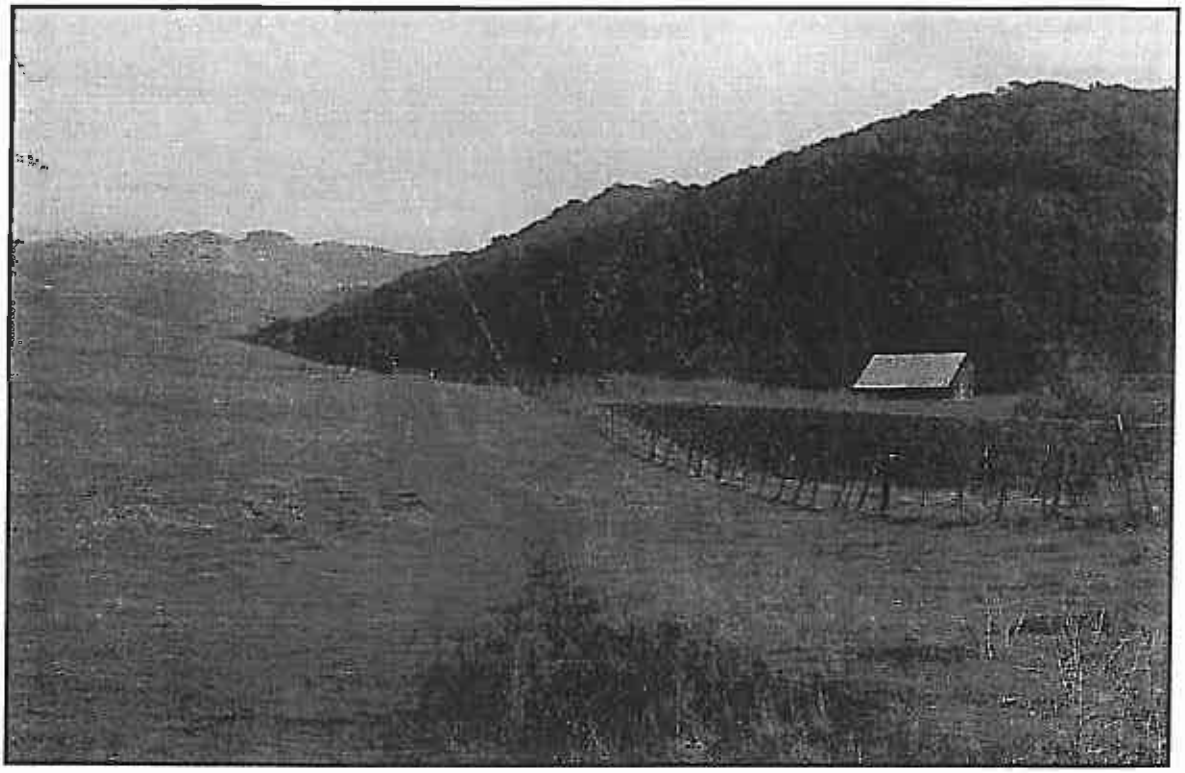
MANAGEMENT PLAN
JACK AND BERNICE NEWELL
OPEN SPACE PRESERVE

City of American Canyon
The Land Trust of Napa County



Prepared for:
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With:
Napa Biological Services
Natural Resources Conservation Service, Napa County
Matt Freeman. GIS Consultant

August, 2001

Revised and Adopted: November 2001

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The following persons played a significant role assisting the consultant team in the development of this Management Plan:

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Section A: Introduction and Summary

In December 1999, Jack and Bernice Newell donated a scenic 640 acre property (see Figure 1) to the City of American Canyon, to be dedicated as public open space for the citizens of the City and the region to enjoy forever, and to protect valuable agricultural and natural resources. With assistance from the Land Trust of Napa County, which holds a conservation easement over the property, and grant support from the State Coastal Conservancy's Bay Area Program, a long-term management plan is being prepared for Newell Open Space Preserve.

Project Objectives

The primary objectives of the management plan are to:

1. Evaluate and document site conditions and resources:
   - vegetation
   - wildlife
   - soils, hydrology, geology
   - cultural and archaeological resources
   - adjacent land uses and plans (especially the adjoining Lynch Canyon Preserve in Solano County)

2. Protect and restore resources:
   - native vegetation protection and enhancement
   - wildlife protection and habitat enhancement
   - grazing and grassland management to support continued agricultural use

3. Provide for public use and enjoyment:
   - designated trail system; special use and protected areas
   - improvements to roads, bridges, fences, signs, barn area; possible caretaker's residence
   - site and recreational use management plans

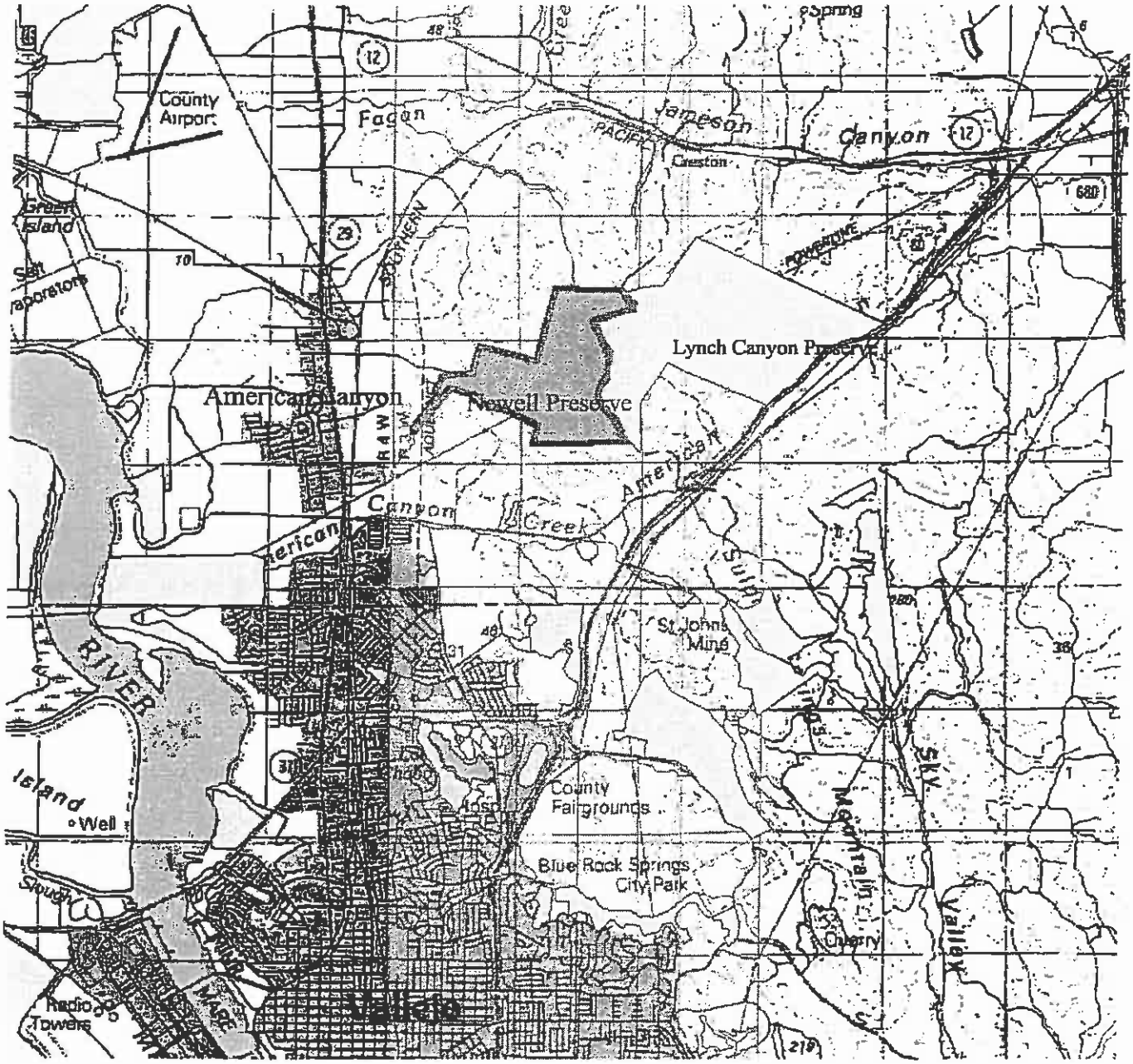


Figure 1
Regional Location Map

Project Phases and Plan Organization

The Part One of the Management Plan documents current site conditions and identifies opportunities, needs and constraints.

Part Two is the Use and Management Program, defining what uses, activities and improvements are appropriate for the site, and generally where and when they should occur. These decisions are based on the Part One findings, and on input from the owners, managers, the general public, and specific stakeholder groups.

The third and final portion of the Management Plan is the Plan Summary and Estimate. This provides a complete list and a very general estimate of the management and improvement projects and tasks, identifying specific requirements, responsibilities, cost, funding or other means of implementation, and general priorities and timing.

The technical appendices, in a separate document, include background and detailed information for the Plan.

Site Overview

The Newell Open Space Preserve site consists of 640 acres of steep hills just east of the limits of the City of American Canyon (see Figure 2). The site is located near the far southeastern corner of Napa County, and the eastern boundary of the site is generally consistent with the Napa-Solano County line.

The site is geographically and environmentally important and unique for a number of reasons. It lies at the crest of the eastern branch of the Coast Range, at the division between the San Francisco Bay and the Central Valley. This location results in dynamic wind and fog conditions almost year-round, spectacular views in both directions, and unique site geology and vegetation. The site provides habitat for federally listed threatened and endangered animal species (Golden eagles and Red-legged frogs), and plant species (Tiburon paintbrush). The site also presents important recreational opportunities, including a key segment of the regionally-adopted Bay Area

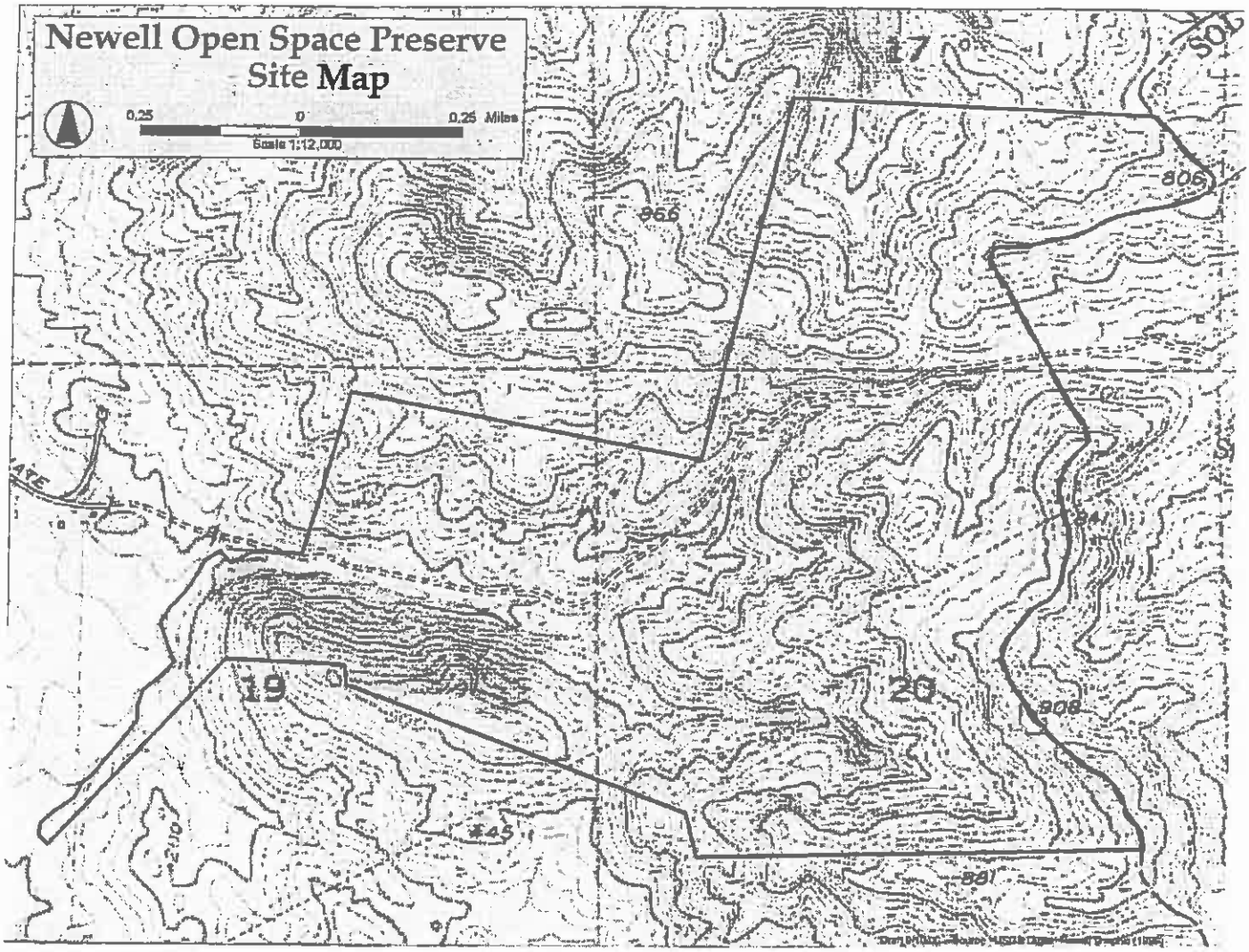


Figure 2 - Site Overview Map

Ridge Trail and opportunity for important east-west trail connection between Solano County and Napa County.

A landfill project, proposed by the American Canyon Development Company during the 1980s, would have created a major solid waste landfill on what is now the Preserve site. The project proponents had purchased the property from Mr. Newell. When the project did not prove to be feasible, Mr. Newell subsequently purchased the land including the preserve site back at auction.

The site is part of a region of productive agricultural lands within Napa and Solano County that have been designated as important resources for protection by both counties (per *Napa County General Plan Land Use Element and Zoning Map, Solano County General Plan Land Use and Circulation Element*). The site is adjacent to, and is currently grazed as a unit with, the 1039 acre Lynch Canyon Open Space Preserve, owned by the Solano County Farmlands and Open Space Foundation. The Lynch Canyon site is part of a complex of 10,000 acres of existing and proposed open space in western Solano County that the Foundation and other local agencies and organizations are actively working to protect.

The Newell Preserve and the Lynch Canyon Preserve are at the cross roads of major regional trail connections envisioned by the respective county General Plans, the General Plans of American Canyon and other cities in the region, and in particular by the Bay Area Ridge Trail Council, an organization working to implement a trail system ringing the entire nine-county Bay region.

Project Team and Approach

The project team for the Management Plan includes:

- Bruce Randolph Anderson & Associates, Planners and Landscape Architects – overall project management, site assessment, resource management and recreational use planning; Randy Anderson, Principal; Jane Buxton, Associate;
- Jake Ruygt, Botanist, Napa Biological Services – vegetation and wildlife assessment;
- Phillip Blake, U.S. Department of Agriculture, Natural Resource Conservation Service, Napa County Office – grazing management, erosion control and stream bank protection;

- Keith Caldwell, Chief of the American Canyon Fire Protection District - fire management and site management;
- Matt Freeman, Consultant - geographic information systems (GIS) mapping.

Documentation of existing conditions has drawn heavily from information contained in the *Draft Environmental Impact Report for the American Canyon Replacement Landfill Project*, prepared in February, 1989 by EIP Associates for the Napa County Conservation, Development and Planning Department.

The Landfill EIR contains extensive useful information about the site, particularly in the areas of geology, soils and hydrology. This section of the current report is basically condensed directly from the EIR text, with added observations regarding stream conditions related to the impact of cattle.

Vegetation, wildlife and cultural resources sections have been updated and expanded based on the EIR sections.

The other sections of this report are primarily entirely new information.

Resource Management Plan for Lynch Canyon Open Space Preserve, prepared in 1999 by Resource Management International, Inc. contains useful information about the site due to the site's adjacency and similarity to the Lynch Canyon Preserve.

Summary of Part One Conclusions

Table A-1 presents the conclusions of the site assessment, organized by subjects consistent with the report. Overall, the site is an open space gem, with unique resources for all three major purposes envisioned for the property: natural resource protection, agricultural production and public recreation. In each case there are some significant needs to realize the full potential of the resource and to ensure that the three purposes are compatible. With planning and commitment, these goals appear to be achievable. The most significant issues identified during phase one include:

- Need and opportunity for restoration of grassland resources;

- Need for protection and restoration of riparian areas and tributary drainages;

- Need for protection of endangered plants and rare habitat in Serpentine bunchgrass area;

- Need for protection of nesting sites for endangered eagles and potentially red legged frog habitat;

- Need and opportunity for coordination of use and management with the adjacent Lynch Canyon Open Space Preserve;

- Need for resolution of access route(s) and physical improvements for public access

Table A-1: Opportunities, Needs and Constraints Summary

General Environment

Issue or Condition	Significance	Related Text
Site is part of a region designated for agricultural and open space protection in two counties; backs up to Solano County Lynch Canyon Open Space Preserve	Protection and enhancement of the site supports important environmental and planning objectives on local, regional and state-wide bases.	Pages 1-3, 1-16
Site is on designated route of Bay Area Ridge Trail, and potential east-west regional trails; Lynch Canyon is being improved for docent-led access in spring 2001	Trail development has regional importance and potential funding opportunities.	Pages 1-16, 1-39 Fig. 7 Appendix E
Dynamic climate caused by location on ridge between Bay and Central Valley creates wind, fog conditions that support biological diversity	Helps shape unique site resources. A constraint to use at some times, but also adds to variety of experiences, illustrates regional weather dynamics.	Page 1-3 Fig. 1
Close proximity to urban areas, diverse habitats, existing road/trail system, stunning views, picturesque rock outcroppings and wind-sculpted trees.	The site offers fine opportunities for public enjoyment and appreciation of nature, and is likely to ultimately be very popular, putting pressure on resources and managers.	Pages 1-4, 1-16 Fig. 5,6

Ownership and Easements

Issue or Condition	Significance	Related Text
Location of property boundaries, fencing	Precise location of site boundaries not located in field, no fence on e. or w. property line, other boundary fences not necessarily on property line.	Pages 1-14, 1-44 Fig. 4, 7
Conservation easement to the Land Trust of Napa County	Uses on the property shall not significantly impair or interfere with Conservation Values; CVs shall be preserved and protected in perpetuity. Allows 50 car parking, sanitary facilities, primitive camping, equestrian facilities up to 2 acres, caretaker residence up to 2,000 s.f.	Page 1-14, Appendix A

Ownership and Easements (continued)

Issue or Condition	Significance	Related Text
Public access to the site	Current access is a private road. Need to resolve arrangements for ongoing use, improvement and maintenance with other property owners.	Pages 1-16, 1-17, 1- 37 Fig. 5, 6, 8, 9
Other's rights on the site: There are recorded water, access and utility easements, may be unrecorded rights of access based on long-term practice	Easements and rights need to be confirmed and accommodated in future planning and management.	Pages 1-14, 1-15 Fig. 3
PG&E electrical transmission easement and line	PG&E regularly uses at least parts of road system, doesn't actively maintain or contribute. PG&E projects sometimes impact habitat or public use.	Page 1-14 Fig. 3, 7
Frog mitigation area	Right is retained to do mitigation project on "dog leg" portion of site for off-site project impacts on frog. Potentially may be proposal to use other portions of site for this purpose	Pages 1-14, 1-15 Fig. 4 Appendix B

Current Land Use

Issue or Condition	Significance	Related Text
Grazing lease status: Grazed for approximately 50 years by Azevedo family, part of a ranching unit including Lynch Canyon, adjacent Azevedo land. Resource management/grazing plan prepared for Lynch but not yet put into effect in lease.	New grazing lease needs to be arranged consistent with preserve use and management, coordinated with Lynch Canyon lease arrangements. Ongoing grazing use requires careful planning, design and management of recreational uses.	Page 1-16, Fig. 3
Lynch Canyon use and plans: Solano County Farmlands & Open Space Foundation has $236,000 grant for trail development, and environmental programs through Bay Area Ridge Trail Council. Includes trails connecting to and on Newell.	Need to coordinate on trail construction, use designations and management.	Pages 1-16, 1-39 Fig. 7 Appendix E

Land Use Plans and Jurisdiction

Issue or Condition	Significance	Related Text
Agriculture, Watershed and Open Space designation in Napa County General Plan	Consistent with open space preserve use. County Measure J requires voter approval to change; constrains potential land use of adjacent areas to west, north and south.	Pages 1-16, 1-17
American Canyon General Plan – Flosden and Eucalyptus Road extensions and Town Center plans	Provides for future development of public railroad crossing, road and path connections to site.	Pages 1-17, 1-37, Fig. 8
City-owned land outside city limits	State law and legal precedent allows City to use and improve site without being subject to County General Plan, zoning or permitting process (but may be subject on the current access road).	Page 1-17

Vegetation

Issue or Condition	Significance	Related Text
80% of site is grassland which has been heavily grazed, invaded by exotic species, especially yellowstar thistle	Current grassland condition detracts from quality of grazing, habitat and aesthetics/experience for users.	Page 1-23 Fig. 7 Appendix C
Great diversity, including many native perennial grass and forb species remains on site, including federally-listed Tiburon paintbrush	Opportunity for remnant species to be re-invigorated through grazing/grassland management.	Pages 1-24 – 1-27
Significant areas of riparian and oak woodland, some seasonal wetlands; support diverse and unique plants. Riparian and wetland vegetation has been impacted by cattle in many locations.	Support unique and potentially threatened species, can be improved and protected through grazing management.	Pages 1-24, 1-25 Fig. 7 Appendix C

Wildlife

Issue or Condition	Significance	Related Text
Site supports large deer population and likely many other native species, potentially federally listed endangered red-legged frog	Important to regional biological diversity and health, and a positive feature for preserve users and supporters.	Pages 1-22 – 1-26; 1-28 Appendix D
Non-native Red fox observed on site	potential threat to native animals and birds	Page 1-24
Site is noted for hosting diverse bird species; populations of raptors, including federally listed golden eagles	Indicates importance and quality of site as part of regional habitat. May require monitoring and potential control of public access during critical breeding periods	Pages 1-27, 1-28 Appendix D

Cultural Resources

Issue or Condition	Significance	Related Text
Native American use sites identified	Need to preserve sites and features. Opportunity to study and expand knowledge. Provides a sense of history and relationship to environment for current park users.	Page 1-30
Early history of site known	Provides opportunity for cultural history interpretation and education, sense of connection for local residents and park users.	Page 1-31
Old barn remains on site	Picturesque, a potential focal point for Preserve activities, environmental education center, storage.	Pages 1-31, 1-44 Fig. 10

Geology, Soils and Hydrology

Issue or Condition	Significance	Related Text
Rugged topography reflects local folding, faulting and uplift – steep slopes subject to slumps and slides.	Requires careful planning and management of uses to avoid problems. Provides interesting view, environments, hikes, illustration of earth resources and processes.	Pages 1-33, 1-34 Fig. 7

Geology, Soils and Hydrology (continued)

Issue or Condition	Significance	Related Text
Clay loam soils are potentially highly productive, exhibit compaction, erosion, especially gullying in drainages	Requires careful design of roads and related drainage, needs to be taken into account in grazing management plans, may limit use of roads and trails in wet conditions.	Pages 1-34, 1-35
Creek channels down cut, entrenched cascading areas, banks eroding, de-vegetated	Reduces habitat quality on site and potentially downstream. Can impact roads and drainage facilities. Requires attention in grazing management plans.	Pages 1-35, 1-36 Fig. 7
Perennial water available at springs and creek bottoms, plus seasonal seeps, pools, some already developed for cattle water	Related to diversity and quality of vegetation. Aids development of alternative water sources for cattle to reduce impact on creeks.	Page 1-36 Fig. 7 Road Inventory and Assessment

Access and Circulation

Issue or Condition	Significance	Related Text
Access is via private road crossing railroad switchyard, road is narrow and in poor condition; unimproved beyond Newell driveway	Significant road and related fencing and drainage improvements required for full public access.	Pages 1-37, 1-38 Fig. 8, 9 Road Inventory and Assessment
3.36 mile system of internal ranch roads generally in good condition, but with site-specific problem areas (identified in Road Inventory and Assessment); some too steep or poorly located for use as trails	Provide good ready-made trail system, patrol and maintenance vehicle access with site specific-repairs and improvements.	Pages 1-38, 1-39 Fig. 7 Road Inventory and Assessment
Network of cattle trails throughout property	May tend to encourage development of unauthorized trails	Page 1-39

Facilities and Infrastructure

Issue or Condition	Significance	Related Text
Relatively level area of approximately 2 acres near preserve entrance	Provides opportunity to accommodate visitor parking, caretaker, picnic sites; primary staging and activity center for Preserve	Pages 1-44, 1-45 Fig. 10
Barn structure is deteriorated but could be improved for interpretive/ storage purposes	Need to design and implement improvements to preserve structure and accommodate public use.	Pages 1-44, 1-45
No bridge crossing of creek remains	Need to provide vehicular bridge and trail crossing.	Page 1-44 Fig. 10
No sanitary sewers available	Need to develop septic system for permanent use, potentially pit toilets and/or portables for visitors.	Page 1-45
Raw and potable water lines located within 1500 feet of potential improvement area	Allows extension for on-site water supply for public, caretaker, fire fighting, and potentially cattle.	Page 1-45 Fig. 8, 10
Electrical and phone lines located within 1500 feet of potential improvement area	Allows extension of service for public and caretaker.	Page 1-45 Fig. 8, 10
Fences and gates are in marginal condition at property boundaries, mostly disappearing on cross-fence lines; no fencing on boundary with Lynch or retained private Newell property.	Need to improve or install in coordination with grazing management plan, design fences, gates and stiles to work with public access plan.	Pages 1-37, 1-38 Fig. 7 Road Inventory and Assessment

Section B: Land Ownership, Use and Designations

Land Ownership and Easements

Approximate boundaries, adjacent parcels, and easements on the site are noted on Figure 3. Figure 4 is the recorded parcel map of the Preserve (Parcel Two), including the associated frog mitigation portion. While calculated for the parcel map, property boundaries have not been located in the field. The east and west boundaries are not fenced, and portions of the north and south boundary fencing diverge from the apparent property lines. Fee title to the Preserve is held by the City of American Canyon, while a conservation easement (see Appendix A) is held by the Napa County Land Trust over the entire property. The easement gives the Trust the right to enter and monitor the property to determine compliance with protection of conservation values. The easement allows uses typical to an agricultural and open space preserve, including development of a paved parking area for up to 50 cars, an equestrian center of up to two acres, and a caretaker's residence of up to 2,000 square feet.

A major PG&E electrical transmission line and easement bisects the site, as does a 25 foot wide road easement following the existing east-west running main road (see Figure 3). The western portion of the site is subject to an aviation and hazard easement to Napa County.

Red-Legged Frog Mitigation Area

When the Newell Preserve property was deeded to the City of American Canyon the right was retained by Jack and Bernice Newell to allow use of a portion of the property for habitat mitigation area for the federally-listed threatened California red-legged frog. Though related to wildlife habitat, the mitigation area is discussed in this section because it is a private property right held on the Preserve land, and its use is based on off-site habitat issues. The mitigation area is delineated on Figure 4. Two nearby proposed residential development projects, Creekside Homes by Young California Homes L.P. and Village Green Homes by Hoffman Land Development Company, will have impacts on existing red-legged frog habitat. The developers are proposing to construct habitat mitigation on the Newell Preserve, through an arrangement with Jack and Bernice Newell.

The U.S. Fish and Wildlife Service (USFWS) has the responsibility for protection of the frog, including determination of the extent of potential impact and the necessary mitigation area and conditions, as part of an overall permit for work in federal wetlands areas issued by the U.S. Army Corps of

Engineers (COE). In a letter to COE dated September 15, 2000 (see Appendix B), USFWS informed the development companies that 1.96 and 2.22 acres of respective habitat mitigation area, or 4.14 acres total, would be required on the Newell Preserve property in order to mitigate for the impacts on frog habitat on the development sites.

At a meeting with representatives of the City of American Canyon, the Napa County Land Trust and USFWS on November 16, 2000, the developers' representatives showed preliminary plans for shallow seasonal wetland ponds to be created in the frog mitigation area on either side of the existing creek. The preliminary plan did not provide all the direct habitat area required by USFWS, though it appeared that the entire requirement could be achieved. A more significant issue arose related to the buffer area required by USFWS around the mitigation areas, which is to be a 600 foot wide by 3000 foot long zone centered on the mitigation area. The buffer zone is to be fenced and no land use or disturbance is to be allowed within the zone.

The proposed buffer zone is incompatible with the potential use and improvement of the preserve because it would extend from the mitigation area well beyond the barn and entry area, which is anticipated to be the most intensely used and improved portion of the entire preserve. This condition is not a part of the mitigation rights retained on the property. In any case, establishing and protecting this buffer zone would require the developers to secure property rights on large strips of private land on either side of the existing mitigation area. Because of these constraints there does not appear to be a feasible current proposal to use the frog mitigation area.

The potential was discussed at the November 16 meeting for using other portions of the preserve, for example areas near the confluence of the main and south canyon streams, for additional or alternative frog habitat. Issues related to this concept are the direct impacts of constructing the shallow ponds, which are likely to be minor, and more significantly, the ability to provide a fenced buffer around the ponds that is satisfactory to the USFWS and does not unduly interfere with public access or grazing operations. Finally, there will be the issue of the property value of the right to create and maintain the mitigation area, which has a relationship to the value the developers would be able to realize on their site, and the cost of obtaining an alternative site. The developers were encouraged to raise such proposals soon if they anticipated doing so, so they could be considered in the context of the preserve management plan. As of this writing no such proposals have been received.

Land Use

The site and all the adjacent lands are used for cattle grazing, although there is some vineyard development on the western portion of the parcel to the north owned by Jaeger Vineyards. The site has been leased by the Newell's to Ron and Ralph Azevedo for cattle grazing for approximately 20 years, and the Azevedos have grazed the property for over 50 years total. Jack Newell collected monthly rent on the annual grazing lease. Lease payments are now made bi-annually to the City of American Canyon.

The Azevedos, early settlers and major property owners and ranchers in the region, also lease the adjacent Lynch Canyon Open Space Preserve in Solano County, which is owned by the Solano County Farmlands and Open Space Foundation. The Lynch Canyon Preserve is being planned and improved for limited public access through a grant from the Bay Area Ridge Trail Council, as discussed further in Section G. Beyond cattle grazing and limited public trail use, the only current use adjacent to the site is a residence owned by the Newell's, which is located in the center of Parcel One approximately ¼ mile to the west of the Preserve, and shares the access road.

Land Use Designations and Jurisdictions

The site is designated as "Agricultural, Watershed and Open Space" in the Land Use Element of the Napa County General Plan. It is zoned "Agricultural Watershed" with an Airport Compatibility overlay on the western portion. Adjacent lands to the north, west and south have the same designation. Adjacent lands to the east are designated as "Extensive Agriculture" (generally grazing lands) in the Solano County General Plan Land Use Element.

The site is within the City of American Canyon Sphere of Influence, as indicated on the City's General Plan Land Use Map (see Figure 5). The City General Plan includes the entire western portion of the site within the proposed urban limit line, but the majority of that portion is designated as "Agriculture". The "dog leg" portion of the site set aside as potential red-legged frog mitigation area, and lands to the south and west, including the remaining Newell property up to the future Flosden Road alignment, are designated as "Residential Estate". Beyond the proposed Flosden Road Extension is the planned Town Center, which is to feature higher density office, commercial and housing at the Eucalyptus Drive extension (see areas M and N on Figure 6), and high to low-density housing to the north and south (areas A and A). The remaining Newell property west of the Preserve (area

F), is designated as a "Regional Park Gateway", with low-density and residential estate uses.

Passage of Napa County Measure J some years ago imposed the requirement for approval of County voters to change any land designated as agricultural or watershed in the County General Plan to an urban designation. The Napa County Local Agency Formation Commission (LAFCO) has approved a Sphere of Influence amendment by the City of American Canyon which allows urban uses up to the future alignment of Flosden Road. Areas to the east of Flosden are subject to the requirements of Measure J. Development of areas M and N and the associated Eucalyptus Drive Extension crossing of the railroad is not subject to any County requirements because these areas are already within the City limits.

Even though it is outside the city limits, because the Preserve site is owned by the City of American Canyon, the City may use and improve the property, subject to the conditions of the conservation easement, without obtaining permits or approvals from Napa County, which would otherwise have jurisdiction over the site (under authority of Government Code Section 53090 et. seq., and *Lawler vs. City of Redding*, 9 Cal. Rptr.2d 392 (1992)).

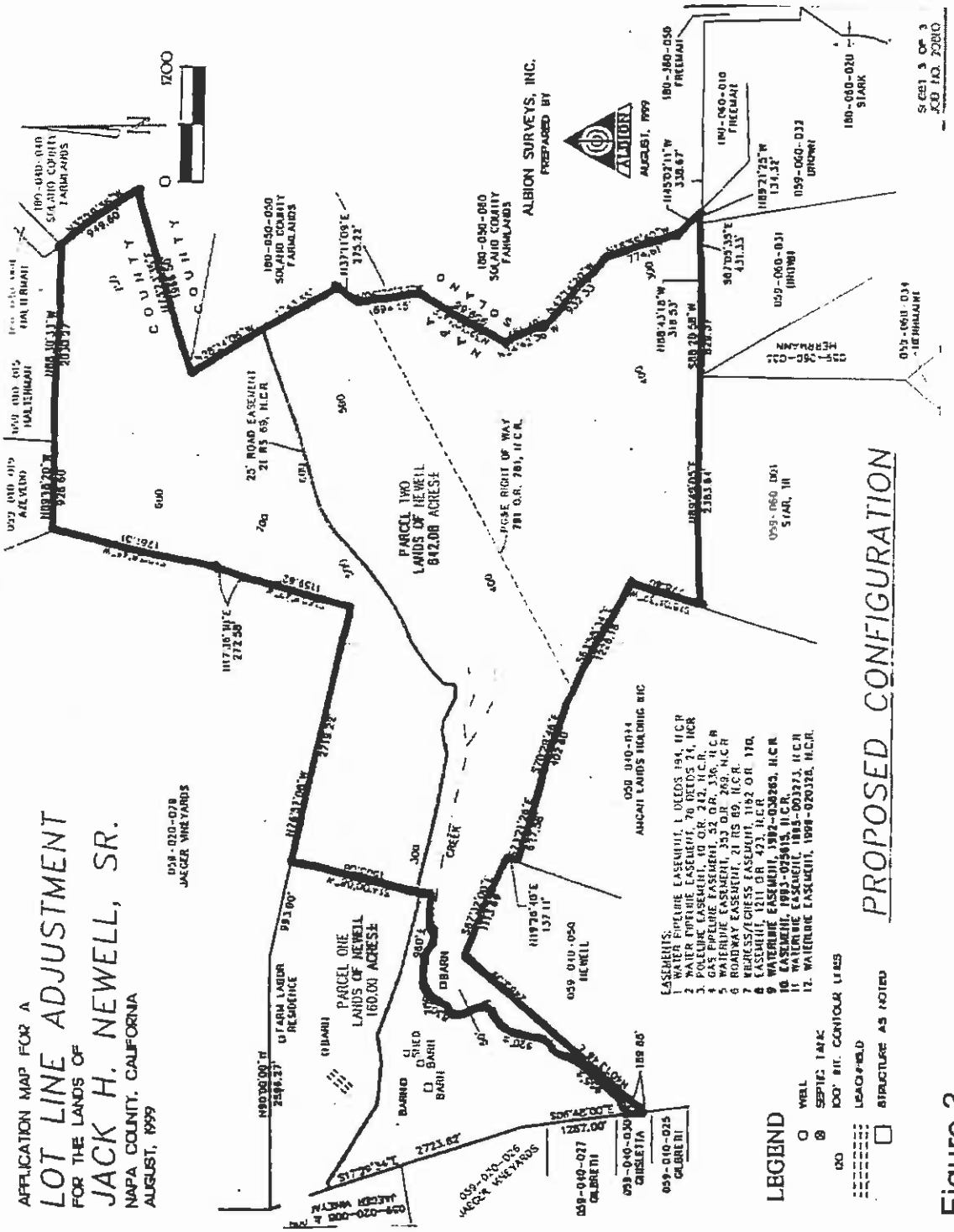


Figure 3
Lot Line Adjustment Map

(not the final property configuration - see Figure 4)

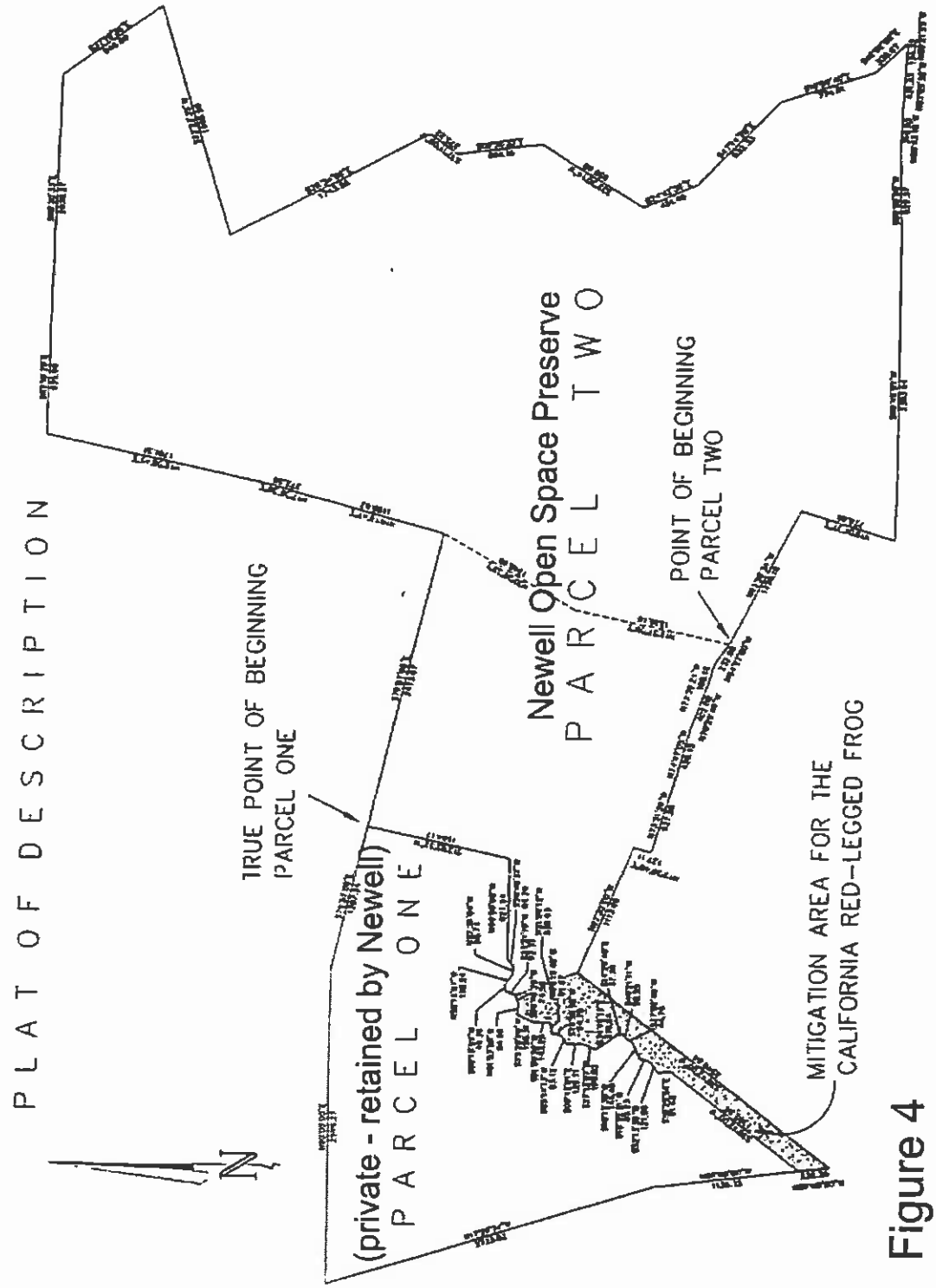
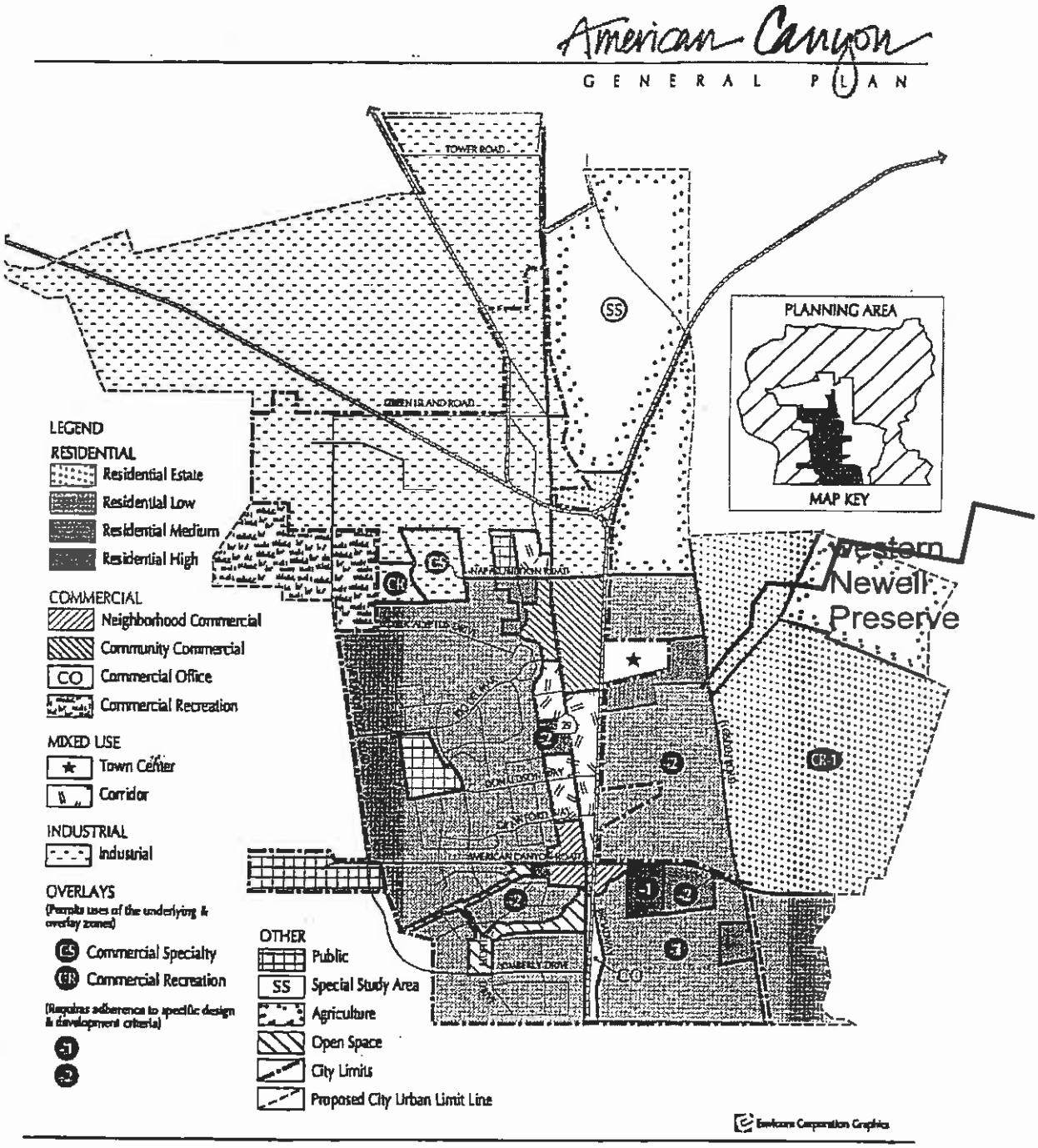


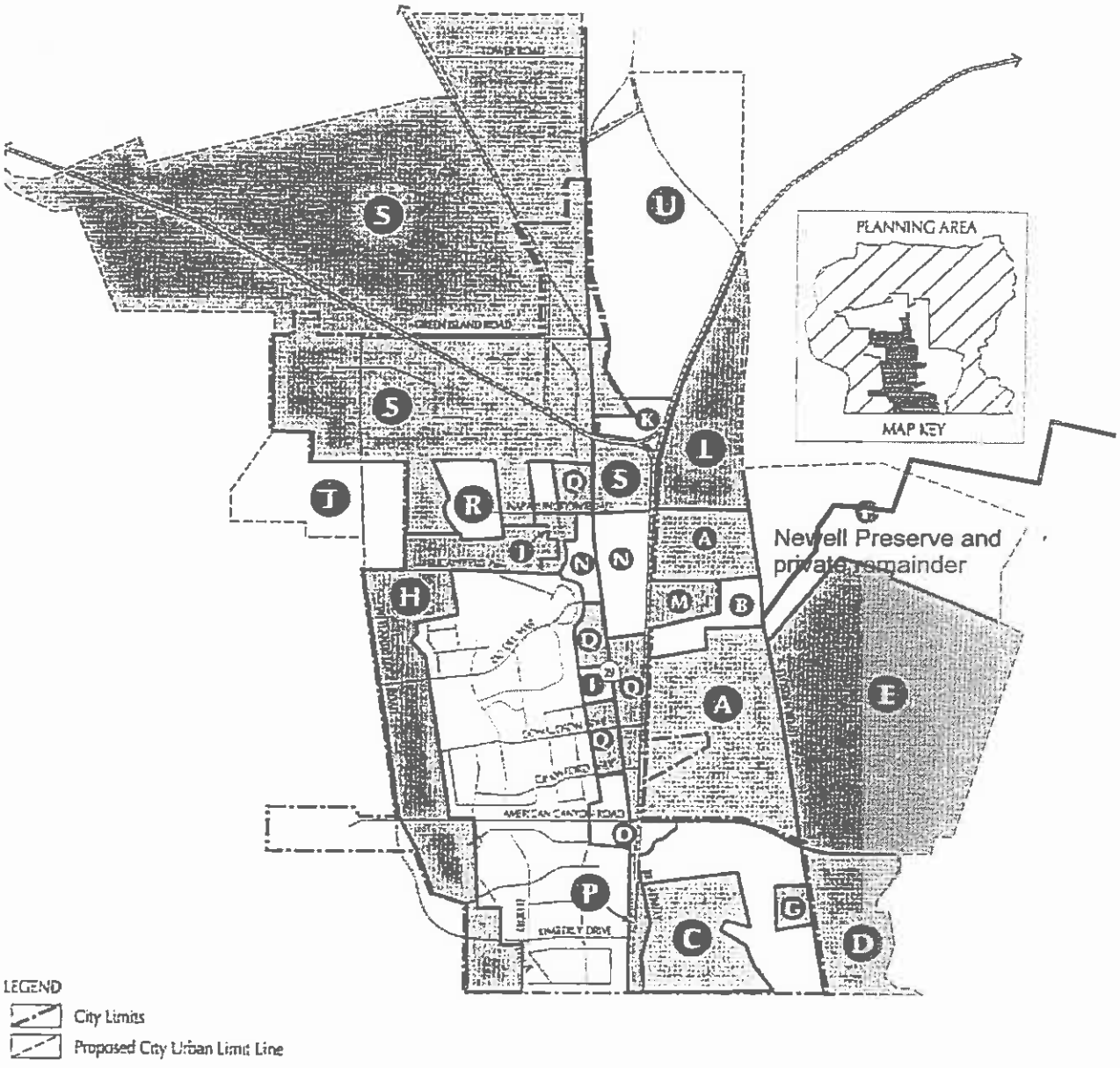
Figure 4
Preserve Plat Map



LAND USE PLAN

Figure 5
General Plan Land Use Map

American Canyon
GENERAL PLAN



PLANNING SUB AREA MAP

Figure 6
General Plan Land Use Subareas

Section C: Vegetation and Wildlife

Newell Open Space Preserve has several qualities that make it very attractive to a rich collection of flora and fauna. It is geographically located in the region between the coast range and the Central Valley and has a mix of both interior and coast vegetation. The Preserve is mostly non-native grassland resulting from early farming for wheat and long-term use for cattle grazing. There are pockets of oak-bay woodlands as well as eucalyptus trees.

Water is a critical habitat element for wildlife and is used for drinking, hydration and breeding. The preserve has water in the creeks and at numerous springs and seeps. Water appears to be present throughout much of the year in sections of the creeks. Saturated soils and standing water are also sometimes present at the hillside springs and seeps. Nearby Napa Marsh and Suisun Marsh are also attractive and accessible bodies of water for birds.

Botanical surveys conducted in 1988 as part of the proposed American Canyon Landfill Replacement Plan identified six plant communities existing on the property. Further surveys conducted in spring 2001 served to refine and bring community descriptions up to date and to complete the inventory of plant species for the entire property. The general plant communities shown in Figure 4.5-1 of the *American Canyon Replacement Landfill Draft EIR* (EIP Associates, 1989) have been shown on Figure 7 in this report, along with new information providing greater detail of sensitive botanical resources. Labels applied to the communities are retained from the EIP document with the attachment of more recent classification (A Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995) included in parentheses. This was done because descriptions in the later document have "lumped" communities in broad series, which would lead to the loss of detail in the descriptions included here. A complete list of vascular plant species encountered during 1988 and 2001 surveys to date can be found in Appendix C.

A description of wildlife species and habitat is integrated into the plant communities to provide greater clarity in habitat management. The site was assessed by a wildlife biologist in 1988 for the Landfill EIR document. Table 4.6-1 on page 4-88 of the EIR indicates rare, endangered or threatened wildlife species known to occur in the project region. The federally-listed threatened California red-legged frog is one wildlife species that should be added to the list, based on identification on nearby sites, as detailed in Appendix B of the current report. A list of common, potential and observed wildlife species can be found in Appendix C-1 of the Landfill EIR, which is reproduced in this report in Appendix D, which also includes a list of observed bird species complied by the Audubon Society. A more detailed

description of observed nesting sites and updated list of observed bird species is included, based on information from the Audubon Society.

Non-Native Grassland (California Annual Grassland Series)

Physical characteristics of the soils on the site, coupled with local weather patterns support a landscape dominated by grassland. Over 80% of the park is covered by grassland. Historically, this was probably a native grassland community (similar to Coastal Bald Hills Prairie) dominated by purple-needlegrass, California oatgrass, creeping rye and blue-eyed grass. The clay soil (Fagan Clay Loam, slow permeability) tends to inhibit tree and shrub growth due to high plasticity. This soil remains saturated for prolonged periods between fall and mid-spring and then cracks under summer drought conditions. This is problematic for the roots of most woody species. However, prior to Spanish colonization in the 1830's, this area may have supported some scattered individual trees or small groves along seasonal drainages. The presence of Indian grinding stones on the Lynch Canyon property, situated distant from oak trees, suggests more extensive woodlands in the past. Regular burning by Native Americans could also have suppressed recruitment of young trees and shrubs. This could also have been the net effect of perennial grazing by cattle as occurs to date. Aging trees could have died, not to be replaced by young recruits. Grazing has helped to give a competitive edge to a number of exotic grasses and forbs, which now dominate the site.

Early season dominant species include wild oats, ripgut grass, winter vetch and redstem filaree. Late in spring the grassland becomes dominated by yellow star thistle and purple star thistle, both extremely aggressive species from the Mediterranean region. Star thistle is unpalatable to cattle after the formation of spines on the flower heads in mid-May. Another Cal EPA listed noxious species, cardoon could pose a serious threat to native vegetation if not controlled. Three other invasive exotics, wild anise, teasel and horehound also occur in localized populations. Other associated species that are common in this community include: Italian thistle, milk thistle, cut-leaved geranium, wild barley and soft cheat. The only native species that retain a strong foothold are erect evax, succulent lupine and common fiddleneck. This community may have historically supported showy Indian clover (*Trifolium amoenum*), which was collected near Napa Junction (American Canyon) in 1891. This Rare and Endangered species (CNPS List 1B) prefers rich grassy swales such as may have existed near the lower, flat area near the mouth of the canyon.

These grasslands support a host of dependant avian species such as meadowlark, say's phoebe, northern shrike, horned lark, savannah sparrow

and killdeer. The horned lark is on the Department of Fish and Game Special Concern list. White tailed kite, northern harrier and golden eagles, all special status species, may utilize this habitat as they prey on small mammals. Eagles are regularly seen in the area and nest within the region. Several mammal species utilize this habitat including pocket gophers, ground squirrels, field mice, blacktail jackrabbit, coyote and mule deer. The open grassland may also provide excellent habitat for western rattlesnake, gopher snake and western terrestrial garter snake. The non-native Red fox has been observed on the site, which may have an adverse impact on native animals, especially on ground nesting birds.

Central Coast Riparian Forest (Coast Live Oak Series)

This is a linearly arranged plant community dependant on the conditions afforded by the stream bank and perennial water. It is nearly continuous along the southern branch of Newell Creek but is fragmented along the northern branch and in the southwest part of the park. This community covers approximately 14.5 acres. Arroyo willow and shining willow are dominant species along the south branch with California bay and coast live oak common especially along the upper reach. In this reach the canopy cover is 100% with trees from 50 to over 75 ft in height. There is little or no understory, which is due to the strong inhibitive properties of bay tree litter. This is also exacerbated by cattle grazing and trampling. Where the riparian community contacts the Coast Live Oak Forest (middle reach), the willows form an outside band and the live oak/bay component blends into the adjacent forest canopy. Through the lower reach of the stream the distinction becomes more obvious with a clear dominance by the shining and arroyo willows. In the understory and between breaks in the canopy there are thickets of California blackberry, poison oak, Santa Barbara sedge and alkali rye. Other common associated species include, common snowberry, California rose, Douglas's mugwort, California figwort and hoary nettle. The adjacent grassland along the lower reach remains saturated under normal winter conditions and has become densely invaded by fuller's teasel. One special status species Victor's gooseberry (*Ribes victoris*) occurs in the upper reach of this community, represented by 8 individuals in three locations. This species is on the watch list of the California Native Plant Society and accorded some protection under CEQA.

Many birds such as, Nuttall's woodpecker, northern flicker, black phoebe, spotted towhee, scrub jay, golden crowned sparrow, song sparrow, and yellow-rumped warbler frequently utilize the riparian community. These isolated strands of woody vegetation are vitally important during spring and fall migration to many species including the special status yellow warbler. This is also habitat for raccoon, skunk, coyote, weasel, and ornate shrew.

The resident amphibians and reptiles may include pacific tree frog, garter snake, ring-necked snake, slender salamander and alligator lizard. Western pond turtle, a special status species, is likely to occur along the lower reaches of the streams. The lower reach of Newell Creek has been designated as a potential habitat mitigation area for the federally-protected red-legged frog.

Coast Live Oak Forest (Coast Live Oak Series)

Conditions on one north-facing slope favor a forest dominated by coast live oak. The soil here is coarser (Millsholm loam, moderate permeability) than that found in the grassland communities. Less sun exposure on north faces lead to the retention of moisture for a longer period of time, effectively extending the growing season. This community covers about 40-45 acres on steep to moderate slopes. Tree cover is greater than 75 % with a number of openings present, especially near the outer edges. Common associated trees include California bay (35%), madrone (5-10%) and black oak (1%), Species such as poison oak, hazelnut, common snowberry, Torrey's melica and California wood fern are common in the brushy understory. This is the most diverse community in the preserve including 78 of the 225 taxa identified on site. No special status plant species were found here but striped coral root (*Corallorhiza striata*), which occurs here in low numbers, is considered rare in Napa County (Napa Valley Chapter, CNPS records).

The dense cover afforded by trees and brush provide habitat for bird species such as great horned owl, pacific slope flycatcher, northern flicker, chestnut-backed chickadee, Steller's jay, and California towhee. A number of mammals may use this habitat including big-brown bat, hoary bat, pallid bat, dusky-footed woodrat, Audubon's cottontail and gray fox. The bat species are species of special concern utilizing tunnels and hollows in trees for roosts. Resident reptiles and amphibians may include tiger salamander, rough-skinned newt, ensatina, pacific treefrog, southern alligator lizard and common kingsnake. A number of special status bird species may utilize this habitat include Cooper's hawk, golden eagle, sharp-shinned hawk, and prairie falcon.

Bald Hills Prairie (Purple Needlegrass Series)

This community shows elements of both interior and coastal grassland communities. The regular influence of coast fog during the summer months and the presence of blue flag (*Festuca idahoensis*) and California oatgrass (*Danthonia californica ssp. californica)* indicate that this is a variation of the Bald Hills Prairie community. This is a remnant of the vegetation community that is likely to have dominated the property historically and is

now confined to the steeper slopes near the eastern and southern boundaries of the site, approximately following the footprint of the Kreyenhagen Formation as mapped on Fig. 4.1-1 of the 1988 Landfill report. Common species here include purple needlegrass, blue eyed grass, California buttercup, Indian soap and wild oats. The ridge line includes a discontinuous strand of sandstone outcrops that supports elements of coastal scrub. A number of picturesque wind-sculpted coast live oak and California bay crown the ridge top. The rocks comprised of Domengine Sandstone also support a locally unique assemblage of shrubs and perennials including hairy golden aster, California mahonia, rock-loving daisy, California Indian pink and California Acaena. The Newell preserve may support as much as 90% of this plant association type occurrence in Napa County. This community also includes (nine) patches California balsamroot (*Balsamorhiza macrolepis ssp. macrolepis*) in the preserve which is listed as a rare and endangered plant by CNPS (List 1B). This member of the sunflower family is confined to the bay area region and protected under CEQA.

This community provides habitat for bird and wildlife species comparable to the Non-native Grassland Community with addition of brushy habitat and rock outcrops, which may support a few additional species. This habitat may be utilized by a number of special status species including northern harrier, rough-legged hawk, golden eagle and ferruginous hawk. Bald eagle and peregrine falcon are rare visitors to this community.

This ridge top offers outstanding scenic opportunities for park visitors including views of Mt. Tamalpias, Mt. Diablo, Mt. St. Helena, Snow Mountain and the Sierra Nevada. Siting of trails including Bay Area Ridge Trail should seek to provide the best hiking experience without impacting biologic values. Rare plant habitat should be avoided by placement of trails a minimum of 25 ft from populations of California balsamroot. Other plants including hairy golden aster and California Acaena are not protected by CEQA but are known to be rare in Napa County. These should likewise be protected from trampling and overgrazing

Serpentine Bunchgrass (Foothill Needlegrass Series)

A small portion of the property, along the southern boundary, supports a grassland community influenced by the difficult growing conditions exacted by serpentine substrate (Ultramafic rock meaning high levels of magnesium and iron). This small area of about 12 acres is part of a community covering more extensive acreage to the south in American Canyon. Serpentine soils tend to exclude many exotic species depending on the severity of the Calcium/Magnesium ratio (0.40 measured in American Canyon, K. Martin, 1987). The dominant species are native annual and perennial species

including California poppy, hayfield tarweed and purple needlegrass. Other common associates include naked-stem buckwheat, small-flowered needlegrass, soft cheat and erect evax. Most noteworthy in this community is the presence of Tiburon paintbrush (*Castilleja affinis ssp. neglecta*), which is a federally listed endangered species. The property supports approximately 5-10 % of the Napa County population of this species (35 plants, March 2001).

This community provides similar wildlife habitat to that described above under Bald Hills Prairie and Non-native Grassland. The area may provide habitat for burrowing owls and higher density of reptiles among the rocky slopes.

Wetlands (Spikerush Series)

The dense clay-loam soils and rock substrate of the preserve give rise to a number of seasonal and perennial seeps and springs where the groundwater intercepts the soil surface. In addition to six seep areas and two springs present on the site, the bottom of several stream channels, where exposed to full light, support a similar assemblage of wetland species. A few seasonal ponds also occur on the preserve. Dominant species here include brown-headed rush, pacific bog rush, bristly ox-tongue, winter cress, clover and curly dock. Other common associated species include Baltic rush, Mexican rush, iris-leaved rush, bird's foot trefoil, American bulrush, and Mexican plantain. This last species is uncommon in Napa County.

This habitat provides water and forage to wildlife species and may provide critical habitat for the red-legged frog. These wetlands feed into the creek system, which exits the preserve through red-legged frog habitat. Cattle grazing has greatly influenced the biomass of wetland plants and altered composition of these areas by opening the habitat to non-native species.

Bird Species Observations

The preserve provides a resting place for birds during migration in the spring, fall and sometimes winter. As a result, a number of the bird species observed on site, while not rare, are unusual for this location, including varied thrush (*Ixoreus naevius*), stellars jay (*Cyanocitta stelleri*), and merlin (*Falco columbarius*), one of the more rare falcons. During the winter, long eared owls use the Preserve's dense grove for refuge during the day. (Mike Rippey, personal communication)

This setting is especially attractive to raptors due to the height of the hills, the location between the coast and Central Valley, the distance from human disturbance and the persistent, strong off-shore westerly winds from spring to fall. As the winds meet the hills a wind inversion takes place, providing favorable soaring conditions.

The existing habitats probably provide for occasional use by such protected bird species as the bald eagle (*Haliaeatus leucocephalus*), peregrine falcon (*Falco peregrinus*) and possibly other raptors. Several bird species of special concern to the Department of Fish and Game could be expected to occur on or near the property. Bird counts by the Solano and Napa County Audubon Society Chapters document the use of the area by prairie falcons (*Falco mexicanus*), white-tailed kite and sharp-shinned hawks (*Accipter striatus*) hawks, which are both Species of Special Concern in California. A northern harrier (*Circus cyaneus*), a Species of Special Concern Priority #2, was observed during the wildlife survey for this report. Habitat suitable for nesting is available on site for several of these species, as indicated in Table 4.6-1 of the 1989 EIR.

Golden eagles (*Aquila chrysaetos*) are considered to be fairly abundant in this area. The first recorded sightings of golden eagles here occurred in 1966. They are regularly observed foraging at adjacent Lynch Canyon. Golden eagles typically select nest sites on cliffs or in large trees near ridge tops. Eagles nest in alternate years and usually alternate between two or three nesting sites (Mike Rippey, personal communication).

There is a triangle of three golden eagle nesting sites or recently active nesting sites in the nearby area. While only one of the nesting sites is located in the Newell Preserve, the other sites are part of the same habitat complex. The characteristics of these sites that make them desirable nesting habitat include cluster of trees on steep hillsides surrounded by open land, distance from human activity, and water availability.

The protection of the nesting sites when in use by eagles is of primary concern in planning for use and management of the Newell Open Space Preserve. Golden eagles court from November to December and raise their young for approximately nine months from December through August. To avoid disturbing their nesting activities, it may be necessary to close the trail (segment D) that passes by active nesting sites and route visitors to and from the ridge via segment F or F(1).

In addition to protection under the Endangered Species Act and California rare, threatened, and endangered lists, two federal acts protect the eagles, one of which protects other migratory birds. The Bald and Golden Eagle Protection Act provides for the protection of the bald and golden eagle by

prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. The Migratory Bird Treaty Act prohibits the taking, killing, possession, transportation and importation of all migratory birds, their eggs, parts and nests except as authorized under a valid permit.

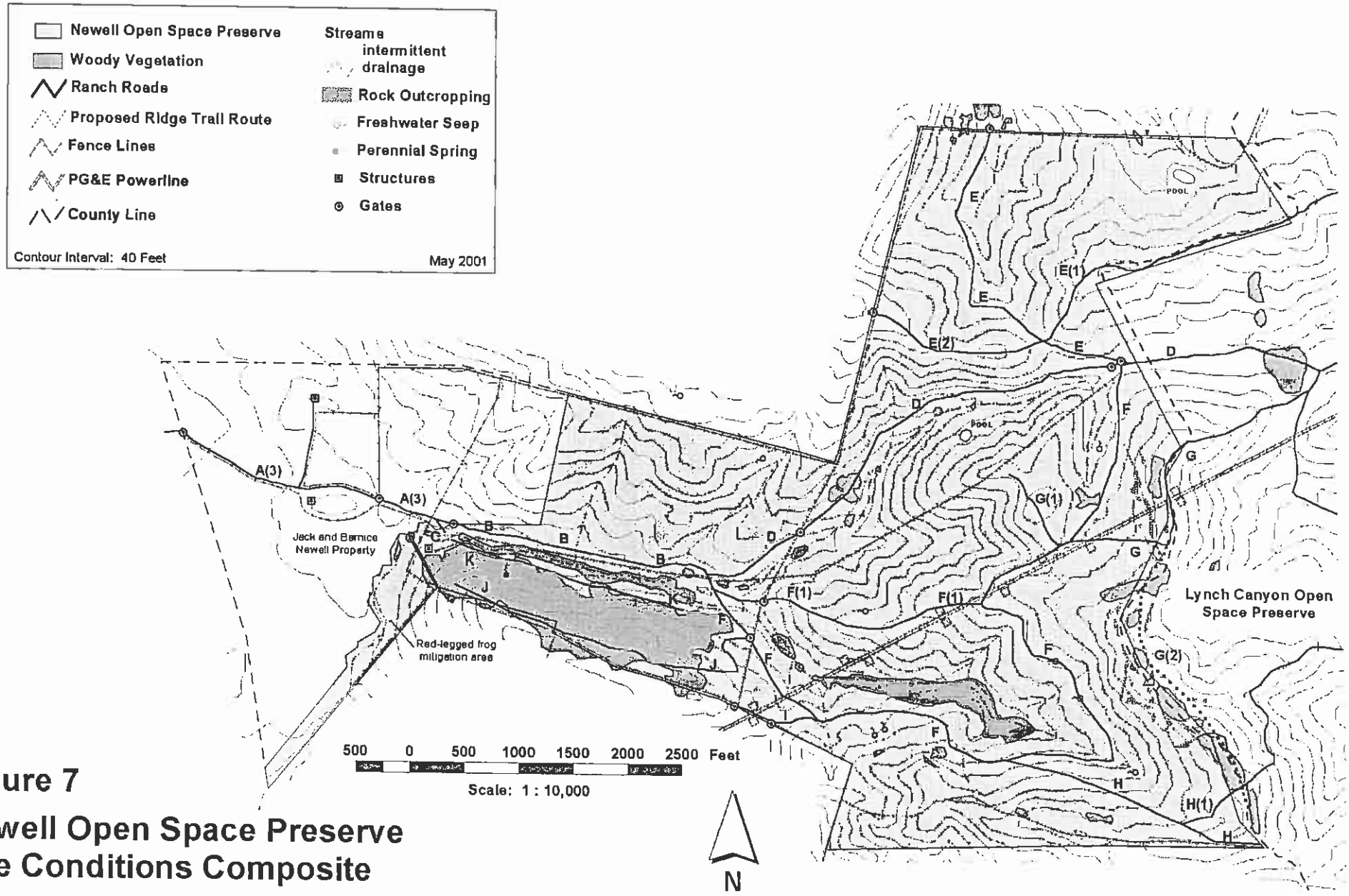


Figure 7

Newell Open Space Preserve
Site Conditions Composite

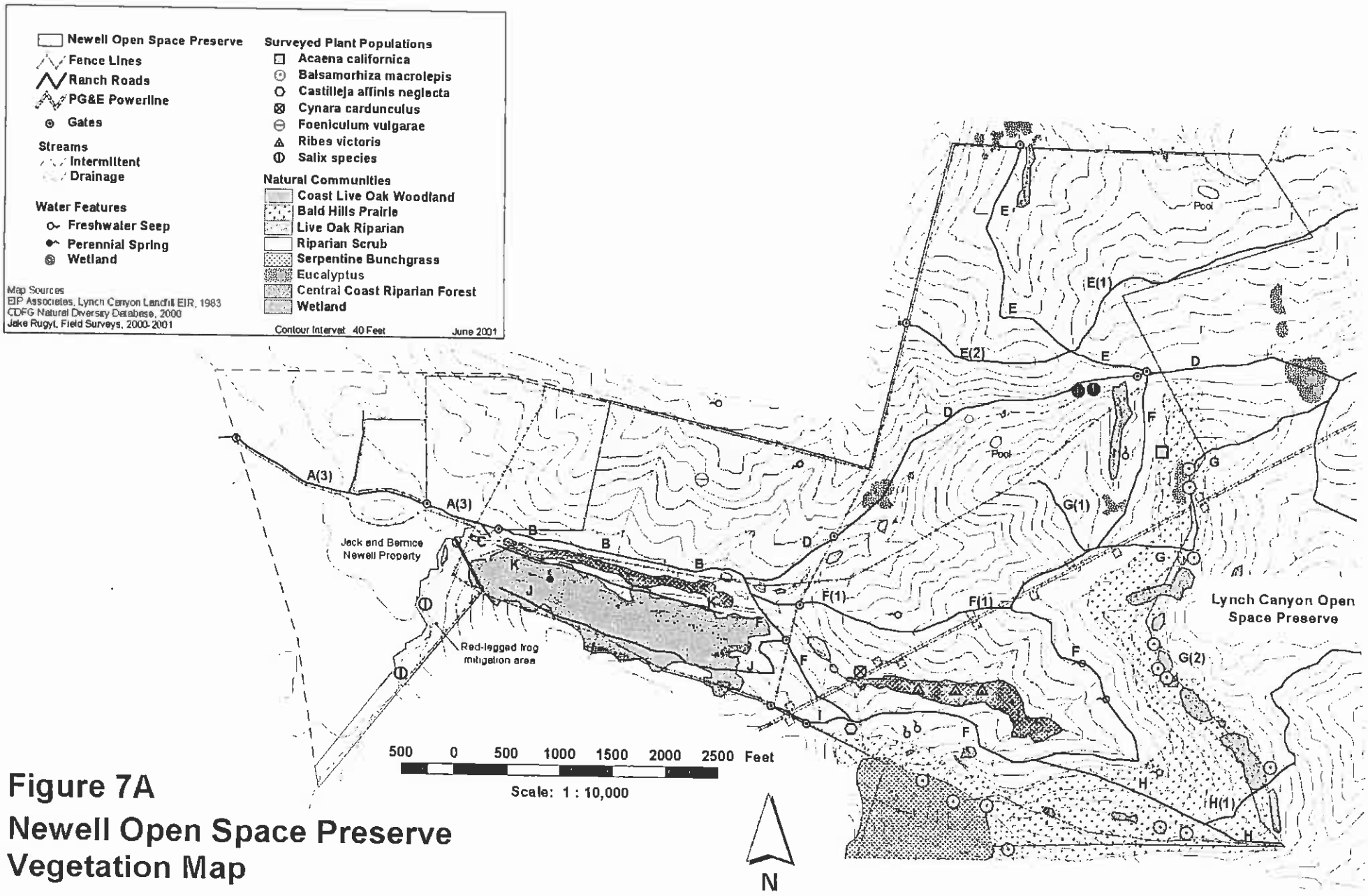


Figure 7A
Newell Open Space Preserve Vegetation Map

Section D: Cultural Resources

The natural beauty of the Newell Open Space preserve is evident immediately. There is a stately grandeur in the clear vistas of rolling hills, clusters of trees and creek vegetation. But there is also a fascinating history of people who have lived, worked, raised families and left the site.

In August 1988, the Cultural Resource Facility at Sonoma State University conducted a cultural resources field survey for the American Canyon Replacement Landfill EIR. According to that study, the Newell Open Space Preserve is part of an area once inhabited by Native American speakers of the Patwin language. Their territory extended approximately 90 miles from Suisun Bay north to Princeton, and about 40 miles west from the Sacramento River. Five village sites have been recorded within ten miles of the Preserve.

The Patwin maintained a diversified fishing, hunting and gathering economy based on the seasonal availability of food. They utilized two distinct settlement/subsistence patterns according to geographic location. During the winters, the valley peoples occupied permanent villages within the marshland and relocated to smaller tributaries on the surrounding plains during the summer. The upland groups wintered where streams exited into the valleys or at other favorable streamside locations. During the summer, they moved from these areas into the surrounding hills.

The upland Patwin would have inhabited the Newell Preserve area. Prehistoric sites in the preserve would likely be winter village sites characterized by middens with large amounts of shell and bone, specialized areas such as butchering stations and seed or acorn grinding areas. The archaeological survey of the preserve area of July 28, 1988 revealed two prehistoric archaeological sites. They have been recorded and designated as sites CA-NAP-751 and CA-NAP-752. (Refer to Appendix D of the EIR). These sites, taken together, could be unique archaeological resources.

Patwin life was rapidly disturbed following contact with Euro-Americans. Some people were removed from the Patwin villages by the Spanish missions, others succumbed to the malaria and smallpox epidemics of the 1830s. The few remaining Patwin were displaced with the American settlement of the area in the 1850s and 1860s.

Early explorers, missionaries and trappers to the area reported the existence of pronghorn antelope, mule deer, elk, bears, mountain lions and coyotes. Herds as great as 1,000-2,000 elk and 3,000 antelope were recorded. Elk, antelope, bears and mountain lions were eliminated soon after the Spanish and Americans first settled the area. Deer were heavily hunted but not eliminated.

The demand for firewood throughout the region resulted in the harvest of the native cottonwoods and oaks. Land owners planted eucalyptus, an Australian import, as an alternative to the rapidly diminishing native wood supplies. Several stands of eucalyptus can still be seen at the Newell Preserve.

In 1864 Mary and Richard J. Falls moved to the Preserve area, which they then called the Falls Ranch. Richard James had acquired a bounty land certificate in New Orleans for the 40-acre parcel. The family grew wheat on the ranch and eventually owned approximately 170 acres. The family home was located in the clearing at the southwest entrance to the preserve, where the old barn is still standing. The children of Mary and Richard Falls continued to run the ranch until it was sold in 1900 to Charles Cantoni.

The Cantoni family had a dairy farm at the ranch. Several current residents of the area recall that the Cantonis had a lovely, white, old-fashioned, two-story house located in the same clearing as the Falls family house. A local resident also remembers going to the Cantoni ranch as a child to purchase butter and eggs and to pick flowers for the grade school May Day celebration. The Cantoni family leased out portions of the ranch at various times.

A portion of the preserve property was owned by the Scally family from about 1913 to 1964, then by Ted and Ruth Brown.

Jack and Bernice Newell purchased the ranch from the Cantonis and Browns in 1980. They leased it to neighbors Ralph and Ron Azevedo for cattle grazing. The ranch was sold to the Tricounty Development Company in 1985 and plans were made for using the site for a replacement landfill operation. When this project plan did not go forward, the Newell's repurchased the ranch in 1992. The Newell family gave the land to the City of American Canyon in 1999 for use as an open space preserve.

The collection and display of historic information and artifacts from the people who have lived in the area would greatly enrich visitors' experience and appreciation of the preserve. A visitors/education center on site provides an ideal environment for these materials. Information about the Patwin way of life, native flora and fauna, and early farming and ranching operations could all be included. Additional planning may be required to protect the Patwin winter settlement sites noted in the cultural resources field study conducted by Sonoma State University.

Information on past use of the site was obtained from local residents Catherine Bonato and Donna Reid Connell (granddaughters of former

owners), Alma Negri and Mary Sanders. John Welker, Assistant Chief Title Officer for Napa Land Title Company, provided chain of title information.

Conclusions

The identified archaeological resources should be protected, and areas of any significant new use or improvements should be investigated for the potential presence of archaeological resources. The old barn, while not historically significant in its own right, offers a focal point and link to the historic use of the site, and could be useful as shelter and storage for site activities. Photos, documents, and stories of historical interest related to the site are available from local descendents of the original European settlers. These should be identified or collected and potentially used as part of interpretive exhibits at the barn.

Section E: Geology, Soils and Hydrology

Geology

The Newell Open Space Preserve is located within the Coast Range, which extends from the Oregon border to Southern California. The site is located east of the Napa River flood plain and is comprised of two main canyons and two tributary canyons. For convenience, names have been assigned to the canyons and drainages. The *lower main canyon drainage and creek* refers to the westward-draining canyon, which divides eastwardly into two tributary canyons. The *south tributary creek* extends from the southeast portion of the site to the junction of the lower and upper main canyon creeks. The *upper main canyon tributary drainage and creek*, lies above the junction with the south tributary creek. On the northeast portion of the property, a second drainage basin drains to the north. This will be referred to as the *north canyon drainage and creek*. Site elevations range from about 125 feet above mean sea level (msl) to the western limit of the property to over 950 feet above msl at the southeastern corner of the site. (EMCON Associates, 1988).

EMCON Associates conducted a geologic and hydrogeologic analysis of the site in 1988. They recorded Quarternay (as old as to two million years) alluvium and landslide deposits; Eocene Markley Sandstone and Nortonville Shale members of the Kreyenhagen Formation; Eocene Domingine Sandstone; and Cretaceous to Jurassic age bedrock units of the Great Valley Sequence and Franciscan Assemblage. (see figure 4.1-1 in the 1989 EIR document)

Alluvium occupies the drainage valleys of the main and tributary canyons. Alluvial deposits are eroded soils and bedrock debris laid down by running waters, rivers, or streams. Alluvium on the site consists predominantly of clay with minor layers of silty sand, sandy silt, and gravelly clay.

Bedrock formations: Markley Sandstone underlies most of the site. This formation consists of medium to thick bedded sandstone with interbeds of claystone, mudstone, and siltstone. The Markley Sandstone is moderately well cemented and slightly fractured with crushed to intensely fractured claystone and mudstone interbeds.

The eastern and southern margins of the property are underlain by the Nortonville Shale and Domengine Sandstone. The Nortonville Shale consists primarily of thinly bedded, intensely fractured claystone and mudstone with some sandstone and siltstone interbeds. The Domengine Sandstone consists of a hard, slightly to intensely fractured sandstone with numerous pebbly layers and some cobble and boulder conglomerate beds.

Bedrock of the Franciscan Assemblage is exposed along the southern margin of the project site. This unit consists mostly of a highly altered basalt known as greenstone. This rock is slightly to moderately fractured and has been altered locally to an extremely hard silica carbonate rock.

Site Geologic Structure: Site geologic structure is dominated by broad, northwest to west-trending folds. Faulting is minor with a few relatively short faults that are thought to be caused by deformation associated with local folding. A 400-foot wide, west-to northwest-trending shear zone was mapped along the southern margin of the site. This shear zone separates the Cretaceous Franciscan rocks, to the south, from the Eocene rocks, to the north. It consists of a zone of mixed lithologies derived from adjacent in-place formations that were sheared and placed into fault contact with each other. EMCON Associates concluded that this fault zone had not been active for several years. No known active faults pass through the site. The closest active fault is the West Napa fault, which passes about one mile west of the project site. Other major San Francisco Bay faults which could generate groundshaking at the site include the Green Valley fault located about four miles northeast, the Rodgers Creek-Healdsburg fault and the San Andreas fault respectively located about 11 and 31 miles southwest (Jennings, 1975)

Numerous landslides of various sizes, ages, depths and states of activity have been mapped on the site (refer to Figure 4.1-2 in the 1989 EIR document). Specific recent and current slope movement and erosion affecting roads are noted in section G. These areas of instability should be considered when planning the placement of preserve roads, bridges, culverts and trails.

There are exposed Markely Sandstone rock faces above the eastern ridge of the site around an elevation of 900 feet. The outcroppings are scenic and may also attract rock climbers. An exploratory mining tunnel dug during World War II in a reported search for the mineral magnetite runs approximately 150 feet horizontally into a hillside located near the southern boundary of the property (Phillip Blake, NRCS, personal conversation). The mine may become a point of historic interest for preserve visitors but may also be a potential danger or magnet for undesirable activities for unsupervised visitors.

Soils

The Soil Conservation Service (SCS, 1978) mapped the majority of the proposed landfill area as clay loam soils of the Fagan series (Figure 4.1-3). The Fagan clay loams (Fa, Fb, Fc) are slowly permeable soils with rapid runoff and a moderate to high erosion hazard. In the southwestern portion of the area, SCS mapped Millsholm loam on a steep north-facing hillside. The Millsholm loam (M) is a moderately permeable soil with very rapid

runoff and a high erosion hazard. There is a small area of Hambright-Rock outcrop complex (HR) in the southern boundary of the preserve. This soil is moderately permeable with rapid to very rapid runoff and a high erosion hazard.

Problems were observed in many of the tributary drainages on the site in the form of "head cuts", or rotational slumps at the upper end of the draw, often leading to slope failures and gullying the length of the draw. These conditions are not directly caused by cattle activity, but may be indirectly caused by cattle through their removal or prevention of woody vegetation that would otherwise protect these drainages (Phillip Blake, NRCS, personal conversation).

The limited use of this site as an Open Space Preserve should not conflict with the soil characteristics of rapid runoff and moderate to high erosion hazard. Recommended management practices will include careful planning and execution of trail and road profiles, limiting off-trail access and ongoing monitoring and management of slope and runoff conditions.

Hydrology

The site is located in a hilly area that separates the alluvial basins of the Napa Valley to the west, drained by the Napa River, from the smaller Green Valley to the east, drained by the Cordelia Slough. The hills are composed of sedimentary and metamorphic rocks with low permeability. They are considered insignificant as a groundwater reservoir resource because of their low permeability and because they are likely to contain trapped marine water (Thomasson, et. al., 1960).

The ridge line along the eastern boundary of the site is the drainage divide between the Napa Valley and Green Valley basins (Figure 4.2.1 of the 1989 EIR). Two stream drainages (basin subareas) have developed at the site. Both drain into the Napa Valley basin. The larger subarea, covering 85% of the site, contains the main canyon and the north and south canyons further east. The smaller subarea drains northward and originates north of the north canyon (refer to Figure 4.2-1 of the 1989 EIR). The site is located above the 100-year floodplain for the Napa River and is not subject to inundation. (FEMA, 1980).

Due to direct activity by cattle, and related reduction of protective woody vegetation and tree roots, many of the stream banks are exhibiting erosion and failure from the impact of stream flow. Many of the stream channels are deeply downcut, with entrenched cascades that are gradually eroding upstream and adding to stream siltation. Vegetation growing in the channel

indicates that these conditions have been present for many years (Phillip Blake and Leonard Jolley, NRCS, personal communication).

Intensive groundwater testing was done for the landfill EIR. The U.S. Army Corps of Engineers derived an isohyetal map for the Napa River Basin from precipitation records gathered between 1906 and 1956, and from information provided by the Napa Flood Control and Water Conservation District. This map indicates average annual precipitation for the site to be between 16 and 20 inches. (Refer to Figure 4.2-2 of the 1989 EIR)

Groundwater levels at the site fluctuate throughout the year and are controlled principally by the amount of precipitation at the site during the winter rainy season. The levels are highest during the winter and spring months as infiltration from rainfall reaches the groundwater table in the bedrock and are lowest in late autumn prior to the rainy season. (EMCON, 1988). During these months, spring discharge increases and ephemeral springs and seeps develop at the bases of the landslide deposits. There are two perennial springs on site, which are interpreted as resulting from the intersection of the groundwater table with the ground surface. Ground at the perennial springs was saturated through the summer into the month of October. (refer to Figure 4.2-1 of the 1989 EIR) Groundwater levels and perennial spring discharge begin to decrease in the late spring. Additional short-lived ephemeral springs are known to occur at the base of the landslides during the winter and spring (EMCON, 1988).) Ephemeral spring discharges cease in the summer months as groundwater levels drop.

Conclusions

The site's varied and unique geologic structure has led to a similarly unique assemblage of plants. Preservation of the geologic features goes hand in hand with protection of these plant communities.

The steep, unstable and erosion-prone slopes require careful placement and ongoing maintenance of roads, trails and any structures. Tributary drainages are experiencing slope failures and erosion that may be related to absence of woody vegetation, especially in wetter areas.

Creek banks along the main canyons are eroding due to the impact of cattle grazing and need to be protected and restored. In the future, creeks and springs should be protected from the impacts of cattle and trail users.

The existing roads and trails require improvement to address numerous instances of bank failures and gullying. This subject is addressed in detail in Section F and the Road Inventory and Assessment.

The rock outcroppings along the ridgeline may attract climbers, and the mine tunnel may attract explorers, especially children. Such use could become a nuisance or liability, and could impact adjacent sensitive resources.

Section F: Access and Circulation

Site Access

There are three potential alternative routes for short-term access to the site (see Figure 8). All three alternatives involve crossing and making road improvements on land owned by Jaeger Vineyards and Jack and Bernice Newell:

- The current access via Napa Junction Road, which crosses through the switchyard of the California Northern Railroad at a private crossing.

- South Napa Junction Road, which crosses a single track at a private crossing approximately ½ mile south of Napa Junction Road and leads to an equipment storage area and an old quarry owned by Jaeger Vineyards.

- Watson Lane, which is a public road crossing of a single track approximately a half mile north of Napa Junction Road.

The Management Program, (Part Two of this Plan) and the Summary and Estimate in Part Three provide recommendations for general and site-specific improvements.

Current vehicular access to the site is from Highway 29 via Napa Junction Road. The current route is described in three segments:

Segment A(1), (see Photo F-1) is a paved, two-lane County-maintained public road approximately 1150 feet in length. Napa Junction Road serves several residences and businesses, including Lena's Tavern, a metal recycling facility, and the switchyard and engine house of the California Northern Railroad. It is controlled by a stop sign at Highway 29.

Segment A(2) (see Photo F-2) is a private road extending from end of Napa Junction Road to the Newell property line. The surface is a combination of rock and deteriorated pavement. Similarly-surfaced roads extend to the north and south serving adjacent businesses west of the railroad tracks. The access road extends through California Northern Railroad switching yard and across its main north-south line, crossing five tracks about 1260 feet beyond the end of Napa Junction Road. The crossing is offset to the south approximately 50' from alignment of Napa Junction Road. A "private railroad crossing" sign is the only control - no other fencing or signing exists to control access across the tracks or into adjacent areas. According to

City of American Canyon staff the train speed limit on these tracks is 10 mph and trains run through the area approximately three times per week.

Beyond the railroad crossing is a cattle guard and a non-operational wood gate. The road extends about 1680 feet from this point through cultivated land owned by the Jaeger Vineyard Company. The road is single lane, with shallow ditches on both sides, and no fencing. The road has a surface of very deteriorated paving and base rock. The land and the road itself are low-lying and appear liable to poor drainage in wet weather. The road surface generally drains into the wheel tracks, which have settled from long use and inadequate subgrade. A dirt road crosses north-south just before the Newell property line. At this point the access road climbs in elevation slightly and the surface is in slightly better condition. This is the future alignment of Flosden Road, as indicated on the City of American Canyon General Plan Circulation Plan (see Figure 8). The Flosden Road extension, and planned extensions of east-west roads across the railroad at Eucalyptus Drive and Donaldson Way are important opportunities to provide public crossings of the railroad. Currently the nearest public crossing is at American Canyon Road, approximately 2700 feet to the south, where there is a signalized crossing with traffic arms. These road improvements are associated with the planned Town Center (see Section B, Land Use, Ownerships and Designations for more information). Flosden Road is planned as a four lane arterial, while Eucalyptus is planned as a two lane collector road. Both roads are planned to include bicycle and paths and/or sidewalks per the General Plan.

Segment A(3) (see Photo F-3) begins at the Newell property line, at a cattle guard and a chain link gate (typically open) in a cattle fence line. The fence is down on the north side. The road extends in a similar condition to A(2) approximately 1250 l.f. to a driveway turning off to the north to the residence. The former ranch homestead site and associated barn and storage building are located on the south side at this point. The driveway itself has more recent, but deteriorating, chip seal surface. The access road to the site, extending 750 l.f. east from this point to Gate G1 (see cover photo), is an unsurfaced dirt road, but it is sloped well for drainage, and is generally in good condition for access when dry, except as noted in the Inventory Chart. Both sides of the road are fenced for pasture up to Gate 1, which is a pipe and chain link "sheep gate" in fair condition, maintained closed. Beyond Gate G1 the road consists only of wheel tracks extending 500 l.f. through gently-sloping pasture, and is fenced only on the south side. This segment is also in good condition for access in dry conditions. Gate G2 is a galvanized steel channel 12' wide, in good condition, maintained closed.

Photo F-1: Napa Junction Road from near R.R. looking west – A(1)

Photo F-2: private Napa Junction Road from near R.R. looking east – A(2)

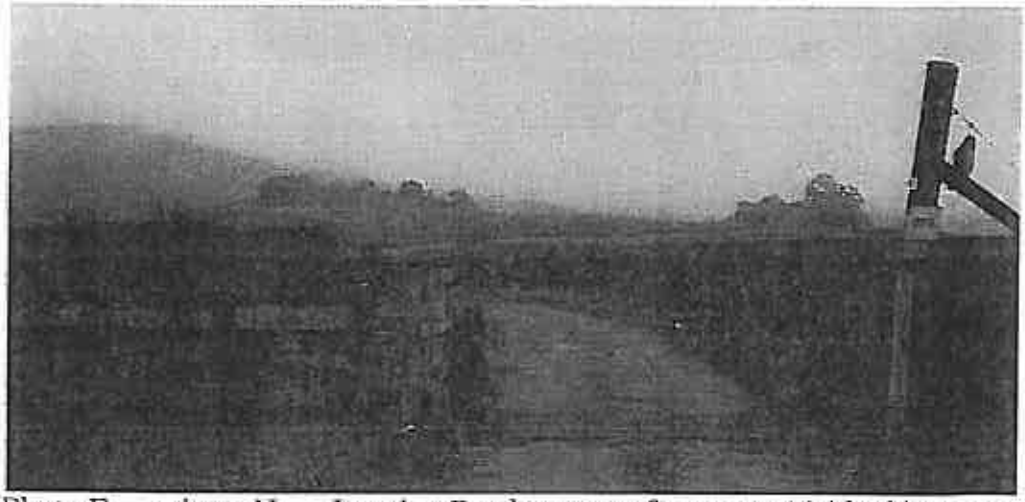


Photo F-3: private Napa Junction Road at start of segment A(3) looking east

A potential alternative to the current access is South Napa Junction Road, a public road extending approximately 800 l.f. from Highway 29 to the railroad, where it becomes a private road crossing a single track (see Photos F-4, F-5, and F-6). It provides access to commercial and residential uses west of the railroad. Beyond the railroad it provides access to an area used for storage of trucks and materials, and a former cement plant and quarry on property owned by Jaeger vineyards. If this route is to be used for access to the Preserve, in addition to permission from Jaeger Vineyards, improvements would need to be made to approximately 3,000 l.f. of existing unpaved roads to connect to the north to segment A3 of Napa Junction Road at the approximate alignment of the future Flosden Road extension.

The second alternative to the current access is Watson Lane, a public road located approximately 2200 l.f. north of Napa Junction Road, and accessible from Highway 29 via Paoli Loop Road (see Photos F-7, F-8, and F-9). Watson Lane provides access to residential and agricultural uses, and crosses the railroad at a single track at a public crossing. The public road ends approximately 800 l.f. east of the railroad at an improved private road on Jaeger Vineyard property that serves agricultural and residential building complexes to the north and south. If this route is to be used for access to the Preserve, in addition to permission from Jaeger Vineyards, improvements would need to be made to approximately 1800 l.f. of existing unpaved roads to connect to the south to segment A3 of Napa Junction Road at the approximate alignment of the future Flosden Road extension.

Preserve Road System

Internal circulation on the site is provided by a system of unpaved ranch roads comprising a total of approximately 3.36 miles (see Figure 7). Roads on the Open Space Preserve site are described in detail in the Road Inventory and Assessment Chart in Part Three. For convenience, roads are given "placeholder" names and assigned segment numbers. Each road segment is covered in the chart with general recommendations, and site-specific recommendations as appropriate. **This Inventory and Assessment is for general planning purposes only. All findings and recommendations are preliminary and should be subject to review and confirmation or correction by qualified engineers.**

The Preserve roads have historically been used for cattle ranching operations and for access to the PG&E transmission towers. Road connections onto adjacent properties (in addition to the main access) are located at five points around the perimeter of the site as indicated on Fig. 7.

Photo F- 4: South Napa Junction Road at Highway 29 (looking west)

Photo F- 5: South Napa Junction Road near R.R. (looking west)

Photo F- 6: South Napa Junction Road at R.R. (looking east)

Photo F- 7: Watson Lane at Paoli Loop (looking east)

Photo F- 8: Watson Lane approaching R.R. crossing (looking east)

Photo F- 9: looking south from end of Watson Lane across Jaeger Vineyards

The road system is generally in good condition, with exceptions as noted in the Road Inventory and Assessment, and most roads are navigable by passenger vehicles during dry conditions. The good condition of the roads can be attributed to a large extent to very low use levels. Many of the roads have vegetation growing across the entire surface, which greatly reduces erosion.

From both functional and aesthetic standpoints the roads are well adapted to use as a public trail system. They afford access to most areas of the site, are generally adequately designed and constructed, and provide enjoyable views and experiences for trail users. A few segments are too steep and/or are routed straight down hillsides, making control of runoff and erosion difficult. Other segments dead-end at private property or steep hillsides. These segments are recommended for abandonment, as noted in the Inventory, and alternative alignments are recommended for trail connections where required. Generally, construction of new roads should not be necessary, and new trails are required only in limited locations to provide connections or as alternatives to road segments with undesirable configurations.

Much of the site, including steep slopes and creek banks, is laced with cattle trails. These trails are highly susceptible to use and expansion by Preserve visitors. While some of the cattle trails may be in appropriate locations and may ultimately become part of the designated trail system, many are locations where expanded use could lead to environmental damage or user safety issues.

The soils on the site (described specifically in Section E) are heavy clay loams, which are extremely slick and sticky when wet, and highly susceptible to slope or bank failure when saturated. While the roads are nearly all passable to passenger vehicles when dry, they are impassible even to four wheel drive vehicles when saturated, at least without risking significant damage to the road surface, and subsequently to the road structure. In wet conditions the roads are also impassible, or at least impractical, for use by bicycles and horses, which can each damage the surface with ruts or hoof prints, respectively. Although pedestrians are less likely to cause surface damage than horses and bikes, they will also experience adverse conditions in wet weather. Judging when the roads are wet enough to cause damage from different types of users requires careful monitoring and experience.

Ridge Trail Planning Studies and Grants

One aspect of road use and trail planning related to the Newell Preserve is proceeding on a separate track from the Management Plan. The Bay Area Ridge Trail Council is a private non-profit organization dedicated to implementation of a regional multi-use public trail ringing the nine Bay Area

counties. Through the State Coastal Conservancy, the Ridge Trail Council has provided a $236,000 grant to the Solano County Farmlands and Open Space Foundation to develop a section of the Ridge Trail, an overall Preserve trail system, a public trail staging area including parking, signage and sanitary facilities, and an environmental education program at the Foundation's Lynch Canyon Preserve. The Ridge Trail Council has also committed grant funding for trail and related public access improvements at the Newell Open Space Preserve.

The plan for trail development and designation for Lynch Canyon (see Appendix E) includes construction of a new trail segment on the east side of the ridge between Lynch and Newell (G (1) on Figure 7), connecting from roads designated as segments D and H in this report, and utilizing a portion of roads G, E and E(1). The Route Study map also shows possible future Ridge Trail use of the remainder of road segment E. The Route Study shows that portions of these trails, including the proposed new trail, are on the Newell property.

The trails were constructed in Spring, 2001. Access on a docent-led basis is to continue, expanding on a limited program already begun by the Foundation. Overall, the Ridge Trail planning and grant support is a tremendous boon to the public access objectives of both the Newell and Lynch Preserves. However, careful coordination of improvements and use will be required, since the areas are managed by different organizations, while the sites are physically one unit, and any uses that occur on one site will inevitably occur on the other.

Conclusions

Any of the three alternative access routes to the site will require agreements with Jaeger Vineyards and the Newell's, and significant improvement to provide a surface suitable for public access. The Watson Lane alternative presents the best physical access situation with the least improvements required. A better public crossing of the railroad and closer access to the site will be created when the Flosden Road and Donaldson Way extensions are completed.

The existing roads on the site are in good condition except for problem areas primarily along segment D and the southern portion of segment F. Except for a few overly steep or dead-end segments the roads, and a few needed connections, the existing road system provides a complete public trail system to serve the Preserve.

Roads that are to be used for public vehicle access at any time, and roads that need to be accessible in wet weather for patrol, emergency or agricultural purposes should have an all-weather surface; at minimum compacted base rock.

Careful attention should be paid to the use designation, improvement and maintenance of roads and trails and related drainage facilities, as no other site feature is likely to have as significant cost, or environmental impact if it fails.

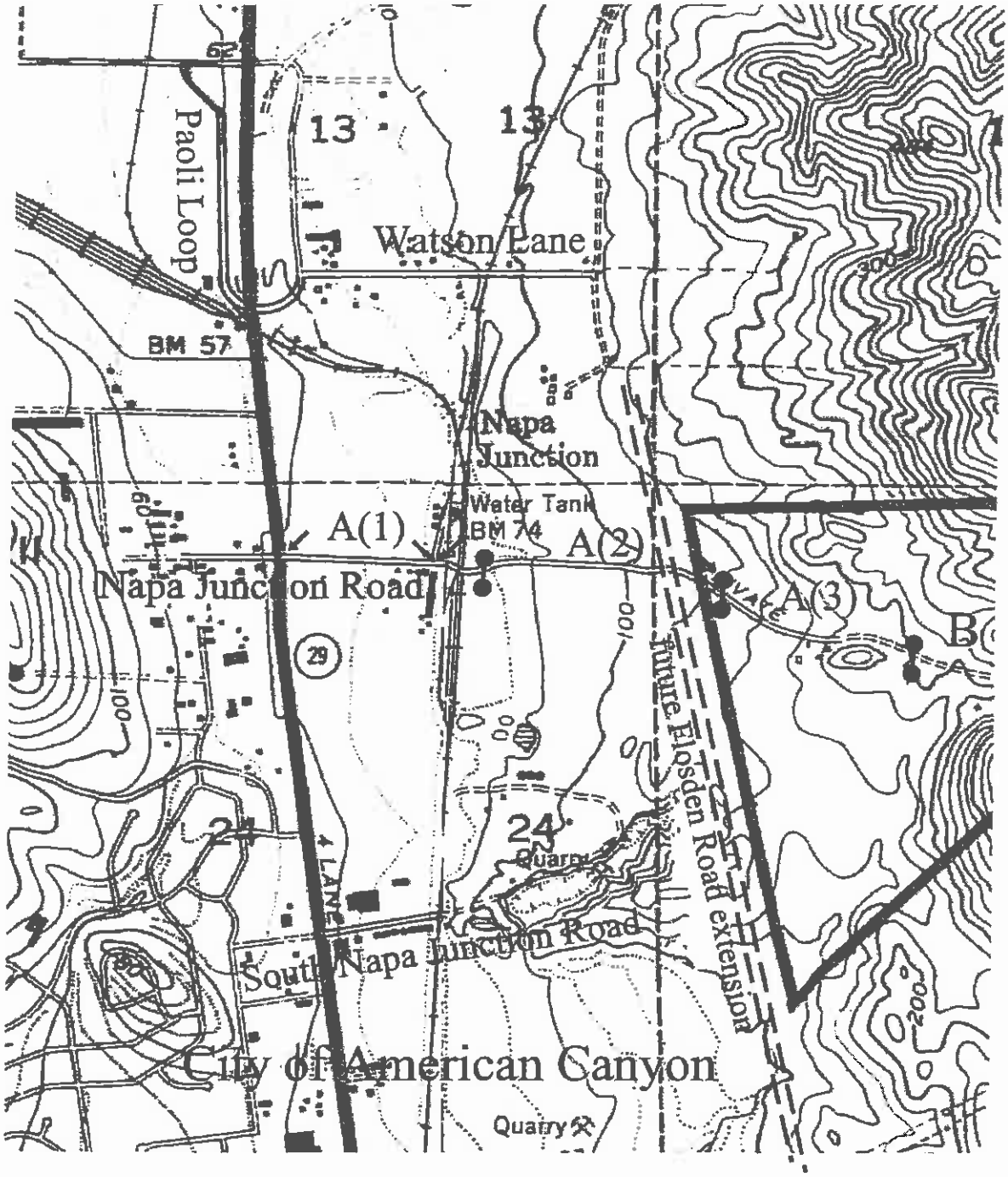
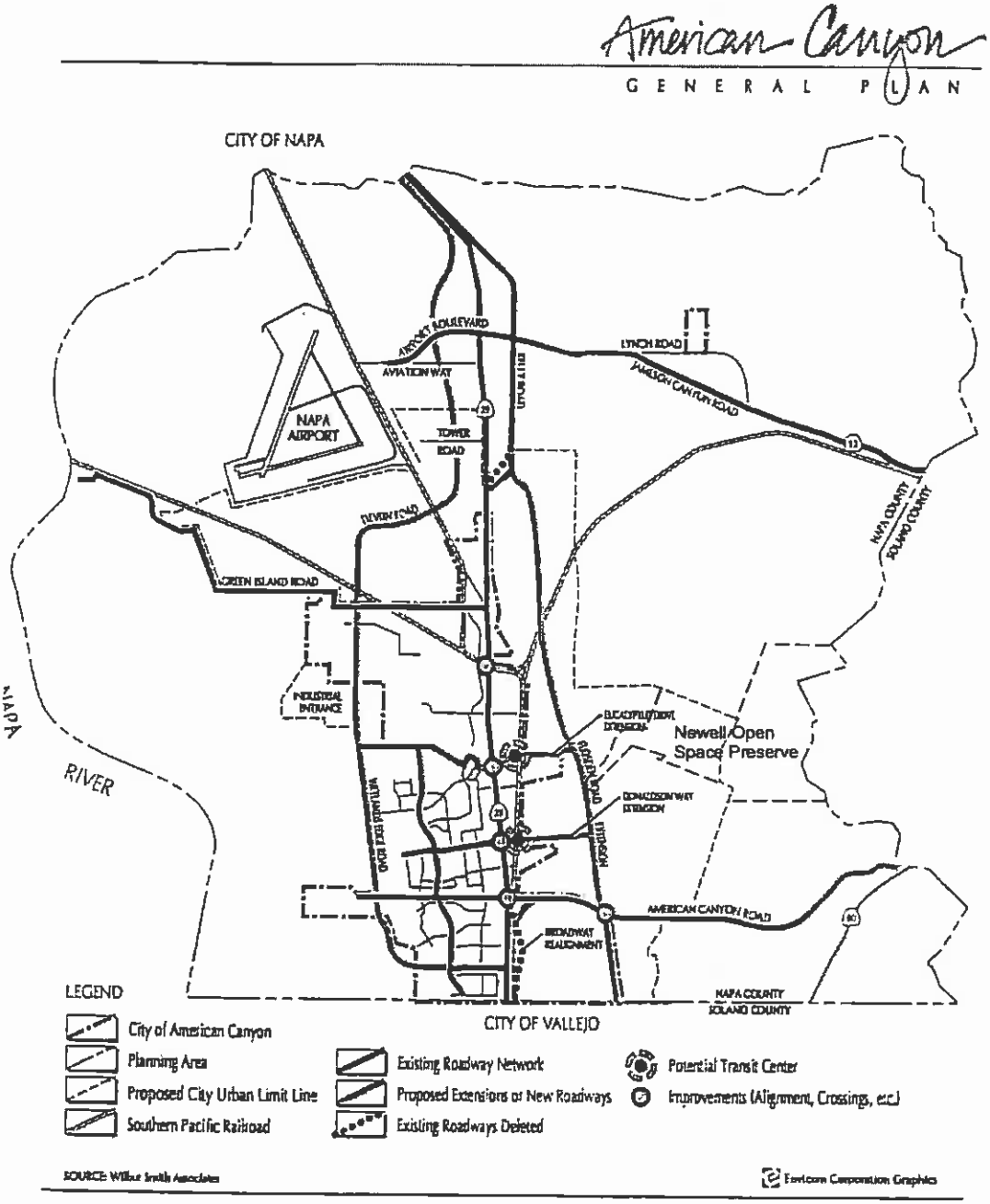


Figure 8
Site Vicinity and Access Map



CIRCULATION IMPROVEMENTS PLAN

Figure 9
General Plan Circulation Map

Section G: Facilities and Infrastructure

The Newell Open Space Preserve will remain mostly undeveloped, in accordance with its purpose to preserve and protect the area's flora and fauna, as well as for public hiking and equestrian use. The one remaining structure on the site, an old barn, is in the only area that is anticipated and suited for development of significant facilities (see Figure 10). This site is located near the entrance to the Preserve, south of the lower canyon creek.

The creek in this area lies between eroded banks rising approximately five to eight feet above the creek bed. There is a margin of vegetation on either side of the creek comprised primarily of Coast Live Oak (*Quercus agrifolia*), red willow (*Salix lasiolepis*) and Blackberry (*Rubus ursinus*). In the past there was a bridge crossing the creek just downstream from a large mass of three oaks.

On the southern side of the lower canyon creek is a relatively level area that has historically been the site of dwellings and agricultural buildings. It lies between the lower canyon creek and a steep wooded hillside to the south, and features a long vista to the west. Near the barn remnants of foundations are apparent from two previous dwellings. It was in this clearing that Mary Falls and Richard James built their house when they established their homestead in 1853 (see Section D, Cultural Resources). At least as late as the 1960s there was an intact home in this area where the Lopez family lived. (Mike Rippey).

Approximately half of the total level area around the barn is within the frog mitigation area described in Section B of this report. The boundary of the mitigation area and the Preserve property lines have been roughly approximated on Figure 10. They should be located accurately by qualified surveyors before detailed planning of facilities is undertaken. The remaining usable area around the barn is approximately 2 acres, which may be a constraint depending on the extent of desired parking and facilities.

The wooden barn, while still standing, is not in good structural condition. It is approximately 53 feet wide by 46 feet long with a steeply sloped aluminum roof that is badly damaged, especially on the south side. The barn has an earth-floored central bay approximately 18 feet wide where the feed was presumably stored and forked into the feed troughs, and open cattle feeding areas under the eaves on the north and south sides. These feeding areas have deteriorated concrete floor surfaces. The low eaves on the open sides have sagged further as the structure has aged, such that the eaves on both sides are less than six feet clear of the ground. The barn structural members appear to have been protected from the weather and appear to be sound. The barn should be inspected by a structural engineer or other qualified person to advise on condition and requirements to stabilize and improve the structure.

It is possible that the barn could remain as a historic relic, and be improved upon to become the preserve visitors/education center.

This area may also be the site of a future caretaker's home. A caretaker could function to monitor the condition of roads and trails as well as provide a presence on site to encourage visitors' compliance with preserve regulations. This area is well suited for the visitors' center and caretakers home because it is close to the preserve property boundary and the entry road, and is relatively close to water and power services.

Access to water is available from City of Vallejo water mains. Both potable water and raw water lines are available approximately 1500 feet west of the Barn area, crossing the access road near the Newell's driveway. Access to electric power and phone service is also at this point, which is the extension serving the Newell residence. Figure 8 notes the location of the power and water lines. There are no sanitary sewer facilities located on or near the site, and waste disposal would have to be provided by septic system(s) or vault toilets.

The only other facilities or infrastructure on the site are PG&E transmission towers, ranch roads and related drainage structures, fences and gates, and rudimentary water collection systems for the cattle operation. These facilities are located on Figure 7 and are described in Section F and Road Inventory and Assessment, the Road Inventory.

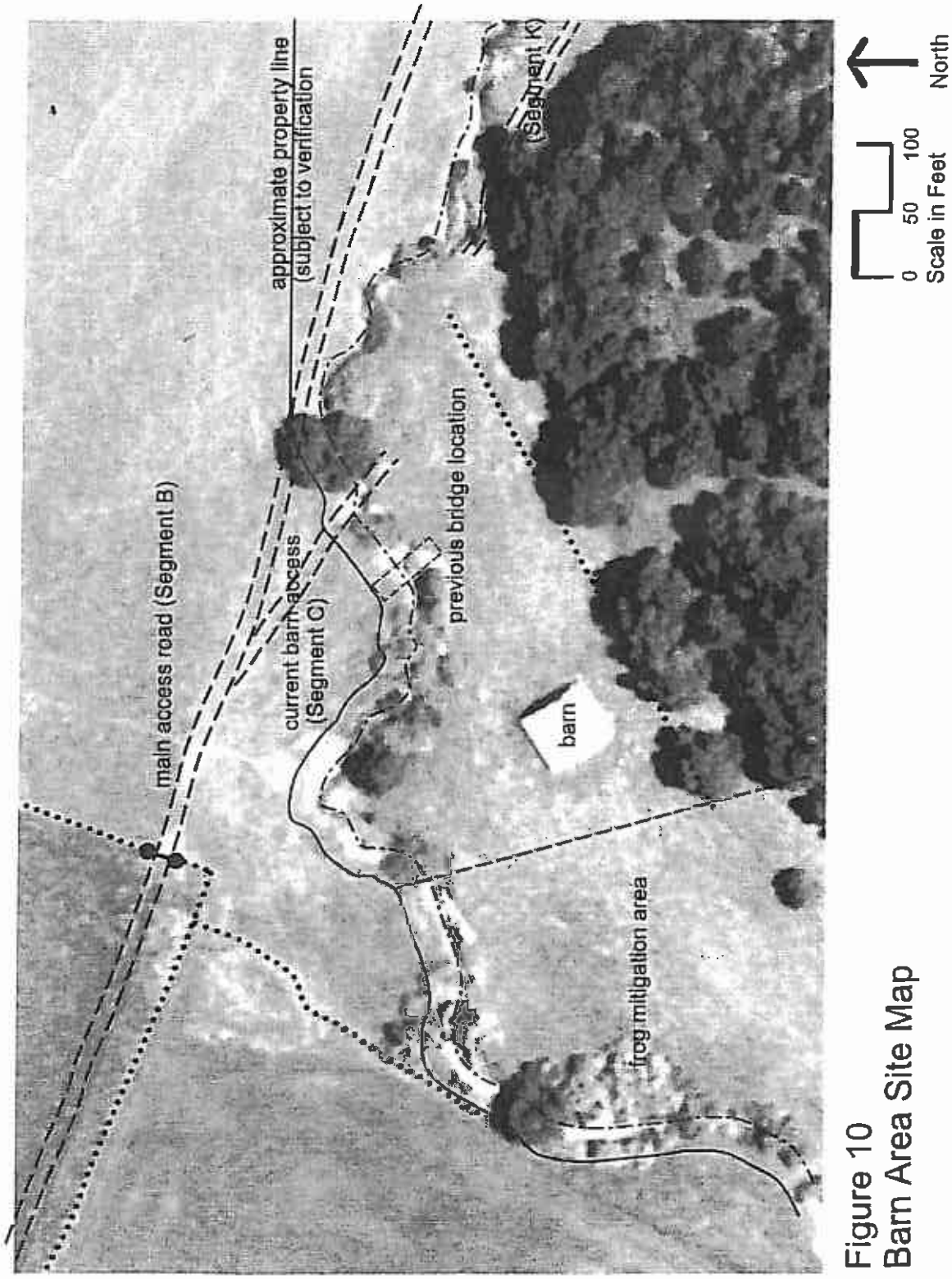


Figure 10
Barn Area Site Map

Overview

Part Two of the Management Plan specifies the policies and actions for management, improvement, and public use of the Preserve. Once adopted by the City of American Canyon and accepted by the Napa County Land Trust, these measures become the official policy and plan for use and management of the Preserve. The Use and Management Program, except for the Grazing Management Plan, is presented in outline form for easier reference. Section A addresses Resource Protection and Restoration, which is the priority goal for the Preserve. This includes the Grazing Management Plan contributed by the Natural Resources Conservation Service, as grazing is an integral part of the resource management approach. Section B addresses Site Use and Improvement: policies for management of public use and implementation of related improvements and facilities. These policies and measures have been designed to support the Resource policies. Section C, Site Management, addresses the tasks and arrangements necessary to effectively administer and manage the site in accordance with the Resource and Site Use and Improvement policies.

Section A: Resource Protection and Restoration

The overall goal is to restore the Preserve to a diverse and relatively natural biological condition, to the extent possible. Given the historical conversion of grassland to dominance by non-native annuals, and the long-term alteration of the landscape by grazing and prior manipulation by Native Americans using fire and rudimentary agriculture, there is no absolute "natural" condition, and even an unaltered landscape evolves and adapts to climatic and biological changes over the long term..

The primary focus of specific resource protection and restoration efforts will be on grazing/grassland management, including fencing and water supply improvements to provide opportunities to rotate cattle and protect creeks; creek bank and creek bed restoration and protection measures, and measures to protect and restore tributary drainage gullies; and protection of rare and sensitive plant species, including serpentine bunchgrass, and Tiburon paintbrush, and animal species including burrowing owls, eagles, and other raptor species that congregate on the site during fall migrations.

1. Native Vegetation

a. Monitoring and Management

1) Develop an agreement with the California Native Plant Society, Natural Resources Conservation Service, local universities, and/or other qualified botanists to annually monitor and report on the condition of native plant populations and habitat, and help identify and coordinate needed protection and restoration action.

2) Coordinate monitoring and management efforts with Solano County Farmlands and Open Space Foundation, managers of Lynch Canyon Open Space Preserve.

3) Conduct a fine scale survey of soils to help identify sites suitable for tree planting.

4) Arrange that consistent scientific study methods are used and records are maintained for future reference and assessment

b. Rare and Sensitive Plant Species

1) Protect habitat of Tiburon paintbrush from grazing by fencing and monitoring population/habitat on a regular basis. Use controlled short-term grazing and/or other management practices to maintain and improve the health of this plant community. Minimize impact to this community by excluding this area from trail construction, but permit casual entry for photography and other forms of passive recreation or study.

2) Regularly monitor the population of Ribes victoris and other special status or unusual plants on site and determine if protection or restoration action is needed.

3) Isolate riparian corridors or create setbacks from cattle grazing areas to improve water quality, minimize erosion and vegetation trampling. Actively restore degraded riparian vegetation.

c. Plant Habitats and Communities

1) Minimize grading to minimize erosion and reduce vulnerability to weed invasions.

2) Install fencing to control grazing access to the Serpentine bunchgrass plant community to maximize quality of sensitive plant habitat (see A.3., Grazing Management). Use controlled short-term grazing and/or other management practices to maintain and improve the health of this plant community.

3) Minimize impact to the Serpentine bunchgrass plant community by excluding this area from trail construction, and providing docent-led access to enhance public appreciation.

4) Install fencing to control grazing access to riparian areas and take action to protect and restore riparian vegetation (see A.5.b., Riparian Areas, for specific protection and restoration measures).

5) Encourage native grasses and forbs by controlled grazing and/or burning, and potentially by collection and planting of seed from existing plants on-site.

6) Prevent erosion along trails, gullies and roads by restoring with perennial ground cover (*Leymus triticoides* and *Carex barbarae*) and shrubs (*Symphoricarpus albus, Rubus ursinus*). Use only locally collected seeds or cuttings for restoration projects.

d. Invasive Plants

1) Control yellow and purple star thistle, teasel, fennel, cardoon, horehound and other invasive plants in grassland areas through careful management of grazing and/or controlled burning (see A.3., Grazing/Grassland Management, and C.1.e., Fire Protection).

2) Control invasive plants in public use areas and other non-grazed portions by hand or machine mowing, pulling, and use of herbicides in an environmentally sound manner in accordance with best management practices.

3) Control weed invasion along streams, particularly Himalayan blackberry, by annual monitoring and if needed, executing a program to control or eliminate where possible.

4) Monitor the Eucalyptus groves on and near the site and remove seedlings as necessary to control the spread of these trees. These eucalypts provide desirable nesting and roosting sites for raptors, and have value as cultural/aesthetic features, but can be invasive if not controlled over the long term. The very long-term objective is to replace these non-native trees with native trees, such as oaks.

5) Remove dead wood from the Eucalyptus grove to reduce potential for falling limbs.

2. Wildlife and Wildlife Habitat

a. Monitoring and Management

1) Work with the Audubon Society, the U.S. Fish and Wildlife Service, local universities, and/or other qualified biologists to monitor and report on the condition of native animal populations and habitat, and help identify and coordinate needed protection and restoration action.

2) Arrange that consistent scientific study methods are used and records are maintained for future reference and assessment. The Land Trust of Napa County will be responsible for reviewing and approving scientific study methods.

3) Monitor and potentially manage populations of feral and non-native animals that may impact preserve resources, such as cats, dogs, red fox, and wild pigs. Cooperate with adjacent property owners, County Animal Control, and state and federal wildlife agencies with regard to any significant control measures.

4) Coordinate monitoring and management efforts with Solano County Farmlands and Open Space Foundation, managers of Lynch Canyon Open Space Preserve.

b. Sensitive Species, Habitats

Regulate traffic or isolate portions of the park during season of ground nesting birds. Specifically protect the colony of burrowing owls located in the southeast corner of the site.

c. Red-Legged Frog Mitigation

Work with US Fish and Wildlife Service to improve habitat for red-legged frog. This may include development of shallow seasonal ponds in the designated mitigation area, and/or along portions of the lower main canyon creek.

d. Eagle Nesting and Other Raptor Protection

Close or limit use of trails that pass near active nests during nesting season of protected raptor species and potentially during heavy fall raptor migration activity. Coordinate with Audubon Society and U.S. Fish and Wildlife Service regarding monitoring and protection methods, and combine efforts to control access with public information and education.

3. Cultural Resources

a. Archaeological Resources

1) Protect existing archaeological sites and features from disturbance, potentially including fencing of the grinding rock along trail K.

2) Use qualified archaeologists to survey any sites to be developed or disturbed prior to initiating work, if the site has not been previously surveyed.

3) Do not publish the location of known archaeological sites in order to protect them.

4) Include information about Native American use of the site in interpretive materials and programs (see 7.c.1), Barn Area Use and Improvements).

b. Historical Resources

1) Continue to collect and maintain information about the history of use of the Newell Preserve site and adjacent areas and make it available to current residents and visitors.

2) Include information about history of the site and the region in interpretive materials and programs (see 7.c.1), Barn Area Use and Improvements).

4. Geology, Soils and Hydrology

Many of the slope failures and eroded gullies on the site are located along road segment D and the parallel creek drainage to the south. Fencing cattle out of the area between the road and the ridge south of the creek as proposed in the grazing management plan will aid the protection and restoration efforts outlined below. The references outlined below provide general guidance. Repair methods should be specified for each particular problem area by a qualified engineer or scientist.

a. Landslides and Bank Failures

Many of these failures are related to down-cutting of stream channels or cuts created during road construction. Other slope failures have occurred naturally and will stabilize and re-vegetate on their own.

1) For slides that are impacting roads on moderate slopes, re-grade the road through the area while minimizing cut or fill slopes.

2) Facilitate drainage of water from the slope by installing subsurface drains similar to the diagram *Surface and Subsurface Drainage to Increase Soil Shear Strength*, USDA, Natural Resource Conservation Service, 1998.

3) Use bio-engineered slope stabilization methods outlined under Riparian Areas (b.5) for very steep or unstable slopes.

b. Riparian Areas

1) Isolate riparian corridors partially or completely from cattle to improve water quality, minimize erosion and trampling (flash grazing may be useful for vegetation management purposes).

2) Monitor the south canyon tributary creek for impacts of cattle. The Grazing Management Plan includes fencing and development of new water supplies that will allow cattle to be fenced out of riparian areas along the entire upper and lower main canyon. The south tributary creek will remain accessible to cattle. It is well vegetated and does not display the impacts of the main canyon creek. It should be monitored and cattle fencing should be considered if impacts are identified.

3) Construct grade control structures (brush or rock dams or hard points) in creek beds as needed to stabilize downcuts. Specific details for construction are contained in *Groundwork, A Handbook for Erosion Control in North Coastal California*, Marin County Resource Conservation District, 1987, pages 21 and 22. Straw bale check dams should be avoided in creeks because they break down too easily.

4) Plant bare and eroding creek banks with native vegetation, i.e. willows and other native riparian plants, preferably collected from material on-site. Use fiber mats or other mulch as necessary to protect slopes until plants become established.

5) For actively eroding and slumping creek banks, use bio-engineered bank protection methods detailed in the *Field Engineering Handbook, Chapter 16, Streambank and Shoreline Protection*, USDA, Natural Resources Conservation Service, 1996, pages 13 – 21 and pages 31 and 32 Use of rock bank protection should generally be limited to the toe of slope on tight apexes of curves where scour will occur.

6) Remove old portions of water systems left in creeks. Reconstruct if necessary in conjunction with improvement of cattle water supply

c. Tributary Drainages

Stabilize and repair eroding gullies through the following methods, which are detailed in *Groundwork, A Handbook for Erosion Control in North Coastal California*, Marin County Resource Conservation District, 1987, pages 6 - 21:

1) Reduce soil compaction by eliminating or rotating grazing activity.

2) Reshape eroding head cuts and gullies by hand or light machine grading. Disturbed areas will require protection with straw mulch or fiber mats until vegetation is re-established. Large and/or steep re-graded areas or slope failures may require slope retention measures as outlined under 5.b.

3) Replant with herbaceous cover (broadcast or hydroseeded native seed mix), and/or with woody vegetation (ideally cuttings from native willows if there is enough soil moisture to support them).

4) Replant north-facing gullies with native oaks, bays and buckeyes to provide cover and slope stabilization.

5) Install rock or brush check dams and rock riprap in particularly steep down-cutting channels.

d. Wetlands

1) Reduce impact to wetlands by controlling grazing and providing alternate water sources.

2) Avoid impacts by keeping trails out and away from wetlands.

e. Unique Geological Features

The rock outcroppings at the southeastern boundary of the Preserve should be protected from potential damage by climbing activities (see Site Use and Improvement, B.3.e)).

5. Grazing Management Plan

Introduction/Setting

During the fall and spring of 2000-2001 NRCS staff began assessing the Newell Open Space Preserve, (NOSP) property, at the request of the City of American Canyon, the Land Trust of Napa County, and planning consultant Randy Anderson. NRCS was requested to prepare a physical assessment of the NOSP and a grazing management plan with the current lessees Ron and Ralph Azevedo. The following natural resource assessment and plan recommendations were prepared following on-site reconnaissance, meetings with the Azevedo brothers and others, and reviews of existing resource information available for the NOSP and neighboring Lynch Canyon lands.

The 648 acres of preserve lands have a long history of farming and ranch use. Livestock grazing has been the dominant use of the land for the last 150 past years or more, (personal communication with Ralph and Ron Azevedo).

About 80% of the land area consists of annual grasslands. The majority of the remainder of the preserve includes bay laurel-oak woodlands and two groves of Eucalyptus. Most lands are steep in terrain with isolated pockets of gentle slope and canyon bottom lands and ridge lines soil types generally differentiate the various vegetation areas. The 1978 SCS Napa County Soil Survey maps most of the grasslands as Fagan clay loams, within two slope phase designations. The bay laurel-oak woodland in the southwestern corner of NOSP is mapped as Millsholm loam 30-75% slope. Two prominent rocky ridgelines consist of Hambright-rock outcrop complexes, and an inclusion of serpentinitic soil along a portion of the southern property boundary.

Fagan soils are generally associated with Markley formation sandstone parent materials. Fagan soils have a high soil moisture holding capacity, owing to a high clay content in both the topsoil and subsoil. Landslides and earth flow instabilities are common occurrences in Fagan-dominated landscapes. NOSP grasslands and riparian areas are heavily pock marked with earthen rotational slumps, landslides, and gullies, throughout much of the uplands. Stream bottom degradation and bank erosion are common along most of the upper riparian area reaches. Fine sediment deposits in lowland riparian areas represent a small fraction of the erosion emanating from hillslopes and down-cutting headwater stream reaches.

Photo 2 -1. Looking northwest from NOSP. Typical hillside landscape of Fagan series. Note recent landslide activity in the background.

Ranch access roads, road culvert outlets, and grazed riparian areas in various areas of NOSP exhibit active concentrated flow, gully, and headcut erosion that has been accelerated by land management practices. Restoration plans will clearly need to focus on protecting these areas from overuse, to allow for vegetation to establish and provide adequate stabilization.

Grazing

Forage production on Mediterranean annual grasslands is highly variable, both on a total annual and seasonal basis. Precipitation, soil type, land slope and aspect, canopy overstory, and forage type/condition, influence the amount, quality, and seasonal availability of feed. High soil moisture capacity and cool, foggy conditions combine to create potential for excellent annual grass and for production in the Jamieson/American Canyon lands of southern Napa County. This potential must be evaluated and balanced with additional considerations with steep slopes, soil compaction, and the presence of yellow star thistle, *Centaurea solstitialis* and purple star thistle, *Centaurea calcitrapa.* Climate, physical conditions and plant community composition alone do not fully determine the productive capacity of the land. Grazing strategies and tools including stocking rate, season of use, watering and mineral supplement location, and paddocks development/ management also significantly influence short and long term feed production and sustenance of desired plant species.

Grazing capacity is defined as forage production available for grazing on a given site. Expressed as animal unit months or AUMs, (the amount of forage needed to support one adult cow with calf for one month), available forage is factored minus that which

should be left as residue at the end of the grazing season. Properly calculated for the site, stocking rate provides a measure of the number of livestock that can be grazed without damage to forage productivity or decline in condition of the land.

Site Productivity Estimation

Because detailed site-specific grazing history and forage production records are not available for the preserve, various sources of information were consulted to determine estimated carrying capacity production. Estimates for the neighboring Lynch Canyon property were examined, but productivity estimates based on short-term plot data appeared to be somewhat high.

Based on local experience in the Jamieson Canyon/ American Canyon area, well-managed ranches have been able to carry an animal unit, (AU) equivalent on 3 to 6 acres, per typical 5 to 6 month grazing season, (NRCS staff long-term observation and experience). County SCS soil survey range site productivity figures for Fagan "fine loamy" range sites place grazing capacity estimates roughly within this estimate in "favorable" vs. "unfavorable" rainfall years. The UC Davis "Estimated Grazing Capacity Scorecard" was consulted, but not used, as precipitation and geographic ranges do not fit well with conditions in southern Napa County.

SCS soil range site descriptions were used for NOSP estimates, as figures closely match long-term productivity observations, and allow for production based on soil and rainfall variables. In years of average to above average rainfall and favorable rain distribution, the survey lists 3,200 pounds of annual air dry production potential per acre. In dryer, less favorable conditions only 1,600 pounds of production are estimated.

A second "Shallow course loamy" range site description is mapped for bay laurel-oak woodland lands in the south west portion of the NOSP. Because this area will be precluded from grazing, acreage and production estimates were precluded from the analysis. In addition, because sensitive plant communities, erosion prone lands, and most riparian areas are being recommended for exclusion from regular grazing, a total area of 460 acres is estimated to be available for forage production. Of these lands, approximately 30%, or 138 acres are moderately sloping with the remaining 322 acres in strongly to steeply sloping terrain. Different grazing utilization factors as well as 2 residual dry matter, (RDM) factors, were used based on terrain variables previously noted. These are reflected in the following NOSP grazing capacity estimate summary:

Table 2-1

Fine-loamy SCS Range Site Production Estimates For NOSP Grazable Lands

		Favorable Years				Less Favorable Years	
	Moderate Lands		Steep Lands		Moderate Lands		Steep Lands
*Total Production	441,600		824,320		220,800		515,200
Recomm'd. RDM *	103,500		322,000		103,500		322,000
Total Avail. Production*	338,100		502,320		117,300		193,200
Total AUM's Available		840				311	

* Figures are in pounds

The above figures were based on an estimated 460 acres of net grazable land. The Grazing Management plan map details locations of pastures, and designated grazing exclusion areas used in the analysis. Computations included higher required residual dry matter, (RDM) levels for steeper lands and a 20% reduced forage use factor for lands less accessible for animal use. Maintaining minimal prescribed levels of RDM throughout NOSP will be an important tool to assess proper grazing use. It is recommended that a minimum of 750 lbs. per acre be left on moderately-sloping land, and 1,000 lbs. per acre retention on the steepest lands. In addition to RDM measurements, visual assessments of plants species composition, and range trend analysis will provide an ongoing measure of grassland restoration and grazing management effectiveness. More detail is provided in the "Monitoring" section of this plan.

Current Grazing Program

The Azevedo's currently graze NOSP lands in combination with other adjacent properties, where they run a diversified cow/calf and stocker operation on their own ranch and other adjoining lands. The NOSP, portions of Lynch Canyon, and the Jaeger ranch, (about 1,500 acres total) are mainly utilized to carry yearlings. The cattle are brought onto the land in mid to late fall and graze into the month of June. Perimeter fencing between NSOP and Jaeger lands is in poor repair, and no fencing is in place between NSOP and the Lynch Canyon Parcel. In January 2001, about 250 yearlings

were grazing NSOP and plans called for keeping the animals on the land through the grazing season, (personal communication with Ralph and Ron Azevedo).

Assuming that the 250 yearlings stay mostly on the NOSP through May, forage demand would roughly equal 1,125 AUM's, (250 x 0.75 AU x 6). Assuming a six-month grazing season, with no winter supplementation of hay, this value exceeds the "favorable" year production estimates by about 33%. It should be noted that these production estimates are based on a future net loss of 20% of currently grazable land, as previously noted. The use of, or need for supplemental hay feed inputs and grazing drift due to lack of fencing control between ranches are management issues that should be clarified prior to implementing a grazing plan agreement between the city and the Azevedos.

Although production estimates for carrying capacity are rough at this point, they do point to the fact that stocking rates and past grazing season range conditions should be closely monitored to evaluate for any needed adjustments. The preliminary analysis strongly suggests that stocking rates would need to be significantly reduced to prevent overgrazing in less favorable rainfall years.

Fencing and other rangeland improvements should be put in place to improve grazing control on the NOSP. Once necessary perimeter fences, cross fencing, and water developments are complete, yearly post-grazing RDM measurements and pasture condition and trend observations will provide information to fine tune stocking rates, and evaluate grassland restoration goals. Applied properly, prescribed grazing management practices should reduce upland erosion rates, help control star thistle, reduce water quality impairment, and improve overall plant species composition. Exclusion fencing of sensitive riparian and upland erosion problem areas, coupled with revegetation and other stabilization measures will be important additional components of the restoration package.

Rangeland Improvements

Currently, NOSP lands have minimal facilities to control and manage livestock grazing. Perimeter fencing between the property and adjacent lands grazed by Azevedo's should be repaired or installed as noted on the plan map. Water development and pasture cross fencing are also lacking, allowing cattle to roam freely throughout the NOSP without the benefit of pasture rotational rest periods. Resting of pasture units will be essential to achieving restoration, production, and management goals.

Photo 2-2. Proposed South Pasture, (Looking northwest)

In addition to grazing management control, certain fences will also create exclusion zones to protect riparian areas, sensitive plant habitat, and the Southern Woodland area. Based on monitoring results, it may be beneficial to periodically introduce short-term "flash" grazing of these sites to manage mediterranean annual weeds and allow for establishment of introduced trees and shrubs.

Wherever possible, fencing should be located downslope from ridgelines to reduce visual impacts. Fencing should also be constructed where maintenance access will be possible. Fencing should also be kept as far away as possible from gullies, landslides and other active erosional areas. Public use of the area precludes building electric cross fencing. The conservation easement calls for "wildlife friendly" fencing with the following specifications:

- Height of fence should be a maximum of 42 inches;
- Smooth (barbless) top wire;
- At least 12 inches between the top two wires;
- Smooth bottom wire at least 16 inches above the ground.

(Source: Colorado Division of Wildlife, Hot Sulphur Springs, CO; (970) 725-3557

Gates and access-through points will be designed for public passage where necessary. NRCS will supply specifications for construction of fences and bracing systems.

Development of watering locations, as noted on the map, will be necessary to replace riparian watering areas along the northern and main-stem creek channels. It will also assist with more efficient, uniform distribution of grazing. It is recommended that the city extend a pressurized water line up the main road, as shown on the map, to feed 2 main troughs in the west and south pastures, (to be created with cross fencing). A third

trough, (spring fed) should be restored in the location noted in the south pasture. NRCS will be available to assist with design of the systems when trough siting is finalized. Water for the north pasture and uplands of the south pasture will source from the Lynch Ranch, and a seasonal pool in the northeast corner of the NOSP. Watering locations will need to be fully developed and operational prior to cross fencing the pastures. If additional paddock units are fenced in the west pasture for yellow star thistle management, one or two additional troughs should be placed west of the one shown on the plan map.

Costs

Cross-fencing required to create the 3 pastures and grazing exclusion areas totals approximately 11,500 feet, (based on the scaled plan map). Based on conversations with Ron and Ralph Azevedo, about 12,900 feet of perimeter fence needs to be replaced as well. Developing the two trough watering locations will require about 3,600 feet of pipe, in addition to the water troughs and appurtenant fixtures. The following table summarizes estimated costs, factoring labor as well as materials for fencing and water improvements.

Table 2-2. Cost Estimate

Item	Extent	Unit Cost	Total
Cross-fencing	11,500 ft.	$2.00 per foot	$23,000.00
Trough Pipe System (1 ¼ in. sch. 40 PVC)	3,600 ft.	$1.80 per foot	$6,480.00
Watering Troughs	3 units	$500.00	$1,500.00
Perimeter Fencing	12,900 ft.	$2.00 per foot	$25,800.00
Spring Development Restoration	1 Development	$1,000.00	$1,000.00
Sum Total Cost	—	—	**$57,780.00**

Various grants or cost-sharing programs may be available to help defray some of the range improvement costs. The USDA's "Environmental Quality Incentives Program", (EQIP) may be a potential source of cost sharing assistance, if the City of American Canyon is deemed to be an eligible sponsor, (this is currently being investigated). Other programs such as the USDA "Wildlife Habitat Improvement Program", (WHIP) may also be a funding vehicle for riparian exclusion fencing and associated habitat improvements.

Photo 2-3. Spring development in need of repair, (South Pasture)

Grazing Monitoring

To achieve grazing production and grassland restoration goals, regular monitoring of range condition should be conducted. This monitoring could be performed by the property caretaker or volunteers, who could be trained by the NRCS. Maintenance of adequate RDM levels will ensure that ground surface conditions enhance control of soil erosion, minimization of soil compaction, and desired plant performance.

Visual gauging tools such as the Wildland Solutions "Residual Dry Matter Monitoring Photo Guide" provide an excellent, practical resource for judging adequacy of RDM levels, and further refinement of stocking rates. Observations of soil capping and crusting, runoff patterns and plant specie composition add to the analysis of grazing effect on the land.

Several visual photo points should be established in each pasture unit to provide yearly comparisons of RDM levels, surface conditions, and trends in general plant community composition. These observation methods should be combined with yearly weather data, stocking records, weaning weights, and animal performance to determine optimum stocking rates, stock density, and season-of-use strategies for the various pastures.

Weed Management

It is proposed that the west pasture be considered as a special management area for yellow star thistle, (YST) control. This weed infests vast areas of annual rangeland in California, and is a troublesome invader in the NOSP.

A great deal of research on YST control has been carried out by the University of California and others. Currently, no single control strategy has emerged as a "silver bullet" for managing the weed. Various methods have been examined, including herbicides, fire, mowing, tillage, and grazing pressure. For the NOSP setting, herbicides and planned grazing timing are the most appropriate management methods. A combination of both methods will likely be the best approach.

A major goal of the grazing management program will be to maximize the distribution and overall stand density of native perennial grasses. Vigorous stands of perennial plants have also been observed to suppress the extent and density of YST infestations in various Napa County rangeland settings. NRCS and the University of California Extension Service will be able to provide further guidance on YST control, as cross fence and water developments enable more intensive management of NOSP pastures.

Critical Erosion Areas

Soil erosion problems are common in the hillside landscapes and upstream riparian areas. Excluding these areas from grazing is an important first step in the restoration process. The eastern-most grazing exclusion area noted on the plan map should be considered a priority, as stream channel erosion as well as active landslides discharge high rates of sediment to the stream, and preclude establishment of needed vegetation and habitat.

A combination of small, in-stream structures, native tree and shrub plantings, and vegetative revetments are recommended to reduce stream bank erosion problems and check head-cut erosion in the stream bottom, and adjacent landslides and gullies. Most measures can be installed with minimal use of heavy equipment and disturbance to fragile in-stream habitat. Typically termed "bio-engineered" treatments, these practices feature maximum use of plant materials, and minimal use of hard-armoring materials such as rock rip-rap. Selection of practices, and installation detail are specifically designed to re-establish stable, stream geometry, in keeping with natural, historic morphological characteristics. Because riparian areas are resilient ecosystems, biological functions and values can typically be restored relatively quickly, as compared to upland habitats.

Photo 2-4. Active head-cut erosion advances upstream in this reach alongside the access road. As the stream down-cuts, stream banks, road embankment, and adjacent hillsides are weakened and made more erosion-prone. Use of placed rock, native willow plant material, and plantings of trees, shrubs, grasses, and grass-like plants should be used to check head-cuts, stabilize stream banks, and restore shade and habitat.

Approximately 5,000 feet of riparian area is in need of erosion control and habitat planting. Most of the serious problems, requiring grade control and extensive plantings occur in the uppermost reach of stream in the grazing exclusion zone, (about 3,000 lineal feet).

No specific cost estimates have been developed, but similar restoration work on streams of this type range from about $50.00 per lineal foot to $80.00 per lineal foot. It is recommended that work be staged to treat lower stream reaches first, working restoration treatments gradually up stream, with in-stream grade control installations performed ahead of stream bank stabilization measures.

Photo 2- 5. Willow Revetment- Willow revetments are a very effective, low cost means of controlling stream bank erosion. On most sites, they can be built without the need for heavy equipment, just able-bodied labor. Collection of dormant plant material should be conducted as near to the planting site as possible. Trained volunteer crews, the California Conservation Corp., or private restoration firms are capable of performing the work, depending on the complexity of treatment needed.

The NRCS will be available to assist the City of American Canyon with further assessment of NOSP conservation needs, and also maintains a listing of qualified professional consultants and local suppliers of materials described and recommended in this plan.

Section B: Site Use and Improvement

This section provides policies and actions for management of public use and implementation of related improvements and facilities. These policies and measures have been designed to support the Resource policies, and to provide opportunities for public to enjoy, appreciate and take part in protection of the natural, historic, aesthetic, and recreational resources of the site.

1. Designated Trail System

a. Designate the trails A through K shown on the Site Conditions Composite map (Figure 7) as the Preserve trail system, with exceptions and additions as noted.

b. Designate the main canyon trail (segments A, B, and D) and/or the south canyon trail (segments F, G, H, and H1) as Community Connector Trails between the Ridge Trail and the City of American Canyon and the Bay Trail.

c. Segments F(1), E(2), G(1), H east of H(1) and the easternmost, switchback portion of J shall not be designated for public trail use due to steep slopes and/or dead ends at private property.

d. Sign segment E north of Segment E(1) to note that it is not a through trail and that there is private property ahead.

e. Designate and sign segments J and K for hiking only on a docent-led basis to ensure protection and appreciation of the more sensitive riparian and woodland habitat accessed by these trails.

2. Designated Trail Uses/Seasonal Limits

a. General

1) Trails shall be open to public use as specified in these policies. No other trail uses shall be allowed except by specific written permission of the City and the Trust.

2) All use will be restricted to designated trails and use areas to protect sensitive resources and minimize disturbance of cattle.

3) Access to specific use groups depends on their compliance with Preserve policies and regulations, suitable environmental and

safety conditions, and the ability of the City to provide adequate management and maintenance.

4) Where specific types of trail use conflict with resource management or agricultural objectives, they may be temporarily or permanently limited or excluded.

5) Trails may be closed to certain uses, or all use, seasonally, days of the week, or times of the day in order to protect resources and manage trail uses for safety and to avoid user conflicts.

b. Hiking

1) Hiking, walking and running shall be allowed on all designated trails subject to Preserve hours and specific trail closures for resource management or safety purposes.

2) Trail Segments K and J shall be designated for hiking use only, to allow a short loop, close to the staging area for families and nature observation.

c. Persons with Disabilities

1) Trails B and C and access within the Preserve staging area shall be improved to accommodate wheelchairs per state and federal standards.

2) All other trails are in natural terrain with slopes and conditions that do not allow improvement to these standards. However, gates, stiles, and other improvements on all trails shall be designed to allow wheelchair access wherever feasible.

d. Bicycles

Bicycles shall be allowed on all designated trails except Segments J and K, subject to Preserve hours, seasonal closures for wet conditions, and specific closures for resource management or safety purposes.

e. Horses and Other Riding and Pack Animals

Horses, mules, llamas and other riding or pack animals shall be allowed on all designated trails, subject to Preserve hours, seasonal closures for wet conditions, and specific closures for resource management or safety purposes.

f. Dogs

The City will carefully monitor and manage access to dogs to protect sensitive natural resources (particularly ground nesting birds), cattle grazing operations, and other public access uses, and to maintain consistency with policies for the adjacent and interconnected Lynch Canyon Open Space Preserve.

3. Designated Use Areas, Programs

a. Picnicking

1) Formal picnic facilities (tables) will be provided at the Preserve staging area and at the group camping area (see Fig. 11, Site Plan, and Fig. 12, Staging Area Improvements). No open fires will be permitted. Cook stoves and grills will be permitted.

2) Tables at the group camping area may be used informally by hike-in visitors when not used by campers, but shall not be available for public drive-in picnic use.

3) Reservation of the picnic tables at the staging area will be allowed for local groups. At least 2 tables will be reserved for public use when other tables are reserved for group use.

b. Hike-in, Group Camping

1) A hike-in/drop off group camping area for up to 20 persons will be provided near the junction of trails B, F, and K (ideally as a cooperative project with a youth organization).

2) The area will be available for use by local residents on a reservation/permit basis through the City Parks and Recreation Department. Basic facilities (water, toilet, tables, and designated sleeping sites) will be provided.

3) No open fires will be permitted. Cook stoves and grills will be permitted for authorized camping groups only on picnic tables or in designated cleared areas. No trash receptacles will be provided – users are to remove everything that they bring.

c. Environmental Education/Docents

1) Formation of a docent group to provide interpretive talks, hikes and rides will be encouraged. If formed, the docent group will be organized and coordinated by the Parks and Recreation Department.

2) A brochure corresponding to labeled stops may be created for docent-guided tours along the forest trail (Segments J and K). A booklet on native plants and animals may be prepared and sold to support environmental education program costs.

d. Stable Facilities

If sufficient and appropriate land becomes available in close proximity to the Staging Area, then stable facilities, including an Arena, may be developed.

e. Old Mine

1) A steel security gate shall be constructed over the entrance to the mine to prevent unauthorized entry.

2) No entry to the mine shall be permitted until the mine is inspected by an engineering geologist or other qualified professional to determine if it is safe for entry, and any recommendations for reinforcement or other safety precautions are implemented.

f. Non-motorized Model Gliders

Subject to the terms and conditions imposed by the Land Trust, non-motorized radio-controlled model gliders may be allowed in designated areas within the Preserve.

4. Facilities and Fixtures

a. Restrooms

1) Restrooms shall be provided at the Preserve staging area, and at the group camping area.

2) Initially, restrooms shall be portable units, to be replaced by prefabricated toilet buildings with concrete holding vaults when funding permits.

3) All temporary and permanent toilets shall be handicapped accessible.

b. Benches and Tables

1) Picnic tables shall be designed and installed to provide handicapped access.

2) Benches may be provided in the locations specified in Fig. 11 and Fig. 12. Generally, the number of benches should be limited to maintain a natural open space appearance.

3) Picnic tables and benches shall be of a consistent, rustic, heavy-duty design, constructed of wood or recycled plastic material.

c. Trash Receptacles

Trash/recycling receptacles will be provided at the staging area. They should be emptied regularly by the Caretaker or other responsible party to avoid attracting undesirable animals and/or animal activity.

d. Fences, Gates and Stiles

1) Fences near the staging area and group camp shall use smooth wire, rather than barbed wire, to avoid a hazard to young visitors.

2) Use split rail fence as required to delineate public use areas and direct trail traffic.

3) Install vehicle/cattle control gates at the locations shown on Figure 12. Vehicular gates shall be steel "Powder River" gates, or equivalent, minimum 12 foot width, on hinge posts set in concrete. Locks and chains shall be hardened steel.

4) Install trail styles and gates at the locations shown on Figures 11 and 12. Stiles and gates shall be designed to allow passage of trail users while preventing the passage of cattle. "Block" stiles will be provided for pedestrian, bicycle and wheelchair access, and "three log" stiles or self-closing gates will be provided for equestrian access.

e. Signs and Maps

1) A map board of approximately five feet high by four feet wide shall be provided at the Preserve staging area, to include a map of the preserve trails, Preserve policies and regulations, special events and notices, and a map box for a published map and brochure.

2) Informational and regulatory signs for the Preserve shall be constructed of durable material compatible with the natural setting (i.e. painted wood, painted aluminum, or recycled plastic).

3) Signs shall be of a consistent design, coloring and lettering style.

4) Necessary signs may include:
   - Preserve regulations
   - Trail names, segment letters and distances
   - Private property ahead: do not trespass
   - Preserve boundary plaques
   - Speed limits
   - Trail rights of way
   - Closed area (area closed for restoration)
   - Trail use signs
   - Informational and interpretive signs
   - Temporary signs for road and trail closures

5) Develop a map/brochure for the Preserve to show the designated trail system, resource and historical information, and basic policies and regulations (Fig. 11 may provide the basis for the map).

6) Develop a brochure for a self-guided tour along a forest trail to correspond to labeled stops.

7) Adopt names for the trails and geographic features for use on the maps, to replace or augment the alpha-numeric system used for the Management Plan.

5. Internal Road/Trail Improvements

Generally the existing road system provides good maintenance and visitor trail access. Construction of new roads must be limited to access and circulation in the staging area, per the terms of the conservation easement. All road and structural designs and specifications should be prepared by a qualified engineer; standards are provided in this Plan for guideline purposes only. New trail construction is limited to new connections or alignments for segments J and K.

a. Construct new trails using the following standards (refer to *California State Parks Trails Handbook* for additional design details):

1) Flag proposed trail alignments and have them checked by a qualified resource management specialist prior to construction to confirm that sensitive resources will not be impacted.

2) Construct trails with a tread width of 4 to 6 feet, depending on the cross-slope (narrower on steeper slopes).

3) Typical maximum grade of trails should be 10%, but short stretches of 15 – 20% are acceptable if necessary. Avoid constructing switchbacks on visible slopes and steep slopes, if possible.

4) Construct trails with cross-slope from 2 – 4% to the outside edge to avoid concentration of runoff.

5) Install culverts at significant drainages, using details similar to road construction.

b. Improvements to Existing Preserve Roads

Refer to *Handbook for Forest and Ranch Roads*, Mendocino County Resource Conservation District, and other references noted in the Bibliography for design details and standards.

1) Grade the road surface annually or as required to smooth the surface and correct drainage patterns.

2) Install rolling dips at regular intervals on new and existing roads to avoid concentration of runoff.

3) Install rock checks and willow plantings on banks at discharge of drain ditches and dips to prevent erosion in the locations noted in Part 3, in the Road Inventory and Assessment

4) Install new or improved culverts at the locations noted in Part 3, in the Road Inventory and Assessment

c. Retaining Walls, Slope Protection

1) Adapt the slope retention methods indicated for creek banks under 5.b.5) where necessary to restore existing bank failures and

protect the road or trail in the locations noted in Part 3, in the Road Inventory and Assessment.

2) For very steep banks, the geogrid, or live cribwall details may be adapted from the *Field Engineering Handbook, Chapter 16, Streambank and Shoreline Protection*, USDA, Natural Resources Conservation Service, 1996, pages 23 – 27.

d. Surfacing

1) If necessary to control erosion on steep road segments, install hardened surface of compacted, engineered-size bedded rock.

2) Based on availability of funding, provide an all-weather surface of a minimum of 4" of compacted base rock on the main canyon road (segments B and D).

3) Use compacted base rock to surface short segments of trail that tend to stay muddy when other trails have generally dried out.

e. Erosion Control

1) Prevent erosion along trails, gullies and roads by seeding disturbed areas with native annual seed mixes, and by planting native perennial ground cover and shrubs.

2) Protect disturbed areas with slopes over 20% with straw mulch, hydroseeded mulch or fiber mats until vegetation is re-established.

6. Vehicle Access and Circulation

a. Short-Term Access Route and Improvements

1) Secure agreement for use of one or more of three alternative routes for short-term access to the site (see Figure 8). All three alternatives involve crossing and making road improvements on land owned by Jaeger Vineyards and Jack and Bernice Newell.

- The current access via Napa Junction Road, which crosses through the switchyard of the California Northern Railroad at a private crossing.

- South Napa Junction Road, which crosses a single track at a private crossing approximately ½ mile south of Napa Junction

Road and leads to an equipment storage area and an old quarry owned by Jaeger Vineyards.

- Watson Lane, which is a public road crossing of a single track approximately a half mile north of Napa Junction Road.

2) Improve roads used for public vehicular access with a surface of a minimum of 4" of compacted base rock over compacted native soil.

3) The minimum interim improved road width shall be 12 feet

4) Construct improved turnouts at intervals of no less than 500 feet along the access road to allow vehicles to pass. Turnouts shall be a minimum of 8 feet wide and 20 feet long, plus transitions.

b. Long-Range Access Route and Improvements

1) Use the Flosden Road extension for public access to the site when it is developed as indicated on Figures 5, 6, and 8.

2) When funding permits, improve roads used for public vehicular access to an all weather surface of a minimum of 3 inches of asphaltic concrete (a.c.) over 6 inches of compacted base rock over compacted native soil.

3) Minimum improved road width shall be 20 feet, plus shoulders.

4) As part of long-range road improvements, place barriers to prevent vehicle access off the access road, consisting of heavy-duty split rail, telephone poles, steel bollards, A.C. or concrete curbs or other substantial barrier.

c. Parking Area and Vehicular Circulation

1) Construct or improve roads for public and service vehicle access (segments A, C, and staging area circulation) with a minimum width of 20 feet and an improved surface of a minimum of 6 inches of compacted base rock over compacted native soil. When funding permits, the surface shall be improved to a minimum of 3 inches of asphaltic concrete (a.c.) over 6 inches of base rock.

2) Develop parking spaces for 12 cars (minimum space 8.5' by 18') and three pull-through horse trailers spaces (minimum space 11' by 30') at the Preserve staging area, generally in the configuration shown in Fig. 12. At least two spaces shall be

designed and signed for handicapped access. Trailer spaces can each accommodate two cars as head-in parking when not needed for trailers. Ultimately the parking may be expanded as noted on Figure 12 and in Part 3.

3) Surface the parking area and roads initially with 6 inches of compacted base rock over compacted native material.

4) Delineate individual parking spaces using half-buried peeler cores, or plastic street reflectors, staked in place. Use telephone pole, log, recycled plastic or concrete wheel stops, staked in place.

5) As part of long-term improvements, when funding permits, the parking and road surface shall be improved to a minimum of 3 inches of asphaltic concrete (a.c.) over 6 inches of base rock. Parking spaces shall be delineated with painted stripes and markings.

6) As part of long-term improvements, when funding permits, provide barriers to prevent vehicle access beyond the parking area and access roads, consisting of heavy-duty split rail, telephone poles, steel bollards, A.C. or concrete curbs or other substantial barrier.

d. Bridge

A recycled rail car vehicular bridge shall be placed across the creek in the location indicated on Figure 12, Staging Area Improvements. The bridge will be founded on undisturbed native soil. The bridge will be fitted with both vehicular bumpers or guardrails and pedestrian railings.

7. Barn Use and Improvements

a. General Use and Improvement Program

The existing barn shall be repaired and improved to provide space for environmental interpretation, storage of tools and materials, and potentially a shaded area for resting and picnicking.

b. Roof Replacement

The damaged barn roof shall be replaced with similar corrugated aluminum material.

c. Structural Improvements

1) A qualified engineer shall evaluate the structure and prepare plans for stabilization and improvement.

2) Barn structural members and foundation shall be replaced and reinforced as required to stabilize the structure.

3) Barn siding shall be repaired or replaced and additional weathered siding used to enclose the central bay for storage.

4) As part of long-range improvements, when funding permits, existing deteriorated concrete pads on either side of the barn shall be removed and replaced with new pads – a minimum of 4" concrete on 4" compacted base rock. The central bay of the barn may be improved by installation of concrete pad, plywood walls and ceiling, lighting and electrical systems (this will be necessary if valuable equipment and materials will be stored in the barn, and/or it is to be used as a base for significant resource management or environmental education efforts, as discussed below).

d. Environmental Education

If an environmental education program is developed, use the barn as a location for exhibits of Preserve and regional history and ecology. If exhibits are simple and relatively weather and vandal-proof, they can be mounted on the outsides of the proposed enclosed central bay. As a long-range project more complicated or fragile exhibits could be stored and/or exhibited inside the improved central bay.

e. Storage

The central bay of the barn may be used for storage of equipment and materials, depending on the need and level of improvement, as discussed above. As a long-range project, if the barn is ultimately used for significant environmental education activities, a separate storage building may be needed.

8. Utilities and Services

a. Water

1) A water meter will be installed and a 4" to 6" water line extended along the main access road from the existing City of Vallejo water

main at approximately the Newell residence driveway to the Preserve staging area/caretaker's residence. A fire hydrant will be installed near the barn and caretakers residence.

2) A lateral water line approximately 1 1/4" dia. will be extended from the new water main near the staging area to the group hike-in camp and to nearby water troughs to be developed for cattle (see Grazing Management Plan).

3) Basic water faucets (with auto-shutoff) and drinking fountains, consisting of standpipes with backing post and rock drain areas, will be installed at the barn/staging area and the hike-in camp.

b. Electrical and Phone Service

1) Electrical and telephone service will be extended to the caretaker's residence and the barn on overhead lines along the main access road from the existing pole at the Newell driveway.

2) As an alternative or supplement to electrical service, the City may consider installation of wind and/or solar energy systems.

3) A pay phone may be provided at the staging area when public use levels warrant.

4) As part of long-range improvements, when funding permits, electrical and phone service will be installed underground.

9. Caretaker's Residence

a. Size and Location

1) A caretaker's residence of up to 2000 square feet may be developed in the area specified in Figure 12.

2) The caretaker's residence improvements within the designated yard area of approximately 10,000 square feet may include parking, deck or patio area(s), garden and landscape areas.

3) Additional structures may include a garage/storage building of up to 400 square feet, and a propane tank and enclosure.

b. Site Improvements

1) A septic system will be developed for the caretaker's residence, generally in the area designated on Figure 12.

2) The residence drive and parking area shall be improved initially with a base rock surface, and ultimately paved, as per other roads and parking.

3) The residence and yard may be fenced and screened for privacy with native landscaping, smooth wire and/or rustic wood fencing.

4) Landscaping shall be drought tolerant, fire resistant native species except in designated garden areas.

10. Public Access and Use

a. Initial Public Use

Initial public access and use will be limited due to problems associated with access to the site, and limited staffing (both paid and volunteer). As these constraints are removed, greater public participation should be expected and encouraged. On the other hand, the Preserve may be closed during inclement weather, such as during the winter months.

b. Coordination with Lynch Canyon Open Space Preserve

Because the Preserve is adjacent to the Lynch Canyon Preserve, public access should be coordinated between the two sites. For example, if Lynch Canyon is open to the general public one weekend per month, then Newell Open Space Preserve should be opened the same weekend. Joint access and use agreements should also be executed between the two entities to facilitate a cooperative working relationship.

c. Other Public Access Opportunities

The Preserve should also be open to the general public during any organized event or activity sponsored or co-sponsored by the City. Use of the Preserve at any other time would be by arrangement with the City's Community Services Department.

d. Public Use of the Staging Area

The Staging Area is intended to accommodate the greatest level and intensity of public uses, such as BBQ's and picnics, special events, or

educational meetings/activities. Beyond the Staging Area, however, more passive uses, such as hiking or horseback riding, are intended.

Section C: Site Management

1. Patrol and Public Safety

a. Caretaker Role

1) The Caretaker shall be responsible for opening and closing gates, basic maintenance, informing visitors of Preserve policies and regulations and encouraging compliance, monitoring resource conditions, public use and grazing activities, and coordinating with the City (see C.2.a. for additional detail).

2) The Caretaker shall be entitled to quiet use of the designated residence area.

b. Volunteer Patrol

1) Formation of a volunteer patrol for the Preserve shall be encouraged. The patrol may include members from any of the permitted Preserve user groups.

2) The volunteer patrol may be organized and managed by the City parks and Recreation Department or by the Caretaker. However, management of the volunteer patrol shall not be a requirement of the Caretaker position.

3) The volunteer patrol shall be responsible for observing conditions, informing visitors and encouraging compliance with Preserve policies and regulations.

4) Volunteer patrol members will be instructed in Preserve natural and cultural history, regulations and policies, basic trail and outdoor safety, first aid, CPR and techniques of public contact.

c. Policies and Regulations

1) Policies for management of the preserve shall be as defined in this Management Plan.

2) Specific Preserve regulations shall be developed and adopted by the City, sufficient to allow enforcement by designated officers. Necessary regulations may include:

- Preserve hours of use

- Consumption of alcoholic beverages
- Protection of natural and cultural resources (killing or harassing wildlife, collection of plants or rocks, etc.)
- Prohibition of fires, smoking, fireworks, and firearms
- Speed limit for vehicles, bikes, and horses (15 mph suggested)
- Prohibition of use off designated trails or entry into closed areas
- Prohibition of dogs and other animals
- Prohibition of camping outside designated areas

d. Law Enforcement

1) If the Caretaker is a sworn public officer, the Caretaker may directly enforce regulations as part of their duties, subject to the specific provisions of the Caretaker agreement.

2) The American Canyon Police Department and the Napa County Sheriffs Department will provide law enforcement service to the Preserve.

3) Long-term use levels of the Preserve in conjunction with use and development of the adjacent Lynch Canyon Preserve and other nearby lands may warrant consideration of a cooperative agreement to share professional ranger staff.

e. Fire Protection

The American Canyon Fire Protection District will provide fire protection services for the Preserve, in coordination with the California Division of Forestry.

2. Property Management and Maintenance

a. Basic Site Management Tasks

Chapter Three of the Management Plan provides an Action Plan, Cost Estimate and Funding Strategy for basic improvements to the Preserve. In addition to managing the planning and completion of these public access and resource management projects and arrangements, there will be many ongoing responsibilities for operation and management of the Preserve. Although volunteers can provide a great deal of assistance, staff will need to take the primary responsibility for these tasks.

Based on staffing levels of other Bay Area regional park and open space agencies, tasks to manage this Preserve will occupy at least the equivalent of a full-time position, plus support on accounting, public information materials, and overall property management and policy direction. Site management tasks will tend to require more than full-time attention in the summer, and less in the winter. Time demands will tend to be heaviest on weekends and in the afternoon during summer.

It is not feasible for a caretaker with other employment to accomplish all these management tasks. Therefore, responsibilities should be assigned to City staff and arrangements for carrying them out should be made well in advance of full public access and use.

1) Patrol and monitor the site for resource protection, public safety, and education and enforcement of policies and regulations, and to facilitate visitor enjoyment.

2) Maintain the trail and road surface and drainage structures, including annual grading, surface prep and drain clean-out

3) Check and clear road and trail drainage systems before, during and after storms.

4) Plan, organize and coordinate projects for resource management and facilities construction or improvement, including volunteer participation.

5) Coordinate resource monitoring and studies.

6) Clean-up litter and remove trash.

7) Control poison oak and encroaching vegetation along trails.

8) Clean, maintain and repair facilities and fixtures.

9) Monitor cattle grazing operations and coordinate with grazing tenants, potentially assist with maintenance of fencing and water supply.

10) Coordinate public use, such as group reservations for camping and picnicking, and special events, collection of parking fees.

11) Post maps, brochures and special information.

12) Maintain basic equipment and ordering and stocking supplies.

13) Pay bills and manage service and supply contracts (i.e. restroom pump-out).

14) Organize, coordinate and support environmental education docents and volunteer trail patrol groups.

b. Caretaker Agreement

1) A written agreement shall be developed between the Caretaker and the City specifying respective responsibilities, investments, private use areas and limits, and other terms as appropriate.

2) The agreement shall specify duties and the number of hours during various seasons and time periods the Caretaker is to spend actively managing or patrolling the Preserve.

c. Agreements with Adjacent property Owners and Easement Holders

1) Prepare a memorandum of understanding with the Solano County Farmlands and Open Space Foundation regarding respective use and management polices and procedures, and methods for communication and coordinating.

2) Develop an agreement with PG&E (or other future owner of utility lines) regarding arrangements for notification of utility work, restoration of any impacts on the Preserve, and sharing of responsibility/costs for road maintenance and repair.

3) Resolve arrangements and legal rights for access and extension of utilities, and new boundary fencing with Jack and Bernice Newell, Jaeger Vineyards, and other adjacent property owners if applicable.

4) Maintain contact with other adjacent property owners who share boundaries and may hold easements over the Preserve. Clarify respective rights and expectations.

3) Revenue Generation Opportunities and Arrangements

a. Donations

1) Donations for the improvement and management of the Preserve will be encouraged. The Trust may act as conduit for donations,

or a separate non-profit organization may be designated or created to receive donations. It may be desirable to install an "iron ranger" payment box on site to handle donations from visitors.

2) Donations will be directed toward projects and purposes identified in this Management Plan unless specifically desired by the donator and determined by the City and the Trust to be consistent with the policies of this Plan.

b. Cattle Grazing Lease

Prepare a new grazing lease to reference the management practices, standards, and arrangements of the Grazing Management Plan. The lease shall be administered by the City of American Canyon City Manager or his designee. The lease shall be reviewed and approved by the Land Trust of Napa County

c. Land Trust Approval

Third party uses or events will be subject to approval of the Land Trust, per the terms of the conservation easement.

d. Communications Leases

Consider communication facility site leases as a revenue source, provided they can be designed and sited to avoid impact on resources and preserve users. Communication leases can be a significant source on revenue for operation and maintenance (a communication facility lease on the Lynch Canyon Preserve generates $10,000 per year).

e. Other Agricultural Uses

Agricultural use other than grazing is specifically prohibited by the Conservation Easement.

f. Other Commercial Use and Special Events

Commercial filming and photography is sometimes proposed, or occurs without permission, on open space preserves. Special events may be commercial or social activities, and may include running, bicycling, orienteering, and equestrian races and rallies.

1) Require permits for all commercial use and special events (defined as an advertised or organized event involving 10 or more

persons). Require sufficient information as part of the permit application to determine that the use is compatible with the open space status of the Preserve.

2) Charge commercial use and special events fees to cover the cost of staff time to ensure that the impacts on resources and other users are avoided.

g. Grants

Research grant programs, and apply for and follow-up on specific grants. Grants are expected to be an important source of funding for the improvement and management of the Preserve, although basic operation and maintenance costs will be borne by the City. Management projects are matched with specific potential grant sources in Part Three of this Management Plan.

h. City of American Canyon Financial Resources

Use of the City's General Fund (or other City taxes, fees and revenues) may be used, but should be limited to those facilities and services that are essential to allow public access to the site or for health and safety reasons. Generally, City funds should be used to leverage grants and other outside funds as much as possible.

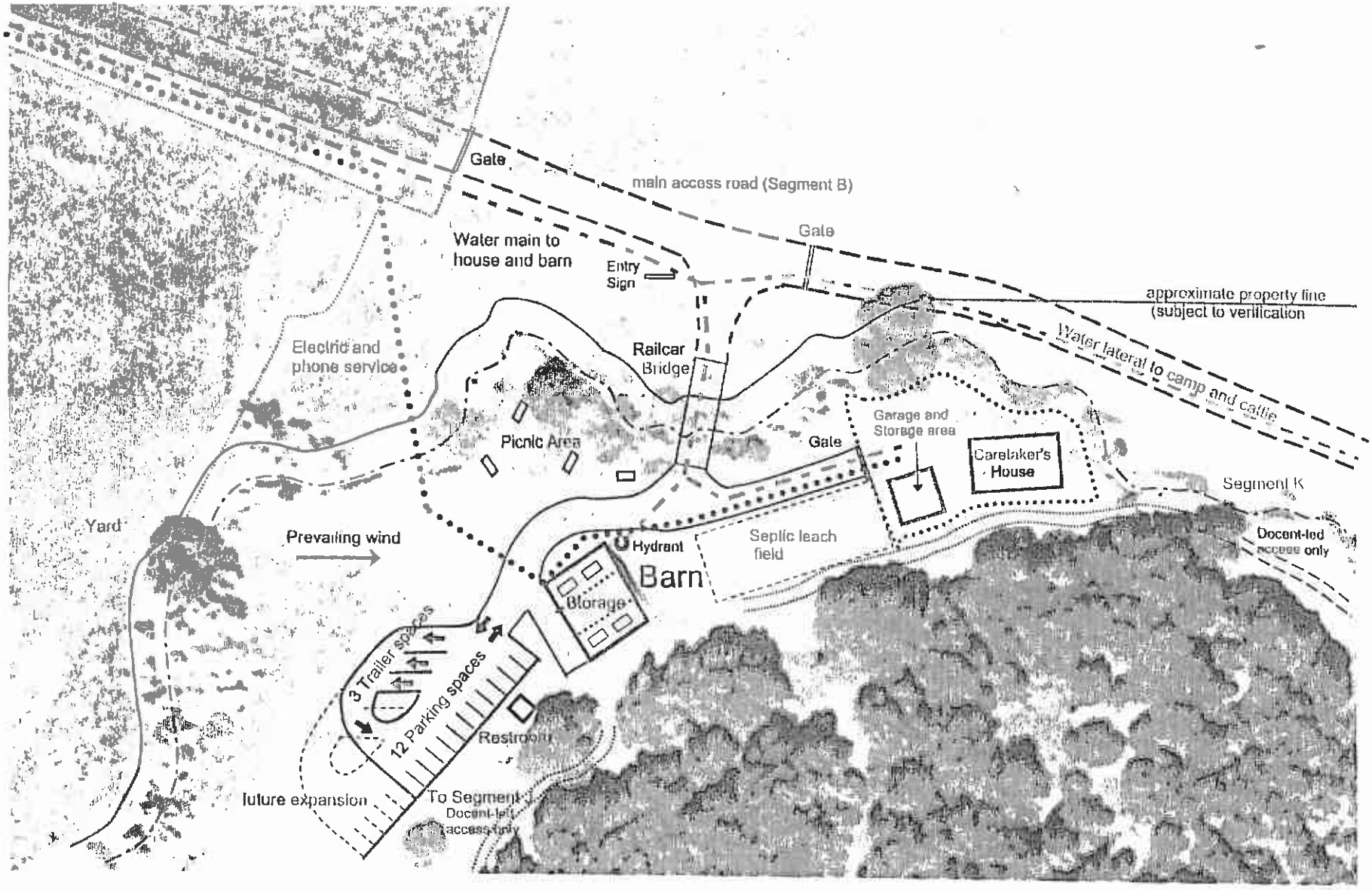


Figure 12
Staging Area Site Improvements

Overview

This summary and estimate table covers the key steps and expenditures to implement the Use and Management Program outlined in Part Two. The detail of each proposed project or improvement is contained in the referenced paragraph in Part Two. Detail for the internal road improvement costs is contained I n the Road Inventory and Assessment Tables. **This summary is not intended to be a specific plan or accurate estimate for implementation, but a tool for future planning and decision-making.**

These estimated costs are very general, as most of the projects are only conceptually defined, and costs are highly variable depending on how and when the project is undertaken. The costs should be considered "placeholder" amounts for budgeting subject to development of more specific plans, estimates and bids.

Specifications, standards and details for most of the fixtures and improvement projects may be found in the reference documents from other park and open space agencies listed in the Bibliography. A copy of these documents has been provided to the City and the Trust in conjunction with this Management Plan.

The "Initial" stage of projects and costs defined in the Summary is the assumed desirable "baseline" of improvements and facilities to open the Preserve to regular public use and begin to actively manage the resources. This stage may take more than one year to accomplish. The total estimated cost for the initial stage of improvement is approximately $861,000 for one-time capital costs, plus approximately $6,000 annually for equipment, supplies and other operating costs.

The "Long Term" stage of projects and costs defined in the Summary is the assumed ultimate extent of improvement and facilities to accommodate public use and efforts to restore and protect the resources. The estimated total long-term improvement cost is approximately $1,063,000 to $1,393,000 for one-time capital costs, plus approximately $20,000 annually for equipment, supplies and other operating expenses.

These costs are in 2001 dollars and should be adjusted for inflation when projecting into the future. These costs do not include the cost for staff time spent in planning, improving, and operating the site. These costs will be partly offset through grazing lease revenues, and through potential participation by the caretaker in the cost of developing the caretaker residence. Many of these costs may be funded through grants, including some which have already been awarded or submitted (the proposed USDA grazing management improvements grant is reflected in the costs, for example). Application for and administration of grant projects is an important part of the ongoing management program.

Vehicle Access and Circulation Improvement Estimate Notes

Improvements to existing access roads and construction of a new road and parking areas for the public and the caretaker residence are a significant part of the initial and long-term costs. These notes provide greater detail on the calculations and assumptions made for these estimates.

I. Initial road and parking design

The proposed initial road width is 12', plus turnouts as noted. The existing road, route, or site would be stripped, ripped, and graded for compaction and positive drainage (roadside ditches). The overall budget and contingency is also expected to cover a number of culverts under the road. The proposed surface is 6" of compacted base rock (Caltrans Class II aggregate base).

A. Initial access road improvements:

1. From end of Watson Lane to new bridge on Newell Preserve:
approx. 12,350 lineal feet (l.f.) x 12' wide = 148,000 square feet (s.f.)

2. Turnouts for above road at 500' intervals: (each turnout 8' wide x 20' long plus transitions 16' long = 288 s.f. per turnout) x 24 turnouts
= 6,912 s.f.

Total s.f. = 154,912 @ $1.50 per s.f. = **$232,368**

B. Initial parking and circulation improvements:

1. Access road from bridge to parking and caretaker's residence:
approx. 450 l.f. x 12' wide = 5,040 s.f.

2. Turn aprons: approx. 650 s.f. per set x 2 sets = 1,300 s.f.

3. Caretaker's parking/turnaround: approx. 50' x 50' = 2,500 s.f.

4. Parking area for 12 cars, 3 trailers: approx. 90' x 120' = 10,800 s.f.

Total s.f. = 19,640 @ $1.50 per s.f. = **$29,460**

Total Initial road and parking improvements cost (A+B) = **$261,828**

II. Long-term road and parking design:

The proposed long-term road width is 20'. The additional road, route, or site would be stripped, ripped, and graded for compaction and positive drainage (roadside ditches). The overall budget and contingency is also expected to cover a number of culverts under the road. The proposed surface is 3" of asphaltic concrete (a.c.) over 6" of compacted base rock (Caltrans Class II aggregate base). The roads and parking would have a.c. curbs or rustic split rail barriers a noted. If curbs are constructed, openings must be provided at regular intervals to allow the road and parking areas to drain.

Two scenarios are estimated for the required grading and base rock:

1. Assume initial base rock road and parking is in good condition, can be used for expanded road and parking.
2. Assume initial base rock road and parking cannot be used and entire road and parking area must be built from scratch. In this case the old base rock would be ripped, stripped and re-compacted as part of the sub-base of the new road.

A. Long-term access road improvements:

20' wide paved road from future Flosden Road Extension to bridge on Newell Preserve: approx. 3,650 l.f.

1. Grading and base rock Scenario 1:
Additional grading and base rock: 3,650 l.f. x 8' wide
= 29,200 s.f. @ $1.50 per s.f. = $43,800

OR

2. Grading and base rock Scenario 2:
All new grading and base rock: 3,650 l.f. x 20' wide
= 73,000 s.f. @ $1.50 per s.f. = $109,500

3. A.C. paving (same in either case): 3,650 l.f. x 20' wide
= 73,000 s.f @ $1.50 per s.f. = $109,500

4. A.C. curbs on both sides of road: 3,650 l.f. x 2
= 7,300 l.f @ $4.00 per l.f. = $29,200

Total cost for scenario 1: (1 + 3 + 4) = **$182,500**

Total cost for scenario 2: (2 + 3 + 4) = **$248,200**

B. Long-term parking and circulation improvements:

20' wide paved access road from bridge to parking and caretaker's residence: approx. 450 l.f., plus parking areas as noted.

1. Grading and base rock Scenario 1:

a. Additional grading and base rock for road:
450 l.f. x 8' wide = 3,600 s.f.

b. Parking area size doubled to 24 cars, 6 trailers: add approx.
90' x 120' additional grading and base rock = 10,800 s.f.

Total additional grading and base rock
= 14,400 s.f. @ $1.50 per s.f. = $21,600

OR

2. Grading and base rock Scenario 2:

a. All new grading and base rock for road: 450 l.f. x 20' wide
= 9,000 s.f.

b. Turn aprons: approx. 650 s.f. per set x 1 set = 650 s.f.

c. Caretaker's parking/turnaround: approx. 50' x 50' = 2,500 s.f.

d. Parking area size doubled to 24 cars, 6 trailers:
total approx. 90' x 240' = 21,400 s.f.

Total additional grading and base rock
= 33,550 s.f. @ $1.50 per s.f. = $50,325

3. A.C. paving (same in either case):
= 33,500 s.f @ $1.50 per s.f. = $50,250

4. A.C. curbs for road and parking:

a. A.C. curbs on both sides of road: 450 l.f. x 2 = 450 l.f

b. A.C. curbs around parking areas: = 760 l.f.

Total A.C. curbs = 1,660 l.f @ $4.00 per l.f. = $6,640

Total cost for scenario 1: (1 + 3 + 4) = **$78,490**

Total cost for scenario 2: (2 + 3 + 4) = **$107,215**

C. Long-term all-weather base rock surface to top of ridge/Lynch Canyon:

1. From new bridge on Newell Preserve to ridge (segments B and D) approx. 7,700 lineal feet (l.f.) x 12' wide = 92,400 s.f.

2. Turnouts for above road at 1000' intervals: (each turnout 8' wide x 20' long plus transitions 16' long = 288 s.f. per turnout) x 8 turnouts = 2,304 s.f.

Total s.f. (1 + 2) = 94,704 @ $1.50 per s.f. = **$142,056**

Total long-term road and parking improvements cost (A + B + C):

Scenario 1 = **$403,046**

Scenario 2 = **$497,471**

Newell Open Space Preserve - Management Plan Summary/Estimate

(Specific work items are contained in Part 2)

Report Reference	Item	Work Scope	Approximate Initial Cost (year 2001 $)	Approximate Long term Improvement Costs (year 2001 $)	Who is Responsible	Who will Support	Funding sources
Section A	**RESOURCE PROTECTION and RESTORATION**						
A1	Basic Vegetation and Wildlife Management	Annual allowance for seeds, pesticides	$1,000 (annually)	$5,000 (annually)	Caretaker	Volunteers Parks and Rec.	Grants Donations
A1a, A2a	Detailed Management Plan	Prepare specific plan and program for restoring streams, native vegetation		In consultant cost factor, end of estimate	Trust, City	Dept.Fish and Game, CALFED, etc.	Grants
A3, B7d	Cultural Resources (also addresses Environmental Education, B7d)	Exhibits and materials (any site assessments funded in conjunction with other projects)		$5,000 to $10,000 (+$500 annually)	Parks and Rec.	Volunteers	Private donations and grants
A4a-e, A5 p 2-17	Geology, Soils and Hydrology	Creek and drainage restoration program. 5,000 lineal feet @ $50 to $80 per lineal foot.		$250,000 to $400,000	Trust, City	Environmental agencies Volunteers	Grants
A5 (Costs)	Grazing Management Water and Cross Fencing Perimeter Fencing	30% match for grant (70% = $22,386)	$6,716 $5,000	$20,800	Caretaker, Lessees	NRCS Volunteers	USDA grant
		Subtotal one time costs	**$11,716**	**$275,800 to $435,800**			
		Subtotal annual costs	**$1,000**	**$5,500**			
Section B	**SITE USE and IMPROVEMENT**						
B1, B2	Designate Trails and Trail Uses	No costs			Parks & Rec. Commission	Volunteers	
B3a-d	Designate Use Area, Programs	No costs, or are in other categories			Parks & Rec. Commission	Volunteers	
B3f	Old Mine Tunnel	Security gate for mine	$500		Caretaker	Public Works	

Newell Open Space Preserve - Management Plan Summary/Estimate

(Specific work items are contained in Part 2)

Report Reference	Item	Work Scope	Approximate Initial Cost (year 2001 $)	Approximate Long term Improvement Costs (year 2001 $)	Who Is Responsible	Who will Support	Funding sources
B4	**Facilities and Fixtures**						
B4a	Restrooms: H.C. Accessible	Initially 2 rented portables Long term pre-fab vault units 2 @ $25,000 ea.	(annually) $1,800	$50,000	Public Works Department or Parks and Rec.	Consultant(s) Contractors	Grants General Fund
B4b	Picnic Tables	Long-term 8 for staging area 3 for camp @ $1200 ea.	$6,000	$7,200			
B4b	Benches	Long term 12 @ $500 ea.					
B4c	Trash Receptacles	2 for staging area					
B4d	Vehicle Gates	12' steel: 7 @ $1500 ea.	$10,500				
B4d	Trail Gates, Stiles, per standard details	Hiker/H.C.access: 2 @ $500 Multi-use: 2 @ $1000 ea.	$1,000 $2,000				
		Subtotal one time costs	**$19,500**	**$57,200**			
		Subtotal annual costs	**$1,800**				
B4e	**Signs, Maps, Brochures** Main Entry Signs	Allowance	(annually) $1,000 $2,000	(annually) $200	Parks and Rec.	Volunteers	Donations?
B5	**Internal Road and Trail Improvements**	*See detail in Road Assessment*	$13,000 critical items	$52,700 other items	Public Works	Consultants, Contractors. Caretaker	Grants General Fund
B6	**Vehicle Access/Circulation** *See Access & Circulation Estimate Notes*				Public Works	Consultants, Contractors. Caretaker	Grants General Fund
B6a	Short Term Access 6" base rock on graded and compacted surface	End Watson Lane to new bridge: 12' wide w/ 8' wide turnouts every 500'	$232,368				
B6c	Short Term Parking Area (same as above)	From bridge to parking areas for public and caretaker	$261,868				
B6b	Long Term Access 3" a.c. on 6" base rock	Future Flosden Road to bridge, 20' wide w/ curbs		$182,500 to $248,200			
B6c	Long-Term Parking Area 3" a.c. on 6" base rock	Pave and double size of public parking area		$78,490 to $107,215			
B6d	Railcar Bridge	w/bumpers and guardrails	$30,000				
B5d	All-weather road to ridge	6" base rock w/turnouts		$142,056			

Newell Open Space Preserve - Management Plan Summary/Estimate

(Specific work items are contained in Part 2)

Report Reference	Item	Work Scope	Approximate Initial Cost (year 2001 $)	Approximate Long term Improvement Costs (year 2001 $)	Who is Responsible	Who will Support	Funding sources
B6	**Vehicle Access/Circulation** (continued)	**Subtotal one time costs**	**$524,236**	**$403,046 to $497,471**			
		Subtotal annual costs	Road maintenance	**$2,000**			
B7	**Barn Use and Improvements**	Replace roof and reinforce structure Enclose bay, add electrical, lighting, concrete pads	$5,000	$15,000	Public Works	Consultants, Contractors. Caretaker	Grants General Fund Donations
B8	**Utilities and Services**	Connection/permit fees	$1,000		Public Works	Consultants, Contractors. Caretaker	General Fund
B8a1	Provide water to staging area and caretaker's residence: connect to City of Vallejo main at Newell driveway	Backflow preventer 4" main: 1850 l.f @$20/ l.f. 3 - 1" water meters for barn, house, and camp/cattle 1 1/4" water lines to barn, house: 400 l.f.@ $2/l.f. Fire hydrant at Staging Area	$5,000 $27,000 $3,000 $800 $2,000				
B8a2	Extend water to group camp and pastures	1 1/4" line (cost is included in grazing management)					
B8a3	Faucets/Drinking Fountains	At barn, house and camp (3)	$3,000				
B8b	Electric, phone service	Extend on poles approx. 1850 l.f. to barn and house	$18,500				
		Subtotal one time costs	**$60,300**	**$0**			
B9	**Caretaker's residence**				Public Works	Consultants, Contractors. Caretaker	General Fund Caretaker
B9a1	House, pad, and foundation	Pre-fab unit < 2000 s.f.	$100,000				
B9a3	Garage/ storage building	Approx. 20' x 20'	$20,000				
	Propane tank, enclosure		$2,000				
B9b	Septic system		$20,000				
	Drive/parking	Cost included in on-site circulation					
	Fencing and Landscaping	Allowance	$5,000				
		Subtotal one time costs	**$147,000**	**$0**			

Newell Open Space Preserve - Management Plan Summary/Estimate

(Specific work items are contained in Part 2)

Report Reference	Item	Work Scope	Approximate Initial Cost (year 2001 $)	Approximate Long term Improvement Costs (year 2001 $)	Who is Responsible	Who will Support	Funding sources
Section C	**SITE MANAGEMENT**						
C1b	Volunteer Patrol		$1,000 (annually)	$5,000 (annually: based on level of effort)	Caretaker	Parks and Rec.	Donations,
C1, C2	Patrol and public safety, property management and maintenance	May need personnel in addition to caretaker	$? Annually Depends on level of use	$? Annually Depends on level of use	City	Volunteers	Fund Raisers General Fund
	Site management, equipment and supplies	Allowance	$1,000 (annually)	$5,000 (annually)	City	Donations	General Fund Grants
		Subtotal annual costs	**$2,000**	**$10,000**			
			Plus staff time	**Plus staff time**			
OVERALL COST SUMMARY							
	Subtotal One Time Costs	**up to**	**$783,252**	**$803,746 $1,053,171**			
	Contingency - 15% For unknown factors and costs	**up to**	**$117,488**	**$120,562 $157,976**			
	Subtotal	**up to**	**$900,740**	**$924,308 $1,211,147**			
	Design, Engineering and Project Management	**15% of One Time Costs**	**$135,111**	**$138,646 $181,672**	Public Works & Parks and Rec	Consultants, Contractors	General Fund
	Grand Total Costs	**One Time Costs up to**	**$1,035,851**	**$1,062,954 $1,392,819**			
		Annual Costs	**$5,800 Plus staff time**	**$19,700 Plus staff time**			

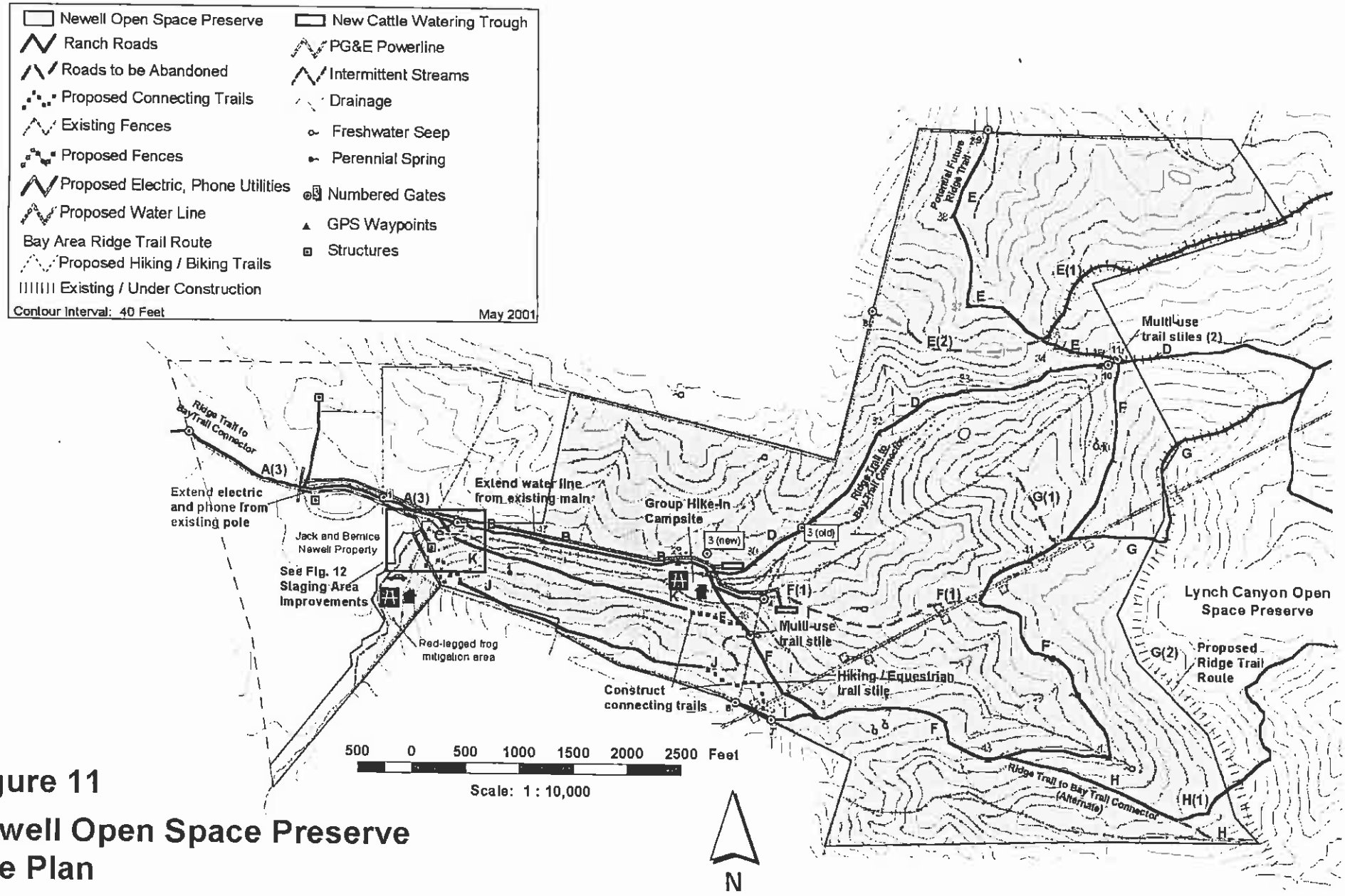


Figure 11

Newell Open Space Preserve
Site Plan

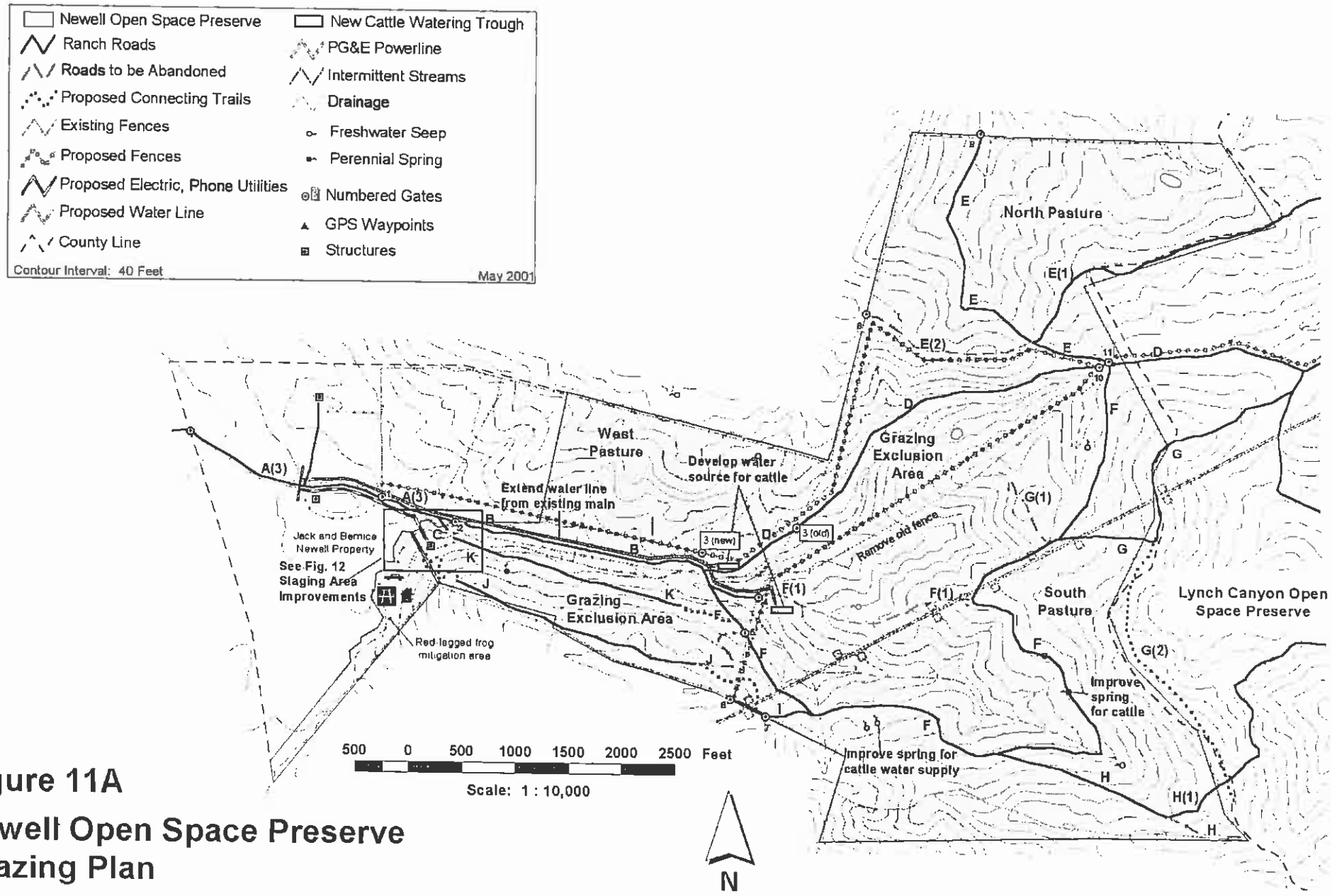


Figure 11A

Newell Open Space Preserve Grazing Plan

Newell Open Space Preserve Management Plan - Road Inventory and Assessment

5/10/01, Bruce Randolph Anderson & Associates

Terms:

Willow Erosion Control Plantings = bedded cuttings or live stakes

Rock Check = engineered size rock energy dissapator

Rock Toe or Slope Reinforcement = stacked engineered size large rock, 1st course bedded at least 1/2 below grade

Note: GPS points begin at 26

Notes:

1. This inventory and assessment is for general planning purposes only. All recommendations and costs should be subject to review and development of specific plans and estimates by qualified engineers or contractors.
2. See list of design and construction reference documents for more detail on recommended treatments.
3. Total of all costs is $56,400 to $65,700, which assumes work is combined as part of large projects and completed primarily with in-house labor, supplemented by contractor and volunteer assistance and some rented equipment. Market rate contractor costs would be substantially higher.

Segment A(1) Napa Junction Road from Highway 29 to Lena's Tavern- Paved public road approx. 20' wide extends approx. 1150 l.f., ends at telephone pole N.E. of Lena's (see report text for description).				**General Recommendation:** No improvements required.	**Approx. Cost:** $0 / **Priority:** N.A.
Segment A(2) Main access road - Private road extending approx. 1700 l.f. from end of Napa Junction Road to Newell property. (see report text for description)				**General Recommendation:** Significant access issues, improvements required - see report text.	**Approx. Cost:** See Summary/Est / **Priority:** Critical
Segment A(3) - Main access road - private road on Newell property, 2,500 l.f. from A(2) to Gate 2, Segment B. (see report text for description)				**General Recommendation:** Significant access issues, improvements required - see report text.Compacted subgrade and 6" base rock surface recommended from Newell driveway to Segment B to accommodate public and caretaker access.	**Approx. Cost:** See Summary/Est / **Priority:** Critical
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific Recommendations**	
	A(3)	Deep potholes just east of Newell driveway	A1	Fill with compacted base rock as temporary fix until major road improvements	$200 / **High**
	A(3)	No fence exists on n. side of road between Gate 1 and Gate 2.	A2	Install fence on n. side of road to provide for public access (see grazing plan for addl. fencing and gating recommendations)	$500 / **High**

Segment B - Main access road/lower main canyon road, Gate 2 to creek crossing/start of Segments D and F, 2500 l.f, of which 200 l.f. is off Preserve property. Gently sloped and curving dirt road 12' wide parallels creek on cut/fill bench approximately 16' to 20' wide.				**General** Recommendations: Construct new access road to junction with Segment C: 20' wide with 6" deep compacted base rock surface over compacted subgrage sloped min. 2% for drainage. Option in Summary/Estimate to place all-weather base rock surface. Provide rolling dips where possible to improve drainage. Install new cattle fence to n. to separate pasture from public access area.	**Approx. Cost:** Drain dips $1,000 - $1,500. Surfacing see Summary/ Estimate	**Priority: Critical**
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific** Recommendations		
26		Gully near Gate 2 has been partially filled with rock, temporary 12" PVC culvert installed	B1	Needs permanent culvert, additional rock, re-shaping and/or planting to reduce gullying	$1,000	**Medium**
27		Creek bank failure on s. side (near conc block) - caused or worsened by cattle?		Place rock at toe of slope, willow planting to protect bank; fence cattle out of creek	$1,500	**High**
	27A	Pile of rusting fence material on s. side of road		Remove	$0	**Medium**
47		Small gully on n. side		Need small culvert at road; head cut in drainage to n. needs re-shaping, planting to prevent gullying.	$1,500	**Medium**
	47A	Low-lying road section approx. 10 yards long	B2	Fill with compacted base rock; may need to fill/regrade section for better drainage	$1,500	**High**
28		Temporary 12" x 20' ABS culvert		Size and install longer permanent culvert	$2,000	**Medium**
29		Low area n. of creek crossing - wet and poor draining		Regrade, possibly fill, create ditch to drain	$1,000	**High**

Segment C - Access road to barn area, 150 l.f. incl. 50' beyond creek centerline, 70 l.f. on Preserve property. This would be a new road. Road currently connects to temporary creek ford a few yards to the east.				**General Recommendations:** Construct new access road 20' wide with 6" deep compacted base rock surface over compacted subgrage sloped min. 2% for drainage.	**Approx. Cost:** See Summary/ Estimate	**Priority: Critical**
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific Recommendations**		
	C	Crossing of main canyon intermittent stream, approx. 10-12' from top of bank to top of bank, 5' deep. Evidence of bank retaining left from previous bridge.	C1	Install railroad flat car bridge founded on earth well back from top of bank on both sides. Provide vehicle guard rail on bridge and approaches and pedestrain railings on bridge.	See Summary/ Estimate	**Critical**
	C	Cut for temporary creek crossing to e. of recommended bridge crossing	C2	Restore disturbed area by seeding and mulching if required, Install stepping stones or small bridge for pedestrian crossing?	$500	**Medium**

Segment D - Upper main canyon road, 6000 l.f. A dirt road approximately 12' wide on a cut/fill bench. Initially gentle climb with steep side slopes, climbs more steeply beyond gate, with high banks, then levels off, widens out through eucalyptus grove, then climbs in narrow canyon with steep banks above and below. Portions are sloped to drain to outside but have intervening berm. Other portions slope to inside ditch. **Photos D1, D2**				**General Recommendations: Provide rolling dips (preferred) or waterbars where possible to improve drainage. Locate so outfall is at gentlest slopes available; provide rock checks and/or willow plantings at outfall to prevent slope erosion. Cost for improvement to all-weather base rock surface is in**	**Approx. Cost:** $1,500 - $3,000	**Priority: High**
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific Recommendations**		
30		Bank failure between creek and road on s. side	D3	Needs rock toe reinforcement, earth bank fill with erosion control planting - willows; mulch, seed disturbed ground	$2,000	**High**
	Gate 3	Inoperable gate in pasture cross-fencing		Install new gate in new location in conjunction w/ grazingIng improvements	See Summary/ Estimate	**N.A.**
31		Actively eroding gully on s. side	D4	Earth fill, rock toe, willow plantings, seed and mulch disturbed ground	$1,500	**High**
32		Gully on both sides of road - not as actively eroding as 31		Reshape, willow plantings, rock check, seed and mulch disturbed ground	$1,500	**Medium**
33		Active erosion on s. side of road, creekbank failure cutting into road - similar to 30	D5	Needs rock toe reinforcement, earth bank fill with erosion control planting - willows; mulch, seed disturbed ground	$2,500	**High**
50		Major slide on slope s. of creek (doesn't threaten road). Probably natural condition, but may be worsened by cattle	D6	Fence cattle out of steep slopes and creek in this area. Revegetating these drainages is part of creek work Summary/Estimate	See Grazing Plan, Summary/ Estimate	**N.A.**
		Bank failure on n. side threatens road		Reshape bank, place rock toe reinforcement, seed and mulch disturbed areas	$500	**Medium**
34		Active erosion gully on both sides	D7	Needs culvert, rock checks, erosion control plantings	$1,500	**High**
35		Major active erosion gully on both sides of road along head of creek drainage	D8, D9	Needs regrading, culvert, rock checks, willow plantings in drainages, seed and mulch disturbed areas	$3,000	**Critical**

Segment E - North canyon road, Segment D to Gate 9, 3400 l.f. A little-used road connecting to property owned by Azevedo. Initial segment cut into rolling terrain acrosss ridge is typically out-sloped for drainage. Generally in good condition. See report text regarding Lynch Canyon trail study proposals.				**General** Recommendation: No work required except at specific locations noted.	**Approx. Cost:** $0	**Priority:** N.A.
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific** Recommendations		
36		Minor bank slipout		Regrade	$200	**Medium**
37		Gully on n. side eroding back across road		Needs culvert, fill gully, place rock and/or planting to prevent gullying, seed disturbed areas	$1,500	**High**
38		Gully on n. side eroding back across road		Needs culvert, fill gully, place rock and/or planting to prevent gullying, seed disturbed areas	$1,500	**High**
	38A	Ravine crosses road - very flat area		Needs culvert or small bridge - or just leave if low traffic	$1,000	**Low**

Segment E(1) - North ridge road east, Segment E to e. property boundary, 2800 l.f. Eventually leads to gate at Lynch Canyon Preserve n. boundary. A steep climb straight up ridge, then winds and dips along ridge. Very little used and thus in excellent condition. See report text regarding Lynch Canyon trail study proposals. **Photos E1, E2**	**General Recommendation:** Initial steep section may experience erosion with heavier use. Use compacted base rock, or if necesary excavate and place engineered rock mat for wear-resistant surface.	**Approx. Cost:** $2,000 **Priority:** Currently Low

Segment E(2) - North ridge road, Segment E to Gate 8 at w. property boundary, 1700 l.f. A steep climb stralght up ridge, then winds and dips along ridge. Very little used and thus in excellent condition.	**General Recommendation:** Discourage use; do not designate as public trail to avoid encouraging tresspass or unauthorized trail connections.	**Approx. Cost:** $50 for signs **Priority:** Medium

Segment F - South canyon road, 9600 l.f. total, looping from segment D past G, H, I, J, and back to D. Dirt road generally 12' wide, initial segment to PG&E line traverses gentle terrain, then steeper slopes, including very active slide zone at crossing of south canyon. Road is used by PG&E for access to towers. **Photos F1, F2**				**General Recommendations:** Provide rolling dips (preferred) or waterbars where possible to minimize runoff on the road. Locate so outfall is at gentlest slopes available; provide rock checks and/or willow plantings at outfall to prevent slope erosion (in addition to locations noted below).	**Approx. Cost:** $2,000 - $4,000	**Priority: High**
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific Recommendations**		
40		Minor gully on w. side eroding toward road		Rock check, re-shape gully, erosion control planting	$1,000	**Medium**
41		Slope failure has undermined road		Rock fill at toe of failure with earth fill above, erosion control planting	$2,000	**High**
	41A	Minor gully s. side of road		Rock check, re-shape gully, erosion control planting	$500	**Medium**
	41B	Old concrete pipe segment, 5' dia. Used for water trough fed by seep, apparently functional	F3	Improve condition and function, improve adjacent surface with gravel, fence spring area from cattle: cost in Grazing Plan, Summary/Estimate	$0	**High**
42		Major slides in this area, road dropped several feet, old CMP culverts displaced. This area is likely to continue to slide.	F4	Remove old culverts, install new culvert(s), reshape, plant in drainage, seed disturbed ground, place rock in gully to prevent further erosion	$5,000	**Critical**
	42A	At least 3 locations where gullying on n. side threatens road	F5	Re-shape gully, erosion control planting, rock checks	$1,500	**High**
43		Old gully above new slump on s. side		Reshape, install drain to intercept subsurface water, seed disturbed ground	$1,000	**Medium**
44		Wet hillside on s. side; natural seep, churned up by cattle. Water trough (old bathtub) overturned nearby	F6	Fence the wet area, conduct water to trough in flat area to west if needed for cattle, install ditch and culvert to conduct overflow across road	$2,000	**High**
	44A	Low point/ drainage crossing road just e. of junction of F and I (no current damage)		Culvert needed	$500	**Medium**
46		Recent slope failure across road has been regraded	F7	Install rock slope reinforcement on uphill side, subdrain(s) to intercept water, waterbars in road	$1,500	**Medium**
	46A	Crossing of s. canyon intermittent stream, flat topography, original culvert has been undermined or removed, is lying on site.	F7	Very flat topography requires multiple culverts or small bridge	$2,000	**High**
29		48" CMP, 8' long at creek crossing	F8, F9	Needs lowering and/or multiple culverts, silt removal, longer culvert(s), sacked concrete or large rock headwalls	$5,000	**Critical**

Segment F(1) - Central ridge road, 2600 l.f. F at upper end to F at lower end. Upper portion cut in sides of ridge to provide access to PG&E towers. Lower portion runs steeply straight down ridge through Gate 4 in cross-fencing. Little used, especially lower segment.	**General Recommendation:** Abandon middle segment as a road or trail; place signs. May require light grading and seeding of abandoned segment. Maintain Gate 4 and short segment of road at west end for access to proposed water trough.	**Approx. Cost:** $500	**Priority: High**
Segment G - East ridge road, 1900 l.f. total to second/last crossing of property line. Climbs to and winds along ridge in gentle terrain. Used by PG&E for access to towers. See report text regarding Lynch Canyon trail study proposals.	**General Recommendation:** no work required.	**Approx. Cost:** $0	**Priority: N.A.**
Segment G(1) - Central spur road. Little used spur road running 900 l.f. n.w. from intersection of F to G.	**General Recommendation:** do not designate as a public trail; would encourage unauthorized connections down steep slope and across creek; abandon if not required for cattle operations. Place signs to close.	**Approx. Cost:** $50 for signs	**Priority: Medium**
Segment G(2) - Proposed Ridge Trail route. Proposed new trail **approx. 3,500** l.f. from H to G. Appears to be entirely on Newell property. See report text regarding Lynch Canyon Ridge Trail study proposals.	**General Recommendation:** coordinate with Lynch Canyon trail planning and construction.	**Approx. Cost:** $0	**Priority: High**
Segment H - Southeast boundary road, 2200 l.f. F to property line. Little-used road climbs steeply, mostly out-sloped. Extends to s.e. boundary of property. Forks on e. side of ridge, where n. fork crosses onto Lynch Canyon Preserve. See report text regarding Lynch Canyon trail study proposals.	**General Recommendation:** Abandon the portion of H to the east of H(1). Sign as closed.	**Approx. Cost:** $50 for signs	**Priority: Medium**
Segment I - South boundary/PG&E road, 800 l.f. total, segment F to Gates 6 and 7. A short road providing access to PG&E towers. Both gates are pipe frame wire "sheep gates" in good condition. Access to the wooded south ridge is more level from I than from J, though only a cattle trail exists as a connection.	**General Recommendation:** no work required. Use this route as a trail connection to the south ridge, rather than Segment J.	**Approx. Cost:** $0	**Priority: N.A.**
Segment J - South ridge road, 3300 l.f. from segment F/Gate 6 to top of ridge. Initial section is a road cut into a steep hillside. The first section is too steep to be practical as a road or a trail. Road continues as a winding track, meandering along with cattle trails to the w. end of the ridge. **Photos J1, J2**	**General Recommendation:** Abandon the first section as a road or trail. Construct approx. 1,500 l.f. of new trail, including trail stile at connection to segment I, and switch backs at the w. end to connect to the barn/parking area; improve/define approx. 2,750 l.f. existing route.	**Approx. Cost:** $2,500 to $5,000, assuming vol. help	**Priority: High**

Segment K - Woodland Trail, 2200 l.f. total from C to F. An old road cut into steep n.-facing hillside or crossing more gentle wooded slopes. Unused for a long time and not drivable. Short portions have steep grades. Road peters out about a thousand feet short of connection to F. May never have connected or have been obliterated by slides and vegetation.				**General Recommendation:** Maintain as a trail connection only: need to improve/define approximately 800 l.f. of existing route at the e. end to connect to F, and at w. end to new trail J. A scenic and shady alternative to main canyon trail.	**Approx. Cost:** $800 to $1,600 assuming vol. help	**Priority: High**
GPS Point	**Approx. Location**	**Description**	**Photo**	**Site-Specific Recommendations**		
	K	A natural spring has been developed with a pipe and rock pools. An obvious acorn grinding rock is also located at this point. The spring is being heavily impacted by cattle.	K1	Fence the spring and grinding rock to protect from cattle (part of grazing management plan). Restore the spring and drainage. Place interpretive sign.	**Approx. Cost:** $200	**Priority: Medium**

REVISED NEWELL MASTER PLAN COSTS, WITH CRITICAL COSTS SEPARATED

Report Reference	Item	Work Scope/Comments	Critical Costs (year 2001 $)	Needed To Complete Plan (year 2001 $)	Approx. Long term Costs (year 2001 $)	Annual Costs (year 2001 $)
Section A	**RESOURCE PROTECTION and RESTORATION**					
A1	Basic Vegetation and Wildlife Management	Annual allowance for seeds, pesticides			5,000	1,000
A1a, A2a	Detailed Management Plan	Prepare specific plan and program for restoring streams, native vegetation				
A3, B7d	Cultural Resources (also addresses Environ-mental Education, B7d)	Exhibits and materials (any site assessments funded in conjunction with other projects)		5,000	10,000	500
A4a-e, A5 p 2-17	Geology, Soils and Hydrology	Creek and dralnage restoratlon program. 5,000 lineal feet @ $50 to $80 per lineal foot.		250,000	150,000	
A5 (Costs)	Grazing Management Water and Cross Fencing Perimeter Fencing	(Grant Portion: $10,260)	32,034	25,800		
		Subtotal one time costs	**32,034**	**280,800**	**160,000**	
Section B	**SITE USE and IMPROVEMENT**					
B1, B2	Designate Trails and Trail Uses	No costs				
B3a-c	Designate Use Area, Programs	No costs, or are in other categories				
B3d	Stable Facilities	If sufficient land is available		50,000		
B3e	Old Mine Tunnel	Security gate for mine	500			

REVISED NEWELL MASTER PLAN COSTS, WITH CRITICAL COSTS SEPARATED

Report Reference	Item	Work Scope/Comments	Critical Costs (year 2001 $)	Needed To Complete Plan (year 2001 $)	Approx. Long term Costs (year 2001 $)	Annual Costs (year 2001 $)
B4	***Facilities and Fixtures***					
B4a	Restrooms: H.C. Accessible	Initially 2 rented portables				1,800
		Long term pre-fab vault units 2 @ $25,000 ea.			50,000	
B4b	Picnic Tables	Long-term 8 for staging area	6,000	3,600		
		3 for camp @ $1200 ea.	2,400	1,200		
B4b	Benches	Long term 12 @ $500 ea.	3,000	3,000		
B4c	Trash Receptacles	2 for staging area	800			
B4d	Vehicle Gates	12' steel: 7 @ $1500 ea.	10,500			
B4d	Trail Gates, Stiles, per standard details	Hiker/H.C.access: 2 @ $500	1,000			
		Multi-use: 2 @ $1000 ea.	2,000			
B4e	Signs, Maps, Brochures	Allowance				1,200
	Main Entry Signs		2,000			
		Subtotal one time costs	**28,200**	**57,800**	**50,000**	
B6	***Vehicle Access/Circulation See Access & Circulation Estimate Notes***					
B5	Internal Road and Trail Improvements	See detail in Road Assessment	13,000	52,700		
B6a	Short Term Access 6" base rock on graded and compacted surface	End Watson Lane to new bridge: 12' wide w/ 8' wide turnouts every 500'		232,368		
B6c	Short Term Parking Area (same as above)	From bridge to parking areas for public and caretaker		261,868		
B6b	Long Term Access 3" a.c. on 6" base rock	Future Flosden Road to bridge, 20' wide w/ curbs			250,000	
B6c	Long-Term Parking Area 3" a.c. on 6" base rock	Pave and double size of public parking area			100,000	
B6d	Railcar Bridge	w/bumpers and guardrails	30,000			
B5d	All-weather road to ridge	6" base rock w/turnouts			142,056	
		Subtotal one time costs	**43,000**	**546,936**	**492,056**	**2,000**

REVISED NEWELL MASTER PLAN COSTS, WITH CRITICAL COSTS SEPARATED

Report Reference	Item	Work Scope/Comments	Critical Costs (year 2001 $)	Needed To Complete Plan (year 2001 $)	Approx. Long term Costs (year 2001 $)	Annual Costs (year 2001 $)
B7	Barn Use and Improvements	Replace roof and reinforce structure	5,000			
		Enclose bay, add electrical, lighting, concrete pads		15,000		
B8	Utilities and Services	Connection/permit fees	1,000			
B8a1	Provide water to staging area and caretaker's residence: connect to City of Vallejo main at Newell driveway	Backflow preventer	5,000			
		4" main: 1850 l.f @$20/ l.f.	27,000			
		3 - 1" water meters for barn, house, and camp/cattle	1,000	2,000		
		1 1/4" water lines to barn, house: 400 l.f.@ $2/l.f.		800		
		Fire hydrant at Staging Area	2,000			
B8a2	Extend water to group camp and pastures	1 1/4" line (cost is included in grazing management)				
B8a3	Faucets/Drinking Fountains	At barn, house and camp (3)		3,000		
B8b	Electric, phone service	Extend on poles approx. 1850 l.f. to barn and house		18,500		
		Subtotal one time costs	**41,000**	**39,300**	**0**	
B9	Caretaker's residence					
B9a1	House, pad, and foundation	Pre-fab unit < 2000 s.f.		100,000		
B9a3	Garage/ storage building	Approx. 20' x 20'			20,000	
	Propane tank, enclosure			2,000		
B9b	Septic system			20,000		
	Drive/parking	Cost included in on-site circulation				
	Fencing and Landscaping	Allowance		5,000		
		Subtotal one time costs	**0**	**127,000**	**20,000**	

REVISED NEWELL MASTER PLAN COSTS, WITH CRITICAL COSTS SEPARATED

Report Reference	Item	Work Scope/Comments	Critical Costs (year 2001 $)	Needed To Complete Plan (year 2001 $)	Approx. Long term Costs (year 2001 $)	Annual Costs (year 2001 $)
Section C	**SITE MANAGEMENT**					
C1b	Volunteer Patrol	Annual Costs depend upon level of use; Long-term costs are annual			5,000	1,000
C1, C2	Patrol and public safety, property management and maintenance	May need personnel in addition to caretaker			Varies	Varies
	Site management, equipment and supplies				5,000	1,000
		Subtotal *annual* costs	0		**10,000**	
		Plus in-house Staff time				
OVERALL COST SUMMARY						
	Subtotal One Time Costs		**144,234**	**1,051,836**	**722,056**	
	Contingency - 15%		21,635	157,775	108,308	
	Subtotal		165,869	1,209,611	830,364	
	Design, Engineering and Project Management	15% of One Time Costs	24,880	181,442	124,555	
	Grand Total Costs	**One Time Costs**	**190,749**	**1,391,053**	**954,919**	
	Total Project Costs		**2,536,722**			
	Annual Costs:	**Initially**	**8,500**			
		Long-term	**23,500**			

VASCULAR PLANTS OCCURING AT NEWELL CANYON OPEN SPACE

Pteridophytes - Ferns and Allies

Adiantum jordanii	California maidenhair fern
Dryopteris arguta	California wood fern
Equisetum laevigatum	Braun's scouring rush
Equisetum telmateia ssp. braunii	giant horsetail
Pentagramma triangularis ssp. triangularis	goldenback fern
Polypodium glycyrrhiza	Polypody
Polystichum imbricans ssp.	sword fern
Pteridium aquilinum var. pubescens	western bracken

Anthophytes – Flowering Plants

Dicots

ANACARDIACEAE

Toxicodendron diversilobum	poison oak

APIACEAE

Angelica californica	California angelica
Heracleum lanatum	cow parsnip
Lomatium macrocarpum	large-fruited lomatium
Lomatium nudicaule	pestle parsnip
Lomatium utriculatum	foothill lomatium
Osmorhiza chilensis	mountain sweet cicely
Perideridia kelloggii	Kellogg's yampah
Sanicula bipinnatifida	purple sanicle
Sanicula crassicaulis	pacific snakeroot
Scandix pectin-veneris	Spanish needles *
Torilis nodosa	knotted hedge parsley *

ARISTOCHIACEAE

Aristolochia californica	dutchman's pipe

ASTERACEAE

Achillea millefolium	common yarrow
Agoseris grandiflora	large-flowered agoseris
Artemisia douglasiana	Douglas's mugwort
Artemisia californica	California sagebrush
Baccharis pilularis	coyote brush
Balsamorhiza macrolepis ssp. macrolepis	California balsamroot
Carduus pycnocephalus	Italian thistle *

Centaurea calcitrapa	purple star thistle *
Centaurea solstitialis	yellow star thistle *
Cirsium vulgare	bull thistle *
Cotula coronopifolia	brass buttons *
Erigeron petrophilus ssp. petrophilus	rock daisy
Eriophyllum lanatum var. achillaeoides	woolly sunflower
Gnaphalium canescens ssp. beneolens	slender cudweed
Gnaphalium purpureum	purple cudweed
Gnaphalium stramineum	cotton-batting plant
Hemizonia congesta ssp. luzulifolia	hayfield tarweed
Hesperevax sparsiflora var. sparsiflora	erect hesperevax
Heterotheca sessiliflora ssp. bolanderi	Bolander's hairy golden aster
Lagophylla ramosissima	common haireleaf
Madia gracilis	slender madia
Picris echioides	prickly ox-tongue *
Silybum marianum	milk thistle *
Sonchus oleraceus	sow thistle *
Wyethia angustifolia	narrow-leaved mule ears
Wyethia glabra	glossy mule ears
BERBERIDACEAE	
Berberis pinnata ssp. pinnata	California mahonia
BETULACEAE	
Corylus cornuta var. californica	California hazelnut
BORAGINACEAE	
Amsinckia menziesii ssp. intermedia	common fiddleneck
Cynoglossum grande	grand hound's tongue
BRASSICACEAE	
Brassica niger	black mustard *
Cardamine californica ssp. californica	California milkmaids
Erysimum capitatum var.	wallflower
Rorippa nasturtium-aquaticum	
Sisymbrium officianale	hedge mustard *
CAPRIFOLIACEAE	
Lonicera hispidula var. vacillans	hairy honeysuckle
Sambucus mexicana	desert elderberry
Symphoricarpus albus ssp. laevigatus	common snowberry
CARYOPHYLLACEAE	
Silene californica	California Indian pink
Silene gallica	windmill pink *
Stellaria media	common chickweed *

CONVOLVULACEAE	
Calystegia subacaulis ssp. subacaulis	hill morning glory
Calystegia ssp.	morning glory
CRASSULACEAE	
Dudleya cymosa ssp. cymosa	live forever
CUCURBITACEAE	
Marah fabaceus	California manroot
DIPSACACEAE	
Dipsacus sativus	Fuller's teasel *
ERICACEAE	
Arbutus menziesii	madrone
FABACEAE	
Lathyrus jepsonii ssp. californicus	Jepson's pea
Lathyrus vestitus var. vestitus	hillside pea
Lotus corniculatus	bird's foot trefoil *
Lupinus bicolor	miniature lupine
Lupinus succulentus	succulent lupine
Medicago arabica	black medic *
Medicago polymorpha	bur clover *
Trifolium dubium	shamrock *
Trifolium hirtum	rose clover
Trifolium subterraneum	subterranean clover *
Vicia ameicana var. Americana	American vetch
Vicia sativa ssp. nigra	winter vetch *
Vicia sativa ssp. sativa	spring vetch *
GERANIACEAE	
Erodium botrys	long-beaked filaree *
Erodium cicutarium	red-stemmed filaree *
Geranium dissectum	cut-leaved geranium *
Geranium molle	dove's foot geranium *
GROSSULACEAE	
Ribes victoris	Victor's gooseberry
HIPPOCASTANACEAE	
Aesculus californica	buckeye
HYDROPHYLLACEAE	
Phacelia distans	common phacelia
Phacelia imbricata	imbricate phacelia

Nemophila heterophylla	woodland nemophila
LAMIACEAE	
Marrubium vulgare	horehound *
Mentha pulegium	pennyroyal *
Monardella villosa ssp. villosa	coyote mint
Stachys ajugoides var.. ajugoides	hedge nettle
Stachys ajugoides var. rigida	rigid hedge nettle
LAURACEAE	
Umbellularia californica	California bay
LYTHRACEAE	
Lythrum hyssopifolia	hyssop-leaved loosestrife *
MYRTACEAE	
Eucalyptus globules	blue gum *
ONAGRACEAE	
Epilobium brachycarpum	panicled willowherb
Zauschneria californica	California fuchsia
PAPAVERACEAE	
Eschscholzia californica	California poppy
Platystemon californicus	cream cups
PLANTAGINACEAE	
Plantago erecta	dwarf plantain
Plantago subnuda	Mexican plantain
Plantago lanceolata	English plantain *
POLYGONACEAE	
Eriogonum nudum var. oblongifolium	nudestem buckwheat
Rumex acetosella	sheep sorrel *
Rumex crispus	curly dock *
PORTULACACEAE	
Claytonia perfoliata ssp. perfoliata	miner's lettuce
PRIMULACEAE	
Anagallis arvensis	scarlet pimpernel *
RANUNCULACEAE	
Ranunculus californicus	California buttercup

Ranunculus muricatus	prickleseed buttercup *
RHAMNACEAE	
Rhamnus californica ssp. californica	California coffeberry
ROSACEAE	
Acaena pinnatifida var. californica	California acaena
Holodiscus discolor	ocean spray
Malus sylvestris	apple *
Potentilla glandulosa ssp.	sticky cinquefoil
Rosa californica	California rose
Rosa spithamea	ground rose
Rubus discolor	Himalayan blackberry
Rubus ursinus	California blaclkberry
RUBIACEAE	
Galium aparine	cleavers *
Galium murale	wall bedstraw *
Galium porrigens ssp. porrigens	climbing bedstraw
SALICACEAE	
Salix exigua	sandbar willow
Salix lasiolepis	arroyo willow
Salix lucida ssp. lasiandra	red willow
SAXIFRAGACEAE	
Lithophragma affine	woodland star
SCROPHULARIACEAE	
Bellardia trixago	bellardia *
Castilleja affinis ssp. affinis	coast paintbrush
Castilleja affinis ssp. neglecta	Tiburon paintbrush
Castilleja exserta ssp. exserta	purple owl's clover
Castilleja rubicundula ssp lithspermoides	cream sacs
Mimulus aurantiacus	sticky monkeyflower
Mimulus guttatus	seep-spring monkeyflower
Scrophularia californica ssp.	California figwort
Triphysaria pusilla	dwarf owl's clover
Veronica americana	american brooklime
SOLANACEAE	
Solanum americanum	small flowered nightshade
Solanum umbelliferum	blue witch
URTICACEAE	
Urtica dioca ssp. holsericea	hoary nettle

VIOLACEAE	
Viola pedunculata	Johnny jump-ups
VISCACEAE	
Phoradendron macrophyllum	long-spiked mistletoe

Monocots

CYPERACEAE	
Carex barbarae	Santa Barbara sedge
Carex deweyana var. leptopoda	short-scaled sedge
Cyperus eragrostis	yellow-nutsedge
Eleocharis macrostachya	creeping spikerush
Scirpus koilolepis	keeled clubrush
Scirpus americanus	american bulrush
IRIDACEAE	
Iris macrosiphon	bowl-tubed iris
Sisyrinchium bellum	blue-eyed grass
JUNCACEAE	
Juncus balticus	Baltic rush
Juncus effusus var. pacificus	pacific bog rush
Juncus mexicanus	Mexican rush
Juncus xiphioides	Iris-leaved rush
Luzula subsessilis	common wood rush
LILIACEAE	
Allium serra	serrated onion
Calochortus luteus	gold nuggets
Chlorogalum pomeridianum var. pomeridianum	Indian soap
Dichelostemma capitatum ssp. capitatum	blue dics
Dichelostemma congestum	ookow
Disporum hookeri	Hooker's fairy bells
Smilacina stellata	star false solomon's seal
Trillium chloropetalum	giant trillium
Zigadenus fremontii	Fremont's star lily
ORCHIDACEAE	
Corallorhiza striata	striped coral root
POACEAE	
Avena barbata	wild oats *

Bromus carinatus var. carinatus	California brome
Bromus daindrus	rip-gut grass *
Bromus hordeaceus	soft chess *
Bromus laevipes	woodland brome
Cynsurus echinatus	dogtail grass *
Elymus elymoides ssp. elymoides	bottlebrush squirrel-tail
Elymus glaucus ssp. glaucus	western rye grass
Elymus multisetus	big squirrel-tail
Hordeum brachyantherum ssp. brachyantherum	meadow barley
Hordeum marinum ssp. gussoneanum	Mediterranean barley *
Leymus triticoides	alkali rye
Lolium multiflorum	Italian rye *
Melica californica	California melica
Nassella lepida	small-flowered neddlegrass
Nassella pulchra	purple needlegrass
Poa annua	annual bluegrass *
Poa secunda ssp. secunda	pine bluegrass
Phalaris paradoxa	paradox canary grass *
Polypogon monspeliensis	rabbit's foot *

TYPHACEAE

Typha angustifolia	Narrow-leaved cat-tail

* = non-native species