A Mitigation Process for Impacts of the All American Pipeline on Oak Woodlands in Santa Barbara County[1]

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Abstract: This paper outlines a mitigation program for pipeline construction impacts to oak tree habitat by describing the requirements for the Offsite Oak Mitigation Program for the All American Pipeline (AAPL) in Santa Barbara County, California. After describing the initial environmental analysis, the County regulatory structure is described under which the plan was required. The plan preparation and approval process is described, as well as how the plan was and is currently implemented in the field. The paper concludes with an assessment of plan objectives and recommendations for future mitigation efforts.

PROJECT DESCRIPTION

The All American Pipeline is a 1,250 mile long, 30-inch diameter buried crude oil pipeline constructed in 1985 and 1986 between Gaviota, California (20 miles west of Santa Barbara) and McCamey, Texas (fig. 1). The purpose of the pipeline is to transport Outer Continental Shelf (OCS) oil from the Santa Barbara and Santa Maria basins to refining centers in the Gulf Coast. Sixty miles of the pipeline are constructed in Santa Barbara County, along an alignment generally shown in figure 2.

Most of the pipeline was built using standard pipeline construction practice. This involved the clearing of an approximately 100-foot wide right-of-way (50 feet permanent and 50 feet temporary work space) to allow for ditch excavation, spoil placement, pipe stringing and welding, and passing room for equipment (fig. 3). Once the pipe ditch was backfilled, graded contours were restored and the right-of-way (ROW) was revegetated.

IMPACT ANALYSIS AND REGULATORY STRUCTURE

Approximately 60 percent of the pipeline length occurred on federal lands, therefore environmental impacts of the project were described and analyzed in a joint National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) document (Environmental Research and Technology 1985). Impacts to oak woodlands occurred primarily in Santa Barbara County and were considered as Class I impacts requiring mitigation.

In Santa Barbara County, the primary discretionary review and approval for the AAPL project was a Development Plan. One of the 140 conditions of approval (Condition H-1) was the preparation of a Restoration, Erosion Control and Revegetation Plan (RECRP) for the pipeline ROW. Because of existing County concern regarding the protection of oak woodlands and the Class I impact to oak woodlands described in the Environmental Impact Report/Statement (EIR/S), Condition H-I specifically required procedures for oak preservation. Though never explicitly stated in permit condition wording, County representatives consistently stated that this meant 100 percent replacement of all removed oak trees. AAPL's Offsite Oak Mitigation Program is an appendix to the RECRP prepared pursuant to Condition H-1. The RECRP in turn is a component of the overall Environmental Quality Assurance Program (EQAP) for the project.

ALL AMERICAN PIPELINE OFF-SITE OAK PROGRAM

The plan finally approved by the County included provisions for minimizing impacts to oak trees during construction, replacing removed trees, using local seed sources, establishing habitat units, and maintaining and monitoring plantings until trees are 6 feet in size.

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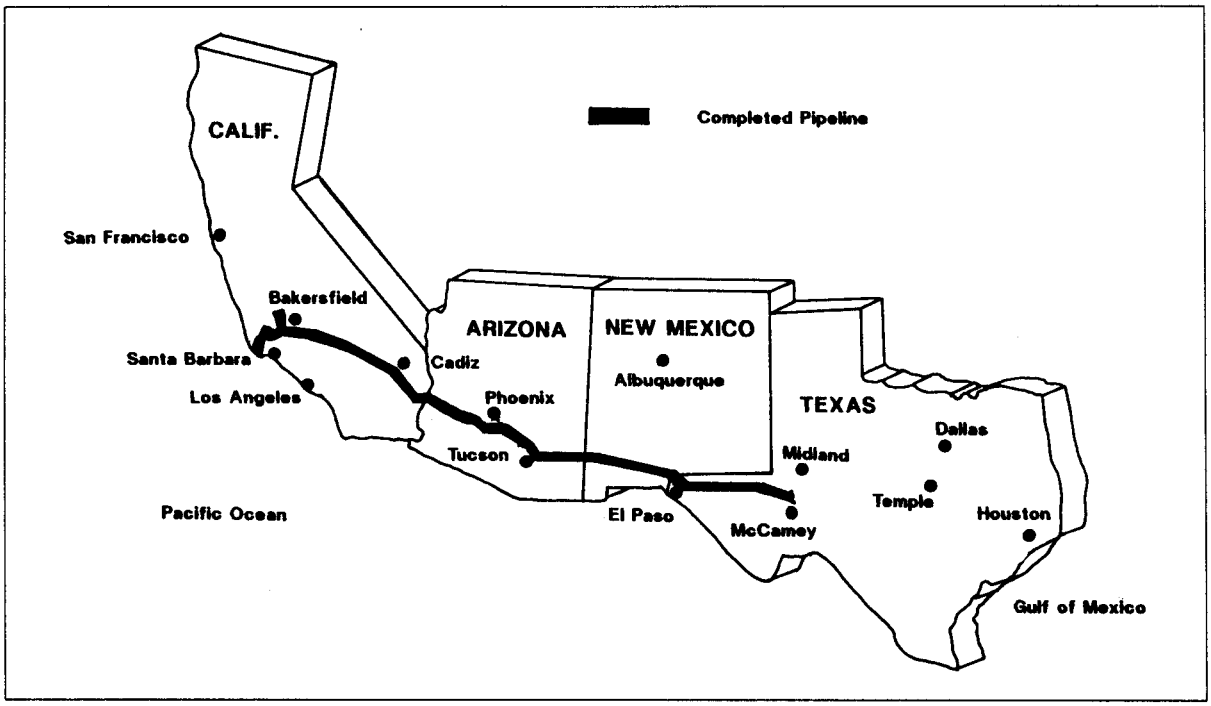

Figure 1—All American Pipeline route.

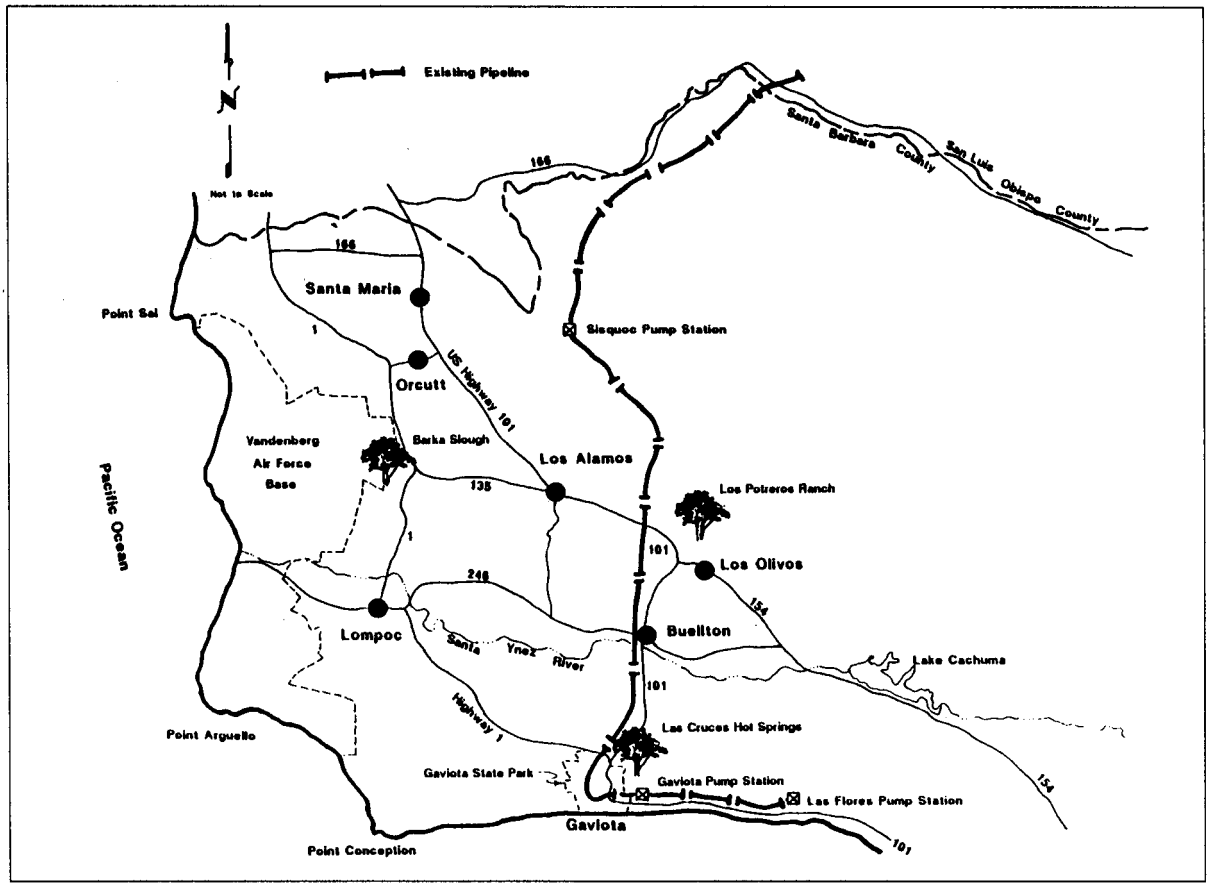

Figure 2—Pipeline alignment in Santa Barbara County.

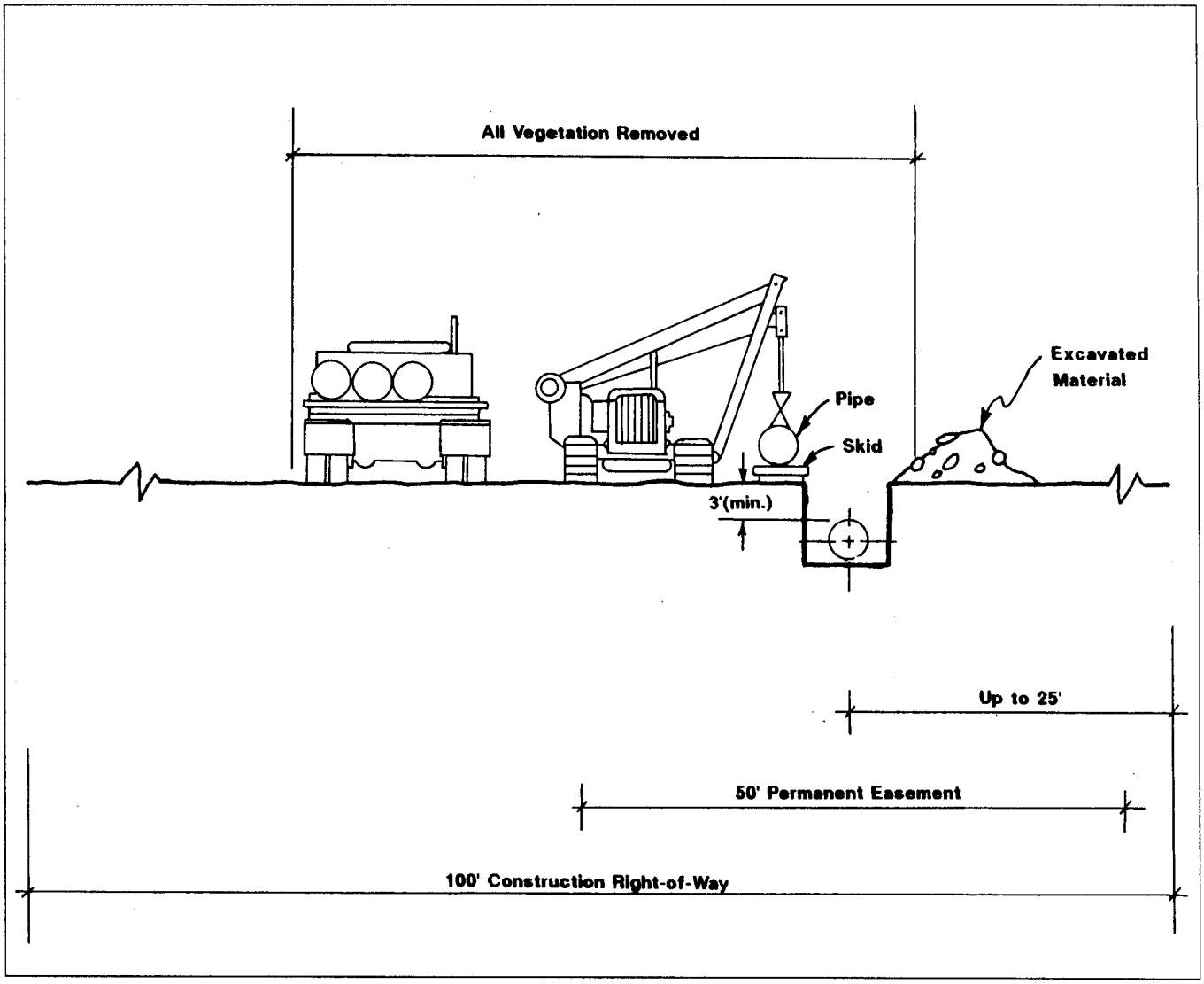

Figure 3—Typical construction right-of-way.

Minimizing Construction Impacts

During construction, trees that had to be removed were identified jointly between AAPL, the construction contractor, and Santa Barbara County's EQAP monitors. Where terrain allowed for a narrower construction corridor, the right-of-way width was reduced from 100 feet to 50 feet in oak woodlands. Where space allowed, individual trees were avoided within the construction ROW. Trees were trimmed instead of removed wherever possible. Slash was disposed of to reduce risk of disease associated with insect infestations. Trees were measured, marked and tallied in the field immediately ahead of construction. The tally was used to determine the number of trees to be replaced pursuant to the Off-site Oak Mitigation Program.

Plan Requirements

AAPL was required to replace all trees greater than 5 inches in diameter measured at breast height (about 40 inches above the ground). The plan estimated, based on aerial photographs, that approximately 500-1,000 oaks would be removed during construction. The final tally indicated that about 2,263 trees greater than 5 inches in diameter were removed. The majority of trees were coast live oak (1,303) and blue oak (878). Only 82 valley oaks were removed.

Habitat Units

The plan required that the trees be planted in natural habitat "units" as opposed to replacement in County Parks or in private landscaping. The plan specified that habitat units be a minimum of 1-5 acres in size. The plots were to be planted with seed source

material (acorns) collected from the site or from surrounding areas extending in concentric circles from the planting site. This was required in an effort to take advantage of genetic stock that should be adapted to each specific site's conditions.

Planting Methods

The program design allowed for flexibility in the methods used to establish new oak trees. Acceptable methods included enhancement of natural regeneration (protecting new seedlings), or planting acorns or propagated seedlings. The plan did not require watering, but allowed supplemental watering as an option. It specified protection of the trees from local predation and required weeding and pest control as necessary to maintain the trees.

MONITORING

The plan required that AAPL maintain, monitor and replant the plots until 6-foot trees are established. Six foot trees were set as the "performance criterion" because this size was expected to be well adapted to its site and large enough to cope with deer or cattle predation without fencing or other protection.

The plan requires that results of each year's efforts be documented in annual reports.

Plan Objectives

AAPL's objectives were to satisfy the condition in the most cost effective and efficient manner possible. In formulating the plan, AAPL depended on existing literature and scientific research to determine the appropriate techniques for planting. The plan was reviewed by recognized experts in order to solicit constructive criticism before the plan was finalized.

"Off site" Planting

The program was to be done "off-site" for several reasons. First, the County had recently approved, as part of a larger package of policies relating to oil and gas development, a set of policies requiring pipeline consolidation. These policies, still in effect today, require with certain exceptions that new pipelines be routed in approved corridors that have undergone previous environmental review. The All American Pipeline approval established a primary north-south pipeline corridor in the County. Therefore, future north-south pipeline approvals would be required to be constructed as closely as possible to the AAPL alignment. This in fact became the case for the County's recommendation for portions of the proposed Exxon Lompoc Pipeline. Therefore, any oak trees replanted along or adjacent to the AAPL corridor could be removed by future pipeline construction, establishing an endless cycle of unfulfilled mitigation.

Second, maintenance and inspection requirements for pipelines require that they be visible from the air and that vegetation on the ROW not hamper equipment in the event of an emergency. There also was a safety concern that roots of mature trees could affect the protective external coating and insulation on the pipeline. Therefore planting trees on the operational ROW was not acceptable.

Finally, it simply was not practical to efficiently manage the program across sixty miles. The pipeline as currently constructed in Santa Barbara County crosses over 40 individual land parcels as well as public lands (U.S. Forest Service and California Department of Parks and Recreation). Land use practices across the pipeline vary greatly. Replanting and maintaining trees in a line across so many different parcels with different management practices was not considered to be efficient. Planting oaks off-site also provided an opportunity to rehabilitate and/or establish new woodland habitats in large plots.

Establishing Valley Oak

Valley oaks are the most threatened species in Santa Barbara County. This is due to a combination of factors including conversion of habitat to other land uses such as crop lands, vineyard, pasture land and housing development, and a lack of natural regeneration and recruitment to the population. Increasing the number of valley oak, and oak savannah habitat in general, was a major focus of the plan.

Encouraging Natural Regeneration

Another overall approach in the plan was to encourage natural regeneration. The focus of the project was to establish young seedlings in habitats capable of supporting oak trees without long term supplemental watering. However, the last four years of drought have severely limited the success of this approach.

Finding Land Parcels

Interest in participating in the program was solicited through a series of formal and informal contacts with private organizations and public agencies. Presentations to service organizations (i.e., Lions Clubs and Rotary Clubs) on the pipeline as a whole always included a discussion of the off-site oak program. Interested parties were contacted and sites were evaluated based on site selection criteria developed jointed between AAPL and the County.

Site Selection Criteria

The primary selection criterion was the site's ability to support oak trees. Criteria for site selection included habitat characteristics such as soil type, slope, presence of oak trees and evidence of natural regeneration. Aerial photographs, soil surveys, interviews with local land managers, and several field trips were conducted to evaluate sites. Other important considerations were the site's size, its access, availability of water, grazing pressure, and future land use.

LANDOWNER OBJECTIVES AND AGREEMENTS

Three agreements were developed with Vandenberg Air Force Base, the California Department of Parks and Recreation (for a site in Gaviota State Park), and one with the Los Potreros Ranch, a family owned ranch in the Santa Ynez Valley. Each agreement allows AAPL to access and replant the site for the next 15 years, provides the land to AAPL without cost, and allows for the construction of structures to protect planted seedlings. The following section briefly outlines the specific objectives and requirements of each agreement.

Vandenberg Air Force Base (VAFB)

The site at VAFB is above Barka Slough and is dedicated wildlife habitat. The site is 900 acres in size and supports scattered coast live oak trees. Historically the site was grazed, and it is apparent trees were removed over time for crops and grazing. VAFB was interested in adding habitat structure to the site and speeding up natural recovery by adding new trees. VAFB agreed to eliminate grazing from the site while oaks were being grown. The site is fenced to exclude cattle, but predation from wild hogs and gophers, combined with continuing drought conditions, have resulted in total mortality of trees at this site. Future plans under consideration include a small planting experiment with supplemental watering.

Gaviota State Park

This regeneration site is within Gaviota State Park near the Las Cruces Hot Springs. The site currently supports coast live oak woodland with some natural regeneration. The site, about 50 acres in size, was burned in 1955. The park was interested in increasing regeneration of the burned site and in participating in a project that would help develop planting techniques for their continuing efforts to replace exotic species with native trees.

Los Potreros Ranch

The Los Potreros Ranch is located in the Santa Ynez Valley near Los Olivos. The ranch is 12,000 acres in size and contains some of the best remaining valley oak habitat in the County. The AAPL project removed 82 valley oaks during 1986 construction across the Santa Ynez Valley; most of the trees came from this ranch. The off-site oak regeneration sites consist of three separate subsites and two large valleys. The sites are less than 0.5 mi from the construction ROW.

Noting the decline of valley oaks on the ranch in the last 40-50 years, the owner was concerned with the lack of natural regeneration and in reversing the decline on their land as well as learning techniques that could be used on other ranches. Currently AAPL has three large fenced subsites on the ranch, each about 5 acres in size. In addition, AAPL is experimenting with small cattle exclosures and has been able to plant 400 trees in these exclosures in two separate valleys.

With the continuing drought in Santa Barbara County, and at the request of the ranch, AAPL has instituted a year round watering schedule for the valley oaks. The ranch has volunteered water for the trees; the plantings on the ranch are located in areas where watering is feasible.

One of the limitations of the landowner agreements is that the plots are not afforded permanent protection beyond the 15 years expected to be used to establish 6-foot trees. The plots are not protected by conservation easements. If permanent easements would have been required it is difficult to predict whether appropriate lands for the project could have been secured at all. The fact that two sites are located on public lands does provide some protection for the plots beyond the term of the AAPL program.

Since oaks are subject to protection in the County, the new oak trees resulting from the plantings should be afforded the same protection as provided naturally regenerated trees. Likewise, both Vandenberg Air Force Base and California Department of Parks and Recreation recognize the oaks as a resource worthy of protection. Oaks planted or present on agricultural lands could be impacted by ranch development if the activity is permitted by agricultural zoning; therefore to some extent the oak trees planted on Los Potreros Ranch are subject to protection as deemed appropriate by the ranch. In the future, the County's current tree protection plan and policies may be modified to address other species besides oaks and the policy may also apply to agricultural lands. If these changes in policy occur, the oaks planted by the AAPL program may benefit from further protection. Currently the greatest challenge to these trees is surviving the drought.

ATTAINMENT OF PLAN GOALS

The fundamental objective of the Offsite Oak Mitigation Program was to satisfy one of many permit requirements on the project in an innovative, resource-sensitive, and cost effective manner. Secondary objectives were to develop needed oak regeneration research data, and provide information for future regulatory policy decisions where oak resources were involved.

Success has been severely hampered by the continuing area-wide drought conditions. This external factor has indefinitely extended the time frame for plan implementation and success. While it was known and recognized during plan formulation that successive iterations of planting and maintenance would be necessary, the severity of drought-induced mortality has been much greater than expected.

Each season AAPL has followed through with best and reasonable efforts toward making the program work. The Offsite Oak Program is now in its fourth season. Based on summer 1990 results, there are approximately 336 valley oak seedlings, or 84 percent of the goal set for valley oaks. However, only 108 coast live oak or less than 1 percent of the coast live oak objective has been reached. This low success rate is directly related to drought-induced mortality at the VAFB and Gaviota State Park sites.

Some success has been achieved. With normal rainfall or supplemental watering, the' ultimate goals of the plan are not impossible but are surely farther away and at greater cost than either AAPL or the County anticipated.

The program continues to meet its objective of providing useful research information through the project's monitoring and reporting program. All information generated from this project is available to the public from AAPL or the County of Santa Barbara. AAPL has and will continue to provide access to the sites for qualified researchers and other interested parties to study and evaluate the ongoing program. Funding provided to the U.S. Forest Service by this project has provided for publishing existing research as well as supporting new scientific work. The program also continues to provide information for regulatory policy decisions, both for agencies as well as applicants.

Agencies can learn that while this program may serve as a precedent for requiring or at least considering this type of mitigation for similar projects in the future, it is obvious that natural conditions will govern the success of any tree replacement program.

RECOMMENDATIONS FOR FUTURE PROJECTS

While the program as envisioned is far from complete, several recommendations can be made for future oak woodland mitigation programs for pipelines and other corridor projects. These recommendations include avoidance, plan flexibility, appropriate program scale and location, and watering contingencies.

Avoidance

For linear or corridor development projects, the main strategy for minimizing impacts continues to be avoidance. Avoiding sensitive resources through careful routing is a special measure not available to all types of development. For corridor development, avoiding impacts altogether can be a realistic and effective method of minimizing environmental costs.

Even after discretionary approvals are obtained, applicants and permitting agencies should not be hesitant to consider minor realignments based on new field information, when the realignment is more beneficial to the resources involved. In order to do this effectively, the applicant must be able to concisely propose realignments and the permitting agency must be able to provide analysis and approval or denial in a timely manner.

Plan Flexibility

Despite the most favorable alignment, however, not all impacts can be avoided. Therefore, the costs of preparing and implementing mitigation programs of the nature described here should be carefully considered. In an effort to begin project construction, developers and agencies often assume that impacts can be easily mitigated. In order for an innovative project to be successful, involved parties must be willing to be flexible and accept a certain amount of "unknowns" in trying a new approach. Not every contingency can be accounted for during the formulation, negotiation, and approval of a mitigation plan, whether for oaks or any other resource.

Both the County and AAPL were willing to allow and encourage flexibility in developing and implementing this program. Both parties agreed to a plan that could not be fully specified until after construction had occurred, since the full scale of the plan (the number of trees ultimately removed) could not be known until that time.

Program Scale

It is necessary to have this flexibility in order to adapt the plan to fit each particular regeneration site's environmental conditions and constraints. What success has occurred to date has come from allowing for flexibility in the program. It will continue to be important in developing continuing strategies at each site as well as the possible selection of new sites.

To achieve an acceptable cost/benefit ratio, mitigation projects should be scaled to a size that is feasible to monitor and maintain effectively while achieving the desired results. Initially AAPL planted over 5,000 trees in an attempt to establish some trees on all of the plots. One site (VAFB) lost 1,600 trees within 3 months of planting due to severe drought at this location. Due to the terrain and size of the planting, it was impossible to institute watering in time to save the trees. AAPL is now considering a much smaller scale planting with supplemental watering to get oak trees started. It is recommended that a small scale but steady effort be done each year to establish trees.

Likewise, agency monitoring efforts borne by the project must be carried out consistently and cost effectively. In the case of AAPL, changes in agency personnel have resulted in additional costs to the project in terms of training and explaining programs that were already underway. In some cases, third party monitoring costs on particular project elements actually exceeded the cost outlay on the element itself.

Watering

The continual drought has been a serious limitation to the success of this natural regeneration project. AAPL is considering providing supplemental watering to those sites where water is available. Therefore, the availability of water and the practicality of establishing irrigation is an important consideration in site evaluation and selection.

In conclusion, it may not be reasonable to expect regeneration alone to provide and sustain oak trees in Southern California within a time frame normally expected and acceptable to most development projects. The results and recommendations in this paper are based on experience with severe drought. While years of normal rainfall could produce some different recommendations, early planning, avoiding trees, flexibility in program design, and proper location and scale of the ultimate mitigation project still remain as key planning factors for future projects.

REFERENCES

All American Pipeline Company, 1986. Erosion control restoration and revegetation plan for Santa Barbara County. Appendix A, Off-site Oak Program.

Environmental Research and Technology, 1985. Draft Environmental Impact Report/Environmental Impact Statement. Proposed Celeron/All American and Getty Pipeline Projects, prepared for California State Lands Commission and Bureau of Land Management.

Oak Tree Preservation in Thousand Oaks, California[1]

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Abstract: The City of Thousand Oaks over the last 20 years has taken aggressive steps to preserve and protect the City's namesake, the oak tree. First adopted in 1972 as an Emergency City Council Proclamation, the City's Oak Tree Ordinance has been considered by some, to be one of the first and toughest municipal native tree preservation ordinances within the State of California. The current Oak Tree Ordinance has undergone twenty years of review and input and has shown to be successful in tree preservation as well as maintaining and increasing community character, quality of development, community image and the quality of life within the City of Thousand Oaks.

Many of the ideas and comments in this paper are a result of practical experience in the administration and development of a resource protection/preservation ordinance and program. They are meant to provide whatever practical information the reader may gain.

In the past, many municipalities and counties had no policy standards or mitigation measures to help offset detrimental impact and loss of oak trees, other hardwoods and associated environmental systems. At the present, the officials and staff of some California municipalities and counties are working with astute and dedicated interest in the protection and preservation of the hardwood resource. They recognize both the value and benefits of the tree resource, and various environmental concerns surrounding proper land and resource use. Enlightened administrative bodies and organizations have come to the realization that they are trustees of, and responsible for, a great and valuable resource to be held and used by both the public at large and future generations (Willeke 1986).

The public has become increasingly aware of the importance of the hardwood resource and the detrimental impact due to its decline. The resource provides many important benefits and values: historical, cultural, environmental, functional, aesthetic, recreational, wildlife habitat, economic, social, philosophical and psychological. This paper reports on how the City of Thousand Oaks deals with the problems caused by the decline of this resource and the steps we have taken to preserve, protect and reforest oak trees in our jurisdiction.

EVOLUTION OF AN OAK TREE ORDINANCE

The current City of Thousand Oaks Oak Tree Ordinance (Lavoie, Moore and others 1986) has undergone political and social evolution over the past 18 years. The Oak Tree Ordinance began as an Emergency City Council Proclamation in 1972, following public outcry after scores of large valley oaks were uprooted within an unapproved development near the center of the community.

Since this first attempt by the City to preserve and protect the community's namesake, the oak, it has become evident that many citizens greatly admire and identify with groves and individual oak trees. The citizenry imparted sometimes emotional, but always forceful political support for oak tree preservation and protection.

The success of the City's Oak Tree Ordinance is in large part due to this considerable and sometimes vocal support of the general community for oak tree preservation and protection, as well as legislative and City Staff support. During the review process of certain proposed oak tree removals to facilitate residential and commercial construction, infrastructure placement and other development, citizens have demanded that the oak trees be preserved and incorporated within development design. With the evolution of life in the City, the oak tree has come to symbolize the quality of life that has been found in Thousand Oaks and other areas of California. Probably the effort to preserve the oak/hardwood resource in Thousand Oaks is motivated by genuine concerns and emotional desires for resource preservation and protection, as well as apprehension for increasing growth, development, and loss of quality of life.

The City's Oak Tree Ordinance has undergone significant community and professional review and revision to reach the current state. It is basically an exercise of the City's police power to promote and preserve a valuable resource asset and the general welfare and health of the community (Mason 1990). In general, the objective of the City's Oak Tree Ordinance is to preserve healthy oak trees over 2 inches diameter breast height on both public and private property within the City's jurisdiction. The Oak Tree Ordinance is enforceable on both private and public property. It is justified by the fact that the City Council of Thousand Oaks has found the oak tree to be a valuable community asset that improves the general health and welfare of the community. The Oak Tree Ordinance protects oak trees from indiscriminate removal or damage. It outlines a procedure for administrative or Planning Commission/City Council review of

[1]Presented at the Symposium on Oak Woodlands and Hardwood Rangeland Management, October 31-November 2, 1991, Davis, California.

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