Preface and Approvals

This Management Plan represents a living document that is revised periodically to reflect the most current approaches and summary information. Major revisions are expected to occur every 5 years unless significant changes warrant updates in a more timely manner. Major revisions will be submitted for review and approvals at a minimum of every five years.

Approvals:

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Brian C. Dietterick, Date
Director, Swanton Pacific Ranch

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Andy Thulin Date
Dean, College of Agriculture, Food, and Environmental Sciences

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EXECUTIVE SUMMARY

Swanton Pacific Ranch has much to offer to complement the educational program of Cal Poly and the College of Agriculture, Food, and Environmental Sciences (CAFES). Much of the effort over the past 10 years have been devoted to 1) expanding educational opportunities, 2) improving facilities, including the planning and initial construction associated with the Swanton Pacific Ranch Education Center and Field Camp, 3) development of sustainable practices, including certification by the Forest Stewardship Council® and formal acceptance of the Swanton Non-Industrial Timber Management Plan (NTMP), and lastly, maintenance and improvements to the Ranch infrastructure, including water and communications development, and road improvements.

Although the new educational facility has not been fully realized, many improvements have been made to existing facilities, including some new construction. This has included the establishment of two new classrooms, one in The Al Smith Training Room in the existing garage at the Al Smith House. Another classroom was established in the Little Creek House (a property purchased in 2005). The installation of a new ranch-wide water storage, delivery, and treatment system is underway adjacent to the Al Smith House and above the site of Swanton Pacific Ranch Education Center and Field Camp. Many of the structures at the Ranch are an established part of the history of the Scotts Creek watershed, and warrant significant effort and funding to maintain and upgrade to benefit Cal Poly and the local community. Additional work includes renovations to the barn built originally in 1874, modifying the bunkhouse to develop individual bedrooms for interns, improvements to staff quarters, and to quarters for visiting faculty and guests.

This Management Plan builds on the content of the previous Plan, with new information about the projects that have been developed since then, such as existing and new educational programs, research forest certification, the NTMP, and the effects of the Lockheed Fire. Some of the proposed actions have been modified to reflect current interests of the Ranch Director and staff as well as the Dean of the College of Agriculture. Other listed actions have been completed or are in currently in progress. Most of the goals for

Swanton Pacific Ranch remain the same, and the five-year matrix in the Appendix identifies which of the CAGR goals for Swanton are addressed by each proposed action.

One addition to this Plan has been the establishment of a Technical Appendix folder that is kept at the Ranch office for documents mentioned within the Plan. Another improvement is the availability of all figures electronically for easy reproduction, and more detailed information on Swanton Pacific Ranch based on the Non-Industrial Timber Management Plan (NTMP) report available on-line at http://spranch.calpoly.edu/documents.

As of March 2019, the Valencia Creek property formally included within the scope of this management plan is no longer under the ownership or management of the Cal Poly Corporation after being sold to Peninsula Open Space Trust (POST). Site descriptions and sections related to the Valencia Creek property that were formally included within this management plan can now be found in Appendix L for educational purposes.

Proposed actions incorporated into the Management Plan include current plans for the Swanton Pacific Ranch Education Center and Field Camp. This plan is expected to help to chart future development in the coming years, and enable the Ranch to have an overall development permit from the County. Other potential Ranch activities and educational programs are discussed including promoting more agri-tourism programs, and improvements to the overall operation and management of the Ranch.

This Plan was developed with the input of many people and thanks especially to Wally Mark, former Ranch Director (1996 – 2004), who has been instrumental in producing this document and in planning and implementing many of the achievements at the Ranch over the last few years as Director and as Associate Dean for the College of Agriculture, Food, and Environmental Sciences before that. The hope is that, with the assistance of this document as a planning tool, we can build on the past achievements to reach the operational and educational potential of this extraordinary facility.

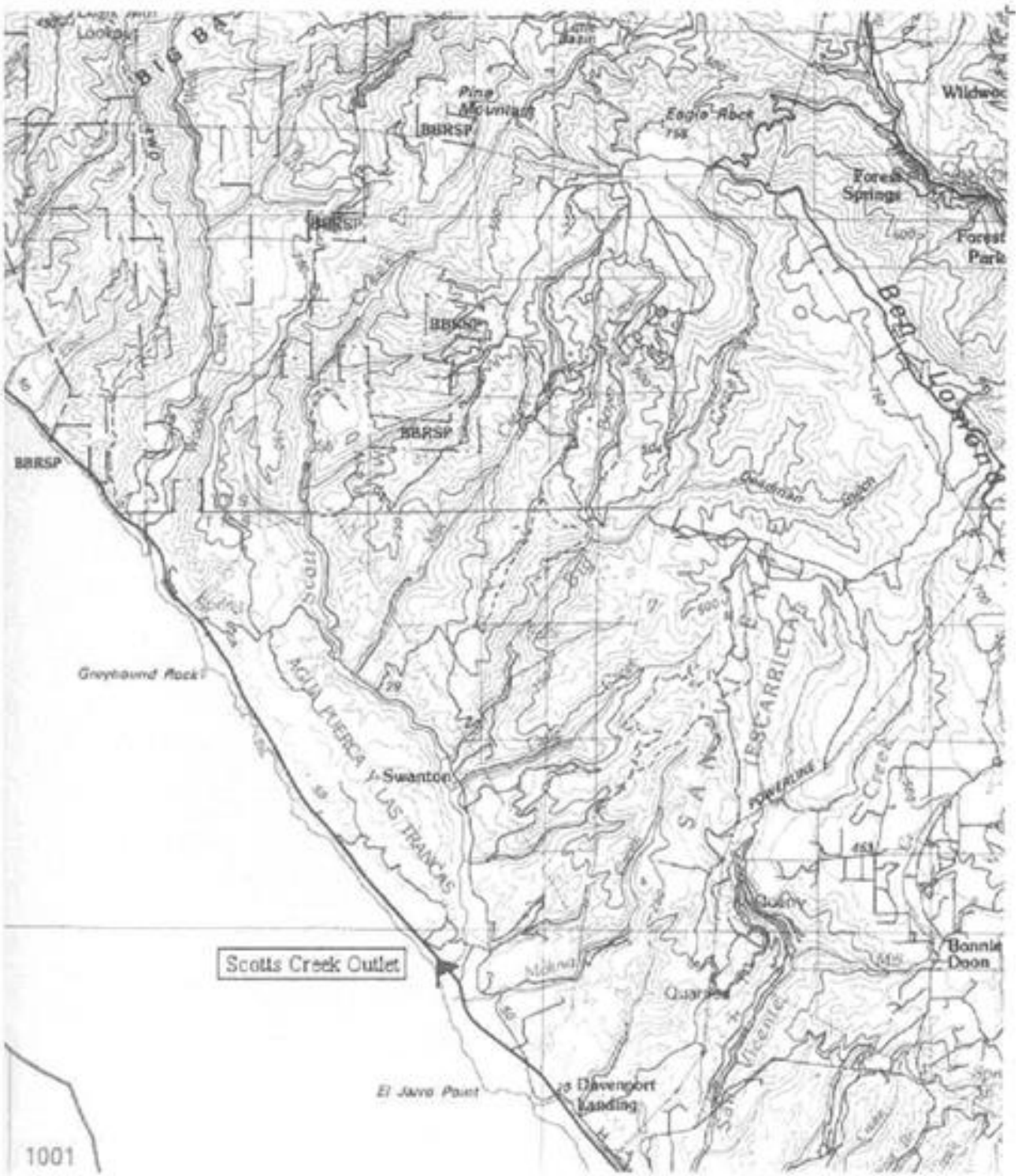


Figure 1 Swanton Pacific Ranch Vicinity Map

1. SITE DESCRIPTION

1.1. Swanton Pacific Ranch site location

Swanton Pacific Ranch is located in the Santa Cruz coastal mountain range, 15 miles northwest of Santa Cruz. Davenport, the nearest town, is two miles south and contains a few stores and approximately 200 residents. The property is approximately 70 miles south of San Francisco and 178 miles north of San Luis Obispo (see Figure 1).

The property is located in the 30-square mile Scotts Creek watershed, the majority of which is owned by four property owners (Cal Poly Corporation, Big Creek Lumber, Lockheed-Martin and San Vicente Redwoods). It is reached from Swanton Road (see Figure 2) that connects to Hwy 1 at both ends. The Pacific Ocean and Hwy 1 form the western boundary, the Coast Dairies property (currently held by the State and a private land trust) lies to the south, the Big Creek Lumber Company property is to the north and east and San Vicente Redwoods property is to the east.

1.2. Swanton Pacific Ranch site setting

The 3,200 acres of Swanton Pacific Ranch consist of approximately 100 acres of cropland, 1,435 of redwood/Douglas-fir forest (including 80 acres with timber but not ownership rights, see Figure 6) and 1,500 acres of grassland (see Figure 7).

The forested land is located primarily on the eastern side of the property and consists of moderate to steep slopes along several creeks that are tributaries of Scotts Creek. The bulk of this forestland lies along Little Creek with additional forest flanking either side of Swanton Road at the northern portion of the property. There is also some forested land on the west side of Scotts Creek on the eastern slopes of the coastal bluffs.

The cropland lies alongside Scotts Creek that bisects the property in a northwest/southeast direction. The grassland is on the coastal terraces on the west side of the property, with some limited grazing on the lower eastern slopes. Swanton Road parallels Scotts Creek through the property for about one mile, then runs adjacent to the property for another 2 miles. The residences on the property are all accessed from Swanton Road.

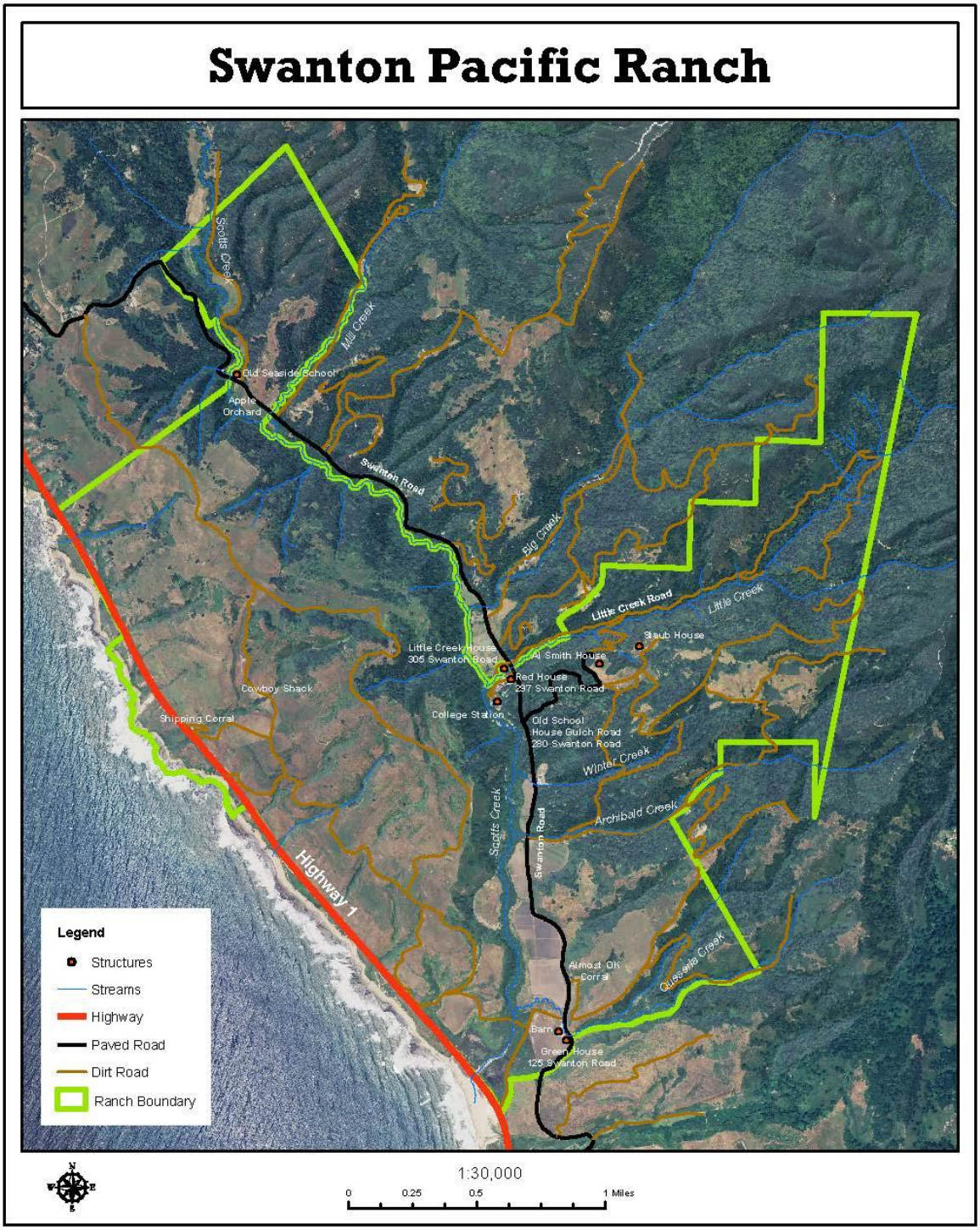


Figure 2 Site Map of Swanton Pacific Ranch

2. GOALS FOR SWANTON PACIFIC RANCH PROPERTY

These goals incorporate those of the College of Agriculture, Food, and Environmental Sciences, the direction desired by Al Smith and those of the current management staff of Swanton Pacific Ranch. These goals will be realized to the extent possible or modified in future Management Plans.

2.1. Donor's Vision

Al Smith, the donor of Swanton Pacific Ranch, wished to maintain Swanton Pacific Ranch "intact and natural, a lab and a classroom for the College of Agriculture for 'Learn by Doing' forever". He had the vision of acquiring as much of the land contained in original Las Puercas y Trancas land grant as possible. He wanted the property to remain as open space, the railroad to be maintained intact and available to the public and the remaining large redwoods, including the tree known as General Smith, left untouched.

2.2. CAGR Cal Poly College of Agriculture Vision

'To provide Cal Poly students, staff, faculty, and the general public a unique interdisciplinary environment in which to live and learn. To foster the 'learn by doing' philosophy by providing learning experiences on a working ranch with diversified agricultural and forest resources.

2.3. Swanton Pacific Ranch Vision

1. To foster Al Smith's vision and Cal Poly's “learn by doing” philosophy by providing collaborative, interdisciplinary, and technology-mediated learning experiences on a working ranch with diversified agricultural and natural resources in California's coastal region.
2. To provide Cal Poly students, staff, faculty, and the general public with a unique interdisciplinary environment in which to live and learn.
3. To explore such interdisciplinary areas as: experimental agriculture; agri-tourism; environmentally conscious architectural design and construction; sustainable uses of the land; and environmental, conservation and ecology studies.
4. To offer educational programs that emphasize pedagogies and formats

appropriate to Cal Poly's commitment to active and applied learning.

5. To provide an opportunity for residential living/learning, co-curricular learning, and participation in applied research projects and community service activities.
6. To assist and guide the University in its realization of the goal to develop a comprehensive environmental vision through teaching environmental literacy and protecting the environmental quality of the Ranch.

2.3.1. Ranch Projects' Goals

The following are general goals for each of the principal activities at Swanton Pacific Ranch:

Education

To expand the present educational facilities and curriculum so as to offer additional 'learn by doing' experiences including 'learning by living' at Swanton Pacific Ranch.

Agriculture

To foster healthy crop production with minimal cost and artificial inputs.

Forestry

To develop and demonstrate uneven-aged forest management that protects ecosystem function, maintains biodiversity, and generates locally produced resources.

Grassland

To improve the grassland and the water supply, resulting in a sustainable rangeland that supports biodiversity and protects the natural habitat for animals and plants.

Natural Habitat Management

To protect and enhance the natural functions and diversity of the varied ranch ecosystems.

The Swanton Pacific Railroad Society

To preserve, protect, and expand the Swanton Pacific Railroad.

2.3.2. Ranch Specific Goals

The CAFES is responsible for deciding the future specific goals of Swanton Pacific Ranch with input from the Ranch Director. The overall management plans and annual budgets are approved by the Dean of the CAFES, the University Vice President, and the Executive Director of the Cal Poly Corporation.

Facilities Expansion

In 2004, a three-phased facility improvement plan was first presented to the Corporation Board of Directors representing the most recent effort to improve Ranch facilities necessary to maximize educational programs. Phase 1 took on projects that were small remodel projects and many were mostly cosmetic improvements. Phase Two included the development of two classroom spaces, the Great Room at the Little Creek House and the Training Room in the former Al Smith garage. Phase three was expected to be the development of a new field camp. The Swanton Pacific Field Camp is being planned to include a larger classroom and mess hall complex (expansion of the Training Room) along with 12 sleeping cabins in the flat below the Al Smith House. The planning process is expected to be complete in Summer 2012, and given current advancement efforts are successful, construction could also begin in 2012.

Field-based courses

During the summer quarter 2006, an intensive 5-week, 15-unit field course, NR 475 Sustainable Forestry and Environmental Practices, was offered at Swanton. It was offered for the ninth time during this past summer with an average student enrollment of 12. The course boasts one of the most unique field-based forestry courses anywhere, attracting more than 40 resource professionals who help to deliver a course designed to develop and defend a timber harvest plan within the 5-week period. The guest speakers are professionals coming from the forest industry, resource agencies, and universities. It has led us to develop two additional courses patterned in a similar way, and referred to as IAU (Industry-Agency-University)-based courses. The Natural Resources and Environmental Sciences department (NRES) will offer the field study term program for a quarter each year once the existing facilities have been remodeled to accommodate the students.

Sustainable Agriculture

Continue lease and growing programs to provide learning opportunities for students and provide an economic resource for the Ranch operations and educational programs. The Ranch has continued to lease 65 acres of crop fields along Scotts Creek to an approved organic operation with whom students can participate and learn. Offer other learning

opportunities through apple, Christmas trees, hay and pumpkin crops that are not labor-intensive and offer both economic returns and a diversity of learning.

Forest Management

Maintain forest certification through the Forest Stewardship Council® (FSC®) to improve financial returns and demonstrate sustainable practices. Implement uneven-aged timber harvesting operations to provide students with ongoing opportunities in all aspects of forestland management as well as an economic resource for the Ranch operations and educational programs. In 2008, the Swanton Pacific Ranch Non-Industrial Timber Management Plan was approved to providing long-term guidance for forest management activities occurring on the Swanton Pacific Ranch property. This plan is amended as needed with all current documents found at: http://spranch.calpoly.edu/documents

Enterprise Projects

Offer opportunities for students to participate in enterprise projects in a variety of existing and potential Ranch activities. Existing enterprise projects include the Stocker Enterprise and the Natural Beef Enterprise.

Scotts Creek Watershed

Cal Poly Corporation and Swanton Pacific Ranch are committed to protecting the Scotts Creek Watershed. The Ranch plans to continue hosting Watershed Council meetings and to participate in implementing actions recommended in the Scotts Creek Watershed Roads and Landslide Inventory (SCWC, 2000) and the Scotts Creek Watershed Assessment (SCWC, 2003). Representatives of the Ranch will also assist in the educational and cooperative efforts of the Council to ensure long-term viability of the area.

Queseria Creek Restoration Project

Restore the hydrological functioning and riparian habitat of the Queseria Creek to avoid flood damage and improve stream anadromous habitat.

Scotts Creek Marsh

Explore the potential of restoring the hydrological functioning of the marsh in conjunction with the rebuilding of the Highway 1 Bridge by Cal Trans. Work with other interested stakeholders to obtain funding and permits for the proposed modifications.

Forest Research and Demonstration

Actively pursue forest management research and demonstration as it pertains to silviculture, restoration, or water quality protection.

Rangeland Research and Demonstration

Actively pursue rangeland management research and demonstration as it pertains to livestock grazing strategies, range restoration, or water quality protection.

2.4. Project Action Plan

In addition to the general goals of the property, the various elements of the Management Plan contain a summary of goals in the form of recommended specific actions. These shall be designated as either ongoing or with a specific time period as follows:

0 - Ongoing maintenance action

1 - Action desired within the next 2 years

2 - Action desired in the next 2 - 5 years

3 - Action desirable when resources are available.

These specific actions provide a management basis that can be reviewed and modified as needed. They are developed by the project leaders and a time frame identified based on budget allocations and the time available by Ranch staff. They are summarized both in the beginning of each relevant section and on the summary of actions spreadsheet. The five-year summary of actions plan identifies in more detail the year in which these actions are to be implemented and also who is to be involved for approximately how many hours and how much money each action will cost.

3. OPPORTUNITIES AND CONSTRAINTS

Swanton Pacific Ranch has a diverse and attractive mix of landscape units and a spectacular setting on the edge of the Pacific Ocean with prominent visibility from Highway 1. It currently offers many educational opportunities to students of various disciplines that will increase with expanded educational facilities. While numerous opportunities exist for the current and future use and enjoyment of this exceptional property, there are also constraints that need to be taken into consideration. A list of opportunities and constraints is provided below:

3.1. Opportunities

The foremost opportunity was envisioned and acted upon by Al Smith. He accumulated several parcels into one property over the years and the University has ultimately become the recipient of this diverse and spectacular property. Within this context, there are several specific opportunities.

Public visibility

Swanton Pacific Ranch has public visibility, both because of its prominent physical position on Highway 1 and as part of an acknowledged institution of higher learning with exceptional standing for its agricultural programs. This is an opportunity to demonstrate sustainable agricultural, habitat management and restoration, and forestry practices.

Diverse Landscape Units

The diversity of habitat types provides for plant and animal species richness as well as different land use practices. While this diversity provides its own management challenges, it is seen as primarily an opportunity as a teaching environment in providing a living laboratory for several academic disciplines.

Watershed Management

The Scotts Creek watershed is relatively small and cohesive and the ongoing efforts by the residents of the watershed to protect and enhance the watershed is an opportunity to maintain its physical and biological functionality as well as its beauty.

Little Creek

The Little Creek watershed provides educational and research opportunities for students and faculty alike. These opportunities have and will continue to provide faculty, undergraduate and graduate students with unique opportunities for the study of the potential impacts of second growth redwood/Douglas fir forests on water quality and quantity.

Railroad Society

Another unique feature of Swanton Pacific Ranch is its railroad that preserves and operates original American Pacific Exposition railroad stock. This is an opportunity both for the members of the Railroad Society and the educational programs of the Ranch, as well as numerous visitors and train passengers.

Financial solvency

Al Smith left endowment funds to the University with a priority for use to support the costs of the educational programs and any operating losses on the Ranch.

Access Easement

There is an access agreement with Jerry Piepmeyer and Ben Hawes to cross their property into the northwest grassland although there are limited trips per day permitted. Additional easement rights are being explored to formalize them if deemed appropriate.

Timber Use Rights

Timber use rights are assigned to Cal Poly on parcel 057-121-10 belonging to Al Smith's family.

Timber Sales

Timber sales are a significant, although sporadic revenue source for SPR and provide some financial security during budget cuts and to cover operating losses. Although timber harvests were expected to occur on average every 3-4 years, the effects of the 2009 Lockheed Fire are likely to affect harvest timing and future revenue.

3.2. Constraints

In addition to the numerous opportunities mentioned above, there are some constraints, several of which are related to the administration of the educational program at Swanton Pacific Ranch.

Distance from Cal Poly campus

There is a travel time of three hours to reach the Ranch from the campus and this distance has contributed to the lack of exposure of Swanton Pacific Ranch to faculty and students and limited their involvement. It is anticipated that this distance will become less of a constraint once the new educational facilities are constructed with adequate accommodations and state-of-the-art interactive media equipment. It should also be mentioned, that having the facility this far from Campus, is also what encourages students to have extended stays and experience more of what the Ranch has to offer.

Funding Limitations

Funding fluctuations occur depending on State resources and financial needs within the CAFES that can cause program cuts or restrictions on desirable activities. In addition, not all Ranch activities are profitable as yet, and fundraising has not been successful to the level necessary to develop the former Educational Center plan.

Limited labor resources

A constraint on agricultural activities is that intern students need to be offered a variety of learning programs rather than be used simply as agricultural labor. Additionally, there is the time constraint of the educational quarters that can affect harvesting and other agricultural activities. Permanent Ranch staff must be used for agricultural activities when no interns are present.

Scotts Creek

Scotts Creek provides an opportunity for natural habitat management and to demonstrate riparian restoration. However, fish habitat can be at risk from land management activities that may introduce sediment, and point and non-point source pollutants, yet opportunities exist to employ best management practices that ensure habitat quality.

Swanton Road

In past years Swanton Road has been badly damaged by storms and some sections may be difficult to repair. There is no guarantee that this will not re-occur in the future,

making travel difficult. Even in normal conditions, the road is narrow and winding, and users of the Ranch must exercise caution if traffic increases as the educational facilities are developed.

Use Agreements external to Cal Poly

Some Use Agreements exist on Ranch property that may be considered a constraint. George Delatorre, a past employee of Al Smith, was bequeathed the use of his house for the duration of his life. Mr. Delatorre passed away in 2005. In addition, lease agreements exist with California Department of Forestry (Cal Fire) for the use of the Big Creek Fire Station on Swanton Road and the Santa Clara Boy Scouts for use of the Boy Scout Camp (see Figure 8). These are discussed more fully in the Operations section.

Easement and Use Agreements

There are utility easements across the Swanton property, (see Figure 8), access easements along Archibald Creek and Scotts Creek and use agreements for Cal Fire and the Boy Scout Camp.

Deed Constraints

The Living Trust of Al Smith specified that the land was donated to Cal Poly on condition that it be maintained as a working ranch for instructional purposes (see Technical Appendix). The property was not to be sold or transferred except to another non-profit organization that would maintain it exclusively for agricultural, recreational or educational purposes. Furthermore, a desire was expressed in the Trust that the Swanton Pacific Railroad rolling stock and all personal property related to the railroad be transferred to the California State Railroad Museum Foundation in Sacramento should the railroad not be well-maintained as an exhibit available to the general public.

Dewatering from Scotts Creek

Swanton Pacific Ranch (SPR) has legal water rights for agriculture (see Technical Appendix) and domestic use from Scotts Creek during May through December. However, the chronically low water levels during summer months, especially during years of drought, has reduced levels to below the minimum levels recommended by California Department of Fish and Game (CDFG). Coho salmon are listed as Federally endangered species, and steelhead as Federally threatened, there are additional expectations to conserve water in Scotts Creek. Since the most extensive water extraction occurs in the lower half mile of

Scotts Creek where the SPR wells exist, it is possible that more restrictive limits may be imposed both on SPR in the future for its water use. It should be noted that well tests were performed and documented in 1997 that found no effect on summer low flow conditions in Scotts Creek.

4. HISTORICAL BACKGROUND

Swanton Pacific Ranch has had a rich historical background in the space of little more than a hundred years. During this time it has passed from the stewardship of local indigenous tribes to large land grants interspersed with smallholdings. Nine hundred acres of the original Agua Puerca y Las Trancas land grant were re-purchased through the efforts of Al Smith to form what is Swanton Pacific Ranch, which has subsequently become the property of the Cal Poly Foundation. This chapter reviews the major historical patterns of both the region and the ranch.

4.1. Regional History

The three principal users of the area have been the Native Americans, the Mexican land grant recipients and the early settlers. Each is discussed below. Logging, settlement, crop production, floods and earthquake/landslide activity have been the principal impacts on the recent regional history.

4.1.1. Native Americans

Linguistic evidence shows that Costanoan Native Americans lived in the area from around 500 AD with approximately 600 inhabitants between Davenport and Aptos. Between 1770 and 1797 there were seven missions established within the Costanoan territory, changing the lifestyle irrevocably. A senior project by Katherine Coe (1990) reports an estimate that, of nearly 11,000 Costanoans located between San Francisco and Salinas on the coast when Europeans first arrived, there were only 56 survivors by 1920.

The Costanoans lived by hunting, fishing, and gathering seeds and acorns. Their huts were six feet in diameter by four feet high made of arched stakes and straw. Women wore cloaks of deerskin with aprons of rushes, while men had cloth furnished by the Mexican clergy. The wealthiest wore cloaks of otter skin. Young boys went naked and young girls wore a girdle. In cold weather they would coat themselves with mud for warmth. The Indians usually cremated their dead and deposited the ashes in a designated place.

Women made baskets of very fine quality, although few remain. Mortars and pestles were used to grind acorns and some of the mortars are still found in stone outcroppings. Flint and chert spear tips and arrowheads were used in hunting, and some of these are occasionally

found on the Ranch. Few large archeological deposits of significance have been found on the Ranch property, although large middens exist nearby.

4.1.2. Mexican Land Grants

The Mexican Portola Party arrived in 1769 and camped in Waddell Creek just to the north. They may well have also stopped in Scotts Creek, although there is no record of that. Land grants in Santa Cruz County were made under Mexican rule and constituted more than 150,000 acres. Land grant recipients usually raised long-horned cattle and limited crops. They had small sawmill operations, grist mills, and often liquor stills. Entertainment in the area consisted of horse races and bull and bear fights. Most of the land grants in the county survived intact until late in the 1850's.

The Rancho Agua Puerca y Las Trancas is Santa Cruz County's most northern rancho. It was a grant of one square league that stretched along the Pacific Ocean between the two creeks that gave the name to the rancho. At the lower end near Davenport Landing is Agua Puerca Creek (the name probably refers to the stagnant water in the stream which comes out at Davenport Landing). At the north end is Las Trancas Creek, which is probably derived from the practice of placing poles for a gate or barrier in a narrow canyon just south of Waddell Creek.

On November 2, 1843 Ramon Rodriguez and Francisco Alviso received the land as Rancho Agua Puerca y las Trancas from Manuel Micheltorena, Mexican Governor of California. On March 1, 1867, President Andrew Johnson issued a patent to their heirs. Earlier claims to the property then called Rancho el Jarro were rejected. It is believed that Scotts Creek was once known as Arroyo del Jarro.

4.1.3. Early settlements

Homestead land was also available and settlers moved right up to the Mexican Land Grant line, which replaced the Sierra designation. (The line is still visible on aerial photos). Many of the long-term families in the Swanton area homesteaded plots behind the Rancho. These pioneer families included the W. H. Purdy family, Alfred and Lucy Miller, J. Shaw, Harold Gianone, A. T. Brownfield, and J. H. and Charles West. Another homesteader was the Staub Family, great grandparents of Bud and Lud McCrary, residents in the Scotts Creek watershed and owners of Big Creek Lumber Company.

The area became the terminus of a railroad line built by the Ocean Shore Railroad. This company was incorporated in 1905 and tracks were laid from San Francisco to Tunitas between Half Moon Bay and Pescadero and in Santa Cruz County between Swanton and Santa Cruz. A daily passenger train ran between Santa Cruz and San Francisco. The line between Tunitas and Swanton was never completed. Passengers were transported between these points by Stanley Steamer bus. Ocean Shore Railroad never fully recovered from the earthquake of 1906, and when Southern Pacific (SP) built a parallel line to Davenport, the cement plant business dried up. Battered by bankruptcy and competition from automobiles, the company succumbed. The rolling stock was sold and the rails removed by the end of 1921.

The Ocean Shore Corporation was also involved in real estate speculation, and in 1907 a town named Folger was laid out by the Shore Line Investment Company and approved by the county in 1908. It was located at a former station on the Ocean Shore Railroad between Scott Junction and Swanton in the present Long Barn area. It never amounted to more than a small settlement serving as the center for the lumber industry that developed in Little Creek. It was named for J. A. Folger, the "coffee king" of San Francisco who was the first vice president of the Ocean Shore Railroad. None of the 324 lots (25 ft x 100 ft) sold, meaning that crops are still grown on the corner of what was named Railroad Avenue and Fir Street.

Just beyond the Ranch boundary however, between Big and Little Creeks on Swanton Road, is the site of the old community of Swanton (formerly Laurel Grove), once a station on the Santa Cruz-Pescadero stagecoach. In 1906 Swanton became the northern terminus of the southern section of the Ocean Shore Railroad. Its residents worked mostly for the railroad and lumber company. The main attraction was the Laurel Grove Inn.

Swanton was named after Fred Swanton, an early mayor of Santa Cruz, who built the Santa Cruz Boardwalk and developed hydro-electric plants on Big Creek, dams on Mill Creek and Berry Creek, and several miles of flume. The plant produced electricity from 1899 to 1948. In that year a forest fire burned the flume, and it was abandoned. It was the first plant of the Central Coast Counties Gas and Electric Company, which is now part of PG&E. Fred Swanton also helped organize the 1915 Panama-Pacific Exposition in San

Francisco, which was the origin of the rolling stock and engines of the Swanton Pacific Railroad.

With all this activity the area needed a post office. A petition was submitted requesting the name Trancas, although the residents liked Laurel Grove, the name of the inn and the livery stable. However, Fred Swanton knew the U.S. Senator and the name Swanton was approved on May 28, 1897 for the Post Office located near the junction of Scotts and Big Creeks on the Santa Cruz and Pescadero Stage Line. It closed on December 31, 1930.

One of the early impacts of settlement on the area between 1907-1923 was the clear-cut logging of redwoods that supplied some of the lumber used to rebuild San Francisco after the 1906 earthquake. The San Vicente Lumber Company used shay engines to haul logs out of Little Creek and took over the Ocean Shore railroad line for logging purposes once the company went out of business in 1921. The SPR railroad is located partially on the old right-of-way of this railroad along Scotts Creek. The wildfire in 1948 in Little Creek destroyed the wooden trestles that had been part of the railroad grade. The logging consisted of clearcutting the stand and burning to make yarding easier. San Vicente Lumber Company also undertook extensive harvesting of tanoak bark in the Swanton area. The bark was stripped off the trees in the woods and hauled out on pack mules to the Kron's Tannery on River Street in Santa Cruz.

4.2. Swanton Pacific History

The 3,000 acres of Swanton Pacific Ranch comprise much of the original Rancho Agua Puerca y Las Trancas Land Grant. One of the early settlers, James Archibald, a farmer from Scotland, owned Rancho Agua Puerca y las Trancas in the 1860's. He was reported to have 120 cows in his dairy in 1878. He arranged for a Swiss dairyman, Ambrogio Gianone, who settled in the area in 1869, to run the dairy. Gianone became a well-known dairyman and built a rock house cheese factory on the Old Coast Road (now known as Swanton Road), opposite the headquarters of the ranch of James Archibald. The cheese produced was called Santa Cruz Jack Cheese, said to be the forerunner of Monterey Jack Cheese.

Later Mr Gianone bought the north third of the rancho, where Swanton Road crosses back over the ridge. It is known locally as Gianone Hill, and there are two families with fourth generation children living there today. Mr. Archibald died in Scotland in 1875 and

after a two-year lawsuit, Mrs. Archibald sold out to Joseph Bloom, who lined up water rights and farmed the valley.

The Staub family eventually settled a portion of the ranch, as well as the Coast Dairy and Land Company and the Ocean Pacific and Southern Pacific railroad lines. The Staub family sold their holdings to the Castro family in the 1940's who sold it soon afterwards to the Jani family. These lands were used primarily for cattle, artichokes, Brussels sprouts and hay.

Some of the leading citizens of Santa Cruz spent their childhood here on windswept little farms with such nicknames as "Siberia" or "Poverty Flats". World War II caused most of the tenant farmers to leave.

4.2.1. Structures

There are several structures that are at least a hundred years old, although the National Historic Register of Historic Places, California Historical Landmarks, and Points of Historical Interest list no cultural resources within the Ranch boundaries. The California Inventory of Historic Resources lists China Ladder, the Gianone Rock House and the Swanton Ranch as historic. Mr Gianone, who built the Rock House, also had some shipwrecked carpenters build the barn in the late 1880's. At the same time he built the Green House that has provided housing for migrant farm workers over the years. Both structures are still in use today, although approximately one-third of the westerly end of the barn blew off in a severe storm.

The Turini family built the Red House in 1935. At that time Swanton Road was the major route between Santa Cruz and San Francisco until Hwy 1 was built in 1937. The Red House was well-known locally as a family-style restaurant serving ravioli, but was sold to the owners of the land, the Morellis and the Pollettis in 1942 (Franklin, 1987). Bruce Bratton, a local writer, rented the house for 16 years after that time.

The Seaside School located in the Scotts Creek valley was moved several times before closing in 1961. The third building for the school was built on the present Schoolhouse site in 1907 on land rented from the Gianone family. Vacation for this school was in December to February when road conditions were very bad due to rain.

4.2.2. Land Uses

Starting in the 1920's, it was discovered that artichokes and Brussels sprouts grew well in the coastal area. Scotts Creek was dammed and huge single cylinder gasoline engines were used to pump the water onto the upper terraces. There are the remnants of some twenty reservoirs and numerous gravity flow structures left on what is now rangeland. There was a Grade B dairy, a beef cattle operation, and row crops, mostly artichokes and Brussels sprouts. Since these crops are labor-intensive, a labor camp was established with mostly Filipino workers east of Swanton Road along Archibald Creek. Some berries were also grown.

When John and Bob Musitelli took over the beef cattle they increased the acreage by converting waste brush land with a bulldozer, herbicide and fire. They had a cow-calf operation and expanded their operation when the Grade B dairy left.

When Al Smith's began ownership of Swanton Pacific in the late 1940's he tried a small cow-calf operation in Little Creek. After hiring a cowboy, he ran stockers at first and then a cow-calf operation, at the wrong time for the market. When the vegetable tenant left, Al leased the land to a flower grower, who grew cut flowers and market peas with little success.

Logging was also an integral part of land use activity on much of Swanton Pacific land and clear-cut logging was undertaken by the San Vicente Lumber Company in Little Creek following the 1906 earthquake until the 1920's using a railroad which went up Little Creek and into Deadman's Gulch. This clear-cut yielded an even-aged stand of redwood and Douglas-fir. There are a few residual trees that for some reason were not cut in the original logging. Logging also took place during the 1950's on Scotts Creek Stand using a partial-cut method. The logging was done by small tractor and resulted in a network of skid roads in the stand. According to the historical background for the Swanton Pacific Ranch Forestry Management Plan (Big Creek Lumber Co, 1991) located on the web-site at: http://spranch.calpoly.edu/documents , the logging was a high-grade selection, with the poor quality trees left as residual trees. Burning followed the logging in parts of the stand to remove the unwanted limbs and resulted in severe damage to some of the residual trees.

4.4. Al Smith's Life

Al Smith purchased parcels comprising the Swanton Pacific Ranch over a 40-year period. He was attracted to the area when his family came on camping vacations from Los Gatos and later when he camped with the Boy Scouts of America who built a house by Scotts Creek. His love of trains had led him early to a job on the railroad as a callboy, waking passengers in the night for their trains. He subsequently became a brakeman, during which time he was injured. When the flood of 1940 washed the Scout house away, the land was put up for sale, and Al Smith, then 24 years old, purchased 412 acres of Little Creek in 1943 with a settlement he received for his railroad injury.

Trains were also instrumental in bringing him to study at Cal Poly, since at that time the rail terminus for north and south destinations was located in the middle of campus. He received a BS in Crop Science in 1944 and in 1956 obtained an MA in Education. He taught agriculture at a high school near San Jose for the next 17 years until his retirement. He also served a term as Mayor of Aptos.

He settled at Swanton Pacific after the purchase of Archibald Ranch in 1978. By that time his family had sold Orchard Supply Hardware and with the proceeds he was able to add to his land purchases and acquire the railroad. He purchased the Valencia Creek property in 1980. Though he ran stocker cattle at Swanton Pacific Ranch, he did not farm much himself, renting out the farmland to others and paying the bills on the land until he established the lease agreement with Cal Poly.

Al never married and left the bulk of his assets to Cal Poly State University for the continued use of Swanton Pacific as a working ranch and an educational forum for students.

4.5. Early Cal Poly Involvement at Swanton

Cal Poly entered into a nominal rent agreement of $100 with Al Smith in 1986 for a three-year period in which to establish an experiential educational program. Originally much of the cropland was leased, some of the grassland was leased and Cal Poly operated the rest of the ranch including the timber stands. The Ranch was used by students for a variety of educational purposes, but student accommodation was limited for the first few years, due to lack of housing and faculty on site.

Initially Al gave $1 million to establish a quasi-endowment for operating capital. In 1991 he donated an additional $1 million of W.R. Grace stock to be used expressly for instructional enhancement and in addition funded a resident faculty position for three years. The internship program was expanded to include part- and full-time interns and the distance learning equipment was purchased and installed in the Red House. The Bunk House and Casa Verde were renovated to accommodate up to 14 interns.

4. ARCHAEOLOGY

There are several archaeological sites known to exist on Swanton Pacific Ranch property. Recorded arch sites are both historic and pre-historic however, specific information is not publically available regarding these sites.

Familiarity with these sites should be made prior to commencing excavations or ground disturbance operations, and may require a qualified person to be present during soil removal to identify any artifacts or new sites that may be discovered. Access to confidential archaeological requests are evaluated on a project by project basis by the Ranch Director and Operations Manager.

There are still areas that require surveys for cultural resources with high likelihoods of additional arch sites. Swanton Pacific Ranch (SPR) plans to facilitate a graduate student to complete this work at a later date. Significant work has been completed on archaeological sites through the Confidential Archaeological Addendum (CAA) that is part of the Non-industrial Timber Management Plans (NTMP) for Swanton Pacific Ranch.

4.1. Swanton Pacific Ranch

National Register of Historic Places, California Historical Landmarks, and Points of Historical Interest list no cultural resources within the Ranch. The California Inventory of Historic Resources lists "China Ladder", the Gianone Rock House", and "The Swanton Ranch" within and adjoining the area (Coe, 1990).

5. GEOPHYSIOGRAPHY

Included in this section are the physical components of geology, topography, climate and soils for the land. Each is described briefly below.

5.1. Climate

The mean annual temperature of Santa Cruz County is 54 to 58 degrees Fahrenheit, with between 220 and 275 frost-free days. Annual precipitation for the area ranges between 20 - 50 inches a year. Skies are overcast for 30 - 40 percent of the daylight hours annually. Average humidity is between 70 - 80 percent in the winter, slightly lower in the summer. Winds are usually light (USDA, 1980).

5.2 Geology

Santa Cruz County is in the Coast Ranges geological province (see Figure 3). The San Andreas Fault zone is northeast of the county and several smaller faults extend northeast of Swanton Pacific Ranch. The San Gregorio Fault is northwest of the Ranch. The axis of the Davenport Syncline crosses the property. Most of the Ranch is underlain by Tertiary Santa Cruz Mudstone which is a medium to thick bedded, laminated siliceous mudstone, grading locally to a sandy siltstone (Clark, 1981). The northeast corner of the Ranch is partially underlain by Paleozoic or Mesozoic metasediments, Cretaceous quartz diorite and tertiary Santa Margarita Sandstone.

Near the Pacific coast, stream-dissected Pleistocene marine terraces, most capped with fine to medium sand, underlie the soils. Scotts Creek and some of its tributaries have deposited Quaternary-age alluvium.

5.2.1. Landslides

Landslides are common where the Santa Cruz Mudstone underlies the soils on steeper slopes (Clark, 1981). Some large landslides of Quaternary age have been mapped; one of these occurs on the Ranch. Extensive research on landslides throughout the Scotts Creek Watershed was undertaken for the Scotts Creek Watershed Council in 2000 with the assistance of funding from the Scotts Creek Watershed Council and from the California Department of Fish and Game. The principal findings of this study as they

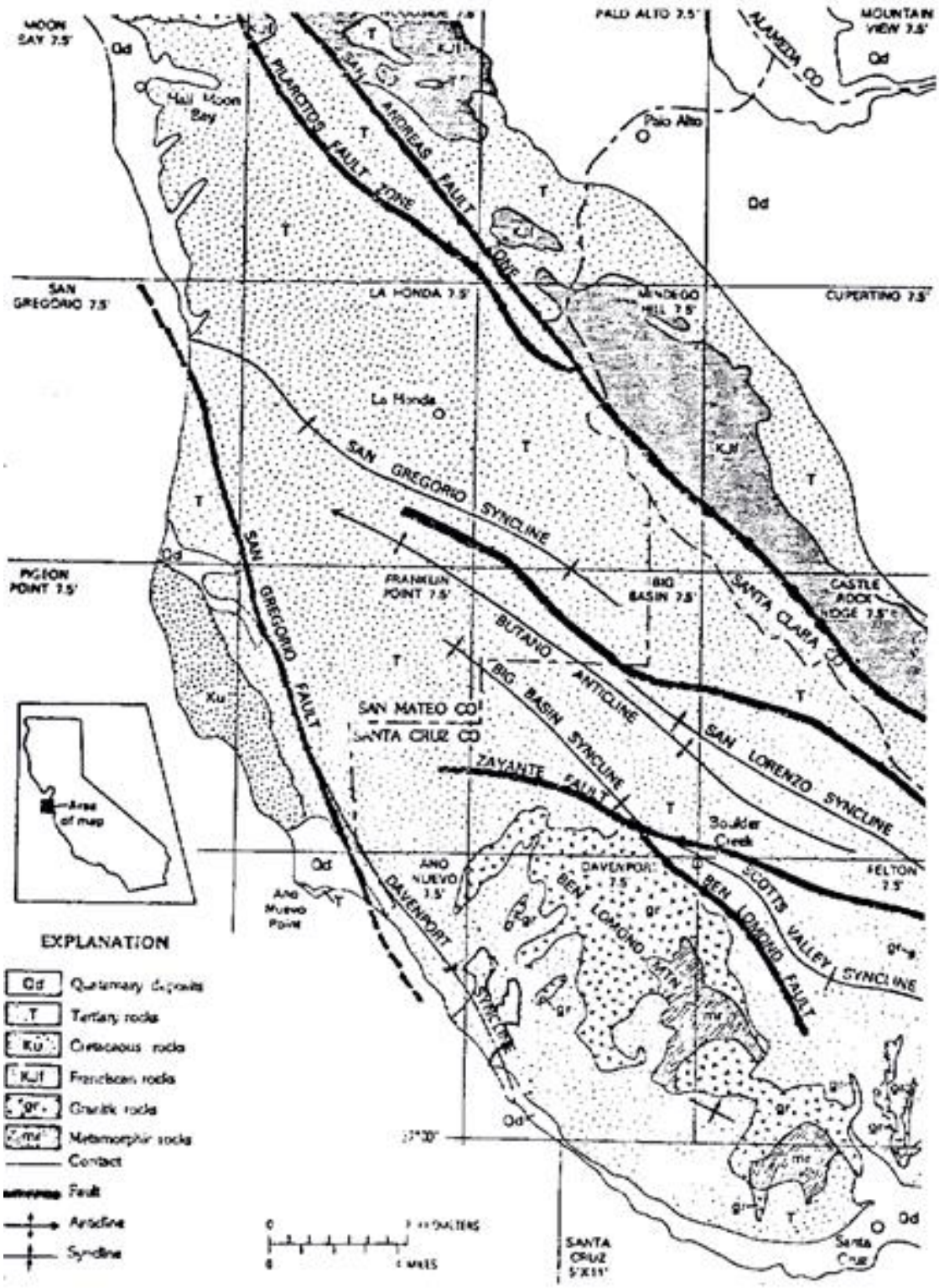


Figure 3 Geological map of the Swanton Pacific Ranch

relate to Swanton Pacific Ranch were that rotational slumps were more common on west or north-west slopes at varying elevations, but tend to arise in failures at or above the sharp slope breaks to marine terrace tops located at the top west side of the valley. Long translational slides are more likely to occur on the east and southeast sides, often at or near the heads of the indented small side canyons and are more likely to have debris flows enter the stream channels. Most of these landslides occur due to soil saturation from rainfall, with some evidence of greater activity in areas of less sun. Slides occur in both granite and mudstone formations.

During the 1997-8 storms there were 125 – 150 slides in the watershed, although little landslide material reaches the stream channels. Little Creek had abundant and destructive landsliding in the 1955 storms. It was the conclusion of the geologist who prepared the report, Roberta Smith, that, despite the presence of numerous small slides throughout the watershed these were mostly not caused by roads which can actually act as a trap for debris. However, elsewhere in the report on roads, it was noted that many landslides did originate at road sites, often caused by the uprooting of a nearby tree during storm events (SCWC, 2000).

5.3. Topography

Elevation ranges from sea level at the estuary of Scotts Creek to 1,000 ft at the eastern boundary of the property. An unnamed peak of 819 feet occupies the central portion of the site with Cooke's Peak at 774 feet that is monumented with a USGS benchmark. The riparian corridor of Scotts Creek extends across the property in a north/south orientation (refer to Figure 4) that is frequently incised in the upper reaches but has a well-developed floodplain along the lowermost 2,000 feet as Scotts Creek approaches the estuary. The cropland of the property is contained in this floodplain region, with valley slopes on each side rising steeply in most locations. Several smaller drainages bisect the eastern slopes.

5.4. Hydrology

The major stream draining through the property is Scotts Creek (named after Hiram Scott who bought a portion of Rancho Agua Puerca y las Trancas in 1852). The stream originates between Eagle Rock and Blooms Creek in the Santa Cruz mountains and flows south-westward for about five miles to a point near Gianone Hill and the Old Seaside School

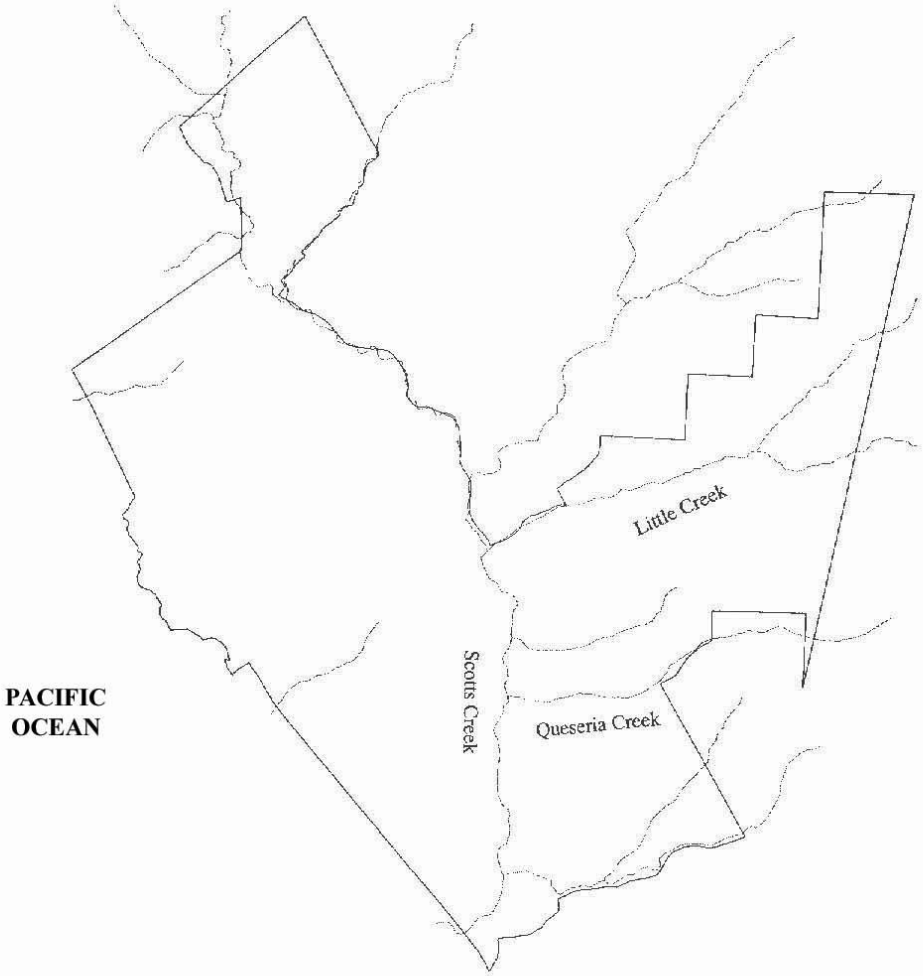


Figure 4 Location of streams on Swanton Pacific Ranch

where it turns southeastward for another five miles to enter the Pacific Ocean. (see Figure 4).

The mainstem of Scotts Creek is approximately 11 miles (Nelson, 1994). In a comparison of 1992 and 1993 streamflows, it was found that streamflow was approximately 7 cfs greater in May 1993 than May 1992, but by late October flows were approximately the same (1.48 cfs in 1992 and 1.43 cfs in 1993). Maximum recorded flows in 1992 were 24.23 (Nelson, 1994), approximately the same as those in mid-summer after heavy rains in 1998.

There are five tributaries to Scotts Creek, all but the largest of which Big Creek, traverse the property. The headwaters of the Scotts Creek tributaries are located in the Santa Cruz Mountains at elevations of between 1,600 and 2,000 feet. The largest of those within the Ranch is Mill Creek, a perennial stream that rises in the west part of Rancho San Vicente at an elevation of 1,500 feet rises on the southern slope of Ben Lomond Mountain at an altitude of 2,000 feet near the present-day Lockheed Martin-Marietta Testing Site. It flows southwestward for five miles to join Scotts Creek near the site of the former Seaside School. Big Creek flows southwestward into Scotts Creek about three tenths of a mile south of the point where Big Creek flows into Scotts Creek (see Figure 4), just beyond the property boundary. Archibald Creek is an intermittent stream about 1.5 miles long that rises in the western part of Rancho San Vicente and flows southwestward to join Scotts Creek very close to the Gianone Rock House on Swanton Road, 1.25 miles north of its junction with Hwy 1. At one time the upper reaches of this creek were known as Schoolhouse Gulch, possibly a former location of the Seaside School. Queseria Creek is also intermittent and passes by the Rock House and Green House/Barn compound.

The lower portion of the property is at or near sea level, and is poorly drained. Heavy rains caused periodic flooding in the crop fields in this location. The marsh at the estuary contains brackish water from salt-water intrusion and tidal action. The lagoon at the estuary is closed by a sandbar in the summer months except when breached. Runoff from the remainder of the property is moderate to rapid due to the steep slopes. There is a historic record of a devastating flood that came as high as the walls of the basement of the Red House in 1955. Other flood events have been recorded in 1940, 1982 and 1998.

5.4.1. Water Quality Monitoring

A water quality monitoring study (see Education section) is currently underway using the four measuring stations on Little Creek. This study is contributing to our understanding

of the hydrology of the area. In 1997, three monitoring stations equipped with rated section flumes (see Figure 5) were installed on Little Creek – one at both the North and South Forks just above their confluence, and one at the downstream end of the Main Stem (see Figure 5). In 2001 a fourth monitoring site without a flume was established as a control at the upper property boundary of the North Fork above the proposed harvest area. These flumes will provide suspended sediment and temperature data before and after single-tree and group-selection harvesting.

These stations contain a stilling well to measure the depth of the water mechanically and electronically to obtain the stage of streamflow throughout the storm event. The rectangular shape of the natural-bottom flumes provides a stable channel cross-section and allows for the electronic measurements of stage and stilling wells that is converted to flow discharge using a rating curve developed for each site.

An ISCO pump sampler records instream turbidity and water temperature readings every minute as well as pumping the one-hour storm samples into bottles for lab analysis. During the summer months, 90° sharp-crested V-notch weirs are installed for more accurate low-flow measurements and a HOBO data logger is installed instream to measure summer temperatures.

Data that is collected from these stations is analyzed and stored at the Water Quality Lab located at Al's house by hydrology graduate students in the NRM Department. The lab contains a turbidimeter to measure turbidity, and gravimetric analysis is used to determine Suspended Sediment Concentrations (SSC) from one-hour sample bottles of water collected from the monitoring stations during storm events. These data are then entered into the computer database for each of the monitoring stations so that a statistical analysis can be performed to determine correlations between the different stations. This will allow for post-harvesting comparisons to evaluate the effectiveness of management practices in protecting water quality.

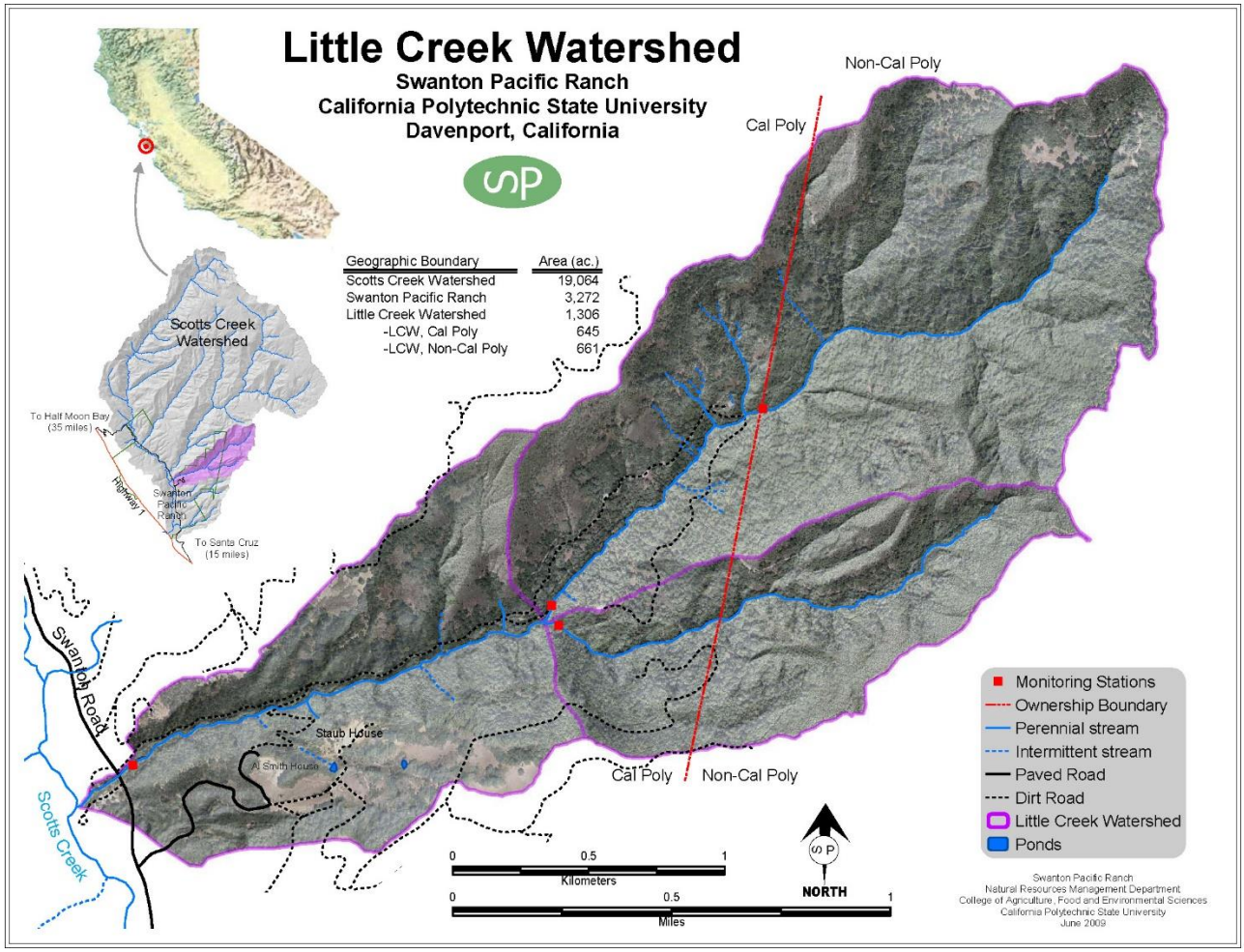


Figure 5 Locations of monitoring stations in Little Creek watershed

5.4.2. Raingages

Rainfall data is collected during the rainy season from eight raingages that are either manual or tipping bucket models. These are checked weekly or immediately following storm events to determine rainfall in each of the areas located on Figure 5. Two of these rain gages are located just beyond the Ranch's property boundary with permission from the owners to measure rainfall amounts near the watershed boundaries of the North and South Forks of Little Creek. A table of recent rainfall figures recorded at Swanton Pacific Ranch by graduate students is included in Appendix B.

5.5. Soils

A brief description of the major soil map units of Swanton Pacific Ranch is provided below.

5.5.1. Swanton Pacific Ranch soils

There are 26 soil map units within the Swanton Pacific Ranch and most of the soils have a high erodibility index. There are very limited Class I and no Class II soils, which are classified by the USDA as the most fertile soils. Grassland activities are suitable for Class III through Class VII. The most productive soils for grassland on the property are the Bonnydoon, Elkhorn and Los Osos. There are no Class VIII soils (considered to be landforms and soils that cannot be used for harvestable plants). A soil study was undertaken at SPR to develop a second order soil survey (Moody, 1987).

The soils on the property have been digitized into a GIS (Arc GIS) and the soil type and land capability class has been correlated to each unit of cropland, pasture or forest. A map of all the soil types on the property is available on the Swanton Pacific Ranch GIS database.

The principal soil units, their agricultural use and locations are summarized briefly below based on information obtained from the USDA Santa Cruz County Soil Survey (1980).

<u>Lomond-Catelli-Sur Complex</u>

This complex is contained primarily in the eastern portion of the property and is typical for the Santa Cruz Mountains. The complex is found on slopes between 30 - 75%. These soils are most suited for forests. Timber production on these soils is highest on Ben Lomond soil and lowest on the Sur series. The Sur Formation consists of metamorphosed rock, with schist being the most common rock that creates a loamy texture soil. The Ben

Lomond soil is deep and well drained and is derived from sandstone or quartz diorite. It has moderately rapid permeability. The Catelli soil is moderately deep and well drained and is also derived from sandstone or granite rock. The Sur complex is moderately deep with a layer of unweathered granodiorite at a depth of 35 inches. Permeability is moderately rapid on all these soils and runoff is rapid.

Watsonville Loam

This soil series is located in the valley between the two ranges containing Bonnydoon Loam. It is a deep, rather poorly drained soil formed on old coastal terraces. Slopes are between 2 - 15% and the soil has a Class IV capability. Water is sometimes perched above the clay. Permeability is very slow. The soil is suitable for such cultivation as irrigated pasture and Brussels sprouts that are adapted to heavy soils. The Watsonville-Tierra loam has the same slow permeability but is slightly better drained. Suitable use is grassland grazing.

Bonnydoon Loam

The central and western portion of the property consists of Bonnydoon Loam. These soils are shallow with moderate permeability, high erosion potential and rapid runoff on slopes ranging from 5 - 85%. Suitable use is grassland, but care should be taken to avoid overgrazing. These soils were created from weathered sandstone, mudstone or shale.

7. EDUCATIONAL PROGRAM

Summary of Recommended Actions

0 = ongoing 1 = within 2 years 2 = 3 - 5 years 3 = desirable

* Expand community involvement/awareness and participation in SPR programs **(0)**
* Encourage inter-/intra-college awareness and participation **(0)**
* Expand intern program **(0)**
* Develop Jacobs Farm educational program **(1)**
* Develop apprenticeship program **(1)**
* Explore potential of Honors Program at Swanton **(1)**
* Develop FNR residential quarter program **(3)**
* Provide faculty incentives to offer distance learning course **(0)**
* Obtain funding for Educational Facilities **(2)**
* Complete communications upgrade **(1)**
* Standardize distance learning courses **(3)**
* Maintain hosting for MESA summer camp **(3)**
* Evaluate research proposal for establishing clonal Monterey pine species **(1)**
* Investigate potential for agri-tourism program on the Ranch **(1)**
* Coordinate PhD program with UCSC **(3)**

Swanton Pacific Ranch offers the opportunity of gaining first-hand experience within the university setting by living and participating in a working ranch. It is intended that this experience will offer the student a holistic view of managing diverse natural resources. Students in other majors are also welcome to participate in order to broaden their educational experience, and the Ranch offers numerous opportunities for field trips, research projects and group workshops. Living on the Ranch provides its own life experience learning and challenges, and students are also required to undertake community service as a part of the internship while at the Ranch.

7.1. Educational Philosophy

The educational programs at SPR are designed to provide a living and learning

experience on a working commercial ranch. Students work in a wide variety of agricultural enterprises and learn how agricultural decisions are made within budgetary and time constraints.

The philosophy of the Ranch is to promote agriculture and natural resources to schools and the general public as well as Cal Poly students. Increasing awareness of the public to Ranch operations is a major focus. Ranch programs also include training opportunities for agricultural and natural resource professionals. These include hosting meetings and seminars to giving tours.

7.2. Educational Involvement at Swanton

An internship program, in which students are paid for work while living at the Ranch for the term, has been offered to students since 1987. Student visits have also been made regularly to Swanton for field trips. Student clubs and faculty retreats and planning days have occurred at the Ranch since the early Cal Poly involvement. It was Al Smith's desire to have a permanent faculty member living at the ranch so that educational opportunities could be expanded, and he funded this position in 1991. In addition, he provided an endowment of $1 million in stock to be used for educational enhancement. At this time accommodations were developed for up to 14 students to live at the ranch and the internship program was initiated.

7.2.1. Intra-College Cooperative Participation

There has been some limited involvement from several other departments within the Cal Poly campus including the architecture, landscape architecture, art, English and biology departments. The College of Liberal Arts has participated on a regular basis in the distance learning instructional program, and it is anticipated that the ability to tele-conference will make it easier for other colleges to have access to the resources of Swanton Pacific. Efforts will be made to expand the use of Swanton Pacific by other majors and to increase the campus courses offered at Swanton Pacific Ranch (SPR) by implementing an incentive program for faculty to use the distance learning equipment. It is desirable to standardize these distance-learning courses so as to facilitate student participation while at the Ranch.

7.2.2. Outside Educational Involvement at Swanton

Both the University of California Berkeley (UCB) and the University of California Santa Cruz (UCSC) had used the ranch for educational purposes prior to purchase by Al Smith. UCSC built septic tanks on the hill to determine the leaching effect of chromium used in the tanning industry and found that chromium bound to the soil and did not leach. Talks are currently underway with UCSC on future educational and resource collaboration such as establishing a PhD program at the Ranch and participating in their apprentice program. UCB's College of Engineering ran summer school at Swanton where they would lay out roads and railroads and survey land. Other groups such as the Future Farmers of America (FFA), California Agricultural Teachers Association, Ag Ambassadors, Equity Leadership Program (ELP), and Mathematics, Engineering, Science Achievement (MESA) Programs have also made use of the facilities for retreats and field trips since Cal Poly has been operating Swanton Pacific Ranch. Current use of the property include the following groups:

<u>MESA Summer Science Camp on Agriculture and Natural Resources</u>

This five-day summer camp is a joint effort between Cal Poly, ELP and MESA Schools Program of University of California, Santa Cruz. The 24 – 30 campers are from the farmworking communities such as Watsonville, Castroville and Soledad, California. In order to attend the camp, the camper has to have participated in an ELP Natural Resource Management Day session at Swanton Pacific Ranch. The emphasis of the curriculum is to use the Ranch as a 'Learn by Doing' outdoor classroom. There is a commitment to continue hosting future MESA events.

<u>Multi-national Exchange for Sustainable Agriculture (MESA)</u>

Not related in any way to the above-mentioned MESA program, this is administered by the non-profit organization MESA in Oakland, California. MESA's mission is to promote sustainable farming practices and to support small farming communities throughout the world by offering one-of-a-kind exchange programs and specialty agriculture training for aspiring international farmers while at the same time proving affordable trainee help in U.S. organic farms. Host farms pay a monthly stipend for up to 48 hours work a week and provide board and lodging. Participants generally spend 8 – 10 months at Swanton Pacific

Ranch and have come from Europe, Asia and Latin America. This program is uncertain after the present year due to budget constraints.

7.3 Applied Research Activities

Ongoing applied research is an important component of agricultural activities at Swanton Pacific Ranch, both for the educational goals and to improve long-term land productivity and net income. Besides more than 100 senior projects that have been undertaken here, Swanton Pacific Ranch has been the location of research by both Cal Poly and external researchers.

7.3.1. Past Research

Past research includes a study on the efficacy of herbicide application methods used to control tanoak in an uneven-aged coast redwood context (Piirto, Smith and Robinson, 1996), implementation of uneven-aged forest management (Piirto, Thompson and Piper, 1996) and hydrological research on Scotts Creek (Dietterick, 1999).

Field research has included a field strip trial comparing drip and overhead irrigation on 4 acres of Brussels sprouts to determine growth rates and input costs. A further study tested the efficiency of fertilizer and insecticide applications through the drip irrigation systems and undertook an economic cost/benefit analysis. Field research has also been undertaken to determine the efficiency of crop dogs in deterring feral pig crop damage. Research external to Cal Poly includes a study by USFWS of the red-legged frog's migration patterns, the sexual habits of the rough-backed newt, the effects of cattle grazing on grassland and the impact of selective harvesting on redwood understory flora.

7.3.2. Current research

This includes the following activities:

<u>Livestock Research</u>

There is always some research being undertaken in association with the livestock program, depending on what is requested. Recent research includes a de-worming study and research in the coming year may either be on implants or mineral supplements.

Little Creek Monitoring Project (Principal investigator: Brian Dietterick)

Water Quality Monitoring

The Little Creek Monitoring Project is a long-term study designed to evaluate the water quality and geomorphic conditions of a coastal mountain stream located in the southernmost extent of the redwood/Douglas-fir forest region. The goal of this study is to provide valuable information documenting watershed conditions before, during, and after single-tree and small group selection harvest by evaluating the effectiveness of timber harvesting best management practices in preventing increases in stream suspended sediment export. Its purpose is to provide substantiated scientific documentation to aid in the debate over impacts from timber harvest on forested watersheds. This information may also assist in evaluating the effectiveness of the current forest practice rules in their ability to permit timber harvests in a manner that maintains healthy and productive watersheds.

The project utilizes the combination of paired watershed and upstream/downstream (nested) study designs to monitor water quality using measuring stations, specifically using the South Fork of Little Creek as a control (see Figure 5) and above and below harvesting areas on the North Fork. At the measuring stations in these locations stage, turbidity, temperature and event-based samples are collected for lab analysis of turbidity, suspended sediment concentration and electrical conductivity.

Geomorphic analysis

In addition to water quality data, there are data gathered for evaluating the short-term geomorphic change in Little Creek. There have been 60 permanent channel cross sections established in Little Creek that are surveyed each year. Additionally, a longitudinal profile survey is also performed. The Near-Stream Sediment Source Survey was developed by Brooke Akers to document actively eroding stream banks, landslides, and numerous other channel characteristics. The survey will be used to monitor sediment source locations and characteristics throughout the study.

Light-Detection and Ranging (LIDAR) measurement of channel characteristics

LIDAR is an airborne laser mapping technique in which rapidly-firing laser is mounted on a fixed-wing aircraft to measure the travel time of the pulses in order to generate a high-dimensional, three-dimensional Digital Elevation Model (DEM). The use of LIDAR allows

for large amounts of data to be collected quickly at a comparable cost to a ground survey but with far greater detail.

Ryan Hilburn is undertaking a Master's thesis on comparing ground survey data with LIDAR data of the Little Creek Watershed to determine whether LIDAR data can be used to measure change in channel features in a forested environment.

Queseria Restoration Project (Project Directors: Brian Dietterick and Wally Mark)

Alyson Aquino and Jason Pearson are undertaking their Master's theses on the Queseria restoration project. The project has realigned about 1600-feet of previously straightened channel and added instream structure to that reach and additional 500-feet of stream to enhance the hydrologic performance and the habitat conditions for salmonids.

Monterey Pine Management Project (Project Directors: Doug Piirto and Wally Mark)

The Investigators, Elicia Wise, Jason Pinkerton, and Dave Yun, have been working on a research project to determine the best way to regenerate native Monterey pine forests in the presence of pitch canker. The project involves 27 plots in the southern end of the Año Nuevo stand on Monterey pine on the ranch property. Of these plots, 9 were left untouched as controls and 18 were group cut to create 6 each of 1/8, ¼, and1/2 acre gaps. There were two slash treatments applied to the plots, lop and scatter and machine pile and burn. Each of the treatment plots was then planted with trees screened for resistance to pitch canker. The gaps were created in fall 2001 and planted in winter of 2002.

7.3.3. Potential Ranch Applied Research Projects

Research and cultivation of clonal Monterey Pine trees

A proposal has been received to plant and research clonal Monterey pine trees at Swanton Pacific Ranch by IMPACT, a research group. This will be evaluated in the coming year to determine whether it is compatible with existing Monterey pine stands.

Investigation of Agri-tourism potential for Swanton Pacific Ranch

A grant has been obtained by Teresa Love of the NRM Department to examine agri-tourism opportunities at the Ranch in the near future.

7.3.4. Current research external to Swanton

There are currently three different forestry research projects underway, which are being undertaken by Dr Walter Mark with assistance from Amy Jirka, a forestry graduate student. These studies are being funded through different grant programs and two of them

are collaborative efforts with other institutions. Although they do not involve Swanton Pacific Ranch property in the research, they are mentioned in this section because of the involvement of Cal Poly faculty and students and its potential application to the SPR forest.

Pitch Canker Resistance Screening Project

This project has been underway since 1999. Approximately 80 trees have been selected for screening and had a series of at least two inoculations done on them to determine the natural resistance or susceptibility level. The trees are located on 5 properties including Coastways Ranch by Año Nuevo State Reserve, Rancho Del Oso in Waddell Creek, Big Creek Ranch, part of the old Gianone Ranch, and Swanton Pacific Ranch. The project is now working on development of cloned rooting stock to be used to produce pitch canker resistant planting stock for Christmas trees and ornamental plantings. Work will start this year in conjunction with the Horticultural and Crop Science Department to grow resistant seedlings from apical meristems.

Foliar Survey for Sudden Oak Death (SOD)

This survey is a cooperative effort between Cal Poly State University and Sonoma State University with funding from the Applied Research Institute (ARI) and the U.S. Forest Service. Both risk and hazard models were generated at Sonoma State University for non-infested counties to determine how well these risk models can detect where SOD may be found.

Statewide Survey for SOD

This research involves an aerial survey to detect signs of SOD by U.S. Fish and Wildlife Service (USFS) and Cal Poly and funded by USFS. Field crews will take samples from sites identified by the survey to find vegetation symptomatic of SOD for lab review.

7.4. Existing Educational Program

Currently the two principal limitations of the existing educational program are the lack of knowledge on campus about SPR's resources and the acceptance by students of distance learning. Efforts are being made by ranch and campus staff to improve this awareness on campus as well as in the local community. Limited accommodations and courses also contribute to low attendance at Swanton currently by students. However, interns do participate at Swanton each quarter, particularly in the summer, and various classes

undertake field trips to the Ranch, especially forestry majors. A number of training courses have also been offered at Swanton, including CDF forest measurements and growth yield, the Watershed Academy program and Hunter Safety Training.

7.4.1. Internship/Apprenticeship Program

It is an objective of CAGR that the internship at Swanton Pacific be an integral part of the curriculum and that the student be offered the opportunity to take a full academic load for the quarter spent at Swanton Pacific. The establishment of the long-distance learning system offering courses in liberal arts has enabled students to enroll in additional units to those that are given for the internship itself.

The student internship program is offered each quarter. Students enrolling in classes take the half-time internship, for which they are expected to contribute 7 hours of work a week. Full time interns work a minimum of 40 hours a week. All interns perform 10 hours of community service during the internship period. Long-distance learning classes and Special Problems units are offered if desired. Senior projects may also be undertaken at the ranch.

7.4.2. Long-Distance Learning

This system transmits images through telephone lines so students can see and hear instructors who can interact with the students at the ranch as well as on campus. The Audio Visual Department at Cal Poly relays the classes to the Distance Learning Room in the Red House at Swanton Pacific. A number of courses have been offered including English, history, political science, geography and forestry classes. Efforts will be made to expand this service to other courses and faculty incentives are provided to offer distance learning courses to the Ranch. It is desirable that these courses be standardized so that students can be assured of having access to campus courses while living at the Ranch. The use of the T1 line at the Red House for all the Ranch residences, which will be completed during the coming year, will further improve internet connectivity and the ability to conference between the students and professors at Cal Poly.

7.5. Future Educational Program

It is the intent to expand educational opportunities at Swanton Pacific Ranch to complement those of the main campus and to make use of the varied natural resources of the

property. Specifically, the following programs are being considered or are in the process of development:

7.5.1. Educational facilities

It is hoped that eventually funding will be obtained for an Educational Facility at Al's House that will be used for the FNR field study term program as well as other environmental education programs. The facilities will also be available the remainder of the year for courses for field trips, research, seminars and conferences. Additional accommodations will be developed to house students for this program using other Ranch accommodations.

7.5.2. Honors Program

There is an Honors Program at Cal Poly and students from that program may undertake special studies at Swanton. Discussions will be had in the coming year to further explore this option.

7.5.3. Apprenticeship program for Cal Poly students

During the next couple of years efforts will be made to establish an apprenticeship program that will complement the intern program and enable students to further develop skills in specific areas of interest. Efforts will also be made to expand the intern program for students from various departments. Intern and apprentice educational opportunities with Jacob's Farm/Del Cabo, Inc., the lessee of the organic crop fields, are encouraged and will be developed further in the future.

7.5.4. Ph.D. Program in watershed management

Discussions are to be initiated with UCSC to sponsor a Ph.D. program at Cal Poly in watershed management in the near future.

7.5.5. Educational program for non-Cal Poly students

Educational opportunities for non-Cal Poly students will be explored during the next few years as this becomes practical and as resources and land uses permit. This may include workshops, apprenticeship programs and/or use of the facilities by non-campus personnel for educational purposes. Specifically, discussions have been initiated with UCSC's Agroecology program to see whether SPR could host several apprentices from that program to learn and work at the Ranch during their apprenticeship.

8. NATURAL RESOURCES

Summary of Recommended Actions

0 = ongoing, 1 = within 2 years 2 = 3 - 5 years 3 = desirable

* Develop and implement a Habitat Management Plan **(3)**
* Monitor natural habitat areas **(0)**
* Control exotic plant invasions **(0)**
* Establish agri-tourism program **(3)**
* Undertake Queseria riparian reforestation **(1)**
* Monitor Queseria riparian restoration and realignment **(1)**
* Conduct a study of the marsh and lagoon **(1)**
* Construct interpretive trails **(3)**
* Plant insectary hedgerow in Long Barn field **(3)**
* Establish perennial grasses in drainage channels **(3)**
* Develop habitat management endowment fund **(3)**
* Participate in the Scotts Creek Watershed Council **(0)**
* Remediate erosion in headcut gullies **(0)**
* Repair and maintain ponds as needed **(3)**
* Re-establish USGS gaging station **(3)**
* Develop native plants website for the Ranch **(1)**

Almost half of Swanton Pacific Ranch (1,355 acres) is covered with mixed forest, of which over 63% contains redwood as the dominant species (Todd, 1988). The majority of the remaining land is grassland with about 330 acres of brush. The major riparian corridor extends through the center of the property along Scotts Creek and widens to 120 feet at the estuary to the ocean. There are several riparian corridors along the tributaries of Scotts Creek, but, except for Little Creek, these are only a few feet wide due to steep slopes. There are 102 acres of cultivated land, primarily in vegetables, herbs apples, Christmas trees, and irrigated and non-irrigated oat hay. For purposes of natural resource management, the Ranch

is divided in four major habitat areas: grassland; wetland; riparian land; and forestland, with the latter divided into three separate forestry type areas (see Figure 6).

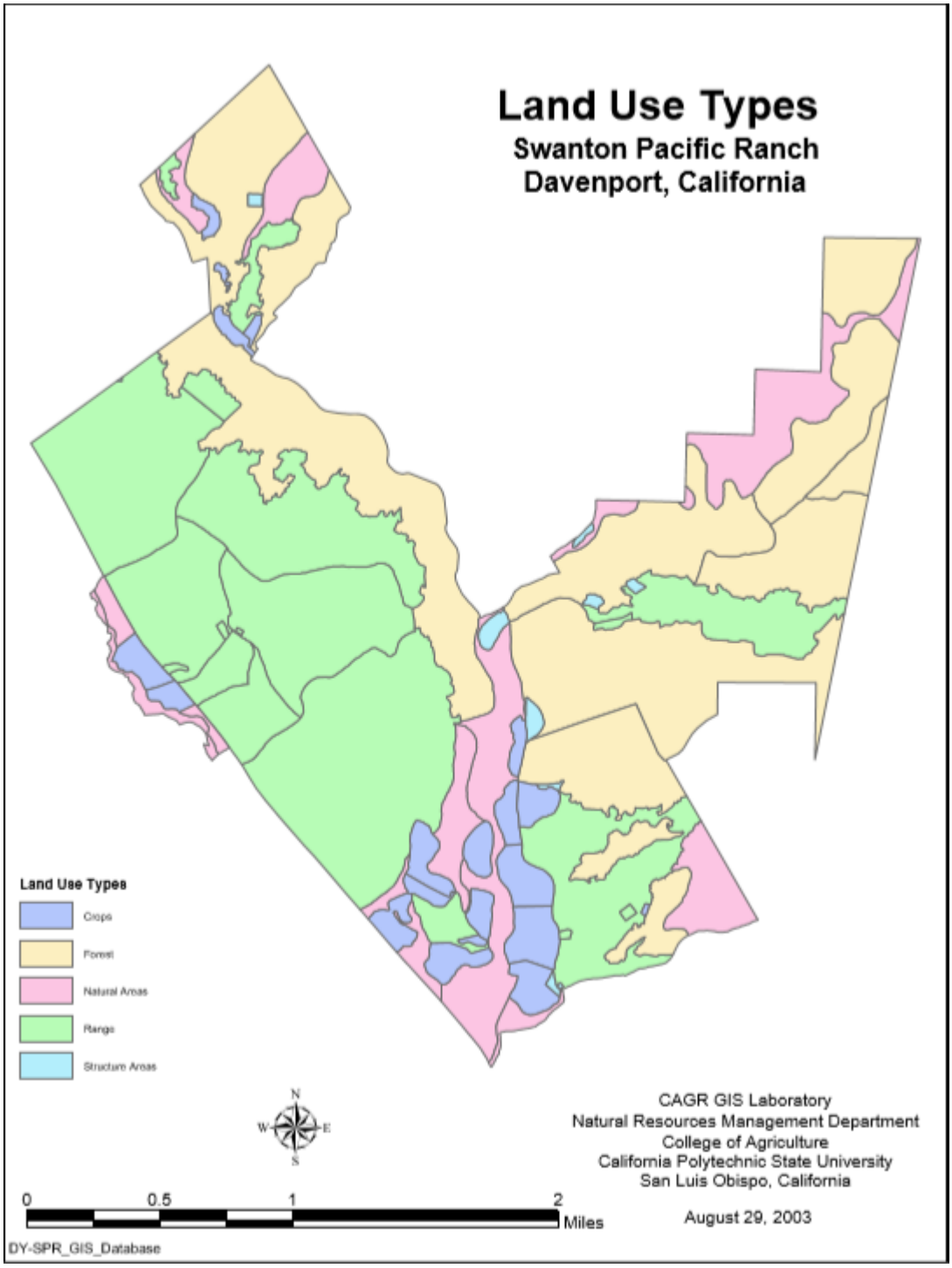


Figure 6 Swanton Pacific Ranch Land Use Map

8.1. Natural Habitat Areas

Swanton Pacific Ranch has exceptional natural habitat resources that vary from wetlands to coastal bluffs to forested slopes. Randy Morgan, a local botanist, estimates that there are probably more than half a dozen plant communities in the Scotts Creek Marsh area alone (for a list of native plant species please refer to the Technical Appendix located at the Ranch office). Many of these areas have been only minimally disturbed and contain numerous varieties of plant species, several of which are considered rare by the California Native Plant Society and a variety of manzanita found near the northwest property boundary which is to be Federally listed as endangered. The natural resources of the Ranch provide habitat for several endangered animal species (see Appendix C).

Natural habitat management is an integral activity at Swanton Pacific, both for educational purposes and incorporated with its forestry and agricultural activities. In part this derives from a desire to manage the land according to Al Smith's wishes and good stewardship practices, but increasingly legislative regulation has increased the need for management of these resources as more species become listed as endangered. It is also noteworthy that habitat management has a potential for income production through agri-tourism and mitigation banking. The management of these areas provides natural resource educational opportunities for interns and classes of Cal Poly, as well as for the public through the provision of interpretative trails and recreational opportunities.

Swanton Pacific Ranch is committed to ongoing habitat management and monitoring. The difficulty is that funding is not always available to undertake desirable management practices and it would be desirable to develop a habitat management fund from natural resource payments such as conservation easements or mitigation bank credits that would ensure the provision of ongoing habitat management costs. It would also be desirable to develop a Habitat Management Plan which would be necessary if an agri-tourism program is to be introduced at the Ranch.

8.1.1. Swanton Pacific Ranch Forestland

The vegetation mosaic on Swanton Pacific Ranch can very generally be described as vegetation communities occurring in bands along a transect starting from the coast and changing as elevation increases and moving east toward the top of Ben Lomond Mountain. The first vegetation type one would encounter is the Coastal Prairie grassland, which occurs on the west-facing slopes with coastal exposure.

Cresting the ridge of the coastal range that separates lower Scotts Creek from the Ocean, the vegetation changes to a Monterey pine plant community. Behind a buffer of Monterey pine, more Douglas-fir become interspersed and on the east side of the ridge, dropping into Scotts Creek, the Monterey pine phases out and the vegetation turns to a Douglas-fir/ hardwood forest. Redwood becomes more prevalent approaching Scotts Creek, especially in moist microsites. The steep hillside trending toward Scotts Creek also has a relatively high incidence of California nutmeg (*Torreya californica*). Also on Scotts Creek was the world record California nutmeg, recently deceased, with a circumference of 251 inches, 96 feet tall with a crown spread of 68 feet. Two other world record size trees are a large diameter California buckeye (*Aesculus californica*) located in the Swanton Train yard and a Shreve oak located on the slopes above the Swanton Train Bridge on Scotts Creek.

The Scotts Creek riparian corridor and the mainstem of the Little Creek riparian corridor have a high hardwood component. Deciduous hardwoods including alder and maple grow on the sand bars of deposited sediment. These stretches of creek are most prone to deposition since they are low-gradient compared to the upstream reaches.

Human activity has had a significant impact on the forests of the Ranch. Indicators of prolonged Native American occupation are widespread from the mouth of Scotts Creek until redwood timber closes in the river bottom of the river bottom north of the Ranch and each tributary. The primary Native American impact on vegetation was their frequent setting of fires to keep the valley open for good hunting and possibly to improve blackberry production. Frequent fires tended to favor grass and restrict spread of Douglas-fir and Monterey pine on more open slopes. Native American fire use dates are estimated as far back as 7000 years ago, so a fire adapted vegetation mosaic probably had time to become well established.

The main timber type encompassed by the forestland is a typical coast redwood and Douglas-fir forest type for the Southern Sub-district of the Coast Forest District in Santa

Cruz County. Characteristic of forests in the Santa Cruz Mountains, trees on the Ranch occur in locations which offer some measure of relief from the drought conditions of the Mediterranean climate. This relief is found on slopes which have a northerly aspect or receive some protection from ridges immediately to the south. Redwoods are generally near the watercourses, or where springs or seeps provide water well into the summer. Leaving the watercourses, the stand transitions to a heavy hardwood component with associated redwood and Douglas-fir. Continuing further up the ridges, this mixed forest transitions into a chaparral and knobcone pine community outside of the harvest area. Immediately east of Swanton Road, from Archibald Creek north, stands of Douglas-fir mixed with Monterey pine are provided protection by the high tableland of the Rancho Agua Puerca between Highway One and Scotts Creek.

The original growth redwood was essentially clear-cut sometime between 1906 and 1922, creating an even aged stand 80-100 years old, some of which has been selectively logged. The Douglas-fir in the Satellite Stands was later high graded in the 1950's for a nearby box factory. The redwoods are predominantly of sprout origin, growing in clumps around the old growth stump. While an individual stump may have supported as many as 20-30 sprouts within a few years after the clear-cut, competition has thinned their ranks so that now as few as one to as many as six or eight are still growing. Where Douglas-fir and redwood trees are growing together, mature Douglas-firs are often dominant. Although tree heights are extremely variable, dominant and co-dominant redwoods are usually between 125-150 feet tall, while dominant Douglas-fir are in the 145 to 180 foot range.

Tanoak is the primary understory tree and becomes the dominant tree species in a few areas, usually where soils are poorly developed or have low water holding capacity, compared to conifer areas. Larger tanoaks are usually between 80-100 feet tall. A stand of exceptional large tanoak is north of the North Fork of Little Creek. Madrone, bay, big leaf maple, buckeye, nutmeg, Shreve oak, coast and interior live oak also make up a component of the forest stands. Within the riparian zones along Little Creek, although conifers are the dominant species, red alder is frequent, especially on sand bars. The zone is as much as 120 feet wide near Swanton Road, narrowing to little more than the channel width of 15 feet on the upper portions of the forks.

Stand health is generally good for the redwood and Douglas-fir, however, pitch canker is present in the Monterey Pine and red ring rot is present in many of the older Douglas-fir, especially those with fire scars.

The Satellite Stands Unit is somewhat of a catch-all compartment. Species composition is quite variable, including patches of pure Douglas-fir, pure redwood, planted non-native Monterey pine, and riparian forest where conifer species are scattered through a mixture of red alder and bay. Site quality is generally lower Site III with limited Site IV. Much of the surrounding type can be characterized as invasionary stands of Douglas-fir which are expanding into areas formerly in grass or brush, since fires became infrequent.

The planted stands of non-native Monterey pine stock present in the Satellite Stands were planted between 1979 and 1984 with genetic clones of hybrids from New Zealand. Within the planted areas, some trees have grown exceptionally fast. Portions of the plantations have been inter-planted with redwood and Douglas-fir seedlings which are now 20-30 feet tall. Due to the threat of gene contamination to the native pine population, the non-native plantation trees shall be gradually to allow redwood and Douglas-fir to re-colonize the site.

8.1.2. Grassland

It is likely that the amount of grassland has decreased in the area with the suppression of natural and human-induced fires. The loss of native herd animals such as elk and antelope may also have encouraged the spread of seedling trees in grassland. Other grassland on the property has been disturbed or was used formerly for such crops as artichokes and now contains primarily annual grasses. The least disturbed portion of the Ranch in the northwest corner has a greater percentage of perennial grasses and the brush consists of native species such as coyote bush, lupine, blackberry and poison oak. While it is not desirable to have a large percentage of grassland in non-grass species, they are less invasive than exotic such as pampas grass, star thistle or Scotch broom and provide important nesting and feeding habitat for birds and prairie animals.

Habitat management considerations for this area are:

- promotion of a healthy mixture of native perennial grasses
- adequate grazing practices to manage thatch cover for the benefit of native

grassland plant species and avoid bare soil;

- suppression of brush invasion;
- protection of riparian areas from livestock damage
- stabilization of erosion of head gullies and
- removal of exotic species to the extent possible.

To achieve these objectives an extensive paddock rotation system is employed for cattle grazing on the western rangelands. The extent of grazing in each of these paddocks depends on the grazing pattern of the animals (sheep for instance crop more closely than cattle), amount of forage available, amount of brush cover, and other potential considerations such as animal health, water availability and weather conditions. Brush management is currently undertaken mechanically while the previous management system using goats has been discontinued due to labor intensiveness and animal predation. Herbicides are applied sporadically along the western grassland fencelines. The eastern grasslands use a different strategy of grazing for the cow/calf operation.

Exclusion of livestock from the riparian area and stock ponds is accomplished by two-strand fencing that does not impede the passage of wildlife. Five-strand barbed wire fencing of riparian areas for livestock exclusion was completed with the assistance of CDFG WHIP program grants. A variety of watering systems are being developed as alternative water sources to pond access which will reduce pond eutrophication and the likelihood of disease from either wild pigs (brucellosis) or parasitic worms from the livestock themselves. Periodic monitoring of the grassland helps determine future livestock grazing management practices.

Existing headcut gully erosion is being remediated through grading and planting with perennial grasses.

8.1.3. Cropland

While most of the cropland is actively managed for a diversity of crops, there are two coastal fields and three other fields that have been converted to grassland. These contain a predominance of wild mustard, oxalis, thistle and ripgut brome weedy species. All crops on the remaining fields have been produced without chemicals since 1996, except for the train field where Christmas trees are planted. The riparian corridor that bisects the cropland provides ample opportunity for wildlife to traverse and inhabit the territory. These include a

variety of rodents and small animals that nest and eat the crops and in turn are a food source for a number of predators including hawks, falcons, great blue herons and other birds of prey. The presence of riparian forest provides habitat for such predators that provide a natural pest management for the crops.

Management considerations include:

- Exclusion and management of undesirable wildlife
- Avoidance of soil erosion and
- Integrated pest management practices that will not adversely affect the natural habitat.

These are accomplished by: maintaining cover crops such as bell beans, fava beans and vetch during the non-active crop season; having a minimum buffer zone of 20' along the riparian areas; and use of crop protection dogs to deter deer and wild pigs from entering the fields in which they are employed. It would be desirable to plant an insectary hedgrow windbreak between the Green House and Scotts Creek so as to protect beneficial insects (and reduce wind damage) and to encourage plants that are hosts for beneficial insects (such as lacewings and ladybugs). The establishment of perennial grasses, sedges and rushes for the drainage ditches in the crop fields to provide additional corridors between other natural habitat areas and potentially use for seed harvest would also be desirable. Harvesting and disking of the oat hay is scheduled to not interfere with the setting of ground nesting birds.

In addition, the riparian zone most prone to flooding in the crop fields has been placed under conservation easement with the Wetlands Reserve Program (WRP) and the surrounding fields have been laser leveled to ensure proper drainage.

8.1.4. Aquatic areas

Swanton Pacific Ranch has a diverse range of aquatic areas that include instream habitat as well as the lagoon and numerous ponds and springs. These are important habitat areas and are managed and protected to the extent possible. Each of these is discussed briefly below:

<u>Lagoon and Marsh</u>

These are located at the estuary of Scotts Creek and contain such species as willow and cattails. There is an open channel in the central portion in which water is channeled to the bridge under Hwy 1 by levees located within the marsh. The bridge and its causeway

have a combined length of 1,120 ft with the opening being 120 feet between three central abutments (recent modifications by Cal Trans have partially closed one of the openings and the other is also partially blocked). A sandbar from tidal deposits is formed during the summer months creating a lagoon that begins approximately 1/3 mile east of Hwy 1 and can extend to the north for 400 to 500 feet when winter stream flows are sufficient (Nelson, 1994). This lagoon is important habitat for young salmonids and breaching of this sandbar by those using the beach can result in significant damage to salmonid habitat. Conversely, when flows are not sufficient to breach the sandbar in the wet season, it prevents access to Scotts Creek by the spawning runs, with the potential of heavy predation on the coho and early steelhead by the abundant pinnipeds and dolphins.

During the December 2002 winter storms the channel migrated from its typical northern route to its present southern location in the estuary, eventually undercutting recently installed asphalt parking along Highway 1 at Scotts Creek beach. The emergency boulder revetment changed the course of the channel to the longest and steepest part of the beach, providing a greater challenge to salmonids' entry into the lagoon as well as likely reducing impermeability and therefore the depth of the lagoon. However, it is also possible that this may not be so important now that the level of the sand bar has been raised, which has reduced the depth of the channel but also provides some protection from the lagoon being emptied. (Sean Hayes, personal communication, 2003). Raising this sandbar may also be causing additional siltation behind it and would be good to investigate in the coming years.

The depth of the lagoon is important for protecting the small fish in the salt marsh from predation by birds, and is usually no more than 3 - 4 feet between storm events, except in the pond area and a deeper channel of about 150 feet that are 6 - 8 feet deep. Reducing this depth could impact the survival of smolt that need off-channel refugia to avoid being swept out to sea during high flows. About two to three acres of the total four or five acres are blocked from access by a dike to the south of the main channel (SCWC, 2003). Currently, Cal Trans is studying how best to replace the bridge on Hwy 1 that will hopefully include improving the functioning of this lagoon. A Marsh Restoration Plan is currently being discussed with a well-know mitigation bank and Cal Trans and would be desirable as mitigation is needed for the bridge replacement. It would also be desirable to conduct a botanical study of plants in the marsh and the surrounding coastal bluffs.

Scotts Creek

This perennial stream is important for steelhead and coho salmon habitat and has the remnants of levees constructed by the Army Corps of Engineers fifty years ago. It has been the subject of numerous studies (see Nelson, 1993, Smith, 1998, Bulger, 1998, Dietterick, 1999) and improvement of its anadromous habitat is important to the Scotts Creek Watershed Council and relevant agencies as well as Cal Poly.

Breaches to the levees have occurred during high flow events with subsequent flooding and damage to the Ranch's crop fields. A longitudinal profile and cross-section survey of Scotts Creek was undertaken in 1998 and 1999 to demonstrate the degree to which changes to the channel are caused by high flow events on the first 3.43 miles of the Creek (Dietterick, 1999). The information from this survey has been entered into the Swanton Pacific Ranch GIS database. A stream inventory report of 8 miles of Scotts Creek undertaken by WSP/Americorps and the California Conservation Corps for the California Department of Fish and Game (1997) found 294 pools that comprised 39% of the total area. However, a 1998 survey (Bulger, 1998) determined a percentage of 58% for the length of his study area. It is unclear whether this difference is due to different survey methods or different channel conditions.

Steeper slopes occur on the western bank fields with valley floor on the eastern bank for 1/2-mile. The slopes contain a mixture of buckeye, elderberry, alder and some willows and redwoods. The riparian area contains a mixture of predominately willow and red alder, with some California bay, big leaf maple, box alder, and hazelnut interspersed. There is also an abundance of nettles, poison oak and native blackberry. Limited amounts of Himalayan blackberries also exist. German ivy, French broom and periwinkle are spreading rapidly along the riparian corridors and need to be controlled to the extent possible. Higher up Scotts Creek there is a greater proportion of redwood and Douglas-fir trees.

The stilling well of the USGS gage operational until 1973 can still be seen on Scotts Creek just north of the SPR Railroad (See hydrological monitoring section below).

The other tributary watersheds are smaller than Scotts Creek with steeper slopes. On the lower stretches of these riparian corridors the vegetation is primarily willow and poison oak. The Stream Inventory Report (WSP/Americorps, 1997) surveyed 1.23 miles of Little Creek and found that only 11.3% of the 53 pools encountered were primary pools and

recommended pool enhancement. There is some non-native eucalyptus that occurs in the riparian corridors, predominately Winter Creek now that they have been removed along Queseria Creek. In the upper portions of these riparian zones, redwood and Douglas-fir predominate with a mixture of hardwoods such as alder, depending on the presence of water and slopes.

Ponds

The other aquatic area on the Ranch is that of the grassland ponds that are home to the endangered red-legged frog. These have now been fenced except for one and removed from livestock access. Water is provided from these by livestock troughs. It is desirable to monitor these ponds for siltation and breaching and repair them as necessary.

Management issues for the aquatic areas are:

- maintenance of channels of adequate depth and unobstructed flow,
- removal and discouragement of exotic species,
- promotion and maintenance of a suitable riparian forest;
- management of water quality, flows and temperature for endangered aquatic species
- maintenance of ponds
- minimizing debris flows and
- adequate discharge capability for Scotts Creek.

Proposed remedies are the removal from the channel of woody matter that risks log jams capable of causing long-term channel instability and diminishing habitat conditions. Additionally, hand removal of exotic species and maintaining good forestry practices to discourage slides and slumping. Longer-term management practices for the promotion of suitable fish habitat are being discussed and implemented with the assistance of CDFG. Grading of portions of the fields adjacent to Scotts Creek should help to create a contained floodplain, and removal of portions of the levees and realignment of riparian stream profile will assist in addressing the aggradation problems and reduce the extent of flooding on agricultural land. Wetland Reserve Program (WRP) money is helping finance restoration work to accomplish this.

8.2. Habitat management practices

Management of each type of habitat will vary according to the activities being practiced and the current issues. There are some general habitat management practices however, that apply to all areas and are the preferred action where appropriate:

Fencing

Fencing has been necessary around crop fields to reduce damage from deer and pig infestations on the crops, and also to exclude livestock from riparian areas. Fencing is designed to restrict only the targeted animals while permitting passage of other wildlife. To the extent possible it is constructed to be visually unobtrusive and is removed when no longer functional. Most of the fencing is maintained by the lessee of the crop fields, Jacobs Farm/Del Cabo Inc.

Wildlife corridors

Areas that serve as wildlife corridors such as gullies and riparian areas will be maintained with vegetative cover. Suitable plants to attract bird and insect predators will be encouraged in these areas.

Pesticide Use

It is now the SPR practice not to use chemical pesticides or fertilizers that are not approved for organic use in the certified organic fields and to limit the use of chemicals to the extent possible elsewhere. This is preferable for the health of the natural habitat and also commands better market prices for crops. It does mean that some more labor-intensive practices such as hand weeding are required, and organic fertilizer needs must be imported or processed on site but this is considered to be an economic as well as an environmental benefit.

Brush Management

Brush is part of the natural succession to forest reversion, but is undesirable for range management and of limits plant diversity. Past control of brush was undertaken by goats, but mechanical brush removal is being undertaken currently. No chemical brush removal is being undertaken and brush is being left in areas unsuitable for grazing and where it assists in preventing soil erosion.

Exotic species

Non-native species, predominately along the riparian areas, roads and trails, will be eradicated by hand, chemical or mechanical extraction to the extent possible.

Riparian Management

The principal management activities are those of exotic plant removal, managing large woody debris concentrations in the stream channel where deficient. The Cal Poly Alder Survey (Kong, 2000 and Kong and Soderlund, 2002) identified hazard alder trees for felling. The Watershed Assessment (SCWC, 2003) assigned a priority one to felling those hazard trees that have the greatest potential to degrade salmonid habitat, infrastructure or land use where they fall. The logs would be strategically placed to improve habitat and streambank stabilization. Where sufficient canopy opening warrants, it recommended that new riparian species be planted. The Assessment also recommended the development of management zones to prevent exotic infestations from getting out of control and assigned a priority 2 to improve large woody debris concentrations to help improve fish habitat. Such LWD might be imported and could include redwood or Aqua Logs (made from reinforced concrete log replicas with wood attachment systems).

8.2.1. Habitat monitoring

Ongoing habitat monitoring will be undertaken to determine aquatic and plant health, presence of endangered species and wildlife counts of targeted species. Monitoring will especially be undertaken in the lower reaches of Queseria Creek where the realignment and revegetation work is being done and in Little Creek for pre- and post-harvesting monitoring.

Hydrological monitoring

It is important to maintain adequate streamflows and water quality conditions for the health of the aquatic ecosystem. Swanton Pacific Ranch is committed to doing what is possible in this regard. This includes: maintenance of buffer zones for riparian habitat; no chemical treatments on the fields; sustainable forestry practices that meet or exceed State/County requirements; proposed water conservation practices such as drip irrigation and use of gray water; removal of some fields from row crop cultivation; and riparian habitat management.

A water quality monitoring program has been established to record the water quality of Little Creek to document watershed conditions before, during, and after single-tree and

small group selection harvest. (See Hydrology and Education sections). An overall water monitoring program is desirable to be established in the future.

USGS Gaging Station

The USGS gaging was operational in Scotts Creek for over 60 years with online data available for 20 years from 1936 – 1941 (Gage # 11162000) at the Railroad bridge and from 1958 – 1973 (Gage # 11161900) opposite the McCrary field north of the Railroad. It collected data on high and low streamflow. The County has expressed an interest in using the station as one of the County's flood estimation gages. This could be done by reactivating the existing installed equipment and purchasing additional equipment for a moderate cost to enable measurement of all stages of flow and to transmit that information in real time through telemetry reporting. However, prior to activation, the SCWC watershed assessment (SCWC, 2003) recommends restoration of the adjacent reach of Scotts Creek between Little and Big Creek and adjacent to the Railroad bridge which is the USGS recommendation for re-establishment of the gage. The total amount for this restoration is estimated in the study at $150,000. It would also be necessary to obtain a commitment for the remainder of the $17,500 annual operating costs of the gaging station with Cal Poly (to date there is a commitment from the USGS to operate the station and for approximately half of the required operating costs). At this time, therefore, this is a desirable action that cannot be implemented until additional resources are provided. An alternative for low-flow monitoring using either doppler or ultrasonic sensors is being investigated that could use the existing stilling well with modifications and provide new data to compare with the historic USGS data.

8.3. Habitat Restoration

Some areas are primarily managed for natural habitat, and may require some restoration work to enhance the potential habitat. This has become particularly important with the federal listing of the coho salmon and steelhead, which require adequate quantities and quality of water, shade, pools, and gravel beds.

Scotts Creek is one of the few remaining streams with suitable habitat for coho salmon and is enrolled in the CDFG's coho salmon recovery program. Restoration includes: increasing the amount of streamflow, especially in the lower 1/2 mile; planting denuded banks; and ensuring that there are adequate pools and riffles by increasing the scouring

effect. While these requirements may demand extra financial and human effort to manage, the success of this program offers another educational opportunity for students and the potential of demonstrating how sustainable forestry and agricultural practices can be compatible with healthy fish habitat.

Another desirable restoration area is the Scotts Creek marsh that is currently channeled by levees. These levees are located in the center of the marsh to direct the flows through the bridge under Hwy 1 leading to the Pacific Ocean. This distorts the natural functioning of the marsh. Experts agree that the current bridge span is inadequate for Scotts Creek flow conditions and requires expansion. While this is a project requiring agreement from Cal Trans and funding, it appears that there would be support from several agencies for this improvement to be made. Restoration would entail removal of the levees in the marsh to restore hydrological functioning and the addition of sinuosity to the Creek so as to reproduce pre-bridge conditions and habitat.

The other riparian areas also have some restoration management requirements, some of which are included in the Ranch's forestry Timber Harvest Plans (THPs). The Queseria Creek Restoration Project is the largest restoration project underway at the Ranch currently and is described in detail below, divided into the two project areas, the Upper and Lower Reaches. These two reaches were previously a "shotgun" drainage ditch devoid of cover except for an extensive planting of exotic eucalyptus species. The project is designed to address the restoration of the natural hydrologic functioning of the lower half-mile of Queseria Creek and the establishment and expansion of a native riparian corridor so as to improve anadromous habitat in an important tributary stream of Scotts Creek. Funding for the project has been obtained through grants from California Department of Fish and Game, Natural Resource Conservation Service (NRCS), U.S. Fish and Wildlife Service (USFWS), Santa Cruz County Department of Public Works and American Rivers. Additional funding was acquired through a McIntire-Stennis grant to research comparisons between instream structures of natural and simulated large woody debris "aqua logs" made from concrete and to monitor channel, vegetation, and selected biological parameters.

8.3.1. Lower Queseria Restoration Project

The Lower Queseria Project area extends west-southwest from the ranch-access road culvert for approximately 1000 feet to the confluence with Scotts Creek about 300 feet above

the marsh and estuary. This project involves the creation of a more natural channel with sinuosity and a native riparian corridor to provide habitat, forage, and refugia. With adequate armament of critical bends, banks will be stable and sediment distribution and delivery will improve. It consists of the following activities:

Channel Realignment

The realignment of Queseria Creek into the floodplain involved the excavation of approximately 950 cubic yards of soil to produce 1,470 feet of channel within the floodplain. The excavated soil has been utilized to raise the outside meander bends by one to two feet to keep floodwaters in the channel.

Once the new channel is fully functioning, the abandoned channel will either be filled in and a uniform field recreated between the existing crop field and the floodplain terrace or used for red-legged frog mitigation habitat. The levee created on the existing channel near the confluence will be removed to allow floodwaters from Scotts Creek to flow past the Queseria Confluence. This will reduce the headcut migration of the gully further up the floodplain and subsequent sediment input into Scotts Creek. The graded surface has beeen ripped and plowed to remove any compacted soil.

Instream structures

The instream structures include rock and log cross vanes as well as log and rock J-hooks using both natural and concrete 'aqua' logs. These structures create scour pools and maintain a pool-riffle structure for fish habitat as well as serving as channel bed grade control to avoid degradation.

The riffle sections of the channel bottom have been lined with a few inches of gravel to prevent erosion while new bedload is recruited from further up in the watershed. The gravel was taken from similar bedload material deposited in the agriculture fields along Archibald Creek.

Revegetation

The 150-foot wide floodplain of the Lower Queseria project has been planted with native grasses and woody vegetation following construction. Approximately 60 redwood rootwads were buried in the floodplain during Fall 2002. Forty of these rootwads are buried along the transition terrace from the floodplain to the upper fields to protect this transition zone from extreme flood erosion. The other rootwads are interspersed in the floodplain and

along the outside meander bends of the stream channel. Once sprouted, these rootwads will provide riparian shade canopy, refugia for fish and wildlife species and will reduce erosion by breaking up flow velocities.

The newly-formed field terrace and transition zone to the adjacent fields have been seeded with native grasses so as to create a mosaic patterning that more correctly represents natural conditions. Irrigation will be undertaken by overhead sprinklers if necessary.

To prevent sediment delivery to Scotts Creek, the newly-excavated channel will not be connected to the existing channel at the top of the floodplain until the native grasses and vegetation are established.

Monitoring

Monitoring will occur on both reaches and consist of baseline data collection of historical and existing conditions. Colored flags will be used to mark plant locations until considerable growth has occurred. Presence of native plant species, presence of non-native plant species, percent survival, percent cover, and percent bare ground will be noted. Percent cover of seeded areas will be determined by visual estimations. The relative success of the instream and bank protective structures as well as the crossing infrastructures will be evaluated after each significant storm event.

A permanent longitudinal profile has been established and will be repeated after each of the first three rain seasons. Permanent channel cross sections have been established along the upper project area and additional cross-sections will be established in the newly constructed channel. Detailed measurements of pool characteristics will also be monitored by a combination of visual and photographic techniques during the rain season and using surveying techniques after each rain season. Comparisons will also be made between log, simulated log, and rock J-hook and cross-vane structures to evaluate hydrologic performance as indicated by these channel characteristics.

8.3.2. Upper Queseria Project

The Upper Queseria project begins 80 feet above Swanton Road and continues west-northwest for approximately 400 feet parallel and south of Swanton Road through the ranch road crossing. The channel in this reach was formerly narrow and deeply incised with a steep gradient acting like a “chute” conveying bedload sediment to lower Queseria Creek. The channel turned sharply upon exiting the culvert at Swanton Road and again at the ranch

road crossing located 300 feet downstream. The ranch road crossing has occasionally exceeded the capacity of the crossing, depositing sediment out onto the adjacent agricultural field. An additional field access crossing is located 100 feet upstream of Swanton Road and also posed fish migration problems.

This project is designed to improve hydrologic flow that currently inhibits anadromous migration and to remove exotic vegetation that affects water quality and habitat. It commenced during the summer of 2003 and will continue through the fall of 2004. It involved the following activities:

Culvert Replacement

The replacement of the existing Swanton Road 30-inch smooth concrete culvert with a larger capacity natural bottom arch culvert will reduce erosive potential, promote fish passage and improve hydrologic performance during high flows. The realignment of the crossing will further reduce outside bank shear stresses and erosion. Concrete footings provide a stable foundation for the culvert to be bolted. The existing culvert at the barn crossing will be replaced with a rail car bridge later this summer. The bridge will be supported by abutments constructed outside of the bankfull channel area prior to removing the existing culverts during the summer of 2004. A second culvert crossing 100 feet upstream of Swanton Road has been removed and replaced by a rock ford for cattle crossing.

Instream Features

A total of ten rock, log and aqua-log cross vane structures have been located in the Upper Queseria project to protect the crossings and prevent downcutting. These vanes are designed to be visually aesthetic while establishing grade control, enhancing fish habitat, reducing streambank erosion, maintaining width/depth ratio, and facilitating sediment transport. The construction of the rock and log cross vanes affected approximately 30 linear feet of channel with the removal of less than 100 cubic yards of soil, some of which was replaced after vane installation.

Eucalyptus removal

The eucalyptus trees that were present on the Upper Queseria project site were planted in the late 1890's probably to stabilize the stream bank. The allelopathic oils in the tree leaves and branches are toxic to fish and some vegetation. Most of the trees had root rot and with the high coastal winds that often blow through this area, the trees were susceptible to

windthrow. The trees that were growing over Swanton Road posed a liability threat to California Polytechnic State University Foundation from people using the road and threatened infrastructure including the Cheese House, other Swanton Pacific Ranch residences, and Pacific Bell Phone lines. The Cheese House was at the greatest risk, from limbs growing over the roof and roots damaging the foundation of this historical landmark building.

Each tree was removed in a manner that did not disturb bank stability. A total of 21 trees were removed adjacent to the channel, and five trees were removed from the east side of Swanton Road.

Revegetation

The vegetation enhancement and revegetation along the channel and floodplain uses locally obtained native species typical indigenous to riparian communities in the Scotts Creek watershed. Streamside vegetation consists of planting in a mosaic natural pattern. The vegetation plan developed for further recruitment of native plant species and control of invasive weed species has been developed and on file. Additional monitoring has been performed to evaluate the overall success of the Project. Numerous grants have helped to support this ongoing effort.

8.4. Watershed management

Swanton Pacific Ranch has been actively involved in the Scotts Creek Watershed Council since its inception, and continues to host Steering Committee meetings for the members who are local residents, landowners and relevant experts within the 30-square mile Scotts Creek watershed. The Scotts Creek Watershed Council is completing the development of a watershed assessment plan with partial funding from CDFG and has also conducted a Roads and Landslide Inventory Plan. It has undertaken several restoration projects already, with more to be undertaken in the future. Cooperation in the watershed management will assist Swanton Pacific in meeting its habitat management goals and to promote the health of the watershed in general.

8.5. Native plant species

A study undertaken by Catherine Coe in 1990 identified the rare and endangered plant species in existence on the property and their locations where this was known. These listings were taken from the California Natural Diversity Database (NDDB), and the listing produced by the Native Plant Society (NPS). Further botanical research by area resident and botanist, Jim West, has recently identified two new species of manzanita that are endemic to the Ranch or nearby, one of which is soon to be federally listed, and two species of clovers also endemic to the watershed (personal communication, Jim West, 2003). A listing of the rare and endangered plant species that do or might exist on the property are included in Appendix C. The native plant list for the Ranch can be obtained from the Technical Appendix file at the Ranch office. A senior project was being undertaken this year to develop a website of the native species found on the Ranch. Additional refinement of this database is being pursued.

Of the listed species, the majority of plants are in the northwest corner, the area northeast of the schoolhouse and on the northern boundary to the west of Swanton Road. Many species show limited occurrence based on Coe's maps, the largest distribution of any species is the Monterey pine (*Pinus radiata*). The northernmost stand of this species is located east of point Año Nuevo and it has a range of only about 130 miles south and usually within 7 miles of the ocean. While these trees are not currently listed as endangered, many have been infected by the pitch canker disease and the removal of infected trees has been undertaken recently.

The most diverse communities of native plant species exist within the grasslands and careful livestock management and rotation promotes their healthy regeneration. Unfortunately, exotic species such as periwinkle and pampas grass are often more invasive and adaptable than the native species and for this reason must be actively controlled and eradicated.

8.6. Exotic plant species

Several exotic species are found on the property, although their occurrence is limited to isolated spots at this time such as along the riparian corridors and around the Green House. The following species are found currently:

Pampas Grass	*Cortaderia selloana*
	Cortaderia jubata
Periwinkle (riparian)	*Vinca major*
Italian Thistle	*Carduus pycnocephlus*
Milk Thistle	*Silybum marianum*
Bull Thistle	*Cirsium vulgare*
Himalayan Blackberry	*Rubus procerus*
German Ivy	*Senecio milkanioides*
French Broom	*Monspessulana genista*
Poison Hemlock (grassland)	*Conium maculatum*
Eucalyptus	*Eucalyptus globulus*

These will be suppressed to the extent possible by hand pulling or spraying when necessary.

8.7. Wildlife

Swanton Pacific Ranch contains a variety of habitats for wildlife that include grassland, wetlands, forestland and cultivated land. Wildlife management is an integral component of the activities on the property, and this includes protection, enhancement and management where necessary. Of crucial importance to wildlife integrity is the existence of corridors or transects between habitat islands to permit migration. The riparian corridors serve as important links in this regard and are also a major source of species diversity. There is an abundance of wildlife on the property, which in general poses no problems to ranch operations. The exception to this is the feral pig and deer populations that have caused crop damage in the past and continued grassland disturbance. Coyotes, bobcats and more recently mountain lions are present which can pose a hazard for small domestic animal species.

8.7.1. Endangered animal species

There are several endangered animal species that are known to exist on or near the SPR property (see Appendix C). The snowy plover is a federally listed endangered species with protected nesting habitat on Scotts Creek beach, but does not nest further inland. The marbled murlet is also a Federally Listed species that is not known to be present on the Ranch, but has been observed in upper Scotts Creek. The Coho salmon and steelhead trout are federally listed and exist in the streams of the property, as does the tidewater goby. The

California red-legged frog is also a federally listed amphibian that lives in shallow water and moist-to-wet areas and is very prevalent in the many stock ponds on the Ranch. Other listed wildlife species may occur with the property boundaries although specific sightings for them have not been recorded.

Coho salmon and steelhead

Extensive coho and steelhead studies have been undertaken by both Jerry Smith of the Department of Biological Sciences at San Jose State University (Smith, 1996 and 2000) and Jennifer Nelson, fishery biologist of the Resources Agency of California Department of Fish and Game (CDFG, 1994). Ms Nelson identified Scotts Creek as one of two streams in Santa Cruz County with a remnant, self-sustaining coho population and a viable steelhead population. She categorizes the ideal habitat for coho salmon parr as consisting of large, deep pools with abundant instream cover, while steelhead parr tend to occupy riffles until moving to pools in the winter. While such rearing habitat is relatively good in Scotts Creek, Ms Nelson discovered that throughout all habitat types, fewer total fish were captured in 1993 than in 1992. She considered that a potential problem may be the high percentage (82%) of spawning areas that consisted of sand and silt. This material will fill pools to an unacceptable depth and/or smother eggs or dislodge them. She was unsure whether this was due to a lack of gravel or that gravel was being covered up. Ongoing efforts will be made to minimize the amount of sand and silt entering the creek through specific management actions such as exclusion fencing, riparian planting and road maintenance.

Ms Nelson recommended that several key erosion sites be armored along the banks, particularly where the west bank is steep at 1.8 miles from the estuary and on the east bank at the Big Creek confluence at 2.5 miles. She also recommended enhancing the existing pool habitat by the placement of complex woody debris to increase the scour effect. Other recommended management practices for the health of these areas include vegetative cover over the streams and maintaining high water quality.

Much of the recent attention has shifted to better understanding habitat quality in Scotts creek. Experts agree that many changes have occurred throughout the mainstem of Scotts over the past several decades, and new information is needed to evaluate current conditions, which are steadily improving by most accounts.

8.7.2. Wildlife population management

Due to the severity of crop losses due to pig and deer populations, fencing has been instituted on the Ranch. Observations since 2000 lead Ranch management to believe there has been a steady decline in pig populations. Some attribute the declining population to an increase in the mountain lion population. It should be noted that pig rooting has been known to cause erosion and damage elsewhere on the property. In the latter 90's there was interest in instituting a wildlife management program through the Department of Fish and Game's Private Land Management Program (PLMP) as part of an agri-tourism program. This may be revisited again sometime in the future should populations and damage again increase. 8.8. Natural Resource Impacts

There are constantly impacts to natural resources as part of the evolutionary process of nature. This includes the succession of habitats as natural conditions alter to favor the introduction of other species. While all species manipulate their natural environment to some extent, man has by far the largest impact on the natural environment that can be negative even when unintentional. Due to the need to live within this natural environment, humans have modified some of these natural processes and exacerbated others. Thus fire suppression during recent years to prevent structural damage has affected the ecology of many of the native Californian species such as Monterey pines that depend on fire for healthy regeneration. Landslides and slips, which occur naturally in young geologic formations and fragile soils, are often increased by human practices. Water runoff is increased by impermeable surfaces and lack of ground cover. The following are the recommended interventions for resource impacts on the Ranch.

8.8.1. Fire

Fire is a natural and useful component of wildland natural resource management in reducing brush load, permitting regeneration of fire adapted plants and restoring nutrients to the soil. It often conflicts with the needs of human activities and settlement areas. The 2009 Lockheed Fire created dramatic changes to the 1100 acres burned on the Ranch. It was primarily forest land that burned, and repeated forest inventories are being conducted to evaluate the full effect on timber resources on the Ranch. A fire management plan will be developed for the Ranch to understand if fuel treatment options should be considered. This will likely involve a forest advisory committee from Cal Poly, Big Creek Lumber Company,

and local agencies. To read more about the Lockheed Fire please see the 2011 NTMP amendment at the following link: http://spranch.calpoly.edu/documents

8.8.2. Erosion

A principal cause of erosion is the presence of bare soil, particularly on fragile and steep slopes. Sustainable forestry practices and selective harvesting help to minimize the effect in the forestland, while careful grassland monitoring and frequent livestock rotation ensure adequate soil cover. Cover crops are used on all crop fields during the winter months to protect the soil as well as providing nutrients. A major source of erosion on the Ranch is the roads. A roads inventory to determine the problem sites was conducted (SCWC, 2000) to identify and prioritize sites with potential erosion problems, as well as recommending necessary actions. Many of these sites have been treated. The treatments are often expensive, and many have been done in conjunction with timber harvests. There remains the strong desire to develop a road treatment plan for the rangeland roads, and possibly seek funding to help implement this plan.

8.8.3. Flooding

Flooding is a natural occurrence that is aggravated locally by the periodic El Niño influence such as occurred in 1998, as well as by trees that topple and clog the waterways and culverts. Specific sizing of culverts recommended in the Roads and Landslides Inventory (SCWC, 2000) can be accessed through the Swanton Pacific Ranch GIS database. The danger of flooding will be reduced by careful riparian management according to CDFG guidelines and striving for a sufficient depth of channel bed to permit unrestricted flows. CDFG representatives approve maintaining a defined floodplain beyond the channel to receive peak flows so as to minimize damage to crop fields such as is being undertaken for Scotts and Queseria Creeks. Such a floodplain area should help prevent Scotts Creek from jumping its banks and cutting another creek bed as occurred during the 1998 storm. No significant flow events have occurred from 2000-2010.

8.8.4. Pests/diseases

Many animals and plants can become pests if numbers become so prolific that they interfere with the functioning of the ecosystem in which they live and ultimately that will impact their own survival. Such a situation occurs currently with the wild pig population and to an increasing extent with the deer, although the growing numbers of mountain lions may

help manage these. Several of the exotic plant species also threaten to become pests if not vigorously eradicated.

Both crop and forestland are susceptible to diseases, but there is no major problem on Swanton Pacific Ranch currently that cannot be managed. A healthy environment is the best prevention for diseases. It is anticipated that the practice of organic methods and the encouragement of insectary plants will also reduce the likelihood of pests and diseases within the agricultural activities.

8.9. Future Plans

The rich diversity of natural habitat areas provides recreational and educational opportunities within the Ranch property and can also provide a source of income if compatibly managed with other ranch activities. Two such opportunities are those of agri-tourism and interpretative trails. Another long-term goal is to improve the functioning of the Scotts Creek Lagoon. These are discussed in further detail below:

8.9.1. Agri-tourism

This program would be designed to offer a wide variety of activities to the public to help inform them of agricultural and forestry operations as well as to experience the many and varied resources of the Ranch. Activities would be supervised by a Ranch employee or intern and may include hiking, biking, wildlife and bird viewing, forestry, range and crop tours, wildlife management, whale watching or photography expeditions. Special tours, such as early settler historical tours and native plant walks could be available upon request.

8.9.2. Scotts Creek Lagoon enhancement

Cal Trans has placed the replacement of the Highway 1 bridge over Scotts Creek in a 10-year planning window. There is an opportunity currently to explore the improvement of the hydrological functioning of the lagoon as part of the replacement of the Highway 1 bridge. Cal Trans is receptive to suggestions as part of its scoping process and other agencies and groups such as the Scotts Creek Watershed Council are supportive of improving the anadromous habitat in the Lagoon. Preliminary scoping studies have been undertaken by private consultants hired by Cal Trans. There is opportunity to explore additional restoration immediately upstream from the estuary along a reach of stream that has been bounded by

levees since the intial construction of the Scotts creek bridge in 1938. The levees are in disrepair and at risk during flood events to channel avualsion out onto the adjacent agricultural fields. One proposal is to create set back levees that protect agriculture from smaller flood events, yet allow the stream more room to adjust in planform creating more complex habitat conditions and better hydrologic function. 8.9.3. Interpretative Trails

The Scotts Creek Marsh area with its frontage on Hwy 1 and its diverse plant communities provides an exceptional opportunity for the development of an interpretive trail around the marsh. A raised walkway could be constructed that would not interfere with the future potential of the marsh as a mitigation bank or with its natural functioning. This trail could provide additional educational and recreational opportunities both for the agri-tourism program and for guided public tours offered by students of the Cal Poly Recreation Administration program.

It would also be desirable to expand the forest interpretative trail that was initiated along Little Creek by a Cal Poly student (Tallitsch-Edson, 1992) so as to create a loop through the forest. A grassland interpretative trail could also be established in the Northwest Pasture where there are many rare grassland plants and from the Scotts Creek marsh to the coastal bluffs.

9. FORESTLAND

Summary of Forestland Actions

0 = ongoing 1 = within 2 years 2 = 3 - 5 years 3 = desirable

- Update Non-industrial Timber Management Plans as necessary (0)
- Maintain Forest Stewardship Council certification (0)
- Generate revenue through forest management activities (0)
- Continue to support the educational mission of the College of Agriculture, Food and Environmental Science with a focus on forestry education through the Natural Resources and Environmental Sciences Department (0)
- Monitor and manage the condition of all forest roads (0)
- Monitor and maintain Continuous Forest Inventory plots (CFI) and create a useable database (0)
- Maintain Licensed Timber Operator certification and heavy equipment (0)
- Maintain one to two Holistic Management Apprentice positions in forestry (0)
- Utilize Woodmizer sawmill to mill wood for the Swanton Pacific Education Center and Field Camp (SPECFC) (1)
- Develop a long-term strategy for Lockheed Fire recovery (1)
- Evaluate revenue generation through specialty milling operations (2)
- Decommission flumes on Little Creek (2)

Forestland Management Objectives:

1. **Maintain health and integrity of forest resource, inclusive of all native flora and fauna, and preserve its function in the watershed**
2. **Continue to manage the property as a demonstration, educational, and research forest facility for the University**
3. **Maintain forest certification with the Forest Stewardship Council**
4. **Continue stand transition from even-aged composition to uneven-aged composition**

5. **Maintain species composition with emphasis on increasing conifer stocking levels. Enhance natural regeneration levels through planting, as deemed necessary.**
6. **Maintain economic viability of management activities through periodic selective harvests.**
7. **Maintain condition of tractor trails, roads, and landings so as to minimize the necessity of new construction.**
8. **Maintain access throughout the property to better facilitate interim management activities and educational activities.**
9. **Minimize effects of surface erosion on roads, landings and tractor trails.**
10. **Enhance and maintain visual aesthetics of the forest.**
11. **Illustrate a high standard in the logging and closeout associated with harvest entries.**
12. **Preserve and promote the ethic of land stewardship in all management activities and decisions.**

9.1. Forestry Philosophy

Cal Poly Swanton Pacific Ranch is committed to providing its students with a quality forestry education that provides experience of the entire forest management process. The forests at Swanton Pacific offer a full range of forest management activities. From conserving, protecting, and researching commercial second growth redwood forests to producing Forest Stewardship Council (FSC) certified lumber products.

The forest resources of Swanton Pacific Ranch are sufficient to enable a selective forest harvest rotation every 3-4 years that will help provide each student the opportunity to experience multiple aspects of forest stewardship in their student careers. The forestry program has a commitment to ensure not only the quality of its educational program for its students, but also the health of the forests and accompanying beneficial uses. To accomplish this, the Ranch is committed to using the best management practices available for minimizing adverse environmental impacts during harvest and providing a diverse resource base for wildlife habitat while ensuring the future health of the forests.

9.2. Forestry Education

Forestry education at Cal Poly and Swanton Pacific are closely aligned to provide significant 'Learn by Doing' opportunities that help students shape their careers. The Natural Resource and Environmental Sciences (NRES) majors participate in many field trips per year in forest management, measurements, growth and yield, silviculture, soil science, and watershed management. Students also participate in internships where they gain meaningful experience in maintaining a Non-Industrial Timber Management Plan (NTMP), preparing Timber Harvest Plans (THPs), estimating harvest yields, maintaining forest inventory, engaging in sawmill operations and preparing materials for Forest Stewardship Council Certification (FSC).

Sustainable Forestry and Environmental Practices is an Industry, Agency, University (IAU)-based course held each summer. Approximately 40 different resource professionals from around the state gather to teach students all aspects of writing and reviewing a THP. The NRES department has been accredited by the Society of American Foresters (SAF), partly due to having access to Cal Poly Swanton Pacific Ranch. Recent approval for the Swanton Pacific Education Center and Field Camp (SPECFC) will provide much needed housing to support existing uses and the development of new educational opportunities.

9.3. Forestland Management

A Non-industrial Timber Management Plan and Forest Stewardship Council (FSC) certification guide the stewardship of the Cal Poly Swanton Pacific Ranch forest. The management plan, referred to as the Swanton Pacific Ranch Non-industrial Timber Management Plan (SPR-NTMP), is a document approved in perpetuity by the State of California in 2008.

Maintaining working lands that provide local resources to local markets, these documents conserve and protect the beneficial uses of the State (soil, water, flora and fauna) under what has been regarded as the strictest Forest Practice Rules in the world. The approximate 500 pages of the NTMP focuses on maintaining a functional ecosystem throughout each harvest entry and responsibly producing resources. Please see Section I of the SPR-NTMP for the Table of Contents on Page iii, found under the link below, to view all the management topics covered. These documents (including the 2011 NTMP Amendment

that discusses the 2009 Lockheed Fire in detail and the 2019 NTMP Amendment that discusses a proposed road reconstruction), FSC certification audit reports, and other supporting forest management plan documents (current and historic), can be viewed under Forest Management Documents

9.3.1. Swanton Pacific Ranch NTMP (SPR-NTMP) – 701 acres

This unit includes the manageable timberland on the Ranch that drains to the North Fork Little Creek. A selection harvest occurred in most of this area in 1993, 1994, 2008 and a salvage harvest in 2010 following the Lockheed Fire of 2009. Several different yarding systems are utilized in the Little Creek watershed to be consistent with the varied terrain and timber. Helicopter and skyline yarding configurations are proposed for steeper areas while ground skidding the balance of the unit. Springs, seeps and unstable areas occur in helicopter, cable, and tractor operating areas. Above a historic railroad grade, redwood is scattered among low-quality Douglas-fir. The combination of low timber value, low timber density and difficult terrain makes these mid slope areas a difficult portion of the unit to manage.

North Fork unit – 191 acres

This unit includes the manageable timberland on the Ranch that drains to the North Fork Little Creek. A selection harvest occurred in most of this area in 1993, 1994, 2008 and a salvage harvest in 2010 following the Lockheed Fire of 2009. Several different yarding systems are utilized in the Little Creek watershed to be consistent with the varied terrain and timber. Helicopter and skyline yarding configurations are proposed for steeper areas while ground skidding the balance of the unit. Springs, seeps and unstable areas occur in helicopter, cable, and tractor operating areas. Above a historic railroad grade, redwood is scattered among low-quality Douglas-fir. The combination of low timber value, low timber density and difficult terrain makes these mid slope areas a difficult portion of the unit to manage.

Tranquility Flats – North Fork sub-unit

The Tranquility Flats sub-unit is approximately 11 acres in the North Fork Unit that has been managed to develop larger diameter trees managed accordingly in the Sustained Yield Analysis of the SPR-NTMP. This Sub-unit is in the best growing site on the Ranch and estimated to have 48,000 BF (board feet (one board foot = 12” x 12” x 1”) per acre of

redwood and Douglas-fir with approximately 1000 BF of growth per acre per year (1000BF = a tree that is approximately 34" in diameter and 140 feet tall). The general cutting prescription will continue to transition more trees into the upper size classes predominantly maintaining the mean diameter of the stand.

South Fork Little Creek unit – 84 acres

The South Fork unit includes manageable timberland that drains to the South Fork of Little Creek. A selection harvest in conjunction with infrastructure development occurred here in 1989 and 1990 with an additional helicopter harvest in 2011. Access to the South Fork Unit is from Swanton Road via the road up Archibald Creek, and across Winter Creek. Yarding in the South Fork unit is a combination of skyline cable yarding on the south ridge access road including tractor yarding from designated skid trails. Logs must be skidded on the road to the landing in some portions of this unit.

The Satellite Units – 426 acres

The timberlands outside the Little Creek drainage are dominated by Douglas-fir and hardwood with non-native Monterey pine stock in several plantations and small pockets of redwood in more protected and moister sites. These areas were evaluated for their management potential under the SPR-NTMP based on current stocking levels, stand condition, and access. Parts of this unit were harvested in 2004 and salvaged following the Lockheed Fire in 2010.

The 2004 harvest focused on removing some defect and improving spacing in areas affected by heavy cutting done in the late 1940's to early 1960's. The 2009 Lockheed Fire burned many portions of the satellite units severely.

The 2010 salvage harvest focused on removing trees previously damaged in 1948. The purpose was to maintain economic viability for our managed stands in the future by reducing compounded defect from both fires in our stands managed for timber production.

Future harvests under the NTMP will build on the timber stand improvement by using selection silviculture, group selection harvests, timber stand improvement, and planting operations to continue establishing reasonably healthy stands with good stocking.

The area previously planted with Monterey pine stock from New Zealand will be managed to phase-out the non-native stock. Some of this area is already interplanted with redwood and Douglas-fir seedlings and indicate that continued planting of these species will

likely result in a stocked stand over time. As new opportunities for spot planting occur, more conifer seedlings may be planted. Release of established saplings from non-native pine or hardwood competition will also continue.

9.3.2. Botanical Conservation Areas

Botanical conservation areas are mapped and discussed in the SPR-NTMP and identify specific habitats, species, or even single trees that are viewed as important components to the integrity of the local forest ecosystem on Swanton Pacific (except for the General Smith Stand, see High Conservation Value forest). Mapped characteristics range from a Shreve oak stand to a second growth redwood tree protected by our benefactor Al Smith. Each of these locations are locally significant with special management considerations given in the SPR-NTMP. In most cases, varying levels of management are allowed, but the goal focuses on the locally significant component different from HCV.

For instance, while it has no listing status, the Shreve oak stand is managed as a locally significant component. Interestingly, the stand of Shreve oak resulted from human activity in the 1950's to 1960's from the clearcut harvest of Douglas-fir for split box products. To maintain the integrity of the Shreve oak stand, Douglas-fir will be removed so that it does not shade out the Shreve oak. More information on the locations of botanical conservation areas can be found on the Botanical Conservation Map in the SPR-NTMP.

Table 1 Summary of gross volumes and net returns for forestland

SPR Location	Year	Gross Volume in Board Feet		Net Return
		Redwood	Douglas-fir	
Little Creek - South Fork	1990	216,000	391,000	$100,000
Little Creek - North Fork	1994	616,000	327,000	$308,000
Little Creek - North Fork	1995	579,000	274,000	$216,000
Valencia Creek Unit 1	2001	1,915,000	91,000	$889,000
Valencia Creek Unit 2	2002	2,000,000	100,000	$950,000
Lower Little Creek	2004	588,000	82,000	$249,000
Little Creek - North Fork	2008	847,000	22,000	$150,000
Little Creek - Lockheed Salvage	2010	838,000	20	$253,000
Little Creek - South Fork	2011	632,000	12,000	$164,000
Valencia Creek Unit 1	2013	2,473,650	50,000	$850,077
Valencia Creek Unit 2	2014	1,479,630	100,000	$557,949
GRAND TOTALS		**12,184,280**	**1,449,020**	**$4,687,026**

* Approximately $750,000 was invested into SPR forest roads that is not reflected in net return

** SPR total timber harvest yields are equivalent to approximately 100 semi trucks per year for 25 years

*** Income is sporadic but, is approximately $187,000 per year for the last 25 years

9.4. Forest Stewardship Council (FSC) Certification (FSC-C022461)

Cal Poly Swanton Pacific Ranch was the first school forest in the western United States to obtain Forest Stewardship Council (FSC) certification in May 2004. FSC is likely the most stringent third-party independent forest certification opportunity in the world and requires significant inputs to maintain. The FSC requires yearly audits with full re-evaluations against their 10 Principles and Criteria every five years. SPR is committed to FSC certification and its principles guide our forest management in concert with our Non-industrial Timber Management Plan (NTMP).

FSC Principles and Criteria

FSC Audit Reports

9.4.1 High Conservation Value Forest (HCV)

As required by FSC certification, Swanton Pacific Ranch defined areas of High Conservation Value. Not to be confused with Botanical Conservation Areas from the SPR-NTMP, HCV is a higher standard and is defined by FSC as possessing one or more of the following High Conservation Values (HCVs):

1. HCV forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia), including RTE species and their habitats;
2. HCV forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;
3. HCV forest areas that are in or contain rare, threatened or endangered ecosystems;
4. HCV forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control);
5. HCV forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health); or,
6. HCV forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

2005 HCV Summary

9.4.2 High Conservation Value Forest (HCV) – Monitoring and Assessment

Swanton Pacific Ranch (SPR) is geographically surrounded by urbanization and is well known to have significant resource attributes. This can be evidenced by the amount of High Conservation Value forest areas identified in the 2005 HCV Summary covering substantial portions of SPR acreage.

Periodically, Swanton Pacific Ranch monitors to confirm that HCV resource protections are maintained. Visual assessments occur at least once a year to confirm that values attributed as HCV are still intact. In addition, many forested locations on Swanton Pacific Ranch utilize a Continuous Forest Inventory system (CFI) to monitor forest conditions. The CFI system can be used to quantify changes in HCV if visual inspections suggest forest conditions of HCV have changed.

High Conservation Value forest areas are assessed periodically to determine changes in the status of HCV. The 2005 HCV Summary still acts as the anchor for HCV compliance with the Forest Stewardship Council (FSC) covering significant portions of SPR.

1. In 2008, SPR re-assessed forestland proposed for long-term management under the Swanton Pacific Ranch Non-industrial Timber Management Plan (SPR-NTMP). This utilized multiple consultants evaluating conservation/protection measures resulting in no additions to HCV. Instead, Botanical Conservation Areas were created to identify specific habitats, species, or even single trees that were viewed as important components to the integrity of the local forest ecosystem on Swanton Pacific.
2. In 2009, the General Smith Stand (an HCV) was burned by the Lockheed Fire. The CFI system was used to assess and quantify the severity of the damage to the General Smith Stand found under the 2011 NTMP Amendment.
3. In 2012, additional property assessment resulted in the creation of the Legacy Tree Report for SPR protecting 18 trees on Swanton Pacific Ranch forever. Although Legacy Trees are not identified as HCV and are protected under a different Principle from FSC, it demonstrates that the property is continually assessed and evaluated for considerations given to HCV.
4. In 2014, the Legacy Tree report was updated following an assessment finding one of the Legacy Trees had fallen over and died (the World Record *Torreya Californica*).

9.5. Forest Monitoring

Forest monitoring is performed to evaluate Ranch protection, conservation, restoration, and management actions. A list of major Research Projects undertaken at Swanton Pacific is provided below. For further information, please see additional research publications related to Swanton Pacific Ranch on Cal Poly Digital Commons

All of the following items can be viewed at Swanton Pacific Ranch Forestry Monitoring:

1. Little Creek Water Quality Monitoring and Channel Change
2. Precipitation

3. Geomorphic Monitoring and Light Detection and Ranging Survey
4. Continuous Forest Inventory (C.F.I.) - A Long Term Monitoring Project
5. Pitch Canker Research and Monitoring
6. Mill Creek Restoration & Monitoring
7. Queseria Creek Restoration & Monitoring
8. Using dual frequency identification sonar (DIDSON) to monitor adult steelhead abundance in Scott Creek

9.6. Legacy Trees

The Swanton Pacific Ranch Legacy Tree report was created to identify, document, and protect legacy trees as defined by the Swanton Pacific Ranch's (SPR) old growth and legacy tree policy. No old growth or legacy trees live or dead will be harvested on lands of Swanton Pacific Ranch. Old growth and legacy characteristic redwood trees can be described as being approximately 60 inches at DBH and were present in the dominant overstory during the late successional stages of forest development of the first-growth stands (pre 1800's). These trees have outward indicators, such as platy bark with deep fissures, basal hollows with fire scars of multiple ages, large complex branching structures, flat tops, and limbs at least 8-10 inches in diameter that provide an opportunity for platforms/nesting.

Legacy Tree Report

9.7. Licensed Timber Operator and Sawmilling Operations

Following the approval of the Swanton Non-industrial Timber Management Plan of 2008, Swanton Pacific Ranch (SPR) became a Licensed Timber Operator (LTO) for its ownership in 2010. Swanton Pacific purchased a Woodmizer LT50 sawmill, and a CAT 515 log skidder to assist in forest re-habilitation following the Lockheed Fire.

The result was to construct a 60' x 30' x 20' barn with FSC certified wood from SPR forestland to house equipment. In addition, Big Creek Lumber Company generously donated a 15,000 lb. Hyster forklift and our benefactor, Al Smith, left us with his John Deere 450 bulldozer (recently over hauled by Cal Poly Farm Operations). This culminated the creation of the Woods Unit and SPR has been milling, on a smaller scale, its own FSC certified lumber.

The first priority for the sawmilling operations is to complete the wood siding, specialty beams, and table slabs for the Swanton Pacific Education Center and Field Camp.

Once complete, a business and education plan will be developed to evaluate the feasibility of starting a specialty milling enterprise.

9.8. Future Plans

Lockheed Fire rehabilitation and accompanying harvest planning are a high priority for Swanton Pacific Ranch (SPR) forestland. Maintaining productive forestlands in the burn area and planning for areas zoned out of timber production in commercial agriculture in the coastal zone will be areas of concentrated effort.

An organized and useable Continuous Forest Inventory (CFI) database will continue to be maintained. A significant amount of opportunity for research publications currently exists with data we have to date. Facilitating adjacent landownerships installing variations of the SPR CFI. University of California Santa Cruz (UCSC) has installed 138 plots.

The specialty milling operation continues to be a revenue-generating possibility for SPR. Incentives justifying a thorough evaluation of proposed production capabilities include the following: Forest Stewardship Council (FSC) certified forest, two Non-industrial Timber Management Plans (NTMP), a Licensed Timber Operators (LTO) certification, logging equipment, including a portable sawmill. Initial projections suggest that the cost of milling vs. purchasing full dimension “bat and board” siding (that’s real 1” x 12” boards) for the Swanton Pacific Education Center will be cut in half, a significant savings.

9.8.1. Forest Management Advisory Group

The formation of an advisory group for SPR forestlands made up of resource professionals was assembled in 2016. The group is one of four groups making up the greater Swanton Pacific Advisory Council that include Forest Management, Livestock and Rangeland Management, Crop Management, and an Education and Research advisory group. The makeup of this group is comprised of educators and researchers (primarily but not necessarily exclusively from the Natural Resources Management Department, as well as representatives from the industry).

It should be re-emphasized that the forestland of Swanton Pacific serves as the school forest for the NRES Department, an important criteria in maintaining Society of American Foresters (SAF) accreditation. The primary responsibility of the advisory group is to stay apprised of near and long-range plans pertaining to management, research, and

demonstration activities, and also forest-related educational opportunities. There is open communication for the group to provide advice directly and frequently to the SPR Director and Natural Resource Manager. A subgroup will review proposed research plans and comment to the SPR management team and the greater advisory group.

10. CROPLAND

Summary of Actions

0 = ongoing, 1 = within 2 years 2 = 3 - 5 years 3 = desirable

***** Input database information for crops **(0)**

***** Develop Xmas tree marketing **(2)**

***** Expand and maintain Xmas trees **(1)**

***** Establish apple marketing outlets **(1)**

***** Maintain organic certification **(0)**

***** Investigate alternative crops and marketing strategies **(0)**

***** Investigate weeding alternatives **(3)**

* Evaluate and upgrade irrigation system **(1)**

***** Coordinate agricultural activities with College Farm **(0)**

***** Evaluate crop program **(1)**

Agricultural activities at Swanton Pacific Ranch consist of crop operations and leased fields. Approximately 100 acres qualify as crop fields although 58 of those are under lease for organic vegetable and flower production. The remainder is either used for tree and vegetable production or has been converted to pasture or natural resource use. These crop fields are mapped on GIS layers and are available on the SPR database. Details on the crops for each field need to be maintained either by Jacobs farm or Swanton Pacific Ranch in order to maintain organic certification and certification renewed annually. All crop fields have now been fenced to protect from losses from feral pigs and deer.

10.1. Cropland Philosophy

The agricultural cropland philosophy of Swanton Pacific Ranch is to provide a diversity of crops and marketing opportunities for student ‘learn by doing’ involvement with the long-term goal of break-even or better on returns. Diversity of products and farming organically are seen as both sound business practice locally and reflective of contemporary sustainable development thinking and will be pursued to the extent possible. Innovative marketing and integration of agriculture with natural resource management will ensure that

Cal Poly University, as represented by Swanton Pacific Ranch, will remain in the forefront of future agricultural practices. All agricultural activities will be designed to complement those of the College Farm.

10.2. Crop Fields

There are eight cropfields currently in use. There are two unused fields on the north and south ocean bluffs and five fields that have been removed from crop production on the north bank of Scotts Creek and converted to grassland. A portion of the Longbarn field that floods periodically has been removed from active agricultural practices.

10.3. Crops

Previously the major crops at Swanton Pacific were artichokes and Brussels sprouts, lettuce and oat hay. These are no longer commercially produced except for Ranch staff consumption and some local sales, since although they are locally suited, they did not provide a diversity of educational experience and suffered extensive feral pig damage. Furthermore, considerable quantities of chemical fertilizers and pesticides were required, which is no longer consistent with the agricultural practices at Swanton Pacific. There are three fields that are still used for oat hay production every other year. Five fields have been leased to Jacob's Farm/Del Cabo Inc. (see lease agreement in the Operations Section). A diversity of organic market garden products has been grown on the 7-acre Long Barn field to offer a variety of educational experience for students and can be marketed directly to the public through U-pick and direct sales programs. This program is currently being re-evaluated.

Because costs consistently exceeded returns on former crops, and to explore the potential of less labor-intensive crops, an apple orchard with a number of varieties of apple trees (see orchard list in Appendix D) has been planted in the School House field. Christmas trees for U-pick are being planted in the Train Flat field and the first planting will be ready to be harvested in approximately two years. Pumpkins continue to be grown for the contract with the Roaring Camp Railroad and the U-pick pumpkin patch in the Long Barn field continues to be popular with school tours and may be offered as an enterprise project if there is sufficient interest on campus.

10.4. Cropland Management

The leasing of several fields for organic farming and the retirement of several previously-used crop fields has reduced the amount of management required on the crop fields. Management on the remaining acreage varies from low (non-irrigated oat hay) to intensive on the vegetable plots. However, all crop activities can now be undertaken with available ranch labor and provide for a diversity of agricultural experience. The description below provides a basic overview of the cropland management activities throughout the year.

10.4.1. Soil Preparation/Seeding

The most intensive soil preparation is required for the annual crops. Oat hay is planted during the winter months every other year and ground preparation for the other annual crops begins in April. Cover crops are planted in the fall.

10.4.2. Fertilizing

Organic amendments are now being used throughout the crop fields. Currently this is purchased from outside sources, but there is potential for processing compost from residual crop material, manure and sawdust available from the neighboring Big Creek Lumber Mill.

10.4.3. Cover Crops

Crop fields are planted with a winter cover crop (primarily Bell beans but also vetch, peas, barley, oats and annual ryegrass) to provide soil cover, increase soil organic content and to add nitrogen to the soil. These crops need to be planted in October or November, and are turned under prior to planting in the spring.

10.4.4. Weed management

Weed management of the crops is labor intensive and of limited educational value. Currently weeding is done by hand or with a flame-thrower. It would be desirable to investigate other weeding alternatives such as the use of plastic mulch, cover crops or weed management.

10.4.5. Irrigation

Despite the cool summers along the coast, some irrigation is necessary for all crops except some of the oat hay. Irrigation is overhead sprinklers manually moved weekly in the market garden acreage and once or twice in the season for oat hay between April and October. Drip irrigation has been installed in the apple orchard and Christmas tree plantation and will be used elsewhere where practical. An evaluation of the entire irrigation system of

underground pipes will be undertaken within the next two years and upgraded as necessary. It is desirable to plant drainage channels with perennial grasses to reduce erosion.

10.4.6. Pest Management

No non-organic pesticides are used (Safer Soap is used for combating a variety of pests but is detergent based). Alternative pest management strategies will be developed over time and an insectary hedgerow is desirable in the Long Barn field to harbor beneficial insects and birds. All crop fields have now been fenced to protect crops from wild pigs and deer. Three dogs are kept in the Long Barn field and two in the apple orchard as additional protection.

A commitment to use organic amendments and integrated pest management practices should eventually improve the health of the soil and crops and lower input costs, as well as complementing the habitat management practices of the Ranch.

10.4.7. Harvesting

The economic returns from crops will always be dependent to some extent on the weather and market demands as well as educational needs. Previously harvesting was an intensive mechanized process, using outside labor for up to a 3-week period. This focus has now changed with more labor-intensive activities on a smaller acreage being handled by resident and student labor. Pumpkins are harvested in October. Hay is harvested in alternate years in July or August by a neighbor (weather permitting). Some vegetables are grown for Ranch use and harvested through the summer.

10.4.8. Marketing

The major commercial crops currently are market garden produce, oat hay and pumpkins. All crops except for oat hay are sold directly to the public or by U-pick activities. Oat hay is sold to stocker and cow/calf operations internally and externally to neighbors for horse feed. Markets for the apple harvest will be developed this year, and for the Christmas trees in the next two years.

10.5. Community Supported Agriculture (CSA)

Swanton Pacific Ranch began involvement in CSA in 1997 and continued the program with a paid coordinator the following two years. CSA is a program that was designed initially to sell shares in the season's crop including losses and risks. It has been

used by Swanton Pacific Ranch, as well as most other participants in the U.S., to promote direct sales to the public. Actual returns will depend on the crops planted, number of shareholders and the growing conditions. Generally produce is provided weekly for a 22 - 24 week period during the summer and fall. The CSA organization provides networking and public information but is not directly involved with management of the Ranch's CSA program. SPR received certification through the California Certified Organic Farms (CCOF) on its CSA acreage in 1998 to strengthen the program.

Currently there is not a CSA program at the Ranch as it failed to attract sufficient shareholders. It was also limited in the range of products offered since most the Ranch crops are limited to cool weather varieties. Research in the past year identified potential collaboration with warm-weather crop producers, add-on products such as coffee, apples and flowers to expand the basket and a delivery outlet in Santa Cruz, but was abandoned due to lack of Ranch resources and a suitable CSA manager.

10.6. Organic Farming

The entire cropland except the Christmas tree field is certified organic and certification requirements will be maintained. Certification requires continued practice of cover crops, pest management activities and organic amendments but is seen as cost-effective and more environmentally beneficial in the long-term.

10.6.1. Leased Lands

Five fields of approximately 58 acres, (Las Trancas, CDF, Folger, Diversion and Upper Ford fields) are currently leased to Jacob's Farm/Del Cabo Inc. Crops are predominately perennial culinary herbs. The lease agreement requires the lessee to pay for all ongoing organic farming inputs and irrigation costs with two wells dedicated for their use.

10.6.2. Organic Certification

Swanton Pacific has met the organic certification requirements of the CCOF to improve the marketability of its produce to the public and to reflect the overall management directions of the Ranch. In order to qualify for certification, fields must have been in organic production for a minimum of three years and no non-potable water used for any processed food that is sold to the public. Certification also requires maintenance of detailed input and crop harvest records as well as implementation of a Crop Plan (see Operations section for

more details). SPR will maintain records of crops and soil amendments on the Long Barn field and Jacobs Farm/Del Cabo Inc. will keep records on the leased fields. Soil tests will determine whether trace chemicals remain in the fields and after certification. Periodic checks may be made to verify that organic practices are still maintained. Annual renewal of certification is by payment of a check.

10.7. Future Plans

While educational opportunities will continue to be a major focus of the Swanton Pacific Ranch, it is also hoped that the farm operations can break-even within the next few years. In order to accomplish this, cropping alternatives and various market strategies will be applied to determine what yields the best results.

A choose-and-cut Christmas tree operation that can be accessed by train rides to the field is being established. Market opportunities for the apple harvest will be further developed. Potentially, the Cheese House could serve as a roadside stand for Ranch products which would require a conditional use permit and additional off-road parking.

The potential of participating in the UCSC's apprentice program would provide income for accommodation costs and also work performed by the apprentices as part of their learning program without pay and will be explored further in the coming year.

11. GRASSLAND

Summary of Recommended Actions

0 = ongoing **1 = within 2 years** **2 = 3 - 5 years** **3 = desirable**

* Maintain database information **(0)**
* Develop range monitoring system **(1)**
* Reduce brush encroachment **(0)**
* Finish paddock fencing **(1)**
* Maintain paddock fencing **(0)**
* Maintain cow/calf program **(0)**
* Maintain stocker program **(0)**
* Review beef enterprise operation **(1)**
* Eradicate exotic plants from grassland **(0)**
* Improve existing water supply **(1)**
* Construct horse facilities **(1)**

The grassland (see Figure 7) at Swanton Pacific provides feed for the stocker cattle, the cows and their calves and the horses for up to 10 months of the year, with hay occasionally provided during the months of November to January for the cow/calf herd. The goals for the improvement of the grassland are to encourage the growth of perennial rather than annual grasses and to limit the spread of brush and invasive plants through mechanical brush removal and intensive grazing rotation practices. The lack of water supplies presently limits the degree to which rotation can be practiced with the cattle but improvements to the water system are currently being completed.

11.1. Grassland Management Philosophy

An important component of the Swanton Pacific Ranch grassland philosophy is based on Holistic Management (HM) that has been developed by Allan Savory and the Center for HM. The basis of this method is the application of the appropriate tools to manage for a particular set of goals that includes quality of life. It helps prevent the desertification to

Figure 7 Swanton Pacific Ranch grassland paddocks

which the rangeland of the Western United States is prone (Savory, 1981). It is designed specifically to promote better use and less over-grazing of grassland but can be used for any resource management situation. The important consideration is that the essential processes are kept in balance to ensure long-term productivity.

11.2. Paddock Descriptions

The fields are divided into paddocks that permit short rotation of animals to practice the HM method of livestock grazing. There are three major groups of these fields. These are the cow/calf fields to the east of Swanton Road, Queseria (holding field), and the paddocks on the west of Scotts Creek. All paddocks are to eventually have their own water supply. The size of the paddocks varies between one and 130 acres with 17 paddocks currently and a future total of 21. Paddocks and livestock ponds are named and GIS mapped.

11.3. Grassland Management

The important considerations in the management of the grassland are the suppression of unwanted brush and the maintenance of a healthy diversity of forbs and grasses with the eventual replacement of annual grasses with perennials. The former is achieved through the regular rotation of livestock every few days (approximately three days on average) so as to ensure thorough but not excessive grazing which permits rapid re-growth and use of all of the paddock. Regular monitoring of the grassland determines the number of animals and the length of their stay in any one paddock.

11.3.1. Paddock rotation

It is the intent of the Ranch to have sufficient paddocks to rotate the stocker cattle and other livestock on paddocks every 60 days, depending on grass growth. The paddocks are regularly monitored to determine the length of stay and the number of animals using the paddock. All paddocks are fenced, some with permanent electric fencing which is solar-powered. Animals are moved with the Polaris Ranger, a whistle and two or three people and takes about two hours. Improving the perimeter fencing of the rangeland is currently being undertaken.

11.3.2. Monitoring

Monitoring of grassland is an important educational and grassland management tool with students participating in this activity and learning to identify forbs and grasses. The grassland monitoring method is to be revised in the near future.

11.3.3. Invasive Species Management

The principal invasive species at this time in the grassland is brush, generally berry bush, poison oak and coyote bush. This is mechanically suppressed with the brush hog. Thistles, poison hemlock and rip-gut have also become established in some areas and need to be controlled. Pastures need to be monitored for pampas grass, cape ivy and periwinkle invasions. There is periodic use of Roundup along fence lines and for control of invasive species on the western grassland.

11.4. Livestock

The two major livestock activities are the stocker cattle and cow/calf operation. There are currently 31 SPR cows and there is an informal agreement with the Webbs for the grazing of 15 cows on the Squirrel Flats and Pozzi fields. The stocker cattle use only the land to the west of Swanton Road.

11.4.1. Stocker Cattle

Currently there are approximately 500 head of cattle grazing under a weight gain contract with the cattle maintained under external ownership. These are pasture-fed at Swanton Pacific Ranch from January - July and are moved to feedlot having gained an average of 250 lbs. The pasture is rested through the remainder of the summer and fall with limited use by the cow/calf herd.

Stock pens are located along Swanton Road and Hwy 1 for use during receiving and shipping operations. Additional corrals, gates, ramps and squeeze have been built recently to handle and process livestock safely and humanely. Animal Science students participate in raising the stockers as an Enterprise Project.

11.4.2. Cow and Calf Operation

This is a limited livestock operation with 31 cows, but it is educational for interns and enterprise students as well as requiring minimal operational inputs. Cows calve in the spring and the calves are raised for 7 to 9 months and then weaned and sold at two years old in a

beef enterprise for additional Ranch income and for Ranch use. Some of the heifer calves are retained for breeding replacement in 18 months. All of the steer calves are raised for eventual use in the grass- and grain-fed beef market. The success of this will be evaluated in the near future through a senior project that is being undertaken by an ag-business student. The operation uses land that would not be suitable for stocker cattle and the grazing reduces fire danger. The cows are moved to the western grassland during the summer after the stockers have been moved. Hay is sometimes provided during the winter months. A budget has been established for the cow/calf operation and the profitability of the project will be evaluated by the end of the year.

11.4.3. Horses

Two to three horses are kept on pasture at Swanton Pacific, and are used at times to assist in the Ranch operations. In addition, students and staff may pasture their own horses at the Ranch while they are living there. Residents at the ranch may ride the horses with approval of the Livestock Manager and provided they wear helmets and demonstrate an ability to ride. Additional horse facilities are planned for construction this year which will include four stables and three pastures.

11.4.4. Poultry

A chicken house and fenced pen currently houses a few hens and a rooster. More will be obtained when this is possible. The eggs are used by the Ranch employees and interns.

11.5. Livestock Management

Livestock management includes the overall health and handling of the livestock as well as the raising and marketing of the animals. For SPR, the rotation of animals is a primary activity in which paddocks must be constantly monitored to determine grazing conditions and the animals moved every few days. Other management is undertaken as needed.

11.5.1. Livestock health

There are currently no livestock health problems and only routine health maintenance is being undertaken. This involves de-worming cows twice and stockers once a year, vaccinating the cows and calves and implanting stockers. No hormones or antibiotics are used on the cows and calves so that the meat can be sold as natural beef.

11.5.2. Feed Supplementation

Feed supplementation is given to the stockers. Hay is given them when they are first delivered so as to train them to a whistle. Horses receive hay in the winter if needed. Mineral blocks are provided to cows and free choice minerals to stockers.

11.5.3. Watering practices

The cattle are watered with ponds, springs and stock tanks. Horses are watered from springs. Fencing around the ponds now prevents livestock from entering them and the water is extracted into nearby troughs for their use.

11.5.4. Marketing

Except for the stocker cattle that are shipped to feedlots, all marketing is done by Ranch staff and students. Processing of the meat is done by the Cal Poly slaughterhouse and sold in San Luis Obispo or brought by refrigerated truck for sale locally as natural grass- or grain-fed beef. No hormones or animal byproducts are used in the meat and the grass-fed beef contains no antibiotics. Sometimes live animals will be sold or retained by the projects themselves for future breeding purposes.

11.6. GIS Grassland Information

Information for each of the fields is available in Excel and linked to GIS so that information can be viewed for any selected field. Ponds and fence lines are also delineated. Additional information will be entered as conditions change and time permits to do this.

11.7. Future Plans

It is the intent of operations at Swanton Pacific Ranch to increase livestock carrying capacity where appropriate by developing additional water supplies, reducing brush encroachment and increasing the number of paddocks.

12. RAILROAD

Summary of Recommended Actions

0 = ongoing, 1 = within 2 years 2 = 3 - 5 years 3 = desirable

* Maintain rail track **(0)**
* Construct or restore rolling stock **(0)**
* Acquire permit to expand railroad track **(3)**
* Expand railroad museum **(1)**
* Teach members railbed maintenance **(0)**
* Complete Foundation and Railroad MOU **(3)**
* Update master plan for restoration and maintenance of engines and rolling stock **(0)**
* Develop a master plan for display of railroad memorabilia **(3)**
* Construct a maintenance-away facility **(2)**
* Maintain calendar of events **(0)**
* Continue training and certification program **(0)**
* Expand railroad station **(2)**
* Design and construct a control tower **(2)**
* Expand railroad two miles north **(3)**
* Construct Scotts Creek bridge north of Red House **(3)**
* Finish Cal Barn **(2)**
* Design and construct a pump house **(2)**
* Remodel interior of roundhouse and use west end for a visitor center **(1)**
* Seek additional funds for special projects **(0)**
* Complete MOU between the university, foundation and SPRR **(2)**

Al Smith bought four of the trains and some of the equipment built for the Pan-American International Exposition of 1915 in San Francisco to celebrate the opening of the Panama Canal and trade with the orient. Three of these steam engines have been converted from coal- to oil-powered and the fourth was donated to the Railroad museum in Old Town

Sacramento. He also purchased a 1/3 scale diesel steam engine. With the help of friends, Al Smith built approximately one mile of track, a roundhouse and a functioning turntable. He maintained the railroad until transferring it to the Swanton Pacific Railroad Society in 1992. The Society purchased a fifth engine built for the Exposition, the 1500 switch engine, which they will be restoring.

The Swanton Pacific Railroad Society serves as a catalyst to bring together railroad friends that Al Smith developed over the years and introduce new members, friends, and students to the operation and maintenance of a railroad, and the conservation of a remarkable piece of history. This railroad is one of the few examples left of a specially built 'people mover' of the early 1900's. Al Smith was very proud of his railroad and said many times, "This is the best home that the Overfair Railway ever had." In concert with the Cal Poly "hands-on" philosophy, the Ranch and railroad serve as a learn-by-doing facility.

The railroad is supported, maintained and operated by volunteer members of the Society throughout the United States, the majority of which reside more than fifty miles from the railway. These volunteers attend scheduled workdays on the second Saturday of each month during winter, and the second and fourth Saturdays of each month during late spring, summer, and fall. Some volunteers find it appropriate, especially those who live more than a hundred miles from the railway, to extend a workday into a work-weekend.

The California Polytechnic State University Foundation maintains ownership to the land, equipment and improvements made on or part of the Swanton Pacific Railroad. The College of Agriculture will manage the Swanton Pacific Railroad as an integral part of its educational program and on behalf of the University as outlined in the Memorandum of Understanding (MOU) with Cal Poly Foundation. It is desirable to complete a MOU between the CAGR, Foundation and SPRR in the near future. The Swanton Pacific Railroad Society serves as an auxiliary, volunteer group to the college in support of Swanton Pacific Railroad.

The railroad was donated to Cal Poly contingent on it being available for public use. Currently railroad events are held on Al Smith’s Day in April, Cal Poly Day in October, Land Conservancy Day in September, various special Cal Poly events and requests from other railroad groups.

12.1. Railroad Philosophy

Swanton Pacific Railroad Society exists for the broadening and improving of one's educational experience while at California Polytechnic State University. The Swanton Pacific Railroad Society serves as a living operational memorial to Albert B. Smith who donated his ranch and railroad to Cal Poly. It brings together Al Smith's life long interest in the railroad and in the students of Cal Poly.

12.2. Railroad Equipment

The railroad equipment consists principally of the rolling stock, both powered and non-powered, and more than a mile of main track with its sidings and turntable. In addition there are several structures, machine equipment and vehicles associated with maintaining the railroad for its members and the public (see station map Appendix E).

12.2.1. Railroad Rolling Stock and Assist

The rolling stock consists of three steam Pacific 4-6-2 locomotives, a switch engine, a diesel engine, a motorcar and a crane car. The non-powered stock comprises four open passenger cars, three covered passenger cars, three flat cars, two boxcars, two hopper cars and a dining car.

In addition to the rolling stock, the railroad has the following structures:

- The Roundhouse is an approximately 2,000 square foot wood frame building with five bays for the garaging and servicing of locomotives. There are 12’ by 35’ wings at either end of the building
- A turntable to move the locomotives
- The machine shop which is a 30 by 50 foot wood frame metal clad building built prior to 1928, with three sets of rails in the floor of the machine shop to store the work on motive equipment.
- The Car barn which is an 80 by 20 foot metal building on the northwest side of the railroad maintenance yard with an approximately 30 by 80 foot car shed attached to the northwest wall.
- A train station for loading and unloading passengers.
- There are also enough parts to build an estimated 20 cars.

12.2.2. Railroad Track

The 1.2 miles of track with a gauge of 19" includes 14 turnouts (switches) and a turntable. The track leaves from the Swanton Pacific station and crosses Scotts Creek. It follows the Creek until reaching the Train Field that it skirts and ends at a junction at the other side of the field. The Train Field has been planted with Christmas trees to be harvested by a special Christmas tree train run. The train journey takes 20 minutes to complete the round trip. The track is maintained by the Swanton Pacific Railroad Society and is in good condition. It is planned to expand the length of track for two miles if permit approval is obtained to construct a bridge across Scotts Creek.

12.3. Financial Operation

It is not intended for the railroad to become a profit center catering to the public, but rather a component of the educational experience and as a living operational memorial to Al Smith. In order to properly maintain and operate the railroad, an initial endowment of $1.2 million has been provided from Al Smith's estate that will pay out 5% annually to fund the operation and maintenance expenses. In addition, an initial principal gift of $100,000 was provided to pay for new construction or restoration of the rolling stock and for adding approximately two miles of track.

12.4. Swanton Pacific Railroad Society

This organization is consistent with the requirements of the National Railway Historical Society and its affiliate organizations. Membership is either voluntary or honorary. Full membership is open to all registered Cal Poly Students, alumni and Cal Poly friends. Honorary membership is reserved for those who have made contributions in excess of 1,000 hours or $10,000 towards the preservation of the Swanton Pacific railroad. Such membership must be approved by 2/3 of members and shall not exceed 10% of the total membership. There were 130 paid members as of June 2002. Members volunteer to help operate and maintain the grounds, buildings and rolling stock consistent with the MOU and operational guidelines. Meetings of the Society are held the second weekend of each month and also the fourth weekend during the summer at Swanton Ranch.

12.4.1. Swanton Pacific Railroad Society's Standing Committees

These committees are responsible for the operation and maintenance of all equipment and facilities as outlined in the Railroad Engineer's Handbook.

The History Committee will obtain and maintain a historical account of the Swanton Pacific Railroad. The committee will develop a master plan for the necessary facilities to maintain and display memorabilia of the Swanton Pacific Railroad.

The Social and Publicity Committees will maintain a calendar of activities for the railroad events.

The Engine and Rolling Stock Committee will establish a master plan for restoration and maintenance of the engines and rolling stock. It will also develop a preventative maintenance program to ensure that trains are available when needed.

The Safety Operation Committee will establish a master plan for a training and certification program to qualify operators of the steam and diesel engines, all powered equipment and rolling stock. The committee will also develop and maintain an operator's manual that includes safety and routine maintenance necessary prior to any operation of all powered equipment.

The Track Committee will maintain and expand the track, roadbed, tools and equipment in good working order. It will coordinate the maintenance and construction activities with other committees.

Facilities and Grounds Committee will establish a master plan for the railroad and establish material lists necessary for any new construction in coordination with other committees.

12.4.2. Training and Certification Program

Since 1995, a training program under the supervision of a professional licensing railroad engineer in railroad and train management has been undertaken. A master plan has been developed to continue this program.

12.5. Future Plans

An immediate project will be to resolve all of the Santa Cruz County code violations. After the code violations are resolved, a number of improvements are planned including the expansion of a museum dedicated to Al Smith and the railroad memorabilia, which is housed in a caboose in the picnic area. Exhibits are still being collected and catalogued and the display expanded. Plans have been drawn up for construction of a railway station waiting room and restrooms. Other improvements include: designing and constructing a control

tower, a maintenance-away facility to store the equipment used to maintain the track, and a pump house; remodeling the interior of the roundhouse to include a Visitor's Center; and finishing the Cal Barn. Additional funding is being sought for special projects. The biggest undertaking will be the establishment of another two miles of track that will necessitate acquiring an easement and obtaining permission to construct a bridge across Scotts Creek. No approval has been received for this as yet. A Memorandum of Understanding with the Foundation will be completed within the next five years.

13. INFRASTRUCTURE

Summary of Recommended Actions

0 = ongoing, 1 = within 2 years 2 = 3 - 5 years 3 = desirable

* Construct new educational facilities **(3)**
* Map utility and water lines, wells and septic tanks **(1)**
* Remodel and repair bunkhouse **(1)**
* Re-roof sheds at Las Trancas **(3)**
* Maintenance of structures in use **(0)**
* Evaluate need to relocate Ranch offices **(1)**
* Repair roof at Al Smith's House **(1)**
* Replace mobile home **(1)**
* Re-roof and expand Archibald Red House **(3)**
* Replace roof shingles of Cheese House **(1)**
* Remodel Red House **(1)**
* Upgrade Red House cabin **(1)**
* Re-roof and upgrade Schoolhouse **(1)**
* Re-roof Cheese House **(2)**
* Determine use of Red House **(3)**
* Demolish Las Trancas structures not in use **(1)**
* Evaluate needed structural repairs annually **(0)**
* Construct bridge at lower Scotts Creek crossing **(3)**
* Maintain ranch roads with grading, water bars or culverts **(0)**
* Repair fencing around Long Barn compound **(1)**
* Install fire protection water tanks and fire hydrants **(1)**
* Install water filtration system **(1)**
* Develop plan for additional staff housing **(1)**
* Replace bridge and culverts at Long Barn crossing **(1)**
* Explore alternative uses of the Long Barn **(3)**
* Investigate potential uses of the Cheese House **(3)**
* Remove old gas tanks at Green House **(1)**

* Upgrade George's house **(1)**
* Conduct a lot line survey at the Green House **(1)**
* Investigate driveway alternatives for Al' House **(1)**
* Assess installation of potable water/internet lines to Al's house **(1)**
* Install garbage and recycling center at Red House **(1)**

The developed areas within the property that belong to Cal Poly are the barn/green house, the red house/railroad station, Al Smith's house and Las Trancas labor camp. Each of the buildings in these areas will be discussed separately below. An evaluation of the repairs needed for the structures in use will be undertaken annually to determine budget needs and a schedule of work. Maintenance will be done as needed.

Infrastructure that is contained within the property, but is leased from Swanton Pacific Ranch are the Boy Scout Camp and the CDF Fire Station. There is also a description of the utilities, fencing, water system and roads. Finally, a preliminary analysis is presented on how the existing infrastructure could be modified, expanded or replaced to accommodate expansion of the SPR program based on the requirements of the Santa Cruz zoning and planning regulations.

13.1. The barn/green house

This area is located at the southern end of the property adjacent to Swanton Road. The perimeter fence is to be repaired or replaced so it can be locked at night since it contains the Ranch machinery and fuel tanks.

Barn

The barn was built in 1874. It is enclosed with wood siding and has a corrugated iron roof. Much of the structure was constructed initially with pegs rather than nails. Barn reinforcements were undertaken by Cal Poly since managing the property but continued deterioration necessitated immediate action to keep the structure from being lost. Remodeling has preserved whatever is in good condition and replicates the initial construction design and materials to the extent practical. Much of the wood used was milled from the Ranch's own timber. A floor has been installed on the east and west ends for

storage. The upgrades include 220-volt electrical power and gas heating. It would be desirable to identify other uses for the barn that might include the construction of a second floor to more fully utilize the building.

Green House

This building of 2,922 sq ft contains the kitchen/dining room facilities for interns staying in the dormitories and currently contains three offices. There is also a bathroom, storage room and interns common room, that has a satellite television and computer installed for student use. Foundation repairs were undertaken on this building in 1997. Recent repairs and remodeling plans of this structure include upgrading the kitchen and laundry room as well as gas heating installation.

Bunkhouse

This building of 1,909 sq ft. has recently been remodeled to accommodate up to 10 student interns in 7 bedrooms, one of which is wheelchair accessible. The new entryway includes a ramp for wheelchair access. There are separate bathroom facilities that have on-demand water heaters for energy efficiency. An apartment at the east end of the building contains a bedroom, bathroom and kitchen facilities.

Loveshack

This one-bedroom structure located between the Green House and Bunk House was moved from another property along Scotts Creek a number of years ago.

Cheese House

This building is listed in the County Register of Historic Buildings and had wall and roof repairs done in 1998. There is some shingle damage from the cattle that will be repaired in the coming year and the roof needs to be redone again within five years. No current use made of the structure but investigations would be desirable to undertake in the future to determine suitable use of the building.

13.2. Red House/railroad

This area is located just past the CDF fire station on Swanton Road. In addition to several buildings, there is a campsite and picnic area.

Red House

This house of 1,595 sq ft currently contains two meeting rooms that can be opened into one large room and also serves as the classroom for long-distance learning. There are accommodations for a total of 6 people, consisting of three bedrooms. There are two bathrooms and a kitchen equipped with cooking utensils and a refrigerator. This building is available for use by groups who can reserve the building by contacting Susan Burgess at slburges@calpoly.edu or (831) 427-1718 or Elizabeth Ball at (805) 756-2548. Cal Poly events have priority for use of the facilities up to one week before the event.

Repair work was undertaken on the foundation and bathroom plumbing of this structure recently. Future remodeling within the next two years includes installing an outside garbage and recycling center, re-roofing and installing a French drain upslope of the house to solve a sub-surface drainage problem.

Red House Cabin

Behind the Red House is an 18 x 30' employee residence containing one bedroom. Foundation work has been undertaken on this structure in the last few years, and heating, entryway to the bathroom and kitchen remodel are scheduled within the next two years.

Mobile Home

A 1,680 sq ft mobile home is currently being permitted to replace the doublewide mobile home of 1,144 sq ft that was placed on the site in 1988 adjacent to the Red House. The replacement should be completed by the end of the summer.

George's House

There is a small house of 757 sq ft located at the driveway entrance to the Red House, which is occupied by George Delatorre, a friend of Al Smith, who has lived there since the 1960's and who has lifetime use of the house. This house was recently inspected and repair work is scheduled for this fall.

Cal Barn

This building was constructed by U.C. Berkeley engineering students during the time they used Swanton Pacific Ranch for summer camps in the 1930's. Some repairs were made recently in order to make it usable and it is currently being upgraded to conform to meet County building code compliance.

Campsite/Picnic Area

There are 30 picnic tables and a barbecue available adjacent to the railroad station. There were seven sites with utilities hookups for RV use but all have now been disconnected. There are two horseshoe pits located adjacent to the railroad track. This area was constructed and is maintained by SPRR Society.

Railroad Structures

The rolling stock is housed in a roundhouse with a square footage of 2,000 sq ft, the 1,600 sq ft Cal Barn, a storage building of 1,600 sq ft with a car shed of 2,400 sq ft (referred to as the car barn), four cabooses, and a machine shop of 1,527 sq ft. A platform waiting shelter for passengers consists of seats and open sides. The cabooses, shed and platform shelter are currently in non-compliance with the County for not having permits.

13.3. Al Smith's House/Educational Center

This is located on the east side of Swanton Road, just north of the CDF fire station. A paved road leads to a locked gate approximately 3/4 mile from Swanton Road, and continues another 1/4 mile to the residence. Built for Al Smith, it is a two-bedroom, two-bath house with two stone fireplaces and a woodstove. There are pleasant views overlooking the ocean from the living room. A covered carport connects with a storage shed and there is a 3-car garage that is presently used for the Water Monitoring Lab. There is a hot tub, satellite dish and small swimming pool in the yard. The yard is fenced but not landscaped. The roof is to be repaired in the next two years.

There are plans in motion to construct educational facilities here by adding on to the existing structure. The facilities will include a media room with large screen TVs and computer hookups on high-speed connections with each student expected to provide his/her own computer. There will be a library/reading room. The structural design of the building will reflect a working ranch style using local timber incorporating passive solar technology to reduce heat and lighting costs and taking into consideration public concerns of visibility, lights, paved surface and road widening to minimize the environmental and social impacts.

Staub House

A paved road leads off the driveway to Al Smith’s house across a cattle guard to this property of 1,972 sq ft. This house consists of a living area upstairs with a studio apartment on the lower level that is used as a kitchen for the yurts. Known as the Staub house from one

of the previous settlers, the building currently houses up to three graduate students or researchers. Two yurts located in front of the house provide accommodation for up to 40 people on field trips. There is also a storage shed that is in good condition.

13.4. Staff Residences

There are several staff residences on the property that are either included as part of the job or are offered if accommodation is available. A review will be undertaken in the near future to determine how to accommodate additional staff.

Seaside School House

This consists of a 1,000 sq ft house with detached bedroom of 500 sq ft that is located at the north end of the property at 480 Swanton Road. It is used by the Ranch Director. It is in the process of being re-roofed and re-painted and the windows, heater and shower replaced.

Archibald Cottage

This area is located approximately 500 feet south of the fire station adjacent to Swanton Road and has a paved road. The site was used previously for farm worker housing. The buildings consist of 9 structures that are in advanced deterioration and a cottage of 655 sq ft.

This cabin has been renovated this year and is used presently by the administrative assistant. It has no building permits on record, although it is supplied with electricity. It was apparently used as a kitchen, dining area and bathrooms for the laborers housed nearby. The building consists of a simple balloon framework attached to a slab on grade. The interior consists of a bedroom, bathroom and kitchen and eating area.

The storage shed structures located adjacent to the cabin need to be re-roofed if they are to remain usable and most of the unused structures will be demolished in the next two years.

Livestock Manager's Mobile Home

The livestock manager lives in the mobile home at the Red House, which is to have a five-year permit from the County as a caretaker's home.

Staub House

Graduate students and intermittent staff people are located in the Staub house that also hosts groups for class visits in the yurts.

13.5. Miscellaneous Structures

There is a cabin built by Earl McCrary near Berry Creek at the uppermost northwest corner of the property. There are also some deteriorated structures on the eastern grassland known as the Strawberry Shacks. There are three buildings known as the Cowboy Shacks on the western grassland that belonged to a previous dairy operation. This is a legal residence and has been restored to provide kitchen and bathroom facilities for up to 20 people who are accommodated in a nearby yurt for field trips. There are also the loading pens and the OK Corral for livestock handling and a haybarn on the border of Jerry Piepmeyer's property that is shared with him.

13.6. Leased Structures

Currently there are two leased structures within Swanton Pacific Ranch, one of which does not include payment and the other a nominal fee (see Figure 8).

13.6.2. CDF Fire Station

This property consists of the firehouse, water supply and surrounding land and was provided for California Department of Forestry (CDF) use for an annual fee by Al Smith. A use agreement provides for the continued use by the CDF through 2017 (see Operations section). However, should use by the CDF be discontinued, the property would revert to SPR.

13.6.3. George's House

This house is used by George Delatorre who is not required to pay rent. It will probably be demolished after his death.

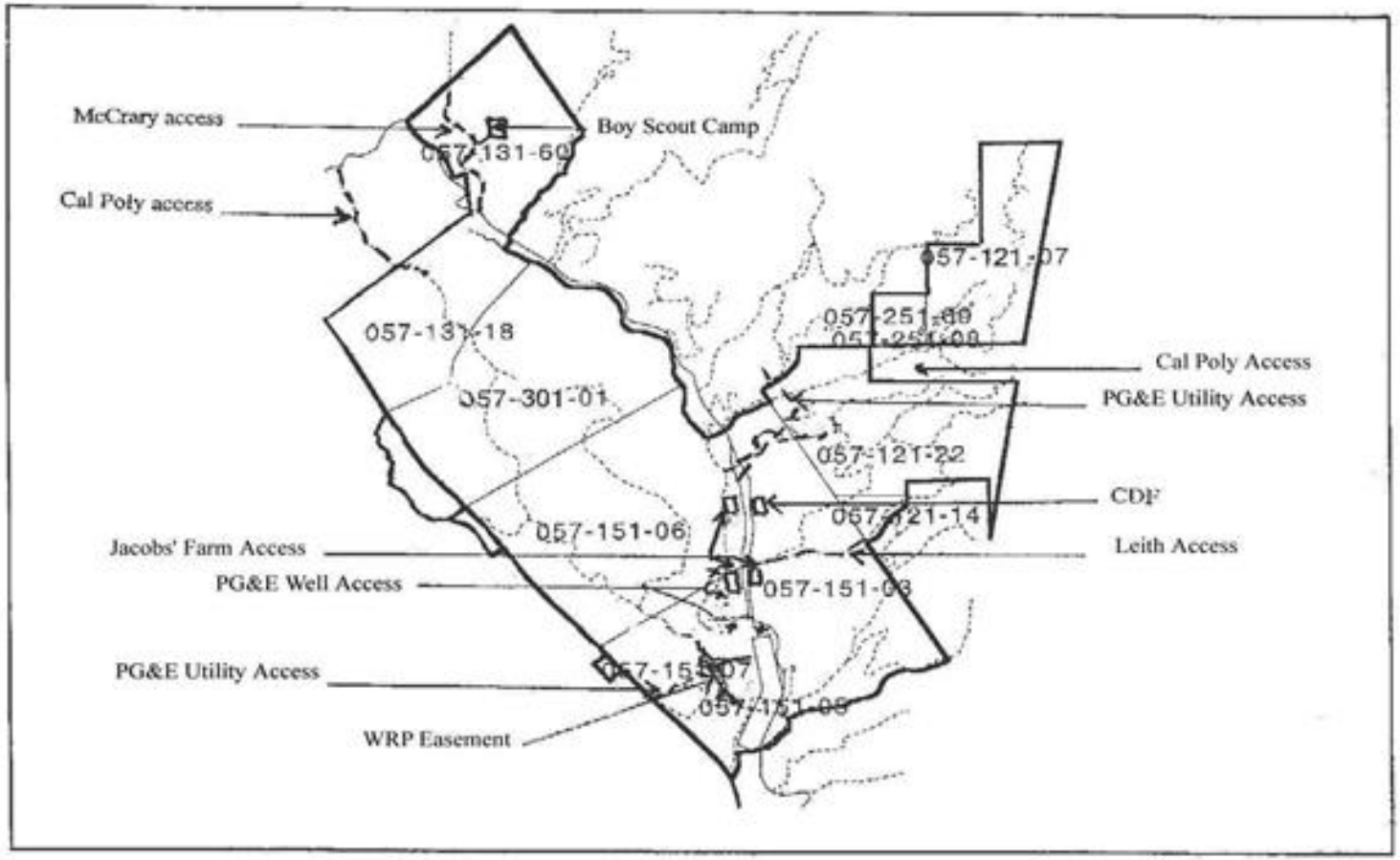


Figure 8 Swanton Pacific Ranch and Easements

13.7. Fencing

The perimeter fencing along Hwy 1, a distance of over 3.5 miles was completely rebuilt in 1987-88. Fencing is adequate for livestock grazing in the grassland along the east of Swanton Road. The crop fields have been fenced. Some additional fencing is needed on the paddocks to improve paddock grazing.

13.7.1. Gates

There are numerous gates on the property, both between fields and from the public roads. There are three gates on Hwy 1 and at least five gates on Swanton Road. Many of these gates are locked except for authorized use. Faculty with the combination number can unlock these gates. Students with special projects and interns may be provided the combination number. PG&E has access to the gates used for utility maintenance (see Figure 8 for PG&E access easements).

13.8. Roads

There is a paved road that is privately owned by Swanton Pacific Ranch that accesses Las Trancas camp and continues uphill to the property boundary. The neighboring properties have an easement to use this. There is another paved road that leads to Al Smith's house and branches off to the Staub house.

There are approximately 10 miles of unpaved roads that are used to access the forest units and fields and are maintained by Swanton Pacific Ranch with its own grading equipment. However, during timber harvest operations, the timber operator is responsible for road maintenance. Additional logging roads were installed during the first Cal Poly timber harvest, as well as two bridges, and some of the previous roads have been mulched and their use discontinued.

There are also several trails that are suitable for hiking, and an interpretive trail has been started along Little Creek.

13.8.1. Road Improvements

Road maintenance of the paved road at Archibald Creek is shared with the access easement users. Ongoing maintenance is undertaken during the spring and fall months on other ranch roads. No major improvements are needed except for rock on the initial part of the Little Creek road which will be done under the forestry budget since they are primarily

used for forestry operations. Access to Al Smith's house will be improved prior to commencing construction of the educational facilities. The haul road that connects Al Smith's House to the Trancas paved road could eventually be upgraded so as to serve as an emergency or one-way road for the educational facilities.

A roads inventory and repairs report has been developed as part of CDFG funding for Scotts Creek Watershed Council (SCWC 2000). The few Cal Poly sites listed in need of repair to minimize erosion are repaired as part of the logging process.

13.8.2. Scotts Creek Crossings

There are currently two ford crossings on Scotts Creek for farm equipment use during the summer months. It would be desirable when funding becomes available to construct a suitable bridge at the lower ford crossing to incorporate as part of an interpretative marsh walk. In addition, a bridge may be constructed north of the Red House that will serve for both forestry and railroad use.

13.8.3. Parking

Parking facilities will be provided for residents and visitors to the educational facilities at Al Smith's house and parking for up to approximately 100 cars is also available at the Red House with an overflow parking lot on the opposite side of Swanton Road. For larger events, parking on neighboring property is arranged. There is parking at the Long Barn compound where the Ranch vehicles and machinery are also stored.

13.9. Water

Swanton Pacific has a number of creeks on the property as well as year-round springs. In former days water from Little Creek was used for household purposes. This is no longer safe from contamination and therefore all potable water now comes from wells or is purchased as bottled water until a filtration system is built. The creeks used to provide water for livestock also, but this is no longer desirable because of fecal contamination and nitrogen eutrophication as well as erosion impacts on the banks and natural habitat management considerations. SPR has therefore constructed exclusion fencing around the existing livestock ponds. On-demand water sources in the paddocks are being installed for livestock use instead.

13.9.1. Domestic

Water is provided on the ranch from several sources and is suitable for washing and irrigation purposes. Water for the Barn and Green House area for non-potable uses is from a well (#1) located at the edge of the Folger field. The water supply for the Red House is delivered at approximately 25 gallons per minute (gpm) from a well approximately 75 feet deep located by Scotts Creek in the railroad campsite area. A filtration system is to be installed at the Red House this year and drinking water piped from there to the Green House and Archibald House. Water for Al Smith's house is gravity-fed from Little Creek and is not potable.

13.9.2. Irrigation

Cal Poly has legal riparian water rights that date from 1922 under permits 28698 and 28699 (see Technical Appendix). Water from the well in Diversion Field is extracted under permit #28699 and is used by Cal Poly. Water under permit #28698 can be extracted at 300 gpm directly from Scotts Creek with a submersible pump so long as creek flows are above the established minimum. However, this has not been done in recent years. The pipe used must be screened to prevent fish entry.

There are three irrigation wells located on the valley floor used by SPR, two in Upper Ford field and one in Folger field, which use submersible pumps (wells are approximately 100 ft deep). Jacobs Farm/Del Cabo Inc. has use of these two wells and maintains them.

PG&E undertakes periodic checks on all the pumps to determine when pumps are no longer functioning efficiently. All pumps were damaged during the 1998 storms but have been repaired and do not usually suffer storm damage.

Pipelines run along the edge of the Trancas, Upper Ford, Diversion and Folger fields and across the center of Long Barn, Folger, and Diversion fields (following the telephone line) and from this to Train Flat field. Numerous valves exist along these lines for irrigation purposes. A shut off valve has been installed in Diversion Field so that the water supply can be isolated when necessary. These pipelines are in the process of being GIS mapped.

13.9.3. Water conservation

Swanton Pacific is plentifully supplied with water both from the numerous perennial creeks and the availability of ground water. However, water conservation is likely to become increasingly important with the need to provide additional water for coho salmon and

steelhead habitat in Scotts Creek. Even before the federal listing of coho as endangered, there were concerns at the chronic and excessive dewatering in the lower half-mile of the creek (Nelson, 1994). In 1992 CDFG called a halt to Coast Dairies pumping when creek flows were measured at only 1.14 cfs instead of the minimum 2 cfs determined necessary at that time for fish survival (Barton, 1992). Since the listing of the coho and steelhead as endangered, the required creek flow is likely to be higher than the previous minimum.

While water used for irrigation from the wells has been shown not to affect creek flows, Swanton Pacific's agricultural practices do have an impact on the amount of water use as well as the electric costs for pumping. The apple orchard and Christmas trees and the conversion of three former crop fields to grassland have reduced the more extensive overhead watering previously required for Brussels sprouts and artichokes. In addition, irrigation of the oat hay is only required two or three times in the season and some of the oat hay is non-irrigated.

Currently the domestic use of water is not a major factor in water use, but will become increasingly so with the expansion of the educational facilities. Future remodeling will use gray water for non-potable uses where possible, and low-flush toilets and showerheads will be installed in all the bathroom areas.

13.9.4. Ponds

There are 13 ponds in the oceanside fields and three to the east of Swanton Road. These ponds vary in surface area from approximately 200 sq ft to 1,000 sq ft. All the ponds have been GIS mapped. All the ponds need to be inspected periodically for silting and/or breaching as they supply most of the water for livestock and are also important habitat for wildlife.

13.9.5. Troughs

There are numerous troughs throughout the grassland for livestock use and eventually enough troughs will be established to replace all the current ponds in use. These troughs are spring- or pond-fed except for three troughs east of the Green House that are supplied from a 10,000 gallon tank fed by a booster pump from well #3. Troughs have been established to replace current riparian drinking water sources in Schoolhouse paddocks.

13.9.6. Emergency Water

The new educational facility will make provision for emergency water supply with water tanks that will be located discretely in nearby trees and kept full with water from Little Creek. This will provide a plentiful water supply under pressure should fire occur in or near the structures. Additional emergency water tanks will be established at the Archibald cottage, Red House and the Green House within the next two years along with fire hydrants.

13.10. Waste Disposal

Waste consists of septic, garbage and recycling facilities. Each is discussed below.

Septic

There are septic tanks at the Red House, the Green House, Archibald Red House, Al Smith's house, Seaside School House and the Staub house that are serviced regularly.

Garbage

Household garbage is placed in the dumpster by the barn and removed by Waste Management Company.

Recycling

Recycling of plastic, aluminum and glass is undertaken by interns.

13.11. Utilities

All residences have electricity, gas and phone service (see Appendix F). Swanton Pacific will minimize its electrical needs for the educational facilities through the use of natural light and ventilation and solar heating.

Electricity

PG&E supplies electric power to all Ranch buildings along Swanton Road and some of the pumps. There is a solar operated pump on the upper meadows that is not in operation currently. There are numerous meters on the property which are listed below:

Meter #	Location
2396R1	Pump #2
88572R	Pump #1
4655T8	Green House
R67351	Pump #3
G14002	Red House
743N17	Red House Cabin

273729	Archibald red house
33715J	George's House
3095J1	Seaside Schoolhouse
55R749	Staub House
087E89	Al's House
33715J	George's House
36N531	Long Barn

There are also solar panels for electric fencing and a solar-powered pump in the Hay Barn field.

Gas

Swanton Pacific has propane gas tanks at the Red House, Green House, Schoolhouse, Staub House and Al Smith's House that are filled as needed by Amerigas.

Phone

A list of phone numbers is contained in Appendix F. There is a pay phone located in the Red House. There are two office phones and a fax number for Ranch business and a student phone in the Green House, and private phones in the mobile home, School House, Staub House, Archibald House and Al Smith's House. Contact phone numbers are listed at the front of this document. There are also two-way radios for use on the Ranch for Ranch and railroad operations. These are helpful in maintaining contact from most locations on the Ranch and there is a speaker located in the office so that conversations may be heard from there. Conversations may also be heard by outside users with radio equipment.

13.12. Preliminary Analysis of Potential Facilities Expansion

Swanton Pacific Ranch has a number of residences on its parcels, but these are mostly old and small. There has recently been insufficient space for all employees to reside on the property, necessitating an external rental, which is likely to occur again in the near future without additional residences. There are enough beds for ten interns and three graduate students, but it is expected that over time there will be a need for additional student accommodations as the program expands. Most specifically, if there is to be a residential program at the Ranch, whether for a part or all of a semester, there needs to be sufficient accommodations for approximately 24 students and faculty in addition to what is available presently.

The previous educational facilities plan included accommodations at Al's house, but has been discarded because of lack of funds. The present strategy is to augment the existing

structures where possible and develop only the educational facilities at Al's house. The alternatives for doing this are discussed below following input from Ranch staff, County planning and Butch Huff, building contractor for the Ranch. Parcels without easy access, water or electricity or with high public visibility are not included in this analysis but a complete listing of the zoning and existing or permitted structures is included in Appendix .

Any building modifications or additions would have to have County and Coastal permits, CEQA and Agricultural Policy Advisory Commission (APAC) approval, conform to the County's List of Required Information (LORI), conform to the Ranch NTMP and preferably have a Master Plan approved by public hearing for the entire Ranch prior to development being undertaken. A Management Plan is also required for educational facilities. The alternatives for each of the main residence areas are presented here for consideration in future operations of the Ranch.

13.12.1 Al Smith's and Staub House Parcel

The parcel is zoned timber production that permits the construction of an ancillary building of up to 28' high and of no square foot limit that is related to timber, natural resource management or agriculture under park recreation provisions. Currently the house has a permit on record as a second dwelling unit, the Staub House being considered the primary dwelling. Both are larger than 1,200 sq ft. If Al's House was to become an ancillary building, the Staub House could become the primary residence, permitting a larger structure of up to 7,000 sq ft to be constructed to replace the existing building that is in deteriorated condition.

Incorporating the existing structure, the facilities could extend a wing to the northwest to replicate the existing wing. The new building could either incorporate the existing carport or enclose this to include a corridor and perhaps a small study/office. There could be a two-story building with a computer room and library reading room, and a large structure suitable for meetings or other larger use needs.

A major constraint to this site is the existing road that is inadequate to accommodate the additional traffic and to provide for emergency access. Several alternatives are possible depending on County requirements, and preliminary research is to be conducted later this year to determine feasibility of a parallel road to the existing one for one-way traffic along part of the route, and widening the remainder based on the geotechnical report undertaken for

the Educational Center Plan. Such improvements could be costly, but would also reduce the existing potential of traffic accidents.

A further constraint at this site is the lack of potable water or high speed telecommunications currently which would need to brought up from Swanton Road. And finally, some concern was expressed previously by the neighbors about noise and lights from increased use of this site, although this principally concerned the proposed inclusion of residences in the Educational Center.

13.12.3. Green House Parcel

The Green House is the reception area to the Ranch on Swanton Road and currently houses the offices as well as being part of the student interns living area. It would be desirable to separate these activities and to include a proper meeting room for Ranch business. One option to expand the existing structures at the Green House/Bunk House compound without greater visibility from Highway 1 or Swanton Road is to extend the roof from the kitchen to adjacent to the Bunk House and remove the Love Shack, currently not permitted. A large room in the existing space (approximately 35') between the two buildings could provide a living room and computer space for the students, freeing up the existing student lounge for office meeting room use. Additional student bedrooms could be built on the existing deck and around the living room space. A basement story could be installed under the existing floor by excavating approximately four feet below ground, where the laundry and computer facilities could be installed. There could be a deck in front of this addition that could provide a wind-protected outdoor space. An additional wing to match the existing 10' x 16' wing in front could provide either an additional bedroom or other office space.

Another option would be to relocate the offices to the recently renovated Barn that will be evaluated this year as one of the alternative uses of this space. That would free up the Green House for a living space as well as extra bedroom space. Another possibility would be to create an insulated and dust-proof room that could serve to display both the historic aspects of the Ranch and its current research and restoration activities and products that could be open to the public. Possibly it could be large enough to also serve as a meeting room for public events. A second floor above could accommodate the present storage needs. However, there may be other alternatives for this building as well so long as they relate to the

agricultural activities of the Ranch and do not modify the exterior of the building. This location has plenty of parking and is easily accessible.

A principal constraint to any expansion of the buildings currently is that these may be located on the Archibald House parcel, thereby exceeding the current zoning limit of one principal residence and a second unit per parcel. A survey will be conducted this year to determine the exact location of the parcel boundary and whether it includes these structures. If they are not on the Archibald parcel, there is the constraint of a conservation easement on the Folger plat that would not permit structures. It would be desirable therefore to remove the conservation easement from the latter parcel to permit development, since this easement no longer confers any property tax benefits and may take up to ten years to extinguish. It would also be desirable to apply to the County for a lot line adjustment if the buildings are included on the Archibald parcel so as to permit development at the Archibald Red House site in the future.

13.12.3. Archibald Red House/Las Trancas Parcel

There is good development potential at the existing Archibald Red House site because there already exist several dilapidated structures; there is road access; it is set back from Swanton Road so as not to be very visible; and it will have both potable and non-potable water available shortly. If the parcel boundary at Queseria Creek ends at Swanton Road, this would enable a primary residence of up to 7,000 sq ft to be constructed and the existing structures could be replaced with a larger second dwelling of up to 1,200 sq ft. There may also be some potential for constructing an educational facility here as the zoning is also Timber Production which permits such use, but space would be limited by the creek and existing agricultural production.

Also on this parcel is the Queseria Cheese House that is currently not used for any purpose. Listed as historic, it cannot be modified externally, and does have moisture problems from slope runoff since it is built into a hill, but could be suitable for summer use activities such as a farm stand, mushroom raising, museum or meeting room. There is electricity and water that could be easily made available through the pipes that have been laid under Swanton Road.

13.12.4. Red House Parcel

Expansion here is limited given the existing buildings and the ongoing railroad activities. The Red House has basement flooding limitations currently and could not easily be expanded without modifying its structure substantially. George's house is not in good condition and will probably be demolished in the future, but there could be some potential for expanding the Red House Cabin as a second unit, particularly if the caretaker's mobile home were to be relocated at some time in the future.

13.12.5. School House Parcel

The site of another historic building, it would be difficult to expand this structure without destroying its character. However, a secondary residence could be constructed near the Boy Scout entrance where it would not be visible from Swanton Road and there is an existing water supply. Road access from Swanton Road is on a dirt road but is flat and not far from the County road.

14. OPERATIONS

* Re-establish Community Advisory Committee **(3)**
* Re-establish Ranch Operations and Education Committee **(3)**
* Resolve Red House and railroad Building Code non-compliance issues **(1)**
* Maintain Ranch calendar of events **(0)**
* Update and provide safety requirements **(0)**
* Provide staff development training **(0)**
* Improve documentation/accuracy of GIS maps **(1)**
* Maintain Ranch Hazardous Materials Plan **(0)**
* Update Ranch Management Plan **(2)**
* Develop Ranch Master Plan **(3)**
* Evaluate change of ownership of Ranch **(1)**
* Apply for rezoning as needed **(2)**
* Maintain lease, use and license agreements **(0)**
* Maintain wells **(0)**
* Undertake a use agreement with the Boys Scouts **(1)**
* Sign WRP agreement annually until payment received **(0)**
* Refine policy regarding use of Ranch by outside entities **(1)**
* Maintain a vehicle maintenance chart at the barn **(0)**
* Maintain vehicle replacement schedule **(0)**
* Dispose of used machinery oil **(0)**
* Update inventory of equipment and machinery **(0)**
* Develop fire management plan **(2)**
* Establish water monitoring program **(2)**
* Update CAGR SPR goals **(3)**
* Evaluate futures staffing needs **(3)**

Swanton Pacific Ranch is operated by the CAGR under a MOU from the Cal Poly Foundation. The organizational chart in F shows how responsibility for the operation of

Swanton Pacific Ranch is delegated. This chapter describes the structure of the decision-making process, job descriptions of Ranch staff and the associated regulations and operational requirements that apply to Swanton Pacific Ranch. Finally, but not least, SPR's involvement in the local community is summarized.

14.1. Decision-Making Responsibilities

The Ranch Director is responsible for planning the educational curriculum, supervising special problems projects and senior projects and interns activities. Each of the project directors responsible for forestry, crops, livestock, railroad and education prepare an annual budget request and plan. This budget is reviewed and approved by the Natural Resource Specialist, Livestock Specialist and Program Assistant before being approved by the Dean of Agriculture, the Foundation and the President. The Ranch planning is coordinated by the Ranch Operations and Education Committee. The Ranch Director reports Ranch program activities to the Dean of the College of Agriculture who in turn advises the Cal Poly Foundation. The Cal Poly Foundation is responsible for administering the finances of the Ranch and ensuring that the terms of the Grant Deed are fulfilled.

An ongoing calendar of scheduled events at the Ranch has been developed to assist in planning activities. This Management Plan is also designed to assist in planning as well as information about different activities at the Ranch. It is to be reviewed to update the summary of recommended actions and other changes as needed. All Ranch decision-making parties have reviewed this Plan and will provide input when it is to be updated. It is desirable to decide whether a Master Plan is needed to deal with zoning and planning issues.

14.2. Committees

There are several committees involved with SPR currently and others may be formed as deemed necessary. A brief description of these committees is provided below:

14.2.1. Community Advisory Committee

The re-formation of this committee is desirable to replace an earlier committee formed in 1987 to help guide initial planning for the ranch enterprises. The former committee consisted of four individuals representing local timber, livestock and crop industries, a local government agency and Al Smith. It might be desirable to include a larger number of individuals such as neighbors, regulatory agency personnel, local government and

industry members, as well as a representative from the CAGR Advisory Committee. The purpose of the committee is to foster a cooperative spirit and to provide expertise for Swanton Pacific Ranch programs. It would provide feedback on topics of interest to the local community.

14.2.2. Ranch Operations and Education Committee

This committee consists of the Project Directors of operations at Swanton Pacific: the Ranch Director, Railroad Director, Resource Management and Livestock Specialists; Associate Dean and Foundation personnel. The group meets to review and coordinate current and proposed Ranch activities. The underlying focus of this committee is to promote the educational aspects of the Swanton Pacific Ranch program. Recommendations from this committee are conveyed to the Dean of the College of Agriculture.

14.2.3. Ad Hoc Committees

These committees are formed as necessary and report to the Swanton Pacific Advisory Committee. They are comprised of individuals considered to have the ability to advocate and further the goals and activities of Swanton Pacific Ranch related to the railroad, education or natural resources. The Railroad Society has a number of committees dealing with railroad activities.

14.3. Ranch Personnel

Ranch personnel consist of permanent, intermittent and provisional positions. Those who are intermittent are employed for a maximum of 1,000 hours annually, while those considered provisional work 19 hours a week. Some of the personnel are required to live on the premises while others are provided accommodation when that is available. It is expected that the number of staff employed at the Ranch will increase with the expansion of the educational activities. It is also possible that additional staff may be hired for temporary or specific job activities to meet the growing diversity of services and products offered by the Ranch. It would be desirable to review staffing needs in the near future. Currently there are two full-time employees, a faculty member who serves as the Director and a part-time administrative assistant position for the Ranch. The Railroad Society also employs a full-time caretaker for cleanup and maintenance activities. The job description for each position and personnel category are described below:

14.3.1. Ranch Director

The Ranch Director is a full-time permanent position with responsibility for the overall supervision of Ranch activities as well as coordinating these with the College of Agriculture, Cal Poly University Foundation and outside entities. In addition, a portion of the Director's time is allocated to teaching natural resources classes, either remotely to the Cal Poly campus through the distance learning equipment, through field trips to the Ranch by the students or at the Cal Poly campus. Additional teaching involves special projects and problems and classes for interns. Specific duties include budget preparation, hands-on assistance where necessary, the long-range planning of activities and programs and any other business that may require his attention. Currently the renovation of existing buildings, the completion of the Queseria Creek restoration project and teaching responsibilities are the prime focus of his time. He is also involved in several watershed projects on Ranch property that have received or could be eligible for Integrated Watershed Restoration Program (IWRP) funds through the Coastal Conservancy.

14.3.2 Resource Management Specialist

This permanent full-time residential position has existed at Swanton Pacific Ranch since 1997 and was designed for the development and implementation of a wildlife habitat enhancement and management program. The employee also participates in general Ranch and instructional operations. This position requires a BS degree in natural resources, experience in Ranch operations, forestry, watershed management, guide services or wildlife habitat management and the ability to operate various forestry and farm equipment.

14.3.3. Livestock Specialist

This is a full-time position responsible for management of the livestock and grasslands on the Ranch and to coordinate work assignments for students and interns under supervision of Dr. Beckett in the Animal Science Department. Additional responsibilities include road maintenance and water systems development. It is a live-in position and requires a B.S. in animal science and one year experience in livestock and ranch management.

14.3.4. Program Coordinator

This full-time position requires a minimum of three years experience in office secretarial work and competence with office equipment and computer programs. The job

involves a variety of often sensitive and complex office support tasks and includes managing the use of educational and housing facilities. Additionally, other tasks involve handling petty cash requests, time cards, mail and travel requests, preparing budget reports and materials for Ranch publications and other support functions as directed by the Ranch Director.

14.3.4. Railroad Director

There is a half-time permanent railroad director position that is funded out of the SPRR railroad endowment. He is responsible for supervising the maintenance of the railroad, project improvements and railroad activities.

14.3.5. Contracted labor

Labor is contracted for specific job assignments as needed. Recent contracts have included forest unit measurements, vehicle and equipment maintenance, remodeling construction, facilitation, geologic research and planning activities.

14.3.6. Provisional/Intermittent Labor

Provisional labor is used on an as-needed basis and is paid hourly. Currently there are five intermittent positions on the Ranch in hydrology, forestry and Sudden Oak Death projects. Some of these positions are funded partly through outside grant monies, such as for the Queseria Creek Restoration Project and the Little Creek Water Monitoring Project.

14.3.7. Interns

A variety of learning positions are available for interns, including forest management, resource management, watershed management, livestock management, crop specialist, horticultural specialist and integrated ranch management. The learning experience includes work in all aspects of the Ranch crops, livestock, forestry and resource management. Opportunities for special problems and senior projects exist in all agriculture and natural resource areas.

The recommended application deadline is the 3rd week of the quarter preceding the quarter before the student plans to study at Swanton Pacific Ranch. Earlier application provides some preference in selection process. Interviews may be included in the selection process. Applicants complete a formal application that states their career goals and desire to participate in the Ranch internship program.

Full-Time Residential Interns

Three full-time intern positions are offered a term during the academic year, and up to 12 during the summer quarter, although not all positions are available all four terms. In order to qualify for an intern position, students must be able to live at Swanton Pacific Ranch, work 40 hours a week (including five for room and board), and enroll in 12 units of internship courses such as AG 339, AG 439 or FNR 339. In addition, interns are required to complete 10 hours of community service during the term and an approved internship project.

Part-Time Residential and Non-Residential Interns

There are some positions each term for part-time interns though not all positions are available all four terms. The residential internships require 20-40 hours work a week (five for room and board), registration in 6 units of internship, completion of approved internship project and 10 hours of community service during the term.

14.3.8. Mesa Students

These international students are selected by the Multi-National Exchange for Sustainable Agriculture (MESA) and assigned to organic farms throughout the U.S. They work full-time for a period of a year and gain experience in a variety of agricultural activities. They are provided accommodation and receive payment for their work. Funding for this program depends on budget availability.

14.4. Staff Development

Staff development is important to SPR in providing quality job performance as well as employee satisfaction. Besides the training required by Foundation and government regulations, there are employee enrichment opportunities that are offered when practical and relevant to the employee's job. A brief description of training provided on site, on campus and other locations is provided below:

14.4.1. Ranch training

Ongoing training is currently provided in handling pesticides, tractor safety, equipment operation, ATV driving and First Aid/CPR. The training program will include an awareness of the locations of power and water lines once these are mapped. All new employees are provided verbal training in the fire management and emergency action plans

as well as evacuation procedures. In addition, key staff is trained in how to assist during on-site evacuation.

14.4.2. Campus training

The Foundation oversees safety training and ensures compliance with the Cal/OSHA Injury and Illness Prevention Program (IIPP) at the main campus. All employees are instructed in general safety and healthful work practices and provided specific instruction with respect to hazards specific to each employee's job assignment. All employees are provided active training on handling hazardous substances based on characteristics common to a class of chemicals. All staff will be trained when a new hazard is introduced and periodically thereafter, normally this will be annually. All staff is trained in workplace security practices and the regulations that prohibit workplace threats or acts of violence.

14.4.3. Off-Site Training

Forklift operator training is required of any employee operating a forklift and this must be renewed annually. Training is undertaken off site as needed. Other training experiences have included participation in the Watershed Academy, holistic management, livestock handling, grazing management and goat husbandry.

14.5. Community Involvement

There is a deep interest in community involvement at Swanton Pacific and an awareness of the Ranch's impact on long-established neighbors in this quiet, rural area. Members of Swanton Pacific Ranch participate in many aspects of community involvement and there is a commitment to provide services and outreach to the extent possible both locally and throughout California. It is anticipated that SPR's role in the community will increase with the development of its educational facilities and the ability to host additional community events. The input of the community also continues to be important to the program at SPR and efforts are made to solicit community opinions to the extent that this is possible. The following sub-sections identify the principal areas of current community involvement.

14.5.1. Intern Community Service

Each intern at Swanton Pacific Ranch is required to contribute 10 hours of community service during their stay on the Ranch to instill a community spirit and a desire to

serve. This community service can be fulfilled in a variety of ways from community assistance at the local Pacific Resource Center to conservation work with Monterey Bay Salmon and Trout Project or Save Our Shores. Interns are free to suggest their preferred contribution or can be provided with a list of possible alternatives. Efforts are made to accommodate specific hours that such service may entail, although normal Ranch activities must still be completed.

14.5.2. Community Outreach

Swanton Pacific Ranch has already been active in its involvement in the community and it is expected that this will continue to develop in the future. Outreach activities include providing the community with contributions such as firewood and produce, assisting in fundraising activities for local groups such as the Land Trust and providing educational opportunities to local school children to visit the Ranch. Of particular importance is the willingness of Ranch personnel to provide neighbors with emergency assistance during such times as the storms of early 1998.

14.5.3. Host Activities

As many as 1,000 people at a time have attended events at Swanton Pacific Ranch. The Railroad Society hosts several events each year to provide train ride opportunities to the public and has monthly work meetings open to its members in the community. At times there may be three or four groups participating in distinct activities on the Ranch and up to 40 people staying overnight. Although many of these groups are from Cal Poly, SPR has also hosted groups such as MESA, the Federal Equity Leadership program, the Watershed Academy, Focus Ag, Hunter Safety Training and CDF Professional Service Training groups. An ongoing host activity is that of hosting the Scotts Creek Watershed Council (SCWC) meetings. These activities are currently limited to four railroad public events a year and events for Cal Poly students and faculty until public use policy can be refined and County compliance requirements resolved.

14.5.4. Community Participation

There are two components of community participation, that of the community participating in the Ranch activities and that of Ranch personnel participating in community activities. During the design phase of the new educational facilities, there was a concerted effort to include community input through public workshops and a design charrette to hear

the public's concerns and incorporate their suggestions into the design. All interested members of the community were invited to participate and have their concerns addressed. In addition, the re-establishment of a Community Advisory Committee to provide input on proposed Ranch activities will give those in the local community an opportunity to provide input into Ranch activities.

For its part in community participation, representatives of the Ranch have been involved in the Community Supported Agriculture (CSA) program which provides networking with other CSA participants, the Holistic Management Organization which has membership both locally and throughout the U.S., and marketing produce in the local farmer's market and stores. In addition, Swanton Pacific personnel are participants in the Scotts Creek Watershed Council, and the Blue Circle County Watershed Council.

14.6. Lease, Use and License Agreements

There are presently five lease agreements in existence on the Ranch, one of which is informal and two are nominal (see Figure 8). All leases are renewable provided the terms of the lease are followed. There are also two use agreements, one of which Cal Poly is the beneficiary. There are also license agreements for residential Ranch employees. The following is a brief description of the terms of these agreements:

14.6.1. CDF Fire Station

There is an existing lease in effect till May 2018 in which rent of $500 shall be paid annually and may be increased or decreased every ten years based on the Consumer Price Index's U.S. City Average Series A.

14.6.2. Boy Scout Camp

An agreement with the Santa Clara Boy Scouts is to be undertaken shortly to permit continued use of the camp in the north of the property to absolve Cal Poly Foundation from liability for its use.

14.6.3. Organic Fields

A lease exists between the Foundation and Jacob's Farms/Del Cabo Inc. for a period of five years beginning on April 1, 2001 to grow organic row crop vegetables and flowers on approximately 58 acres (Fields 1, 2, 3, 5, and 6) including the irrigation pump's main line and the fencing. These fields shall be re-measured subsequent to any approved brush

removal by the lessee as a basis for future amendments or renewals of the lease. The lease requires the lessee to pay all expenses for the construction of the fence on Fields 5 and 6 that shall be maintained by lessee but shall be the property of the Foundation. The lessee shall pay all relevant property taxes and insurance costs. Provision is made to include field instructional sessions and to engage students and interns in field operations. Specifically, Jacob's Farm/Del Cabo Inc. is to provide quarterly educational modules for the students. Cal Poly may also obtain food products for the food processing program at cost plus 10%.

14.6.4. Cow/Calf grassland

An informal agreement exists with the McCrary family to pasture a cow/calf operation on the fields at the Schoolhouse in return for an animal unit per month (AUM) fee. The owner is responsible for maintaining the fence in good condition.

14.6.5. Use Rights on Spafford lands

The Spafford family owns an 80-acre parcel on the northeast boundary of Swanton Pacific, but Cal Poly has the timber harvest rights on this land as well as use rights for educational and research purposes.

14.6.7. License Agreements

These license agreements regulate the terms of residency at the Ranch and every Ranch employee provided with accommodations is required to sign an agreement and abide by the terms. George Delatorre, permanent resident at the Ranch, also has a license agreement with the Foundation.

14.7. Easements

There are several access and utility easements across Swanton Pacific property. There is also a Wetlands Reserve Program (WRP) conservation easement on 20.4 acres of the Scotts Creek floodplain. The easements for SPR are shown on Figure 8.

14.7.2. Swanton Pacific

Swanton Pacific Railroad has an easement from the adjacent property owners, the McCrarys, for the railroad track through the field to the north of the Red House. A road easement exists across the property of Jerry Piepmeyer to reach the northwest pasture. Currently access is restricted to one trip a day.

Neighbors east of the Labor Camp have an easement for access on the paved road that they help to maintain. The McCrarys have an access easement past the Schoolhouse, the Boy Scouts have access to their Scout Camp and PG&E has utility line access from Swanton Road across Al Smith's Driveway, from Hwy 1 on the west of the marsh and across the fields to the pumps.

The Wetlands Reserve Program (WRP) is designed to remove crop fields that are prone to flooding from production and the former crop fields and riparian zone along Scotts Creek and the new Queseria Creek alignment met all the criteria for enrolment in the program. $40,000 have been setup in a WIP account for 20.4 acres that have been enrolled in the NRCS WRP. Besides this payment for retiring the land from production and placing under conservation easement, the WRP also is contributing to restoration costs for grading the floodplain and restoring the hydrologic performance and habitat of Queseria Creek.

14.8. Vehicle Operations

There are 8 licensed vehicles in use on the Ranch. A vehicle is provided for the Ranch Director, Livestock Manager and Natural Resource Specialist. All Ranch personnel are required to undertake vehicle safety training prior to driving any Ranch vehicle. A list of the type of vehicle and registration is contained in Appendix G.

The remaining machinery is used primarily for cropland and consists of the following equipment. There are three tractors, one dual-wheel tractor and one tractor harvester used by Swanton Pacific Ranch staff and interns. These are used to pull the planter, disks, rototillers, mowers or trailers as needed. There are also a forklift, grader, skidder, extendahoe, and a transportable sawmill for the Ranch use. Two ATVs and a Polaris Ranger are used for off-road transportation. License and machinery identification numbers are included in Appendix G as well as other Ranch equipment.

There is a convault tank located at the barn containing two 500-gallon tanks, one for diesel and one for unleaded fuel tanks. These tanks are for Ranch vehicle use only and fuel records are kept at the tanks. It is desirable to remove the old tanks from the Ranch when there is an alternative site for them.

14.8.1. Management

Ranch personnel manage the farm machinery, and an inventory of all vehicles and machinery is kept updated to help determine a vehicle replacement schedule that is required by the Foundation. All equipment is stored at the Long Barn.

14.8.2. Maintenance

This is either undertaken onsite by the intermittent staff person or by the local dealer. Tires are replaced by Lloyds Tire Mobile Service of Santa Cruz. A vehicle maintenance chart is maintained by the Ranch mechanic at the barn. Used oil is stored in 55-gallon drums in a concrete pit at the Long Barn and is disposed of approximately every two years.

14.8.3. Vehicle Needs

All the general purpose Ranch vehicles are deteriorating and an effort is underway to replace these vehicles through donations and through existing funding.

14.9. Regulations

Swanton Pacific Ranch must address all relevant Federal, State and County Regulations in addition to those of the California State University System and the Cal Poly Foundation. This section briefly describes those regulations that are pertinent to operations on the Ranch with reference to the pertinent legislation or document for more complete information. All employees are informed of the regulations that affect them during staff development sessions and when pertinent regulations are modified or introduced.

14.9.1. Santa Cruz County Building Code Compliance

Building permits must be obtained from the County for modifications to existing buildings and the construction of additional structures. The Cheese House building which is listed as historic may not be modified from its original structure. A Santa Cruz County Building Code Violation was issued on the Red House/Railroad parcel for the following:

- Holding in excess of four annual public fundraising events without the required development permit
- Installation of four cabooses without a Discretionary Permit
- Construction of an approx 400 sq ft equipment shed without permits
- Construction of a covered railroad station without permits
- Structural remodel of Cal Barn without permits

- Void building permits #78681 (engine house) and 87870 (mobile home)
- Installation of 7 RV hookups without permits

The stipulation signed by the Foundation provides that within two years from February 13, 2003 the Foundation shall obtain all required Development and Building permits or the Enforcement Costs of $648 and Civil Penalties of $4,500 shall become a Special Assessment Lien on the subject property. This deadline may be extended by discretion of the Hearing Officer upon written request by the Foundation to the Planning Department no later than 30 days prior to the deadline.

14.9.2. Streambed Alterations

Sections 1600 - 1616 of the California Fish and Game Code affect all persons whose activities might substantially divert or obstruct the natural flow or change any portion of the bank or bed of the water body (see http://www.dfg.ca.gov/1600/1600code.html for full details). Such activities include the removal or deposit of material into the water. The CDFG Department must be informed of any such proposed activity and may make onsite investigations if invited or it deems necessary. The Department must notify the operator of its proposals within 30 days of receipt of the application and the operator respond within 14 days unless mutually extended.

Persons submitting Timber Harvesting Plans under provisions of the California Forest Practices Act may consider that notification to the CDFG has been given provided that the information requested in the Department's addendum to the Timber Harvesting Plan application is included.

Since 1996, Section 1600 of the California Department of Fish and Game provides for emergency work necessary to protect life or property. The code requires that the CDFG be notified within 14 days of the commencement of such emergency work with possible mitigation recommendations provided by the Department at a later date. CEQA Guidelines Section 21060 specifies that emergency means a sudden unexpected occurrence involving a clear and imminent danger and demanding immediate action to prevent or mitigate damage.

The general guidelines provided for projects in and adjacent to watercourses are: avoidance of substances hazardous to aquatic life; minimum disturbance of vegetation and restoration as far as possible; minimization of work with heavy and mechanical equipment in flowing water; and avoidance of impeding fish passageway by any water crossings. Repairs

should not impact the hydraulic integrity of the watercourse nor modify levees from their original dimensions or materials. See the CDFG website listed in the Technical Appendix for further details.

14.9.3. Forestry

All SPR forestry operations conform to the California Forest Practice Rules. In addition, harvesting activities conform to the State approved, Non-industrial Timber Management Plan referred to as the Swanton Pacific Ranch NTMP. Agencies who approved the NTMP as part of the review process included, CAL FIRE, California Department of Fish and Wildlife, United States Fish and Wildlife Service, National Oceanic and Atmospheric Administration which the National Marine Fisheries Service is a part, Army Corp of Engineers, California Geologic Survey, Coastal Commission, and the County of Santa Cruz. Forest management activities are also guided by the Forest Stewardship Council. Detailed information on the extent of these activities can be found at this link:
http://spranch.calpoly.edu/documents

14.9.4. Endangered Species

The 1973 Endangered Species Act (ESA) provides a means whereby the ecosystems upon which endangered and threatened species depend may be conserved and to develop a program for the conservation of such species. Species are designated as endangered if in danger of extinction throughout all or a significant portion of its range and threatened if likely to become endangered in the forseeable future. Species can be listed as candidate species while awaiting classification. Section 9 of the ESA prohibits the 'taking' of any endangered species which includes 'to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct (Section 3-19). This section applies to private parties as well as public parties. Harm is currently interpreted to be an act that actually kills or injures wildlife, but may include habitat modification that produces the same result by altering behavioral patterns or impeding the recovery of the species. Plants are not offered the same degree of protection as animals by this provision.

Swanton Pacific Ranch and its employees are immune from the 'take' provision of this Section while fording Scotts Creek with farm equipment due to the exercise of this activity prior to listing of any endangered species. Currently several federally listed animal species exist on the property although no plant species are listed as yet.

The State of California has its own Endangered Species Act that conforms to a large extent to the Federal Program but recognizes additional species, often at the recommendation of the California Native Plant Society (CNPS). Several plant species on Swanton Pacific Ranch land have been identified by CNPS as rare. State sanctions are not as stringent as those of the Federal Regulations.

14.9.5. CCOF Organic Certification

In order to qualify for CCOF certification, the operation must adhere to the California Organic Foods Act of 1990. This includes maintaining written and comprehensive records for at least three years after the crop has been sold that are available for inspection within 72 hours of a request. Records must include maps with the dimensions and boundaries of the land on an accurate base map. These boundaries must be marked by permanent physical objects and have a minimum buffer zone of 25 feet from the dripline of the crop if there is any concern about the possibility of contamination from adjacent areas. Organic Farm Input Reports or similar must record all inputs with dates of application, quantities and the source for materials used on the fields, seeds and water including post harvest rinse water. Harvest records must include the crop, field identification, date of harvest and amount harvested. Sales records must include the date of sale, the crop, the amount sold and the field identification. A chronological log of all activities is also encouraged.

No food certified as organic may contain more than 5% of the federal Environmental Protection Agency tolerance level of any prohibited material or residue including that beyond the control of the producer. Accepted organic practices include rotation and diversification as key principles incorporated with legume and cover crops and integrated pest management practices.

In applying for certification, the operator must complete the application form and will receive an inspection of the operation within 90 days. At this time the farm manager and the person responsible for maintaining records must be present. The Farm/Handling Plan Update form must also be completed either before or during the inspection. Complete input, harvest and sales records must be available for inspection. Soil, product or water samples may be taken for analysis. Reports for growers are submitted to the local certifying Chapter and State within 30 days of the inspection.

A second follow-up inspection is required prior to receiving certification. This occurs 90 days after the first inspection or longer if that is required to bring the operation in full compliance with certification conditions. The public may obtain the name and address of the operation, organic acreage, crops, inspection date and inspector's name, certification status and the growing practices as well as the dates of the last prohibited material use.

Once certified, all food grown, handled, sold, advertised or represented as organic must be prominently labeled, invoiced, and represented with language substantially similar to 'organically grown in accordance with the California Organic Foods Act of 1990'. For unpackaged food, it is sufficient to place the language on or near the container holding the food. Organic products must also be distinguished from non-organic products. An assessment fee of 1% is charged on gross sales of all product sold as 'organic' or 'transitional'. This fee is paid quarterly in addition to the $100 annual fee (for sales less than $20,000) and the $175 application fee.

All active operations are inspected at least annually. A soil fertility analysis must be done in the first year of CCOF membership and at least every third year thereafter. Two sources that prove non-use of prohibited materials are required. This can be a letter from the County Agricultural Commissioner that no Pesticide Use Reports have been filed for the parcel, an affidavit from a third party, or a signed affidavit from a neighbor. A long-term soil management plan must be implemented to create a healthy, fertile and biologically active soil to correct nutrient deficiencies. A separate application must be made for any additional land entered into the program.

14.9.6. OSHA Regulations

The following posters are required for the workplace and are displayed at the Green House:

Pay Day Notice (DLSE 8)

Discrimination in Employment is Prohibited by Law (DFEH 16-2)

Equal Employment Opportunity is the Law

Safety and Health Protection on the Job

Notice of Workers' Compensation Carrier

Notice to Employees: Unemployment Insurance and Disability Insurance

Fire Prevention and Evacuation Plan (not for less than 11 employees)

Emergency Phone Numbers

Notice: Employee Polygraph Protection Act WH 1462

Notice to Employees of Possible Exposure to Toxic Substances

Industrial Tuck (Forklift) and Industrial Tow Tractor Operator's Rules

Worksite Permits

Citations, Special Orders, Orders to Take Special Action and Notices of No Violations

Notice to Employees: Time off to Vote (posted 10 days preceding statewide elections)

Injury and Illness Prevention Program

Identification of the person(s) responsible for implementing the program, how workplace hazards are identified and corrected, how employees are instructed in and comply with general safe and healthy work practices and how they may communicate hazards.

Injury/Illness Recordkeeping and Reporting System

If an employee suffers an occupational injury, illness or death forms DWC form 1 (Employee's worker compensation claim), DLSR Form 5020 Rev 5 (Employer's report) and DLSR Form 5021 Rev 3 (physician treatment form) must be completed. The employee's claim form must be provided within 24 hours to the employee and a copy sent to the insurer. The employee Form 5020 is only required if the injury/illness results in absence from work of a full shift or more beyond the date of injury or more than first aid is required. The employee should complete a portion of the Form 5021 if able to do so. The nearest Cal/OSHA district office (408) 452-7288 must be contacted within 24 hours after employer learns about serious work-related injury/illness or death of an employee on the job site.

Emergency Action Plan.

This plan may be communicated orally when there are less than 10 employees. Such a plan should include emergency escape routes and evacuation procedures, how employees will be accounted for, how emergencies will be reported, and the type of alarm system.

Fire Prevention Plan

A fire prevention plan is also required listing potential fire hazards, ignition sources and how they will be handled including the type of fire protection equipment or system. The

plan should include the names or regular job titles of those responsible for the control of flammable or combustible materials and maintaining the equipment for fire prevention or control. Housekeeping procedures should also be included in the plan. Employees should be notified of the relevant portions of this fire prevention plan. This is to be developed in the near future and will include fire prevention and emergency evacuation procedures for the educational facilities.

Access to Employee Exposure and Medical Records

Access must be provided within 15 days of request. Medical and exposure records must be kept for 30 years beyond the duration of employment.

Safe Drinking Water and Toxics Enforcement Act

Requires that all those visiting the work site be informed of any chemical known to the state to cause cancer or reproductive toxicity.

Hazard Communication Program

This requires a written company program to document compliance with the standard, a list of hazardous substances, collection of Material Safety Data Sheets (MSDS) and making them available to employees, labeling containers of hazardous substances and undertaking employee hazardous chemical training. The Hazard Communication Program should detail the names of the persons responsible, hazardous substances inventory, and methods used for training, labeling and MSDS handling. Each hazardous substance should have an MSDS containing 18 items that is kept on file. Raw materials or products to be disposed of must be recorded on a MSDS. A Hazardous Materials Plan has been developed for the Ranch and will be updated as needed.

Electrical Extension Cords

Extension cords shall be used only as temporary extensions for portable equipment unless not routinely used and where permanently wired receptacles are not available. Outlet strips are a possible alternative to extension cords.

Pesticide Use

Employees must be trained for each pesticide to be used before being allowed to handle pesticides and must be given an annual update. The date and extent of initial and

annual training must be given along with the job assignment and signed by both the employee and employer. Physician treatment is required for any suspected pesticide illness or exposure.

14.9.7. Cal Poly Regulations

Cal Poly Foundation, in accordance with Title 8, Section 3203 of the California Code of Regulations, has assigned a Safety Administrator to insure proper processing, storage and reporting of all documents, routine inspection of Foundation facilities, implementation of employee safety training and analysis of the cause of injury or illness. The Foundation also sponsors a Safety and Health Committee with Department Heads responsible for reporting injuries or illnesses to the Committee.

Injuries

If an injury occurs and medical treatment is required, the injured employee must be accompanied to a suitable treatment facility and the doctor provided with the Authorization for Workers' Compensation Medical Care form. The Foundation's insurance carrier is CalComp Insurance Company. The injured employee must be provided with Employee's Claim for Workers Compensation Benefits, DWC FORM 1 within 24 hours and the Safety, Fitness and Training Office must be notified at (805)
756-1151. The Supervisor's Injury/Illness Report must be submitted to the Safety Office within 24 hours of the incident, and DWC FORM 1 attached if medical treatment was given. Pat Hosegood Martin at 756-1151 must be informed of the patient's progress and date of return to work. A doctor's release must be obtained before the employee returns to work and forwarded to the Safety, Fitness and Training Office.

Safety Training

The Foundation requires each supervisor to use the Supervisor's Safety Orientation checklist during the orientation of each new regular employee and to send a completed, signed checklist for inclusion in the employee's personnel file. Safety training should occur within five days of the employee's hiring. Both formal and informal training must be documented.

Hazardous Chemicals

All employees are to have easy access to the Material Safety Data Sheets (MSDS) of all hazardous chemicals in use on the premises and supervisors will annually train employees

regarding hazardous chemicals or when a new, significant hazard is introduced. Proposition 65 requires that all employees be notified before any exposure to any chemical known to the State of California to cause cancer or reproductive toxicity. The Ranch has the responsibility of developing its own hazardous materials list that is to be kept updated.

Vehicle/Heavy Equipment Use

In order to drive any Foundation vehicles, all employees must maintain a driving record acceptable to the Foundation's insurance carrier. Department heads shall submit to the Foundation the names of all Department employees who regularly drive Foundation or State vehicles as part of their job duties and the employees may be required to attend periodic training on vehicle safety. Each vehicle is to be inspected on a daily basis and the results maintained in a logbook. Only trained operators shall be permitted to operate a power forklift after completing annual training and successful examination.

First Aid

Each work area shall be equipped with a first aid kit and individuals in the work area shall be familiar with its contents.

Emergency Evacuation

Each Department Head shall insure that all employees are familiar with the emergency evacuation route and designated gathering area for their specific department. Emergency drills are to be conducted at least annually. In the event of an emergency, all special attention areas should be inspected. All fire extinguishers are to be inspected annually.

Workplace Violence

Supervisors are responsible for maintaining a copy of the Foundation's Injury and Illness Prevention Program (IIPP) that address the hazards associated with violent acts in the workplace. All employees need to be informed of the IIPP and trained on workplace security practices and to abide by the regulations that prohibit workplace threats or acts of violence. Periodic workplace assessments are performed to determine security hazards and threats of workplace violence and corrected in a timely manner when they are discovered.

14.9.8. Swanton Pacific Residents' Regulations

All visitors and employees of Swanton Pacific Ranch are expected to abide by the Ranch regulations that are available for review upon request. In addition, those employees

residing at the Ranch as a part of their job duties are required to sign a license agreement stating the terms of residence.

14.10. Swanton Pacific Ranch Plans

This Management Plan covers actions as they are currently conceived for the next five years. These may not be implemented within the designated time frame and include recommended actions that currently do not have resources for implementation. The five-year matrix further specifies how these actions are to be implemented and the document as a whole is designed as an informational account of Ranch programs. This will be updated regularly by Ranch staff and project leaders. Other actions that are related to the development of this Plan are those of evaluating a change of ownership from the Foundation to the State and applying for rezoning as needed.

14.11. Resource Management Monitoring

In addition to monitoring that is undertaken for specific projects (such as grassland and forest monitoring), it is desirable to establish water monitoring and fire management plans. There is work underway currently on water quality monitoring for Little Creek forestry operations.

14.12 GIS database for SPR

A significant amount of good work has been completed on the GIS database which also incorporates County database information. The GIS maps are widely used in classes and in support of Ranch projects. There is, however, a need to continue to develop a “master” administrative GIS file and back-up CDs of the most requested Swanton maps.

15. FINANCES

This section is intended to describe the available sources of income for the operation of SPR as well as a summary of previous and projected fiscal activities. The various actions outlined within this plan and summarized in Appendix A are assigned costs and hours in the Action Implementation Matrix contained in Appendix I. A summary of actual and projected expenses for the Ranch for the 2003-04 Budget is included in J. A complete breakdown of expenses is included in the Technical Appendix.

15.1. Income Sources for Swanton Pacific Ranch

Prior to the transfer of the Swanton Pacific Ranch quasi-endowment, Al Smith provided funds for the improvement and operation of the Ranch and railroad activities. These endowment funds have made it possible for Cal Poly to undertake the responsibility and costs of administering the Ranch as a component of its educational program. The principal of the three existing quasi-endowment funds can be used at any time if approved by the respective Project Director and the President, but normally an annual payout is made using a spending formula. This formula is based on a three-year average of the endowment's value at December 31st multiplied by a payout percentage that is currently 4.5%. Each endowment fund is described in greater detail below:

<u>Swanton Pacific Ranch Railroad Quasi-Endowment (Account #0394)</u>

This fund is intended 'for the exclusive purpose of supporting and enhancing the Swanton Pacific Ranch Railroad Program as outlined in the plan of operations, or as that plan may be amended from time to time with approval from the University President.'

Project Director

Ed Carnegie

Current balance

$2.145 million approximately

Funding mechanism

The Dean of the College of Agriculture and the University President approves funding requests and funds are deposited in a Foundation restricted gift account #6053.

<u>Al Smith Agriculture Endowment (Account #0395)</u>

This endowment was established 'for the exclusive purpose of supporting and enhancing the agricultural educational programs at California Polytechnic State University, San Luis Obispo, including the support of Swanton Pacific Ranch and related programs or projects.'

Project Administrator

David Wehner

Current balance

$18.735 million approximately

Funding Mechanism

Dean Wehner requests funding with the uses approved by the President after other available operational income has been projected and applied. Payment is made through a Foundation restricted gift account #6087.

15.1.1. Operations income

Money is available from the Al Smith Agriculture endowment fund to augment the income obtained at Swanton Pacific Ranch for operating costs. However, the Ranch has been self-supporting in all its operations recently except for the educational operation. This operation will depend on continued support from the Al Smith Agriculture Endowment. To achieve operational profitability, a number of financial strategies are being employed. These include: forestry, livestock and crop operations; lease payments; and grant awards. There is also some potential for income from private/public partnerships which is being explored currently.

<u>Forestry – Fund 27030</u>

Forest management activities are ongoing at Swanton Pacific Ranch. Our primary goal is to establish a forest that demonstrates the leading edge of the science and practice of sustainable timber management, consistent with state and county laws, for the benefit of Cal Poly/CAGR/FNR students and the community-at-large. The management objective is to establish a regulated uneven-age forest that will provide a sustainable, economical yield of coast redwood and Douglas-fir forest products, other forest uses, and amenities.

Forest Management Plans have been completed for all Swanton forest properties. Project completion is tiered to direction provided in the Forest Management Plan.

A timber harvest has occurred in Lower Little Creek for 2004/05 with projected revenue of $125,000. The budget for this fund is presented in detail below.

Table 2 Summary of Forestry fund (27030) budget

	Actual 6/30/02	Actual 6/30/03	Budget 6/30/04	Projected 6/30/04	Budget 6/30/05
Sales and Revenue	$1,109,433	$525,495	$2,000	$0	$134,500
Operating Expenses and Payroll	166,853	116,249	97,394	107,921	139,139
Income from Operations (Loss)	942,580	409,247	(95,394)	(107,921)	(4,639)
Transfer to Educational Endowment	(109,782)	0	0	0	0
Support (960000)	0	0	0	0	0
Other Income and Expenses	(375)	(533)	0	0	0
Net to Reserve	$832,423	$408,713	($95,394)	($107,921)	($4,639)

Livestock

This includes the stocker and cow/calf projects currently.

Beef – (Fund 27010)

The Swanton Pacific Ranch lends itself to an excellent grazing operation because of the steep hillsides and potential for improved grass management and long growing season. Together with Holistic Resource Management teachings practiced on the Ranch, beef cattle have had a long successful history in this educational enterprise. Stocker cattle make up most of the beef cattle found on the Ranch after the large cowherd was disbanded several years ago.

The number of stocker cattle grazed each year depends entirely on the perceived forage production on the ranch, which is a function of water storage, rainfall and temperature. The 2003 grazing season was poorer than expected. Rainfall was under average, resulting in decreased forage growth. Fortunately, the number of cattle was decreased so the forage production would match the consumption needs. It is difficult to build the budget for each successive fiscal year because the cattle that are currently on the range will leave the Ranch in either June or July - the next fiscal year. The timing of their departure will influence the fiscal year that the grazing fee will be credited. The proposed budget was developed with

the assumption that the cattle will remain at the Swanton Pacific Ranch until the 2004-2005 fiscal year.

For the 2003 grazing season, the cattle were flown over. For the 2004 grazing season, the Hawaiian cattle were shipped by boat in containers. In addition, the Kahua Ranch was not able to supply enough cattle to meet our demands for 2004. Therefore, 202 animals were provided by Caprock Industries. These cattle are being run with the Kahua and some Swanton cattle on the West Range.

Average daily gains were better than average, thereby increasing income. This is a function of the weather, obviously beyond our control. The student enterprise expenses were higher than projected with 18 students participating last year and 18 again this year. The enterprise continues to cost a significant portion of our proceeds. However, the educational experience for the students is critical and consistent with the mission of Cal Poly and the Swanton Pacific Ranch.

Income is projected to be higher for 2004-05 than the previous fiscal year because the number of cattle is greater. Unfortunately, the rangeland is approximately 10 inches below normal precipitation, with no additional rain in the forecast. The number of stockers is approximately 550. The stocker enterprise should meet projections in the current fiscal year.

A capital request of $7,000 has been approved this year for this fund to purchase 20 new galvanized gates which can better resist the oceanside environment.

Table 3 Summary of Beef fund (27010) budget

	Actual 6/30/02	Actual 6/30/03	Budget 6/30/04	Projected 6/30/04	Budget 6/30/05
Sales and Revenue	$34,530	$40,714	$30,812	$25,879	$42,875
Operating Expenses and Payroll	46,673	56,442	49,112	38,400	51,706
Income from Operations (Loss)	(12,143)	(15,729)	(18,300)	(12,520)	(8,831)
Support (960000)	0	0	0	0	0
Other Income and Expenses	(1,564)	1,817	0	(400)	0
Net to Reserve	($13,707)	($18,300)	($13,912)	($12,921)	($8,831

Beef Cow/Calf (Fund 27050)

Maintenance of a cow/calf herd at Swanton has a long history at the Ranch. Although downsized from 15 years ago, the cows still provide a valuable service to the Ranch, and serve as a profit center for the beef program. The cows are utilized to reduce brush and forage growth that may otherwise lead to a fire hazard. In addition, the herd provides the opportunity for students to gain experience in cow/calf herd management.

The cow/calf herd management is undergoing substantial changes. In the past, all calves were sent to market, and all replacement females were purchased from the Cal Poly Foundation Beef Program. However, we have been developing a breeding program that will specifically target the Santa Cruz County population's demand for grass-fed, natural beef. Starting in 1998, replacement females have been selected from the heifer calves. The genetics of the herd will be shifted toward more early-maturing, muscular cattle. This type of animal is conducive to other grass-fed beef programs.

After a transition period during which losses were incurred, the project is now profitable and is projected to continue to be so. We are not selling as many calves in order to replace old, non-productive cows. However, part of the management program is to be more selective in the cowherd. We now have all of the cows individually identified, have implemented a pregnancy checking program, and are building a database for record keeping.

In the past, the beef project considered both the stocker program and cow/calf herds as one entity. However, the projects are distinctly unique in their management, budgeting and philosophy. Therefore, the stockers and cow/calf herds were split into separate projects to facilitate more accurate budgeting and allow for profit analyses.

A natural beef marketing enterprise was established in 2003-2004 to establish a market in San Luis Obispo and Santa Cruz. Seven steers were harvested in May/June 2003, and four more in October 2003. There were 14 steers harvested in Spring 2004. Price per pound has been increased from last year. The revenue from each animal will exceed $1,800. This is much greater than otherwise possible through traditional marketing.

Table 4 Summary of Beef Cow/calf fund (27050) budget

	Actual 6/30/02	Actual 6/30/03	Budget 6/30/04	Projected 6/30/04	Budget 6/30/05
Sales and Revenue	$8,755	$20,510	$22,200	$16,455	$21,500
Operating Expenses and Payroll	12,666	13,897	20,734	13,903	20,80713
Income from Operations (Loss)	(3,911)	6,613	1,466	2,552	693
Support (960000)	0	0	0	0	0
Other Income and Expenses	3,654	9,478	3,000	(143)	0
Net to Reserve	($257)	$16,091	$4,466	$2,409	$693

Crops – Fund 27020

Jacobs Farm/Del Cabo Inc. continues to lease and conduct the farming of Swanton Pacific cropland. The lease agreement is for 55 acres at $300 per acre a year. Jacobs Farm has an educational lease agreement with Cal Poly Foundation. Swanton Pacific Ranch and Jacobs Farm will work together with Crop Science students in providing a dynamic internship opportunity. We will be able to work with four Crop Science students during the summer quarter and one to two students Spring and Fall quarters.

The primary source of income for the Crops fund is the Jacobs Farm/Del Cabo land lease. All the maintenance for tractors, implements, fencing and equipment gets charged to the project. By increasing the lease of the cropland, there is a decrease in oat hay production, which in turn results in a lowered use of the pumps for irrigation. However, considering the increase in electrical charges there will not be a noticeable difference in utility costs. Crops production has been reduced over the past few years in favor of the educational lease arrangement with Jacobs Farm/Del Cabo. The current crops include five acres of pumpkins, two acres of apples, two acres of Christmas trees, and a garden for intern and Ranch personnel use. This pattern of cropping is anticipated to continue in the future with better payouts due to apple and Christmas tree sales.

We are looking at alternative enterprise endeavors within the Crops projects to increase student involvement at the ranch.

Actual and projected budget figures are provided below.

Table 5 Summary of Crops fund (27020) budget

	Actual 6/30/02	Actual 6/30/03	Budget 6/30/04	Projected 6/30/04	Budget 6/30/05
Sales and Revenue	$6,000	$23,200	$18,000	$500	$18,000
Operating Expenses and Payroll	22,464	23,625	20,167	12,094	19,463
Income from Operations (Loss)	(16,464)	(425)	(2,167)	(11,594)	(1,463)
Support (960000)	0	0	0	0	0
Other Income and Expenses	(960)	(139)	0	0	0
Net to Reserve	($17,424)	($564)	($2,167)	($11,594)	($1,463)

Christmas Trees (Fund 27260)

The second planting of Christmas trees occurred in fiscal year 2003-2004. The third planting will occur in this fiscal year. The area was fenced to protect the trees from deer.

The first sales from this are anticipated in two years. No net revenues are projected for this project for the next two years with a loss of $5,436 for 2003-04 and a projected loss of $3,759 for 2004-05.

Oat Hay (Fund 27270)

No planting will occur; this is again a fallow year. Minor expenses will occur such as disking and seeding. Actual net revenues were a loss of $714 for 2003-04 and a projected loss for 2004-05 of $1,159.

Pumpkins (Fund 27280)

The Ranch continues to grow pumpkins for a fall market. The majority of the pumpkins grown are for contracted sales to Roaring Camp Railroad. The entire sales period is the month of October. A limited number of pumpkins will be sold in the apple orchard and at fall events at Swanton Pacific Ranch. Fall school tours were abandoned last year as part of the budget reduction. Leasing the land currently cultivated for pumpkins is being considered due to the low educational value and the lack of participation of crops students and faculty. Students and faculty interested in crop production, particularly with organic growing, will be encouraged to consider projects or internships with Jacobs Farms.

Net revenues for 2003-04 were a loss of $1,118 and a projected loss of $4,570 for 2004-05.

Apples (Fund 27240)

The third sale of apples will be this year. The entire orchard has been deer fenced to protect the apples from being eaten by the deer. Net revenues were a loss of $5,902 for 2003-04 and a projected loss of $406 for 2004-05, although new vendors have been identified and sales are expected to be increased from projections.

Market Garden (Fund 27230)

This one-acre garden is grown to supplement food for the interns and as another educational tool for the interns to have the opportunity to produce their own vegetables. The area has been deer fenced which will increase the yield. Also, this has protected the crop from feral pigs. Net revenue was a loss of $977 in 2003-04 and a projected loss of $309 in 2004-05.

Education (Fund 60170)

Endowment support of $45,627 will be deposited to this account for funding the 2004-2005 fiscal year activities. The Instructional program at the Ranch continues in the same mode as in the past few years. Internships are offered all four quarters, with summer quarter being the most heavily enrolled. There were seven Cal Poly interns for the summer quarter 2004. The number of interns present affects the budgets for all projects on the Ranch during various quarters.

We continue to support international participation of interns at the Ranch through MESA (Multinational Exchange for Sustainable Agriculture) and from the EARTH campus in Costa Rica. For 2004-05 we are planning on two MESA interns from April through November.

The maintenance on the Al Smith residence and facilities is being covered out of this fund, since the main purpose of that facility is for educational workshops and meetings. No Capital expenditures are planned.

No income is generated from this fund and net losses were $35,221 for last year and there is a projected loss of $17,115 for this fiscal year.

General Administration – Fund 27000

General operations are continuing at the reduced level implemented in 2003-04 due to budget restrictions. A small timber sale in Little Creek will add to the revenues; however, a significant amount of support will be required from the Al Smith Endowment

for Agriculture. Progress is continuing on the facilities and infrastructure upgrades to support the educational efforts at the Ranch. We are continuing to review the infrastructure of the ranch and upgrade where necessary, with health and safety issues taking first priority.

Capital requests include $18,000 for a new pickup truck, $10,000 for 4 new computers and $500 for a new printer.

Table 6: Summary of General Administration Fund 27000 budget

Table 6 Summary of General Administration fund (27000) budget

	Actual 6/30/02	Actual 6/30/03	Budget 6/30/04	Projected 6/30/04	Budget 6/30/05
Sales and Revenue	$10,404	$11,191	$0	$24,486	$0
Operating Expenses and Payroll	371,859	567,633	341,478	372,912	339,485
Income from Operations (Loss)	(361,455)	(556,442)	(341,478)	(348,426)	(348,426)
Transfer to Educational Endowment	0	0	0	0	0
Support (960000)	(420)	(960)	0	(139)	0
Other Income and Expenses	(12,648)	(8,750)	(40,000)	(3,882)	471,000
Net to Reserve	($105,782)	($565,192)	($381,478)	($352,308)	$131,515

15.1.2. Lease Payments

There are two nominal lease agreements which were put in place by Al Smith and that do not generate income for the Ranch (the CDF station and Troop 534 Scout Camp). There is a lease agreement that has been made for five years beginning on April 1, 2001 with Jacobs Farm/Del Cabo Inc. for an income of $300 an acre.

15.1.3. Grants

There is considerable potential for obtaining grant monies for habitat improvements on the property. To date funds have been awarded for grants for riparian livestock exclusionary fencing through the NRCS WHIP program with a 25% in-kind match. Funds have also been awarded for the Scotts Creek watershed from CDFG for activities that will benefit the ranch as part of this watershed. There were three CDFG grant awards for exotic plant removal, roads inventory and watershed council support activities. Funding was also obtained from the Farm Services Administration (FSA) to repair the existing levees after the 1998 storm damage and more recently from NRCS, CDFG and American Rivers for restoration work to Queseria Creek. Conservation easement monies of approximately

$40,000 have been setup in a WIP account for 20.4 acres that have been enrolled in the NRCS WRP.

15.1.4. Public/Private Partnerships

A future direction for the Ranch is to encourage private partnerships that complement and enhance the educational program of the ranch and increase operational returns. Funding for the construction of the educational facilities will be financed entirely through this means to augment the existing endowment fund monies.

Another potential partnership that is currently being explored is that of the establishment of a mitigation bank for habitat values of the Scotts Creek Marsh and riparian areas. A well-established commercial bank operator is in the process of entering into partnership with Cal Poly Foundation to implement a restoration plan and manage the bank in cooperation with Swanton Pacific Ranch.

Appendix A: Summary of Actions 2004 -2009

Appendix B: 2002-03 Rainfall totals for Swanton Pacific Ranch

+ MS = missing data
+ If blank, station was not recorded on that date but is reflected in the subsequent recording
+ Readings are in inches
* LQC = Lower Queseria Creek (outside map area)

Station:	A	B	C	D	E	F	LQC*
Elevation (feet):	1530	660	1620	660	450	70	40
Dist. from coast (mi.):	3.7	2.8	3.2	2.4	1.5	1.2	0.5
Date							
11/12/02	Gauge installed on 01/17/03	2.19	Gauge installed on 02/12/03	2.80	2.17	2.19	1.31
12/10/02		0.38		0.36	0.35	0.42	0.41
12/17/02		11.55		10.50	8.95	7.31	5.84
12/24/02		2.79		2.70	2.70	2.95	2.26
12/30/02		2.65		2.30	1.70	1.40	
01/07/03		0.95		0.82	0.59	0.73	2.06
01/14/03		1.50		1.45	1.02	0.99	0.85
01/21/03	0.13	0.07		0.07	0.06	0.08	0.08
01/23/03	0.82	0.64		0.57	0.32	0.30	0.25
02/15/03	1.36	1.10	1.28	1.10	0.77	0.63	0.73
02/17/03	1.64	1.55	1.38	1.50	1.20	1.13	0.95
02/20/03	0.10	0.20	0.18	0.18	0.10	0.08	0.07
02/25/03		0.65	0.78	0.52	0.49	0.53	0.51
02/27/03		0.33	0.30	0.30	0.28	0.27	0.27
03/14/03	Missing data	0.31	0.41	0.33	0.16	0.12	
03/15/03		0.90	1.03	0.87	0.70	0.64	
03/17/03		0.45	0.42	0.37	0.29	MS	1.20
03/20/03		0.09	0.07	0.08	0.06	0.02	0.09
03/25/03		0.04	0.02	0.03	0.02	0.02	0.03
03/04/03		0.05	0.03	0.04	0.03	0.02	0.02
03/11/03		0.72	0.68	0.68	0.60	0.55	0.62
04/15/03		3.35	3.49	2.85	2.50	2.83	2.16
04/22/03		0.64	0.57	0.75	0.82	0.92	0.67
04/29/03		1.43	2.43	1.70	1.35	1.33	0.95
05/06/03		1.06	0.99	1.18	1.38	1.36	1.34
05/13/03		0.21	0.21	0.15	0.16	0.21	0.15
06/05/03		0.02	0.04	0.04	0.02	0.01	0.06
06/10/03		0.17	0.27	0.23	0.19	0.13	0.12
06/18/03		0.07	0.07	0.05	0.02	0.05	0.02
Season Totals:	**Not valid**	**36.06**	**Not valid**	**34.52**	**29.00**	**27.22**	**23.02**

Appendix C: List of Threatened, Rare and Endangered Plant and Wildlife Species

SWANTON PACIFIC RANCH
FEDERALLY THREATENED AND/OR ENDANGERED WILDLIFE

Scientific name	Common name	Status
Charadrius alexandrinus nivosus	Snowy plover	T
Eucyclogobius newberryi	Tidewater goby	E
Oncorhynchus (=salmo) kisutch	Coho salmon	T
Oncorhyncus (=salmo) mykiss	Steelhead	E, T
Rana aurora draytonii	Red-legged frog	T

THREATENED OR ENDANGERED PLANT SPECIES

Scientific name	**Common name**	**NPS**	**CDFG**	**NPS rating**
Agrostisblasdalei	Marin bent grass	X	X	1B
Amsinkia lunaris	Bent flowered fiddleneck	X		4
Arctostaphylos glutinosa	Schreibner's manzanita	X		
Calochortus albus nanus	n/a	X		**
Clarkia (aff. C. Davyii)	n/a	X		**
Collinsia multicolor	San Francisco collinsia	X		4
Elymus Californica	California bottlebrush	X		4
Sebinsoseris decipiens	Santa Cruz microseris	X	X	1B
Nemophila gianonei	n/a	X		**
Castilleja densiflora	n/a	X		**
Perideridia gairdneri	Gairdner's yampah	X		1B
Pinus radiata	Monterey pine	X	X	4
Piperia michaelii	n/a	X		4
Plagiobothrys chorisianus	Artist's allocarya	X		3
Silene verecunda	San Francisco campion	X	X	1B
Micropus amphibolus	Mt Diablo cottonwood	X		4
Trifolium morganii	n/a	X		**
Trifoliumbuckwesteriorum	n/a	X		**

NPS RATING SYSTEM

1B - rare and endangered in California and elsewhere
3 - plants about which NPS needs more information. Suggested for consideration as rare and endangered since 1980 rare and endangered list.
4 .- plants of limited distribution. Vulnerability/susceptibility low at this time. Status needs to be monitored. "Watch list".
** - new (undescribed) taxa – discovered on or near Swanton Pacific Ranch. Very rare – deserving 1B status. Exact locations not available

Appendix D: List of Swanton Pacific Ranch apple varieties and characteristics

LODI

White fruit, tinged green, juicy, somewhat firm, tender, crisp, tart acid. Used for cooking, processing, juice, poor to fair for eating fresh.

GINGER GOLD

Sweet, tangy and juicy, Ginger Gold apples are an early apple, harvested in August and available until September. This is a crisp and juicy apple with excellent taste. The Ginger gold apples are round with a smooth green-yellow skin that has a slight red blush.

ROYAL GALA

Excellent eating apple. Yellow flesh, crispy and fresh. Harvested during the summer.

RED DELICIOUS

Sali Red Delicious variety has outstanding color and sugar. The fruit is dark red blushed, firm and sweet. Ripens early as does Early Red Delicious. Good all-purpose apple.

JONICA (JONAGOLD)

As the name suggests, this is a cross between 'Jonathan' and 'Golden Delicious'. The fruit is large, yellow striped red, with cream colored flesh. Tender skin, crisp, very juicy, good complex flavor with a nice sweet-tart balance. An excellent apple for cooking and eating.

YELLOW NEWTON

An old New York variety (1759) still in great demand because of its versatility. It is excellent for cider, cooking, and eating fresh. The fruit is large, yellow green, sometimes russeted, with firm, crisp, fine-grained somewhat tart flesh. Vigorous. Ripens October.

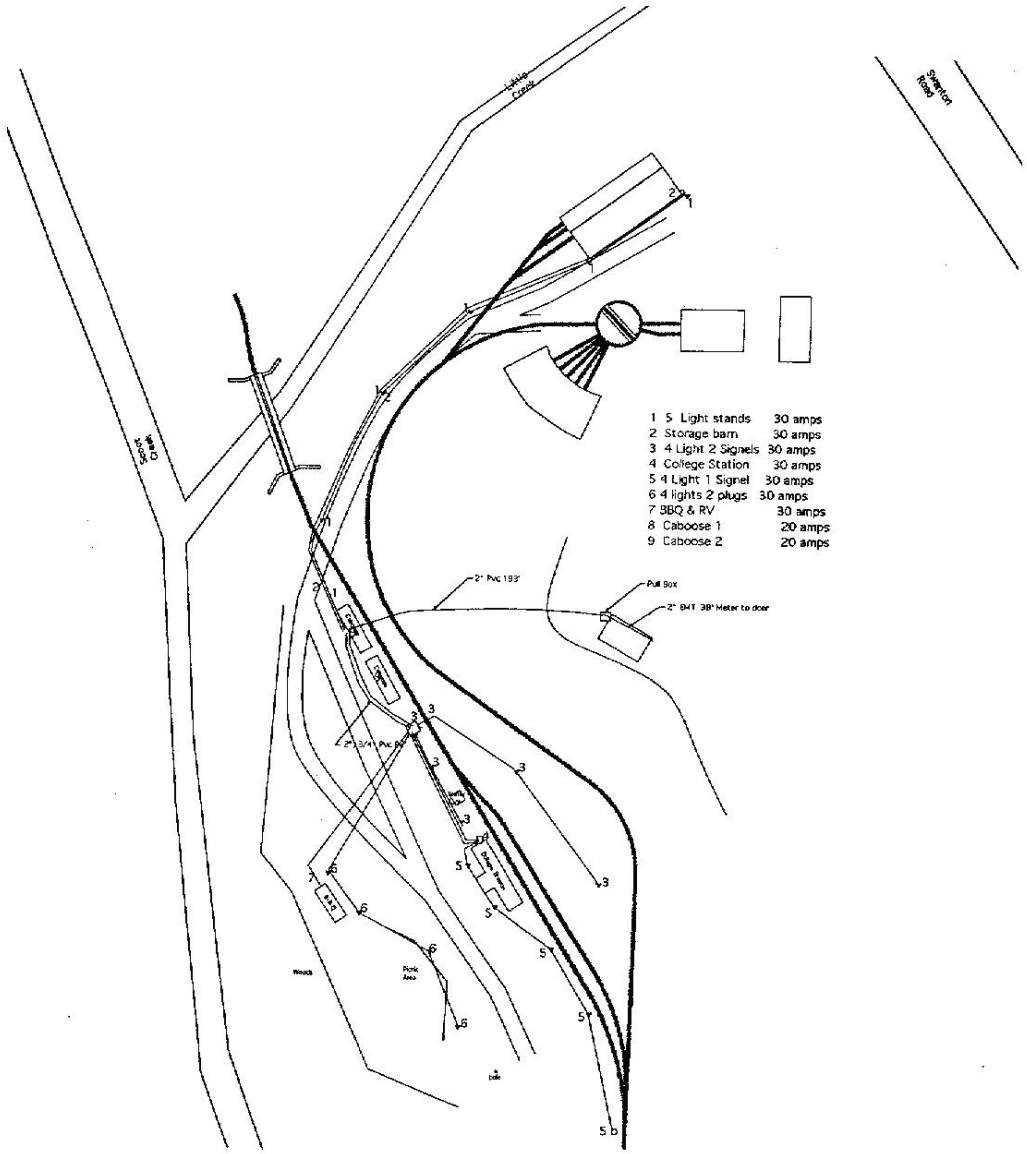
MYRA RED FUJI

The flesh is white, firm, crunchy, very sweet, with excellent flavor. Superb fresh; good for cooking. Ripens mid-September, though fruit will be sweeter if left on the tree into October or even November. Fuji apples retain their shape when cooked, but take longer than average to cook tender. Excellent for storage.

GRANNY SMITH

A medium to large apple with a very juicy, white, tart, super-hard flesh. As the season progresses; Granny Smiths get sweeter during the season Although they're not particularly good for baking, Granny Smiths are great for pies. Has high juice content and keeps very well.

Appendix E: Railroad Infrastructure Map



Appendix F: Addresses, phone numbers, parcel numbers and acreage

Addresses:	Red House	299 Swanton Road
	Green House	125 Swanton Road
	Seaside School House	480 Swanton Road
	George's House	295 Swanton Road
	Staub House	280 Swanton Road
	Al's House	282 Swanton Road
	Las Trancas	228 Swanton Road
	Red House Cabin	297 Swanton Road
	McDougall rental	476 Swanton Road

Phone Numbers:	(805) 756-2161	Dean of the College of Agriculture
	(805) 756-1121	Foundation
	(831) 427-1718	Office Line 1
	427-1728	Office Line 2
	459-6956	Fax
	427-0853	Intern Phone
	426-2884	Al's House/Research Barn
	427-1297	Red House Local
	425-9850	Red House Pay Phone
	469-9850	DL Line
	460-9216	Staub House
	425-2243	Wally Mark
	423-8204	Railroad

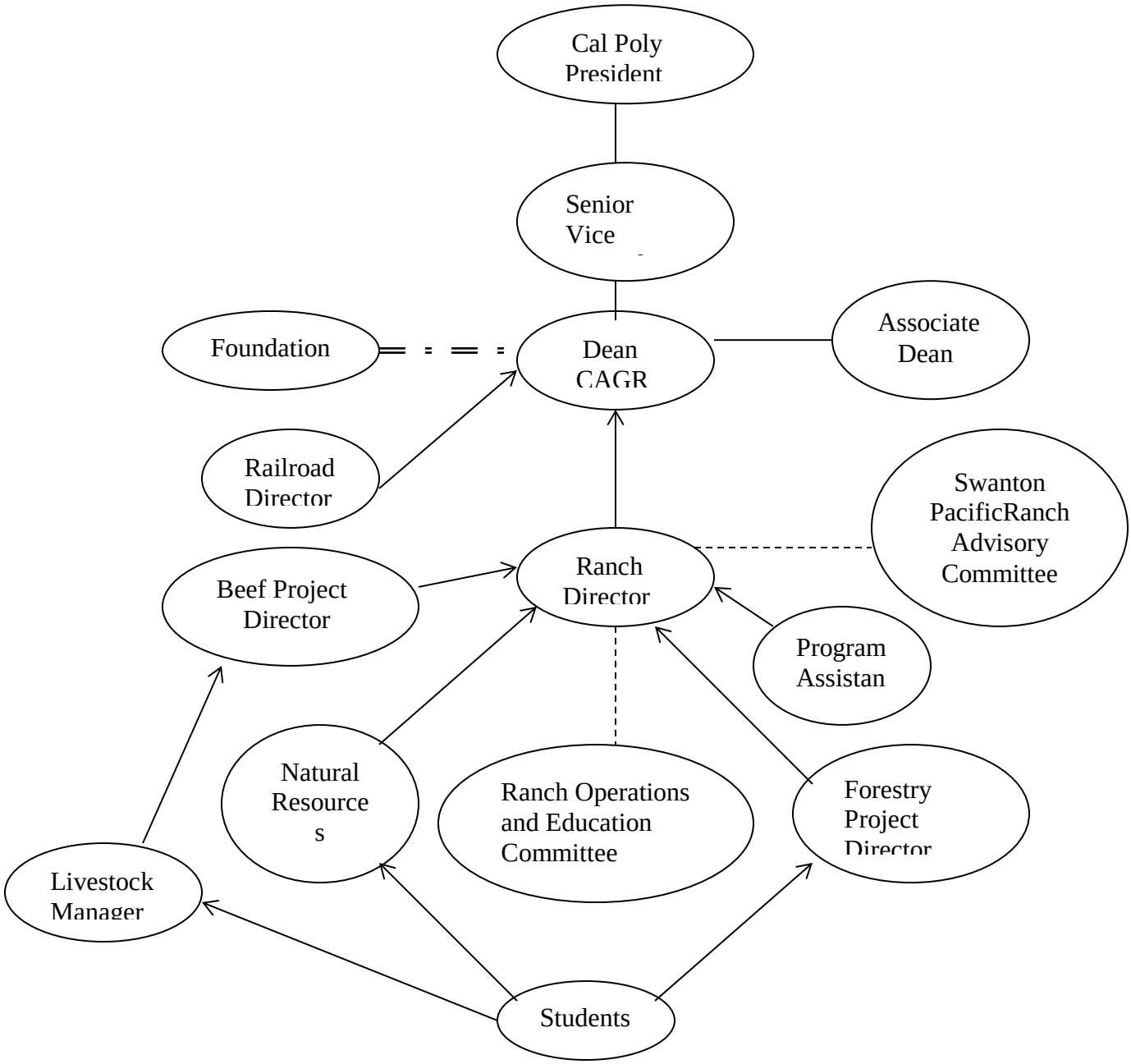
Swanton Pacific Ranch

Assessor Parcel #s:	**Acreage**	**Zoning**	**Use**
***Williamson Act**			
057-251-08	.70	RA	Timber
057-251-09	39.3	TP	Timber
057-121-07	246.77	TP	Timber
057-121-14	40.0	RA	Timber/Range
057-121-22	379.26	TP	Timber/Range
057-131-18*	269.9	CA	Range/Timber
057-131-60	272.16	TP	Range/Crops/Timber
057-301-01*	529.3	CA	Range/Timber
057-151-03	442.0	TPZ	Timber/Range
057-151-05*	31.3	CA	Crops
057-151-06*	558.2	CA	Range/Timber
057-151-07*	196.3	CA	Range/Crops

Valencia Creek

Assessor's Parcel #s	**Acreage**	**Zoning**	**Use**
105-021-08	547.179	TPZ	Timber Production Zone
105-221-01	71.000	TPZ	Timber Production Zone
105-221-03	1.257	TPZ	Timber Production Zone
105-221-02	no acreage listed	TPZ	Timber Production Zone
107-061-01	13.735	SU	Special Use

Appendix G: Organizational Chart



Key

Budgetary review/approval only

Advisory only

Reporting to

Appendix H: Ranch machinery and equipment

Account #	Year	Vehicle Description	Vehicle Id#	Registration #
500	1991	Chevy 1-ton Flat Bed	1GBJK34N4ME165259	E431620
501	1991	Chevy 510 Blazer	1GNDT13Z4M2226424	E431312
504	1989	Ram 50 Pick Up	JB7FLZDOKPO12556	E416547
506	2000	Ford 15-passenger Van	1FBSS31SXYHA71972	E431357
507	1991	Dodge Pick Up 1 ton	1B7ME36C3M5339478	E421849
508		Flatbed 30’ trailer	SWPA555	E17505
510	1995	Jeep Cherokee Sierra	1J4FJ28S5SL653296	E390166
511	1993	GMC Suburban	1GKGK26K7PJ727805	E431278
513		Apple Trailer	1A9SU0815XH18704	E954703
514	1988	Ford F250 Ext-cab 4x4	2FTPX28L1WCA80950	E431382
515	2002	BigTex Trailer	16VAX101X21A46406	1057631
516	2003	Dump Trailer	4ZEDT122931155041	1100476
517	1998	Ford Expedition	1FMPU18L2WLC20413	1148770
518	2003	Featherlite Trailer	4FGL016253C062650	19391
519	2001	GMC 1500	IGTEC19TX1Z161372	1177367
520	2000	Ford 350	1FDWW37S9YEC61901	1177374
521	1999	Ford 250	1FTNW21F3XEE4850	1177375
522	2000	Chevy Blazer	1GNCS13W72K152840	1177376
	1996	Stock trailer	49TSB1620T1025081	E17375

AGRIGULTURAL MACHINERY

1955	International 350 tractor 2-wheel drive	6878	
	John Deere 850 tractor 4-wheel drive	CH08505017379	
	Hesston 180-90 double rear wheels 4-w drive	DMG4951MA0M	058587
	Hesston 70-66 4-wheel drive	D6M4732MA0M	061429
T75	Ford 3000 2-wheel drive, tow only		
T83	1987 Wiggins Fork Lift 5000 lb	WLC871094	

	1942	R4 Caterpillar	GG2100	NLF
		Massey Ferguson 50E Front Loader Bucket	50E 5103 Y0189	
T18		John Deere Backhoe	300BD 344376T	
	NLF	John Deere JD 450C Front blade tracked	450CC 3335861	
		Clark Ranger 668 Skidder Winch on back	507A-443-CAC	
		Basic Grader 701A		NLF
		CASE 850 super L extendahoe		
	1996	Honda 4x4 Foreman 400 and trailer	478TE2007TA109959	538U05
	1996	Suzuki LT4WD T Quad Runner 250	JSAAJ45A2T2102770	U41P78
	2002	Polaris Ranger 10 4x4 3-person ATV	4XARD50AS1D632723	W54J21
	2003	Polaris Ranger 4x4	4XARD50A34D163197	N89Z31

RANCH EQUIPMENT

Quantity	Description	Id #
3	Category II 3 pt Hitches	
2	Bin Trailers	one NLF
4	Harvesting backpacks	
1	Chisel Plow construction	
2	Irrigation pump and access	
1	Sprayer 55 gal	
1	106-300 gal hort. tank	NLF
2	Gearmore H-165 rototillers	L135#691 & H165#10418
2	Strathmore disks 136 model	H8714 and X8503
1	Bean Planter/Harvester 386	CP#11696059229
1	Landplane CTC Towner	370312#23164
1	14’ Schmeiser Til Pak Ring	
1	Mower Seppim	SMO/RB 900187
1	John Deere Mower 25A	P00025A632380
1	John Deere Planter	EOFBB #066107M
1	Post Hole Drill/3-pt hitch	E711
1	325 gal tank and trailer	
1	Spray rig	NLF
1	Brush hog	
1	Hay rake Darf	
1	John Deere Seed Drill	TYOO50A
1	Trailer	VD 5376
1	IH 26 offset Disk Harrow	Hydraulic wheel control
1	Raestan 5 shank vee-bar chisel plow	Perhaps on campus
	Transportable saw mill	Temp out of service

Appendix I: Implementation of Recommended Actions Table

Appendix J: 2003-04 Consolidated Operating Budget Presentation

Appendix K: 2004 Management Plan Technical Appendix

The following documents are referred to in the Swanton Pacific Ranch Management Plan 2003 and are to be kept in a folder for reference in the office.

Al Smith Living Trust

CAGR Goals

Scotts Creek Watershed Assessment Executive Summary

Scotts Creek Watershed Assessment Table of Contents and Appendices

Agricultural Water Rights

Roads and Landslides Inventory Map

Soil Maps for SPR and Valencia Creek

Santa Cruz County Zoning Requirements

List of Native Plant Species for SPR and Scotts Creek Watershed

Scientific Certification Systems (SCS) Forestry Certification requirements

WRP Map and agreement

Forest Practices 2090 (www.fire.ca.gov/ResourceManagement/pdf/FPA2003.pdf)

CDFG Section 1602 (www.dfg.ca.gov/1600/1600code.html)

Mitigation Bank Proposal

SPR 2004-06 Budget

Al Smith Grant Deed

Appendix L: Valencia Creek Property

Valencia Creek property location

The Valencia Creek property is also considered a part of the Swanton Pacific Ranch, although it is located approximately 30 miles east near Aptos. This property is accessed via the town of Corralitos from Eureka Canyon Road to the top of Rider Road.

Valencia Creek property setting

The Valencia Creek property comprises approximately 600 acres of rugged forested land that has no structures on it (See Figure). The site as a whole was clear cut at the turn of the century with four selective harvest entries in the 60's, 70's, 2001 – 2002, and 2013 - 2014. Valencia Creek forest is dominated by redwoods with scattered stands of Douglas-fir. Some hardwoods consisting of tan oak, madrone and Shreve oak are interspersed throughout the forested area. Valencia Creek forms the northwest border of the property bordered by a ridgeline to the south that traverses to a peak called Bean Hill.

Valencia Creek Property History

The Valencia Creek property was added in 1844 to the Rancho Shoquel land grant, the largest land grant in Santa Cruz County, hence the name "Augmentation". The addition consisted of 32,702 acres. Parts of the rancho extended into Santa Clara County. Rancho Shoquel and the augmentation were granted to Martina Castro and patented to her in 1860. The Rancho took its name from an indian rancheria that was located along what later became known as Soquel Creek.

The Valencia Creek parcel was clear-cut and railroad logged in the early 1900's. There were apparently two railroad routes on the property. The Ruske Grade still exists and is part of the main access road into the property from Rider Road. The rails and ties have been removed from this grade. The second route was along Valencia Creek. Most of this grade has been eroded away but short sections of the old grade still exist and many rails are located in Valencia Creek. The early logging resulted in a second-growth redwood-Douglas-fir with some areas of brush and tanoak. There have been at least two re-entry selection harvests in the 1960's and 1970's prior to ownership by Cal Poly Corporation who selectively harvested in 2001-2002 and 2013-2014. A Non-Industrial Timber Management Plan (NTMP) has been implemented on this property (Culver, Piirto and Mark, 2001).

Valencia Creek Soils

There are eleven soil types on the Valencia Creek property, the majority of which is Ben Lomond-Felton Complex from 30 to 75% slope in the north and east of the property. The other prevalent soil types are Nisene-Aptos 15 to 50% slopes and Lompico 5 to 50% slopes. Erosion hazard rating is listed as extreme in the Valencia Creek NTMP on the northern and western edges of the property. Most of the remainder of the property is rated high with moderate erosion potential on eastern and southern portions.

Valencia Creek Forestland

The vegetation on the property is comprised largely of mixed-conifer and hardwood stands, with some areas dominated by brush species. There are four distinct vegetation types over the Valencia Creek property: (1) commercially-stocked mixed conifer forestlands, (2) mixed hardwood-conifer forestlands, (3) hardwood forestlands, and (4) shrub and brushlands.

The mixed-conifer forest is comprised of an overstory of redwood (Sequoia sempervirens) and Douglas-fir (Pseudotsuga menziesii) interspersed with various hardwood species such as tanoak (Notholithocarpus densiflorus), madrone (Arbutus menziesii), coast live oak (Quercus agrifolia) big-leaf maple (Acer macropyhllum), and California bay (Umbellularia californica). The conifers have been harvested five times in the past (an initial, clear-cut harvest around the turn of the 20th Century, two harvest occurring in the 70's and 80's, 2001-2002, and 2013-2014). Understory species in the forested portion include various ferns and assorted herbaceous species, including sword fern (Polystichum californicum), bracken fern (Pteridium aquilinum var pubescens), and chain fern (Woodwardia fimbriata). Understory brush species include poison oak (Toxicodendron diversilobum), coffeeberry (Rhamnus californica), toyon (Heteromeles arbutifolia), California blackberry (Rubus ursinus), gooseberry (Ribes californicum), and thimbleberry (Rubus parviflorus).

The mixed hardwood-conifer forestland is comprised of a varying proportion of conifers (redwood and Douglas-fir) and hardwoods (tanoak, madrone, big-leaf maple, coast live oak, and California bay). The understory is similar to the mixed-conifer forest type.

The shrublands are dominated by brush species common to this region, such as coyotebush (*Bacchairs pilularis*), blue blossom ceanothus (*Ceanothus thyrsiflorus*), poison-oak (*Toxicodendron diversilobum*), manzanita (*Archtostaphylos* spp.), and monkeyflower

(*Mimulus aurantiacus*), and various forb and grass species. The understory vegetation is dominated by annuals and ruderal species (native and non-native).

Several non-native species have spread over portions of the Valencia Creek property, principally correlated in distribution with past disturbance and road-building activities. Such non-native species include pampus grass (*Cortaderia* spp.) and French broom (*Genista monspessulana*).

The growing conditions for redwood over the property vary strongly, typically related to the aspect, topographical stature, and amount of soil moisture in a location. The Natural Resource and Environmental Sciences Department (NRES) conducted a very limited analysis of growing conditions (measured by Site Index *per* Lindquist & Palley 1963). This analysis concluded that there is a variation in Site Index predominantly Site III with some Site II. The best growing conditions likely represent Site Class II growth, and over a limited area in the north part of the property.

Valencia Creek NTMP (VC-NTMP) – 504 acres

A precursor to the SPR-NTMP, the VC-NTMP also took tremendous steps forward by utilizing multiple consultants in the same manner as the SPR-NTMP. Most notable changes for this NTMP were changes in harvesting infrastructure. Formerly, timber operations utilized oxen, steam donkey, railroad and tractor logging on or along watercourses. The VC-NTMP moved infrastructure away from the watercourses and utilized skyline cable yarding systems to fully span the creek. In addition, many old Humboldt crossings were removed in favor of more robust and functional road drainage and watercourse crossing options. These improvement have resulted in only one culvert over the entire 600 acres. Another step in future forest management was to break silvicultural units by subwatershed rather than by yarding method.

The Valencia Creek property was clearcut in the late 1800's and had two selective second growth harvests that occurred in 70's and 80's. In addition, Valencia Creek has been harvested in 2001-2002 and 2013-2014. A total of five harvest entries.

The VC-NTMP details three separate units: Unit 1 (213 acres), Unit II (254 acres), and Unit III (37 acres). Unit 1 and Unit II are predominantly characterized by Site III second growth redwood. Running from north to south, the property begins at Valencia Creek and is extremely steep with significant inner gorge characteristics. When approaching the

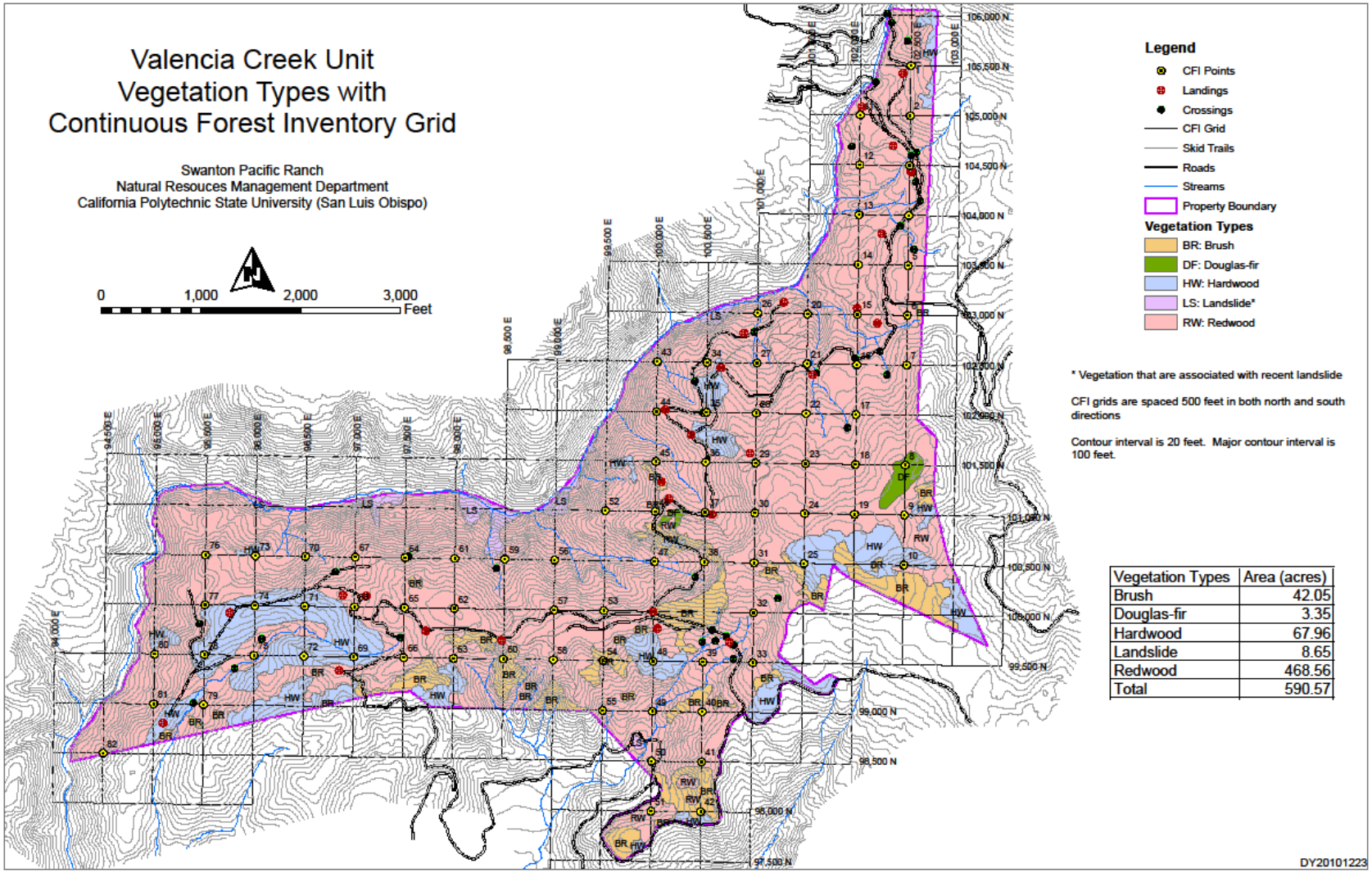
ridgetops, these steep slopes become more gradual after transitioning through steep perennial and intermittent streams to Valencia's upper watershed headwaters. Finally the property transitions to a striking ridgetop referred to as Bean Hill with a view of the entire Monterey Bay National Marine Sanctuary.

Potential wildlife species that could exist on the Valencia Creek property include the red-shouldered and red-tailed hawks, the American kestrel, the great horned owl, western screech owl, northern pygmy owl and the northern saw whet owl.

Valencia Creek Easements

The Valencia Creek Title Report (Anderson, 1994) shows numerous easements exist across that property (see Technical Appendix). The roads with public access are listed as Fern Flat Road, Ruske Grade, Flume Road, Cookhouse Road, Bean Hill Road, Bean Hill Orchard Road and Deer Valley Road. There are also water diversion easements, three utility easements, a 25 ft right-of-way for the Harrison property, and an option to exercise a right-of-way between Rider Road and Fern Flat road.

Site Map of Valencia Creek



Vegetation Types	Area (acres)
Brush	42.05
Douglas-fir	3.35
Hardwood	67.96
Landslide	8.65
Redwood	468.56
Total	590.57

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