east and west sides of Antonelli Pond to increase buffer area. Precise boundary of buffer area shall be determined through project review and/or environmental review process.
- Prohibit motor powered boats from Antonelli Pond.
- Require that re-landscaping for habitat enhancement on the east and west sides of Antonelli Pond be part of project review of future development projects. Landscaping shall be undertaken in consultation with registered professional and be consistent with recommendations of the Harvey and Stanley Associates report of 1980.

Site Specific Management Policies

Programs for City Greenbelt Lands

Should any development of existing City Greenbelt lands west of Moore Creek be considered, a specific area plan designed to implement the goals of the Moore Creek Access and Management Plan shall first be developed to:

- Determine appropriate land uses and circulation patterns;
- Designate setbacks from canyon edges;
- Designate significant land forms and existing vegetation for preservation;
- Designate pedestrian pathways to and from canyon edge, and Moore Creek;
- Determine appropriate lands for fee simple or easement acquisition;

Programs Affecting Unincorporated Lands

- Review development of lands adjacent to Moore Creek and its tributaries within the unincorporated areas of the County to ensure conformity with policies and programs of the Moore Creek Access and Management Plan.
- Request the County to adopt relevant policies and programs of the Moore Creek Access and Management Plan as part of the County's Local Coastal Plan and General Plan.

Programs Relating to UCSC Long-Range Development Plan.

- Request that the University of California adopt relevant policies and programs of the Moore Creek Access and Management Plan as part of its Long Range Development Plan.
- Request that the University of California incorporate public access and watershed management measures into future projects within that portion of Moore Creek Corridor that lies within the UCSC campus.

Program Affecting Westside Lands Study Area.

- Future development of lands adjacent to Antonelli Pond within Westside Lands Study Area shall incorporate relevant policies and programs of the Moore Creek Access and Management Plan.

Program Relating to Operation of Shaffer Road Corporation Yard

- Require Granite Construction Co., Inc., to implement, as soon as possible after obtaining City approval, improvements such as construction of a landscaped berm and installation of sediment and grease traps to prevent sedimentation or pollution of Moore Creek potentially caused by Granite's storage of loose materials or other operations on the site.

Program Relating to Special Habitat Area West of Grandview Street Cul-de-Sac

- Prohibit tree removal within the existing eucalyptus grove northwest of the extension of Grandview Street unless approved by the City, with advise of a qualified biologist or expert.

Program Related to Southern Pacific Railroad

- Investigate an easement across the existing right-of-way between Antonelli Pond and Natural Bridges Drive as soon as possible.

III. Implementation

Many of the proposed policies and programs are already contained in the City's policy documents, administrative procedures and development regulations. The remainder must be incorporated if the goals of this plan are to be achieved.

Following adoption of the Moore Creek Access and Management Plan, the Plan shall become a specific area plan of the City's General and Local Coastal Plans. As such, the Plan will have the legal standing of the General Plan itself. As an example, future development within the Moore Creek Study Area must be consistent with policies and program of the Plan.

Once the Plan is adopted as a specific plan, many of the policies and programs contained in the Plan must be incorporated into the City's regulatory framework. Three vehicles then pertain for carrying out this policy: 1) incorporation of appropriate policies and programs into the City's Zoning Ordinance; 2) implementation of policies and programs through such administrative procedures as conditions of approval, City Council policy, and 3) incorporation of proposed public improvements (sidewalks, signage, etc.) into the City's capital improvement program. A table summarizing the various methods for implementing the policies of programs contained in this plan follow.

The City of Santa Cruz cannot act alone to actualize this Plan. It will take a concerted effort by a number of individuals and organizations. Cooperation of property owners, the State of California Coastal Commission and Department of Transportation, Santa Cruz County, Southern Pacific Railroad Company, Santa Cruz County Land Trust and local residents are all needed. But, the efforts are not without their rewards. Working together to implement the goals of the Plan will result in an open space legacy that will be enjoyed and valued by future residents of the City of Santa Cruz.

JR/NE
Moore Creek

Introduction

The Moore Creek Corridor Access and Management Plan was developed in order to provide the policy necessary to ensure the protection of this unique watershed and natural area while making it more accessible to passive recreational uses. Providing increased access to this recreational resource is intended in part to engender a greater public appreciation of the area in order to perpetuate public policy aimed at its protection. Map 1 delineates the planning area.

The following sections present (1) reasons for developing the plan, (2) a description of the setting, (3) a discussion of relevant policies and regulations, (4) natural history of the area, (5) recommended policies and programs in both areas of access and enhancement, and (6) proposed implementation of the plan.

I. Reasons for Developing Plan

The Moore Creek Corridor Access and Management Plan stems largely from the Western Drive Master Plan which was conceived during the development of the 1990 General Plan (adopted on January 8, 1980).

As an area plan, the Western Drive Master Plan works together with the General Plan for the City of Santa Cruz. Such plans, prepared in conformance with General Plan recommendations, provide an opportunity to develop more specific policies and programs than can be accommodated under the General Plan itself.

The recommendations in the Western Drive Master Plan fall into three major categories: improving the Western Drive right-of-way; retaining the rural character of the area; and, protecting Moore Creek and Arroyo Seco Canyon and providing public access to them. The Moore Creek Corridor Access and Enhancement Plan responds to this last recommendation.

The Plan also responds to Local Coastal Plan policy which designates Moore Creek Canyon as an urban limit (lands forming a transition between urban and rural uses), thus making it land on which development could have potential for adversely impacting the view shed of the north coast, an area characterized by agriculture, recreation uses and open space. Development could also have the potential for disturbing Moore Creek, along with its wildlife and riparian habitat, downstream ponds and waters, and its potential as an attractive inland link to coastal recreation resources at Natural Bridges State Park.

In addition to established policies, the Moore Creek Corridor Access and Management Plan responds to a public interest in a plan which establishes whether there should be public access and to what extent, whether there should be equestrian access and other recreational uses and to what extent natural areas are to be preserved.

II. Existing Conditions

Moore Creek is an intermittent stream that lies at the western boundary of the City limits. (See Map 1) It has its beginnings on the University of California campus. Moore Creek is fed by both surface and subsurface drainage including numerous springs, and drains a watershed area of some 1.5 square miles before it terminates in a coastal lagoon within Natural Bridges State Park. Prior to emptying into this coastal lagoon, Moore Creek passes through Antonelli Pond, also known as Moore Creek Lake.

Antonelli Pond is an artificial fresh water pond formed in the early 1900's when the San Vicente Lumber Company dammed Moore Creek to create a holding basin for logs shipped from the north coast to a sawmill on the eastern shores of the pond. The mill operated from 1909-1923, during which time the company logged some 400 million feet of lumber from redwood forests on the old San Vicente land grant near Davenport. The logs were hauled by the mill to the Ocean Shore Railroad which ran along the coast between Santa Cruz and Swanton. After being unloaded into the pond, the floating logs could be easily washed, sorted and then maneuvered to a conveyer belt which hauled them up into the main sawing room.

The mill was financed by a group of Mormon businessmen from Salt Lake City who were only able to break even during the 14 years of operation. The Pond and surrounding lands to the east were sold finally in the 1940's to the Antonelli family which grew begonias and bulbs.

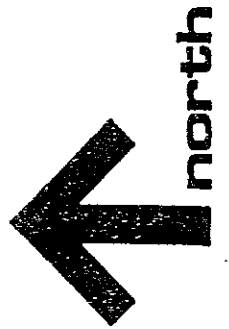
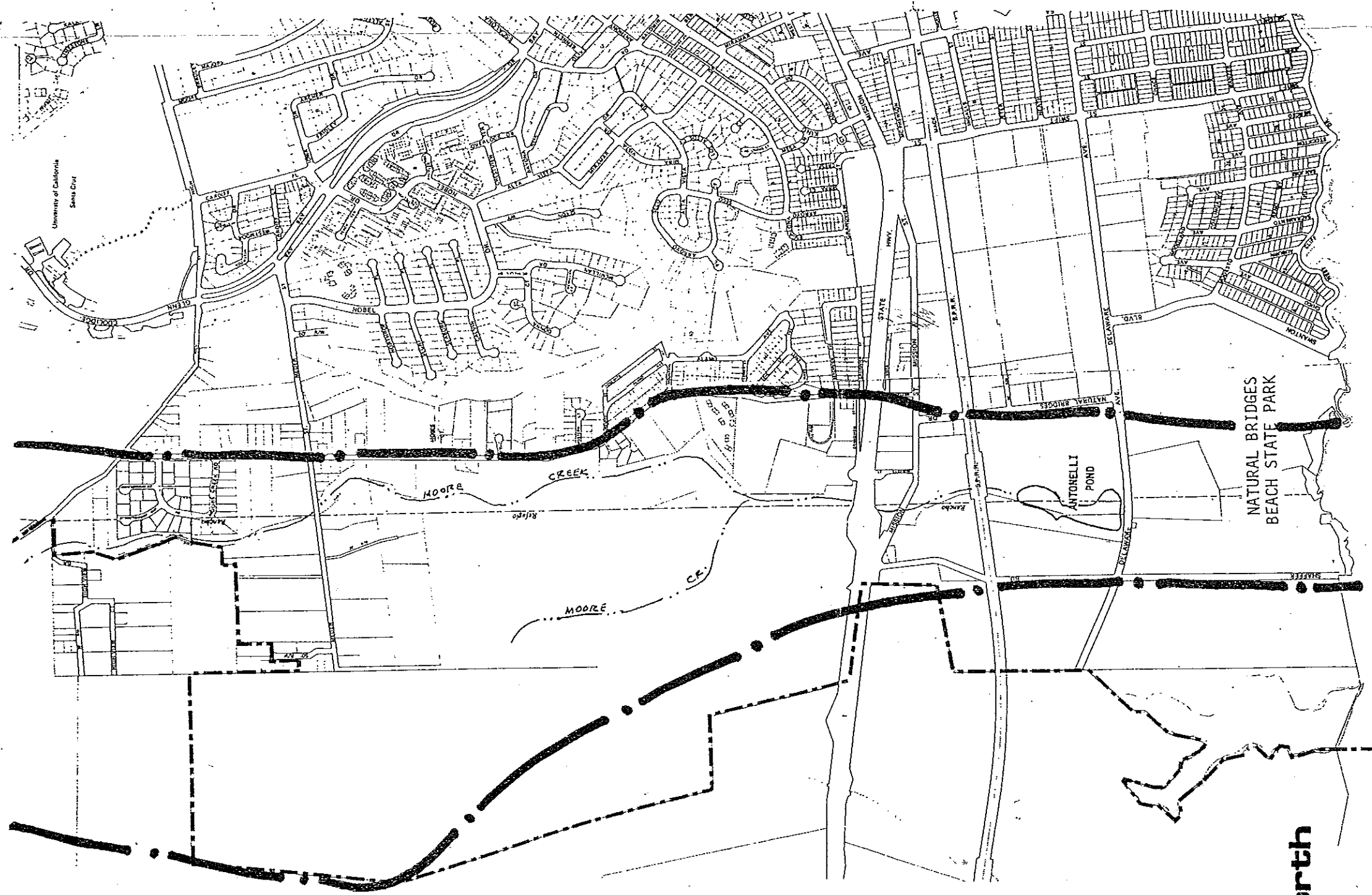
In 1982, the Antonelli family sold the land on the eastern shore for industrial development. Remnants of the old sawmill were removed during development of the industrial complex in the 1980's. The western half of the Pond was donated by the Antonelli family in 1982 to the Santa Cruz County Land Trust.

The Moore Creek corridor has been identified as the "least disturbed watershed in the City" and as such has been designated for special protection by the City's Open Space and Conservation Element. The Planning Department has estimated that approximately 40 percent of the watershed has been developed to allowable densities. Map 2 depicts the existing land uses within the planning area. The majority of development has occurred on the eastern rim of the corridor; large undeveloped acreage both within the City limits and the unincorporated area lie along the corridor's western boundaries. The fact that the watershed is largely undeveloped and physically isolated from the surrounding urbanized area by steep slopes gives Moore Creek corridor a unique wilderness feeling, unmatched in the City. These unique characteristics have led to a variety of City policies to protect and enhance the Moore Creek corridor.

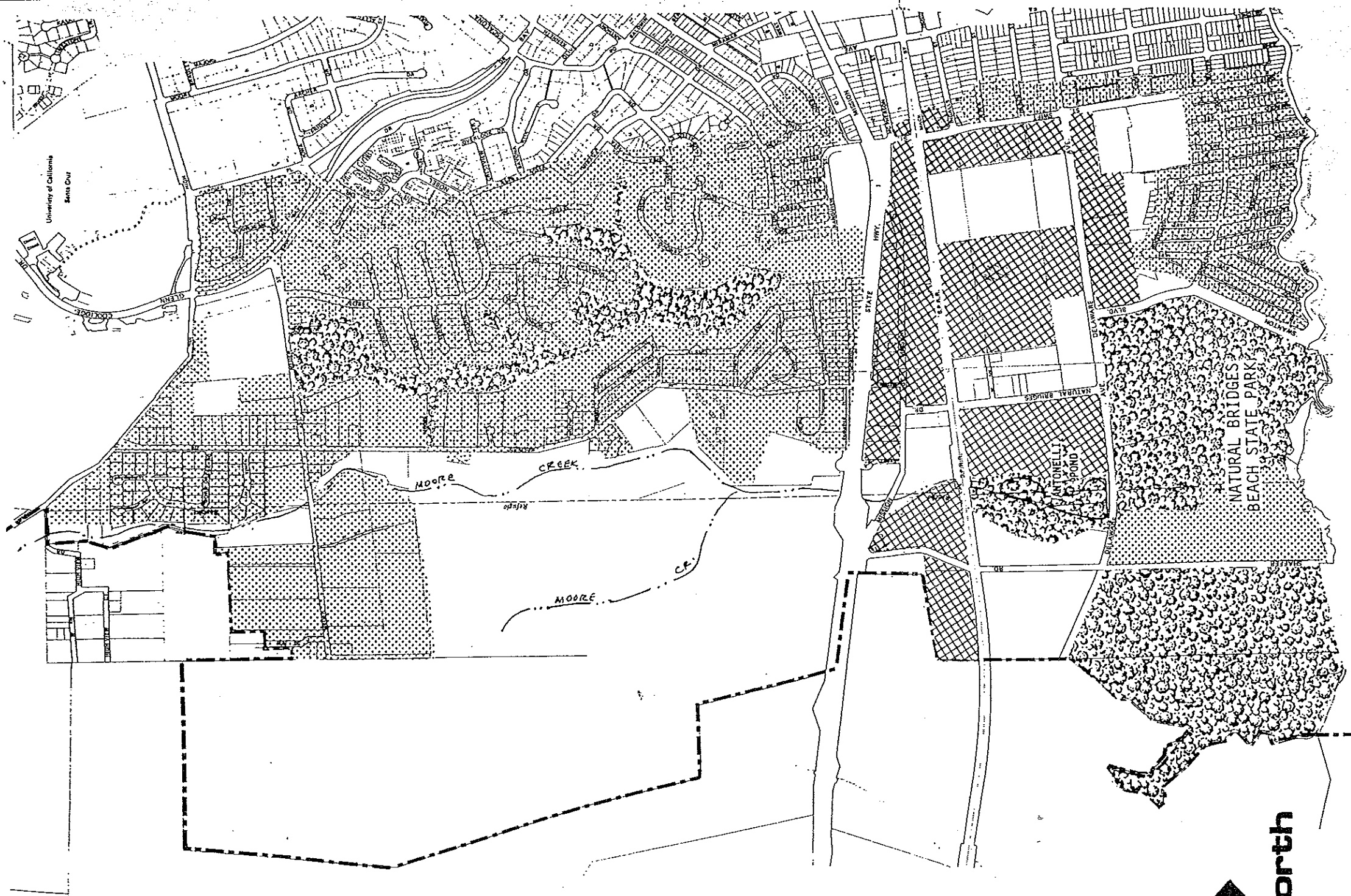
III. Relevant City Policy/Regulations

A. Western Drive Master Plan





The Western Drive Master Plan provides the most specific policies for the area. This document presents planning policies for Western Drive, adjacent land uses and the two canyons which frame this planning area, Moore Creek and Arroyo Seco. Recommendations fall into three categories: those relating to the public domain, those relating to the private domain and those regarding canyons. Policies relating to the canyon areas follow.

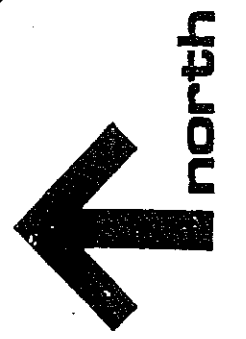


MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN STUDY AREA



LEGEND

-  RESIDENTIAL
-  VACANT
-  PARK AND OPEN SPACE
-  INDUSTRIAL



MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN

LAND USE

PROTECT THE QUALITY OF THE ADJACENT CANYONS AND PROVIDE ACCESS TO CANYON AREAS

	Public Domain	Private Domain
Preserve existing trees and groves that demarcate adjacent canyons.	X	X
Require a varied building setback from steep slopes for new development.		X
No structures shall be constructed on the steep slopes in accordance with Conservation Regulations.		X
Provide public access to Moore Creek Canyon and Arroyo Seco greenbelts.	X	
Establish trails to the canyons as part of the City's greenbelt system connecting to the Natural Bridges Coastal Trail.	X	
Establish relatively large lots adjacent to the Moore Creek Corridor in future subdivisions.		X

Recommendations In Regard To The Canyons

The Master Plan recommends that the canyons be maintained as public resources, both to protect the natural environment and wildlife habitat, and to provide recreational opportunities for the public at large. The City has taken a leadership role in assuring public access to Arroyo Seco by placing canyon lands in the public domain. In great part, this has been achieved through the dedication of land in conjunction with residential development. The Master Plan recommends that the same course of action be pursued for Moore Creek Canyon, including both canyon lands and public access points. As part of the City's park planning process, an overall plan for the development of improvements in Moore Creek Canyon and Arroyo Seco should be prepared. The improvements themselves should contribute towards the protection of vegetation, wildlife and riparian habitat and, therefore, may include restrictions on types of recreational uses. For example, it may be appropriate to restrict access to pedestrians and prohibit motorcycles and off-the-road vehicles.

The Master Plan emphasizes the protection of the quality of both Moore Creek Canyon and Arroyo Seco. In fact, the Moore Creek riparian corridor is listed in the Open Space and Conservation Element as the highest priority area for the preservation of natural resources. As pointed out earlier in this Plan, the retention of vegetation and the control of erosion are especially important in protecting the riparian habitat. The implementation of the policies adopted by the City of Santa Cruz in the Open Space and Conservation Element, observance of the provisions of the Conservation District, existing grading regulations, as well as the Heritage Tree Ordinance, all serve to contribute toward the protection of the Canyon lands. The drainage planning guidelines and design guidelines present in this Plan are also directed towards this end.

B. General Plan

General Plan policies regarding Community Form and Size, Environmental Resource Management, Residential Opportunities and Community Design, address the Moore Creek Canyon directly. Two programs make a specific mention of Moore Creek:

Environmental Resource Management

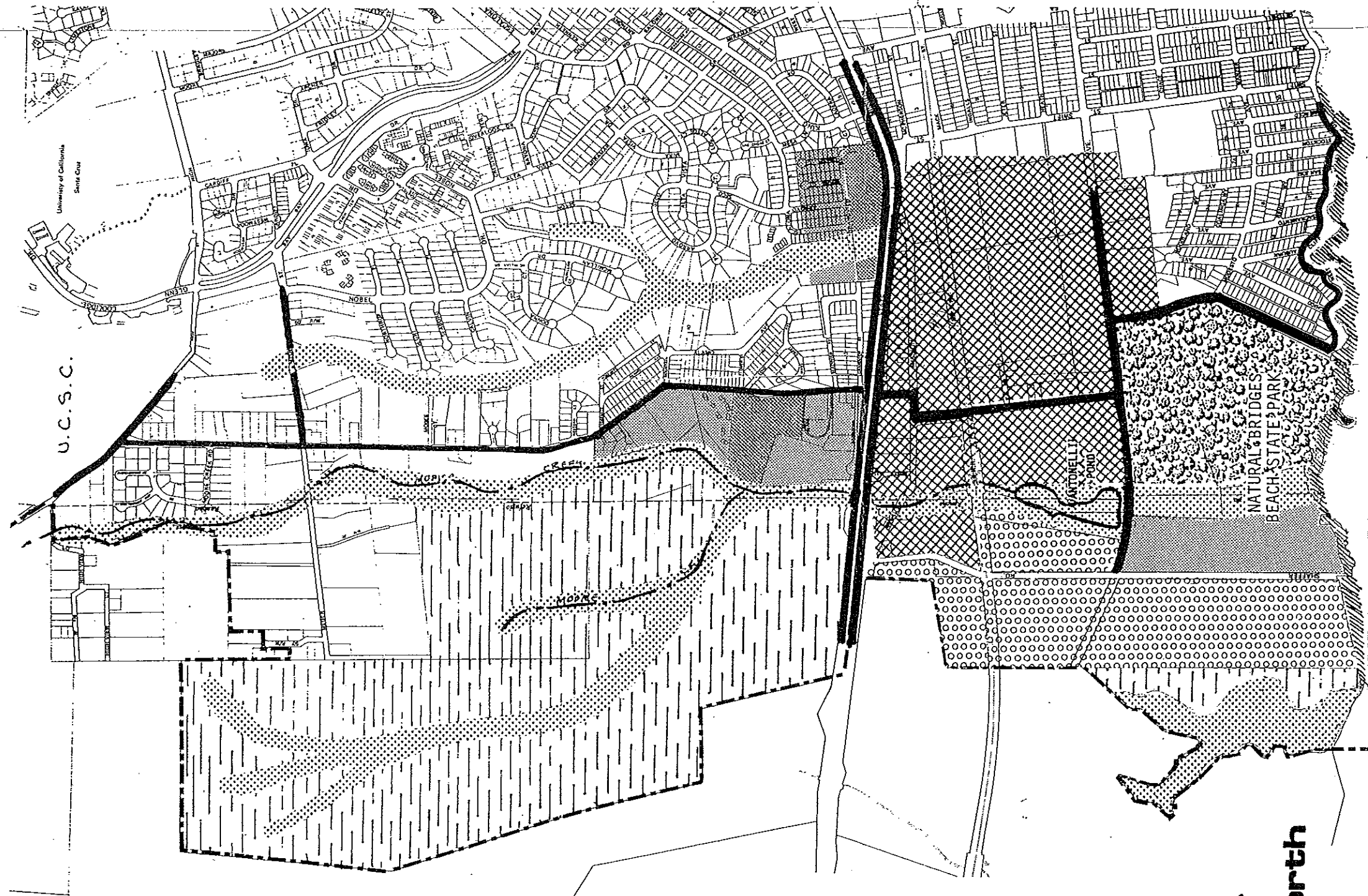
Policy B, Program 4: Develop greenways and pathways along the San Lorenzo River, the ocean and bay frontage, within DeLaveaga Park, canyons and arroyos including Arana Gulch, Reinelt Canyon and Moore Creek Canyon, proceeding with a work program to be completed within the planning period.

Community Design













Policy A, Program 1: Develop techniques to protect and enhance unique natural areas including, but not limited to, Arana Gulch, the San Lorenzo River, Neary's Lagoon, Antonelli's Pond, and Moore Creek Canyon.

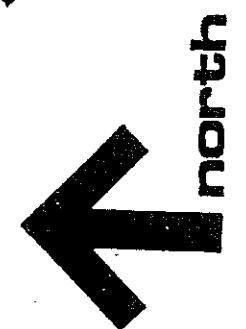
The General Plan map designates the entire length of Moore Creek as "natural area" (see Map 3). General Plan map designation also includes "single-family residential" in the area of Meder Street and along Western Drive; "open space" in the majority of the area north of Mission Street/Highway 1. South of Mission Street/Highway 1, the General Plan designation is "industrial" up to the railroad tracks and south of the railroad tracks on the east side of the creek. On the west side of the creek and south of the railroad tracks, the designation is "special area" with a small strip of "natural area" adjacent to Antonelli's Pond. The "special area" designation covers what is commonly known as the Swenson/Wolfsen/Antonelli tract or the "Westside Lands". These lands are currently being studied for urban uses. The City is working with property owners to develop a plan compatible with surrounding uses, planning policy and one which is responsive to the needs of local residents. So far, a residential/coastal dependent mix of uses is being discussed. The density of residential development, exact amount of each use, and size and type of buffer area separating the uses are yet to be established.

South of Delaware Avenue, the designation is "open space" on the east side of the creek and "multi-family residential" on the west side of the creek.



LEGEND

-  SINGLE-FAMILY RESIDENTIAL
-  MULTI-FAMILY RESIDENTIAL (10-15)
-  MULTI-FAMILY RESIDENTIAL (20-25)
-  INDUSTRIAL
-  SPECIAL AREAS
-  PARKS
-  OPEN SPACE
-  COASTAL RECREATION
-  NATURAL AREAS
-  MAJOR ARTERIAL
-  SECONDARY ARTERIAL
-  COLLECTOR



north

MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN GENERAL PLAN

C. Open Space and Conservation Element (OSCE)

This element of the General Plan also contains a number of policies on the use and importance of Moore Creek and Canyon. Various maps indicate the importance of the area as a wildlife habitat and as an area of significant vegetation. Similar maps also note the area's constraints in terms of slope, erosion, etc. The area is also noted for being an unprotected flood plain, an extreme fire hazard area and area subject to very intensive shaking during seismic events. In a priority list for preservation of natural resources, the Moore Creek riparian corridor is at the top of the list as an area not currently under any type of protection.

The element discusses controlled access, both the merits and problems associated with it. It states that development of a trail system in arroyos and canyons is a method of providing controlled access. Multi-use of open space areas is intended to provide a number of passive and active recreational activities for the residents of Santa Cruz and at the same time preserve these areas of ecological value.

In summary, the element states that "From the information developed in determining wildlife and plant characteristics in Santa Cruz, it appears that the areas with the most unique characteristics and balance of life are those areas where land is least suited for urban uses. These include the canyon and arroyo areas, where redwoods and mixed forests occur; the marsh and stream areas of Moore Creek and San Lorenzo. . . Due to the difficulty of developing such areas and its adverse effect on the environment, it is recommended that zoning measures and other controls should be considered for such areas. Careful study should also be given to the Moore Creek watershed area, which is the most unspoiled riparian corridor within the City. Implementation of these measures would ensure the most important wildlife habitats in the City continue to serve this important function."

D. Local Coastal Program (LCP)

The LCP reiterates many general and specific General Plan policies noted above. Other coastal policies include the following:

COASTAL ACCESS - 5: MOORE CREEK/WESTERN DRIVE COASTAL ACCESS A proposed coastal access trail is shown Western Drive (Western Drive Land Use Plan map A and B) along Moore Creek linking the Western Drive area with Natural Bridges and the Coastal Trail System. The City currently has policy (Council policy #26.2) to obtain public easements where appropriate along creeks wherever possible as part of the project review process. This policy may need to be strengthened in the form of City ordinance as part of the LCP implementation program.

WESTERN DRIVE MASTER PLAN - 28: Establish relatively large lots adjacent to the Moore Creek Corridor and future subdivisions.

ENVIRONMENTAL RESOURCE MANAGEMENT - POLICY B: Preserve open space within the City to meet recreational, social, economic and environmental needs of the community.

NATURAL RESOURCES - NR-1: Preserve and renew unique plant and animal communities of aesthetic, scientific and recreational value.

NATURAL RESOURCES - NR-2: Regulate development in proximity to streams, creeks and other water bodies to maintain and possibly exceed required water quality standards.

NATURAL RESOURCES - NR-3: Protect perennial streams, marshes and estuaries and related vegetation and wildlife for their aesthetic, scientific and recreational value.

NATURAL RESOURCES - NR-4: Require environmental review of all development in or directly adjacent to natural areas.

NATURAL RESOURCES - NR-5: Protect the public health, safety and community welfare, preserve natural environmental resources, minimize man-made effects on the terrain, preserve riparian areas and encourage development in harmony with natural vegetation and land forms by regulating.

NATURAL RESOURCES - NR-10: Develop an ordinance requiring the dedication of or granting an easement to natural areas appropriate for passive recreation and open space uses.

NATURAL RESOURCES - NR-11: Develop an erosion control ordinance to minimize conditions of accelerated erosion that have lead to or could lead to the degradation of water quality, also aquatic habitat, damage to property, loss of top soil and vegetation cover, and increase flooding danger.

E. Zoning Ordinance: Conservation Regulations

Part I, Chapter 24.14 (Conservation Regulations) of the City's Zoning Ordinance sets forth regulations (attached) related to development on slopes, performance standards, drainage control, erosion hazard areas, seismic hazard areas, and ground water recharge areas. These regulations apply to Moore Creek and Canyon.

Slope Regulations

These regulations are designed to minimize risks associated with development in areas characterized by combustible vegetation and steep or unstable slopes. Moore Creek Canyon is characterized by steep slopes and combustible materials thus making any project proposed for the Canyon subject to these regulations.

Erosion Hazard Areas

Since much of Moore Creek Canyon is designated an erosion hazard area in the Open Space and Conservation Element, any project, including trail or observation area development, would be subject to the general provisions of these regulations.

Intermittent/Perennial Streams, Wetland Areas, Wildlife Habitats and Plant Communities

These regulations generally prohibit grading or removal of vegetation in any designated riparian area or within 100 feet from the center of a watercourse.

Moore Creek Canyon is, in part, a designated riparian area bisected by a watercourse. Thus, any proposed recommendations need to conform with these regulations. Uses permitted in such areas are limited to maintenance, non-motor trails, public service projects, nature study, landscaping, passive recreation and habitat preservation and restoration.

F. Zoning Ordinance: District Regulations

The corridor is zoned F-P, Flood Plain District, a district intended to regulate uses in areas unprotected from flooding. Permitted uses are primarily agricultural (included farm dwellings) in nature but recreational facilities and infrastructure uses are also allowed.

Lands adjacent to the corridor are zoned primarily residential (R-1-10, R-L single-family and multi-family residential); other districts include E-A (Exclusive Agricultural), I-G (General Industrial) and LB-P (Public Lands and Buildings). Map 4 delineates the current zoning districts within the Moore Creek Corridor planning area.

The zoning includes 2 overlay zones. There are special regulations in addition to the basic underlying district. Areas in the coastal zone have a Coastal Zone Overlay (CZ-O). A Greenbelt Overlay Zone (GB-O) affects certain parcels (see below).

Map 4 depicts the existing zone districts which lie within the Moore Creek planning area.

G. Measure "O"

Measure "O" was adopted by the City of Santa Cruz voters in 1979. Portions of the west side of Moore Creek and adjacent lands were designated as greenbelt lands by this initiative. Measure "O" resulted in the adoption of specific Zoning Ordinance provisions and overlay land use districts which were designed to "maintain essentially undeveloped lands surrounding existing urban development in uses that retain the land's physical characteristics and its potential for future development . . ."

H. Municipal Code: Heritage Tree Ordinance

Significant trees in the Moore Creek Canyon corridor are protected by the Heritage Tree Ordinance. Trees with trunks at least 50 inches in circumference, approximately 16 inches in diameter or more, measured at 24 inches above natural grade or a tree or grove of trees designated by City Council resolution to be of special historical value or of significant community benefit are defined as "heritage trees." Special provisions for their preservation and maintenance are set forth in this ordinance.

IV. Relevant County Policy/Regulations

County policy and regulations affecting lands adjacent to and west of Moore Creek are consistent with the spirit and intent of both City and Local Coastal Policy affecting the Moore Creek Corridor. A brief summary of all relevant County policies and regulations follows.

A. County Zoning Ordinance: Map

Lands adjacent to the Moore Creek Corridor on the County side are zoned "rural residential" (2½-20 acre min. lot size), "rural" and "institutional" (UCSC). The rural residential lots are all developed except two (3½ and 11½ acre parcels).

B. County Zoning Ordinance: Text

The County Zoning Ordinance contains a chapter on Riparian Corridor and Wetlands Protection, the County's counterpart to the City's Conservation Regulations.

C. General Plan: Map

The County's General Plan contains four maps which bear relevance to Moore Creek Corridor proposals: Land Use Plan, Resources and Constraints, Intermediate Riparian Corridor and Sensitive Habitats.

The Land Use Plan Map shows lands adjacent to Moore Creek Corridor in "agricultural" and "rural residential".

The Resources and Constraints Map shows the UCSC property as an "agricultural resource" and the TMI property (a large vacant site near Highway 1) "grazing"; "forest" and "high erosion" designations are also shown as constraints on adjacent lands.

The Intermediate Riparian Corridor Map shows lands adjacent to Moore Creek Corridor as "aquifer".

The Sensitive Habitats Map indicates "grasslands" on nearly all the adjacent lands.

D. County Local Coastal Program

County Local Coastal Program policies relevant to recommendations for Moore Creek Corridor policy include sensitive habitat policy for "grasslands" and "riparian corridors" and erosion control and watershed protection policy. These policies are included in the Appendix.

V. Relevant State Policy

A. Coastal Act Policies: Natural Systems

Like County policies, State policy reflects the purpose and intent of City policy and regulations.

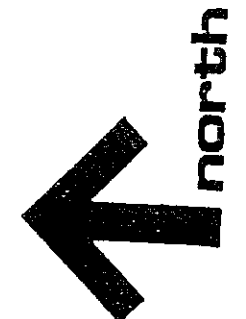
Section 30240

- (a) Environmentally sensitive habitat area shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.



LEGEND

- EA EXCLUSIVE AGRICULTURAL
- LBP PUBLIC LAND AND BUILDING
- R-1 SINGLE-FAMILY RESIDENCE
- R-L MULTI-FAMILY RESIDENTIAL LOW RISE
- R-M MULTI-FAMILY RESIDENTIAL MEDIUM RISE
- I-G GENERAL INDUSTRIAL
- F-P FLOOD PLAIN
- OFR OCEAN FRONT RECREATION
- OVERLAYS
- GBO GREENBELT
- CZO COASTAL ZONE
- SPO SHORELINE PROTECTION



MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN

ZONING

- (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

Section 30230

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of groundwater supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

VI. Natural History

A. Soil and Geology

The study area is located at the southeastern end of Ben Lomond Mountain, a major north-south trending ridge in the Santa Cruz mountains. This ridge consists of crystalline basement rocks overlain by a thick layer of tertiary sedimentary rocks. A series of marine terraces covered with their deposits of sand and gravel cut into these bedrock units. These terraces were formed over the last few million years by simultaneous fluctuations in the level of the sea and massive uplifting of the earth's surface. Terrace deposits are generally soft, unconsolidated and uncemented. Over time, Moore Creek has incised a deep canyon in these coastal terraces. The underlying bedrock geology in the Moore Creek area consists of two sedimentary units -- The Santa Margarita sandstone and the overlying Santa Cruz Mudstone.

Alluvial materials are found along the banks of Moore Creek and its tributaries.

B. Soils

Moore Creek corridor includes a variety of soil types; however, two principal types are most prevalent: Watsonville loam (soil unit 179), which occurs on slopes of 2 to 15%, generally on the flat terraces overlooking Moore Creek Canyon, and Bonny Doon-Rock outcrop complex (Unit 118) which occurs on the steep canyon faces, with slopes of 50 to 85%.

The Watsonville loam soils that develop on marine and terrace areas are moderately well-drained, exhibit "very slow" subsoil permeability, "medium" run-off potential and slight to moderate erosion hazards. Effective depth and water holding capacity is 24 to 40 inches. Land capability is for crops, pasture and urban development. Perched water tables are generally formed in this soil during wet seasons and from irrigation. Perched water tables generally last about 2 weeks after rain storms. These soils exhibit "severe" constraints for shallow excavations on zero to 15% slopes due to the clay content and on 15% plus due to slope wetness and clay content. Suitability for local roads and streets is poor on the zero to 15% slopes due to low strength, shrinkswell potential.

The Bonny Doon - Rock outcrop complex contains about 40 or more percent Bonny Doon loam and 20% rock outcrop. The Bonny Doon soils are shallow and excessively drained. Permeability of the Bonny Doon soils is moderate; runoff is rapid to very rapid and erosion potential is very high. This soil type is prevalent on the steeper slopes and canyon faces throughout the Moore Creek watershed.

The City's Open Space and Conservation Element indicates that the soils on the steep slopes that border Moore Creek are highly susceptible to erosion. These soils are generally the Bonny Doon-Rock outcrop complex unit types. Intensive use of and/or vegetation removal on these steeply sloped areas can adversely impact Moore Creek and Antonelli Pond through increased sedimentation loading. Sedimentation impacts on Antonelli Pond have been extensively studied by H. Esmarli and Associates by use of industrial aerial photographs. Based upon these studies, the consultants concluded that "the (Antonelli) Pond may be expected to fill over (in) about a 100-year period" based upon sedimentation rates occurring between 1962 and 1974.


However, should the watershed undergo a period of major road or residential construction, without appropriate mitigation measures, the pond might become half-filled in just over a period of ten years or less, jeopardizing its long term viability and productivity.

C. Landslides/Liquefaction Potential - from City Seismic Safety Element

The Seismic Safety Element of the City General Plan identifies areas within the upper Moore Creek watershed where landslide areas and areas of soil creep may be present. Typically, landslide potential is the greatest in areas of 30% + slopes, where the slopes have become water-saturated from heavy rainfall. Areas of steep slopes where loosely consolidated soils overlay more stable basement rock are particularly prone to landslides. Map 5 delineates the location of slopes in excess of 30% within the Moore Creek Corridor planning area.

Moore Creek watershed contains both spring activity and perched water tables. Damp areas resulting from perched water tables and subsurface spring activity create weak soil conditions. Under such conditions, the potential for soil creep and shrinking is very high. Site specific studies have located areas of potential soil creep in the east and west facing slopes in the Moore Creek corridor above Meder Street.




 SLOPES
 30% AND OVER

MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN TOPOGRAPHY

D. Hydrology and Drainage

The Moore Creek drainage basin comprises an area of approximately 1.5 square miles. Moore Creek is composed of two main tributaries which come together approximately 1000 feet north of State Highway 1. Precipitation within the watershed varies from 32 inches at the headwaters to 25 inches at its southeasterly terminus. Moore Creek is fed by both surface and subsurface drainage. Spring activity is common on the lands bordering the creek.

In 1974, the Public Works Department estimated that Moore Creek would carry some 670 cubic feet per second (cfs) during the 10 year storm event at the point where the creek intersects Highway 1. In the same preliminary study, total future flow in Moore Creek was anticipated to be some 860 cfs assuming low residential buildout. Present channel capacity of Moore Creek is unknown.

Of the five existing culverts in Moore Creek, three were found to be "entirely too small to accommodate present or future flows." The inadequate culverts are located under High Street, Meder Street, and old Mission Street. The Meder Street culvert is a 42" diameter corrugated metal pipe which delivers only 72 cfs. Ten year storm data for Moore Creek between Meder Street and Empire Grade indicate flows of 180 cfs. Therefore, during intense storm periods with present runoff, this culvert can overtop. Residents in the area have complained about the flooding problems in the area around the culvert.

The City's Western Drive Master Plan identifies Moore Creek as an important drainage way. The plan suggests that drainage be routed to Moore Creek as Western Drive has no underground storm-drain facilities and gutters are currently at capacity.

E. Flood Plain Information

The most recent federal insurance maps (1978) show the 100-year flood plain at an elevation of 58 feet with the 500-year flood event at 68 feet above sea level. (See City Seismic Safety Element).

F. Flora-Fauna Inventory

Wildlife

Moore Creek Canyon provides an important wildlife corridor and ecological link between the open lands of the University of California and Natural Bridges State Park. The Open Space and Conservation Element (O.S.C.E.) of the General Plan designates Moore Creek Corridor and Antonelli Pond as a wildlife habitat area. Special habitat status is suggested for the monarch butterfly habitats at the Natural Bridges State Park and along Moore Creek just north of Highway 1.

Moore Creek is the least disturbed watershed within the City limits. As such the O.S.C.E. identified Moore Creek as a high priority area for preservation. In addition, the O.S.C.E. suggests that this preservation include not only habitat restoration but also controlled access to allow the public to gain a first hand open space experience.

The City's Open Space and Conservation element provides a listing of wildlife found in the Moore Creek Corridor and Antonelli Pond. Based upon these field observations, Moore Creek and Antonelli Pond were identified as key wildlife communities. Other more site-specific studies conducted in the Moore Creek corridor have documented the wide diversity of bird life, mammals, waterfowl, insects and aquatic life. Visits to Moore Creek have documented the existence of numerous game trails used by domestic animals such as cattle and sheep as well as deer and other large mammals.

Plant Communities

In order to preserve and enhance identified wildlife resources, it is essential that the wildlife environment or "habitat" be maintained in its existing natural state. Specifically, this means preservation or protection of those plant communities that are the basis of the ecological system which makes up the habitat. This system is dependent upon large numbers of insects and herbivores to support small organisms which, in turn, support a small number of large carnivorous species.

Whereas, the City's Open Space and Conservation Element (O.S.C.E.) identifies only 4 distinct plant communities within the Moore Creek Watershed area, more specific evaluation of biotic resources has been conducted by environmental impact reports prepared for specific projects within the watershed. Each of these communities occupies an important place in the ecosystem of Moore Creek and provides specific limitations and/or opportunities for human use of the corridor. Each community type is characterized by the presence or relative abundance, of certain plant species and each represents a biological response to environmental factors of geology, soils, topography, available water and climatic conditions existing in any given site. Other factors such as fire, slope stability and human modifications are also important in determining plant species, composition and successful potential.

Plants not only respond to, but also have a significant impact upon, their environment. Plant roots and organic debris aid the soil in absorption of rain water thereby decreasing surface runoff at the same time enabling ground water to percolate and recharge underground aquifers. Plant roots and debris also help secure the soil and retard erosion. This in turn reduces siltation in lower stream channels and flood control structures thereby reducing flood hazards. Root systems serve a third function in promoting slope stability. Dense trees and shrub stands prevent many of the surface landslips and large slumping, common in grasslands and non-vegetative slopes.

Vegetation cover is also an important modifier of local climate conditions or micro-climate. Larger shrubs and trees provide considerable shade which has an ameliorating effect on both temperature and humidity beneath the vegetative crown cover. Trees also modify the moisture regime by intercepting and redistributing precipitation.

Plant communities also have other beneficial functions. They serve as habitats for wildlife and support the complex food web of herbivore, carnivore, and decomposer. They provide foliage for livestock and to a limited extent food for man. Finally, plant leaves and other vegetative detritus furnish the upper soil with organic matter containing nutrients necessary for continued plant growth and succession to higher forms.

The O.S.C.E. identifies four (4) separate plant communities within Moore Creek Corridor and Antonelli Pond. These plant communities are delineated on Map 6. Each of these communities will impact upon and be impacted by increasing levels of use within the corridor.

The OSCE identifies four (4) separate plant communities within Moore Creek Corridor:

- Brush
- Grassland
- Oak-Madrone Woodland
- Riparian

These plant communities are delineated on Map 6.

In addition to these identifiable native plant communities, non-native eucalyptus groves are present in increasing numbers in the northern portion of Moore Creek Corridor. These plant communities will impact upon and be impacted by increasing levels of use within the corridor.

Brush:

This category includes a wide variety of plant life dominated by chaparral and coastal scrub, both of which are highly valuable as wildlife habitats.

The coastal scrub community is intermittent with grazed areas and forests. In areas that are grazed, the scrub is limited to slopes, ravines and other sites from which cattle are excluded. In forested portions, the scrub community occupies warmer slopes unsuitable for forest development. In areas where the forest has been opened in lumbering activities, scrub has resulted. In many cases, the presence of the scrub community may only be a transitional step to development of forests. On sites which have a low potential for regeneration of forests, the scrub community may be more permanent. Plant species in this community include coyote brush, poison oak, california sage and yarrow.

This community occupies greenbelt lands at the canyon edge and east-facing slopes on the west side of Moore Creek.

The chaparral community develops on drier southwest facing slopes but is also associated with rocky, infertile soil types on steep slopes of any aspect. Dominant species include chamise, manzanita, chaparral and leather oak. California coffeeberry, ceanothus and toyon also appear in the chaparral community. In their natural state, chaparral species are subject to periodic wildfires which eliminate the collected undergrowth and allow for new growth. Without periodic wildfire, the undergrowth collects in increasing volumes and substantially increases the intensity of future fires. If proper precautions are not taken with development in these areas, periodic wildfires may cause substantial damage to nearby urban development.

Chaparral communities serve several important functions. Shrub species are a source of food and shelter for wildlife. They are also valuable in preventing erosion especially on steep slopes or in soil zones which will not support other vegetation types. However, the chaparral community presents a potential fire hazard, and must therefore be carefully considered during planning activities.

Grasslands:

Grassland community is found on the marine terraces overlooking Moore Creek, along ridge tops and on ridge spurs. These are areas having higher evaporation rates due to direct, year round exposure to the sun and westerly winds. Therefore, they were able to support only grass and certain drought-tolerant brush species.

The grassland community is a composite of annual grasses dominated by European grass species, such as Rye Grass, which were introduced as the area was settled. Major species of the grassland community include Plantain Clover, California Buttercup, Mil Thistle, Cat's Ear, Filaree, Snake Root, Scarlet Pimpernel, Miner's Lettuce, and Brome Grass.








Small pockets of native perennial bunch grasses remain on portions of Moore Creek Corridor, principally on the west side of Moore Creek, between Meder Street and High Street. Needlegrass, Bluegrass, and Blue Bunch Grass are the dominant species. These grasses are but a small remnant of a much larger perennial grassland association which extended over much of California prior to 1850. Owing to a combination of heavy livestock grazing and periodic drought in the late 19th century, the introduced annual species were able to seed in and maintain a competitive advantage over native species. Furthermore, continued grazing has favored the perpetuation of annual species because of their ability to produce and disseminate new seed after grazing during the dry summer season. If any such areas are discovered through environmental impact report analysis or other means, measures should be taken to protect the areas.

Associated with annual grasses are a number of other plant species. Exotic herbs from Europe such as mustard, thistle, fennel and wild radish are commonly observed. A great variety of native wildflower species are also conspicuous during spring and early summer months. These are associated in some areas with scattered shrub species such as bush lupine, yarrow, golden bush, and baccharis. The latter species is common, and in areas of higher precipitation, it represents a transitional stage in succession to brush and woodland.

Grasslands serve several valuable functions. Except in overgrazed areas, grasses retain water and thereby serve as watershed. Fibrous root structures also tend to retard surface soil erosion and aid in the formation of upper soil horizons. The numerous seeds, leaves and roots are an irreplaceable source of food for birds, small mammals, and beneficial soil organisms. When development occurs in grasslands, the environmental impact reports should address themselves to measures that ensure grasslands continue to serve these valuable functions outside the developed area.



PLANT COMMUNITIES

-  RIPARIAN
-  GRASSLAND
-  BRUSH
-  OAK-MADRONE WOODLAND
-  MIXED FOREST
-  EVERGREEN
-  URBAN

MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN

VEGETATION

Oak Madrone Woodland:

This community inhabits moisture-retentive northeast facing slopes. It is characterized by a variety of co-dominant tree species in a dense closed canopy or semi-open canopy with an interspersed brush or grass understory. Major tree species include California Laurel, Madrone, Buckeye, Big Leaf Maple, Coast Live Oak. Under story types include Toyon, Coffeeberry, Poison Oak and Ceanothus.

All these species are highly sensitive to changes in the environment, brought about by urban development. It also appears that where urban development has disturbed the moisture content of the subsoil, the oak and madrone trees are frequently destroyed by fungus. Since Oak Madrone creates a highly distinctive appearance, its disappearance is of significance from an aesthetic and an environmental standpoint.

Riparian:

These communities are associated with standing or flowing water and represent a most significant and valuable habitat. Riparian communities are found generally at the flatter portions of the Moore Creek corridor adjacent to Highway 1 and between Highway 1 and Antonelli Pond. The riparian zone is defined by a variety of species including Arroyo Willow, Coast Live Oak with California Blackberry, Poison Oak and Brocken and a few other non-native species.

Many birds and animals use the riparian zone for cover, often for nesting and foraging. The transition areas between the riparian vegetation and grassland areas are particularly important for wildlife protection.

Significant marsh areas are located at the northern end of Antonelli Pond and along the pond edge. These marsh areas have been created over time as Antonelli Pond has received increasing sediment loads from upper Moore Creek. A number of significant plant species occupy these marsh areas, including cattails, tules and knotweed. In total, these plant species provide food, protection, nesting areas and cover for a variety of fish, aquatic organisms, water fowl, and birds. The extent of marsh vegetation and marsh areas will increase as the upper portion of the pond becomes increasingly shallow resulting from deposition of sediments from Moore Creek.

Eucalyptus Grove:

The northern portion of the Moore Creek Corridor (between Meder Street and Empire Grade) and steep slopes adjacent to the Outlook Apartments have been taken over by stands of non-native Blue Gum Eucalyptus a very invasive species that chokes out most native trees and nearly all understory growth due to toxic debris that accumulates around them.

VII. Recommended Policies and Programs

The foregoing information on natural history and environmental and resource constraints provides a policy direction for development of lands adjacent to Moore Creek as well as guidance for decision-making regarding future access to the watershed lands and the creek. The existing natural constraints clearly suggest that access should be both directed and restricted; development activity within the watershed must be carefully managed to minimize soil erosion and preserve existing wildlife habitat areas. Counterbalancing these natural constraints are a number of City policies which suggest that public access to Moore Creek Canyon lands should be provided and trail systems along the stream course should be encouraged. How then to balance these potentially conflicting goals is the next task. If successful, a continuous pedestrian link from the Natural Bridges State Park to the lands of UCSC through a relatively undisturbed, natural area can be realized.

A. Access to Moore Creek Canyon

The preparation of the Moore Creek Corridor Access and Management Plan comes at a critical time in the history of the watershed area. The lands west of the main branch of Moore Creek and west of Western Drive are largely undeveloped. In addition, the provision of access through lands east of Moore Creek, with minor inconvenience to property owners and existing development, is still possible due to sparse development on key properties and the existence of public access easements.

For these reasons, access to the Corridor should be based on the goal of keeping the Corridor wild and undeveloped as it is today. Toward this end, paved pathways, inviting and accessible entryways, or prominent signage are not suggested. Instead, utilization of existing trailways and game trails is the order of the day. The goal of this portion of the plan is to provide means of public access, compatible with the needs of private property, existing development, and within the constraints of the watershed's natural setting. Access to the corridor is proposed to be limited to key locations in order to avoid inconvenience to existing development as well as protect sensitive environmental conditions.

Proposed improvements to facilitate access to Moore Creek and adjacent canyon lands relates to the land use intensity of surrounding neighborhood, sensitivity of the corridor and existing recreational opportunities. The proposed trail would make use of and follow existing trailways and game trails. New trails would be comparably developed utilizing such materials as decomposed granite pathways or the equivalent.

The more intensive public use areas are proposed south of Meder Street where impacts on existing and future development would be negligible due to the relative isolation of Moore Creek from surrounding neighborhoods. In addition the higher intensity use proposed reflects the higher population densities along this portion of the Corridor. Thus, more formal, developed entryways at Grandview Street and Monarch Way (described below) and the viewing areas along Western Drive reflect the level of intensity of the surrounding neighborhood. Similarly, the development of trails without a high level of amenities north of Meder Street reflect the lower intensity, predominantly low density single-family uses adjacent to this portion of the Corridor.

Due to existing development patterns and physical accessibility, the majority of this study focuses on the east branch of Moore Creek. It is along this branch that specific recommendations are provided. However, as pointed out above, the majority of the west bank of Moore Creek lies on lands which are presently undeveloped and in private ownership. Therefore, recommendations for access points, viewing stations, etc. within these lands must necessarily be schematic.

Visual access to the Corridor is considered as important as physical access, as the majority of City residents will undoubtedly partake of Moore Creek Corridor in this fashion. Therefore, a number of viewing areas, with access from existing public rights-of-way, are suggested. However, it is also suggested that where clearly identifiable visual resources are present, that private development accommodate the needs of the general public through the construction and/or provision of access to the viewing areas themselves.

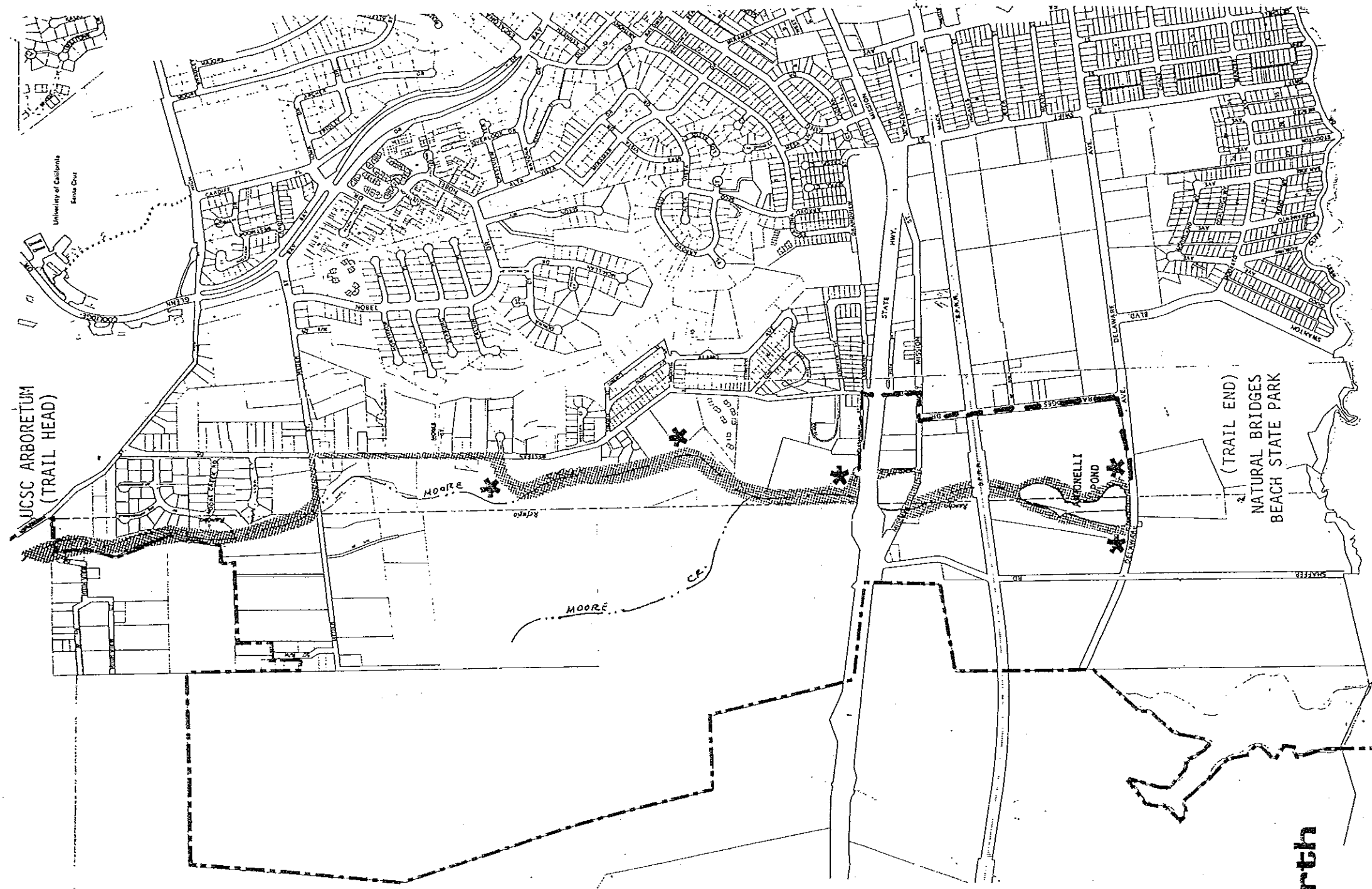
Trails

The proposed trail system is shown on Map 7. The route of the trail was selected to achieve compatibility with the needs of private property owners, existing development patterns and to take advantage of the visual and other resources of the corridor while respecting the constraints imposed by the watershed's natural setting. The trail system seeks to parallel Moore Creek and to utilize existing informal trails where possible but switches to existing City sidewalk and rights-of-way where topography, habitat areas or other constraints limit access to the Creek. The proposed trail rejoins Moore Creek at key access points.

Access to Moore Creek and adjacent canyon lands is already provided by a number of access pathways and informal trails resulting in part from City regulations requiring the dedication of accessways as a condition of tentative map or planned development approval. Public access easements along the east side of Moore Creek occur north of Meder Street where recent developments have resulted in dedication requirements. The trail along this portion of Moore Creek would utilize these existing accessways. However, due to existing topography and wildlife habitats, it may be preferable to re-establish trails and accessways on the west side of Moore Creek and abandon some or all of existing entry points on the east side. Final trail alignment will be based upon extensive on-site investigations and consultation with neighboring property owners.

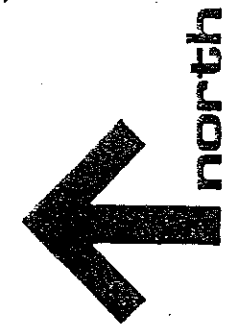
Public access to Moore Creek Corridor has been enhanced through the efforts of the Santa Cruz County Land Trust which has acquired either easements or fee simple ownership of a number of key properties. The principal acquisition has been lands adjacent to the western shores of Antonelli Pond, across the street from Natural Bridges State Park. Map 8 indicates the existing easements, public/quasi-public ownership within the Moore Creek Corridor.

A key issue then is to provide access to this corridor in a manner that is compatible with existing development patterns and with the existing constraints. As mentioned, it is the goal of this plan to limit access to the corridor except for designated areas. Practically speaking, topography and vegetation perform this function. However, as an aid to development of future parcels, it is important that accessways be identified early on.



LEGEND

- * PROPOSED TRAIL ENTRY POINT OR VIEWING AREA
- MOORE CREEK CORRIDOR TRAIL
- INTERIM TRAIL CONNECTION

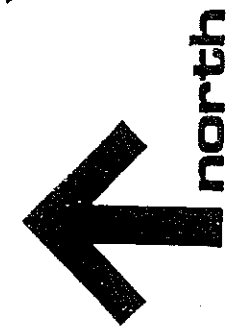


MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN **TRAIL AND VIEWING AREAS**



LEGEND

-  EXISTING
-  PROPOSED



MOORE CREEK CORRIDOR ACCESS & MANAGEMENT PLAN

LANDS IN PUBLIC OWNERSHIP

Potential access points have been reviewed for feasibility of access within the stated goals of the Plan and their relationship to existing pedestrian pathways. A key potential access point to Moore Creek lies opposite the intersection of Monarch Way and Western Drive (APN 2-061-04). It is suggested that public access from Western Drive across this parcel be acquired through dedication or purchase. This parcel is suggested for three reasons: 1) the topography and vegetation cover are favorable to permit access to the creek; 2) the parcel is large and undeveloped at present and such that access would not conflict with existing or proposed land uses; and 3) a public access point here could link up with an existing pedestrian easement through Monarch Way to Arroyo Seco to the east.

The other key access point to Moore Creek lies west of the Grandview Street turnaround area (APN 2-061-19). It is suggested that this location could serve not only as a point of entry to the Corridor from the Grandview Street neighborhood, but also serve as a mini-park which could serve that neighborhood as well as the industrial lands to the south.

The proposed Moore Creek pathway originates on the north at the UCSC Arboretum and terminates at Natural Bridges State Park to the south. A trail head is proposed at the UCSC Arboretum. From the Arboretum, the pathway ultimately would head south along Moore Creek. Existing access points south of High Street provide access to the east side of Moore Creek; however, due to presence of slopes and vegetation on this side of the creek it may be preferable to provide future access to the Creek from the west side should unincorporated lands along this portion of Moore Creek develop. Precise location of future trails will be determined through field surveys and consultation with neighboring property owners and residents.

The pathway would then follow Moore Creek south from these access points to a point where it intersects Meder Street. At this point, the pathway would run along Meder Street to Western Drive, since Moore Creek drops some 40 feet in elevation just south of Meder Street. The pathway continues along the existing Western Drive sidewalk to a point opposite Monarch Way where access to the creek could again be gained. Existing informal pathways along the Creek lead to the point where Moore Creek crosses under Highway 1. At this point, the existing, informal trail system would be upgraded to route pedestrians to the westerly terminus of Grandview Street. As a short-term solution, pedestrians could utilize Grandview Street to Western Drive and cross at Highway 1. Sidewalks on the south side of Highway 1 would be followed along Western Drive, Mission Street, Natural Bridges Drive and Delaware Avenue. The trail would terminate (or begin) at the western shores of Antonelli Pond. While this use of the pedestrian crossing at Highway 1 may be suitable as an interim solution, it is suggested that, as a longer-term solution, a pedestrian crossing of Highway 1, either at, above or below grade, between Shaffer Road and Western Drive, be explored. The intermittent use of this crossing point would continue to ensure smooth flow of traffic along State Highway 1.

If a safe, approved crossing of Highway 1 can be obtained a longer-term solution would provide a more "natural" route to the trail's end at Antonelli Pond. Following a crossing of State Highway 1, the proposed pathway would travel along the east side of Burkett Street crossing Mission Street Extension. From this point, there are two alternates suggested. As an interim solution, pedestrians would travel on the sidewalk along Mission Street Extension and down the sidewalk along the west side of Natural Bridges Drive. However, as a more long term solution, pedestrians would turn west along Mission Street Extension, pick up a pathway along Moore Creek and traverse the Southern Pacific Railroad right-of-way. This ultimate solution is extremely meritorious in that it could connect directly with existing pathways along the east side of Antonelli Pond.

In order to complete the proposed trail system, it will be necessary to acquire the rights to traverse several parcels which are in private ownership. Fortunately, this acquisition can be done in a way that will be compatible with existing and proposed development within the watershed. This is due to the fact that the majority of lands on which the trail system is present or proposed is adjacent to Moore Creek on lands which are already restricted in their developability as a result of their proximity to existing slopes and/or placement of parcels in the floodplain (FP) district. The flood plain district permits only a limited number of uses which would not be severely impacted by flood waters or interfere with carrying flood waters. Uses such as trails are permitted in this district. And, access to the creek itself is limited by existing topography. Thus, only several points are suitable for access to the Creek, and these lands are largely undeveloped.

Since current City regulations require that structures be setback 20 feet from any 30% slope and 100 feet from the center line of creeks such as Moore Creek, use of these areas for trails would have a negligible impact on present or future land uses. In order to implement this trail system, it is necessary to acquire (through purchase, dedication or donation) lands between the center line of Moore Creek and the 100 foot setback line. Acquisition of lands within this setback area will result in a continuous band of lands in public ownership or control along Moore Creek and its tributaries. In addition to furthering the public access goals of this Plan, acquisition or control of these lands will also protect the public interest by dramatically reducing the risks of flood damage to future structures in these setback areas.

Viewing Areas And Creek Access Points

Consistent with goals to limit and direct public access to the Moore Creek, the majority of City residents will enjoy Moore Creek visually rather than access it physically. Proposed viewing areas will also benefit those residents who are physically unable to use the proposed trail system to enjoy the grandeur of Moore Creek Canyon. Therefore, the provision of strategically located viewing areas is critical. Viewing areas are suggested in those areas where visual resources are the highest. These are generally panoramic views of the steep cliffs which border Moore Creek. Viewing areas may also function as transition points between trails or as entry points to the creek side trail. Map 7 delineates the location of proposed viewing areas.

Development of three viewing areas are recommended between Moore Creek and Western Drive:

- 1) one at the entryway to the corridor opposite Monarch Way (APN# 2-041-04)
- 2) on the promontory west of Mountain Way and Western Drive (APN # 2-061-27, 28, 35, 36, 37, 38)
- 3) at the entryway to the corridor west of Grandview Street cul-de-sac (APN # 2-061-09)

Other viewing areas are suggested on promontories on designated greenbelt lands on the west side of Moore Creek.

Monarch Way Viewing Area:

This area is suggested to serve two functions: 1) to provide visual access to Moore Creek Corridor; and 2) to provide a point of entry to creek-side trail, a resting point and linkage with the Arroyo Seco to the east. The viewing area should be low key and consistent with the goals of the access plan but also urban in feel as it lies adjacent to Western Drive. It should include benches or other places to rest from the uphill climb from both Arroyo Seco and Moore Creek, and signs and other information about routes and distances.

The location for this combined access point and viewing area was first identified in 1978 during development of the Western Drive Master Plan. It is recommended that acquisition of access across this parcel be given top priority during the plan implementation phase. Acquisition by purchase or dedication is suggested.

Western Drive Overlook:

The views from the promontory west of Mountain Way and Western Drive are the most spectacular along the watershed area. Existing informal trail systems provide direct access to the cliff edge for viewing. The importance of this promontory is already recognized in the City's adopted Western Drive Master Plan. The purpose of the discussion here is to suggest how this viewing area should be developed and utilized. It is anticipated that a housing development will occur on this vacant parcel in the future, thus the flavor of this viewing area should be distinctly urban to reflect its location in the neighborhood. Due to existing topography, it is possible that this viewing area and pathway from Western Drive could be handicapped accessible and yet separated from the development anticipated around it. Unlike other view areas, this view station should be developed in a more urban style with paving, furniture, lighting, guard rails, etc.

It is anticipated that the suggested viewing area and pathway from Western Drive would be utilized by both the surrounding neighborhood, general public as well as residents of the future housing project. Therefore, it is suggested that the provision of this open space amenity be "counted" toward the developer's open space requirement during project development. This technique may also provide viable in other cases where public access improvements are suggested for specific sites by this Plan.

Grandview Street Entryway:

Access to Moore Creek Corridor from the Grandview Street neighborhood already occurs at this location. However, this access should be formalized into a distinct entryway to the corridor. It could also serve other functions as well. It is suggested that a mini-park of distinct urban flavor could be developed that could serve as an entryway to Moore Creek Corridor and a gateway to the City as a whole.

The schematic in Appendix "A" illustrates one proposed treatment of this Grandview Street entryway. It must be emphasized that this drawing is only intended to illustrate one possible approach and is intended to be used as a point of departure for project planning and evaluation.

The Grandview Street entryway provides the second of only two points of feasible access to Moore Creek, between Meder Street and Highway I. Consequently, acquisition of site is critical to achieving the public access goals of the Plan. Therefore, it is recommended that this site be acquired as soon as possible through either purchase, donation or dedication.

The following policies and programs are intended to implement the access provisions of the Moore Creek Plan.

Recommended Policies and Programs

Policy

Develop a low-intensity use trail system in Moore Creek Canyon corridor linking the corridor with UCSC, Natural Bridges State Park Coastal Trail and Wilder Ranch and Beaches State Park.

Programs

- Require dedication or purchase or solicit donation of lands on both sides of Moore Creek to include Canyon slopes below the 30% slope line, for lands between State Highway I and High Street to be included in the trail system. Exceptions may be made to protect the privacy of existing development.
- Develop safe, controlled pedestrian crossing point at Highway I either at, below or above grade.
- Develop pathway along east side of Moore Creek south of Mission Street Extension. Obtain rights for pathway to traverse Southern Pacific right-of-way to link up with existing trail system on the eastern shore of Antonelli Pond.
- Encourage the University of California to provide public access along Moore Creek from north of High Street to the headwaters as part of its Long Range Development Plan (LRDP).

- New development on the bluff tops above Moore Creek or its tributaries shall be setback sufficiently so that it will not be visible from the creek bed.
- Use of existing and proposed trail system shall be limited to pedestrians only.

Policy

Provide connections from existing City rights-of-way to Moore Creek Canyon trail system.

Programs

- Purchase or require dedication or solicit donation of necessary lands for access to Moore Creek Canyon; the access points recommended are 1) opposite the intersection of Monarch Way and Western Drive; and 2) west of Grandview Street turnaround area.
- Require construction and provision of public viewing areas as part of private developments in locations designated in the Moore Creek Access and Management Plan. To minimize impact on private developer, open space provided for pedestrian trails and/or viewing areas, mini-parks, etc. should be "counted" toward the developer's normal open space contribution.
- Develop specific Grandview Street turnaround area and Monarch Way viewing area to enhance their use as public access and viewing stations. Provide for access by handicapped persons.

B. Management of Moore Creek and Adjacent Lands

Provision of public access to Moore Creek and adjacent lands is but one of the goals of the Moore Creek Corridor Access and Management Plan. Equally important is protection and enhancement of the corridor's natural environment. Without it, even its scenic qualities can be compromised.

Although largely undeveloped and physically isolated from surrounding urbanized areas, Moore Creek Corridor has nevertheless been adversely impacted by activities within the watershed. An extensive study of Antonelli Pond and, by inference, Moore Creek itself was undertaken by the firm of Harvey and Stanley Associates, in August 1980. It documented the impacts of watershed activities on sedimentation rates and pond water quality and suggested measures to mitigate identified impacts. This analysis detailed extensive amounts of phosphorous within the water, owing directly to the composition of rock types in the upper watershed area. However, the analysis also detailed the presence of inorganic nitrogens which are directly attributable to developing residential uses within the watershed. In general, nutrient levels in the pond were comparable to those reported from Pinto Lake, an intensively used recreation lake area 20 miles to the east. Pinto Lake, although experiencing adverse effects from urbanization, is broadly appreciated for its recreation and wildlife values, by residents of southern Santa Cruz county. This fact allowed for the conclusion that Antonelli Pond, though currently adversely impacted by activities in the watershed, may be transformable to a successfully managed resource for City residents.

The 1980 study documented a more severe problem: the sedimentation of Antonelli Pond itself. The rate of sediment increase is accelerating from 36 tons of sediment deposited yearly in 1940 to some 190 tons per year deposited between 1968 and 1974. This sedimentation is directly attributable to management practices in the watershed as well as the inherent soil erosion rates on steep slopes bordering the creek. Without specific attention to soil erosion mitigation measures, the pond may be expected to fill over at the present rate of sedimentation in about 100 years. However, with accelerated development in the watershed area, this 100-year projection may be expected to shorten to 10 years or less at which point the pond may be quite difficult to manage effectively.

Sedimentation also directly affects the substantial nutrient and heavy metals which were found in Antonelli Pond during the studies performed by Harvey & Stanley Associates in August 1980. Therefore for two reasons, the careful management of land use activities, grading, cut and fill, etc., is of extreme importance.

Moore Creek Corridor provides an important wildlife corridor and ecological link between the open lands of the University of California on the north and the Natural Bridges State Park on the south. To maintain the continued viability of this resource, management must also be directed to preservation and enhancement of existing wildlife habitat areas. The following policies and programs are designed to address the issues of water quality maintenance and enhancement, sedimentation, and preservation and enhancement of wildlife resources within the Moore Creek Watershed Area. The recommendations are organized into two distinct parts:

- a). Those recommendations relating to Moore Creek Corridor generally; and
- b). Policies and programs which are directed at specific sites (e.g. Antonelli Pond) within the watershed.

Policies and programs are also provided for lands within the unincorporated lands of the County and lands owned by the University of California.

Water Quality

Policy

Maintain the water quality of Moore Creek at the highest level feasible by regulating the discharge of storm waters into Moore Creek and its tributaries.

Programs

- Maintain all post-project runoff at pre-project levels through the use of retention or detention ponds, with a controlled release, to trap sediment and sediment bound heavy metals, nitrates and phosphates.

- Equip new storm drain systems both on-site and off-site with sediment/oil and grease traps. Regular maintenance program should be developed as part of local Homeowner Association policies and City Public Works Department Maintenance Programs.
- Institute regular street sweeping program in the Moore Creek Canyon watershed area.
- Direct all storm water, once cleansed, to Moore Creek, a groundwater recharge area. This will enhance groundwater recharge in the lower Moore Creek Corridor.
- Equip all outflow culverts and storm drain facilities with energy dissipators to minimize downstream sedimentation of Moore Creek.
- Provide control and improve quality of storm runoff from Granite Rock Corporation Yard.

Soil Erosion, Sedimentation and Grading

Policy

Significantly reduce the quantity of sediments transported to Moore Creek and Antonelli Pond.

Programs

- Require the submission and installation of erosion control and grading plans for all projects located in Moore Creek Watershed Area.
- Require that all exposed slopes be revegetated immediately upon cessation of grading activities through installation of permanent vegetation in conjunction with hydroseeding and other temporary erosion control measures. Temporary berms shall be in place at the edge of the setback line to prevent siltation of Moore Creek. These temporary berms shall be replaced by permanent measures prior to project clearance and/or subdivision acceptance.
- Limit vegetation removal to that amount necessary to complete approved construction projects. Any vegetation removed shall be replaced or replanted so as to ensure slope stability, limit soil erosion potential and significantly reduce off-site sedimentation.
- Require that land be developed in increments of workable size which can be completed in a single construction season. Erosion and sediment control measures shall be coordinated with a sequence of grading, development, and construction operations. Erosion control measures shall be put into effect prior to the commencement of the next increment period.

- Prohibit all earth-moving activities between December 1st and March 1st. In addition, grading activities shall not begin after September 1st unless grading can be expected to be completed and plantings completed by December 1st.
- Prohibit grading, vegetation removal, construction of structures or alteration of the existing contours within twenty feet of any 30% slope. Precise topographic survey shall be conducted as part of project review to ensure that erodible soil conditions beyond the 20-foot setback are not disturbed.
- Specific building envelopes shall be designated on all plans submitted for permit processing within the Moore Creek Corridor study area. No construction shall occur outside of the designated building envelope.

Vegetation

Policy

Existing vegetation shall be retained and protected to the maximum feasible.

Programs

- Require that replanting and/or plant removal be designed to increase quantity, diversity and productivity of native vegetation and to ensure slope protection, habitat enhancement and buffering.
- Removal of non-native vegetation should be considered only in those areas where this action will serve to protect concentrations of native vegetation. Efforts should be made to contain eucalyptus, particularly when it threatens existing native species. Selective removal of non-native trees and other vegetation may be permitted or required by the City if authorized or approved by a qualified professional with relevant academic training and experience. This removal shall only be permitted when accompanied by an approved replanting program. However, no removal shall be permitted in designated special or unique habitat areas.
- Require that existing landscaping be incorporated into final project landscape plans.
- Require that landscaping plans emphasize native species and include those varieties with both habitat and food-bearing value.

Public Service Systems

Policy: Drainage

Improve existing culverts to accommodate projected flows in Moore Creek.

Policy: Sanitary Sewers

Provide sanitary sewage facilities and necessary appurtenances thereto in such a way as to minimize impact on Moore Creek Canyon.

Programs

- Prohibit construction of new sanitary sewer lines down Moore Creek Canyon.
- Allow use of septic tanks in areas west of Meder Street "dip" in those areas not currently served by sanitary sewer facilities only when endorsed by registered sanitarian and approved by the County Department of Environmental Health and the City's Public Works Department.

Policy: Access and Circulation

Future improvements to circulation facilities should be designed to improve access to Moore Creek, both physically and visually to the extent consistent with environmental constraints.

Programs

- Require that future road improvements or improvements to existing roadways include provisions for pedestrians, bicyclists as well as other vehicles.
- Install sidewalks along streets leading to and from proposed trail including Meder Street, Burkett Street, Mission Street Extension, Grandview Street and Delaware Avenue.
- Require that access to public viewing areas established by this Plan be accessible to the handicapped to the maximum extent feasible.

The foregoing policies and programs are applicable to general development activities within the Moore Creek Corridor and watershed. However, a need to provide policies and programs on a site specific basis to provide specific guidance to individual property owners during project planning and development. These are enumerated below:

Management of Antonelli Pond

Policy

Implement management action plans of Harvey and Stanley Associates Report of August 1980.

Programs

- Consider a requirement for the dedication of additional lands on the east and west sides of Antonelli Pond to increase buffer area. Precise boundary of buffer area shall be determined through project review and/or environmental review process.
- Prohibit motor powered boats from Antonelli Pond.
- Require that re-landscaping for habitat enhancement on the east and west sides of Antonelli's Pond be part of project review of future development projects. Landscaping shall be undertaken in consultation with registered professional and be consistent with recommendations of the Harvey and Stanley Associates report of 1980.

Site Specific Management Policies

Programs for City Greenbelt Lands

Should any development of existing City Greenbelt lands west of Moore Creek be considered, a specific area plan designed to implement the goals of the Moore Creek Access and Management Plan shall first be developed to:

- Determine appropriate land uses and circulation patterns;
- Designate setbacks from canyon edges;
- Designate significant land forms and existing vegetation for preservation;
- Designate pedestrian pathways to and from canyon edge, and Moore Creek;
- Determine appropriate lands for fee simple or easement acquisition;

Programs Affecting Unincorporated Lands

- Review development of lands adjacent to Moore Creek and its tributaries within the unincorporated areas of the County to ensure conformity with policies and programs of the Moore Creek Access and Management Plan.
- Request the County to adopt relevant policies and programs of the Moore Creek Access and Management Plan as part of the County's Local Coastal Plan and General Plan.

Programs Relating to UCSC Long Range Development Plan.

- Request that the University of California adopt relevant policies and programs of the Moore Creek Access and Management Plan as part of its Long Range Development Plan.

- Request that the University of California incorporate public access and watershed management measures into future projects within that portion of Moore Creek Corridor that lies within the UCSC campus.

Program Affecting Westside Lands Study Area.

- Future development of lands adjacent to Antonelli Pond within Westside Lands Study Area shall incorporate relevant policies and programs of the Moore Creek Access and Management Plan.

Program Relating to Operation of Shaffer Road Corporation Yard

- Require Granite Construction Co., Inc. to implement, as soon as possible after obtaining City approval, improvements such as construction of a landscaped berm and installation of sediment and grease traps to prevent sedimentation or pollution of Moore Creek potentially caused by Granite's storage of loose materials or other operations on the site.

Program Relating to Special Habitat Area West of Grandview Street Cul-de-Sac

- Prohibit tree removal within the existing eucalyptus grove northwest of the extension of Grandview Street unless approved by the City, with advise of a qualified biologist or expert.

Program Related to Southern Pacific Railroad

- Investigate an easement across the existing right-of-way between Antonelli Pond and Natural Bridges Drive as soon as possible.

VIII. Implementation

The foregoing pages set forth policies and programs which, if implemented, will greatly contribute to watershed protection and enhancement of public access to Moore Creek itself as well as to adjacent canyon lands. Many of these policies and programs are already incorporated into the City's decision-making framework, policy documents and development regulations. The remainder must be included to ensure that the Moore Creek Corridor will remain a permanent part of the City's irreplaceable open space heritage. Development of an action plan necessary to implement these policies and programs is the subject of this section.

There are three primary vehicles by which policies and programs are implemented within the existing City decision-making framework: 1) incorporation of appropriate policies and programs into the General Plan and Zoning Ordinance, 2) implementation of policies and programs through such administrative procedures as conditions of approval, City Council policy, and 3) incorporation of items such as sidewalks, construction of pathways, installation of signage, etc. into the City's annual budget or Capital Improvement Program. The prerequisite for implementation through any of these vehicles is the adoption of the Moore Creek Corridor Access and Management Plan as an area plan and its incorporation into the City's General Plan. Once adopted, the Plan becomes official City policy and legally binding on future public and private projects.

It should be noted that the task of implementing such a far-reaching plan cannot be undertaken by the City acting alone; nor should it. Instead, it will take a concerted effort by a number of other players to make the goals of the plan a reality. One key player in implementation of the plan will be owners of property along the corridor. It is extremely important that affected property owners be advised early on of the part their particular lands play in protection of this critical resource for benefit of all residents of the City of Santa Cruz. In this way, future development plans can proceed with a minimum of disruption.

A second key player will be the California Department of Transportation (CALTRANS) which controls a 100-foot swath of property (State Highway 1), which divides Moore Creek. The proposed plan calls for a pedestrian crossing of State Highway 1, either at, above or below grade in the area where Moore Creek crosses the Highway. It will be important to coordinate and indeed receive permission from CALTRANS to realize this component of the plan.

Another key player is the Southern Pacific Railroad Company. Like State Highway 1, Southern Pacific railway company controls a key parcel of property which crosses Moore Creek where the creek enters Antonelli Pond. The ability of the City to obtain an easement across Southern Pacific railway company right-of-way will play a critical part in completion of a pedestrian link from Antonelli pond on the south to the Moore Creek trail in a manner which is compatible with the natural conditions of the corridor.

No less important is the California Coastal Conservancy, which provides a source of funding to construct or upgrade existing improvements which enhance access to coastal resources like Moore Creek and Antonelli Pond. Most recently, the Conservancy provided monies to upgrade public facilities on the west side of Antonelli Pond. The California Coastal Conservancy will be looked to for funding of required improvements such as future trails so that Antonelli Pond and Moore Creek will be an accessible coastal resource now and in the future.

Finally, the Santa Cruz County Land Trust, a non-profit public benefit corporation, has played an active role in accepting land donated by private individuals to secure them in perpetuity for the public benefit and securing grant funds to improve public access to the west shore of Antonelli Pond. The Land Trust should continue to be looked at as an alternative to and a partner with the City of Santa Cruz to ensure that public access to the corridor and protection of valuable watershed lands along the corridor come to fruition.

A. Adoption of Moore Creek Access and Management Plan as part of the City General Plan

The first step in implementation of the Plan is its adoption as part of the overall planning policy of the City of Santa Cruz. This is done through incorporation of the Plan into the City's General Plan as an area plan. With its adoption, future public and private development projects must be consistent with policies and programs of the Plan prior to project approval. The Planning Commission and City Council would adopt the plan pursuant to Chapter 24.06.080 of the City's Zoning Ordinance.

B. Revisions to City Zoning Ordinance

The City Zoning Ordinance provides the main implementation tool for policies and programs contained within the City General Plan and any plan such as Moore Creek Corridor Access and Enhancement Plan. Consequently, it is within the Zoning Ordinance that the majority of the policies and programs of the plan would be located. More specifically, Chapter 24.14, which contains existing policy regarding environmental resource management, is the appropriate location of many of the policies contained in the Moore Creek Plan. Many of the proposed policies regarding resource protection are already included in existing conservation regulations. However, major additions to the ordinance will be required to implement the land dedication provisions of the plan.

Resource Protection Provisions

The Moore Creek Plan provides policy and programs in three specific areas relating to resource protection: a) water quality, b) soil erosion, sedimentation and grading, and c) vegetation removal and replanting.

Water Quality:

A major goal of the Plan is to "maintain the water quality of Moore Creek at the highest level feasible by regulating discharge of storm waters into Moore Creek and its tributaries". To implement this goal, several policies are established. The majority of these policies are already a part of the City Zoning Ordinance (Section 24.14.050). However, whereas the policies contained within the Plan are not based upon the size of project, existing City implementation policies differentiate between small and large projects. Existing Zoning Ordinance provisions require greater detail and more stringent requirements for larger (four units and above) projects than for single-family developments. Since single-family development is the predominant development in the watershed and uncontrolled storm water has the potential to degrade Moore Creek water quality, it is recommended that drainage plans comparable in detail to those required for larger projects be required on single-family residence on lots which border Moore Creek. These plans would then be reviewed during the course of building permit issuance. Alternately, a discretionary permit such as a design permit could be required for all single-family residences on parcels which border Moore Creek so that drainage impacts on the creek can be carefully evaluated and mitigation measures required when necessary.

Existing land use activities at the Granite Rock Corporation Yard on Shaffer Road just north of Antonelli Pond has the potential to seriously degrade the water quality of Moore Creek. These potential impacts are due to storage of building materials, street reconstruction debris, asphalt etc. adjacent to the creek bank. Without proper precautions such as protective berming and/or relocation, such materials could wash into the creek and then into Antonelli Pond. The Plan has as one of its high priorities, the installation of necessary remedial measures to prevent this occurrence.

Soil Erosion, Sedimentation, and Grading:

The goal of this section of the Moore Creek Plan is to significantly reduce the quantities of sediments transported to Moore Creek and Antonelli Pond. Without careful management of earth-moving activities, the resultant sedimentation of Moore Creek and its tributaries will adversely affect Antonelli Pond. To fully accomplish the protection of the water quality of both Moore Creek and Antonelli Pond, it is anticipated that the existing and proposed prohibitions against placement of structures, removal of vegetation and alteration of contours specified by the City Zoning Ordinance (Section 24.14.030d) will be strictly enforced and no exception to these regulations granted by the City. As noted in Section VII-B above, Antonelli Pond could be silted up beyond manageable levels within a decade without limitations on earthmoving activities in the watershed.

Fortunately the provisions of Chapter 24.14.060 (erosion hazard areas) have bearing on development within the Moore Creek Corridor watershed area, inasmuch as that area is listed as an area subject to erosion by the City's Open Space and Conservation Element. Though the regulating mechanism is present, diligent adherence to the general provisions of that section will be required during both plan review and on-site inspection to protect exposed slopes. However, several programs contained within the plan must be added to this section to fully accomplish the goals of the Plan. Specifically, greater protection of the slope setback area should be considered. Presently, no structures are permitted within 20 feet of 30% slopes (Section 24.14.030.d). However, this section does not prohibit either grading or vegetation removal within the setback area. It is suggested that all vegetation removal and grading activities be prohibited within this setback area.

Another recommended addition is the expansion of the City policy with respect to grading deadlines. Currently, City Council policy #26.10 specifies that no grading will be done between December 1 and March 1. It is recommended that this policy be codified within the Zoning Ordinance which provides it with increased legal standing and enforceability. In addition, it is recommended that the period of prohibition be expanded to provide greater protection for the Moore Creek Corridor. It is recommended that the period of grading limitation be expanded to October 15 - April 15 on an annual basis. Rainfall figures provided by the Water Department indicate that the periods of heaviest rains occur between November and April. (See Appendix "A") Cessation of grading on October 15 would provide a two-week "grace" period during which erosion control measures could be installed and take hold prior to the heavier November rains.

Vegetation:

A major new policy of this section is that native vegetation chosen for its wildlife and habitat value and food bearing value be part of the final landscaping plans of projects within the Moore Creek Corridor. New policies also address selective removal of non-native invasive plant species as well as protection of a designated special habitat area at the end of Grandview Street. In addition, it is suggested that vegetation removal be limited in slope setback areas. Existing City policies with respect to vegetation do not clearly require the preservation of vegetation within the 20-foot setback area. This policy should be included in Section 24.14.080 of the Conservation Regulations.

C. Land Dedication and Open Space Easements

Existing City policy (General Plan, Western Drive Master Plan, Local Coastal Plan, City Council Policy) clearly indicates that land dedication for access and resource protection purposes is necessary in the public interest. However, the City's Zoning Ordinance currently does not provide specific language to implement this policy. Furthermore, no specific guidance is provided as to whether dedication should be in fee simple or easement. As a result, over the years, acquisition of lands in fee or easement has often seemed arbitrary and without direction or goal. The purpose of this section is to suggest specific guidelines to determine when fee simple and easement dedication is appropriate.

One purpose of the City's Conservation Regulations is to "preserve riparian areas and other natural habitat by controlling development near the edge of pond, streams or rivers". The most efficient way of controlling development near streams such as Moore Creek is to acquire public ownership of these riparian areas or development control through easements. It is recommended that the purpose of the conservation regulations be amended to implement a land dedication policy. Since land dedication furthers the two primary goals of the Moore Creek Plan -- Public Access and Watershed Management -- language should be included in Section 24.14.010 to facilitate both these goals. Once these purposes are specifically identified, then specific implementation programs can be established. To provide clear direction on land and easement dedication, it is recommended that a section of the Conservation Regulations be established (24.14.100) for that purpose.

I. Land Dedication

As an overall policy, public ownership through acquisition, dedication or donation is recommended where one or more of the following goals is sought:

- a. To permit the construction of improvements to facilitate public access to natural areas such as Moore Creek and its tributaries. These improvements could include but are not limited to trails and mini-parks;
- b. To permit construction of improvements providing benefits primarily to the public at large such as flood control devices; or
- c. To protect environmentally-sensitive land in cases where use restrictions are determined to be inadequate for this purpose.

In the case of Moore Creek, public ownership is recommended for lands which directly abut the center line of Moore Creek and its principal tributaries. Lands proposed for public ownership are shown on Map 8. Public ownership is shown for lands south of the Monarch Way entry point and north of Meder Street along Moore Creek and Antonelli Pond. For lands along Moore Creek between the Monarch Way entry point and Meder Street easements for resource protection rather than land ownership is recommended.

Specifically, it is recommended that land on either side of the center line of Moore Creek and its major tributaries be acquired, through purchase, dedication or donation by the City of Santa Cruz or other public/quasi-public agency. For the portion of the corridor between Meder Street and Highway 1, a 100-foot swath on either side of the center line is suggested. This width directly corresponds to the limit of the F-P zone district as shown on the City's zoning map. Due to existing topography and current City regulations, no structures are located within this area. As mentioned above, fee simple ownership is recommended between Monarch Way entry point and Highway 1.

Between Meder and High Street, fee simple ownership rather than easements is again recommended. The width of the land proposed for ownership between Meder and High streets should be determined on a case-by-case basis to ensure that public access does not interfere with existing developments.

The method by which acquisition in either fee simple or easement is accomplished depends upon timing and the availability of funds. If possible, acquisition through dedication as part of discretionary project approval should be sought first. In this way, scarce financial resources can be used to improve acquired lands. However, once a timetable is established for trail development, and key parcels remain unimproved, then purchase of necessary lands should be diligently pursued utilizing available resources.

Public ownership of corridors leading to and from Moore Creek should also be sought. Specifically, the City should move to obtain through land dedication (as a condition of project approval) or purchase, land in the following areas which provide feasible pedestrian access to Moore Creek: (a) the existing parcel or portions thereof opposite the intersection of Monarch Way and Western Drive (APN 2-041-04); and (b) the area west of the westerly terminus of Grandview Street cul-de-sac (APN 2-061-09). These areas provide feasible pedestrian and/or visual access to Moore Creek. The property opposite Monarch Way is favorable for access and possesses magnificent views of Moore Creek and adjacent lands. In addition, the parcel lies close to an existing pedestrian access way leading to Arroyo Seco.

In order to ensure implementation of these policies in a manner least disruptive to private ownership interests, it is recommended that the intentions to provide for a public benefit through public access be provided to property owners early on so that development can proceed in a manner compatible with the public interest. For these parcels, it is recommended that the Planning Commission indicate its intent to provide public amenity -- either corridor access, mini-park and/or

viewing area -- and to require dedication of land or lands as these parcels develop. It is likely that prior to any development on any of the parcels mentioned, a discretionary permit will be required by the property owner resulting from either substandard frontage (Grandview Avenue), or proximity to 30% slopes (parcel across from Monarch Way/Western Drive intersection 2-041-04). Land dedication, consistent with this Plan, can be made a condition of project approval. However, to protect against the possibility that no discretionary permit is required and that only a single-family residence is to be constructed on one of the two key parcels mentioned above, it is recommended that the Planning Commission require a discretionary permit prior to development of the subject parcels.

The alternative of donating land to the City or other quasi-public agency such as the Santa Cruz County Land Trust should be actively encouraged as a viable way to achieve goals of the Plan. Donations of lands within Moore Creek Corridor to the Santa Cruz Land Trust have already played a significant role in ensuring that sensitive lands are managed for the long-term public benefit. The Santa Cruz County Trust currently holds title to two parcels of land within the watershed: the western shore and western portion of Antonelli Pond and a 0.5 acre parcel along the west side of Moore Creek. The Trust has also installed improvements to enhance public access on the property which it owns on the west shores of Antonelli Pond.

Donation of lands to a quasi-public agency like the Land Trust is advantageous to both the property owner and the City. The City can be assured that lands will be managed and improved in the general public interest without the necessity of direct City financial or managerial involvement. For the land owner, significant tax advantages result from land donation.

Given these advantages, it is recommended that the Santa Cruz County Land Trust or other similar organization be encouraged to become an active participant with the City to achieve the goals of the Moore Creek Corridor Access and Management Plan.

Map 8 delineates the location of lands proposed for public ownership.

2. Dedication of Easements

Public ownership through land donation, dedication or acquisition is just one way that interest in property can be acquired. Another possibility is to obtain restrictions or use entitlements on use of property through dedication or acquisition of easements. Unlike property acquisition through dedication or purchase, easements limit or entitle specific users to certain activities without the necessity for public ownership. The land is still owned by the property owners, while a specific portion of the property as defined by the easement provides a particular use or restriction. Examples of such easements include open space easements which restrict certain land use activities and public access easements which entitle the public to traverse the property in question. The Moore Creek Plan could make use of both of these easements to implement certain provisions of the Plan.

Acquisitions of easements instead of fee simple ownership is suggested where:

- a. Use restrictions alone could implement the Plan and its policies. This is particularly true for the land management provisions of the Plan.
- b. Beneficiaries of proposed improvements are both public and private interests but where benefits to private interests are at a level equal to or greater than the public at large. A prime example is a viewing area developed on private property as part of a development project but is also available for public use. Such is the case with the identified overlook area on Western Drive across from Mountain Way.

It is recommended that easements be acquired through dedication (as a condition of project approval), purchase or donation in the following specific cases:

- a. portions of parcels between the 100-foot setback line along Moore Creek and its tributaries and the 30% slope line on the east and west sides of Moore Creek Canyon between Highway 1 and High Street.
- b. portions of parcels within twenty feet of 30% slopes; and
- c. to provide for public access to the rim of Moore Creek Canyon on property on Western Drive, west of Mountain Way (APN 2-061-27, 28, 35, 36, 37 and 38).

In addition, easements may be appropriate for other properties within Moore Creek Corridor to achieve goals of public access and watershed protection.

Acquisition of an open space easement to restrict activities within the required setback from slopes is consistent with the purpose of City conservation regulations, the General Plan and the Western Drive Master Plan. The exact language and restrictions should be evaluated on a case-by-case basis. To implement this requirement, amendment to section 24.14.030 (Slope Regulations) would be necessary.

Portions of the large vacant parcel on Western Drive, west of Mountain Way, have been identified as a site for development for both public and private use activities in concert with future development. The importance of this parcel to the Western Drive neighborhood was first identified in the Western Drive Master Plan. That Plan detailed the site's panoramic views of Moore Creek Canyon, greenbelt lands and the Pacific Ocean. Protection of this parcel's visual amenity was established as a priority of the Western Drive Master Plan. To implement this proposal, it is recommended that a public access easement be required of future developments and/or acquired by the City around the rim of property, with viewing areas constructed at its terminus. This trail system could be developed by the owner and be "credited" to his open space required under the Zoning Ordinance.

D. Implementation of Public Service Policies

The Moore Creek Plan establishes specific policies in the area of public service systems, access and circulation and site specific management policies.

Public Service Systems

Sanitary Sewer and Storm Drainage Facilities:

The City recently completed a study of its sanitary sewer system. Although the Master Plan did not specifically address the development of greenbelt lands west of Western Drive, it is very likely that additional sewer capacity will be needed. One suggestion previously considered as a possible solution to the sewer issue has been the construction of a sanitary sewer line down Moore Creek Canyon. This option is no longer under active consideration by the City Public Works Department. In addition, the Public Works Department indicates that locations of utilities in Moore Creek is not advisable due to difficult access and maintenance problems. However, it is recommended that the City's position on utilities in Moore Creek Canyon be made explicit so as to alert future developers on lands west of Western Drive. Adoption of policies contained in the Moore Creek Corridor Plan would prohibit the construction of sewer lines within Moore Creek.

The Plan also recommends that existing drainage culverts within the Moore Creek Corridor be improved in a systematic fashion to accommodate projected storm water flows.

Access and Circulation Policies

The importance of working with private property owners and the Santa Cruz County Land Trust to facilitate access to Moore Creek and adjacent canyon lands has already been noted. However, in order to complete this pedestrian linkage from the University of California campus to Natural Bridges State Park, cooperation from the State Department of Transportation (CALTRANS) and the Southern Pacific Railroad Company will be needed. In addition, improvements within existing City rights-of-way will also be required. This section of the Plan addresses these issues.

The idea of a pedestrian way linking Natural Bridges State Park with the University of California lands was first proposed in 1973 in the City's Open Space and Conservation Element. The idea was reinforced and strengthened by adoption of the Western Drive Master Plan in 1979. The Western Drive Master Plan specifically called for a trail system to and within Moore Creek Canyon linking up with the Natural Bridges coastal trail. Implicit in this recommendation is some form of pedestrian crossing of State Highway 1, either at, below or above grade, as approved by CALTRANS. It is recommended that the Public Works Department open a dialogue with CALTRANS to establish a timetable and necessary conditions for such a crossing immediately following adoption of the Moore Creek Plan.

The second access issue concerns crossing of Southern Pacific Railway right-of-way where Moore Creek meets Antonelli Pond below Highway 1. There are two alternatives for involvement of Southern Pacific Railway Company at this location. One is securing of a north-south crossing easement, the second would allow parallel access to Natural Bridges Drive, crossing on the public sidewalk and then a second east to west easement to connect with existing pathways on AT&T property. Either of those 2 scenarios would require obtaining an easement from the Southern Pacific Railroad.

A final component to the proposed access program involves the construction of sidewalks along portions of routes leading to and from the proposed Moore Creek Corridor trail system. In many key locations, sidewalks have yet to be installed. The reasons range from the presence of vacant parcels (along Mission Street Extension between Western Drive and Burkett Street), to lack of adequate right-of-way (Grandview Street) or physical barriers (Delaware Avenue west of A T & T, Meder Street west of Western Drive). It is recommended that "missing" sidewalks be included in the City's capital improvement program so that sidewalks may be installed in the near future. Sidewalks would also be installed in conjunction with future development projects.

E. Implementation of Site Specific Policies

The Plan also proposes policies and programs which affect specific sites or areas within the watershed. These policies and programs help to integrate the subject Plan with current of future planning efforts in the watershed.

Antonelli Pond and Westside Lands Study Area

An extensive study of Antonelli Pond was undertaken by the firm of Harvey and Stanley Associates in 1980. This study documents the impact of watershed activity on sedimentation rates and pond water quality and suggests measures to mitigate identified impacts. The Plan recommends that the mitigation measures suggested in this August 1980 study be implemented. In addition, the Plan recommends the acquisition of additional buffer areas on the east and west shores of Antonelli Pond and the landscaping of exposed slopes to minimize erosion.

Implementation of recommendations in the Harvey and Stanley Associates report would occur in three ways through the action of three property owners:

1. Dedication or donation of additional buffer lands as recommended in environmental review documents. Management of these dedicated lands in conjunction with implementation of Westside Lands Study Area (APN 3-061-09);
2. Installation of erosion control measures and drainage improvements on lands owned by Santa Cruz County Land Trust (APN #3-061-13). Completion of improvements to facilitate public access to Antonelli Pond western shoreline. Funds to be derived from State funding sources.
3. Dedication or donation of lands by AT&T (APN #3-061-12) and landscaping of these lands by the City of Santa Cruz and/or Santa Cruz County Land Trust.

Greenbelt Lands

Much of the west side of Moore Creek Corridor is located in designated greenbelt lands. The Plan recommends the preparation of a specific area plan for these lands should any development of greenbelt lands be considered.

Unincorporated County Lands

Portions of Moore Creek Corridor between Meder and High streets lie within the jurisdiction of the County of Santa Cruz. As such, policies and programs developed by the City with respect to Moore Creek have no legal standing in these areas. In an effort to address this issue, the Plan recommends that the County be requested to adopt relevant policies and programs of the Moore Creek Plan as part of the County's planning process. Implementation of policies and programs would then occur in conjunction with development approvals or acquisition of lands as specified in preceding sections of this Plan.

University of California Santa Cruz Lands

The headwaters of Moore Creek lie within the boundary of the University of California, Santa Cruz campus. Thus, activities undertaken by the University will directly impact downstream users of Moore Creek Corridor. Since University lands in the vicinity of Moore Creek are largely undeveloped and planning activities are now underway for the next phase of University growth, now is an opportune time to make known to the University City goals with respect to Moore Creek. Implementation of relevant policies and programs of the Moore Creek Plan by the University will help ensure that the plan's goals of a continuous pedestrian link along Moore Creek from UCSC to Natural Bridges State Park and watershed management will be realized.

The following table summarizes the implementation of policies and programs contained within the Moore Creek Corridor Access and Management Plan.

MOORE CREEK CORRIDOR ACTION PLAN

POLICY

PROGRAM

IMPLEMENTING BODY

IMPLEMENTATION MECHANISM

Access

Develop a low-intensity trail system in Moore Creek Corridor linking the Corridor with UCSC, Natural Bridges State Park Coastal Trail and Wilder Ranch and Beaches State Park

Require dedication or purchase or solicit donation of lands on both sides of Moore Creek to include canyon slopes below the 30% slope line, for lands between State Highway 1 and High Street to be included in the trail system. Exceptions may be made to protect the privacy of existing development.

ZA/ZB/CC/City Parks and Recreation Departments/S.C.L.T.

Condition of project approval/acquisition with State Coastal Conservancy Fund

New development on the bluff tops above Moore Creek or its tributaries shall be setback sufficiently so that it will not be visible from the creek bed

CPC/CC

Zoning Ordinance amendment to slope regulations (Section 24.14.030)

Use of existing and proposed trail system shall be limited to pedestrians only

Parks & Recreation Commission/CC

Santa Cruz Municipal Code 13.04

Require dedication of lands for trail system along east side of Moore Creek south of Mission Street when parcel #3-011-01 develops

ZA/ZB/CC

Condition of project approval

Provide connections from existing City rights-of-way to Moore Creek Corridor trail system

Purchase or require dedication or solicit donation of lands necessary for access to Moore Creek Corridor and/or trail system. Parcels recommended are:

City Parks & Recreation Department/ZA, ZB, CC S.C.L.T.

Utilize State Coastal Conservancy Funds/ conditions of project approval

- a. 2-061-09 (west of Grandview Avenue turn-around area)
- b. 2-041-04 (west of Western Drive/ Monarch Way intersection)
- c. 2-061-27, 28, 35, 36, 37, 38 (west of Western Drive/Mountain Way intersection)

ZA = Zoning Administrator ZB = Zoning Board CPC = City Planning Commission CC = City Council S.C.L.T. = Santa Cruz Land Trust

MOORE CREEK CORRIDOR ACCESS AND MANAGEMENT PLAN

Adopted November 10, 1987

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MOORE CREEK CORRIDOR ACTION PLAN

POLICY	PROGRAM	IMPLEMENTATION MECHANISM	IMPLEMENTING BODY
<u>Access (Cont'd)</u>	<p>Require construction and provision of public viewing areas as part of development of parcels 2-061-27, 28, 35, 36, 37, 38 and 2-041-04</p> <p>Develop controlled pedestrian crossing of Highway 1 at below or above grade.</p>	Condition of project approval	ZA, ZB, CC
<u>Management</u>	<p>Obtain rights to traverse Southern Pacific Railroad Company right-of-way south of parcel 3-011-01 to link up with existing trail system on the eastern shore of Antonelli Pond</p> <p>Encourage the University of California to provide access along Moore Creek from north of High Street to the headwaters as part of its Long Range Development Plan</p>	Public safety department heads, City Manager, CALTRANS approval, Capital Improvement Program (on-grade); be-low grade crossing to be developed as part of future Public Works Department projects (e.g., sewer line upgrading)	City Public Works Department/CALTRANS
<u>Water Quality</u>	<p>Maintain the water quality of Moore Creek at the highest feasible level by regulating the discharge of storm waters into Moore Creek and its tributaries</p>	Partially implemented Zoning Ordinance Section 24.14.050.1; additional changes to Zoning Ordinance Section 24.14.050 required	CPC/CC

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MOORE CREEK CORRIDOR ACTION PLAN

POLICY

PROGRAM

IMPLEMENTATION MECHANISM

IMPLEMENTING BODY

Management

Water Quality (Cont'd)

Equip new storm drain systems both on- and off-site with sediment/oil and grease traps. Regular maintenance program should be developed as part of local Homeowner Association policies and City Public Works Department Maintenance Program.	Implemented Section 24.14.050.1(d) for on-site; amend City standard specifications for off-site	Public Works Dept.
Institute regular street sweeping program in Moore Creek Canyon watershed area.	Administrative decision/budget allocation	Public Works Dept. City Manager, CC
Provide control and improve quality of storm runoff from Granite Rock Corporation Yard.	Condition of project approval	ZA/ZB/CC
Direct all storm water to Moore Creek, to the maximum extent feasible.	Condition of project approval	ZA/ZB/CC
Equip all outflow culverts and storm drain facilities with energy dissipators to minimize downstream sedimentation of Moore Creek.	Condition of project approval; City standard specifications	ZA/ZB/CC Public Works Department
Require the submission and installation of erosion control and grading plans for all projects located in Moore Creek watershed area	Implemented Section 24.14.060	_____

Soil Erosion, Sedimentation and Grading

Significantly reduce the quantity of sediments transported to Moore Creek and Antonelli's Pond

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MOORE CREEK CORRIDOR ACTION PLAN

POLICY	PROGRAM	IMPLEMENTATION MECHANISM	IMPLEMENTING BODY
Soil Erosion, Sedimentation and Grading (Cont'd)	<p>Revegetate all exposed slopes following completion of grading activities</p> <p>Limit vegetation removal to that amount necessary to complete approved development projects. Any vegetation removed shall be replaced or replanted so as to ensure slope stability, limit soil erosion potential and significantly reduce off-site sedimentation</p> <p>Require that land be developed in increments of workable size which can be completed in a single construction season</p> <p>Prohibit all earth-moving activities between December 1st and March 1st. In addition, grading activities shall not begin after September 1st unless grading can be expected to be completed and plantings completed by December 1st.</p> <p>Prohibit grading activities, vegetation removal or construction of structures within twenty feet (20') of any thirty percent (30%) slope</p> <p>Specific building envelopes shall be designated on all plans submitted for permit processing within the Moore Creek Corridor Study Area. No construction shall occur outside of the designated building envelope.</p>	<p>Implemented Section 24.14.060.2d</p> <p>Implemented Section 24.14.060.2c</p> <p>Implemented Section 24.14.060.2f.</p> <p>Section 24.14.030 and 24.14.060</p> <p>Zoning Ordinance amendment Section 24.14.030</p> <p>Zoning Ordinance amendment Section 24.14.080(e)</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>CPC/CC</p> <p>CPC/CC</p>

MOORE CREEK CORRIDOR ACTION PLAN

POLICY	PROGRAM	IMPLEMENTATION MECHANISM	IMPLEMENTING BODY
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Vegetation

Existing vegetation shall be retained and protected to the maximum extent feasible
 Require that replanting and/or plant removal be designed to increase the quantity, diversity and productivity of native vegetation to the maximum extent feasible

Require that existing landscaping be incorporated into final project landscape plans
 Utilize native species with habitat and food-bearing value in final landscape plans

Implemented Section 24.14.080.4c

Zoning Ordinance Amendment Section 24.14

CPC/CC

Selective removal of non-native trees and other vegetation may be permitted or required by the City if authorized or approved by a qualified professional with relevant academic training and experience. This removal shall only be permitted when accompanied by an approved replanting program. However, no removal shall be permitted in designated special or unique habitat areas.

Zoning Ordinance Amendment Section 24.14.080(e) Heritage Tree Ordinance (Santa Cruz Municipal Code 9.56)

CPC/CC
 Parks & Recreation
 CC

Public Service Systems

Storm Drainage Systems

Improve existing culverts to accommodate projected flows in Moore Creek

Replace or enlarge existing culverts under High Street, Meder Street and Mission Street Extension to accommodate projected flows in Moore Creek

Capital Improvement Program

CC

MOORE CREEK CORRIDOR ACTION PLAN

IMPLEMENTING BODY

IMPLEMENTATION MECHANISM

PROGRAM

POLICY

Sanitary Sewers

Provide sanitary sewage facilities and necessary appurtenances thereto in such a way as to minimize impacts on Moore Creek Canyon

Prohibit construction of new sanitary sewer lines down Moore Creek Canyon.

City Council policy

CPC/CC

Allow septic tanks in areas west of Meder Street 'dip' only if approved by County Department of Environmental Health and City Public Works Department

Santa Cruz Municipal Code 6.20.020

Public Works Department
CC

Access and Circulation

Future improvements to circulation facilities should be designed to improve access to Moore Creek, both physically and visually.

Install sidewalks along street leading to and from proposed trail including Meder Street, Burkett Street, Mission Street Extension, Grandview Street and Delaware Avenue

Capital Improvement Program

CC

Access to public viewing area on Western Drive, across from Mountain Way (APN 2-061-27, 28, 35, 36, 37, 38) shall be accessible to the handicapped to the maximum extent feasible

Uniform Building Code, Title 18; condition of project approval

Chief Building Official
ZA

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MOORE CREEK CORRIDOR ACTION PLAN

IMPLEMENTING BODY

IMPLEMENTATION MECHANISM

PROGRAM

POLICY

Site Specific Policies and Programs

Management of Antonelli's Pond

Implement management action plan of Harvey & Stanley Associates report of August 1980

Condition of project approval

ZA, ZB, CC/S.C. L.T.

Consider a requirement for the dedication of additional lands on the east and west sides (APN 3-061-13; 3-061-12) of Antonelli's Pond to increase buffer area and ensure long-term public access and management (east side). Precise boundary of buffer area shall be determined through project review and/or environmental review process.

Relandscape east and west shores of Antonelli's Pond for habitat enhancement pursuant to recommendations contained in 8/80 report by Harvey & Stanley Associates

ZA/S.C.L.T.

Conditions of project approval (east side - 3-061-12); funding through Coastal Conservancy Grant Program (west side - 3-061-13)

Prohibit motor powered boats from Antonelli's Pond

City Parks & Recreation Department, CC

Amendment to S.C. Municipal Code (13.08.070)

City Greenbelt Lands

Incorporate the access and management goals of the Moore Creek Corridor Plan.

Should any development of existing City Greenbelt lands west of Moore Creek be considered, a specific area plan designed to implement the goals of the Moore Creek Access and Management Plan shall first be developed to:

CPC/CC

Adoption of specific area plan pursuant to Section 24.06.080

S.C.L.T. = Santo Cruz Land Trust

CC = City Council

CC = City Council

CPC = City Planning Commission

ZA = Zoning Administrator

ZB = Zoning Board

CC = City Council

CPC = City Planning Commission

S.C.L.T. = Santo Cruz Land Trust

MOORE CREEK CORRIDOR ACTION PLAN

POLICY	PROGRAM	IMPLEMENTATION MECHANISM	IMPLEMENTING BODY
<u>City Greenbelt Lands (Cont'd)</u>	<ul style="list-style-type: none"> - Determine appropriate land uses and circulation patterns; - Designate setbacks from canyon edges; - Designate significant land forms and existing vegetation for preservation; - Designate pedestrian pathways to and from canyon edge, and Moore Creek; - Determine appropriate lands for fee simple or easement acquisition 	Administrative Procedure Order 1-41	Planning Department Staff, CPC, CC
<u>Unincorporated Lands</u>	<p><u>Programs Relating to Unincorporated Lands</u></p> <p>Review development of lands adjacent to Moore Creek and its tributaries within the unincorporated areas of the County to ensure conformity with policies and programs of the Moore Creek Access and Management Plan.</p> <p>Request the County to adopt relevant policies and programs of the Moore Creek Access and Management Plan as part of the County's Local Coastal Plan and General Plan.</p>	Administrative Procedure Order 1-41	Planning Department Staff, CPC, CC

ZA = Zoning Administrator ZB = Zoning Board CPC = City Planning Commission CC = City Council S.C.L.T. = Santa Cruz Land Trust

MOORE CREEK CORRIDOR ACTION PLAN
POLICY PROGRAM IMPLEMENTATION MECHANISM IMPLEMENTING BODY

Unincorporated Lands (Cont'd)

Programs Relating to UCSC Long Range Development Plan

Request that the University of California adopt relevant policies and programs of the Moore Creek Access and Management Plan as part of its Long Range Development Plan.

University Long Range Development Plan UCSC

Request that the University of California incorporate public access and watershed management measures into future projects within that portion of Moore Creek Corridor that lies within the UCSC campus.

Program Affecting Westside Lands Study Area

Future development of lands adjacent to Antonelli Pond within Westside Lands Study Area shall incorporate relevant policies and programs of Moore Creek Access and Management Plan.

CPC/CC

Adoption of Specific Area Plan Pursuant to Section 24.06.080 Preparation of EIR

ZB/CC

Conditions of project approval

Programs Relating to Operation of Shaffer Road Storage Yard

Require Granite Construction Co., Inc. to implement, as soon as possible after obtaining City approval, improvements such as construction of a landscaped berm and installation of sediment and grease traps to prevent sedimentation or pollution of Moore Creek potentially caused by Granite's storage of loose materials or other operations on the site.

ZA/ZB

Condition of project approval/ initiate zoning enforcement pursuant to Section 24.14.240

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MOORE CREEK CORRIDOR ACTION PLAN
PROGRAM

IMPLEMENTING BODY

POLICY

IMPLEMENTATION MECHANISM

Unincorporated Lands (Cont'd)

Programs Related to Special Habitat Area West of Grandview Street cul-de-sac Section 2-061-16

Prohibit tree removal within the existing eucalyptus grove northwest of the extension of Grandview Street unless approved by the City, with advise of a qualified biologist or expert.

Require dedication or purchase or solicit donation of native acquisition of eucalyptus grove on parcel 2-061-16 to ensure long-term habitat protection for resident Monarch Butterfly population

Program Related to Southern Pacific Railroad

Investigate the acquisition of an easement across the existing right-of-way between Antonelli's Pond and Natural Bridges Park

ZA, ZB, Parks & Recreation Commission

Condition of project review and approval. Heritage Tree Ordinance (Santa Cruz Municipal Code 9.56)

ZA, ZB/S.C.L.T. Calif. Coastal Conservancy Monarch Project

Condition of project approval/donation or acquisition utilizing State Coastal Conservancy Fund

Planning and Public Works Department/Southern Pacific Railroad Company

Consultation with Southern Pacific Railroad Planning

CC = City Council S.C.L.T. = Santa Cruz Land Trust.

ZA = Zoning Administrator ZB = Zoning Board CPC = City Planning Commission

JR:NE
Moore Creek Corridor

APPENDIX

Excerpted from Local Coastal Plan, County
of Santa Cruz

"Grasslands" policy is as follows:

Permitted/conditional uses within habitat area:

nature observation
educational instruction
viticulture
residential uses
meeting performance
criteria
grazing.

Permitted/conditional uses adjacent to habitat area:

agriculture
rural and mountain
residential uses
consistent with LCP
policies.

Policies: Allow no division of land with grassland habitat.

For a parcel containing
grassland habitat,
density credit for the
grassland may be
allowed for residential
development on
developable portions of
the parcel outside the
grassland, only at the
lowest density allowed
by the Land Use Plan.
Require clustering of
new development
projects where feasible,
and place development
outside grassland
habitat.

"Riparian Corridor" policy is as follows:

Permitted/conditional uses within Habitat Area:

nature observation
educational instruction
scientific research
aquaculture
recreational fishing
subject to Dept. of
Fish & Game
regulations
existing agriculture

Permitted/conditional uses adjacent to Habitat Area:

with appropriate setbacks, the following uses:
timber production
agriculture
and residential

Policies:

Prohibit development activities, land alteration and vegetation disturbance within riparian corridors and wetlands, defined to include:

- o 50' from the mean rain season (bankfull) flowline of a perennial stream;
- o 30' from the mean rainy season (bankfull) flowline of an intermittent stream as designated on the GP maps and through field inspection of undesignated intermittent streams;
- o 50' of the high water mark of a marsh, pond, slough, lagoon, lake or natural body of standing water;
- o 50' from the landward limit of riparian woodland vegetation;
- o wooded arroyos within urban areas.

Exclude lands within riparian corridors in rural areas in the calculation of development density or net parcel size. Require a 50 foot setback from the top of the arroyo for all development on parcel bordering riparian corridors within the Urban Services Line. This setback may be reduced under special circumstances if specific findings can be made that the resource will not be reduced or adversely impacted and there is no feasible less environmentally damaging alternative. Grant full density credit for the portion of the property which is within the 50 foot setback excluding areas over 30% slope up to a maximum of 50% of the total area of the property outside the riparian corridor.

Erosion control policies are as follows:

Exclude lands with slopes exceeding 30 percent in urban areas, and 50 percent in rural areas from density calculations for land divisions.

Prohibit structures in discretionary projects on slopes in excess of 30 percent. A single family dwelling on an existing lot of record may be excepted from the prohibition where siting on greater slopes would result in less land disturbance, or siting on lesser slopes is infeasible.

Deny any grading project or timber harvest application where a potential danger to soil or water resources has been identified, and adequate mitigation measures cannot be undertaken.

Require, as a condition of new development approval, abatement of any grading or drainage condition on the property which gives rise to existing or potential erosion problems.

Require development plans in rural areas and sensitive habitats to indicate the areas where vegetation is to be removed (building and construction envelopes). Limit vegetation removal to the identified building and construction envelope, and minimize the area covered by envelopes, consistent with sensitive habitat policies and fire safety requirements.

For development activities, require protection of exposed soil from erosion between October 15 and April 15 and require vegetation and stabilization of disturbed areas prior to completion of the project. For agricultural activities, require that adequate measures are taken to prevent excessive sediment from leaving the property.

Require topsoil to be stockpiled and reapplied upon completion of grading to promote regrowth of vegetation; native vegetation should be used in replanting disturbed areas to enhance long-term stability.

Require containment of all sediment on the site during construction and require drainage improvements for the completed development that will provide for runoff control including on-site retention or detention where appropriate. Runoff control systems shall be adequate to prevent any increase in site runoff over pre-existing volumes.

Prohibit earthmoving operations in areas subject to very high or high erosion hazard potential and in least-disturbed or water supply watersheds between October 15 and April 15, unless preauthorized by the building official. If such activities take place, measures to control erosion must be in place at the end of each day's work.

Require site design in areas subject to very high or high erosion hazard potential and in least-disturbed or water supply watersheds to minimize grading activities and reduce vegetation removal based on the following guidelines:

- a. Structures would be clustered;
- b. Access roads and driveways should not cross slopes greater than 30 percent; cuts and fills should not exceed 10 feet; providing, however, that exceptions to this rule may be granted where alternative routes would result in less environmental damage;

- c. Foundation designs should not require major excavation or fill;
- d. Designate building and access envelopes on the basis of site inspection to avoid particularly erodible areas;
- e. Require all sidecast material to be recompacted to engineered standards, reseeded, and mulched and/or burlapped.

Require approval of final site development plans including drainage and erosion control plans for new development, in areas subject to very high or high erosion hazard potential and in least-disturbed or water supply watersheds prior to authorization of any clearing and grading activities.

Require the installation of erosion control measures consistent with the Erosion Control Ordinance, by October 15, or the advent of significant rain, or the completion of the timber harvest, whichever occurs first. Prior to October 15, require adequate erosion control to be provided so as to prevent erosion from early storms.

Allow no land clearing prior to erosion control plan approval. Require a permit and an erosion control plan for clearing one or more acres, except when clearing is for existing agricultural uses. Require that any erosion control and land clearing activities be consistent with all LCP policies.

Require a permit for any land clearing in a sensitive habitat area, water supply watershed, least disturbed watershed, very high and high erosion hazard areas no matter what the parcel size. Require that any land clearing be consistent with all LCP policies.

JS:NE
A/P

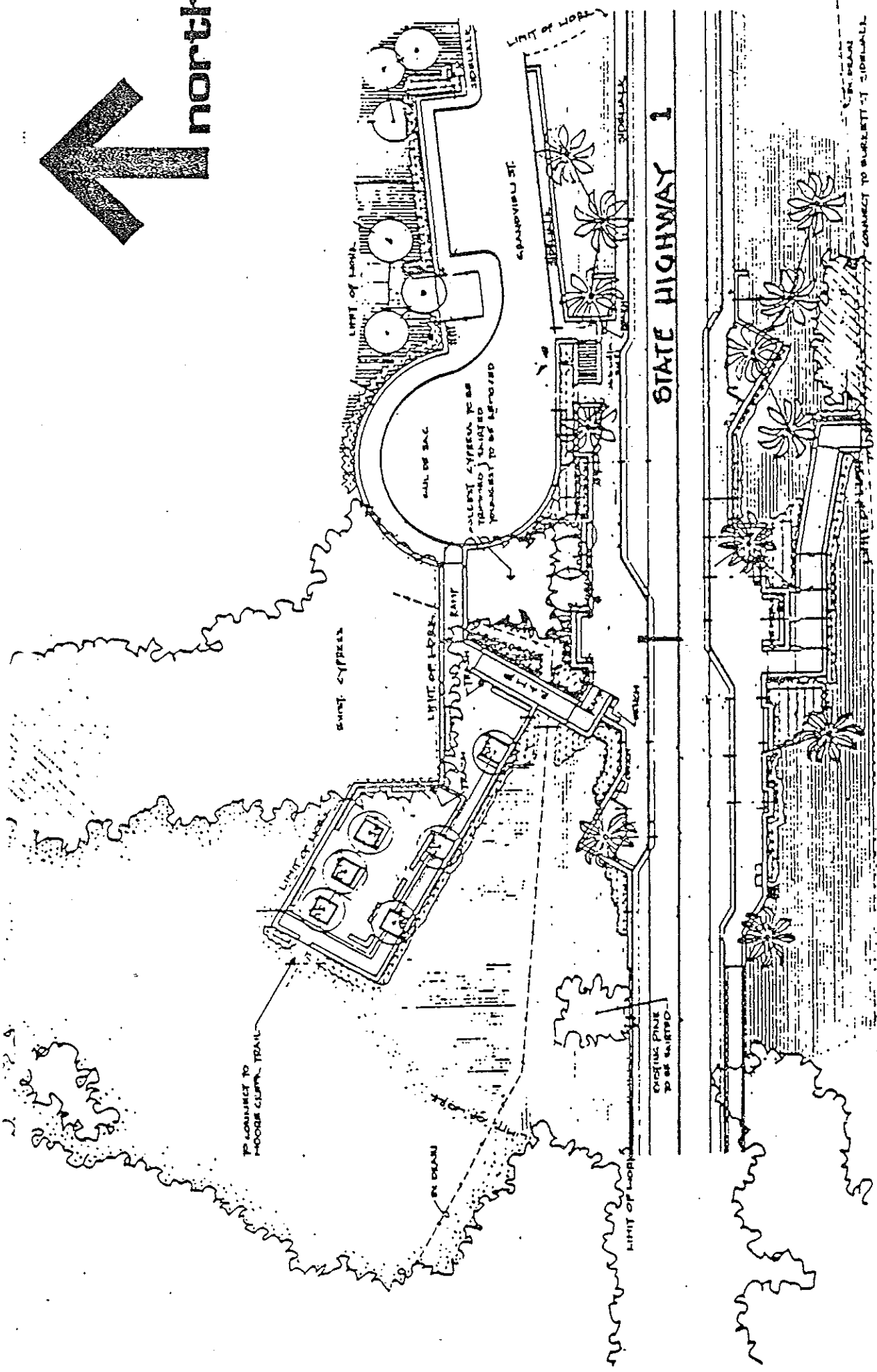
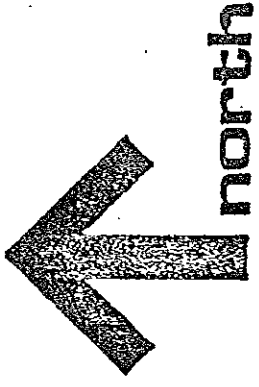
APPENDIX "A"

RAINFALL IN INCHES, 1973 - 1983
(Graham Hill Water Treatment Plant)

MONTH	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	TEN YEAR MON AVE
July	.00	2.89	.14	-.00	.00	-.00	-.28	.75	-.00	-.00	-.4
August	.00	.00	-.85	1.17	.00	-.00	-.00	-.00	-.00	-.04	.2
September	.38	.00	.00	1.89	1.96	-.87	.00	-.00	.22	1.13	-.6
October	3.41	2.89	4.50	.00	.38	.00	2.62	.00	1.96	2.59	1.8
November	9.56	1.07	.53	4.15	2.37	5.24	2.92	-.27	8.98	9.36	4.4
December	6.27	3.91	.63	4.10	7.56	-.88	8.94	3.22	6.37	12.20	5.4
January	3.99	1.28	.32	2.40	13.09	11.94	11.77	7.75	13.32	10.92	7.8
February	2.00	5.72	3.89	1.67	6.73	9.13	10.05	3.88	8.16	17.06	6.8
March	7.85	6.65	.93	3.22	7.91	4.33	2.52	11.65	9.70	17.97	7.2
April	4.81	2.63	.91	-.56	4.89	1.35	2.59	-.22	5.92	6.80	3.0
May	-.02	-.00	.00	-.83	.00	1.12	-.84	-.31	-.00	-.54	-.3
June	.31	-.10	.00	-.01	-.02	-.00	-.38	.00	-.04	-.00	-.0
TOTAL	40.60	27.14	12.70	20.00	44.91	34.86	42.91	28.03	34.67	78.61	

10 YEAR YEARLY AVERAGE 38.4
 MAX YEARLY RAINFALL 78.6
 MAX MONTH RAINFALL 17.9

SOURCE: City of Santa Cruz Water Department
 Annual Report 1982-83, June, 1983.



**GRANDVIEW ST. ENTRYWAY
SCHEMATIC PLAN FIG. 1**

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